



# 24 100M M12 + 4 Gigabit Bypass M12 Layer 3 Managed Industrial Ethernet Switch User Manual

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# Preface

Layer 3 Ethernet Switch User Manual has introduced this switch:

- Product features
- Product network management configuration
- Overview of related principles of network management

## Audience




This manual applies to the following engineers:



- Network administrators responsible for network configuration and maintenance
- On-site technical support and maintenance personnel
- Network engineers

## Text Format Convention

Format	Description
" "	Words with "" represent the interface words. Such as: "Port No."
>	Multi-level path is separated by ">". Such as opening the local connection path description: Open "Control Panel> Network Connection> Local Area Connection".
Light blue Font	It represents the words clicked to achieve hyperlink. The font color is as follows: 'Light Blue'.

## Symbols

Format	Description
 Notice	Reminder of precautions in the operation, improper operation may result in data loss or equipment damage.
 Warning	Pay attention to the notes on the mark, improper operation may cause personal injury.
 Note	Conduct necessary supplements and explanations for the description of operation content.

Format	Description
 Key	Configuration, operation, or tips for device usage.
 Tips	Pay attention to the operation or information to ensure success device configuration or normal working.

## Port Convention

The port number in this manual is only an example, and does not represent the actual port with this number on the device. In actual use, the port number existing on the device shall prevail.

## Revision Record

Version No.	Revision Date	Revision Note
01	12/28/2023	Product release

# Contents

<b>PREFACE</b> .....	<b>1</b>
<b>CONTENTS</b> .....	<b>1</b>
<b>PART ONE: OPERATION</b> .....	<b>1</b>
<b>1 LOGGING IN TO WEB INTERFACE</b> .....	<b>1</b>
1.1 SYSTEM REQUIREMENTS FOR WEB BROWSING .....	1
1.2 SET THE IP ADDRESS OF PC .....	1
1.3 LOGIN TO THE WEB CONFIGURATION INTERFACE .....	2
<b>2 SYSTEM INFORMATION</b> .....	<b>4</b>
<b>3 SYSTEM CONFIGURATION</b> .....	<b>6</b>
3.1 IP ADDRESS CONFIGURATION .....	6
3.2 USER CONFIGURATION .....	7
3.3 NETWORK DIAGNOSIS .....	8
3.3.1 Ping .....	8
3.3.2 Traceroute .....	9
3.3.3 Port Loopback .....	10
3.4 LOGIN MODE CONFIGURATION .....	12
<b>4 PORT CONFIGURATION</b> .....	<b>14</b>
4.1 PORT SETTINGS .....	14
4.2 STORM CONTROL .....	17
4.3 PORT SPEED LIMIT .....	20
4.4 PORT MIRRORING .....	22
4.5 LINK AGGREGATION .....	24
4.6 AGGREGATION PROTECTION .....	27
4.7 PORT STATISTICS .....	28
4.7.1 Port Statistics-Overview .....	28
4.7.2 Port Statistics-Port .....	29
4.7.3 Port Rate .....	30
4.8 PORT ISOLATION .....	32
4.9 LINK SHOCK PROTECTION .....	33
4.9.1 Global Configuration .....	33
4.9.2 Port Configuration .....	34
<b>5 LAYER 2 CONFIGURATION</b> .....	<b>37</b>
5.1 MAC CONFIGURATION .....	37

5.1.1	MAC Settings .....	37
5.1.2	Static MAC .....	39
5.1.3	Static Multicast MAC .....	40
5.2	VLAN CONFIGURATION .....	41
5.2.1	VLAN Configuration .....	41
5.2.2	Access Configuration .....	42
5.2.3	Trunk Configuration .....	44
5.2.4	Hybrid Configuration .....	45
5.3	SPANNING-TREE CONFIGURATION .....	50
5.3.1	Bridge Configuration .....	50
5.3.2	Instance Configuration .....	52
5.3.3	Port Configuration .....	53
5.3.4	Instance Port Configuration .....	55
5.4	ERPS CONFIGURATION .....	56
5.4.1	Timer Configuration .....	57
5.4.2	Ring Configuration .....	58
5.4.3	Instance Configuration .....	59
5.5	RING CONFIGURATION .....	61
5.6	IGMP SNOOPING CONFIGURATION .....	66
5.6.1	Global Configuration .....	68
5.6.2	Interface Configuration .....	69
5.6.3	Interface Configuration .....	70
5.6.4	Routing Interface information .....	71
5.7	PORT LOOPBACK DETECTION .....	72
5.7.1	Global Configuration .....	72
5.7.2	Port Configuration .....	74
<b>6</b>	<b>LAYER 3 CONFIGURATION .....</b>	<b>76</b>
6.1	INTERFACE CONFIGURATION .....	76
6.1.1	Layer 3 Interface .....	77
6.1.2	Loopback Interface Configuration .....	79
6.2	ARP CONFIGURATION .....	80
6.2.1	ARP Information .....	80
6.2.2	Static ARP Configuration .....	81
6.2.3	ARP Parameter Configuration .....	81
6.3	VRRP CONFIGURATION .....	82
6.4	NAT CONFIGURATION .....	4
<b>7</b>	<b>UNICAST ROUTING .....</b>	<b>7</b>
7.1	IPv4 CONFIGURATION .....	7
7.1.1	IPv4 Routing Table .....	7
7.1.2	IPv4 Static Route .....	8
7.2	RIP CONFIGURATION .....	9
7.2.1	RIP Global Configuration .....	9
7.2.2	RIP Network Configuration .....	11

---

7.2.3	RIP Interface Configuration .....	12
<b>8</b>	<b>MULTICAST ROUTING .....</b>	<b>14</b>
8.1	MULTICAST ROUTING .....	14
8.1.1	Multicast Routing .....	14
8.1.2	Multicast Translate .....	15
8.1.3	Multicast Routing Information .....	15
8.2	IGMP CONFIGURATION .....	16
8.2.1	Interface Configuration .....	16
8.2.2	SSM-Mapping Configuration .....	18
8.2.3	Multicast Group Information .....	20
8.3	PIM-SM CONFIGURATION .....	21
8.3.1	Global Configuration .....	21
8.3.2	Static RP Configuration .....	23
8.3.3	C-RP Configuration of Interface .....	24
8.3.4	Interface Configuration .....	24
8.3.5	Status Display .....	25
8.3.6	Multicast PR Address .....	26
8.4	PIM-DM CONFIGURATION .....	27
8.4.1	Global Configuration .....	27
8.4.2	Interface Configuration .....	28
8.4.3	Status Display .....	29
<b>9</b>	<b>ADVANCED CONFIGURATION .....</b>	<b>31</b>
9.1	DHCP - SERVER CONFIGURATION .....	31
9.1.1	DHCP Switch .....	31
9.1.2	Address Pool Configuration .....	32
9.1.3	Server Configuration .....	33
9.1.4	MAC Bind .....	34
9.1.5	Port Bind .....	35
9.1.6	Client List .....	36
9.2	DHCP-SNOOPING CONFIGURATION .....	37
9.2.1	Global Configuration .....	38
9.2.2	VLAN Enable Configuration .....	39
9.2.3	Binding Configuration .....	40
9.2.4	Port Configuration .....	40
9.3	DHCP-RELAY CONFIGURATION .....	42
9.4	LLDP CONFIGURATION .....	44
9.4.1	Current configuration .....	44
9.4.2	Port Configuration .....	45
9.4.3	Neighbor Information .....	47
9.5	ACL CONFIGURATION .....	48
9.5.1	Time Range Configuration .....	48
9.5.2	IP ACL Configuration .....	51
9.5.3	MAC ACL Configuration .....	53

---

9.5.4	ACL GROUP Configuration .....	55
9.6	SNMP CONFIGURATION .....	58
9.6.1	SNMP switch .....	58
9.6.2	View .....	59
9.6.3	Group .....	60
9.6.4	SNMP Group .....	60
9.6.5	V3 User .....	62
9.6.6	Trap alarm .....	64
9.7	RMON CONFIGURATION .....	65
9.7.1	Event Group .....	65
9.7.2	Statistical Group .....	66
9.7.3	Historical Group .....	67
9.7.4	Alarm Group .....	68
9.8	TIME CONFIGURATION .....	70
9.9	TIME CONFIGURATION .....	71
9.10	OSPF CONFIGURATION .....	71
9.10.1	Global Configuration .....	72
9.10.2	Network Configuration .....	73
9.10.3	Interface Configuration .....	74
9.11	IPDT CONFIGURATION .....	75
9.12	TRDP CONFIGURATION .....	76
<b>10</b>	<b>SYSTEM MAINTENANCE .....</b>	<b>78</b>
10.1	CONFIGURATION MANAGEMENT .....	78
10.1.1	Current Configuration .....	78
10.1.2	Configuration Update .....	79
10.1.3	Restore Factory Settings .....	79
10.2	ALARM CONFIGURATION .....	80
10.2.1	Port .....	80
10.2.2	Power .....	82
10.3	SOFTWARE UPGRADE .....	83
10.4	LOG INFORMATION .....	84
10.4.1	Log Information .....	84
10.4.2	Syslog Server .....	85
	<b>THE SECOND PART: FREQUENTLY ASKED QUESTIONS .....</b>	<b>87</b>
<b>11</b>	<b>FAQ .....</b>	<b>87</b>
11.1	SIGN IN PROBLEMS .....	87
11.2	CONFIGURATION PROBLEM .....	87
11.3	INDICATOR PROBLEM .....	88

# Part One: Operation

## 1 Logging in to WEB Interface

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### 1.1 System Requirements for WEB Browsing

While using managed industrial Ethernet switches, the system should meet the following conditions.

Hardware and Software	System Requirements
CPU	Above Pentium 586
Memory	Above 128MB
Resolution	Above 1024x768
Color	256 colors or above
Browser	Internet Explorer 8.0 or above
Operating system	Windows XP/7/8/10

### 1.2 Set the IP Address of PC

The switch default management is as follows:

IP Settings	Default Value
IP Address	192.168.1.254
Subnet mask	255.255.255.0

While configuring the switch via Web:

- Before remote configuration, please make sure the route between computer and

switch is reachable.

- Before local configuration, please make sure the IP address of the computer is on the same subnet to the one of switch.

Note:

While first configuring the switch, if it is a local configuration mode, please make sure that the network segment of current PC is 1.

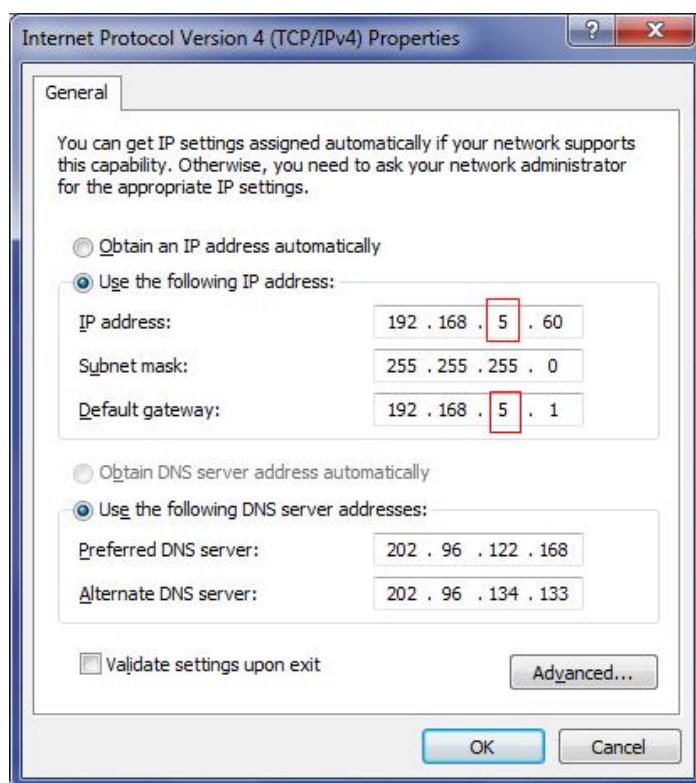
Eg: Assume that the IP address of the current PC is 192.168.5.60, change the network segment "5" of the IP address to "1".

## Operation Steps

Amendment steps are as follows:

**Step 1** Open "Control Panel> Network Connection> Local Area Connection> Properties> Internet Protocol Version 4 (TCP / IPv4)> Properties".

**Step 2** Change the selected "5" in red frame of the picture to "1".



**Step 3** Click "OK", modification is successful.

**Step 4** End.

## 1.3 Login to the WEB Configuration Interface

### Operation Steps

Log in to the WEB configuration interface as follows:

**Step 1** Run the computer browser.

**Step 2** On the address bar of browser, enter in the IP address of the switch "http://192.168.1.254".

**Step 3** Click the "Enter" key.

**Step 4** Pop-up dialog box as shown below, enter the user name and password in the login window.



The image shows a login dialog box with a light gray background and a dark gray border. It contains two input fields: 'Username' with the text 'admin123' and 'Password' with seven dots. Below the fields is a dark gray button labeled 'Login'. At the bottom, there are two checkboxes: 'Save username' and 'Save password', both of which are currently unchecked.

Note:

- The default username and password are "admin123"; please strictly distinguish capital and small letter while entering.
- Default user account has the administrator privilege.

**Step 5** Click "Login".

**Step 6** End.

After login successfully, user can configure relative parameters and information of WEB interface according to demands.

Note:

After logging in to the device, you can modify the IP address of the switch for ease of use.

## 2 System Information

### Function Description

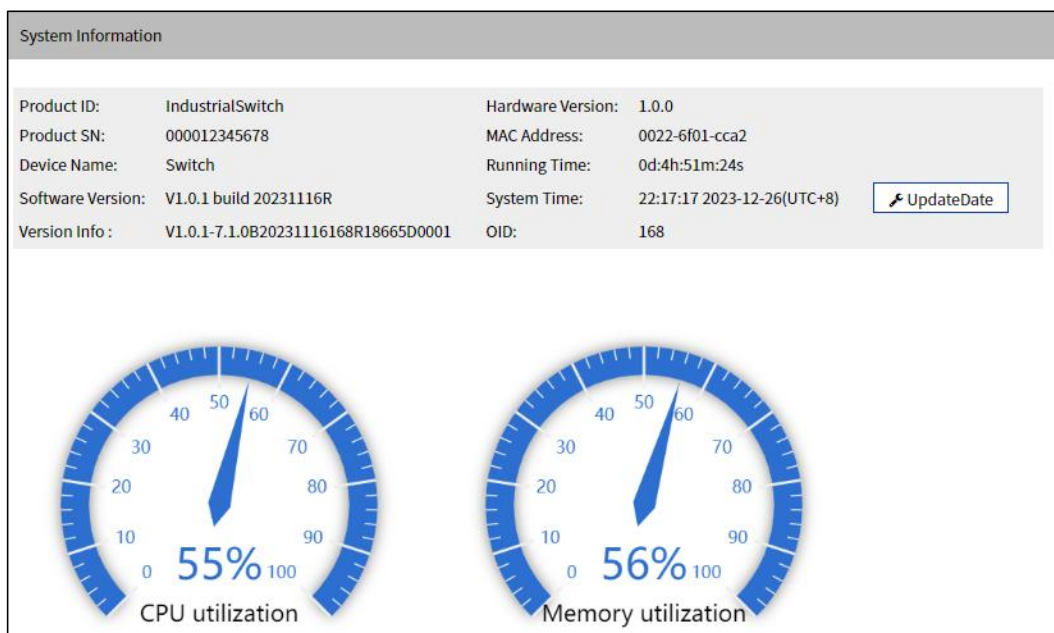
On the “System Information” page, you can view product information such as product model, hardware version, software version and MAC address.

### Operation Path

Open: “System Information”.

### Interface Description

System information interface as follows:



The main element configuration description of System Info interface:

Interface Element	Description
Product ID	Model of the device.
Product SN	Product SN
Device Name	Network identity used by the device.

Interface Element	Description
Software Version	Software version information currently in use.
Version Info	The version information of current device, such as ID-Version-Time.
Hardware Version	Current hardware version information, pay attention to the hardware version limits in software version.
MAC Address;	Hardware address of device factory configuration.
Running Time	Running time of the current device.
System Time	Current system time information. Users can specify the time zone and server in "NTP Configuration".
Update Date	Click the "Update Date" button to synchronize the local host time to the device.
CPU Utilization	CPU usage of the current device. Note: When the CPU utilization rate and memory utilization rate are lower than 90%, the system is running normally.
Memory Utilization	Memory usage of the current device. Note: When the CPU utilization rate and memory utilization rate are lower than 90%, the system is running normally.

# 3 System Configuration

## 3.1 IP Address Configuration

### Function Description

On the "IP Address Configuration" page, users can modify the vlanif1 interface address of the device. The format of IP address is: XXX.XXX.XXX.XXX/XX. For example, 192.168.1.254/24, 192.168.1.254 represents IP address, and 24 represents subnet mask 255.255.0.

### Operation Path

Open in order: "System Configuration > IP Address Configuration".

### Interface Description

IP address configuration interface is as follow:

The screenshot shows a web interface titled "IP Configuration". It features a text input field containing "192.168.1.254/24". To the right of the input field is the label "vlanif1 interface address". Below the input field is a "Set" button.

The main elements configuration description of IP address configuration interface:

Interface Element	Description
IP address	IP address and subnet mask of the device, such as 192.168.1.254/24. Note: After modifying the IP of the device, re-enter the corresponding IP address to access the WEB interface.

## 3.2 User Configuration

### Function Description

On the page of "User Configuration", user can:

- Add users, and set their login password and user rights.
- Delete user.

### Operation Path

Open in order: "System Configuration > User Configuration".

### Interface Description

The user configuration interface is as follows:

User Configuration					
<input type="checkbox"/>	Username	Password	Privilege	Protocol	Operation
<input type="checkbox"/>	admin123	admin123	15		Edit

The main element configuration description of user configuration interface:

Interface Element	Description
Username	Identification of the visitor. Note: The user name cannot be empty, and the length is less than 16 characters.
Password	Password used by the visitor. Note: Password cannot be empty and the length is less than 8 characters.
Privilege	User permissions are divided into 16 levels from 0 to 15, corresponding to 4 different types of permissions, and the corresponding relationship is as follows. <ul style="list-style-type: none"> <li>• 0: visit level, user can only check system information, device IP address and log information, and cannot modify configuration.</li> <li>• 1: check level, user can check device configuration information without modifying it.</li> <li>• 2: configuration level, user can check and configure device information, but not manage devices.</li> <li>• 3-15: manage level, user has all privileges of the device, including downloading, uploading, rebooting, modifying device information and other other operations.</li> </ul>
Protocol	The current communication protocol of the device, telnet or

Interface Element	Description
	ssh. Note: As long as the Information Security Level Protection is turned on, the protocol would be displayed. If it is not turned on, this item is reserved.

## 3.3 Network Diagnosis

Network diagnosis is used to detect the status of the network, including:

- Ping
- Traceroute
- Port Loopback

### 3.3.1 Ping

#### Function Description

On the "Ping" page, users can use the Ping command to check whether the network is clear or the network connection speed. The Ping command uses the uniqueness of the IP addresses of the machines on the network to send a packet to the target IP address, and then asks the opposite end to return a packet with the same size to determine the connection status and delay value of the two network devices.

#### Operation Path

Open in order: "System Configuration > Network Diagnosis > Ping".

#### Interface Description

The Ping interface is as follows:

The main element configuration description of Ping interface:

Interface Element	Description
IP address	The IP address of the detected device, that is, the destination address. The device can check the network intercommunity

Interface Element	Description
	to other devices via the ping command.

## Ping Configuration:

**Step 1** Fill in the IP address that needs ping in the IP address text box;

**Step 2** Click the "Start" button to check the ping results;

IP address

PING 192.168.1.62 (192.168.1.62): 56 data bytes

--- 192.168.1.62 ping statistics ---

4 packets transmitted, 0 packets received, 100% packet loss

**Step 3** End.

## 3.3.2 Traceroute

### Function Description

On the "Traceroute" page, you can test the network situation between the switch and the target host, check whether the network connection is reachable, and help analyze where the network fails. Traceroute measures how long it takes by sending small packets to the destination device until they return. Each device on a path Traceroute returns a test result three times, up to the maximum number of hops, until the destination address returns a test result. Output results include the time of each test (ms), the name of the device (if there is no name, replace it with IP address), and IP address.

### Operation Path

Open in order: "System Configuration > Network Diagnosis > Traceroute".

### Interface Description

Traceroute interface as follows:



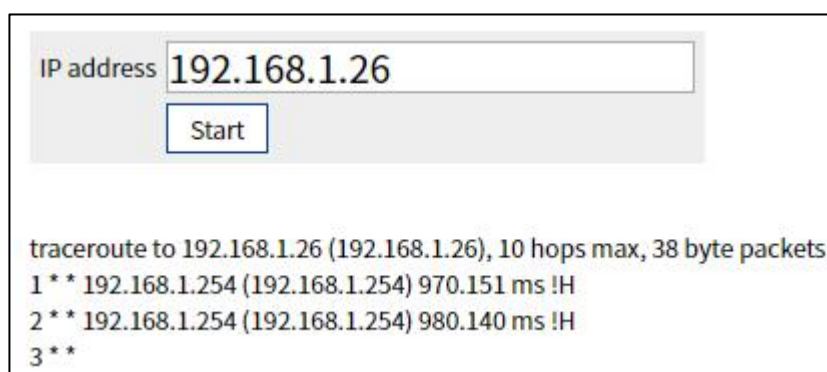
The main element configuration description of Traceroute interface:

Interface Element	Description
IP address	IP address of the destination device, fill in the IP address of the opposite device that needs to be detected.

## Traceroute Configuration:

**Step 1** Fill in the destination IP address in the "IP address" text box;

**Step 2** Click the "Start" button to check the results, as the picture below.



Note:

"\* \* \*" means that no response message is received within a certain period of time after the Nth hop. The number of device node hops in the path can be up to 10 hops.

**Step 3** End.

## 3.3.3 Port Loopback

### Function Description

On "Port Loopback" page, user can measure the loopback situation of the switch port PHY or MAC for the convenience of troubleshooting. Port loopback is a common method for the maintenance and troubleshooting of communication port line. Connect the sending end of tested device or line to its receiving end, then the tested device can judge whether the line or port exists breakpoint by receiving the signal sent by it.

The test instrument hanged on the loopback route can also test the transmission quality of the loopback route.

## Operation Path

Open in order: "System Configuration > Network Diagnosis > Port Loopback".

## Interface Description

Port loopback interface is as follows:

Port	State	Mode
<input type="checkbox"/> fe1	down	disable
<input type="checkbox"/> fe2	down	disable
<input type="checkbox"/> fe3	up	disable
<input type="checkbox"/> fe4	down	disable
<input type="checkbox"/> fe5	down	disable
<input type="checkbox"/> fe6	down	disable
<input type="checkbox"/> fe7	down	disable
<input type="checkbox"/> fe8	down	disable
<input type="checkbox"/> fe9	down	disable
<input type="checkbox"/> fe10	down	disable
<input type="checkbox"/> fe11	down	disable
<input type="checkbox"/> fe12	down	disable
<input type="checkbox"/> fe13	down	disable
<input type="checkbox"/> fe14	down	disable
<input type="checkbox"/> fe15	down	disable
<input type="checkbox"/> fe16	down	disable
<input type="checkbox"/> fe17	down	disable
<input type="checkbox"/> fe18	down	disable
<input type="checkbox"/> fe19	down	disable
<input type="checkbox"/> fe20	down	disable
<input type="checkbox"/> fe21	down	disable
<input type="checkbox"/> fe22	down	disable
<input type="checkbox"/> fe23	down	disable
<input type="checkbox"/> fe24	down	disable
<input type="checkbox"/> ge1	down	disable
<input type="checkbox"/> ge2	down	disable
<input type="checkbox"/> ge3	down	disable
<input type="checkbox"/> ge4	down	disable

The main element configuration description of port loopback interface:

Interface Element	Description (check the checkbox of the port, click "config" to configure it.)
Port	The corresponding port name of the device Ethernet port.
State	Display the connection status of the current port.

Interface Element	Description (check the checkbox of the port, click "config" to configure it.)
	<ul style="list-style-type: none"> <li>up: connected;</li> <li>down: disconnected.</li> </ul>
Mode	Port loopback method, options as follows: <ul style="list-style-type: none"> <li>Disable: the port loopback function of this port is disabled;</li> <li>MAC: Data is looped back after transmitted to the MAC layer of Ethernet;</li> <li>PHY: Data is looped back after transmitted to the physical layer of Ethernet.</li> </ul>

## 3.4 Login Mode Configuration

### Function Description

On the "Login Mode Configuration" page, Telnet service and SSH service of the device can be enabled or disabled. Telnet service and SSH service can both control the WEB or CLI interface access of devices. Their difference lies in:

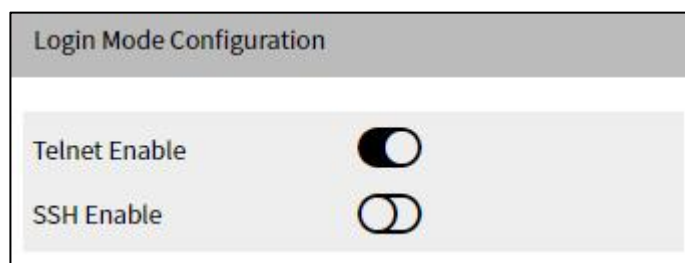
- Telnet transmission process adopts TCP protocol for plaintext transmission.
- SSH (Secure Shell) protocol provides secure remote login and encrypts transmission data, ensuring the safe transmission of data.

### Operation Path

Open in order: "System Configuration > Login Mode Configuration".





### Interface Description

Login mode configuration interface as follow:



Main elements configuration description of login mode configuration interface:

Interface Element	Description
Telnet Enable	TELNET service enable switch button, which is enabled by default. It has the following status:

Interface Element	Description
	<ul style="list-style-type: none"><li>• : represents enable;</li><li>• : represents disable.</li></ul>
SSH Enable	SSH service enable switch button, which is disabled by default. It has the following status: <ul style="list-style-type: none"><li>• : represents enable;</li><li>• : represents disable.</li></ul>

# 4 Port Configuration

---

## 4.1 Port Settings

### Function Description

On the "Port Settings" page, you can implement the following functions:

- Set parameters such as rate mode, duplex mode, flow control, maximum frame length and interface switch;
- View port status.

### Operation Path

Open in order: "Port Configuration > Port Setting".

### Interface Description

Port setting interface is as follows:

Port Setting

Config

Note: Affecting the configuration of webpage access, changing the configuration may cause the web to no longer be accessible !

Port type selection:     fe    ge

	Port	State	Medium	Rate	Duplex mode	Flow control	Max frame	Enable	Description
<input type="checkbox"/>	fe1	down	copper	auto	auto	disable	1518	enable	
<input type="checkbox"/>	fe2	down	copper	auto	auto	disable	1518	enable	
<input type="checkbox"/>	fe3	up	copper	100m( auto )	full( auto )	disable	1518	enable	
<input type="checkbox"/>	fe4	down	copper	auto	auto	disable	1518	enable	
<input type="checkbox"/>	fe5	down	copper	auto	auto	disable	1518	enable	
<input type="checkbox"/>	fe6	down	copper	auto	auto	disable	1518	enable	
<input type="checkbox"/>	fe7	down	copper	auto	auto	disable	1518	enable	
<input type="checkbox"/>	fe8	down	copper	auto	auto	disable	1518	enable	
<input type="checkbox"/>	fe9	down	copper	auto	auto	disable	1518	enable	
<input type="checkbox"/>	fe10	down	copper	auto	auto	disable	1518	enable	
<input type="checkbox"/>	fe11	down	copper	auto	auto	disable	1518	enable	
<input type="checkbox"/>	fe12	down	copper	auto	auto	disable	1518	enable	
<input type="checkbox"/>	fe13	down	copper	auto	auto	disable	1518	enable	
<input type="checkbox"/>	fe14	down	copper	auto	auto	disable	1518	enable	
<input type="checkbox"/>	fe15	down	copper	auto	auto	disable	1518	enable	
<input type="checkbox"/>	fe16	down	copper	auto	auto	disable	1518	enable	
<input type="checkbox"/>	fe17	down	copper	auto	auto	disable	1518	enable	
<input type="checkbox"/>	fe18	down	copper	auto	auto	disable	1518	enable	
<input type="checkbox"/>	fe19	down	copper	auto	auto	disable	1518	enable	
<input type="checkbox"/>	fe20	down	copper	auto	auto	disable	1518	enable	
<input type="checkbox"/>	fe21	down	copper	auto	auto	disable	1518	enable	
<input type="checkbox"/>	fe22	down	copper	auto	auto	disable	1518	enable	
<input type="checkbox"/>	fe23	down	copper	auto	auto	disable	1518	enable	
<input type="checkbox"/>	fe24	down	copper	auto	auto	disable	1518	enable	
<input type="checkbox"/>	ge1	down	copper	auto	auto	disable	1518	enable	
<input type="checkbox"/>	ge2	down	copper	auto	auto	disable	1518	enable	
<input type="checkbox"/>	ge3	down	copper	auto	auto	disable	1518	enable	
<input type="checkbox"/>	ge4	down	copper	auto	auto	disable	1518	enable	

Main elements configuration description of port settings interface:

Interface Element	Description (check the checkbox of the port, click “config” to configure it.)
Port type selection	Select the port type, and check the ports of the same type in batches: <ul style="list-style-type: none"> <li>100M port (Fe);</li> <li>Gigabit port (ge);</li> <li>10Gigabit port (xe);</li> <li>Static aggregation port (sa);</li> <li>Dynamic Aggregation Port (po).</li> </ul> Note: The port type shall be determined by the port supported by the device, and the aggregation port shall be reflected after configuration.
Port	The corresponding port name of the device Ethernet port.
State	Ethernet port connection status, display status as follows: <ul style="list-style-type: none"> <li>down: represent the port is disconnected;</li> </ul>

Interface Element	Description (check the checkbox of the port, click "config" to configure it.)
	<ul style="list-style-type: none"> <li>up: represent the port is connected.</li> </ul>
Medium	<p>The connection types of Ethernet ports, the status are shown as follows:</p> <ul style="list-style-type: none"> <li>copper: copper port medium.</li> </ul>
Rate	<p>The default is self-adaption mode, and the display status is as follows:</p> <ul style="list-style-type: none"> <li>auto: self-adaption;</li> <li>10m: 10M;</li> <li>100m: 100M;</li> <li>1g: Gigabit.</li> </ul> <p>Note: The selected maximum rate is different for different bandwidth ports.</p>
Duplex Mode	<p>The default is self-adaption mode, and the display status is as follows:</p> <ul style="list-style-type: none"> <li>auto: self-adaption;</li> <li>half: half-duplex;</li> <li>full: full duplex.</li> </ul>
Flow Control	<p>Port flow control status, the display status is as follows:</p> <ul style="list-style-type: none"> <li>disable</li> <li>tx: enable the port to send data flow control;</li> <li>rx: enable flow control of port data receiving;</li> <li>both: enable flow control of both port data sending and receiving.</li> </ul>
Max-Frame	<p>The maximum data frame length that passes Ethernet port, the default value is 1518 and the supported input range is 64~16360.</p>
Enable	<p>Enable or disable Ethernet port. Options are as follows:</p> <ul style="list-style-type: none"> <li>enable</li> <li>disable</li> </ul> <p>Notice: If the port "disable" is selected, the port will not be used.</p>
Description	<p>Port information description, supporting 24 valid characters.</p>

## 4.2 Storm Control

### Function Description

On the "Storm Control" page, user can set the maximum broadcast, multicast or unknown unicast packet flow the port allows. When the sum of each port broadcast, unknown multicast or unknown unicast flow achieves the value user sets, the system will discard the packets beyond the broadcast, unknown multicast or unknown unicast flow limit, so that the proportion of overall broadcast, unknown multicast or unknown unicast flow can be reduced to limited range, ensuring the normal operation of network business.

### Operation Path

Open in order: "Port Configuration > Storm Control".

### Interface Description

Storm control interface is as follows:

Storm Control

⚙️ Config

Note: All bandwidths are k=1000, m=1000k, g=1000m; all unrestricted or unconfigured are indicated by "-" !

