ALL-SG8316M

Smart managed 16 Port Gigabit Switch

User Manual

Default-IP

192.168.1.1

Username & Password:

admin

SAVE CONFIGURATION – PLEASE NOTE!

You need to save you configuration into flash memory.

Otherwise your configuration will be lost after the next reboot.

How to save your configuration:
SAVE -> SAVE CONFIGURATION TO FLASH and confirm with **APPLY**.

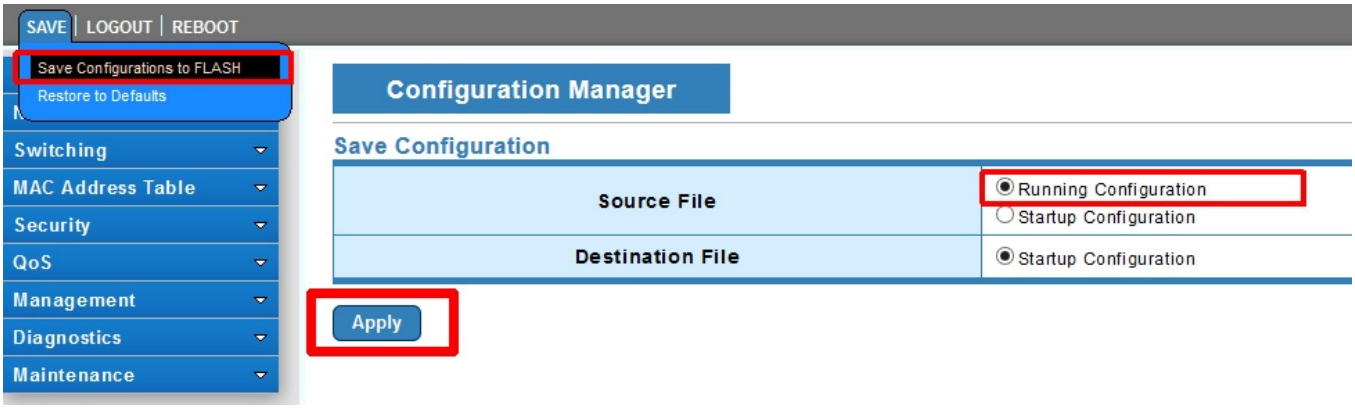


Table of Contents

Chapter 1 Introduction to the Web Smart Switch

1.1 General Description

High Performance

The device is a powerful, high-performance Gigabit Ethernet switch with 16 10/100/1000 Mbps ports, providing you a cost-effective, space-saving solution for expanding your network. The gigabit ports can lead you to a real gigabit connection, making you be able to transfer high bandwidth-needed files higher and faster in an easy way.

This device provides the easy management function through the Ethernet Web. The network administrator can configure the status and the port function setting of the device through the Web-Based UI. When installing the auto-discovery management tool helps network managers to search and access those switches on LAN easily. Therefore, network managers can access switches that support auto-discovery on LAN without memorizing IP address.

Smart Features

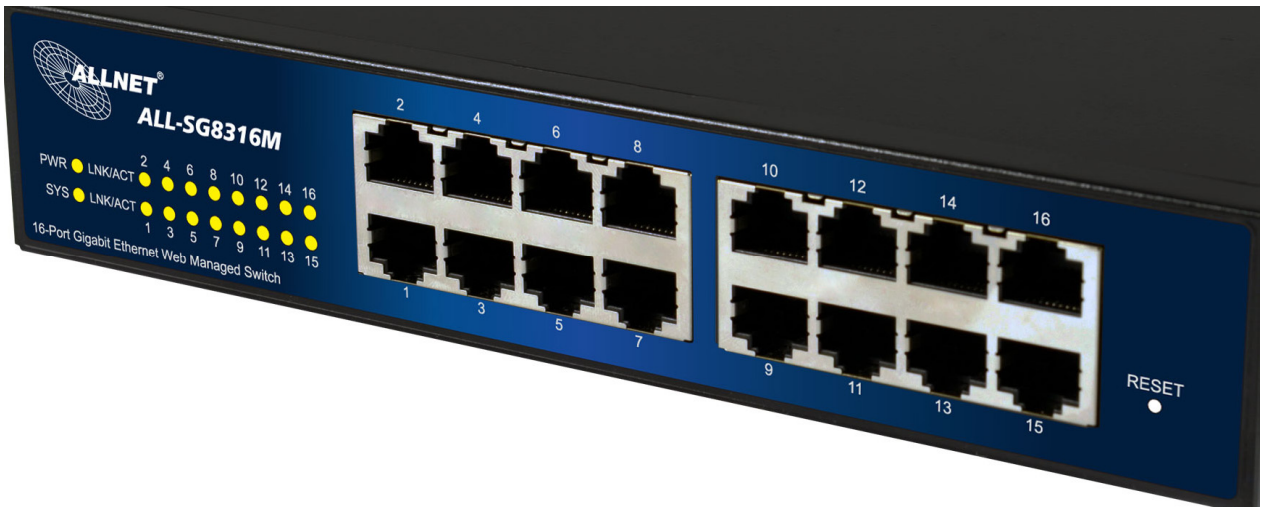
The device provides rich features including Link Aggregation, VLANs, IGMP Snooping, Port Trunking, Spanning Tree, Security and other network management to meet the requirements evolving medium and small-sized enterprises. QoS secures the bandwidth for some bandwidth-demanded applications including VoIP or video conference. Additionally, IEEE 802.3az Energy Efficient Ethernet ability is supported to promise operation in Low Power Idle Mode and save power consumption.

Easy Installation and Management

This switch is plug & play and hassle-free in installation. Auto-MDI/MDI-X crossover on all ports eliminates the need for crossover cables for connection to another switch or hub. Auto-Negotiation on each port senses the link speed of a network device and intelligently adjusts for compatibility and optimal performance. This switch also features diagnostic LEDs, which display the status and activities of the network.

1.2 The Front Panel

The following figure shows the front panel of the switch.



The following table describes the port labels on the front panel.

LABEL	DESCRIPTON
16 10/100/1000 RJ-45 Ethernet Ports	Connect these ports to a computer, a hub, an Ethernet switch or router

1.3 LEDs Definition

This device provides extensive leds to show the activities on power, system and ports.
See the following description for your reference:

LED	Status	Operation
PWR	Steady Green	The switch is powered on.
	Off	The switch is powered off.
SYS	Steady Green	The switch is on and functioning properly.
	Blinking Green	The switch is rebooting and performing self-diagnostic tests.
	Off	The power is off or the system is not ready/malfunctioning.
Link/ACT	Steady Green	The link to a 1000 Mbps Ethernet network is up.
	Blinking Green	The system is transmitting/receiving to/from a 1000 Mbps Ethernet network.
	Off	Port disconnected.

The RESET Button

Reset the switch to its factory default configuration via the RESET button. **Press the RESET button for 10 seconds and release.** The switch automatically reboots and reloads its factory configuration file. The RESET button is on the front panel of the switch.

1.4 The Rear Panel

The following figure shows the rear panel of the switch:

Power Receptacle

To be compatible with the electric service standards around the world, the switch is designed to afford the power supply in the range from 100 to 240 VAC, 50/60 Hz. Please make sure that your outlet standard to be within this range.

To power on the switch, please plug the female end of the power cord firmly into the receptacle of the switch, the other end into an electric service outlet, and use the **POWER ON/OFF** switch to have the Switch power on or off. After the switch powered on, please check if the power LED is lit for a normal power status.

1.5 Installation

This switch can be placed on your desktop directly, or mounted in a rack. Please refer to the instructions for installation.

Before installing the switch, we recommend:

1. The switch is placed with appropriate ventilation environment. A minimum 25 mm space around the unit is recommended.
2. The switch and the relevant components are away from sources of electrical noise such as radios, transmitters and broadband amplifiers
3. The switch is away from environments beyond recommend moisture

Desktop Installation

1. Install the switch on a level surface that can support the weight of the unit and the relevant components.
2. Plug the switch with the female end of the provided power cord and plug the male end to the power outlet.

Rack-mount Installation

The switch may be standalone, or mounted in a rack. Rack mounting facilitate to an orderly installation when you are going to install series of networking devices.

Procedures to Rack-mount the switch:

1. Disconnect all the cables from the switch before continuing.
2. Place the unit the right way up on a hard, flat surface with the front facing you.
3. Locate a mounting bracket over the mounting holes on one side of the unit.
4. Insert the screws and fully tighten with a suitable screwdriver.
5. Repeat the two previous steps for the other side of the unit.
6. Insert the unit into the rack and secure with suitable screws.
7. Reconnect all the cables.

Installing Network Cables

1. Crossover or straight-through cable: All the ports on the switch support Auto-MDI/MDI-X functionality. Both straight-through or crossover cables can be used as the media to connect the switch with PCs as well as other devices like switches, hubs or router.

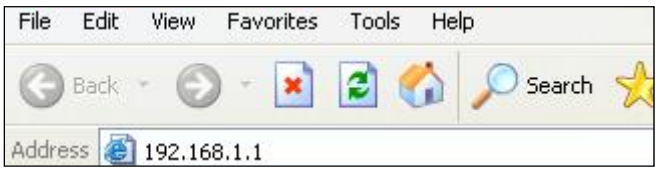
2. Category 3, 4, 5 or 5e, 6 UTP/STP cable: To make a valid connection and obtain the optimal performance, an appropriate cable that corresponds to different transmitting/receiving speed is required. To choose a suitable cable, please refer to the following table.

Media	Speed	Wiring
10/100/1000 Mbps copper	10 Mbps	Category 3,4,5 UTP/STP
	100 Mbps	Category 5 UTP/STP
	1000 Mbps	Category 5e, 6 UTP/STP

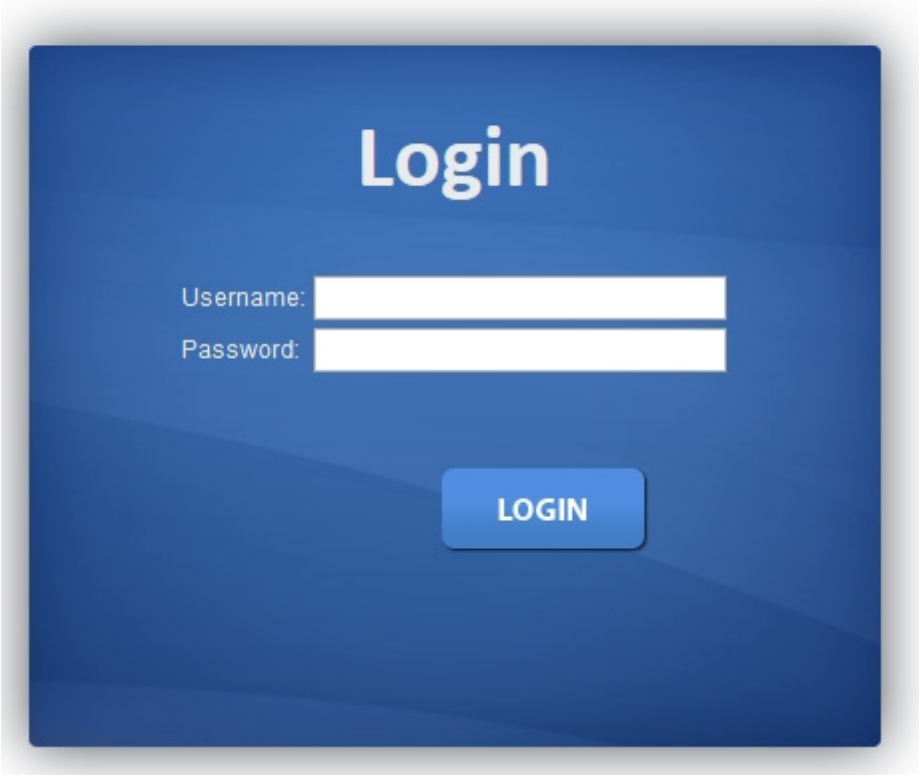
Chapter 2 Basic Web Management Information

2.1 System login

1. Start your web browser.
2. Type "http:///"and the IP address of the switch (for example, the default management IP address is 192.168.1.1) in the Location or Address field. Press **[ENTER]**.

