8 Gigabit Copper Ports + 2 2.5G SFP Layer 2 Managed Industrial Ethernet Switch

User Manual

Document Version: 02

Issue Date: 06/01/2021

Preface

Managed Industrial Ethernet Switch User Manual has introduced this series of switches:

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

Audience

This manual applies to the following engineers:

- Network administrators
- Technical support engineers
- Network engineer

Text Format Convention

Format	Description
" "	Words with “” represent the interface words. Fox example “Port number”.
>	Multiple paths are separated by the symbol ‘>’. Such as opening the local connection path description: Open "Control Panel> Network Connection> Local Area Connection".
Light Blue Font	It represents the words clicked to achieve hyperlink. The font color is as follows: ‘Light Blue’.

Symbols

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

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

Revision Record

Version No.	Date	Revision note
01	4/21/2021	Product release
02	6/1/2021	Function Optimization

Contents

1 Log in the Web Interface

1.1 WEB Browsing System Requirement

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	Internet Explorer 6.0 or above
Operating system	• Windows XP • Windows 7/8/10

1.2 Setting IP Address of PC

The switch default management as follows:

IP Settings	Default Value
IP Address	192.168.1.254
Subnet mask	255.255.255.0

When configuring a switch through the Web:

- Before making remote configuration, make sure that the route between the computer and the 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:
When the switch is first configured. If it is configured locally, make sure the current computer network segment is 1.

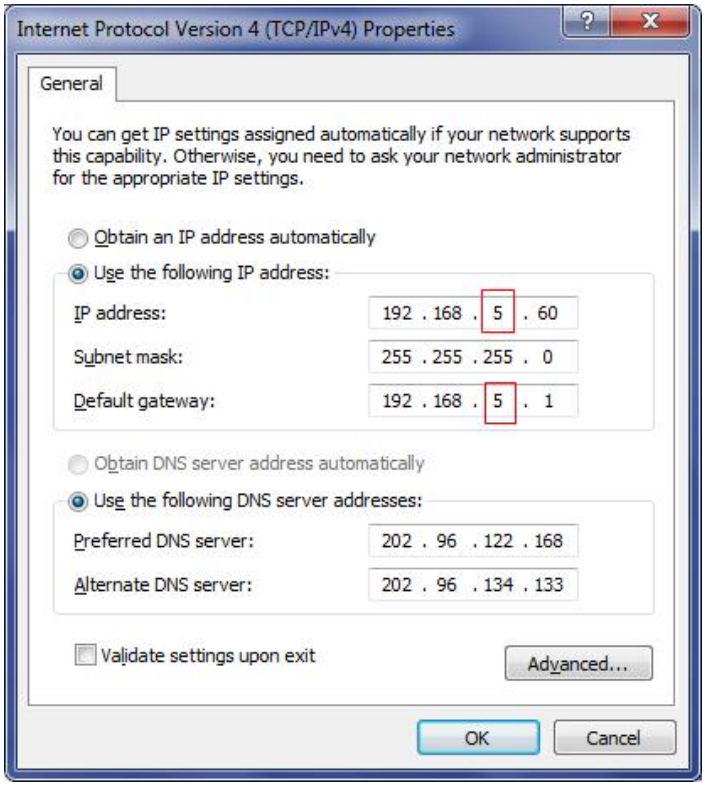
Eg: Assume that the IP address of the current PC is 192.168.5.60, change the network segment "5" of the IP address to "1".

Operation Steps

Amendment steps as follow:

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.

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 Enter the address "http://192.168.1.254” of the switch in the address bar of the browser.

Step 3 Click the “Enter” key.

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

Note:

- This switch supports one default user. This user has administrator privilege and can configure devices via WEB, TELNET, SSH, CLI, etc.
- The default username and password are “admin”; please strictly distinguish capital and small letter while entering.
- To ensure the security of device and network, please modify the password information of the default user after logging in to the device; at the same time, please keep the user password information properly to avoid leakage or loss.
- On the page of "Safety Device> Users > User Settings", you can modify the password information of default users and add new users.

Step 5 Click “OK”

Step 6 Select Chinese in the language selection window.

Step 7 Click the "confirm" button.

Step 8 End.

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

Note:

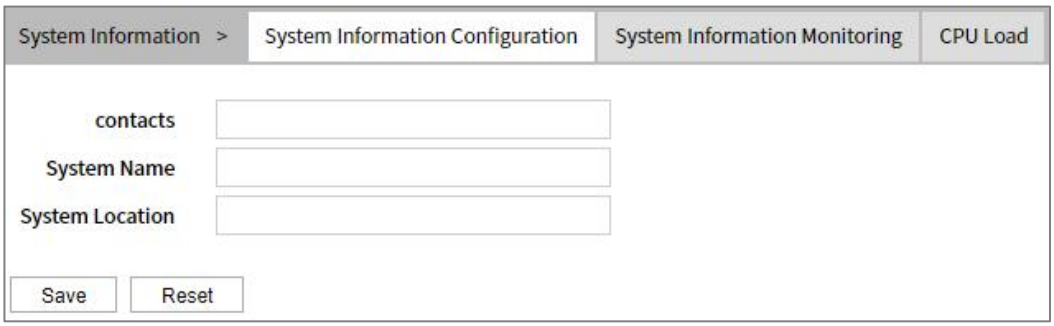
After logging in to the device, you can modify the IP address of the switch for ease of use.

2 System

2.1 System Information

2.1.1 System Information Configuration

The switch system information is provided here.



Contacts

The textual identification of the contact person for this managed node, together with information on how to contact this person. The allowed string length is 0 to 255, and the allowed content is the ASCII characters from 32 to 126.

System Name

An administratively assigned name for this managed node. By convention, this is the node's fully-qualified domain name. A domain name is a text string consisting of the alphabet (A-Z, a-z), digits (0-9) and minus sign (-). No space characters are permitted as part of a name. The first character must be an alpha character. And the first or last character must not be a minus sign. The allowed string length is 0 to 255.

System Location

The physical location of this node(e.g., telephone closet, 3rd floor). The allowed string length is 0 to 255, and the allowed content is the ASCII characters from 32 to 126.

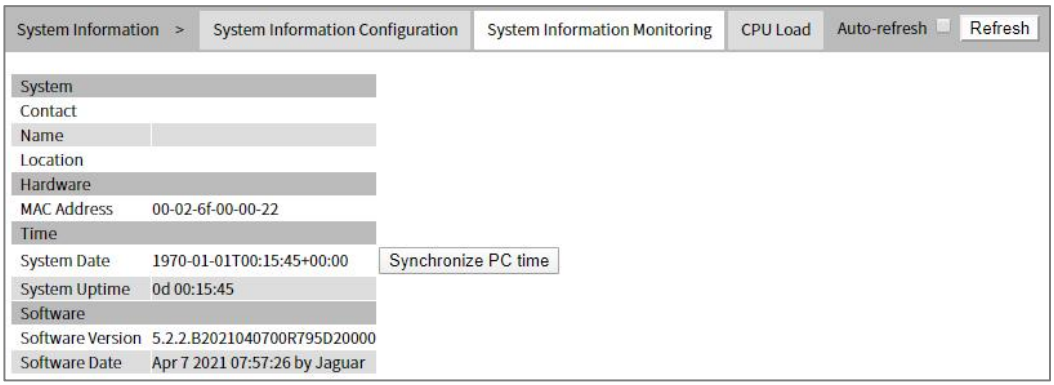
Buttons

Save: Click to save changes.

Reset: Click to undo any changes made locally and revert to previously saved values.

2.1.2 System Information Monitor

The switch system information is provided here.



Contact

System contact configured by the path "System > System Information > System Information Configuration > System Administrator".

Name

System name configured by the path "System > System Information > System Information Configuration > System Name".

Location

System location configured by the path "System > System Information > System Information Configuration > System Location".

MAC Address

The MAC Address of this switch.

System Date

The current (GMT) system time and date. The system time is obtained through the Timing server running on the switch, if any.

System Uptime

The period of time the device has been operational.

Software Version

The software version of this switch.

Software Date

The date when the switch software was produced.

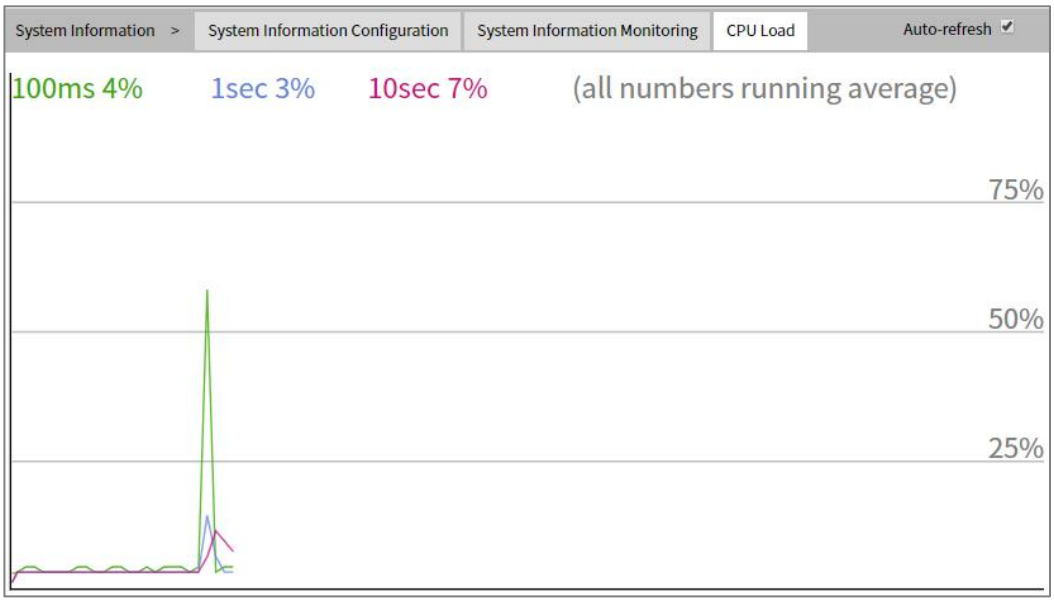
Buttons

Auto-refresh: Check this box to refresh the page automatically. Automatic refresh occurs every 3 seconds.

Refresh: Click to refresh the page.

2.1.3 CPU Load

This page displays the CPU load, using an SVG graph.



The load is measured as averaged over the last 100ms, 1sec and 10 seconds intervals. The last 120 samples are graphed, and the last numbers are displayed as text as well.

In order to display the SVG graph, your browser must support the SVG format. Consult the SVG Wiki for more information on browser support. Specifically, at the time of writing, Microsoft Internet Explorer will need to have a plugin installed to support SVG.

Buttons

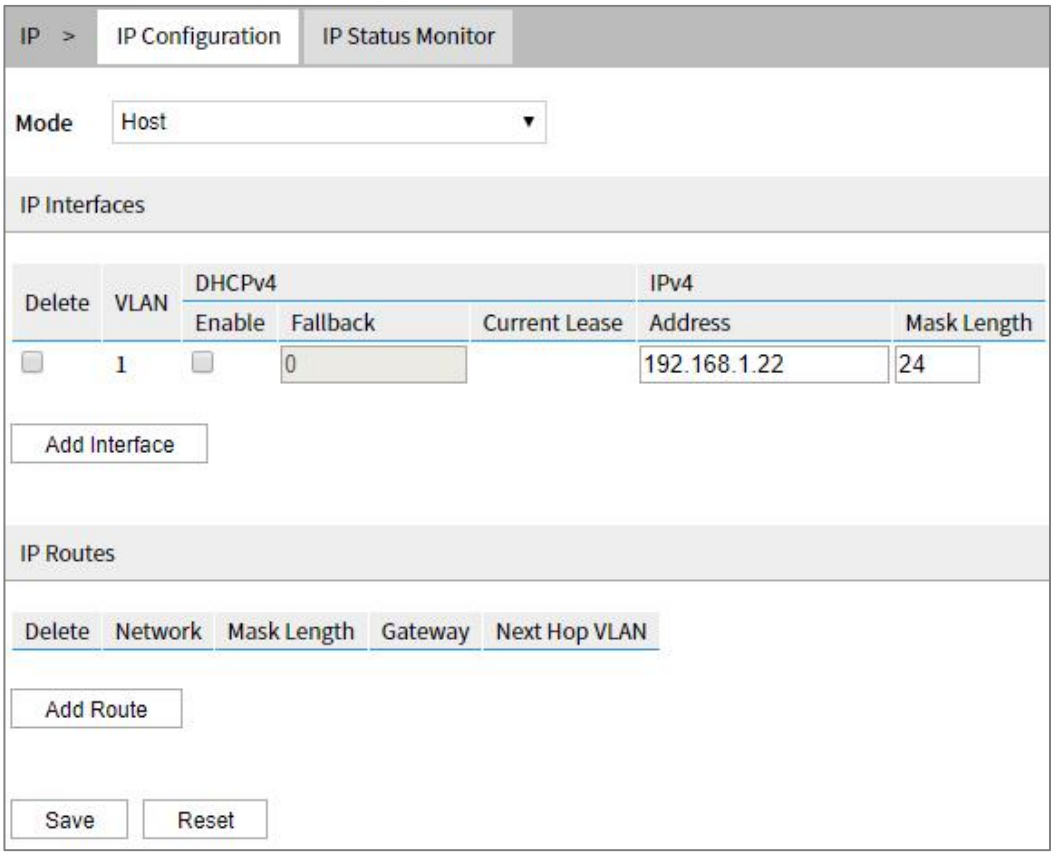
Auto-refresh: Check this box to refresh the page automatically. Automatic refresh occurs every 3 seconds.

2.2 IP

2.2.1 IP Configuration

Configure IP basic settings, control IP interfaces and IP routes.

The maximum number of interfaces supported is 8 and the maximum number of routes is 32.



Mode

Configure whether the IP stack should act as a Host or a Router. In Host mode, IP traffic between interfaces will not be routed. In Router mode traffic is routed between all interfaces.

IP Interface

Delete

Select this option to delete an existing IP interface.

VLAN

The VLAN associated with the IP interface. Only ports in this VLAN will be able to access the IP interface. This field is only available for input when creating a new interface.

DHCPv4 Enable

Enable the DHCPv4 client by checking this box. If this option is enabled, the system will configure the IPv4 address and mask of the interface using the DHCPv4 protocol. The DHCPv4 client will announce the configured System Name as hostname to provide DNS lookup.

DHCPv4 Fallback

The number of seconds for trying to obtain a DHCP lease. After this period expires, a configured IPv4 address will be used as IPv4 interface address. A value of zero disables the fallback mechanism, such that DHCP will keep retrying until a valid lease is obtained. Legal values are 0 to 4294967295 seconds.

DHCPv4 Current Lease

For DHCP interfaces with an active lease, this column show the current interface address, as provided by the DHCP server.

IPv4 Address

The IPv4 address of the interface in dotted decimal notation.

If DHCP is enabled, this field configures the fallback address. The field may be left blank if IPv4 operation on the interface is not desired - or no DHCP fallback address is desired.

IPv4 Mask Length

The IPv4 network mask, in number of bits (prefix length). Valid values are between 0 and 30 bits for a IPv4 address.

If DHCP is enabled, this field configures the fallback address network mask. The field may be left blank if IPv4 operation on the interface is not desired - or no DHCP fallback address is desired.

IP Routes

Delete

Select this option to delete an existing IP route.

Network

The destination IP network or host address of this route. Valid format is dotted decimal notation or a valid IPv6 notation. A default route can use the value 0.0.0.0or IPv6:: notation.

Mask Length

The destination IP network or host mask, in number of bits (prefix length). It defines how much of a network address that must match, in order to qualify for this route. Valid values are between 0 and 32 bits respectively 128 for IPv6 routes. Only a default route will have a mask length of 0 (as it will match anything).

Gateway

The IP address of the IP gateway. Valid format is dotted decimal notation or a valid IPv6 notation. Gateway and Network must be of the same type.

Next Hop VLAN (Only for IPv6)

The VLAN ID (VID) of the specific IPv6 interface associated with the gateway.

The given VID ranges from 1 to 4095 and will be effective only when the corresponding IPv6 interface is valid.

If the IPv6 gateway address is link-local, it must specify the next hop VLAN for the gateway.

If the IPv6 gateway address is not link-local, system ignores the next hop VLAN for the gateway.

Buttons

Add new IP interface: click here to add new IP interface. A maximum of 8 interfaces is supported.

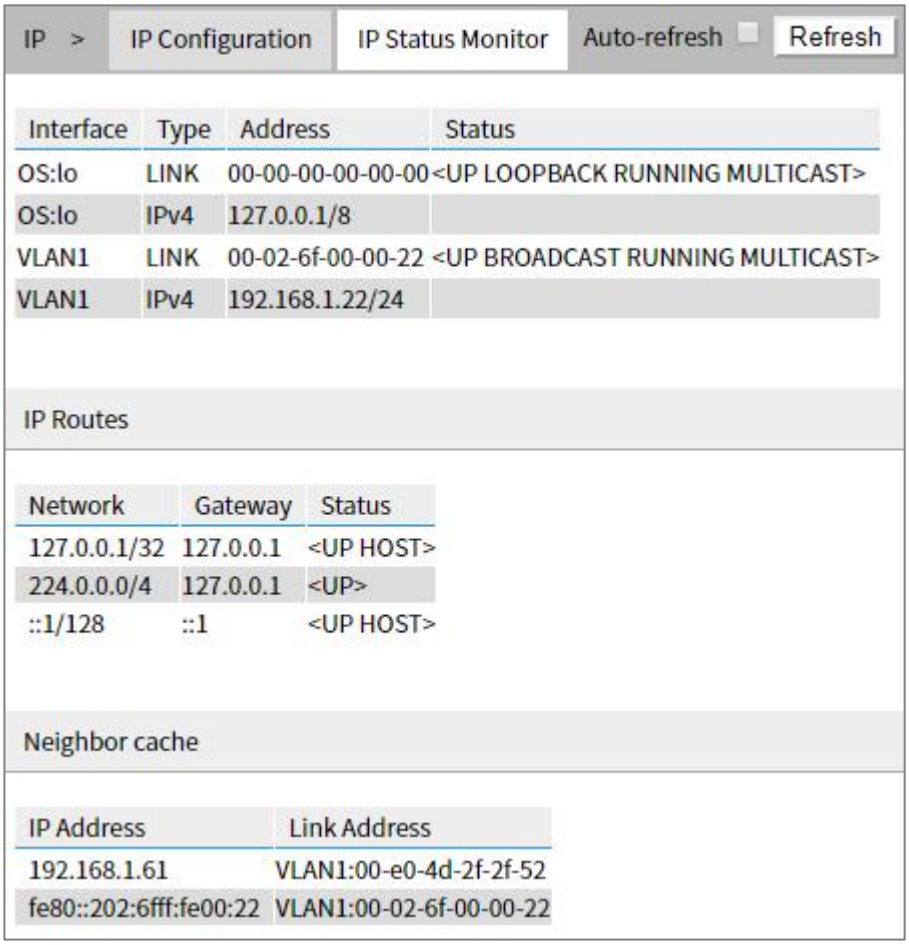
Add new IP route: click to add new IP route. A maximum of 32 routes is supported.

Save: Click to save changes.

Reset: Click to undo any changes made locally and revert to previously saved values.

2.2.2 IP Status Monitoring

This page displays the status of the IP protocol layer. The status is defined by the IP interfaces, the IP routes and the neighbour cache (ARP cache) status.



IP Interface

Interface

Interface Name.

Type

The address type of the entry. This may be LINK or IPv4.

Address

The current address of the interface (of the given type).

Status

The status flags of the interface (and/or address).

IP Routes

Network

The destination IP network or host address of this route.

Gateway

The gateway address of this route.

Status

The status flags of the route.

Neighbour Cache

IP Address

The IP address of the entry.

Link Address

The Link (MAC) address for which a binding to the IP address given exist.

Buttons

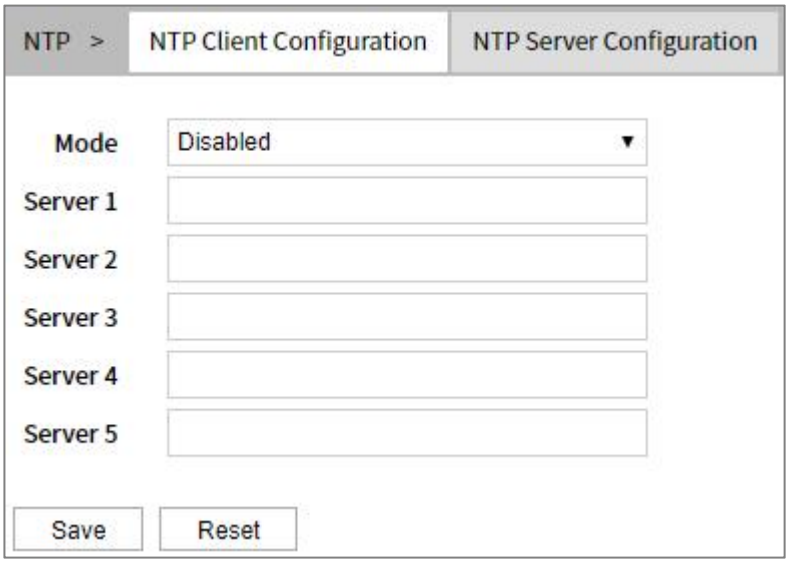
Refresh: Click to refresh the page immediately.

Auto-refresh: Check this box to refresh the page automatically. Automatic refresh occurs every 3 seconds.

2.3 NTP Configuration

2.3.1 NTP Client Configuration

Configure NTP client on this page.



Mode

Indicates the NTP mode operation. Possible modes are:

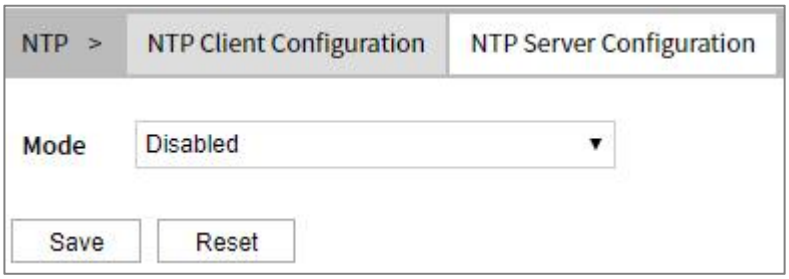
- Enabled: Enable NTP client mode operation.
- Disabled: Disable NTP client mode operation.

Server

Provide the IPv4 or IPv6 address of a NTP server. A IPv6 address is in 128-bit records represented as eight fields of up to four hexadecimal digits with a colon separating each field (:). For example, fe80::215:c5ff:fe03:4dc7. The symbol is a special syntax that can be used as a shorthand way of representing multiple 16-bit groups of contiguous zeros; but it can appear only once. It can also represent a legally valid IPv4 address. For example, "::192.1.2.34". In addition, it can also accept a domain name address.

2.3.2 NTP Server Configuration

Configure NTP server on this page.

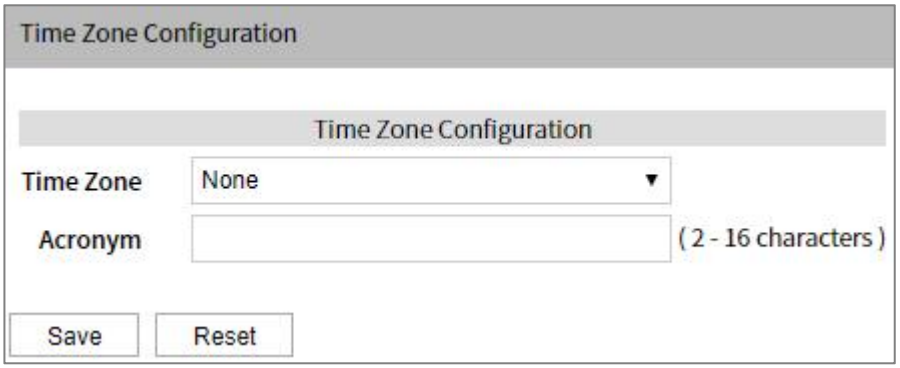


Mode

Configure the NTP server mode, options are as follows:

- Enable: Enable NTP Server.
- Disable: Disable NTP Server.

2.4 Time Zone Configuration



Time Zone

Lists the various Time Zones worldwide. Select appropriate Time Zone from the drop down and click Save to set.

Acronym

User can set the acronym of the time zone. This is a User configurable acronym to identify the time zone. (Range: Up to 16 characters).

2.5 System Log

2.5.1 System Log Configuration

Server Mode

Indicates the server mode operation. When the mode operation is enabled, the syslog message will send out to the syslog server. The syslog protocol is based on UDP communication and received on UDP port 514 and the syslog server will not send acknowledgments back since UDP is a connectionless protocol and it does not provide acknowledgments. The syslog packet will always send out even if the syslog server does not exist. Possible modes are:

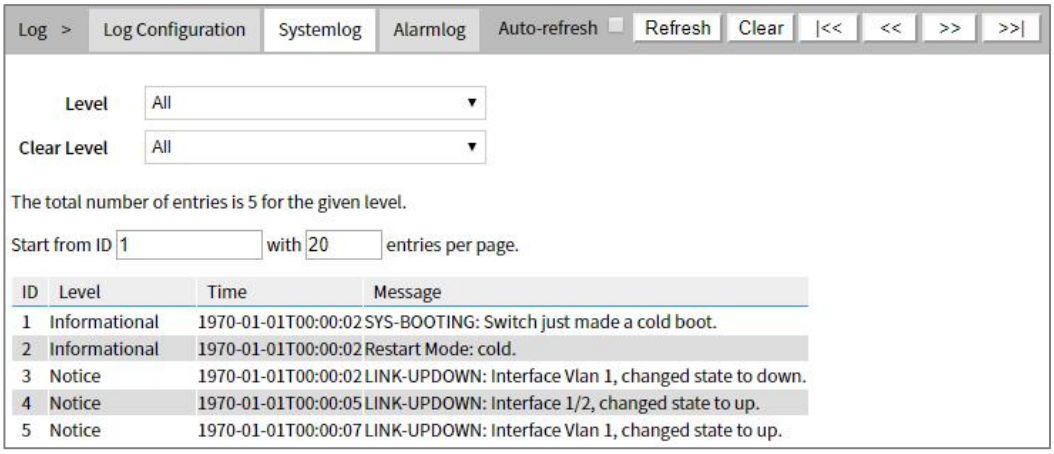
- Enabled: Enable server mode operation.
- Disabled: Disable server mode operation.

Server Address

Indicates the IPv4 host address of syslog server. If the switch provides DNS feature, it also can be a domain name.

2.5.2 System Log Information

The switch system log information is provided here.



Level

Indicates what kind of message will send to syslog server. Possible modes are:

- Error: Send the specific messages which severity code is less or equal than Error.
- Warning: Send the specific messages which severity code is less or equal than Warning.
- Notice: Send the specific messages which severity code is less or equal than Notice.
- Informational: Send the specific messages which severity code is less or equal than Informational.

Navigating the System Log Information Table

Each page shows up to 999 table entries, selected through the "Display per page" input field. When first visited, the web page will show the beginning entries of this table.

The "Level" input field is used to filter the display system log entries.

The "Clear Level" input field is used to specify which system log entries will be cleared.

To clear specific system log entries, select the clear level first then click the “Clear” button.

The "Start from ID" input field allow the user to change the starting point in this table. Clicking the “Refresh” button will update the displayed table starting from that or the closest next entry match.

In addition, these input fields will upon a “Refresh” button click - assume the value of the first displayed entry, allowing for continuous refresh with the same start input field. “>>” will use the last entry of the currently displayed table as a basis for the next lookup.

When the end is reached the text "No more entries" is shown in the displayed table. Use the “|<<” button to start over.

System Log Information Entry Columns

ID

The identification of the system log entry.

Level

The level of the system log entry.

- Notification: System log entries are at the notification level.
- Important: system log entries are at the important level.
- Warning: The system log entry is belonged warning level.
- Error: The system log entry is belonged error level.

Time

The occurred time of the system log entry.

Message

The detailed message of the system log entry.

Buttons

Auto-refresh: Check this box to refresh the page automatically. Automatic refresh occurs every 3 seconds.

Refresh: Updates the table entries, starting from the current entry.

Delete: Refresh the selected entries.

|<<: Updates the table entries, starting from the first available entry.

<<: Updates the table entries, ending at the last entry currently displayed.

>>: Updates the table entries, starting from the last entry currently displayed.

>>|: Updates the table entries, ending at the last available entry.

2.5.3 System Alert Log

The alarm log interface of switch system is as follows.

ID

The ID (>= 1) of the system log entry.

Category

Syslog level category.

Level

The severity level of the system log entry.

Time

The occurred time of the system log.

Product Name

Device name.

Message

The detailed message of the system log entry.

Buttons

Refresh: Updates the system log entry to the current entry ID.

|<<: Updates the system log entry to the first available entry ID.

<<: Updates the system log entry to the previous available entry ID.

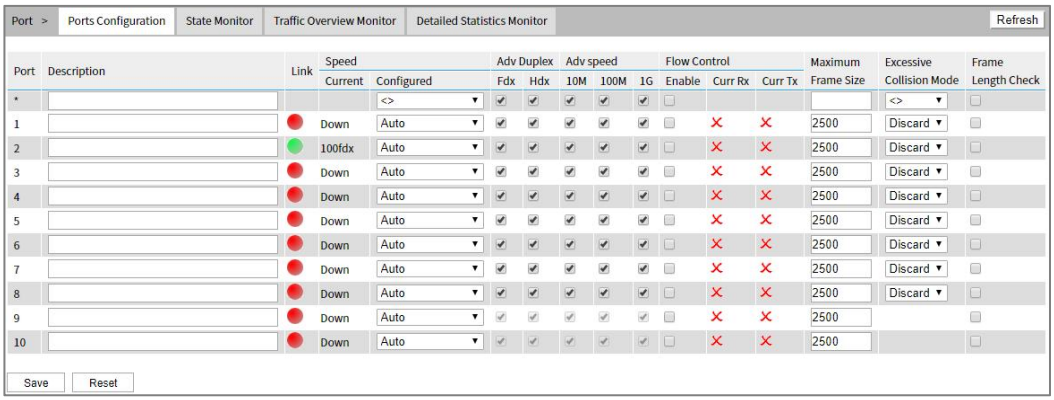
>>: Updates the system log entry to the next available entry ID.

>>|: Updates the system log entry to the last available entry ID.

2.6 Port

2.6.1 Port Settings

This feature displays current port configurations. Ports can also be configured using this feature.



Port

This is the logical port number for this row.

Description

The description of the port. It is an ASCII string no longer than 256 characters.

Link

The current link state is displayed graphically. Green indicates the link is up and red that it is down.

Current Link Speed

Current speed duplexes the current link speed of this port.

Configured Link Speed

Selects any available link speed for the given switch port. Only speeds supported by the specific port is shown. Possible speeds are:

- Disabled: disables the switch port.
- Auto: the port automatically negotiates the transmission speed and duplex with the connected device, and keeps the highest compatible speed with the connected device.
- 10Mbps HDX: Forces the port in 10 Mbps half duplex mode.
- 10Mbps FDX: Forces the port in 10 Mbps full duplex mode.
- 100Mbps HDX: Forces the port in 100 Mbps half duplex mode.
- 100Mbps FDX: Forces the port in 100 Mbps full duplex mode.
- 1Gbps FDX: Forces the port in 1 Gbps full duplex.
- 2.5Gbps FDX: Forces the port in 2.5Gbps full duplex mode.

Advertise Duplex

When duplex is set as auto that is, Autonegotiation, the port will only advertise the specified duplex as either Fdx or Hdx to the link partner. By default port will advertise all the supported duplexes if the Duplex is Auto.

Advertise Speed

When Speed is set as auto that is, Autonegotiation, the port will only advertise the specified speeds (10M 100M 1G) to the link partner. By default port will advertise all the supported speeds if speed is set as Auto.

Flow Control

When Auto Speed is selected on a port, this section indicates the flow control capability that is advertised to the link partner. When a fixed-speed setting is selected, that is what is used. The Current Rx column indicates whether pause frames on the port are obeyed, and the Current Tx column indicates whether pause frames on the

port are transmitted. The Rx and Tx settings are determined by the result of the last Auto-Negotiation.

Maximum Frame Size

Enter the maximum frame size allowed for the switch port, including FCS. The range is 1518-10240 bytes.

Excessive Collision Mode

Configure port transmit collision behavior.

- Discard: Discard frame after 16 collisions (default).
- Restart: Restart backoff algorithm after 16 collisions.

Frame Length Check

Configures if frames with incorrect frame length in the EtherType/Length field shall be dropped. An Ethernet frame contains a field EtherType which can be used to indicate the frame payload size (in bytes) for values of 1535 and below. If the EtherType/Length field is above 1535, it indicates that the field is used as an EtherType (indicating which protocol is encapsulated in the payload of the frame). If "frame length check" is enabled, frames with payload size less than 1536 bytes are dropped, if the EtherType/Length field doesn't match the actually payload length. If "frame length check" is disabled, frames are not dropped due to frame length mismatch. Note: Frames with mismatched frame lengths calculated by the calculator are not deleted.

Buttons

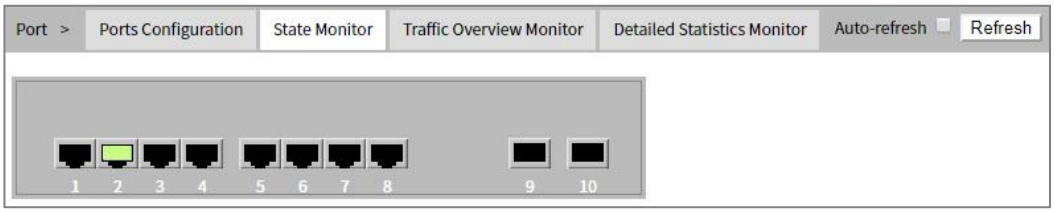
Save: Click to save changes.

Reset: Click to undo any changes made locally and revert to previously saved values.

Refresh: Click to refresh the page; any changes made locally will be undone.

2.6.2 Port State Monitoring

This page provides port state monitoring of the current switch.



The port states are illustrated as follows:

RJ45 port 

SFP ports 

Status Disable Disconnect Link

Buttons

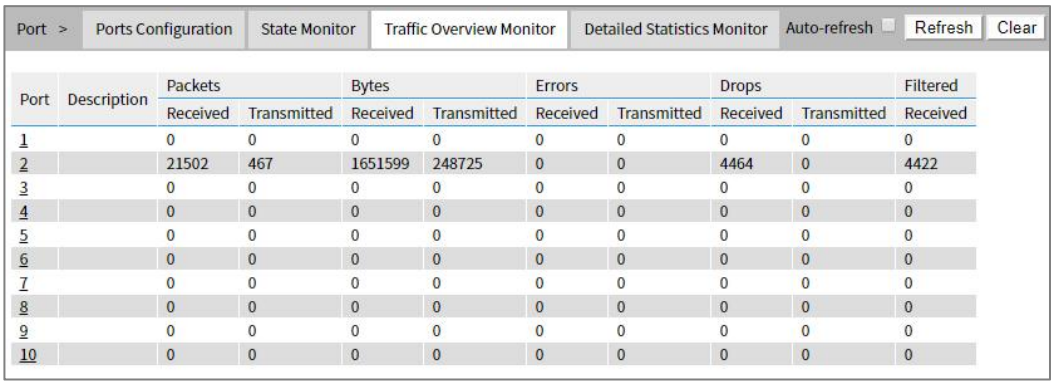
Auto-refresh: Check this box to refresh the page automatically. Automatic refresh occurs every 3 seconds.

Refresh: Click to refresh the page.

2.6.3 Summary Statistical Monitoring

This page provides an overview of general traffic statistics for all switch ports.

The displayed counters are:



Port	Description	Packets		Bytes		Errors		Drops		Filtered
		Received	Transmitted	Received	Transmitted	Received	Transmitted	Received	Transmitted	Received
1		0	0	0	0	0	0	0	0	0
2		21502	467	1651599	248725	0	0	4464	0	4422
3		0	0	0	0	0	0	0	0	0
4		0	0	0	0	0	0	0	0	0
5		0	0	0	0	0	0	0	0	0
6		0	0	0	0	0	0	0	0	0
7		0	0	0	0	0	0	0	0	0
8		0	0	0	0	0	0	0	0	0
9		0	0	0	0	0	0	0	0	0
10		0	0	0	0	0	0	0	0	0

Port

The switch port number.

Description

The description of the port.

Packets

The number of received and transmitted packets per port.

Bytes

The number of received and transmitted bytes per port.

Errors

The number of frames received in error and the number of incomplete transmissions per port.

Drops

The number of frames discarded due to ingress or egress congestion.

Filtered

The number of received frames filtered by the forwarding process.

Buttons

Refresh: Click to refresh the page immediately.

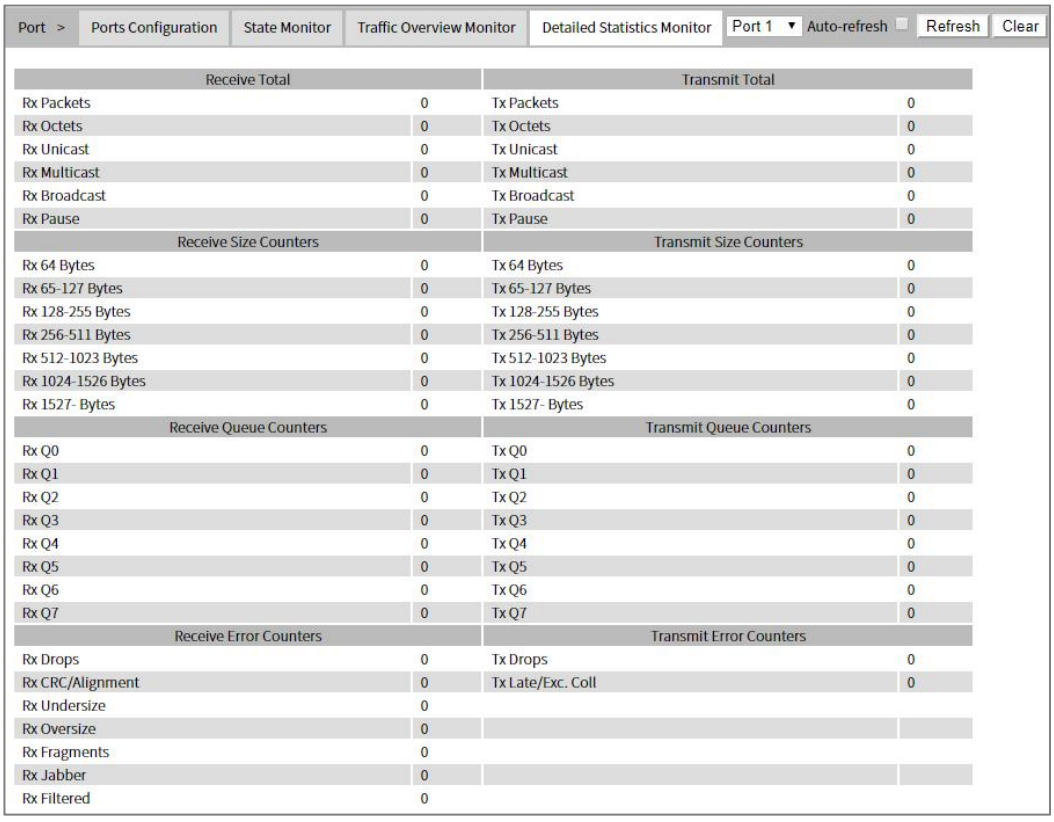
Clear: Clears the counters for all ports.

Auto-refresh: Check this box to enable an automatic refresh. Automatic refresh occurs every 3 seconds.

2.6.4 Detailed Port Statistics

This page provides detailed traffic statistics for a specific switch port. Use the port select box to select which switch port details to display.

The displayed counters are the totals for receive and transmit, the size counters for receive and transmit, and the error counters for receive and transmit.



Receive Total		Transmit Total	
Rx Packets	0	Tx Packets	0
Rx Octets	0	Tx Octets	0
Rx Unicast	0	Tx Unicast	0
Rx Multicast	0	Tx Multicast	0
Rx Broadcast	0	Tx Broadcast	0
Rx Pause	0	Tx Pause	0
Receive Size Counters		**Transmit Size Counters**	
Rx 64 Bytes	0	Tx 64 Bytes	0
Rx 65-127 Bytes	0	Tx 65-127 Bytes	0
Rx 128-255 Bytes	0	Tx 128-255 Bytes	0
Rx 256-511 Bytes	0	Tx 256-511 Bytes	0
Rx 512-1023 Bytes	0	Tx 512-1023 Bytes	0
Rx 1024-1526 Bytes	0	Tx 1024-1526 Bytes	0
Rx 1527- Bytes	0	Tx 1527- Bytes	0
Receive Queue Counters		**Transmit Queue Counters**	
Rx Q0	0	Tx Q0	0
Rx Q1	0	Tx Q1	0
Rx Q2	0	Tx Q2	0
Rx Q3	0	Tx Q3	0
Rx Q4	0	Tx Q4	0
Rx Q5	0	Tx Q5	0
Rx Q6	0	Tx Q6	0
Rx Q7	0	Tx Q7	0
Receive Error Counters		**Transmit Error Counters**	
Rx Drops	0	Tx Drops	0
Rx CRC/Alignment	0	Tx Late/Exc. Coll	0
Rx Undersize	0		
Rx Oversize	0		
Rx Fragments	0		
Rx Jabber	0		
Rx Filtered	0		

Receiving statistics and sending statistics

Total receiving and sending data packets

The number of received and transmitted (good and bad) packets.

Rx and Tx Octets

Number of bytes received and sent (good and bad). Includes FCS, but excludes framing bits.

Receiving and sending unicast packets

The number of unicast packets received and sent (good and bad).

Receiving and sending multicast packets

The number of multicast packets received and sent (good and bad).

Receiving and sending broadcast packets

Number of broadcast packets received and sent (good and bad).

Receiving and sending Pause frames

A count of MAC control frames received or sent on this port, which have an opcode indicating pause operation.

Receiving and sending message length statistics

Number of packets of different lengths received and sent. They are categorized according to their respective frame sizes.

Receive and Transmit Queue Counters

The number of received and transmitted packets per input and output queue.

Receive Error Counters

Rx Drops

The number of frames dropped due to lack of receive buffers or egress congestion.

Rx CRC/Alignment

The number of frames received with CRC or alignment errors.

Rx Undersize

The number of short 1 frames received with valid CRC.

Rx Oversize

The number of long 2 frames received with valid CRC.

Rx Fragments

The number of short 1 frames received with invalid CRC.

Rx Jabber

The number of long 2 frames received with invalid CRC.

Rx Filtered

The number of received frames filtered by the forwarding process.

1 Short frames are frames that are smaller than 64 bytes.

2 Long frames are frames that are longer than the configured maximum frame length for this port.

Transmit Error Counters

Tx Drops

The number of frames dropped due to output buffer congestion.

Tx Late/Exc.Coll

The number of frames dropped due to excessive or late collisions.

Buttons

The port select box determines which port is affected by clicking the buttons.

Refresh: Click to refresh the page immediately.

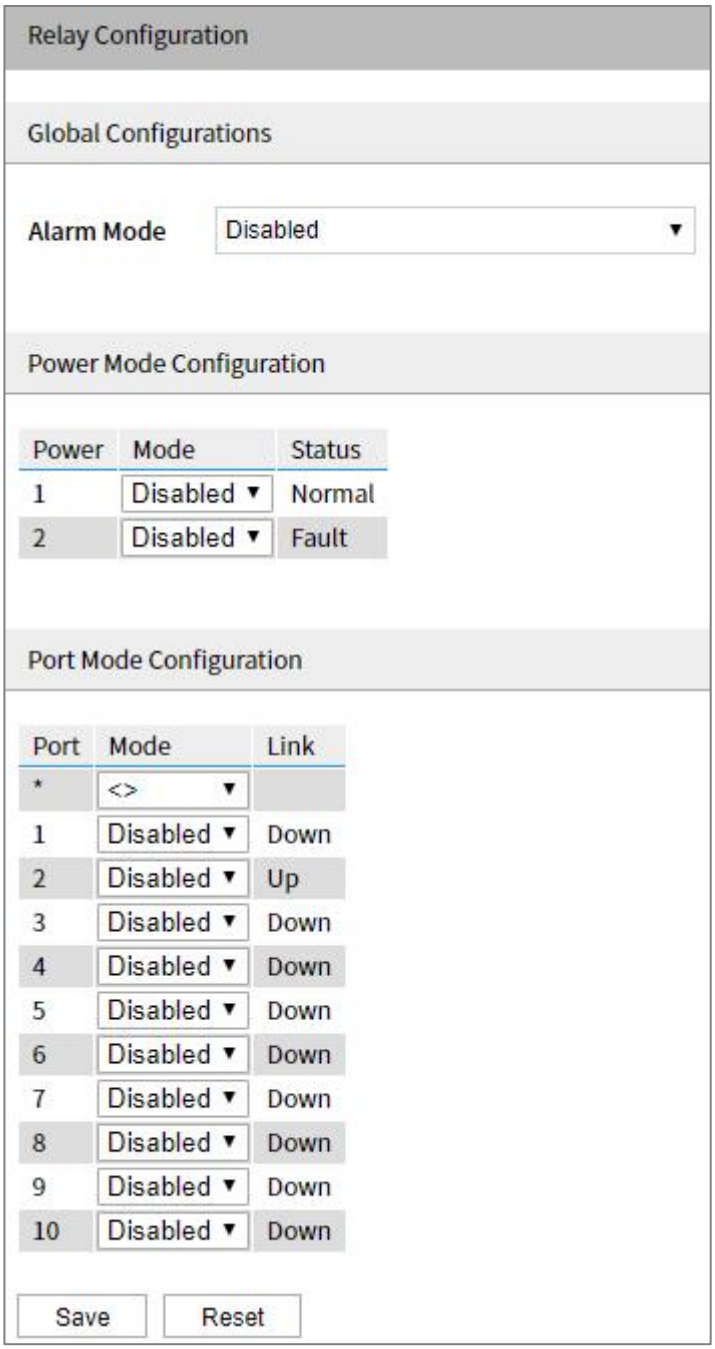
Clear: Clears the counters for all ports.

Auto-refresh: Check this box to enable an automatic refresh. Automatic refresh occurs every 3 seconds.

2.7 Relay Alarm

2.7.1 Relay Configuration

On the page of “Relay Configuration”, user can enable power supply, port alarm, and configure relevant alarm information.



Stack Global Settings

Alarm Mode

Enable relay alarm or not, options as follows:

- Enable
- Disable

Power Mode Configuration

Power

Display power supply of the device, value is 1 or 2.

Mode

Enable the power supply alarm or not, options as follows:

- Enable: when the power supply fails, power supply alarm will be triggered.
- Disable

Link

Connection status of power supply, the device will automatically recognize and display, values include:

- Fault
- Normal.

Port Mode Configuration

Port

Displays the port number of the device.

Pattern

Enable the port alarm or not, options as follows:

- Enable: when the port is disconnected, port alarm will be triggered.
- Disable

Link

Connection status of the port, the device will automatically recognize and display, values include:

- Connection
- Not connected

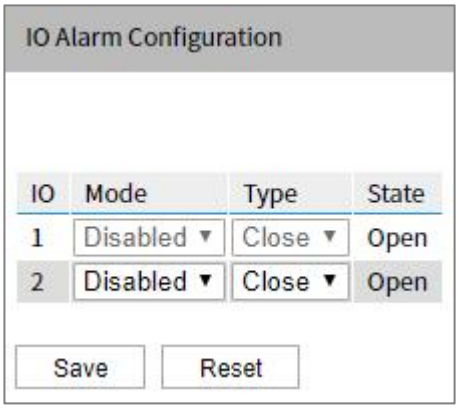
Buttons

Save: Click to save changes.

Reset: Click to undo any changes made locally and revert to previously saved values.

2.8 IO Alarm

On the page of “IO Alarm”, user can enable IO alarm and configure IO alarm information.



IO

Display IO number of the device, value is 1 or 2.

Pattern

Enable the IO alarm or not, options as follows:

- Enable
- Disable

Type

Configure the type of enabling IO alarm, when input state conforms to the value of Type, IO alarm will be triggered. Type options as follows:

- Open
- Close
- Both

Status

IO input state, the device will automatically recognize and display, values as follows:

- Open
- Close

Buttons

Save: Click to save changes.

Reset: Click to undo any changes made locally and revert to previously saved values.

3 Safety Device

3.1 User Configuration

This option provides an overview of the current users. Currently, the only way to log in as another user on the web server is to close and reopen the browser.

The values displayed by each user are:

User name

The name identifying the user. This is also a link to edit a user.

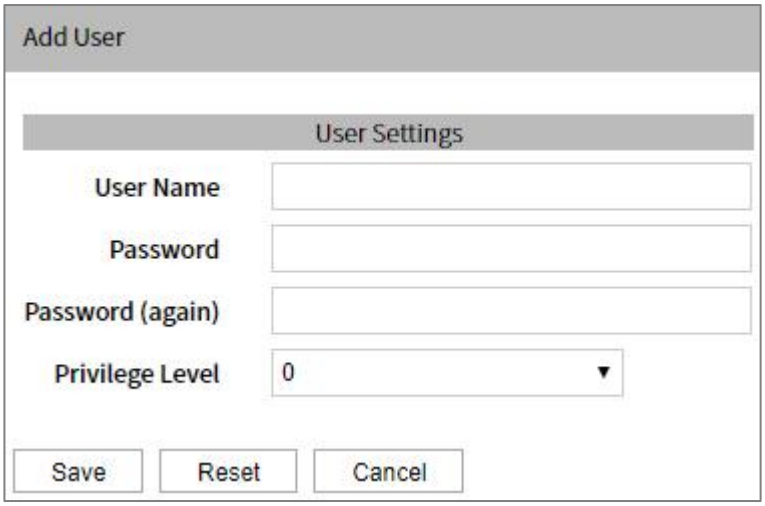
Privilege Level

The privilege level of the user. The allowed range is 0 to 15. If the privilege level value is 15, it can access all groups, that is, that is granted the fully control of the device. However, other values need to refer to the privilege level of each group. User's privilege should be same or greater than the group privilege level to have the access of that group. By default setting, most groups privilege level 5 has the read-only access and privilege level 10 has the read-write access. And the system maintenance (software upload, factory defaults, and so on) need user privilege level 15. Generally, the privilege level 15 can be used for an administrator account, privilege level 10 for a standard user account and privilege level 5 for a guest account.

Buttons

Add New User: Click this button to add a new user.

This page configures a user.



User Name

A string identifying the user name that this entry should belong to. The allowed string length is 1 to 31. The valid user name allows letters, numbers and underscores.

Password

The password of the user. The allowed string length is 0 to 31. Any printable characters including space is accepted.

Privilege Level

The privilege level of the user. The allowed range is 0 to 15. If the privilege level value is 15, it can access all groups, i.e. that is granted the fully control of the device. But others value need to refer to each group privilege level. User's privilege should be same or greater than the group privilege level to have the access of that group. By default setting, most groups privilege level 5 has the read-only access and privilege level 10 has the read-write access. And the system maintenance (software upload, factory defaults and etc.) need user privilege level 15. Generally, the privilege level 15 can be used for an administrator account, privilege level 10 for a standard user account and privilege level 5 for a guest account.

Buttons

Save: Click to save changes.

