



# 30-Port Layer 3 Managed Industrial Ethernet Switch User Manual

Version 01

Issue Date: 10/26/2020

# Preface

Layer 3 Industrial Ethernet Switch User Manual has introduced this switch:

- Product features
- Network management method
- Network management relative principle overview

## Readers



This manual mainly suits for engineers as follows:




- Network administrator responsible for network configuration and maintenance
- On-site technical support and maintenance staff
- Hardware engineer

## Text Format Convention

Format	Description
“”	Words with “” represent the interface words. e.g.: "The port number".
>	Multi-level paths are 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'.
About this chapter	The section 'about this chapter' provides links to various sections of this chapter, as well as links to the Principles Operations Section of this chapter.

## Symbols

Format	Description
 Notice	Remind the announcements in the operation, improper operation may result in data loss or equipment damage.
 Warning	Pay attention to the notes on the mark, improper operation

Format	Description
	may cause personal injury.
 Note	Make a necessary supplementary instruction for operation 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.

## Revision Record

Version No.	Revision Date	Revision Description
01	2020-10-26	Product release

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# The First Part: Operation

## 1 Log in the Web Interface

### 1.1 WEB Browsing System Requirements

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 color or above
Browser	Above Internet Explorer 6.0
Operating system	<ul style="list-style-type: none"> <li>• Windows XP</li> <li>• Windows 7</li> <li>• Windows 10</li> </ul>

### 1.2 Set the IP Address of the Computer

The switch default management 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.

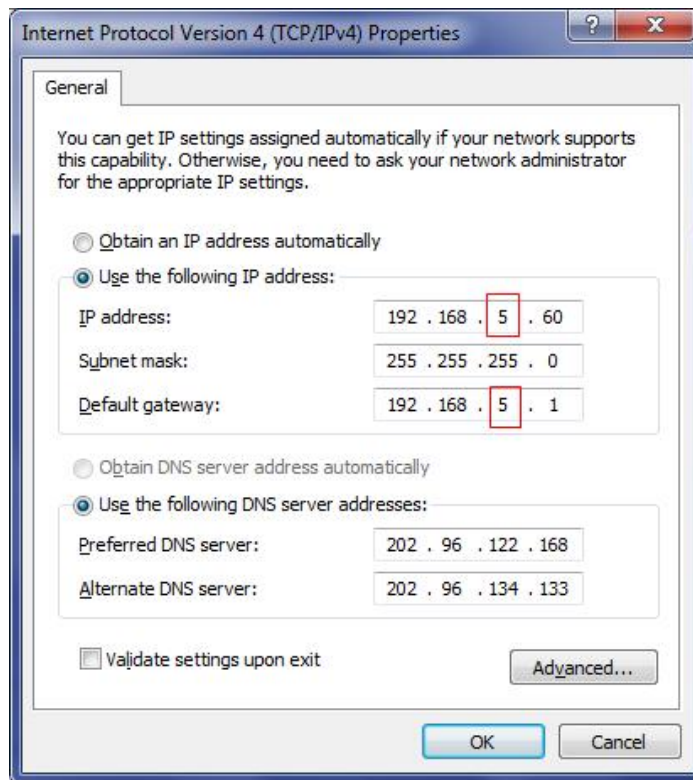
Eg: Assume that the IP address of the current PC is 192.168.5.60, change the network segment "5" of the IP address to "1".

### Operation Steps

Amendment steps 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 below to "1".



**Step 3** Click "OK", IP address is modified successfully.

**Step 4** End.



Notice

In windows system, if user adopts the advanced configuration function of IP address and accesses the switch device via setting IP dummy address, the following managed functions can't be achieved: IEEE 802.1x polling.

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## 1.3 Log in the Web Configuration Interface

### Operation Steps

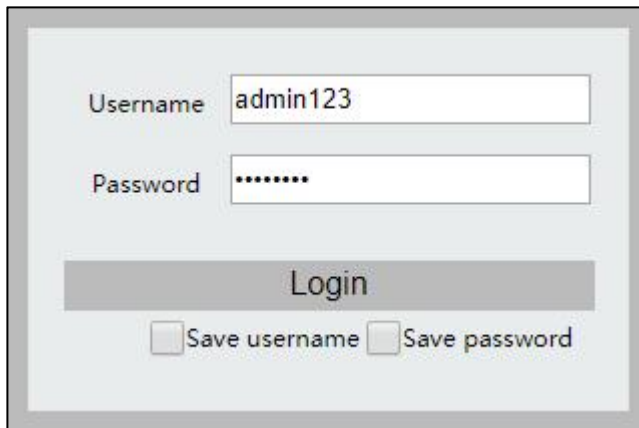
Login in the web configuration interface as follow:

**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 a window as the figure below, enter the user name and password on the login window.



The image shows a web browser window with a login form. The form has two input fields: 'Username' containing 'admin123' and 'Password' containing masked characters '\*\*\*\*\*'. Below the fields is a 'Login' button and two checkboxes: 'Save username' and 'Save password'.

Note:

- The default username and password are "admin123"; please strictly distinguish capital and small letter while entering.
- Default user account has the administrator privileges.
- Webserver will provide 3 times opportunities to enter username and password. If user enters the error information for 3 times, the browser will display "Access denied" to reject access message. Refresh the page and try again.

**Step 5** Click "Login".

**Step 6** End.

After login in successfully, user can configure relative parameters and information according to demands.

Note:

After login in the device, modify the switch IP address for usage convenience.

# 2 System Information

## Function Description

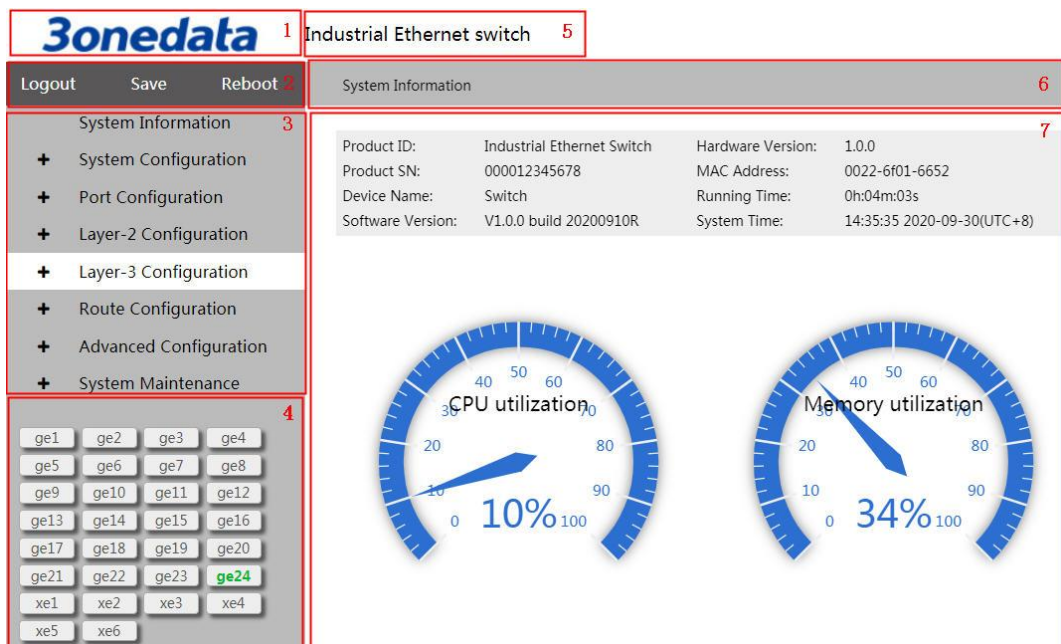
In "System Information" page, user can check "Device Information".

## Operation Path

Open: "System Information".

## Interface Description 1: WEB Interface Description

WEB interface as below:

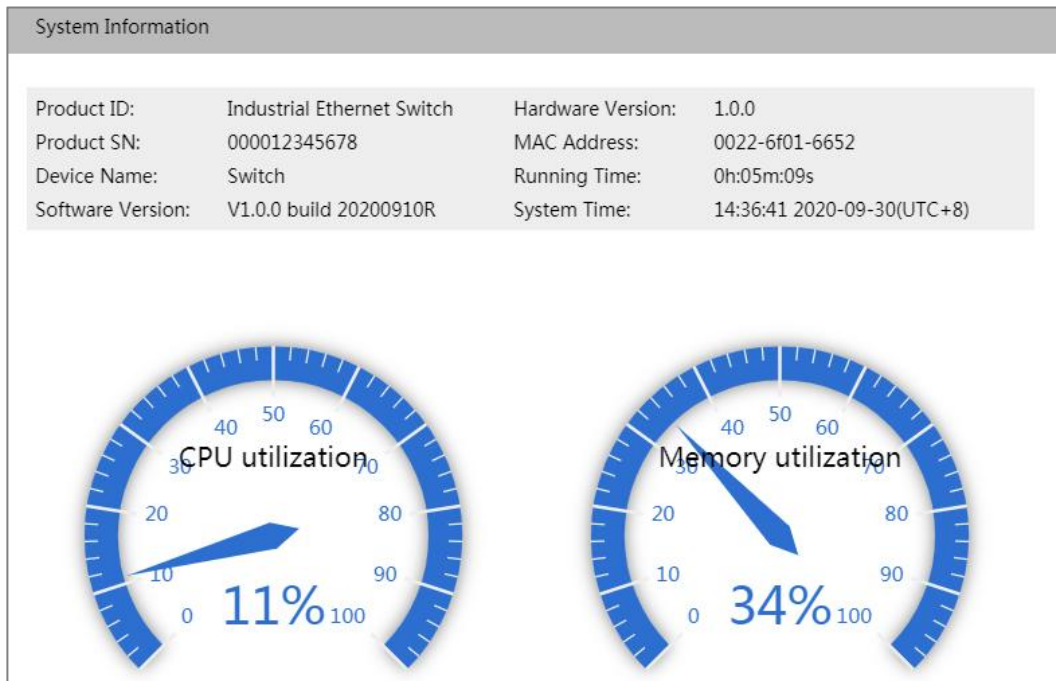


Main elements configuration descriptions of WEB interface:

Number	Interface Element	Description
1	LOGO	Display pictures of the company LOGO.
2	Logout      Save Reboot	Common shortcuts are as follows: <ul style="list-style-type: none"> <li>Logout: click to log out the web login interface;</li> </ul>

Number	Interface Element	Description
		<ul style="list-style-type: none"> <li>Save: click and confirm to save the current configuration file;</li> <li>Reboot: click and confirm to restart the current device.</li> </ul> <p>Notice: If the "Save" operation is not performed after the current configuration is modified, the device will revert to the last saved configuration after restart, and the current unsaved configuration will be lost.</p>
3	The menu bar	The function list of the device
4	Interface information	Information and status of the product interface
5	Industrial Ethernet Switch	Product Type
6	System Information	Current menu
7	Web interface	Current page

### Interface Description 2: System Information



The main element configuration description of System Info interface:

Interface Element	Description
CPU Utilization	CPU usage of the current device.

<b>Interface Element</b>	<b>Description</b>
Memory Utilization	Memory usage of the current device.
Product ID	The batch number used by the device to facilitate the management of device tags.
Hardware Version	Current hardware version information, pay attention to the hardware version limits in software version.
Product SN	Product SN
MAC address	Hardware address of device factory configuration.
Device name	Network identity used by the device.
Running time	Running time of the current device.
Software Version	Current software version information, updated software version with more features.

# 3 System Configuration

## 3.1 IP Address Configuration

### Function Description

On the "IP Address Configuration" page, user can set the IP address and subnet mask of this device.

### 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" with the label "IP address" to its left and "vlanif1 interface address" to its right. Below the input field is a "Set" button.

The main elements configuration description of IP address configuration interface:

Interface Element	Description
IP address	Set the device's IP address and subnet mask, for example: 192.168.1.254/24

## 3.2 User Configuration

### Function Description

On the "User Config" page, user is free to add and delete username, user needs to enter username and password to access the device, the initial username and password are: admin123.

### Operation Path

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

### Interface Description

User configuration interface as follows:

User Configuration			
<input type="button" value="+ Add"/>	<input type="button" value="Delete"/>		
<input type="checkbox"/>	Username	Password	Privilege
<input type="checkbox"/>	admin123	admin123	15

Main element configuration instructions in user Configuration interface:

Interface Element	Description
User name	<p>Visitor ID, cannot be empty.</p> <p>Note: Up to 16 characters, if the system already has this user, change the corresponding password and permissions.</p>
Password	<p>Password for Visitor, cannot be empty, up to 8 characters.</p>
Privilege	<p>The visitor's privilege is 0-15, and it supports 16 priorities in 4 categories.</p> <ul style="list-style-type: none"> <li>• 0: visit level: user can only check device version information and some simple 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 cannot manage devices.</li> <li>• 3-15: manage level, user has all privileges of the device, including downloading, uploading, rebooting, modifying device information and other operations.</li> </ul> <p>User name and password can only be set as numbers or characters or! @# ¥%.</p>

## 3.3 Network Diagnosis

### 3.3.1 Ping

#### Function Description

On the "Ping" page, Ping is used to check whether the network is open or network connection speed. Ping utilizes the uniqueness of network machine IP address to send a data packet to the target IP address, and then ask the other side to return a similarly sized packet to determine whether two network machines are connected and communicated, and confirm the time delay.

#### Operation Path

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

#### Interface Description

Ping information interface as follows:

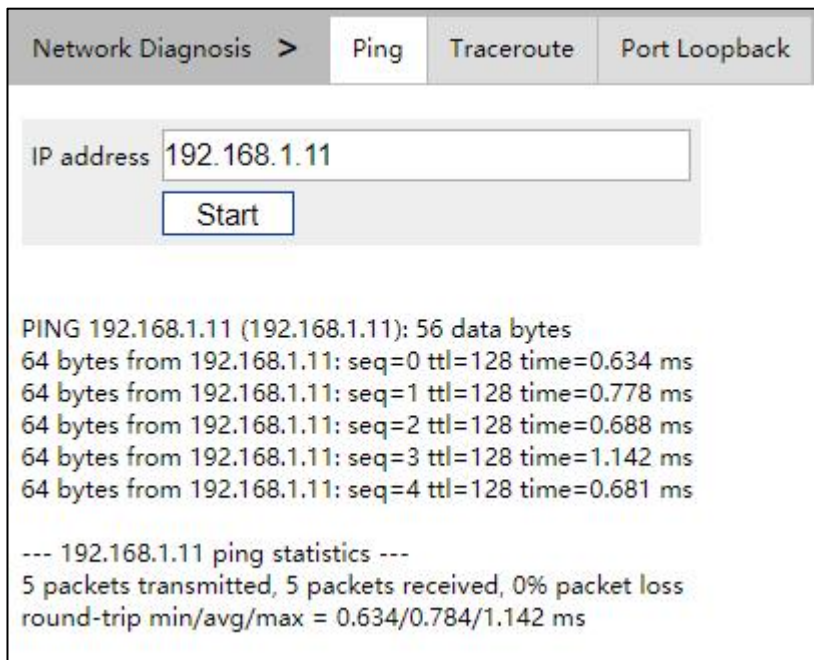
Main element configuration instructions in Ping interface:

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



**Step 3** End.

### 3.3.2 Traceroute

#### Function Description

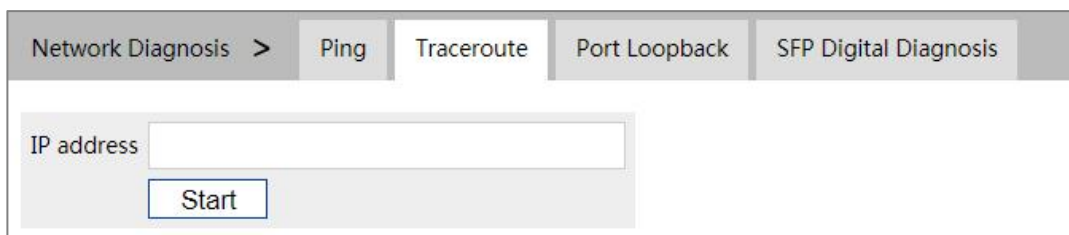
In the "Traceroute" page, users can test the network situation between the switch and the target host. Traceroute sends the small data packet to destination device until it returns and measure the time. Each device on a path Traceroute returns three test results. The output includes the time of each test (ms), the name of the device (if any), and its IP address.

