

Ethernet Switch (Managed Switch)

User's Manual



V1.0.0

Foreword

General

This manual introduces operations on web interface of the RTL switch (hereinafter referred to as "the switch"). You can visit the switch on web browser, configure and manage the switch.

Safety Instructions

The following categorized signal words with defined meaning might appear in the manual.

Signal Words	Meaning
 DANGER	Indicates a high potential hazard which, if not avoided, will result in death or serious injury.
 WARNING	Indicates a medium or low potential hazard which, if not avoided, could result in slight or moderate injury.
 CAUTION	Indicates a potential risk which, if not avoided, could result in property damage, data loss, lower performance, or unpredictable result.
 TIPS	Provides methods to help you solve a problem or save you time.
 NOTE	Provides additional information as the emphasis and supplement to the text.

Frequently Used Functions

Icon/Parameter	Description
	Edit an item.
 or Delete	Delete items one by one or in batches.
 or 	Enable or disable items one by one or in batches.
Refresh or Auto Refresh	Refresh or auto refresh the content.

Revision History

Version	Revision Content	Release Time
V1.0.0	First release.	January 2024

Privacy Protection Notice

As the Device user or data controller, you might collect the personal data of others such as their face, audio, fingerprints, and license plate number. You need to be in compliance with your local privacy protection laws and regulations to protect the legitimate rights and interests of other people by implementing measures which include but are not limited: Providing clear and visible

identification to inform people of the existence of the surveillance area and provide required contact information.

About the Manual

- The manual is for reference only. Slight differences might be found between the manual and the product.
- We are not liable for losses incurred due to operating the product in ways that are not in compliance with the manual.
- The manual will be updated according to the latest laws and regulations of related jurisdictions. For detailed information, see the paper user's manual, use our CD-ROM, scan the QR code or visit our official website. The manual is for reference only. Slight differences might be found between the electronic version and the paper version.
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1 Login

1.1 Initializing the Switch

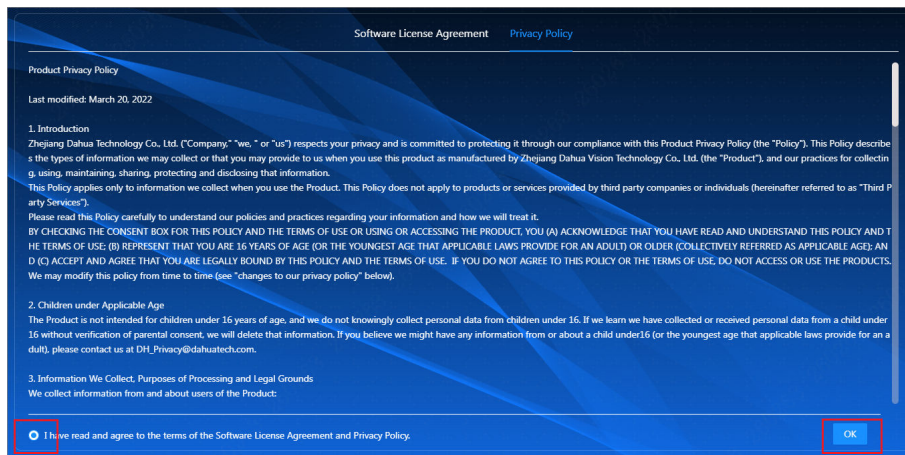
Prerequisites

Before login, make sure that the switch and the configuration device are connected and powered on.

Procedure

- Step 1 Open the IE browser, enter the IP address (192.168.1.110 by default) of the switch in the address bar of the web browser, and then press the Enter key.
- Step 2 Read **Software License Agreement** and **Privacy Policy**, click **I have read and agree to the terms of the Software License Agreement and Privacy Policy**, and then click **OK**.

Figure 1-1 Read policy

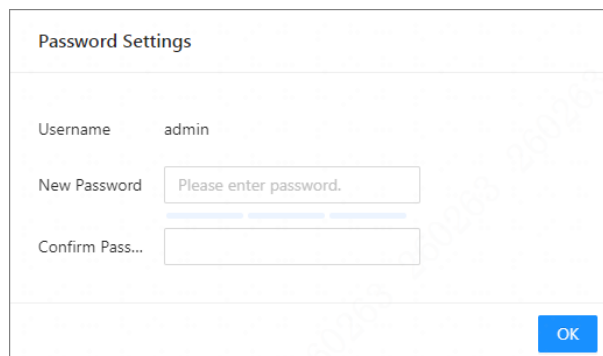


- Step 3 Set the password.



The username is admin.

Figure 1-2 Set password



- Step 4 Click **OK**.

1.2 Logging in

Prerequisites

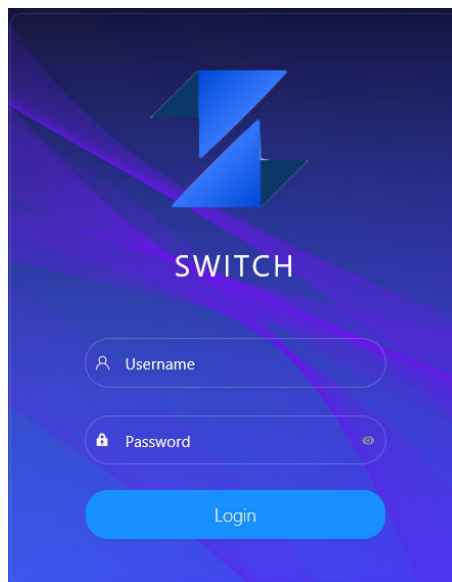
Before login, make sure:

- You have already configured the IP address of the switch. The IP address of VLAN 1 is 192.168.1.110 by default.
- The computer is connected to the network and can ping the switch.

Procedure

- Step 1 Enter the IP address (192.168.1.110 by default) of the switch in the address bar of the web browser, and then press the Enter key.
- Step 2 Enter the username and password.
- Step 3 Click **Login**.

Figure 1-3 Login



- Change the password after the first login. The password must consist of 8 to 32 non-blank characters and contain at least two types of characters among upper case, lower case, number, and special character (excluding ' " ; : &).
- For details on changing the password, see "3.3 Changing Password".

Figure 1-4 Home page

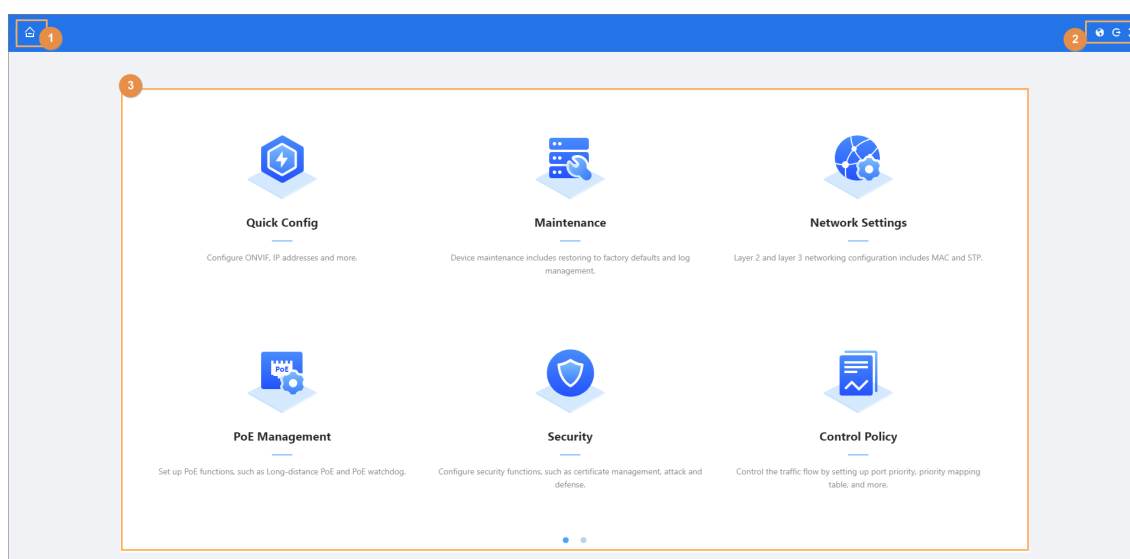


Table 1-1 Description of the homepage

No.	Name	Description
1		Go back to the home page.
2		Switch the system languages. Supports multiple languages.
		Logout the user, and then return to the login page.
		Full-screen displays the web page.
3	Status Display	Live view the current status of the switch.
	Quick Config	Configure quick settings, including ONVIF, IP address and more.
	Maintenance	Configure maintenance settings, including restoring to factory defaults and log management.
	Network Settings	Configure network settings, including MAC and STP settings.
	PoE Management	Configure PoE settings, including long-distance PoE and PoE watchdog.
	Security	Configure security settings, including certificate management, attack and defense.
	Control Policy	Configure traffic flow settings, including setting port priority, priority mapping table and more.
	Authentication	Configure authentication management, including 802.1x and RADIUS.

2 Quick Configuration

You can view the system information, and configure the switch parameters including ONVIF, IP address and more. The pages on the manual are for reference only, and might differ from the actual pages.

2.1 Configuring General Information

You can view and configure the general information, including name, IP address, subnet mask, and default gateway.

Procedure

- Step 1** Select **Quick Config > General**.
- Step 2** You can view and configure the general information of the switch.
- Step 3** (Optional) Click  to enable the DHCP function.



Please be advised of this function. Once DHCP is enabled, the router or the DHCP server connected with the switch will automatically assign an IP address to the switch. The original IP address will fail to access the webpage.

Figure 2-1 General information

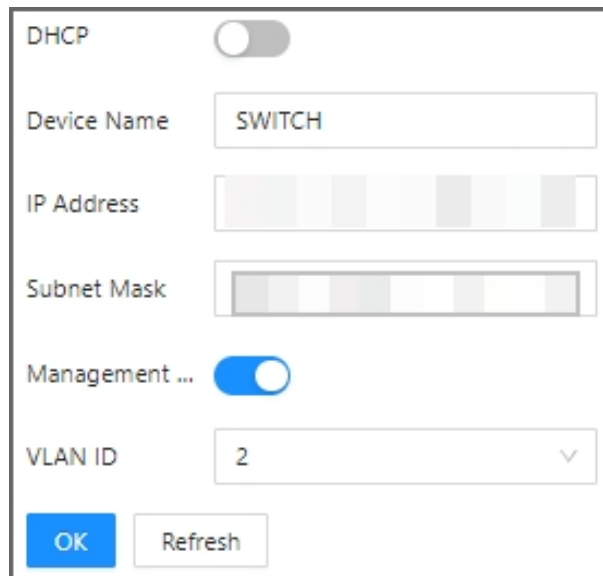


Table 2-1 Description of general information

Parameter	Description
DHCP	Supports enabling DHCP. After enabling DHCP, new IP will be automatically acquired and assigned. Before new IP is assigned, the default IP 192.168.1.110 is adopted.
Device Name	Displays the current device name. Support changing the name.
IP Address	Displays the current IP address. Support manual configuration.
Subnet Mask	Supports entering the subnet mask.