Port type selection:       fe    ge

<input type="checkbox"/>	Port	Broadcast(bps)	Multicast(bps)	Unicast(bps)
<input type="checkbox"/>	fe1	1M	-	10M
<input type="checkbox"/>	fe2	1M	-	10M
<input type="checkbox"/>	fe3	1M	-	10M
<input type="checkbox"/>	fe4	1M	-	10M
<input type="checkbox"/>	fe5	1M	-	10M
<input type="checkbox"/>	fe6	1M	-	10M
<input type="checkbox"/>	fe7	1M	-	10M
<input type="checkbox"/>	fe8	1M	-	10M
<input type="checkbox"/>	fe9	1M	-	10M
<input type="checkbox"/>	fe10	1M	-	10M
<input type="checkbox"/>	fe11	1M	-	10M
<input type="checkbox"/>	fe12	1M	-	10M
<input type="checkbox"/>	fe13	1M	-	10M
<input type="checkbox"/>	fe14	1M	-	10M
<input type="checkbox"/>	fe15	1M	-	10M
<input type="checkbox"/>	fe16	1M	-	10M
<input type="checkbox"/>	fe17	1M	-	10M
<input type="checkbox"/>	fe18	1M	-	10M
<input type="checkbox"/>	fe19	1M	-	10M
<input type="checkbox"/>	fe20	1M	-	10M
<input type="checkbox"/>	fe21	1M	-	10M
<input type="checkbox"/>	fe22	1M	-	10M
<input type="checkbox"/>	fe23	1M	-	10M
<input type="checkbox"/>	fe24	1M	-	10M
<input type="checkbox"/>	ge1	10M	-	100M
<input type="checkbox"/>	ge2	10M	-	100M
<input type="checkbox"/>	ge3	10M	-	100M
<input type="checkbox"/>	ge4	10M	-	100M

Main elements configuration description of storm suppression interface:

Interface Element	Description (check the checkbox of the port, click "config" to configure it.)
Port type selection	<p>Select the port type, and check the ports of the same type in batches:</p> <ul style="list-style-type: none"> <li>100M port (Fe);</li> <li>Gigabit port (ge);</li> <li>10Gigabit port (xe);</li> <li>Static aggregation port (sa);</li> <li>Dynamic Aggregation Port (po).</li> </ul> <p>Note: The port type shall be determined by the port supported by the device, and the aggregation port shall be reflected after</p>

Interface Element	Description (check the checkbox of the port, click "config" to configure it.)
	configuration.
Port	The corresponding port name of the device Ethernet port.
Broadcast (bps)	<p>The port control for broadcast packet transmission speed, input value range:</p> <ul style="list-style-type: none"> <li>• 100M interface: 10-100,000Kbps or 1-100Mbps.</li> <li>• Gigabit interface: 100-1000000Kbps or 1-1000Mbps or 1Gbps.</li> </ul> <p>Note: Broadcast packet, namely, the data frame with the destination address of FF-FF-FF-FF-FF-FF.</p>
Multicast (bps)	<p>The port control for unknown multicast data packet transmission speed, input value range:</p> <ul style="list-style-type: none"> <li>• 100M interface: 10-100,000Kbps or 1-100Mbps.</li> <li>• Gigabit interface: 100-1000000Kbps or 1-1000Mbps or 1Gbps.</li> </ul> <p>Note: Multicast packet, namely, the destination address is XX-XX-XX-XX-XX-XX data frame, the second X is odd number, such as: 1, 3, 5, 7, 9, B, D, F, other X represents arbitrary number.</p>
Unicast (bps)	<p>The port control for unknown unicast data packet transmission speed, input value range:</p> <ul style="list-style-type: none"> <li>• 100M interface: 10-100,000Kbps or 1-100Mbps.</li> <li>• Gigabit interface: 100-1000000Kbps or 1-1000Mbps or 1Gbps.</li> </ul> <p>Note: Unknown unicast packet, namely, the MAC address of the data frame doesn't exist in the MAC address table of the device, which needs to be forwarded to all ports.</p>



## Note

- Support unit of K/M/G when click the "Config" button to configure the rate. In WEB display, unit conversion will be conducted and similar values will be taken according to the input value and the unit.
- Different types of ports support different rates, and the port type is based on the actual port supported by the device.

## 4.3 Port Speed Limit

### Function Description

On the "Port Speed Limit" page, User can limit the communication flow of each port or cancel the port flow limit. The device provides port speed limit, including entrance and exit speed limit. User can select a fixed speed, the device will discard the packet or adopt flow control to limit the transmission speed or receiving speed of opposite device according to the flow control is enabled or not.

### Operation Path

Open in order: "Port Configuration > Port Speed Limit".

### Interface Description

Port Speed limit interface as follows:

**Port Speed Limit**

🔧 Config

Note: All bandwidths are k=1000, m=1000k, g=1000m; all unrestricted or unconfigured are indicated by "-" !

Port type selection:       fe    ge

	Port	Bandwidth(kbps)	Operation
<input type="checkbox"/>			
<input type="checkbox"/>	fe1	-	Clear
<input type="checkbox"/>	fe2	-	Clear
<input type="checkbox"/>	fe3	-	Clear
<input type="checkbox"/>	fe4	-	Clear
<input type="checkbox"/>	fe5	-	Clear
<input type="checkbox"/>	fe6	-	Clear
<input type="checkbox"/>	fe7	-	Clear
<input type="checkbox"/>	fe8	-	Clear
<input type="checkbox"/>	fe9	-	Clear
<input type="checkbox"/>	fe10	-	Clear
<input type="checkbox"/>	fe11	-	Clear
<input type="checkbox"/>	fe12	-	Clear
<input type="checkbox"/>	fe13	-	Clear
<input type="checkbox"/>	fe14	-	Clear
<input type="checkbox"/>	fe15	-	Clear
<input type="checkbox"/>	fe16	-	Clear
<input type="checkbox"/>	fe17	-	Clear
<input type="checkbox"/>	fe18	-	Clear
<input type="checkbox"/>	fe19	-	Clear
<input type="checkbox"/>	fe20	-	Clear
<input type="checkbox"/>	fe21	-	Clear
<input type="checkbox"/>	fe22	-	Clear
<input type="checkbox"/>	fe23	-	Clear
<input type="checkbox"/>	fe24	-	Clear
<input type="checkbox"/>	ge1	-	Clear
<input type="checkbox"/>	ge2	-	Clear
<input type="checkbox"/>	ge3	-	Clear
<input type="checkbox"/>	ge4	-	Clear

The main element configuration description of port rate limit interface:

Interface Element	Description (check the checkbox of the port, click "config" to configure it.)
Port type selection	Select the port type, and check the ports of the same type in batches: <ul style="list-style-type: none"> <li>100M port (Fe);</li> <li>Gigabit port (ge);</li> <li>10Gigabit port (xe);</li> <li>Static aggregation port (sa);</li> </ul>

Interface Element	Description (check the checkbox of the port, click "config" to configure it.)
	<ul style="list-style-type: none"> <li>Dynamic Aggregation Port (po).</li> </ul> Note: The port type shall be determined by the port supported by the device, and the aggregation port shall be reflected after configuration.
Port	The corresponding port name of the device Ethernet port.
Bandwidth (bps)	The port control for all input and output data transmission speed, it has to be a multiple of 64Kbps, input value range: <ul style="list-style-type: none"> <li>100M interface: 64-100,000Kbps or 1-100Mbps.</li> <li>Gigabit interface: 64-1000000Kbps or 1-1000Mbps or 1Gbps.</li> </ul> Note: Supports unit of K/M/G when configure the rate. In WEB display, unit conversion will be conducted and the simplest values will be displayed according to the input value and the unit.
Operation	Click "delete" to delete port rate limit configuration, port rate restores to no limit by default.



Note

- Flow control should be enabled when using port speed limit, otherwise the speed between devices would not be stable.
- When using the port rate limit, packet loss should not occur unless the flow control is disabled. The representation of packet loss is the fluctuating transmission speed.
- Port speed limit has high requirements on network cable quality, otherwise lots of conflict packets and broken packet would appear.

## 4.4 Port Mirroring

### Function Description

On the "Port mirroring" page, user can copy the data from the origin port to appointed port for data analysis and monitoring.

### Operation Path

Open in order: "Port Configuration > Port Mirroring".

### Interface Description

Port mirror interface as follows:

Port Mirroring					
<input type="checkbox"/>		<input type="checkbox"/>			
<input type="checkbox"/>	Session ID	Source port	Destination port	Operation	
<input type="checkbox"/>	1	fe10(bx)	fe1	Edit	Delete

The main element configuration description of port mirror interface:

Interface Element	Description (check the checkbox of the port, and click "Add" button to configure it.
Session ID	Device mirror ID number, value is 1-4. Note: The device supports maximum 4-way mirror sessions.
Source port	Monitored ports, from which the device will collect input or output messages. There can be one or more mirror ports.
Destination port	Monitoring port, copying and analyzing messages from source port.
Operation	Click "Edit" under "Operation" to configure the direction type of source port data to be monitored in this session. Click "Delete" under "operation" to delete the corresponding port mirroring entry directly. Data direction options are as follows: <ul style="list-style-type: none"> <li>transmit: egress data, the message sent by the source port will be mirrored to the destination port;</li> <li>receive: ingress data, the packet received by the source port will be mirrored to the destination port;</li> <li>Both: all data, mirror the source port receiving and sending packets at the same time.</li> </ul> Note: Directions can only be superimposed and cannot be deleted.
Add	Click "Add" to increase the port mirror entries.
Delete	Check the checkbox of port mirror entries, click "Delete" button to delete all mirror group entries



#### Note

- This function must be disabled during normal use, otherwise all port-based advanced management functions, such as RSTP and IGMP Snooping, cannot be used.
- Mirror function only deals with FCS normal packet; it cannot handle the wrong data frame

## 4.5 Link Aggregation

Link aggregation is the shorter form of Ethernet link aggregation; it binds multiple Ethernet physical links into a logical link, achieving the purpose of increasing the link bandwidth. At the same time, these bundled links can effectively improve the link reliability by mutual dynamic backup.

The Link Aggregation Control Protocol (LACP) protocol based on the IEEE802.3ad standard is a protocol for implementing dynamic link aggregation. Devices running this protocol exchange LACPDU (Link Aggregation Control Protocol Data Unit, Link Aggregation Control Protocol Data Unit) to exchange link aggregation related information.

Based on the enabling or disabling of LACP protocol, the link aggregation can be divided into two modes, static aggregation and dynamic aggregation. LACP priority is used to distinguish the priority of different interfaces being selected as active interfaces. The smaller the priority value, the higher the priority.

### Function Description

Under static aggregation mode, the member port in aggregation group disables LACP protocol, its port status is maintained manually.

### Operation Path

Open in order: "Port Configuration > Link Aggregation".

### Interface Description

Link Aggregation interface as below:

Group name	Work mode	Port list	Operation
sa1	src-dst-mac	ge1,ge2	Edit Delete

The main element configuration description of Link Aggregation interface:

Interface Element	Description
Lacp priority	LACP priority setting, the setting range is 0-65535, and the default value is 32768. Note:

Interface Element	Description
	The lower the priority value of the system LACP is, the higher the priority is, and the activity interface of the device with high system priority is selected at both ends of the aggregation link.
Group name	The ID number of static aggregation link, support up to 12 groups, each group can configure up to 8 ports to join aggregation.
Work mode	<p>There are 6 options for the configuration of trunk group load balance mode:</p> <ul style="list-style-type: none"> <li>• Dst-ip: Load balance mode based on destination IP;</li> <li>• Dst-mac: Load balance mode based on destination MAC;</li> <li>• Src-dst-ip: Load balance mode based on source and destination IP;</li> <li>• Src-dst-mac: Load balance mode based on source and destination MAC;</li> <li>• Src-ip: Load balance mode based on source IP;</li> <li>• Src-mac: Load balance mode based on source MAC.</li> </ul>
Port list	Port member in the link aggregation group.
Port priority	<p>Port LACP priority, value range 0-65535, default value 32768. Used to distinguish the priority of different interfaces in the same aggregation link being selected as activity interfaces.</p> <p>Note: The lower the priority value of interface LACP is, the higher the priority is, and the interface with higher priority will be selected as the activity interface.</p>
Operation	Click "Edit" under "Operation" to set the working mode for the specified dynamic aggregation group. Click "Delete" under "operation" to delete the corresponding link aggregation group directly.
Add	Click "Add" to add link aggregation entry.
Delete	Check the checkbox of link aggregation entry and click "Delete" button to delete link aggregation entry.

## Interface Description: Add

The Link Aggregation-Add interface is as follows:

The main elements configuration description of Link Aggregation-Add interface:

Interface Element	Description
Group ID	The ID number of static aggregation link, support up to 12 groups, each group can configure up to 8 ports to join aggregation.
Type	Aggregation group mode: <ul style="list-style-type: none"> <li>• Static: Static aggregation.</li> <li>• Dynamic: Dynamic aggregation.</li> </ul>
Port list	The drop-down box of port member: <ul style="list-style-type: none"> <li>• Active: the active interface, that is, the interface for forwarding data.</li> <li>• Passive: inactive interface, that is, interface that does not forward data.</li> </ul> <p>Note: When the type is Static, this function cannot be edited.</p>
Load mode	There are 6 options for the configuration of trunk group load balance mode: <ul style="list-style-type: none"> <li>• Dst-ip: Load balance mode based on destination IP;</li> <li>• Dst-mac: Load balance mode based on destination MAC;</li> <li>• Src-dst-ip: Load balance mode based on source and destination IP;</li> <li>• Src-dst-mac: Load balance mode based on source and destination MAC;</li> <li>• Src-ip: Load balance mode based on source IP;</li> <li>• Src-mac: Load balance mode based on source MAC.</li> </ul>

Interface Element	Description
Port	Port member in the aggregation group.

## 4.6 Aggregation Protection

### Function Description

Aggregation protection provides protection against link failure when there are multiple links between two devices. In the aggregation protection mode, when a link between two nodes fails, both nodes only need to redistribute traffic to the remaining links.

### Operation Path

Open in order: "Port Configuration > Aggregation Protection".

### Interface Description

The aggregation protection interface is shown as follows:

Aggregate Protection									
Group name	Enable	State	Port list	Aggregate Protection	Default VLAN ID	Neighbor	Role	Master Port	Error State
sa1	Enable	Down	ge1,ge2						

Description of configuration of main elements of aggregation protection interface:

Interface Element	Description
Group name	The name of the static aggregation group set in Link Aggregation.
Enable	The enabled state of the aggregation group. <ul style="list-style-type: none"> <li>• Enable</li> <li>• Disable</li> </ul>
State	Status of the aggregation group port. <ul style="list-style-type: none"> <li>• Up: as long as any port member is Up, the status of the aggregation group is up;</li> <li>• Down: if all port members are Down, the status of the aggregation group is Down.</li> </ul>
Port list	Port member in the aggregation group.
Aggregation Protection	Aggregation protection switch, when aggregation protection is enabled: <ul style="list-style-type: none"> <li>• Ports that can participate in data forwarding will be selected to participate in link aggregation, and the port status is active;</li> </ul>

Interface Element	Description
	<ul style="list-style-type: none"> <li>Ports that cannot participate in data forwarding will be unselected and the port status will be passive, so as to avoid data loss or ring formation caused by link failure.</li> </ul>
Default VLAN ID	The VLAN where that aggregate group port reside.
Neighbor	MAC address of the opposite device of aggregation group. Note: If no device is connected to the opposite end, the MAC address is displayed as 0000.0000.0000.
Role	Elected roles in this device and the opposite device <ul style="list-style-type: none"> <li>Master: the one with a smaller MAC address is elected as master;</li> <li>Slave: the one with a larger MAC address is elected as Slave;</li> </ul>
Master Port	The second link port of the master device is the master port.
Error State	Error message prompt of aggregation protection: <ul style="list-style-type: none"> <li>Neighbor timed out;</li> <li>Loop: forming a loop;</li> <li>Link error (such as generating a large number of error frames).</li> </ul>

## 4.7 Port Statistics

On the Port Statistics page, you can implement the following functions:

- Check the number of messages sent and received by each port and the number of message bytes; Number of discarded and erroneous messages.
- Check the classification statistics of the total number of messages sent and received by the designated port and the number of bytes of messages.

### 4.7.1 Port Statistics-Overview

#### Function Description

In the "Port Statistics - Overview" page, the following functions can be achieved:

- Check the number of messages sent and received by each port and the number of message bytes; Number of discarded and erroneous messages.
- Click the "Clear" button to clear the overview information of the screen.

#### Operation Path

Open in order: "Port Configuration > Port statistics > Port Statistics-Overview".

## Interface Description

Port Statistics-Overview interface is as follows:

Port Statistics > Port Statistics - Overview									
Port Statistics - Port									
Port rate									
<input type="button" value="Clear"/>									
Port	Received packets	Sent packets	Received byte	Sent byte	Received drop	Sent drop	Hol drop	Receive error message	Send error message
fe1	0	0	0	0	0	0	0	0	0
fe2	0	0	0	0	0	0	0	0	0
fe3	10278	14031	1856534	18614251	601	0	0	0	0
fe4	0	0	0	0	0	0	0	0	0
fe5	0	0	0	0	0	0	0	0	0
fe6	0	0	0	0	0	0	0	0	0
fe7	0	0	0	0	0	0	0	0	0
fe8	0	0	0	0	0	0	0	0	0
fe9	0	0	0	0	0	0	0	0	0
fe10	0	0	0	0	0	0	0	0	0
fe11	0	0	0	0	0	0	0	0	0
fe12	0	0	0	0	0	0	0	0	0
fe13	0	0	0	0	0	0	0	0	0
fe14	0	0	0	0	0	0	0	0	0
fe15	0	0	0	0	0	0	0	0	0
fe16	0	0	0	0	0	0	0	0	0
fe17	0	0	0	0	0	0	0	0	0
fe18	0	0	0	0	0	0	0	0	0
fe19	0	0	0	0	0	0	0	0	0
fe20	0	0	0	0	0	0	0	0	0
fe21	0	0	0	0	0	0	0	0	0
fe22	0	0	0	0	0	0	0	0	0
fe23	0	0	0	0	0	0	0	0	0
fe24	0	0	0	0	0	0	0	0	0
ge1	0	0	0	0	0	0	0	0	0
ge2	0	0	0	0	0	0	0	0	0
ge3	0	0	0	0	0	0	0	0	0
ge4	0	0	0	0	0	0	0	0	0

### 4.7.2 Port Statistics-Port

#### Function Description

On the Port Statistics-Port page, you can implement the following functions:

- Check the classification statistics of the total number of messages sent and received by the designated port and the number of bytes of messages.
- Click the “Clear” button to clear the port information from the screen.

#### Operation Path

Open in order: "Port Configuration > Port statistics > Port Statistics-Port".

#### Interface Description

Port Statistics-Port interface is as follows:

Port Statistics > Port Statistics - Overview			
Port Statistics - Port			
Port rate			
Port	ge1		Clear
	Inbound direction	Outbound direction	
Counting statistics			
No. of packets	0	0	
No. of bytes	0	0	
Unicast No.	0	0	
Multicast No.	0	0	
No. of broadcasts	0	0	
Pause frame	0	0	
Length count			
64 bytes	0	0	
65-127 bytes	0	0	
128-255 bytes	0	0	
256-511 bytes	0	0	
512-1023 bytes	0	0	
1024-1518 bytes	0	0	
1519-2047 bytes	0	0	
2048-4095 bytes	0	0	
4096-9216 bytes	0	0	

### 4.7.3 Port Rate

#### Function Description

On the "Port Rate" page, users can view the real-time rate of messages sent and received by the port, as well as the number of discarded messages.

#### Operation Path

Open in order: "Port Configuration > Port Statistics > Port rate".

#### Interface Description

The port rate interface is as follows:

Port Statistics >		Port Statistics - Overview	Port Statistics - Port	Port rate					
Clear									
20 s									
Port	RX rate(bps)	RX peak(bps)	RX dropped(pps)	RX error(pps)	TX rate(bps)	TX peak(bps)	TX dropped(pps)	Hol drop(pps)	TX error(pps)
fe1	0( 0.000%)	0	0	0	0( 0.000%)	0	0	0	0
fe2	0( 0.000%)	0	0	0	0( 0.000%)	0	0	0	0
fe3	3.75K( 0.004%)	34.61K	0	0	13.70K( 0.014%)	758.51K	0	0	0
fe4	0( 0.000%)	0	0	0	0( 0.000%)	0	0	0	0
fe5	0( 0.000%)	0	0	0	0( 0.000%)	0	0	0	0
fe6	0( 0.000%)	0	0	0	0( 0.000%)	0	0	0	0
fe7	0( 0.000%)	0	0	0	0( 0.000%)	0	0	0	0
fe8	0( 0.000%)	0	0	0	0( 0.000%)	0	0	0	0
fe9	0( 0.000%)	0	0	0	0( 0.000%)	0	0	0	0
fe10	0( 0.000%)	0	0	0	0( 0.000%)	0	0	0	0
fe11	0( 0.000%)	0	0	0	0( 0.000%)	0	0	0	0
fe12	0( 0.000%)	0	0	0	0( 0.000%)	0	0	0	0
fe13	0( 0.000%)	0	0	0	0( 0.000%)	0	0	0	0
fe14	0( 0.000%)	0	0	0	0( 0.000%)	0	0	0	0
fe15	0( 0.000%)	0	0	0	0( 0.000%)	0	0	0	0
fe16	0( 0.000%)	0	0	0	0( 0.000%)	0	0	0	0
fe17	0( 0.000%)	0	0	0	0( 0.000%)	0	0	0	0
fe18	0( 0.000%)	0	0	0	0( 0.000%)	0	0	0	0
fe19	0( 0.000%)	0	0	0	0( 0.000%)	0	0	0	0
fe20	0( 0.000%)	0	0	0	0( 0.000%)	0	0	0	0
fe21	0( 0.000%)	0	0	0	0( 0.000%)	0	0	0	0
fe22	0( 0.000%)	0	0	0	0( 0.000%)	0	0	0	0
fe23	0( 0.000%)	0	0	0	0( 0.000%)	0	0	0	0
fe24	0( 0.000%)	0	0	0	0( 0.000%)	0	0	0	0
ge1	0( 0.000%)	0	0	0	0( 0.000%)	0	0	0	0
ge2	0( 0.000%)	0	0	0	0( 0.000%)	0	0	0	0
ge3	0( 0.000%)	0	0	0	0( 0.000%)	0	0	0	0
ge4	0( 0.000%)	0	0	0	0( 0.000%)	0	0	0	0

The main element configuration description of port rate interface:

Interface Element	Description
Clear	Click the "Clear" button to clear all port rate statistical information. Note: The "Port Rate" page will be automatically refreshed every 30 seconds to update the port information.
Port	The corresponding port name of the device Ethernet port.
RX rate (bps)	Displays the current receiving rate of the port, in bps.
RX peak (bps)	Displays the historical peak value of the port receiving rate in bps.
RX dropped (pps)	Displays the number of dropped messages currently received by the port in pps.
RX error (pps)	Displays the current number of error messages received by the port in pps.
TX rate (bps)	Displays the current sending rate of the port in bps.
TX peak (bps)	Displays the historical peak value of the port sending rate in bps.
TX dropped (pps)	Displays the number of dropped messages currently sent by the port in pps.
Hol drop (pps)	Displays the current number of overspeed packet loss of the port in pps.
TX error (pps)	Displays the current number of error messages sent by the

Interface Element	Description
	port in pps.

## 4.8 Port Isolation

### Function Description

Port isolation is to isolate different interfaces of the same VLAN. Ports of the same VLAN that are not in the same isolation group cannot be accessed from each other.

Port isolation has provided safer and more flexible networking scheme for users.

### Operation Path

Open in order: "Port Configuration > Port Isolation".

### Interface Description

Isolate-port configuration interface is as follows:

Port Isolation Group			
<input type="checkbox"/>	Group name	Port member	Operation
<input type="checkbox"/>	1	fe1,fe2	Delete

The main element configuration description of isolate-port config interface:

Interface Element	Description
Group name	The Group ID of the device's port isolation group. Its value range is 1-8.
Port member	The port of the isolation group that this device joins
Operation	Click "Delete" button to delete the corresponding port isolation group.
Add	Click "add" button to add the group name of isolation group and isolation port.
Delete	Check the radio box of port isolation group, and click "delete" button to delete port isolation group.

## 4.9 Link SHock Protection

Network jitter or network cable failure will cause frequent Up/Down changes in the physical state of device interface, which will lead to link flapping and frequent changes in network topology, thus affecting user communication. For example, in the application of active-standby link, when the physical Up/Down state of the main link interface changes frequently, the service will switch back and forth between the active-standby link, which will not only increase the device burden, but also cause the loss of service data.

In order to solve the above problems, users can configure the link flapping protection function, and close the interface whose physical Up/Down state changes frequently to keep it remain Down, so that the network topology will stop changing frequently back and forth.

### 4.9.1 Global Configuration

#### Function Description

On the "Global Configuration" page, user can configure relative parameters of link flapping protection.

#### Operation Path

Open in order: "Port Configuration > Link Shock Protection > Global configuration".

#### Interface Description

Global configuration interface is as follows:

The main element configuration description of global configuration interface:

Interface Element	Description
Detection interval	The value range of link detection interval is 10-100s, and the

Interface Element	Description
	default value is 20s.
Flapping threshold	The threshold value of oscillation times for link detection, when the oscillation times exceed the threshold value within a certain detection time, an alarm log will be generated, and the port will be set to shutdown state. The range is from 3 to 100, default value is 5.
Automatic recovery	Automatic recovery radio box. After being checked, the port will automatically return to normal within the specified time.
Rescovery time	The value range of the time when the port automatically returns to normal is 30-86400s, and the default value is 3600s.

## 4.9.2 Port Configuration

### Function Description

On the "Port Configuration" page, user can enable port link flapping protection.

### Operation Path

Open in order: "Port Configuration > Link Shock Protection > Port Configuration".

### Interface Description

Check port configuration interface as below:

Link Shock Protection > Global configuration Port Configuration

In the default state, the link oscillates five times within 20s, an alarm log is generated, and the port is set to shutdown state

Port type selection:  fe  ge  all

<input type="checkbox"/>	Port	Enabled state	Port status
<input type="checkbox"/>	fe1	-	down
<input type="checkbox"/>	fe2	-	down
<input type="checkbox"/>	fe3	-	up
<input type="checkbox"/>	fe4	-	down
<input type="checkbox"/>	fe5	-	down
<input type="checkbox"/>	fe6	-	down
<input type="checkbox"/>	fe7	-	down
<input type="checkbox"/>	fe8	-	down
<input type="checkbox"/>	fe9	-	down
<input type="checkbox"/>	fe10	-	down
<input type="checkbox"/>	fe11	-	down
<input type="checkbox"/>	fe12	-	down
<input type="checkbox"/>	fe13	-	down
<input type="checkbox"/>	fe14	-	down
<input type="checkbox"/>	fe15	-	down
<input type="checkbox"/>	fe16	-	down
<input type="checkbox"/>	fe17	-	down
<input type="checkbox"/>	fe18	-	down
<input type="checkbox"/>	fe19	-	down
<input type="checkbox"/>	fe20	-	down
<input type="checkbox"/>	fe21	-	down
<input type="checkbox"/>	fe22	-	down
<input type="checkbox"/>	fe23	-	down
<input type="checkbox"/>	fe24	-	down
<input type="checkbox"/>	ge1	-	down
<input type="checkbox"/>	ge2	-	down
<input type="checkbox"/>	ge3	-	down

The main element configuration description of port configuration interface:

Interface Element	Description
Enable	Select the port and click Enable to enable the link flapping protection function of the port.
Cancel	Select the port and click Disable to disable the link flapping protection function of the port.
Port type selection	Click to select ports of the same type in batches, and the options are fe, ge, xe and all, where all is all selected. Note: The port type shall be determined by the port supported by the device, and the aggregation port shall be reflected after configuration.
Radiobox	Tick to enable link oscillation protection for this port.
Port	The corresponding port number of this device's Ethernet port.

Interface Element	Description
Enabled state	Whether the port is enabled for link flapping protection. <ul style="list-style-type: none"><li data-bbox="619 293 938 327">• ON: means enabled;</li><li data-bbox="619 338 954 371">• - : means not enabled.</li></ul>
Port status	Ethernet port connection status, display status as follows: <ul style="list-style-type: none"><li data-bbox="619 427 1018 461">• down: port is disconnected;</li><li data-bbox="619 472 948 506">• up: port is connected.</li></ul>

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# 5 Layer 2 Configuration

---

## 5.1 MAC Configuration

MAC (Media Access Control) address is the hardware identity of network device; the switch forwards the message according to MAC address. MAC address has uniqueness, which has guaranteed the correct retransmission of message. Each switch is maintaining a MAC address table. In the table, MAC address is corresponding to the switch port. When the switch receives data frames, it decides whether to filter them or forward them to the corresponding port according to the MAC address table. MAC address is the foundation and premise that switch achieves fast forwarding.

### 5.1.1 MAC Settings

Each port in the switch is equipped with automatic address learning function, it stores the frame source address (source MAC address, switch port number) that port sends and receives in the address table. Ageing time is a parameter influencing the switch learning process; the default value is 300 seconds. When the timekeeping starts after an address record is added to the address table, if each port doesn't receive the frame whose source address is the MAC address within the ageing time, then these addresses will be deleted from dynamic forwarding address table (source MAC address, destination MAC address and their corresponding switch port number).

#### Function Description

On the page of "MAC Settings", user can:

- Enable or disable the aging time of dynamic MAC addresses;
- Filters view static/dynamic unicast/multicast information.

## Operation Path

Open in order: "Layer 2 Configuration > MAC Configuration > MAC Settings".

## Interface Description

MAC configuration interface is as follows:

MAC Configuration > MAC Settings Static MAC Static Multicast MAC

MAC aging time  range 10-1000000 unit(s)

Filter mode

The MAC and VLAN ID are the same, the ports will be merged, but the total number will not change !

MAC	Forwarding type	Port	VLAN ID	Type
408d.5c8a.7f41	forward	fe3	1	dynamic

Total item 1 Total page 1 Current page <  >

The main element configuration description of MAC setting interface:

Interface Element	Description
MAC aging Time	MAC address aging-time, unit is second, default value is 300, and range is 10-1000000. Note: When "Close Address Aging" is selected, the MAC address will no longer age and become a static address.
Filter mode	Drop-down list of MAC mode to filter the display of the MAC address list of the specified type. The options are as follows: <ul style="list-style-type: none"> <li>All;</li> <li>Dynamic Unicast</li> <li>Dynamic Multicast</li> <li>Static Multicast</li> <li>Static Unicast</li> </ul>
MAC	The dynamic MAC addresses that the device have learned or the static MAC address information that user has configured.
Forwarding type	MAC forwarding type, as shown below: <ul style="list-style-type: none"> <li>Discard</li> <li>Forward</li> </ul>
Port	Corresponding port number of the MAC address.
VLAN ID	VLAN ID number the data MAC address sending belongs to.
Type	The type of MAC address, it displays as follows: <ul style="list-style-type: none"> <li>Dynamic: dynamic MAC address;</li> <li>Static: static MAC address.</li> </ul>

## 5.1.2 Static MAC

### Function Description

On the static MAC page, you can bind unicast MAC addresses manually. The unicast address after binding is static MAC, which will not age.

### Operation Path

Open in order: "Layer 2 Configuration > MAC Configuration > Static Mac".

### Interface Description

Static MAC interface is as follows:

MAC Configuration >					
MAC Settings		Static MAC	Static Multicast MAC		
<input type="button" value="+ Add"/>		<input type="button" value="Delete"/>			
<input type="checkbox"/>	MAC	Forwarding type	Port	VLAN ID	Operation
<input type="checkbox"/>	0001.0001.0001	discard	fe1	1	Delete
Total item 1		Total page 1		Current page < 1 >	

The main element configuration description of static MAC interface:

Interface Element	Description
MAC	Fill in the unicast MAC address that needs to bind the interface, such as 0001.0001.0001.
Forwarding Type	The forward type of MAC, discard or transmit, it displays as follows: <ul style="list-style-type: none"> <li>Discard;</li> <li>Forward.</li> </ul>
Port	The Binding Port Number.
VLAN ID	The VLAN ID number to which the data sent by this MAC address belongs, for example, 1-4094. Note: Input VLAN ID is the existing ID.
Operation	Click "Delete" under "operation" to delete the corresponding MAC entry directly.
Add	Click "Add" button to add static MAC entry.
Delete	Check the radio box of MAC entries and click "delete" button to delete MAC entries



Note

- The function is a sort of security mechanism, please carefully confirm the setting, otherwise, part of the devices won't be able to communicate;
- Please don't adopt multicast address as the entering address;
- Please don't enter reserved MAC address, such as the local MAC address.

### 5.1.3 Static Multicast MAC

#### Function Description

On the static multicast MAC page, you can bind multicast MAC addresses. The bound multicast address is static multicast MAC, which will not age.

#### Operation Path

Open in order: "Layer 2 Configuration > MAC Configuration > Static Multicast Mac".