#### Operation Path

Open in order: "System Configuration > Diagnosis > TRACEROUTE".

#### Interface Description

TRACEROUTE interface as follows:



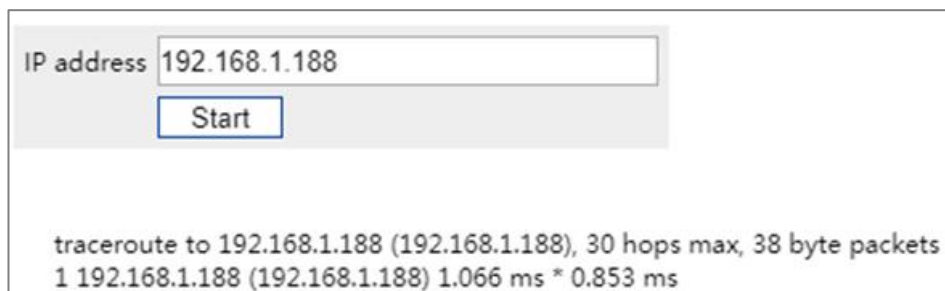
Main element configuration instructions in TRACEROUTE interface:

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 "TRACEROUTE" text box;

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



Note:

The picture above shows the time that the device takes to get to IP address 192.168.1.188, it needs up to 30 hops and 38 bytes' data packet. The returned Traceroute time is 1.066ms and 0.853ms.

**Step 3** End.

## 3.3.3 Port Loopback

### Function Description

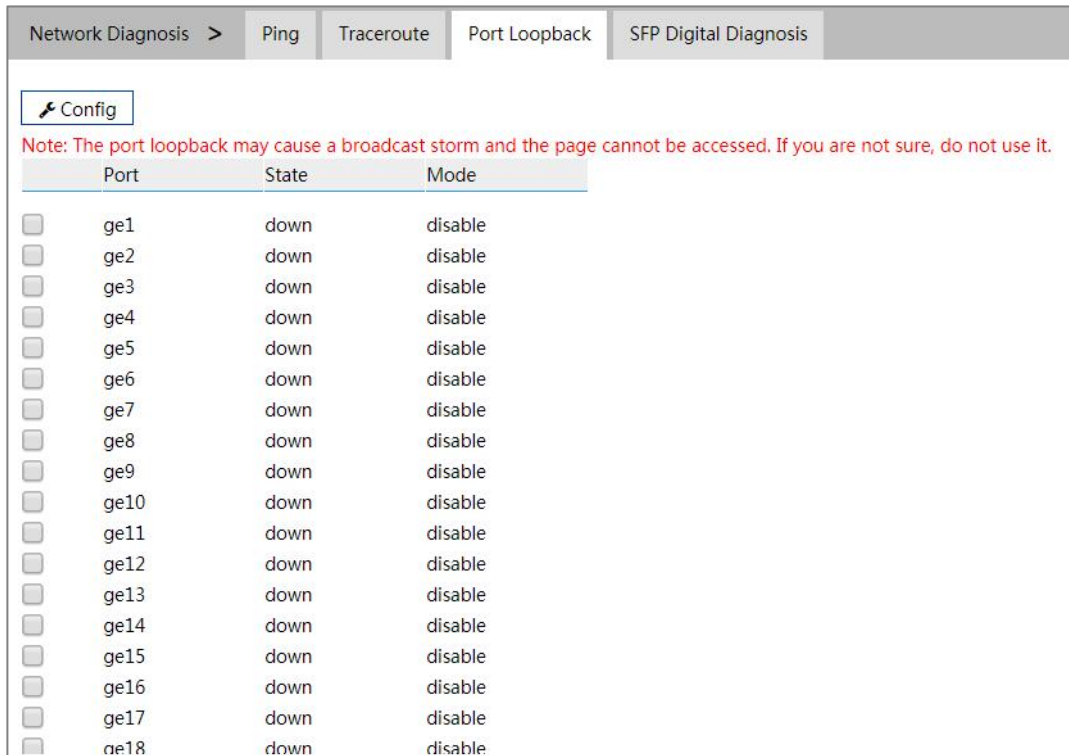
On "Port Loopback" page, user can measure the loopback situation of the switch port PHY or MAC for the convenience of troubleshooting. Port loopback is a common method for the maintenance and troubleshooting of communication port line. Connect the sending end of tested device or line to its receiving 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 > Diagnosis > Port Loopback".

### Interface Description

Port loopback interface as follows:



The main element configuration description of port loopback interface:

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

### 3.3.4 SFP Digital Diagnosis

#### Function Description

On the "SFP Digital Diagnostics" page, user can monitor SFP parameter in real time. This function has greatly facilitated the troubleshooting process of optical fiber link and the cost of on-site debugging.

### Operation Path

Open in order: "Main Menu > System Configuration > Network Diagnosis > SFP Digital Diagnosis".

### Interface Description

The SFP digital diagnosis interface is as follows:

Network Diagnosis >				
Ping				
Traceroute				
Port Loopback				
SFP Digital Diagnosis				
Port ge18(SFP/SFP+) -				
Parameter	Mark	Actual Value	Unit	Reference Range
Temperature		44.00	°C	-40.00 - 95.00
Voltage		3.32	V	3.00 - 3.60
Bias Current		12.73	mA	0.00 - 55.00
Rx Power(dBM)		0.00	mW	-27.96 - 0.00
Tx Power(dBM)		-6.39	mW	-10.00 - -2.01
Port xe5(SFP/SFP+) -				
Parameter	Mark	Actual Value	Unit	Reference Range
Temperature		44.00	°C	0.00 - 100.00
Voltage		3.37	V	2.90 - 3.60
Bias Current		39.89	mA	3.00 - 85.00
Rx Power(dBM)	↓	-40.00	mW	-18.00 - 2.00
Tx Power(dBM)		-3.06	mW	-6.99 - 1.00

Configuration description of main elements of SFP digital diagnosis interface:

Interface Element	Description
Port	The corresponding name of this device's Ethernet port
Parameter	<p>Parameter information of optical module:</p> <ul style="list-style-type: none"> <li>• Temperature: This device's SFP temperature. Its unit is °C. The operating temperature of this SFP module should be within the temperature range of normal operation;</li> <li>• Voltage: The voltage that this device offers SFP. Its unit is V. Overvoltage could lead to the breakdown of CMOS device; under voltage would disable the normal operation of lasers.</li> <li>• Bias current: laser bias current;</li> <li>• Receiving power: Optical input power, referring to the lowest optical power of receiving in certain rate and bit error rate;</li> <li>• Transmission power: Optical output power, referring to the output power of optical source in the sending end of optical module.</li> </ul>
Mark	<p>Identification of whether the parameter value is normal:</p> <ul style="list-style-type: none"> <li>• ↓: The parameter value is less than the normal</li> </ul>

Interface Element	Description
	reference range; <ul style="list-style-type: none"> <li>↑: The parameter value is greater than the normal reference range;</li> <li>No ID: the parameter value is normal.</li> </ul>
Actual value	Current values of parameters of optical module
Unit	Units of each parameter of optical module: <ul style="list-style-type: none"> <li>Temperature: °C;</li> <li>Voltage: V;</li> <li>Bias current: mA;</li> <li>Receiving power: mW;</li> <li>Transmission power: mW.</li> </ul>
Reference range	Reference range of optical module parameters

## 3.4 Login Mode Configuration

### Function Description

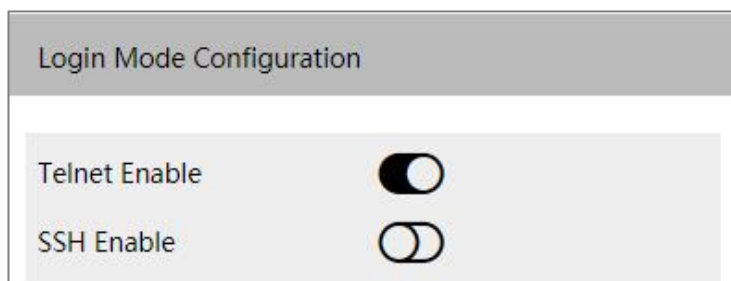
On the "Login Mode Configuration" page, TELNET service and SSH service of the device can be enabled. The CLI interface of the device can be accessed through TELNET protocol and SSH2.0 protocol. TELNET transmission process uses TCP protocol for plaintext transmission, and SSH (Secure Shell) protocol provides secure remote login, 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
-------------------	-------------

---

Interface Element	Description
Telnet enable	TELNET service function status switch. By default, it is enabled.
SSH enable	SSH service function status switch. By default, it is disabled.



Note

For TELNET and SSH login methods, please refer to the section "1.2 login switch" in the CLI command line manual.

---

# 4 Port Configuration

## 4.1 Port Settings

### Function Description

On the "Port Setting" page, user can check port type, rate and connection state, set rate mode, duplex mode, port enable, flow control and other parameters.

### Operation Path

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

### Interface Description

Port setting interface as follows:

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

<input type="checkbox"/>	ge ▾	Port	State	Medium	Rate	Duplex mode	Flow control	Max frame	Enable
<input type="checkbox"/>		ge1	down	fiber	auto	auto	disable	1518	enable
<input type="checkbox"/>		ge2	down	fiber	auto	auto	disable	1518	enable
<input type="checkbox"/>		ge3	down	fiber	auto	auto	disable	1518	enable
<input type="checkbox"/>		ge4	down	fiber	auto	auto	disable	1518	enable
<input type="checkbox"/>		ge5	down	fiber	auto	auto	disable	1518	enable
<input type="checkbox"/>		ge6	down	fiber	auto	auto	disable	1518	enable
<input type="checkbox"/>		ge7	down	fiber	auto	auto	disable	1518	enable
<input type="checkbox"/>		ge8	down	fiber	auto	auto	disable	1518	enable
<input type="checkbox"/>		ge9	down	fiber	auto	auto	disable	1518	enable
<input type="checkbox"/>		ge10	down	fiber	auto	auto	disable	1518	enable
<input type="checkbox"/>		ge11	down	fiber	auto	auto	disable	1518	enable
<input type="checkbox"/>		ge12	down	fiber	auto	auto	disable	1518	enable
<input type="checkbox"/>		ge13	down	fiber	auto	auto	disable	1518	enable
<input type="checkbox"/>		ge14	down	fiber	auto	auto	disable	1518	enable
<input type="checkbox"/>		ge15	down	fiber	auto	auto	disable	1518	enable
<input type="checkbox"/>		ge16	down	fiber	auto	auto	disable	1518	enable
<input type="checkbox"/>		ge17	down	auto ▾	auto	auto	disable	1518	enable
<input type="checkbox"/>		ge18	down	auto ▾	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	The corresponding port name of the device Ethernet port.
Status	Ethernet port connection status, display status as follows: <ul style="list-style-type: none"> <li>• down: represent the port is disconnected;</li> <li>• up: represent the port is connected.</li> </ul>
Medium	Ethernet port connection type as follows: <ul style="list-style-type: none"> <li>• The medium of copper port defaults to "copper";</li> <li>• The medium of fiber port defaults to "fiber";</li> <li>• The medium of Combo port is "auto", "copper" or "fiber" optional</li> </ul>
Rate	Self-adaption mode by default. Options are: <ul style="list-style-type: none"> <li>• auto</li> <li>• 10m</li> <li>• 100m</li> <li>• 1g</li> <li>• 10g</li> </ul>
Duplex Mode	Self-adaption mode by default. Options are: <ul style="list-style-type: none"> <li>• auto</li> <li>• half</li> <li>• full</li> </ul>
Flow Control	Port flow control status, options as follows: <ul style="list-style-type: none"> <li>• DISABLE: disable;</li> <li>• Tx: enable flow control of port data sending;</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	The maximum data frame length that passes Ethernet port, the default value is 1518 and the supported input range is 64~16360.
Enable	Enable or disable Ethernet port. Options are as follows: <ul style="list-style-type: none"> <li>• enable</li> <li>• disable</li> </ul> Notice: If user doesn't check the port "enable" checkbox, the port won't be connected to use.

## 4.2 Storm Suppression

### 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 Suppression".

### Interface Description

Storm control interface as follows:

The screenshot shows a web interface titled "Storm Control". At the top left, there is a "Config" button with a wrench icon. Below it, a red note states: "Note: All bandwidths are k=1000, m=1000k, g=1000m; all unrestricted or unconfigured are indicated by '-' !". The main part of the interface is a table with the following columns: a checkbox, a dropdown menu currently showing "ge", "Port", "Broadcast(bps)", "Multicast(bps)", and "Unicast(bps)". The table lists 18 ports (ge1 to ge18) and a final row with "--". Each port has a checkbox on the left, a "10M" value in the "Broadcast(bps)" column, a "-" value in the "Multicast(bps)" column, and a "100M" value in the "Unicast(bps)" column.

<input type="checkbox"/>	ge ▾	Port	Broadcast(bps)	Multicast(bps)	Unicast(bps)
<input type="checkbox"/>		ge1	10M	-	100M
<input type="checkbox"/>		ge2	10M	-	100M
<input type="checkbox"/>		ge3	10M	-	100M
<input type="checkbox"/>		ge4	10M	-	100M
<input type="checkbox"/>		ge5	10M	-	100M
<input type="checkbox"/>		ge6	10M	-	100M
<input type="checkbox"/>		ge7	10M	-	100M
<input type="checkbox"/>		ge8	10M	-	100M
<input type="checkbox"/>		ge9	10M	-	100M
<input type="checkbox"/>		ge10	10M	-	100M
<input type="checkbox"/>		ge11	10M	-	100M
<input type="checkbox"/>		ge12	10M	-	100M
<input type="checkbox"/>		ge13	10M	-	100M
<input type="checkbox"/>		ge14	10M	-	100M
<input type="checkbox"/>		ge15	10M	-	100M
<input type="checkbox"/>		ge16	10M	-	100M
<input type="checkbox"/>		ge17	10M	-	100M
<input type="checkbox"/>		ge18	10M	-	100M
<input type="checkbox"/>		--	10M	-	100M

Main elements configuration description of storm suppression interface:

Interface Element	Description (check the checkbox of the port, click "config" to configure it.)
-------------------	---

Interface Element	Description (check the checkbox of the port, click "config" to configure it.)
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>• Gigabit interface: 0-1000000Kbps or 0-1000Mbps;</li> <li>• 10GbE interface: 0-10000000Kbps, 0-10000Mbps or 0-10Gbps.</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>• Gigabit interface: 0-1000000Kbps or 0-1000Mbps;</li> <li>• 10GbE interface: 0-10000000Kbps, 0-10000Mbps or 0-10Gbps.</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>• Gigabit interface: 0-1000000Kbps or 0-1000Mbps;</li> <li>• 10GbE interface: 0-10000000Kbps, 0-10000Mbps or 0-10Gbps.</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

Supports 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. In general, 1Gbps=1024Mbps, 1Mbps=1024Kbps.