Parameter	Description
Managed VLAN	After Managed VLAN is enabled, you can only access the webpage through the IP from managed VLAN.
VLAN ID	Displays the current the managed VLAN ID.

2.2 Port Information

You can view information including port, type, link status, speed/duplexing, VLAN, RX usage, TX usage and media type of the switch.

Procedure

- Step 1** Select **Quick Config > Port Info**.
- Step 2** View the port information of the switch.

Figure 2-2 Port information

Refresh Auto Refresh ☐							
Port	Type	Link Status	Speed/Duplexing	VLAN	RX Usage	TX Usage	Media Type
1	Access	Down	Down	4094	0	0	Copper
2	Access	Down	Down	1	0	0	Copper
3	Access	UP	100M_Full	1	0	0	Copper
4	Access	Down	Down	1	0	0	Copper
5	Access	Down	Down	1	0	0	Fiber
6	Access	Down	Down	1	0	0	Fiber
7	Access	Down	Down	1	0	0	Fiber

Table 2-2 Description of port information

Parameter	Description
Port	Displays all ports of the switch.
Description	Set the port description. Support entering number, letter, special character, regardless of upper case and lower case. Up to 16 non-blank characters can be used. No description is by default.
Type	Includes three types: Access , Hybrid , and Trunk .
Link status	Includes two statuses: Up and Down . - Up: The port is connected. - Down: The port is not connected or the connection fails.
Speed/Duplexing	- Online: Displays the port rate and the duplex mode. - Offline: Displays Down.
VLAN	VLAN port. VLAN 1 by default.
RX usage	Displays the receiving usage.

Parameter	Description
TX usage	Displays the sending usage.
Media type	Includes two types: Copper and Fiber . ● Copper: RJ-45 port. ● Fiber: Fiber port.

Related Operations

- Click **Refresh** to manually refresh the port information.
- Click ☐ next to **Auto Refresh** to enable the automatic refreshing.

2.3 ONVIF

Select **Quick Config** > **Port Info**, you can view the port information of the switch.

Click ☐ to enable the ONVIF display function. After enabling, the page displays all the ports and the connection status of the switch.

- Green port: Indicates successful connection.
- Light blue port: Indicates no connection or connection failure.



Different models are equipped with different numbers of ports. The following figure is only for reference. Please refer to the actual product.

Figure 2-3 ONVIF information

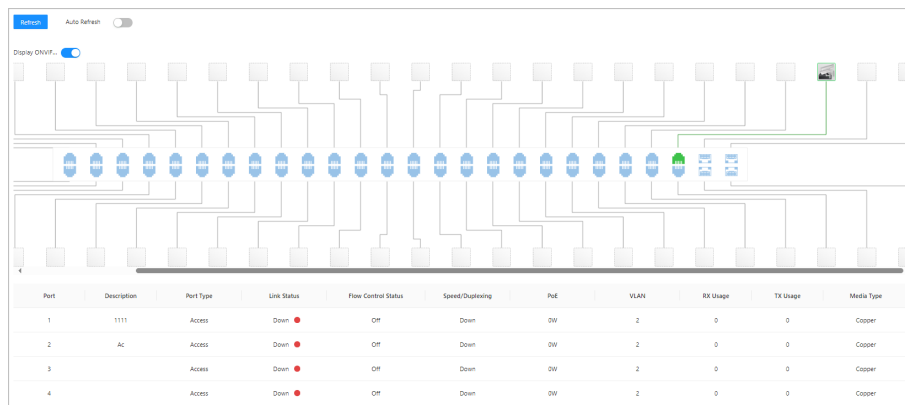


Table 2-3 Port descriptions

Name	Description
Port	Displays the port number.
Description	Displays port description.
Port Type	Includes three types: Access , Hybrid , and Trunk .
Link Status	Includes two statuses: Up and Down . ● Up: The port is connected. ● Down: The port is not connected or the connection fails.

Name	Description
Flow Control Status	Check the status of the flow control function.
Speed/Duplexing	● Online: Displays the port rate and the duplex mode. ● Offline: Displays Down.
VLAN	VLAN port. VLAN 1 by default.
PoE	Displays the PoE power consumption.  ● Non-PoE switches do not support this function. ● Different models are equipped with different numbers of the PoE ports. Please refer to the actual product.
RX Usage	The current reception rate divided by the actual negotiated rate for a period of time(usually 5 minutes).
TX Usage	The current sending rate divided by the actual negotiated rate for a period of time(usually 5 minutes).
Media Type	Includes two types: Copper and Fiber . ● Copper: RJ-45 port. ● Fiber: Fiber port.

2.4 Viewing IPC and NVR

Select **Quick Config** > **IPC&NVR**, you can view the information of the IPC, NVR and other devices connected to the switch.

3 Maintenance

3.1 Configuring System Time

You can view and configure the system time of the switch.

Procedure

- Step 1 Select **Maintenance** > **System Time**.
- Step 2 Configure the system time. There are 3 methods:
- Manually configure the **System Time** and **Time Zone**, and then click **OK**.
 - Click **Sync PC** to synchronize the switch time to the computer time.
 - Click ☐ to synchronize the switch time to the server time, and then click **OK**.

Figure 3-1 Configure time

The screenshot shows a 'System Time' configuration window. At the top, there's a 'System Time' field displaying '2024-01-09 16:55:08' with a calendar icon and a 'Sync PC' button. Below is a 'Time Zone' field with a dropdown menu. The 'Time Synchronization' section has two radio buttons: 'NTP' (selected) and 'Do Not Sync'. Underneath, there's a 'Server IP' field with the text 'time.windows.com'. At the bottom, there are three buttons: 'OK' (blue), 'Refresh', and 'Sync PC'.

3.2 Viewing Legal Information

Select **Maintenance** > **Legal Info**, you can view **Open Source Software Notice**.

3.3 Changing Password

Background Information



- To use the iLinkView function, the username and password of the iLinkView platform and the switch must be the same.
- The username is admin by default, and it cannot be changed.

Procedure

- Step 1 Select **Maintenance** > **Change Password**.
- Step 2 Enter **Old Password**, **New Password** and **Confirm Password**.



The password must consist of 8 to 32 non-blank characters and contain at least two types of characters among upper case, lower case, number, and special character (excluding ' " ; : &).

- Step 3 Select time that the password expires in the list of **Password Expires in**.
You can select **Password Expires in** from never, 30 days, 60 days, 90 days, and 180 days.
- Step 4 Click **OK**.

3.4 Configuring Firmware

Select **Maintenance** > **Firmware Config**, you can restore the device, update system and restart switch.

Restore Factory Default

Click **Restore Factory Default** to restore all the device parameters to the factory defaults.



All parameters restore to default settings except the IP address of the VLAN1.

Update Software

Click **Browse** to import the update file, and then click **Update Now**.



It might take 3 minutes to update the software. After the update, the system will automatically restart.

Restart Device

Click **Restart Now** to restart the device.

Figure 3-2 Firmware configuration

The screenshot shows the 'Firmware configuration' interface. At the top, there is a 'Restore Factory Default' section with a blue button labeled 'Restore Factory Default'. Below this is a light blue box containing an information icon and the text 'Completely restore device parameters to factory default.' The main section of the interface displays 'System Version' with a blurred value, 'Security Baseline Version' as 'V2.3', and an 'Import Update File' section with a text input field, a 'Browse' button, and an 'Update Now' button. At the bottom, there is a 'Device Restart' section with a blue button labeled 'Restart Now'.

3.5 File Management

You can configure the backup file and restore file.

Backup Configuration

We recommend backing up the logs for the future reference.

Select **Maintenance** > **File Management** > **Backup Config**, click **Export Configuration File** to export the file.

Restoration Configuration

We recommend backing up the logs for the future reference.

Select **Maintenance** > **File Management** > **Config Restore**, click **Browse** to select the file, and then click **Import Configuration Files** to import the file.



Imported configuration will overwrite previous configuration.

3.6 Viewing Device Information

Select **Maintenance** > **Device Info**, you can view the information on **System**, **Software**, **Hardware** and **Time**.

Figure 3-3 Device information

System	
Device Name	SWITCH
Device Model	4 Ports PoE Switch
IP Address	
Software	
Software Version	1.001.0000000.2.R
Compile Date	2022-03-31
Hardware	
MAC	
SN	000000000000000000
Time	
System Time	
Operation Time	18 Days 22 hr 13 min 53 sec

3.7 Viewing Log Information

You can view the log information on the switch operations.

Background Information

We recommend enabling the log function to ensure that the key logs can be synchronized to the server for future reference.

Procedure

- Step 1
- Select **Maintenance** > **Log**.
- Step 2
- Configure **Time** and **Type**, and then click **Search**.
- Step 3
- You can view the log information.
- Log type includes **Error** , **Warning** and **Message**.

Figure 3-4 Log information

Time

2023-06-12 00:00

→

2023-06-12 23:59

Type

Select All

▼

Search

Backup

☐ Encrypt Log Backup

No.	Time	Type	User	IP Address	Description
1	2023-06-12 15:23:43	Warning	System		Interface 1/1, PoE DC Load Disconnect.
2	2023-06-12 15:23:35	Warning	System		Interface 1/1, PoE DC Load Disconnect.
3	2023-06-12 15:23:28	Warning	System		Interface 1/1, PoE DC Load Disconnect.
4	2023-06-12 15:23:21	Warning	System		Interface 1/1, PoE DC Load Disconnect.
5	2023-06-12 15:23:14	Warning	System		Interface 1/1, PoE DC Load Disconnect.

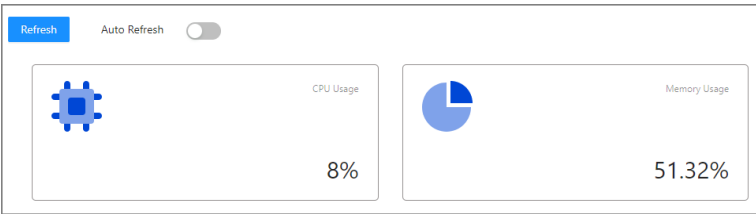
Table 3-1 Parameter description

Parameter	Description
Backup	Tap to backup the searched logs.
Encrypt Log Backup	Click the checkbox to encrypt the back-up logs.

3.8 Status Monitoring

Select **Maintenance** > **Status Monitoring**, and then you can view the CPU usage and memory usage.