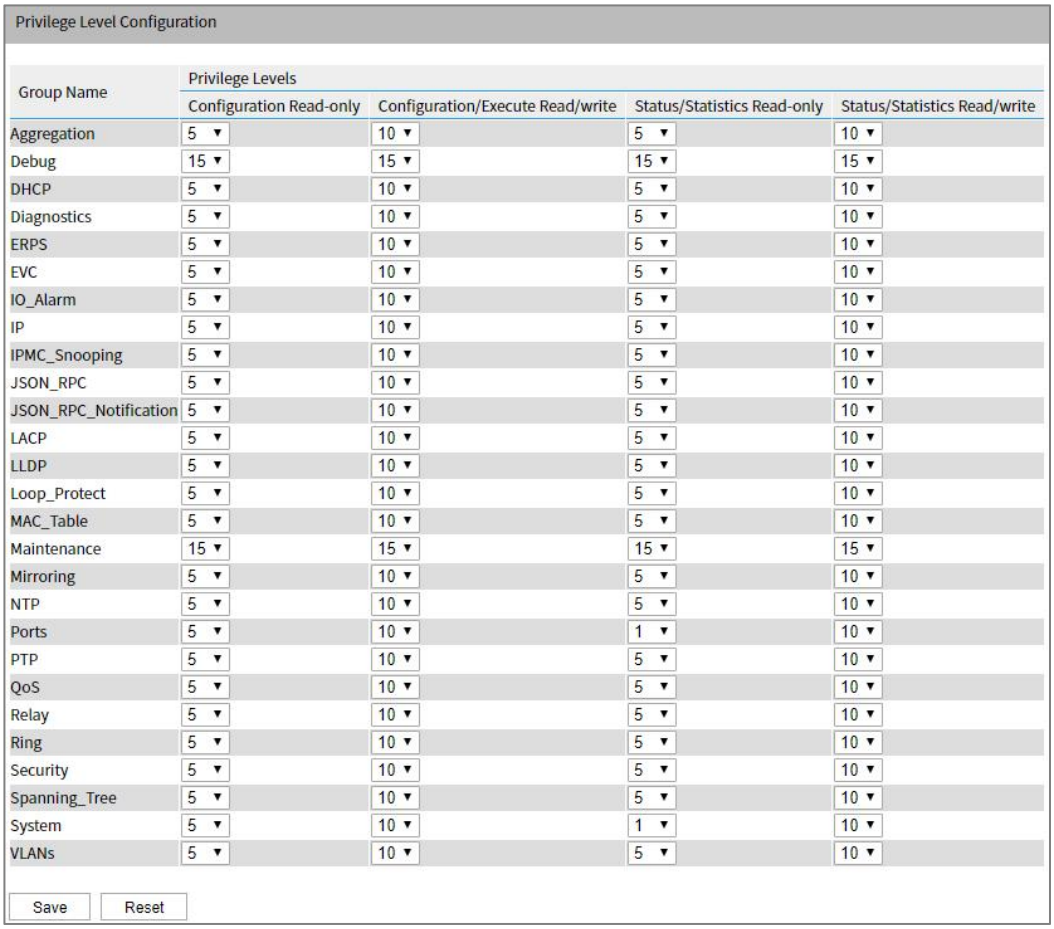
Reset: Click to undo any changes made locally and revert to previously saved values.

Back: Click to undo any changes made locally and return to the Users.

Delete user: Delete the current user. This button is not available for new configurations (Add new user)

3.2 Privilege Level

This option provides an overview of the privilege levels configuration.



Group Name

The name identifying the privilege group. In most cases, a privilege level group consists of a single module (for example, LACP, RSTP or QoS), but a few of them contains more than one. The following description defines these privilege level groups in details:

- System: Contact, Name, Location, Time Zone, Log.
- Security: Authentication, System Access Management, Port (including Dot1x port, MAC based and the MAC Address Limit), ACL, HTTPS, SSH, ARP Inspection, IP source guard.
- IP: Everything except ping.
- Port: Everything except VeriPHY.
- Diagnostics: Ping and VeriPHY.

- Maintenance: CLI- System Reboot, System Restore Default, System Password, Configuration Save, Configuration Load and Firmware Load. Web- Users, Privilege Levels and everything in Maintenance.
- Debug: Only present in CLI.

Privilege Level

Every group has an authorization Privilege level for the following sub groups: configuration read-only, configuration/execute read-write, status/statistics read-only, status/statistics read-write (for example, for clearing of statistics). User Privilege should be same or greater than the authorization Privilege level to have the access to that group.

Buttons

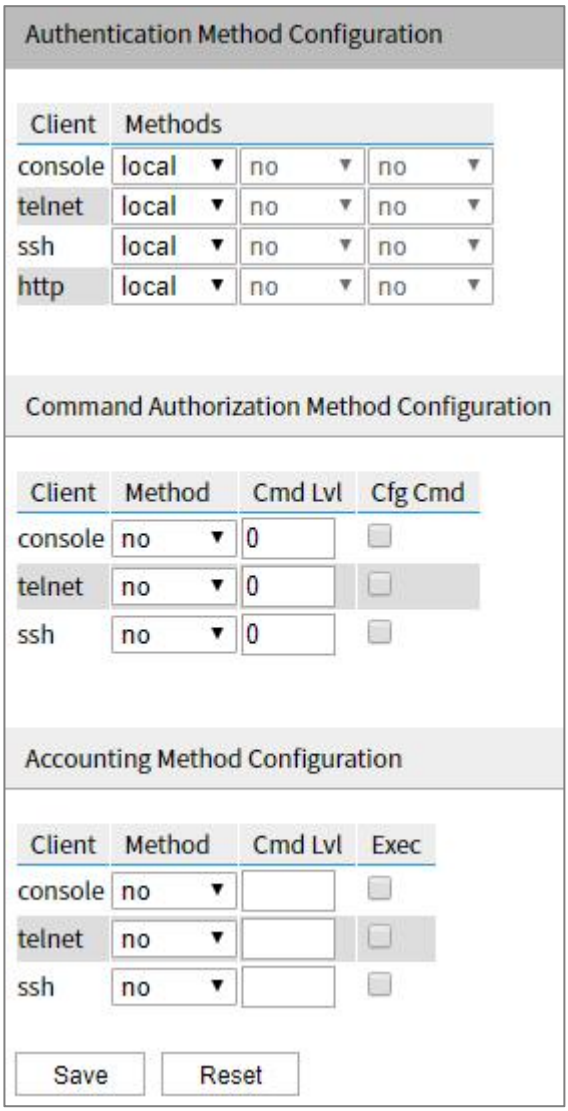
Save: Click to save changes.

Reset: Click to undo any changes made locally and revert to previously saved values.

3.3 Authentication method

Authentication Method Configuration

This option allows you to configure how a user is authenticated when he logs into the switch via one of the management client interfaces.



The table has one row for each client type and a number of columns which are as follows:

Client

The management client for which the configuration below applies.

Method

Method can be set to one of the following values:

- no: Authentication is disabled and login is not possible.
- local: Use the local user database on the switch for authentication.
- radius: Uses one or more of the remote RADIUS servers for authentication.
- tacacs: Uses one or more of the remote TACACS+ servers for authentication.

Methods that involves remote servers are timed out if the remote servers are offline. In this case the next method is tried. Each method is tried from left to right and continues until a method either approves or rejects a user. If a remote server is used for primary authentication it is recommended to configure secondary authentication as

local. This will enable the management client to log in via the local user database if none of the configured authentication servers are alive.

Command Authorization Method Configuration

The command authorization section allows you to limit the CLI commands available to a user. The table has one row for each client type and a number of columns which are as follows:

Client

The management client for which the configuration below applies.

Method

Method can be set to one of the following values:

- no: disable command authorization. User is granted access to CLI commands according to his privilege level.
- tacacs: Uses one or more of the remote TACACS+ servers for command authorization. If all remote servers are offline, the user is granted access to CLI commands according to his privilege level.

Cmd Lvl

Authorizes all commands with a privilege level higher than or equal to this level. Valid values are in the range 0 to 15.

Cfg Cmd

Also, authorizes configuration commands.

Accounting Method Configuration

The accounting section allows you to configure command and exec (login) accounting. The table has one row for each client type and a number of columns which are as follows:

Client

The management client for which the configuration below applies.

Method

Method can be set to one of the following values:

- no: disable authentication.
- tacacs: Uses one or more of the remote TACACS+ servers for accounting.

Cmd Lvl

Enable statistics of all commands with a privilege level higher than or equal to this level. Valid values are in the range 0 to 15. Leave the field empty to disable command accounting.

Exec

Enables exec (login) accounting.

Buttons

Save: Click to save changes.

Reset: Click to undo any changes made locally and revert to previously saved values.

3.4 SSH Configuration

This option allows you to configure SSH.

Mode

The Mode option indicates the SSH mode operation. Possible modes are:

- Enabled: Enables SSH mode operation.
- Disabled: Disables SSH mode operation.

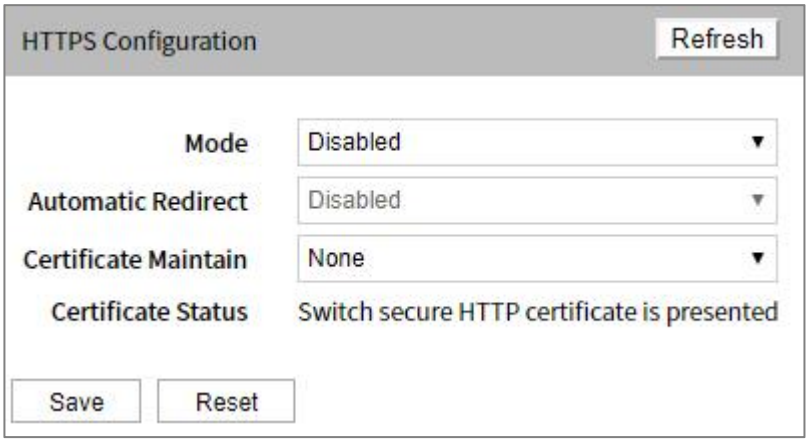
Buttons

Save: Click to save changes.

Reset: Click to undo any changes made locally and revert to previously saved values.

3.4.1 HTTPS Setting

This page allows you to configure the HTTPS settings and maintain the current certificate on the switch.



Mode

Indicate the HTTPS mode operation.

Possible modes are:

- Enabled: Enable HTTPS mode operation.
- Disabled: Disable HTTPS mode operation.

Automatic Redirect

Indicate the HTTPS redirect mode operation. It is only significant when "HTTPS Mode Enabled" is selected. When the redirect mode is enabled, the HTTP connection will be redirected to HTTPS connection automatically.

Notice that the browser may not allow the redirect operation due to the security consideration unless the switch certificate is trusted to the browser. You need to initialize the HTTPS connection manually for this case.

Possible modes are:

- Enabled: Enable HTTPS redirect mode operation.
- Disabled: Disable HTTPS redirect mode operation.

Certificate Maintain

The operation of certificate maintenance.

Possible operations are:

- None: No operation.
- Delete: Delete the current certificate.
- Upload: Upload a certificate PEM file. Possible methods are: Web Browser or URL.
- Generate: Generate a new self-signed RSA certificate.

Certificate Pass Phrase

Enter the pass phrase in this field if your uploading certificate is protected by a specific passphrase.

Certificate Upload

Upload a certificate PEM file into the switch. The file should contain the certificate and private key together. If you have two separated files for saving certificate and private key. Use the Linux cat command to combine them into a single PEM file. For example, cat my.cert my.key > my.pem

Notice that the RSA certificate is recommended since most of the new version of browsers has removed support for DSA in certificate, e.g. Firefox v37 and Chrome v39.

Possible methods are:

- Web Browser: Upload a certificate via Web browser.
- URL: Upload a certificate via URL, the supported protocols are HTTP, HTTPS, TFTP and FTP. URL format<protocol>://[<username>[:<password>]@]<host>[:<port>][/<path>]/<file_name>. For example, tftp://10.10.10.10/new_image_path/new_image.dat，http://username:password@10.10.10.10:80/new_image_path/new_image.dat.A valid file name is a text string drawn from alphabet (A-Z, a-z), digits (0-9), dot (.), hyphen (-), under score(_). The maximum length is 63 and hyphen must not be first character. The file name content that only contains '.' is not allowed.

Certificate Status

Display the current status of certificate on the switch.

Possible statuses are:

- The device security HTTP certificate has been submitted.
- The device security HTTP certificate has not been submitted.
- The device security HTTP certificate is generating ...

Buttons

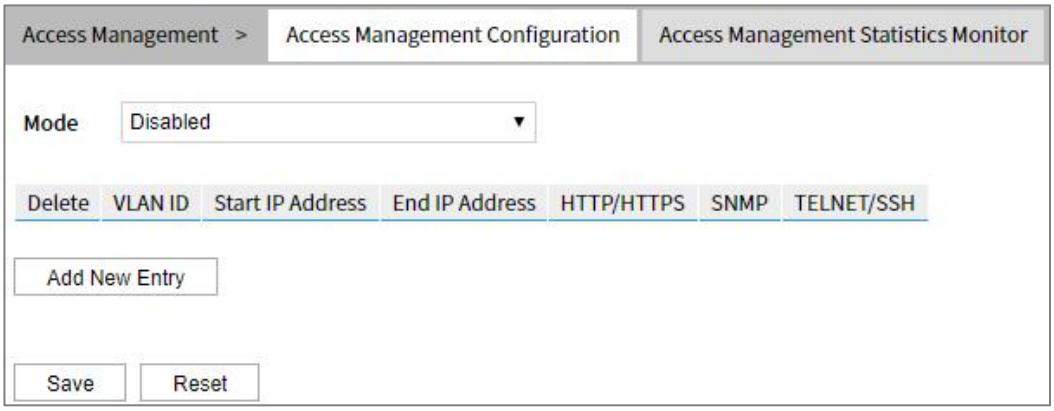
Save: Click to save changes.

Reset: Click to undo any changes made locally and revert to previously saved values.

3.5 Access Management

3.5.1 Access Management Configuration

This option allows you to configure access management. The maximum number of entries is 16. If the type of the application matches any one of the access management entries, it allows access to the switch.



Mode

Indicates the access management mode operation. Possible modes are:

- Enabled: Enables access management mode operation.
- Disabled: Disables access management mode operation.

Delete

Check the corresponding check box to delete an entry. It will be deleted during the next Save operation.

VLAN ID

Indicates the VLAN ID for the access management entry.

Start IP Address

Indicates the start IP address for the access management entry.

Ending IP Address

Indicates the end IP address for the access management entry.

HTTP/HTTPS

Indicates that the host can access the switch from HTTP/HTTPS interface if the host IP address matches the IP address range provided in the entry.

SNMP

Indicates that the host can access the switch from SNMP interface if the host IP address matches the IP address range provided in the entry.

TELNET/SSH

Indicates that the host can access the switch from TELNET/SSH interface if the host IP address matches the IP address range provided in the entry.

Buttons

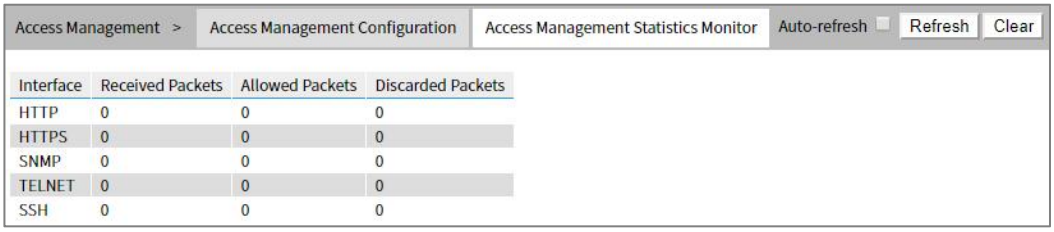
Add new entry: Click to add a new access management entry.

Save: Click to save changes.

Reset: Click to undo any changes made locally and revert to previously saved values.

3.5.2 Access Management Statistics Monitoring

This page provides statistics for access management.



Interface

The interface type through which the remote host can access the switch.

Received Packets

Number of received packets from the interface when access management mode is enabled.

Allowed Packets

Number of allowed packets from the interface when access management mode is enabled.

Discarded Packets

Number of discarded packets from the interface when access management mode is enabled.

Buttons

Auto-refresh: Check this box to refresh the page automatically. Automatic refresh occurs every 3 seconds.

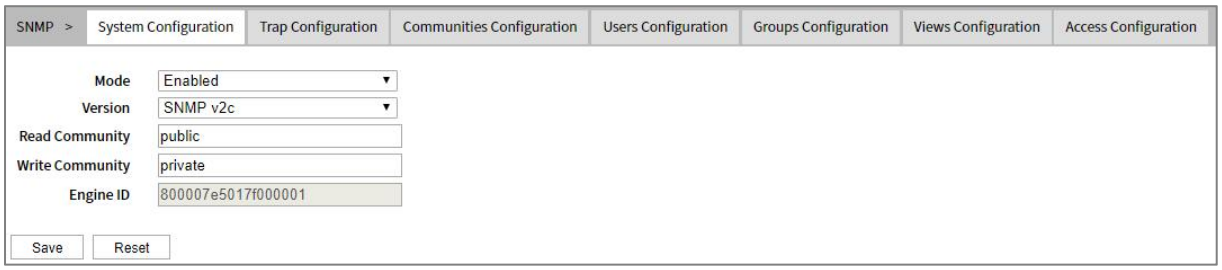
Refresh: Click to refresh the page immediately.

Clear: Clear all statistics.

3.6 SNMP

3.6.1 System Configuration

This option allows you to system configure the SNMP feature.



Mode

Indicates the SNMP mode operation. Possible modes are:

- Enabled: Enables SNMP mode operation.
- Disabled: Disables SNMP mode operation.

Version

Indicates the SNMP supported version. Possible versions are:

- SNMP v1: Set version 1 supported by SNMP.
- SNMP v2c: Set SNMP supported version 2c.
- SNMP v3: Set version 3 supported by SNMP.

Read Community

Indicates the community read access string to permit access to SNMP agent. The allowed string length is 1 to 255, and the allowed content is the ASCII characters from 33 to 126. The field is applicable only when SNMP version is SNMPv1 or SNMPv2c. If SNMP version is SNMPv3, the community string is associated with SNMPv3 communities table. It provides more flexibility to configure security name than a SNMPv1 or SNMPv2c community string. In addition to community string, a particular range of source addresses can be used to restrict source subnet.

Write Community

Indicates the community write access string to permit access to SNMP agent. The allowed string length is 1 to 255, and the allowed content is the ASCII characters from 33 to 126. The field is applicable only when SNMP version is SNMPv1 or SNMPv2c. If SNMP version is SNMPv3, the community string is associated with SNMPv3 communities table. It provides more flexibility to configure security name than a SNMPv1 or SNMPv2c community string. In addition to community string, a particular range of source addresses can be used to restrict source subnet.

Engine ID

Indicates the SNMPv3 engine ID. The string must contain an even number(in hexadecimal format) with number of digits between 10 and 64, but all-zeros and all-'F's are not allowed. Change of the Engine ID will clear all original local users.

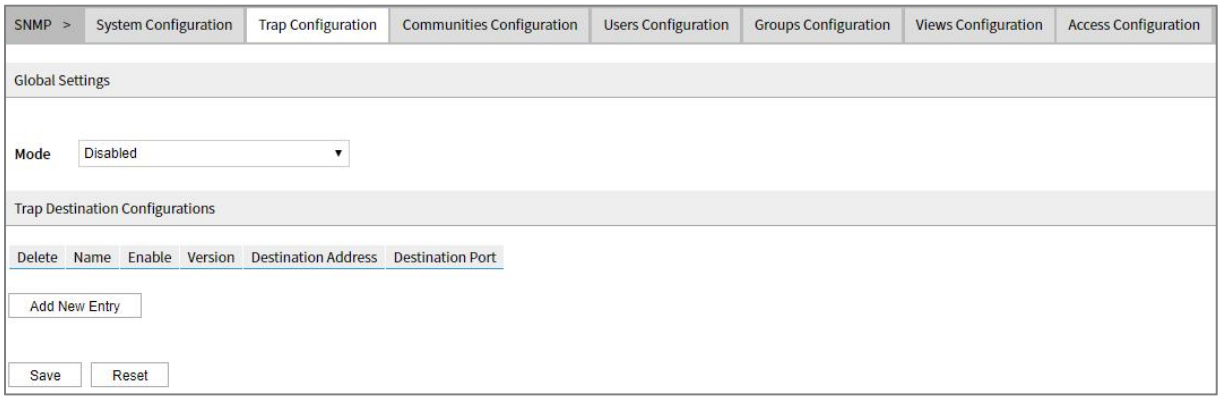
Buttons

Save: Click to save changes.

Reset: Click to undo any changes made locally and revert to previously saved values.

3.6.2 Trap Configuration

This option allows you to configure the SNMP trap feature.



Global Settings

Mode

Indicates the trap mode operation. Possible modes are as follows:

- Enabled: Enables SNMP trap mode operation.
- Disabled: Disables SNMP trap mode operation.

Trap Destination Configurations

Configure trap destinations on this page.

Name

Indicates the name of the trap configuration.

Enable

Indicates the trap destination mode operation. Possible modes are as follows:

- Enabled: Enables SNMP trap mode operation.
- Disabled: Disables SNMP trap mode operation.

Version

Indicates the SNMP trap supported version. Possible versions are as follows:

- SNMPv1: Sets SNMP trap supported version 1.
- SNMPv2c: Sets SNMP trap supported version 2c.
- SNMPv3: Set SNMP trap supported version 3.

Destination Address

Indicates the SNMP trap destination address. It allows a valid IP address in dotted decimal notation ('x.y.z.w') as well as a valid hostname. A valid host name is a string extracted from alphabet (A-Z, a-z), number (09), dot (.) and dash (-). Spaces are not allowed, the first character must be an alpha character, and the first and last characters must not be a dot or a dash. Indicates the SNMP trap destination IPv6 address. A IPv6 address is in 128-bit records represented as eight fields of up to four hexadecimal digits with a colon separating each field (:). For example, 'fe80::215:c5ff:fe03:4dc7'. The symbol is a special syntax that can be used as a shorthand way of representing multiple 16-bit groups of contiguous zeros; but it can appear only once. It can also represent a legally valid IPv4 address. For example, "::192.1.2.34".

Target Port

Indicates the SNMP trap destination port. SNMP Agent sends an SNMP message via this port. The port range is 1~65535.

Buttons

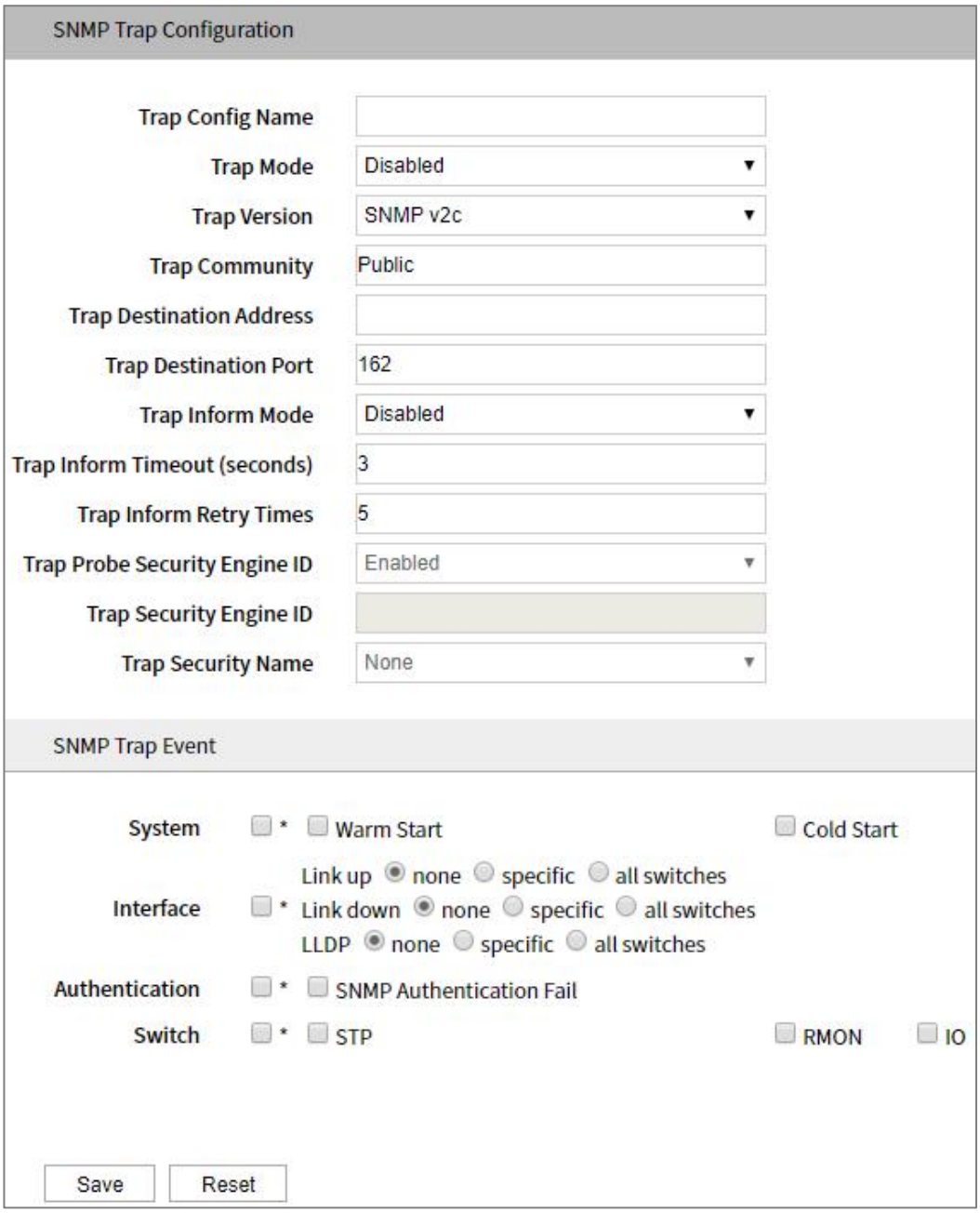
Add new entry: Click to add a new user.

Save: Click to save changes.

Reset: Click to undo any changes made locally and revert to previously saved values.

3.6.2.1 SNMP Trap Configuration

Configure SNMP trap on this page.



Trap Config Name

Indicates which trap Configuration's name for configuring. The allowed string length is 1 to 32, and the allowed content is ASCII characters from 33 to 126.

Trap Mode

Indicates the SNMP mode operation. Possible modes are:

- Enabled: Enable SNMP mode operation.
- Disabled: Disable SNMP mode operation.

Trap Version

Indicates the SNMP supported version. Possible versions are:

- SNMP v1: Set version 1 supported by SNMP.

- SNMP v2c: Set SNMP supported version 2c.
- SNMP v3: Set version 3 supported by SNMP.

Trap Community

Indicates the community access string when sending SNMP trap packet. The allowed string length is 0 to 255, and the allowed content is ASCII characters from 33 to 126.

Trap Destination Address

Indicates the SNMP trap destination address. It allows a valid IP address in dotted decimal notation ('x.y.z.w').

And it also allow a valid hostname. A valid host name is a string extracted from alphabet (A-Z, a-z), number (09), dot (.) and dash (-). Spaces are not allowed, the first character must be an alpha character, and the first and last characters must not be a dot or a dash.

Indicates the SNMP trap destination IPv6 address. A IPv6 address is in 128-bit records represented as eight fields of up to four hexadecimal digits with a colon separating each field (:). For example, 'fe80::215:c5ff:fe03:4dc7'. The symbol is a special syntax that can be used as a shorthand way of representing multiple 16-bit groups of contiguous zeros; but it can appear only once. It can also represent a legally valid IPv4 address. For example, "::192.1.2.34".

Trap Destination port

Indicates the SNMP trap destination port. SNMP Agent will send SNMP message via this port, the port range is 1~65535.

Trap Inform Mode

Indicates the SNMP trap inform mode operation. Possible modes are:

- Enabled: Enable SNMP trap inform mode operation.
- Disabled: Disable SNMP trap inform mode operation.

Trap Inform Timeout (seconds)

Indicates the SNMP trap inform timeout. The allowed range is 0 to 2147.

Trap Inform Retry Times

Indicates the SNMP trap inform retry times. The allowed range is 0 to 255.

Trap Probe Security Engine ID

Indicates the SNMP trap probe security engine ID mode of operation. Possible values are:

- Enabled: Enable SNMP trap probe security engine ID mode of operation.
- Disabled: Disable SNMP trap probe security engine ID mode of operation.

Trap Security Engine ID

Indicates the SNMP trap security engine ID. SNMPv3 sends traps and informs using USM for authentication and privacy. A unique engine ID for these traps and informs is needed. When "Trap Probe Security Engine ID" is enabled, the ID will be probed automatically. Otherwise, the ID specified in this field is used. The string must contain an even number(in hexadecimal format) with number of digits between 10 and 64, but all-zeros and all-'F's are not allowed.

Trap Security Name

Indicates the SNMP trap security name. SNMPv3 traps and informs using USM for authentication and privacy. A unique security name is needed when traps and informs are enabled.

SNMP Trap Event

Configure SNMP trap on this page.

System

Enable/disable that the Interface group's traps. Possible traps are:

- Warm Start: Enable/disable Warm Start trap.
- Cold Start: Enable/disable Cold Start trap.

Interface

Indicates that the Interface group's traps. Possible traps are: Indicates that the SNMP entity is permitted to generate authentication failure traps. Possible modes are:

- Link Up: Enable/disable Link up trap.
- Link Down: Enable/disable Link down trap.
- LLDP: Enable/disable LLDP trap.

Authentication

Indicates that the authentication group's traps. Possible traps are:

- SNMP authentication failure: Enable/disable SNMP trap authentication failure trap.

Enable

Indicates that the Switch group's traps. Possible traps are:

- STP: Enable/disable STP trap.
- RMON: Enable/disable RMON trap.

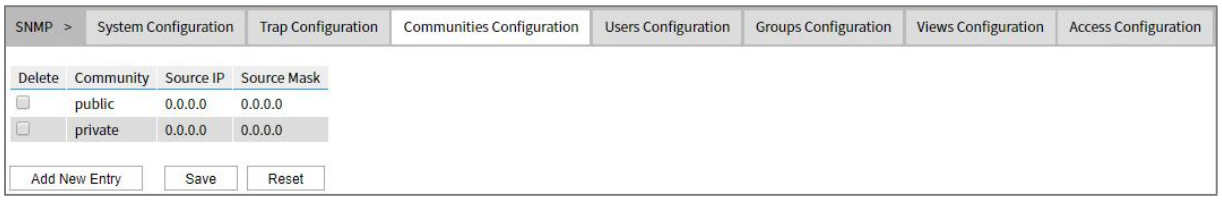
Buttons

Save: Click to save changes.

Reset: Click to undo any changes made locally and revert to previously saved values.

3.6.3 Community Configuration

This option allows you to configure SNMPv3 community table. The entry index key is Community.



Delete

Check the corresponding check box to delete an entry. It will be deleted during the next Save operation.

Community

Indicates the community access string to permit access to SNMPv3 agent. The allowed string length is 1 to 32, and the allowed content is ASCII characters from 33 to 126. The community string will be treated as security name and map a SNMPv1 or SNMPv2c community string.

Source IP

Indicates the SNMP access source address. A particular range of source addresses can be used to restrict source subnet when combined with source mask.

Source Mask

Indicates the SNMP access source address mask.

Buttons

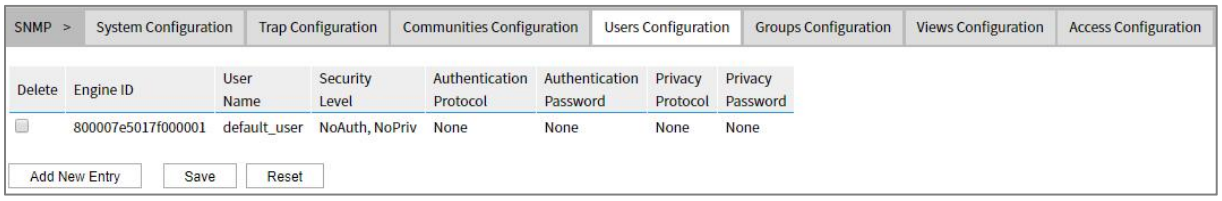
Add new community entry: Click to add a new community entry.

Save: Click to save changes.

Reset: Click to undo any changes made locally and revert to previously saved values.

3.6.4 User Configuration

This option allows you to configure SNMPv3 user table. The entry index keys are Engine ID and User Name.



Delete

Check the corresponding check box to delete an entry. It will be deleted during the next Save operation.

Engine ID

An octet string identifying the engine ID that this entry should belong to. The string must contain an even number(in hexadecimal format) with number of digits between 10 and 64, but all-zeros and all-'F's are not allowed. The SNMPv3 architecture uses the User-based Security Model (USM) for message security and the View-based Access Control Model (VACM) for access control. For the USM entry, the usmUserEngineID and usmUserName are the entry's keys. In a simple agent, usmUserEngineID is always that agent's own snmpEngineID value. The value can also take the value of the snmpEngineID of a remote SNMP engine with which this user can communicate. In other words, if user engine ID equal system engine ID then it is a local user; otherwise it is a remote user.

Username

A string identifying the user name that this entry should belong to. The allowed string length is 1 to 32, and the allowed content is ASCII characters from 33 to 126.

Security Level

Indicates the security model that this entry should belong to. Possible security models are:

- NoAuth, NoPriv: No authentication and no encryption.
- Auth, NoPriv: Authentication and no encryption.
- Auth, Priv: Authentication and encryption.

The value of security level cannot be modified if entry already exists. That means must first ensure that the value is set correctly.

Authentication Mode

Indicates the authentication protocol that this entry should belong to. Possible modes are:

- None: No authentication protocol.
- MD5: An optional flag to indicate that this user uses MD5 authentication protocol.
- SHA: An optional flag to indicate that this user uses SHA authentication protocol.

The value of security level cannot be modified if entry already exists. That means must first ensure that the value is set correctly.

Authentication Password

A string identifying the authentication password phrase. For MD5 authentication protocol, the allowed string length is 8 to 32. For SHA authentication protocol, the allowed string length is 8 to 40. The allowed content is ASCII characters from 33 to 126.

Privacy Protocol

Indicates the privacy protocol that this entry should belong to. Possible privacy protocols are:

- None: No privacy protocol.
- DES: An optional flag to indicate that this user uses DES authentication protocol.
- AES: An optional flag to indicate that this user uses AES authentication protocol.

Privacy Password

A string identifying the privacy password phrase. The allowed string length is 8 to 32, and the allowed content is ASCII characters from 33 to 126.

Buttons

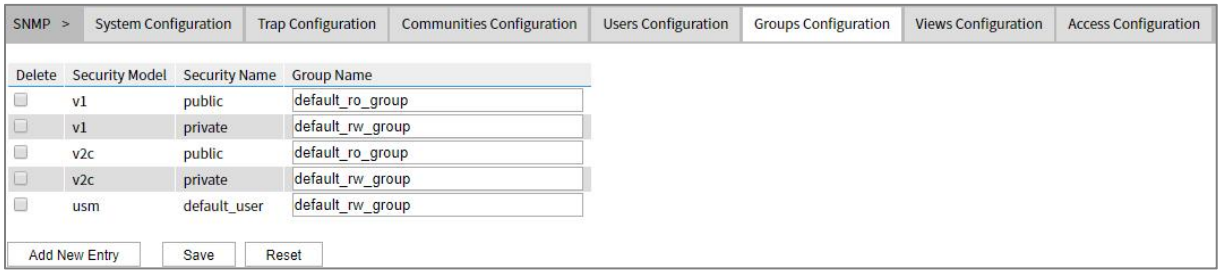
Add New Entry: Click to add new entry.

Save: Click to save changes.

Reset: Click to undo any changes made locally and revert to previously saved values.

3.6.5 Group Configuration

This option allows you to configure the SNMPv3 group table. The entry index keys are Security Model and Security Name.



Delete

Check the corresponding check box to delete an entry. It will be deleted during the next Save operation.

Security Model

Indicates the security model that this entry should belong to. Possible security models are as follows:

- v1: Reserved for SNMPv1.
- v2c: Reserved for SNMPv2c.
- usm: User-based Security Model (USM).

Security Name

A string identifying the security name that this entry should belong to. The allowed string length is 1 to 32, and the allowed content is ASCII characters from 33 to 126.

Group Name

A string identifying the group name that this entry should belong to. The allowed string length is 1 to 32, and the allowed content is ASCII characters from 33 to 126.

Buttons

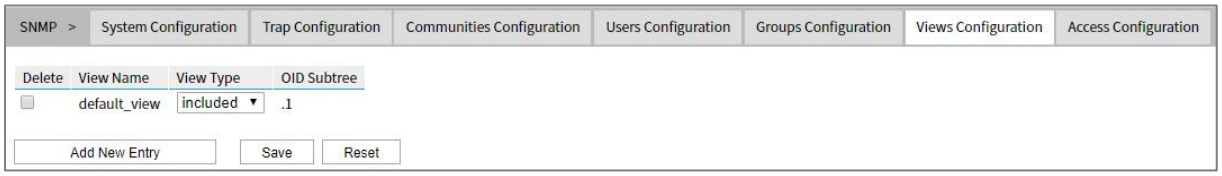
Add new group entry: Click to add a new community entry.

Save: Click to save changes.

Reset: Click to undo any changes made locally and revert to previously saved values.

3.6.6 View Configuration

Configure SNMPv3 view table on this page. The entry index keys are View Name and OID Subtree.



Delete

Check to delete the entry. It will be deleted during the next save.

View Name

A string identifying the view name that this entry should belong to. The allowed string length is 1 to 32, and the allowed content is ASCII characters from 33 to 126.

View Type

Indicates the view type that this entry should belong to. Possible view types are:

- included: An optional flag to indicate that this view subtree should be included.
- excluded: An optional flag to indicate that this view subtree should be excluded.

In general, if a view entry's view type is 'excluded', there should be another view entry existing with view type as 'included' and it's OID subtree should overstep the 'excluded' view entry.

OID Subtree

The OID defining the root of the subtree to add to the named view. The allowed OID length is 1 to 128. The allowed string content is digital number or asterisk(*).

Buttons

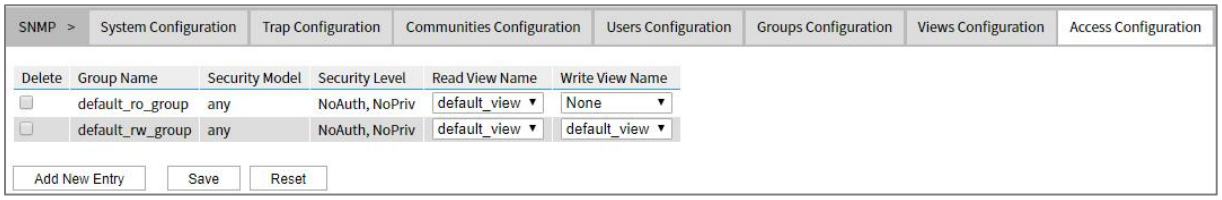
Add new view entry: click to add a new view entry.

Save: Click to save changes.

Reset: Click to undo any changes made locally and revert to previously saved values.

3.6.7 Access Configuration

Configure SNMPv3 access table on this page. The entry index keys are Group Name, Security Model and Security Level.



Delete

Check to delete the entry. It will be deleted during the next save.

Group Name

A string identifying the group name that this entry should belong to. The allowed string length is 1 to 32, and the allowed content is ASCII characters from 33 to 126.

Security Model

Indicates the security model that this entry should belong to. Possible security models are:

- any: Any security model accepted(v1|v2c|usm).
- v1: Reserved for SNMPv1.
- v2c: Reserved for SNMPv2c.
- usm: User-based Security Model (USM).

Security Level

Indicates the security model that this entry should belong to. Possible security models are:

- NoAuth, NoPriv: No authentication and no encryption.
- Auth, NoPriv: Authentication and no encryption.
- Auth, Priv: Authentication and encryption.

Read View Name

The name of the MIB view defining the MIB objects for which this request may request the current values. The allowed string length is 1 to 32, and the allowed content is ASCII characters from 33 to 126.

Write View Name

The name of the MIB view defining the MIB objects for which this request may potentially set new values. The allowed string length is 1 to 32, and the allowed content is ASCII characters from 33 to 126.

Buttons

Add new access entry: click to add a new access entry.

Save: Click to save changes.

Reset: Click to undo any changes made locally and revert to previously saved values.

3.7 RMON

3.7.1 Statistics Configuration

Configure RMON Statistics table on this page. The entry index key is ID.

Delete

Check to delete the entry. It will be deleted during the next save.

ID

Indicates the index of the entry. The range is from 1 to 65535.

Data Source

Indicates the port ID which wants to be monitored. If in stacking switch, the value must add 1000000*(switch ID-1), for example, if the port is switch 3 port 5, the value is 2000005.

Buttons

Add new entry: Click to add a new community entry.

Save: Click to save changes.

Reset: Click to undo any changes made locally and revert to previously saved values.

3.7.2 History Configuration

Configure RMON History table on this page. The entry index key is ID.

Delete

Check to delete the entry. It will be deleted during the next save.

ID

Indicates the index of the entry. The range is from 1 to 65535.

Data Source

Indicates the port ID which wants to be monitored. If in stacking switch, the value must add 1000000*(switch ID-1), for example, if the port is switch 3 port 5, the value is 2000005.

Sampling Interval

Indicates the interval in seconds for sampling the history statistics data. The range is from 1 to 3600, default value is 1800 seconds.

Buckets

Indicates the maximum data entries associated this History control entry stored in RMON. The range is from 1 to 3600, default value is 50.

Buckets Granted

The number of data shall be saved in the RMON.

Buttons

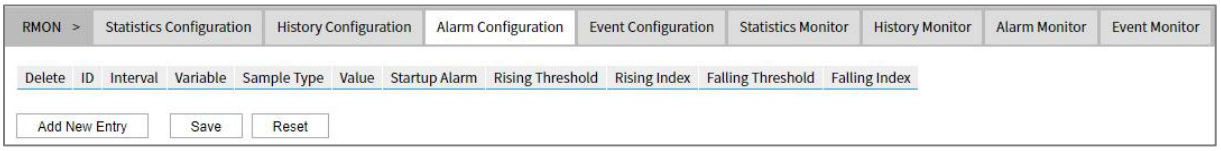
Add new entry: Click to add a new community entry.

Save: Click to save changes.

Reset: Click to undo any changes made locally and revert to previously saved values.

3.7.3 Alarm Configuration

Configure RMON alarm table on this page. The entry index key is ID.



Delete

Check to delete the entry. It will be deleted during the next save.

ID

Indicates the index of the entry. The range is from 1 to 65535.

Sampling interval

Indicates the interval in seconds for sampling and comparing the rising and falling threshold. The range is from 1 to 2^31-1.

Variable

Indicates the particular variable to be sampled, the possible variables are:

- InOctets: The total number of octets received on the interface, including framing characters.
- InUcastPkts: The number of unicast packets delivered to a higher-layer protocol.
- InNUcastPkts: The number of broad-cast and multi-cast packets delivered to a higher-layer protocol.
- InDiscards: The number of inbound packets that are discarded even the packets are normal.
- InErrors: The number of inbound packets that contained errors preventing them from being deliverable to a higher-layer protocol.
- InUnknownProtos: the number of the inbound packets that were discarded because of the unknown or un-support protocol.
- OutOctets: The number of octets transmitted out of the interface , including framing characters.
- OutUcastPkts: The number of uni-cast packets that request to transmit.
- OutNUcastPkts: The number of broad-cast and multi-cast packets that request to transmit.
- OutDiscards: The number of outbound packets that are discarded event the packets is normal.
- OutErrors: The number of outbound packets that could not be transmitted because of errors.
- OutQLen: The length of the output packet queue (in packets).

Sample Type

The method of sampling the selected variable and calculating the value to be compared against the thresholds, possible sample types are:

- Absolute: Get the sample directly.
- Delta: Calculate the difference between samples (default).

Variable

The value of the statistic during the last sampling period.

Startup Alarm

The method of sampling the selected variable and calculating the value to be compared against the thresholds, possible sample types are:

- RisingTrigger alarm when the first value is larger than the rising threshold.
- FallingTrigger alarm when the first value is less than the falling threshold.
- RisingOrFallingTrigger alarm when the first value is larger than the rising threshold or less than the falling threshold (default).

Rising Threshold

Rising threshold value (-2147483648-2147483647).

Rising Index

Rising event index (1-65535).

Falling Threshold

Falling threshold value (-2147483648-2147483647).

Falling Index

Falling event index (1-65535).

Buttons

Add new entry: Click to add a new community entry.

Save: Click to save changes.

Reset: Click to undo any changes made locally and revert to previously saved values.

3.7.4 Link Event Configuration

Configure RMON Event table on this page. The entry index key is ID.

Delete

Check to delete the entry. It will be deleted during the next save.

ID

Indicates the index of the entry. The range is from 1 to 65535.

Description

Indicates this event, the string length is from 0 to 127, default is a null string.

Type

Indicates the notification of the event, the possible types are:

- none: No operations.
- Log: When an event is triggered, create SNMP log entries.
- snmptrap: send SNMP trap when an event is triggered.
- Logandtrap: Create SNMP log entry and send SNMP trap when an event is triggered.

Community

Specify the community when trap is sent, the string length is from 0 to 127, default is "public".

Event Last Time

Indicates the value of sysUpTime at the time this event entry last generated an event.

Buttons

Add new entry: Click to add a new community entry.

Save: Click to save changes.

Reset: Click to undo any changes made locally and revert to previously saved values.

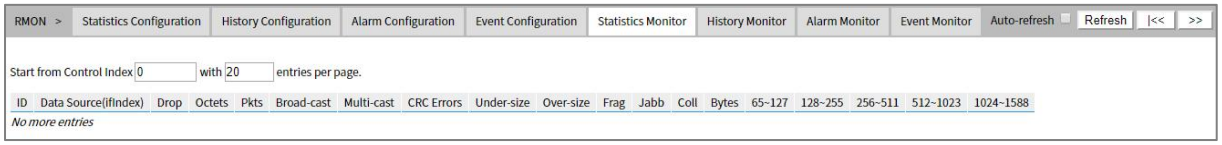
3.7.5 Statistics Monitoring

This page provides an overview of RMON Statistics entries. Each page shows up to 99 entries from the Alarm table, default being 20, selected through the "entries per page" input field. When first visited, the WEB page will show the first 20 entries from the beginning of the Statistics table. The first displayed will be the one with the lowest ID found in the Statistics table.

The "Start from Control Index" allows the user to select the starting point in the Alarm table. Clicking the “Refresh” button will update the displayed table starting from that or the next closest Statistics table match.

This “>>” button will use the last entry of the currently displayed entry as a basis for the next lookup. When the end is reached the text "No more entries" is shown in the displayed table. Use the “|<<” button to start over.

The displayed counters are:



ID

Indicates the index of Statistics entry.

Data Source(Interface)

The port ID which wants to be monitored.

Discarded Packets

The total number of events in which packets were dropped by the probe due to lack of resources.

Eight-bit Byte

The total number of octets of data (including those in bad packets) received on the network.

Packets

The total number of packets (including bad packets, broadcast packets, and multicast packets) received.

Broadcast

The total number of good packets received that were directed to the broadcast address.

Multicast

The total number of good packets received that were directed to a multicast address.

CRC Error

Total number of packets received. Eight-bit byte with length (excluding the frame part, but including FCS octets) between 64 and 1518, but there is an integer (FCS error) bad frame check sequence (FCS) of eight-bit byte or a bad FCS eight-bit byte which is not an integer (alignment error).

Undersize

The total number of packets received that were less than 64 octets.

Oversize

The total number of packets received that were longer than 1518 octets.

Fragment

The number of frames which size is less than 64 octets received with invalid CRC.

Expectation

The number of frames which size is larger than 64 octets received with invalid CRC.

Conflicts

The best estimate of the total number of collisions on this Ethernet segment.

Bytes

The total number of packets (including bad packets) received that were 64 octets in length.

65~127

The total number of packets (including bad packets) received that were between 65 to 127 octets in length.

128~255

The total number of packets (including bad packets) received that were between 128 to 255 octets in length.

256~511

The total number of packets (including bad packets) received that were between 256 to 511 octets in length.

512~1023

The total number of packets (including bad packets) received that were between 512 to 1023 octets in length.

1024~1588

The total number of packets (including bad packets) received that were between 1024 to 1588 octets in length.

Buttons

Auto-refresh: Check this box to refresh the page automatically. Automatic refresh occurs every 3 seconds.

Refresh: Click to refresh the page immediately.

|<<: Updates the table starting from the first entry in the Statistics table, i.e. the entry with the lowest ID.

>>: Updates the table, starting with the entry after the last entry currently displayed.

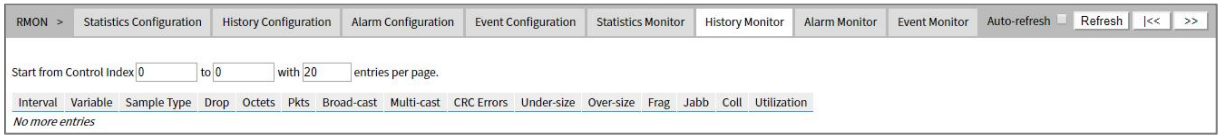
3.7.6 History Monitoring

This page provides an overview of RMON History entries. Each page shows up to 99 entries from the History table, default being 20, selected through the "entries per page" input field. When first visited, the WEB page will show the first 20 entries from the beginning of the History table. The first displayed will be the one with the lowest History Index and Sample Index found in the History table.

“Start from Control Index” allows the user to select a starting point in the history table. Clicking the “Refresh” button will update the displayed table starting from that or the next closest History table match.

This “>>” button will use the last entry of the currently displayed entry as a basis for the next lookup. When the end is reached the text "No more entries" is shown in the displayed table. Use the “|<<” button to start over.

The displayed fields are:



Interval

Indicates the interval in seconds for sampling and comparing the rising and falling threshold.

Variable

Indicates the particular variable to be sampled

Sample Type

The method of sampling the selected variable and calculating the value to be compared against the thresholds.

Discarded Packets

The total number of events in which packets were dropped by the probe due to lack of resources.

Eight-bit Byte

The total number of octets of data (including those in bad packets) received on the network.

Packets

The total number of packets (including bad packets, broadcast packets, and multicast packets) received.

Broadcast

The total number of good packets received that were directed to the broadcast address.

Multicast

The total number of good packets received that were directed to a multicast address.

CRC Error

Total number of packets received. Eight-bit byte with length (excluding the frame part, but including FCS octets) between 64 and 1518, but there is an integer (FCS error) bad frame check sequence (FCS) of eight-bit byte or a bad FCS eight-bit byte which is not an integer (alignment error).

Undersize

The total number of packets received that were less than 64 octets.

Oversize

The total number of packets received that were longer than 1518 octets.

Fragment

The number of frames which size is less than 64 octets received with invalid CRC.

Expectation

The number of frames which size is larger than 64 octets received with invalid CRC.

Conflicts

The best estimate of the total number of collisions on this Ethernet segment.

Application

The best estimate of the mean physical layer network utilization on this interface during this sampling interval, in hundredths of a percent.

Buttons

Auto-refresh: Check this box to refresh the page automatically. Automatic refresh occurs every 3 seconds.

Refresh: Click to refresh the page immediately.

|<<: Updates the table starting from the first entry in the Statistics table, i.e. the entry with the lowest ID.

>>: Updates the table, starting with the entry after the last entry currently displayed.

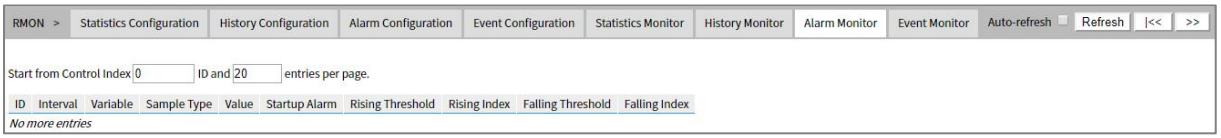
3.7.7 Alarm Monitoring

This page provides an overview of RMON Statistics entries. Each page shows up to 99 entries from the Statistics table, default being 20, selected through the "entries per page" input field. When first visited, the WEB page will show the first 20 entries from the beginning of the Statistics table. The first displayed will be the one with the lowest ID found in the Statistics table.

The "Start from Control Index" allows the user to select the starting point in the Alarm table. Clicking the “Refresh” button will update the displayed table starting from that or the next closest Statistics table match.

This “>>” button will use the last entry of the currently displayed entry as a basis for the next lookup. When the end is reached the text "No more entries" is shown in the displayed table. Use the “|<<” button to start over.

The displayed fields are:



ID

Indicates the index of Alarm control entry.

Interval

Indicates the interval in seconds for sampling and comparing the rising and falling threshold.

Variable

Indicates the particular variable to be sampled

Sample Type

The method of sampling the selected variable and calculating the value to be compared against the thresholds.

Value

The value of the statistic during the last sampling period.

Startup Alarm

The alarm that may be sent when this entry is first set to valid.

Rising Threshold

Rising threshold value.

Rising Index

Rising event index.

Falling Threshold

Falling threshold value.

Falling index

Falling event index.

Buttons

Auto-refresh: Check this box to refresh the page automatically. Automatic refresh occurs every 3 seconds.

Refresh: Click to refresh the page immediately.

|<<: Updates the table starting from the first entry in the Statistics table, i.e. the entry with the lowest ID.

>>: Updates the table, starting with the entry after the last entry currently displayed.

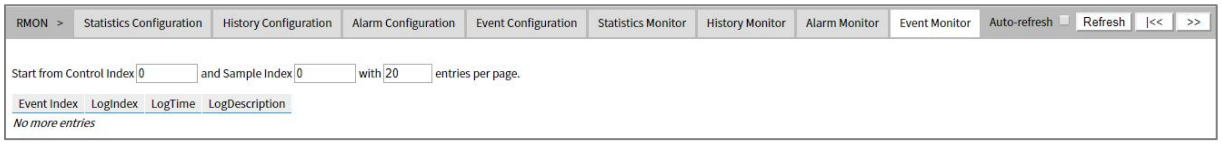
3.7.8 Event Monitoring

This page provides an overview of RMON event entries. Each page shows up to 99 entries from the event table, default being 20, selected through the "entries per page" input field. When first visited, the WEB page will show the first 20 entries from the beginning of the Event table. The first displayed will be the one with the lowest Event Index and Log Index found in the Event table.