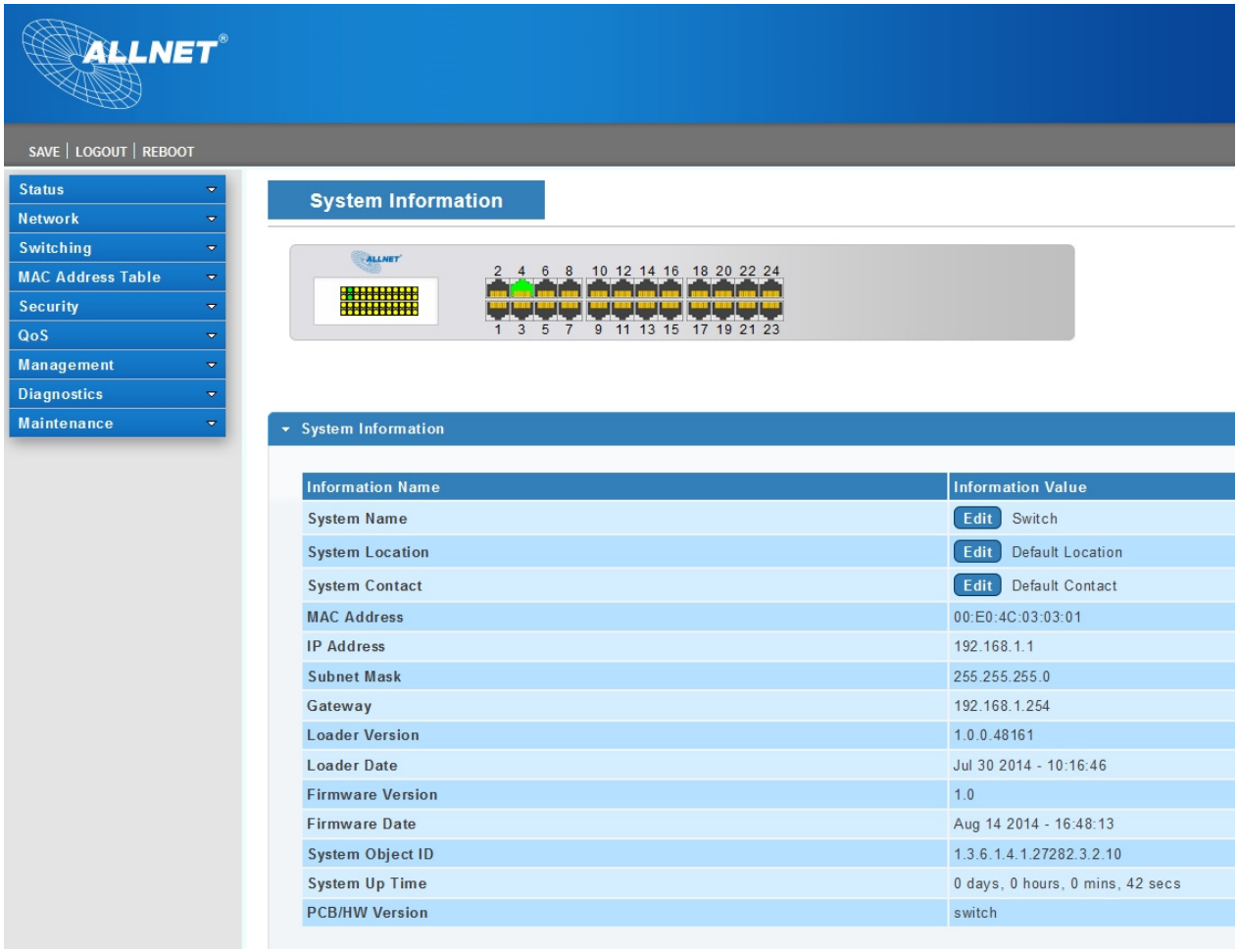


3. The login screen appears. The default username and password are "**admin**", so you can click **OK** and go to the web configuration screen directly.



2.2 The Graphic User Interface

After the password authorization, the information page shows up. You may click on each folder on the left column of each page to get access to each configuration page. The Graphic User Interface is as follows:

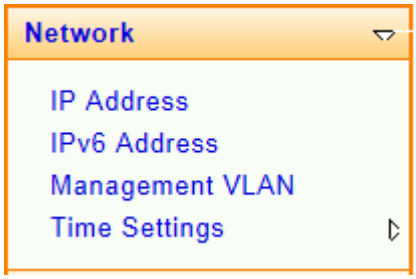
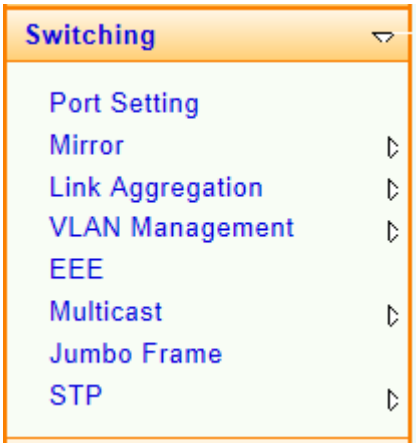
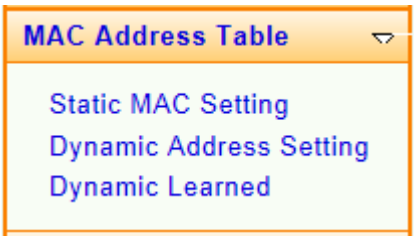
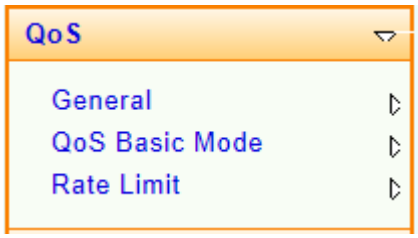
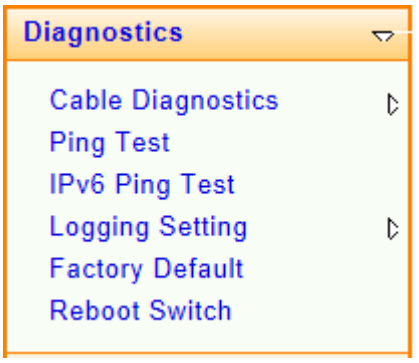
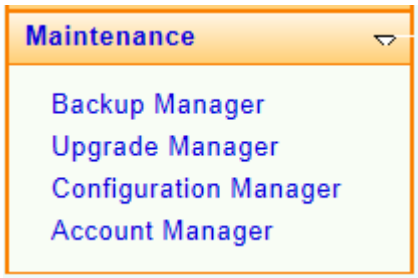


A –Click the menu items to open submenu links, and then click on a submenu link to open the screen in the main window.

B –It shows the switch's current link status. Green squares indicate the port link is up, while black squares indicate the port link is down.

C –Displays system information such as MAC address and firmware version.

In the navigation panel, click a main link to reveal a list of submenu links shown as the following:

Status	Network	Switching
		
MAC Address Table	**Security**	**QoS**
		
Management	**Diagnostics**	**Maintenance**
		

The following table describes the links in the navigation panel.

LINKS	DESCRIPTION
Status	
System Information	This link takes you to a screen that displays general system information.
Logging Message	This sub-menu takes you to screens where you can view and setup system logs.
Port	This link takes you to a screen where you can configure the port information.
Link Aggregation	This link takes you to a screen where you review the LAG

	Status and the LACP Information.
LLDP Statistics	This link takes you to view the summary and per-port information for LLDP frames transmitted and received on the switch.
IGMP Snooping Statistics	This link takes you to see the statistics information of IGMP.
Network	
IP Address	This link takes you to a screen where you can configure the IP information.
IPv6 Address	This link takes you to a screen where you can configure the IPv6 information.
Management VLAN	This link takes you to view the entry of a VLAN from which a management station will be allowed to manage the device using TCP/IP (in-band via web manager or Telnet).
Time Settings	This link takes you to a screen where you can configure the switch's time settings.
Switching	
Port Setting	This link takes you to a screen where you can configure settings for individual switch ports.
Mirror	This sub-menu takes you to screens where you can copy traffic from one port or ports to another port in order that you can examine the traffic from the first port without interference.
Link Aggregation	This link takes you to a screen where you can configure the trunk settings on a port.
VLAN Management	This link takes you to a screen where you can configure the VLAN (IEEE 802.1Q) settings on a port.
EEE	This link takes you to enable or disable port EEE(Energy Efficient Ethernet) function.
Multicast	This link takes you to set multicast filtering and unknown multicast action.
Jumbo Frame	This link takes you to a screen where you can configure the Jumbo Frame size.
STP	This sub-menu takes you to screens where you can configure the STP to prevent network loops.
MAC Address Table	
Static MAC Setting	This link takes you to display and configure the Static MAC settings.
Dynamic Address Setting	This link takes you to configure the Dynamic Address settings.
Dynamic Learned	This link takes you to a screen where you can to view the Dynamic Address settings information.
Security	
Storm Control	This link takes you to a screen where you can limit the number of broadcast, multicast and unknown unicast and multicast packets the Switch receives per second on the ports.

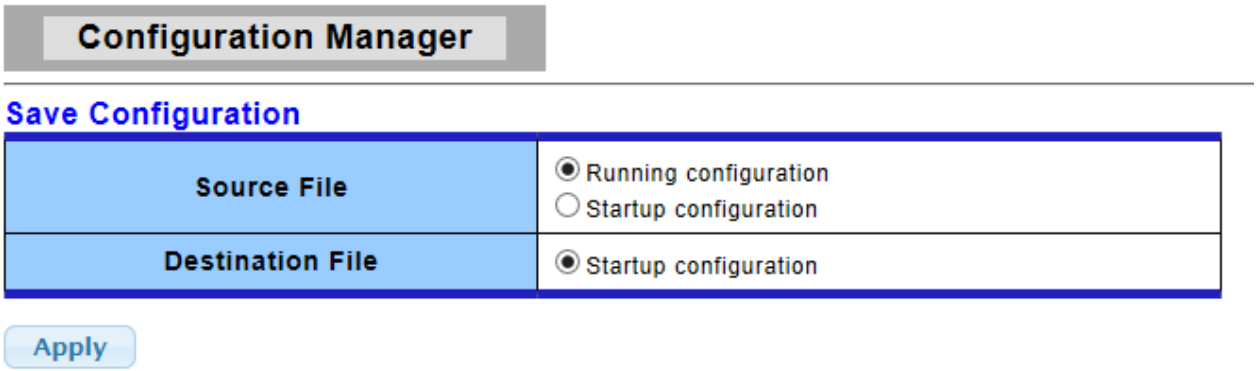
Protected Ports	This link takes you to a screen to setting and revising the protected ports.
DoS	This link takes you to configure DoS setting to enable/disable DoS function and all others related in the sub-menu.
Access	This link takes you a way to access the switch.
QoS	
General	This link takes you to a screen where you can configure QoS through the sub-menu, including QoS Priorities, Port Settings, Queue Settings, CoS Mapping, DSCP Mapping, and IP Precedence Mapping.
QoS Basic Mode	This link takes you to a screen where you can configure the QoS Basic Mode through the sub-menu, including the Global Settings and the Port Settings.
Rate Limit	This link takes you to a screen where you can configure the QoS Rate Limit through the sub-menu, including Ingress Bandwidth Control, Egress Bandwidth Control, and Egress Queue.
Management	
LLDP	This link takes you to a screen where you can set and revise the LLDP.
SNMP	This link takes you to a screen where you can set and revise the SNMP.
Diagnostics	
Cable Diagnostics	This link takes you to a screen where you can do Copper test on each port.
Ping Test	This link takes you to a screen where you can do Ping test.
Ping6 Test	This link takes you to a screen where you can do Ping6 test.
Logging Setting	This link takes you to a screen where you can configure log settings.
Factory Default	This link takes you back to the factory default configuration.
Reboot Switch	This link takes you to a screen where you can reboot the switch.
Maintenance	
Backup Manager	This link takes you to a screen where you can backup the settings you have made.
Upgrade Manager	This link takes you to a screen where you can upgrade the switch settings.
Configuration Manager	This link takes you to a screen where you can save all the configurations you have made to the switch.
Account Manager	This link takes you to a screen where you can change the web configuration login account.

2.3 SAVE LOGOUT REBOOT

2.3.1 SAVE

2.3.1.1 Saving running configurations

Click **SAVE**-> **Save Configuration to FLASH** to view the screen as shown next. This page allow user to copy running configuration, startup configuration or backup configuration to startup configuration or backup configuration.



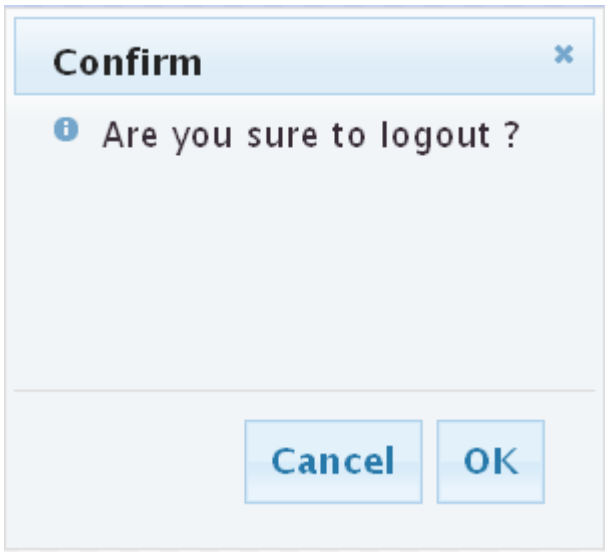
Configuration Manager Page

Configuration Manager Fields

LABEL	DESCRIPTION
Source File	Select upgrade method ■ Running configuration: Running configuration file ■ Startup configuration: Startup configuration file
Destination File	Select Upgrade Type ■ Startup Configuration: Startup configuration file

2.3.2 LOGOUT

Click **Logout** to exit the web configurator. You have to log in with your password again after you log out, if there is any. This is recommended after you finish a management session for security reasons.