## 4.3 Port Rate Limit

### Function Description

On the "Port Rate-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 RateLimit".

### Interface Description

Port rate limit interface as follows:

Port Speed Limit			
<input type="button" value="Config"/>			
Note: All bandwidths are k=1000, m=1000k, g=1000m; all unrestricted or unconfigured are indicated by "-" !			
<input type="checkbox"/> ge ▾	Port	Bandwidth(kbps)	Operation
<input type="checkbox"/>	ge1	-	Clear
<input type="checkbox"/>	ge2	-	Clear
<input type="checkbox"/>	ge3	-	Clear
<input type="checkbox"/>	ge4	-	Clear
<input type="checkbox"/>	ge5	-	Clear
<input type="checkbox"/>	ge6	-	Clear
<input type="checkbox"/>	ge7	-	Clear
<input type="checkbox"/>	ge8	-	Clear
<input type="checkbox"/>	ge9	-	Clear
<input type="checkbox"/>	ge10	-	Clear
<input type="checkbox"/>	ge11	-	Clear
<input type="checkbox"/>	ge12	-	Clear
<input type="checkbox"/>	ge13	-	Clear
<input type="checkbox"/>	ge14	-	Clear
<input type="checkbox"/>	ge15	-	Clear
<input type="checkbox"/>	ge16	-	Clear
<input type="checkbox"/>	ge17	-	Clear
<input type="checkbox"/>	ge18	-	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	The corresponding port name of the device Ethernet port.

Interface Element	Description (check the checkbox of the port, click “config” to configure it.)
Bandwidth (bps)	<p>The port control for all input and output data transmission speed, it has to be a multiple of 64Kbps, input value range:</p> <ul style="list-style-type: none"> <li>Gigabit interface: 64-1000000Kbps or 0-1000Mbps;</li> <li>10GbE interface: 64-10000000Kbps, 0-10000Mbps or 0-10Gbps.</li> </ul> <p>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. In general 1Gbps=1024Mbps, 1Mbps=1024Kbps.</p>
Operation	Click “delete” to delete port rate limit configuration, port rate restores to no limit by default.



Note

1. When using the port rate limit, flow control should be enabled, otherwise the rate between devices will no longer be a smooth curve;
2. 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.
3. 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="button" value="+ Add"/>		<input type="button" value="Delete"/>		
<input type="checkbox"/>	Session ID	Source port	Destination port	Operation

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	A set of monitored ports, which will collect data from these ports in the specified direction, and the mirror port can be one or more.
Destination port	The destination port of device mirroring.
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>
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

1. The function must be shut down in normal usage, otherwise all senior management functions based on port are not available, such as RSTP, IGMP snooping etc.
2. Mirror function only deals with FCS normal packet; it cannot handle the wrong data frame
3. The direction of mirror group members cannot be replaced, and can only be increased on the basis of the previous ones.

## 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 LACPDUs (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.

### 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 Config".

### Interface Description

Link Aggregation interface as below:

Group name	Work mode	Port list	Port priority	Operation
------------	-----------	-----------	---------------	-----------

The main element configuration description of Link Aggregation interface:

Interface Element	Description
Lacp Priority	<p>priority level setting, the setting range 0-65535, defaults to 32768.</p> <p>Note: The smaller of interface LACP priority level value is, the higher priority level is, which is used for distinguishing the priority degree of selecting different ports as active port.</p>

Interface Element	Description
Group Name	Static aggregation link ID number, support maximum 12 groups, each group can configure 8 ports to join aggregation.
Work 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>
Port list	Port member in the link aggregation group.
Operation	Click "Edit" under "operation" to set the working mode and port priority 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 as follows:

The screenshot shows a configuration window for Link Aggregation. It includes the following elements:

- Group ID:** A dropdown menu set to '1'.
- Type:** A dropdown menu set to 'static'.
- Port list:** A dropdown menu set to 'active'.
- Load mode:** A dropdown menu set to 'dst-ip'.
- Port:** A grid of 24 checkboxes, each labeled with a port name: ge1, ge2, ge3, ge4, ge5, ge6, ge7, ge8, ge9, ge10, ge11, ge12, ge13, ge14, ge15, ge16, ge17, ge18, ge19, ge20, ge21, ge22, ge23, ge24, xe1, xe2, xe3, xe4, xe5, xe6.
- Tick up to 8:** A text label below the port checkboxes.
- Set:** A button at the bottom center of the window.

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

Interface Element	Description
Group ID	Static aggregation link ID number, support maximum 12 groups, each group can configure 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 mode: <ul style="list-style-type: none"> <li>• Active;</li> <li>• Passive.</li> </ul> Note: This function needs to be set only when the type is dynamic.
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> </ul>

Interface Element	Description
	<ul style="list-style-type: none"> <li>Src-ip: Load balance mode based on source IP;</li> <li>Src-mac: Load balance mode based on source MAC.</li> </ul>
Port	Port member in the aggregation group.

## 4.6 Port Statistics

### 4.6.1 Port Statistics-Overview

#### Function Description

On the "Port Statistics-Overview" page, user can check the data packet and byte number that each port sends and receives and the message number it discards.

#### Operation Path

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

#### Interface Description

Port Statistics-Overview interface as follows:

Port Statistics >		Port Statistics - Overview		Port Statistics - Port				
<input type="button" value="Clear"/>								
Port	Received packets	Sent packets	Received byte	Sent byte	Received drop	Sent drop	Receive error message	Send error message
ge1	0	0	0	0	0	0	0	0
ge2	0	0	0	0	0	0	0	0
ge3	0	0	0	0	0	0	0	0
ge4	0	0	0	0	0	0	0	0
ge5	0	0	0	0	0	0	0	0
ge6	0	0	0	0	0	0	0	0
ge7	0	0	0	0	0	0	0	0
ge8	0	0	0	0	0	0	0	0
ge9	0	0	0	0	0	0	0	0
ge10	0	0	0	0	0	0	0	0
ge11	0	0	0	0	0	0	0	0
ge12	0	0	0	0	0	0	0	0
ge13	0	0	0	0	0	0	0	0
ge14	0	0	0	0	0	0	0	0
ge15	0	0	0	0	0	0	0	0
ge16	0	0	0	0	0	0	0	0
ge17	0	0	0	0	0	0	0	0
ge18	0	0	0	0	0	0	0	0
ge19	0	0	0	0	0	0	0	0
ge20	0	0	0	0	0	0	0	0
ge21	0	0	0	0	0	0	0	0
ge22	0	0	0	0	0	0	0	0
ge23	0	0	0	0	0	0	0	0

## 4.6.2 Port Statistics-Port

### Function Description

On the "Port Statistics-Port" page, user can check the classified statistic of message sum and the number of message bytes sent and received by specified port.

### Operation Path

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

### Interface Description

Port Statistics-Port interface as follows:

Port Statistics > Port Statistics - Overview Port Statistics - Port		
Port	ge1	Clear
	Inbound direction	Outbound direction
<b>Counting statistics</b>		
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
<b>Length count</b>		
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
1518-2047 bytes	0	0
2048-4095 bytes	0	0
4096-8191 bytes	0	0

## 4.7 Port Isolation

### Function Description

Port isolation is used for the layer 2 isolation between messages. It could add different ports to different VLANs, but waste limited VLAN resources. Adopting isolate-port characteristics can achieve isolation of ports within the same VLAN. After adding the ports to isolation group, user can achieve the layer 2 data isolation of ports within isolation group. Port isolation function 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 as follows:

Port Isolation Group		
<input type="button" value="+ Add"/> <input type="button" value="Delete"/>		
<input type="checkbox"/>	Group name	Port member
		Operation

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

Interface Element	Description
VLAN name	The Group ID of the device's port isolation group. Its value range is 0-8.
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.

# 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 "MAC setting" page, user can configure the aging time of dynamic MAC address and check static and dynamic MAC address information.

## Operation Path

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

## Interface Description

MAC configuration interface as follows:

MAC Configuration > MAC Settings Static MAC Static Multicast MAC

MAC aging time 300 range 10-1000000 unit(s) Set Close Address Aging

Filter mode ALL

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
aa22.660d.6468	forward	ge24	1	dynamic

Total item 1 Total page 1 Current page 1

The main element configuration description of MAC setting interface:

Interface Element	Description
MAC Ageing Time	MAC address aging-time, unit is second, default value is 300, and range is 10-1000000.
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	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	Corresponding port number of the MAC address.
VLAN ID	VLAN ID number the data MAC address sending belongs to.
Type	MAC address type, dynamic MAC and static MAC address, display as follows: <ul style="list-style-type: none"> <li>dynamic;</li> <li>static.</li> </ul>

## 5.1.2 Static MAC

### Function Description

On the "Static Mac" page, user can manually configure the static MAC address and bind the source unicast MAC address without aging.

### Operation Path

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

### Interface Description

Static MAC interface as follows:

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
VLAN ID	VLAN ID number the data MAC address sending belongs to, such as 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



- 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

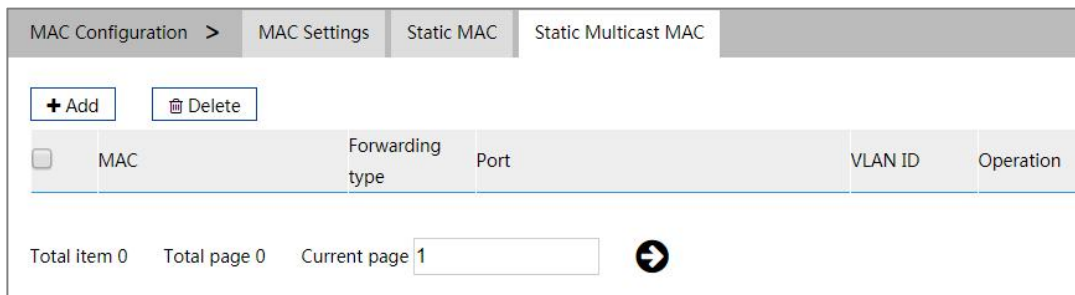
On the "Static Multicast Mac" page, user can manually configure the static MAC address and bind the source multicast MAC address without aging.

#### Operation Path

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

#### Interface Description

Static multicast MAC interface as follows:



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
VLAN ID	VLAN ID number the data MAC address sending belongs to, such as 1-4094. Note: Input Vlan ID is the existing ID.

Interface Element	Description
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

## 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-config" page, user can create VLAN and edit VLAN description.

#### Operation Path

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

#### 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	ge1 ge2 ge3 ge4 ge5 ge6 ge7 ge8 ge9 ge10 ge11 ge12 ge13 ge14 ge15 ge16 ge17 ge18 ge19 ge20 ge21 ge22 ge23 ge24 xe1 xe2 xe3 xe4 xe5 xe6		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;</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.

## 5.2.2 Access Configuration

### Function Description

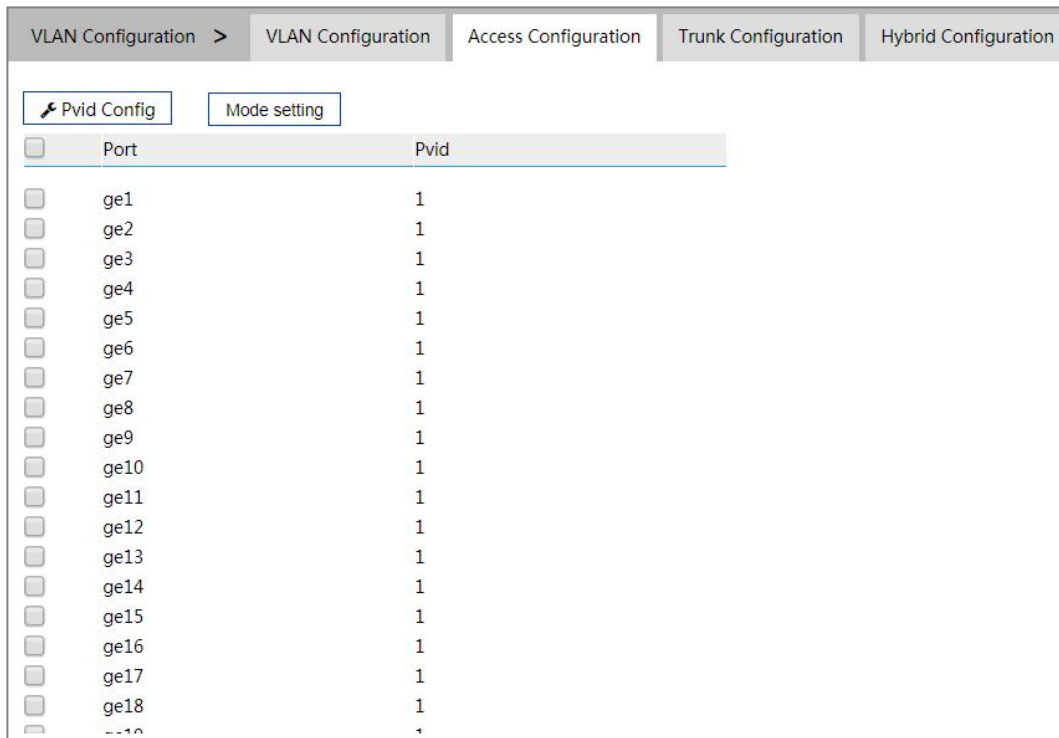
On the "Access Configuration" page, user can configure the port VLAN mode (access, trunk, Hybrid), and port VLAN ID: PVID.

### Operation Path

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

## Interface Description

Access configuration interface as follow:



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 "Config" 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 and all PVID are 1.</li> <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.</li> </ul>

Interface Element	Description
	<p>Commonly used in the connection between network devices.</p> <ul style="list-style-type: none"> <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>

### 5.2.3 Trunk Configuration

#### Function Description

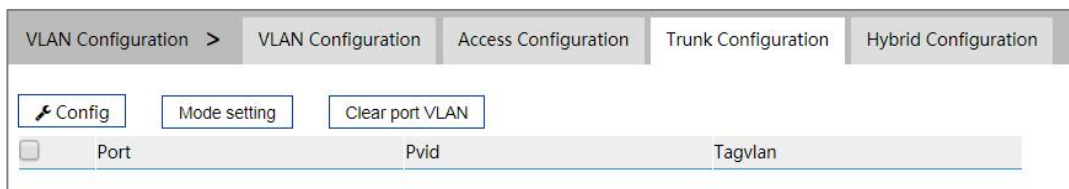
On the “Trunk configuration” page, user can configure port pvid value and tagvlan, as well as transforming the value of Trunk type to Access or Hybrid type.