Figure 3-5 Status monitoring



3.9 Viewing Diagnosis

Procedure

- Step 1 Select **Maintenance** > **Diagnosis**.
- Step 2 Enter the **Destination IP** , and then select **Packet Size** and **Ping Times**.
- Step 3 Click **Diagnose**.

Figure 3-6 Diagnosis



The screenshot shows a web form for configuring a diagnosis. It contains three input fields: 'Destination IP' (a text box), 'Packet Size' (a dropdown menu currently showing '64'), and 'Ping Times' (a text box with '1' entered and a range '(1-10000)' to its right). Below these fields is a blue button labeled 'Diagnose'.

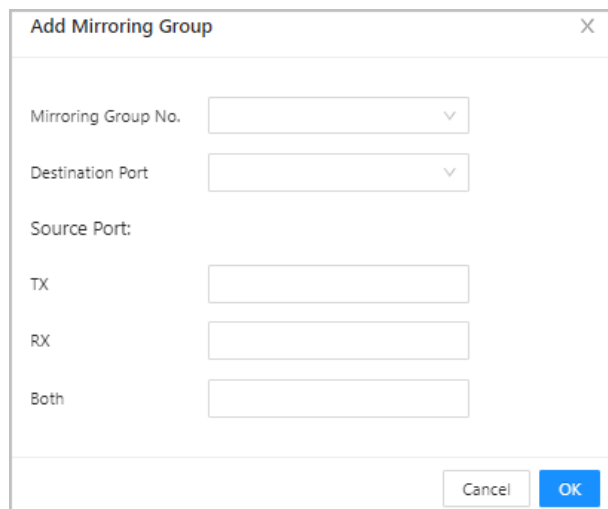
3.10 Configuring Mirroring

Mirroring copies traffic received or sent or both on a specified source to a destination port for analysis. The specified source is called mirrored source, the destination port is called observing port, and the copied traffic is called mirrored traffic. Mirroring sends a copy of the traffic through an observing port on the switch to a monitoring device for service analysis.

Procedure

- Step 1 Select **Maintenance** > **Mirror**.
- Step 2 Click **Add**.
- Step 3 In **Add Mirroring Group** page, select **Mirroring Group No.**, **Mirroring Destination Port**, and then select from **TX Only**, **RX Only**, and **Both** according to the actual situation.
- Step 4 Click **OK**.

Figure 3-7 Add Mirroring Group



The screenshot shows a dialog box titled 'Add Mirroring Group' with a close button (X) in the top right corner. Inside the dialog, there are three dropdown menus: 'Mirroring Group No.', 'Destination Port', and 'Source Port'. The 'Source Port' section has three radio buttons labeled 'TX', 'RX', and 'Both', each followed by an empty text input field. At the bottom right of the dialog are two buttons: 'Cancel' and 'OK'.

Table 3-2 Source port description

Name	Description
TX Only	Only supports sending traffic.
RX Only	Only supports receiving traffic.
Both	Supports both sending and receiving.

Related Operations

- Click  to edit the information of mirroring group.
- Click  or **Delete** to delete the mirroring group.

4 Network Settings

4.1 Configuring Ports

Background Information

You can configure the port parameters, including speed/duplexing, flow control, and other parameters. The port parameters will directly affect the working mode of the port. Make configurations according to the practical requirements.



The webpage might differ from different devices. Refer to the actual pages.

Procedure

Step 1 Select **Network Settings** > **Port**.

Step 2 You can view and configure the parameters.

Figure 4-1 Port settings

Port	Description	Type	Link Stat...	Speed/D...	Speed/Duplexing	Flow Co...	RX Usage	TX Usage	Details
1		Ethernet...	Down	Down	Auto ▾	☐	0	0	
2		Ethernet...	Down	Down	Auto ▾	☐	0	0	
3		Ethernet...	Down	Down	Auto ▾	☐	0	0	
4		Ethernet...	UP	100M Full	Auto ▾	☐	0	0	
5		Optical...	Down	Down	Auto ▾	☐	0	0	
6		Optical...	Down	Down	Auto ▾	☐	0	0	
7		Optical...	Down	Down	Auto ▾	☐	0	0	

Table 4-1 Description of the port parameters

Parameter	Description
Port	Displays all ports of the switch.
Description	Enter the description of the port. The description cannot exceed 16 characters. Only numbers, letters and the following special characters are allowed: . _ -. The first character must be a letter and the last character must not be a special character.
Media Type	Displays two kinds of media type, includes two types: Copper and Fiber. ● Copper: Ethernet port. ● Fiber: Optical port.

Parameter	Description
Link status	Includes two statuses: Up and Down . - Up: The port is connected. - Down: The port is not connected or the connection fails.
Speed/Duplexing status	- Online: Displays the port rate and the duplex mode. - Offline: Displays Down.
Speed/Duplexing	Set the speed and the duplex mode from Down , Auto , 10M Half , 10M Full , 100M Half , 100M Full , and 1000M Full .  The speed/duplexing is set as Auto for combo port.
Flow control	Click  to enable or disable the function.
RX usage	Displays the receiving usage.
TX usage	Displays the sending usage.
Details	- View the total RX and total TX of each port. You can refresh or clear the detailed information of each port. - View the number of error bytes.

Step 3 Click **OK**.

4.2 Configuring EEE

Enable the EEE (Energy-Efficient Ethernet) function.

Procedure

Step 1 Select **Network Settings** > **EEE**.

Step 2 Select the checkbox of the port to enable the **Energy-Efficient Ethernet** function, and then click **OK** to save the configuration.

Figure 4-2 EEE function

Port	Energy-Efficient Ethernet
1	☐
2	☐
3	☐
4	☐
5	☐
6	☐
7	☐
8	☐
9	☐
10	☐
11	☐

OK Refresh

4.3 Configuring VLAN

4.3.1 VLAN Definition

Logically, one LAN (Local Area Network) can be divided into many subsets. Each subset has its own broadcast area: virtual LAN (VLAN). A VLAN is divided from a LAN on a logical basis rather than on a physical basis, to realize the isolated broadcast area in the VLAN.

4.3.2 VLAN Function

- Enhance the network performance. The broadcast packets are in the VLAN, which can effectively control the network broadcast storm, reduce network bandwidth and enhance network processing ability.
- Enhance the network security. The switches in different VLANs cannot access each other, and the hosts in different VLAN cannot communicate with each other. They need a router or the three-layer switch to forward the message.
- Simplify the network management. The host of the same virtual working group is not limited in one physical area, which can simplify the network management and facilitate to establish working groups for users in different areas.

4.3.3 Port-based VLAN

The port types include **Access**, **Trunk** and **Hybrid**.

- Access: The port belongs to one VLAN, and is used to connect to the computer port.
- Trunk: The port allows multiple VLANs to pass, to receive and send messages of multiple VLANs, and is used to connect between the switches.
- Hybrid: The port allows multiple VLANs to pass, to receive and send messages of multiple VLANs, and is used to connect between the switches, and connect the computer.

4.3.4 Adding VLAN

Background Information

You can add the port to the VLAN. The VLAN is VLAN1 by default.



Port isolation and VLAN cannot be enabled at the same time. If one of them is enabled, the other one will be automatically disabled. Please be advised.

Procedure

Step 1 Select **Network Settings** > **VLAN**.

Figure 4-3 VLAN setting

Port	Mode	PVID	Tagged VLAN(s)	Untagged VLAN(s)
9	Hybrid	6	1-4094	6
10	Access	6		6
11	Access	7		7
12	Access	7		7
13	Access	8		8
14	Access	8		8
15	Access	9		9

Step 2 On the **Add VLAN** page, click **Add**, enter the **VLAN ID** and **Description**.

Figure 4-4 Add VLAN

Add VLAN

VLAN ID: (1-4094)

Description:

It can contain up to 64 characters, and can only consist of numbers, letters and underscores.

Cancel OK

Step 3 Click **OK**.



VLAN1 cannot be deleted.

Related Operations

- Click to edit VLAN.
- Click to delete VLAN.

4.3.5 Configuring Port VLAN

You can configure the port VLAN parameters.

Figure 4-5 Configure VLAN

Add VLAN VLAN

You can enter single, multiple or continuous Tagged VLAN(s) Untagged VLAN(s), such as "2", "3,7", "1-9". The value is between 1-4094.

Port	Mode	PVID	Tagged VLAN(s)	Untagged VLAN(s)
9	Hybrid	6	1-4094	6
10	Access	6		6
11	Access	7		7
12	Access	7		7
13	Access	8		8
14	Access	8		8
15	Access	9		9

OK Refresh

Table 4-2 Port VLAN configuration parameter

Parameter	Description
Port	Displays all ports of the switch.
Mode	Includes three modes: Access , Hybrid, and Trunk. ● Access: Belongs to one VLAN. Commonly used to connect computer ports. ● Trunk: Allows multiple VLANs through. Receives and sends multiple VLAN packets. Typically used for connection between switches. ● Hybrid: Allow multiple VLANs through. Receives and sends multiple VLAN packets. Used for connection between switches, or switch and computer.
Tagged VLAN(s)	Set the VLAN ID for the port that is allowed to be tagged when sending packets.
Untagged VLAN(s)	Set the VLAN ID for the port that is allowed to be untagged when sending packets.

Table 4-3 Frame processing comparison

Port type	Untagged frame processing	Tagged frame processing	Frame transmission
Access	Receives an untagged frame and adds a tag with the default VLAN ID to the frame.	- Accepts the tagged frame if the frame's VLAN ID matches the default VLAN ID. - Discards the tagged frame if the frame's VLAN ID differs from the default VLAN ID.	After the PVID tag is removed, the frame is transmitted.
Trunk	- Adds a tag with the default VLAN ID to an untagged frame and accepts the frame if the interface permits the default VLAN ID. - Adds a tag with the default VLAN ID to an untagged frame and discards the frame if the interface denies the default VLAN ID.	- Accepts a tagged frame if the VLAN ID carried in the frame is permitted by the interface. - Discards a tagged frame if the VLAN ID carried in the frame is denied by the interface.	- If the frame's VLAN ID matches the default VLAN ID and the VLAN ID is permitted by the interface, the device removes the tag and transmits the frame. - If the frame's VLAN ID differs from the default VLAN ID, but the VLAN ID is still permitted by the interface, the device will directly transmit the frame.
Hybrid			If the frame's VLAN ID is permitted by the interface, the frame is transmitted. The interface can be configured whether to transmit frames with tags.

4.4 Configuring VLANIF

Background Information

A VLANIF interface is a Layer 3 logical interface most commonly used to implement Layer 3 communication between hosts in different VLANs across different network segments.