2.3.3 REBOOT

Reboot allows you to restart the switch without physically turning the power off.
Follow the steps below to reboot the switch.
1. Click **REBOOT** to view the screen as shown next.

2. Click **Reboot** button, then the following interface pops up.

3. When it finished, the switch has been restarted.

Chapter 3 Web Management Configuration

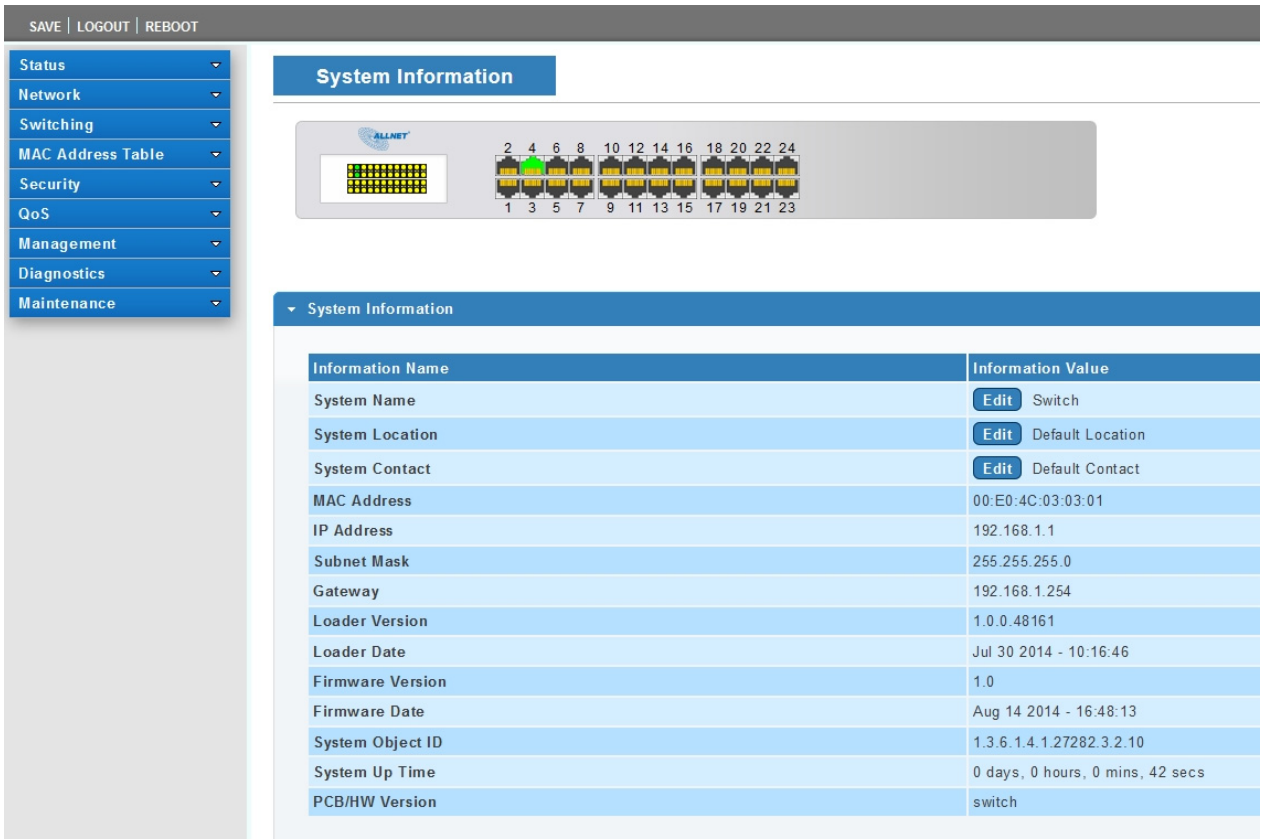
3.1 Status

Use the Status pages to view system information and status.

3.1.1 System Information

In the navigation panel, click **Status** > **System Information** to display the screen as shown below.

This page allow user to configure and browse some system information such as MAC address, IP address, loader version and firmware version and so on.

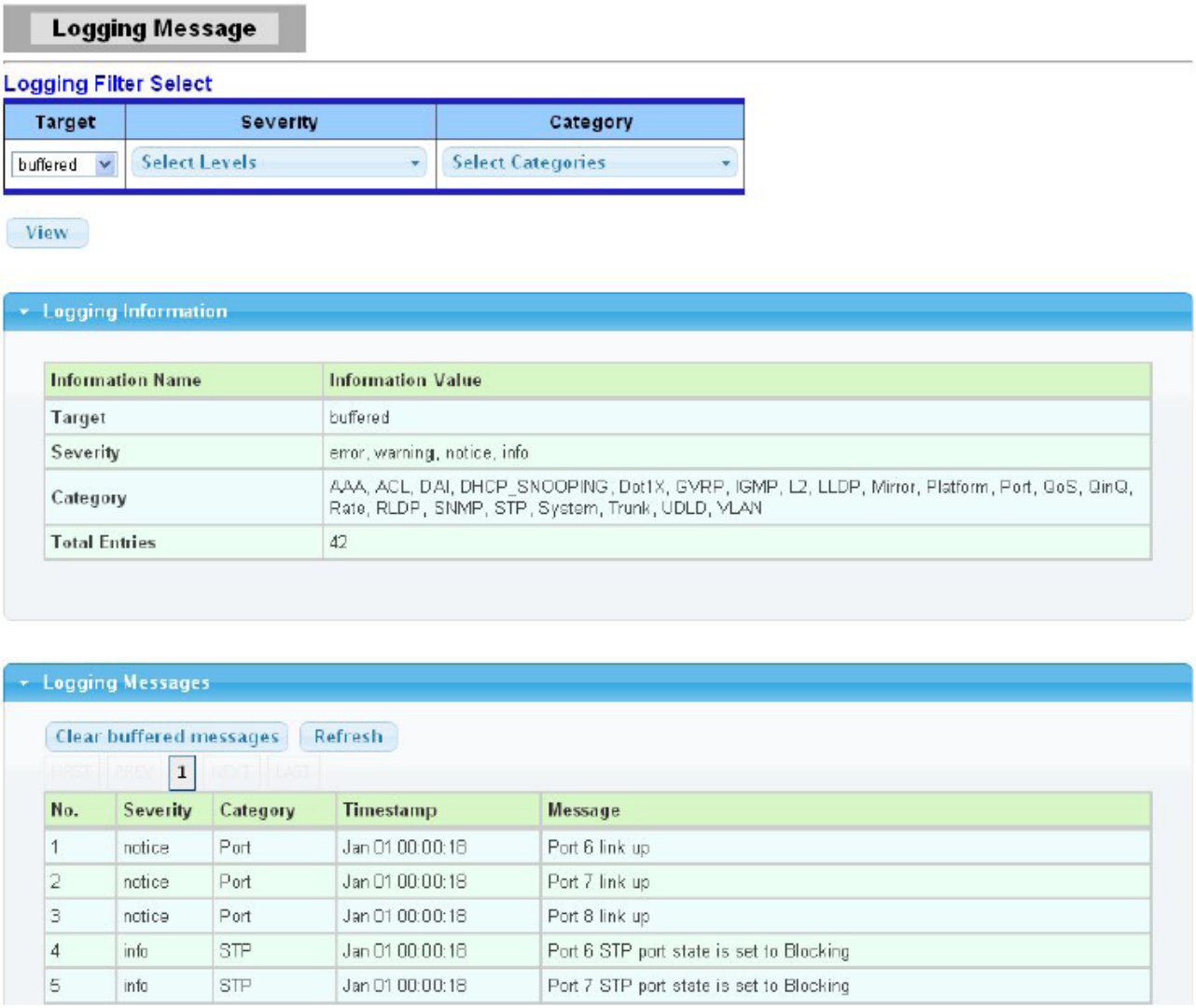


With “Edit”button in the table，user could configure the field value.

LABEL	DESCRIPTION
System Name	System name of the switch. This name will also use as CLI prefix of each line. (“Switch>” or “Switch#”)
System Location	System location of the switch.
System Contact	System contact of the switch.

3.1.2 Logging Message

Use this screen to display the switch logs. Click **Status** > **Logging Message** in the navigation panel to display the screen as shown below.



The following table describes the labels in this screen.

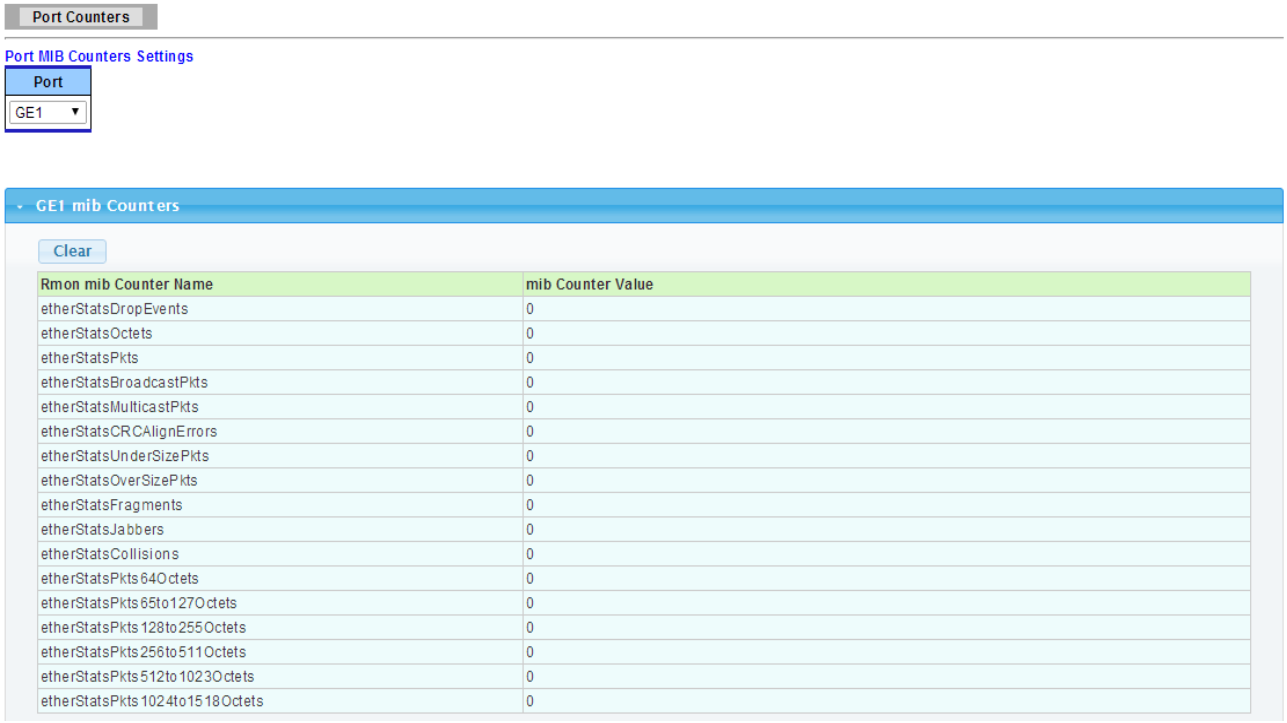
LABEL	DESCRIPTION
Target	Select the log message source to show on the table ■ Buffered: Logs store in the device buffer. ■ FLASH: Logs store in the device flash.
Severity	Select severity to filter log messages.
Category	Select category to filter log messages.

3.1.3 Port

The Port configuration page displays port summary and status information.