#### Interface Description

Static multicast MAC interface as follows:

MAC Configuration > MAC Settings > Static MAC > Static Multicast MAC					
<input type="button" value="+ Add"/>		<input type="button" value="Delete"/>			
<input type="checkbox"/>	MAC	Forwarding type	Port	VLAN ID	Operation
<input type="checkbox"/>	0100.0001.0001	-	fe5	1	Delete
Total item 1		Total page 1		Current page < 1 >	

The main element configuration description of static multicast MAC interface:

Interface Element	Description
MAC	Fill in the multicast MAC address that needs to bind the interface, such as 0100.0001.0001.
Forwarding type	The forward type of MAC, discard or transmit, it displays as follows: <ul style="list-style-type: none"> <li>• Discard;</li> <li>• Forward.</li> </ul>
Port	The Binding Port Number.
VLAN ID	The VLAN ID number to which the data sent by this MAC address belongs, for example, 1-4094. Note: Input VLAN ID is the existing ID.
Operation	Click "Delete" under "operation" to delete the corresponding

Interface Element	Description
	MAC entry directly.
Add	Click "Add" button to add static MAC entry.
Delete	Check the radio box of MAC entries and click "delete" button to delete MAC entries

## 5.2 VLAN Configuration

VLAN is Virtual Local Area Network. VLAN is the data switching technology that logically (note: not physically) divides the LAN device into each network segment (or smaller LAN) to achieve the virtual working group (unit).

VLAN advantages mainly include:

- Port isolation. Ports in different VLAN, even in the same switch, can't intercommunicate. Such a physical switch can be used as multiple logical switches.
- Network security. Different VLAN can't directly communicate with each other, which has eradicated the insecurity of broadcast information.
- Flexible management. Changing the network user belongs to needn't to change ports or connection; only needs to change the firmware configuration.

That is, ports within the same VLAN can intercommunicate; otherwise, ports can't communicate with each other. A VLAN is identified with VLAN ID, and ports with the same VLAN ID belong to a same VLAN.

### 5.2.1 VLAN Configuration

#### Function Description

On the "VLAN-Configuration" page, user can create VLAN and edit VLAN description.

#### Operation Path

Open in order: "Layer 2 Configuration > VLAN Configuration > VLAN-Configuration".

#### Interface Description

Vlan configuration interface as follows:

VLAN Configuration >		VLAN Configuration	Access Configuration	Trunk Configuration	Hybrid Configuration	
<input type="button" value="+ Add"/> <input type="button" value="Delete"/> <input type="button" value="Range delete"/>						
<input type="checkbox"/>	VLAN	Description	Untagged port	Tagged port	State	Operation
<input type="checkbox"/>	1	default	fe1 fe2 fe3 fe4 fe5 fe6 fe7 fe8 fe9 fe10 fe11 fe12 fe13 fe14 fe15 fe16 fe17 fe18 fe19 fe20 fe21 fe22 fe23 fe24 ge1 ge2 ge3 ge4 sa1		static	Edit Delete
Total item 1		Total page 1		Current page < 1 >		

The main element configuration description of Vlan configuration interface.

Interface Element	Description
VLAN	VLAN ID number, value range is 1-4094.
Description	VLAN ID description, maximum 16 characters.
Untagged port	Untagged port member to conduct untagged process to sending data frame.
Tagged port	Tag port member to conduct tagged process to sending data frame.
State	Status type: <ul style="list-style-type: none"> <li>Static Configuration</li> <li>Dynamic.</li> </ul>
Operation	Click "edit" button to add description. Click "Delete" under "operation" to delete the corresponding VLAN entry directly.
Add	Click "Add" to add VLAN entry.
Delete	Check VLAN entry and click "delete" button to delete VLAN entry.
Delete in batches	Click the "Batch Delete" button to delete range-specified VLAN entry.

## 5.2.2 Access Configuration

### Function Description

On the "Access Configuration" page, user can configure the PVID (Port Default VLAN ID) of the Access interface. User can switch Access interface to Trunk interface or Hybrid interface via "Mode Setting".

### Operation Path

Open in order: "Layer 2 Configuration > VLAN Configuration > Access Configuration".

### Interface Description

Access configuration interface is as follows:

VLAN Configuration >		VLAN Configuration	Access Configuration	Trunk Configuration	Hybrid Configuration
<input type="checkbox"/> Pvid Config		<input type="checkbox"/> Mode setting			
<input type="checkbox"/>	Port	Pvid			
<input type="checkbox"/>	fe1	1			
<input type="checkbox"/>	fe2	1			
<input type="checkbox"/>	fe3	1			
<input type="checkbox"/>	fe4	1			
<input type="checkbox"/>	fe5	1			
<input type="checkbox"/>	fe6	1			
<input type="checkbox"/>	fe7	1			
<input type="checkbox"/>	fe8	1			
<input type="checkbox"/>	fe9	1			
<input type="checkbox"/>	fe10	1			
<input type="checkbox"/>	fe11	1			
<input type="checkbox"/>	fe12	1			
<input type="checkbox"/>	fe13	1			
<input type="checkbox"/>	fe14	1			
<input type="checkbox"/>	fe15	1			
<input type="checkbox"/>	fe16	1			
<input type="checkbox"/>	fe17	1			
<input type="checkbox"/>	fe18	1			
<input type="checkbox"/>	fe19	1			
<input type="checkbox"/>	fe20	1			
<input type="checkbox"/>	fe21	1			
<input type="checkbox"/>	fe22	1			
<input type="checkbox"/>	fe23	1			
<input type="checkbox"/>	fe24	1			
<input type="checkbox"/>	ge3	1			
<input type="checkbox"/>	ge4	1			
<input type="checkbox"/>	sa1	1			

The main element configuration description of Access configuration interface.

Interface Element	Description
Port	The corresponding port name of the device Ethernet port.
Pvid	Port Default VLAN ID, which is the default VLAN of the port. Default is 1, value range is 1-4094. Note: Each port has a PVID property, when the port receives Untag messages, it adds Tag mark on them according to PVID. When the port transmits data message with the same Tag mark as PVID, it would erase the Tag mark and then transmit the message. The PVID of all ports default to 1.
Pvid Config	Check the entries of pvid value that need to be reset, click "Pvid Configuration" button to reset pvid value.
Mode setting	There are three port link types that the switch supports: <ul style="list-style-type: none"> <li>Access: port only belongs to 1 VLAN (which is the default VLAN), all ports of the switch are Access mode by default</li> </ul>

Interface Element	Description
	<p>and all PVID are 1.</p> <ul style="list-style-type: none"> <li>• Trunk: port can belong to multiple VLAN, Trunk port can allow the messages of multiple VLANs to pass with Tag, but only allow the messages of one VLAN to transmit without tag (strip Tag) from this kind of interface. Commonly used in the connection between network devices.</li> <li>• Hybrid: port can belong to multiple VLANs. Hybrid port allows messages of multiple VLANs to pass with tag, and allows the messages sent from this kind of interface to configure whether the messages of some VLANs is with tag (not strip Tag) or not (strip Tag) . It could be used in the connection between network devices, as well as user devices.</li> </ul> <p>Note: If the port mode is set to Trunk or Hybrid, the port display will be updated to the tab corresponding to “Trunk Configuration” or “Hybrid Configuration”.</p>

## 5.2.3 Trunk Configuration

### Function Description

On the "Trunk Configuration" page, a list of ports in mode "Trunk" is displayed. Users can:

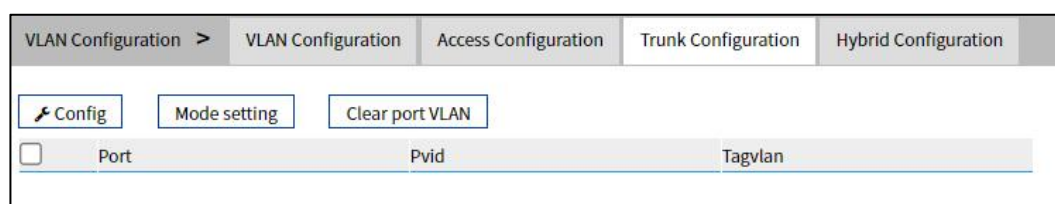
- Configure Trunk port PVID value and Tagvlan, and Tagvlan is the port tag value.
- Configure VLAN mode, switch Trunk interface to Access interface or Hybrid interface.

### Operation Path

Open in order: "Layer 2 Configuration > VLAN Configuration > Trunk Configuration".

### Interface Description

Trunk configuration interface as follows:



The main element configuration description of Trunk configuration interface:

Interface Element	Description
Port	The corresponding port name of the device Ethernet port.
Pvid	VLAN ID number, value range is 1-4094.
Tagvlan	An tagged value, a single value or range (range denoted by a "-"), such as 9 or 10-15.
Config	Check the entries that need to be reconfigured, click configure to reset pvid value and tagvlan parameters.
Mode setting	Click mode setting to set the mode to Access or Hybrid. Note: If the port mode is set to Access or Hybrid, the port display will be updated to the tab corresponding to "Access Configuration" or "Hybrid Configuration".
Clear port VLAN	Check the entries that need to be configured, click to clear port VLAN, input Tagvlan value to delete Tagvlan.

## 5.2.4 Hybrid Configuration

### Function Description

In the "Hybrid Configuration" page, the list of ports in mode "Hybrid" is displayed. The functions can be achieved as follows:

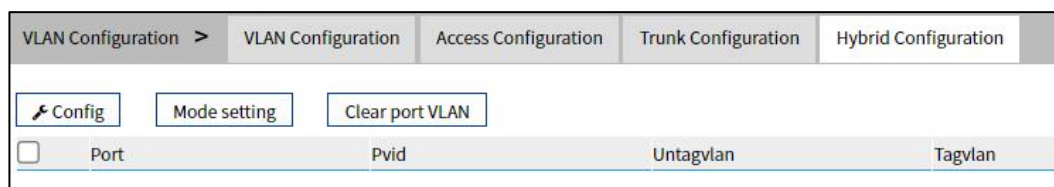
- Configure Hybrid port Pvid value, Untagvlan and Tagvlan, and Tagvlan is the port tag value.
- Configure VLAN mode, switch Hybrid interface to access interface or trunk interface.

### Operation Path

Open in order: "Layer 2 Configuration > VLAN Configuration > Hybrid Configuration".

### Interface Description

Hybrid configuration interface as follow:



The main element configuration description of Hybrid configuration interface.

Interface Element	Description
Port	The corresponding port name of the device Ethernet port.

Interface Element	Description
Pvid	VLAN ID number, value range is 1-4094.
Untagvlan	An untagged value, a single value or range (range denoted by a "-"), such as 9 or 10-15.
Tagvlan	An tagged value, a single value or range (range denoted by a "-"), such as 9 or 10-15.
Config	Check the entries that need to be reconfigured, click configure to reset pvid value and tagvlan parameters.
Mode setting	Click mode setting to set the mode to Access or Trunk Note: If the port mode is set to Access or Trunk, the port display will be updated to the tab corresponding to "Access Configuration" or "Hybrid Configuration".

## Process for Port Receiving Message

Interface Type	Process for Receiving Untagged Message	Process for Receiving Tagged Message
Access	Receive this message and tag it with default VLAN ID.	<ul style="list-style-type: none"> <li>Receive the message when the VLAN ID is the same as default VLAN ID.</li> <li>Discard the message when the VLAN ID is different from the default VLAN ID.</li> </ul>
Trunk	Receive this message and tag it with default VLAN ID.	<ul style="list-style-type: none"> <li>Receive this message when the VLAN ID is in the list of VLAN ID that allow to pass through the interface.</li> <li>Discard this message when the VLAN ID is not in the list of VLAN ID that allow to pass through the interface.</li> </ul>
Hybrid		

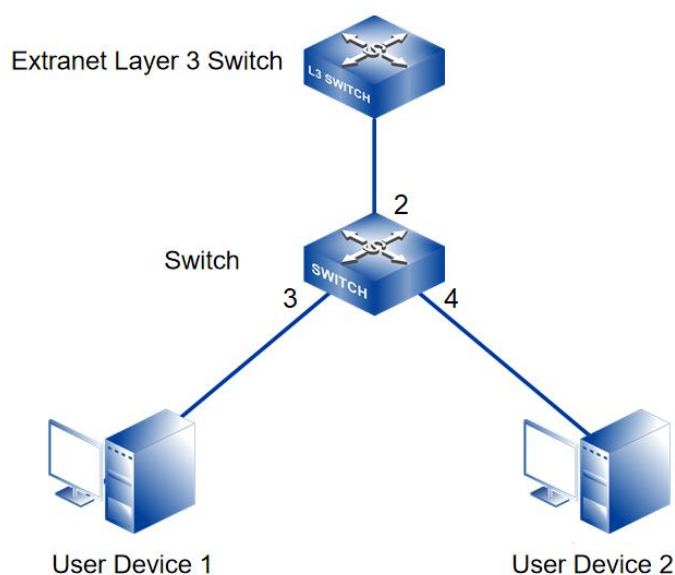
## Process for Sending Message

Interface type	The process of transmit frame
Access	Strip the PVID Tag of the message first, then transmit it.
Trunk	<ul style="list-style-type: none"> <li>When the VLAN ID is the same as the default VLAN ID, and it is the VLAN ID allowed to pass through the interface, it would strip the Tag and send this message.</li> <li>When the VLAN ID is different from the default VLAN ID, and it's the VLAN ID allowed to pass through the interface, it</li> </ul>

Interface type	The process of transmit frame
	would remain its original Tag and send the message.
Hybrid	When the VLAN ID is the one allowed to pass through the interface, it would send this message. It could be set to whether to carry Tag during transmission.

## Instance: typical VLAN configuration

If the switch port 2, 3, 4 meet the following requirements: port2 that connects the external network device is the upper interface, Port3/4 that connect the user device are the downward interface. Port2 communicates with Port3, Port2 communicates with Port4, and Port3 cannot communicate with Port4. As shown below. Do not consider other ports, how to set the VLAN?



## Instance analysis

Port2, Port3 and Port4 are set with different port types to realize the communication between the ports. Analyse the configuration of each port as below:

- Port3

Port3 is upper interface, set Ports to Access type. Configure the PVID value of Port3 to 3.

- Port 4

Port4 is downward interface, set Ports to Access type. The PVID value of Port4 is set to 4.

- Port2

Port2 is upper interface, set Port2 to Trunk type. Add Port2 into VLAN3 and VLAN4.  
Port2 can communicate with Port3 and Port4.

## Operation Steps

**Step 1** Access "Layer 2 Configuration > VLAN Configuration > VLAN Configuration".

**Step 2** Set VLAN value: VLAN3 and VLAN4.

- 1 Click "Add", enter 3 and 4 in "VLAN " text box as shown below:

VLAN

3 4

A group of input boxes of the same size indicates a vlan, otherwise a group of vlan ranges

Set

- 2 Click "Set" button, the VLAN settings are as the picture below.

VLAN Configuration >		VLAN Configuration	Access Configuration	Trunk Configuration	Hybrid Configuration	
<input type="button" value="+ Add"/> <input type="button" value="Delete"/> <input type="button" value="Range delete"/>						
<input type="checkbox"/>	VLAN	Description	Untagged port	Tagged port	State	Operation
<input type="checkbox"/>	1	default	fe1 fe2 fe3 fe4 fe5 fe6 fe7 fe8 fe9 fe10 fe11 fe12 fe13 fe14 fe15 fe16 fe17 fe18 fe19 fe20 fe21 fe2 2 fe23 fe24 ge1 ge2 ge3 ge4 sa1		static	Edit Delete
<input type="checkbox"/>	3	VLAN0003			static	Edit Delete
<input type="checkbox"/>	4	VLAN0004			static	Edit Delete
Total item 3		Total page 1		Current page < 1 >		

**Step 3** Set the corresponding pvid of port3 and port4, as well as the type of port2, port 3 and port4.

- 1 Access "Layer 2 Configuration > VLAN Configuration > Access Configuration".
- 2 Check port ge3, click "Configure", enter "3" in "Pvid", and click "set".
- 3 Check port ge4, click "Configure", enter "4" in "Pvid", and click "set".
- 4 Check port ge2, click "mode setting", select "trunk" as "type", and click "set".

VLAN Configuration >		VLAN Configuration	Access Configuration	Trunk Configuration	Hybrid Configuration
<input type="checkbox"/> Pvid Config		<input type="checkbox"/> Mode setting			
<input type="checkbox"/>	Port	Pvid			
<input type="checkbox"/>	fe1	1			
<input type="checkbox"/>	fe2	1			
<input type="checkbox"/>	fe3	1			
<input type="checkbox"/>	fe4	1			
<input type="checkbox"/>	fe5	1			
<input type="checkbox"/>	fe6	1			
<input type="checkbox"/>	fe7	1			
<input type="checkbox"/>	fe8	1			
<input type="checkbox"/>	fe9	1			
<input type="checkbox"/>	fe10	1			
<input type="checkbox"/>	fe11	1			
<input type="checkbox"/>	fe12	1			
<input type="checkbox"/>	fe13	1			
<input type="checkbox"/>	fe14	1			
<input type="checkbox"/>	fe15	1			
<input type="checkbox"/>	fe16	1			
<input type="checkbox"/>	fe17	1			
<input type="checkbox"/>	fe18	1			
<input type="checkbox"/>	fe19	1			
<input type="checkbox"/>	fe20	1			
<input type="checkbox"/>	fe21	1			
<input type="checkbox"/>	fe22	1			
<input type="checkbox"/>	fe23	1			
<input type="checkbox"/>	fe24	1			
<input type="checkbox"/>	ge1	1			
<input type="checkbox"/>	ge3	3			
<input type="checkbox"/>	ge4	4			

**Step 4** Set the tagvlan value of port 2.

- 1 Access "Layer 2 Configuration > VLAN Configuration > Trunk Configuration".
- 2 Check the item and click "Configuration".
- 3 Enter "1" in "Pvid" and "3-4" in "Tagvlan".
- 4 Click "Set" button, as the picture below.

VLAN Configuration >		VLAN Configuration	Access Configuration	Trunk Configuration	Hybrid Configuration
<input type="checkbox"/> Config		<input type="checkbox"/> Mode setting			
		<input type="button" value="Clear port VLAN"/>			
<input type="checkbox"/>	Port	Pvid	Tagvlan		
<input checked="" type="checkbox"/>	ge2	1	3-4		

- 5 Enter "layer 2 configuration > VLAN configuration", check configuration result as show below.

VLAN Configuration >		VLAN Configuration	Access Configuration	Trunk Configuration	Hybrid Configuration	
<input type="button" value="+ Add"/> <input type="button" value="Delete"/> <input type="button" value="Range delete"/>						
<input type="checkbox"/>	VLAN	Description	Untagged port	Tagged port	State	Operation
<input type="checkbox"/>	1	default	fe1 fe2 fe3 fe4 fe5 fe6 fe7 fe8 fe9 fe10 fe11 fe12 fe13 fe14 fe15 fe16 fe17 fe18 fe19 fe20 fe21 fe22 2 fe23 fe24 ge1 ge2		static	Edit Delete
<input type="checkbox"/>	3	VLAN0003	ge3	ge2	static	Edit Delete
<input type="checkbox"/>	4	VLAN0004	ge4	ge2	static	Edit Delete
Total item 3		Total page 1	Current page	< 1 >		

**Step 5** End.

## 5.3 Spanning-tree Configuration

Spanning-tree protocol is a sort of layer 2 management protocol; it can eliminate the network layer 2 circuit via selectively obstructing the network redundant links. At the same time, it has link backup function. Here are three kinds of spanning-tree protocols:

- STP (Spanning Tree Protocol);
- RSTP (Rapid Spanning Tree Protocol);
- MSTP (Multiple Spanning Tree Protocol).

Spanning-tree protocol has two main functions:

- First function is utilizing spanning-tree algorithm to establish a spanning-tree that takes a port of a switch as the root to avoid ring circuit in Ethernet.
- Second function is achieving the convergence protection purpose via spanning-tree protocol when Ethernet topology changes.

Compared to STP, RSTP, MSTP can converge the network more quickly when network structure changes; MSTP is compatible with STP and RSTP, and is better than STP and RSTP. It can not only quickly converge but also send different VLAN along each path to provide better load sharing system for redundant link.

### 5.3.1 Bridge Configuration

#### Function Description

On the "Bridge Configuration" page, user can configure relative parameters of spanning-tree.

## Operation Path

Open in order: "Layer 2 Configuration > Spanning-tree > Bridge Configuration".

## Interface Description

Bridge configuration interface is as follows:

Spanning-tree Configuration >	Bridge Configuration	Instance Configuration	Port Configuration	Instance Port Configuration
Enable <input type="radio"/> Disable by default				
Work mode <input type="radio"/> 0-STP <input type="radio"/> 2-RSTP <input checked="" type="radio"/> 3-MSTP <span style="float: right;">Mstp by default</span>				
Priority	<input type="text" value="32768"/>	0-61440 32768 by default		
Max hop count	<input type="text" value="20"/>	1-40 20 by default		
Forwarding delay	<input type="text" value="15"/>	4-30 15s by default		
Aging time	<input type="text" value="20"/>	6-40 20s by default		
Handshake time	<input type="text" value="2"/>	1-10 2s by default		
MST version	<input type="text" value="0"/>	0-65535 0 by default		
MST name	<input type="text" value="Default"/>	Up to 32 characters Default by default		
<input type="button" value="Set"/>				
Note: 1. Forwarding delay and aging time should meet: (forwarding delay-1)*2>=aging time 2. The aging time and handshake time should meet: (handshake time+1)*2<=aging time				

The main element configuration description of bridge configuration interface:

Interface Element	Description
Enable	Spanning-tree enable switch. Disable by default
Work mode	Defaults to MSTP, there are three modes for spanning-tree protocol choice: <ul style="list-style-type: none"> <li>0-STP: Spanning-tree;</li> <li>2-RSTP: Rapid spanning tree;</li> <li>3-MSTP: Multiple spanning-trees.</li> </ul>
Priority	Bridge priority level, value range is 0-61440. Note: Smaller the priority level value is, higher the priority level is.
Max hop count	The maximum hop in MST region, defaults to 20, the value range is 1-40. Note: The maximum hop in MST region has limited the size of MST region. The maximum hop configured on a domain root will be used as the maximum hop in MST region.
Forwarding delay	Port state transition delay, defaults to 15S, the value range is 4-30.
Aging time	The maximum lifetime of the message in the device, defaults to 20S, the value range is 6-40. It's used to determine

Interface Element	Description
	whether the configuration message times out.
Handshake time	Message sending cycle, defaults to 2S, the value range is 1-10. Note: The spanning tree protocol sends configuration information every Hello time to check whether the link is faulty.
MST version	MSTP revision level, defaults to 0, the value range is 0-65535. Note: When the MST region name, revision level, instance-to-VLAN mapping relation are the same, the two or more bridges will belong to a same MST region.
MST name	MST domain name, defaults to Default, up to 32 characters.

## 5.3.2 Instance Configuration

### Function Description

On the "Instance Configuration" page, user can configure instance-to-VLAN mapping. Multiple Spanning Tree Regions (MST Regions) are composed of multiple devices in the switched network and the network segments between them.

In a MST region, multiple spanning trees can be generated through MSTP. Each spanning tree is independent to others and corresponding to special VLAN. Each spanning tree is called an MSTI (Multiple Spanning Tree Instance).

VLAN mapping table is an attribute of MST region, and it's used to describe the mapping relation between VLAN and MSTI.

### Operation Path

Open in order: "Layer 2 Configuration > Spanning-tree > Instance Configuration".

### Interface Description

Instance configuration interface as follows:

Spanning-tree Configuration >				
Bridge Configuration		Instance Configuration		Port Configuration
Instance Port Configuration				
<input type="button" value="+ Add"/>		<input type="button" value="Delete"/>		
<input type="checkbox"/>	Instance	Priority	VLAN mapped	Operation
<input type="checkbox"/>	1	0	1	Edit Delete

The main element configuration description of instance configuration interface:

Interface Element	Description
Instance	Instance ID number of Multiple Spanning-tree. The value range is 1-16.
Priority	Device priority level, value range is 0-61440, default to 32769, step is 4096. During adding, choose a priority based on 0-15 times the value on the 4096. Note: The priority of a device participates in spanning tree calculation. Its size determines whether the device can be selected as the root bridge of a spanning tree.
Vlan Mapped	VLAN mapping table is separated by commas, such as: 4, 5, 6, 7; "-" represents range, such as: 4-7. Note: VLAN mapping table is an attribute of MST region, and it's used to describe the mapping relation between VLAN and MSTI. MSTP achieves load balancing based on the VLAN mapping table.

### 5.3.3 Port Configuration

#### Function Description

On the "Port Configuration" page, user can enable port to participate in spanning-tree and configure port type, link type and BPDU protection function.

#### Operation Path

Open in order: "Layer 2 Configuration > Spanning-tree Configuration > Port Configuration".

#### Interface Description

Check port configuration interface as below:

Spanning-tree Configuration >		Bridge Configuration	Instance Configuration	Port Configuration	Instance Port Configuration
<input type="checkbox"/> Config					
<input type="checkbox"/>	Port	Enable	Bpduguard	Edge port	Connection Type
<input type="checkbox"/>	fe1	enable	default	disable	auto
<input type="checkbox"/>	fe2	enable	default	disable	auto
<input type="checkbox"/>	fe3	enable	default	disable	auto
<input type="checkbox"/>	fe4	enable	default	disable	auto
<input type="checkbox"/>	fe5	enable	default	disable	auto
<input type="checkbox"/>	fe6	enable	default	disable	auto
<input type="checkbox"/>	fe7	enable	default	disable	auto
<input type="checkbox"/>	fe8	enable	default	disable	auto
<input type="checkbox"/>	fe9	enable	default	disable	auto
<input type="checkbox"/>	fe10	enable	default	disable	auto
<input type="checkbox"/>	fe11	enable	default	disable	auto
<input type="checkbox"/>	fe12	enable	default	disable	auto
<input type="checkbox"/>	fe13	enable	default	disable	auto
<input type="checkbox"/>	fe14	enable	default	disable	auto
<input type="checkbox"/>	fe15	enable	default	disable	auto
<input type="checkbox"/>	fe16	enable	default	disable	auto
<input type="checkbox"/>	fe17	enable	default	disable	auto
<input type="checkbox"/>	fe18	enable	default	disable	auto
<input type="checkbox"/>	fe19	enable	default	disable	auto
<input type="checkbox"/>	fe20	enable	default	disable	auto
<input type="checkbox"/>	fe21	enable	default	disable	auto
<input type="checkbox"/>	fe22	enable	default	disable	auto
<input type="checkbox"/>	fe23	enable	default	disable	auto
<input type="checkbox"/>	fe24	enable	default	disable	auto
<input type="checkbox"/>	ge1	enable	default	disable	auto
<input type="checkbox"/>	ge2	enable	default	disable	auto
<input type="checkbox"/>	ge3	enable	default	disable	auto
<input type="checkbox"/>	ge4	enable	default	disable	auto

The main element configuration description of port configuration interface:

Interface Element	Description (check the checkbox of the port, click "config" to configure it.)
Port	The corresponding port name of the device Ethernet port.
Enable	Status of participating in spanning tree enable switch.
Bpduguard	BPDU (Bridge Protocol Data Unit) protection function status: <ul style="list-style-type: none"> <li>• Enable;</li> <li>• Disable;</li> <li>• Default.</li> </ul>
Edge port	Configure port type: <ul style="list-style-type: none"> <li>• Enable;</li> <li>• Disable</li> </ul>
Connection type	Port link type: <ul style="list-style-type: none"> <li>• Auto: Automatic system detection;</li> <li>• Point-to-point: point-to-point link;</li> <li>• Shared: Non point-to-point link.</li> </ul>

## 5.3.4 Instance Port Configuration

### Function Description

On the "Inst Port Configuration" page, user can configure port priority level and cost.

### Operation Path

Open in order: "Layer 2 Configuration > Spanning-tree > Inst Port Configuration".

### Interface Description

Instance port configuration interface as follows:

Spanning-tree Configuration >					Bridge Configuration	Instance Configuration	Port Configuration	Instance Port Configuration
MSTID 0								
Config								
<input type="checkbox"/>	Port	Enable	Instance	Priority	Configuration cost	Role	State	
<input type="checkbox"/>	fe1	enable	0	128	20000000	disabled	discarding	
<input type="checkbox"/>	fe2	enable	0	128	20000000	disabled	discarding	
<input type="checkbox"/>	fe3	enable	0	128	20000000	disabled	forwarding	
<input type="checkbox"/>	fe4	enable	0	128	20000000	disabled	discarding	
<input type="checkbox"/>	fe5	enable	0	128	20000000	disabled	discarding	
<input type="checkbox"/>	fe6	enable	0	128	20000000	disabled	discarding	
<input type="checkbox"/>	fe7	enable	0	128	20000000	disabled	discarding	
<input type="checkbox"/>	fe8	enable	0	128	20000000	disabled	discarding	
<input type="checkbox"/>	fe9	enable	0	128	20000000	disabled	discarding	
<input type="checkbox"/>	fe10	enable	0	128	20000000	disabled	discarding	
<input type="checkbox"/>	fe11	enable	0	128	20000000	disabled	discarding	
<input type="checkbox"/>	fe12	enable	0	128	20000000	disabled	discarding	
<input type="checkbox"/>	fe13	enable	0	128	20000000	disabled	discarding	
<input type="checkbox"/>	fe14	enable	0	128	20000000	disabled	discarding	
<input type="checkbox"/>	fe15	enable	0	128	20000000	disabled	discarding	
<input type="checkbox"/>	fe16	enable	0	128	20000000	disabled	discarding	
<input type="checkbox"/>	fe17	enable	0	128	20000000	disabled	discarding	
<input type="checkbox"/>	fe18	enable	0	128	20000000	disabled	discarding	
<input type="checkbox"/>	fe19	enable	0	128	20000000	disabled	discarding	
<input type="checkbox"/>	fe20	enable	0	128	20000000	disabled	discarding	
<input type="checkbox"/>	fe21	enable	0	128	20000000	disabled	discarding	
<input type="checkbox"/>	fe22	enable	0	128	20000000	disabled	discarding	
<input type="checkbox"/>	fe23	enable	0	128	20000000	disabled	discarding	
<input type="checkbox"/>	fe24	enable	0	128	20000000	disabled	discarding	
<input type="checkbox"/>	ge1	enable	0	128	20000000	disabled	discarding	
<input type="checkbox"/>	ge2	enable	0	128	20000000	disabled	discarding	
<input type="checkbox"/>	ge3	enable	0	128	20000000	disabled	discarding	

The main element configuration description of instance port configuration interface:

Interface Element	Description (check the checkbox of the port, click "config" to configure it.)
MSTID	Choose multiple Spanning-tree ID number.
Port	The corresponding port name of the device Ethernet port.

Interface Element	Description (check the checkbox of the port, click “config” to configure it.)
Enable	Port enable status: <ul style="list-style-type: none"> <li>• Enable: participate in spanning-tree;</li> <li>• Disable: not participate in spanning-tree.</li> </ul>
Instance	Instance ID number port belongs to.
Priority	Port priority level, the value range is 0-240. Note: Port priority level in bridge, port priority level is higher when the value is smaller. The higher the priority of the port, the more likely it is to be a root port.
Configuration Cost	The path cost from network bridge to root bridge. Value range: 1-200000000.
Role	Port role. <ul style="list-style-type: none"> <li>• unkn: Unknown;</li> <li>• root: Root port;</li> <li>• desg: Designated port;</li> <li>• altn: Alternate port;</li> <li>• back: Backup port;</li> <li>• disa: Disable port.</li> </ul>
State	Port status in spanning-tree: <ul style="list-style-type: none"> <li>• Disable: Port close status;</li> <li>• Blocking: Blocked state;</li> <li>• Listening: Monitoring state.</li> <li>• Learning: Learning state;</li> <li>• Forwarding: Forwarding state;</li> </ul>

## 5.4 ERPS Configuration

Ethernet Ring Protection Switching (ERPS) is the Ethernet Ring Network Link Layer Technology with high reliability and stability. It can prevent the broadcast storm caused by data loop when the Ethernet ring is intact. When the Ethernet ring link failure occurs, it has high convergence speed that can rapidly recover the communication path between each node in the ring network.

## 5.4.1 Timer Configuration

### Function Description

On the "Timer configuration" page, user could configure ring network.

An Ethernet network topology connected in ring is called a ERPS Ring. It could be divided into main ring and subring. Each device in ERPS ring is called a node. The main node is in charge of blocking and opening ports on this node, preventing loops from forming.

### Operation Path

Open in order: "Layer 2 Configuration > ERPS Configuration > Timer Configuration".