#### 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	The tagged value, an individual number or range ("- represents range). For example: 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 type to access or hybrid
Clear port VLAN	Check the entries that need to be configured, click to clear

Interface Element	Description
	port VLAN, input tagvlan value to delete tagvlan

## 5.2.4 Hybrid Configuration

### Function Description

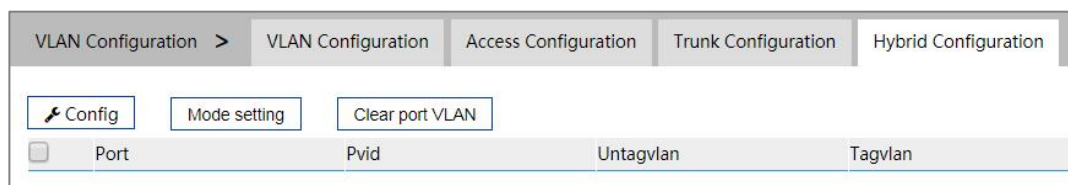
On the "Hybrid Configuration" page, user can configure Hybrid relative parameters.

### 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.
Pvid	VLAN ID number, value range is 1-4094.
Untagvlan	The untagged value, an individual number or range ("-") represents range). For example: 9 or 10-15
Tagvlan	The tagged value, an individual number or range ("-") represents range). For example: 9 or 10-15
Configuration	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 type to access or trunk

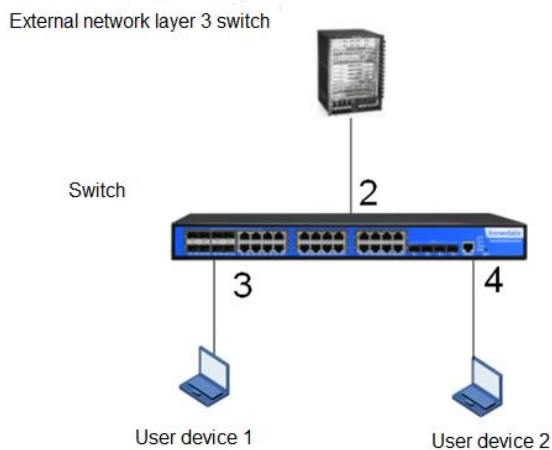
### Process for Port Receiving and Sending Message

Interface type	Process for Receiving Untagged Message	Process for Receiving Tagged Message	The process of transmit frame

Interface type	Process for Receiving Untagged Message	Process for Receiving Tagged Message	The process of transmit frame
Access interface	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>	Strip the PVID Tag of the message first, then transmit it.
Trunk interface		<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>	<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 would remain its original Tag and send the message.</li> </ul>
Hybrid interface			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 the picture 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. Analyze the configuration of each port as below:

- Port3
  - Port3 is upper interface, set Ports to Access type. The PVID value of Port3 is set 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.

### Operating Steps

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

**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
4	4

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

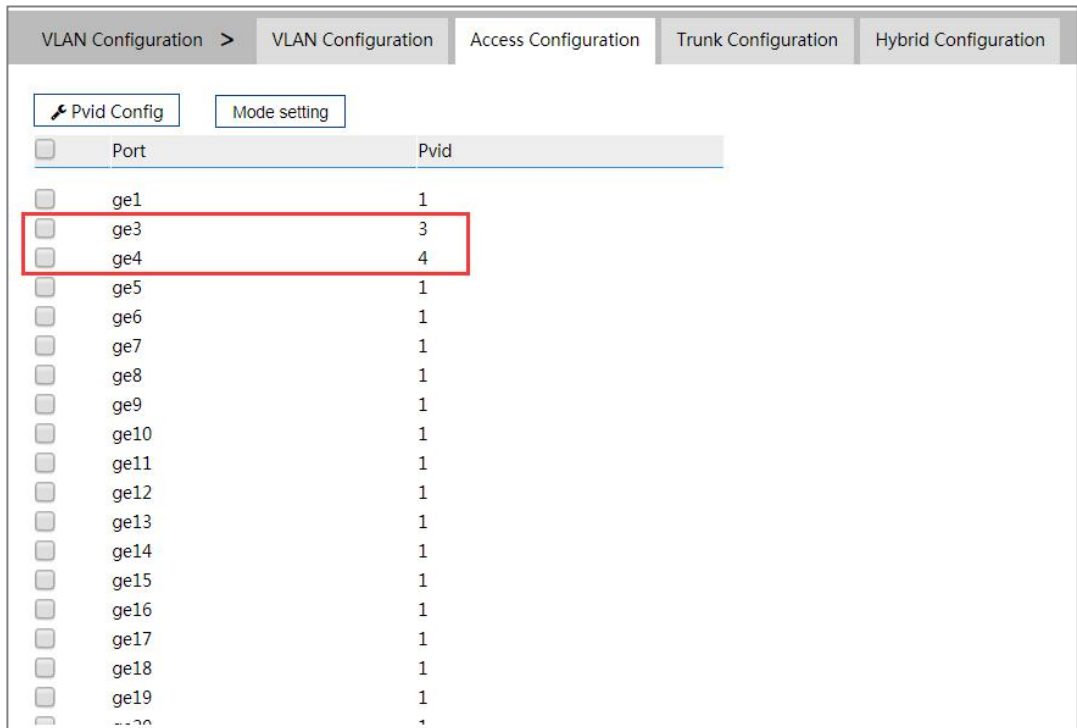
Set

2. Click "Apply" 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	ge1 ge2 ge3 ge4 ge5 ge6 ge7 ge8 ge9 ge10 ge11 ge12 ge13 ge14 ge15 ge16 ge17 ge18 ge19 ge20 ge21 ge22 ge23 ge24 xe1 xe2 xe3 xe4 xe5 xe6		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		

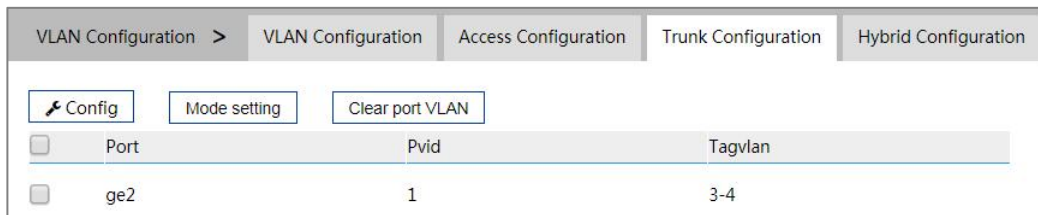
**Step 3** Set the corresponding pvid of port3 and port4, as well as the type of port2, port 3 and port4.

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



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

- 1 Access "Layer 2 Configuration > VLAN Configuration > Trunk Configuration".
- 2 Click "Apply".
- 3 Enter "1" in "pvid" and "3-4" in "tagvlan".
- 4 Click "Apply" button, as the picture below.



- 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	ge1 ge2 ge5 ge6 ge7 ge8 ge9 ge10 ge11 ge12 ge13 ge14 ge15 ge16 ge17 ge18 ge19 ge20 ge21 ge22 ge23 ge24 xe1 xe2 xe3 xe4 xe5 xe6		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	<input type="text" value="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 as follows:

Field	Value	Default
Work mode	0-STP 2-RSTP 3-MSTP	Mstp by default
Priority	32768	0-61440 32768 by default
Max hop count	20	1-40 20 by default
Forwarding delay	15	4-30 15s by default
Aging time	20	6-40 20s by default
Handshake time	2	1-10 2s by default
MST version	0	0-65535 0 by default
MST name	Default	Up to 32 characters Default by default

The main element configuration description of bridge configuration interface:

Interface Element	Description
Enable	Enable Spanning-tree 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>• STP: Spanning-tree;</li> <li>• RSTP: Rapid spanning tree;</li> <li>• 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.
Maximum 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

Interface Element	Description
	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 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).

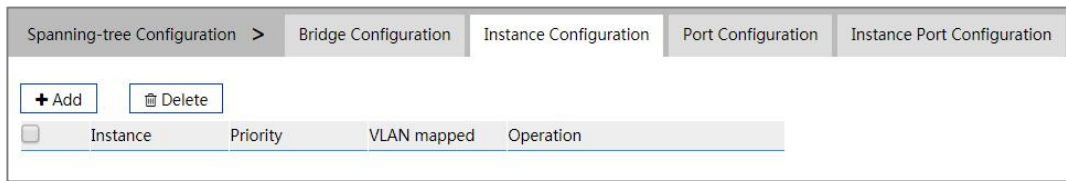
VLAN mapping table is an attribute of MST region, and it's used to describe the mapping relation between VLAN and MSTI.

### Operation Path

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

### Interface Description

Instance configuration interface as follows:



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 > Port Configuration".

#### Interface Description

Check port configuration interface as below:

Spanning-tree Configuration >					
Bridge Configuration		Instance Configuration		Port Configuration	
<input type="checkbox"/> Config					
<input type="checkbox"/>	Port	Enable	Bpduguard	Edge port	Connection Type
<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
<input type="checkbox"/>	ge5	enable	default	disable	auto
<input type="checkbox"/>	ge6	enable	default	disable	auto
<input type="checkbox"/>	ge7	enable	default	disable	auto
<input type="checkbox"/>	ge8	enable	default	disable	auto
<input type="checkbox"/>	ge9	enable	default	disable	auto
<input type="checkbox"/>	ge10	enable	default	disable	auto
<input type="checkbox"/>	ge11	enable	default	disable	auto
<input type="checkbox"/>	ge12	enable	default	disable	auto
<input type="checkbox"/>	ge13	enable	default	disable	auto
<input type="checkbox"/>	ge14	enable	default	disable	auto
<input type="checkbox"/>	ge15	enable	default	disable	auto
<input type="checkbox"/>	ge16	enable	default	disable	auto
<input type="checkbox"/>	ge17	enable	default	disable	auto
<input type="checkbox"/>	ge18	enable	default	disable	auto
<input type="checkbox"/>	...	...	...	...	...

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	Enable checkbox to participate in spanning-tree.
BPDU Guard	BPDU (Bridge Protocol Data Unit) protection function.
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 Config" 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					
<input type="button" value="Config"/>							
<input type="checkbox"/>	Port	Enable	Instance	Priority	Configuration cost	Role	State
<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
<input type="checkbox"/>	ge4	enable	0	128	20000000	disabled	discarding
<input type="checkbox"/>	ge5	enable	0	128	20000000	disabled	discarding
<input type="checkbox"/>	ge6	enable	0	128	20000000	disabled	discarding
<input type="checkbox"/>	ge7	enable	0	128	20000000	disabled	discarding
<input type="checkbox"/>	ge8	enable	0	128	20000000	disabled	discarding
<input type="checkbox"/>	ge9	enable	0	128	20000000	disabled	discarding
<input type="checkbox"/>	ge10	enable	0	128	20000000	disabled	discarding
<input type="checkbox"/>	ge11	enable	0	128	20000000	disabled	discarding
<input type="checkbox"/>	ge12	enable	0	128	20000000	disabled	discarding
<input type="checkbox"/>	ge13	enable	0	128	20000000	disabled	discarding
<input type="checkbox"/>	ge14	enable	0	128	20000000	disabled	discarding
<input type="checkbox"/>	ge15	enable	0	128	20000000	disabled	discarding
<input type="checkbox"/>	ge16	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.
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, 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> </ul>

Interface Element	Description (check the checkbox of the port, click “config” to configure it.)
	<ul style="list-style-type: none"> <li>• back: Backup port;</li> <li>• disa: Disable port.</li> </ul>
Status	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.

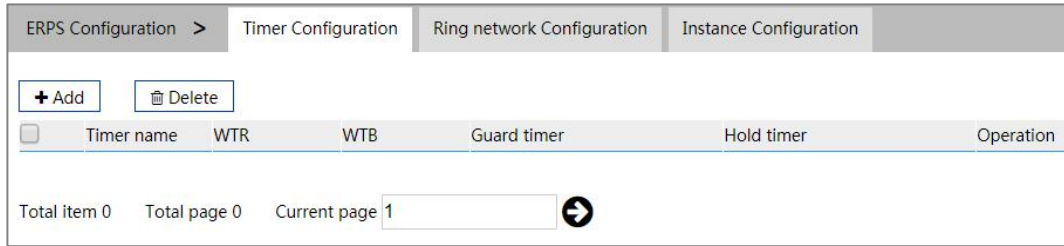
An Ethernet network topology connected in ring is called a ERPS Ring. It could be divided into main ring and subring. Each device in ERPS ring is called a node. The main node is in charge of blocking and opening ports on this node, preventing loops from forming.

#### Operation Path

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

#### Interface Description

Timer configuration interface as follows:



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.
GuardTimer	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.
HoldTimer	Hold timer, its value range is 0-10ms. The timer starts when 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:

Ring name	Ring network ID	East-port	West-port	Ring level	Operation
Total item 0    Total page 0    Current page 1					

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
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 Configuration >		Timer Configuration	Ring network Configuration	Instance Configuration											
<input type="button" value="+ Add"/>		<input type="button" value="Delete"/>													
<input type="checkbox"/>	ERPS name	ID	Ring name	Timer name	Device role	RPL port	Ring role	Master instance	Virtual	Manage VLAN	Reversibile	State	Enable	Operation	

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> <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.

Interface Element	Description
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> <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.

Interface Element	Description
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 adopts 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

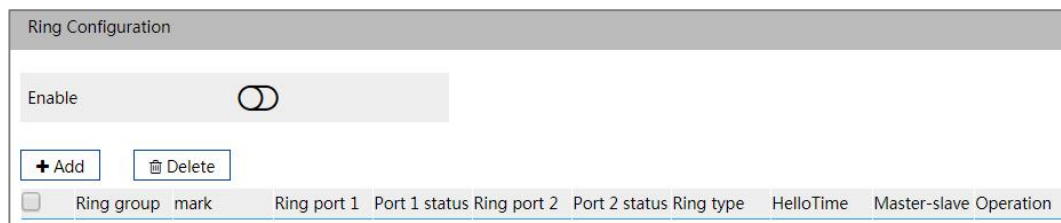
On the "Ring Configuration" page, user can enable/disable the ring network.

### 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.

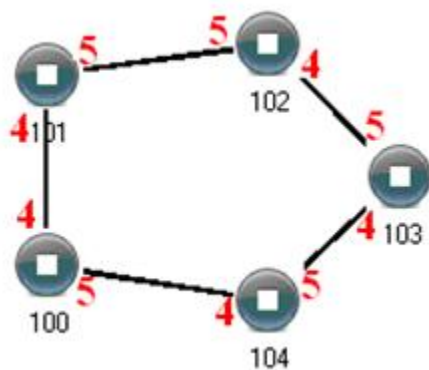
Interface Element	Description
Enable switch	Enable switch, enable Ring network function or not.
Ring group	Support ring group 1-4, it can create 4 ring networks at the same time.