3.1.3.1 Port Counters

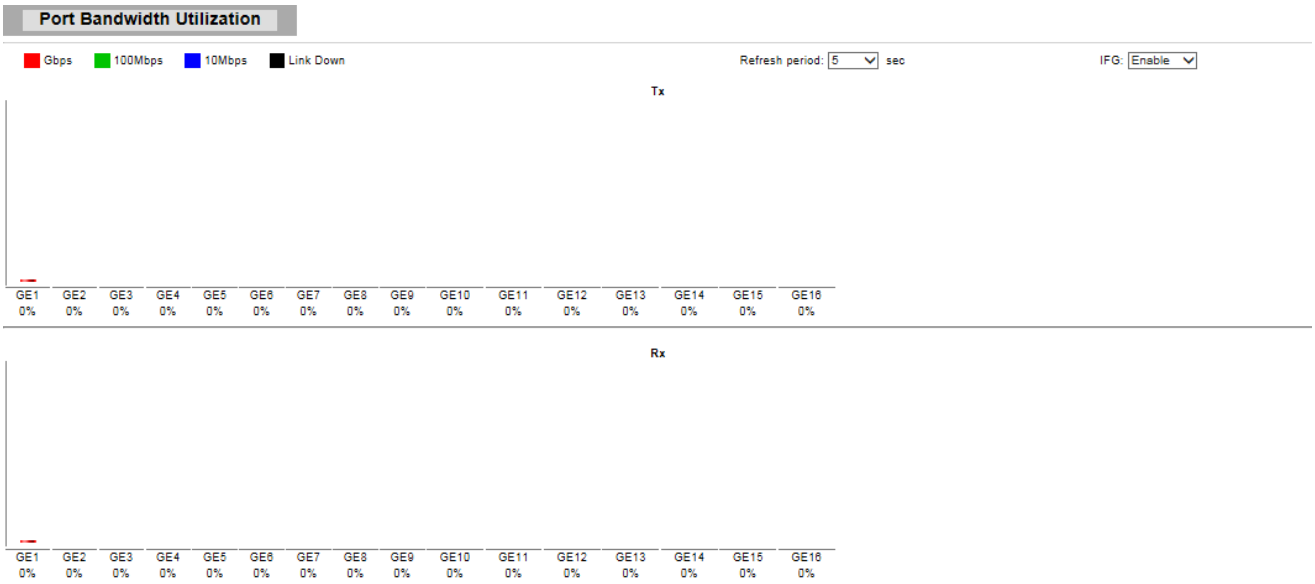
Use this screen to display the Switch port statistics. Click **Status->Port** > **Port Counters** to view the screen as shown next.



The following table describes the labels in this screen.

LABEL	DESCRIPTION
Port	This identifies the Ethernet port.

3.1.3.2 Bandwidth Utilization

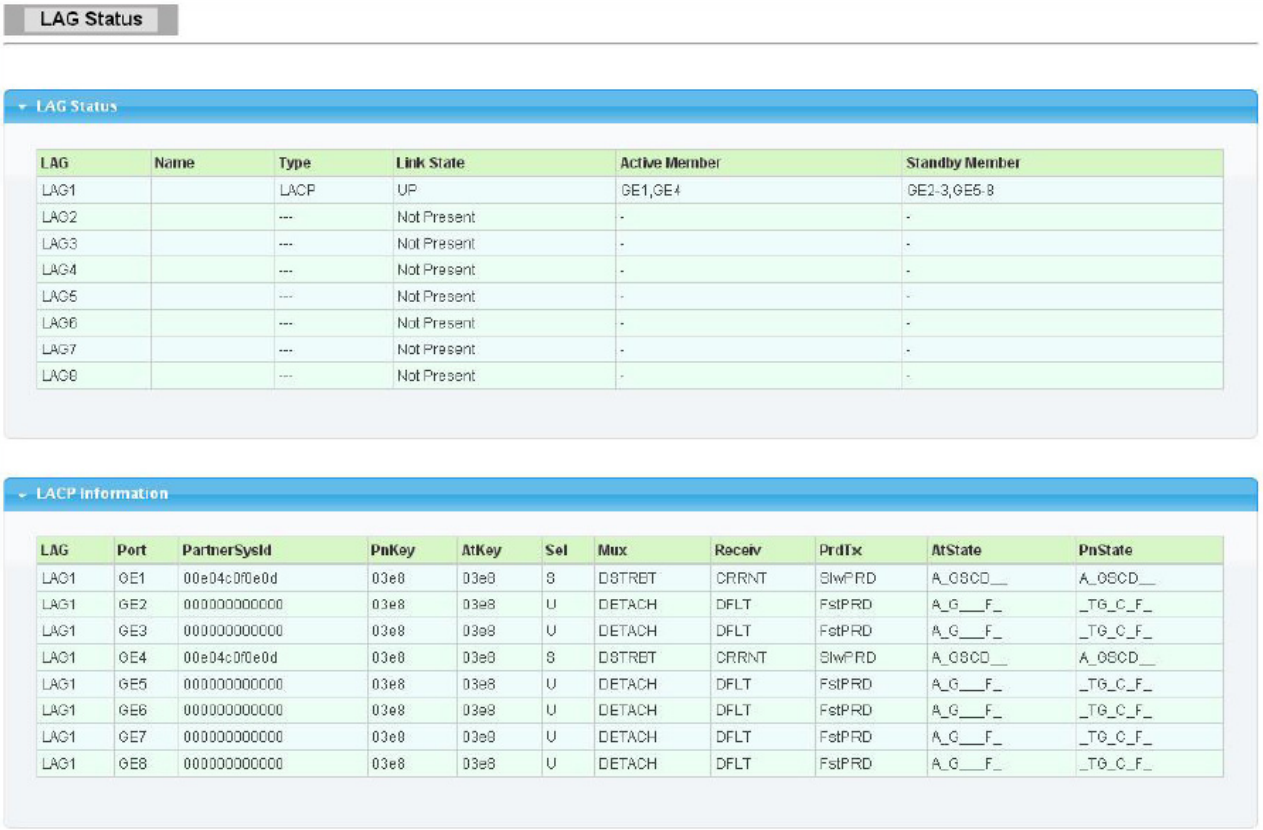


The following table describes the labels in this screen.

LABEL	DESCRIPTION
Refresh Period	Refresh the web page every period of seconds
IFG	Inter frame gap in bandwidth calculation ■ **Enable:** Add inter frame gap to bandwidth calculation ■ **Disable:** Remove inter frame gap to bandwidth calculation

3.1.4 Link Aggregation

Click **Status** > **Link Aggregation** in the navigation panel to view the screen as shown below.



The following table describes the labels in this screen.

LAG Status Field:

LABEL	DESCRIPTION
LAG	LAG Name
Name	LAG port description
Type	The type of the LAG ■ **Static:** The groups of ports assigned to a static LAG are always active members. ■ **LACP:** The groups of ports assigned to dynamic LAG are candidate ports. LACP determines which candidate ports are active member ports.

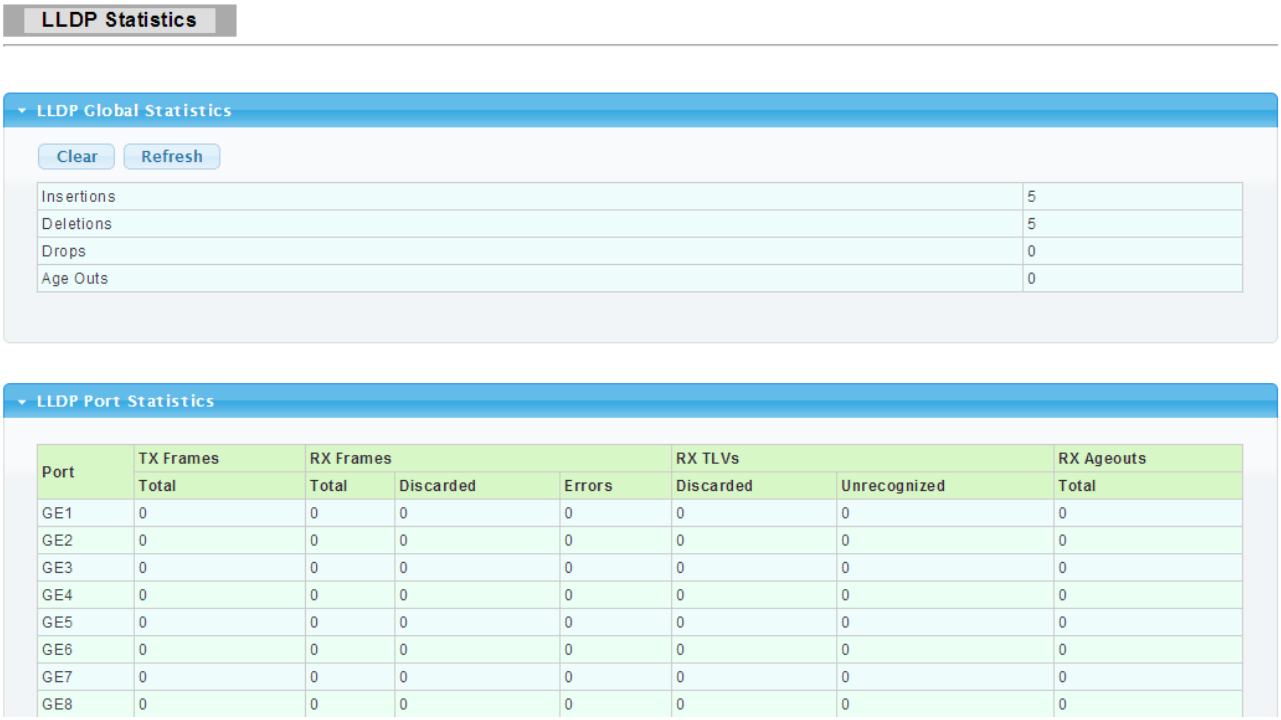
Link State	LAG port link status
Active Member	Active member ports of the LAG
Standby Member	Inactive or candidate member ports of the LAG

LACP Status Field:

LABEL	DESCRIPTION
LAG	LAG Name
Port	Member port name.
PartnerSysId	The system ID of link partner. This field would be updated when the port receives LACP PDU from link partner.
PnKey	Port key of partner. This field would be updated when the port receives LACP PDU from link partner.
AtKey	Port key of actor. The key is designed to be the same as trunk ID.
Sel	LACP selection logic status of the port. “S” means selected, “U” means unselected, and “D” means standby.
Mux	LACP mux state machine status of the port. “DETACH” means the port is in detach state, “WAIT” means waiting state, “ATTACH” means attach state, “CLLCT”
Receiv	LACP receive state machine status of the port. “INIT” means the port is in initialize state, “PORTds” means port disabled state, “EXPR” means expired state, “LACPds” means LACP disabled state, “DFLT” means defaulted state, “CRRNT” means current state.
PrdTx	LACP periodic transmission state machine status of the port. “no PRD” means the port is in no periodic state, “FstPRD” means fast periodic state, “SlwPRD” means slow periodic state, “PrdTX” means periodic TX state.
AtState	The actor state field of LACP PDU description. The field from left to right describes: “LACP_Activity”, “LACP_Timeout”, “Aggregation”, “Synchronization”, “Collecting”, “Distributing”, “Defaulted”, and “Expired”. The contents could be true or false. If the contents are false, the web shows “_”; if the contents are true, the web shows “A”, “T”, “G”, “S”, “C”, “D”, “F” and “E” for each content respectively.
PnState	The partner state field of LACP PDU description. The field from left to right describes: “LACP_Activity”, “LACP_Timeout”, “Aggregation”, “Synchronization”, “Collecting”, “Distributing”, “Defaulted”, and “Expired”. The contents could be true or false. If the contents are false, the web shows “_”; if the contents are true, the web shows “A”, “T”, “G”, “S”, “C”, “D”, “F” and “E” for each content respectively.

3.1.5 LLCP Statistics

Click **Status > LLDP Statistics.** The Link Layer Discovery Protocol (LLDP) Statistics page displays summary and per-port information for LLDP frames transmitted and received on the switch.

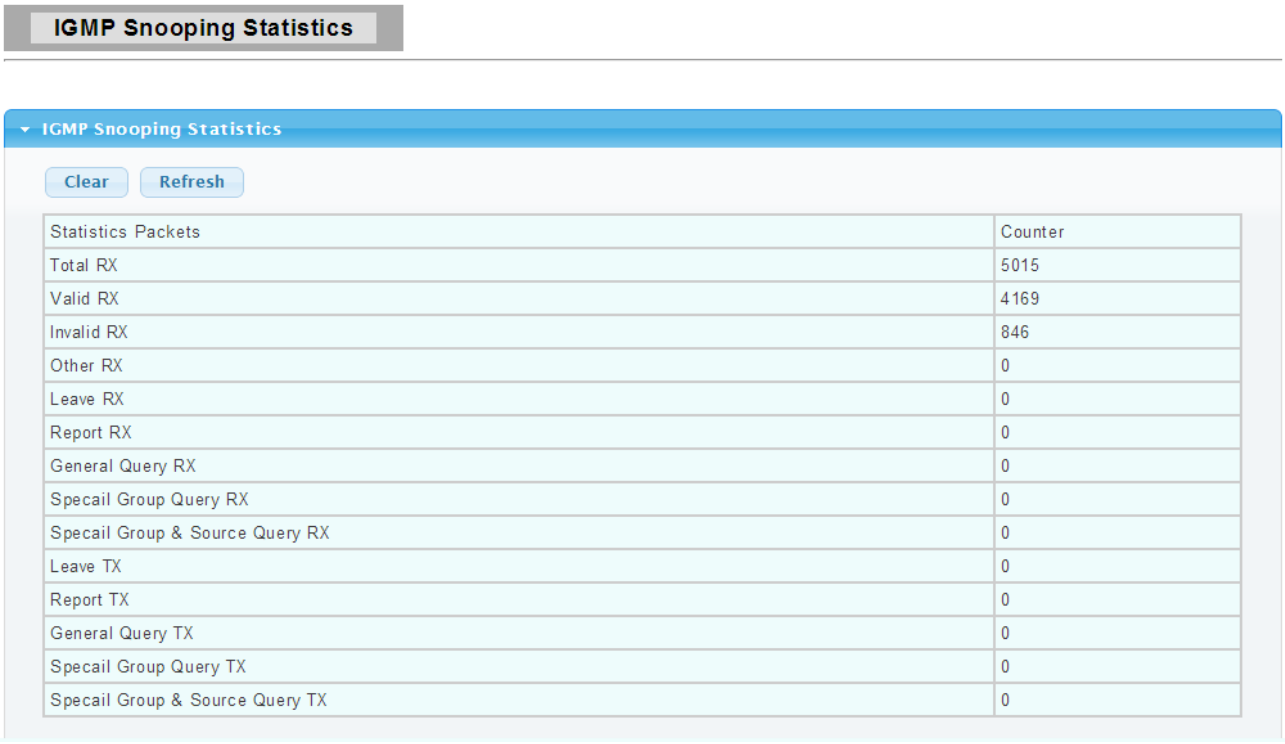


The following table describes the labels in this screen.