### Interface Description

Timer configuration interface as follows:

ERPS Configuration >		Timer Configuration	Ring network Configuration	Instance Configuration		
<input type="button" value="+ Add"/>	<input type="button" value="Delete"/>					
<input type="checkbox"/>	Timer name	WTR	WTB	Guard timer	Hold timer	Operation
<input type="checkbox"/>	T1	5	5	10	0	Edit Delete

Main elements configuration description of timer configuration interface:

Interface Element	Description
Timer Name	The default name of timer is timer, which is up to 32 bytes.
WTR	WTR(Wait To Restore)timer, its value range is 1-12 minutes. Under revertive mode, the timer starts when the owner node in protection state receives NR packet. The owner node blocks the RPL port and unblocks the fault port after the timer expires.
WTB	WTB (Wait To Block) timer, its value range is 1-12 minutes. Under revertive mode, when the owner node is in MS (Manual Switch) or FS (Forced Switch) status, WTB timer will start if user carries out clean command on the owner node. After the timer expires, the owner node will block the RPL port and unblock temporary blocking port.
Guard Timer	Guard timer, its value range is 10-2000ms. The timer starts when the port detects the link restoration, before the timer expires, the port won't deal with R-APS (Ring Automatic Protection Switching) packet.
Hold Timer	Hold timer, its value range is 0-10ms. The timer starts when

Interface Element	Description
	the port detects the link restoration, delay the fault report speed. When the link fails, the timer should report the fault if it exists after Hold timer expires.
Add	Clicking "Add" button can add the configuration of timer.
Delete	Check the radio box of timer entry, click "delete" button to delete timer entry.

## 5.4.2 Ring Configuration

### Function Description

On the "Ring configuration" page, user could configure ring network.

An Ethernet network topology connected in ring is called a ERPS Ring. It could be divided into main ring and subring. Each device in ERPS ring is called a node. The main node is in charge of blocking and opening ports on this node, preventing loops from forming.

### Operation Path

Open in order: "Layer 2 Configuration > ERPS Configuration > Ring Configuration".

### Interface Description

Ring configuration interface as follows:

ERPS Configuration >		Timer Configuration	Ring network Configuration	Instance Configuration		
<input type="checkbox"/>	Ring name	Ring network ID	East-port	West-port	Ring level	Operation
<input type="checkbox"/>	R1	1	-	-	1	Edit Delete

The main element configuration description of ring configuration interface.

Interface Element	Description
Ring Name	The default name of ring network is ring, which is up to 32 bytes.
Ring network ID	The ID of ring network, its value range is 1-255.
East-port	Ring network 1, its value range is 1-port number
West-port	Ring network 2, its value range is 1-port number.
Ring level	The higher the ring network level is, the greater the value is, its value range is 1-7.

Interface Element	Description
Add	Click "Add" button to add ring network configuration.
Delete	Check the radio box of ring network entry, click "delete" button to delete ring network entry.

## 5.4.3 Instance Configuration

### Function Description

On the "Instance configuration" page, user could configure instance.

### Operation Path

Open in order: "Layer 2 Configuration >ERPS Configuration > Instance Configuration".

### Interface Description

Instance configuration interface as follows:

ERPS name	ID	Ring name	Timer name	Device role	RPL port	Ring role	Master instance Virtual	Manage VLAN Reversible	State	Enable	Operation			
<input type="checkbox"/>	E1	1	R1	T1	rpl-owner	east-ifindex	sub-ring	-	enable	1	enable	ERPS_INIT	<input type="radio"/>	Edit Delete

The main element configuration description of instance configuration interface:

Interface Element	Description
ERPS name	The default name of ERPS is erp, which is up to 32 bytes
ID	The ID of instance, its value range is 0-16
Ring Name	The default name of ring network is the ring name that has been added in the ring network list
Timer Name	The default name of timer is the name that has been added in the timer list
Device Role	<p>Each device in ERPS ring is called a node. The node role is decided by user configuration, they are divided into following types:</p> <ul style="list-style-type: none"> <li>rpl-owner: owner node is responsible for blocking and unblocking the port in RPL of the node to prevent loop forming and conduct link switching.</li> <li>rpl-neighbor: neighbor node is connected to Owner node on RPL. Cooperating to the Owner node, it blocks and unblocks the ports on RPL of the node and conduct link switching.</li> </ul>

Interface Element	Description
	<ul style="list-style-type: none"> <li>interconnection: interconnected node is the node to connect multiple rings in the multi-loop model, it belongs to the subring, and the primary ring has no interconnected node. In the link protocol packet upload mode between the two subring interconnected nodes, the subring protocol packet ends in the interconnected node, but the data packet won't end.</li> <li>other: normal node is the other node in addition to the above three nodes. Normal node is responsible for receiving and forwarding the protocol packet and data packet in the link.</li> </ul>
RPL-Port	RPL (Ring Protection Link) port is the appointed ring network port for Owner node to establish RPL.
Ring Role	Options of Ring Role drop-down box: <ul style="list-style-type: none"> <li>Major-ring: main ring network</li> <li>Sub-ring: subring network</li> </ul>
Master Instance	The major instance name could be set and need to be set as ERPS instance name only when the ring role is Sub-ring
Virtual	After enable virtual channel, the subring protocol packet could transmit across the primary ring; otherwise, the subring protocol packet can only transmit in the ring. Options: <ul style="list-style-type: none"> <li>enable</li> <li>disable</li> </ul>
Manage VLAN	The VLAN channel of protocol packet, its value range is 1-4094
Reversible	Options: <ul style="list-style-type: none"> <li>Enable: In revertive mode, WTR timer starts when the owner node receives the link recovery packet after the clearing of fault. The timer will change from fault link protection status to idle status after expiring.</li> <li>Disable: Irreversible mode: Owner node doesn't conduct any action after receiving the link recovery packet and keeps the port status set before.</li> </ul>
State	The instance statuses of ERPS are as follows: <ul style="list-style-type: none"> <li>ERPS_INIT: initial state, which is the initialized state when the protocol starts.</li> <li>ERPS_IDLE: idle state, it would enter this state when the ring topology is complete.</li> <li>ERPS_FS: force-switch state, it would enter this state when force-switch command is implemented.</li> </ul>

Interface Element	Description
	<ul style="list-style-type: none"> <li>ERPS_MS: manual-switch state, it would enter this state when manual-switch command is implemented.</li> <li>ERPS_PROTECTION: protection state, it would enter this state when the ring link has failure.</li> <li>ERPS_PENDING: pending state, it would enter this state when the ring link has recovered from failure.</li> </ul>
Enable	Instance ring protection protocol switch: <ul style="list-style-type: none"> <li>ON: enable Ethernet ring protection protocol;</li> <li>OFF: disable Ethernet ring protection protocol.</li> </ul>
Operation	Click "operation-edit" button to modify instance configuration. Click "Delete" under "operation" to delete the corresponding instance entry directly.
Add	Click "Add" button to add instance configuration.
Delete	Check the radio box of instance configuration entry, click "delete" button to delete instance configuration.

## 5.5 Ring Configuration

Ring provides automatic recovery and reconnection mechanism for the disconnected Ethernet network, which has link redundancy and self-recovery ability in case of network interruption or network failure.

The core of Ring technology adopt non-master station setting. In a multi-ring network of up to 250 switches, the network self-recovery time is less than 20 milliseconds. Each port in this series of switches can be used as a ring port and connected with other switches. When an interruption occurs in the network connection, the relay for fault alarm will be activated and the Ring redundant mechanism enables the backup link to quickly recover the network communication.

### Function Description

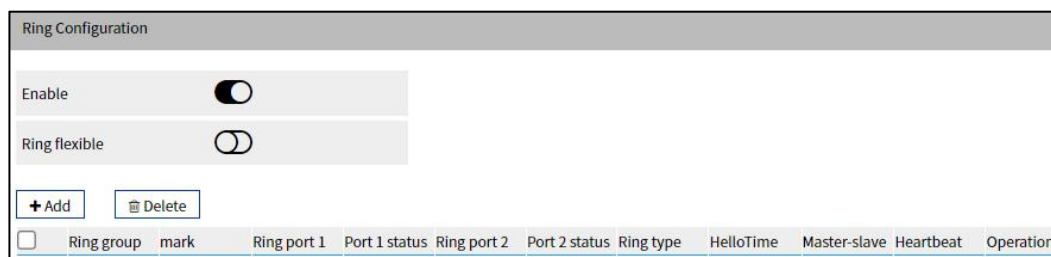
On the "Ring Configuration" page, user can enable/disable the ring network.

### Operation Path

Open in order: "Layer 2 Configuration > Ring Configuration".


### Interface Description

Ring configuration interface as follow:



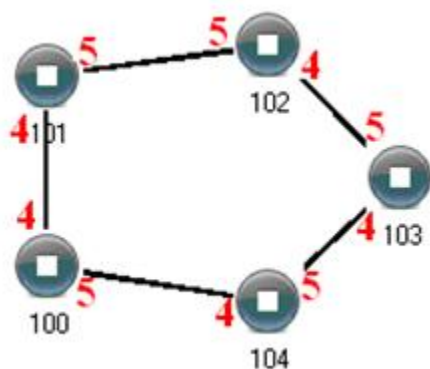
The main element configuration description of Ring configuration interface.

Interface Element	Description
Enable	Enable switch, slide to the right to enable the Ring ring network function.
Ring flexible	Easy mode enable switch. After this switch is enabled, devices with different network identifiers can also establish ring networks.
Ring group	Support ring group 1-12, it can create 12 ring networks at the same time.
mark	When multiple switches form a ring, the current ring ID would be network ID. Different ring network has different ID. Value range is 1-255. Note: The ring network identification must remain the same in one ring network.
Ring port 1	The network port 1 on the switch device used to form the ring network. Note: When the ring network type is "Couple", port 1 is the "Coupled Port". Coupling port is the port that connects different network identities.
Port1 status	The current state of Port 2. <ul style="list-style-type: none"> <li>block;</li> <li>forward.</li> </ul>
Ring port 2	The network port 2 on the switch device used to form the ring network. Note: <ul style="list-style-type: none"> <li>When the ring network type is "Couple", port 2 is the "console port". Console port is the port in the chain where two rings intersect.</li> <li>"Port 1" and "Port 2" cannot be set to the same port, and the port number it sets must be the same as it actually connects without sequential order;</li> </ul>
Port 2 status	The current state of Port 2. <ul style="list-style-type: none"> <li>block;</li> </ul>

Interface Element	Description
	<ul style="list-style-type: none"> <li>• forward.</li> </ul>
Ring Type	<p>According to the requirement in the scene, user can choose different ring type.</p> <ul style="list-style-type: none"> <li>• Single: single ring, using a continuous ring to connect all device together.</li> <li>• Couple: couple ring is a redundant structure used for connecting two independent networks.</li> <li>• Chain: chain can enhance user's flexibility in constructing all types of redundant network topology via an advanced software technology.</li> <li>• Dual-homing: two adjacent rings share one switch. User could put one switch in two different networks or two different switching equipments in one network.</li> </ul>
Hello Time	<p>Hello_time is the sending time interval of Hello packet; via the ring port, CPU sends query packet to adjacent device for confirming the connection is normal or not. Value range is 0-300.</p>
Master-slave	<p>Single loop network supports no-master station structure and one-master multi-slave structure.</p> <ul style="list-style-type: none"> <li>• When all the single-loop devices are slave stations, the single-loop structure is no-master station.</li> <li>• When a single ring device is a master and multiple slave station, one device can be designated as the master device and the other devices as the slave device. One end of the main device of the ring network is the backup link. When the ring network fails, the backup link is enabled from the master station to ensure the normal operation of the network.</li> </ul>
Heartbeat	<p>Heartbeat detection mechanism. When this configuration is enabled, the network association will periodically send heartbeat messages to detect whether the corresponding devices are in live state, thus enhancing the reliability of the network. Swipe the “” button to the right to activate the heartbeat function.</p>
Add	<p>Click “Add” button to add ring network configuration.</p>
Delete	<p>Check the radio box of ring network configuration entry and click “delete” button to delete ring network configuration.</p>

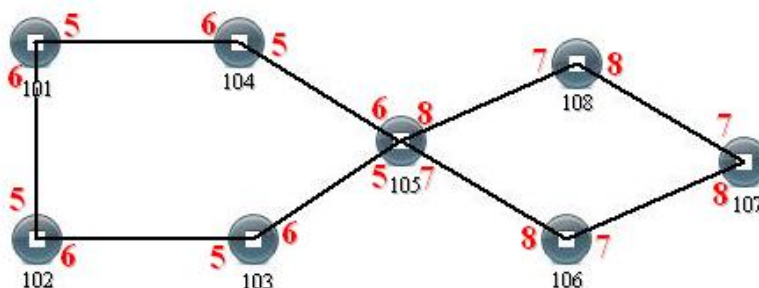
## Single Ring Configuration

Enable Single, enable ring group 1 (other ring group is OK), Set the device port 4 and port 5 to ring port, and set other switches to the same configuration as the switch above, Enable these devices, and adopt network cable to connect port 4 and port 5 of the switch, then search it via network management software, the ring topology structure picture as below:



## Double Ring Configuration

Double ring as shown below, in the figure, double ring is the tangency between two rings, and the point of tangency is NO. 105 switch.

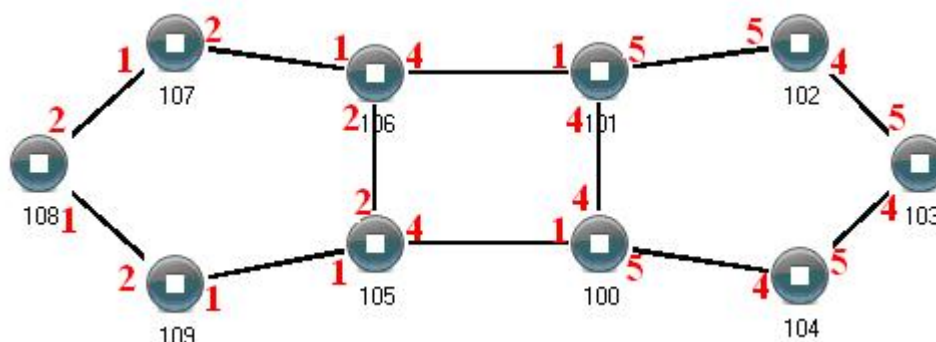


### Configuration Method:

- Step 1** Adopt single ring configuration method to configure port 5 and port 6 of NO. 101, 102, 103, 104, 105 switches as the ring port, and the ring group is 1;
- Step 2** Adopt single ring configuration method to configure port 7 and port 8 of NO. 105, 106, 107 and 108 switches as the ring ports and the ring group 2;
- Step 3** Adopt network cable to connect the ring group 1;
- Step 4** Adopt network cable to connect the ring group 2;
- Step 5** Search the topology structure picture via network management software;  
Since NO. 105 devices belong to two ring groups, the network IDs of the two ring groups cannot be the same.

## Coupling Ring Configuration

Coupling ring basic framework as the picture below:



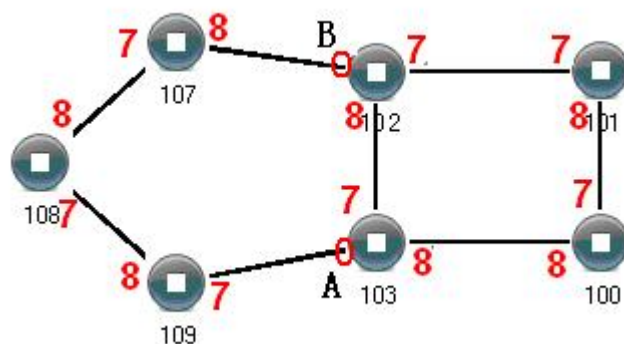
### Operation method:

- Step 1** Enable ring network group 1 and 2: (Hello\_time could be disabled, but the time could not be set to make Hello packet send too fast, otherwise it would effect CPU processing speed seriously);
- Step 2** Set the ring port of NO. 105, 106 device ring group to port 1 and port 2, network identification to 1, ring type to Single; Set the coupling port of ring group 2 to port 4, console port to 2, ring identification to 3, ring type to Coupling.
- Step 3** Set the ring port of NO. 100, 101 device ring group 1 to port 4 and port 5, network identification to 2, ring type to Single; Set the coupling port of ring group 2 to port 1, console port to port 4, ring identification to 3, ring type to Coupling.
- Step 4** Set the ring port of NO. 107, 108 and 109 device ring group 1 to port 1 and port 2, network identification to 1, ring type to Single; Set the ring port of NO. 102, 103 and 104 device ring group 1 to port 4 and port 5, network identification to 2, ring type to Single.
- Step 5** Connect the port 4 and port 5 of five devices NO. 100-104 to the single ring in turn, adopt network cable to connect the port 1 and port 2 of four devices NO. 105-109 to the single ring in turn, Then adopt Ethernet cable to connect port 4 of NO. 106 device to port 1 of NO. 101 device, port 4 of NO. 105 device to port 1 of NO. 100 device, coupling ring combination is completed.

Console ports are two ports connected to NO. 105 device and NO. 106 device in the above picture. The two ports connected to NO. 100 device and NO. 101 device are also called console ports.

## Chain Configuration

Chain basic framework as the picture below:



#### Operation method:

- Step 1** Enable ring group1: (Hello\_time could be disabled, but the time shouldn't be set to send Hello packet too fast, otherwise it would affect the processing speed of CPU seriously).
- Step 2** Set the ring port of NO. 100, 101, 102 and 103 device ring group 1 to port 7 and port 8, network identification to 1, ring type to Single. Set the ring port of NO. 107, 108 and 109 devices ring group 1 to port 7 and port 8, network identification to 2, ring type to Chain.
- Step 3** Adopt network cable to connect the port 7 and port 8 of three devices NO. 107-109, adopt network cable to connect the port 7 and port 8 of four devices NO. 100-103 to the single ring in turn, Then adopt network cable to connect port 7 of NO. 107 device and port 7 of NO. 109 device to normal ports of NO. 102 and 103 device, chain combination is complete.



#### Note

- Port that has been set to port aggregation can't be set to rapid ring port, and one port can't belong to multiple rings;
- Network identification in the same single ring must be consistent, otherwise it cannot form a normal ring or normal communicate;
- Network identification in different ring must be different;
- When forming double ring and other complex ring, user should notice whether the network identification in the same single ring is consistent, and network identification in different single ring is different.

## 5.6 IGMP Snooping Configuration

IGMP Snooping (Internet Group Management Protocol Snooping) is an IPv4 layer 2 multicast Protocol. It maintains the egress interface information of Group broadcast by

snooping for the multicast protocol messages sent between the layer 3 multicast device and the user host, so as to manage and control the forwarding of multicast data message in the data link layer.

After IGMP Snooping is configured, the layer 2 multicast device can snoop and analyze the IGMP messages between the multicast user and the upstream router. Based on these information, the layer 2 multicast forwarding and publishing items can be established to control the forwarding of multicast data message. This prevents multicast data from being broadcast in the layer 2 network.

The ways of IGMP Snooping processing different messages:

- 1 IGMP universal group query message: IGMP universal group query message is sent periodically to all hosts and routers in the local network segment to query which multicast group members are in the network segment.
- 2 Specific group query message: when receiving a specific group query message for a multicast group, if there are member ports in the forwarding table entry corresponding to the group, reply the report message of the group to all router ports.
- 3 IGMP report message, when receiving the report message of a multicast group from a certain port, is handled in three situations:
  - If the forwarding table entry corresponding to the group already exists and the dynamic member port is included in the outgoing port list, reset its aging timer;
  - If the forwarding table entry corresponding to the group already exists, but the port is not included in the out port list, the port is added to the out port list as a dynamic member port and its aging timer is started;
  - If there is no forwarding table entry corresponding to the group, create a forwarding table entry, add the port as a dynamic member port to the out port list, start its aging timer, and then send the report message of the group to all router ports.
- 4 IGMP leave message: After receiving the leave message of a multicast group from a port, send a specific group inquiry message for the group to the port. Only when the last member port in the forwarding table entry corresponding to a multicast group is deleted, the leaving message of the group will be sent to all router ports.

## 5.6.1 Global Configuration

### Function Description

On the "Global Configuration" page, user can enable/disable IGMP monitoring and resident multicast.

### Operation Path

Open in order: "Layer 2 Configuration > IGMP-Snooping Configuration > Global Configuration".

### Interface Description

Global configuration interface is as follows:

The screenshot shows the 'IGMP-Snooping Configuration' page with the following configuration options:

- Enable IGMP-Snooping:
- Permanent Group:
- Source address:
- Set button:

Below the configuration options is a table with columns: VLAN ID, Group Members, and Port list. At the bottom, there is a pagination bar showing: Total item 0, Total page 0, Current page < 1 >

The main element configuration description of global configuration interface:

Interface Element	Description
Enable IGMP-snooping	Check to enable IGMP listening configuration.
Permanent group	Configure the multicast group as a resident multicast group, and the multicast address will not age in the forwarding table.
Source address	When there is no IP address in the VLAN, you can specify the address from which to send an IGMP listener message.
VLAN ID	The VLAN ID number of multicast was listened.
Group members	The multicast address that was listened.
Port list	List of multicast member group ports and routing ports listened to.

## 5.6.2 Interface Configuration

### Function Description

On the "Interface Configuration" page, user can configure the related parameters of interface IGMP Snooping.

### Operation Path

Open in order: "Layer 2 Configuration > IGMP-snooping > Interface Configuration".

### Interface Description

Interface configuration interface as follows:

IGMP-Snooping Configuration >												
Global configuration												
Interface Configuration												
Routing Interface Configuration												
Routing Interface Information												
<input type="button" value="+ Add"/> <input type="button" value="Delete"/>												
<input type="checkbox"/>	VLAN ID	IGMP Snooping	Fast leave	Querier	Querier election disable	Startup query count	Startup query interval	Query interval	Query max response time	Last member query interval	Last member query count	Operation
<input type="checkbox"/>	1	enable	disable	disable	disable	2	31	125	10	1000	2	Edit Delete
Total item 1 Total page 1 Current page < 1 >												

The main element configuration description of interface configuration interface:

Interface Element	Description
VLAN ID	VLAN ID number, value range is 1-4094.
IGMP Snooping	IGMP Snooping status, enabling IGMP snooping on global or VLAN interface. Note: Only when IGMP snooping is enabled on the global and VLAN interfaces can the configuration of the other IGMP snooping properties on that interface take effect.
Fast Leave	The enable state of the multicast group fast leave. After fast leaving is enabled, when the switch receives the IGMP leaving group message sent by the host from a port, it directly deletes the port from the outgoing port list of the corresponding forwarding table entry. <ul style="list-style-type: none"> <li>Enable: enable the multicast fast leave function.</li> <li>Disable: disable the multicast fast leave function.</li> </ul>
Querier	Enable status of IGMP inquirer. IGMP querier can send general query messages to all hosts and other multicast routers in this network segment.
Querier election disable	Enable non-election status of IGMP-Querier. IGMPv2 uses an independent inquirer election mechanism. When there are multiple multicast routers on the shared network

Interface Element	Description
	segment, the router with the smallest IP address becomes an inquirer, while the non-inquirer no longer sends universal group inquiry messages.
Startup query number	The number of times an IGMP query is started
Startup query interval	The starting query interval of IGMP querier, in seconds.
Query interval	Time interval for the inquirer to send IGMP universal group inquiry message. Note: The query interval of universal group must be greater than the maximum response of universal group.
Query max response time	Maximum response time of IGMP universal group query.
Last member query interval	Time interval when the inquirer sends IGMP specific group inquiry message.
Last member query count	Number of IGMP specific group inquiry messages sent by the inquirer.
Operation	Click the "Edit" button to edit relevant parameters; Click the "Delete" button to delete the entry.

## 5.6.3 Interface Configuration

### Function Description

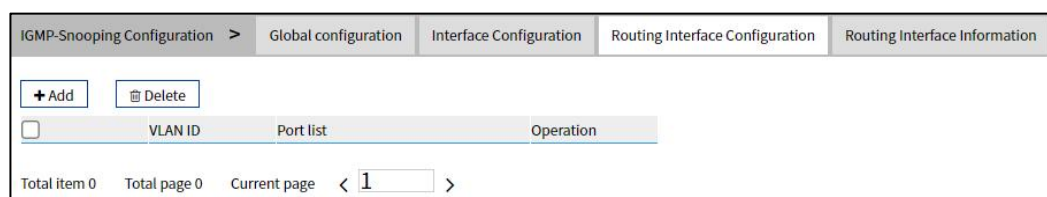
On the "Interface Configuration" page, user can configure the port of multicast router.

### Operation Path

Open in order: "Layer 2 Configuration > IGMP Snooping > Interface Configuration".

### Interface Description

Interface configuration interface is as below:



Main elements configuration description of routing port configuration interface:

Interface Element	Description
VLAN ID	VLAN ID number, value range is 1-4094.
Port list	Check the checkbox of port list, select device port as the static router port that connects router.
Operation	Click the "Delete" button to delete the entry.

## 5.6.4 Routing Interface information

### Function Description

On the Routing Interface Information page, you can view the startup time, aging time and port type of the routing port. The startup time starts from the port setting as the routing port.

### Operation Path

Open in order: "Layer 2 Configuration > IGMP Snooping Configuration > Routing Interface Information".

### Interface Description

Routing Interface information interface is as follows:

IGMP-Snooping Configuration > Global configuration > Interface Configuration > Routing Interface Configuration > Routing Interface Information				
VLAN ID	Port list	Start Time	Aging time	Type
Total item 0    Total page 0    Current page < 1 >				

Main element description of routing port information interface:

Interface Element	Description
VLAN ID	VLAN ID number, value range is 1-4094.
Port List	List of online routing ports.
Start Time	The length of time the routing port has been started.
Aging Time	<p>Aging time of routing port:</p> <ul style="list-style-type: none"> <li>The dynamic routing port. Aging time calculated according to the query message interval of snooping IGMP and related items in the message.</li> <li>The static routing port displays "stopped", indicating that the port will not age.</li> </ul>
Type	<p>Two types:</p> <ul style="list-style-type: none"> <li>S: Static routing port</li> <li>D: Dynamic routing port</li> </ul>

## 5.7 Port Loopback Detection

Loop Detection technology is to periodically send a special detection message from the interface, and then detect whether the message returns to the device, and then judge whether there is a loop between the interface, the device's down-link network or the device and the device's dual interfaces:

- If detection packets are received by the same interface, a loopback occurs on the interface or a loop occurs on the downstream network or device connected to the interface.
- If detection packets are received by another interface on the same device, a loop occurs on the device or network connected to the interface.

After discovering the loop, the device will send an alarm to the network management and record the log, and close the interface at the same time to reduce the impact of the loop on the device and even the network. After the interface is closed, do not participate in any calculation or forwarding completely to prevent network storms.

After a certain period of time, if the device does not receive the detection message sent by the interface, the loop is considered to have been eliminated and the controlled interface will automatically return to the normal state. This process is called controlled interface automatic recovery. After the loop elimination, the recovery port can also be manually configured.

### 5.7.1 Global Configuration

#### Function Description

On the "Global Configuration" page, you can use the enable switch to enable the loop detection technology and check the configuration information of port loop detection.

Note:

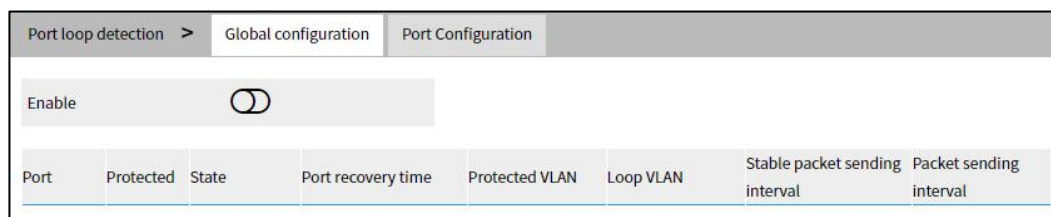
If the loop monitoring function is enabled in the VLAN, it is not recommended to configure the port mirroring function on the ports belonging to the VLAN, otherwise it may cause errors in the loop monitoring function.

#### Operation Path

Open in order: "Layer 2 Configuration > Port Loop-detection > Global Configuration".

#### Interface Description

Global configuration interface is as follows:



The main element configuration description of global configuration interface:

Interface Element	Description
Enable	Global enable switch of port loop detection.
Port	The corresponding port number of this device's Ethernet port.
Protected	The state of the port protected by a loop.
State	The connection status of this port, values are: <ul style="list-style-type: none"> <li>Down: the port is physically disconnected</li> <li>Up: the port is connected</li> <li>Shutdown: the port is closed</li> <li>No Shutdown: the port is not closed</li> </ul>
Port recovery time	Recovery time after detection of loop action. If the disabled port does not receive the loop monitoring message after the "port recovery time", it is judged that the loop has been eliminated and the port is reactivated.
Protected VLAN	The VLAN ID of the loop protection.
Loop VLAN	The VLAN ID of the currently generated loop.
Stable packet sending interval	After the ports are started stably, that is, after three "packet-sending intervals", a loop monitoring message is sent at a "stable packet-sending interval" to determine whether there is a loop at each port and whether the loop on the port has been eliminated.
Packet sending interval	When the port is just started, the default time interval for sending loop monitoring messages is 1s, a total of 3 times, and then the packet issuing interval returns to the normal packet issuing interval.

## 5.7.2 Port Configuration

### Function Description

On the "Port Configuration" page, user can implement relevant configuration of port loop detection.

### Operation Path

Open in order: "Layer 2 Configuration > Port Loop Detection > Port Configuration".

### Interface Description

Check port configuration interface as below:

Port loop detection > Global configuration Port Configuration								
Config								
<input type="checkbox"/>	Port	Protected	State	Port recovery time	Protected VLAN	Loop VLAN	Stable packet sending interval	Packet sending interval
<input type="checkbox"/>	fe1	No	Down	300	-	-	10	1
<input type="checkbox"/>	fe2	No	Down	300	-	-	10	1
<input type="checkbox"/>	fe3	No	Up	300	-	-	10	1
<input type="checkbox"/>	fe4	No	Down	300	-	-	10	1
<input type="checkbox"/>	fe5	No	Down	300	-	-	10	1
<input type="checkbox"/>	fe6	No	Down	300	-	-	10	1
<input type="checkbox"/>	fe7	No	Down	300	-	-	10	1
<input type="checkbox"/>	fe8	No	Down	300	-	-	10	1
<input type="checkbox"/>	fe9	No	Down	300	-	-	10	1
<input type="checkbox"/>	fe10	No	Down	300	-	-	10	1
<input type="checkbox"/>	fe11	No	Down	300	-	-	10	1
<input type="checkbox"/>	fe12	No	Down	300	-	-	10	1
<input type="checkbox"/>	fe13	No	Down	300	-	-	10	1
<input type="checkbox"/>	fe14	No	Down	300	-	-	10	1
<input type="checkbox"/>	fe15	No	Down	300	-	-	10	1
<input type="checkbox"/>	fe16	No	Down	300	-	-	10	1
<input type="checkbox"/>	fe17	No	Down	300	-	-	10	1
<input type="checkbox"/>	fe18	No	Down	300	-	-	10	1
<input type="checkbox"/>	fe19	No	Down	300	-	-	10	1
<input type="checkbox"/>	fe20	No	Down	300	-	-	10	1
<input type="checkbox"/>	fe21	No	Down	300	-	-	10	1
<input type="checkbox"/>	fe22	No	Down	300	-	-	10	1
<input type="checkbox"/>	fe23	No	Down	300	-	-	10	1
<input type="checkbox"/>	fe24	No	Down	300	-	-	10	1
<input type="checkbox"/>	ge1	No	Down	300	-	-	10	1
<input type="checkbox"/>	ge2	No	Down	300	-	-	10	1
<input type="checkbox"/>	ge3	No	Down	300	-	-	10	1
<input type="checkbox"/>	ge4	No	Down	300	-	-	10	1

The main element configuration description of port configuration interface:

Interface Element	Description
Port	The corresponding port number of this device's Ethernet port.
Protected	The state of the port protected by a loop.
State	The connection status of this port, values are: <ul style="list-style-type: none"> <li>Down: the port is physically disconnected</li> </ul>

Interface Element	Description
	<ul style="list-style-type: none"> <li>• Up: the port is connected</li> <li>• Shutdown: the port is closed</li> <li>• No Shutdown: the port is not closed</li> </ul>
Port recovery time	The resume time after the action of detecting loop, value range: 300-600, its unit is second.
Protected VLAN	<p>The VLAN ID of loop protection. It is None by default. The value range: 1-4094, the number of VLAN ID is <math>\leq 16</math>.</p> <p>Note: This parameter must be configured, otherwise there would be errors in down sending the data.</p>
Loop VLAN	The VLAN ID of the currently generated loop.
Stable packet sending interval	After the ports are started stably, that is, after three "packet-sending intervals", a loop monitoring message is sent at a "stable packet-sending interval" to determine whether there is a loop at each port and whether the loop on the port has been eliminated. Stable packet issuing interval time, the value range is 10-300, and the unit is seconds.
Packet sending interval	When the port is just started, the default time interval for sending loop monitoring messages is 1s, a total of 3 times, and then the packet issuing interval returns to the normal packet issuing interval.