The "Start from Control Index and Sample Index" input field allows the user to select a starting point in the Event table. Clicking the “Refresh” button will update the displayed table starting from that or the next closest Event table match.

This “>>” button will use the last entry of the currently displayed entry as a basis for the next lookup. When the end is reached the text "No more entries" is shown in the displayed table. Use the “|<<” button to start over.

The displayed fields are:



Event Index

Indicates the index of the event entry.

Log Index

Indicates the index of the log entry.

LogTime

Indicates Event log time

LogDescription

Indicates the Event description.

Buttons

Auto-refresh: Check this box to refresh the page automatically. Automatic refresh occurs every 3 seconds.

Refresh: Click to refresh the page immediately.

|<<: Updates the table starting from the first entry in the Event Table, i.e. the entry with the lowest Event Index and Log Index.

>>: Updates the table, starting with the entry after the last entry currently displayed.

4 Secure Network

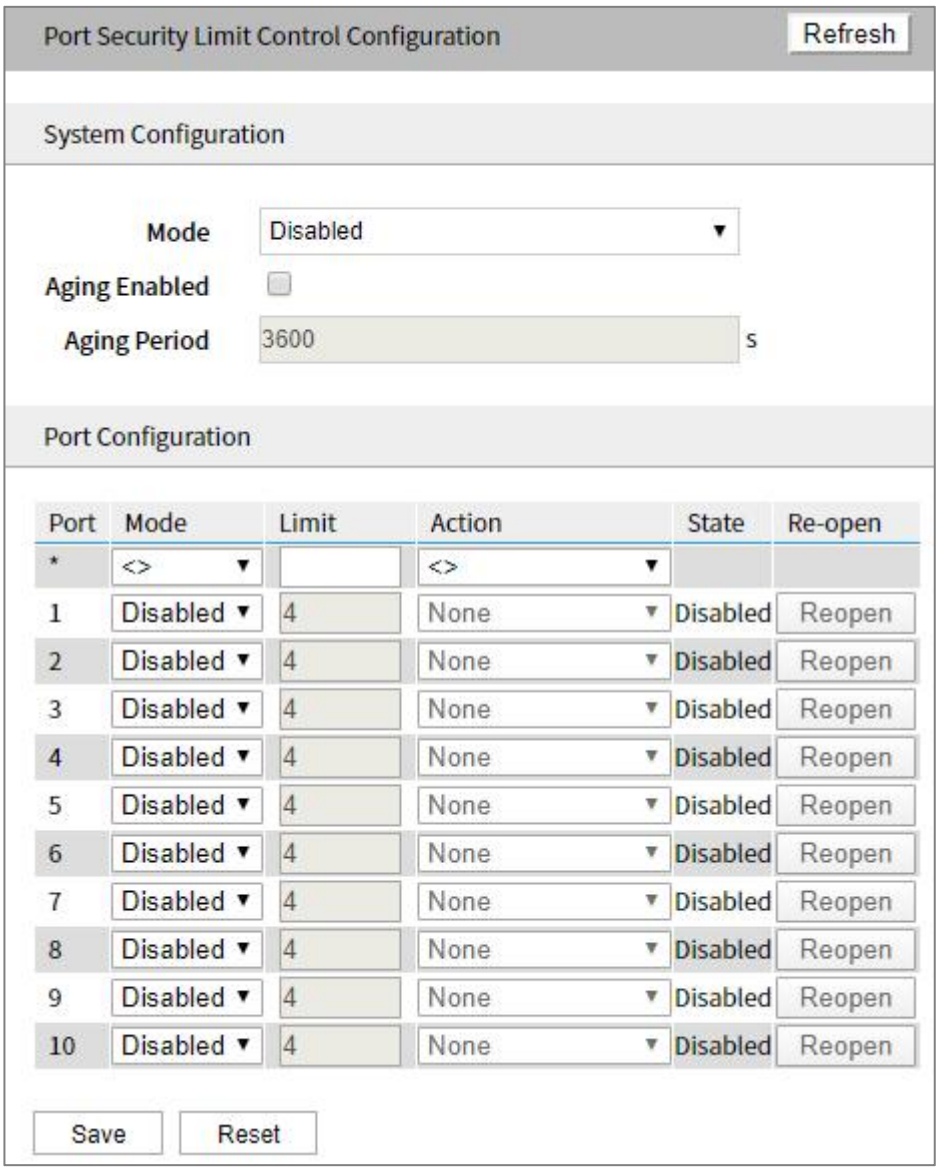
4.1 Port Limit Control

This page allows you to configure the Port Security Limit Control system and port settings.

Limit Control allows for limiting the number of users on a specified port. A user is identified by a MAC address and VLAN ID. If Limit Control is enabled on a port, the limit specifies the maximum number of users on the port. If this number is exceeded, an action is taken. The action can be one of the four different actions as described below.

The Limit Control module utilizes a lower-layer module, Port Security module, which manages MAC addresses learnt on the port.

The Limit Control configuration consists of two sections, a system- and a port-wide.



System Configuration

Mode

Indicates if Limit Control is globally enabled or disabled on the switch. If globally disabled, other modules may still use the underlying functionality, but limit checks and corresponding actions are disabled.

Aging Enabled

If checked, secured MAC addresses are subject to aging as discussed under Aging Period.

Aging Period

If Aging Enabled is checked, then the aging period is controlled with this input. If other modules are using the underlying port security for securing MAC addresses, they may

have other requirements to the aging period. The underlying port security will use the shorter requested aging period of all modules that use the functionality.

The Aging Period can be set to a number between 10 and 10,000,000 seconds.

To understand why aging may be desired, consider the following scenario: Suppose an end-host is connected to a 3rd party switch or hub, which in turn is connected to a port on this switch on which Limit Control is enabled. The end-host will be allowed to forward if the limit is not exceeded. Now suppose that the end-host logs off or powers down. If it wasn't for aging, the end-host would still take up resources on this switch and will be allowed to forward. To overcome this situation, enable aging. With aging enabled, a timer is started once the end-host gets secured. When the timer expires, the switch starts looking for frames from the end-host, and if such frames are not seen within the next Aging Period, the end-host is assumed to be disconnected, and the corresponding resources are freed on the switch.

Port Configuration

The table has one row for each port on the switch and a number of columns, which are:

Port

The port number for which the configuration below applies.

Mode

Controls whether Limit Control is enabled on this port. Both this and the Global Mode must be set to Enabled for Limit Control to be in effect. Notice that other modules may still use the underlying port security features without enabling Limit Control on a given port.

Limit

The maximum number of MAC addresses that can be secured on this port. This number cannot exceed 1024. If the limit is exceeded, the corresponding action is taken.

The switch is "born" with a total number of MAC addresses from which all ports draw whenever a new MAC address is seen on a Port Security-enabled port. Since all ports draw from the same pool, it may happen that a configured maximum cannot be granted, if the remaining ports have already used all available MAC addresses.

ACTION

If Limit is reached, the switch can take one of the following actions:

- None: Do not allow more than Limit MAC addresses on the port, but take no further action.
- Trap: If Limit +1 MAC addresses is seen on the port, send an SNMP trap. If Aging

is disabled, only one SNMP trap will be sent, but with Aging enabled, new SNMP traps will be sent every time the limit gets exceeded.

- Shutdown: If Limit +1 MAC addresses is seen on the port, shut down the port. This implies that all secured MAC addresses will be removed from the port, and no new address will be learned. Even if the link is physically disconnected and reconnected on the port (by disconnecting the cable), the port will remain shut down. There are three ways to re-open the port:

  1) Boot the switch,

  2) Disable and re-enable Limit Control on the port or the switch,

  3) Click the Reopen button.
- Trap & Shutdown: If Limit + 1 MAC addresses is seen on the port, both the "Trap" and the "Shutdown" actions described above will be taken.

Status

This column shows the current state of the port as seen from the Limit Control's point of view. The state takes one of four values:

- Disabled: Limit Control is either globally disabled or disabled on the port.
- Ready: The limit is not yet reached. This can be shown for all actions.
- Limit Reached: Indicates that the limit is reached on this port. This state can only be shown if Action is set to None or Trap.
- Shutdown: Indicates that the port is shut down by the Limit Control module. This state can only be shown if Action is set to Shutdown or Trap & Shutdown.

Re-open Button

If a port is shutdown by this module, you may reopen it by clicking this button, which will only be enabled if this is the case.

Note that clicking the "Reopen" button will refresh the page, so uncommitted changes will be lost.

Buttons

Save: Click to save changes.

Reset: Click to undo any changes made locally and revert to previously saved values.

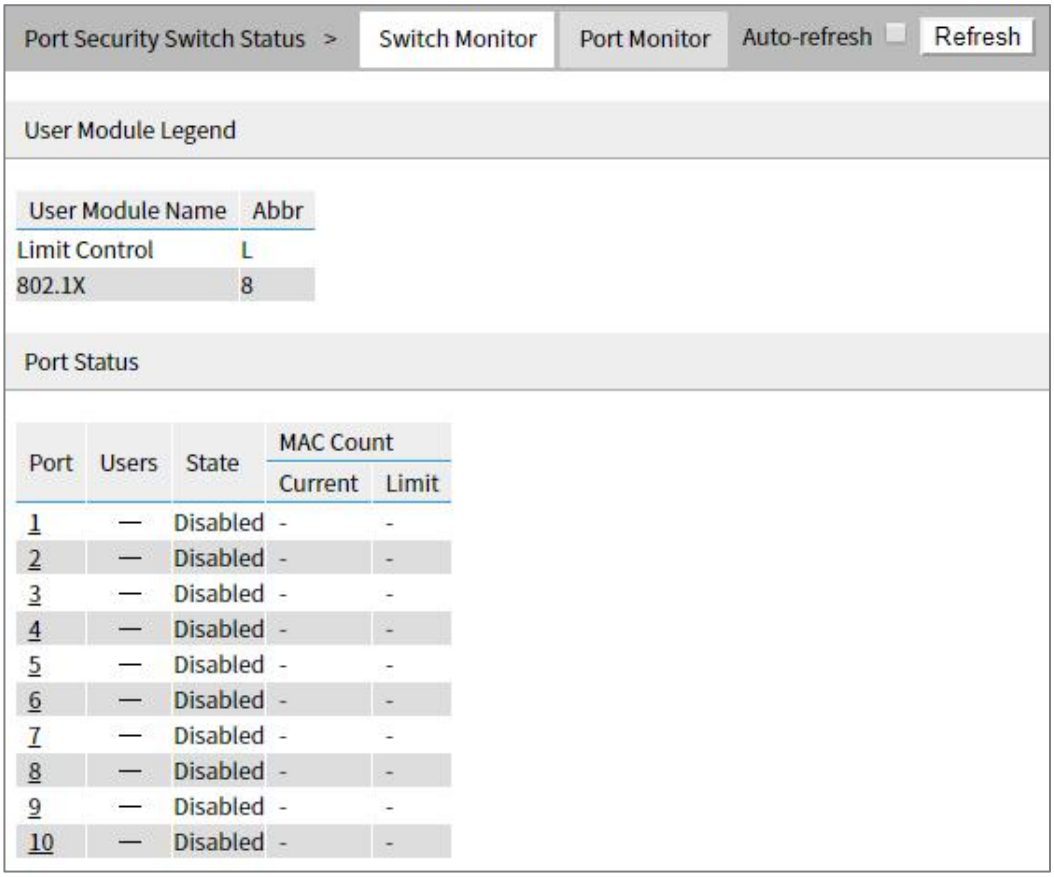
4.2 Port Security

4.2.1 Switch Monitoring

This page shows the Port Security status. Port Security is a module with no direct configuration. Configuration comes indirectly from other modules - the user modules. When a user module has enabled port security on a port, the port is set-up for software-based learning. In this mode, frames from unknown MAC addresses are

passed on to the port security module, which in turn asks all user modules whether to allow this new MAC address to forward or block it. For a MAC address to be set in the forwarding state, all enabled user modules must unanimously agree on allowing the MAC address to forward. If only one chooses to block it, it will be blocked until that user module decides otherwise.

The status page is divided into two sections - one with a legend of user modules and one with the actual port status.



User Module Legend

The legend shows all user modules that may request Port Security services.

User Module Name

The full name of a module that may request Port Security services.

Abbr

A one-letter abbreviation of the user module. Used in the user column of the port status table.

Port Status

The table has one row for each port on the switch and a number of columns, which are:

Port

The port number for which the status applies. Click the port number to see the status for this particular port.

Users

Each of the user modules has a column that shows whether that module has enabled Port Security or not. '-' means that the corresponding user module is not enabled, whereas a letter indicates that the user module abbreviated by that letter (see Abbr) has enabled port security.

Status

Shows the current state of the port. It can take one of four values:

- Disabled: No user modules are currently using the Port Security service.
- Ready: The Port Security service is in use by at least one user module, and is awaiting frames from unknown MAC addresses to arrive.
- Limit Reached: The Port Security service is enabled by at least the Limit Control user module, and that module has indicated that the limit is reached and no more MAC addresses should be taken in.
- Shutdown: The Port Security service is enabled by at least the Limit Control user module, and that module has indicated that the limit is exceeded. No MAC addresses can be learned on the port until it is administratively re-opened on the Limit Control configuration Web-page.

MAC Count (Current, Limit)

The two columns indicate the number of currently learned MAC addresses (forwarding as well as blocked) and the maximum number of MAC addresses that can be learned on the port, respectively.

If no user modules are enabled on the port, the Current column will show a dash (-).

If the restriction control user module is not enabled on the port, the restriction column will display a dash (-).

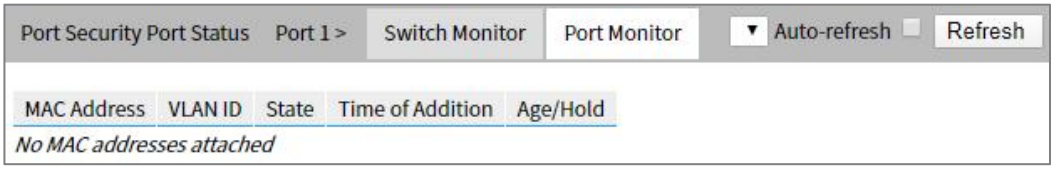
Buttons

Auto-refresh: Check this box to refresh the page automatically. Automatic refresh occurs every 3 seconds.

Refresh: Click to refresh the page immediately.

4.2.2 Port Monitoring

This page shows the MAC addresses secured by the Port Security module. Port Security is a module with no direct configuration. Configuration comes indirectly from other modules - the user modules. When a user module has enabled port security on a port, the port is set-up for software-based learning. In this mode, frames from unknown MAC addresses are passed on to the port security module, which in turn asks all user modules whether to allow this new MAC address to forward or block it. For a MAC address to be set in the forwarding state, all enabled user modules must unanimously agree on allowing the MAC address to forward. If only one chooses to block it, it will be blocked until that user module decides otherwise.



MAC Address & VLAN ID

The MAC address and VLAN ID that is seen on this port. If no MAC addresses are learned, a single row stating "No MAC addresses attached" is displayed.

Status

Indicates whether the corresponding MAC address is blocked or forwarding. In the blocked state, it will not be allowed to transmit or receive traffic.

Time of Addition

Shows the date and time when this MAC address was first seen on the port.

Age/Hold

If at least one user module has decided to block this MAC address, it will stay in the blocked state until the hold time (measured in seconds) expires. If all user modules have decided to allow this MAC address to forward, and aging is enabled, the Port Security module will periodically check that this MAC address still forwards traffic. If the age period (measured in seconds) expires and no frames have been seen, the MAC address will be removed from the MAC table. Otherwise a new age period will begin.

If aging is disabled or a user module has decided to hold the MAC address indefinitely, a dash (-) will be shown.

Buttons

Use the port select box to select which port to show status for.

Auto-refresh: Check this box to enable an automatic refresh. Automatic refresh occurs every 3 seconds.

Refresh: Click to refresh the page immediately.

4.3 NAS

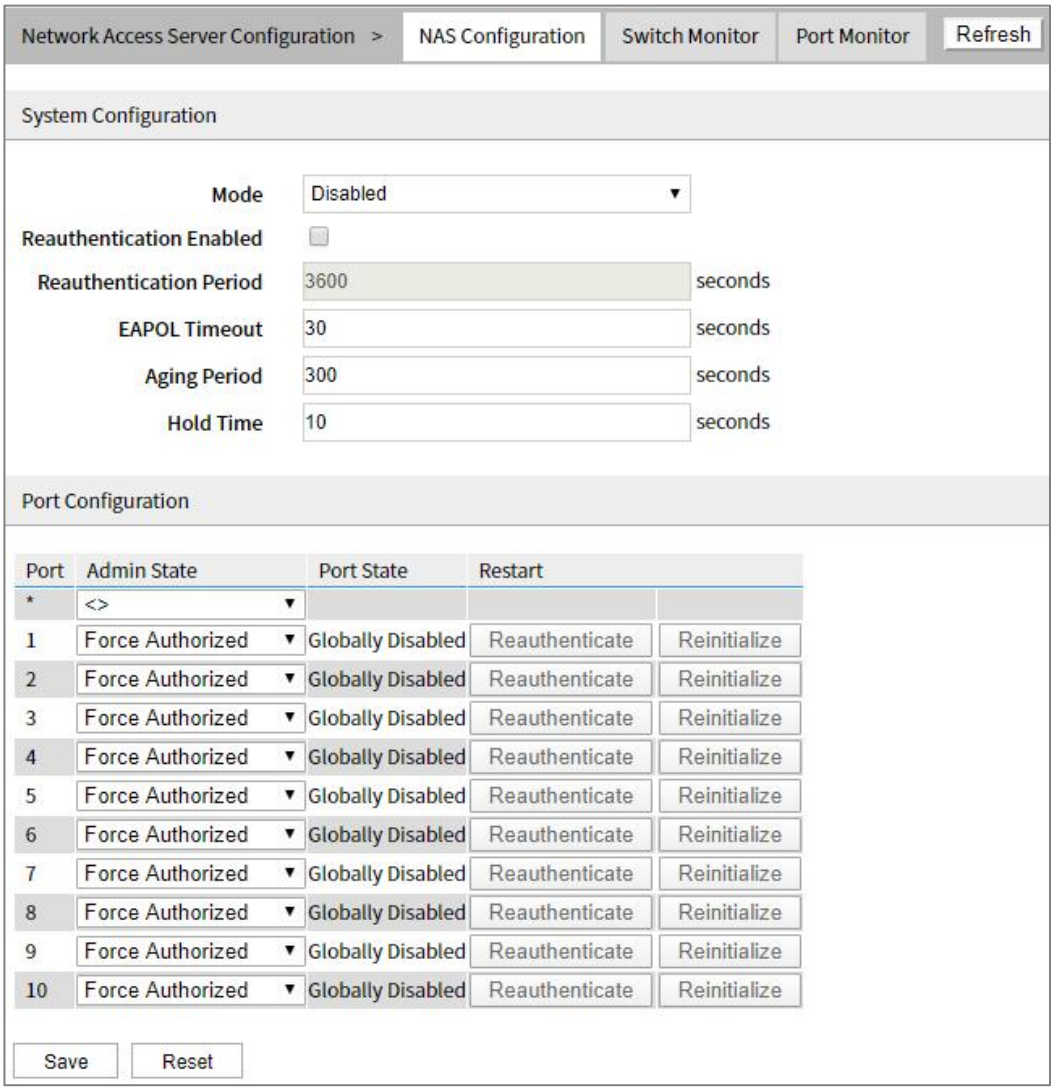
4.3.1 NAS Configuration

This page allows you to configure the IEEE 802.1X and MAC-based authentication system and port settings.

The IEEE 802.1X standard defines a port-based access control procedure that prevents unauthorized access to a network by requiring users to first submit credentials for authentication. One or more central servers, the backend servers, determine whether the user is allowed access to the network. These backend (RADIUS) servers are configured on the "Security Network" page. The IEEE802.1X standard defines port-based operation, but non-standard variants overcome security limitations as shall be explored below.

MAC-based authentication allows for authentication of more than one user on the same port, and doesn't require the user to have special 802.1X supplicant software installed on his system. The switch uses the user's MAC address to authenticate against the backend server. Intruders can create counterfeit MAC addresses, which makes MAC-based authentication less secure than 802.1X authentication.

The NAS configuration consists of two sections, a system- and a port-wide.



System Configuration

Mode

Indicates if NAS is globally enabled or disabled on the switch. If globally disabled, all ports are allowed forwarding of frames.

Reauthentication Enabled

If checked, successfully authenticated supplicants/clients are reauthenticated after the interval specified by the Reauthentication Period. Reauthentication for 802.1X-enabled ports can be used to detect if a new device is plugged into a switch port or if a supplicant is no longer attached.

For MAC-based ports, reauthentication is only useful if the RADIUS server configuration has changed. It does not involve communication between the switch and the client, and therefore doesn't imply that a client is still present on a port (see Aging Period below).

Reauthentication Period

Determines the period, in seconds, after which a connected client must be reauthenticated. This is only active if the Reauthentication Enabled checkbox is checked. Valid values are in the range 1 to 3600 seconds.

EAPOL Timeout

Determines the time for retransmission of Request Identity EAPOL frames.

Valid values are in the range 1 to 65535 seconds. This has no effect for MAC-based ports.

Aging Period

This setting applies to the following modes, i.e. modes using the Port Security functionality to secure MAC addresses:

- Single 802.1X
- Multi 802.1X
- MAC-Based Auth.

When the NAS module uses the Port Security module to secure MAC addresses, the Port Security module needs to check for activity on the MAC address in question at regular intervals and free resources if no activity is seen within a given period of time. This parameter controls exactly this period and can be set to a number between 10 and 1000000 seconds.

If reauthentication is enabled and the port is in an 802.1X-based mode, this is not so critical, since supplicants that are no longer attached to the port will get removed upon the next reauthentication, which will fail. But if reauthentication is not enabled, the only way to free resources is by aging the entries.

For ports in MAC-based Auth. mode, reauthentication doesn't cause direct communication between the switch and the client, so this will not detect whether the client is still attached or not, and the only way to free any resources is to age the entry.

Hold Time

This setting applies to the following modes, i.e. modes using the Port Security functionality to secure MAC addresses:

- Single 802.1X
- Multi 802.1X
- MAC-Based Auth.

If a client is denied access - either because the RADIUS server denies the client access or because the RADIUS server request times out - the client is put on hold in the Unauthorized state. The hold timer does not count during an on-going authentication.

In MAC-based Auth. mode, the switch will ignore new frames coming from the client during the hold time.

The Hold Time can be set to a number between 10 and 1000000 seconds.

Port configuration

The table has one row for each port on the switch and a number of columns, which are:

Port

The port number for which the configuration below applies.

Admin State

If NAS is globally enabled, this selection controls the port's authentication mode. The following modes are available:

- Force Authorized
  In this mode, the switch will send one EAPOL Success frame when the port link comes up, and any client on the port will be allowed network access without authentication.
- Force Unauthorized
  In this mode, the switch will send one EAPOL Failure frame when the port link comes up, and any client on the port will be disallowed network access.
- Port-based 802.1X
  In the 802.1X-world, the user is called the supplicant, the switch is the authenticator, and the RADIUS server is the authentication server. The authenticator acts as the man-in-the-middle, forwarding requests and responses between the supplicant and the authentication server. Frames sent between the supplicant and the switch are special 802.1X frames, known as EAPOL (EAP Over LANs) frames. EAPOL frames encapsulate EAP PDUs (RFC3748). Frames sent between the switch and the RADIUS server are RADIUS packets. RADIUS packets also encapsulate EAP PDUs together with other attributes like the switch's IP address, name, and the supplicant's port number on the switch. EAP is very flexible, in that it allows for different authentication methods, like MD5-Challenge, PEAP, and TLS. The important thing is that the authenticator (the switch) doesn't need to know which authentication method the supplicant and the authentication server are using, or how many information exchange frames are needed for a particular method. The switch simply encapsulates the EAP part of the frame into the relevant type (EAPOL or RADIUS) and forwards it. When authentication is complete, the RADIUS server sends a special packet containing a success or failure indication. Besides forwarding this decision to the supplicant, the switch uses it to open up or block traffic on the switch port

connected to the supplicant.

Note:
Suppose two backend servers are enabled and that the server timeout is configured to X seconds (using the AAA configuration page), and suppose that the first server in the list is currently down (but not considered dead). Now, if the supplicant retransmits EAPOL Start frames at a rate faster than X seconds, then it will never get authenticated, because the switch will cancel on-going backend authentication server requests whenever it receives a new EAPOL Start frame from the supplicant. And since the server hasn't yet failed (because the X seconds haven't expired), the same server will be contacted upon the next backend authentication server request from the switch. This scenario will loop forever. Therefore, the server timeout should be smaller than the supplicant's EAPOL Start frame retransmission rate.

- MAC-based Auth.

  Unlike port-based 802.1X, MAC-based authentication is not a standard, but merely a best-practices method adopted by the industry. In MAC-based authentication, users are called clients, and the switch acts as the supplicant on behalf of clients. The initial frame (any kind of frame) sent by a client is snooped by the switch, which in turn uses the client's MAC address as both username and password in the subsequent EAP exchange with the RADIUS server. The 6-byte MAC address is converted to a string on the following form "xx-xx-xx-xx-xx-xx", that is, a dash (-) is used as separator between the lower-cased hexadecimal digits. The switch only supports the MD5-Challenge authentication method, so the RADIUS server must be configured accordingly.

  When authentication is complete, the RADIUS server sends a success or failure indication, which in turn causes the switch to open up or block traffic for that particular client, using the Port Security module. Only then will frames from the client be forwarded on the switch. There are no EAPOL frames involved in this authentication, and therefore, MAC-based Authentication has nothing to do with the 802.1X standard.

  The advantage of MAC-based authentication over 802.1X-based authentication is that the clients don't need special supplicant software to authenticate. The disadvantage is that MAC addresses can be spoofed by malicious users - equipment whose MAC address is a valid RADIUS user can be used by anyone. Also, only the MD5-Challenge method is supported. The maximum number of clients that can be attached to a port can be limited using the Port Security Limit Control functionality.

Port Status

The current state of the port. It can undertake one of the following values:

- Globally Disabled: NAS is globally disabled.
- Link Down: NAS is globally enabled, but there is no link on the port.
- Authorized: The port is in Force Authorized or a single-supplicant mode and the

supplicant is authorized.

- Unauthorized: The port is in Force Unauthorized or a single-supplicant mode and the supplicant is not successfully authorized by the RADIUS server.
- X Auth/Y Unauth: The port is in a multi-supplicant mode. Currently X clients are authorized and Y are unauthorized.

Restart

Two buttons are available for each row. The buttons are only enabled when authentication is globally enabled and the port's Admin State is in an EAPOL-based or MAC-based mode.

Clicking these buttons will not cause settings changed on the page to take effect.

- Reauthenticate: Schedules a reauthentication whenever the quiet-period of the port runs out (EAPOL-based authentication). For MAC-based authentication, reauthentication will be attempted immediately.

  The button only has effect for successfully authenticated clients on the port and will not cause the clients to get temporarily unauthorized.
- Reinitialize: Forces a reinitialization of the clients on the port and thereby a reauthentication immediately. The clients will transfer to the unauthorized state while the reauthentication is in progress.

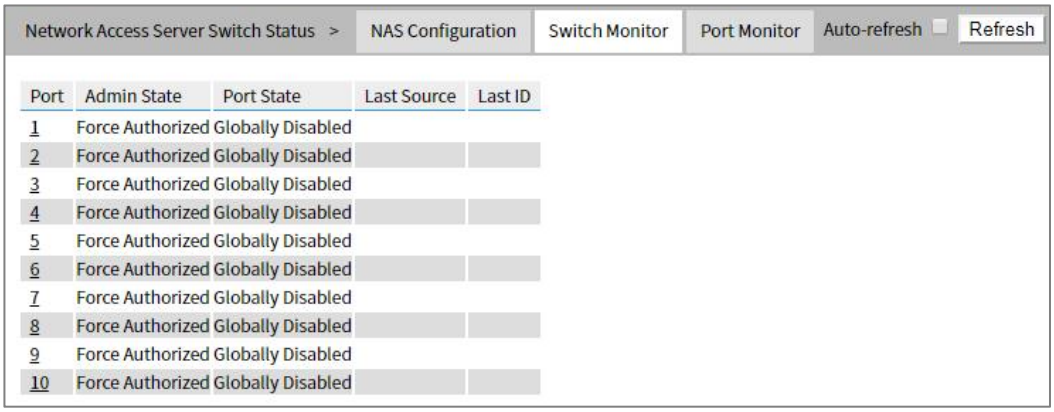
Buttons

Save: Click to save changes.

Reset: Click to undo any changes made locally and revert to previously saved values.

4.3.2 Device Monitoring

This page provides an overview of the current NAS port states.



Port

The switch port number. Click to navigate to detailed NAS statistics for this port.

Admin State

The port's current administrative state. Refer to NAS Admin State for a description of possible values.

Port Status

The current state of the port. Refer to NAS Port State for a description of the individual states.

Last Source

The source MAC address carried in the most recently received EAPOL frame for EAPOL-based authentication, and the most recently received frame from a new client for MAC-based authentication.

Last ID

The user name (supplicant identity) carried in the most recently received Response Identity EAPOL frame for EAPOL-based authentication, and the source MAC address from the most recently received frame from a new client for MAC-based authentication.

Buttons

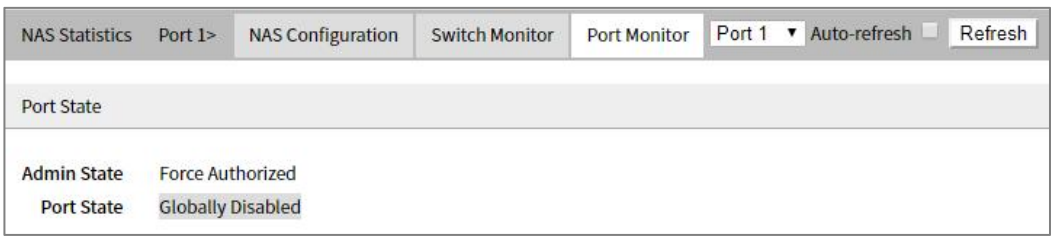
Auto-refresh: Check this box to refresh the page automatically. Automatic refresh occurs every 3 seconds.

Refresh: Click to refresh the page immediately.

4.3.3 Port Monitoring

This page provides detailed NAS statistics for a specific switch port running EAPOL-based IEEE 802.1X authentication. For MAC-based ports, it shows selected backend server (RADIUS Authentication Server) statistics, only

Use the port select box to select which port details to be displayed.



Port Status

Admin State

The port's current administrative state. Refer to NAS Configuration Admin State for a description of possible values.

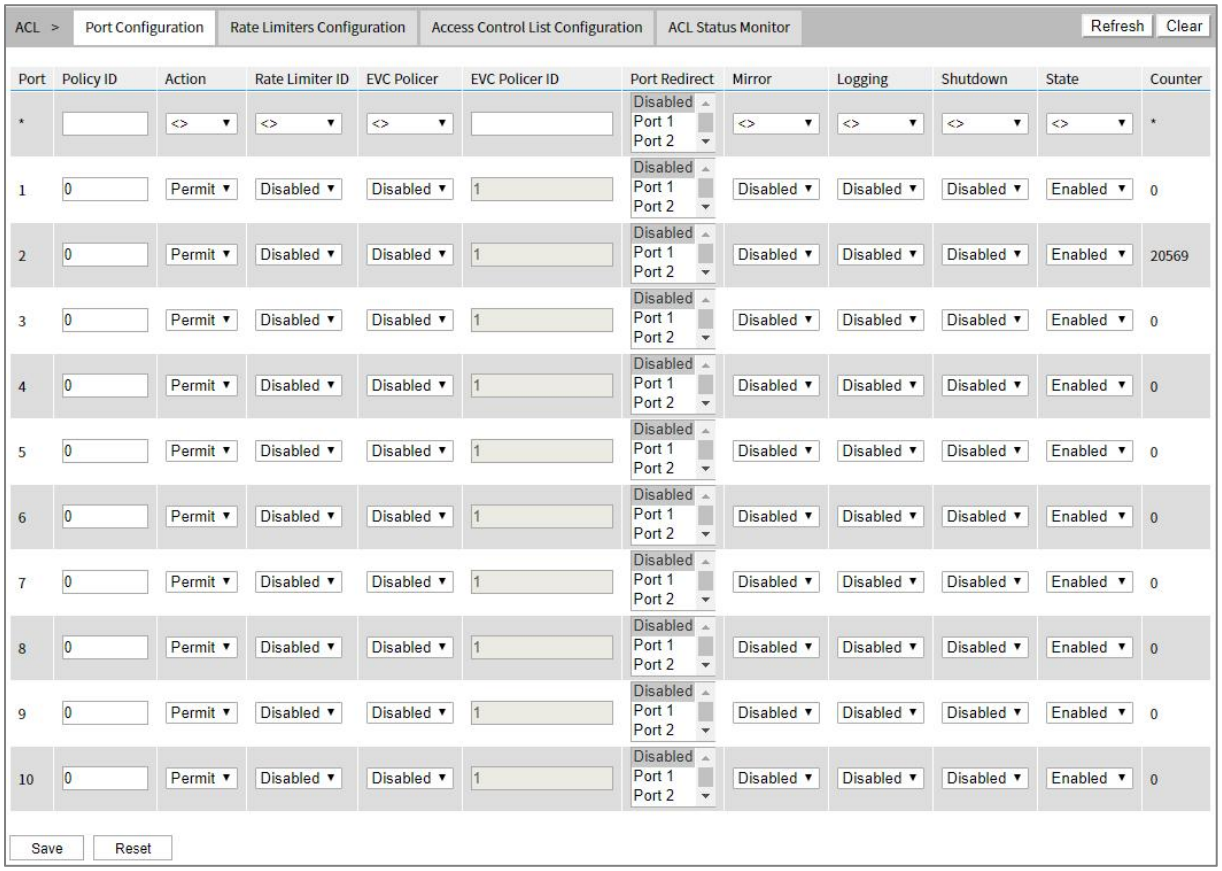
Port Status

The current state of the port. Refer to NAS Configuration Admin State for a description of possible values.

4.4 ACL

4.4.1 Port Configuration

Configure the ACL parameters (ACE) of each switch port. These parameters will affect frames received on a port unless the frame matches a specific ACE.



Port

The switch port number.

Policy ID

Select the policy to apply to this port. The allowed values are 0 through 255. The default value is 0.

ACTION

Select whether forwarding is permitted ("Permit") or denied ("Deny"). The default value is "Permit".

Rate Limiter ID

Select which rate limiter to apply on this port. The allowed values are Disabled or the values 1 through 16. The default value is "Disabled".

EVC Policer

Select whether EVC policer is enabled or disabled. The default value is "Disabled". Note that ACL rate limiter and EVC policer can not both be enabled.

EVC Policer ID

Select which EVC policer ID to apply on this port. The allowed values are Disabled or the values 1 through 256.

Re-mirror Port

Select which port frames are redirected on. The allowed values are Disabled or a specific port number and it can't be set when action is permitted. The default value is "Disabled".

Mirroring

Specify the mirror operation of this port. The allowed values are:

- Enabled: Frames received on the port are mirrored.
- Disabled: Frames received on the port are not mirrored.

The default value is "Disabled".

Logging

Specify the logging operation of this port. Notice that the logging message doesn't include the 4 bytes CRC. The allowed values are:

- Enabled: Frames received on the port are stored in the System Log.
- Disabled: Frames received on the port are not logged.

The default value is "Disabled".

Note:

The logging feature only works when the packet length is less than 1518(without VLAN tags) and the System Log memory size and logging rate is limited.

Shutdown

Specify the port shut down operation of this port. The allowed values are:

- Enabled: If a frame is received on the port, the port will be disabled.
- Disabled: Port shut down is disabled.

The default value is "Disabled".

Note:

Only when the packet length is less than 1518 (without VLAN tag), the shutdown function is effective.

Status

Specify the port state of this port. The allowed values are:

- Enabled: To reopen ports by changing the volatile port configuration of the ACL user module.
- Disabled: To close ports by changing the volatile port configuration of the ACL user module.

The default value is "Enabled".

Counter

Counts the number of frames that match this ACE.

Buttons

Save: Click to save changes.

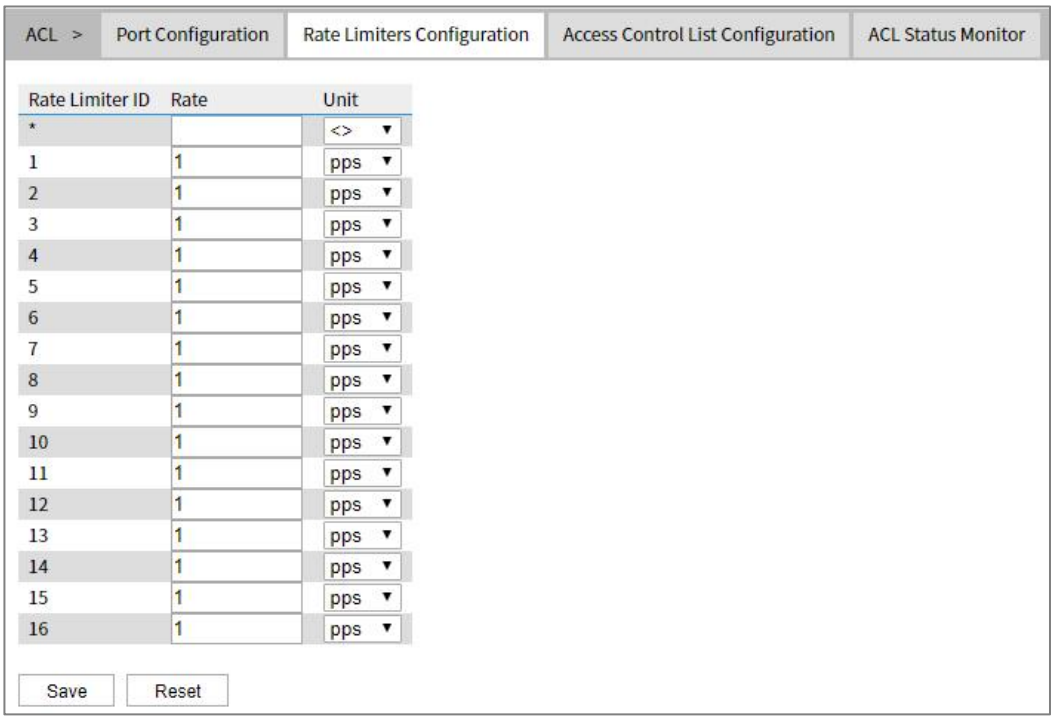
Reset: Click to undo any changes made locally and revert to previously saved values.

Refresh: Click to refresh the page; any changes made locally will be undone.

Clear: Click to clear the counters.

4.4.2 Rate Limiter Configuration

Configure the rate limiter for the ACL of the switch.



Rate Limiter ID

The rate limiter ID for the settings contained in the same row and its range is 1 to 16.

Speed

The valid rate is 0-3276700pps.

Or 0,100,200,300, ..., 1000000kbps.

Unit

Specify the rate unit. The allowed values are:

- pps: packets per second.
- kbps: Kbits per second.

Buttons

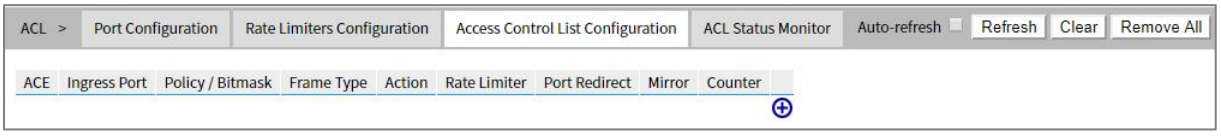
Save: Click to save changes.

Reset: Click to undo any changes made locally and revert to previously saved values.

4.4.3 Access Control List Configuration

This page shows the Access Control List (ACL), which is made up of the ACEs defined on this switch. Each row describes the ACE that is defined. The maximum number of ACEs is 256 on each switch.

Click on the lowest plus sign to add a new ACE to the list. The reserved ACEs used for internal protocol, cannot be edited or deleted, the order sequence cannot be changed and the priority is highest.



ACE

Indicates the ACE ID.

Egress Port

Indicates the ingress port of the ACE. Possible values are:

- All: The ACE will match all ingress port.
- Port: The ACE will match a specific ingress port.

Policy / Bitmask

Indicates the policy number and bitmask of the ACE.

Frame Type

Indicates the frame type of the ACE. Possible values are:

- Any: The ACE will match any frame type.
- EType: The ACE will match Ethernet Type frames.

  Note:
  Ethernet Type based ACE will not get matched by IP and ARP frames.
- ARP: The ACE will match ARP/RARP frames.
- IPv4: The ACE will match all IPv4 frames.
- IPv4/ICMP: The ACE will match IPv4 frames with ICMP protocol.
- IPv4/UDP: The ACE will match IPv4 frames with UDP protocol.
- IPv4/TCP: The ACE will match IPv4 frames with TCP protocol.
- IPv4/Other: The ACE will match IPv4 frames, which are not ICMP/UDP/TCP.
- IPv6: The ACE will match all IPv6 standard frames.

ACTION

Indicates the forwarding action of the ACE.

- Permit: Frames matching the ACE may be forwarded and learned.
- Deny: Frames matching the ACE are dropped.
- Filter: Frames matching the ACE are filtered.

Rate Limiter

Indicates the rate limiter number of the ACE. The allowed range is 1 to 16. When Disabled is displayed, the rate limiter operation is disabled.

Port Redirect

Indicates the port redirect operation of the ACE. Frames matching the ACE are redirected to the port number. The allowed values are Disabled or a specific port number. When Disabled is displayed, the port redirect operation is disabled.

Mirroring

Specify the mirror operation of this port. Frames matching the ACE are mirrored to the destination mirror port. The allowed values are:

- Enabled: Frames received on the port are mirrored.
- Disabled: Frames received on the port are not mirrored.

The default value is "Disabled".

Counter

The counter indicates the number of times the ACE was hit by a frame.

Modification Buttons

You can modify each ACE (Access Control Entry) in the table using the following buttons:

Add: Insert a new ACE before the current row.

Edit: Edit the ACE row.

Up: move ACE up to the list.

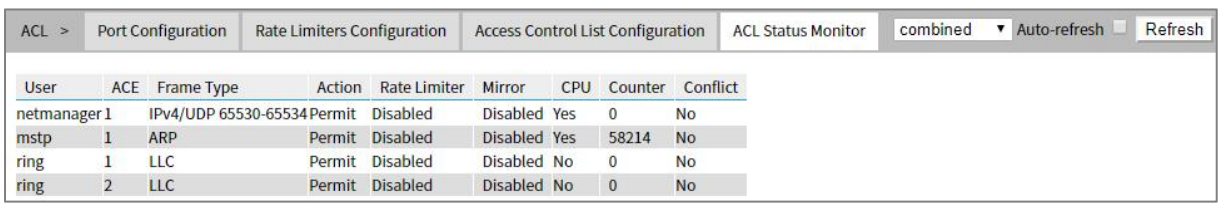
Down: move ACE down to the list.

Delete: delete ACE.

Add: the lowest plus sign adds a new entry at the bottom of the ACE list.

4.4.4 ACL Status

This page shows the ACL status by different ACL users. Each row describes the ACE that is defined. It is a conflict if a specific ACE is not applied to the hardware due to hardware limitations. The maximum number of ACEs is 256 on each switch.



User

Indicates the ACL user.

ACE

Indicates the ACE ID on local switch.

Frame Type

Indicates the frame type of the ACE. Possible values are:

- Any: The ACE will match any frame type.
- EType: The ACE will match Ethernet Type frames. Note that an Ethernet Type based ACE will not get matched by IP and ARP frames.
- ARP: The ACE will match ARP/RARP frames.
- IPv4: The ACE will match all IPv4 frames.
- IPv4/ICMP: The ACE will match IPv4 frames with ICMP protocol.
- IPv4/UDP: The ACE will match IPv4 frames with UDP protocol.
- IPv4/TCP: The ACE will match IPv4 frames with TCP protocol.
- IPv4/Other: The ACE will match IPv4 frames, which are not ICMP/UDP/TCP.
- IPv6: The ACE will match all IPv6 standard frames.

ACTION

Indicates the forwarding action of the ACE.

- Allow: frames matching ACE can be forwarded and learned.
- Reject: frames matching ACE are deleted.
- Filter: Frames matching the ACE are filtered.

Rate Limiter

Indicates the rate limiter number of the ACE. The allowed range is 1 to 16. When Disabled is displayed, the rate limiter operation is disabled.

CPU

Forward packet that matched the specific ACE to CPU.

Counter

The counter indicates the number of times the ACE was hit by a frame.

Conflicts

Indicates the hardware status of the specific ACE. The specific ACE is not applied to the hardware due to hardware limitations.

Buttons

The select box determines which ACL user is affected by clicking the buttons.

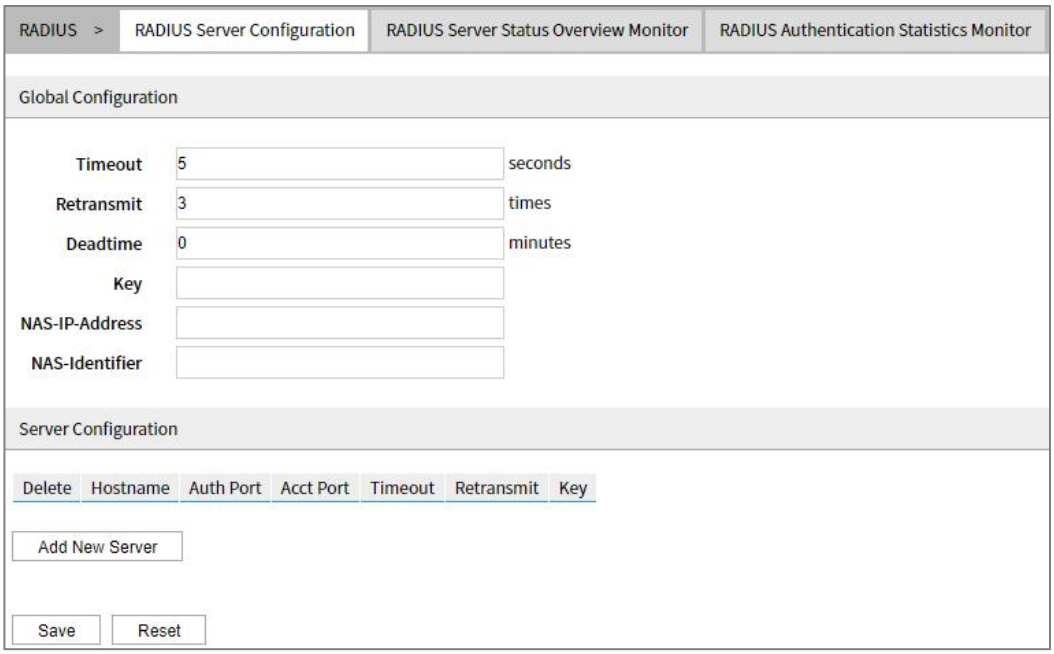
Auto-refresh: Check this box to enable an automatic refresh. Automatic refresh occurs every 3 seconds.

Refresh: Click to refresh the page.

4.5 RADIUS

4.5.1 RADIUS Server Configuration

This page allows you to configure the RADIUS servers.



Global Configuration

These setting are common for all of the RADIUS servers.

timeout

Timeout is the number of seconds, in the range 1 to 1000, to wait for a reply from a RADIUS server before retransmitting the request.

Retransmit

Retransmit is the number of times, in the range 1 to 1000, a RADIUS request is retransmitted to a server that is not responding. If the server has not responded after the last retransmit it is considered to be dead.

Deadtime

Deadtime, which can be set to a number between 0 to 1440 分, is the period during which the switch will not send new requests to a server that has failed to respond to a previous request. This will stop the switch from continually trying to contact a server that it has already determined as dead.

Setting the Deadtime to a value greater than 0 (0) will enable this feature, but only if more than one server has been configured.

Key

The secret key - up to 63 characters long - shared between the RADIUS server and the switch.

NAS-IP-Address（Attribute 4）

The IPv4 address to be used as attribute 4 in RADIUS Access-Request packets. If this field is left blank, the IP address of the outgoing interface is used.

NAS-Identifier（Attribute 32）

The identifier - up to 253 characters long - to be used as attribute 32 in RADIUS Access-Request packets. If this field is left blank, the NAS-Identifier is not included in the packet.

Server Configuration

The table has one row for each RADIUS server and a number of columns, which are:

Delete

To delete a RADIUS server entry, check this box. The entry will be deleted during the next Save.

Hostname

The IP address or hostname of the RADIUS server.

Auth Port

The UDP port to use on the RADIUS server for authentication. Set to 0 to disable authentication.

Acct Port

The UDP port to use on the RADIUS server for accounting. Set to 0 to disable accounting.

Timeout

This optional setting overrides the global timeout value. Leaving it blank will use the global timeout value.

Retransmit

This optional setting overrides the global retransmit value. Leaving it blank will use the global retransmit value.

Key

This optional setting overrides the global key. Leaving it blank will use the global key.

Adding a New Server

Click “Add New Server” to add a new RADIUS server. An empty row is added to the table, and the RADIUS server can be configured as needed. Up to 5 servers are supported.

The “Delete” button can be used to undo the addition of the new server.

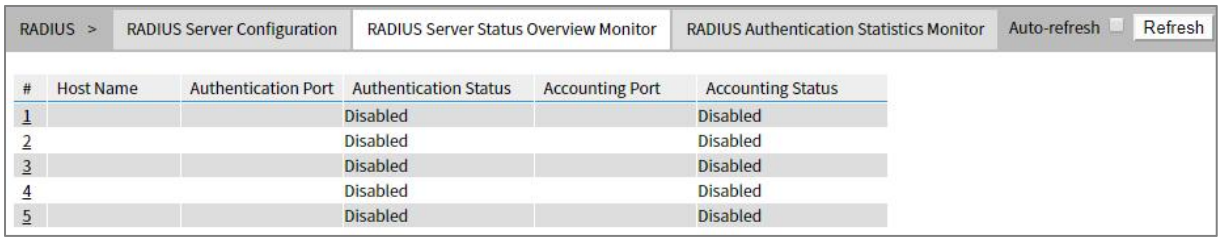
Buttons

Save: Click to save changes.

Reset: Click to undo any changes made locally and revert to previously saved values.

4.5.2 RADIUS Server Status Overview Monitoring

This page provides an overview of RADIUS server status. This server is configurable on the Authentication configuration page.



RADIUS Servers#

The RADIUS server number. Click to navigate to detailed statistics for this server.

IP Address

The IP address of this server.

Authentication Port

UDP port number for authentication.

Authentication Status

The current status of the server. This field takes one of the following values:

- Disabled: The server is disabled.
- Not Ready: The server is enabled, but IP communication is not yet up and running.
- Ready: The server is enabled, IP communication is up and running, and the RADIUS module is ready to accept access attempts.
- Dead (X seconds left): Access attempts were made to this server, but it did not reply within the configured timeout. The server has temporarily been disabled, but will get re-enabled when the dead-time expires. The number of seconds left before this occurs is displayed in parentheses. This state is only reachable when

more than one server is enabled.

Accounting Port

Billing UDP port number.

Accounting Status

The current status of the server. This field takes one of the following values:

- Disabled: The server is disabled.
- Not Ready: The server is enabled, but IP communication is not yet up and running.
- Ready: The server is enabled, IP communication is up and running, and the RADIUS module is ready to accept access attempts.
- Dead (X seconds left): Access attempts were made to this server, but it did not reply within the configured timeout. The server has temporarily been disabled, but will get re-enabled when the dead-time expires. The number of seconds left before this occurs is displayed in parentheses. This state is only reachable when more than one server is enabled.