Each VLANIF interface corresponds to a VLAN. After an IP address is configured for a VLANIF interface, the VLANIF interface becomes the gateway of the user hosts within that VLAN and forwards packets across network segments at Layer 3.

Procedure

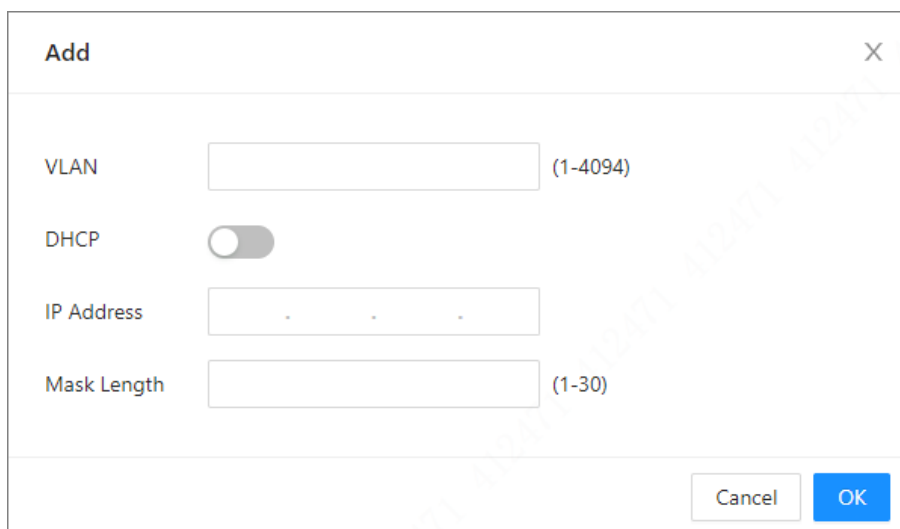
Step 1 Select **Network Settings** > **VLANIF**.

Step 2 Click **Add**, input **VLAN** number, and then enable **DHCP** for the port with **Mode** as **Dynamic**.



When **DHCP** disabled, you need to enter **IP Address** and **Mask Length**.

Figure 4-6 Add VLANIF



The 'Add' dialog box for configuring a VLANIF interface. It contains four fields: 'VLAN' with a range of (1-4094), 'DHCP' with a toggle switch, 'IP Address' with a dotted decimal input field, and 'Mask Length' with a range of (1-30). At the bottom right are 'Cancel' and 'OK' buttons.

Related Operations

- Delete the VLANIF: Select the VLAN, and then click **Delete** or .
- Refresh the parameter: Click **Refresh** to refresh the VLAN parameters.

4.5 Configuring IP and Routing

Introduces the IP settings and the routing settings of the switch.

Procedure

- Step 1 Select **Network Settings** > **IP & Routing**.
- Step 2 On the **Routing Settings** tab, click **Add**, and then configure the parameters.



Some models only support default routing. Refer to the actual product.

Figure 4-7 Routing settings



The 'Add' dialog box for configuring routing settings. It contains three fields: 'Network' with a dotted decimal input field, 'Mask Length' with a range of (1-30), and 'Next Hop' with a dotted decimal input field. At the bottom right are 'Cancel' and 'OK' buttons.

Table 4-4 Description of the routing parameters

Parameter	Description
Network	Enter the destination address or destination network to identify the IP packet.
Mask Length	Set the segment to identify the destination switch or router with the destination address.
Next Hop	Set the next hop address of the router.

Related Operations

- Delete the routing: Select the VLAN and routing, and then click **Delete** or .
- Refresh the parameter: Click **Refresh** to refresh the parameters of the routing.

4.6 Configuring ERPS

ERPS is a protocol defined by the International Telecommunication Union - Telecommunication Standardization Sector (ITU-T) to eliminate loops at Layer 2. Generally, redundant links are used on an Ethernet switching network such as a ring network to provide link backup and enhance network reliability. The use of redundant links, however, may produce loops, causing broadcast storms and rendering the MAC address table unstable. As a result, communication quality deteriorates, and communication services may even be interrupted. ERPS prevents broadcast storms and implements fast traffic switchover on a network where there are loops, provides fast convergence and carrier-class reliability, and allows all ERPS-capable devices on a ring network to communicate.



Some models might not support ERPS function. Please refer to the actual products.

4.6.1 ERPS Settings

Procedure

- Step 1 Select **Network Settings** > **ERPS**.
- Step 2 On the **ERPS** tab, click **Add** to add ERPS.
- Step 3 Configure the parameters, and then click **OK**.

Figure 4-8 Add ERPS

Table 4-5 Parameter description

Parameter	Description
ERPS ID	The ID number of the ERPS.
Port 0	Two ports of the switch to be added into the ERPS.
Port 1	
Port 0 APS MEP	- BPDU MEP of the ERPS port. - Link monitoring MEP of the ERPS port. Port 0 APS MEP keeps the same as Port 0 SF MEP. Port 1 APS MEP keeps the same as Port 1 SF MEP.
Port 1 APS MEP	
Port 0 SF MEP	
Port 1 SF MEP	

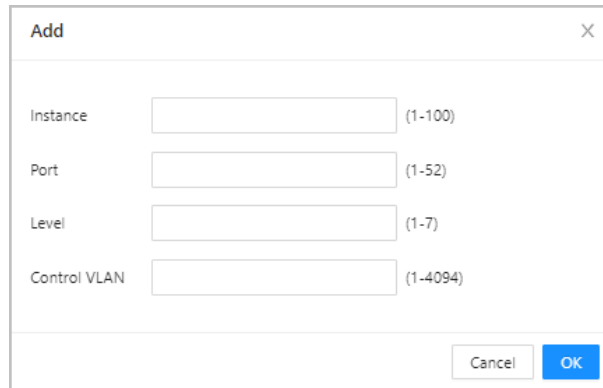
4.6.2 MEP Settings

MEP (Maintenance Entity Group End Point) is a part of the ERPS ring. A node refers to a Layer 2 switching device added to an ERPS ring. A maximum of two ports on each node can be added to the same ERPS ring.

Procedure

- Step 1 Select **Network Settings** > **ERPS**.
- Step 2 On the **MEP** tab, click **Add** to add MEP.
- Step 3 Configure MEP parameters.
- Step 4 Click **ok**.

Figure 4-9 Add MEP



The 'Add' dialog box contains four input fields with their respective ranges:

- Instance: [] (1-100)
- Port: [] (1-52)
- Level: [] (1-7)
- Control VLAN: [] (1-4094)

At the bottom right, there are 'Cancel' and 'OK' buttons.

Table 4-6 MEP parameter description

Parameter	Description
Instance	The number of the MEP instance.
Port	The port number of MEP.
Level	Maintenance level. We recommend setting as 0.
Control VLAN	The ID of the control VLAN in a SEP segment.

4.7 Configuring IGMP Snooping

IGMP Snooping (Internet Group Management Protocol Snooping) is the multicast constraint mechanism running on the device of layer 2, for managing and controlling the multicast. Through analyzing the received IGMP packet, the device of layer 2, which runs IGMP Snooping, creates the mapping between the port and the MAC multicast address, and forwards the multicast data according to the mapping.

Procedure

- Step 1** Select **Network Settings > IGMP Snooping**.
- Step 2** Click ☐ next to **IGMP Snooping** to enable the function.
- Step 3** Click ☐ next to **IGMP Leave Group Messages** to enable the function.
- Enable the function: Once the function is enabled, if the switch receives group messages that are not registered, it leaves the messages. The bandwidth will be saved, and then the forwarding rate will be increased.
 - Disable the function: If the group messages are not registered, the messages will be broadcast in the VLAN. The bandwidth will be occupied, and then the the forwarding rate will be decreased.



Please be advised on enabling **IGMP Leave Group Messages**, otherwise the multicast might fail.

- Step 4** Click **OK** .

4.8 Configuring STP

Spanning Tree Protocol (STP) builds a loop-free logical topology for LANs. It blocks redundant links between any two network devices and leaves a single active link between them so as to eliminate loops.

STP, RSTP, and MSTP provide the following capabilities:

- STP: A management protocol at the data link layer, is used to detect and prevent loops on a Layer 2 network. It, however, converges the network topology slowly.
- RSTP: An enhancement to STP, allows for rapid network topology convergence. However, both RSTP and STP have a defect that all the VLANs on the same LAN share the same spanning tree.
- MSTP: A virtual VLAN mapping table in which VLAN IDs are associated with spanning tree instances. Not only this, MSTP divides a switching network into multiple regions, each of which has multiple spanning tree instances that are mutually independent. Unlike STP and RSTP, MSTP provides multiple redundant paths for data forwarding. In addition, it implements load balancing among VLANs.

4.8.1 STP

Background Information



When spanning tree is enabled, iLinkView cannot be used.

Procedure

- Step 1 Select **Network Settings** > **STP**.
- Step 2 Click ☐ next to **STP** to enable STP function.
- Step 3 Select Working Mode.
- Step 4 Click **Advanced**, and then configure the advanced parameters.

Figure 4-10 Configure STP

STP Port Instance

STP ☒

Working Mode RSTP

Advanced

Input Rules

Max Aging Time $\geq$ (Hello Timer + 1) $\times$ 2

Max Aging Time $\leq$ (Forwarding Delay Time - 1) $\times$ 2

Hello Timer 2 s(1~10)

Max. Aging Time 20 s(6~40)

Forwarding Delay Time 15 s(4~30)

Bridge Priority 0 (0-61440)

OK Refresh

Table 4-7 Description of the advanced parameters

Parameter	Description
STP	The basic spanning tree protocol.
RSTP	An enhancement to STP, allows for rapid network topology convergence.
Hello timer	The period of root bridge sending BPDU. The time ranges from 1 second to 10 seconds.
Max. aging time	The aging time of current BPDU. The time ranges from 6 seconds to 40 seconds.
Forwarding delay time	After setting topological change, the bridge maintains the time of snooping and study state. The time ranges from 4 seconds to 30 seconds.
Bridge priority	The value ranges from 0 to 61440.

4.8.2 Port Instance

Procedure

Step 1 Select **Network Settings > STP > Port Instance**.

Step 2 Enter **Priority** and **Root Path Cost** of each port.



- The value of **Priority** ranges from 0 to 240, and must be an integral multiple of 16.
- The value of **Priority** is 128 by default.