# 6 Layer 3 Configuration

## 6.1 Interface Configuration

Interface configuration mainly refers to setting the device's interface IPv4 address. The interface configuration only supports manual configuration, doesn't support automatic acquisition (DHCP). User chooses the interface, and fill in IPv4 address. IPv6 address setting can be achieved via command line.

### IPV4 address:

The IP address is a 32-bit address assigned to the device connected to Internet. IP address is composed of two fields: Network number field (net-id) and host number field (host-id). IP addresses are allotted by the Network Information Center (NIC) of U.S. Defense Data Network. IP addresses are divided into five categories for the convenience of IP address management. As the table below:

Network Type	Address Range	Usable IP Network Range
A	0.0.0.0~126.255.255.255	1.0.0.0~126.0.0.0
B	128.0.0.0~191.255.255.255	128.0.0.0~191.254.0.0
C	192.0.0.0~223.255.255.255	192.0.0.0~223.255.254.0
D	224.0.0.0~239.255.255.255	None
E	240.0.0.0~246.255.255.255	None
Other addresses	255.255.255.255	255.255.255.255

Thereinto, category A, B, C address are unicast address; category D address is multicast address; category E address is reserved address for the future special purpose. Now, most of the using IP addresses belong to category A, B, C address.

IP address adopts dotted decimal notation recording mode. Each IP address is expressed as four decimal integers separated by radix point, each integer is corresponding to a byte, such as 10.110.50.101.

#### **IPv6 address:**

IPv6 (Internet Protocol Version 6) is the second standard protocol of network layer protocol, also called IPng (IP Next Generation); it's a set of standards designed by IETF (Internet Engineering Task Force) and is the upgrade version of IPv4. The most significant difference between IPv4 and IPv6: IP address length is increased from 32 bits to 128 bits.

IPv6 address is expressed as a series of 16 bits hexadecimal number separated by colon. Each IPv6 address is divided into eight groups, 16 bits in each group is expressed by four hexadecimal numbers, two groups are separated by colon, such as: 2001:0000:130F:0000:0000:09C0:876A:130B. In order to simplify the expression of IPv6 address, "0" in IPv6 address can be handled in the following way: The leading "0" in each group can be omitted, that is above address can be written as 2001:0:130F:0:0:9C0:876A:130B. If the address contains two or more successive 0 group, it can be replaced by double colon "::", that is, above address can be written as 2001:0:130F::9C0:876A:130B.



#### **Notice**

One IPv6 address can only use the double colon "::" once, otherwise, when the device changes "::" to 0 for restoring 128 bits address, 0 number represented by "::" won't be able to confirm.

---

IPv6 address is composed of two parts: address prefix and interface identification. Thereinto, address prefix is the network number field part in IPv4 address, interface identification is the host number part in IPv4 address.

The expression method of address prefix is: IPv6 address/prefix length. Thereinto, IPv6 address is any form listed before, and prefix length is a decimal number, it represents how many bits in the leftmost of IPv6 address is the address prefix.

## **6.1.1 Layer 3 Interface**

The IP of layer 3 switch could be used as the device management address or gateway. The IP of layer 3 switch needs to be configured at layer 3 interface.

## Function Description

On the "Interface Configuration" page, user can configure the Layer 3 interface IP address.

## Operation Path

Open in order: "Layer-3 Configuration > Interface Configuration > Layer-3 Interface".

## Interface Description

Layer-3 interface configuration interface as follows:

Interface Configuration >		Layer-3 Interface	Loopback Interface Configuration			
<input type="checkbox"/>	Interface	State	Primary address	Secondary address	Enable	Operation
<input type="checkbox"/>	vlanif1	up	192.168.1.254/24		enable	Edit Delete
Total item 1	Total page 1	Current page	< 1			>

The main element configuration description of interface configuration interface:

Interface Element	Description
Interface	Layer 3 interface names, such as, vlanif1, value range: vlanif1-vlanif4094.
State	Interface state information, options: <ul style="list-style-type: none"> <li>Up;</li> <li>Down.</li> </ul>
Primary Address	Primary IPv4 address and subnet mask, such as 192.168.1.1/24.
Secondary Address	Backup IPv4 address (or virtual IP) and subnet mask, such as 192.168.1.253/24.
Enable	Interface switch options as follows: <ul style="list-style-type: none"> <li>enable;</li> <li>disable.</li> </ul>
Operation	Click "Edit" button to set interface and IPv4 address, enable/disable interface switch. Click "Delete" under "operation" to delete the corresponding interface configuration directly.
Add	Click "Edit" button to add the configuration of layer 3 interface.
Delete	Check the radio box of layer 3 interface entry, and click "Delete" button to delete layer 3 interface entry.



## 6.2 ARP Configuration

ARP (Address Resolution Protocol) is the protocol that resolves IP address into Ethernet MAC address (or physical address).

In local area network, when the host or other network device sends data to another host or device, it must know the network layer address (IP address) and MAC address of the opposite side. So it needs a mapping from IP address to the physical address. ARP is the protocol to achieve the function.

### 6.2.1 ARP Information

#### Function Description

On the "ARP Information" page, user can check the ARP address, MAC, output port and other parameters.

#### Operation Path

Open in order: "Layer-3 Configuration > ARP Configuration > ARP Information".

#### Interface Description

ARP Information interface as follow:

ARP Configuration >		ARP Information	Static ARP Configuration	ARP Parameter Configuration			
Clear ARP table							
Destination IP	Destination MAC	Interface	Type	Expires	Port	Operation	
192.168.1.25	408d.5c8a.7f41	vlanif1	dynamic	950	fe3	To Static	
Total item 1	Total page 1	Current page	< 1 >				

The main element configuration description of ARP information interface:

Interface Element	Description
Destination IP	Destination IP address of accessing device.
Destination MAC	Destination MAC address of accessing device.
Interface	Output port of accessing device data transmission.
Type	ARP mode of accessing device.
Expires	ARP age-time of accessing device.
Port	Port number of the accessing device.

Interface Element	Description
Operation	Click "To Static" to convert dynamic address to static address.

## 6.2.2 Static ARP Configuration

### Function Description

On the "Static ARP" page, user can conduct static ARP configuration.

### Operation Path

Open in order: "Layer-3 forward Configuration > ARP Configuration > Static ARP Configuration".

### Interface Description

Static ARP Configuration interface as follows:

ARP Configuration >		ARP Information	Static ARP Configuration	ARP Parameter Configuration
<input type="button" value="+ Add"/>	<input type="button" value="Delete"/>			
<input type="checkbox"/>	IP address	MAC Address	Interface	Operation
<input type="checkbox"/>	192.168.1.61	00e0.4d2f.2f52	vlanif1	Edit Delete
Total item 1		Total page 1	Current page	< 1 >

The main element configuration description of static ARP configuration interface:

Interface Element	Description
IP Address	IP address of accessing device, such as 192.168.1.1.
MAC Address;	MAC address of the access device, such as 0001.0001.0001.
Interface	Output port of accessing device data transmission.
Operation	Click "Edit" under "operation" to edit the MAC address information again. Click "Delete" under "operation" to delete the entry directly.

## 6.2.3 ARP Parameter Configuration

### Function Description

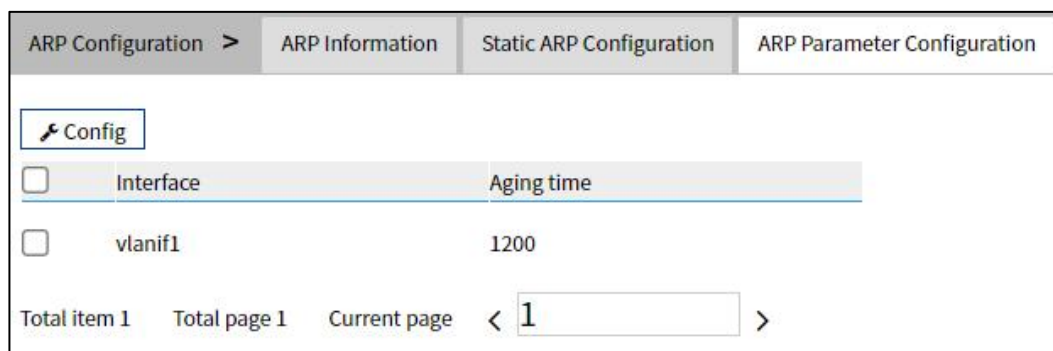
On the "ARP age-time" page, user can conduct ARP age-time configuration.

## Operation Path

Open in order: "Layer-3 Configuration > ARP Configuration > ARP Parameters Configuration".

## Interface Description

ARP parameter configuration interface as follows:



The main element configuration description of ARP age-time interface:

Interface Element	Description
Interface	Interface Name.
Aging Time	Ageing time display.
Configuration	Check the ARP interface entry checkbox and click the "Config" button to configure the aging time of the specified interface. It is 1200 by default, valid input range is 30-1200 (second).

## 6.3 VRRP Configuration

VRRP (Virtual Router Redundancy Protocol) is a fault-tolerant protocol. In general, all hosts in a network will set a default route, when the destination address of the message sent by host isn't in the network segment; the message will be sent to the Router A via default router, achieving the communication between the host and external network. When the Router A breaks down, all hosts that takes Router A as default router in the network segment will disconnect communication to the outside, generating single point of failure. VRRP is proposed to solve the problem above, and it's designed for the local area network (such as: Ethernet) with multicast or broadcast capability.

VRRP organizes a set of routers (including a Master, that is the active router and several Backup, that is the standby router) in the local area network into a virtual router, which is called a backup team. The virtual router possesses its own IP address 10.100.10.1 (The IP address can be same to a router interface address in the backup team, it's called IP owner), routers in the backup team have their own IP address (such as IP address of Master is 10.100.10.2, IP address of Backup is 10.100.10.3). Hosts in the local area network only knows the virtual router IP address is 10.100.10.1, it doesn't know that the specific Master router IP address is 10.100.10.2 and Backup router IP address is 10.100.10.3. Hosts set their own default router next hop address to the virtual router IP address 10.100.10.1. Thereupon, hosts in the network start to communicate with other networks via the virtual router. If the Master router in backup team breaks down, Backup router will elect a new Master router via election strategy and provide router service for hosts in the network. Therefore, hosts in the network can uninterruptedly communicate with outside network.

### **Principle of realization**

A VRRP router has the only identification: VRID, range is 0-255. The router has only one virtual MAC address, and the address format is 00-00-5E-00-01-[VRID]. Master router is responsible for replying the ARP request by MAC address. Regardless of the switching, it's ensured to give the only consistent IP and MAC address to the terminal device, declining the switching influence to terminal device.

VRRP control message includes only one type: VRRP announce (advertisement). It's packaged by IP multicast data packet, the multicast address is 224.0.0.18, issue range can be only in the same local area network. It has ensured that VRID can be repeatedly used in different network. In order to decrease the network bandwidth consumption, only the master router can periodically send VRRP announce message. Backup router will start new VRRP election if it can't receive VRRP in three consecutive announce intervals or receives announce with 0 priority.

In the VRRP router group, the master router is elected by priority. The priority range in VRRP protocol is 0-255. If VRRP router IP address is the same to virtual router interface IP address, then the virtual router is called IP address owner in VRRP group; IP address owner automatically has the highest priority: 255. Priority 0 is usually used when IP address owner forwardly gives up the master role. Configurable priority range is 1-254. Priority configuration principle is set according to the link speed and cost, router performance and reliability, and other management strategies. In the election of

master router, virtual router with high priority wins; therefore, if there exists IP address owner in VRRP group, it will appear as the master router. Candidate router with the same priority can be elected according to IP address size order. VRRP has also provided priority preemption strategy, if the strategy is configured, backup router with high priority will deprive current master router with low priority and become the new master router.

In order to ensure the safety of VRRP protocol, two safety certification measures are provided: Plaintext authentication and IP header authentication. Plaintext authentication method requirements: User must provide the VRID and plaintext password while joining a VRRP router. It suits for avoiding the configuration error in the local area network but can't prevent gaining the password via network monitoring method. IP header authentication method has provided higher security, and it can prevent message replay and modification attack.

## Function Description

On the "VRRP Configuration" page, user can configure VRRP parameters.

## Operation Path

Open in order: "Layer-3 Configuration > VRRP Configuration".

## Interface Description

VRRP configuration interface as follow:

VRRP Configuration															
<input type="checkbox"/>	VRID	Layer-3 Interface	State	Virtual IP	IP address owner	Priority	Announcement Interval (s)	Authentication mode	Preemption mode	Preemption delay time	IPDT ID	Type	Priority Delta	Enable	Operation
<input type="checkbox"/>	1	vlanif1	Backup	192.168.1.253	no	100	1	disable	false	0				enable	Edit Delete
Total item 1    Total page 1    Current page < 1 >															

The main element configuration description of VRRP configuration interface:

Interface Element	Description
VRID	Virtual router ID, valid range is 1-255.
Layer 3 Interface	Layer 3 interface information, such as, vlanif1.
State	Current status, options as follows: <ul style="list-style-type: none"> <li>• Master;</li> <li>• Backup.</li> </ul>
Virtual IP	Virtual router IP address, such as 192.168.1.253.
IP address owner	The IP address owner takes the virtual router IP address as the real interface address.
Priority	Priority defaults to 100, the valid range is 1-254.

Interface Element	Description
	<p>Note: When the IP address owner is configured, the default priority can only be 255.</p>
Announcement interval (s)	<p>The Master router in the VRRP backup group will send a notification message to notify the routers in the VRRP backup group that they are working normally, unit: second, default: 1 second, valid range: 1-10 seconds.</p>
Authentication mode	<p>Configure how the backup group sends and receives VRRP messages. By default, no authentication is performed.</p> <p>Options are as follows:</p> <ul style="list-style-type: none"> <li>• disable;</li> <li>• text.</li> </ul> <p>Note:</p> <ul style="list-style-type: none"> <li>• Different backup groups on an interface can set different authentication methods.</li> <li>• Members joining the same backup group need to set up the same authentication mode.</li> </ul>
Preemption mode	<p>In the preemption mode, once the routers in the backup group find that their priority is higher than that of the current Master router, they will send VRRP announcement messages to the outside. It causes the router in the backup group to reelect the Master router and eventually replace the original Master router. Accordingly, the original Master router will become the Backup router. Preemption mode, options as follows:</p> <ul style="list-style-type: none"> <li>• false;</li> <li>• true.</li> </ul>
Preempt delay time	<p>Set a preemption delay for a VRRP backup group to avoid frequent primary and standby state transitions among members of the backup group. Valid range is 0-255s, the default value is 0s.</p>
IPDT ID	<p>The value range of IPDT ID is 1-8.</p>
Type	<p>IPDT priority type, options are as follows:</p> <ul style="list-style-type: none"> <li>• Increased: After "Track" is enabled, the VRRP priority value is equal to the original VRRP priority value plus the IPDT priority value when the IPDT link fails.</li> <li>• Reduced: After "Track" is enabled, the VRRP priority value is equal to the original VRRP priority value minus the IPDT priority value when the IPDT link fails.</li> </ul>
Priority Delta	<p>IPDT priority level, the value range is 1-253.</p>

Interface Element	Description
Enable	Enable switch, options are as follows: <ul style="list-style-type: none"> <li>• Enable;</li> <li>• Disable.</li> </ul>
Operation	Click "Edit" under "Operation" to re-edit VRRP configuration information; Click "Delete" under "Operation" to delete the entry directly.

## 6.4 NAT Configuration

NAT(Network Address Translation) is a process of translating an IP address in an IP data header into another IP address. In practical application, NAT is mainly used to realize the function of private network accessing public network. This way of using a few public IP addresses to represent more private IP addresses will help to slow down the exhaustion of available IP address space.

### Function Description

On the "NAT Configuration" page, user can add or remove NAT entries and set up the Intranet and extranet interfaces of the device.

### Operation Path

Open in order: "Layer-3 Configuration > NAT Configuration".

### Interface Description

The NAT configuration interface is as follows:

NAT Configuration											
<input type="checkbox"/> <input type="button" value="+ Add"/> <input type="button" value="Delete"/>											
<input type="checkbox"/>	Name	Active state	Inside interface	Inside IP	Inside port	Outside interface	Outside IP	Outside port	Protocol/VRID	Destination network	Operation
Total item 0   Total page 0   Current page < 1 >											

The main element configuration description of NAT configuration interface:

Interface Element	Description
Add	Click the "Add" button and set the Intranet and external interfaces of the device.
Delete	Check NAT port binding information to be deleted, and click "Delete" to delete it
Name	NAT entry name. Note:

Interface Element	Description
	Support input of up to 32 characters of letters, numbers or @ ! .
Active state	Whether NAT rule is activated or not, the status is as follows: <ul style="list-style-type: none"> <li>Activated: enable;</li> <li>Inactive: disable.</li> </ul>
Inside interface	Connect the VLAN of the intranet device, access the IP of this VLAN, and access the public network through NAT.
Inside IP	Intranet IP that can be mapped to external network through NAT.
Inside port	Port number of intranet VLAN corresponding to port mapping protocol. Note: tcp/udp :1-65535/ no filling indicates any port; all/icmp: No distinction between port numbers.
Outside interface	The VLAN connecting the external network device, through which the external network can access the internal network device through NAT.
Outside IP	The external network IP mapped by the internal network IP through NAT.
Outside port	The port number of the external VLAN corresponding to the port mapping protocol. Note: tcp/udp :1-65535/ no filling indicates any port; all/icmp: No distinction between port numbers.
Protocol	Mapping port protocol, options are as follows: <ul style="list-style-type: none"> <li>All: supports tcp, udp and icmp protocol forwarding;</li> <li>tcp: supports tcp protocol forwarding;</li> <li>udp: supports udp protocol forwarding;</li> <li>icmp: supports icmp protocol forwarding.</li> </ul> Note: When all and icmp protocols are selected, it is not supported to input internal network port and external network port. Please keep the internal network port and external network port blank.
VRID	VRID is the VRRP ID, with values ranging from 1 to 255. When the devices in the VRRP backup group are configured with the NAT address pool, it is possible for both devices to perform NAT translation on the packet, resulting in a conflict. Configuring the VRID allows you to optionally specify the Master device to do the NAT conversion, effectively avoiding collisions.
Destination network	The destination network of internal terminal device, namely

---

Interface Element	Description
	the IP address and subnet mask of the destination network, such as 10.1.1.0/24.
Operation: delete	Delete the NAT entry of the current line.

# 7 Unicast Routing

## 7.1 IPv4 Configuration

### 7.1.1 IPv4 Routing Table

#### Function Description

On the "IPv4 Routing Table" page, user can check various router configuration methods.

#### Operation Path

Open in order: "Unicast Routing > IPv4 Configure > Ipv4 Routing Table".

#### Interface Description

The IPv4 routing table interface as follows:

IPv4 Configuration > IPv4 Routing Table IPv4 Static Route					
Destination IP	Mask length of destination IP	Protocol type	Next hop	Outgoing interface	
127.0.0.0	8	connected	-	lo	
192.168.1.0	24	connected	-	vlanif1	
192.168.1.253	32	connected	-	vlanif1	
Total item 3 Total page 1 Current page < 1 >					

The main element configuration description of show route interface:

Interface Element	Description
Destination IP	Destination IP addresses.
Mask length of destination IP	The length of destination subnet mask.
Protocol type	Protocol type, corresponding full name relationship as below: <ul style="list-style-type: none"> <li>K-kernel route;</li> </ul>

Interface Element	Description
	<ul style="list-style-type: none"> <li>• C - connected;</li> <li>• S – static;</li> <li>• R – RIP;</li> <li>• O – OSPF;</li> <li>• I - IS-IS;</li> <li>• B – BGP;</li> <li>• A – Babel;</li> <li>• &gt; - selected route;</li> <li>• * - FIB route.</li> </ul>
Next hop	Gateway address information of next hop.
Output port	Interface Name.

## 7.1.2 IPv4 Static Route

Static route refers to the route information that user or network administrator manually configures. When the network topology structure or link status changes, network administrator needs to manually modify relative static route information in the routing table. Static route usually adapts to simple network environment, under this environment, network administrator can clearly know the network topology structure, which is convenient for setting correct route information.

### Function Description

On the "IPv4 Static Route" page, user can configure static route.

### Operation Path

Open in order: "Unicast Routing > IPv4 Configure > IPv4 Static Route".

### Interface Description

The IPv4 Static Route interface as follows:

The main element configuration description of IPv4 Static Route interface:

Interface Element	Description
Destination IP	Destination network IP address, such as

Interface Element	Description
	destination address is 10.1.1.0.
Mask length of destination IP	Destination IP mask length. Value range is 0-32.
Next hop	The gateway address of the next hop, format: no input or 192.3.3.3.
Outgoing port	Interface Name.
Operation	Click the "Delete" button to delete the the current entry.

## 7.2 RIP Configuration

RIP (Routing Information Protocol) is a simple Interior Gateway Protocol (IGP) and mainly used in small network, such as Campus Network and Local Area Network with simple structure. RIP isn't used in more complex environment and large network.

RIP is simple to achieve and easier in configuration and maintenance than OSPF or IS-IS, so it's widely used in actual networking.

### 7.2.1 RIP Global Configuration

#### Function Description

On the "RIP Global Configuration" page, user can conduct RIP global relative parameters configuration.

#### Operation Path

Open in order: "Unicast Routing > RIP Configuration > RIP Global Configuration".

#### Interface Description

RIP global configuration interface as follows:

RIP Configuration >	RIP Global Configuration	RIP Network Configuration	RIP Interface Configuration
Enable <input checked="" type="checkbox"/>			
RIP version	2	Default 2	
Assign default route	Disable	Default disable	
Metric	1	Range 1-16,Default:1	
Distance	120	Range 1-255,Default:120	
Update time	30	Range 5-2147483647,Default:30, Unit: s	
Invalid time	180	Range 5-2147483647,Default:180, Unit: s	
Invalid retention time	120	Range 5-2147483647,Default:120, Unit: s	
Redistribution	<input type="checkbox"/> Connected <input type="checkbox"/> Static <input type="checkbox"/> Ospf <input type="checkbox"/> bgp		
<input type="button" value="Set"/>			

The main element configuration description of RIP global configuration interface:

Interface Element	Description
Enable	RIP function enable switch. After enabling, the RIP related parameter configuration will appear.
RIP version	<p>RIP version drop-down list, the default version is RIP-2, the options of version are as follows:</p> <ul style="list-style-type: none"> <li>1: RIP-1 is Classful Routing Protocol, it only supports releasing protocol message via broadcast mode, only natural network segments such as A, B and C can be identified.</li> <li>2: RIP-2 is a non-classified routing protocol, which is extended on the basis of RIP-1.</li> </ul> <p>Note: Interface can only send/receive data packets of the RIP version configured.</p>
Assign default route	<p>The default route with the destination address of 0.0.0.0 is assigned to RIP routing database, which is disabled by default. The options are as follows:</p> <ul style="list-style-type: none"> <li>Enable;</li> <li>Disable.</li> </ul>
Metric	The metric is equal to the number of devices from this route to the destination route, with a default value of 1 and a value range of 1-16. Hops greater than or equal to 16 are defined as infinite, i.e. the destination network or host is unreachable.
Distance	RIP route management distance, the default distance is 120, the value range is 1-255. When there are routes from two different routing protocols to the same destination, the

Interface Element	Description
	smaller the management distance value of the routing protocol is, the more reliable the route obtained by the protocol is.
Update time	Routing information update time. When the timer timeout, immediately send update message, update messages are sent every 30 seconds by default. Value range is 5-2147483647 seconds. Note: When the routing information changes, the trigger update message is immediately sent to the neighbor device instead of waiting for the update timer timeout, thus avoiding the routing loop.
Invalid time	If no routing update message is received from the neighbor within the invalid time, the route is considered unreachable. By default, it is 180 seconds, value range is 5-2147483647 seconds.
Invalid retention time	If the unreachable route does not receive an update message from the same neighbor before the invalid retention timer countdown ends, the route will be completely deleted from the RIP routing table. By default, it is 120 seconds, value range is 5-2147483647 seconds.
Redistribution	To reallocate routes learned from other routing protocols to RIP, options are as follows: <ul style="list-style-type: none"> <li>• connected: direct connection routing.</li> <li>• static: static route.</li> <li>• ospf: OSPF route.</li> <li>• bgp: BGP border gateway protocol.</li> </ul>
Set	Click the "Set" button to save and validate the configuration of RIP related parameters.

## 7.2.2 RIP Network Configuration

### Function Description

On the "RIP Network Configuration" page, user can configure the RIP network address.

### Operation Path

Open in order: "Unicast Routing > RIP Configuration > RIP Network Configuration".

### Interface Description

RIP network setting interface as follows:

The main element configuration description of RIP global configuration interface:

Interface Element	Description
Add	Click the “Add” button to specify the IP address of the network interface to enable RIP, such as 35.0.0.0/8.
Delete	Check the network entry to be deleted, and then click the “Delete” button to delete the specified network entry.
IP Address	Displays IP address information of the configured network interface.

## 7.2.3 RIP Interface Configuration

### Function Description

On the "RIP Interface Configuration" page, user can conduct RIP network parameter configuration.

### Operation Path

Open in order: "Unicast Routing > RIP Configuration > RIP Interface Configuration".

### Interface Description

RIP interface configuration interface as follows:

The main element configuration description of interface configuration interface:

Interface Element	Description
-------------------	-------------

Interface Element	Description
Interface	RIP interface information.
Split Horizon	<p>Horizontal partition. Options are as follows:</p> <ul style="list-style-type: none"><li>• None;</li><li>• Split-horizon;</li><li>• Poison-reverse.</li></ul> <p>Note: Route that RIP learns from an interface, it won't be sent from the interface to neighbor router. It can not only reduce bandwidth consumption but also prevent routing loops.</p>
Send version	<p>RIP protocol version of sending data, options as follows:</p> <ul style="list-style-type: none"><li>• None;</li><li>• 1</li><li>• 2;</li><li>• 1 and 2;</li><li>• 1-compatible.</li></ul>
Receive version	<p>RIP protocol version of receiving data, options as follows:</p> <ul style="list-style-type: none"><li>• None;</li><li>• 1</li><li>• 2;</li><li>• 1 and 2.</li></ul>

# 8 Multicast Routing

## 8.1 Multicast Routing

### 8.1.1 Multicast Routing

#### Function Description

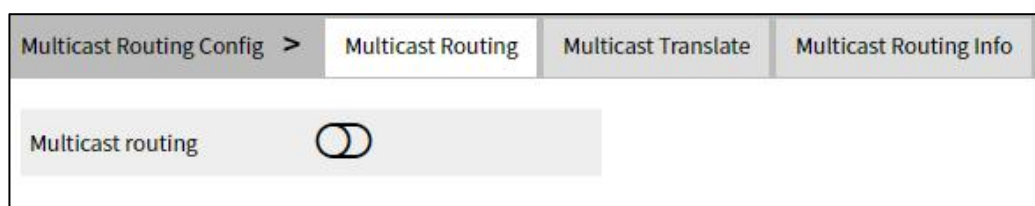
On the Multicast Routing page, user can enable or disable the layer 3 multicast routing feature.

#### Operation Path

Open in order: "Multicast Routing > Multicast Routing > Multicast Routing".

#### Interface Description

The multicast routing interface is shown as follows:



Main element configuration description of multicast routing interface:

Interface Element	Description
Multicast routing	Click the button to enable or disable multicast routing, swipe right to enable it, swipe left to disable it.

## 8.1.2 Multicast Translate

### Function Description

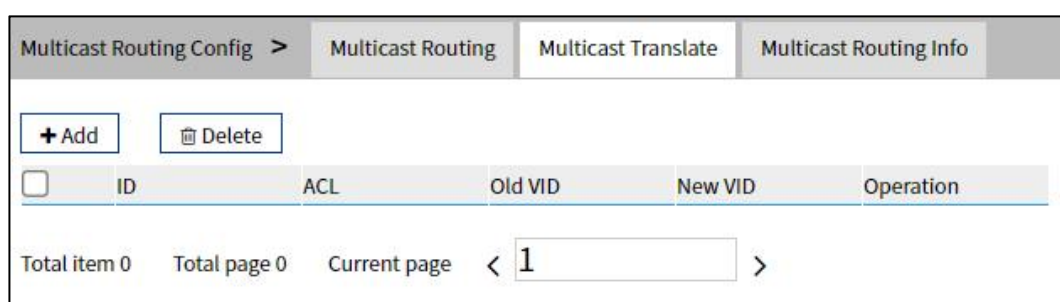
On the "Multicast Translate" page, you can configure multicast translation between two VLANs.

### Operation Path

Open in order: "Multicast Routing > Multicast Routing > Multicast Translate".

### Interface Description

Multicast translate interface is as follows:



The main element configuration description of multicast translate interface:

Interface Element	Description
ID	VLAN ID number of multicast translate, value range is 1-64.
ACL	ACL number or name, used for multicast translation control.
Old VID	The old VLAN ID of multicast packet, with a value range of 1-4094.
New VID	The new VLAN ID after multicast packet transparent transmission, with a value range of 1-4094.
Operation	You can edit or delete the current entry.

## 8.1.3 Multicast Routing Information

### Function Description

On the "Multicast Routing Information" page, user can view the layer 3 multicast routing information.

### Operation Path

Open in order: "Multicast Routing > Multicast Routing > Multicast Routing Information".

## Interface Description

The multicast routing information interface is as follows:

Multicast Routing Config >		Multicast Routing	Multicast Translate	Multicast Routing Info			
Flags: I - Immediate Stat, T - Timed Stat, F - Forwarder installed							
Source address	Group address	Uptime	Expires	Owner	Flgs	Incoming interface	Outgoing interface (TTL)
Total item 0		Total page 0		Current page < 1 >			

Main elements of the multicast routing information interface:

Interface Element	Description
Source address	Multicast source address
Group address	Multicast group address
Uptime	The existed time of the multicast route.
Expires	Multicast routing aging time.
Owner	The owner of a multicast route may be a multicast routing protocol.
Flags	Multicast routing protocol flag: <ul style="list-style-type: none"> <li>I: Immediate Stat (Immediately the statistics)</li> <li>T: Timed Stat (Statistics Timer)</li> <li>F: Forwarder installed (Set to forward table)</li> </ul>
Incoming interface	Multicast data ingress interface. The interface on the local device that receives multicast data.
Outgoing interface (TTL)	Multicast data egress interface. The interface that forwards multicast data out.

## 8.2 IGMP Configuration

### 8.2.1 Interface Configuration

#### Function Description

On the interface configuration page, user can add or delete IGMP configuration of Ethernet ports.

#### Operation Path

Open in order: "Multicast Routing > IGMP Configuration > Interface Configuration".

## Interface Description

Interface configuration interface as follows:

IGMP Configuration >											
Interface Configuration			SSM-Mapping Configuration			Group Members					
<input type="button" value="+ Add"/> <input type="button" value="Delete"/>											
<input type="checkbox"/>	Interface	IGMP	Version	Router-Alert option	Unlimited same subnet	Robustness coefficient	Other querier present timer	Fast leave ACL	Deny multicast ACL	Multicast group Max	Operation
<input type="checkbox"/>	vlanif1	enable	3	disable	disable	2	255			0	Edit Delete
Total item 1 Total page 1 Current page < 1 >											

The main element configuration description of interface configuration interface:

Interface Element	Description
Interface	Layer 3 interface, such as vlanif1.
IGMP	IGMP status: <ul style="list-style-type: none"> <li>enable;</li> <li>disable.</li> </ul>
Version	IGMP version, options are: <ul style="list-style-type: none"> <li>1: IGMPv1, it defines the basic querying and reporting process of group members;</li> <li>2: IGMPv2, it adds the mechanism of polling and leaving group members on IGMPv1;</li> <li>3: IGMPv3, members are added to IGMPv2 to specify whether to receive or not to receive messages from certain multicast sources.</li> </ul>
Router-Alert option	RA(Router-Alert). When a network device receives a message, only the message whose destination IP address is the interface address of the device will be sent to the corresponding protocol module for processing. If the destination address of the protocol message is not the interface address of the device, check whether the IP message header carries the Router-Alert option, if so, it will be directly sent to the corresponding protocol module for processing without checking the destination address. Note: For compatibility reasons, after receiving IGMP message, the current switch will send it to IGMP protocol module for processing by default regardless of whether its IP header contains Router-Alert option.
Unlimited same subnet	Limit the multicast source and interface to the same subnet, otherwise the port cannot receive multicast messages.
Robustness	Specify the robustness of the IGMP query, ranging from 2 to

Interface Element	Description
coefficient	7. This coefficient is used to specify the default value of the number of times an IGMP query message is sent by the IGMP query at startup, and the number of times an IGMP query message is sent by the IGMP query after the IGMP query receives the message leaving the group.
Other querier present timer	<p>Timer time of non-inquirer.</p> <ul style="list-style-type: none"> <li>• Before the timer expires, if the inquiry message from the inquirer is received, reset the timer;</li> <li>• Otherwise, the original inquirer is considered invalid, and a new inquirer election process is initiated.</li> </ul>
Fast leave ACL	By default, when the interface works in IGMP v2 or v3, after receiving IGMP leave message, it will send a specific group query message to determine whether to age multicast member entries. After configuring the fast leave ACL, if the group address specified by the leave message is within the group address range specified by the ACL, the multicast member table entry can be aged immediately.
Deny multicast ACL	List of restricted multicast groups.
Multicast group Max	The maximum number of multicast supported.
Operation: edit	Modify IGMP entries.
Operation: delete	Delete the current IGMP entry.