Interface Element	Description
Mark	<p>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.</p> <p>Note: The ring network identification must remain the same in one ring network.</p>
Ring Port 1	<p>Port 1 can be used for the formation of ring network in switch.</p> <p>Note: When the ring network type is “Couple”, it displays “coupling port”. Coupling port is the port that connects different network identities.</p>
Ring Port 2	<p>Port 2 can be used for the formation of ring network in switch.</p> <p>Note:</p> <ul style="list-style-type: none"> <li>• When the ring network type is “Couple”, it displays “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>
Ring Type	<p>According to the requirement in the scene, user can choose different ring network.</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 time interval of Hello packet transmission. It is a query packet sent to adjacent device via ring network port to confirm whether the connection is normal. Value range is 0-300.</p>
Master-slave	<p>Master-slave mode option:</p> <ul style="list-style-type: none"> <li>• Master;</li> <li>• Slave.</li> </ul> <p>Note: There is only one Master in one ring network.</p>
Add	<p>Click “Add” button to add ring network configuration.</p>
Delete	<p>Check the radio box of ring network configuration entry and</p>

Interface Element	Description
	click “delete” button to delete ring network configuration.

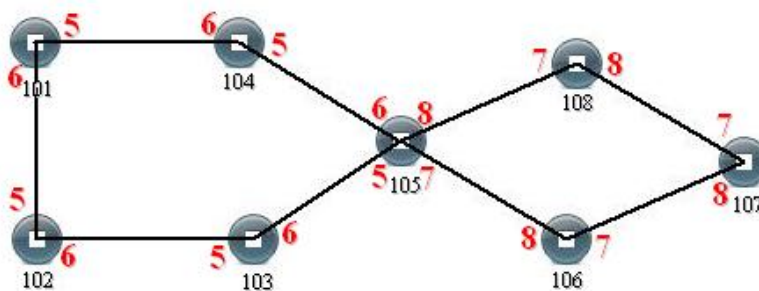
### Single Ring Configuration

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;

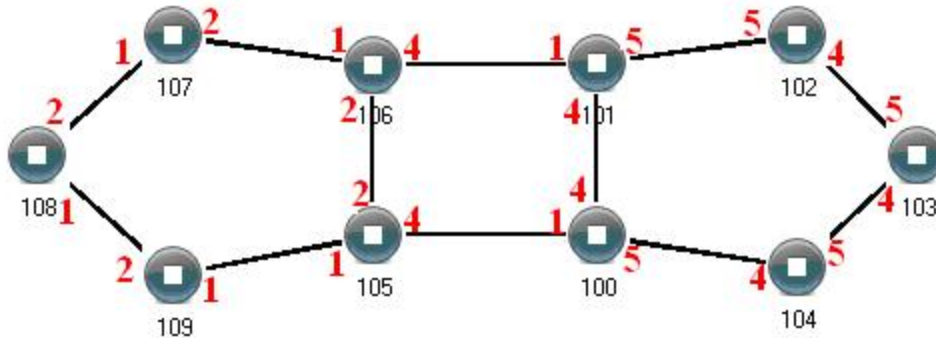
**Step 4** Adopt network cable to connect the ring group 2;

**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:



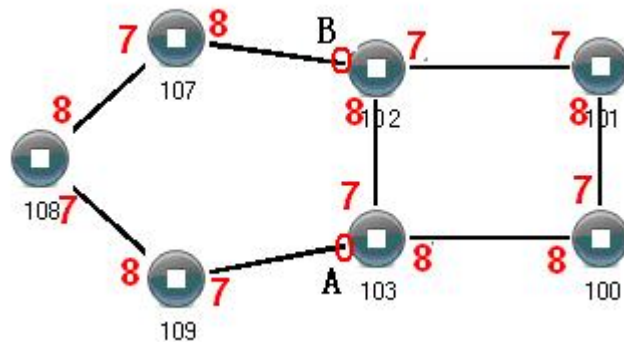
#### Operation method:

- 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 devices, chain combination is complete.



#### Note

1. 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;
2. Network identification in the same single ring must be consistent, otherwise it cannot form a normal ring or normal communicate;
3. Network identification in different ring must be different;
4. 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

IP host applies for joining (or leaving) multicast group to nearby routers through the Internet Group Management Protocol (IGMP). IGMP Snooping is a multicast suppression mechanism that manages and controls multicast group by listening and analyzing IGMP messages exchanged between host and multicast devices.

The working process of IGMP Snooping: The switch snoops the messages between user host and router, as well as tracking multicast information and the ports that have been applied for. When the switch intercepts the IGMP Report (request) sent by the host toward router, the switch adds the port to multicast forwarding table. When the switch intercepts the IGMP Leave message sent by the host, the router sends a Group-Specific Query message of the port. If other hosts need the multicast, they will respond with the IGMP Report message. If the router can't receive any response from the host, the switch deletes the port from the multicast forwarding table. The router sends IGMP Query message periodically. When switch receives IGMP Query message, it would delete this port from multicast table if it doesn't receive IGMP Report message from the host in a given period time.

### 5.6.1 Global Configuration

#### Function Description

On the "Global Config" page, user can enable/disable IGMP and configure the dispatch address.

#### Operation Path

Open in order: "Main Menu > Layer 2 Config > IGMP-snooping > Global Config".

#### Interface Description

Global configuration interface is as follows:

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

- Navigation tabs: Global configuration (selected), Interface Configuration, Routing Interface Configuration, Routing Interface Information.
- Configuration options:
  - Enable IGMP-Snooping:
  - Permanent Group:
  - Set button
- Table with columns: VLAN ID, Group Members, Port list.
- Page navigation: Total item 0, Total page 0, Current page < 1 >

The main element configuration description of global configuration interface:

Interface Element	Description
Enable IGMP-snooping	Enable IGMP-snooping configuration checkbox.
Permanent group	Multicast resident checkbox. Configure multicast resident by checking the box. Multicast will not age
VLAN ID	Port number VLAN ID number.
Group Members	Multicast IP address.
Port list	The corresponding port name of the device Ethernet port.

## 5.6.2 Interface Configuration

### Function Description

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

### Operation Path

Open in order: "Main Menu > Layer 2 Config > IGMP-snooping > Interface Config".

### 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	Queryer does not elect	Startup query count	Startup query interval	Query interval	Max response time	Last member query interval	Last member query count	Operation
Total item 0 Total page 0 Current page < 1 >												

The main element configuration description of interface configuration interface:

Interface Element	Description
VLAN ID	VLAN ID number. Its value range is 1-4094.
Fast Leave	Fast Leave checkbox. Port fast leave means that when the switch receives the IGMP leaving a multicast group message sent by the host from a port, the port is directly deleted from the list of outgoing ports of the corresponding forwarding item.
Querier	IGMP Querier checkbox, the device can join in IGMP Querier

Interface Element	Description
	election. It would send query message and receive report message of the member to maintain the relationship of multicast group member.
Startup query number	Configure the startup query times of IGMP querier, with a value range of 2-10
Startup query interval	Configure the startup query interval of IGMP querier, with the value range of 1-1800 s.
Query interval	Configure the time interval for sending IGMP universal group inquiry message, with the value range of 1-1800 s. Note: The query interval of universal group must be greater than the maximum response of universal group.
Max response time	Configure the maximum response time of IGMP universal group query message, with the value range of 1-240 s.
Last member query interval	Configure the time interval for sending IGMP specific group inquiry message, with the value range of 1000-25500ms.
Last member query count	Configure the number of IGMP specific group inquiry messages sent. The value range is 2-7

### 5.6.3 Routing Port Configuration

#### Function Description

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

#### Operation Path

Open in order: "Main Menu > Layer 2 Config > IGMP Snooping > Routing Port Configuration".

#### Interface Description

Routing port configuration interface is as below:

IGMP-Snooping Configuration > Global configuration > Interface Configuration > Routing Interface Configuration > Routing Interface Information

+ Add    Delete

VLAN ID	Port list	Operation
Total item 0    Total page 0    Current page < 1 >		

Main elements configuration description of routing port configuration interface:

Interface Element	Description
VLAN ID	VLAN ID number. Its value range is 1-4094.
Port list	Display port list, select device port as the static router port that connects router.
Add	Click the "add" button to configure the parameters of the routing port

## 5.6.4 Routing port information

### Function Description

On the "Routing Port Information" page, users can configure multicast router ports.

### Operation Path

Open in order: "Main Menu > Layer 2 Config > IGMP Snooping > Routing Port Configuration".

### Interface Description

Routing port 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 >					

Configuration description of main elements of routing port information interface:

Interface Element	Description
VLAN ID	VLAN ID number. Its value range is 1-4094.
Port list	Display port list, select device port as the static router port that connects router.
Start time	Display the startup time of the querier where the routing port is located
Aging time	Display the aging time of the querier where the routing port is located
Type	According to the type of routing port status, valid values are: <ul style="list-style-type: none"> <li>Secure</li> <li>Dynamic</li> </ul>

## 5.7 Port Loopback Detection

The function of loop detection is to detect whether loop exists in external network of single port of switch. If it does, it would lead to address learning errors and broadcast storm easily, even switch and network breakdown in severe case. The influence created by port loop could be effectively eradicated when enabling port protocol and closing port with loop.

### 5.7.1 Global Configuration

#### Function Description

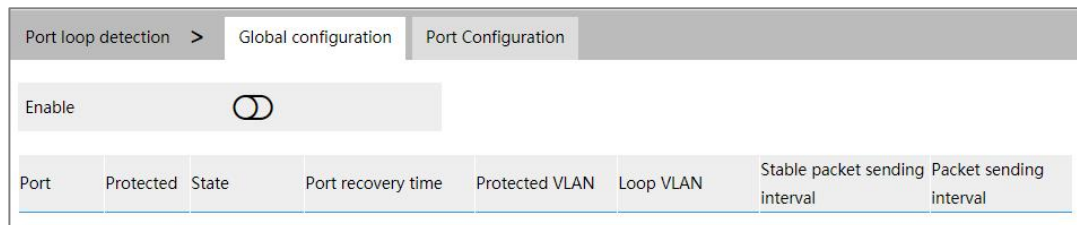
On the "Global config" page, user can enable loop-detect configuration.

#### Operation Path

Open in order: "Main Menu > Layer 2 Config > Port Loop-detect > Global Config".

#### Interface Description

Global configuration interface is as follows:



The main element configuration description of global configuration interface:

Interface Element	Description
Enable	The checkbox of enabling loop detection. User can implement relevant configuration on the page of loop detection port configuration after checking the box

## 5.7.2 Port Configuration

### Function Description

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

### Operation Path

Open in order: "Main Menu > Layer 2 Config > Port Loop-detect > Port Config".

### Interface Description

Check port configuration interface as below:

Port loop detection >		Global configuration	Port Configuration						
<input type="checkbox"/> Config									
<input type="checkbox"/>	Port	Protected	State	Port recovery time	Protected VLAN	Loop VLAN	Stable packet sending interval	Packet sending interval	
<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	
<input type="checkbox"/>	ge5	No	Down	300	-	-	10	1	
<input type="checkbox"/>	ge6	No	Down	300	-	-	10	1	
<input type="checkbox"/>	ge7	No	Down	300	-	-	10	1	
<input type="checkbox"/>	ge8	No	Down	300	-	-	10	1	
<input type="checkbox"/>	ge9	No	Down	300	-	-	10	1	
<input type="checkbox"/>	ge10	No	Down	300	-	-	10	1	
<input type="checkbox"/>	ge11	No	Down	300	-	-	10	1	
<input type="checkbox"/>	ge12	No	Down	300	-	-	10	1	
<input type="checkbox"/>	ge13	No	Down	300	-	-	10	1	
<input type="checkbox"/>	ge14	No	Down	300	-	-	10	1	
<input type="checkbox"/>	ge15	No	Down	300	-	-	10	1	
<input type="checkbox"/>	ge16	No	Down	300	-	-	10	1	
<input type="checkbox"/>	ge17	No	Down	300	-	-	10	1	
<input type="checkbox"/>	ge18	No	Down	300	-	-	10	1	
<input type="checkbox"/>	ae19	No	Down	300	-	-	10	1	

The main element configuration description of port configuration interface:

Interface Element	Description
Radiobox	Check the box to enable the loop detection configuration of this port
Port	The corresponding port number of Ethernet port
Protected	Whether it is protected by loop, the values are: <ul style="list-style-type: none"> <li>No;</li> <li>Yes</li> </ul>
State	The status of this port, displayed items 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>

Interface Element	Description
Port recovery time	The resume time after the action of detecting loop, value range: 10-300, its unit is second.
Protected VLAN	The VLAN ID of loop protection. It is 1 by default. The value range: 1-4094, the number of VLAN ID is $\leq 5$
Loop VLAN	The detected and learned VLAN ID
Stable packet sending interval	Outward packet sending interval after the port is UP and stable
Packet sending interval	The interval time of loop detection data packet sending, value range: 10-300, its unit is second.

# 6 Layer 3 Configuration

## 6.1 Interface Configuration

Interface configuration mainly refers to setting the device interface IPV4 address. The interface configuration only supports manual configuration and 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	-
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

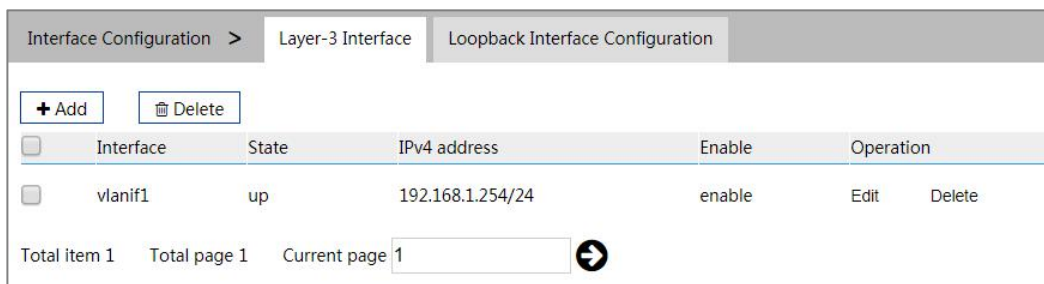
On the "Interface Configuration" page, user can configure the Layer 3 interface IP address.

### Operation Path

Open in order: "L3 Configuration > Interface Configuration > L3 Interface".

### Interface Description

L3 interface configuration interface as follows:



The main element configuration description of interface configuration interface:

Interface Element	Description
Interface	Layer 3 interface names, such as, vlanif1, value range: vlanif1-vlanif4094.
Status	Interface state information, options: <ul style="list-style-type: none"> <li>Up;</li> <li>Down.</li> </ul>
IPv4 address	IPv4 address and subnet mask, such as 192.168.1.1/24.
Interface switch	Interface switch options as follows: enable; disable.
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.