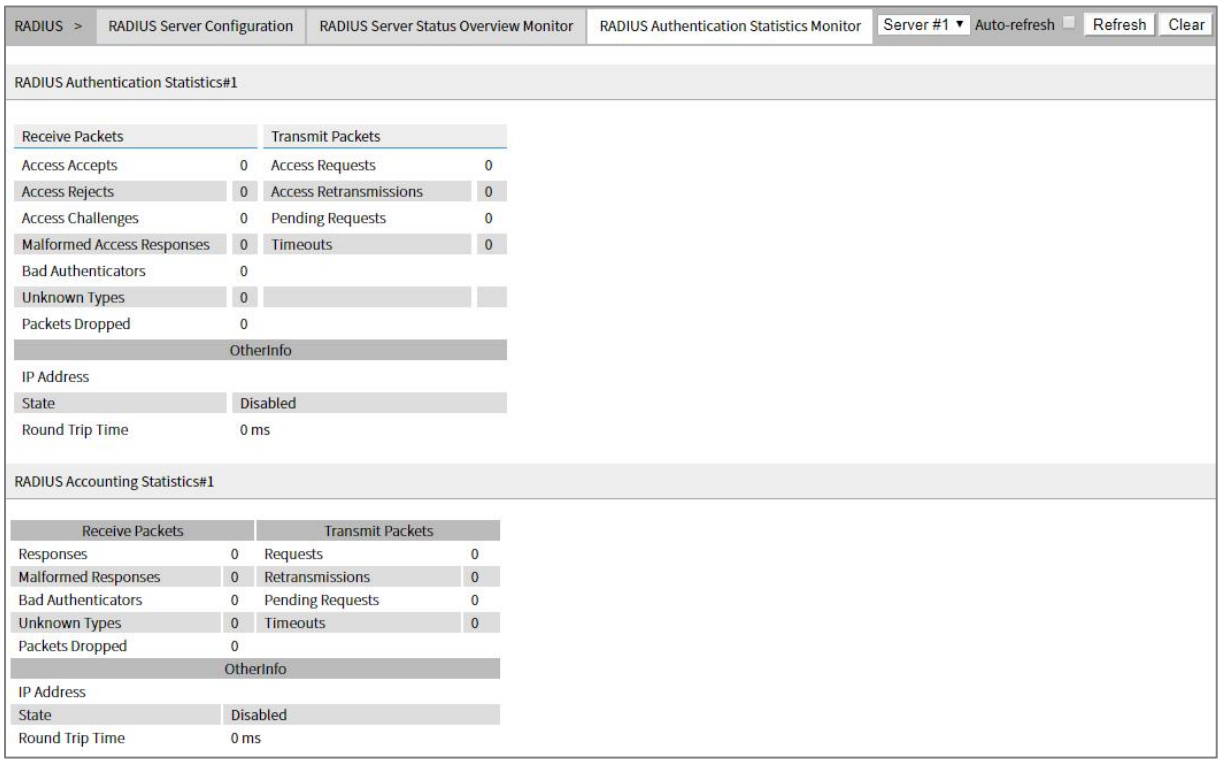
Buttons

Auto-refresh: Check this box to refresh the page automatically. Automatic refresh occurs every 3 seconds.

Refresh: Click to refresh the page immediately.

4.5.3 RADIUS Authentication Statistics Link Monitoring

This page provides detailed statistics for a particular RADIUS server.



RADIUS Authentication Statistics

The statistics map closely to those specified in RFC4668 – RADIUS Authentication Client MIB.

Use the server select box to switch between the backend servers to show details for.

Packet Counters

RADIUS authentication server packet counter. There are seven receive and four transmit counters.

Direction	Name	RFC4668 Name	Note
Received	Receive access	radiusAuthClientExtAccessAccepts	The number of RADIUS Access-Accept packets (valid or invalid) received from the server.
Received	Deny access	radiusAuthClientExtAccessRejects	The number of RADIUS Access-Reject packets (valid or invalid) received from the server.
Received	Challenge access	radiusAuthClientExtAccessChallenges	The number of RADIUS Access-Challenge packets (valid or invalid) received from the server.
Received	Exception access	radiusAuthClientExtMalformedAccessRespon	The number of malformed RADIUS Access-Response packets received

Direction	Name	RFC4668 Name	Note
	response	ses	from the server. Malformed packets include packets with an invalid length. Bad authenticators or Message Authenticator attributes or unknown types are not included as malformed access responses.
Received	Wrong authenticator	radiusAuthClientExtBadAuthenticators	The number of RADIUS Access-Response packets containing invalid authenticators or Message Authenticator attributes received from the server.
Received	Unknown type	radiusAuthClientExtUnknownTypes	The number of RADIUS packets that were received with unknown types from the server on the authentication port and dropped.
Received	Discarded Packets	radiusAuthClientExtPacketsDropped	The number of RADIUS packets that were received from the server on the authentication port and dropped for some other reason.
Transmitted	Request access	radiusAuthClientExtAccessRequests	The number of RADIUS Access-Request packets sent to the server. This does not include retransmissions.
Transmitted	Retransmission access	radiusAuthClientExtAccessRetransmissions	The number of RADIUS Access-Request packets retransmitted to the RADIUS authentication server.
Transmitted	Pending request	radiusAuthClientExtPendingRequests	The number of RADIUS Access-Request packets destined for the server that have not yet timed out or received a response. This variable is incremented when an Access-Request is sent and decremented due to receipt of an Access-Accept, Access-Reject, Access-Challenge, timeout, or retransmission.

Direction	Name	RFC4668 Name	Note
Transmitted	timeout	radiusAuthClientExtTimeouts	The number of authentication timeouts to the server. After a timeout, the client may retry to the same server, send to a different server, or give up. A retry to the same server is counted as a retransmit as well as a timeout. A send to a different server is counted as a Request as well as a timeout.

Other Info

This section contains information about the state of the server and the latest round-trip time.

Name	RFC4668 Name	Description
IP Address	-	IP address and UDP port number of the related authentication server
Status	-	Shows the state of the server. It adopts one of the following values： • Disabled: The selected server is disabled. • Not Ready: The server is enabled, but IP communication is not yet up and running. • Ready: The server is enabled, IP communication is up and running, and the RADIUS module is ready to accept access attempts. • Dead (X seconds left): Access attempts were made to this server, but it did not reply within the configured timeout. The server has temporarily been disabled, but will get re-enabled when the dead-time expires. The number of seconds left before this occurs is displayed in parentheses. This state is only reachable when more than one server is enabled.
Round-trip time	radiusAuthClientExtRoundTripTime	The time interval (measured in milliseconds) between the most recent Access-Reply/Access-Challenge and the

Name	RFC4668 Name	Description
		Access-Request that matched it from the RADIUS authentication server. The granularity of this measurement is 100 ms. A value of 0 ms indicates that there hasn't been round-trip communication with the server yet.

RADIUS Accounting Statistics

The statistics map closely to those specified in RFC4670-RADIUS Accounting Client MIB.

Use the server select box to switch between the backend servers to show details for.

Packet Counters

RADIUS accounting server packet counter. There are five receive and four transmit counters.

Direction	Name	RFC4670 Name	Description
Received	Responses	radiusAccClientExtResponses	The number of RADIUS packets (valid or invalid) received from the server.
Received	Anomaly response	radiusAccClientExtMalformedResponses	The number of malformed RADIUS packets received from the server. Malformed packets include packets with an invalid length. Bad authenticators or unknown types are not included as malformed access responses.
Received	Wrong authentication	radiusAcctClientExtBadAuthenticators	The number of RADIUS packets containing invalid authenticators received from the server.
Received	Unknown type	radiusAccClientExtUnknownTypes	The number of RADIUS packets of unknown types that were received from the server on the accounting port.
Received	Discarded Packets	radiusAccClientExtPacketsDropped	The number of RADIUS packets that were received from the server on the accounting port and dropped for some other reason.
Transmitted	REQUEST	radiusAccClientExtRequests	The number of RADIUS packets sent to the server. This does not include

Direction	Name	RFC4670 Name	Description
			retransmissions.
Transmitted	Retransmission	radiusAccClientExtRetransmissions	The number of RADIUS packets retransmitted to the RADIUS accounting server.
Transmitted	Pending request	radiusAccClientExtPendingRequests	The number of RADIUS packets destined for the server that have not yet timed out or received a response. This variable is incremented when a Request is sent and decremented due to receipt of a Response, timeout, or retransmission.
Transmitted	timeout	radiusAccClientExtTimeouts	The number of accounting timeouts to the server. After a timeout, the client may retry to the same server, send to a different server, or give up. A retry to the same server is counted as a retransmit as well as a timeout. A send to a different server is counted as a Request as well as a timeout.

Other Info

This section contains information about the state of the server and the latest round-trip time.

Name	RFC4670 Name	Description
IP Address	-	IP address and UDP port for the accounting server in question.

Name	RFC4670 Name	Description
Status	-	Shows the state of the server. It takes one of the following values: • Disabled: The selected server is disabled. • Not Ready: The server is enabled, but IP communication is not yet up and running. • Ready: The server is enabled, IP communication is up and running, and the RADIUS module is ready to accept accounting attempts. • Dead (X seconds left): Accounting attempts were made to this server, but it did not reply within the configured timeout. The server has temporarily been disabled, but will get re-enabled when the dead-time expires. The number of seconds left before this occurs is displayed in parentheses. This state is only reachable when more than one server is enabled.
Round-trip time	radiusAccClientExtRoundTripTime	The time interval (measured in milliseconds) between the most recent Response and the Request that matched it from the RADIUS accounting server. The granularity of this measurement is 100 ms. A value of 0 ms indicates that there hasn't been round-trip communication with the server yet.

Buttons

The server select box determines which server is affected by clicking the buttons.

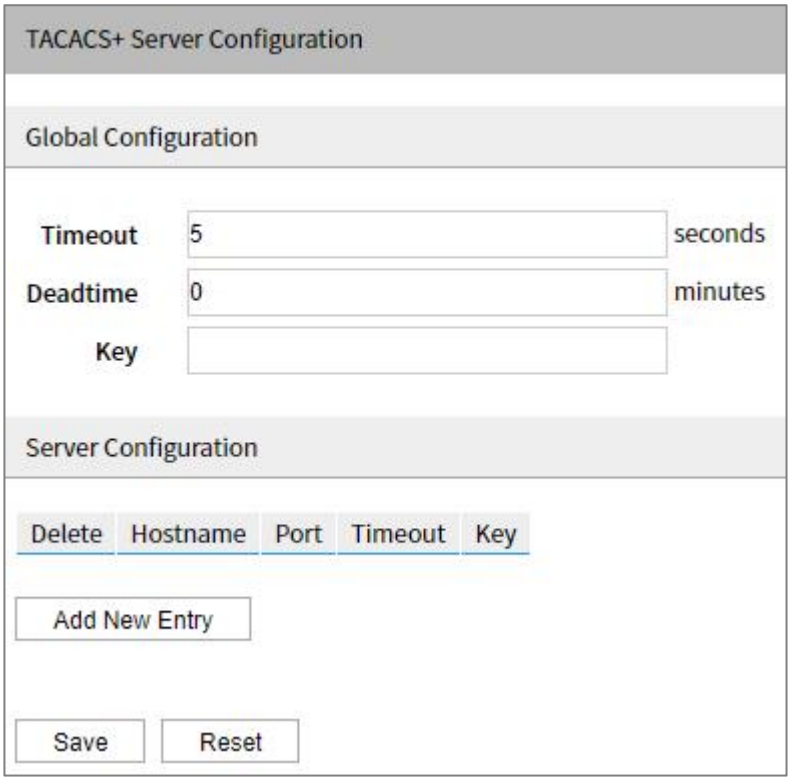
Auto-refresh: Check this box to enable an automatic refresh. Automatic refresh occurs every 3 seconds.

Refresh: Click to refresh the page immediately.

Clear: Clears the counters for the selected server. The "Pending Requests" counter will not be cleared by this operation.

4.6 TACACS+ Server Configuration

This page allows you to configure the TACACS+ servers.



Global Configuration

These setting are common for all of the TACACS+ servers.

Timeout

Timeout is the number of seconds, in the range 1 to 1000, to wait for a reply from a TACACS+ server before it is considered to be dead.

Deadtime

Deadtime, which can be set to a number between 0 to 1440 分, is the period during which the switch will not send new requests to a server that has failed to respond to a previous request. This will stop the switch from continually trying to contact a server that it has already determined as dead.

Setting the Deadtime to a value greater than 0 (0) will enable this feature, but only if more than one server has been configured.

Key

The secret key - up to 63 characters long - shared between the TACACS+ server and the switch.

Server Configuration

The table has one row for each TACACS+ server and a number of columns, which are:

Delete

To delete a TACACS+ server entry, check this box. The entry will be deleted during the next Save.

Hostname

The IP address or hostname of the TACACS+ server.

Auth Port

The TCP port to use on the TACACS+ server for authentication.

Timeout

This optional setting overrides the global timeout value. Leaving it blank will use the global timeout value.

Key

This optional setting overrides the global key. Leaving it blank will use the global key.

Adding a New Server

Click “Add new server” to add a new TACACS + server. An empty row is added to the table, and the TACACS+ server can be configured as needed. Up to 5 servers are supported.

The “Delete” button can be used to undo the addition of the new server.

Buttons

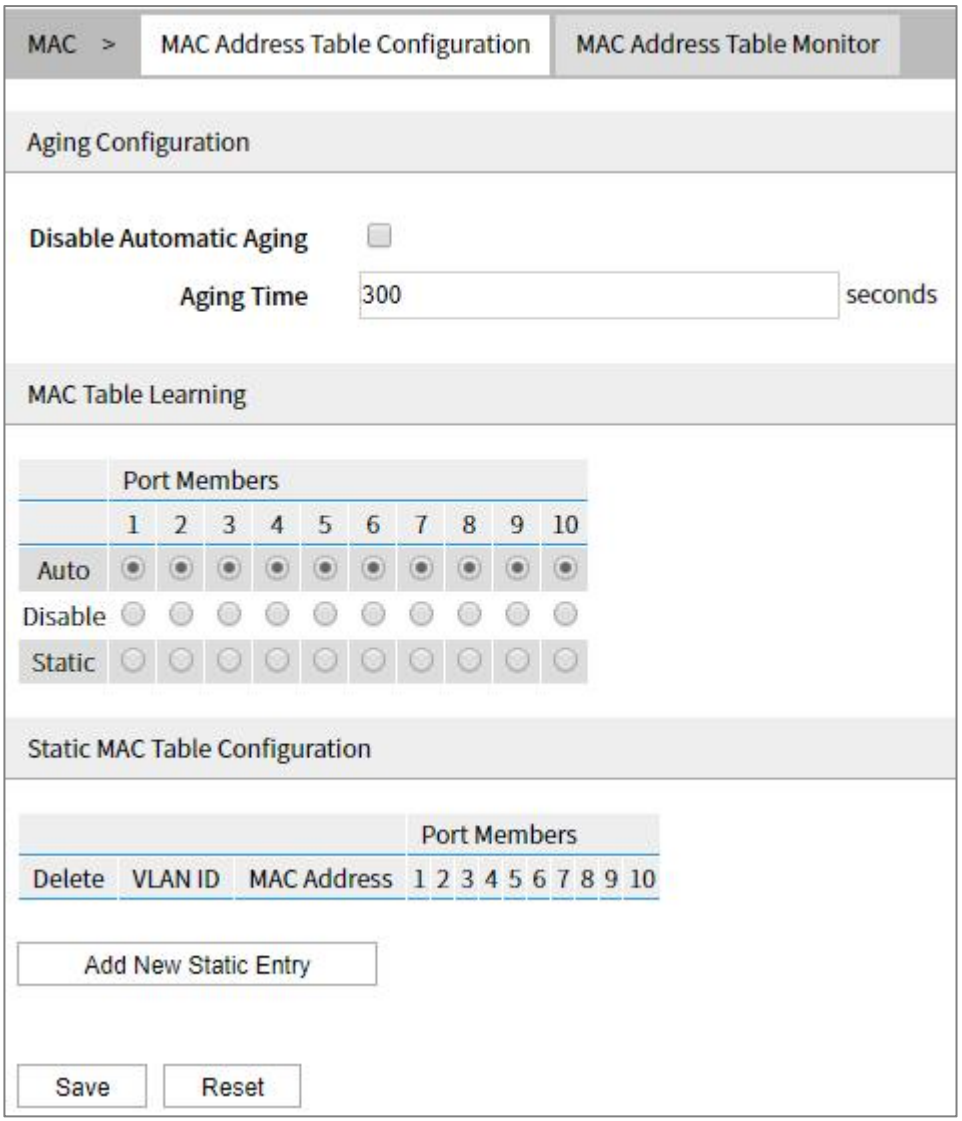
Save: Click to save changes.

Reset: Click to undo any changes made locally and revert to previously saved values.

5 Layer 2 Protocol

5.1 MAC Address Table

5.1.1 MAC Address Table Configuration



The MAC Address Table is configured on this page. Set timeouts for entries in the dynamic MAC Table and configure the static MAC table here.

Aging Configuration

By default, dynamic entries are removed from the MAC table after 300 seconds. This removal is also called aging.

Configure aging time by entering a value here in seconds; for example, Age time seconds.

"Aging time": the allowed range is 0.1 to 1 million seconds.

"Disable Auto Aging": disable the auto aging function of dynamic entries by checking Disable Auto Aging.

MAC table learning

If the learning mode for a given port is greyed out, another module is in control of the mode, so that it cannot be changed by the user. An example of such a module is the MAC-Based Authentication under 802.1X.

Each port can do learning based upon the following settings:

Auto

Learning is done automatically as soon as a frame with unknown SMAC is received.

Disable

No learning is done.

Secure

Only static MAC entries are learned, all other frames are dropped.

Notice:

Make sure that the link used for managing the switch is added to the Static Mac Table before changing to secure learning mode, otherwise the management link is lost and can only be restored by using another non-secure port or by connecting to the switch via the serial interface.

Static MAC Table Configuration

The static entries in the MAC table are shown in this table. The static MAC table can contain 64 entries.

The MAC table is sorted first by VLAN ID and then by MAC address.

Delete

Check to delete the entry. It will be deleted during the next save.

VLAN

The VLAN ID of the entry.

MAC address

The MAC address of the entry.

Port Members

Checkmarks indicate which ports are members of the entry. Check or uncheck as needed to modify the entry.

Add New Static Entry

Click “add new static entry” to add a new MAC table entry. Specify the VLAN ID, MAC address, and port members for the new entry. Click "Apply".

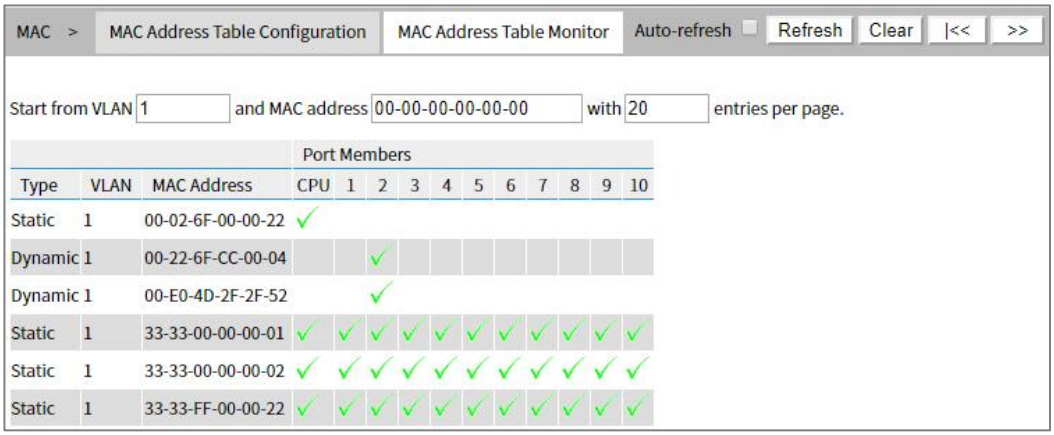
Buttons

Save: Click to save changes.

Reset: Click to undo any changes made locally and revert to previously saved values.

5.1.2 MAC Address Table Monitoring

Entries in the MAC Table are shown on this page. The MAC Table contains up to 8192 entries, and is sorted first by VLAN ID, then by MAC address.



Each page shows up to 999 entries from the MAC table, default being 20, selected through the "entries per page" input field. When first visited, the web page will show the first 20 entries from the beginning of the MAC Table. The first displayed will be the one with the lowest VLAN ID and the lowest MAC address found in the MAC Table.

The Start “MAC address" and "VLAN" input fields allow the user to select the starting point in the MAC Table. Clicking the “Refresh” button will update the displayed table starting from that or the closest next MAC Table match. In addition, the two input fields will - upon a “Refresh” button click - assume the value of the first displayed entry, allowing for continuous refresh with the same start address.

The “>>” button will use the last entry of the currently displayed entry as a basis for the next lookup. When the end is reached the text "No more entries" is shown in the displayed table. Use the “|<<” button to start over.

MAC Table Columns

Type

Indicates whether the entry is a static or a dynamic entry.

VLAN

The VLAN ID of the entry.

MAC address

The MAC address of the entry.

Configured ports

The ports that are members of the entry.

Buttons

Auto-refresh: Automatic refresh occurs every 3 seconds.

Refresh: Refreshes the displayed table starting from the "Start from MAC address" and "VLAN" input fields.

Clear: refresh all dynamic entries.

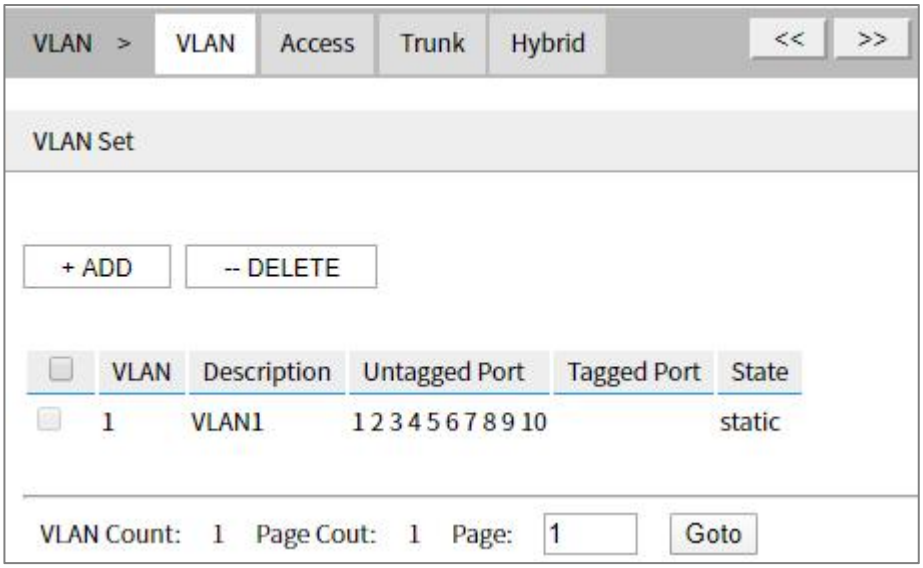
|<<: Updates the table starting from the first entry in the MAC Table, i.e. the entry with the lowest VLAN ID and MAC address.

>>: Updates the table, starting with the entry after the last entry currently displayed.

5.2 VLAN

5.2.1 VLAN

On this page, users can create VLAN and edit VLAN description.



VLAN

VLAN ID number, value range is 1-4094.

Description

Description information of VLAN.

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:

- Static；
- Dynamic。

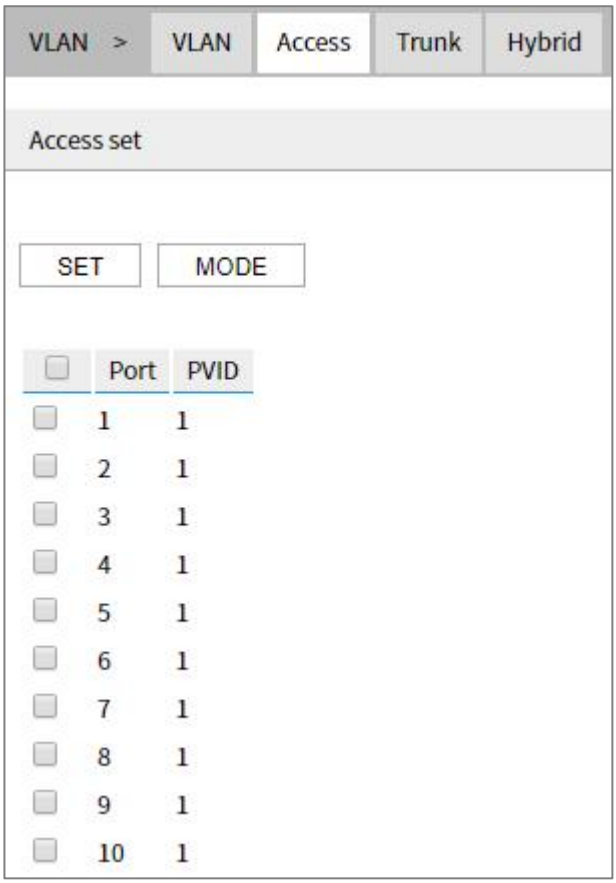
Buttons

Add: click to add VLAN.

Delete: Click to delete the selected VLAN.

5.2.2 Access

On this page, users can configure the port VLAN mode (access, trunk, Hybrid), and port PVID.



Port

The corresponding port name of the device Ethernet port.

Port VLAN ID

PVID value, it defaults to 1, value range is 1-4094. 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.

Buttons

Configuration: Click to configure the PVID of the selected port.

Port Mode: Click to configure the port mode of the selected port.

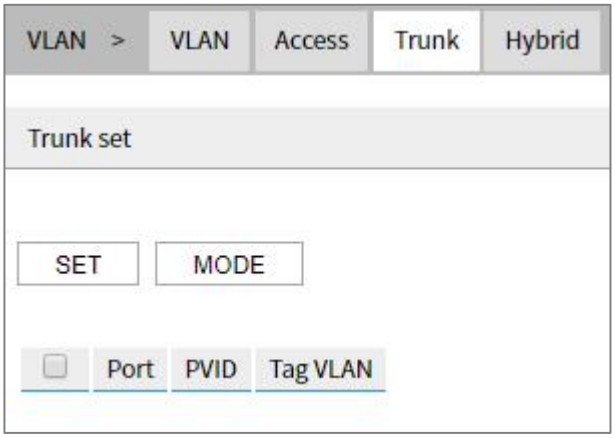
There are three port link types that the switch supports:

- 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.
- Trunk: port can belong to multiple VLAN, Trunk port can allow the messages of multiple VLANs to pass with Tag, but only allow the messages of one VLAN to transmit without tag (strip Tag) from this kind of interface. Commonly used in the connection between network devices.
- 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.

If the port mode is set to Trunk or Hybrid, the port display will be updated to the tab corresponding to “Trunk” or “Hybrid”.

5.2.3 Trunk

On this page, user can configure the relevant parameters of Trunk port mode.



Port

The corresponding port name of the device Ethernet port.

Port VLAN ID

The PVID number of the port, ranging from 1-4094.

TagVLAN

VLAN ID number with TAG allowed by interface, a single value or range ("-"indicates the range). For example: 9 or 10-15.

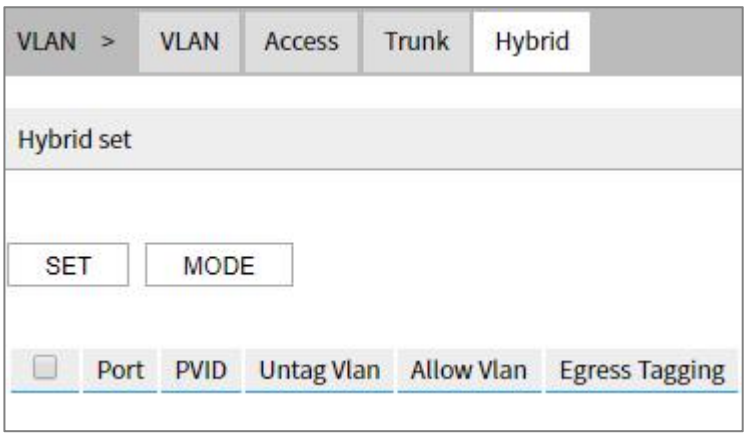
Buttons

Set: Check the entries that need to be reconfigured, click “Set” to reset PVID value and TagVLAN parameters.

Port mode: Click “Mode Settings” to set the mode to Access or Hybrid. If the port mode is set to Access or Hybrid, the port display will be updated to the tab corresponding to Access or Hybrid.

5.2.4 Hybrid

On this page, user can configure the relevant parameters of Hybrid port mode.



Port

The corresponding port name of the device Ethernet port.

Port VLAN ID

The PVID number of the port, ranging from 1-4094.

Untag Vlan

The VLAN ID number that the port allows to pass without tags.

Allow Vlan

The VLAN ID number that the port allows to pass, a single value or range (the range is indicated by "-"). For example: 9 or 10-15.

Egress Tagging

Processing mode of Hybrid interface for marking of exit message;

- UntagPortVLAN：PVID is not tagged;
- TagAll: Tag all VLAN;
- UntagAll: Untag all VLAN.

Process for Port Receiving Message

Interface type	Process for Receiving Untagged Message	Process for Receiving Tagged Message
Access	Receive this message and tag it with default VLAN ID.	• Receive the message when the VLAN ID is the same as default VLAN ID. • Discard the message when the VLAN ID is different from the default VLAN ID.
Trunk	Receive this message and tag it with default VLAN ID.	• Receive this message when the VLAN ID is in the list of VLAN ID that allow to pass through the interface. • Discard this message when the VLAN ID is not in the list of VLAN ID that allow to pass through the interface.
Hybrid		

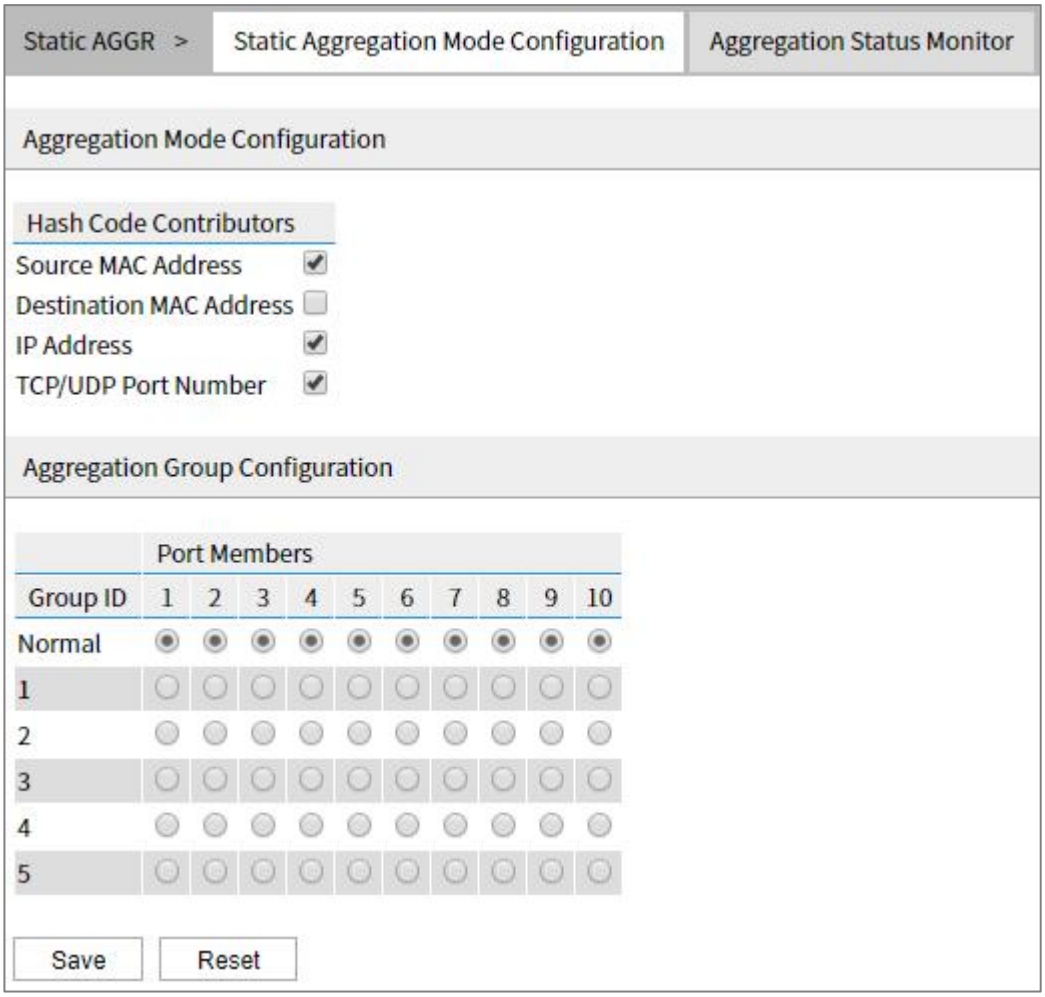
Process for Port Sending Message

Interface type	The process of transmit frame
Access	Strip the PVID Tag of the message first, then transmit it.
Trunk	• 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. • 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.
Hybrid	When the VLAN ID is the one allowed to pass through the interface, it would send this message. It could be set to whether to carry Tag during transmission.

5.3 Static Aggregation

5.3.1 Static Link Aggregation Mode Configuration

This page is used to configure the aggregation mode and the aggregation group.



Hash algorithm

Source MAC Address

The Source MAC address can be used to calculate the destination port for the frame. Check to enable the use of the Source MAC address, or uncheck to disable. By default, Source MAC Address is enabled.

Destination MAC Address

The Destination MAC Address can be used to calculate the destination port for the frame. Check to enable the use of the Destination MAC Address, or uncheck to disable. By default, Destination MAC Address is disabled.

IP Address

The IP address can be used to calculate the destination port for the frame. Check to enable the use of the IP Address, or uncheck to disable. By default, IP Address is enabled.

TCP/UDP Port Number

The TCP/UDP port number can be used to calculate the destination port for the frame. Check to enable the use of the TCP/UDP Port Number, or uncheck to disable. By default, TCP/UDP Port Number is enabled.

Aggregation Group Configuration

Group ID

Indicates the group ID for the settings contained in the same row. Group ID "Normal" indicates there is no aggregation. Only one group ID is valid per port.

Configured ports

Each switch port is listed for each group ID. Select a radio button to include a port in an aggregation, or clear the radio button to remove the port from the aggregation. By default, no ports belong to any aggregation group. Only full duplex ports can join an aggregation and ports must be in the same speed in each group.

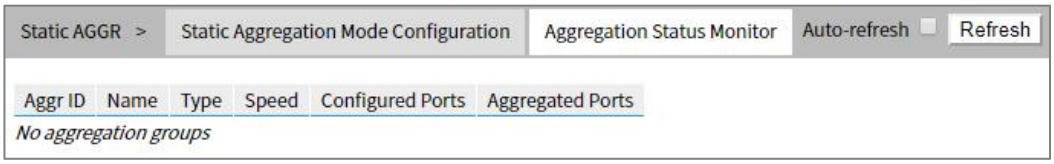
Buttons

Save: Click to save changes.

Reset: Click to undo any changes made locally and revert to previously saved values.

5.3.2 Link Aggregation Status Monitoring

This page is used to see the status of ports in Aggregation group.



Aggregation Group Status

Aggr ID

The Aggregation ID associated with this aggregation instance.

Group name

Name of the Aggregation group ID.

Type

Type of the Aggregation group(Static or LACP).

Speed

Speed of the Aggregation group.

Configured ports

Configured member ports of the Aggregation group.

Aggregated ports

Aggregated member ports of the Aggregation group.

Buttons

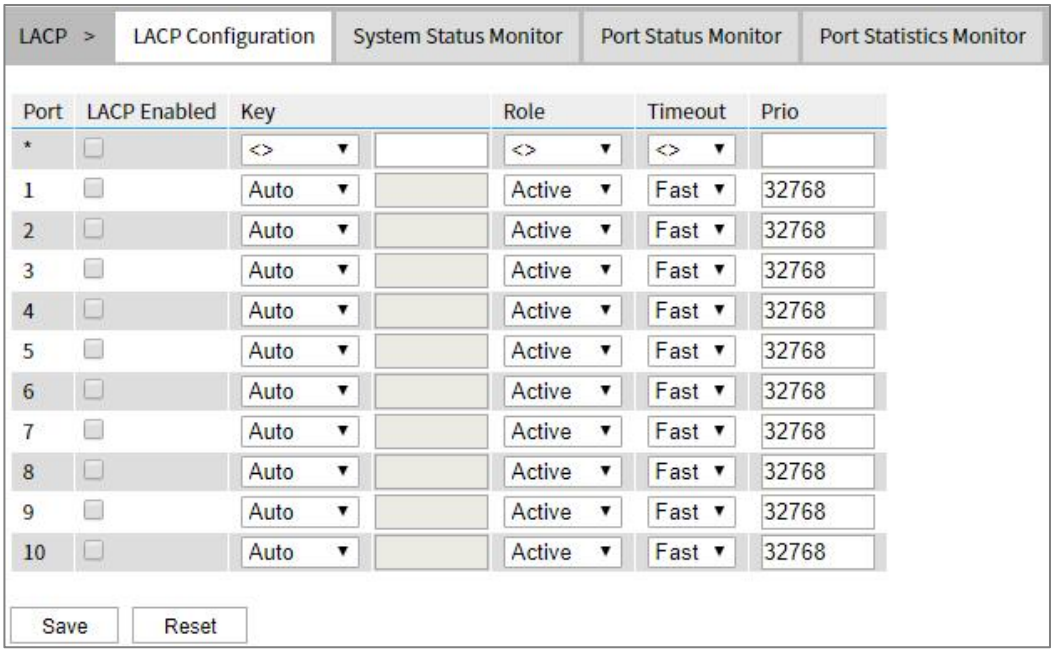
Refresh: Click to refresh the page immediately.

Auto-refresh: Automatic refresh occurs every 3 seconds.

5.4 LACP

5.4.1 LACP Configuration

This page allows the user to inspect the current LACP port configurations, and possibly change them as well.



Port

The switch port number.

LACP Enable

Controls whether LACP is enabled on this switch port. LACP will form an aggregation when 2 or more ports are connected to the same partner.

Key

The Key value incurred by the port, range 1-65535. The Auto setting will set the key as appropriate by the physical link speed, 10Mb=1, 100mb=2, 1gb=3. Using the Specific setting, a user-defined value can be entered. Ports with the same Key value can participate in the same aggregation group, while ports with different keys cannot.

Role

The Role shows the LACP activity status. The Active will transmit LACP packets each second, while Passive will wait for a LACP packet from a partner (speak if spoken to).

timeout

The Timeout controls the period between BPDU transmissions. Fast will transmit LACP packets each second, while Slow will wait for 30 seconds before sending a LACP packet.

Prio

The priority of the control port, range 1-65535. If the LACP partner wants to form a larger group than is supported by this device then this parameter will control which ports will be active and which ports will be in a backup role. Lower number means greater priority.

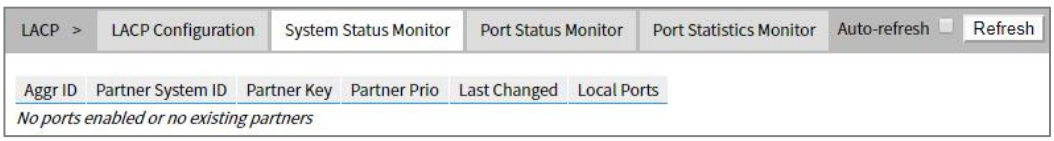
Buttons

Save: Click to save changes.

Reset: Click to undo any changes made locally and revert to previously saved values.

5.4.2 System Status Monitoring

This page provides a status overview for all LACP instances.



Aggr ID

The Aggregation ID associated with this aggregation instance. For LLAG, id is shown as 'isid：aggr-id’ and for GLAGs as 'aggr-id'.

Partner System ID

The system ID (MAC address) of the aggregation partner.

Partner Key

The key that the partner has assigned to this aggregation ID.

Partner Prio

Port priority of aggregation partner.

Last changed

The time since this aggregation changed.

Local Ports

Shows which ports are a part of this aggregation for this switch.

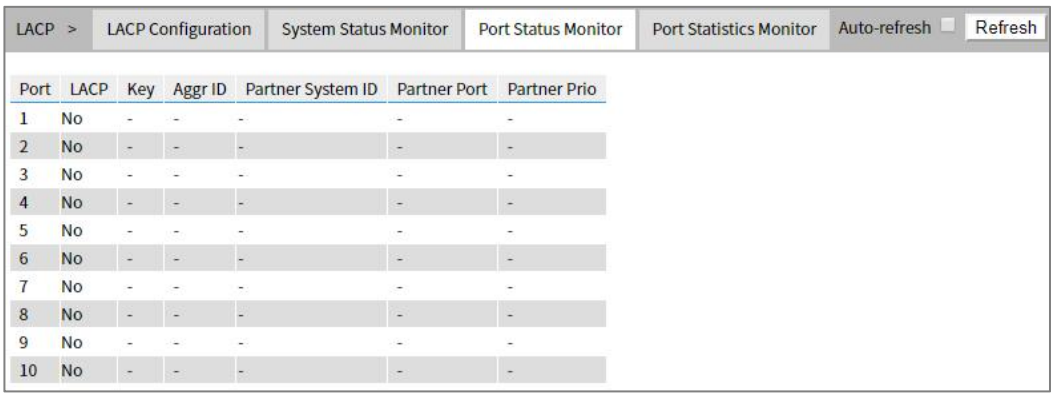
Buttons

Refresh: Click to refresh the page immediately.

Auto-refresh: Automatic refresh occurs every 3 seconds.

5.4.3 Port State Monitoring

This page provides a status overview for LACP status for all ports.



Port

The switch port number.

LACP

'Yes' means that LACP is enabled and the port link is up. 'No' means that LACP is not enabled or that the port link is down. 'Backup' means that the port could not join the aggregation group but will join if other port leaves. Meanwhile it's LACP status is disabled.

Key

The key assigned to this port. Only ports with the same key can aggregate together.

Aggr ID

The Aggregation ID assigned to this aggregation group.

Partner System ID

The system ID (MAC address) of the partner.

Partner Port

The partner's port number connected to this port.

Partner Prio

The partner's port priority.

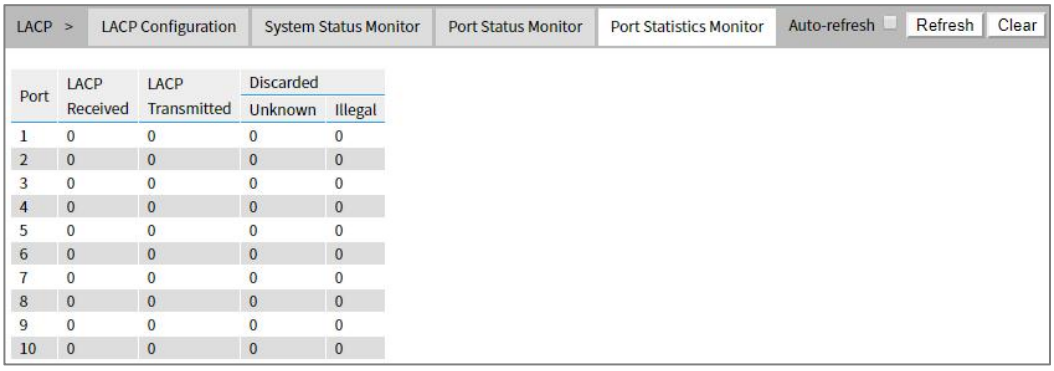
Buttons

Refresh: Click to refresh the page immediately.

Auto-refresh: Automatic refresh occurs every 3 seconds.

5.4.4 Port Statistics Monitoring

This page provides an overview for LACP statistics for all ports.



Port

The switch port number.

LACP Received

Shows how many LACP frames have been received at each port.

LACP Transmitted

Shows how many LACP frames have been sent from each port.

Discarded

Shows how many unknown or illegal LACP frames have been discarded at each port.

Buttons

Auto-refresh: Automatic refresh occurs every 3 seconds.

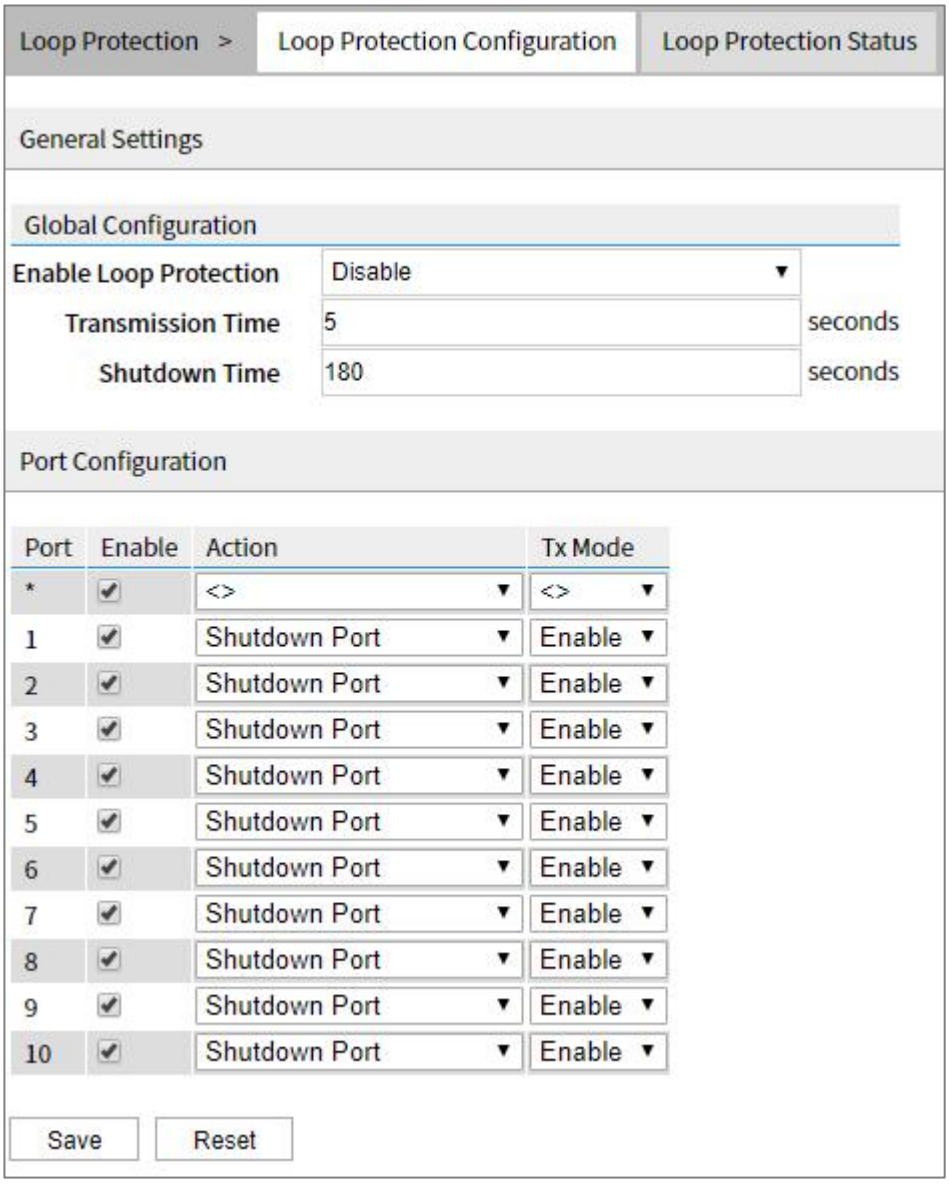
Refresh: Click to refresh the page immediately.

Clear: Clears the counters for all ports.

5.5 Loop Protection

5.5.1 Loop Protection Configuration

This page allows the user to inspect the current Loop Protection configurations, and possibly change them as well.



General Settings

Enable Loop Protection

Controls whether loop protections is enabled (as a whole).

Transmission Time

The interval between each loop protection PDU sent on each port. Valid values are 1 to 10 seconds. Default value is 5 seconds.

Shutdown Time

The period (in seconds) for which a port will be kept disabled in the event of a loop is detected (and the port action shuts down the port). Valid values are 0 to 604800 seconds (7 days). A value of zero will keep a port disabled (until next device restart). Default value is 180 seconds.

Port Configuration

Port

The switch port number.

Switch

Controls whether loop protection is enabled on this switch port.

Action

Configures the action performed when a loop is detected on a port. Valid values are

- Shutdown Port
- Shutdown Port and Log
- Log Only

Tx Mode

Controls whether the port is actively generating loop protection PDU's, or whether it is just passively looking for looped PDU's.

Buttons

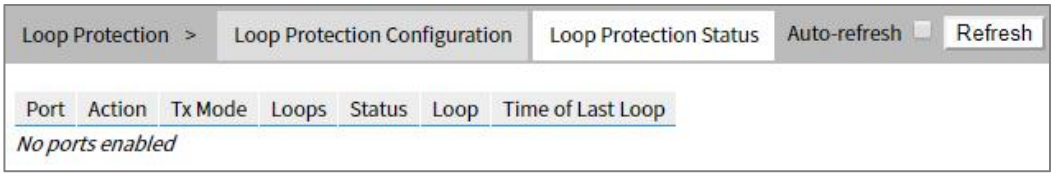
Save: Click to save changes.

Reset: Click to undo any changes made locally and revert to previously saved values.

5.5.2 Loop Protection Status

This page displays the loop protection port status the ports of the switch.

Loop protection port status is:



Port

The switch port number of the logical port.

Action

The currently configured port action.

Tx Mode

Status of port active protection.

Loops

The number of loops detected on this port.

Status

The current loop protection status of the port.

Loop

Whether a loop is currently detected on the port.

Time of Last Loop

The time of the last loop event detected.

Buttons

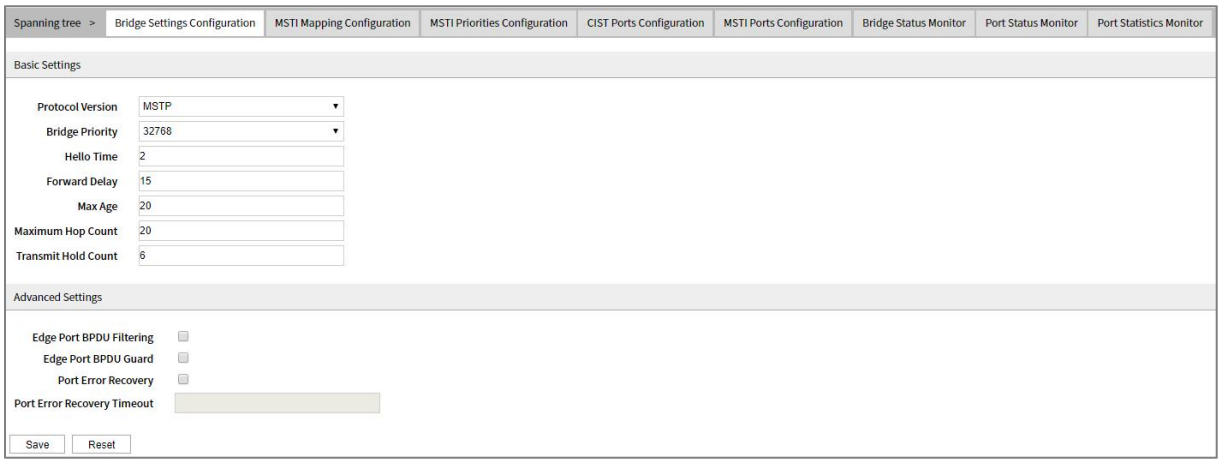
Refresh: Click to refresh the page immediately.

Auto-refresh: Check this box to enable an automatic refresh of the page at regular intervals.

5.6 Spanning Tree

5.6.1 Bridge Setting Configuration

This page allows you to configure STP system settings. The settings are used by all STP Bridge instances in the Switch.



Basic Settings

Protocol Version

The MSTP/RSTP/STP protocol version setting. Valid values are STP, RSTP and MSTP.

Bridge Priority

Controls the bridge priority. Lower numeric values have better priority. The bridge priority plus the MSTI instance number, concatenated with the 6-byte MAC address of the switch forms a Bridge Identifier.

For MSTP operation, this is the priority of the CIST. Otherwise, this is the priority of the STP/RSTP bridge.

Hello Time

The interval between sending STP BPDU's. Valid values are in the range 1 to 10 seconds, default is 2 seconds.

Note

Changing this parameter from the default value is not recommended, and may have adverse effects on your network.

Forward Delay

The delay used by STP Bridges to transit Root and Designated Ports to Forwarding (used in STP compatible mode). Valid values are in the range 4 to 30 seconds.

Max Age

The maximum age of the information transmitted by the Bridge when it is the Root Bridge. Valid values are in the range 6 to 40 seconds, and MaxAge must be <= (FwdDelay-1)*2.

Maximum Hop Count

This defines the initial value of remaining Hops for MSTI information generated at the boundary of an MSTI region. It defines how many bridges a root bridge can distribute its BPDU information to. Valid values are in the range 6 to 40 hops.

Transmit Hold Count

The number of BPDU's a bridge port can send per second. When exceeded, transmission of the next BPDU will be delayed. Valid values are in the range 1 to 10 BPDU's per second.

Advanced Settings

Edge Port BPDU Filtering

Control whether a port explicitly configured as Edge will transmit and receive BPDUs.

BPDU Guard

Control whether a port explicitly configured as Edge will disable itself upon reception of a BPDU. The port will enter the error-disabled state, and will be removed from the active topology.

Port Error Recovery

Control whether a port in the error-disabled state automatically will be enabled after a certain time. If recovery is not enabled, ports have to be disabled and re-enabled for normal STP operation. The condition is also cleared by a system reboot.