## 8.2.2 SSM-Mapping Configuration

SSM(Source-Specific Multicast) requires routers to know the multicast source designated by member hosts when they join the multicast group. A host running IGMPv3 can specify multicast source addresses in IGMPv3 Report messages. However, hosts running IGMPv1 or IGMPv2 rely on the IGMP SSM mapping function to obtain the SSM service.

The mechanism of IGMP SSM Mapping is: by statically configuring SSM address Mapping rules on the router, information in IGMPv1 and IGMPv2 report packets is converted into corresponding information to provide SSM multicast service.

After the configuration of SSM Mapping rules, when the IGMP query receives the IGMPv1 or IGMPv2 report packets from the member host, it first checks the multicast group addresses carried in the paper, and then processes them separately according to the different inspection results.

- If the Multicast group is within the range of ANY-Source Multicast, then only ASM services are provided.
- If the multicast group is within the SSM group address range (the default is 232.0.0.0 ~ 232.255.255.255) :
  - If the router does not have the SSM Mapping rule corresponding to the multicast group, the SSM service cannot be provided and the article is discarded.
  - If there are SSM Mapping rules corresponding to the multicast group on the router, according to the rules, the information contained in the report packet (member, multicast group) will be mapped to (multicast group, INCLUDE, member) information, and SSM service will be provided.

Note:

By default, the IGMP SSM Mapping function is disabled. The switch can be turned on after sliding to the right.

## Function Description

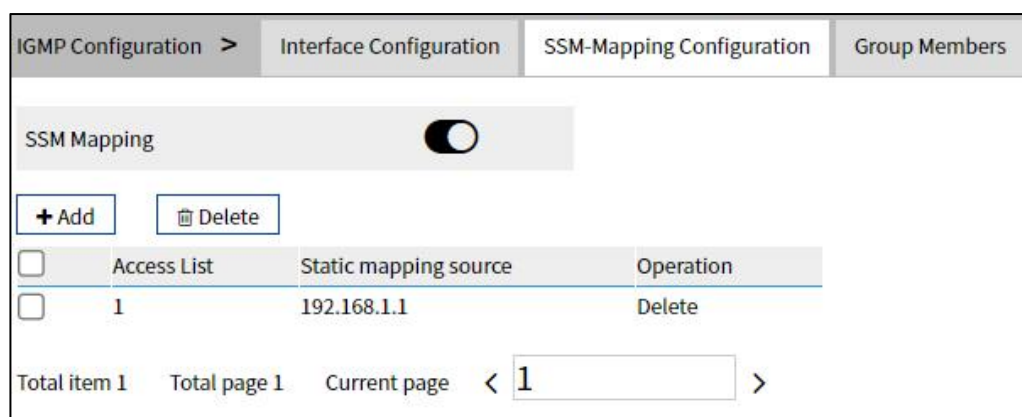
On the interface configuration page, user can add or delete IGMP configuration of Ethernet ports.

## Operation Path

Open in order: "Multicast Routing > IGMP Configuration > SSM-Map Configuration

## Interface Description

The SSM-Map configuration interface is as follows:



Main element configuration description of SSM-Map configuration interface:

Interface Element	Description
-------------------	-------------

Interface Element	Description
SSM Mapping	IGMP SSM Mapping function switch is closed by default and turned on after sliding the switch to the right.
Access List	Access list.
Static mapping source	The specified multicast source address in the access list.

## 8.2.3 Multicast Group Information

### Function Description

On the "Multicast Group Information" page, display the multicast information received by the device interface.

### Operation Path

Open in order: "Multicast Routing > IGMP Configuration > Multicast Group Information".

### Interface Description

The multicast group information interface is as follows:

IGMP Configuration >		Interface Configuration	SSM-Mapping Configuration	Group Members
Interface	Group Members	Type		
vlanif1	239.255.255.250	dynamic		
Total item 1	Total page 1	Current page	< 1 >	

Main element configuration description of multicast group information interface:

Interface Element	Description
Interface	Ethernet port.
Group Members	The multicast address received by the interface.
Type	Multicast type: <ul style="list-style-type: none"> <li>dynamic</li> <li>static</li> </ul>

## 8.3 PIM-SM Configuration

PIM-SM is a multicast routing protocol in sparse mode, which uses "Pull mode" to transmit multicast data. It is usually suitable for large and medium-sized networks with relatively scattered multicast group members and a wide range. Its basic principle is as follows:

- PIM-SM assumes that all hosts do not need to receive multicast data, but only forward it to the hosts that explicitly propose that they need multicast data. The core task of PIM-SM to realize multicast forwarding is to construct and maintain RPT(Rendezvous Point Tree). RPT selects a router in PIM domain as a common root node RP(Rendezvous Point), and multicast data is forwarded to receivers along RPT through RP.
- The router connecting the receiver sends a Join Message to the RP corresponding to a multicast group, and the message is delivered to the RP hop by hop, and the path it passes forms a branch of RPT;
- If a multicast source wants to send multicast data to a multicast group, the DR(Designated Router (DR) on the multicast source side is responsible for registering with the RP, and sending a Register Message to the RP by unicast, which triggers the establishment of SPT after reaching the RP. After that, the multicast source sends the multicast data to RP along SPT. When the multicast data reaches RP, it is copied and sent to the receiver along RPT.

The working mechanism of PIM-SM can be summarized as follows:

- Neighbor Discovery
- DR election
- RP Discovery
- Construct RPT
- Multicast source note
- SPT Switchover
- Assertion

### 8.3.1 Global Configuration

#### Function Description

On the global configuration page, user can configure the global parameters of PIM-SM.

#### Operation Path

Open in order:"Multicast Routing > PM-SM Configuration > Global Configuration".

## Interface Description

Global configuration interface is as follows:

PIM-SM Configuration >	Global configuration	Static RP Configuration	Interface C-RP Configuration	Interface Configuration	Status Display	Multicast RP address
Ignore CRP priority	<input type="checkbox"/>					
RP reachability check	<input type="checkbox"/>					
SPT switch	<input type="checkbox"/>					
Join/Prune interval	<input type="text" value="60"/>					1 - 65535 s
Registration suppression time	<input type="text" value="60"/>					1 - 65535 s
KAT aging	<input type="text" value="185"/>					1 - 65535 s
-----Optional-----						
Deny register source ACL	<input type="text"/>					100 - 199   2000 - 2699   name
C-BSR	<input type="text" value="-"/>					
Message rate	<input type="text"/>					1 - 65535
Register message interface/IP	<input type="text" value="-"/>					
	<input type="button" value="Set"/>					

The main element configuration description of global configuration interface:

Interface Element	Description
Ignore CRP priority	When selecting the RP corresponding to multicast, whether to ignore the priority of CRP and choose according to IP address. The one with the larger IP address is elected.
RP reachability check	Whether it is necessary to check the reachability of RP when sending the registration message; if it is not, it means that it cannot be registered.
SPT Switch	RP is a necessary transit station for all multicast messages. when the multicast message rate gradually increases, it will create a huge burden on RP. PIM-SM allows RP or group member DR to reduce the burden of RP by triggering SPT switching.
Join/prune interval	Time interval for PIM router to send join/pruning messages. Note: By default, the join/prune message is sent at an interval of 60 seconds.
Registration suppression time	The time interval for sending the registration message again after receiving the registration stop message ranges from 1 to 65535, and the unit is seconds. The default value is 60 seconds.
KAT aging	The aging time of KAT timer after receiving the registration message ranges from 1 to 65535 in seconds. Note: By default, after receiving the registration message, the aging time of KAT timer = registration inhibition time * 3+registration

Interface Element	Description
	detection time (the default is 5 seconds).
Deny register source ACL	Configure illegal neighbor source address range. Note: By default, there are no restrictions on the neighbor source addresses that an interface can learn from.
C-BSR	C-BSR Interface Configuration. <ul style="list-style-type: none"> <li>vlanif: vlanif interface;</li> <li>Loopback: loopback interface.</li> </ul>
Message rate	The rate of receiving and processing multicast service messages ranges from 1 to 65535, and the unit is one/second.
Register message interface/IP	The VLAN interface, source IP address or loopback interface that sends the registration message.

## 8.3.2 Static RP Configuration

### Function Description

On the static RP configuration page, you can set up the static RP manually.

### Operation Path

Open in order: "Multicast Routing > PIM-SM Configuration > Static RP Configuration".

### Interface Description

Static RP configuration interface as follow:

The main element configuration description of static RP configuration interface:

Interface Element	Description
IP Address	Configure the IP address of the static RP. Note: The address must be a legal unicast IP address, and should not be configured as the address of the 127.0.0.0/8 network segment.
Operation: delete	Delete the static RP entry of the current line.

## 8.3.3 C-RP Configuration of Interface

### Function Description

On the interface C-RP configuration page, you can add or delete C-RP interfaces.

### Operation Path

Open in order: "Multicast Routing > PM-SM Configuration > Interface C-RP Configuration".

### Interface Description

The interface C-RP configuration interface is as follows:

Main element configuration description of interface C-RP configuration interface:

Interface Element	Description
C-RP interface	To configure the C-RP interface: <ul style="list-style-type: none"> <li>vlanif: vlanif interface;</li> <li>Loopback: loopback interface.</li> </ul>
Operation: delete	Delete the candidate convergence point entry in the current line.

## 8.3.4 Interface Configuration

### Function Description

On the "Interface Configuration" page, user can set interface PIM- SM parameters.

### Operation Path

Open in order: "Multicast Routing > PM-SM Configuration > Interface Configuration".

### Interface Description

Interface configuration interface as follows:

PIM-SM Configuration >		Global configuration	Static RP Configuration	Interface C-RP Configuration	Interface Configuration	Status Display	Multicast RP address	
+ Add		Delete						
<input type="checkbox"/>	Interface	PIM-SM	Exclude GenID	DR priority	Neighbor holdtime	Hello interval	Deny neighbor ACL	Operation
Total item 0		Total page 0		Current page < 1 >				

The main element configuration description of interface configuration interface:

Interface Element	Description
Interface	Configure interface: <ul style="list-style-type: none"> <li>vlanif: vlanif interface;</li> <li>Loopback: loopback interface.</li> </ul>
PIM-SM	PIM-SM status. <ul style="list-style-type: none"> <li>enable;</li> <li>disable.</li> </ul>
Exclude GenID	The interface is configured to send hello messages without carrying GenID information. Note: GenID is a random value at the initial creation of the interface to identify unique interface information. With this information, users can detect whether the neighbor device has been restarted.
DR priority	Specify the priority of running for DR from 0 to 4294967294. Note: The higher the value, the higher the priority.
Neighbor holdtime	Specify the time to keep PIM neighbor reachable, the value range is 1 ~ 65535, and the unit is seconds. Note: If specified as 65535 seconds, the PIM neighbor is always reachable.
Hello interval	Time period for sending Hello messages between PIM routers.
Deny neighbor ACL	Illegal neighbor source address range.
Operation: edit	Modify and delete interface configuration items.
Operation: delete	Delete the interface configuration item of the current line.

### 8.3.5 Status Display

#### Function Description

On the "Status Display" page, you can view the parameter configuration of PIM multicast, including:

- BSR information
- Interface Information
- Local multicast
- Multicast routing table
- Neighbor
- Next hop information
- RP-Set information

## Operation Path

Open in order: "Multicast Routing > PIM-SM Configure > Status Display".

## Interface Description

The status display interface is as follows:

## 8.3.6 Multicast PR Address

### Function Description

In multicast RP address, user can query the multicast RP address.

### Operation Path

Open in order: "Multicast Routing > PIM-SM Configure > Multicast RP Address".

### Interface Description

The multicast RP address interface is as follows:

Main element configuration description of multicast RP address interface:

Interface Element	Description
IP Address	Multicast address.

Interface Element	Description
RP Address	RP address.
Source Address	CRP source address.

## 8.4 PIM-DM Configuration

PIM-DM is a multicast routing protocol in dense mode, which uses "Push mode" to transmit multicast data. It is usually suitable for small networks with relatively dense multicast group members. Its basic principle is as follows:

- PIM-DM assumes that each subnet in the network has at least one multicast group member, so multicast data will be Flooding to all nodes in the network. Then, PIM-DM prune the branches without multicast data forwarding, leaving only the branches containing receivers. This "Flooding-Prune" phenomenon occurs periodically, and the pruned branches can also be restored to forwarding status periodically.
- In order to reduce the time required for the node to return to the forwarding state when the multicast group members appear on the branched node, PIM-DM actively resumes its forwarding of multicast data by using the Graft mechanism.

Generally speaking, the forwarding path of data packets in dense mode is a Source Tree (a forwarding tree with multicast source as its root and multicast group members as its branches and leaves). Source Tree is also called SPT(Shortest Path Tree) because it uses the shortest path from multicast source to receiver.

The working mechanism of PIM-DM can be summarized as follows:

- Neighbor Discovery
- Build SPT
- Graft
- Assertion

### 8.4.1 Global Configuration

#### Function Description

On the Global Configuration page, user can refresh the pruning timer status and set the time interval between sending status and receiving status.

#### Operation Path

Open in order:"Multicast Routing > PM-DM Configuration > Global Configuration".

## Interface Description

Global configuration interface is as follows:

PIM-DM Configuration >	Global configuration	Interface Configuration	Status Display
State Refresh	<input checked="" type="checkbox"/>		
Send status refresh interval	<input type="text" value="60"/>	1 - 100 s	
Receive status refresh interval	<input type="text" value="30"/>	1 - 100 s	
	<input type="button" value="Set"/>		

The main element configuration description of global configuration interface:

Interface Element	Description
State refresh	When checked, refresh the status of pruning timer to prevent the clipped interface from resuming forwarding due to timeout of pruning timer.
Send status refresh interval	The pruning timer updates the sending state time interval.
Receive status refresh interval	The pruning timer updates the receiving state time interval.

## 8.4.2 Interface Configuration

### Function Description

On the "Interface Configuration" page, user can configure interface PIM-DM parameters.

### Operation Path

Open in order: "Multicast Routing > PIM-DM Configure > Interface Configuration".

### Interface Description

Interface configuration interface as follows:

PIM-DM Configuration >	Global configuration	Interface Configuration	Status Display
<input type="button" value="+ Add"/>	<input type="button" value="Delete"/>		
<input type="checkbox"/>	Interface	PIM-DM	Exclude GenID DR priority Neighbor holdtime Hello interval Deny neighbor ACL Operation
Total item 0	Total page 0	Current page	< <input type="text" value="1"/> >

The main element configuration description of interface configuration interface:

Interface Element	Description
Interface	Configure interface: <ul style="list-style-type: none"> <li>vlanif: vlanif interface;</li> <li>Loopback: loopback interface.</li> </ul>
PIM-DM	PIM-DM status. <ul style="list-style-type: none"> <li>enable;</li> <li>disable.</li> </ul>
Exclude GenID	The interface is configured to send hello messages without carrying GenID information. Note: GenID is a random value at the initial creation of the interface to identify unique interface information. With this information, users can detect whether the neighbor device has been restarted.
DR priority	Specify the priority of running for DR from 0 to 4294967294. Note: The higher the value, the higher the priority.
Neighbor holdtime	Specify the time to keep PIM neighbor reachable, the value range is 1 ~ 65535, and the unit is seconds. Note: If specified as 65535 seconds, the PIM neighbor is always reachable.
Hello interval	Time period for sending Hello messages between PIM routers.
Deny neighbor ACL	Illegal neighbor source address range.
Operation: edit	Modify and delete interface configuration items.
Operation: delete	Delete the interface configuration item of the current line.

### 8.4.3 Status Display

#### Function Description

On the "Status Display" page, you can view the parameter configuration of PIM multicast, including:

- BSR information
- Interface Information
- Local multicast
- Multicast routing table
- Neighbor
- Next hop information
- RP-Set information

## Operation Path

Open in order: "Multicast Routing > PIM-DM Configure > Status Display".

## Interface Description

The status display interface is as follows:

PIM-DM Configuration >						
Global configuration		Interface Configuration		Status Display		
Interface information ▾						
Address	Interface	Vlanif index	Version / Mode	Neighbor count	DR priority	DR address
Total item 0    Total page 0    Current page < 1 >						

# 9 Advanced Configuration

## 9.1 DHCP - Server Configuration

DHCP(Dynamic Host Configuration Protocol) is usually applied to large LAN environment. Its main functions are centralized management and IP address distribution, which enables the host in the network to acquire IP address, Gateway address, DNS server address dynamically and improve the usage of addresses.

### 9.1.1 DHCP Switch

#### Function Description

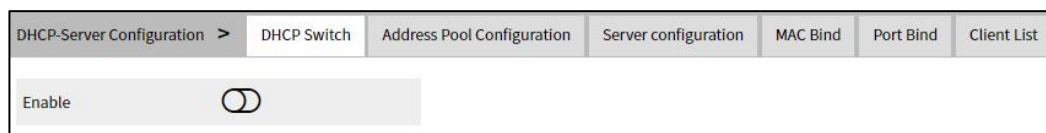
On the "DHCP Switch" page, user can enable/disable DHCP.

#### Operation Path

Open in order: "Advanced Configuration > DHCP-Server Configuration > DHCP Switch".

#### Interface Description

DHCP switch configuration interface as follows:



The main element configuration description of DHCP switch configuration interface.

Interface Element	Description
Enable	After enabling the switch, set the device as a DHCP server by setting static allocation address table, the device can distribute IP address to devices connected to it.

## 9.1.2 Address Pool Configuration

After user defines DHCP range and exclusion range, surplus addresses constitute an address pool; addresses in the address pool can be dynamically distributed to hosts in network. Address pool is valid only for the method of automated IP acquisition; manual IP configuration can ignore this option only if conforming to the rules.

DHCP server chooses and distributes IP address and other relative parameters for client from address pool.

DHCP server adopts tree structure: Tree root is the address pool of natural network segment. Branch is the subnet address pool of the network segment. Leaf node is the manually binding client address. The order of address pool at the same level is decided by the configuration order. This kind of tree structure has realized the inheritance of configuration, that is, subnet configuration inherits the configuration of natural network segment, and client configuration inherits the subnet configuration. Therefore, as for some common parameters (such as DNS server address), user only needs to configure in the natural network segment or subnet. Specific inheritance situation as follows:

1. When the parent-child relationship is established, sub address pool will inherit the existing configuration of parent address pool.
2. After the parent-child relationship is established, parent address pool is configured, sub-address pool will inherit or not, two situations as follows:
  - If the child address pool doesn't include the configuration, it will inherit the configuration of parent address pool;
  - If the child address pool has included the configuration, it won't inherit the configuration of parent address pool.

### Function Description

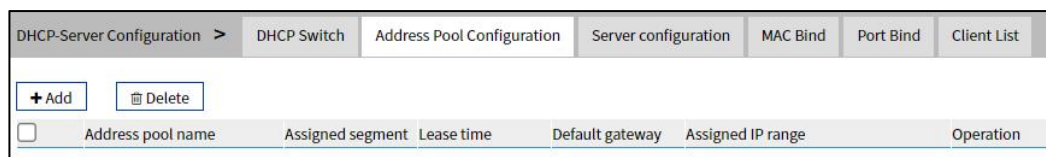
On the "Address Pool Configuration" page, user can add, delete the address pool and look over the configuration information of address pool.

### Operation Path

Open in order: "Advanced Configuration > DHCP-Server Configuration > Address Pool Configuration".

### Interface Description

DHCP address pool configuration interface as follows:



The main element configuration description of DHCP pool configuration interface:

Interface Element	Description
Address pool name	The name of address pool, up to 32 characters.
Assigned segment	Address pool distributes the IP address network segment of client, for example: 192.168.0.1/24.
Lease time	IP address utilization valid time of client, format: day, hour, minute, range is 0-30 day, 0-24h and 0-60m, which are separated by space. Note: When the time of ip address obtained by dhcp client reaches the lease time, it needs to renew it otherwise the ip address would be invalid and dhcp client needs to request ip address again.
Default gateway	Default client gateway address, example: 192.168.1.0/24
Assign IP range	The lowest address and the highest address in the DHCP address pool. The address that belongs to the range could be distributed effectively.
Operation	Click "Edit" button to modify the information of address pool. Click "Delete" under "operation" to delete the corresponding address pool entry directly.
Add	Click "add" button to add the information of address pool.
Delete	Check address pool entry, click "delete" button to delete address pool information.

## 9.1.3 Server Configuration

### Function Description

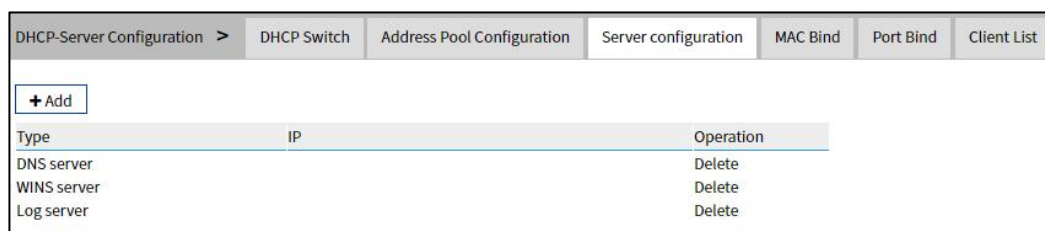
On the "Server Configuration" page, user can add, delete DNS/WINS/Log Server Address Pool.

### Operation Path

Open in order: "Advanced Configuration > DHCP-Server Configuration > Server Configuration".

## Interface Description

Server configuration interface as follows:



The main element configuration description of server configuration interface:

Interface Element	Description
Add	Click the “Add” button to configure IP address pools for DNS servers, WINS servers, and log servers, with three IP addresses per server.
Type	Three kinds of address pool servers are supported, as shown below: <ul style="list-style-type: none"> <li>• DNS server: parse the domain name to be visited to an IP address, realizing domain name access network.</li> <li>• WINS server: parse the NetBIOS host name using the Windows Microsoft operating system to an IP address.</li> <li>• Log server.</li> </ul>
IP	Server address pool, which supports up to three different server IP addresses.
Operation	Click “Delete” under “operation” to delete the corresponding server address pool.

### 9.1.4 MAC Bind

#### Function Description

On the “MAC Bind” page, users can bind the IP address assigned by the address pool to the MAC address of the device.

#### Operation Path

Open in order: "Advanced Configuration > DHCP Server Configuration > MAC Bind".

#### Interface Description

The MAC bind configuration interface is as follows:

DHCP-Server Configuration >	DHCP Switch	Address Pool Configuration	Server configuration	MAC Bind	Port Bind	Client List
<input type="button" value="+ Add"/> <input type="button" value="Delete"/>						
<input type="checkbox"/>	Address pool name	IP address	MAC Address	Operation		
Total item 0    Total page 0    Current page < 1 >						

The main element configuration description of MAC bind interface:

Interface Element	Description
Add	Click the "Add" button to add a static binding between the IP address assigned by the address pool and the MAC address of the device.
Delete	After checking the entry, click the "Delete" button to delete the binding of the corresponding IP address and MAC address.
Address pool name	Corresponding list name of DHCP address pool.
IP Address	IP addresses distributed by DHCP address pool, IP addresses obtained by this MAC address.
MAC Address;	The MAC address information of this device.
Operation	Click "Delete" under "operation" to delete this MAC binding.

## 9.1.5 Port Bind

### Function Description

On the "Port Bind" page, users can bind the relationship of IP addresses assigned by ports. Device A enables DHCP Server function and sets 2 static distribution address tables: 192.168.1.19 corresponding port is 1; 192.168.1.20 corresponding port is 2. After device B enables IP address automated acquisition function, if device A is connected to device B via port 1, device B can automatically obtain IP address 192.168.1.19; If device A is connected to device B via port 2, device B can automatically gain IP address 192.168.1.20.

### Operation Path

Open in order: "Advanced Configuration > DHCP Server Configuration > Port Bind".

### Interface Description

Port bind configuration interface as follows:

DHCP-Server Configuration >		DHCP Switch	Address Pool Configuration	Server configuration	MAC Bind	Port Bind	Client List
<input type="button" value="+ Add"/> <input type="button" value="Delete"/>							
<input type="checkbox"/>	Address pool name	IP address	Port	Operation			
Total item 0		Total page 0		Current page < 1 >			

The main element configuration description of port binding interface:

Interface Element	Description
Add	Click "Add" button to add a static binding between IP address allocated by address pool and layer 2 port.
Delete	After checking the entry, click the "Delete" button to delete the binding between the corresponding IP address and the layer 2 port.
Address pool name	Corresponding list name of address pool.
IP address	IP address distributed by DHCP address pool, the IP addresses that client gains in the port.
Port	The corresponding port name of the device Ethernet port.
Operation	Click "Delete" under "Operation" to delete this port binding.

## 9.1.6 Client List

### Function Description

On the "Client List" page, user can look over the information of DHCP client.

### Operation Path

Open in order: "Advanced Configuration > DHCP Configuration > Client List".

### Interface Description

Client list interface as follows:

DHCP-Server Configuration >		DHCP Switch	Address Pool Configuration	Server configuration	MAC Bind	Port Bind	Client List
IP address	MAC Address	Start time	End time	Remaining time			
Total item 0		Total page 0		Current page < 1 >			

The main element configuration description of client list interface:

Interface Element	Description
IP address	IP address of DHCP client-side device.

Interface Element	Description
MAC address;	MAC address of DHCP client device.
Start time	Valid start time of DHCP client.
End time	Valid end time of DHCP client.
Remaining time	Valid remaining time of DHCP client.

## 9.2 DHCP-Snooping Configuration

### The function of DHCP Snooping

DHCP Snooping is a security feature of DHCP, which has the following functions:

- 1 Ensure that clients get IP addresses from legitimate servers.

If there is a pseudo-DHCP server set up privately in the network, it may cause the DHCP client to get the wrong IP address and network configuration parameters, and can't communicate normally. To enable DHCP clients to obtain IP addresses through legitimate DHCP servers, DHCP Snooping security mechanism allows ports to be set as trusted ports and untrusted ports:

- The trust port forwards the received DHCP message normally.
- The untrusted port discards the DHCP-ACK and DHCP-OFFER messages responded by the DHCP server.

The ports connecting DHCP server and other DHCP Snooping devices need to be set as trusted ports, and other ports should be set as untrusted ports, so as to ensure that DHCP clients can only obtain IP addresses from legitimate DHCP servers, while pseudo-DHCP servers erected privately cannot assign IP addresses to DHCP clients.

- 2 Record the corresponding relationship between IP address and MAC address of DHCP client

DHCP Snooping records DHCP Snooping entries by listening to DHCP-REQUEST messages and DHCP-ACK messages received by trusted ports, including MAC addresses of clients, acquired IP addresses, ports connected with DHCP clients and VLAN to which the ports belong. Using this information, you can achieve:

- ARP Detection: according to the DHCP Snooping table entry, judge whether the user sending ARP message is legal or not, so as to prevent ARP attack by illegal users.

- IP Source Guard: filter the messages forwarded by the port by dynamically obtaining DHCP Snooping entries to prevent illegal messages from passing through the port.

### Option 82

Option 82 is called the relay agent information option and records the location information of the DHCP client. When the DHCP relay or DHCP Snooping device receives the request message sent by the DHCP client to the DHCP server, it adds Option 82 to the message and sends it to the DHCP server.

Administrators can obtain location information of DHCP client from Option 82, so as to locate DHCP client and realize control over security and billing of client. Servers that support Option 82 can also make allocation policies for IP addresses and other parameters based on information about that Option, providing a more flexible address allocation scheme.

Option 82 can contain up to 255 sub-option. If Option 82 is defined, define at least one sub-option. Currently, the DHCP relay supports only three sub-options: Sub-Option 1 (Circuit ID, Circuit ID sub-option) and Sub-option 2 (Remote ID, Remote ID sub-option) and sub-option 3 (Subscriber ID, Subscriber ID sub-option).

## 9.2.1 Global Configuration

### Function Description

On the "Global Configuration" page, user can enable/disable DHCP Snooping.

### Operation Path

Open in order: "Advanced Configuration > DHCP-Snooping Configuration > Global Configuration".

### Interface Description

Global configuration interface is as follows:

The screenshot displays the DHCP-Snooping configuration interface. At the top, there are navigation tabs: "DHCP-Snooping configuration >", "Global configuration", "VLAN Enable Configuration", "Binding Configuration", and "Port Configuration". The "Global configuration" tab is selected. Below the tabs, there are several configuration options:

- "Enable DHCP-Snooping" with a toggle switch that is currently turned on.
- "MAC check" with an unchecked checkbox.
- "Port Disable Time Enable" with an unchecked checkbox.
- "Port Disable Time" with a text input field containing the value "30" and a "Set" button. To the right of the input field, the text "1-3600 ,default:30 (s)" is displayed.

The main element configuration description of global configuration interface:

Interface Element	Description
Enable DHCP-snooping	Swipe to the right to enable DHCP-Snooping.
MAC check	Enable DHCP client MAC address checking. Note: Enabling DHCP-Snooping will automatically turn on DHCP client MAC address checking.
Port Disable Time Enable	When the DHCP message rate of a port is lower than the configured rate of the port, the port's port disable duration will be disabled.
Port Disable Time	Port disable time, the input range is 1-3600, the unit is s, and the default is 30s.

## 9.2.2 VLAN Enable Configuration

### Function Description

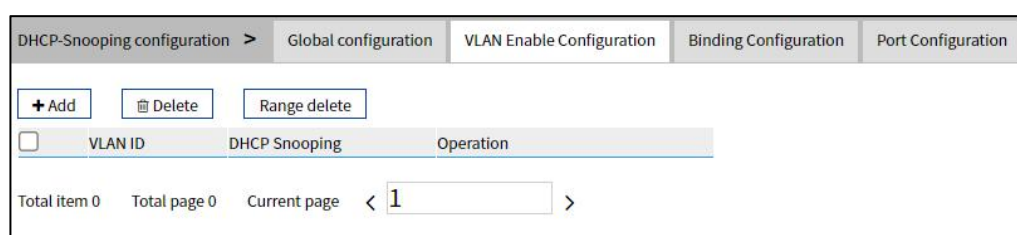
On the "VLAN Enable Configuration" page, user can specify that the VLAN to enable DHCP Snooping.

### Operation Path

Open in order: "Advanced Configuration > DHCP-Snooping Configuration > Vlan enable Configuration".

### Interface Description

The Vlan enable configuration interface is as follows:



Main elements configuration description of Vlan enabled configuration interface:

Interface Element	Description
VLAN ID	The VLAN number.
DHCP Snooping	Enable status of DHCP Snooping. <ul style="list-style-type: none"> <li>enable</li> <li>disalbe</li> </ul>
Operation: delete	Delete the current VLAN enable entry

## 9.2.3 Binding Configuration

### Function Description

On the Binding Configuration page, user can bind ports, IP addresses and MAC addresses.

### Operation Path

Open in order: "Advanced Configuration > DHCP-Snooping Configuration > Binding Configuration".

### Interface Description

The binding configuration interface is as follows:

Main elements configuration description of Binding configuration interface:

Interface Element	Description
VLAN ID	Binding VLAN ID information, for example: 1-4096.
Port	The corresponding port name of the device Ethernet port.
IP	Binding IP address, for example: 192.168.1.1.
MAC	Binding MAC address, for example: 0001-0001-0001.
Type	Port type: <ul style="list-style-type: none"> <li>• Static</li> <li>• Dynamic</li> </ul>
Aging Time	Port aging time.
Operation: edit	Modify the port binding information.
Operation: delete	Delete the port binding configuration of the current row.

## 9.2.4 Port Configuration

### Function Description

On the port configuration page, user can configure DHCP Snooping port information.

## Operation Path

Open in order: "Advanced Configuration > DHCP-Snooping Configuration > Port Configuration".