## 6.1.2 Loopback Interface

Loopback interface is virtual interface, and most of the platforms support using it to simulate real interface. This interface is in virtual forever UP state, which is more stable than any other physical interface. As long as the router starts, the loopback interface would be in an active state. If there are multiple routes that arrive at this loopback address, they would not be unreachable when one of the interface of the device is down. It only be invalid when the router no longer has effect.

### Function Description

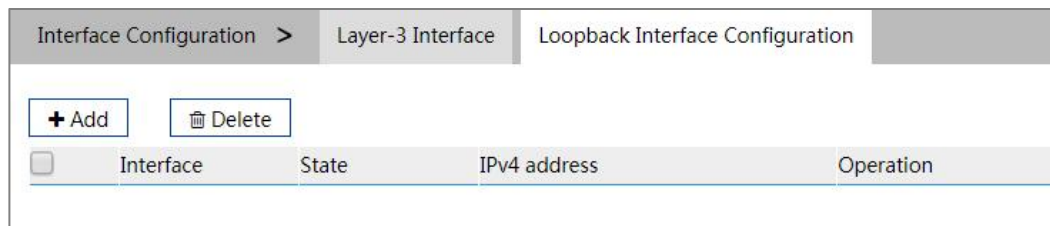
On the "Loopback Interface" page, user can configure the parameter of loopback interface.

### Operation Path

Open in order: "L3 forward Config > Interface Config > Loopback Interface".

### Interface Description

Loopback interface configuration interface as follows:



The main element configuration description of loopback interface:

Interface Element	Description
Interface	The name of loopback interface, value range: loopback0 or loopback1.
Status	Loopback interface state information, options are: <ul style="list-style-type: none"> <li>Up;</li> <li>Down.</li> </ul>
IPv4 address	IPv4 address and subnet mask, such as 10.1.1.0/24.
Operation	Click the "Edit" button to set the interface and IPv4 address. Click "Delete" under "operation" to delete the relevant loop back interface directly.
Add	Click "add" button to add the configuration of loopback interface.
Delete	Check the radio box of loopback interface entry, click "delete" button to delete loopback 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 Show ARP

#### Function Description

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

#### Operation Path

Open in order: "L3 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	
192.168.1.2	aa22.660d.6468	vlanif1	dynamic	460	ge24	To Static	
192.168.1.116	aa22.660d.6468	vlanif1	dynamic	640	ge24	To Static	
Total item 2		Total page 1	Current page 1	➔			

The main element configuration description of ARP information interface:

Interface Element	Description
Dest IP	Destination IP address of accessing device.
Dest 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.

## 6.2.2 Static ARP

### Function Description

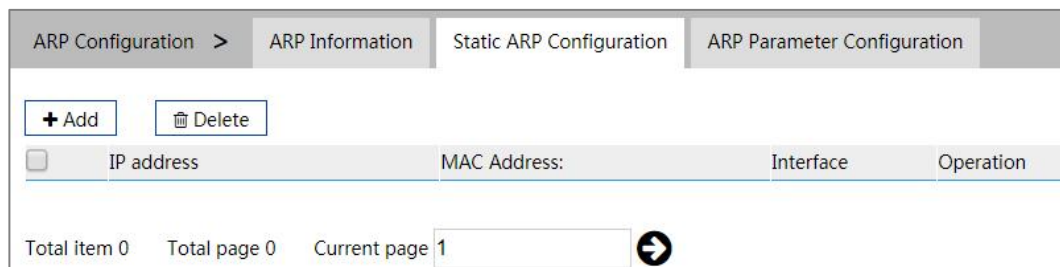
On the "Static ARP" page, user can conduct static ARP configuration.

### Operation Path

Open in order: "L3 forward Configuration > ARP Configuration > Static ARP".

### Interface Description

Static ARP interface as follows:



The main element configuration description of static ARP interface:

Interface Element	Description
IP address	IP address of accessing device, such as 192.168.1.1.
MAC address	MAC address of accessing 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: "L3 Configuration > ARP Configuration > ARP Parameters Configuration".

## Interface Description

ARP parameter configuration interface as follows:

Interface	Aging time
<input type="checkbox"/> vlanif1	1200

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

Interface Element	Description
Interface	Interface Name.
Aging time	Ageing time display.
Config	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

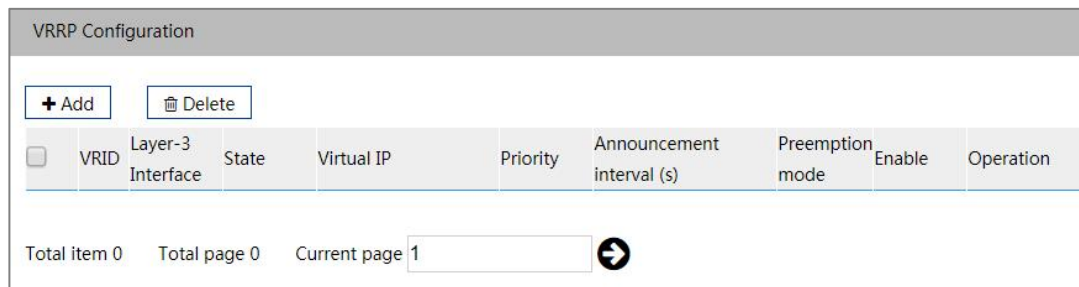
On the "VRRP Configuration" page, user can configure VRRP parameters.

### Operation Path

Open in order: "L3 Configuration > VRRP Configuration".

### Interface Description

VRRP configuration interface as follow:



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.
Priority	Priority defaults to 100, valid range is 1-254.
Announcement interval (second)	Annunciate time interval, unit: second, default: 1s, valid range is 1-10 seconds.
Preemption mode	Preemption mode, options as follows: <ul style="list-style-type: none"> <li>• false;</li> </ul>

Interface Element	Description
	<ul style="list-style-type: none"> <li>true.</li> </ul>
Enable switch	Enable switch, options are as follows: <ul style="list-style-type: none"> <li>Enable;</li> <li>Disable;</li> </ul>

## 6.4 IGMP Configuration

### 6.4.1 Interface Configuration

#### Function Description

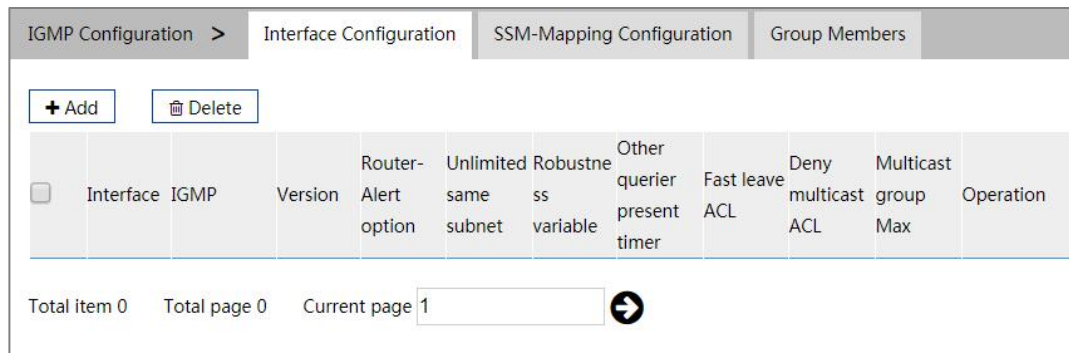
On the interface configuration page, user can add or delete IGMP configuration of Ethernet ports.

#### Operation Path

Open in order: "L3 forward Config > IGMP Config > Interface Config".

#### Interface Description

Interface configuration interface as follows:



The main element configuration description of interface configuration interface:

Interface Element	Description
Add	Add an IGMP entry.
Delete	Delete an IGMP entry.
Interface	Ethernet port number.
IGMP	IGMP status: <ul style="list-style-type: none"> <li>- enable;</li> <li>- disable.</li> </ul>

Interface Element	Description
Version	IGMP version, options are: -1: IGMPv1, which defines the basic inquiry and reporting process of group members; -2: IGMPv2, adding the mechanism of querier polling and group member leaving on IGMPv1; -3: IGMPv3. Members are added to IGMPv2 to specify whether to receive or not to receive
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	When this function is enabled, it will not limit whether the source address and receiving interface of the message are in the same subnet, and the default is off
Robustness variable	Specify the robustness of the IGMP query, ranging from 2 to 7. This coefficient is used to specify the default number of times the IGMP query sends the universal group query message at startup and the number of times the IGMP query sends the specific group query message after receiving the outgoing group message.
Other inquiry present timer	Timer time of non-inquirer. - Before the timer expires, if the inquiry message from the inquirer is received, reset the timer; - Otherwise, the original inquirer is considered invalid, and a new inquirer election process is initiated.

Interface Element	Description
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 multicasts supported.
Operation: edit	Modify IGMP entries.
Operation: delete	Delete the current IGMP entry.

## 6.4.2 SSM-Map configuration

SSM(Source-Specific Multicast) requires routers to know the multicast source designated by member hosts when they join the multicast group. If IGMPv3 is running on the member host, the multicast source address can be directly specified in the IGMPv3 report message. However, in some cases, member hosts can only run IGMPv1 or IGMPv2. In order to enable them to use SSM services, the router needs to provide IGMP SSM Mapping function.

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. It can be enabled after being checked on this page.

### Function Description

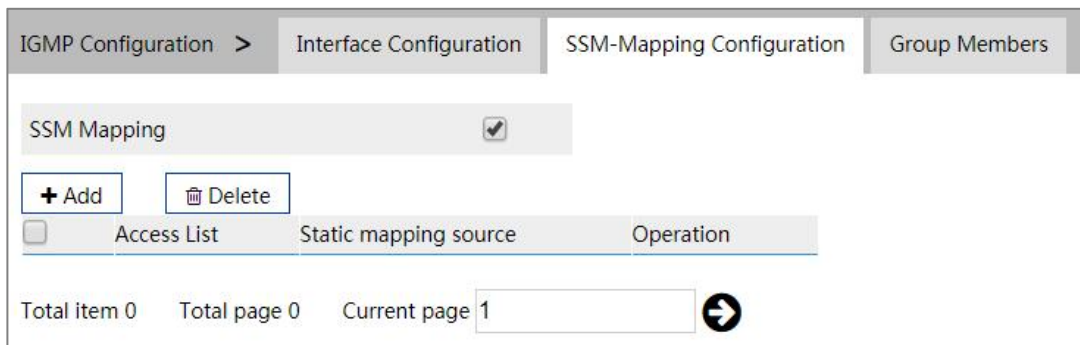
On the SSM-Map configuration page, you can configure SSM-Map.

### Operation Path

Open in order: "L3 Configuration > 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
Add	Add a SSM-Map configuration rule.
Delete	Delete a SSM-Map configuration rule.
Access List	Access list.
Static mapping source	The specified multicast source address in the access list.

## 6.4.3 Multicast Group Information

### Function Description

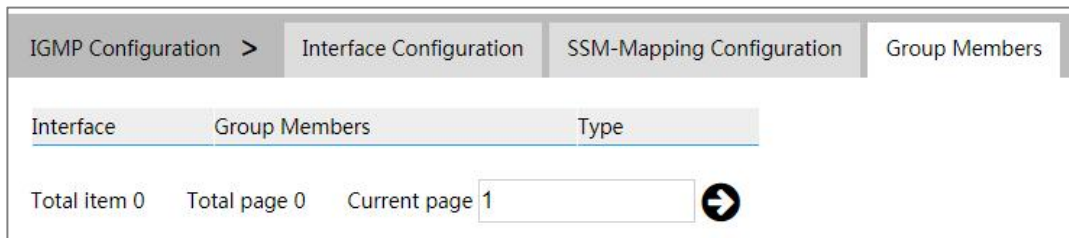
On the "Multicast Group Information" page, display the multicast information received by the device interface.

### Operation Path

Open in order: "L3 Configuration > IGMP Configuration > Multicast Group Information".

### Interface Description

The multicast group information interface is as follows:



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: -dynamic -static

## 6.5 PIM-SM Configuration

### PIM Introduction

PIM is protocol independent multicast. Protocol-independent here means that it is independent of unicast routing protocol, that is, PIM does not need to maintain special unicast routing information. As a multicast routing solution, it directly uses the routing information of unicast routing table to perform RPF(Reverse Path Forwarding) check on multicast messages, and creates multicast routing table entries after passing the check, thus forwarding multicast messages.

At present, PIM protocols actually supported by device include:

- PIM-DM(PIM-Dense Mode) Protocol Independent Multicast-Dense Mode
- PIM-SM(PIM-Sparse Mode) Protocol Independent Multicast-Sparse Mode.

## PIM-SM

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 switching
- Assertion

## 6.5.1 Global Configuration

### Function Description

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

### Operation Path

Open in order: "L3 Configuration > PIM-SM Configuration > Global Configuration".

## Interface Description

Global configuration interface is as follows:

The screenshot shows the 'Global configuration' tab of the PIM-SM Configuration interface. It includes several configuration options:

- Ignore CRP priority:
- RP reachability check:
- SPT switch:
- Join/Prune interval: 60 (range: 1 - 65535 s)
- Registration suppression time: 60 (range: 1 - 65535 s)
- KAT aging: 185 (range: 1 - 65535 s)
- Deny register source ACL: [text input] (range: 100 - 199 | 2000 - 2699 | name)
- C-BSR: [dropdown menu]
- Message rate: [text input] (range: 1 - 65535)
- Register message interface/IP: [dropdown menu]

A 'Set' button is located at the bottom of the configuration area.

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 switching	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.
Add/prune interval	Time interval for PIM router to send join/pruning messages. Note: By default, the join/pruning 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 is 1 ~ 65535, and the unit is 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 detection time (the default is 5 seconds).
Illegal message ACL	Configure illegal neighbor source address range. Note: By default, there are no restrictions on the neighbor source

Interface Element	Description
	addresses that an interface can learn from.
C-BSR	C-BSR(Candidate-BSR), the priority of C-BSR, the value range is 0 ~ 255. Note: The higher the value, the higher the priority.
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.
Settings	Global configuration takes effect after clicking "Apply".

## 6.5.2 Static RP Configuration

### Function Description

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

### Operation Path

Open in order: "L3 Configuration > PIM-SM Configuration > Static RP Configuration".

### Interface Description

Static RP configuration interface is as follows:

Main element configuration description of static RP configuration interface:

Interface Element	Description
Add	Add a static RP entry.
Delete	Delete the checked static RP entry.
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.

## 6.5.3 C-RP Configuration of Interface

### Function Description

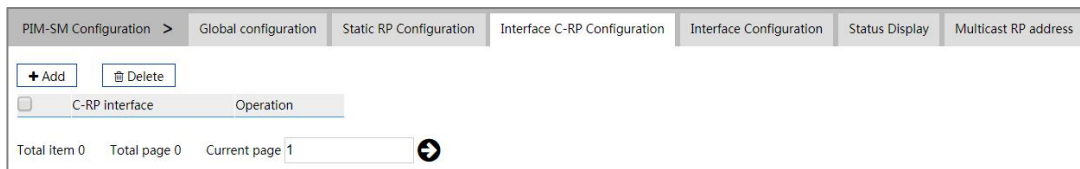
On the interface C-RP configuration page, you can add or delete C-RP interfaces.