Figure 4-11 Port instance

Port	Role	Status	Priority	Root Path Cost	Designated Bridge ID	Designated Port ID
1	Designated Port	Enabling	128	1	8000-0000-0000	8078
2	Designated Port	Enabling	128	1	8000-0000-0000	8079
3	Designated Port	Enabling	128	1	8000-0000-0000	8071
4	Designated Port	Enabling	128	1	8000-0000-0000	8072
5	Designated Port	Enabling	128	1	8000-0000-0000	8073
6	Designated Port	Enabling	128	1	8000-0000-0000	8074
7	Designated Port	Enabling	128	1	8000-0000-0000	8075

Table 4-8 Parameter description of the port instance

Parameter	Description
Role	The basic STP.
Status	An enhancement to STP, allows for rapid network topology convergence.
Priority	The priority of the port.
Root Path Cost	The root path cost of the port.
Designated Bridge ID	The designated bridge ID of the port.
Designated Port ID	The designated port ID of the port.

4.9 Configuring Link Aggregation

Background Information

Link aggregation is to form a multiple physical ports of the switch into the logical port. The multiple links in the same group can be regarded as a logical link with a larger bandwidth.

Through aggregation, the ports in the same group can share the communication flow, to make a larger bandwidth. Besides, the ports in the same group can back up reciprocally and dynamically to enhance the link reliability.



- The link aggregation is mutually exclusive with STP mode, IGMP Snooping, and 802.1x mode. When STP mode is enabled, link aggregation cannot be configured. You must disable STP mode before configuring link aggregation.
- We do not recommend implementing configuration and advanced functions for the ports which are used for link aggregation.
- Link aggregation can be divided into static aggregation and LACP. Generally, the peer devices with the switch link aggregation are switch and network adapter.
- Only the ports with the same speed rate, duplex, long distance and VLAN configuration can be in the one aggregation group.

Procedure

Step 1 Select **Network Settings** > **Link Aggregation**.

Step 2 Click **Add**.

Step 3 Select the **Aggregation Group No.**.

Step 4 Select the **Aggregation Group Mode**, and then click **OK**.

Aggregation group mode includes static, LACP active, and LACP passive.

- **Static:** Static is also known as manual mode. The Eth-Trunk interface must be manually created and member interfaces need to be manually added. The LACP protocol is disabled.
- **LACP active:** The Eth-Trunk interface must be manually created and member interfaces need to be manually added. Compared with static, the selection of interface is configured by LACP protocol. This mode places an interface in an active negotiating state. In this mode, the interface initiates negotiations with other interfaces by sending LACPDU.
- **LACP passive:** The Eth-Trunk interfaces are created and member interfaces are added by LACP protocol. This mode places an interface in a passive negotiating state. In this mode, the interface responds to the LACPDU that it receives but does not initiate LACPDU negotiation.

Step 5 Select ports to be added, and then click **OK**.

Step 6 Set the **Operational Key**.

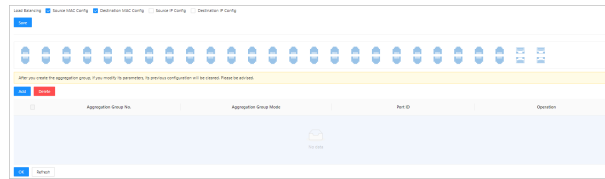


- You can only configure link aggregation when the **Aggregation Group Mode** is set as LACP.
- The value ranges from 1 to 65535.

Step 7 Select the **Timeout** from **Long Timeout** or **Short Timeout**.

Step 8 Click **OK**.

Figure 4-12 Link aggregation



4.10 Configuring SNMP Protocol

SNMP (Simple Network Management Protocol) is the standard protocol for network management in Internet, and it is widely applied for accessing and managing the managed devices. SNMP has the following features:

- It supports intelligent management for network device. By using the network management platform based on SNMP, the network administrator can query the running status and the parameters of the network device, and can configure the parameter, find the error, perform fault diagnosis, and then plan the capacity and create the report.
- SNMP supports to manage the devices of different physical features. SNMP provides only the most basic function library. It makes the management task and the physical feature and the networking technology of the managed device independent, to manage the devices from different manufacturers.

SNMP network provides 2 elements, NMS and Agent.

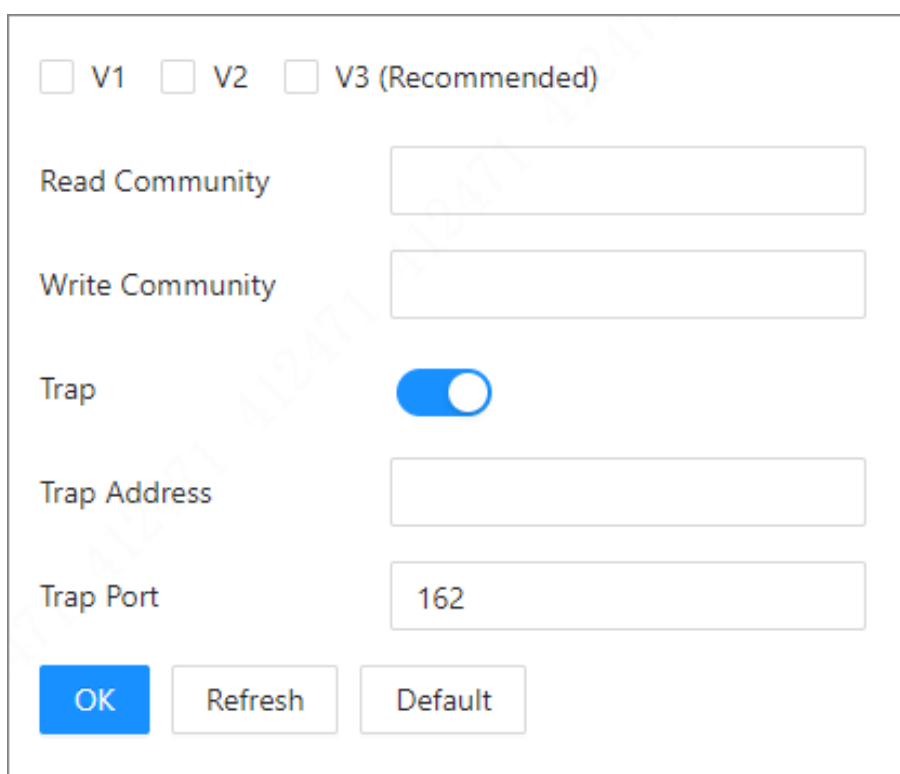
- NMS (Network Management System) is the manager in SNMP network, and it provides friendly human-machine interface to help the network administrator to finish most of the network management work.
- Agent is the managed role in SNMP network, and it receives and handles the request packet from NMS. In some emergency circumstances, for example, if the port status changes, Agent can send alarm packet to NMS proactively.

4.10.1 Configuring SNMP V1 and V2

Procedure

- Step 1 Select **Network Settings** > **SNMP**.
- Step 2 Select **V1** or **V2** version.
- Step 3 Configure parameters, including **Read Community** , **Write Community**, **Trap Address**, and **Trap Port**.

Figure 4-13 SNMP



The image shows a configuration window for SNMP. At the top, there are three radio buttons: 'V1', 'V2', and 'V3 (Recommended)'. Below these are two text input fields labeled 'Read Community' and 'Write Community'. A 'Trap' toggle switch is turned on. Below the toggle is a text input field for 'Trap Address'. At the bottom of the input fields is a text input field for 'Trap Port' containing the value '162'. At the very bottom are three buttons: 'OK' (highlighted in blue), 'Refresh', and 'Default'.

Step 4 Click **OK**.

4.10.2 Configuring SNMP V3

Procedure

- Step 1 Select **Network Settings > SNMP**.
- Step 2 Select **V3**.
- Step 3 Configure parameters.

Figure 4-14 SNMP V3

The image shows a configuration window for SNMP V3. At the top, there are three radio buttons: V1, V2, and V3 (Recommended), with V3 selected. Below this, there are several configuration sections:

- Read Community:** A text input field.
- Write Community:** A text input field.
- Trap:** A toggle switch.
- Read-Only Username:** A text input field containing 'public'.
- Authentication Type:** Two radio buttons, MD5 (selected) and SHA.
- Authentication Password:** A password input field with masked characters.
- Encryption Type:** Two radio buttons, CBC-DES (selected) and CFB-AES.
- Encryption Password:** A password input field with masked characters.
- Read/Write Username:** A text input field containing 'private'.
- Authentication Type:** Two radio buttons, MD5 (selected) and SHA.
- Authentication Password:** A password input field with masked characters.
- Encryption Type:** Two radio buttons, CBC-DES (selected) and CFB-AES.
- Encryption Password:** A password input field with masked characters.

At the bottom of the window, there are three buttons: OK, Refresh, and Default.

Table 4-9 Description of SNMP parameters

Parameter	Description
Read community	Read community supported by the agent programs.
Write community	Write community supported by the agent programs.
Trap address	The destination address of trap information sent by the agent program.
Trap port	The destination port of trap information sent by the agent program.
Read-only username	Set the read-only username. It is for V3 only.
Authentication type	Set authentication mode when the security level is Authentication no encryption or Authentication and encryption . The authentication mode includes MD5 and SHA .
Authentication password	Set authentication password.
Encryption type	Set encryption mode when the authentication mode is Authentication and encryption .

Parameter	Description
Encryption password	Set the encryption password when the authentication mode is Authentication and encryption .
Read/Write username	Set read and write user.

Step 4 Click **OK**.

4.11 Configuring MAC Table

MAC (Media Access Control) Table records the relationship between the MAC address and the port, and the information including the VLAN that the port belongs to. When the device is forwarding the packet, it queries in the MAC address table for the destination MAC address of the packet. If the destination MAC address of the packet is contained in the MAC address table, the packet is forwarded through the port in the table directly. And if the destination MAC address of the packet is not contained in the MAC address table, the device adopts broadcasting to forward the packet to all the ports except the receiving port in VLAN.

4.11.1 Adding MAC Table

You can bind the MAC address to the port on certain VLAN.

Procedure

Step 1 Select **Network Settings** > **MAC Table**.

Step 2 On the **MAC Table** tab, click **Add**.

Step 3 Set the MAC address, VLAN, and Port.

For example, bind the MAC address 00:00:00:00:00:01 to the port 3 in VLAN 2.

Step 4 Click **OK**.

Figure 4-15 Add MAC table

Related Operations

Figure 4-16 related operations

- Delete static MAC address: Select a MAC, and then click **Delete**.
- Refresh the MAC address list: Click **Refresh** or enable **Auto Refresh**.
- Clear dynamic MAC address: Click **Clear Dynamic MAC**.
- Search for MAC address and port: Enter the MAC address or port number on the upper-right corner, and then click **Search**.

4.11.2 Filtering Port MAC

Background Information

After enabling port MAC filtering, the following MAC devices can communicate with the port.

- Devices in MAC allowlist.
- The static MAC devices changing from the dynamic MAC devices.



After enabling port MAC filtering, the port cannot access the managing address or login.