LABEL	DESCRIPTION
Insertions	The number of times the complete set of information advertised by a particular MAC Service Access Point (MSAP) has been inserted into tables associated with the remote systems.
Deletions	The number of times the complete set of information advertised by MSAP has been deleted from tables associated with the remote systems.
Drops	The number of times the complete set of information advertised by MSAP could not be entered into tables associated with the remote systems because of insufficient resources.
Age Outs	The number of times the complete set of information advertised by MSAP has been deleted from tables associated with the remote systems because the information timeliness interval has expired.
Port	Interface or port number.
TX Frames Total	Number of LLDP frames transmitted on the corresponding port.
RX Frames Total	Number of LLDP frames received by this LLDP agent on the corresponding port, while the LLDP agent is enabled.
RX Frames Discarded	Number of LLDP frames discarded for any reason by the LLDP agent on the corresponding port.
RX Frames Errors	Number of invalid LLDP frames received by the LLDP agent on the corresponding port, while the LLDP agent is enabled.
RX TLVs Discarded	Number of TLVs of LLDP frames discarded for any reason by the LLDP agent on the corresponding port.
RX TLVs Unrecognized	Number of TLVs of LLDP frames that are unrecognized while the LLDP agent is enabled
RX Ageouts Total	Number of age out LLDP frames.

3.1.6 IGMP Snooping Statistics

Click **Status** > **IGMP Snooping Statistics** in the navigation panel to view the screen as shown below.



The following table describes the labels in this screen.

LABEL	DESCRIPTION
Total RX	This field displays the total amount of RX
Valid RX	This field displays the total amount of valid RX.
Invalid RX	This field displays the total amount of invalid RX.
Other RX	This field displays the total amount of other RX.
Leave RX	This field displays the total amount of leave RX.
Report RX	This field displays the total amount of report RX.
General Query RX	This field displays the total amount of general query RX.
Special Group Query RX	This field displays the total amount of Special Group query RX.
Special Group & Source Query RX	This field displays the total amount of Special Group & Source query RX.
Leave TX	This field displays the total amount of leave TX.
Report TX	This field displays the total amount of report TX.
General Query TX	This field displays the total amount of general query TX.
Special Group Query TX	This field displays the total amount of Special Group query TX.
Special Group & Source Query TX	This field displays the total amount of Special Group & Source query TX.

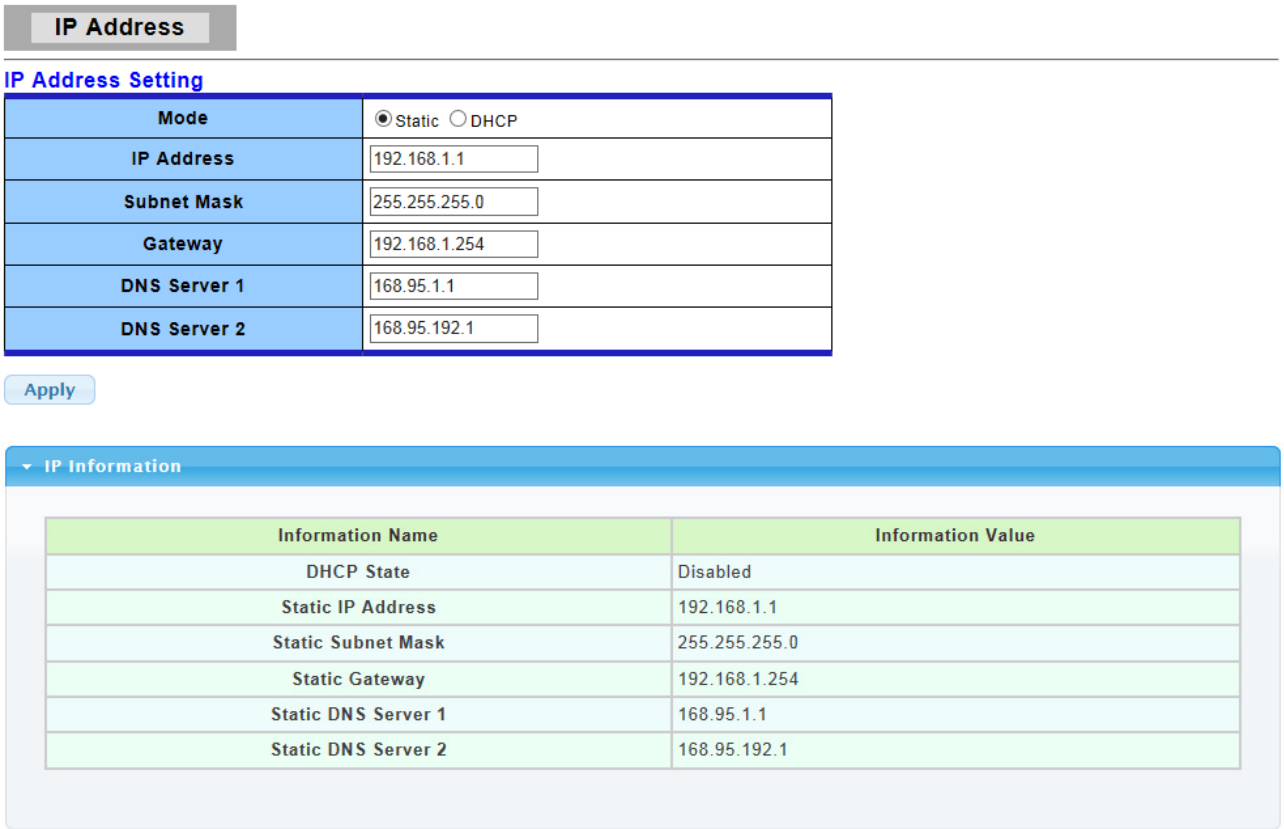
3.2 Network

Use the Network pages to configure settings for the switch network interface and how the switch connects to a remote server to get services.

3.2.1 IP Address

Use the IP Setting screen to configure the switch IP address and the default gateway device. The gateway field specifies the IP address of the gateway (next hop) for outgoing traffic.
The switch needs an IP address for it to be managed over the network. The factory default IP address is 192.168.1.1. The subnet mask specifies the network number portion of an IP address. The factory default subnet mask is 255.255.255.0.

Click Network > IP Address in the navigation panel to display the screen as shown below.



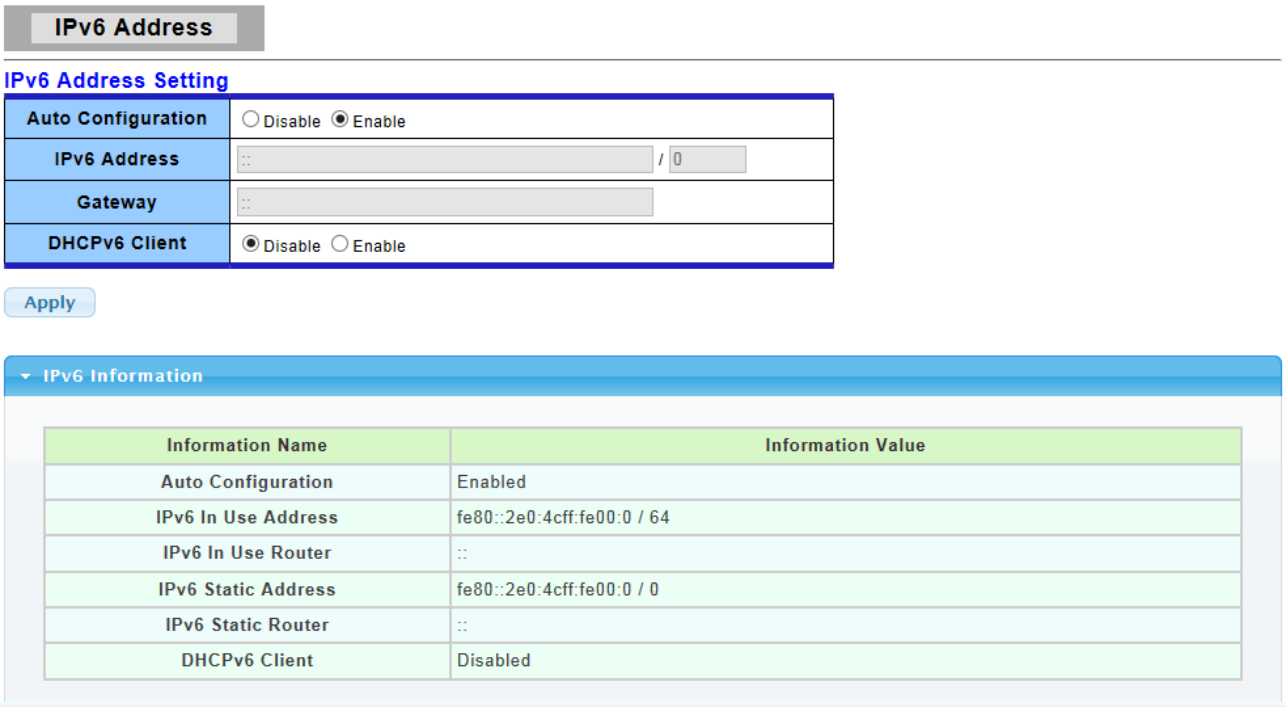
The following table describes the labels in this screen.

LABEL	DESCRIPTION
Mode	Select the mode of network connection ■ **Static**: Enable static IP address. ■ **DHCP**: Enable DHCP to obtain IP information from a DHCP server on the network.
IP Address	Enter the IP address of your switch in dotted decimal notation for

	example 192.168.1.1. If static mode is enabled, enter IP address in this field.
Subnet Mask	Enter the IP subnet mask of your switch in dotted decimal notation for example 255.255.255.0. If static mode is enabled, enter subnet mask in this field.
Gateway	Enter the IP address of the gateway in dotted decimal notation. If static mode is enabled, enter gateway address in this field.
DNS Server 1	If static mode is enabled, enter primary DNS server address in this field.
DNS Server 2	If static mode is enabled, enter secondary DNS server address in this field.
Apply	Click **Apply** to save your changes to the switch.

3.2.2 IPv6 Address

Click Network> IPv6 Address in the navigation panel to display the screen as shown below.



The following table describes the labels in this screen.

IPv6 Information Filed:

LABEL	DESCRIPTION
Auto Configuration	Select **Enable** or **Disable** this function.
IPv6 Address	Enter the IPv6 address of your switch. If auto configuration mode is disabled, enter IPv6 address in this field.
Gateway	Enter the IP address of the gateway in dotted decimal notation. If auto configuration mode is disabled, enter IPv6 gateway address in this field.
DHCPv6	DHCPv6 client state.