Port Error Recovery Timeout

The time to pass before a port in the error-disabled state can be enabled. Valid values are between 30 and 86400 seconds (24 hours).

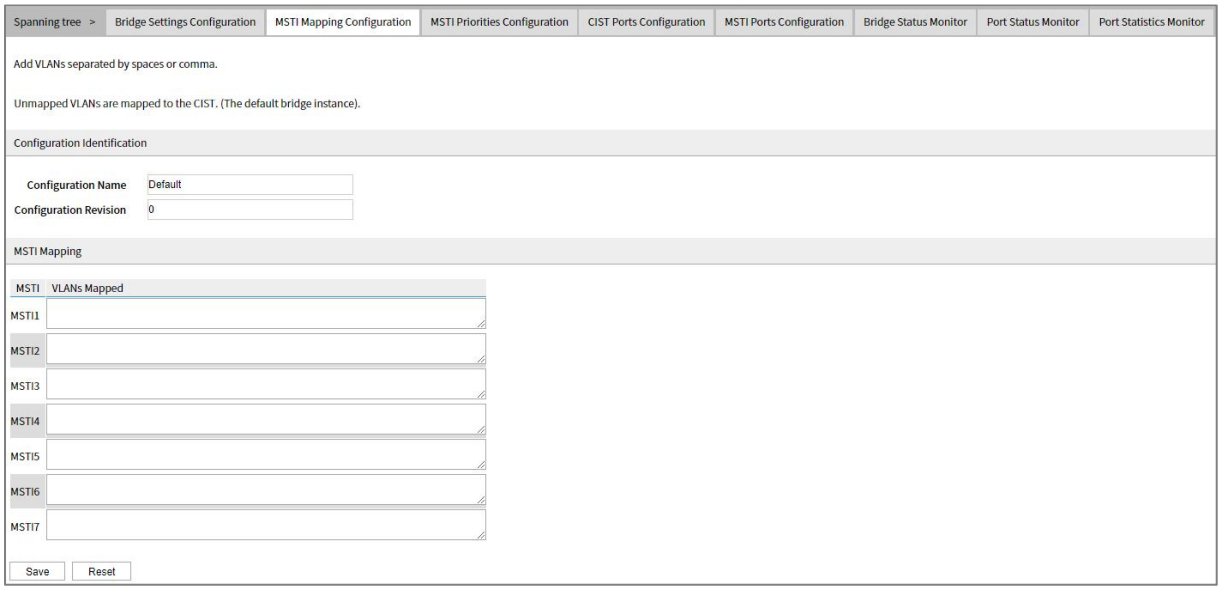
Buttons

Save: Click to save changes.

Reset: Click to undo any changes made locally and revert to previously saved values.

5.6.2 MSTI Mapping Configuration

This page allows the user to inspect the current STP MSTI bridge instance priority configurations, and possibly change them as well.



Configuration Identification

Domain Name

The name identifying the VLAN to MSTI mapping. Bridges must share the name and revision (see below), as well as the VLAN-to-MSTI mapping configuration in order to share spanning trees for MSTI's (Intra-region). The name is at most 32 characters.

Configuration Revision

The revision of the MSTI configuration named above. This must be an integer between 0 and 65535.

MSTI Mapping

MSTI

The Bridge Instance. The CIST is not available for explicit mapping, as it will receive the VLANs not explicitly mapped.

VLANs Mapped

The list of VLANs mapped to the MSTI. The VLANs can be given as a single (xx, xx being between 1 and 4094) VLAN, or a range (xx-yy), each of which must be separated with comma and/or space. A VLAN can only be mapped to one MSTI. An unused MSTI should just be left empty. (I.e. not having any VLANs mapped to it.) Example: 2, 5, 20-40.

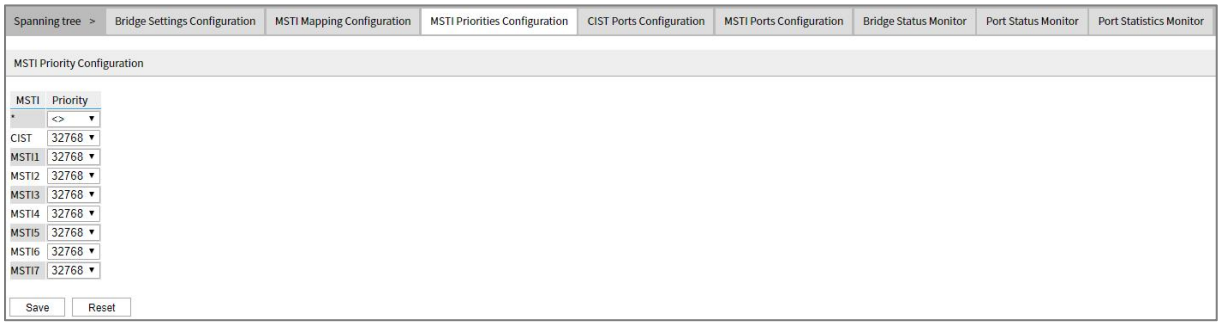
Buttons

Save: Click to save changes.

Reset: Click to undo any changes made locally and revert to previously saved values.

5.6.3 MSTI Priority Configuration

This page allows the user to inspect the current STP MSTI bridge instance priority configurations, and possibly change them as well.



MSTI

The Bridge Instance. The CIST is the default instance, which is always active.

Priority

Controls the bridge priority. Lower numeric values have better priority. The bridge priority plus the MSTI instance number, concatenated with the 6-byte MAC address of the switch forms a Bridge Identifier.

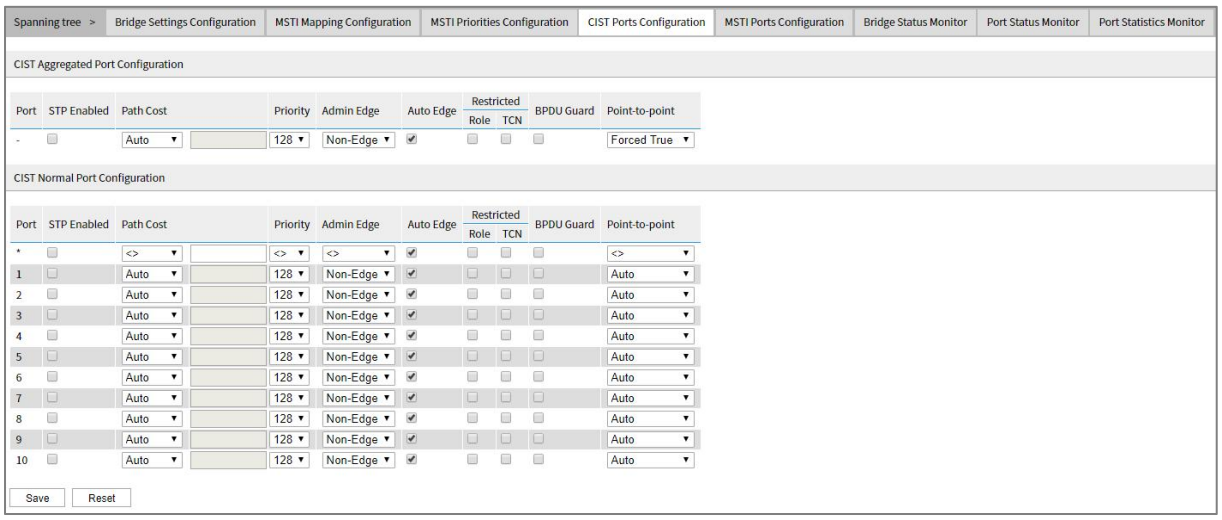
Buttons

Save: Click to save changes.

Reset: Click to undo any changes made locally and revert to previously saved values.

5.6.4 CIST Port Configuration

This page allows the user to inspect the current STP CIST port configurations, and possibly change them as well.



This page contains settings for physical and aggregated ports.

Port

The switch port number.

STP Enabled

Controls whether STP is enabled on this switch port.

Path Cost

Controls the path cost incurred by the port. The Auto setting will set the path cost as appropriate by the physical link speed, using the 802.1D recommended values. Using the Specific setting, a user-defined value can be entered. The path cost is used when establishing the active topology of the network. Lower path cost ports are chosen as forwarding ports in favour of higher path cost ports. Valid values are in the range 1 to 200000000.

Priority

Controls the port priority. This can be used to control priority of ports having identical port cost.

Edge management

Controls whether the operEdge flag should start as set or cleared. (The initial operation edge state when a port is initialized).

AutoEdge

Controls whether the bridge should enable automatic edge detection on the bridge port. This allows operEdge to be derived from whether BPDU's are received on the port or not.

Restriction Role

If enabled, causes the port not to be selected as Root Port for the CIST or any MSTI, even if it has the best spanning tree priority vector. Such a port will be selected as an Alternate Port after the Root Port has been selected. If set, it can cause lack of spanning tree connectivity. It can be set by a network administrator to prevent bridges external to a core region of the network influence the spanning tree active topology, possibly because those bridges are not under the full control of the administrator. This feature is also known as Root Guard.

Restriction TCN

If enabled, causes the port not to propagate received topology change notifications and topology changes to other ports. If set it can cause temporary loss of connectivity after changes in a spanning tree's active topology as a result of persistently incorrect learned station location information. It is set by a network administrator to prevent bridges external to a core region of the network, causing address flushing in that region, possibly because those bridges are not under the full control of the administrator or the physical link state of the attached LANs transits frequently.

BPDU Guard

If enabled, causes the port to disable itself upon receiving valid BPDU's. Contrary to the similar bridge setting, the port Edge status does not effect this setting.

A port entering error-disabled state due to this setting is subject to the bridge Port Error Recovery setting as well.

Point-to-Point

Controls whether the port connects to a point-to-point LAN rather than to a shared medium. This can be automatically determined, or forced either true or false. Transition to the forwarding state is faster for point-to-point LANs than for shared media.

Buttons

Save: Click to save changes.

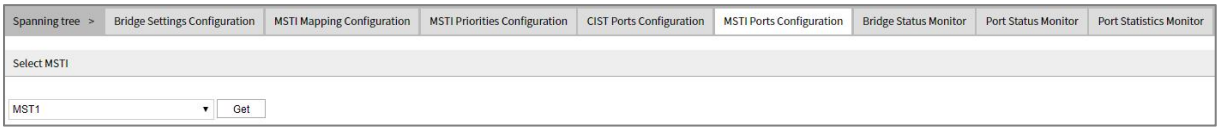
Reset: Click to undo any changes made locally and revert to previously saved values.

5.6.5 MSTI port configuration

This page allows the user to inspect the current STP MSTI port configurations, and possibly change them as well.

An MSTI port is a virtual port, which is instantiated separately for each active CIST (physical) port for each MSTI instance configured on and applicable to the port. The MSTI instance must be selected before displaying actual MSTI port configuration options.

This page contains MSTI port settings for physical and aggregated ports.



Port

The switch port number of the corresponding STP CIST (and MSTI) port.

Cost

Controls the path cost incurred by the port. The Auto setting will set the path cost as appropriate by the physical link speed, using the 802.1D recommended values. Using the Specific setting, a user-defined value can be entered. The path cost is used when establishing the active topology of the network. Lower path cost ports are chosen as forwarding ports in favour of higher path cost ports. Valid values are in the range 1 to 200000000.

Priority

Controls the port priority. This can be used to control priority of ports having identical port cost. (See above).

Buttons

Get: Click to retrieve settings for a specific MSTI.

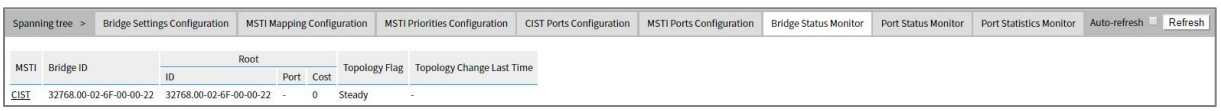
Save: Click to save changes.

Reset: Click to undo any changes made locally and revert to previously saved values.

5.6.6 Bridge Status Monitoring

This page provides a status overview of all STP bridge instances.

The displayed table contains a row for each STP bridge instance, where the column displays the following information:



MSTI

The Bridge Instance. This is also a link to the STP Detailed Bridge Status.

Bridge ID

The Bridge ID of this Bridge instance.

Root ID

The Bridge ID of the currently elected root bridge.

Root Port

The switch port currently assigned the root port role.

Root Cost

Root Path Cost. For the Root Bridge this is zero. For all other Bridges, it is the sum of the Port Path Costs on the least cost path to the Root Bridge.

Topology Flag

The current state of the Topology Change Flag of this Bridge instance.

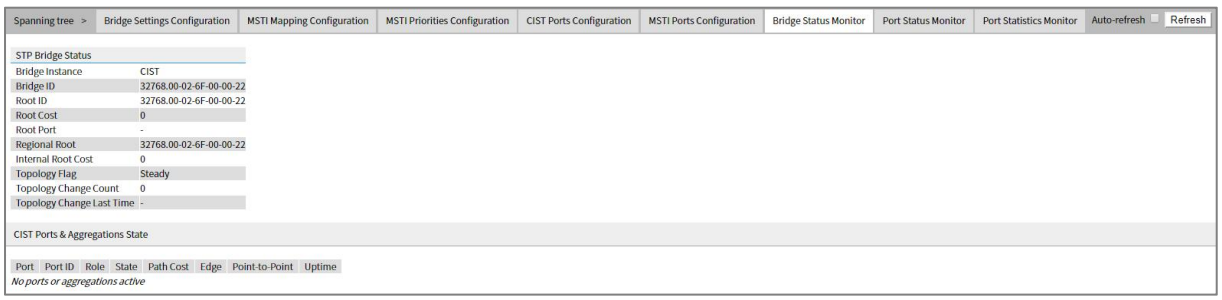
Topology Change Last

The time since last Topology Change occurred.

Buttons

Refresh: Click to refresh the page immediately.

Auto-refresh: Check this box to refresh the page automatically. Automatic refresh occurs every 3 seconds.



STP Bridge Status

Bridge Instance

Bridge Instance -CIST, MST1, ……

Bridge ID

The Bridge ID of this Bridge instance.

Root ID

The Bridge ID of the currently elected root bridge.

Root Cost

Root Path Cost. For the Root Bridge this is zero. For all other Bridges, it is the sum of the Port Path Costs on the least cost path to the Root Bridge.

Root Port

The switch port currently assigned the root port role.

Regional Root

The Bridge ID of the currently elected regional root bridge, inside the MSTP region of this bridge. (For the CIST instance only).

Internal Root Cost

The Regional Root Path Cost. For the Regional Root Bridge this is zero. For all other CIST instances in the same MSTP region, it is the sum of the Internal Port Path Costs on the least cost path to the Internal Root Bridge. (For the CIST instance only).

Topology Flag

The current state of the Topology Change Flag of this Bridge instance.

Topology Change Count

The number of times where the topology change flag has been set (during a one-second interval).

Topology Change Last

The time passed since the Topology Flag was last set.

CIST Port and Aggregation State

Port

The switch port number.

Port ID

The port id as used by the STP protocol. This is the priority part and the logical port index of the bridge port.

Role

The current STP port role. The port role can be one of the following values： Alternate Port, Backup Port, Root Port, Designated Port.

Status

The current STP port state. The port state can be one of the following values: Discarding Learning Forwarding.

Cost

The current STP port path cost. This will either be a value computed from the Auto setting, or any explicitly configured value.

Edge

The current STP port (operational) Edge Flag. An Edge Port is a switch port to which no Bridges are attached. The flag may be automatically computed or explicitly configured. Each Edge Port transits directly to the Forwarding Port State, since there is no possibility of it participating in a loop.

Point-to-Point

The current STP port point-to-point flag. A point-to-point port connects to a non-shared LAN media. The flag may be automatically computed or explicitly configured. The point-to-point properties of a port affect how fast it can transit to STP state.

Uptime

The time since the bridge port was last initialized.

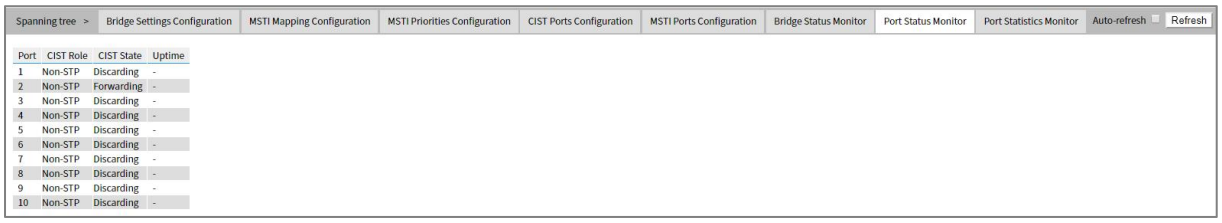
Buttons

Refresh: Click to refresh the page immediately.

Auto-refresh: Check this box to refresh the page automatically. Automatic refresh occurs every 3 seconds.

5.6.7 Port State Monitoring

This page displays the STP CIST port status for physical ports of the switch. STP port state:



Port

The switch port number.

CIST Role

The current STP port role of the CIST port. The port role can be one of the following values: AlternatePort BackupPort RootPort DesignatedPort Disabled.

CIST Status

The current STP port state of the CIST port. The port state can be one of the following values: Discarding Learning Forwarding.

Running time

The time since the bridge port was last initialized.

Buttons

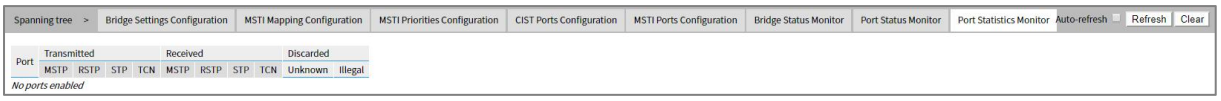
Refresh: Click to refresh the page immediately.

Auto-refresh: Check this box to refresh the page automatically. Automatic refresh occurs every 3 seconds.

5.6.8 Port Statistics Monitoring

This page displays the STP port statistics counters of bridge ports in the switch.

The STP port statistics counters are:



Port

The switch port number.

MSTP

The number of MSTP BPDU's received/transmitted on the port.

RSTP

The number of RSTP BPDU's received/transmitted on the port.

STP

The number of legacy STP Configuration BPDU's received/transmitted on the port.

TCN

The number of (legacy) Topology Change Notification BPDU's received/transmitted on the port.

Discarded Unknown

The number of unknown Spanning Tree BPDU's received (and discarded) on the port.

Discarded Illegal

The number of illegal Spanning Tree BPDU's received (and discarded) on the port.

Buttons

Refresh: Click to refresh the page immediately.

Clear: click to reset the counts.

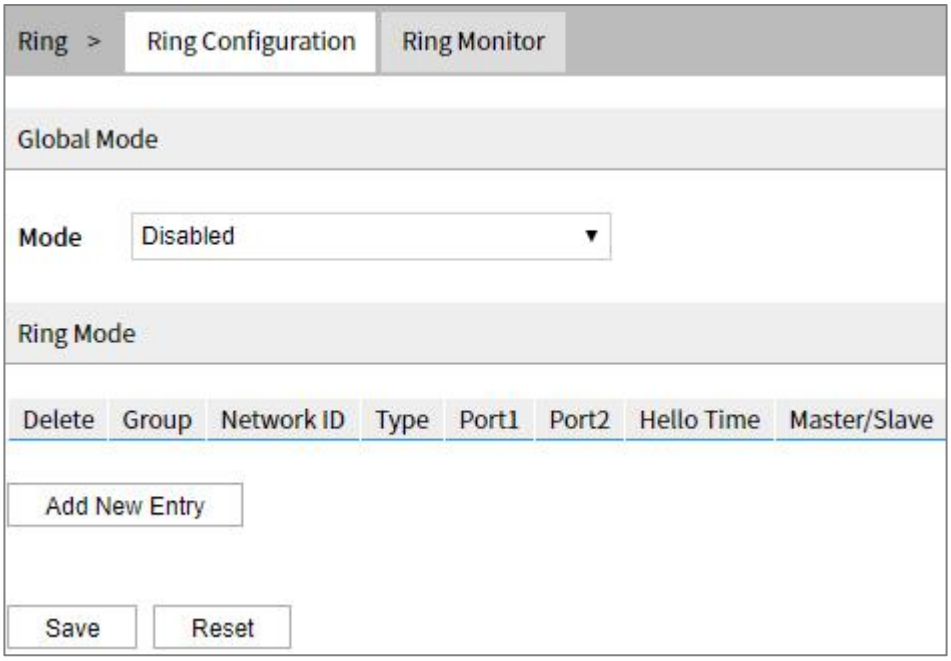
Auto-refresh: Check this box to enable an automatic refresh. Automatic refresh occurs every 3 seconds.

5.7 Ring

5.7.1 Ring Configuration

This page provides ring related configurations.

It 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.



Global Mode

Mode

Enable/Disable the Global mode.

The ring configuration only takes effect when the global mode is enabled.

Ring Mode

Delete

Check the corresponding check box to delete an entry. It will be deleted during the next Save operation.

Groups

Support ring group 1-4, it can create 4 ring networks at the same time.

Network ID

When multiple switch devices constitute a ring network, the current ring identification of the ring is network identification; the network identifications of different ring network are different.

Type

According to the scene environment requirement, choose different ring type.

- Single: Single ring, it adopts a continuous ring to connect each device together.
- Couple: Coupling ring is a redundant structure proposed to connect two independent networks.
- Chain: The chain, it enhances the flexibility that user builds any type of redundant network topology structure via a kind of advanced software technology.
- Dual-homing: Two adjacent rings share a switch; users can carry the same switch on two different networks or two different switching devices on the same network.

Port1

The network port 1 on the switch device used to form the ring network.

Port2

The network port 2 on the switch device used to form the ring network.

Hello time

Hello_time is the sending time interval of Hello packet; via the ring port, CPU sends information packet to adjacent device for confirming the connection is normal or not.

Master-slave mode

Single ring has master/slave device option. One-Master Multi-Slave mode is recommended in one single ring. When the device is set as master device and one end of it is backup link, it can enable backup link to ensure the normal operation of the network when failure occurs in ring network.

Note:

Some products don’t support Master-slave option, so their ring network is non-master station structure.

Buttons

Add new entry: Click to add a new loop entry. Specify the ID and configure the new entry. Click "Save".

Save: Click to save changes.

Reset: Click to undo any changes made locally and revert to previously saved values.

5.7.2 Ring Status

This page displays the ring status.

Group ID

Group ID of the ring network.

Network ID

The current ring identification of the ring is network ID.

Master and Slave

Single ring has master/slave device option. One-Master Multi-Slave mode is recommended in one single ring. When the device is set as master device and one end of it is backup link, it can enable backup link to ensure the normal operation of the network when failure occurs in ring network.

Note:

Some products don't support Master-slave option, so their ring network is non-master station structure.

Port1

The network port 1 on the switch device used to form the ring network.

Port2

The network port 2 on the switch device used to form the ring network.

Port1 Status

The status of network port 1 on the switch device used to form the ring network.

Port2 Status

The status of network port 2 on the switch device used to form the ring network.

Buttons

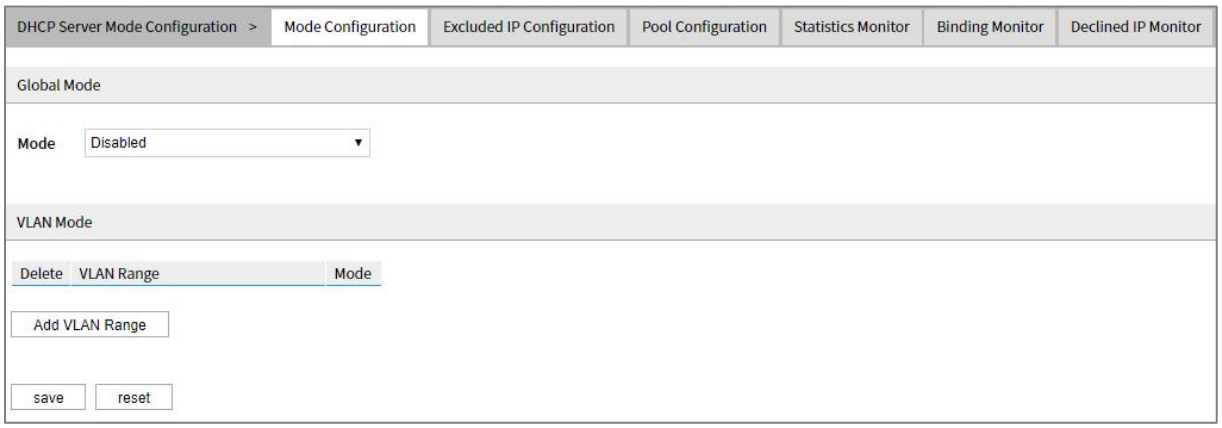
Auto-refresh: Automatic refresh occurs every 3 seconds.

Refresh: Click to refresh the page immediately.

5.8 DHCP server

5.8.1 Mode Setting

This page configures global mode and VLAN mode to enable/disable DHCP server per system and per VLAN.



Global Mode

Configure operation mode to enable/disable DHCP server per system.

Mode

Configure the operation mode per system. Possible modes are:

- Enabled: Enable DHCP server per system.
- Disabled: Disable DHCP server per system.

VLAN Mode

Configure operation mode to enable/disable DHCP server per VLAN.

VLAN Range

Indicate the VLAN range in which DHCP server is enabled or disabled. The first VLAN ID must be smaller than or equal to the second VLAN ID. BUT, if the VLAN range contains only 1 VLAN ID, then you can just input it into either one of the first and second VLAN ID or both.

On the other hand, if you want to disable existed VLAN range, then you can follow the steps.

1 click “add VLAN range” to add a new VLAN range.

2Input the VLAN range that you want to disable.

3Choose Mode to be disabled.

4 Press "Apply" to apply the changes.

Then, you will see the disabled VLAN range is removed from the DHCP Server mode configuration page.

Mode

Indicate the operation mode per VLAN. Possible modes are:

- Enabled: Enable DHCP server per VLAN.
- Disabled: Disable DHCP server per VLAN.

Buttons

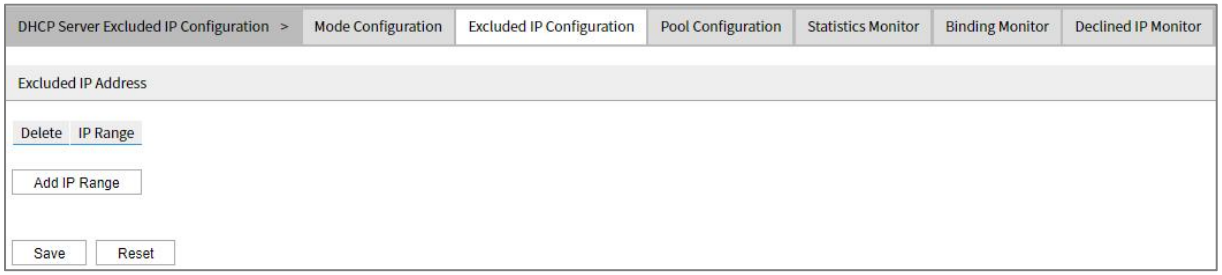
Add VLAN range: click to add new VLAN range.

Apply: Click to save changes.

Reset: Click to undo any changes made locally and revert to previously saved values.

5.8.2 Reserve IP Address Configuration

This page configures excluded IP addresses. DHCP server will not allocate these excluded IP addresses to DHCP client.



Excluded IP Address

Configure excluded IP addresses.

IP Range

Define the IP range to be excluded IP addresses. The first excluded IP must be smaller than or equal to the second excluded IP. BUT, if the IP range contains only 1 excluded IP, then you can just input it to either one of the first and second excluded IP or both.

Buttons

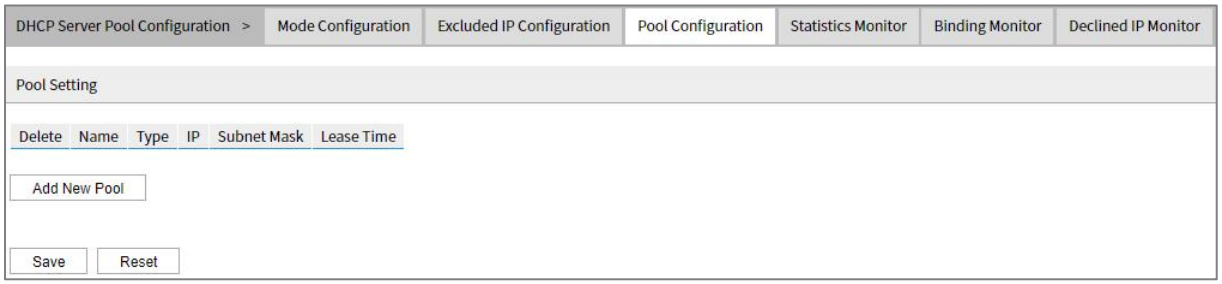
Add IP range: Click to add a new excluded IP range.

Save: Click to save changes.

Reset: Click to undo any changes made locally and revert to previously saved values.

5.8.3 DHCP Pool Configuration

This page manages DHCP pools. According to the DHCP pool, DHCP server will allocate IP address and deliver configuration parameters to DHCP client.



Pool Setting

Delete

Add or delete pools.

Adding a pool and giving a name is to create a new pool with "default" configuration. If you want to configure all settings including type, IP subnet mask and lease time, you can click the pool name to go into the configuration page.

Name

Configure the pool name that accepts all printable characters, except white space. If you want to configure the detail settings, you can click the pool name to go into the configuration page.

Type

Display which type of the pool is.

- Network: the pool defines a pool of IP addresses to service more than one DHCP client.
- Host: the pool services for a specific DHCP client identified by client identifier or hardware address.

If "-" is displayed, it means not defined.

IP

Display network number of the DHCP address pool.

If "-" is displayed, it means not defined.

Subnet Mask

Display subnet mask of the DHCP address pool.

If "-" is displayed, it means not defined.

Lease Time

Display lease time of the pool.

Buttons

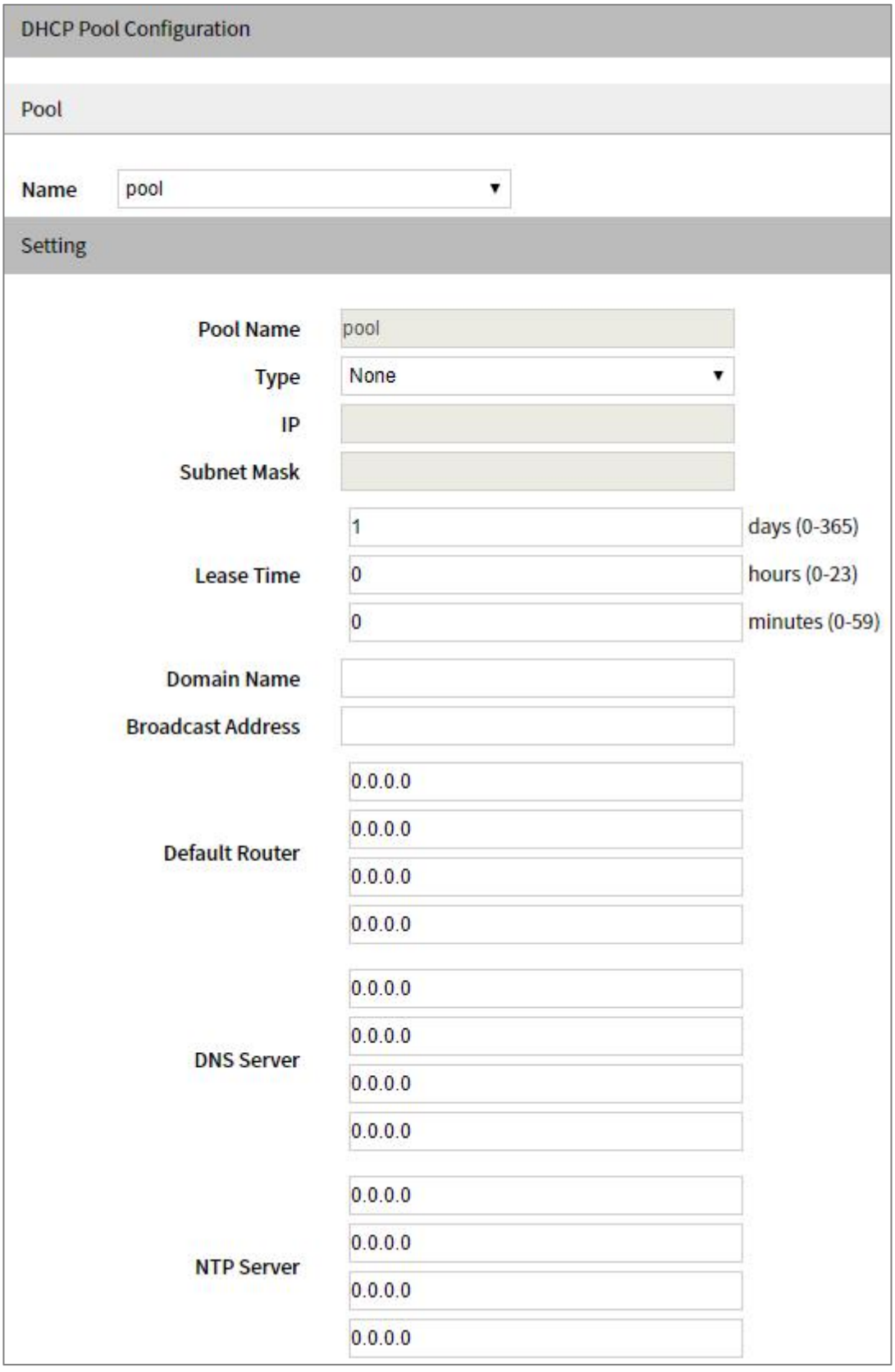
Add new address pool: click to add a DHCP pool.

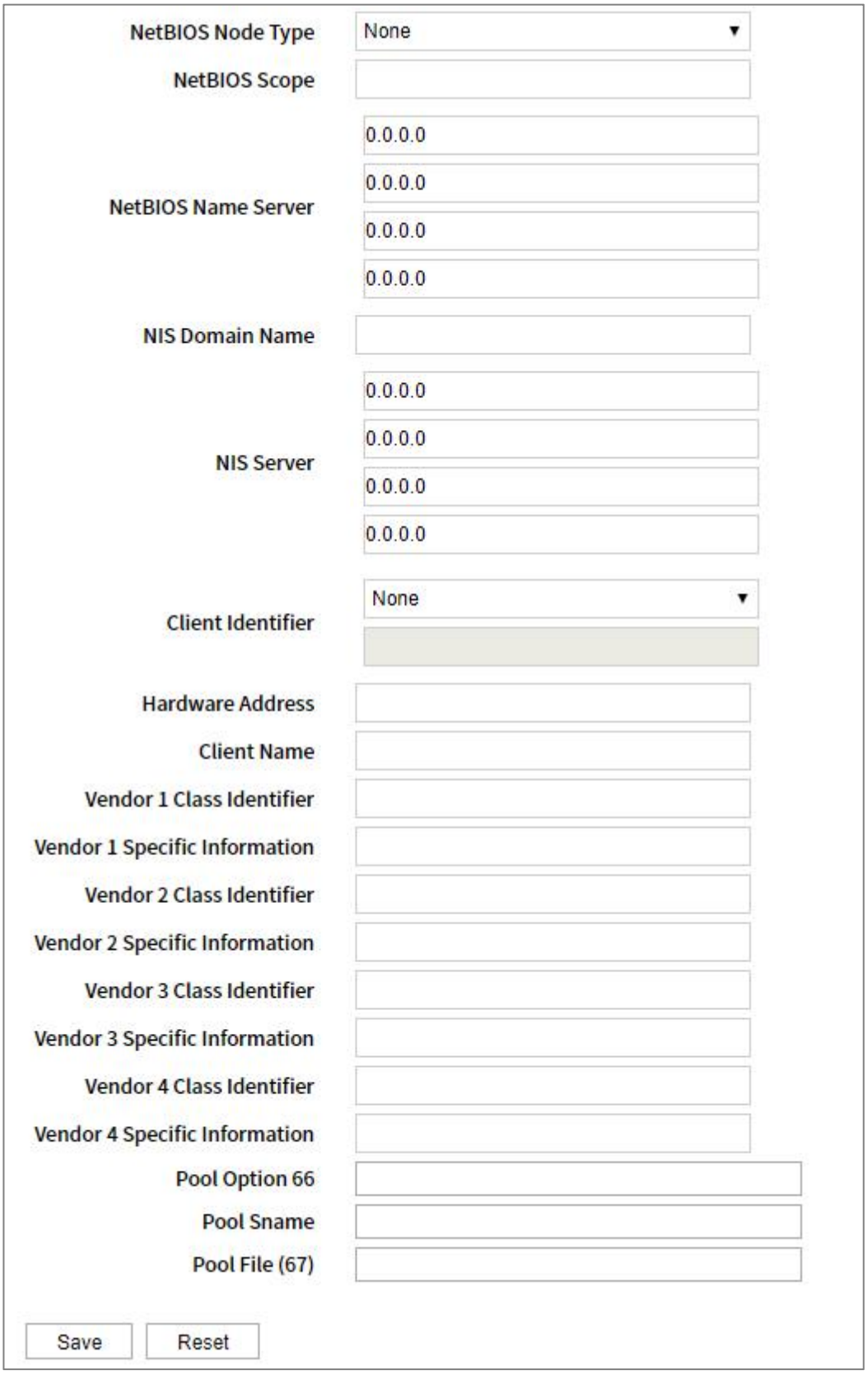
Save: Click to save changes.

Reset: Click to undo any changes made locally and revert to previously saved values.

5.8.3.1 Add a new DHCP pool

This page configures all settings of a DHCP pool.


DHCP Pool Configuration
Pool
Name
pool
Setting
Pool Name
pool
Type
None
IP
Subnet Mask
Lease Time
1
days (0-365)
0
hours (0-23)
0
minutes (0-59)
Domain Name
Broadcast Address
Default Router
0.0.0.0
0.0.0.0
0.0.0.0
0.0.0.0
DNS Server
0.0.0.0
0.0.0.0
0.0.0.0
0.0.0.0
NTP Server
0.0.0.0
0.0.0.0
0.0.0.0
0.0.0.0



Pool Name

Select a pool to configure the settings.

Name

Select a pool by pool name.

Setting

Configure pool settings.

Name

Display the selected pool name.

Type

Specify which type of the pool is.

- Network: the pool defines a pool of IP addresses to service more than one DHCP client.
- Host: the pool services for a specific DHCP client identified by client identifier or hardware address.

IP

Specify network number of the DHCP address pool.

Subnet Mask

DHCP option 1.

Specify subnet mask of the DHCP address pool.

Lease Time

DHCP option 51, 58 and 59.

Specified Lease Time. Allow the client to request a lease time for the IP address. If all are 0s, then it means the lease time is infinite.

Domain Name

DHCP option 15.

Specify domain name that client should use when resolving hostname via DNS.

Broadcast Address

DHCP option 28.

Specify the broadcast address in use on the client's subnet.

Default Router

DHCP option 3.

Specify a list of IP addresses for routers on the client's subnet.

DNS Server

DHCP option 6.

Specify a list of Domain Name System name servers available to the client.

NTP Server

DHCP option 42.

Specify a list of IP addresses indicating NTP servers available to the client.

NetBIOS Node Type

DHCP option 46.

Specify NetBIOS node type option to allow Netbios over TCP/IP clients which are configurable to be configured as described in RFC 1001/1002.

NetBIOS Scope

DHCP option 47.

Specify the NetBIOS over TCP/IP scope parameter for the client as specified in RFC 1001/1002.

NetBIOS Server

DHCP option 44.

Specify a list of NBNS name servers listed in order of preference.

NIS Domain Name

DHCP option 40.

Specify the name of the client's NIS domain.

NIS Server

DHCP option 41.

Specify a list of IP addresses indicating NIS servers available to the client.

Client Identifier

DHCP option 61.

Specify client's unique identifier to be used when the pool is the type of host.

Hardware Address

Specify client's hardware(MAC) address to be used when the pool is the type of host.

Client Name

DHCP option 12.

Specify the name of client to be used when the pool is the type of host.

Vendor / Class Identifier

DHCP option 60.

Specify to be used by DHCP client to optionally identify the vendor type and configuration of a DHCP client. DHCP server will deliver the corresponding option 43 specific information to the client that sends option 60 vendor class identifier.

Vendor / Specific Information

DHCP option 43.

Specify vendor specific information according to option 60 vendor class identifier.

Buttons

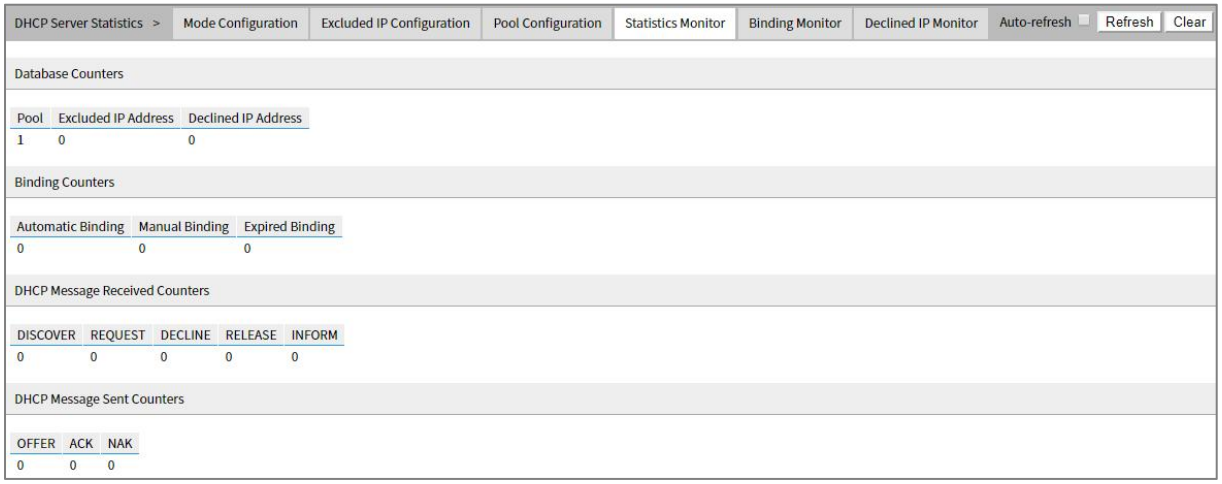
Save: Click to save changes.

Reset: Click to undo any changes made locally and revert to previously saved values.

5.8.4 Statistics Monitoring

DHCP Server Statistics

This page displays the database counters and the number of DHCP messages sent and received by DHCP server.



Database Counters

Display counters of various databases.

Pool

Number of pools.

Excluded IP Address

Number of excluded IP address ranges.

Declined IP Address

Number of declined IP addresses.

Binding Counters

Display counters of various databases.

Automatic Binding

Number of bindings with network-type pools.

Manual Binding

Number of bindings that administrator assigns an IP address to a client. That is, the pool is of host type.

Expired Binding

Number of bindings that their lease time expired or they are cleared from Automatic/Manual type bindings.

DHCP Message Received Counters

Display counters of DHCP messages received by DHCP server.

DISCOVER

Number of DHCP DISCOVER messages received.

REQUEST

Number of DHCP REQUEST messages received.

DECLINE

Number of DHCP DECLINE messages received.

RELEASE

Number of DHCP RELEASE messages received.

INFORM

Number of DHCP INFORM messages received.

DHCP Message Sent Counters

Display counters of DHCP messages sent by DHCP server.

OFFER

Number of DHCP OFFER messages sent.

ACK

Number of DHCP ACK messages sent.

NAK

Number of DHCP NAK messages sent.

Buttons

Save: Click to save changes.

Reset: Click to undo any changes made locally and revert to previously saved values.

5.8.5 Binding Monitoring

DHCP Server Binding IP

This page displays bindings generated for DHCP clients.

Binding IP Address

Display all bindings.

IP

IP address allocated to DHCP client.

Type

Type of binding. Possible types are Automatic, Manual, Expired.

Status

State of binding. Possible states are Committed, Allocated, Expired.

Pool Name

The pool that generates the binding.

Server ID

Server IP address to service the binding.

Buttons

Auto-refresh: Check this box to refresh the page automatically. Automatic refresh occurs every 3 seconds.

Refresh: Click to refresh the page immediately.

Clear selected: click to clear selected bindings. If the selected binding is Automatic or Manual, then it is changed to be Expired. If the selected binding is Expired, then it is freed.

Clear Automatic: Click to clear all automatic bindings and change them to expired bindings.

Clear Manual: Click to clear all manual bindings and change them to expired bindings.

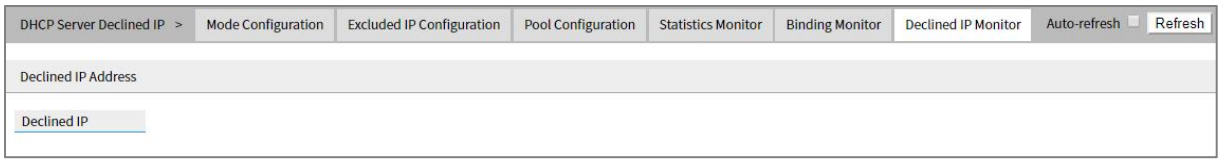
Clear Expired: Click to clear all expired bindings and free them.

5.8.6 Deny IP Monitoring

This page displays declined IP addresses.

Conflicting IP addresses

Display IP addresses declined by DHCP clients.



Conflicting IP

List of IP addresses declined.

Buttons

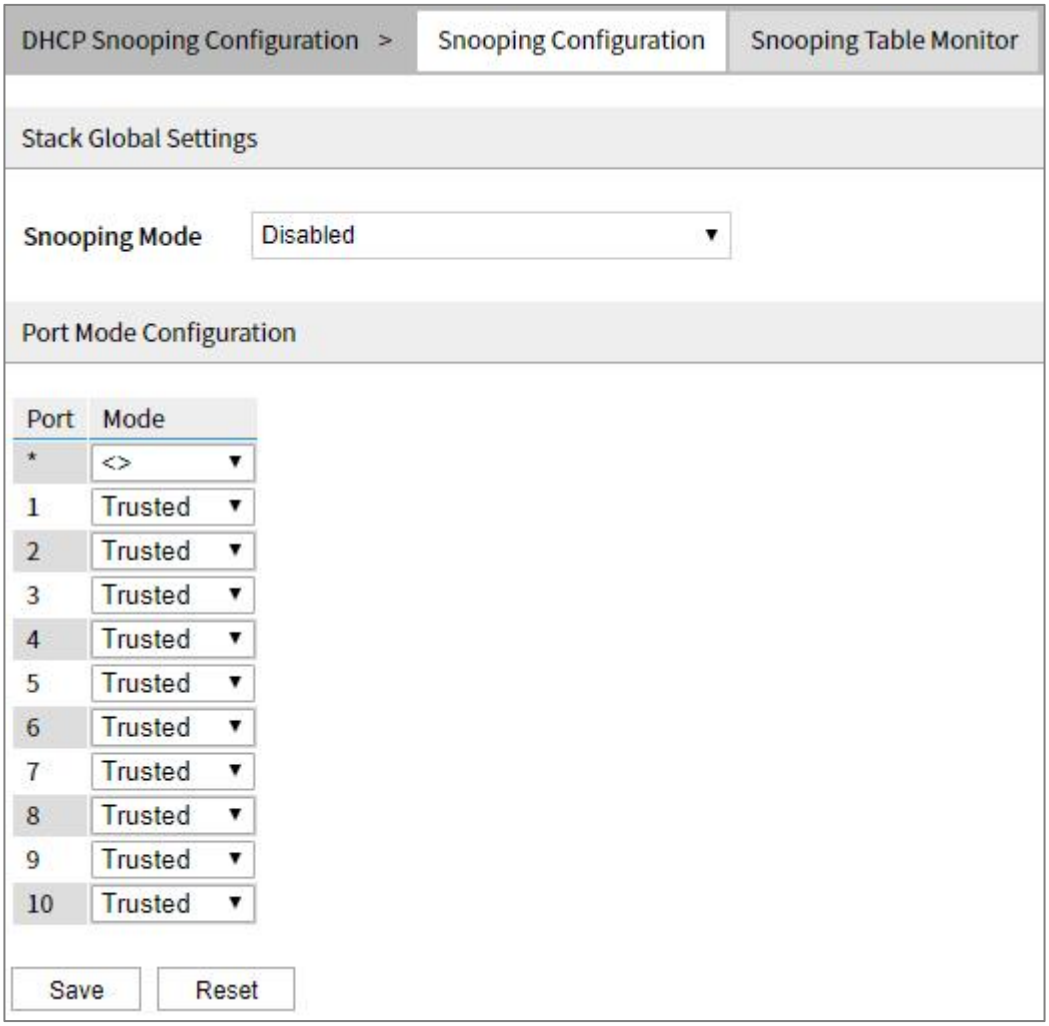
Auto-refresh: Check this box to refresh the page automatically. Automatic refresh occurs every 3 seconds.

Refresh: Click to refresh the page immediately.

5.9 DHCP Snooping

5.9.1 Listening Configuration

Configure DHCP Snooping on this page.



Snooping Mode

Indicates the DHCP snooping mode operation. Possible modes are:

- Enabled: Enable DHCP snooping mode operation. When DHCP snooping mode operation is enabled, the DHCP request messages will be forwarded to trusted ports and only allow reply packets from trusted ports.
- Disabled: Disable DHCP snooping mode operation.

Port Mode Configuration

Indicates the DHCP snooping port mode. Possible port modes are:

- Trusted: Configures the port as trusted source of the DHCP messages.
- Untrusted: Configures the port as untrusted source of the DHCP messages.

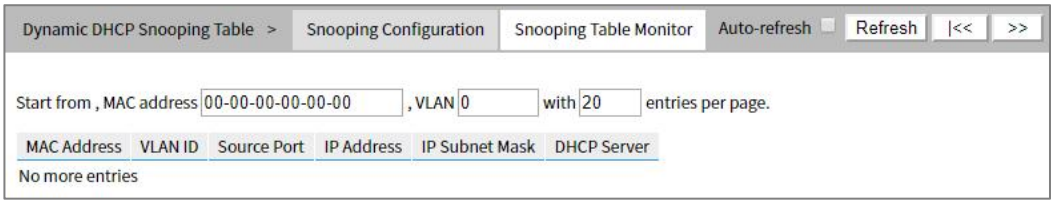
Buttons

Save: Click to save changes.

Reset: Click to undo any changes made locally and revert to previously saved values.

5.9.2 Listening Table Monitoring

This page display the dynamic IP assigned information after DHCP Snooping mode is disabled. All DHCP clients obtained the dynamic IP address from the DHCP server will be listed in this table except for local VLAN interface IP addresses. Entries in the Dynamic DHCP snooping Table are shown on this page.



Navigating the DHCP snooping Table

Each page shows up to 99 entries from the Dynamic DHCP snooping table, default being 20, selected through the "per page" input field. When first visited, the web page will show the first 20 entries from the beginning of the Dynamic DHCP snooping Table.

The "MAC address" and "VLAN" input fields allows the user to select the starting point in the Dynamic DHCP snooping Table. Clicking the “Refresh” button will update the displayed table starting from that or the closest next Dynamic DHCP snooping Table match. In addition, the two input fields will - upon a “Refresh” button click - assume the value of the first displayed entry, allowing for continuous refresh with the same start address.

“>>” will use the last entry of the currently displayed table as a basis for the next lookup. When the end is reached the text "No more entries" is shown in the displayed table. Use the “|<<” button to start over.

DHCP snooping Table Columns

MAC Address

User MAC address of the entry.

VLAN

VLAN-ID in which the DHCP traffic is permitted.

Source Port

Switch Port Number for which the entries are displayed.

IP Address

User IP address of the entry.

IP Subnet Mask

User IP subnet mask of the entry.

DHCP Server

DHCP Server address of the entry.

Buttons

Auto-refresh: Check this box to refresh the page automatically. Automatic refresh occurs every 3 seconds.

Refresh: Refresh the displayed table starting from the input fields.

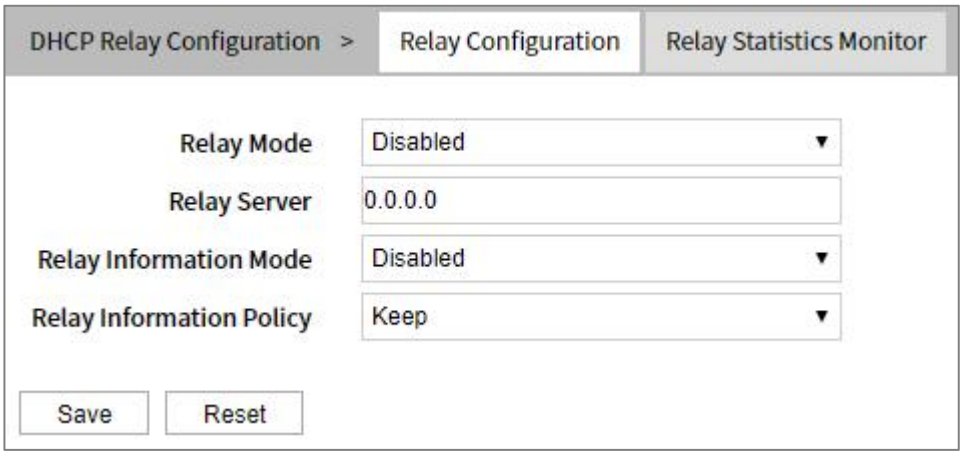
|<<: Updates the table starting from the first entry in the Dynamic DHCP snooping Table.