### Operation Path

Open in order: "L3 Configuration > PIM-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
Add	Add candidate convergence point entry.
Delete	Delete the checked candidate convergence point entry.
C-RP interface	To configure the C-RP interface: -vlanif: vlanif interface; - loopback: loopback interface.
Operation: delete	Delete the candidate convergence point entry in the current line.

## 6.5.4 Interface Configuration

### Function Description

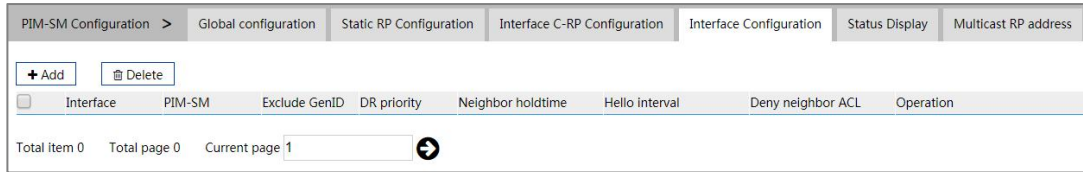
On the Interface Configuration page, you can configure the interface.

### Operation Path

Open in order: "L3 Configuration > PIM-SM Configuration > Interface Configuration".

### Interface Description

Interface configuration interface as follows:



The main element configuration description of interface configuration interface:

Interface Element	Description
Add	Add interface configuration items.
Delete	Delete the checked interface configuration item.
Interface	Configure interface: -vlanif: vlanif interface; - loopback: loopback interface.
PIM-SM	PIN-SM status. - enable; - disable.
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, device 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 hold time	Specify the time to keep PIM neighbor reachable, the value range is 1 ~ 65535, and the unit is seconds. Note: If specify 65535 seconds, the PIM neighbors are 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.

## 6.5.5 Status Display

### Function Description

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

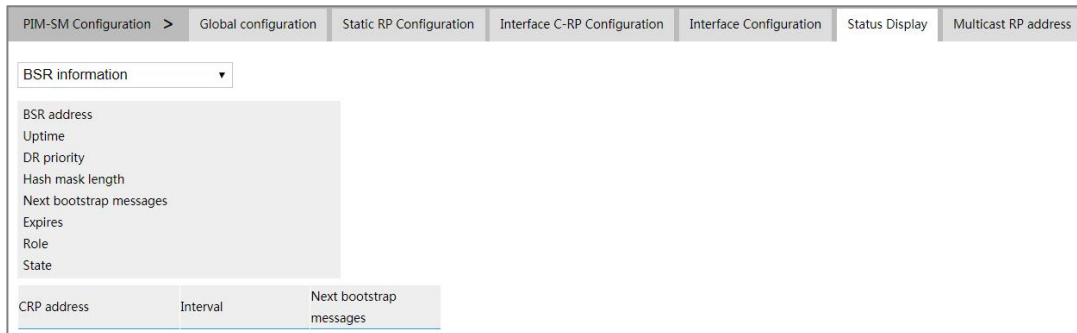
- BSR information
- Interface information
- Local multicast
- Multicast routing table
- Neighbor
- Next hop information
- RP-Set information

### Operation Path

Open in order: "L3 Configuration > PIM-SM Configuration > Status Display".

### Interface Description

The status display interface is as follows:



Main element configuration description of status display interface:

Interface Element	Description
Drop - down box	Parameter configuration of PIM multicast includes: <ul style="list-style-type: none"> <li>• BSR information</li> <li>• Interface information</li> <li>• Local multicast</li> <li>• Multicast routing table</li> <li>• Neighbor</li> <li>• Next hop information</li> <li>• RP-Set information</li> </ul>

## 6.5.6 Multicast RP Address

### Function Description

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

### Operation Path

Open in order: "L3 Configuration > PIM-SM Configuration > 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.
RP address	RP address.
Source Address	Source Address.

## 6.6 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

## 6.6.1 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 "L3 Configuration > PIM-DM Configuration > Global Configuration".

### Interface Description

Global configuration interface is as follows:

The screenshot shows a configuration page for PIM-DM. At the top, there are four tabs: 'PIM-DM Configuration >', 'Global configuration', 'Interface Configuration', and 'Status Display'. The 'Global configuration' tab is active. Below the tabs, there is a configuration area with a 'State Refresh' checkbox checked. Underneath, there are two input fields: 'Send status refresh interval' with the value '60' and a range '1 - 100 s', and 'Receive status refresh interval' with the value '30' and a range '1 - 100 s'. A 'Set' button is located at the bottom of the configuration area.

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.
Settings	Global configuration takes effect after clicking Apply.

## 6.6.2 Interface Configuration

### Function Description

On the Interface Configuration page, user can configure the interface.

### Operation Path

Open in order: "L3 Configuration > PIM-DM Configuration > Interface Configuration".

### Interface Description

Interface configuration interface as follows:

The main element configuration description of interface configuration interface:

Interface Element	Description
Add	Add interface configuration items.
Delete	Delete the checked interface configuration item.
Interface	Configure interface: -vlanif: vlanif interface; - loopback: loopback interface.
Operation: delete	Delete the candidate convergence point entry in the current line.
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, device 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 specify 65535 seconds, the PIM neighbors are always reachable.
Hello interval	Time period for sending Hello messages between PIM

Interface Element	Description
	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.

### 6.6.3 Status Display

#### Function Description

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

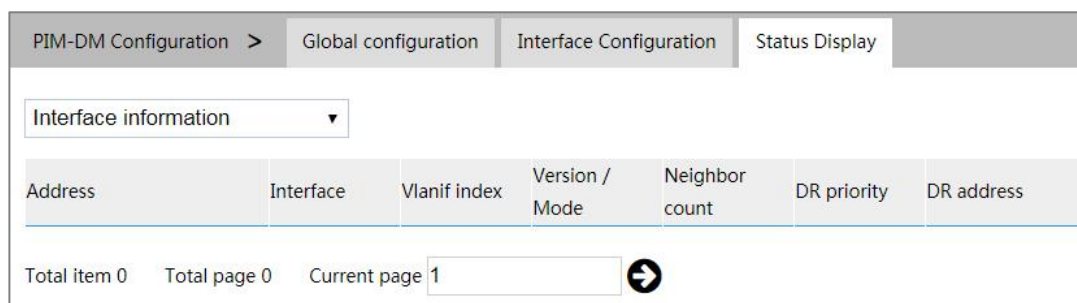
- Interface information
- Local multicast
- Multicast routing table
- Neighbor
- Next hop information

#### Operation Path

Open in order: "L3 Configuration > PIM-SM Configuration > Status Display".

#### Interface Description

The status display interface is as follows:



Main element configuration description of status display interface:

Interface Element	Description
Drop - down box	Parameter configuration of PIM multicast includes: <ul style="list-style-type: none"> <li>• Interface information</li> <li>• Local multicast</li> <li>• Multicast routing table</li> <li>• Neighbor</li> </ul>

---

Interface Element	Description
	<ul style="list-style-type: none"><li data-bbox="651 277 954 309">• Next hop information</li></ul>

# 7 Router Configuration

## 7.1 IPv4 Configuration

## 7.2 IPv4 Routing Table

### Function Description


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

### Operation Path

Open in order: "Main Menu > IPv4 Configuration > 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	
Total item 2	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: K - kernel route; C - connected; S – static; R – RIP; O – OSPF; I - IS-IS; B – BGP; A – Babel; > - selected route; * - FIB

Interface Element	Description
	route.
Next hop	Gateway address information of next hop.
Outgoing port	Interface Name.

### 7.3 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

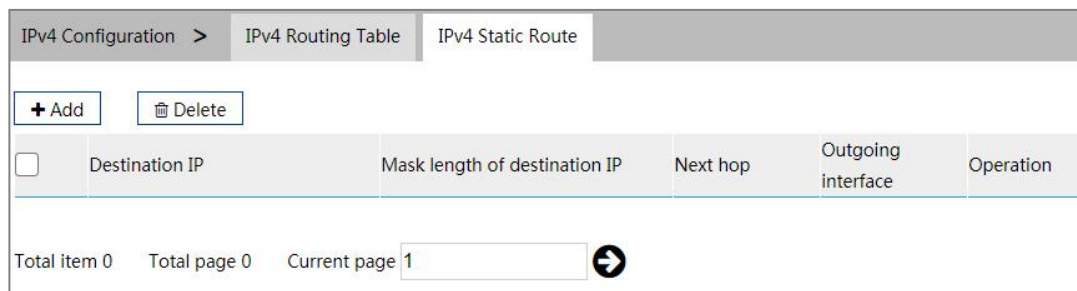
On the "IPv4 Static Route" page, user can configure static route.

#### Operation Path

Open in order: "Route Configuration > IPv4 Configuration > 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 destination address is 10.1.1.0.
mask length of destination IP	Destination IP mask length. Value range is 0-32.

Interface Element	Description
Next hop	The gateway address of the next hop, format: no input or 192.3.3.3
Outgoing port	Interface Name

## 7.4 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.

### 7.4.1 RIP Global Configuration

#### Function Description

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

#### Operation Path

Open in order: "Route Configuration > RIP Configuration > RIP Global Configuration".

#### Interface Description

RIP global configuration interface as follows:

The main element configuration description of RIP global configuration interface:

Interface Element	Description
Enable	Enable RIP function check box. After checking, the RIP related parameter configuration will appear.
RIP version	RIP version drop-down list, the default version is RIP-2, the options of version are as follows: <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> Note: Interface can only send/receive data packets of the RIP version configured.
Assign default route	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: <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

Interface Element	Description
	120, the value range is 1-255. When there are routes from two different routing protocols to the same destination, the 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 routing.</li> <li>• ospf: OSPF routing.</li> </ul>
Set	Click the "Set" button to save and validate the configuration of RIP related parameters.

## 7.4.2 RIP Network Setting

### Function Description

On the "RIP network setting" page, user can configure RIP IP address.

### Operation Path

Open in order: "Route Config > RIP Config > RIP Network Setting".

## Interface Description

RIP network setting interface as follows:

The main element configuration description of RIP network setting 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.

## 7.4.3 RIP Interface Configuration

### Function Description

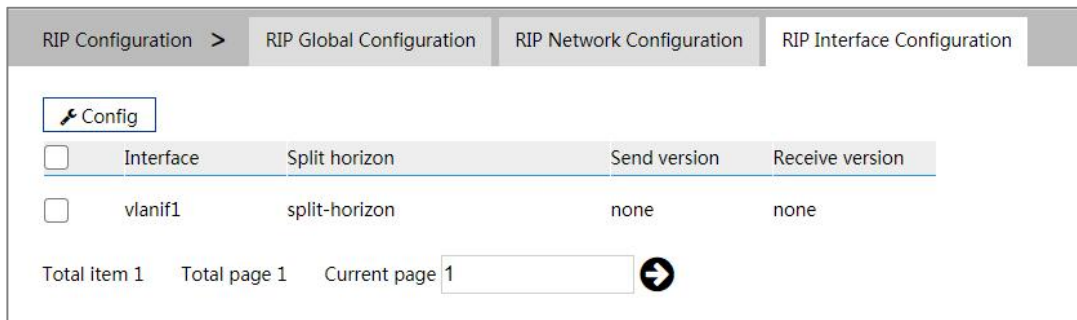
On the "RIP Interface Configuration" page, user can conduct RIP network parameter configuration.

### Operation Path

Open in order: "Route Configuration > 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	RIP interface information
Split horizon	Horizontal partition. Options are as follows: <ul style="list-style-type: none"> <li>• None;</li> <li>• Split-horizon;</li> <li>• Poison-reverse.</li> </ul> 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.
Send version	RIP protocol version of sending data, options as follows: <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	RIP protocol version of receiving data, options as follows: <ul style="list-style-type: none"> <li>• None;</li> <li>• 1;</li> <li>• 2;</li> <li>• 1 and 2.</li> </ul>
Auth type	Authentication type, options as follows: <ul style="list-style-type: none"> <li>• No auth;</li> <li>• Simple;</li> <li>• MD5.</li> </ul>

# 8 Advanced Configuration

## 8.1 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.

### 8.1.1 DHCP Switch

#### Function Description

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

#### Operation Path

Open in order: "Advanced Configuration > DHCP 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.

## 8.1.2 DHCP 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-side 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. Same level address pool order 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

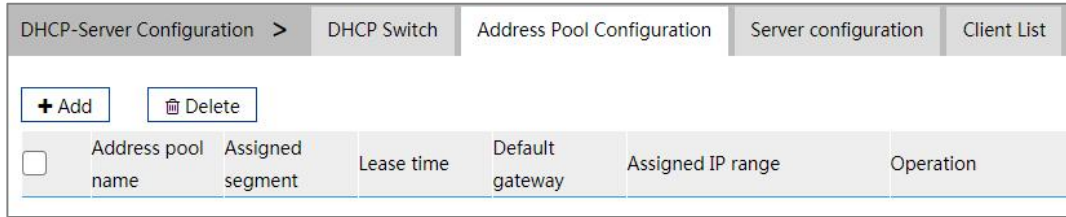
On the "DHCP Pool Config" page, user can add, delete the address pool and look over the configuration information of address pool.

### Operation Path

Open in order: "Advanced Configuration > DHCP Configuration > 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-side, 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 0-60m which are separated by space. Notes: 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
Assigned 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.

### 8.1.3 Server Configuration

#### Function Description

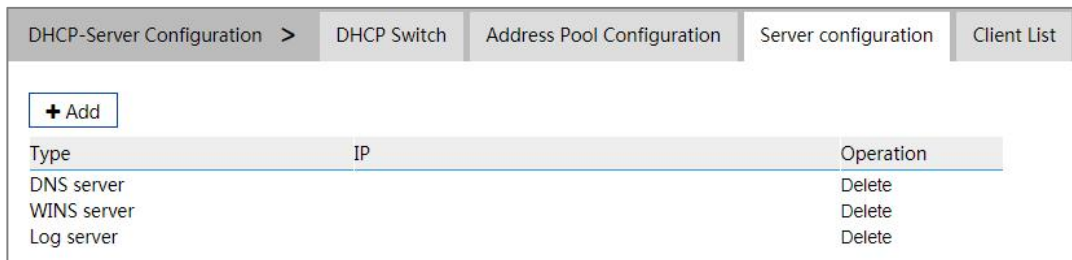
On the "Address Pool Server Config" page, user can add, delete DNS/WINS/Log Server Address Pool.

### Operation Path

Open in order: "Advanced Configuration > DHCP 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.