## Interface Description

Check port configuration interface as below:

DHCP-Snooping configuration >											
		Global configuration	VLAN Enable Configuration	Binding Configuration	Port Configuration						
Config											
<input type="checkbox"/>	Port	Trust Enable	Message Rate	Option 82 Check	Option 82 Strategy	Circuit Type	Circuit ID	remote Type	Remote ID	Subscriber Type	Subscriber ID
<input type="checkbox"/>	fe1	disable	1000	disable	-	-	-	-	-	-	-
<input type="checkbox"/>	fe2	disable	1000	disable	-	-	-	-	-	-	-
<input type="checkbox"/>	fe3	disable	1000	disable	-	-	-	-	-	-	-
<input type="checkbox"/>	fe4	disable	1000	disable	-	-	-	-	-	-	-
<input type="checkbox"/>	fe5	disable	1000	disable	-	-	-	-	-	-	-
<input type="checkbox"/>	fe6	disable	1000	disable	-	-	-	-	-	-	-
<input type="checkbox"/>	fe7	disable	1000	disable	-	-	-	-	-	-	-
<input type="checkbox"/>	fe8	disable	1000	disable	-	-	-	-	-	-	-
<input type="checkbox"/>	fe9	disable	1000	disable	-	-	-	-	-	-	-
<input type="checkbox"/>	fe10	disable	1000	disable	-	-	-	-	-	-	-
<input type="checkbox"/>	fe11	disable	1000	disable	-	-	-	-	-	-	-
<input type="checkbox"/>	fe12	disable	1000	disable	-	-	-	-	-	-	-
<input type="checkbox"/>	fe13	disable	1000	disable	-	-	-	-	-	-	-
<input type="checkbox"/>	fe14	disable	1000	disable	-	-	-	-	-	-	-
<input type="checkbox"/>	fe15	disable	1000	disable	-	-	-	-	-	-	-
<input type="checkbox"/>	fe16	disable	1000	disable	-	-	-	-	-	-	-
<input type="checkbox"/>	fe17	disable	1000	disable	-	-	-	-	-	-	-
<input type="checkbox"/>	fe18	disable	1000	disable	-	-	-	-	-	-	-
<input type="checkbox"/>	fe19	disable	1000	disable	-	-	-	-	-	-	-
<input type="checkbox"/>	fe20	disable	1000	disable	-	-	-	-	-	-	-
<input type="checkbox"/>	fe21	disable	1000	disable	-	-	-	-	-	-	-
<input type="checkbox"/>	fe22	disable	1000	disable	-	-	-	-	-	-	-
<input type="checkbox"/>	fe23	disable	1000	disable	-	-	-	-	-	-	-
<input type="checkbox"/>	fe24	disable	1000	disable	-	-	-	-	-	-	-
<input type="checkbox"/>	ge1	disable	1000	disable	-	-	-	-	-	-	-
<input type="checkbox"/>	ge2	disable	1000	disable	-	-	-	-	-	-	-
<input type="checkbox"/>	ge3	disable	1000	disable	-	-	-	-	-	-	-
<input type="checkbox"/>	ge4	disable	1000	disable	-	-	-	-	-	-	-

The main element configuration description of global configuration interface:

Interface Element	Description
Port	The corresponding port name of the device Ethernet port.
Trust Enable	Port trust enable, and the trust port forwards the received DHCP message normally.
Message Rate	Message transmission speed of port, the input range is 10-1000 (s), and the default value is 1000s.
Option 82 Check	When Option 82 check is turned on, the location information of DHCP client can be obtained from Option 82, so as to locate DHCP client.
Option 82 Strategy	Option 82 dealing strategy, options as follows: <ul style="list-style-type: none"> <li>Drop: Discard messages.</li> <li>Keep: Adopt different modes to fill Option 82, replace prime Option 82 in message and forward, filling modes will be described as below.</li> <li>Replace: Keep Option 82 in messages unchanged and forward.</li> </ul>

Interface Element	Description
Circuit Type	Circuit ID sub-option filling type, options as follows: <ul style="list-style-type: none"> <li>• Normal: Normal mode;</li> <li>• String: Detailed mode.</li> </ul>
Circuit ID	Circuit ID sub-option filling content, support ASCII and HEX mode. Note: <ul style="list-style-type: none"> <li>• The input length is limited between 2 and 64;</li> <li>• When Hex is selected, the input content is a combination of uppercase and lowercase letters and numbers.</li> <li>• When ASCII is selected, the content is not limited.</li> </ul>
Remote Type	Remote ID sub-option filling type, options as follows: <ul style="list-style-type: none"> <li>• Normal: Normal mode;</li> <li>• Sysname: Directly adopt device system name to fill Option 82;</li> <li>• String: Detailed mode.</li> </ul>
Remote ID	The filling content of the remote ID sub-option supports ASCII and HEX formats. Note: <ul style="list-style-type: none"> <li>• The input length is limited between 2 and 64;</li> <li>• When Hex is selected, the input content is a combination of uppercase and lowercase letters and numbers.</li> <li>• When ASCII is selected, the content is not limited.</li> </ul>
Subscriber Type	User option fill type, which supports ASCII format.
Subscriber ID	The filling content of Subscriber ID sub-option supports ASCII and HEX formats. Note: <ul style="list-style-type: none"> <li>• The input length is limited between 2 and 64;</li> <li>• When Hex is selected, the input content is a combination of uppercase and lowercase letters and numbers.</li> <li>• When ASCII is selected, the content is not limited.</li> </ul>

## 9.3 DHCP-Relay Configuration

### Function Description

On the "DHCP-Relay Configuration" page, user can configure the relevant parameters of Relay port.

## Operation Path

Open in order: "Advanced Configuration > DHCP-Relay Configuration".

## Interface Description

DHCP-Relay configuration interface is as follows:

DHCP-Relay Configuration						
<input type="button" value="Clear config"/>						
<input type="checkbox"/>	Interface	Enable	Option82	Option82 Policy	Server IP	Operation
<input type="checkbox"/>	vlanif1	disable	disable			Edit Delete
Total item 1		Total page 1		Current page < 1 >		

Main element configuration description of DHCP-Relay configuration interface:

Interface Element	Description
Interface	Interface Name.
Enable	Enable switch, options as follows: <ul style="list-style-type: none"> <li>• Enable: enable the dhcp relay function of the interface;</li> <li>• Disable: disable the dhcp relay function of the interface.</li> </ul>
Option82	Option82 function, options as follows: <ul style="list-style-type: none"> <li>• - Enable: enable the option 82 function of dhcp relay;</li> <li>• - Disable: disable the option 82 function of dhcp relay.</li> </ul> Note: When the option82 function is enabled, the relay message sent by relay process would carry option 82.
Option82 Policy	The processing strategy of option82 is shown as follows: <ul style="list-style-type: none"> <li>• untouched</li> <li>• append</li> <li>• discard</li> <li>• replace</li> </ul>
Server IP	IP address information of proxy server.
Operation: edit	Click "edit" button to set the parameters of the switch and option82.
Operation: delete	Check Relay interface configuration entry, click "delete" to delete Relay interface configuration.

## 9.4 LLDP Configuration

LLDP is a layer 2 topology discovery protocol, its basic principle is: Devices in network send the status information message to adjacent device, and each port in the device stores its own information, if there is change in the status of local device, it can also send updated information to the adjacent device directly connected to it. Adjacent devices will store the information in standard SNMP MIB bank. The network management system could inquiry the connection status of current layer 2 from SNMP MIB bank. It should be noted that LLDP is only a remote device status information discovery protocol, which cannot complete the network device configuration, port control and other functions.

### 9.4.1 Current configuration

#### Function Description

On the "Current Configuration" page, user can configure the relevant parameters of LLDP.

#### Operation Path

Open in order: "Advanced Configuration > LLDP Configuration > Current Configuration".

#### Interface Description

The current configuration interface is as follows:

The screenshot shows a web-based configuration interface for LLDP. At the top, there are four tabs: "LLDP Configuration >", "Current Configuration", "Port Configuration", and "Neighbor Information". The "Current Configuration" tab is active. Below the tabs, there are two main configuration items: "Enable" with an unchecked checkbox, and "Transmission period" with a text input field containing the value "30". To the right of the input field, there is a label "Range:5-300,Unit: s,Default:30". Below the input field is a "Set" button.

Main elements configuration description of the current configuration interface:

Interface Element	Description
Enable	The radio box of LLDP function status, check to enable.
Transmission period	LLDP transmission period, range 5-300, unit: second, default: 30 Note: When no device status changes, the device periodically sends LLDP packets to its adjacent nodes. The interval is called the period for sending LLDP packets.

Interface Element	Description
Set	Click "Set" button to operate.

## 9.4.2 Port Configuration

### Function Description


On the "Port Configuration" page, user can configure the sending and receiving mode and management address of the port.

### Operation Path

Open in order: "Advanced Configuration > LLDP Configuration > Port Configuration".

### Interface Description

Check port configuration interface as below:

LLDP Configuration >		Current Configuration	Port Configuration	Neighbor Information
<input type="checkbox"/>  Config				
<input type="checkbox"/>	Local port	Port status	Port Configuration	Management IP
<input type="checkbox"/>	fe1	down	txrx-enable	0.0.0.0
<input type="checkbox"/>	fe2	down	txrx-enable	0.0.0.0
<input type="checkbox"/>	fe3	up	txrx-enable	0.0.0.0
<input type="checkbox"/>	fe4	down	txrx-enable	0.0.0.0
<input type="checkbox"/>	fe5	down	txrx-enable	0.0.0.0
<input type="checkbox"/>	fe6	down	txrx-enable	0.0.0.0
<input type="checkbox"/>	fe7	down	txrx-enable	0.0.0.0
<input type="checkbox"/>	fe8	down	txrx-enable	0.0.0.0
<input type="checkbox"/>	fe9	down	txrx-enable	0.0.0.0
<input type="checkbox"/>	fe10	down	txrx-enable	0.0.0.0
<input type="checkbox"/>	fe11	down	txrx-enable	0.0.0.0
<input type="checkbox"/>	fe12	down	txrx-enable	0.0.0.0
<input type="checkbox"/>	fe13	down	txrx-enable	0.0.0.0
<input type="checkbox"/>	fe14	down	txrx-enable	0.0.0.0
<input type="checkbox"/>	fe15	down	txrx-enable	0.0.0.0
<input type="checkbox"/>	fe16	down	txrx-enable	0.0.0.0
<input type="checkbox"/>	fe17	down	txrx-enable	0.0.0.0
<input type="checkbox"/>	fe18	down	txrx-enable	0.0.0.0
<input type="checkbox"/>	fe19	down	txrx-enable	0.0.0.0
<input type="checkbox"/>	fe20	down	txrx-enable	0.0.0.0
<input type="checkbox"/>	fe21	down	txrx-enable	0.0.0.0
<input type="checkbox"/>	fe22	down	txrx-enable	0.0.0.0
<input type="checkbox"/>	fe23	down	txrx-enable	0.0.0.0
<input type="checkbox"/>	fe24	down	txrx-enable	0.0.0.0
<input type="checkbox"/>	ge1	down	txrx-enable	0.0.0.0
<input type="checkbox"/>	ge2	down	txrx-enable	0.0.0.0
<input type="checkbox"/>	ge3	down	txrx-enable	0.0.0.0
<input type="checkbox"/>	ge4	down	txrx-enable	0.0.0.0

The main element configuration description of port configuration interface:

Interface Element	Description
Local port	The corresponding port name of the device Ethernet port.
Port status	<p>The options of LLDP working modes of device port are as follows:</p> <ul style="list-style-type: none"> <li>tx-enable: work mode is Tx, it only transmits LLDP message and not receive it.</li> <li>rx-enable: work mode is Rx, it only receives LLDP message and not transmit it.</li> </ul>

Interface Element	Description
	<ul style="list-style-type: none"> <li>txrx-enable: work mode is TxRx, it transmits LLDP message as well as receive it.</li> <li>disable: the working mode is Disable, neither receiving nor sending LLDP message.</li> </ul> <p>Note: By default, the working mode of LLDP is TxRx when global LLDP is enabled.</p>
Management IP	<p>Corresponding LLDP management IP address of the port.</p> <p>Note:</p> <ul style="list-style-type: none"> <li>LLDP management address is the address to be marked and managed by network management system. Management address can definitely mark a device, which is beneficial to the drawing of network topology and network management. Management address is encapsulated in Management Address TLV field of LLDP message and sent to adjacent nodes.</li> <li>The management address released by the port in the LLDP message defaults to the main IP address of the smallest VLAN o in the VLAN where the port resides. If the VLAN is not configured with a main IP address, it will be 0.0.0.0.</li> </ul>

### 9.4.3 Neighbor Information

#### Function Description

On the "Neighbors Information" page, user can look over the relative information of neighbors.

#### Operation Path

Open in order: "Advanced Configuration > LLDP Configuration > Neighbor Information".

#### Interface Description

Neighbor information interface as follows:

LLDP Configuration >				
Current Configuration		Port Configuration		Neighbor Information
Local port	Chassis ID	Remote port	System name	Management IP

Main elements configuration description of neighbor information interface:

Interface Element	Description
-------------------	-------------

Interface Element	Description
Local port	Local port number of local switch connected to adjacent devices.
Chassis ID	Bridge MAC address of neighbor device or port.
Remote port	Port number of neighbor device.
System Name	System name of the neighbor device.
Management IP	Management IP address of neighbor device or port.

## 9.5 ACL Configuration

The ACL (Access Control List) is a set composed of one or more rules. Rule refers to the judgment statement describing the message matching condition. These conditions may be the source address, destination address, port number of message. ACL can realize accurate identification and control of message flow in the network, and achieve the purpose of controlling network access behavior, preventing network attacks and improving network bandwidth utilization, thus ensuring the security of network environment and the reliability of network service quality.

### 9.5.1 Time Range Configuration

#### Function Description

On the "Time Range Configuration" page, you can configure the effective time period of ACL rules.

#### Operation Path

Open in order: "Advanced Configuration > ACL Configuration > Time Range Configuration".

#### Interface Description

The Time Range configuration interface is as follows:

ACL Configuration > Time Range config | IP ACL config | MAC ACL config | ACL GROUP config

+ Add | Delete

<input type="checkbox"/>	Time-Range name	Start time	End time	Regular	Operation
Total item 0    Total page 0    Current page < 1 >					

The main element configuration description of Time Range configuration interface:

Interface Element	Description
Add	Click "Add" to add time-range entry.
Delete	Check time range entry and click "Delete" button to delete specified entries in batches.
Time-Range Name	The name of the ACL valid time period, which supports absolute time and regular time.
Start time	The start time of the absolute time or regular time range.
End time	The end time of the absolute time or regular time range.
Regular	Date of the regular time.
Operation	Delete: Click the "Delete" button to delete the the current entry.

Click "Add" button to add time entry.

In the "Add" interface, check the "Absolute time" radio box.

## Interface Description 1: Add-Absolute Time

The Add-absolute time interface as follows:

The main element configuration description of Add-Absolute time interface:

Interface Element	Description
Time-Range Name	<p>The name of the ACL effective time period. There are two modes in the effective time period, and the options that can be checked are:</p> <ul style="list-style-type: none"> <li>• Absolute time: it starts from a certain time on a certain day of a certain year and ends at a certain time on a certain day of a certain year, which means that the rules will take effect within this time range.</li> <li>• Regular time: the time range is defined by taking the week or workday as the parameter, which means that the rule takes effect cyclically with a week cycle (e.g., 8:00 to 12:00 every Monday).</li> </ul>

Interface Element	Description
Start time	Start time of absolute time, format: hh:mm:ss (hour:minute:second); YYYY-MM-DD (year-month-day).
End time	End time of absolute time, format: hh:mm:ss (hour:minute:second); YYYY-MM-DD (year-month-day).

In the “Add” interface, check the “Regular time” radio box.

## Interface Description 2: Add-Regular Time

The Add-regular time interface as follows:

The main element configuration description of Add-Regular Time interface:

Interface Element	Description
Time-Range Name	The name of the ACL effective time period. There are two modes in the effective time period, and the options that can be checked are: <ul style="list-style-type: none"> <li>Absolute time: it starts from a certain time on a certain day of a certain year and ends at a certain time on a certain day of a certain year, which means that the rules will take effect within this time range.</li> <li>Regular time: the time range is defined by taking the week or workday as the parameter, which means that the rule takes effect cyclically with a week cycle (e.g., 8:00 to 12:00 every Monday).</li> </ul>
Regular Time	Time range of regular time, format: hh:mm:ss- hh:mm:ss (Hour: minute:second). Check the week or workday radio box to specify the date to be repeated.

## 9.5.2 IP ACL Configuration

### Function Description

On the "IP ACL Configuration" page, user can configure IP ACL rule. Users can assign numbers to ACLs when creating them, and different numbers correspond to different types of ACLs. At the same time, in order to facilitate memory and identification, users can also create named ACLs, that is, when creating ACLs, set their names.

### Operation Path

Open in order: "Advanced Configuration > ACL Configuration > IP ACL Configuration".

### Interface Description

IP ACL configuration interface is as follows:

The main element configuration description of IP ACL Configuration interface:

Interface Element	Description
Add	Click "Add" to add IP ACL entry.
Delete	Check rule entry and click "Delete" button to delete specified entries in batches.
Rule name	IP ACL rule name or number.
Operation	Action of IP ACL rule, including permit/deny.
Protocol	Protocol type of data packets.
Source IP	Source IP address information of the packet.
Source wildcard	Source IP address wildcard mask.
Destination IP	Destination IP address information of the packet.
Destination wildcard	Destination IP address wildcard mask.
Time-Range Name	Effective time period of IP ACL rule.
Operation	Click "Edit" or "Delete" to modify or delete the name of Time-Range.

Click "Add" button to add IP ACL entry.

## Interface Description: Add

The interface of Add is as follows:

The screenshot shows a configuration window titled 'Add' with the following fields and values:

- Rule type: No.
- Rule name: (empty)
- Operation: deny
- Protocol: (empty)
- Source IP: (empty)
- Source wildcard: (empty)
- Destination IP: (empty)
- Destination wildcard: (empty)
- Time-Range name: (empty)

Additional information provided in the interface:

- Rule name: 1-199 Or 1300-2699
- Protocol: 0-255
- Source IP: eg:192.168.1.1, null represents any ip.
- Source wildcard: eg:0.0.0.255
- Destination IP: eg:192.168.1.1, null represents any ip.
- Destination wildcard: eg:0.0.0.255
- Time-Range name: Choosable

A 'Set' button is located at the bottom center of the window.

The main element configuration description of Add interface:

Interface Element	Description
Rule type	The drop-down list of IP ACL rule type. The options are: <ul style="list-style-type: none"> <li>Name: ACL is identified by name instead of number.</li> <li>Number: When creating an ACL, specify a unique number to identify the ACL.</li> </ul>
Rule name	IP ACL rule name or number. When the rule type is name, it supports the combination of @, !, _, numbers and letters that does not exceed 16 digits. When the rule type is number, 1-199 or 1300-2699 is supported. Note: <ul style="list-style-type: none"> <li>Standard ACL(1-99, 1300-1999): Only the source IP address, fragmentation information and effective time period information of the message are used to define the rule.</li> <li>Extended ACL (100-199, 2000-2699): both the source IP address of IPv4 message and the destination IP address, protocol type and effective time period can be used to define rules.</li> </ul>
Operation	The action drop-down list of ACL rules. The options are: <ul style="list-style-type: none"> <li>Permit</li> <li>Deny</li> </ul>
Protocol	The protocol type of extended ACL rules, support filtering

Interface Element	Description
	messages based on protocol type, and the value range of protocol number is 0-255. You can click the drop-down list of "Protocol" to select an existing agreement name.
Source IP	The source IP address information of the packet, such as 192.168.1.1. No input indicates any IP address.
Source wildcard	Wildcard mask of source IP address, such as 0.0.0.255. The wildcard mask of IP address is a 32-bit numeric string used to indicate which bits in IP address will be checked. "0" means "check the corresponding bit", and "1" means "do not check the corresponding bit".
Destination IP	The destination IP address information of the packet, such as 192.168.1.1. No input indicates any IP address.
Destination wildcard	Wildcard mask of destination IP address, such as 0.0.0.255. The wildcard mask of IP address is a 32-bit numeric string used to indicate which bits in IP address will be checked. "0" means "check the corresponding bit", and "1" means "do not check the corresponding bit".
Time-Range Name	The name of the effective time period of the IP ACL rule.
Operation	Click "Edit" or "Delete" to modify or delete the name of Time-Range.

## 9.5.3 MAC ACL Configuration

### Function Description

On the "MAC ACL Configuration" page, you can create MAC ACL rules. The layer-2 ACL uses the Ethernet header information of the message to define rules, such as according to the source MAC (Media Access Control) address, destination MAC address, etc.

### Operation Path

Open in order: "Advanced Configuration > ACL Configuration > MAC ACL Configuration".

### Interface Description

MAC ACL configuration interface as follows:

The main element configuration description of MAC ACL configuration interface:

Interface Element	Description
Add	Click "Add" to add MAC ACL entry.
Delete	Check rule entry and click "Delete" button to delete specified entries in batches.
Rule ID	Mac ACL rule number.
Operation	Action of MAC ACL rule: including permit/deny.
Source MAC	Source MAC address information of the packet.
Source wildcard	Source MAC address wildcard mask.
Destination MAC	Destination MAC address information of the packet.
Destination wildcard	Destination MAC address wildcard mask.
Ethernet type	Ethernet type of packet.
Time-Range Name	Effective time period of MAC ACL rule.
Operation	Click "Edit" or "Delete" to modify or delete the name of Time-Range.

Click the "Add" button to add MAC ACL rule entries.

## Interface Description: Add

The interface of Add is as follows:

The main element configuration description of Add interface:

Interface Element	Description
-------------------	-------------

Interface Element	Description
Rule ID	MAC ACL rule number, the value range is 3000-3699.
Operation	The action drop-down list of ACL rules. The options are: <ul style="list-style-type: none"> <li>• Permit</li> <li>• Deny</li> </ul>
Source MAC	The source MAC address information of the packet, such as 0001.0001.0001. No input indicates any MAC address.
Source wildcard	Wildcard mask of source MAC address, such as 0001.0001.0001. Wildcard mask of MAC address, used to indicate which bits in the MAC address will be checked. "0" means "check the corresponding bit", and "1" means "do not check the corresponding bit".
Destination MAC	The destination MAC address information of the packet, such as 0001.0001.0001. No input indicates any MAC address.
Destination wildcard	Wildcard mask of destination MAC address, such as 0001.0001.0001. Wildcard mask of MAC address, used to indicate which bits in the MAC address will be checked. "0" means "check the corresponding bit", and "1" means "do not check the corresponding bit".
Ethernet type	Ethernet type of the packet, value range is 1536-65535 (0x0600-0xffff).
Time-Range Name	The name of the effective time period of the IP ACL rule.
Operation	Click "Edit" or "Delete" to modify or delete the name of Time-Range.

## 9.5.4 ACL GROUP Configuration

### Function Description

On the "ACL GROUP Configuration" page, you can configure ports to enable IP ACL and MAC ACL rules.

### Operation Path

Open in order: "Advanced Configuration > ACL Configuration > ACL GROUP Configuration".

## Interface Description

ACL GROUP Configuration interface as follows:

The main element configuration description of ACL GROUP Configuration interface:

Interface Element	Description
Add	Click "Add" to add port ACL GROUP.
Delete	Check port entry and click "Delete" button to delete specified entries in batches.
Port	The Ethernet port number of the device.
MAC Access List ID (direction)	The port supports MAC ACL rules.
IP Access List ID (in)	The port supports IP ACL rules.
Operation	Click "Edit" or "Delete" to modify or delete the IP / MAC access list ID.

Click "Add" button to add ACL GROUP.

Check the "Mac" radio box after "Type".

### Interface Description 1: Add-MAC

The Add-MAC interface is as follows:

The main element configuration description of Add-MAC interface:

Interface Element	Description
Type	Radiobox of ACL type, options are as follows: <ul style="list-style-type: none"> <li>Mac</li> </ul>

Interface Element	Description
	<ul style="list-style-type: none"> <li>IP</li> </ul>
Port	Drop down list of Ethernet ports for the device.
MAC Access List ID	The number of the MAC ACL rule.

Check the "IP" radio box after "Type".

## Interface Description 2: Add-IP

The Add-IP interface is as follows:

The main element configuration description of Add-IP interface:

Interface Element	Description
Type	Radiobox of ACL type, options are as follows: <ul style="list-style-type: none"> <li>Mac</li> <li>IP</li> </ul>
Port	Drop down list of Ethernet ports for the device.
ID type	The drop-down list of IP ACL rule, options as follows: <ul style="list-style-type: none"> <li>NO.</li> <li>Name</li> </ul>
IP access list ID	The number or name of the IP ACL rule.
Direction	The drop-down list of IP ACL rule filtering direction. The options are: <ul style="list-style-type: none"> <li>In: data ingress direction;</li> <li>Out: data egress direction.</li> </ul>

## 9.6 SNMP Configuration

Now, the broadest network management protocol in network is SNMP (Simple Network Management Protocol). SNMP is the industrial standard that is widely accepted and comes into use, it's used for guaranteeing the management information transmission between two points in network, and is convenient for network manager search information, modify information, locate faults, complete fault diagnosis, conduct capacity plan and generate a report. SNMP adopts polling mechanism and only provides the most basic function library, especially suit for using in minitype, rapid and low price environment. SNMP implementation is based on connectionless transmission layer protocol UDP, therefore, it can achieve barrier - free connection to many other products.

### 9.6.1 SNMP switch

#### Function Description

On the "SNMP Switch" page, user can enable/disable SNMP function.

#### Operation Path

Open in order: "Advanced Configuration > SNMP Configuration > SNMP Switch".

#### Interface Description

SNMP switch interface is as follows:



The main element configuration description of SNMP switch interface:

Interface Element	Description
Enable	SNMP enable switch, which is enabled by default Note: If the agent side has opened, the SNMP server can't be closed.

## 9.6.2 View

### Function Description

On the "View" page, user can add/delete SNMP view.

### Operation Path

Open in order: "Advanced Configuration > SNMP Configuration > View".

### Interface Description

View interface as below:

SNMP Configuration > SNMP Switch View Group SNMP group V3 user Trap alarm				
<input type="button" value="+ Add"/> <input type="button" value="Delete"/>				
<input type="checkbox"/>	Name	OID	Mode	Operation
<input type="checkbox"/>	system	1	included	Delete
Total item 1    Total page 1    Current page < 1 >				

The main element configuration description of view interface:

Interface Element	Description
Name	SNMP view name definition, support 32 characters input. Notice: Name can't be empty or contain "&", ";", "\", "\" or "/".
OID	Node location information of MIB tree where the device resides. Note: <ul style="list-style-type: none"> <li>OID object identifier, a component node of MIB, uniquely identified by a string of numbers that represent the path.</li> <li>The information of OID could be viewed via the third-party software MG-SOFT MIB Browser.</li> </ul>
Mode	Node OID dealing method, options as below: <ul style="list-style-type: none"> <li>Included: It contains all objects under the node subtree;</li> <li>Excluded: Eliminate all objects beyond the node subtree.</li> </ul>
Operation	Check the entry and click the "Delete" button to delete it.

## 9.6.3 Group

### Function Description

On the "Group" page, user can add/delete SNMP community. Define MIB view that community name can access, set MIB object access privilege of community name as read-write privilege or read-only privilege.

### Operation Path

Open in order: "Advanced Configuration > SNMP Configuration > Group".

### Interface Description

Group interface as below:

SNMP Configuration > SNMP Switch > View > Group				
<input type="button" value="+ Add"/> <input type="button" value="Delete"/>				
<input type="checkbox"/>	Name	View name	Read-write type	Operation
<input type="checkbox"/>	public	system	read-only	Delete
Total item 1    Total page 1    Current page < 1 >				

The main element configuration description of Group interface:

Interface Element	Description
Name	Group name, including numbers or letters, with a length of no more than 32 characters.
View Name	SNMP view name definition, which has been configured in the View page.
Read-write type	Read-write privilege view name selection, options: <ul style="list-style-type: none"> <li>• Read only</li> <li>• Read and write</li> </ul>
Operation	You can check this item and click the "Delete" button to delete it.

## 9.6.4 SNMP Group

### Function Description

On the "SNMP Group" page, user can configure a new SNMP group and set the secure mode and corresponding SNMP view of the SNMP group.

## Operation Path

Open in order: "Advanced Configuration > SNMP Configuration > SNMP Group".

## Interface Description

SNMP Group interface as follows:

Main elements configuration description of SNMP Group interface:

Interface Element	Description
Name	SNMP group name, ranging from 1 to 32 bytes.
Encryption mode	Whether to authenticate and encrypt the message, values: <ul style="list-style-type: none"> <li>auth: indicates that the message is authenticated but not encrypted;</li> <li>noauth: indicates that the message is neither authenticated nor encrypted;</li> <li>priv: indicates that the message is authenticated and encrypted.</li> </ul>
Read view	Specify the read view of the group. Note: The view must be configured in the View interface.
Write view	Specify the write and read view of the group Note: The view can be matched or not. To configure, the view must be configured by the View interface.
Notification view	Specify the notification view of the group. Note: The view can be matched or not. To configure, the view must be the view configured in the View interface.
Operation	You can check this item and click the "Delete" button to delete it.

## 9.6.5 V3 User

### Function Description

SNMPv3 adopts User-Based Security Model (USM) authentication mechanism. Network manager can configure authentication and encryption function. Authentication is used to verify the validity of the packet sender and prevent unauthorized users from accessing it. Encryption encrypts the transmission packet between NMS and Agent to prevent eavesdropping. It adopts authentication and encryption function to provide higher security for the communication between NMS and Agent.

### Operation Path

Open in order: "Advanced Configuration > SNMP Configuration > V3 User".

### Interface Description

V3 user interface as follows:

The main element configuration description of V3 user interface:

Interface Element	Description
Username	SNMP v3 user name definition, can only contain numbers, letters, or @_! , no longer than 32 characters.
Group name	Group name, ranging from 1 to 32 bytes. Note: Group name must be created snmp group, and only created group can create SNMP v3 users.
Safe mode	Whether to authenticate and encrypt the message, values: <ul style="list-style-type: none"> <li>• auth: indicates that the message is authenticated but not encrypted;</li> <li>• noauth: indicates that the message is neither authenticated nor encrypted;</li> <li>• priv: indicates that the message is authenticated and encrypted.</li> </ul>
Encryption mode	Authentication mode type, acceptable value: <ul style="list-style-type: none"> <li>• Md5: Information abstract algorithm 5;</li> </ul>

Interface Element	Description
	<ul style="list-style-type: none"> <li>Sha: Secure hash algorithm.</li> </ul>
Privilege	V3 user data encryption algorithm, options as follows: <ul style="list-style-type: none"> <li>Des: Adopt data encryption algorithm;</li> <li>Aes: Adopt advanced encryption standard.</li> </ul>
Operation	You can check this item and click the "Delete" button to delete it.

## V3 User: “Add” Interface Description

The screenshot shows a configuration window titled 'X' with the following fields and options:

- Username: Text input field.
- Group name: Dropdown menu.
- v3
- auth
- Auth info: Dropdown menu showing 'md5'.
- Auth password: Text input field.
- priv
- Encrypted info: Dropdown menu showing 'des'.
- Encrypted password: Text input field.
- Privilege: Dropdown menu showing 'ro'.
- Set: Button at the bottom.

The main element configuration description of V3 user “add” interface:

Interface Element	Description
Username	SNMP v3 user name definition, can only contain numbers, letters, or @_! , no longer than 32 characters.
Group name	The drop-down list of SNMP group name.
V3	It refers to SNMP V3 version user, and defaults to V1 version user.
auth	Indicate that security mode requires authentication. If do not check this parameter, the default is no authentication, no encryption mode.
Auth info	Authentication information type, acceptable values: <ul style="list-style-type: none"> <li>Md5: Information abstract algorithm 5;</li> </ul>

Interface Element	Description
	<ul style="list-style-type: none"> <li>Sha: Secure hash algorithm.</li> </ul>
Auth password	Authentication password, character string, length greater than or equal to 8 bytes.
priv	Indicate that security mode requires encryption.
Encrypted info	V3 user data encryption algorithm, options as follows: <ul style="list-style-type: none"> <li>Des: Adopt data encryption algorithm;</li> <li>Aes: Adopt advanced encryption standard.</li> </ul>
Privacy password	Encrypted password, character string, length greater than or equal to 8 bytes.