>>: Updates the table, starting with the entry after the last entry currently displayed.

5.10 DHCP Relay

5.10.1 Relay Configuration

A DHCP relay agent is used to forward and to transfer DHCP messages between the clients and the server when they are not in the same subnet domain. It stores the incoming interface IP address in the GIADDR field of the DHCP packet. The DHCP server can use the value of GIADDR field to determine the assigned subnet. For such condition, please make sure the switch configuration of VLAN interface IP address and PVID (Port VLAN ID) correctly.



Relay Mode

Indicates the DHCP relay mode operation. Possible modes are:

- Enabled: Enable DHCP relay mode operation. When DHCP relay mode operation is enabled, the agent forwards and transfers DHCP messages between the clients and the server when they are not in the same subnet domain. And the DHCP broadcast message won't be flooded for security considerations.
- Disabled: Disable DHCP relay mode operation.

Relay Server

Indicates the DHCP relay server IP address.

Relay Information Mode

Indicates the DHCP relay information mode option operation. The option 82 circuit ID format as "[vlan_id][module_id][port_no]". The first four characters represent the VLAN ID, the fifth and sixth characters are the module ID(in standalone device it always equal 0, in stackable device it means switch ID), and the last two characters are the port number. For example, "00030108" means the DHCP message receive form VLAN ID 3, switch ID 1, port No 8. And the option 82 remote ID value is equal the switch MAC address.

Possible modes are:

- Enabled: Enable DHCP relay information mode operation. When DHCP relay information mode operation is enabled, the agent inserts specific information (option 82) into a DHCP message when forwarding to DHCP server and removes it from a DHCP message when transferring to DHCP client. It only works when DHCP relay operation mode is enabled.
- Disabled: Disable DHCP relay information mode operation.

Relay Information Policy

Indicates the DHCP relay information option policy. When DHCP relay information mode operation is enabled, if the agent receives a DHCP message that already contains relay agent information it will enforce the policy. The 'Replace' policy is invalid when relay information mode is disabled. Possible policies are:

- Replace: Replace the original relay information when a DHCP message that already contains it is received.
- Keep: Keep the original relay information when a DHCP message that already contains it is received.
- Drop: Drop the package when a DHCP message that already contains relay information is received.

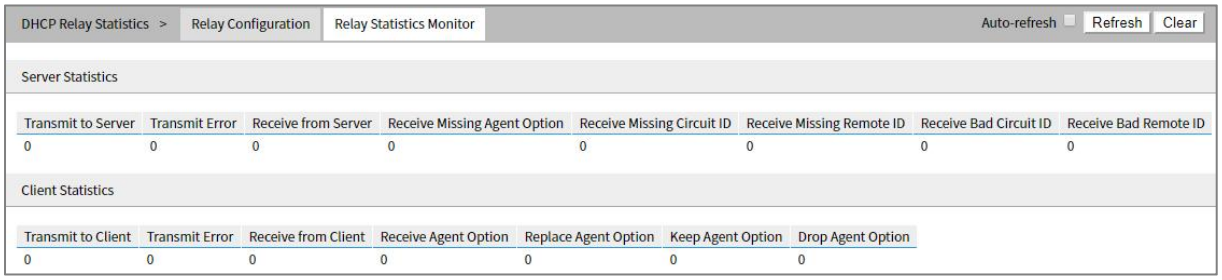
Buttons

Save: Click to save changes.

Reset: Click to undo any changes made locally and revert to previously saved values.

5.10.2 Relay Statistics Monitoring

This page provides statistics for DHCP relay.



Server Statistics

Transmit to Server

The number of packets that are relayed from client to server.

Transmit Error

The number of packets that resulted in errors while being sent to clients.

Receive from Server

The number of packets received from server.

Receive Missing Agent Option

The number of packets received without agent information options.

Receive Missing Circuit ID

The number of packets received with the Circuit ID option missing.

Receive Missing Remote ID

The number of packets received with the Remote ID option missing.

Receive Bad Circuit ID

The number of packets whose Circuit ID option did not match known circuit ID.

Receive Bad Remote ID

The number of packets whose Remote ID option did not match known Remote ID.

Client Statistics

Transmit to Client

The number of relayed packets from server to client.

Transmit Error

The number of packets that resulted in error while being sent to servers.

Receive from Client

The number of received packets from server.

Receive Agent Option

The number of received packets with relay agent information option.

Replace Agent Option

The number of packets which were replaced with relay agent information option.

Keep Agent Option

The number of packets whose relay agent information was retained.

Drop Agent Option

The number of packets that were dropped which were received with relay agent information.

Buttons

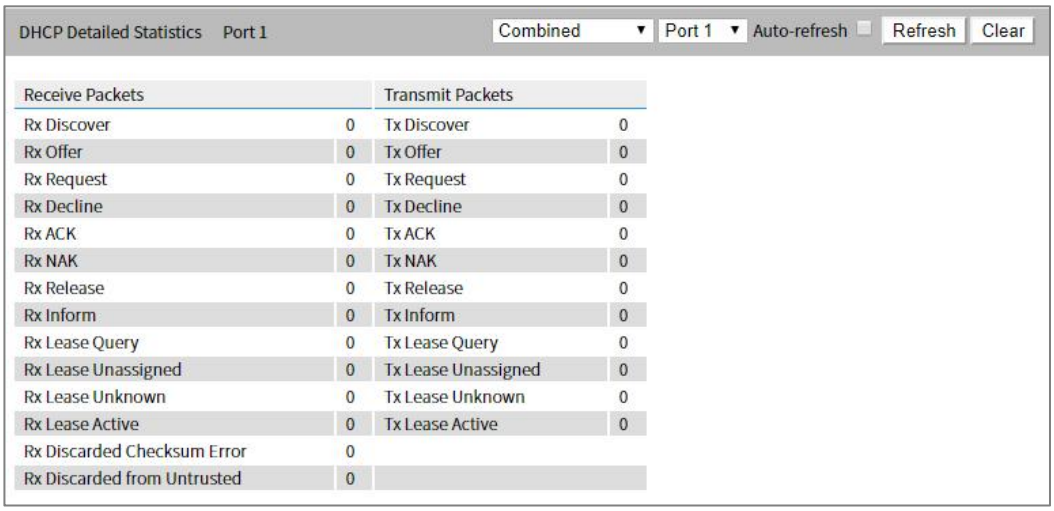
Auto-refresh: Check this box to refresh the page automatically. Automatic refresh occurs every 3 seconds.

Refresh: Click to refresh the page immediately.

Clear: : Clear all statistics.

5.11 DHCP Detailed Statistics

This page provides statistics for DHCP snooping. Notice that the normal forward per-port TX statistics isn't increased if the incoming DHCP packet is done by L3 forwarding mechanism. And clear the statistics on specific port may not take effect on global statistics since it gathers the different layer overview.



Receive and Transmit Packets

Rx and Tx Discover

Number of Discover (option 53 with a value of 1) packets received and sent.

Rx and Tx Offer

Number of offer (option 53, value 2) packets received and sent.

Rx and Tx Request

Number of requests received and sent (option 53, value 3)

Rx and Tx Decline

Number of falling packets (option 53, value 4) received and sent.

Rx and Tx ACK

Number of ACK (option 53 with a value of 5) packets received and sent.

Rx and Tx NAK

Number of NAK (option 53 with a value of 6) packets received and sent.

Rx and Tx Release

Number of release packets received and sent (option 53, value 7).

Rx and Tx Inform

Number of information packets received and sent (option 53, value 8).

Rx and Tx Lease Query

Number of lease request packages received and sent (option 53, value 10).

Rx and Tx Lease Unassigned

Number of unallocated lease received and sent (option 53, value 11).

Rx and Tx Lease Unknown

Unknown number of leases received and sent (option 53, value 12).

Rx and Tx Lease Active

Number of lease activity packages received and sent (option 53 with a value of 13).

Rx Discarded checksum error

The number of discard packet that IP/UDP checksum is error.

Rx Discarded from Untrusted

The number of discarded packet that are coming from untrusted port.

Buttons

The DHCP user select box determines which user is affected by clicking the buttons.

The port select box determines which port is affected by clicking the buttons.

Auto-refresh: Check this box to refresh the page automatically. Automatic refresh occurs every 3 seconds.

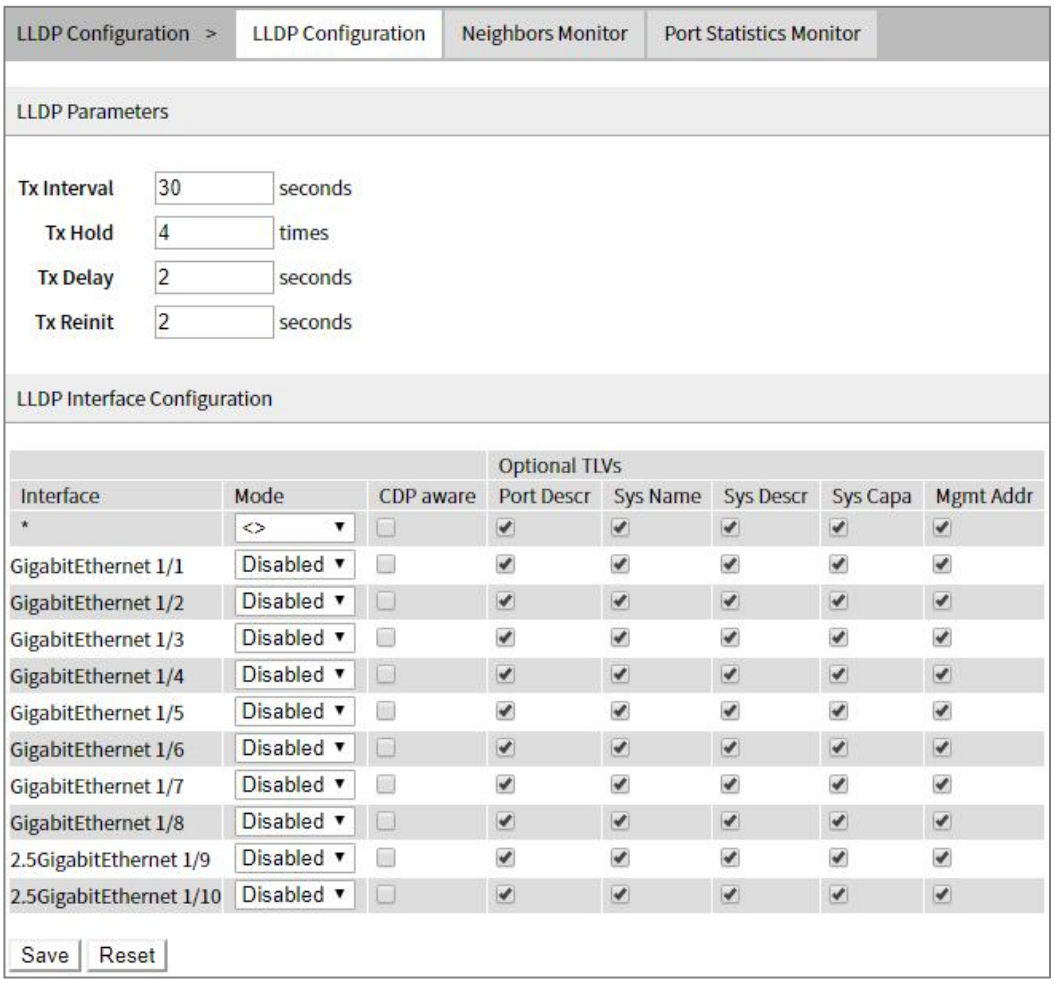
Refresh: Click to refresh the page immediately.

Clear: clear the counters of all ports.

5.12 LLDP

5.12.1 LLDP Configuration

This page allows the user to inspect and configure the current LLDP interface settings.



LLDP Parameters

Tx Interval

The switch periodically transmits LLDP frames to its neighbors for having the network discovery information up-to-date. The interval between each LLDP frame is determined by the Tx Interval value. Valid values are restricted to 5 - 32768 seconds.

Tx Hold

Each LLDP frame contains information about how long time the information in the LLDP frame shall be considered valid. The LLDP information valid period is set to Tx Hold multiplied by Tx Interval seconds. Valid values are restricted to 2 - 10 times.

Tx Delay

If some configuration is changed (e.g. the IP address) a new LLDP frame is transmitted, but the time between the LLDP frames will always be at least the value of Tx Delay seconds. Tx Delay cannot be larger than 1/4 of the Tx Interval value. Valid values are restricted to 1 - 8192 seconds.

Tx Reinit

When a interface is disabled, LLDP is disabled or the switch is rebooted, a LLDP shutdown frame is transmitted to the neighboring units, signaling that the LLDP information isn't valid anymore. Tx Reinit controls the amount of seconds between the shutdown frame and a new LLDP initialization. Valid values are restricted to 1 - 10 seconds.

LLDP Interface Configuration

Interface

The switch interface name of the logical LLDP interface.

Mode

Select LLDP mode.

- Rx only: The switch will not send out LLDP information, but LLDP information from neighbor units is analyzed.
- Tx only: The switch will drop LLDP information received from neighbors, but will send out LLDP information.
- Disabled: The switch will not send out LLDP information, and will drop LLDP information received from neighbors.
- Tx and Rx: The switch will send out LLDP information, and will analyze LLDP information received from neighbors.

CDP Aware

Select CDP awareness.

The CDP operation is restricted to decoding incoming CDP frames (The switch doesn't transmit CDP frames). CDP frames are only decoded if LLDP on the interface is enabled.

Only CDP TLVs that can be mapped to a corresponding field in the LLDP neighbors' table are decoded. All other TLVs are discarded (Unrecognized CDP TLVs and discarded CDP frames are not shown in the LLDP statistics.). CDP TLVs are mapped onto LLDP neighbors' table as shown below.

- CDP TLV "Device ID" is mapped to the LLDP "Chassis ID" field.
- CDP TLV "Address" is mapped to the LLDP "Management Address" field. The CDP address TLV can contain multiple addresses, but only the first address is shown in the LLDP neighbors table.
- CDP TLV "Port ID" is mapped to the LLDP "Port ID" field.
- CDP TLV "Version and Platform" is mapped to the LLDP "System Description" field.

Both the CDP and LLDP support "system capabilities", but the CDP capabilities cover capabilities that are not part of the LLDP. These capabilities are shown as "others" in the LLDP neighbors' table.

If all interfaces have CDP awareness disabled the switch forwards CDP frames received from neighbor devices. If at least one interface has CDP awareness enabled all CDP frames are terminated by the switch.

Note:

When CDP awareness on an interface is disabled the CDP information isn't removed immediately, but gets removed when the hold time is exceeded.

Port Descr

Optional TLV: When checked the "port description" is included in LLDP information transmitted.

System Name

Optional TLV: When checked the "system name" is included in LLDP information transmitted.

System description

Optional TLV: When checked the "system description" is included in LLDP information transmitted.

System Capabilities

Optional TLV: When checked the "system capability" is included in LLDP information transmitted.

Mgmt Addr

Optional TLV: When checked the "management address" is included in LLDP information transmitted.

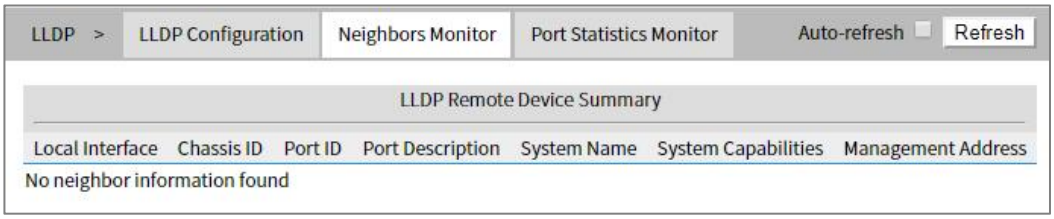
Buttons

Save: Click to save changes.

Reset: Click to undo any changes made locally and revert to previously saved values.

5.12.2 LLDP Neighbor Information

This page provides a status overview for all LLDP neighbors. The displayed table contains a row for each interface on which an LLDP neighbor is detected. The columns hold the following information:



Local interface

The interface on which the LLDP frame was received.

Chassis ID

The Chassis ID is the identification of the neighbor's LLDP frames.

Port ID

The Port ID is the identification of the neighbor port.

Port Description

Port Description is the port description advertised by the neighbor unit.

System Name

System Name is the name advertised by the neighbor unit.

System Capabilities

System Capabilities describes the neighbor unit's capabilities. The possible capabilities are:

- 1other
- 2Repeater
- 3Bridge
- 4Wireless network node
- 5Router

- 6Telephone
- 7DOCSIS cable device
- 8Station only
- 9Reserved

When a function is enabled, the function is followed by (+). If the function is disabled, the function is followed by (-).

Mgmt Addr

Management Address is the neighbor unit's address that is used for higher layer entities to assist discovery by the network management. This could for instance hold the neighbor's IP address.

Buttons

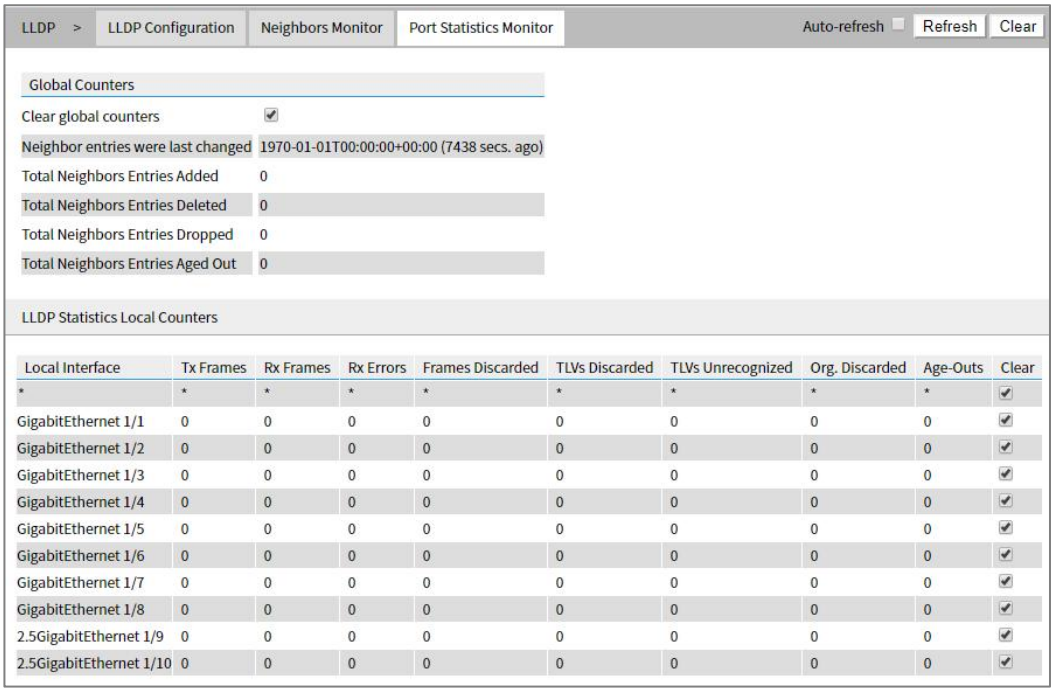
Auto-refresh: Check this box to refresh the page automatically. Automatic refresh occurs every 3 seconds.

Refresh: Click to refresh the page.

5.12.3 Port Statistics Monitoring

This page provides an overview of all LLDP traffic.

Two types of counters are shown. Global counters are counters that refer to the whole switch, while local counters refer to per interface counters for the currently selected switch.



Global Statistics

Clear global counters

If checked the global counters are cleared when “Clear” is clicked.

Neighbor entries were last changed

Shows the time when the last entry was last deleted or added. It also shows the time elapsed since the last change was detected.

Total Neighbors Entries Added

Shows the number of new entries added since switch reboot.

Total Neighbors Entries Deleted

Shows the number of new entries deleted since switch reboot.

Total Neighbors Entries Dropped

Shows the number of LLDP frames dropped due to the entry table being full.

Total Neighbors Entries Aged Out

Shows the number of entries deleted due to Time-To-Live expiring.

LLDP count local counter

The displayed table contains a row for each interface. The columns hold the following information:

Local interface

The interface on which LLDP frames are received or transmitted.

Tx Frames

The number of LLDP frames transmitted on the interface.

Rx Frames

The number of LLDP frames received on the interface.

Rx Errors

The number of received LLDP frames containing some kind of error.

Frames Discarded

If a LLDP frame is received on a interface, and the switch's internal table has run full, the LLDP frame is counted and discarded. This situation is known as "Too Many Neighbors" in the LLDP standard. LLDP frames require a new entry in the table when the Chassis ID or Remote Port ID is not already contained within the table. Entries are removed from the table when a given interface's link is down, an LLDP shutdown frame is received, or when the entry ages out.

TLVs Discarded

Each LLDP frame can contain multiple pieces of information, known as TLVs (TLV is short for "Type Length Value"). If a TLV is malformed, it is counted and discarded.

TLVs Unrecognized

The number of well-formed TLVs, but with an unknown type value.

Org. Discarded

If LLDP frame is received with an organizationally TLV, but the TLV is not supported the TLV is discarded and counted.

Age-Outs

Each LLDP frame contains information about how long time the LLDP information is valid (age-out time). If no new LLDP frame is received within the age out time, the LLDP information is removed, and the Age-Out counter is incremented.

Clear

If checked the counters for the specific interface are cleared when “Clear” is clicked.

Buttons

Auto-refresh: Check this box to refresh the page automatically. Automatic refresh occurs every 3 seconds.

Refresh: Click to refresh the page.

Clear: Clear the counters which have the corresponding checkbox checked.

5.13 MEP

The Maintenance Entity Point instances are configured here.

Delete

This box is used to mark a MEP for deletion in next Save operation.

Instance

The ID of the MEP. Click on the ID of a MEP to enter the configuration page. The range is from 1 through 100.

Domain

- Port: This is a MEP in the Port Domain.
- EVC: This is a MEP in the EVC Domain. 'Flow Instance' is an EVC. The EVC must be created
- VLAN: This is a MEP in the VLAN Domain. 'Flow Instance' is a VLAN. In case of Up-MEP the VLAN must be created

Mode

- MEP: This is a Maintenance Entity End Point.
- MIP: This is a Maintenance Entity Intermediate Point.

Direction

- Down: This is a Down MEP - monitoring ingress OAM and traffic on 'Residence Port'.
- Up: This is a Up MEP - monitoring ingress OAM and traffic on 'Residence Port'.

Residence Port

The port where MEP is monitoring - see 'Direction'. For a EVC MEP the port must be a port in the EVC. For a VLAN MEP the port must be a VLAN member.

Level

The MEG level of this MEP.

Flow Instance

The MEP is related to this flow - See 'Domain'. This is not relevant and not shown in case of Port MEP.

Tagged VID

- Port MEP: An outer C/S-tag (depending on VLAN Port Type) is added with this VID. Entering '0' means no TAG added.
- EVC MEP: This is not used.
- VLAN MEP: This is not used.
- EVC MIP: On Serval, this is the Subscriber VID that identifies the subscriber flow in this EVC where the MIP is active.

This MAC

The MAC of this MEP - can be used by other MEP when unicast is selected (Info only).

Alarm

There is an active alarm on the MEP.

Buttons

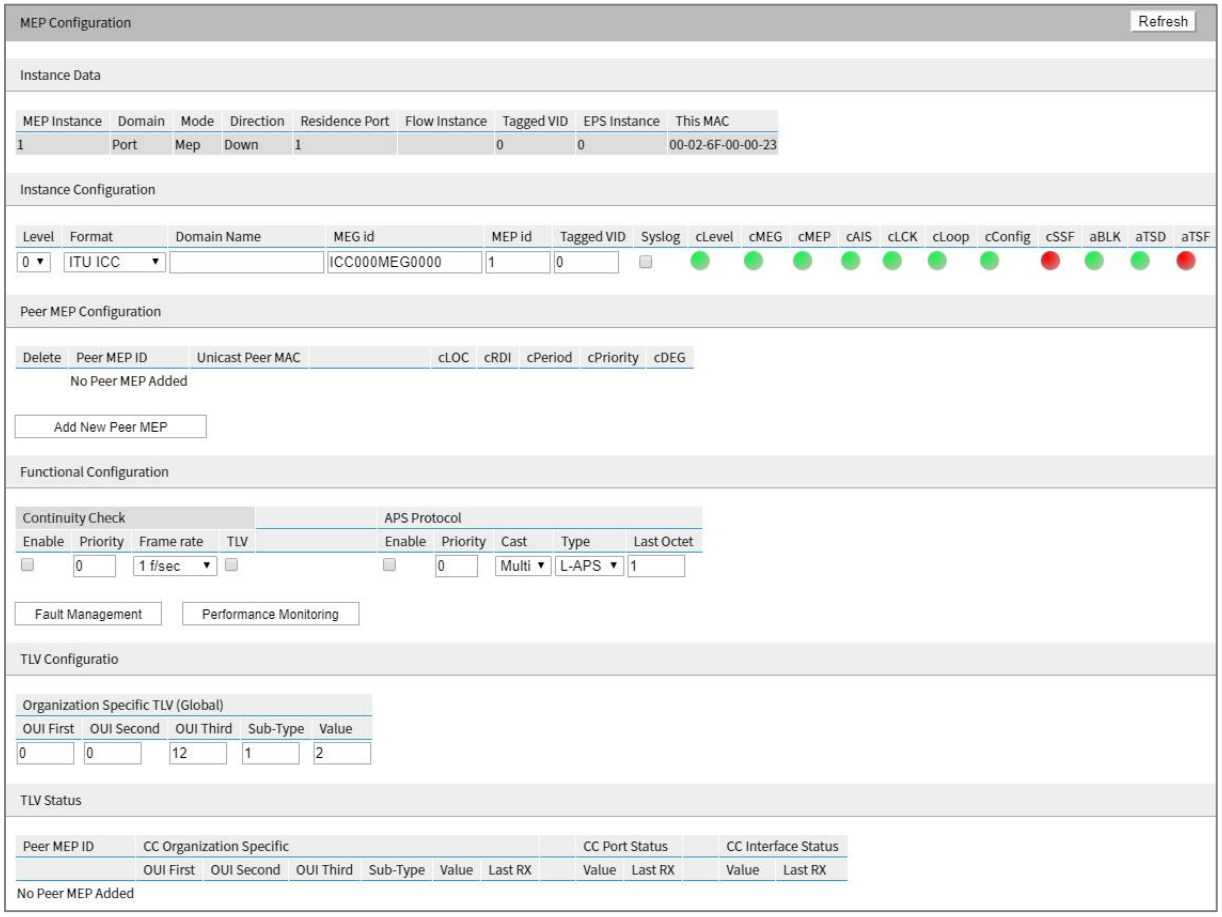
Add new MEP: Click to add a new MEP entry.

Refresh: Click to refresh the page immediately.

Save: Click to save changes.

Reset: Click to undo any changes made locally and revert to previously saved values.

This page allows the user to inspect and configure the current MEP Instance.



Instance Data

MEP Instance

The ID of the MEP.

Domain

- Port: This is a MEP in the Port Domain.
- EVC: This is a MEP in the EVC Domain. 'Flow Instance' is an EVC. The EVC must be created
- VLAN: This is a MEP in the VLAN Domain. 'Flow Instance' is a VLAN. In case of Up-MEP the VLAN must be created

Mode

- MEP: This is a Maintenance Entity End Point.
- MIP: This is a Maintenance Entity Intermediate Point.

Direction

- Down: this is an ingress OAM and flow of downlink MEP-monitoring "monitoring port".
- Up: this is an egress OAM and flow of uplink MEP-monitoring "monitoring port".

Residence Port

The port where MEP is monitoring - see 'Direction'. For a EVC MEP the port must be a port in the EVC. For a VLAN MEP the port must be a VLAN member.

Flow Instance

The MEP is related to this flow - See 'Domain'. This is not relevant and not shown in case of Port MEP.

Tagged VID

- Port MEP: An outer C/S-tag (depending on VLAN Port Type) is added with this VID. Entering '0' means no TAG added.
- EVC MEP: This is not used.
- VLAN MEP: This is not used.
- EVC MIP: On Serval, this is the Subscriber VID that identifies the subscriber flow in this EVC where the MIP is active.

This MAC

The MAC of this MEP - can be used by other MEP when unicast is selected (Info only).

Instance Configuration

EVC QoS

This is only relevant for a EVC MEP. This is the Qos of the EVC and used for getting QoS counters for Loss Measurement.

Level

The MEG level of this MEP.

Format

This is the configuration of the two possible Maintenance Association Identifier formats.

- ITU ICC: This is defined by ITU (Y1731 Fig. A3). 'Domain Name' is not used. 'MEG id' must be max. 13 char.
- IEEE String: This is defined by IEEE (802.1ag Section 21.6.5). 'Domain Name' can be max. 16 char. 'MEG id' (Short MA Name) can be max. 16 char.

- ITU CC ICC: This is defined by ITU (Y1731 Fig. A5). 'Domain Name' is not used. 'MEG id' must be max. 15 char.

Domain Name

This is the IEEE Maintenance Domain Name and is only used in case of 'IEEE String' format. This string can be empty giving Maintenance Domain Name Format 1 - Not present. This can be max 16 char.

MEG Id

This is either ITU MEG ID or IEEE Short MA Name - depending on 'Format'. See 'Format'. In case of ITU ICC format this must be 13 char. In case of ITU CC ICC format this must be 15 char. In case of IEEE String format this can be max 16 char.

MEP Id

This value will become the transmitted two byte CCM MEP ID.

Tagged VID

This value will be the VID of a TAG added to the OAM PDU.

VOE

This will attempt to utilize VOE HW for MEP implementation. Not all platforms support VOE.

cLevel

Fault Cause indicating that a CCM is received with a lower level than the configured for this MEP.

cMEG

Fault Cause indicating that a CCM is received with a MEG ID different from configured for this MEP.

cMEP

Fault Cause indicating that a CCM is received with a MEP ID different from all 'Peer MEP ID' configured for this MEP.

cAIS

Fault Cause indicating that AIS PDU is received.

cLCK

Fault Cause indicating that LCK PDU is received.

cDEG

Fault Cause indicating that server layer is indicating Signal Degraded.

cSSF

Fault Cause indicating that server layer is indicating Signal Fail.

aBLK

The consequent action of blocking service frames in this flow is active.

aTSD

The consequent action of indicating Trail Signal Degrade is calculated.

aTSF

The consequent action of indicating Trail Signal Fail to-wards protection is active.

Peer MEP Configuration

Delete

This box is used to mark a Peer MEP for deletion in next Save operation.

Peer MEP ID

This value will become an expected MEP ID in a received CCM - see 'cMEP'.

Unicast Peer MAC

This MAC will be used when unicast is selected with this peer MEP. Also this MAC is used to create HW checking of receiving CCM PDU (LOC detection) from this MEP.

cLOC

Fault Cause indicating that no CCM has been received (in 3,5 periods) - from this peer MEP.

cRDI

Fault Cause indicating that a CCM is received with Remote Defect Indication - from this peer MEP.

cPeriod

Fault Cause indicating that a CCM is received with a period different what is configured for this MEP - from this peer MEP.

cPriority

Fault Cause indicating that a CCM is received with a priority different what is configured for this MEP - from this peer MEP.

Buttons

Add New Peer MEP: Click to add a new peer MEP.

Function Configuration

Continuity Check

Enable

Continuity Check based on transmitting/receiving CCM PDU can be enabled/disabled. The CCM PDU is always transmitted as Multi-cast Class 1.

Priority

The priority to be inserted as PCP bits in TAG (if any). In case of enable of Continuity Check and Loss Measurement both implemented on SW based CCM, 'Priority' has to be the same.

Frame rate

Selecting the frame rate of CCM PDU. This is the inverse of transmission period as described in Y.1731.: This value has the following uses:

- The transmission rate of the CCM PDU.
- Fault Cause cLOC is declared if no CCM PDU has been received within 3.5 periods - see 'cLOC'.
- Fault Cause cPeriod is declared if a CCM PDU has been received with different period - see 'cPeriod'.

Selecting 300f/sec or 100f/sec will configure HW based CCM (if possible). Selecting other frame rates will configure SW based CCM. In case of enable of Continuity Check and Loss Measurement both implemented on SW based CCM, 'Frame Rate' has to be the same.

TLV

Enable/disable of TLV insertion in the CCM PDU.

APS Protocol

Enable

Automatic Protection Switching protocol information transportation based on transmitting/receiving R-APS/L-APS PDU can be enabled/disabled. Must be enabled to support ERPS/ELPS implementing APS. This is only valid with one Peer MEP configured.

Priority

The priority to be inserted as PCP bits in TAG (if any).

Cast

Selection of APS PDU transmitted unicast or multi-cast. The unicast MAC will be taken from the 'Unicast Peer MAC' configuration. Unicast is only valid for L-APS - see

'Type'. The R-APS PDU is always transmitted with multi-cast MAC described in G.8032.

Type

R-APS: APS PDU is transmitted as R-APS - this is for ERPS.

L-APS: APS PDU is transmitted as L-APS - this is for ELPS.

Last Octet

This is the last octet of the transmitted and expected RAPS multi-cast MAC. In G.8031(03/2010), RAPS multicast MAC is defined as 01-19-A7-00-00-XX. In current standard the value for this last octet is '01' and the usage of other values is for further study.

TLV Configuration

Configuration of the OAM PDU TLV. Currently only TLV in the CCM is supported.

Organization Specific - OUI First

The transmitted first value in the OS TLV OUI field.

Organization Specific - OUI Second

The transmitted second value in the OS TLV OUI field.

Organization Specific - OUI Third

The transmitted third value in the OS TLV OUI field.

Organization Specific - Sub-Type

The transmitted value in the OS TLV Sub-Type field.

Organization Specific - Value

The transmitted value in the OS TLV Value field.

TLV Status

Display of the last received TLV. Currently only TLV in the CCM is supported.

CC Organization Specific - OUI First

The last received first value in the OUI field.

CC Organization Specific - OUI Second

The last received second value in the OS TLV OUI field.

CC Organization Specific - OUI Third

The last received third value in the OS TLV OUI field.

CC Organization Specific - Sub-Type

The last received value in the OS TLV Sub-Type field.

CC Organization Specific - Value

The last received value in the OS TLV Value field.

CC Organization Specific - Last RX

OS TLV was received in the last received CCM PDU.

CC Port Status - Value

The last received value in the PS TLV Value field.

CC Port Status - Last RX

PS TLV was received in the last received CCM PDU.

CC Interface Status - Value

The last received value in the IS TLV Value field.

CC Interface Status - Last RX

IS TLV was received in the last received CCM PDU.

Link State Tracking

Enable

When LST is enabled in an instance, Local SF or received 'isDown' in CCM Interface Status TLV, will bring down the residence port. Only valid in Up-MEP. The CCM rate must be 1 f/s or faster.

Buttons

Fault management: Click to enter Fault Management page.

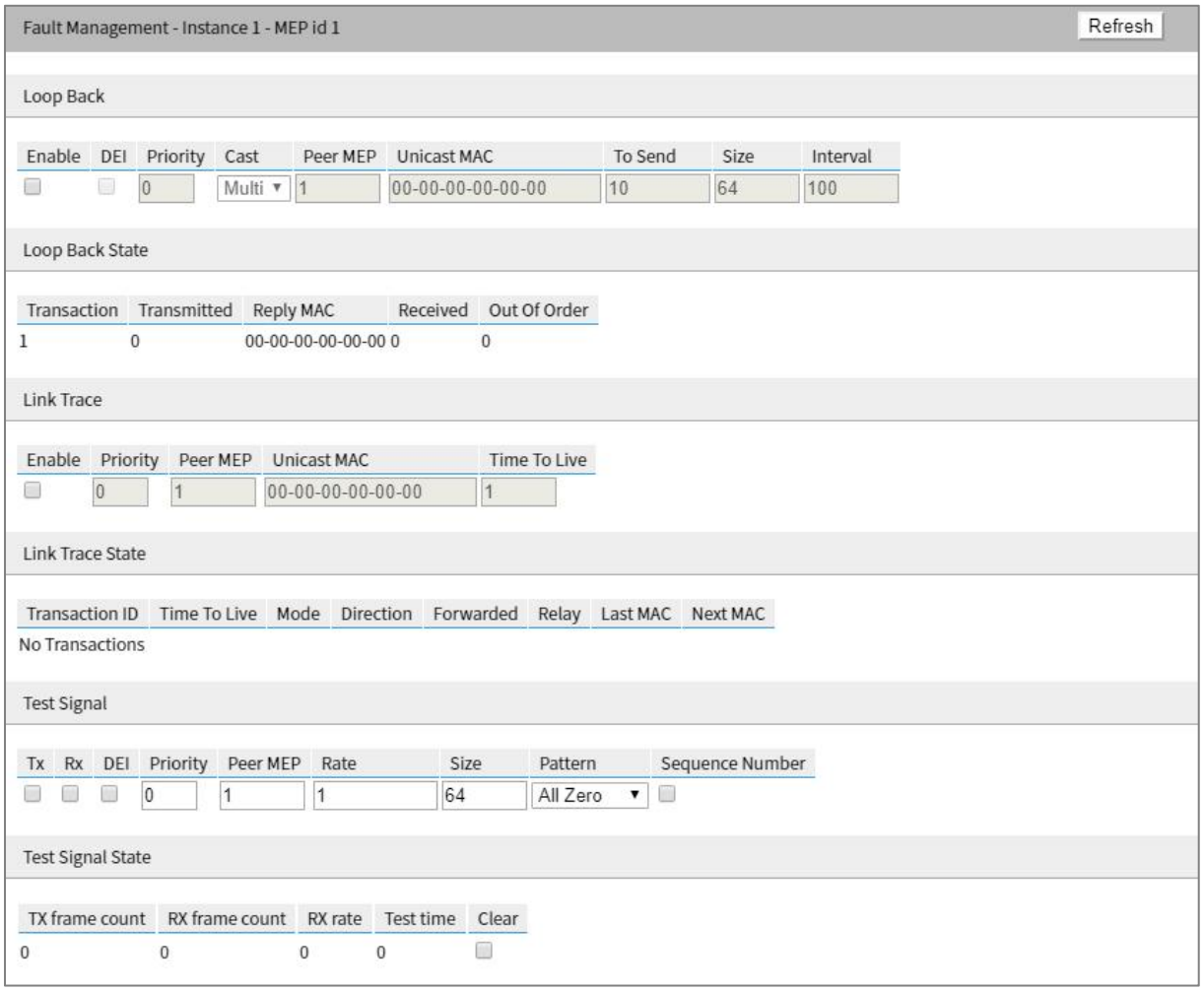
Performance Monitoring: Click to go to Performance Monitor page.

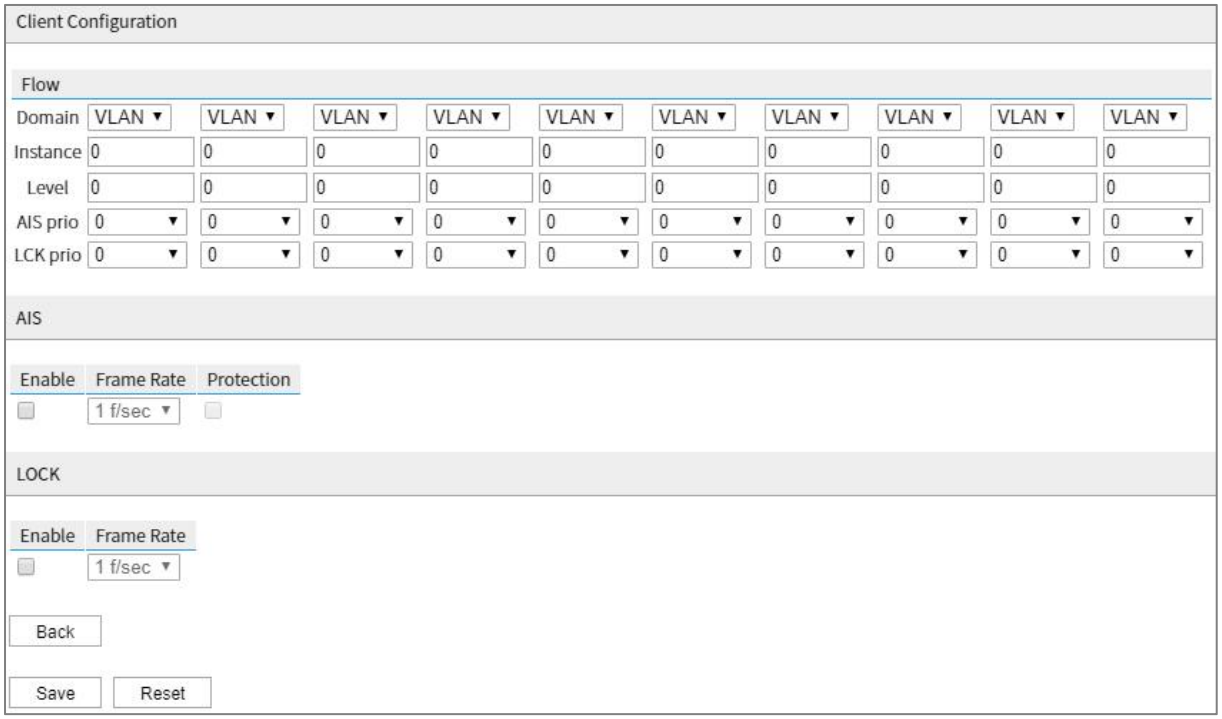
Refresh: Click to refresh the page immediately.

Save: Click to save changes.

Reset: Click to undo any changes made locally and revert to previously saved values.

This page allows the user to inspect and configure the Fault Management of the current MEP Instance.


Fault Management - Instance 1 - MEP id 1
Refresh
Loop Back
Enable DEI Priority Cast Peer MEP Unicast MAC To Send Size Interval
0 Multi 1 00-00-00-00-00-00 10 64 100
Loop Back State
Transaction Transmitted Reply MAC Received Out Of Order
1 0 00-00-00-00-00-00 0 0
Link Trace
Enable Priority Peer MEP Unicast MAC Time To Live
0 1 00-00-00-00-00-00 1
Link Trace State
Transaction ID Time To Live Mode Direction Forwarded Relay Last MAC Next MAC
No Transactions
Test Signal
Tx Rx DEI Priority Peer MEP Rate Size Pattern Sequence Number
0 1 1 64 All Zero
Test Signal State
TX frame count RX frame count RX rate Test time Clear
0 0 0 0


Client Configuration
Flow
Domain VLAN VLAN VLAN VLAN VLAN VLAN VLAN VLAN VLAN VLAN
Instance 0 0 0 0 0 0 0 0 0 0
Level 0 0 0 0 0 0 0 0 0 0
AIS prio 0 0 0 0 0 0 0 0 0 0
LCK prio 0 0 0 0 0 0 0 0 0 0
AIS
Enable Frame Rate Protection
1 f/sec
LOCK
Enable Frame Rate
1 f/sec
Back
Save
Reset

Loop Back

Enable

Loop Back based on transmitting/receiving LBM/LBR PDU can be enabled/disabled. Loop Back is automatically disabled when all 'To Send' LBM PDU has been transmitted - waiting 5 sec. for all LBR from the end.

DEI

The DEI to be inserted as PCP bits in TAG (if any).

Prio

The priority to be inserted as PCP bits in TAG (if any).

Cast

Selection of LBM PDU transmitted unicast or multi-cast. The unicast MAC will be configured through 'Peer MEP' or 'Unicast Peer MAC'. To-wards MIP only unicast Loop Back is possible.

Peer MEP

This is only used if the 'Unicast MAC' is configured to all zero. The LBM unicast MAC will be taken from the 'Unicast Peer MAC' configuration of this peer.

Unicast MAC

This is only used if NOT configured to all zero. This will be used as the LBM PDU unicast MAC. This is the only way to configure Loop Back to-wards a MIP.

Transmitted

The number of LBM PDU to send in one loop test. The value 0 indicate infinite transmission (test behaviour). This is HW based LBM/LBR and Requires VOE.

Size

The LBM frame size. This is entered as the wanted size (in bytes) of a un-tagged frame containing LBM OAM PDU - including CRC (four bytes).

Example when 'Size' = 64 => Un-tagged frame size = DMAC(6) + SMAC(6) + TYPE(2) + TST PDU LENGTH(46) + CRC(4) = 64 bytes

The transmitted frame will be four bytes longer for each tag added - 8 bytes in case of a tunnel EVC.

There are two frame MAX sizes to consider.

Switch RX frame MAX size: The MAX frame size (all inclusive) accepted on the switch port of 9600 Bytes

CPU RX frame MAX size: The MAX frame size (all inclusive) possible to copy to CPU of 1526 Bytes

Consider that the Peer MEP must be able to handle the selected frame size. Consider that In case of SW based MEP, the received LBR PDU must be copied to CPU Warning will be given if selected frame size exceeds the CPU RX frame MAX size Frame MIN Size is 64 Bytes.

Interval

The interval between transmitting LBM PDU. In 10 ms. If 'To Send' != 0 (max 100 - '0' is as fast as possible) in 1us.

Link Trace State

Transaction ID

The transaction id of the first LBM transmitted. For each LBM transmitted the transaction ID in the PDU is incremented.

Transmitted

The total number of LBM PDU transmitted.

Reply MAC

The MAC of the replying MEP/MIP. In case of multicast LBM, replies from all peer MEP in the group can be received. This MAC is not shown in case of 'To Send' == 0.

Received

The total number of LBR PDU received from this 'Reply MAC'.

Out Of Order

The number of LBR PDU received from this 'Reply MAC' with incorrect 'Transaction ID'.

Link Tracking

Enable

Link Trace based on transmitting/receiving LTM/LTR PDU can be enabled/disabled. Link Trace is automatically disabled when all 5 transactions are done with 5 sec. interval - waiting 5 sec. for all LTR in the end. The LTM PDU is always transmitted as Multi-cast Class 2.

Prio

The priority to be inserted as PCP bits in TAG (if any).

Peer MEP

This is only used if the 'Unicast MAC' is configured to all zero. The Link Trace Target MAC will be taken from the 'Unicast Peer MAC' configuration of this peer.

Unicast MAC

This is only used if NOT configured to all zero. This will be used as the Link Trace Target MAC. This is the only way to configure a MIP as Target MAC.

Time To Live

This is the LTM PDU TTL value as described in Y.1731. This value is decremented each time forwarded by a MIP. Will not be forwarded reaching zero.

Link Trace State

Transaction ID

The transaction id is incremented for each LTM send. This value is inserted the transmitted LTM PDU and is expected to be received in the LTR PDU. Received LTR with wrong transaction id is ignored. There are five transactions in one Link Trace activated.

Time To Live

This is the TTL value taken from the LTM received by the MIP/MEP sending this LTR - decremented as if forwarded.

Mode

Indicating if is was a MEP/MIP sending this LTR.

Direction

Indicating if MEP/MIP sending this LTR is ingress/egress.

Forwarded

Indicating if MEP/MIP sending this LTR has forwarded the LTM.

Relay

The Relay action can be one of the following:

- MAC: This is a hit on the LT Target MAC.
- FDB: LTM is forwarded based on hit in the Filtering DB.
- MFDB: LTM is forwarded based on hit in the MIP CCM DB.

Last MAC

The MAC identifying the last sender of the LBM causing this LTR - initiating MEP or previous MIP forwarding.

Next MAC

The MAC identifying the next sender of the LBM causing this LTR - MIP forwarding or terminating MEP.

Test Signal

Transmitted

Sending Test Signal based on transmitting TST PDU can be enabled/disabled.

Transmitted

Receiving Test Signal based on transmitting TST PDU can be enabled/disabled.

DEI

The DEI to be inserted as PCP bits in TAG (if any).

Prio

The priority to be inserted as PCP bits in TAG (if any).

Peer MEP

The TST frame destination MAC will be taken from the 'Unicast Peer MAC' configuration of this peer.

Rate

The TST frame transmission bit rate - in Mega bits pr. second. Limit is 400 Mbps. This is the bit rate of a standard frame without any encapsulation. If 1 Mbps rate is selected in a EVC MEP, the added tag will give a higher bitrate on the wire.

Size

The TST frame size. This is entered as the wanted size (in bytes) of a un-tagged frame containing TST OAM PDU - including CRC (four bytes).
Example when 'Size' = 64 => Un-tagged frame size = DMAC(6) + SMAC(6) + TYPE(2) + TST PDU LENGTH(46) + CRC(4) = 64 bytes
The transmitted frame will be four bytes longer for each tag added - 8 bytes in case of a tunnel EVC.
There are two frame MAX sizes to consider.

Switch RX frame MAX size: The MAX frame size (all inclusive) accepted on the switch port of 9600 Bytes
CPU RX frame MAX size: The MAX frame size (all inclusive) possible to copy to CPU of 1526 Bytes
Consider that the Peer MEP must be able to handle the selected frame size. Consider that in order to calculate the 'RX rate' a received TST PDU must be copied to CPU
Warning will be given if selected frame size exceeds the CPU RX frame MAX size
Frame MIN Size is 64 Bytes.

Mode

The 'empty' TST PDU has the size of 12 bytes. In order to achieve the configured frame size a data TLV will be added with a pattern.

Example when 'Size' = 64 => Un-tagged frame size = DMAC(6) + SMAC(6) + TYPE(2) + TST PDU LENGTH(46) + CRC(4) = 64 bytes

The TST PDU needs to be 46 bytes so a pattern of 46-12=34 bytes will be added.

- All Zero: Pattern will be '00000000'
- All 1: the mode is "11111111"
- 10101010: Pattern will be '10101010'

Test Signal State

TX frame count

The number of transmitted TST frames since last 'Clear'.

RX frame count

The number of received TST frames since last 'Clear'.

RX rate

The current received TST frame bit rate in Kbps. This is calculated on a 1 s. basis, starting when first TST frame is received after 'Clear'. The frame size used for this calculation is the first received after 'Clear'

Test time

The number of seconds passed since first TST frame received after last 'Clear'.

Clear

This will clear all Test Signal State. Transmission of TST frame will be restarted. Calculation of 'Rx frame count', 'RX rate' and 'Test time' will be started when receiving first TST frame.

Client Configuration

Only a Port MEP is able to be a server MEP with flow configuration. The Priority in the client flow is always the highest priority configured in the EVC.

Domain

The domain of the client layer flow.

Inst

Client layer flow instance numbers.

Level

Client layer level - AIS and LCK PDU transmitted in this client layer flow will be on this level.

AIS priority

The priority to be used when transmitting AIS in each client flow. Priority resulting in highest possible PCP can be selected.

LCK priority

The priority to be used when transmitting LCK in each client flow. Priority resulting in highest possible PCP can be selected.

AIS

Enable

Insertion of AIS signal (AIS PDU transmission) in client layer flows, can be enable/disabled.

Frame rate

Selecting the frame rate of AIS PDU. This is the inverse of transmission period as described in Y.1731.:

Protection

Selecting this means that the first 3 AIS PDU is transmitted as fast as possible - in case of using this for protection in the end point.

LOCK

Enable

Insertion of LOCK signal (LCK PDU transmission) in client layer flows, can be enable/disabled.