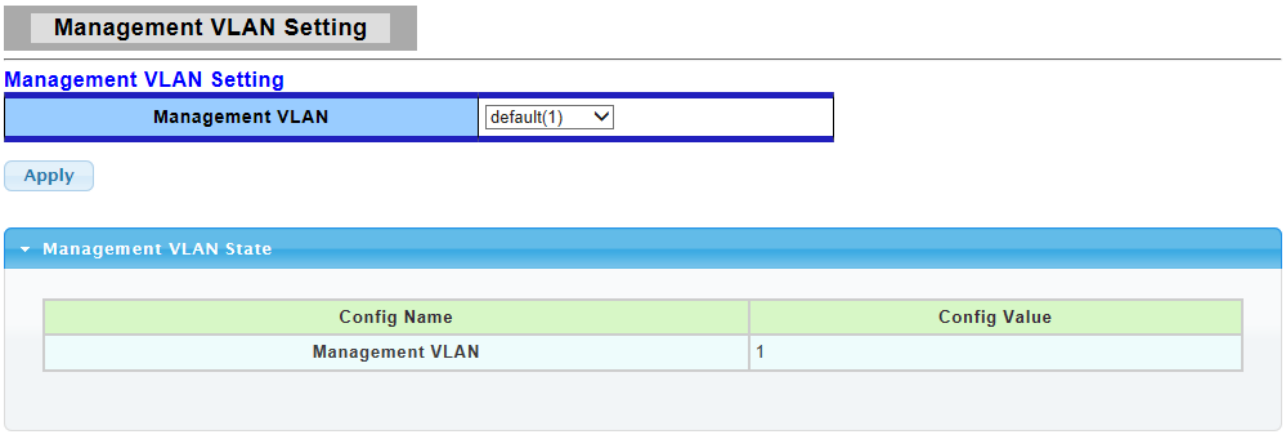
Client	■ **Enable**: Enable DHCPv6 client function. ■ **Disable**: Disable DHCPv6 client function
Apply	Click **Apply** to save your changes to the switch.

IPv6 Address Setting Filed:

LABEL	DESCRIPTION
Auto Configuration	It displays whether the auto configuration function is opened or not.
IPv6 In Use Address	It displays the in use address information of IPv6.
IPv6 In Use Router	It displays the in use router information of IPv6.
IPv6 Static Address	It displays the static address of IPv6.
IPv6 Static router	It displays the static router of IPv6.
DHCPv6 Client	It displays the DHCPv6 Client Status.

3.2.3 Management VLAN

Click **Network**> **Management VLAN** in the navigation panel to display the screen as shown below.

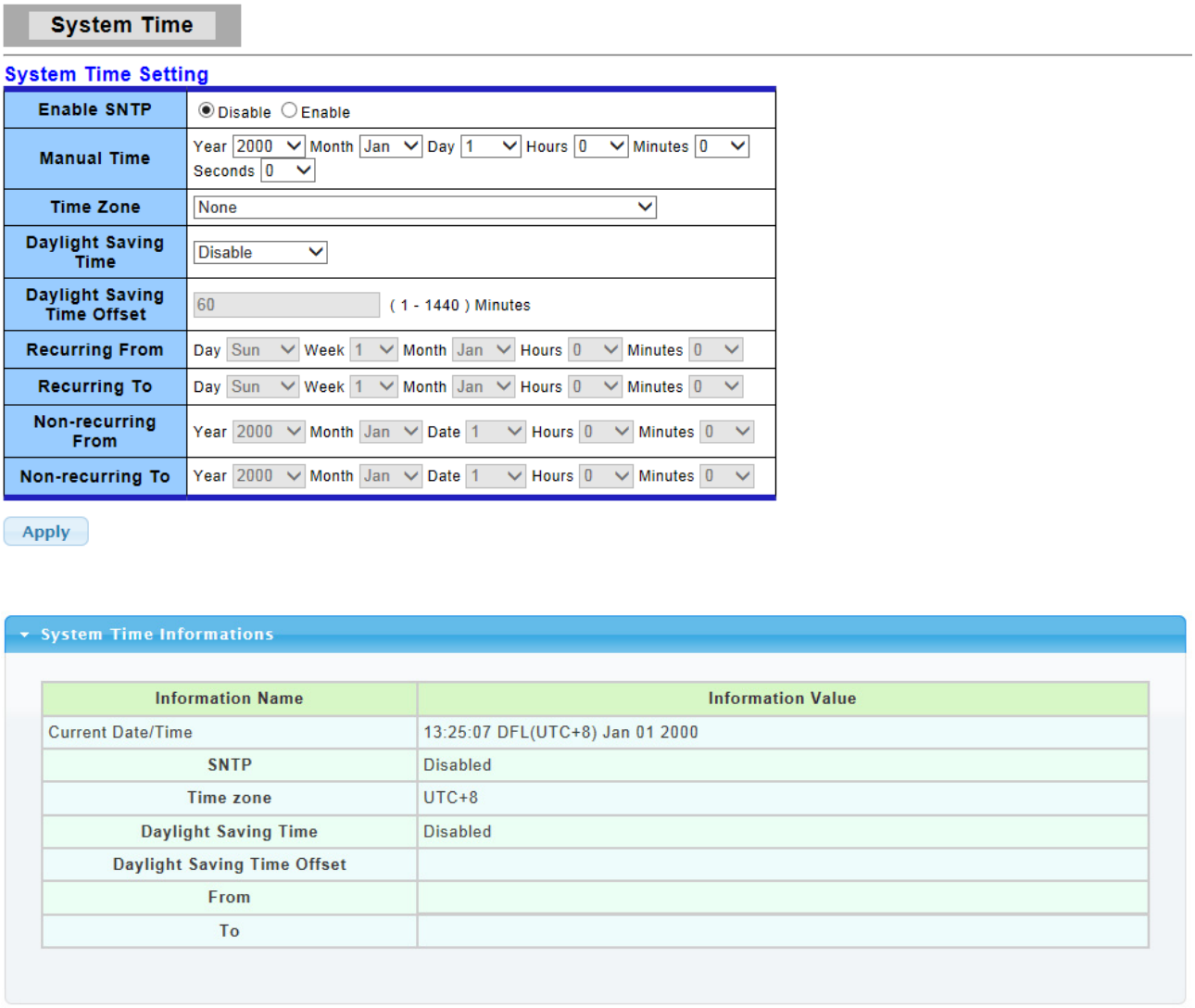


The following table describes the labels in this screen.

LABEL	DESCRIPTION
Management VLAN	This allows the entry of a VLAN from which a management station will be allowed to manage the device using TCP/IP (in-band via web manager or Telnet). Management stations that are on VLANs other than the one selected here will not be able to manage the Switch. The default management VLAN is VLAN 1.

3.2.4 Time Settings

Click **Network**> **Time Settings** in the navigation panel to display the screen as shown below.



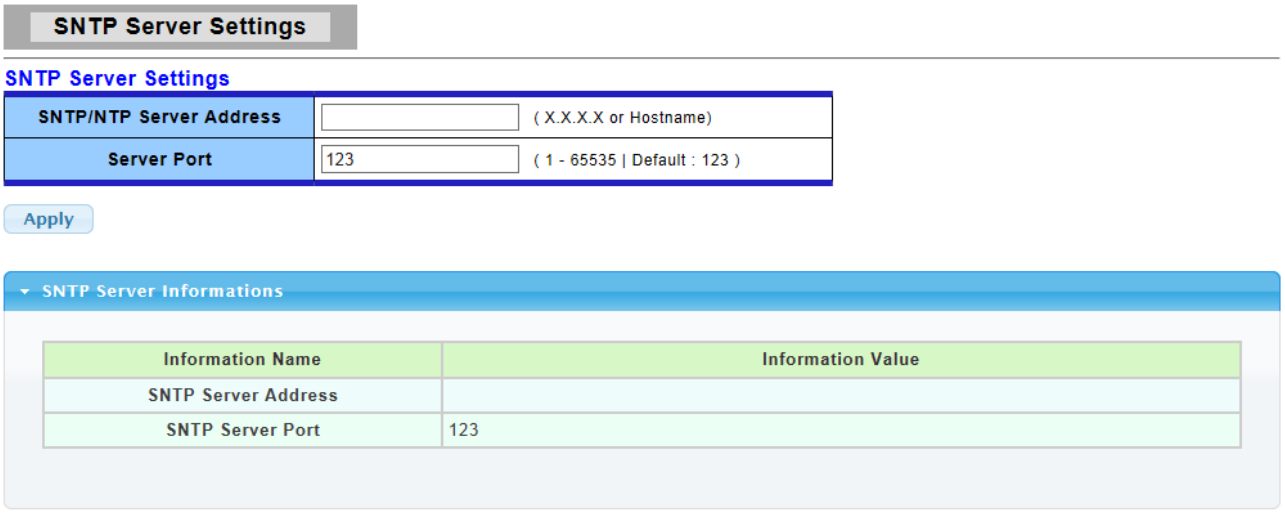
The following table describes the labels in this screen.

LABEL	DESCRIPTION
Enable SNTP	Select the radio button to enable or disable using SNTP server.
Manual Time	Specify static time.
Time Zone	Select a time zone
Daylight Saving Time	Select the mode of daylight saving time. ■ **Disable**: Disable daylight saving time. ■ **Recurring**: Using recurring mode of daylight saving time. ■ **Non-Recurring**: Using non-recurring mode of daylight saving time. ■ **USA**: Using daylight saving time in the United States that starts on the second Sunday of March and ends on the first Sunday of November ■ **European**: Using daylight saving time in the Europe that starts on the last Sunday
Daylight Saving Time	Specify the adjust offset of daylight saving time.

Offset	
Recurring From	Specify the starting time of recurring daylight saving time. This field available when selecting “Recurring” mode.
Recurring To	Specify the ending time of recurring daylight saving time. This field available when selecting “Recurring” mode.
Non-recurring From	Specify the starting time of non-recurring daylight saving time. This field available when selecting “Non-Recurring” mode.
Non recurring To	Specify the ending time of recurring daylight saving time. This field available when selecting “Non-Recurring” mode.
Apply	Click **Apply** to save your changes to the switch.

3.2.5 SNTP Settings

Click **Network**> **Time Settings** in the navigation panel to display the screen as shown below.



The following table describes the labels in this screen.

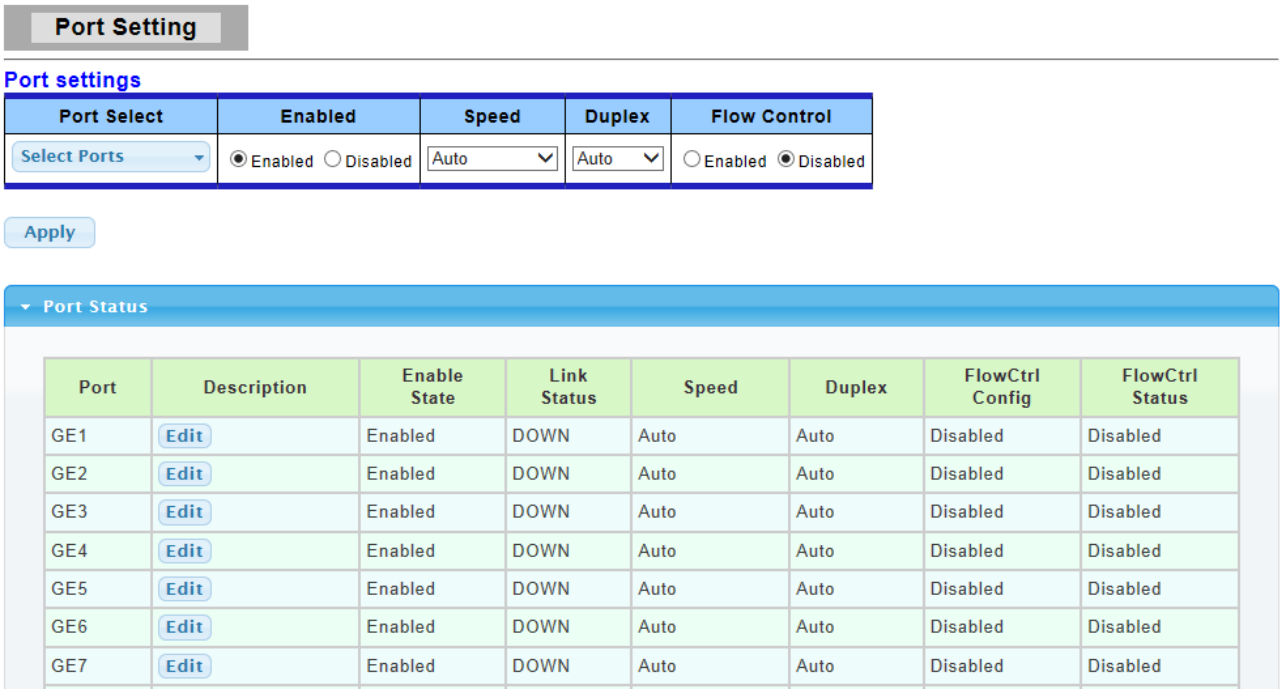
LABEL	DESCRIPTION
SNTP/NTP Server Address	Input IP address or hostname of time server.
Server port	Input time server port number. Default is 123.

3.3 Switching

Use the Switching pages to configure settings for the switch ports, trunk, Layer 2 protocols and other switch features.

3.3.1 Port Setting

This page allow user to configure switch port settings and show port current status.
Click **Switching** > **Port Setting** in the navigation panel to display the screen as shown below.



The following table describes the labels in this screen.