## 9.6.6 Trap alarm

### Function Description

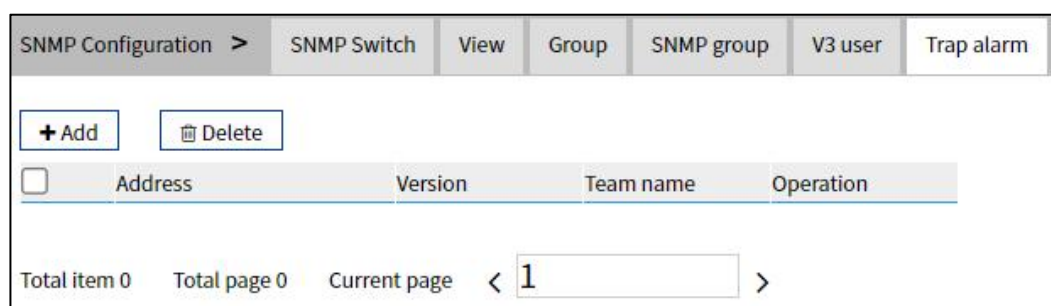
Base on TCP/IP protocol, SNMP usually adopts UDP port 161 (SNMP) and 162 (SNMP-traps), SNMP protocol agent exists in the network device and adopts information specific to the device (MIBs) as the device interface; these network devices can be monitored or controlled via Agent. When a trap event occurs, the message is transmitted by SNMP Trap. At this point, an available trap receiver can receive the trap message.

### Operation Path

Open in order: "Advanced Configuration > SNMP Configuration > Trap Alarm".

### Interface Description

Trap alarm interface as below:



The main element configuration description of Trap alarm interface:

Interface Element	Description
Address	IP address of SNMP management device, used for

Interface Element	Description
	receiving alarm information, such as PC.
Version	SNMP management device version, options as below: <ul style="list-style-type: none"> <li>v1;</li> <li>v2c;</li> </ul> Note: V3 is not supported temporarily.
Team name	Community name or snmpv3 user name.
Operation	You can check this item and click the "Delete" button to delete it.

## 9.7 RMON Configuration

RMON (Remote Network Monitoring) mainly achieves statistics and alarm functions, which are used for remote monitoring and management of management device to managed devices. Statistical function refers to that managed device can periodically or continuously keep track of all the traffic information on the network segment connected to the port, For example, the total number of packets received on a network segment in a period of time, or the total number of received super long packets. Alarm function refers to that the managed device can monitor the value of the specified MIB variable. When the value reaches the alarm threshold (such as the port rate reaches the specified value or the proportion of broadcast message reaches the specified value), it can automatically log and send Trap messages to the managed device.

### 9.7.1 Event Group

#### Function Description

On the "Event Group" page, user can add, delete or check the configuration information of event.

#### Operation Path

Open in order: "Advanced Configuration > RMON Configuration > Event Group".

#### Interface Description

Event group interface as below:

RMON Configuration >							
Event group		Statistical group		Historical group		Alarm group	
<input type="button" value="+ Add"/>		<input type="button" value="Delete"/>					
<input type="checkbox"/>	No.	Description	Type	Team name	Recent time	Owner	Operation
Total item 0		Total page 0		Current page		< 1 >	

The main element configuration description of event group interface:

Interface Element	Description
No.	Triggered event serial number when monitoring MIB object exceeds threshold value. Note: This serial number corresponds to the rising event index and falling event index set in RMON alarm configuration information.
Description	Some description information for describing the event.
Type	Event dealing method, options as below: <ul style="list-style-type: none"> <li>log: Record the event in the log table when the event is triggered;</li> <li>trap: Send Trap information to management station for informing the occurring of event when the event is triggered;</li> <li>Log, trap: Record the event in the log table and produce a trap information when the event is triggered.</li> </ul>
Team name	Community name of the network management station receiving the alarm information.
Recent time	The time of the last incident occurred.
Owner	The creator of the table entry.
Operation	Check the entry and click the "Delete" button to delete it.

## 9.7.2 Statistical Group

### Function Description

On the "Statistical Group" page, user can add, delete or check the configuration information of statistical.

### Operation Path

Open in order: "Advanced Configuration > RMON Configuration > Statistical Group".

## Interface Description

Statistical group interface as below:

The screenshot shows a web interface for RMON Configuration. At the top, there are tabs for 'Event group', 'Statistical group', 'Historical group', and 'Alarm group'. Below the tabs are two buttons: '+ Add' and 'Delete'. A table with the following columns is visible: 'No.', 'Port No.', 'Port name', 'Owner', and 'Operation'. At the bottom of the interface, there is a pagination control showing 'Total item 0', 'Total page 0', 'Current page < 1 >'.

The main element configuration description of statistical group interface:

Interface Element	Description
No.	Serial number is used to identify a special application interface, when the serial number is same to the application interface serial number set before, previous configuration will be replaced.
Port No.	The counted port serial number.
Port Name	The name of the port being counted.
Owner	The creator of the table entry.
Operation	Check the entry and click the "Delete" button to delete it.

### 9.7.3 Historical Group

#### Function Description

On the "Historical Group" page, user can add, delete or check the configuration information of history.

#### Operation Path

Open in order: "Advanced Configuration > RMON Configuration > Historical Group".

#### Interface Description

Historical group interface as below:

RMON Configuration >							
Event group		Statistical group		Historical group		Alarm group	
<input type="button" value="+ Add"/>		<input type="button" value="Delete"/>					
<input type="checkbox"/>	No.	Actual buckets number	Port name	Max buckets number	Sampling period	Owner	Operation
Total item 0		Total page 0		Current page < 1 >			

The main element configuration description of historical group interface:

Interface Element	Description
No.	Serial number is used to identify a special application interface, when the serial number is same to the application interface serial number set before, previous configuration will be replaced.
Actual buckets number	Set the historical statistics capacity corresponding to the history group, ranging from 1-65535.
Port name	The recorded port name.
Max buckets number	Maximum capacity of historical statistics table supported by device.
Sampling period	The interval time of gaining statistics data each two times.
Owner	The creator of the table entry.
Operation	Check the entry and click the "Delete" button to delete it.

## 9.7.4 Alarm Group

### Function Description

On the "Alarm Group" page, user can add, delete the alarm or check the alarm configuration information. Alarm type adopts absolute to directly monitor MIB object value; Alarm type adopts delta to monitor changes in MIB object values between two samples;

- When monitoring MIB object reaches or surpasses the rising threshold value, it will trigger corresponding event of rising event index;
- When monitoring MIB object reaches or surpasses declining threshold value, it will trigger corresponding event of declining event index;

### Operation Path

Open in order: "Advanced Configuration > SNMP Configuration > Alarm Group".

## Interface Description

Alarm group interface as below:

RMON Configuration >											
		Event group		Statistical group		Historical group		Alarm group			
<input type="checkbox"/>		<input type="button" value="+Add"/>		<input type="button" value="Delete"/>							
No.	State	Sampling interval	Sampling type	Alarm parameter	Alarm value	Rising edge threshold	Rising edge event	Falling edge threshold	Falling edge event	Owner	Operation
Total item 0 Total page 0 Current page < 1 >											

The main element configuration description of alarm group interface:

Interface Element	Description
No.	Triggered event serial number when monitoring MIB object exceeds threshold value. Note: This serial number corresponds to the rising event index and falling event index set in RMON alarm configuration information.
State	The status of alarm list items, which is not configurable when configuring alarm list items and is VALID by default.
Sampling interval	Sampling time interval value, value range is 1-2147483647, unit: second.
Sampling type	Two sampling methods, options as follows: <ul style="list-style-type: none"> <li>Absolute: When alarm variable value reaches alarm threshold value, an alarm is triggered; If the second sampling is same to last sampling alarm type, alarm isn't triggered again;</li> <li>Delta: When alarm variable value reaches alarm threshold value during each sampling, an alarm is triggered.</li> </ul>
Alarm parameter	The monitored MIB node supports string format instead of oid format.
Rising edge threshold	Alarm variable value, upper limit alarm, threshold value is between 1-12147483647. Note: In the rising process of alarm variable value, when the variable value surpasses rising threshold, an alarm occurs at least one time.
Rising edge event	Event index, when alarm variable value reaches or surpasses the rising event threshold value, it will activate corresponding event in event group, value range is 1-65535.
Falling edge threshold	Alarm variable value, lower limit alarm, threshold value is between 1-12147483647. Note: In the falling process of alarm variable value, when the variable value reaches falling threshold, an alarm occurs at least one time.

Interface Element	Description
Falling edge event	Event index, when alarm variable value reaches or is less than the falling threshold value, it will activate corresponding event in event group, value range is 1-65535.
Owner	The creator of the table entry.
Operation	Check the entry and click the "Delete" button to delete it.

## 9.8 Time Configuration

NTP protocol refers to Network Time Protocol. Its destination is to transmit uniform and standard time in international Internet. Specific implementation scheme is appointing several clock source websites in the network to provide user with timing service, and these websites should be able to mutually compare to improve the accuracy. It can provide millisecond time correction, and is confirmed by the encrypted way to prevent malicious protocol attacks.

### Function Description

On the "NTP Configuration" page, user can configure the device time and NTP server information.

### Operation Path

Open in order: "Advanced Configuration > NTP Configuration".

### Interface Description

The NTP configuration interface is as follows:

Main element configuration description of NTP configuration interface:

Interface Element	Description
-------------------	-------------

Interface Element	Description
Time Zone	UTC (Universal Time Coordinated) time zone.
Server	IP address of NTP server, for example: 192.168.1.1. Note: As NTP client, the system will synchronize time with NTP server every 11 minutes.

## 9.9 Time Configuration

### Function Description

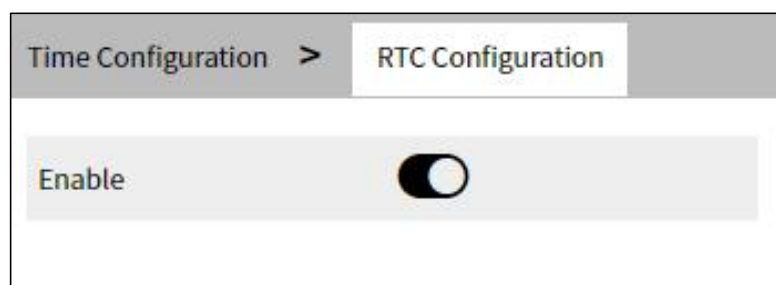
As a clock source, RTC clock is mainly used to synchronize the time of RTC clock to the device when the device is restarted to ensure its normal operation. At the same time, if the device time is synchronized by other clock sources, it will also be synchronized to RTC clock.

### Operation Path

Open in order: "Advanced Configuration > Time Configuration".

### Interface Description

The time configuration interface is shown below. Turn on the "Enable" switch to enable the time configuration.



Interface Element	Description
Enable	RTC enable switch button, which is enabled by default. It has the following status: <ul style="list-style-type: none"> <li>• : represents enable;</li> <li>• : represents disable.</li> </ul>

## 9.10 OSPF Configuration

The Open Shortest Path First (OSPF) protocol is link-state Interior Gateway Protocol (IGP) developed by the Internet Engineering Task Force (IETF).

OSPF Version 2 (RFC 2328) is currently used for the IPv4 protocol.

- Dividing an Autonomous System (AS) into one or more logical areas
- Advertising routes by sending Link State Advertisements (LSAs)
- Exchanging OSPF packets between devices in an OSPF area to synchronize routing information
- Encapsulating OSPF packets into IP packets and then sending the packets in unicast or multicast mode

RIP is a distance-vector routing protocol. Due to RIP's slow convergence, routing loops, and poor scalability, OSPF is now the most widely accepted and used IGP.

OSPF, as a link-state based protocol, can solve many problems faced by RIP. In addition, OSPF has the following advantages:

- Multicast packet transmission to reduce load on the switches that are not running OSPF
- Classless Inter-Domain Routing (CIDR)
- Load balancing among equal-cost routes
- Packet authentication

## 9.10.1 Global Configuration

### Function Description

On the "Global Configuration" page, you can configure OSPF process ID, router ID, default route, import external route and other information.

### Operation Path

Open in order: "Advanced Configuration > OSPF Configuration > Global Configuration".

### Interface Description

The OSPF configuration interface is as follows:

The screenshot shows a web-based configuration interface for OSPF. At the top, there are navigation tabs: "OSPF Configuration >", "Global Configuration", "Network Configuration", and "Interface Configuration". Below the tabs, there are two buttons: "+ Add" and "Delete". A table is displayed with the following columns: "Process id", "Router id", "Assign default route", "Redistribute", and "Operation". Below the table, there are pagination controls: "Total item 0", "Total page 0", "Current page < 1 >".

Main element configuration description of OSPF configuration interface:

Interface Element	Description
Process ID	The value range of OSPF process ID is 1-65535. OSPF supports multi-processes, and many different OSPF

Interface Element	Description
	processes can run on the same router, which do not affect each other and are independent of each other. An interface of a router can only call one OSPF process.
Router ID	Router ID is used to uniquely identify a router running OSPF in the autonomous system. The format of ID is the same as that of IP address. Each OSPF router that runs OSPF has a router ID.
Assign default route	Default routes have all 0s as the destination address and mask. A device uses a default route to forward packets when no matching route is discovered.
Redistribute	The routes learned from other routing protocols are introduced into the OSPF routing table, which is suitable for autonomous system boundary routers. External routing describes how to select a route to a destination address other than AS. <ul style="list-style-type: none"> <li>• connected: direct connection routing.</li> <li>• static: static route.</li> <li>• rip: RIP route.</li> </ul>
Operation	Click "Edit" or "Delete" to modify or delete the entry.

## 9.10.2 Network Configuration

### Function Description

On the "Network Configuration" page, you can configure the OSPF area to which each network interface of the device belongs.

### Operation Path

Open in order: "Advanced Configuration > OSPF Configuration > Network Configuration".

### Interface Description

Network configuration interface as follows:

OSPF Configuration >		Global Configuration	Network Configuration	Interface Configuration	
<input type="button" value="+ Add"/>		<input type="button" value="Delete"/>			
<input type="checkbox"/>	Process id	IP	Wildcard	Area	Operation
<input type="checkbox"/>	1	192.168.1.0/24		1	Delete
Total item 1		Total page 1	Current page	< 1 >	

The main element configuration description of network configuration interface:

Interface Element	Description
Process ID	The value range of OSPF process ID is 1-65535.
IP	The network address, or network address / network prefix, of the OSPF process.
Wildcard	Wildcard of the network address.
Area	Set the OSPF area to which the network interface belongs. The identification of the OSPF area supports IP address format or integer value in the range of 0-4294967295.
Operation	Click the "Delete" button to delete the entry.

## 9.10.3 Interface Configuration

### Function Description

On the "Interface Configuration" page, you can configure the cost, expiration time, hello interval and DR priority of the device interface.

### Operation Path

Open in order: "Advanced Configuration > OSPF Configuration > Interface Configuration".

### Interface Description

Interface configuration interface as follows:

OSPF Configuration >		Global Configuration	Network Configuration	Interface Configuration		
<input type="button" value="+ Add"/>		<input type="button" value="Delete"/>				
<input type="checkbox"/>	Interface	Cost	Neighbor dead	Hello interval	Dr priority	Operation
Total item 0		Total page 0	Current page	< 1 >		

The main element configuration description of interface configuration interface:

Interface Element	Description
Interface	VLAN interface of the device.
Cost	The cost required to run OSPF protocol on the interface. The value range is 1-65535.
Neighbor dead	OSPF neighbor dead time, in seconds, value range 1-65535. If the Hello message from the neighbor is not received within this time, the neighbor is considered invalid. If the failure time between two adjacent routers is different, the neighbor relationship cannot be established.
Hello Interval	The time interval for the interface to send Hello message, in seconds, with a value range of 1-65535. The Hello message is periodically sent to the neighbor router to maintain the neighbor relationship and the election of DR (Designated Router) / BDR (Backup Designated Router).
DR priority	DR priority of the interface, ranging from 1 to 255. The DR priority determines the qualification of the interface for election of DR/BDR. The higher the value, the higher the priority. High priority will be taken into account when voting rights conflict.
Operation	Click "Edit" or "Delete" to modify or delete the entry.

## 9.11 IPDT Configuration

### Function Description

On the "IPDT Configuration" page, you can configure IPDT (IP Detection) to detect the specified destination address (ICMP) and link it with other functions, such as VRRP.

### Operation Path

Open in order: "Advanced Configuration > IPDT Configuration".

### Interface Description

The IPDT configuration interface is as follows:

IPDT Configuration											
<input type="checkbox"/>	IPDT ID	State	Source IP	Destination IP	Requests Try	Request Interval (ms)	Opposite Device State Requests	Response	Failed Requests	Other Responses	Operation
<input type="checkbox"/>	1	Disable	192.168.1.1	192.168.1.11	1	1000	not be detected	0	0	0	Delete

Main element configuration description of IPDT configuration interface:

Interface Element		Description
IPDT ID		IPDT session ID, value range 1-8.
State		IPDT function enable status.
Source IP		The source IP address that sends ICMP probe packet.
Destination IP		Destination IP address of ICMP probe packet.
Requests Try		The number of request packets sent by each probe.
Request Interval (ms)		The time interval of each probe request, the unit is 100ms, with a value range of 5-15.
Opposite Device State		The status of the opposite device is shown as follows: <ul style="list-style-type: none"> <li>• UP: the opposite end device is online normally.</li> <li>• DOWN: there is no response from the opposite end device, which may lead to device disconnection or link failure.</li> <li>• undefined (undefined): undefined / undetected.</li> </ul>
Requests		Display the number of probe packets sent.
Response		Display the number of probe packets answered by the destination IP.
Failed Requests		Displays the number of requests that failed.
Other Responses		Displays the number of probe packets responded by other devices.
Operation		Click the "Delete" button to delete the entry.

## 9.12 TRDP Configuration

In the appendix A of IEC 61375-2-3, the TRDP (Train Real-time Data Protocol) is defined. TRDP protocol is designed to ensure the real-time, reliability and security of data transmitted on locomotive network.

### Function Description

On the "TRDP Configuration" page, user can configure the destination address and ComId of TRDP. Through the TRDP protocol, devices can send device port LINK status information to the security monitoring network.

### Operation Path

Open in order: "Advanced Configuration > TRDP Configuration".

## Interface Description

Interface screenshot of TRDP configuration is as follows:

Main element configuration description of TRDP configuration interface:

Interface Element	Description
Version	TRDP protocol version, with the following options: <ul style="list-style-type: none"> <li>v2</li> <li>v3</li> </ul>
ComId	The communication identifier ComId is a unique identifier of the TRDP protocol data unit, used to uniquely identify an identification number of a data, with a value range of 1-4294967295.
Time interval	The time interval for sending TRDP protocol messages, with a value range of 10-3000ms.
Destination IP	The destination IP address for sending TRDP protocol messages.
Global	TRDP protocol Global enable switch, with the following options: <ul style="list-style-type: none"> <li>enable</li> <li>disable</li> </ul>

# 10 System Maintenance

## 10.1 Configuration Management

### 10.1.1 Current Configuration

#### Function Description

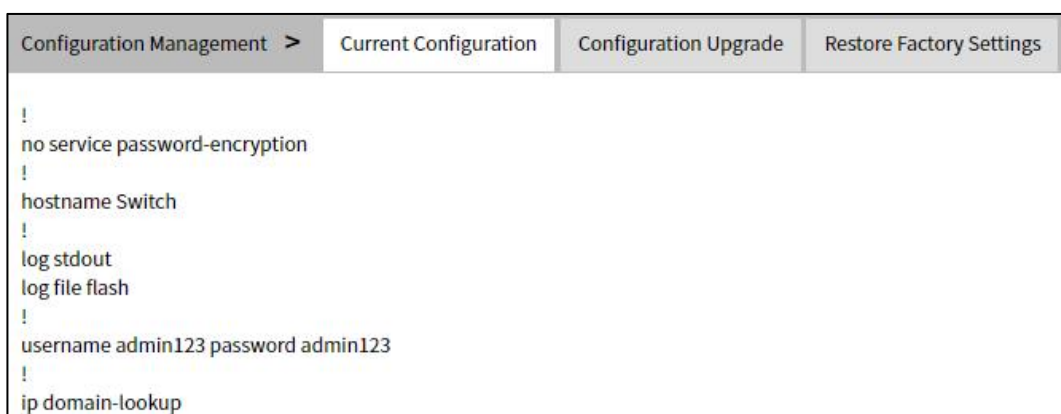
On the "Current Configuration" page, user can view current configuration information.

#### Operation Path

Open in order: "System Maintenance > Configuration Management > Current Configuration".

#### Interface Description

Global configuration interface is as follows:



```
Configuration Management > Current Configuration Configuration Upgrade Restore Factory Settings
!
no service password-encryption
!
hostname Switch
!
log stdout
log file flash
!
username admin123 password admin123
!
ip domain-lookup
```

## 10.1.2 Configuration Update

### Function Description

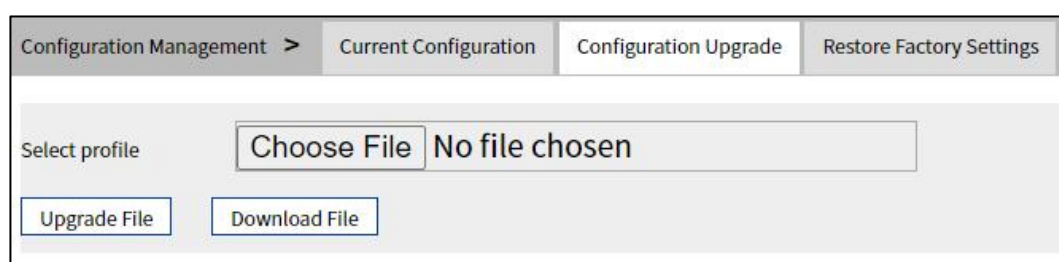
On the "Configuration Update" page, user can download and upload configuration file.

### Operation Path

Open in order: "System Maintenance > Configuration Management > Configuration Upgrade".

### Interface Description

Configuration upgrade interface as follows:



The main element configuration description of configuration file upgrade interface:

Interface Element	Description
Select profile	Locally uploading configuration file path, click "Select File" to select required configuration file.
Upgrade File	Upload local configuration file, format: .conf.
Download File	Download the configuration file of current device, format: .conf.

## 10.1.3 Restore Factory Settings

### Function Description

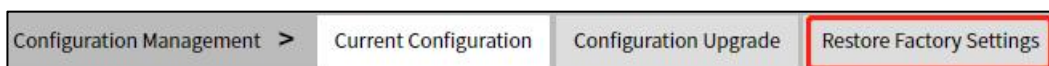
On the "Restore Factory Settings" page, user can restore the device to default setting.

### Operation Path

Open in order: "System Maintenance > Configuration Management > Restore Factory Setting".

### Interface Description

Restore Factory Settings interface is as follows:



The main element configuration description of restore factory settings interface:

Interface Element	Description
Restore Factory Settings	Click the button to confirm, the device will lose all existing configuration and restore to default setting.

## 10.2 Alarm Configuration

### 10.2.1 Port

#### Function Description

On the "Port" page, user can configure the port alarm function. When the device port is in an abnormal state, the administrator can be informed in time, and the device state can be quickly repaired to avoid excessive loss.

#### Operation Path

Open in order: "System Maintenance > Alarm Configuration > Port".

#### Interface Description

Port interface as below:

Alarm Configuration >			
Port		Power	
<input type="button" value="Enable"/> <input type="button" value="Disable"/>			
<input type="checkbox"/>	Port	State	Alarm switch
<input type="checkbox"/>	fe1	down	disable
<input type="checkbox"/>	fe2	down	disable
<input type="checkbox"/>	fe3	up	disable
<input type="checkbox"/>	fe4	down	disable
<input type="checkbox"/>	fe5	down	disable
<input type="checkbox"/>	fe6	down	disable
<input type="checkbox"/>	fe7	down	disable
<input type="checkbox"/>	fe8	down	disable
<input type="checkbox"/>	fe9	down	disable
<input type="checkbox"/>	fe10	down	disable
<input type="checkbox"/>	fe11	down	disable
<input type="checkbox"/>	fe12	down	disable
<input type="checkbox"/>	fe13	down	disable
<input type="checkbox"/>	fe14	down	disable
<input type="checkbox"/>	fe15	down	disable
<input type="checkbox"/>	fe16	down	disable
<input type="checkbox"/>	fe17	down	disable
<input type="checkbox"/>	fe18	down	disable
<input type="checkbox"/>	fe19	down	disable
<input type="checkbox"/>	fe20	down	disable
<input type="checkbox"/>	fe21	down	disable
<input type="checkbox"/>	fe22	down	disable
<input type="checkbox"/>	fe23	down	disable
<input type="checkbox"/>	fe24	down	disable
<input type="checkbox"/>	ge1	down	disable
<input type="checkbox"/>	ge2	down	disable
<input type="checkbox"/>	ge3	down	disable
<input type="checkbox"/>	ge4	down	disable

The main element configuration description of port configuration interface:

Interface Element	Description
Port	The corresponding port name of the device Ethernet port.
State	Port link status, display items as follows: <ul style="list-style-type: none"> <li>• up;</li> <li>• down.</li> </ul>

Interface Element	Description
Alarm switch	Port alarm function status, options as follows: <ul style="list-style-type: none"> <li>• Enable;</li> <li>• Disable</li> </ul>
Enable	Check the port that needs to enable port alarm, and click enable to enable this function. Note: After enable port alarm, when port occurs abnormal status, such as connection break down, the device will output a signal to hint the abnormal operation of device.
Disable	Check the port that needs to disable port alarm, and click disable to disable this function.

## 10.2.2 Power

### Function Description

On the "Power" page, user can configure the alarm functions of the power supply.

### Operation Path

Open in order: "System Maintenance > Alarm Configuration > Power".

### Interface Description

Power interface as below:

	Power	State	Alarm switch
<input type="checkbox"/>	1	Absent	disable
<input type="checkbox"/>	2	Normal	disable

Main elements configuration description of power alarm interface:

Interface Element	Description
Power	The corresponding name of this device's power supply
State	Device power link status, display items as follows: <ul style="list-style-type: none"> <li>• Normal;</li> <li>• Absent.</li> </ul>
Alarm switch	Port alarm function status, options as follows: <ul style="list-style-type: none"> <li>• Enable;</li> </ul>

Interface Element	Description
	<ul style="list-style-type: none"> <li>Disable</li> </ul>
Enable	Check the port that needs to enable power alarm, and click enable to enable this function.
Disable	Check the port that needs to disable power alarm, and click disable to disable this function.

## 10.3 Software Upgrade

### Function Description

On the "Software Upgrade" page, user can update and upgrade the device procedure via TFTP server.

### Operation Path

Open in order: "System Maintenance > Software Upgrade".

### Interface Description

The software update interface as follows:

The main elements configuration description of software update interface:

Interface Element	Description
Select file	Choose upgrade file, format ".bin". Supports WEB pages and software feature upgrades.

## 10.4 Log Information

### 10.4.1 Log Information

#### Function Description

On the page of “Log information”, user can check the log information of the device. Log information mainly records user operation, system failure, system safety and other information, including user log, security log and diagnostic log.

- User log: records user operations and system operation information.
- Security log: records information including account management, protocol, anti-attack and status.
- Diagnostic log: records information that assists in problem identification.

#### Operation Path

Open in order: "System Maintenance > Log Information > Log Information".

#### Interface Description

Log information interface as follow:

The screenshot displays the 'Syslog server' configuration page. At the top, there are navigation tabs: 'Log Information >', 'Log Information', and 'Syslog server'. Below the tabs, there is a toggle switch for 'Log power failure storage' which is currently turned off. Two buttons, 'Clear Log' and 'Download Log', are visible. The main area contains a list of log entries with timestamps and details such as 'iProc user.debug NSM[628]: NSM: vlanif1 link state changed to UP.' and 'iProc auth.info sshd[736]: Server listening on 0.0.0.0 port 22.'. At the bottom, there is a pagination control showing 'Total item 1168', 'Total page 59', 'Current page', and a dropdown menu set to '1'.

Main elements configuration description of log information interface:

Interface Element	Description
Log power failure storage	Log information is stored in FLASH, log information will not be lost after power failure.
Clear Log	Click the "Clear Log" button to clear the current log information record.
Download Log	Click the "Download Log" button to download the current log information to the local.

## 10.4.2 Syslog Server

### Function Description

On the "Syslog server" page, user can configure the Syslog server IP address, and the system log information can be sent to the configured syslog server.

## Operation Path

Open in order: "System Maintenance > Log Information > Syslog Server".

## Interface Description

The Syslog server interface as follows:

The screenshot shows a web-based configuration interface for Syslog servers. At the top, there is a breadcrumb trail: "Log Information > Log Information > Syslog server". Below this, the main configuration area is divided into three sections. On the left, the text "Syslog server" is displayed. In the center, there are four empty input boxes stacked vertically, intended for entering the IP addresses of up to four Syslog servers. On the right side of this area, an example is provided: "eg: 192.168.1.1:80". At the bottom left of the configuration area, there is a "Set" button to save the changes.

Syslog server interface main elements configuration instructions:

Interface Element	Description
Syslog Server	<p>IP address of Syslog server</p> <p>Note:</p> <ul style="list-style-type: none"> <li>• Supports port configuration and the input format is IP: port, for example: 192.168.1.1:80.</li> <li>• Users can configure up to 4 syslog servers at a time. If the configuration of one or more syslog servers need to be canceled, delete the input box and click Set.</li> </ul>

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# The Second Part: Frequently Asked Questions

## 11 FAQ

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### 11.1 Sign in Problems

1. **Why the web page display abnormally when browsing the configuration via WEB?**

Before accessing the WEB, please eliminate IE cache and cookies. Otherwise, the web page will display abnormally.

2. **What should I do if I forget my login password?**

For forgetting the login password, the password can be initialized by restoring factory setting, specific method is adopt network management software to search and use restore factory setting function to initialize the password. Both of the initial user name and password are "admin123".

3. **Is configuring via WEB browser same to configuring via BlueEyes\_II software?**

Both configurations are the same, without conflict.

### 11.2 Configuration Problem

1. **Why the bandwidth can't be increased after configuring Trunking (port aggregation) function?**

Check whether the port attributes set to Trunking are consistent, such as rate, duplex mode, VLAN and other attributes.

**2. What's the difference between RING V2 and RING V3?**

RING V2 and RING V3 are our company's ring patents. RING V2 only supports single ring and coupling ring. RING V3 supports single ring, coupling ring, chain and Dual\_homing, and Hello\_Time can be set to detect port connection status.

**3. How to deal with the problem that part of switch ports are impassable?**

When some ports on the switch are impassable, it may be network cable, network adapter and switch port faults. User can locate the faults via following tests:

- Keep connected computer and switch ports unchanged, change other network cables;
- Keep connected network cable and switch port unchanged, change other computers;
- Keep connected network cable and computer unchanged, change other switch port;
- If the switch port faults are confirmed, please contact supplier for maintenance.

**4. How about the order of port self-adaption state detection?**

The port self-adaption state detection is conducted according to following order: 1000Mbps full duplex, 100Mbps full duplex, 100Mbps half-duplex, 10Mbps full duplex, 10Mbps half-duplex, detect from high to low, connect automatically in supported highest speed.

## 11.3 Indicator Problem

**1. Why is the power supply indicator off?**

Possible reasons include:

- Not connected to the power socket; troubleshooting, connected to the power socket.
- Power supply or indicators faults; troubleshooting, change the power supply or device test.
- Power supply voltage can't meet the device requirements; troubleshooting, configure the power supply voltage according to the device manual.

## 2. Why is the Link/Act indicator off?

Possible reasons include:

- The network cable portion of Ethernet copper port is disconnected or bad contact; troubleshooting, connect the network cable again.
- Ethernet terminal device or network card works abnormally; troubleshooting, eliminate the terminal device fault.
- Not connected to the power socket; troubleshooting, connected to the power socket.
- Interface rate doesn't match the pattern; troubleshooting, examine whether the device transmission speed matches the duplex mode.

## 3. Ethernet copper port and fiber port indicator are connected normally, but can't transmit data, what's the reason?

When the system is power on or network configuration changes, the device and switch configuration in the network will need some time. Troubleshooting, after the device and switch configuration are completed, Ethernet data can be transmitted; if it's impassable, power off the system, and power on again.

## 4. Why does the communication crashes after a period of time, namely, it cannot communicate, and it returns to normal after restarting?

Reasons may include:

- Surrounding environment disturbs the product; troubleshooting, product grounding adopts shielding line or shields the interference source.
- Site wiring is not normative; Troubleshooting, optical fiber, network cable, optical cable cannot be arranged with power line and high-voltage line.
- Network cable is disturbed by static electricity or surge; Troubleshooting, change the shielded cable or install a lightning protector.
- High and low temperature influence; troubleshooting, check the device temperature usage range.