Frame rate

Selecting the frame rate of LCK PDU. This is the inverse of transmission period as described in Y.1731.:

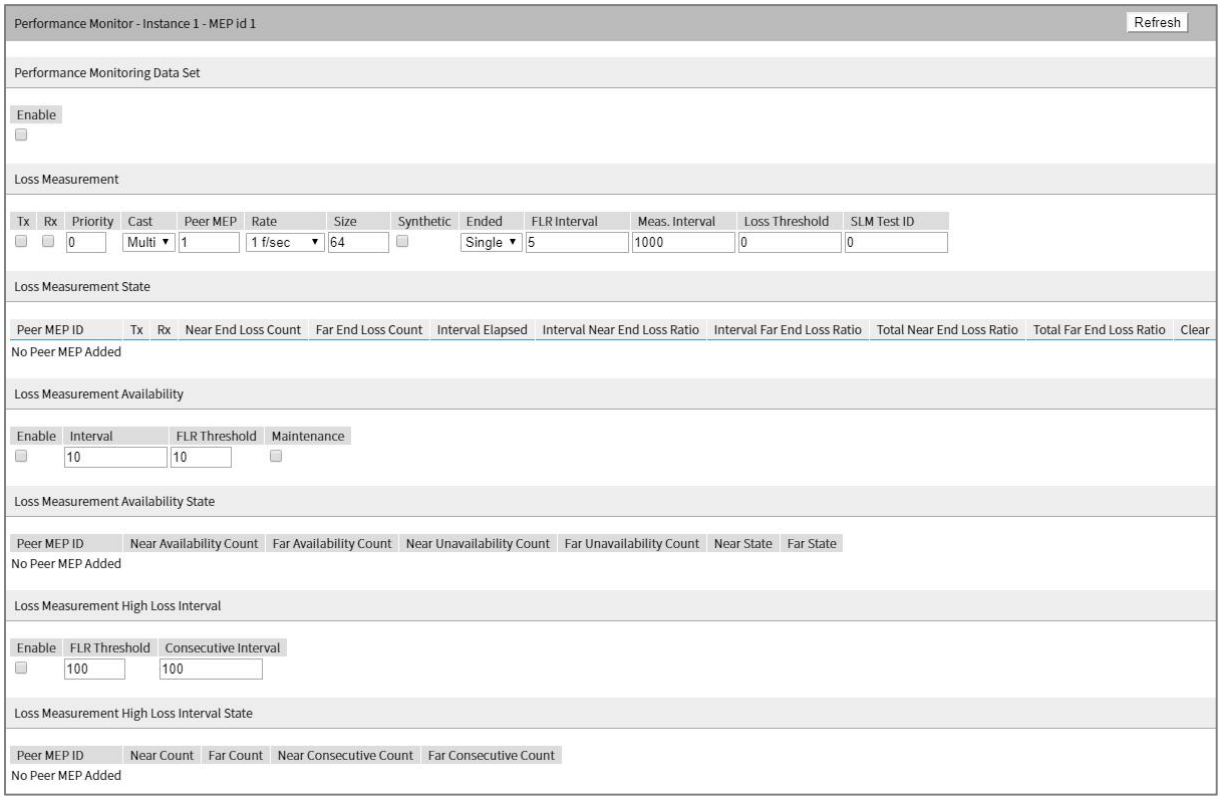
Buttons

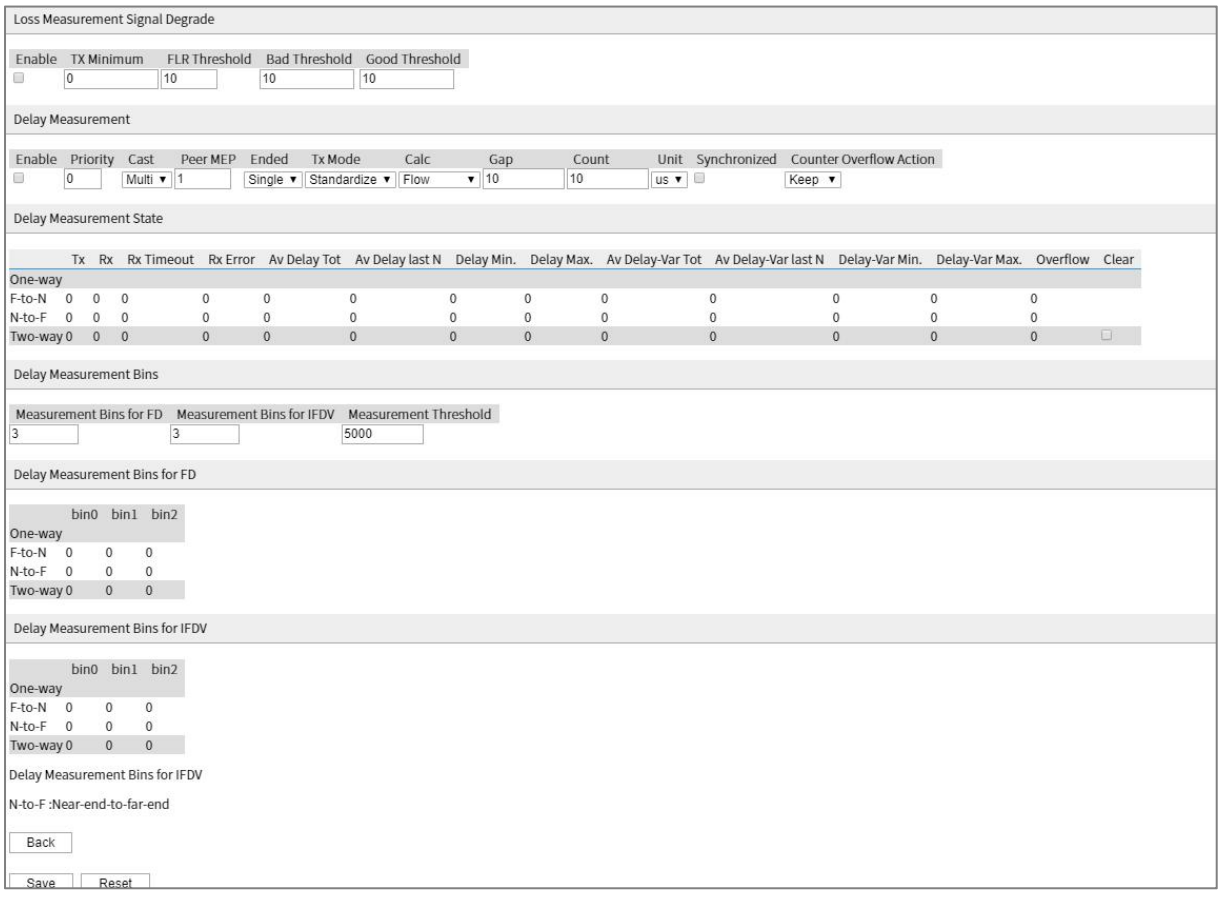
Back: Click to go back to this MEP instance main page.

Save: Click to save changes.

Reset: Click to undo any changes made locally and revert to previously saved values.

This page allows the user to inspect and configure the performance monitor of the current MEP Instance.


Performance Monitor - Instance 1 - MEP id 1
Refresh
Performance Monitoring Data Set
Enable
Loss Measurement
Tx Rx Priority Cast Peer MEP Rate Size Synthetic Ended FLR Interval Meas. Interval Loss Threshold SLM Test ID
0 Multi 1 1 f/sec 64 Single 5 1000 0 0
Loss Measurement State
Peer MEP ID Tx Rx Near End Loss Count Far End Loss Count Interval Elapsed Interval Near End Loss Ratio Interval Far End Loss Ratio Total Near End Loss Ratio Total Far End Loss Ratio Clear
No Peer MEP Added
Loss Measurement Availability
Enable Interval FLR Threshold Maintenance
10 10
Loss Measurement Availability State
Peer MEP ID Near Availability Count Far Availability Count Near Unavailability Count Far Unavailability Count Near State Far State
No Peer MEP Added
Loss Measurement High Loss Interval
Enable FLR Threshold Consecutive Interval
100 100
Loss Measurement High Loss Interval State
Peer MEP ID Near Count Far Count Near Consecutive Count Far Consecutive Count
No Peer MEP Added


Loss Measurement Signal Degrade
Enable TX Minimum FLR Threshold Bad Threshold Good Threshold
0 10 10 10
Delay Measurement
Enable Priority Cast Peer MEP Ended Tx Mode Calc Gap Count Unit Synchronized Counter Overflow Action
0 Multi 1 Single Standardize Flow 10 10 us Keep
Delay Measurement State
Tx Rx Rx Timeout Rx Error Av Delay Tot Av Delay last N Delay Min. Delay Max. Av Delay-Var Tot Av Delay-Var last N Delay-Var Min. Delay-Var Max. Overflow Clear
One-way
F-to-N 0 0 0 0 0 0 0 0 0 0 0 0
N-to-F 0 0 0 0 0 0 0 0 0 0 0 0
Two-way 0 0 0 0 0 0 0 0 0 0 0 0
Delay Measurement Bins
Measurement Bins for FD Measurement Bins for IFDV Measurement Threshold
3 3 5000
Delay Measurement Bins for FD
bin0 bin1 bin2
One-way
F-to-N 0 0 0
N-to-F 0 0 0
Two-way 0 0 0
Delay Measurement Bins for IFDV
bin0 bin1 bin2
One-way
F-to-N 0 0 0
N-to-F 0 0 0
Two-way 0 0 0
Delay Measurement Bins for IFDV
N-to-F :Near-end-to-far-end
Back
Save
Reset

Performance Monitoring Data Set

Enable

When enabled this MEP instance will contribute to the 'PM Data Set' gathered by the PM Session.

Loss Measurement

Tx

Loss Measurement initiator is enabled/disabled. Initiator is transmitting/receiving CCM or LMM/LMR or SLM/SLR/1SL PDUs - see 'Synthetic' and 'Ended'.
Service frame LM (not 'Synthetic') is only allowed with one Peer MEP configured.
Synthetic frame LM is allowed with multiple Peer MEPs configured.

Rx

Enable loss calculation when receiving LM PDUs (LMM/SLM/1SL). This is ignored when LM initiator is enabled.

Prio

The priority to be inserted as PCP bits in TAG (if any). In case of enable of Continuity Check and Loss Measurement both implemented on SW based CCM, 'Priority' has to be the same.

Cast

Selection of LM PDU transmitted unicast or multicast. The unicast MAC will be taken from the 'Unicast Peer MAC' database. In case of enable of Continuity Check and dual ended Loss Measurement both implemented on SW based CCM, 'Cast' has to be the same.

Peer MEP

Peer MEP-ID for unicast LM. The MAC is taken from the 'Unicast Peer MAC' database. Only used in case of multiple peers ('Synthetic' LM).

Speed

Selecting the frame rate of LM PDU. This is the inverse of transmission period as described in Y.1731
Selecting 100f/sec is only valid in case of 'Synthetic' LM.
Selecting 6f/min is not valid in case of dual ended 'Service frame' LM (CCM PDU based).
In case of enable of Continuity Check and Loss Measurement both implemented on SW based CCM, 'Frame Rate' has to be the same.

Size

The 'Synthetic' SLM/1SL frame size. This is entered as the wanted size (in bytes) of a un-tagged frame containing LM OAM PDU - including CRC (four bytes).

Example when 'Size' = 64 => Un-tagged frame size = DMAC(6) + SMAC(6) + TYPE(2) + TST PDU LENGTH(46) + CRC(4) = 64 bytes

The transmitted frame will be four bytes longer for each tag added - 8 bytes in case of a tunnel EVC.

There are two frame MAX sizes to consider.

Switch RX frame MAX size: The MAX frame size (all inclusive) accepted on the switch port of Bytes

CPU RX frame MAX size: The MAX frame size (all inclusive) possible to copy to CPU of Bytes

Consider that the Peer MEP must be able to handle the selected frame size. Consider that the received SLR PDU must be copied to CPU

Warning will be given if selected frame size exceeds the CPU RX frame MAX size

Frame MIN Size is 64 Bytes.

Synthetic

Synthetic frame LM is enable. This is SLM/SLR/1SL PDU based LM.

Ended

Single: Single ended Loss Measurement implemented on LMM/LMR or SLM/SLR.

Dual: Dual ended Loss Measurement implemented on SW based CCM or 1SL.

FLR Interval

This is the interval in number of measurement intervals where the interval Frame Loss Ratio is calculated.

Meas Interval

This is the 'synthetic' LM measurement interval in milliseconds. This must be a whole number of the LM PDU transmission interval (inverse 'Rate'). This is the interval in time where the loss and FLR is calculated based on the counted number of SL OAM PDUs. It is in this interval that the calculated FLR is checked against availability, high loss and degraded FLR threshold.

For example: 'Rate' = 100f/sec => 'Meas Interval' = N*10 milliseconds.

For example: 'Rate' = 10f/sec => 'Meas Interval' = N*100 milliseconds.

In case of service frame based LM this attribute is not used and the measurement interval is always the LM PDU transmission interval.

Loss Threshold

Far end loss threshold count is incremented if a loss measurement is above this threshold.

SLM Test ID

The Test ID value to use in SLM PDUs (see G.8013, section 9.22.1). The default value is 0.

Loss Measurement State

Peer MEP

The Peer MEP ID that the following state relates to.

Tx

The accumulated transmitted LM PDUs - since last 'clear'.

Rx

The accumulated received LM PDUs - since last 'clear'.

Near End Loss Count

The accumulated near end frame loss count - since last 'clear'.

Far End Loss Count

The accumulated far end frame loss count - since last 'clear'.

Interval Elapsed

The accumulated number of 'FLR Interval' elapsed - since last 'clear'.

Interval Near End Loss Ratio

The near end frame loss ratio calculated based on the near end frame loss count and far end frame transmitted - in the latest 'FLR Interval'. This is shown in (Loss/Tx)*10000. Same as 1/100 Percent.

Interval Far End Loss Ratio

The far end frame loss ratio calculated based on the far end frame loss count and near end frame transmitted - in the latest 'FLR Interval'. This is shown in (Loss/Tx)*10000. Same as 1/100 Percent.

Total Near End Loss Ratio

The near end frame loss ratio calculated based on the near end frame loss count and far end frame transmitted - since last 'clear'. This is shown in (Loss/Tx)*10000. Same as 1/100 Percent.

Total Far End Loss Ratio

The far end frame loss ratio calculated based on the far end frame loss count and near end frame transmitted - since last 'clear'. This is shown in (Loss/Tx)*10000. Same as 1/100 Percent.

Clear

Set of this check and save will clear the accumulated counters and restart ratio calculation.

Loss Measurement Availability

Enable

Enable/disable of loss measurement availability.

Interval

Availability interval - number of measurements with same availability in order to change availability state.

FLR Threshold

Availability frame loss ratio threshold in per mile.

Maintenance

Enable/disable of loss measurement availability maintenance.

Loss Measurement Availability Status

Near Avail Count

Near end availability count.

Far Avail Count

Far end availability count.

Near Unavail Count

Near end unavailability count.

Far Unavail Count

Far end unavailability count.

Near State

Near end availability state.

Far State

Far end availability state.

Loss Measurement High Loss Interval

Enable

Enable/disable of loss measurement high loss interval.

FLR Threshold

High Loss Interval frame loss ratio threshold in per mile.

Consecutive Interval

High Loss Interval consecutive interval (number of measurements).

Loss Measurement High Loss Interval Status

Near Count

Near end high loss interval count (number of measurements where availability state is available and FLR is above high loss interval FLR threshold.

Far Count

Far end high loss interval count (number of measurements where availability state is available and FLR is above high loss interval FLR threshold.

Near Consecutive Count

Near end high loss interval consecutive count.

Far Consecutive Count

Far end high loss interval consecutive count.

Loss Measurement Signal Degrade

Enable

Enable/disable of loss measurement signal degrade.

TX Minimum

Minimum number of frames that must be transmitted in a measurement before frame loss ratio is tested against loss ratio threshold.

FLR Threshold

Signal Degraded frame loss ratio threshold in per mile.

Bad Threshold

Number of consecutive bad interval measurements required to set degrade state.

Good Threshold

Number of consecutive good interval measurements required to clear degrade state.

Delay Measurement

Enable

Delay Measurement based on transmitting 1DM/DMM PDU can be enabled/disabled. Delay Measurement based on receiving and handling 1DM/DMR PDU is always enabled.

Priority

The priority to be inserted as PCP bits in TAG (if any).

Cast

Selection of 1DM/DMM PDU transmitted unicast or multicast. The unicast MAC will be configured through 'Peer MEP'.

Peer MEP

This is only used if the 'Cast' is configured to Uni. The 1DM/DMR unicast MAC will be taken from the 'Unicast Peer MAC' configuration of this peer.

Enable

Single: Single ended Delay Measurement implemented on DMM/DMR.

Dual: Dual ended Delay Measurement implemented on 1DM.

Tx Mode

Standardize: Y.1731 standardize way to transmit 1DM/DMR.

Proprietary： Proprietary way with follow-up packets to transmit 1DM/DMR.

Counter

This is only used if the 'Ended' is configured to single ended.

Round trip: The frame delay calculated by the transmitting and receiving timestamps of initiators. Frame Delay = RxTimeb-TxTimeStampf

Flow: The frame delay calculated by the transmitting and receiving timestamps of initiators and remotes. Frame Delay = (RxTimeb-TxTimeStampf)-(TxTimeStampb-RxTimeStampf).

Gap

The gap between transmitting 1DM/DMM PDU in 10ms. The range is 10 to 65535.

Count

The number of last records to calculate. The range is 10 to 2000.

Unit

The time resolution.

Synchronized

Enable to use DMM/DMR packet to calculate dual ended DM. If the option is enabled, the following action will be taken. When DMR is received, two-way delay (roundtrip or flow) and both near-end-to-far-end and far-end-to-near-end one-way delay are calculated. When DMM or 1DM is received, only far-end-to-near-end one-way delay is calculated.

Counter Overflow Action

The action to counter when overflow happens.

Delay Measurement State

Tx

The accumulated transmit count - since last 'clear'.

Rx

The accumulated receive count - since last 'clear'.

Rx Timeout

The accumulated receive timeout count for two-way only - since last 'clear'.

Rx Error

The accumulated receive error count - since last 'clear'. This is counting if the frame delay is larger than 1 second or if far end residence time is larger than the round trip time.

Av Delay Tot

The average total delay - since last 'clear'.

Av Delay last N

The average delay of the last n packets - since last 'clear'.

Delay Min.

The minimum delay - since last 'clear'.

Delay Max.

The maximum delay - since last 'clear'.

Av Delay-Var Tot

The average total delay variation - since last 'clear'.

Av Delay-Var last N

The average delay variation of the last n packets - since last 'clear'.

Delay-Var Min.

The minimum delay variation - since last 'clear'.

Delay-Var Max.

The maximum delay variation - since last 'clear'.

Overflow

The number of counter overflow - since last 'clear'.

Clear

Set of this check and save will clear the accumulated counters.

Far-end-to-near-end one-way delay

The one-way delay is from remote devices to the local devices. Here are the conditions to calculate this delay. DM received by 1. 2DMM received with Synchronized enabled. 3DMR received with Synchronized enabled.

Near-end-to-far-end one-way delay

The one-way delay is from the local devices to remote devices. The only case to calculate this delay is below. DMR received with Synchronized enabled.

Delay Measurement Bins

A Measurement Bin is a counter that stores the number of delay measurements falling within a specified range, during a Measurement Interval.

Measurement Bins for FD

Configurable number of Frame Delay Measurement Bins per Measurement Interval.

The minimum number of FD Measurement Bins per Measurement Interval supported is 2.

The maximum number of FD Measurement Bins per Measurement Interval supported is 10.

The default number of FD Measurement Bins per Measurement Interval supported is 3.

Measurement Bins for IFDV

Configurable number of Inter-Frame Delay Variation Measurement Bins per Measurement Interval.

The minimum number of FD Measurement Bins per Measurement Interval supported is 2.

The maximum number of FD Measurement Bins per Measurement Interval supported is 10.

The default number of FD Measurement Bins per Measurement Interval supported is 2.

Measurement Threshold

Configurable the Measurement Threshold for each Measurement Bin.

The unit for a measurement threshold is in microseconds (us).

The default configured measurement threshold for a Measurement Bin is an increment of 5000 us.

Delay Measurement Bins for FD

A Measurement Bin is a counter that stores the number of delay measurements falling within a specified range, during a Measurement Interval.

If the measurement threshold is 5000 us and the total number of Measurement Bins is four, we can give an example as follows.

Bin	Threshold	Range
bin0	0 us	0 us <= measurement < 5,000 us
bin1	5,000 us	5,000 us <= measurement < 10,000 us
bin2	10,000 us	10,000 us <= measurement < 15,000 us
bin3	15,000 us	15,000 us <= measurement < infinite us

Delay Measurement Bins for IFDV

A Measurement Bin is a counter that stores the number of delay measurements falling within a specified range, during a Measurement Interval.

If the measurement threshold is 5000 us and the total number of Measurement Bins is four, we can give an example as follows.

Bin	Threshold	Range
bin0	0 us	0 us <= measurement < 5,000 us
bin1	5,000 us	5,000 us <= measurement < 10,000 us
bin2	10,000 us	10,000 us <= measurement < 15,000 us
bin3	15,000 us	15,000 us <= measurement < infinite us

Buttons

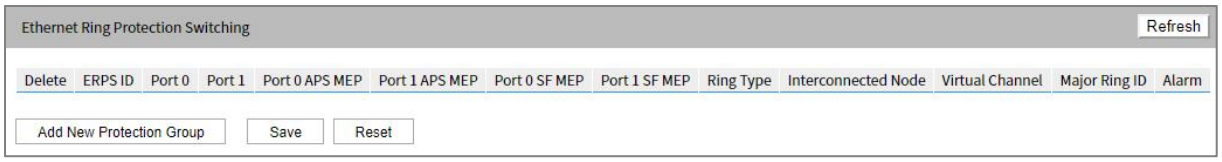
Back: Click to go back to this MEP instance main page.

Save: Click to save changes.

Reset: Click to undo any changes made locally and revert to previously saved values.

5.14 ERPS

The ERPS instances are configured here.



Delete

This box is used to mark an ERPS for deletion in next save operation.

ERPS ID

The ID of the created Protection group, It must be an integer value between 1 and 64. The maximum numbers of ERPS Protection Groups that can be created are 64. Click on the ID of a Protection group to enter the configuration page.

Port 0

This will create a Port 0 of the switch in the ring.

Port 1

This will create "Port 1" of the switch in the Ring. As interconnected sub-ring will have only one ring port, "Port 1" is configured as "0" for interconnected sub-ring. "0" in this field indicates that no "Port 1" is associated with this instance

Port 0 SF MEP

The Port 0 Signal Fail reporting MEP.

Port 1 SF MEP

The Port 1 Signal Fail reporting MEP. As only one SF MEP is associated with interconnected sub-ring without virtual channel, it is configured as "0" for such ring instances. "0" in this field indicates that no Port 1 APS MEP is associated with this instance.

Port 0 APS MEP

The Port 0 APS PDU handling MEP.

Port 1 APS MEP

The Port 1 APS PDU handling MEP. As only one APS MEP is associated with interconnected sub-ring without virtual channel, it is configured as "0" for such ring instances. "0" in this field indicates that no Port 1 APS MEP is associated with this instance.

Ring Type

Type of Protecting ring. It can be either major ring or sub-ring.

Interconnected Node

Interconnected Node indicates that the ring instance is interconnected. Click on the checkbox to configure this. "Yes" indicates it is an interconnected node for this instance. "No" indicates that the configured instance is not interconnected.

Virtual Channel

Sub-rings can either have virtual channel or not on the interconnected node. This is configured using "Virtual Channel" checkbox. "Yes" indicates it is a sub-ring with virtual channel. "No" indicates, sub-ring doesn't have virtual channel.

Major Ring ID

Major ring group ID for the interconnected sub-ring. It is used to send topology change updates on major ring. If ring is major, this value is same as the protection group ID of this ring.

Alarm

There is an active alarm on the ERPS.

Buttons

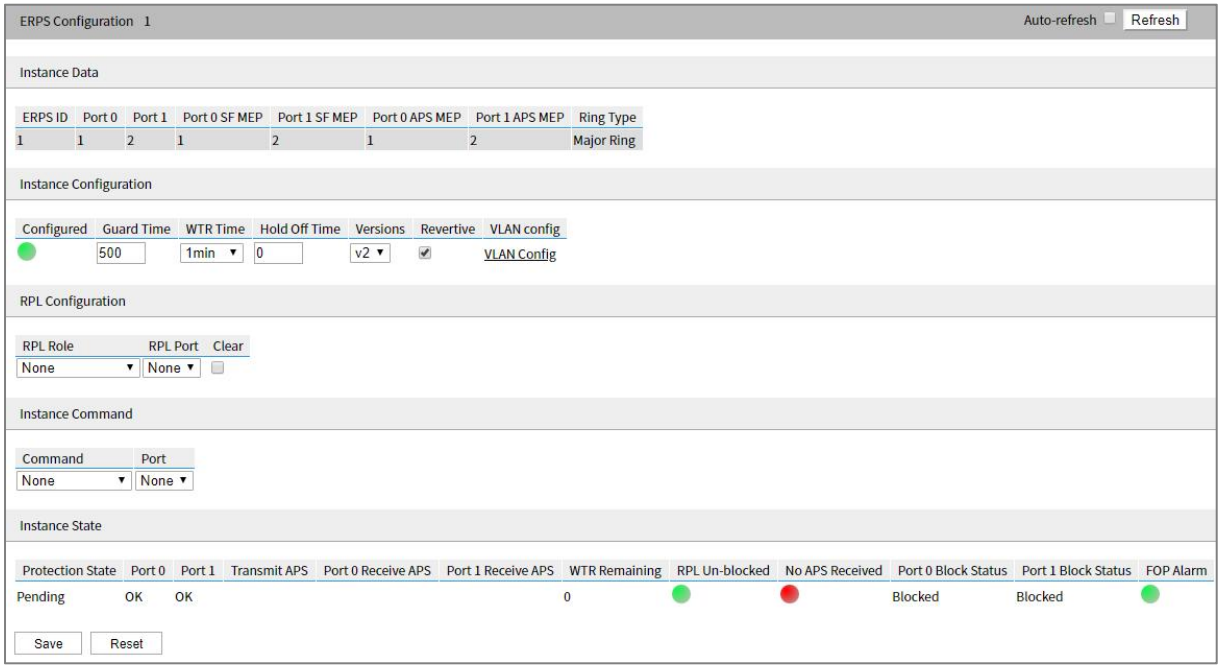
Add new protection group: Click to add a new protection group entry.

Refresh: Click to refresh the page immediately.

Protect: Click to save changes.

Reset: Click to undo any changes made locally and revert to previously saved values.

This page allows the user to inspect and configure the current ERPS Instance.



Instance Data

ERPS ID

The ID of the Protection group.

Port 0

This will create a Port 0 of the switch in the ring.

Port 1

This will create "Port 1" of the switch in the Ring. As interconnected sub-ring will have only one ring port, "Port 1" is configured as "0" for interconnected sub-ring. "0" in this field indicates that no "Port 1" is associated with this instance

Port 0 SF MEP

The Port 0 Signal Fail reporting MEP.

Port 1 SF MEP

The Port 1 Signal Fail reporting MEP. As only one SF MEP is associated with interconnected sub-ring without virtual channel, it is configured as "0" for such ring instances. "0" in this field indicates that no Port 1 APS MEP is associated with this instance.

Port 0 APS MEP

The Port 0 APS PDU handling MEP.

Port 1 APS MEP

The Port 1 APS PDU handling MEP. As only one APS MEP is associated with interconnected sub-ring without virtual channel, it is configured as "0" for such ring instances. "0" in this field indicates that no Port 1 APS MEP is associated with this instance.

Ring Type

Type of Protecting ring. It can be either major ring or sub-ring.

Instance Configuration

Configured

Red: This ERPS is only created and has not yet been configured - is not active.

Green: This ERPS is configured - is active.

Guard Time

Guard timeout value to be used to prevent ring nodes from receiving outdated R-APS messages.

The period of the guard timer can be configured in 10 ms steps between 10 ms and 2 seconds. The default value is 500 ms.

WTR Time

The Wait To Restore timing value to be used in revertive switching.

The period of the WTR time can be configured by the operator in 1 minute steps between 5 and 12 minutes. The default value is 5 minutes.

Hold Time

The timing value to be used to make persistent check on Signal Fail before switching.

The range of the hold off timer is 0 to 10 seconds in steps of 100 ms

Version

ERPS Protocol Version - v1 or v2

Revertive

In Revertive mode, after the conditions causing a protection switch has cleared, the traffic channel is restored to the working transport entity, i.e., blocked on the RPL.

In Non-Revertive mode, the traffic channel continues to use the RPL, if it is not failed, after a protection switch condition has cleared.

VLAN config

VLAN configuration of the Protection Group. Click on the "VLAN Config" link to configure VLANs for this protection group.

RPL Configuration

RPL Role

It can be either RPL owner or RPL Neighbor.

RPL Port

This allows to select the east port or west port as the RPL block.

Clear

If the owner has to be changed, then the clear check box allows to clear the RPL owner for that ERPS ring.

Sub-Ring Configuration

Topology Change

Clicking this checkbox indicates that the topology changes in the sub-ring are propagated in the major ring.

Instance Command

Command

Administrative command. A port can be administratively configured to be in either manual switch or forced switch state.

Forced Switch

Forced Switch command forces a block on the ring port where the command is issued.

Manual Switch

In the absence of a failure or FS, Manual Switch command forces a block on the ring port where the command is issued.

Clear

The Clear command is used for clearing an active local administrative command (e.g., Forced Switch or Manual Switch).

Port

Port selection - Port0 or Port1 of the protection Group on which the command is applied.

Instance State

Protection State

ERPS state according to State Transition Tables in G.8032.

Port 0

OK: State of East port is ok

SF: State of East port is Signal Fail

Port 1

OK： State of West port is ok.

SF： State of West port is Signal Fail.

Transmit APS

The transmitted APS according to State Transition Tables in G.8032.

Port 0 Receive APS

The received APS on Port 0 according to State Transition Tables in G.8032.

Port 1 Receive APS

The received APS on Port 1 according to State Transition Tables in G.8032.

WTR Remaining

Remaining WTR timeout in milliseconds.

RPL Un-blocked

APS is received on the working flow.

No APS Received

RAPS PDU is not received from the other end.

Port 0 Block Status

Block status for Port 0 (Both traffic and R-APS block status). R-APS channel is never blocked on sub-rings without virtual channel.

Port 1 Block Status

Block status for Port 1 (Both traffic and R-APS block status). R-APS channel is never blocked on sub-rings without virtual channel.

FOP Alarm

Failure of Protocol Defect(FOP) status. If FOP is detected, red LED glows; else green LED glows.

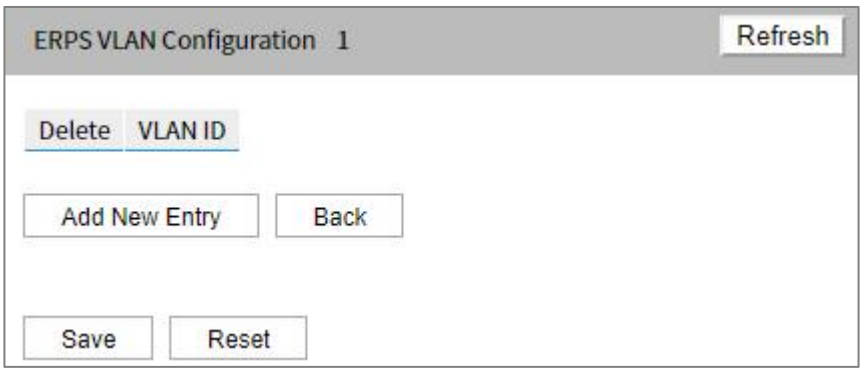
Buttons

Save: Click to save changes.

Auto-refresh: Check this box to enable an automatic refresh. Automatic refresh occurs every 3 seconds.

Refresh: Click to refresh the page immediately.

Reset: Click to undo any changes made locally and revert to previously saved values.



Delete

To delete a VLAN entry, check this box. The entry will be deleted during the next Save.

VLAN ID

Indicates the ID of this particular VLAN.

Adding a New VLAN

Click “Add New Entry” to add a new VLAN ID. Legal values for a VLAN ID are 1 through 4095.

The VLAN is enabled when you click “save”. A VLAN without any port members will be deleted when you click "Save".

The “Delete” button can be used to delete the added vlan.

Buttons

Save: Click to save changes.

Reset: Click to undo any changes made locally and revert to previously saved values.

Back: Click to go back to this MEP instance main page.

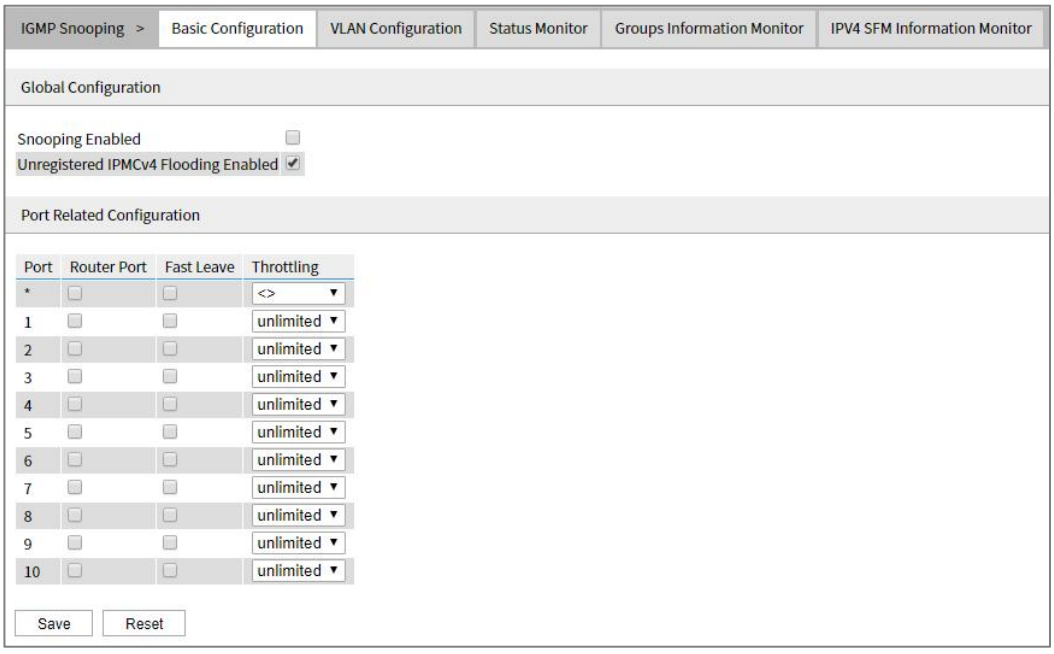
Refresh: Refreshes the displayed table starting from the "VLAN ID" input fields.

6 Multicast

6.1 IGMP Snooping

6.1.1 Basic Configuration

This page provides IGMP Snooping related configuration.



Global Configuration

Snooping Enabled

Enable the Global IGMP Snooping.

Unregistered IPMCv4 Flooding Enabled

Enable unregistered IPMCv4 traffic flooding.

The flooding control takes effect only when IGMP Snooping is enabled.

When IGMP Snooping is disabled, unregistered IPMCv4 traffic flooding is always active in spite of this setting.

Port-related Configuration

Router Port

Specify which ports act as router ports. A router port is a port on the Ethernet switch that leads towards the Layer 3 multicast device or IGMP querier.

If an aggregation member port is selected as a router port, the whole aggregation will act as a router port.

Fast Leave

Enable the fast leave on the port.

Throttling

Enable to limit the number of multicast groups to which a switch port can belong.

Buttons

Save: Click to save changes.

Reset: Click to undo any changes made locally and revert to previously saved values.

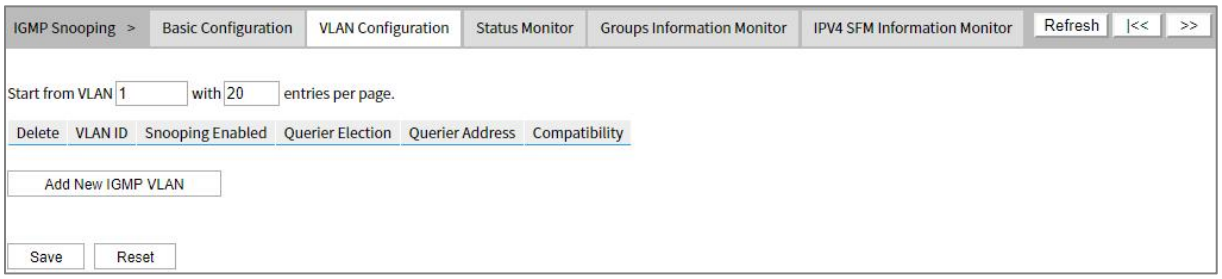
6.1.2 VLAN Configuration

Navigating the IGMP Snooping VLAN Table

Each page shows up to 99 entries from the VLAN table, default being 20, selected through the "__ entries per page" input field. When first visited, the WEB page will show the first 20 entries from the beginning of the VLAN Table. The first displayed will be the one with the lowest VLAN ID found in the VLAN Table.

The "VLAN" input field allows the user to select the starting point in the VLAN Table. Clicking the “Refresh” button will update the displayed table starting from that or the closest next VLAN Table match. In addition, the two input fields will - upon a button click - assume the value of the first displayed entry, allowing for continuous refresh with the same start address.

Pressing the “>>” button will use the last entry of the currently displayed entry as a basis for the next lookup. When the end is reached the text "No more entries" is shown in the displayed table. Use the “|<<” button to start over.



Delete

Check to delete the entry. The designated entry will be deleted during the next save.

VLAN ID

The VLAN ID of the entry.

Enable Listening

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

Querier Election

Enable to join IGMP Querier election in the VLAN. Disable to act as an IGMP Non-Querier.

Querier Address

Define the IPv4 address as source address used in IP header for IGMP Querier election.

When the Querier address is not set, system uses IPv4 management address of the IP interface associated with this VLAN.

When the IPv4 management address is not set, system uses the first available IPv4 management address.

Otherwise, system uses a pre-defined value. By default, this value will be 192.0.2.1.

IGMP Versions

Compatibility is maintained by hosts and routers taking appropriate actions depending on the versions of IGMP operating on hosts and routers within a network.

The allowed selection is IGMP-Auto, Forced IGMPv1, Forced IGMPv2, Forced IGMPv3, default compatibility value is IGMP-Auto.

Buttons

Refresh: Refreshes the displayed table starting from the "VLAN" input fields.

|<<: Updates the table starting from the first entry in the VLAN Table, i.e. the entry with the lowest VLAN ID.

>>: Updates the table, starting with the entry after the last entry currently displayed.

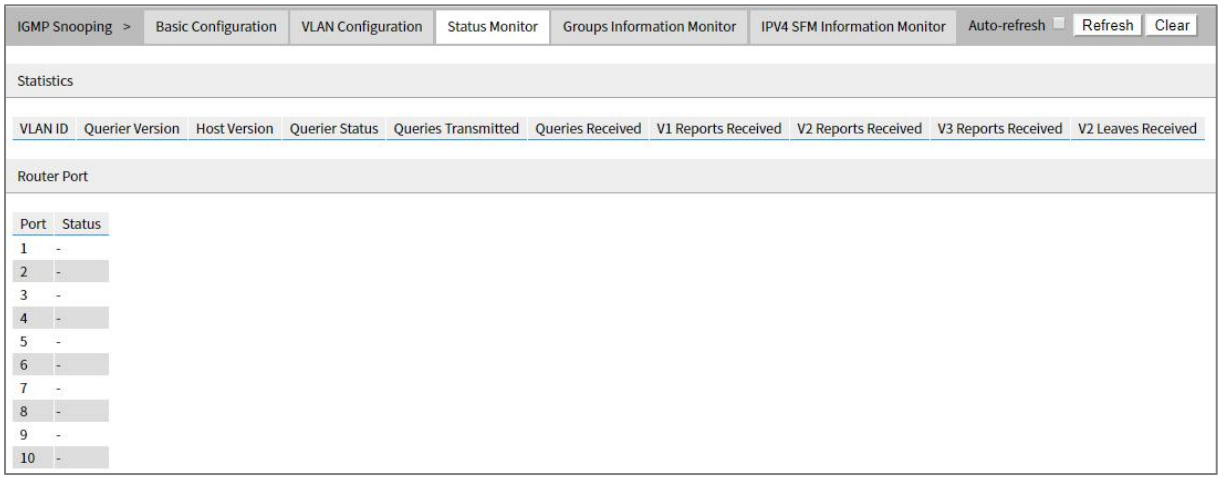
Add New IGMP VLAN: click here to add new IGMP VLAN. Specify the VID and configure the new entry. Click "Save". The specific IGMP VLAN starts working after the corresponding static VLAN is also created.

Save: Click to save changes.

Reset: Click to undo any changes made locally and revert to previously saved values.

6.1.3 Status Monitoring

This page provides IGMP Snooping status.



VLAN ID

The VLAN ID of the entry.

Querier Version

Working Querier Version currently.

Host Version

Working Host Version currently.

Query Status

Shows the Querier status is "ACTIVE" or "IDLE".

"DISABLE" denotes the specific interface is administratively disabled.

Number of Transmitted Inquiry Messages

The number of Transmitted Queries.

Queries Received

The number of Received Queries.

V1 Reports Received

The number of Received V1 Reports.

V2 Reports Received

The number of Received V2 Reports.

V3 Reports Received

The number of Received V3 Reports.

V2 Leaves Received

The number of Received V2 Leaves.

Router Port

Display which ports act as router ports. A router port is a port on the Ethernet switch that leads towards the Layer 3 multicast device or IGMP querier.

Static denotes the specific port is configured to be a router port.

Dynamic denotes the specific port is learnt to be a router port.

Both denote the specific port is configured or learnt to be a router port.

Port

The switch port number.

Status

Indicate whether specific port is a router port or not.

Buttons

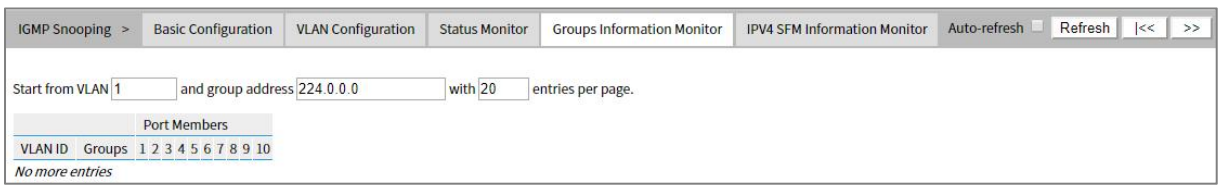
Auto-refresh: Automatic refresh occurs every 3 seconds.

Refresh: Click to refresh the page immediately.

Clear: Clears all Statistics counters.

6.1.4 Group Information Monitoring

Entries in the IGMP Group Table are shown on this page. The IGMP Group Table is sorted first by VLAN ID, and then by group.



Navigating the IGMP Group Table

Each page shows up to 99 entries from the IGMP Group table, default being 20, selected through the "__ entries per page" input field. When first visited, the WEB page will show the first 20 entries from the beginning of the IGMP Group Table.

The "Start from VLAN__", and "group" input fields allow the user to select the starting point in the IGMP Group Table. Clicking the “Refresh” button will update the displayed table starting from that or the closest next IGMP Group Table match. In addition, the two input fields will - upon a “Refresh” button click - assume the value of the first displayed entry, allowing for continuous refresh with the same start address.

“>>” will use the last entry of the currently displayed table as a basis for the next lookup. When the end is reached the text "No more entries" is shown in the displayed table. Use the “|<<” button to start over.

IGMP Group Table Columns

VLAN ID

VLAN ID of the group.

Group

Group address of the group displayed.

Port Members

Ports under this group.

Buttons

Auto-refresh: Automatic refresh occurs every 3 seconds.

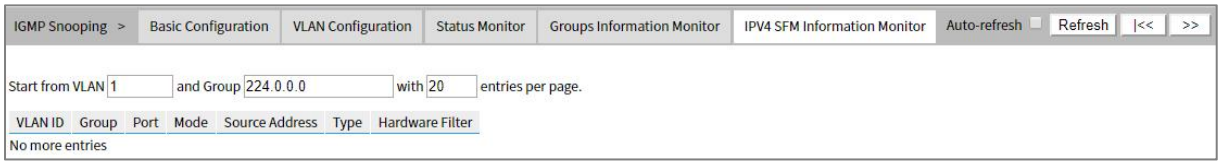
Refresh: Refresh the displayed table starting from the input fields.

|<<: Updates the table, starting with the first entry in the IGMP Group Table.

>>: Updates the table, starting with the entry after the last entry currently displayed.

6.1.5 IPv4 SFM Information Monitoring

Entries in the IGMP SFM Information Table are shown on this page. The IGMP SFM (Source-Filtered Multicast) Information Table also contains the SSM (Source-Specific Multicast) information. This table is sorted first by VLAN ID, then by group, and then by Port. Different source addresses belong to the same group are treated as single entry.



Navigating the IGMP SFM Information Table

Each page shows up to 99 entries from the IGMP SFM Information Table, default being 20, selected through the "entries per page" input field. When first visited, the

WEB page will show the first 20 entries from the beginning of the IGMP SFM Information Table.

The "Start from VLAN__and Group__" input fields allow the user to select the starting point in the IGMP SFM Information Table. Clicking the “Refresh” button will update the displayed table starting from that or the closest next IGMP SFM Information Table match. In addition, the two input fields will - upon a “Refresh” button click - assume the value of the first displayed entry, allowing for continuous refresh with the same start address.

“>>” will use the last entry of the currently displayed table as a basis for the next lookup. When the end is reached the text "No more entries" is shown in the displayed table. Use the “|<<” button to start over.

IGMP SFM Information Table Columns

VLAN ID

VLAN ID of the group.

Group

Group address of the group displayed.

Port

The switch port number.

Mode

Indicates the filtering mode maintained per (VLAN ID, port number, Group Address) basis. It can be either Include or Exclude.

Source Address

IP Address of the source.

Currently, the maximum number of IPv4 source address for filtering (per group) is 8.

When there is no any source filtering address, the text "None" is shown in the Source Address field.

Type

Indicates the Type. It can be either Allow or Deny.

Hardware Filter/Switch

Indicates whether data plane destined to the specific group address from the source IPv4 address could be handled by chip or not.

Buttons

Auto-refresh: Automatic refresh occurs every 3 seconds.

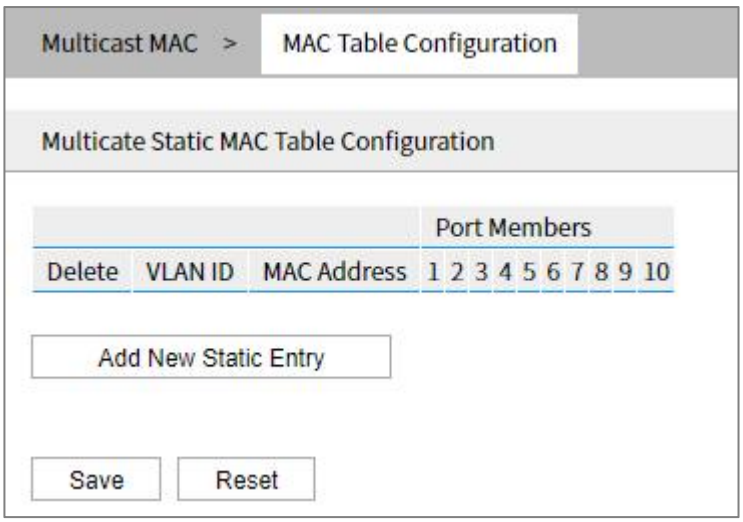
Refresh: Refresh the displayed table starting from the input fields.

|<<: Updates the table starting from the first entry in the IGMP SFM Information Table.

>>: Updates the table, starting with the entry after the last entry currently displayed.

6.2 Multicast MAC

Static multicast MAC address could be added on this page.



Delete

Click the "Delete" button to delete the the current entry.

VLAN

The VLAN ID of the entry.

MAC Address

The multicast MAC address of the entry, such as “01-00-5E-XX-XX-XX”.

Configured ports

The ports that are members of the entry.

Buttons

Add new static entry: click to add a new static multicast MAC address entry.

Save: Click to save changes.

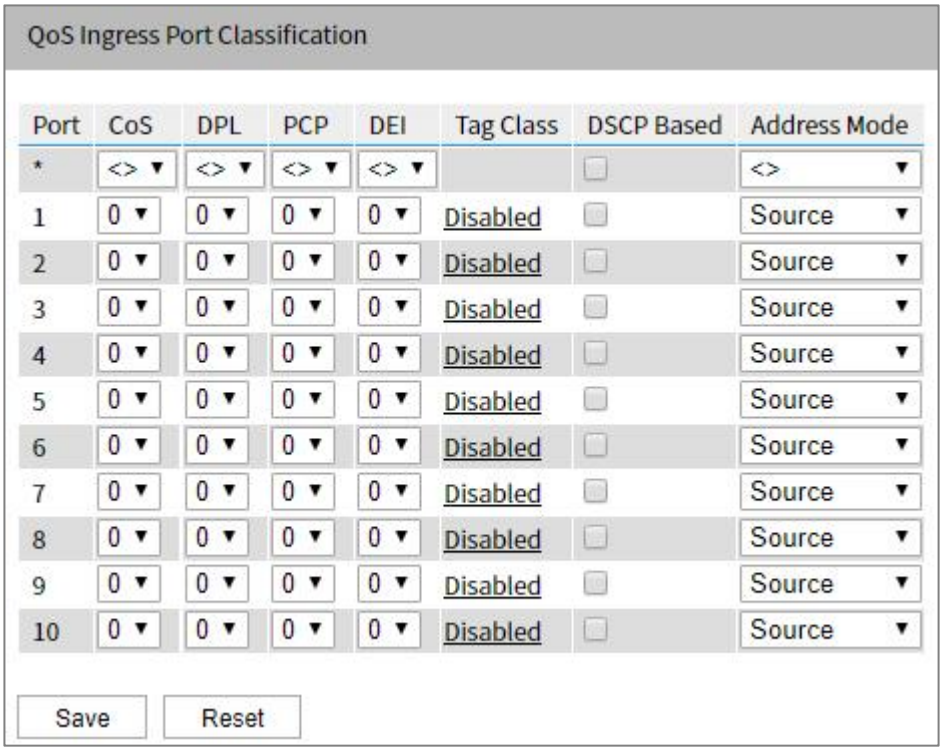
Reset: Click to undo any changes made locally and revert to previously saved values.

7 Service Quality

7.1 Port Classification

This page allows you to configure the basic QoS Ingress Classification settings for all switch ports.

The displayed settings are:



Port

The port number for which the configuration below applies.

CoS

Controls the default class of service.

All frames are classified to a CoS. There is a one to one mapping between CoS, queue and priority. A CoS of 0 (zero) has the lowest priority.

If the port is VLAN aware, the frame is tagged and Tag Class. is enabled, then the frame is classified to a CoS that is mapped from the PCP and DEI value in the tag. Otherwise the frame is classified to the default CoS.

The classified CoS can be overruled by a QCL entry.

Note:

If the default CoS has been dynamically changed, then the actual default CoS is shown in parentheses after the configured default CoS.

DPL

Controls the default drop precedence level.

All frames are classified to a drop precedence level.

If the port is VLAN aware, the frame is tagged and Tag Class. is enabled, then the frame is classified to a DPL that is mapped from the PCP and DEI value in the tag. Otherwise the frame is classified to the default DPL.

The classified DPL can be overruled by a QCL entry.

PCP

Controls the default PCP value.

All frames are classified to a PCP value.

If the port is VLAN aware and the frame is tagged, then the frame is classified to the PCP value in the tag. Otherwise the frame is classified to the default PCP value.

DEI

Controls the default DEI value.

All frames are classified to a DEI value.

If the port is VLAN aware and the frame is tagged, then the frame is classified to the DEI value in the tag. Otherwise the frame is classified to the default DEI value.

Label Classification

Display the classification mode of label frames on this port. Display the label classification of tagged frames on this port.

- Disabled: Use default CoS and DPL for tagged frames.
- Enabled: Use mapped versions of PCP and DEI for tagged frames.

Click on the mode in order to configure the mode and/or mapping.

Note:

This setting has no effect if the port can’t identify VLAN. Tagged frames received on VLAN unaware ports are always classified to the default CoS and DPL.

DSCP-based Classification

Click to Enable DSCP Based QoS Ingress Port Classification.

Address Mode

The IP/MAC address mode specifying whether the QCL classification must be based on source (SMAC/SIP) or destination (DMAC/DIP) addresses on this port. The allowed values are:

- Source: Enable SMAC/SIP matching.
- Destination: Enable DMAC/DIP matching.

Buttons

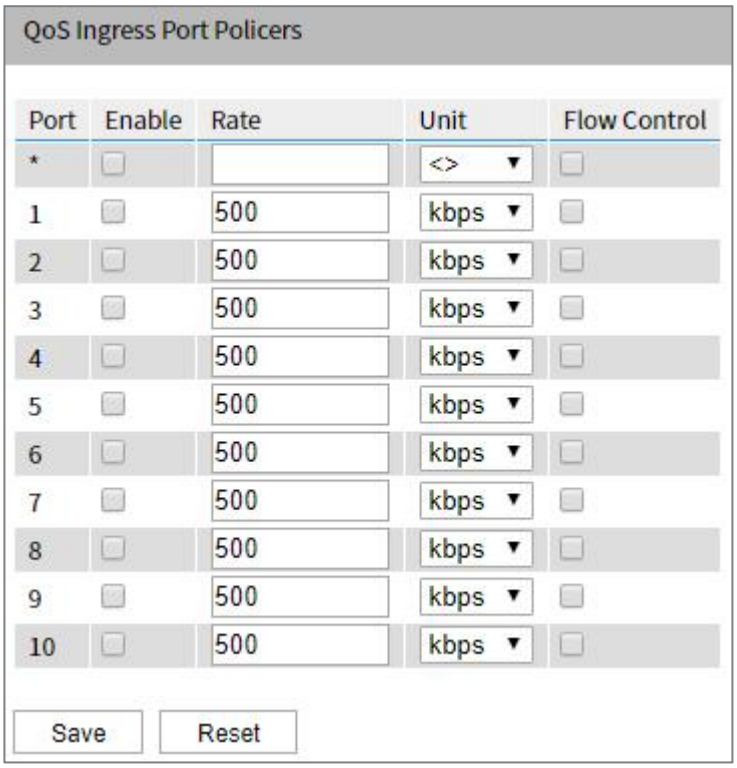
Save: Click to save changes.