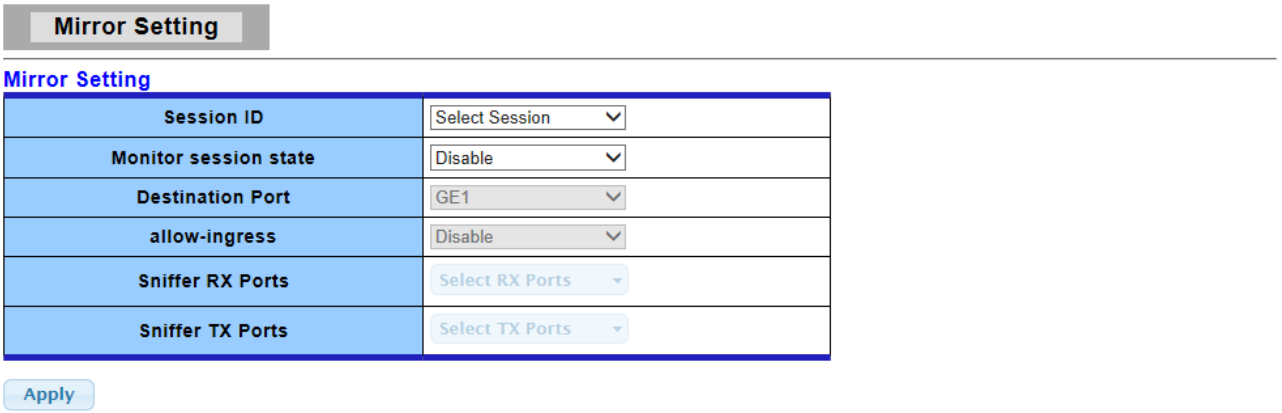
LABEL	DESCRIPTION
Port Select	Select the port(s) from the list box that you will change the port settings for.
Enabled	Select **Enable** from the drop-down box to enable a port. The factory default for all ports is enabled. A port must be enabled for data transmission to occur. Select **Disable** to not use a port.
Speed	Port speed capabilities: · **Auto:** Auto speed with all capabilities. · **Auto-10M:** Auto speed with 10M ability only. · **Auto-100M:** Auto speed with 100M ability only. · **Auto-1000M:** Auto speed with 1000M ability only. · **Auto-10/100M:** Auto speed with 10/100M ability. · **10M:** Force speed with 10M ability. · **100M:** Force speed with 100M ability. · **1000M:** Force speed with 1000M ability. Selecting Auto (auto-negotiation) allows one port to negotiate with a peer port automatically to obtain the connection speed and duplex mode that both ends support. When auto-negotiation is turned on, a port on the switch negotiates with the peer automatically to determine the connection speed and duplex mode. If the peer port does not support auto-negotiation or turns off this feature, the switch determines the connection speed by detecting the signal on the cable and using half duplex mode. When the switch's auto-negotiation is turned off, a port uses the pre-configured speed and duplex mode when making a connection, thus requiring you to make sure that the settings of the peer port are the same in order to connect.
Duplex	Port duplex capabilities: · **Auto:** Auto duplex with all capabilities. · **Half:** Auto speed with 10/100M ability only. · **Full:** Auto speed with 10/100/1000M ability only.

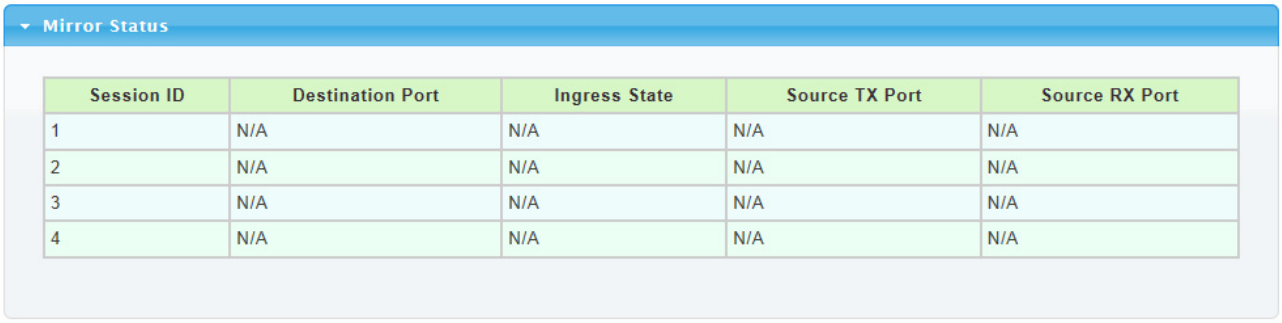
Flow Control	A concentration of traffic on a port decreases port bandwidth and overflows buffer memory causing packet discards and frame losses. Flow Control is used to regulate transmission of signals to match the bandwidth of the receiving port. The switch uses IEEE802.3x flow control in full duplex mode and backpressure flow control in half duplex mode. IEEE802.3x flow control is used in full duplex mode to send a pause signal to the sending port, causing it to temporarily stop sending signals when the receiving port memory buffers fill. Back Pressure flow control is typically used in half duplex mode to send a "collision" signal to the sending port (mimicking a state of packet collision) causing the sending port to temporarily stop sending signals and resend later. Select "**Enabled**" to enable it. Or select "**Disabled**" to disable it.
Apply	Click **Apply** to save your changes to the switch.
Flow Control Config	The Config column displays if Flow Control has been configured to be turned On or Off for the port.
Flow Control Status	The column displays the port's current Flow Control status.

3.3.2 Port Mirroring

The Mirror function copies all the packets that are transmitted by the source port to the destination port. It allows administrators to analyze and monitor the traffic of the monitored ports.

The Mirror Configuration steps are as follows:
Click **Switching > Mirror > Local Mirror Setting** in the navigation panel to display the screen as shown below.





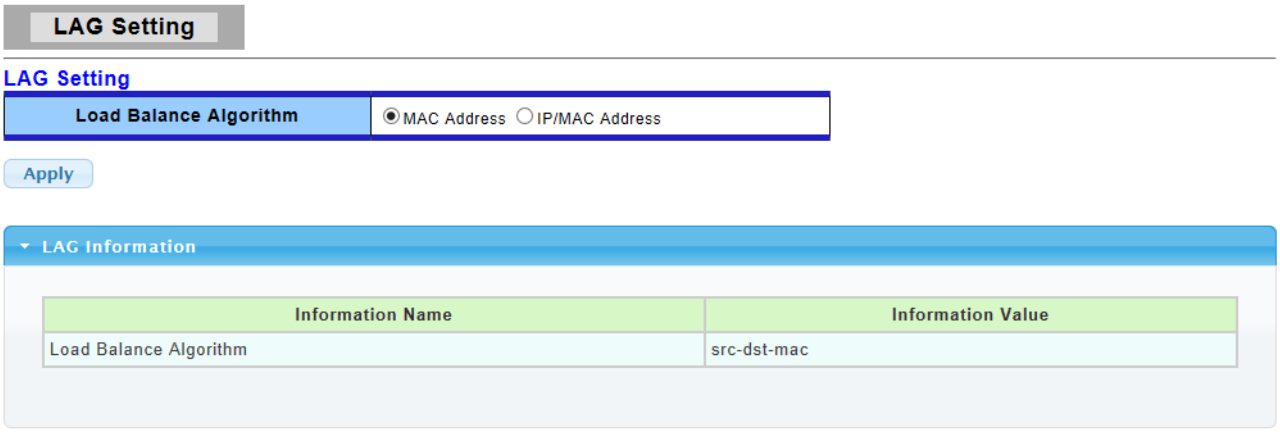
The following table describes the labels in this screen.

LABEL	DESCRIPTION
Session ID	Select mirror session ID
Monitor session state	Select mirror session state : port-base mirror or disable
Destination Port	Select mirror session destination port
Allow-ingress	Select destination port ingress state.
Sniffer Rx ports	Select mirror session source rx ports only select portbased-enabled state, this field is valid only when "**Monitor session state**" is port-base mirror
Sniffer Tx ports	Select mirror session source tx ports only select portbased-enabled state, this field is valid only when "**Monitor session state**" is port-base mirror
Apply	Click **Apply** to save your changes to the switch.

3.3.3 Link Aggregation

3.3.3.1 LAG Setting

Click **Switching**> **Link Aggregation** > **LAG Setting** in the navigation panel to view the screen as shown below.



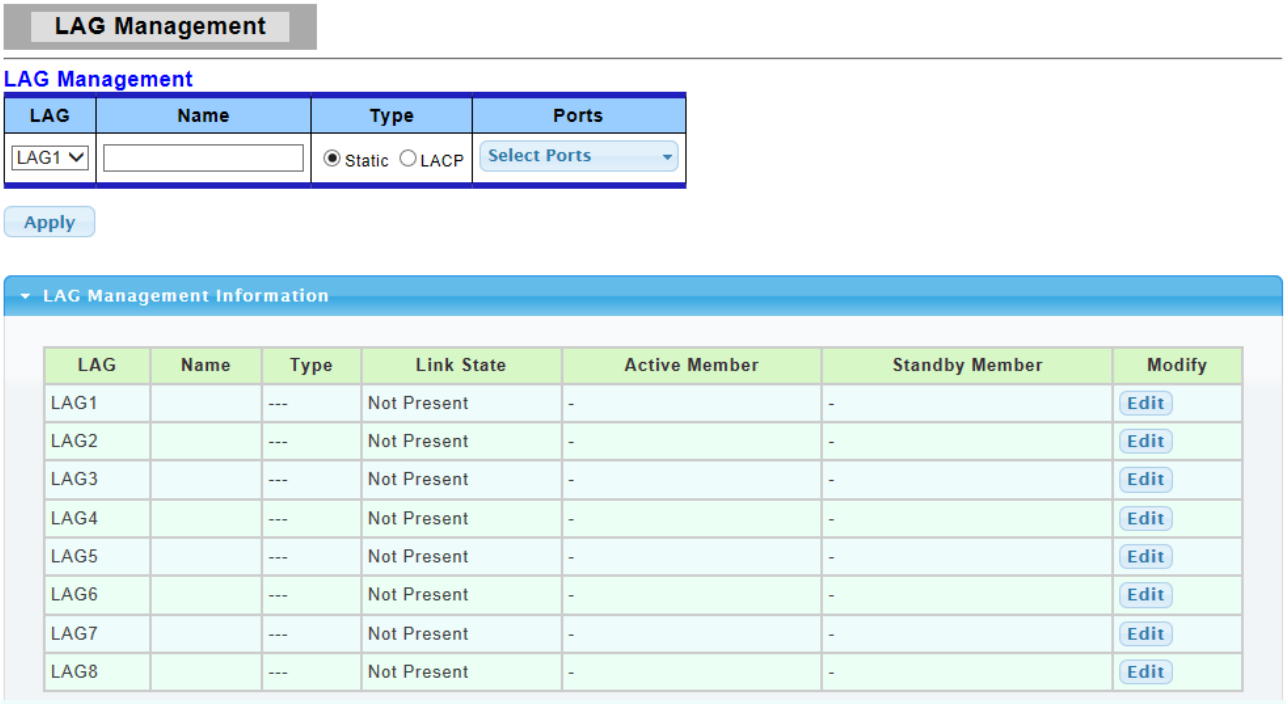
The following table describes the labels in this screen.

LABEL	DESCRIPTION

Load Balance Algorithm	Select the LAG load balance distribution algorithm ■ **MAC Address**: Based on source and destination MAC address for all packets ■ **IP/MAC Address**: Based on source and destination IP addresses for IP packet, and source and destination MAC address for non-IP packets.
Apply	Click **Apply** to save your changes to the switch.

3.3.3.2 LAG Management

Click **Switching**> **Link Aggregation** > **LAG Management** in the navigation panel to view the screen as shown below.



The following table describes the labels in this screen.