Procedure

Step 1 Select **Network Settings** > **MAC Table**.

Step 2 On the **MAC Filtering** tab, select the port, and then click ☐ to enable the filtering function.

Step 3 Configure the MAC filtering of the port.

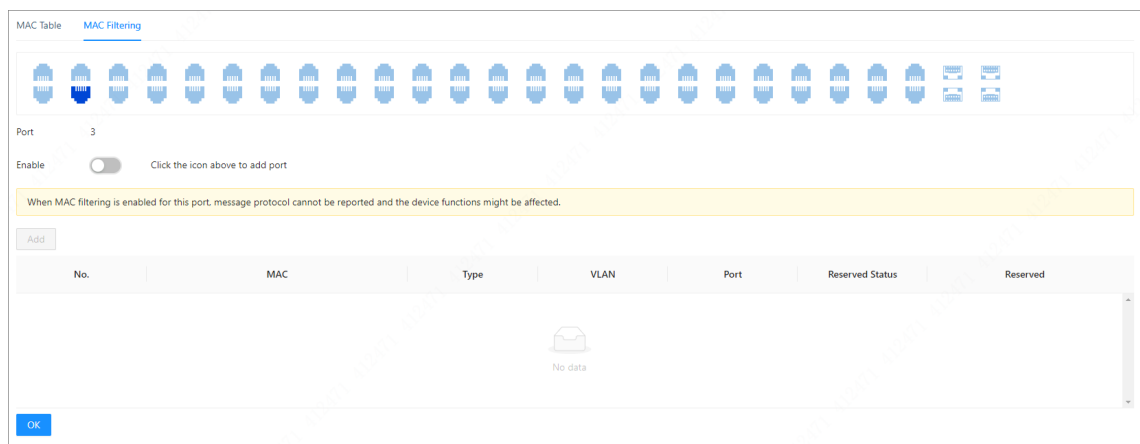
- Change from dynamic to static.
 1. Select one record, and then select ☐ next to **Reserved**.
 2. Click **OK**.

The type changes from **Dynamic** to **Static**.

Static MAC devices can communicate with the port normally.

- Create MAC allowlist.
 1. Click **Add**.
 2. Set MAC address and VLAN.
 3. Click **OK**.

Figure 4-17 MAC filtering



4.12 Configuring LLDP

LLDP (Link Layer Discovery Protocol) is a standard link layer discovery way. It can form its main capabilities, management address, device number and port number as TLV (Type Length Value), encapsulate it in LLDPDU (Link Layer Discovery Protocol Data Unit), and release it to its neighbor. The neighbor will keep the received information in the form of standard MIB (Management Information Base), so that the network management can query and judge the communication state of the link.

Procedure

- Step 1 Select **Network Settings > LLDP**.
- Step 2 On the **LLDP Remote Device** tab, view the information of LLDP remote device.

Figure 4-18 LLDP remote device

Global Enable ☒					
Refresh Auto Refresh ☐					
Local Port	Port ID	Port Description	System Name	System Capacity	Address Management
GigabitEthernet1/0/48	eth-0-36	eth-0-36	qwert	Bridge(+), Router(+)	

5 PoE Management

PoE refers to that the device uses network cables to externally connect PD (Powered Device) for remote power supply through Ethernet electrical ports. PoE function enables centralized power supply and convenient backup. Network terminals do not need external power supply, but only one network cable. Complied with IEEE 802.3af, IEEE 802.3at and IEEE 802.3bt standards, the device uses a globally unified power port. It can be used in IP phones, wireless AP (Access Point), portable power charger, credit card machine, network camera, data collection.

- Non-PoE switches do not support this function.
- Only some models of PoE switches comply with IEEE 802.3at standard. Single BT port supports up to 90 W. Please refer to the actual products.

5.1 Configuring PoE Settings

Select **PoE Management** > **PoE Settings**. You can configure power settings, power status, port status and control.

Procedure

- Step 1** In **Power Settings**, you can view the total power of the 4 ports, and configure reserved power and alert power.
- Step 2** In **Power Status**, you can view consumed power, remaining power and reserved power.
- Step 3** In **Port Status and Control**, select from the list below the **PoE Management** to enable or disable PoE of the corresponding port.
- Step 4** Click **OK**.

Figure 5-1 PoE settings

The screenshot displays the PoE settings interface. It is divided into three main sections: 'Power Settings', 'Power Status', and 'Port Status and Control'.
1. 'Power Settings' includes input fields for 'Total Power' (set to 150 W), 'Reserved Power' (set to 140 W), and 'Alert Power' (set to 120 W).
2. 'Power Status' shows 'Consumed Power' (0 W), 'Remaining Power' (10 W), and 'Reserved Power' (0 W).
3. 'Port Status and Control' is a table with columns: 'Port', 'Level', 'Consumed Power', and 'PoE Management'. It lists ports 1 through 5. Port 5 has a blue square icon in the 'PoE Management' column, indicating it is enabled. A 'Default' button is at the bottom left.

Table 5-1 Description of PoE parameters

Parameter		Description
Power settings	Total power	Displays the total PoE power.
	Reserved power	Configure the reserved PoE power.
	Alert Power	Configures the alert PoE power.
Power status	Consumed power	Displays the current PoE power consumed by all ports.
	Remaining power	Displays the current remaining PoE power.
	Reserved power	Unusable PoE power. Reserved power = total power – overload power.
Port status and control	Level	Displays the power supply level of the terminal devices. The power supply level ranges from 0 through 8, and the Hi-PoE power supply standard level is displayed as 5+.

Parameter		Description
	Consumed power	Displays the current PoE power consumed by the corresponding single port.
	PoE management	Select from Enable and Disable. - When selecting the Disable, the system does not supply power to the PD or reserve power for the PD. - When selecting the Enable, the PoE port will not result in PoE power overload. Otherwise, you are not allowed to enable PoE for the PoE port.  By default, PoE is disabled on a PoE port. PSE power overload: When the total amount of the power consumption of all ports exceeds the maximum power of PSE, the system considers the PSE is overloaded.

5.2 Configuring Perpetual PoE

Procedure

- Step 1 Select **PoE Management** > **Perpetual PoE**.
- Step 2 Click ☐ to enable **Global Enable**.
- Step 3 Click **OK** to save the configuration.

5.3 Configuring Long Distance PoE

Background Information

After you enable long distance PoE, the maximum transmission distance will change from 100 m to 250 m, and the transmission speed will be reduced from 100 Mbps to 10 Mbps.



In Extend Mode, the transmission distance of the PoE port is up to 250 m but the transmission rate drops to 10 Mbps. The actual transmission distance might vary due to power consumption of connected devices or the cable type and status.

Procedure

- Step 1 Select **PoE Management** > **Long Distance PoE**.
- Step 2 Click ☐ of the corresponding port to enable long distance PoE.
- Step 3 Click **OK**.

Figure 5-2 Long distance PoE

After long distance PoE is enabled, the maximum transmission distance will be increased from 100 meters to 250 meters, but the transmission speed will be reduced from 100 Mbps to 10 Mbps.

Port	☐ Long Distance PoE
1	☐
2	☐
3	☐
4	☐
5	☐
6	☐
7	☐
8	☐
9	☐
10	☐
11	☐

OK Refresh

5.4 Viewing PoE Event Statistics

Select **PoE Management** > **PoE Event Statistics** to view PoE event statistics.

Table 5-2 Description of PoE event statistics

Parameter	Description
Overload	Single port boots up when the power current has exceeded the current threshold.
Short circuited	When the powering chip sends power to the port, it becomes short-circuit.
DC disconnect	Single port power is off.
Short circuit during startup	The power is short-circuit when the powering chip sends out power.
Overheat protection	Single port boots up when the temperature of powering chip has exceeded the threshold.

5.5 Configuring Green PoE

Green PoE can reduce power consumption while retaining full compatibility with existing equipment.

Procedure

- Step 1 Select **PoE Management** > **Green PoE**.
- Step 2 Add **Start Time** and **End Time**.
- Step 3 Select the port, and then click ☐ to enable the green PoE.
- Step 4 Click **OK**.

Figure 5-3 Green PoE

The 'Add' dialog box contains the following configuration options:

- Start Time:** Sun, 01:00
- On/Off:** On (toggle)
- End Time:** Sun, 01:00
- On/Off:** Off (toggle)
- Weekly Cycle:** On (toggle)

Buttons: Cancel, OK

5.6 Configuring Force PoE

Background Information



After force PoE is enabled, the port will force power supply to the powered device, whether or not the device connected to the port meets the requirements. Please be advised.

Procedure

- Step 1 Select **PoE Management** > **Force PoE**.
- Step 2 Click ☐ of the corresponding port to enable force PoE.
- Step 3 Click **OK**.

Figure 5-4 Force PoE

After force PoE is enabled, the port will force power supply to the powered device, whether or not the device connected to the port meets the requirements. Please be advised.

Port	Force PoE
1	☒
2	☐
3	☐
4	☐

Buttons: OK, Refresh

5.7 Configuring PoE Watchdog

Background Information

With PoE watchdog enabled, you can monitor PD and keep it online, and check the status of PD devices every 60 s. If there is no data transmission, the PoE port will be automatically powered off and restarted.



Force PoE and **PoE watchdog** cannot be enabled at the same time.

Procedure

- Step 1 Select **PoE Management** > **PoE watchdog**.

- Step 2** Click  of the corresponding port to enable PoE watchdog.
- Step 3** Click **OK**.

Figure 5-5 PoE watchdog

Force PoE and PoE watchdog cannot be enabled at the same time.

Port	☐ PoE Watchdog
1	☐
2	☐
3	☐
4	☐

6 Security

6.1 Basic Services

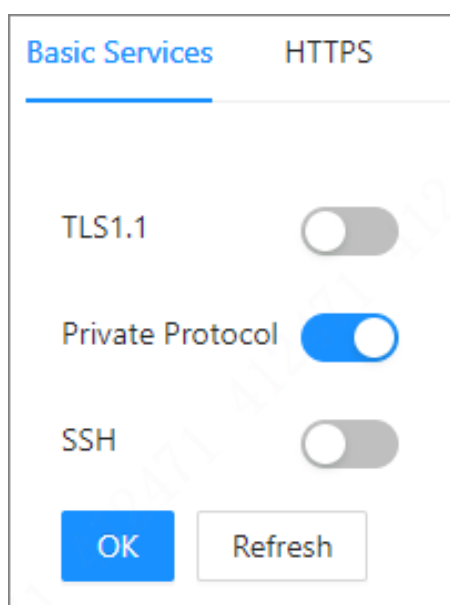
6.1.1 Configuring Basic Services

The secure transport layer protocol (TLS) is used to guarantee confidentiality and data integrity between two communication applications. This protocol consists of two layers: TLS Record and TLS Handshake. TLS1.1 uses a weak encryption algorithm. We recommend you disable it.