Reset: Click to undo any changes made locally and revert to previously saved values.

7.2 Ingress Policy

This page allows you to configure the Policer settings for all switch ports.

The displayed settings are:



Port

The port number for which the configuration below applies.

Enable

Enable or disable the port policer for this switch port.

Rate

Controls the rate for the port policer. This value is restricted to 100-3276700 when "Unit" is kbps or fps, and 1-3276 when "Unit" is Mbps or kfps. The rate is internally rounded up to the nearest value supported by the port policer.

Unit

Controls the unit of measure for the port policer rate as kbps, Mbps, fps or kfps.

Flow Control

If flow control is enabled and the port is in flow control mode, then pause frames are sent instead of discarding frames.

Buttons

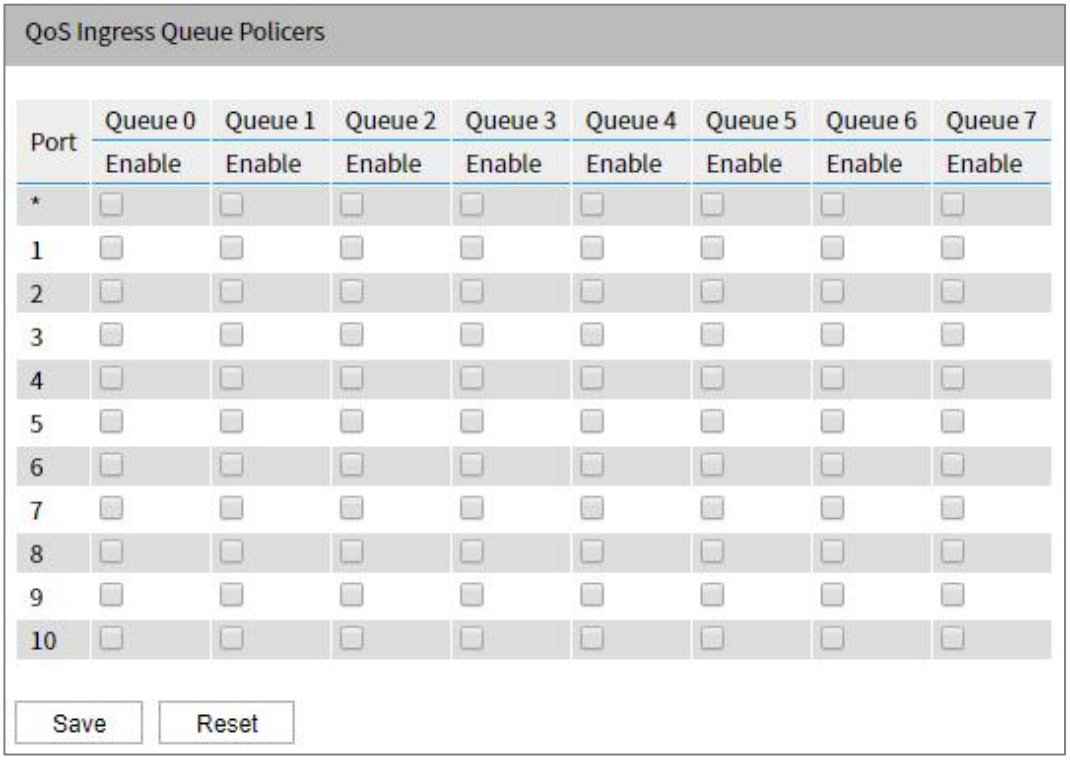
Save: Click to save changes.

Reset: Click to undo any changes made locally and revert to previously saved values.

7.3 Queue Strategy

This page allows you to configure the Queue Policer settings for all switch ports.

The displayed settings are:



Port

The port number for which the configuration below applies.

Enable (E)

Enable or disable the queue policer for this switch port.

Rate

Controls the rate for the queue policer. This value is restricted to 100-3276700 when "Unit" is kbps, and 1-3276 when "Unit" is Mbps. The rate is internally rounded up to the nearest value supported by the queue policer.

This field is only shown if at least one of the queue policers are enabled.

Unit

Controls the unit of measure for the queue policer rate as kbps or Mbps.

This field is only shown if at least one of the queue policers are enabled.

Buttons

Save: Click to save changes.

Reset: Click to undo any changes made locally and revert to previously saved values.

7.4 Egress Scheduling

This page provides an overview of QoS Egress Port Schedulers for all switch ports.

The displayed settings are:

QoS Egress Port Schedulers

Port	Mode	Weight					
		Q0	Q1	Q2	Q3	Q4	Q5
1	Strict Priority	-	-	-	-	-	-
2	Strict Priority	-	-	-	-	-	-
3	Strict Priority	-	-	-	-	-	-
4	Strict Priority	-	-	-	-	-	-
5	Strict Priority	-	-	-	-	-	-
6	Strict Priority	-	-	-	-	-	-
7	Strict Priority	-	-	-	-	-	-
8	Strict Priority	-	-	-	-	-	-
9	Strict Priority	-	-	-	-	-	-
10	Strict Priority	-	-	-	-	-	-

Port

The switch port number.

Click on the port number in order to configure the schedulers.

Mode

Shows the scheduling mode for this port.

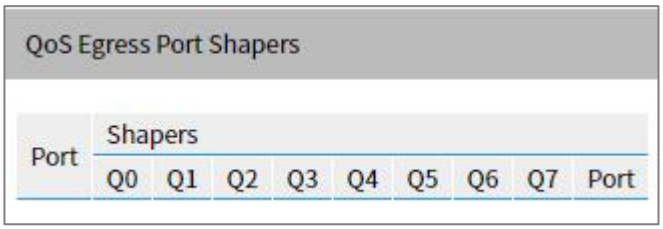
Qn

Shows the weight for this queue and port.

7.5 Egress Shaping

This page provides an overview of QoS Egress Port Shapers for all switch ports.

The displayed settings are:



Port

The switch port number.

Click on the port number in order to configure the shapers.

Qn

Shows "-" for disabled or actual queue shaper rate - e.g. "800 Mbps".

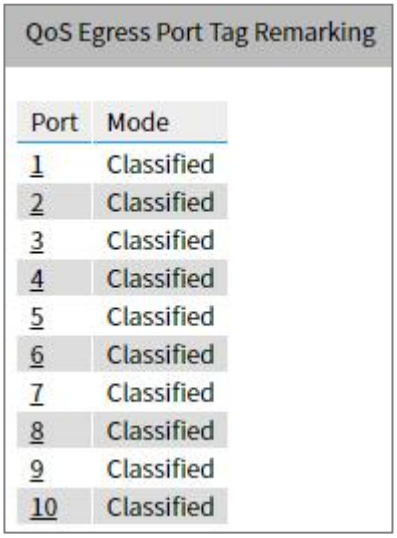
Port

Shows "-" for disabled or actual port shaper rate - e.g. "800 Mbps".

7.6 Egress Relabeling

This page provides an overview of QoS Egress Port Tag Remarking for all switch ports.

The displayed settings are:



Port

The switch port number.

Click on the port number in order to configure tag remarking.

Mode

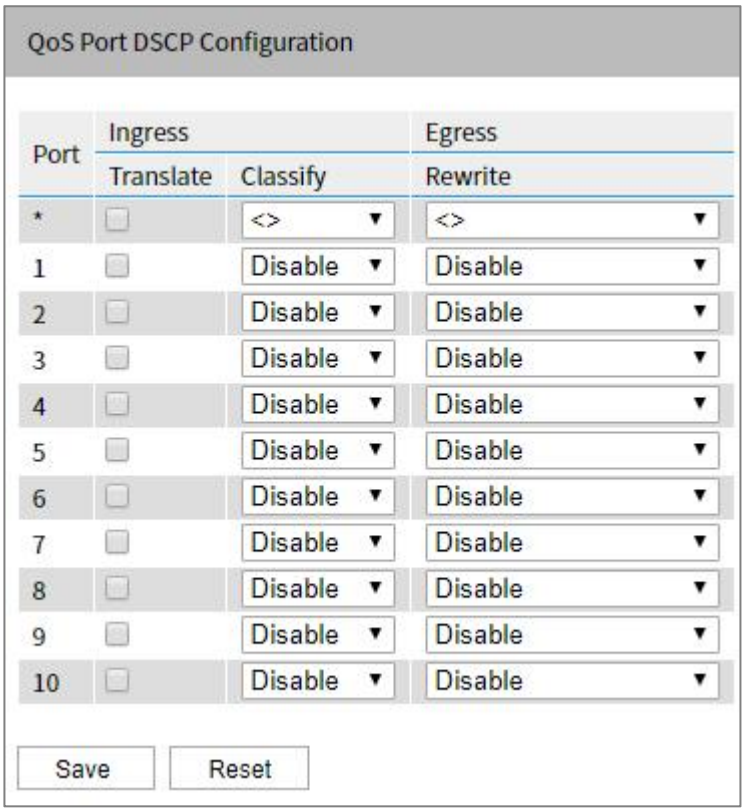
Shows the tag remarking mode for this port.

- Classified: Use classified PCP/DEI values.
- Default: Use default PCP/DEI values.
- Mapped: Use mapped versions of QoS class and DP level.

7.7 Port DSCP

This page allows you to configure the basic QoS Port DSCP Configuration settings for all switch ports.

The displayed settings are:



Port

The Port column shows the list of ports for which you can configure dscp ingress and egress settings.

Ingress

In Ingress settings you can change ingress translation and classification settings for individual ports.

There are two configuration parameters available in Ingress:

- Translate
- Classify

Translate

To Enable the Ingress Translation click the checkbox.

Classify

Classification for a port have 4 different values.

- Disable: No Ingress DSCP Classification.
- DSCP=0: Classify if incoming (or translated if enabled) DSCP is 0.
- Selected: Classify only selected DSCP for which classification is enabled as specified in DSCP Translation window for the specific DSCP.
- All: all DSCP are classified.

Egress

Port Egress Rewriting can be one of:

- Disabled: no egress rewrite.
- Enable: enable rewrite without remapping.
- Remap DP Unaware: DSCP from analyzer is remapped and frame is remarked with remapped DSCP value. The remapped DSCP value is always taken from the “DSCP Conversion > Egress Remap DP0” table.
- Remap DP Aware: DSCP from analyzer is remapped and frame is remarked with remapped DSCP value. According to the DP level of the frame, the remapped DSCP value can be obtained from either the “DSCP Conversion > Egress Remap DP0” table or the “DSCP Conversion > Egress Remap DP1” table.

Buttons

Save: Click to save changes.

Reset: Click to undo any changes made locally and revert to previously saved values.

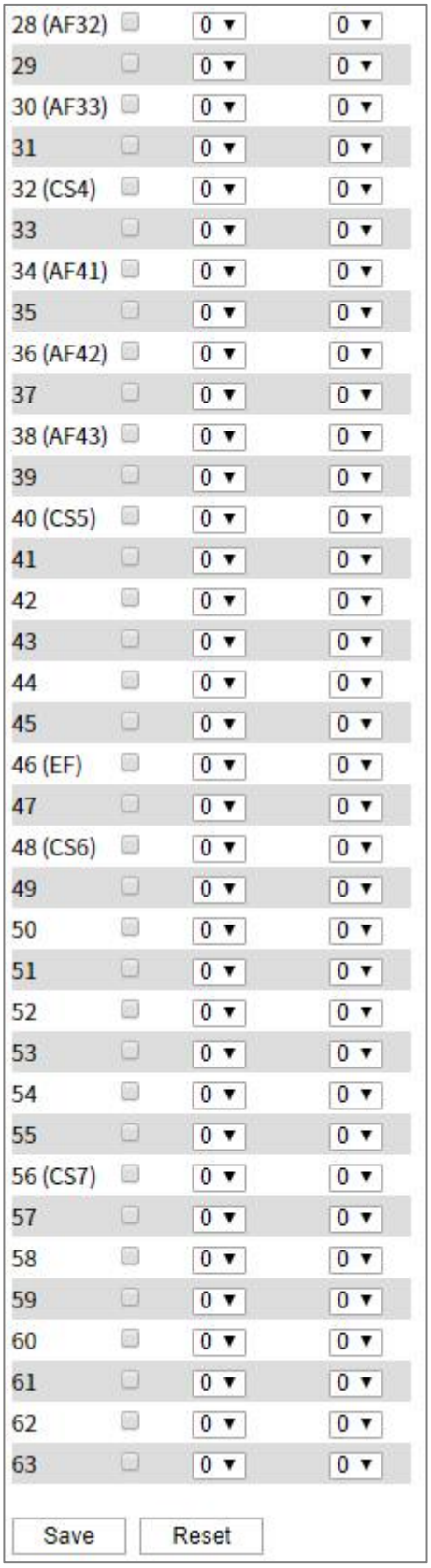
7.8 DSCP-based QoS

This page allows you to configure basic QoS DSCP ingress classification settings based on QoS DSCP for all switches.

The displayed settings are:

DSCP-Based QoS Ingress Classification

DSCP	Trust	QoS Class	DPL
*	☐	<>	<>
0 (BE)	☐	0	0
1	☐	0	0
2	☐	0	0
3	☐	0	0
4	☐	0	0
5	☐	0	0
6	☐	0	0
7	☐	0	0
8 (CS1)	☐	0	0
9	☐	0	0
10 (AF11)	☐	0	0
11	☐	0	0
12 (AF12)	☐	0	0
13	☐	0	0
14 (AF13)	☐	0	0
15	☐	0	0
16 (CS2)	☐	0	0
17	☐	0	0
18 (AF21)	☐	0	0
19	☐	0	0
20 (AF22)	☐	0	0
21	☐	0	0
22 (AF23)	☐	0	0
23	☐	0	0
24 (CS3)	☐	0	0
25	☐	0	0
26 (AF31)	☐	0	0
27	☐	0	0



DSCP

Maximum number of supported DSCP values are 64.

Trust

Controls whether a specific DSCP value is trusted. Only frames with trusted DSCP values are mapped to a specific QoS class and Drop Precedence Level. Frames with untrusted DSCP values are treated as a non-IP frame.

QoS Class

QoS class value can be any of (0-7).

DPL

Drop Precedence Level (0-1).

Buttons

Save: Click to save changes.

Reset: Click to undo any changes made locally and revert to previously saved values.

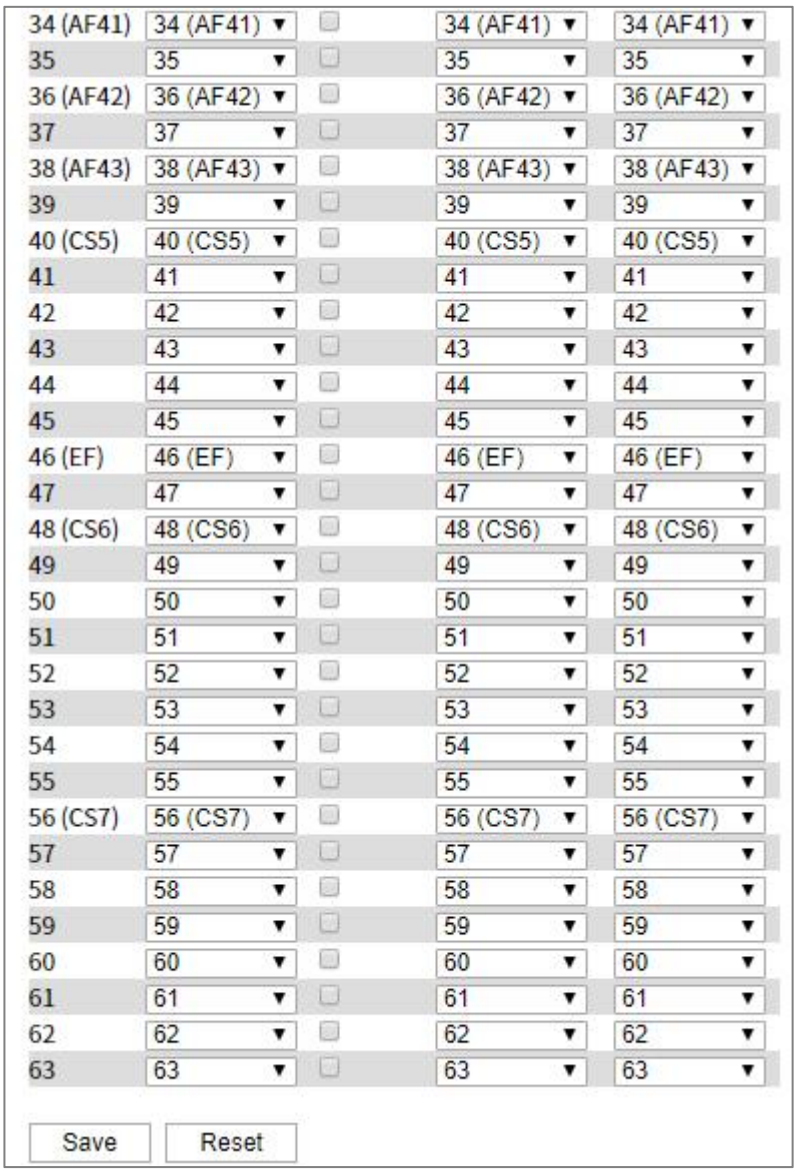
7.9 DSCP Conversion

This page allows you to configure the basic QoS DSCP Translation settings for all switches. DSCP translation can be done in Ingress or Egress.

The displayed settings are:

DSCP Translation

DSCP	Ingress		Egress	
	Translate	Classify	Remap DP0	Remap DP1
*	<>	☐	<>	<>
0 (BE)	0 (BE)	☐	0 (BE)	0 (BE)
1	1	☐	1	1
2	2	☐	2	2
3	3	☐	3	3
4	4	☐	4	4
5	5	☐	5	5
6	6	☐	6	6
7	7	☐	7	7
8 (CS1)	8 (CS1)	☐	8 (CS1)	8 (CS1)
9	9	☐	9	9
10 (AF11)	10 (AF11)	☐	10 (AF11)	10 (AF11)
11	11	☐	11	11
12 (AF12)	12 (AF12)	☐	12 (AF12)	12 (AF12)
13	13	☐	13	13
14 (AF13)	14 (AF13)	☐	14 (AF13)	14 (AF13)
15	15	☐	15	15
16 (CS2)	16 (CS2)	☐	16 (CS2)	16 (CS2)
17	17	☐	17	17
18 (AF21)	18 (AF21)	☐	18 (AF21)	18 (AF21)
19	19	☐	19	19
20 (AF22)	20 (AF22)	☐	20 (AF22)	20 (AF22)
21	21	☐	21	21
22 (AF23)	22 (AF23)	☐	22 (AF23)	22 (AF23)
23	23	☐	23	23
24 (CS3)	24 (CS3)	☐	24 (CS3)	24 (CS3)
25	25	☐	25	25
26 (AF31)	26 (AF31)	☐	26 (AF31)	26 (AF31)
27	27	☐	27	27
28 (AF32)	28 (AF32)	☐	28 (AF32)	28 (AF32)
29	29	☐	29	29
30 (AF33)	30 (AF33)	☐	30 (AF33)	30 (AF33)
31	31	☐	31	31
32 (CS4)	32 (CS4)	☐	32 (CS4)	32 (CS4)
33	33	☐	33	33



DSCP

Maximum number of supported DSCP values are 64 and valid DSCP value ranges from 0 to 63.

Ingress

Before using DSCP to realize QoS class and DPL mapping, the DSCP at the entrance can be converted into a new DSCP.

There are two configuration parameters for DSCP mapping:

- Translate
- Classify

Translate

DSCP at Ingress side can be translated to any of (0-63) DSCP values.

Classify

Click to enable Classification at Ingress side.

Egress

There are the following configurable parameters for Egress side:

- Remap DP0: Controls the remapping for frames with DP level 0.
- Remap DP1: Controls the remapping for frames with DP level 1.

Remap DP0

Select the DSCP value from the drop-down list that needs to be remapped. DSCP value ranges from 0 to 63.

Remap DP1

Select the DSCP value from the drop-down list that needs to be remapped. DSCP value ranges from 0 to 63.

Buttons

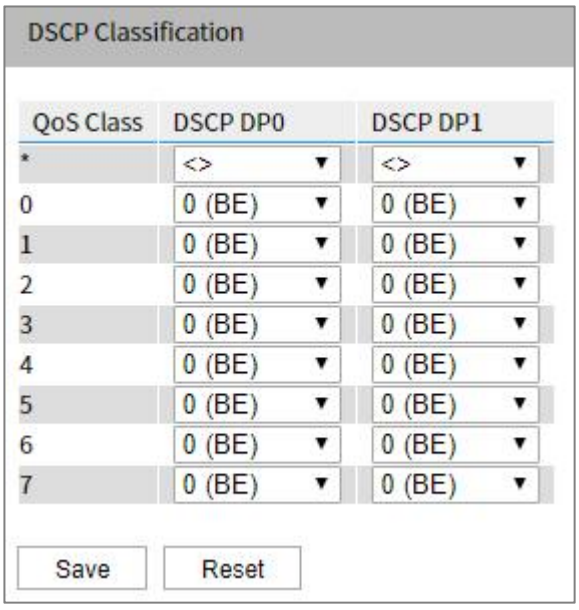
Save: Click to save changes.

Reset: Click to undo any changes made locally and revert to previously saved values.

7.10 DSCP Classification

This page allows you to configure the mapping of QoS class and Drop Precedence Level to DSCP value.

The displayed settings are:



QoS Classification

Actual QoS class.

DSCP DP0

Select the classified DSCP value (0-63) for Drop Precedence Level 0.

DSCP DP1

Select the classified DSCP value (0-63) for Drop Precedence Level 1.

Buttons

Save: Click to save changes.

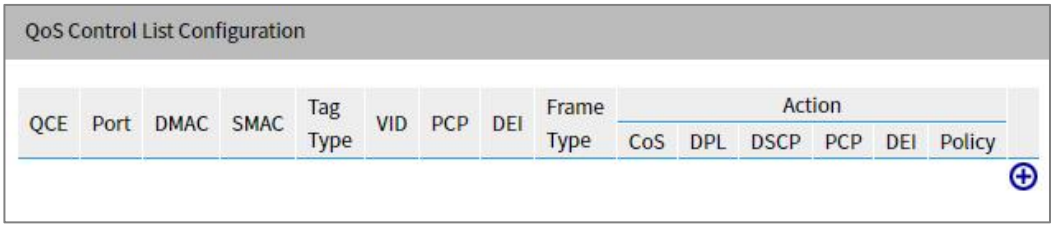
Reset: Click to undo any changes made locally and revert to previously saved values.

7.11 QoS Control List

QoS Control List Configuration

This page shows the QoS Control List(QCL), which is made up of the QCEs. Each row describes a QCE that is defined. The maximum number of QCEs is 256 on each switch.

Click on the lowest plus sign to add a new QCE to the list.



QCE

Indicates the QCE id.

Port

Indicates the list of ports configured with the QCE or 'Any'.

DMAC

Indicates the destination MAC address. Possible values are:

- Any: Match any DMAC.
- Unicast: Match unicast DMAC.
- Multicast: Match multicast DMAC.
- Broadcast: Match broadcast DMAC.

The default value is 'Any'.

SMAC

Match specific source MAC address or 'Any'.

If a port is configured to match on destination addresses, this field indicates the DMAC.

Tag Type

Indicates tag type. Possible values are:

- Any: Match tagged and untagged frames.
- Untagged: Match untagged frames.
- Tagged: Match tagged frames.

The default value is 'Any'.

VID

Indicates (VLAN ID), either a specific VID or range of VIDs. The range of VID can be 1-4095 or "any".

PCP

Priority Code Point： Valid values of PCP are specific (0, 1, 2, 3, 4, 5, 6, 7) or range (0-1, 2-3, 4-5, 6-7, 0-3, 4-7) or 'Any'.

DEI

Drop Eligible Indicator: Valid value of DEI are 0, 1 or 'Any'.

Frame Type

Indicates the type of frame. Possible values are:

- Any: Match any frame type.
- Ethernet: Match EtherType frames.
- LLC: Match (LLC) frames.
- SNAP: Match (SNAP) frames.
- IPv4: Match IPv4 frames.
- IPv6: Match IPv6 frames.

ACTION

Indicates the classification action taken on ingress frame if parameters configured are matched with the frame's content.

Possible actions are:

- CoS: Classify Class of Service.
- DPL: Classify Drop Precedence Level.
- DSCP: Classify DSCP value.
- PCP: Classify PCP value.
- DEI: Classify DEI value.
- Policy: Classify ACL Policy number.

Modification Buttons

You can modify each QCE (QoS Control Entry) in the table using the following buttons:

: Insert a new QCE before the current row.

: Edit QCE.

: move QCE entry up.

: move QCE entry down.

: delete QCE.

: add new QCE entries at the bottom of the QCE list.

7.12 Storm Policer Configuration

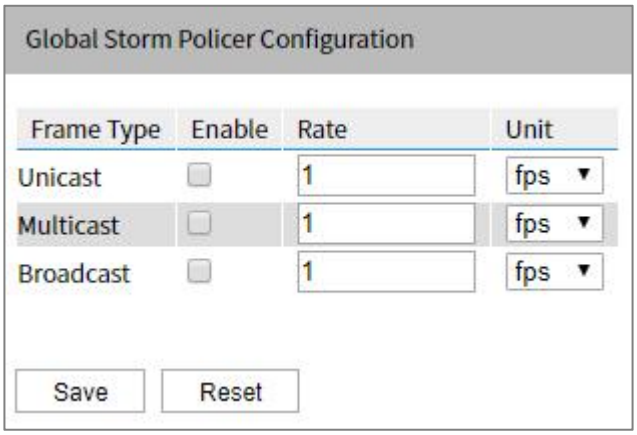
Global Storm Policer Configuration

Global storm policers for the switch are configured on this page.

There is a unicast storm policer, multicast storm policer, and a broadcast storm policer.

These only affect flooding frames, that is, (VLAN ID, DMAC) paired frames do not exist in the MAC address table.

The displayed settings are:



Frame Type

The frame type for which the configuration below applies.

Enable

Enable or disable the global storm policer for the given frame type.

Rate

Controls the rate for the global storm policer. This value is restricted to 1-1024000 when "Unit" is fps, and 1-1024 when "Unit" is kfps. The rate is internally rounded up to the nearest value supported by the global storm policer.

Unit

Controls the unit of measure for the global storm policer rate as fps or kfps.

Buttons

Save: Click to save changes.

Reset: Click to undo any changes made locally and revert to previously saved values.

7.13 QoS Statistics

This page provides statistics for the different queues for all switch ports.

The displayed counters are:

Queuing Counters Auto-refresh Refresh Clear

Port	Q0		Q1		Q2		Q3		Q4		Q5		Q6		Q7	
	Rx	Tx	Rx	Tx	Rx	Tx	Rx	Tx	Rx	Tx	Rx	Tx	Rx	Tx	Rx	Tx
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	122156	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2205
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Port

The switch port number.

Qn

There are 8 QoS queues per port. Q0 is the lowest priority queue.

Rx/Tx

The number of received and transmitted packets per queue.

Buttons

Auto-refresh: Check this box to refresh the page automatically. Automatic refresh occurs every 3 seconds.

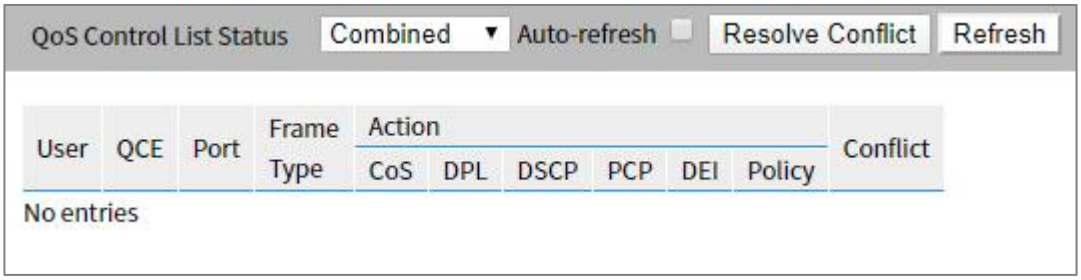
Refresh: Click to refresh the page immediately.

Clear: Clears the counters for all ports.

7.14 QCL Status

QCL Status

This page shows the QCL status by different QCL users. Each row describes the QCE that is defined. It is a conflict if a specific QCE is not applied to the hardware due to hardware limitations. The maximum number of QCEs is 256 on each switch.



User

Indicates the QCL user.

QCE

Indicates the QCE id.

Port

Indicates the list of ports configured with the QCE.

Frame Type

Indicates the type of frame. Possible values are:

- Any: Match any frame type.
- Ethernet: Match EtherType frames.
- LLC: Match (LLC) frames.
- SNAP: Match (SNAP) frames.
- IPv4: Match IPv4 frames.
- IPv6: Match IPv6 frames.

ACTION

Indicates the classification action taken on ingress frame if parameters configured are matched with the frame's content.

Possible actions are:

- CoS: Classify Class of Service.
- DPL: Classify Drop Precedence Level.
- DSCP: Classify DSCP value.
- PCP: Classify PCP value.
- DEI: Classify DEI value.
- Policy: Classify ACL Policy number.

Conflicts

Displays Conflict status of QCL entries. As H/W resources are shared by multiple applications. It may happen that resources required to add a QCE may not be available, in that case it shows conflict status as 'Yes', otherwise it is always 'No'. Please note that conflict can be resolved by releasing the H/W resources required to add QCL entry on pressing 'Resolve Conflict' button.

Buttons

Select QCL status from the drop-down list.

Auto-refresh: Check this box to enable an automatic refresh. Automatic refresh occurs every 3 seconds.

Resolve Conflict: Click to release the resources required to add QCL entry, in case the conflict status for any QCL entry is 'yes'.

Refresh: Click to refresh the page.

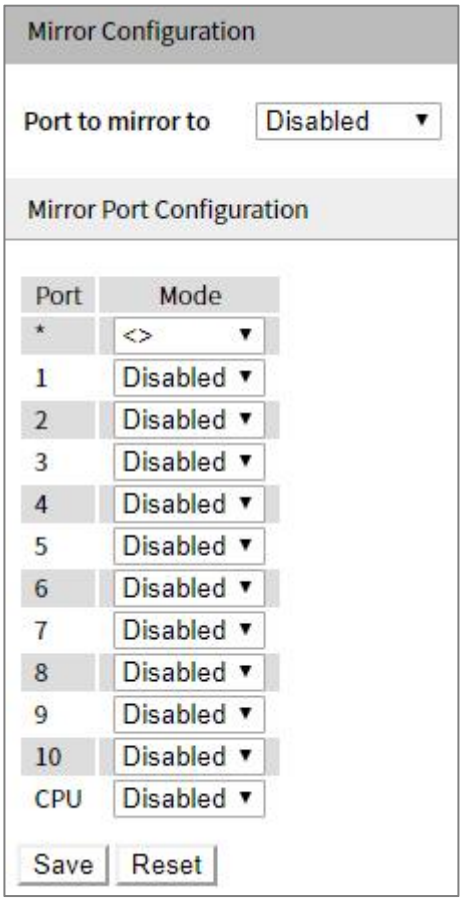
8 System Diagnosis

8.1 Mirroring

Mirroring is a feature for switched port analyzer. The administrator can use the Mirroring to debug network problems. The selected traffic can be mirrored or copied on a destination port where a network analyzer can be attached to analyze the network traffic.

Remote Mirroring is an extend function of Mirroring. It can extend the destination port in other switch. So the administrator can analyze the network traffic on the other switches.

If you want to get the tagged mirrored traffic, you have to set VLAN egress tagging as "Tag All" on the reflector port. On the other hand, if you want to get untagged mirrored traffic, you have to set VLAN egress tagging as "Untag ALL" on the reflector port.



Mirror configuration

From port mirroring to

This checkbox is designed for selecting destination port.

The destination port is a switched port that you receive a copy of traffic from the source port.

Notice:

- On mirror mode, the device only supports one destination port.
- The destination port needs to disable MAC Table learning.

Mirror port configuration

Port

The switch port number.

Mode

Enable/disable Mirroring function.

Configuration Guideline for All Features

When the switch is running on Remote Mirroring mode, the administrator also needs to check whether or not other features are enabled or disabled.

For example, the administrator is not disabled the MSTP on reflector port. All monitor traffic will be blocked on reflector port.

All recommended settings are described as follows.

	Impact	source port	reflector port	intermediate port	destination port	Remote Mirroring VLAN
arp_inspection	High		* disabled	* disabled		
acl	Critical		* disabled	* disabled	* disabled	
dhcp_relay	High		* disabled	* disabled		
dhcp_snooping	High		* disabled	* disabled		
ip_source_guard	Critical		* disabled	* disabled	* disabled	
ipmc/igmpsnp	Critical					un-conflict
ipmc/mldsnp	Critical					un-conflict
lacp	Low				o disabled	
lldp	Low				o disabled	
mac learning	Critical		* disabled	* disabled	* disabled	
mstp	Critical		* disabled		o disabled	
mvr	Critical					un-conflict
nas	Critical		* authorized	* authorized	* authorized	
psec	Critical		* disabled	* disabled	* disabled	
qos	Critical		* unlimited	* unlimited	* unlimited	
upnp	Low				o disabled	
mac-based vlan	Critical		* disabled	* disabled		
protocol-based vlan	Critical		* disabled	* disabled		
vlan_translation	Critical		* disabled	* disabled	* disabled	
voice_vlan	Critical		* disabled	* disabled		
mrp	Low				o disabled	
mvrp	Low				o disabled	

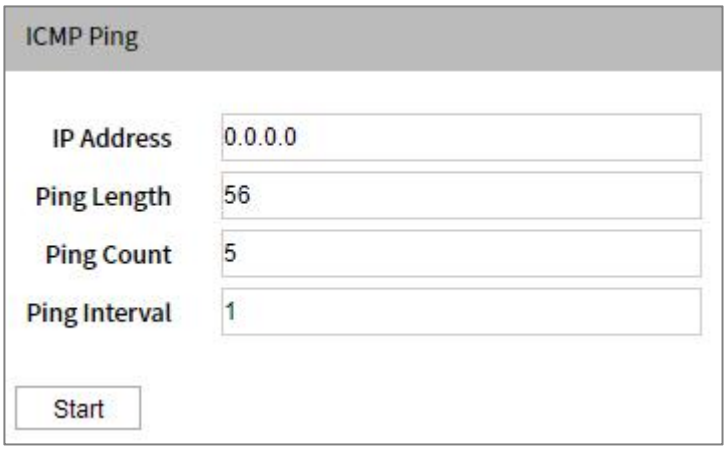
Buttons

Save: Click to save changes.

Reset: Click to undo any changes made locally and revert to previously saved values.

8.2 Ping

This page allows you to issue ICMP PING packets to troubleshoot IP connectivity issues.



After pressing “Start”, ICMP packet is sent, and serial number and round trip time are displayed after receiving reply. The amount of data received in an IP packet of ICMP ECHO_REPLY type is always 8 bytes more than the requested data space (ICMP

header). The page refreshes automatically until responses to all packets are received, or until a timeout occurs.

PING server 192.168.1.61, 56 bytes of data.

64 bytes from 192.168.1.61: icmp_seq=0, time=0ms

64 bytes from 192.168.1.61: icmp_seq=1, time=0ms

64 bytes from 192.168.1.61: icmp_seq=2, time=0ms

64 bytes from 192.168.1.61: icmp_seq=3, time=0ms

64 bytes from 192.168.1.61: icmp_seq=4, time=0ms

Sent 5 packets, received 5 OK, 0 bad

You can configure the following properties of the issued ICMP packets:

Destination IP

The destination IP Address.

Length of Transmission Message

The payload size of the ICMP packet. Values range from 2 bytes to 1452 bytes.

Send Count

The count of the ICMP packet. Values range from 1 time to 60 times.

Time interval

The interval of the ICMP packet. Values range from 0 second to 30 seconds.

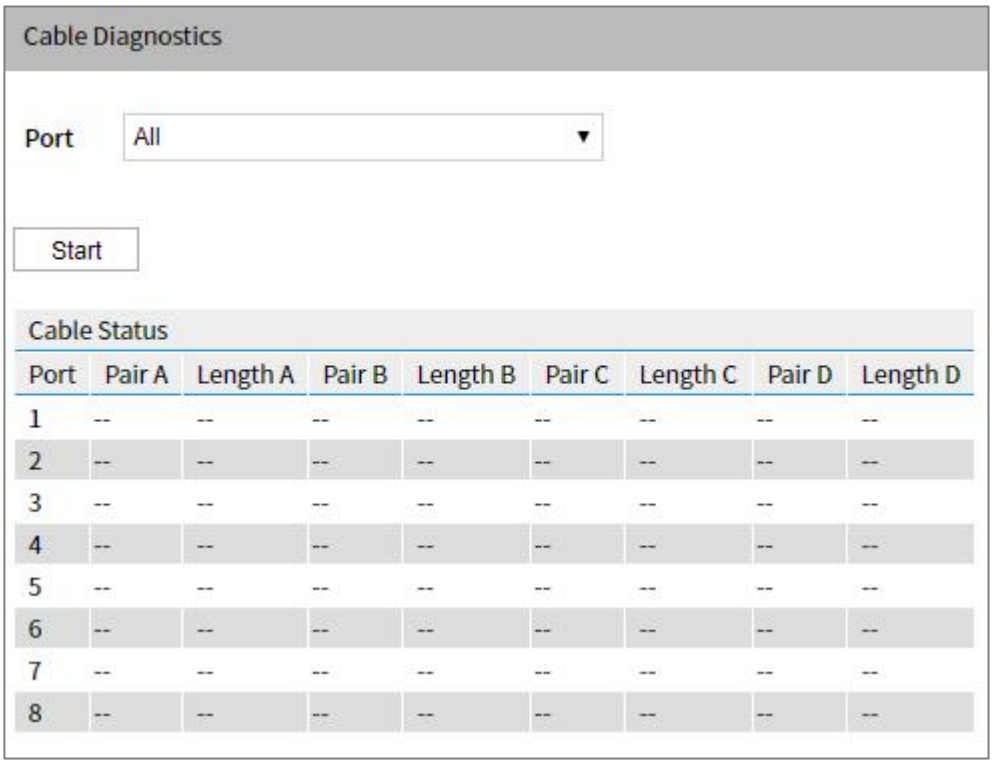
Buttons

Start: Click Start to send ICMP data package.

New Ping: Click to restart diagnostics with PING.

8.3 Cable Detection

This page is used for running the VeriPHY Cable Diagnostics for 10/100 and 1G copper ports.



Press "Start" to run diagnostics. This will take approximately 5 seconds. If all ports are selected, this can take approximately 15 seconds. When completed, the page refreshes automatically, and you can view the cable diagnostics results in the cable status table. Please note that VeriPHY is only applicable to cables with a length of 7-140m.

10 and 100 Mbps ports will be linked down while running VeriPHY. Therefore, running VeriPHY on a 10 or 100 Mbps management port will cause the switch to stop responding until VeriPHY is complete.

Port

The port where you are requesting VeriPHY Cable Diagnostics.

Cable Status

Port

Switch port number.

Pair

The status of the cable pair.

OK - Correctly terminated pair

Open - Open pair

Short - Shorted pair

Short A - Cross-pair short to pair A

Short B - Cross-pair short to pair B

Short C - Cross-pair short to pair C

Short D - Cross-pair short to pair D

Cross A-Abnormal cross-pair coupling with pair A

Cross B-Abnormal cross-pair coupling with pair B

Cross C-Abnormal cross-pair coupling with pair C

Cross D-Abnormal cross-pair coupling with pair D

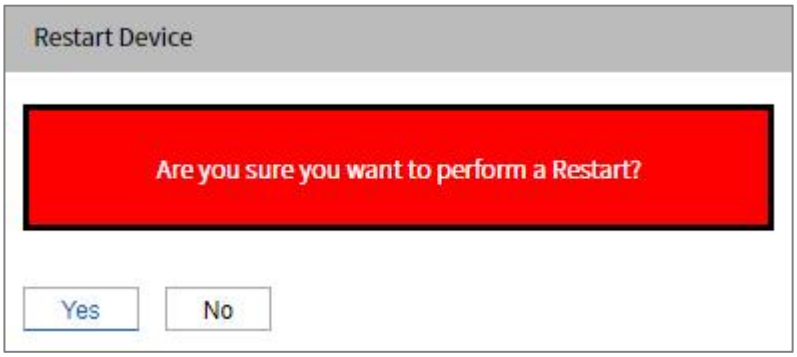
Length

Length of cable pair (m). The resolution is 3m.

9 System Maintenance

9.1 Restart Device

You can restart the switch on this page. After restart, the switch will boot normally.



Buttons

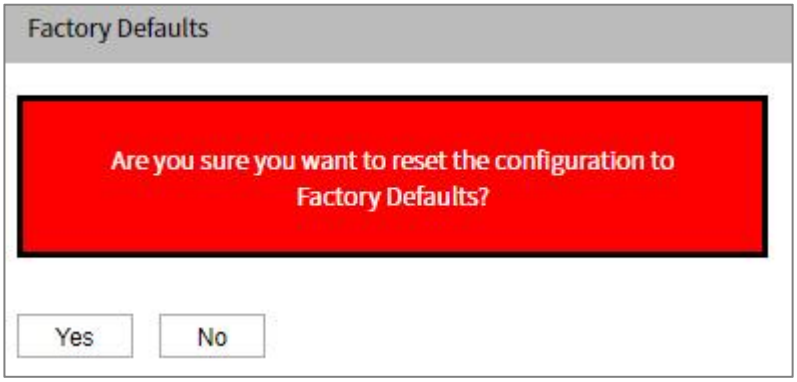
Yes: Click to restart the device.

No: Click to return to the port status page without restarting.

9.2 Restore Factory Settings

You can reset the configuration of the switch on this page. Only the IP configuration is retained.

The new configuration is available immediately, which means that no restart is necessary.



Buttons

Yes: Click to reset the configuration to factory default settings.

No: Click to return to the port status page without reconfiguration.

Notice:

Restoring factory defaults can also be done by making a physical loopback between port 1 and port 2 within the first minute of the switch restart. In the first minute after boot, 'loopback' packets will be transmitted at port 1. If a "loop" packet is received at port 2, the switch will make a recovery to the default value.

9.3 Upgrade

This page facilitates an update of the firmware controlling the switch.

“Select File” in the software firmware, and then click “Update”.

After uploading the software firmware, the page will announce to start the firmware update. After about a minute, the firmware is updated and the switch restarts.

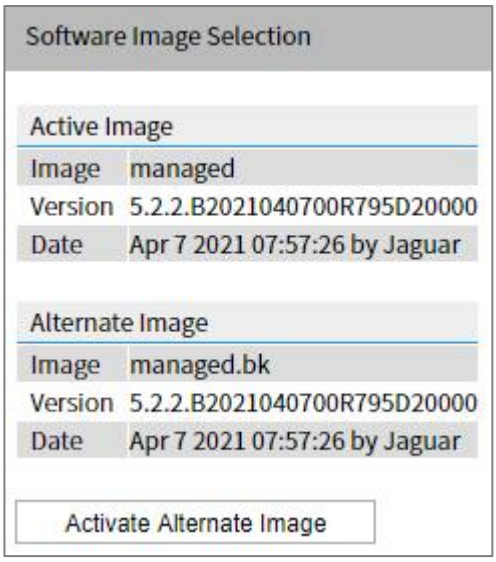
Warning:

When firmware is being updated, network access seems to be unavailable. The front LED flashes Green/Off with a frequency of 10 Hz while the firmware update is in progress. Do not restart or power off the device at this time or the switch may fail to function afterwards.

9.4 Firmware Selection

This page provides information about the active and standby (backup) firmware in the device, and allows recovery to the standby firmware.

The WEB page displays two tables containing information about the active firmware and the standby firmware.



Note:

- If the active firmware is an alternate image, only the “Active Firmware” table is displayed. In this case, the activate standby firmware button is also disabled.
- If the standby image is active (due to damage to the main firmware or manual intervention), uploading new firmware to the device will automatically use the main firmware slot and activate it.
- The firmware version and date information may be empty for older firmware releases. This does not constitute an error.

Firmware

File name of firmware, starting from the time when firmware was last updated.

Version

The version of the firmware.

Date

The date where the firmware was produced.

Buttons

Activate alternate firmware: click to use alternate image. This button may be disabled depending on system state.

Undo: deactivate the backup image. Navigates away from this page.

10 System Configuration

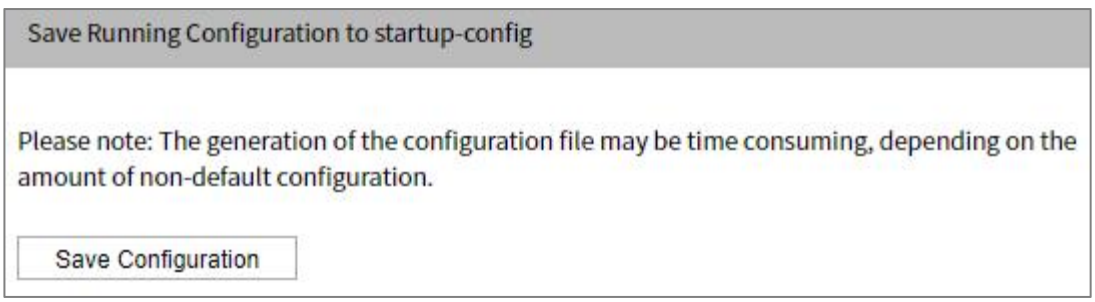
The switch stores its configuration in a number of text files in CLI format. These files are either virtual (based on RAM) or stored in Flash on the switch.

Available documents are:

- running-config: representing the virtual file currently configured by the activity on the switch. This file is volatile.
- startup-config: The startup configuration for the switch, read at boot time. If this file doesn't exist at boot time, the switch will start up in default configuration.
- default-config: A read-only file with vendor-specific configuration. This file is read when the system is restored to default settings.
- Up to 31 other files, typically used for configuration backups or alternative configurations.

10.1 Save startup-config

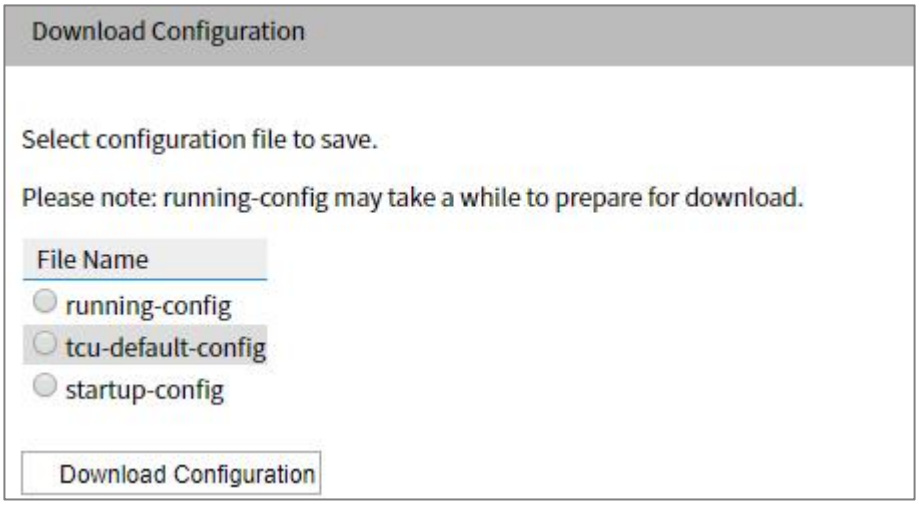
This will copy running-config to startup-config, thus ensuring that the currently active configuration will be used on the next restart.



10.2 Download

It is possible to download any of the files on the switch to the WEB browser. Select the file and click “Download Configuration File”.

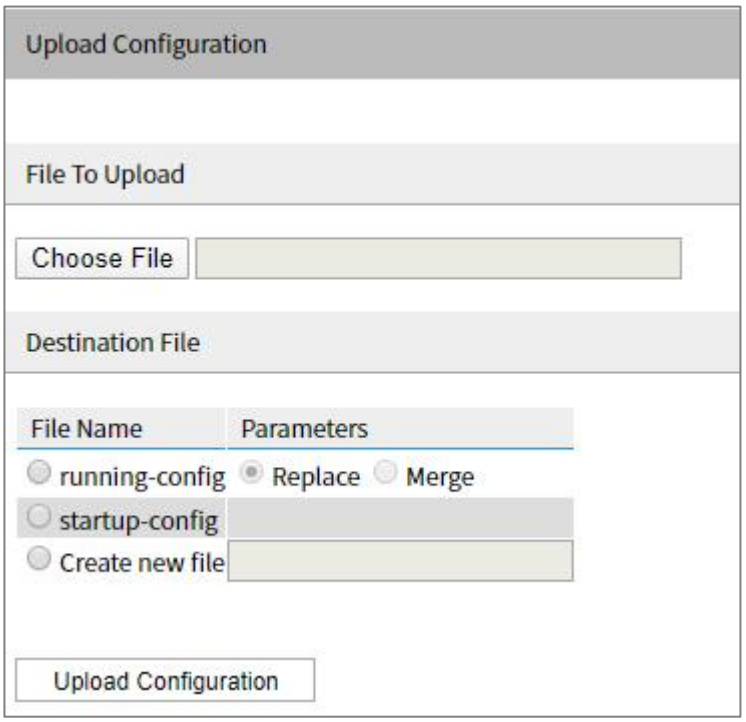
running-config download may take some time to complete, because files must be prepared for download.



10.3 Upload

It is possible to upload a file from the WEB browser to all the files on the switch, except default-config which is read-only.

Select the file to upload, select the target file on the target file, and then click “Upload Configuration”.



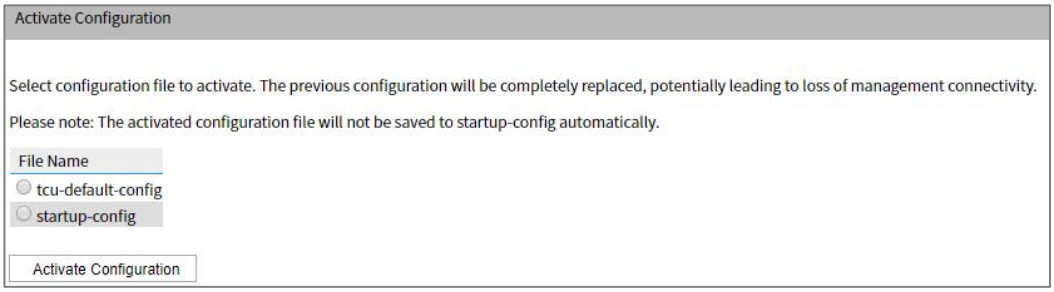
If the target is running-config, the file will be applied to the switch configuration. This can be achieved in two ways:

- Replace mode: the current configuration is completely replaced with the configuration in the uploaded file.
- Merge mode: the uploaded files are merged into running-config.

If the Flash file system is full (that is, it contains the default configuration and 32 other files, usually including startup-config), it is impossible to create a new file. Instead an existing file must be overwritten or another file must be deleted.

10.4 Activate

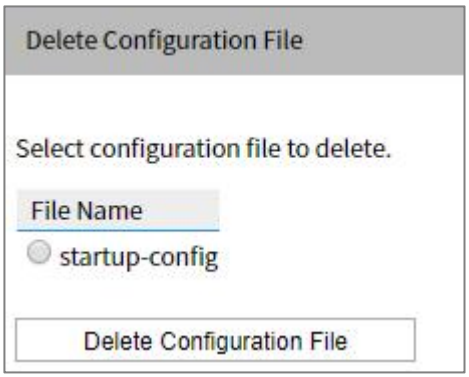
You can activate any configuration file on the switch, except that running-config represents the currently active configuration.



Select the file to activate and click “Activate Configuration”. This will initiate the process of completely replacing the existing configuration with that of the selected file.

10.5 Delete

It is possible to delete any of the writable files stored in Flash, including startup-config. If this is done and the switch is rebooted without a prior Save operation, this effectively resets the switch to default configuration.



11 FAQ

11.1 Sign in Problems

1. **Why the webpage display 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 "admin".

3. **Is configuring via WEB browser same to configuring via BlueEyes_Ⅱ software?**
   Both configurations are the same, without conflict.

11.2 Configuration Problem

1. **How to configure the device restore default setting via DIP switch?**
   Turn the DIP switch 2 to ON position, and restore default setting after power on again.

2. **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.

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.

11.3 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, monitoring host computer buzzer will continue to emit alarm sounds.

11.4 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.