## 8.1.4 Client List

### Function Description


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

### Operation Path

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

## Interface Description

Client list interface as follows:

IP address	MAC Address:	Start time	End time	Remaining time
Total item 0    Total page 0    Current page 1 <input type="text" value="1"/> 				

The main element configuration description of client list interface:

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

## 8.2 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).

## **8.2.1 Global Configuration**

### **Function Description**

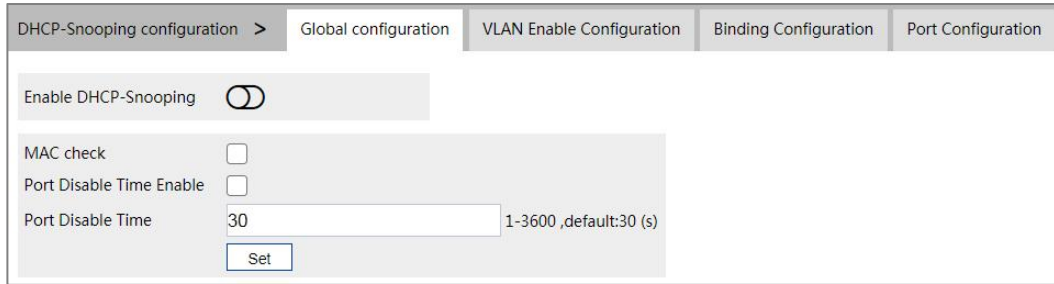
On the "Global Config" page, user can configure DHCP-Snooping parameters information.

### **Operation Path**

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

### **Interface Description**

Global configuration interface is as follows:



The main element configuration description of global configuration interface:

Interface Element	Description
Enable DHCP-snooping	Check to enable DHCP-Snooping function.
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.

## 8.2.2 Vlan Enable Configuration

### Function Description

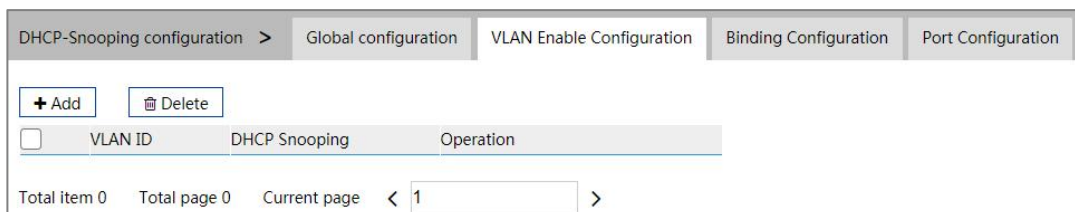
On the Global Configuration page, Vlan enabling configuration can be performed.

### 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
Add	Add VLAN enable entry.
Delete	Delete the checked entry.
VLAN ID	The VLAN number.
DHCP Snooping	Enable status of DHCP Snooping. <ul style="list-style-type: none"> <li>• Disable</li> <li>• enable</li> </ul>
Operation: delete	Delete the current VLAN enable entry

## 8.2.3 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:

The screenshot shows the 'Binding Configuration' interface. At the top, there are navigation tabs: 'DHCP-Snooping configuration >', 'Global configuration', 'VLAN Enable Configuration', 'Binding Configuration', and 'Port Configuration'. Below the tabs are two buttons: '+ Add' and 'Delete'. A table header is visible with columns: 'VLAN ID', 'Port', 'IP', 'MAC', 'Type', 'Aging Time', and 'Operating'. At the bottom, there is a pagination bar showing 'Total item 0', 'Total page 0', 'Current page < 1 >'.

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.

Interface Element	Description
Operation: edit	Modify the port binding information.
Operation: delete	Delete the port binding configuration of the current row.

## 8.2.4 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

Port configuration interface as follows:

DHCP-Snooping configuration >											
Global configuration			VLAN Enable Configuration			Binding Configuration			Port Configuration		
✎ Config											
	Port	Trus Enable	Message Rate	Option 82 Check	Option 82 Strategy	Circuit Type	Circuit ID	remote Type	Remote ID	Subscriber Type	Subscriber ID
<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	-	-	-	-	-	-	-
<input type="checkbox"/>	ge5	disable	1000	disable	-	-	-	-	-	-	-
<input type="checkbox"/>	ge6	disable	1000	disable	-	-	-	-	-	-	-
<input type="checkbox"/>	ge7	disable	1000	disable	-	-	-	-	-	-	-
<input type="checkbox"/>	ge8	disable	1000	disable	-	-	-	-	-	-	-
<input type="checkbox"/>	ge9	disable	1000	disable	-	-	-	-	-	-	-
<input type="checkbox"/>	ge10	disable	1000	disable	-	-	-	-	-	-	-
<input type="checkbox"/>	ge11	disable	1000	disable	-	-	-	-	-	-	-
<input type="checkbox"/>	ge12	disable	1000	disable	-	-	-	-	-	-	-
<input type="checkbox"/>	ge13	disable	1000	disable	-	-	-	-	-	-	-
<input type="checkbox"/>	ge14	disable	1000	disable	-	-	-	-	-	-	-
<input type="checkbox"/>	ge15	disable	1000	disable	-	-	-	-	-	-	-
<input type="checkbox"/>	ge16	disable	1000	disable	-	-	-	-	-	-	-
<input type="checkbox"/>	ge17	disable	1000	disable	-	-	-	-	-	-	-
<input type="checkbox"/>	ge18	disable	1000	disable	-	-	-	-	-	-	-

The main element configuration description of port configuration interface:

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

Interface Element	Description
	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>
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: -Input length is limited between 2 and 64; -When Hex is selected, the input content is a combination of uppercase and lowercase letters and numbers. -When ASCII is selected, the content is not limited.
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: -Input length is limited between 2 and 64; -When Hex is selected, the input content is a combination of uppercase and lowercase letters and numbers. -When ASCII is selected, the content is not limited.
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: -Input length is limited between 2 and 64;

Interface Element	Description
	-When Hex is selected, the input content is a combination of uppercase and lowercase letters and numbers. -When ASCII is selected, the content is not limited.

## 8.3DHCP-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	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.
Server IP	IP address information of proxy server
Operation: "Edit"	Click "edit" button to set the parameters of the switch and option82.

Interface Element	Description
Clear configuration	Check Relay interface configuration entry, click “clear configuration” to delete Relay interface configuration.

## 8.4 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.

### 8.4.1 Global Configuration

#### Function Description

On the "Global Config" page, user can configure LLDP relative parameters.

#### Operation Path

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

#### Interface Description

Global configuration interface is as follows:

The screenshot shows the LLDP Configuration interface with the following elements:

- Navigation tabs: LLDP Configuration > Current Configuration | Port Configuration | Neighbor Information
- Enable:
- Transmission period:  Range:5-300,Unit: s,Default:30
- Set:

The main element configuration description of global configuration interface:

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

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.
Set	Click "Set" button to operate

## 8.4.2 Port Configuration

### Function Description


On the "Port Config" 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
 Config			
<input type="checkbox"/>	Local port	Port status	Management IP
<input type="checkbox"/>	ge1	txrx-enable	0.0.0.0
<input type="checkbox"/>	ge2	txrx-enable	0.0.0.0
<input type="checkbox"/>	ge3	txrx-enable	0.0.0.0
<input type="checkbox"/>	ge4	txrx-enable	0.0.0.0
<input type="checkbox"/>	ge5	txrx-enable	0.0.0.0
<input type="checkbox"/>	ge6	txrx-enable	0.0.0.0
<input type="checkbox"/>	ge7	txrx-enable	0.0.0.0
<input type="checkbox"/>	ge8	txrx-enable	0.0.0.0
<input type="checkbox"/>	ge9	txrx-enable	0.0.0.0
<input type="checkbox"/>	ge10	txrx-enable	0.0.0.0
<input type="checkbox"/>	ge11	txrx-enable	0.0.0.0
<input type="checkbox"/>	ge12	txrx-enable	0.0.0.0
<input type="checkbox"/>	ge13	txrx-enable	0.0.0.0
<input type="checkbox"/>	ge14	txrx-enable	0.0.0.0
<input type="checkbox"/>	ge15	txrx-enable	0.0.0.0
<input type="checkbox"/>	ge16	txrx-enable	0.0.0.0
<input type="checkbox"/>	ge17	txrx-enable	0.0.0.0
<input type="checkbox"/>	ge18	txrx-enable	0.0.0.0
<input type="checkbox"/>	ge19	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 state	<p>The 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> <li>txrx-enable: work mode is TxRx, it transmits LLDP message as well as receive it.</li> <li>Disable: work mode is Disable, it neither transmits nor receives LLDP message.</li> </ul> <p>Note: When global LLDP is enabled, the work mode of LLDP is TxRx by default.</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</li> </ul>

Interface Element	Description
	<p>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.</p> <ul style="list-style-type: none"> <li>The management address released by the port in the LLDP message defaults to the main IP address of the smallest VLAN of the VLANs this port is in. If the VLAN is not configured with a main IP address, it will be 0.0.0.0.</li> </ul>

### 8.4.3 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 > LLDP Neighbors".

#### 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
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.

## 8.5 NTP Configuration

### Function Description

On the NTP configuration page, user can select the time zone and set the IP address of the server.

### Operation Path

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

### Interface Description

The NTP configuration interface is as follows:

The screenshot shows the NTP Configuration interface. It features a title bar labeled "NTP Configuration". Below the title bar, there are two main configuration sections. The first section is for the "Time Zone", which includes a dropdown menu currently set to "UTC+8" and a "Set" button. The second section is for the "Server", which includes a text input field with a placeholder "eg: 192.168.1.1" and two buttons: "Set" and "Cancel".

Main element configuration description of NTP configuration interface:

Interface Element	Description
Timezone	<p>Time zone selection drop-down box, for example, UTC+8 means UTC+08:00, and time zone selection options are as follows:</p> <ul style="list-style-type: none"> <li>- UTC-12</li> <li>- UTC-11</li> <li>- UTC-10</li> <li>- UTC-9</li> <li>- UTC-8</li> <li>- UTC-7</li> <li>- UTC-6</li> <li>- UTC-5</li> <li>- UTC-4</li> <li>- UTC-3</li> </ul>

Interface Element	Description
	- UTC-2 - UTC-1 - UTC+0 - UTC+1 - UTC+2 - UTC+3 - UTC+4 - UTC+5 - UTC+6 - UTC+7 - UTC+8 - UTC+9 - UTC+10 - UTC+11 - UTC+12
Server	IP address information of the NTP server.

# 9 System Maintenance

---

## 9.1 Configuration File Management

### 9.1.1 Global Configuration

#### Function Description

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

#### Operation Path

Open in order: "System Management > Configuration File Settings > 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
!
username admin123 privilege 15 password admin123
!
ip domain-lookup
!
maximum-paths 4
spanning-tree disable
!
spanning-tree mst configuration
region Default
!
interface ge1
!
interface ge2
!
interface ge3
!
interface ge4
!
interface ge5
!
interface ge6
!
    
```

## 9.1.2 Configuration File Update

### Function Description

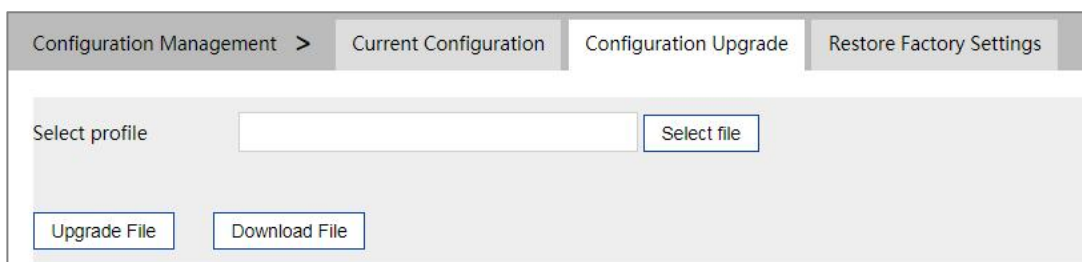
On the "Management File" page, user can download and upload configuration file.

### Operation Path

Open in order: "System Management > Configuration File Settings > Configuration File Upgrade".

### Interface Description

Configuration file 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.

## 9.1.3 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 management > Configure Management > Restore Factory Setting".

### Interface Description

Restore Factory Settings interface is as follows:



Main element configuration instructions in 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.

## 9.2 Alarm Configuration

User can configure power supply alarm and port alarm; when the equipment runs abnormally, it can promptly notify the administrator, and quickly repair the equipment to avoid excessive loss.

## 9.2.1 Port Alarm

### Function Description

On the “port alarm” page, user can configure the port alarm function.

### Operation Path

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

### Interface Description

Port alarm interface as below:

Alarm Configuration >			
Port		Power	
<input type="checkbox"/> Enable <input type="checkbox"/> Disable			
<input type="checkbox"/>	Port	State	Alarm switch
<input type="checkbox"/>	ge1	down	disable
<input type="checkbox"/>	ge2	down	disable
<input type="checkbox"/>	ge3	down	disable
<input type="checkbox"/>	ge4	down	disable
<input type="checkbox"/>	ge5	down	disable
<input type="checkbox"/>	ge6	down	disable
<input type="checkbox"/>	ge7	down	disable
<input type="checkbox"/>	ge8	down	disable
<input type="checkbox"/>	ge9	down	disable
<input type="checkbox"/>	ge10	down	disable
<input type="checkbox"/>	ge11	down	disable
<input type="checkbox"/>	ge12	down	disable
<input type="checkbox"/>	ge13	down	disable
<input type="checkbox"/>	ge14	down	disable
<input type="checkbox"/>	ge15	down	disable
<input type="checkbox"/>	ge16	down	disable
<input type="checkbox"/>	ge17	down	disable
<input type="checkbox"/>	ge18	down	disable
<input type="checkbox"/>	ge19	down	disable

The main element configuration description of port alarm 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>Not connected;</li> </ul>

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

## 9.2.2 Power Alarm

### Function Description

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

### Operation Path

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

### Interface Description

Power alarm interface as below:

Alarm Configuration >		Port	Power
<input type="button" value="Enable"/>	<input type="button" value="Disable"/>		
<input type="checkbox"/>	Power	State	Alarm switch
<input type="checkbox"/>	1	Absent	disable
<input type="checkbox"/>	2	Normal	disable

The main element configuration description of port 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> </ul>

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

## 9.3 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 management > 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.

## 9.4 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”.

### Interface Description

Log information interface as follow:

Main elements configuration description of log information interface:

Interface Element	Description
Store to Flash	Save to Flash enable switch, which is turned off by default
Send to Syslog server	IP address information of Syslog server
Clear log	Click the “clear log” button to clear the current log

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Interface Element	Description
	information record.
Download log	Click the "Download Log" button to download the log file locally

# The Second Part: Frequently Asked Questions

## 10 FAQ

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### 10.1 Sign in Problems

1. **Why the webpage displays abnormally when browsing the configuration via WEB?**

Before access the WEB, please eliminate IE cache buffer and cookies. Otherwise, the webpage 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 BlueEyes\_II 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.

## 10.2 Configuration Problem

1. **Why the bandwidth can't be increased after configure 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:

- Connected computer and switch ports keep invariant, change other network cable;
- Connected network cable and switch port keep invariant, change other computers;
- Connected network cable and computer keep invariant, 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.

## 10.3 Alarm Problem

1. **When the device alarms, except BlueEyes\_II software nether alarm information display area will display alarm information, is there any other way to notify technical staffs?**

When the device alarms, the computer buzzer for host monitoring will continue to

emit alarm sounds.

## 10.4 Indicator Problem

### 1. Power indicator isn't bright, what's the reason?

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. Link/Act indicator isn't bright, what's the reason?

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. Communication crashes after a period of time, that is, 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.