A private protocol is an unpublished protocol. We recommend you disable it.

SSH and Secure Shell are security protocols based on the application layer. SSH is a reliable protocol that provides security for remote login sessions and other network services. Using SSH can effectively prevent information leakage during remote management.

Figure 6-1 Basic services



6.1.2 Configuring HTTPS

HTTPS (Hyper Text Transfer Protocol over Secure Socket Layer) is a service entry based on Transport Layer Security (TLS). HTTPS provides web service, ONVIF access service and RTSP access service.

Procedure

Step 1 Select **Security** > **HTTPS**.

Step 2 (Optional) On the **Basic Services** tab, click  to enable TLS1.1 as needed, and then click **OK**.



By default, the webpage only supports TLS1.2. If you must use TLS1.1, you must enable TLS1.1 on the webpage. Please be advised that TLS1.1 poses security risks. We recommend you disable TLS1.1 to avoid unexpected risks.

Step 3 On the **HTTPS** tab, click ☐ to enable HTTPS.

Step 4 Select a device certificate.

Step 5 Select **Certificate Management** and the page will turn to **CA Certificate** page.



For details, see "6.2 Configuring CA Certificate".

Step 6 Click **OK**.

Figure 6-2 Configure HTTPS

Basic Services **HTTPS**

Enable ☒

HTTPS is a service entry based on Transport Layer Security (TLS). HTTPS provides web service and ONVIF access service.

Select a device certificate Certificate Management

No.	Custom Name	Certificate Number	Validity Period	User	Issued by	Used by
☒ 1		38383233353635313239383...	2052-11-24 10:13:53		TS	HTTPS
☐ 2		38383233353635313239383...	2029-12-24 08:00:51	192.168.1.110	TS	

6.2 Configuring CA Certificate

6.2.1 Installing Device Certificate

A device certificate is a proof of device legal status. For example, when the browser is visiting device via HTTPS, the device certificate shall be verified.

Procedure

Step 1 Select **Security** > **CA Certificate** > **Device Certificate**.

Step 2 On the **Device Certificate** tab, click **Install Device Certificate**.

Step 3 Select an installation mode as needed.

Figure 6-3 Select installation mode

Step 1: Select installation mode.

☐ Create Certificate

Fill in certificate information, and the device will create and issue the certificate.

☒ Apply for CA Certificate and Import (Recommended)

After you fill in certificate information, the device will generate a certificate request file. Please submit the file to a CA institute to apply for a signature and certificate, and then import them into the device.

☐ Install Existing Certificate

If you already have a certificate and private key file, please import the certificate and private key file in this way.

Next

Cancel

Step 4 Fill in certificate information, and then Click **Create and install certificate** , **Create and Download**, and **Import and Install**.

Step 5 (Optional) Click **Enter Edit Mode** to edit the **Custom Name**, and then click **Save Config**.

Figure 6-4 Edit certificate

No.	Custom Name	Certificate Num...	Validity Period	User	Issued by	Used by	Certificate Status	Download	Delete
1		323032313131...	2029-12-24 08:...	192.168.1.110	TS	HTTPS	Normal	Download	Delete

Related Operations

- Download the certificate: Click .
- Delete the certificate: Click .

6.2.2 Installing Trusted CA Certificates

Background Information

A trusted CA certificate is used to verify the legal status of a host. For example, a switch CA certificate shall be installed for 802.1x authentication.



Only support installing subordinate CA certificate.

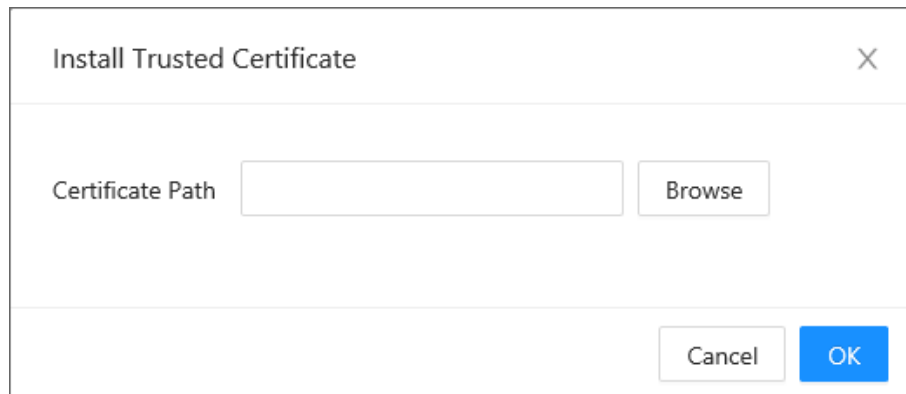
Procedure

Step 1 Select **Security** > **CA Certificate**.

Step 2 On **Trusted CA Certificates** tab, click **Install Trusted Certificate**.

Step 3 Click **Browse** , and then Click **OK**.

Figure 6-5 Install Trusted Certificate

A dialog box titled "Install Trusted Certificate" with a close button (X) in the top right corner. It contains a "Certificate Path" label followed by a text input field and a "Browse" button. At the bottom right, there are "Cancel" and "OK" buttons.

Install Trusted Certificate

Certificate Path **Browse**

Cancel **OK**

Step 4 (Optional) Click **Enter Edit Mode** to edit the **Custom Name**, and then click **Save Config**.

Figure 6-6 Edit certificate

No.	Custom Name	Certificate N...	Validity Period	User	Issued by	Used by	Certificate St...	Download	Delete
1		6364336236...	2030-10-17...	TS	TS		Expired		

Related Operations

- Download the certificate: Click .
- Delete the certificate: Click .

6.3 Configuring Attack Defense

6.3.1 Configuring Firewall

Procedure

Step 1 Select **Security** > **Attack Defense**.

Step 2 On the **Firewall** tab, click **All**, and all source hosts IP/MAC are allowed to access all the device ports.

Click **Allowlist** , and only source hosts whose IP/MAC are in the following list are allowed to access corresponding ports of the device, and then click **Add** to add hosts to allowlist.

Figure 6-7 Add to allowlist

Click **Blocklist**, and the listed corresponding source host of IP addresses/MAC is prohibited from visiting the corresponding ports of the device by network connection. Click **Add** to add hosts to blocklist.

Figure 6-8 Add to blocklist

Table 6-1 Firewall

Parameter	Description
All	All source hosts IP/MAC are allowed to access all the device ports.
Allowlist	Only source hosts whose IP/MAC are in the following list are allowed to access corresponding ports of the device.
Blocklist	The listed corresponding source host of IP addresses/MAC is prohibited from visiting the corresponding ports of the device.

Step 3 Click **OK**.

6.3.2 Configuring Anti-DoS Attack

Procedure

- Step 1 Select **Security** > **Attack Defense**.
- Step 2 On the **Anti-DoS Attack** tab, click ☐ to enable different defense functions as needed.
- Step 3 Click **Save**.

Figure 6-9 Anti-DoS attack

The screenshot shows the 'Anti-DoS Attack' configuration page under the 'Firewall' tab. It features two sections: 'SYN Flood Attack Defense' and 'ICMP Flood Attack Defense'. Each section has a toggle switch and a descriptive text box. The 'SYN Flood Attack Defense' section includes a text box explaining that an attacker might send repeated SYN messages, leaving half-open TCP connections and potentially crashing the device. The 'ICMP Flood Attack Defense' section includes a text box explaining that an attacker might send an abnormally large number of ICMP packets, using up computing resources and making the device crash. At the bottom, there are 'Save' and 'Refresh' buttons.

6.4 Configuring Port Isolation

Port isolation is to achieve layer 2 isolation between messages. You only need to add the port to the isolation group to isolate the layer 2 data between the ports in the isolation group. The port isolation function provides users a safer and more flexible networking solution.

Procedure

- Step 1 Select **Security** > **Port Isolation**.
- Step 2 Click **Add**.

Figure 6-10 Add isolated group

The screenshot shows the 'Add Isolated Group' dialog box. It has a title bar with a close button (X). Inside, there are two input fields: 'Isolated Group No.' with a dropdown menu showing '1', and 'Isolated Member' with a text input field. At the bottom right, there are 'Cancel' and 'OK' buttons.

- Step 3 Select **Isolated Group No.** and **Isolated Member**, and then click **OK**.

Related Operations

- Edit isolated group: Click .
- Clear isolated group: Click .

7 Control Policy

7.1 Configuring Port Priority

Background Information

By default, the 802.1p priority and DSCP priority for a voice VLAN are 6 and 46 respectively. You can dynamically configure 802.1p priority and DSCP priority to plan priorities for different voice services.

- The 802.1p priority is indicated by the value in the 3-bit PRI field in each 802.1Q VLAN frame. This field determines the transmission priority for data packets when a switching device is congested.
- The DSCP value is indicated by the 6 bits in the Type of Service (ToS) field in the IPv4 packet header. DSCP, as the signaling for DiffServ, is used for QoS guarantee on IP networks. The traffic controller on the network gateway takes actions merely based on the information carried by the 6 bits.

Procedure

Step 1 Select **Control Policy** > **Port Priority**.

Step 2 Select from the **Priority** and **Trust Mode**.



Trust mode includes 4 types of **Untrust**, **802.1P**, **DSCP**, and **DSCP & 802.1P**.

Step 3 Click **OK**.

Figure 7-1 Configure port priority

Port	Priority	Trust Mode
1	0	Untrust
2	0	Untrust
3	0	Untrust
4	0	Untrust
5	0	Untrust
6	0	Untrust
7	0	Untrust

7.2 Configuring Priority Mapping Table

Procedure

Step 1 Select **Control Policy** > **Priority Mapping Table**.

Step 2 Select **DSCP** > **Local Priority** or **802.1p** > **Local Priority**.

Step 3 Select **Output Value**.



The input value and the output value vary from different modes.

Step 4 Click **OK**.

Figure 7-2 Priority mapping

Input Value	Output Value
0	0
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	1

7.3 Configuring Queue Scheduling

Background Information

- PQ: Priority queuing. PQ schedules packets in descending order of priority. Packets in queues with a lower priority can be scheduled only after all packets in queues with a higher priority have been scheduled.
- WRR: Weighted Round Robin. In WRR scheduling, the device schedules packets in queues in a polling manner based on the queue weight. After one round of scheduling, the weights of all queues are decreased by 1. The queue whose weight is decreased to 0 cannot be scheduled.

Procedure

Step 1 Select **Control Policy > Queue Scheduling**.

Step 2 Select from the **Queue Algorithm**.



In WRR mode, the weight ratio of the priority queue is Queue0:Queue1:Queue2:Queue3=1:2:4:8.

Step 3 Click **OK**.

Figure 7-3 Queue scheduling

Interface	Queue Algorithm	Q0	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Operation
		Weight	Weight	Weight	Weight	Weight	Weight	Weight	Weight	
1	SP									
2	SP									
3	SP									
4	SP									
5	SP									
6	SP									
7	SP									
8	SP									
9	SP									
10	SP									
11	SP									

Total 52 records < 1 2 3 > Go to Page

7.4 Configuring Port Speed Limit

Procedure

Step 1 Select **Control Policy** > **Port Speed Limit**.

Step 2 Click **Add**.

Figure 7-4 Add port speed limit

Add Port Speed Limit

* Interface

* Direction

* CIR

Kbps Range: 16 - 100000

Cancel

OK

Step 3 Enter the **Interface**, **Direction**, and **CIR**.



- The values of **Direction** include **In** and **Out**.
- The input rule for CIR: Range from 16 to 100000, and must be an integer multiple of 16.

Step 4 Click **OK**.

7.5 Configuring Storm Control

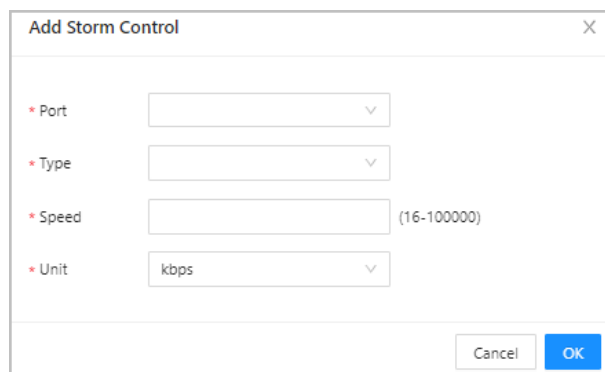
The broadcast frames on the network are forwarded continuously, which affects the proper communications, and greatly reduces the network performance. The storm control can limit the broadcast flows of the port and discard the broadcast frames once the flow exceeds the specified threshold, which can reduce the risk of the broadcast storm and ensure the network proper operation.

Procedure

Step 1 Select **Control Policy** > **Storm Control**.

Step 2 Click **Add**.

Figure 7-5 Add storm control



The image shows a dialog box titled "Add Storm Control" with a close button (X) in the top right corner. Inside the dialog, there are four fields, each preceded by a red asterisk (*):

- Port**: A dropdown menu.
- Type**: A dropdown menu.
- Speed**: A text input field with a range "(16-100000)" to its right.
- Unit**: A dropdown menu with "kbps" selected.

At the bottom right of the dialog, there are two buttons: "Cancel" and "OK".

Step 3 Enter the **Port**, **Type**, and **Speed**.

Step 4 Click **OK**.

8 Authentication

8.1 Configuring 802.1x

802.1X is a network authentication protocol that opens ports for network access when an organization authenticates a user's identity and authorizes them for access to the network.

Procedure

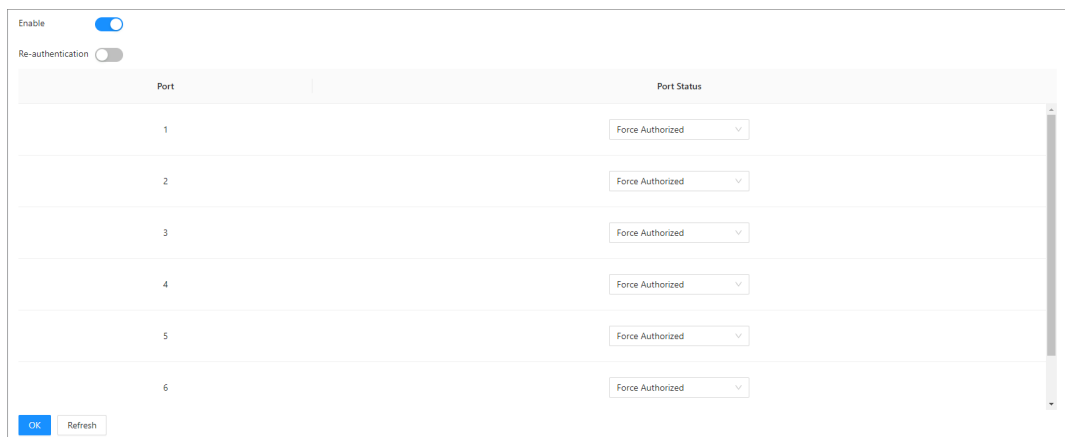
Step 1 Click  next to the **Enable** to enable NAS (Network Attached Storage).

Step 2 Select from **Port Status**.



The status includes **Auto** , **Force unAuthorized**, and **Force Authorized**.

Figure 8-1 Configure 802.1x



Port	Port Status
1	Force Authorized
2	Force Authorized
3	Force Authorized
4	Force Authorized
5	Force Authorized
6	Force Authorized

Table 8-1 Description of 802.1x

Parameter	Description
Auto	The port automatically configure status according to the authentication results.
Force unAuthorized	• The port is always in an unauthorized status, and users are not allowed to authenticate. • The device does not provide authentication services for users that access through this port.
Force authorized	The port is always in the authorized status, and users are allowed to access network resources without authentication.

Step 3 Click **OK**.

8.2 Configuring Radius

Background Information

RADIUS (Remote Authentication Dial-In User Service) is a common protocol to realize AAA (Authentication, Authorization and Accounting).

RADIUS is an information interaction protocol of distributed and C/S construction. It can protect the network from unauthorized visits. It is used in the network that allows remote visits but requests the higher security. It defines the RADIUS packet format and the message transmission mechanism. It stipulates that using UDP as transport layer protocol to encapsulate the RADIUS packet.

At the beginning, RADIUS is the AAA protocol for the dial-up users only. With the development of the user accesses, RADIUS adapts to various access, including Ethernet access and ADSL access. It accesses server through authentication and authorization, and collects records the usage of network source through accounting.

Procedure

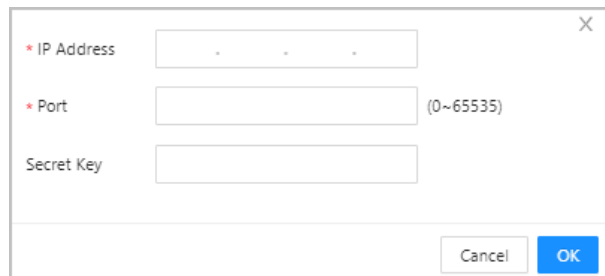
Step 1 Select **Authentication** > **RADIUS**.

Figure 8-2 RADIUS



Step 2 Click **Add**.

Figure 8-3 Add RADIUS



Step 3 Set the **IP Address**, **port**, and **key**.

Step 4 Click **OK**.

Appendix 1 Security Recommendation

Account Management

1. Use complex passwords

Please refer to the following suggestions to set passwords:

- The length should not be less than 8 characters;
- Include at least two types of characters: upper and lower case letters, numbers and symbols;
- Do not contain the account name or the account name in reverse order;
- Do not use continuous characters, such as 123, abc, etc.;
- Do not use repeating characters, such as 111, aaa, etc.

2. Change passwords periodically

It is recommended to periodically change the device password to reduce the risk of being guessed or cracked.

3. Allocate accounts and permissions appropriately

Appropriately add users based on service and management requirements and assign minimum permission sets to users.

4. Enable account lockout function

The account lockout function is enabled by default. You are advised to keep it enabled to protect account security. After multiple failed password attempts, the corresponding account and source IP address will be locked.

5. Set and update password reset information in a timely manner

The device supports password reset function. To reduce the risk of this function being used by threat actors, if there is any change in the information, please modify it in time. When setting security questions, it is recommended not to use easily guessed answers.

Service Configuration

1. Enable HTTPS

It is recommended that you enable HTTPS to access web services through secure channels.

2. Encrypted transmission of audio and video

If your audio and video data contents are very important or sensitive, it is recommended to use encrypted transmission function in order to reduce the risk of your audio and video data being eavesdropped during transmission.

3. Turn off non-essential services and use safe mode

If not needed, it is recommended to turn off some services such as SSH, SNMP, SMTP, UPnP, AP hotspot etc., to reduce the attack surfaces.

If necessary, it is highly recommended to choose safe modes, including but not limited to the following services:

- SNMP: Choose SNMP v3, and set up strong encryption and authentication passwords.
- SMTP: Choose TLS to access mailbox server.
- FTP: Choose SFTP, and set up complex passwords.
- AP hotspot: Choose WPA2-PSK encryption mode, and set up complex passwords.

4. Change HTTP and other default service ports

It is recommended that you change the default port of HTTP and other services to any port between 1024 and 65535 to reduce the risk of being guessed by threat actors.

Network Configuration

1. **Enable Allow list**

It is recommended that you turn on the allow list function, and only allow IP in the allow list to access the device. Therefore, please be sure to add your computer IP address and supporting device IP address to the allow list.

2. **MAC address binding**

It is recommended that you bind the IP address of the gateway to the MAC address on the device to reduce the risk of ARP spoofing.

3. **Build a secure network environment**

In order to better ensure the security of devices and reduce potential cyber risks, the following are recommended:

- Disable the port mapping function of the router to avoid direct access to the intranet devices from external network;
- According to the actual network needs, partition the network: if there is no communication demand between the two subnets, it is recommended to use VLAN, gateway and other methods to partition the network to achieve network isolation;
- Establish 802.1x access authentication system to reduce the risk of illegal terminal access to the private network.

Security Auditing

1. **Check online users**

It is recommended to check online users regularly to identify illegal users.

2. **Check device log**

By viewing logs, you can learn about the IP addresses that attempt to log in to the device and key operations of the logged users.

3. **Configure network log**

Due to the limited storage capacity of devices, the stored log is limited. If you need to save the log for a long time, it is recommended to enable the network log function to ensure that the critical logs are synchronized to the network log server for tracing.

Software Security

1. **Update firmware in time**

According to the industry standard operating specifications, the firmware of devices needs to be updated to the latest version in time in order to ensure that the device has the latest functions and security. If the device is connected to the public network, it is recommended to enable the online upgrade automatic detection function, so as to obtain the firmware update information released by the manufacturer in a timely manner.

2. **5.2 Update client software in time**

It is recommended to download and use the latest client software.

Physical Protection

It is recommended that you carry out physical protection for devices (especially storage devices), such as placing the device in a dedicated machine room and cabinet, and having access control

and key management in place to prevent unauthorized personnel from damaging hardware and other peripheral equipment (e.g. USB flash disk, serial port).