LAG Management Setting Field:

LABEL	DESCRIPTION
LAG	Select the LAG to be configured.
Name	LAG port description
Type	Select the type of the LAG ■ **Static**: The group of ports assigned to a static LAG are always active members. ■ **LACP**: The group of ports assigned to dynamic LAG are candidate ports. LACP determines which candidate ports are active member ports.
Ports	Select the trunk member ports in this field. There are the following

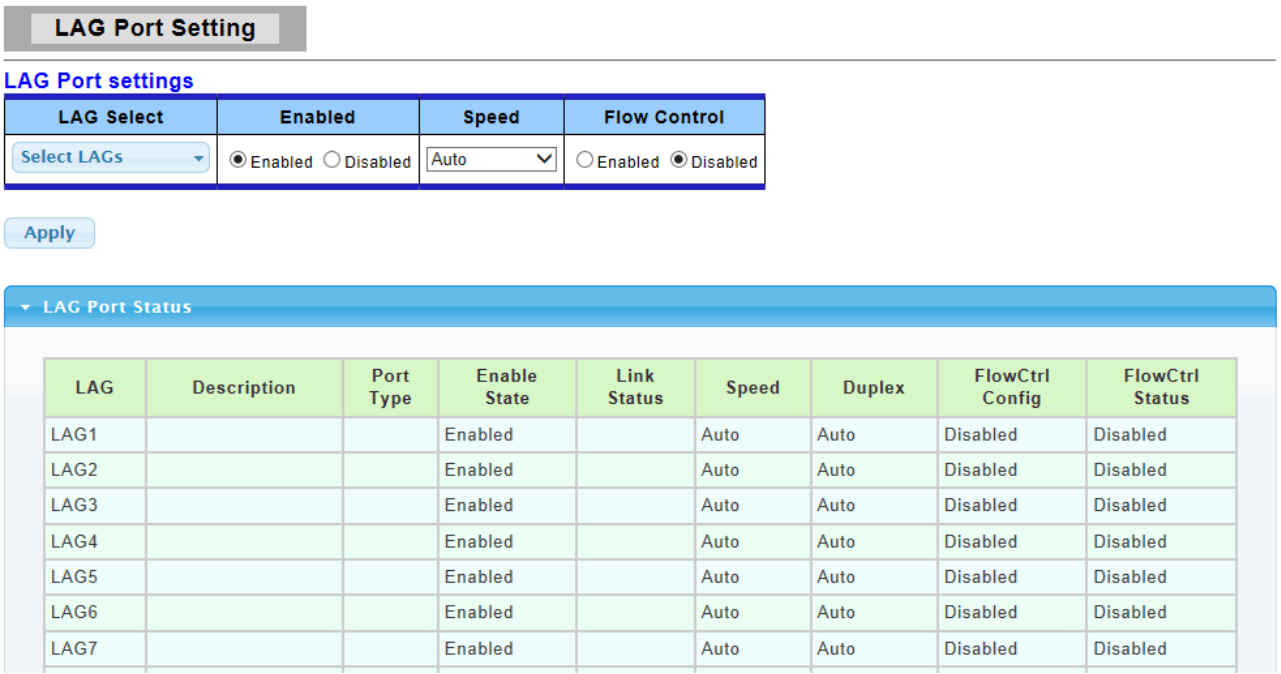
	limitations for choosing the member ports: ■ All ports in a LAG must be of the same media type. ■ To add a port to the LAG, it cannot belong to any VLAN except the default VLAN. ■ Ports in a LAG must not be assigned to another LAG. ■ Ports in a LAG must not be a mirroring port. ■ No more than eight ports are assigned to a LAG. ■ When a port is added to a LAG, the configuration of the LAG is applied to the port. When the port is removed from the LAG, its original configuration is reapplied. ■ There could be at most 8 member ports in a trunk.
Apply	Click **Apply** to save your changes to the switch.

LAG Management Information Field:

LABEL	DESCRIPTION
LAG	LAG Name
Name	LAG port description
Type	Select the type of the LAG ■ **Static**: The group of ports assigned to a static LAG are always active members. ■ **LACP**: The group of ports assigned to dynamic LAG are candidate ports. LACP determines which candidate ports are active member ports.
Link State	LAG port link status
Active Member	Active member ports of the LAG
Standby Member	Inactive or candidate member ports of the LAG
Modify	Click "Edit" button to edit LAG.

3.3.3.3 LAG Port Settings

Click **Switching**> **Link Aggregation** > **LAG Port settings** in the navigation panel to view the screen as shown below.



The following table describes the labels in this screen.

LAG Port Setting Field:

LABEL	DESCRIPTION
LAG	Select the LAG to be configured.
Name	LAG port description
Enabled	Port admin state. ■ Enabled: Enable the port. ■ Disabled: Disable the port.
Speed	Port speed capabilities. ■ **Auto**: Auto speed with all capabilities ■ **Auto-10M**: Auto speed with 10M ability only ■ **Auto-100M**: Auto speed with 100M ability only ■ **Auto-1000M**: Auto speed with 1000M ability only ■ **Auto-10M/100M**: Auto speed with 10M/100M ■ abilities ■ **10M**: Force speed with 10M ability ■ **100M**: Force speed with 100M ability ■ **1000M**: Force speed with 1000M ability
Flow Control	Port flow control. ■ **Enabled**: Enable flow control ability. ■ **Disabled**: Disable flow control ability.
Apply	Click **Apply** to save your changes to the switch.

LAG Port Status Field:

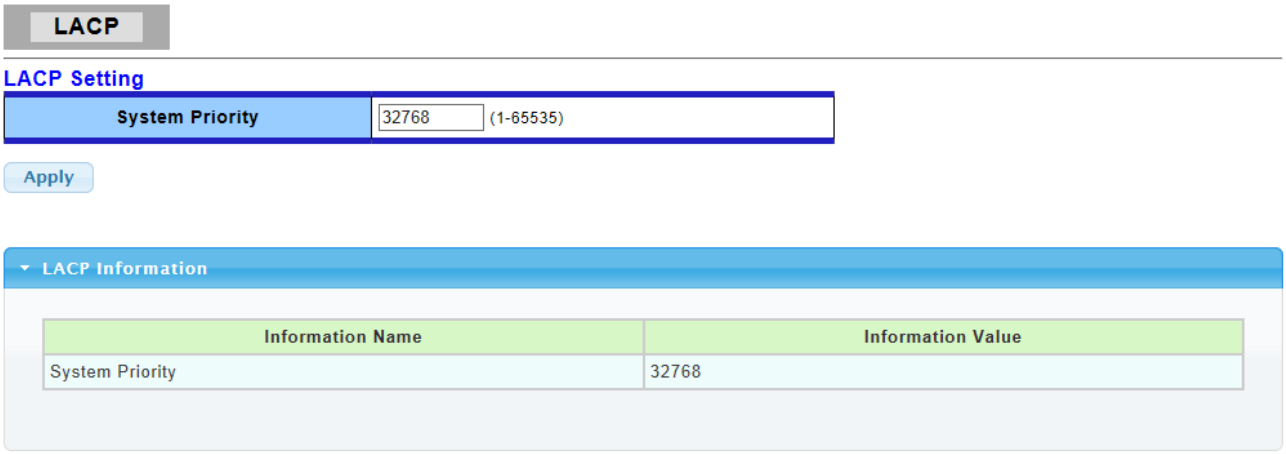
LABEL	DESCRIPTION
LAG	LAG Name
Description	LAG port description
Port Type	Member port media type
Enable	LAG port admin state
Link Status	LAG port link status
Speed	Current LAG port speed

Duplex	Current LAG port duplex
Flow Control Config	LAG port flow control configuration
Flow Control Status	Current LAG port flow control state

3.3.3.4 LACP Setting

Click **Switching** > **Link Aggregation** > **LACP Setting** to display the screen shown next.

LACP: Link Aggregation Control Protocol.



The following table describes the labels in this screen.

LAG Setting Field:

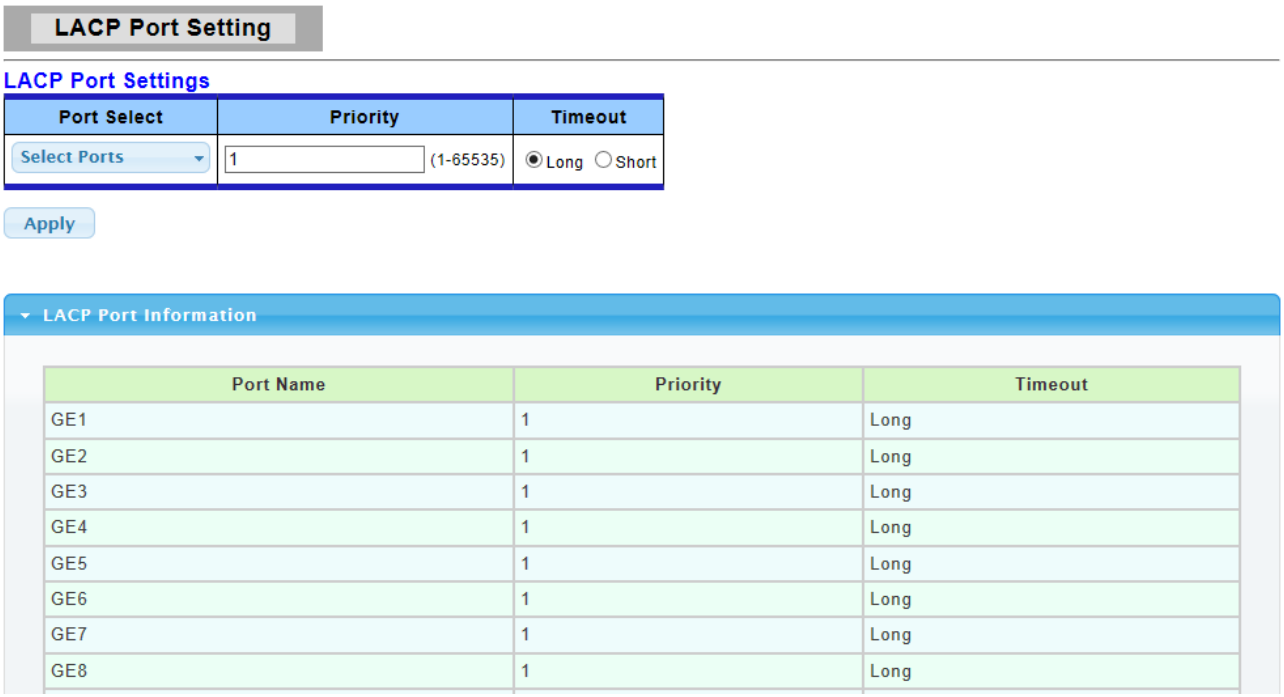
LABEL	DESCRIPTION
System Priority	Configure the system priority of LACP. This decides the system priority field in LACP PDU.
Apply	Click **Apply** to save your changes to the Switch.

LAG Information Field:

LABEL	DESCRIPTION
System Priority	LACP system priority value

3.3.3.5 LACP Port Setting

Click **Switching** > **Link Aggregation** > **LACP Port Setting** to display the screen shown next.



The following table describes the labels in this screen.

LABEL	DESCRIPTION
Port Select	Select one or multiple ports to configure
Priority	Enter the LACP priority value of the port
Timeout	Select the periodic transmissions of LACP PDUs. ■ **Long**: Transmit LACP PDU with slow periodic (30s). ■ **Short**: Transmit LACPP DU with fast periodic (1s).
Apply	Click **Apply** to save your changes to the Switch.

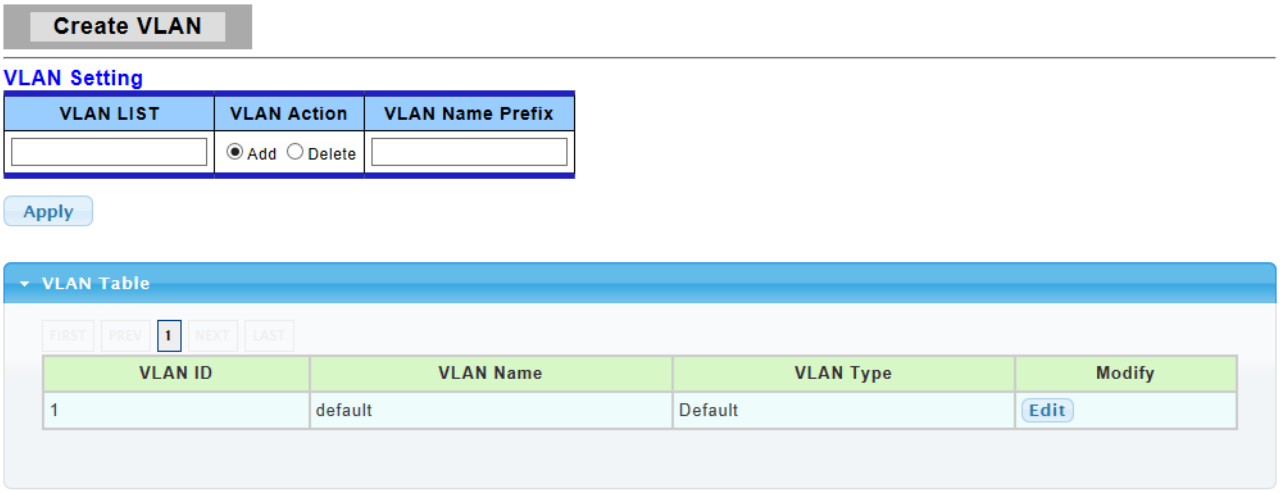
3.3.4 VLAN Management

A virtual local area network, virtual LAN or VLAN, is a group of hosts with a common set of requirements that communicate as if they were attached to the same broadcast domain, regardless of their physical location. A VLAN has the same attributes as a physical local area network (LAN), but it allows for end stations to be grouped together even if they are not located on the same network switch. VLAN membership can be configured through software instead of physically relocating devices or connections.

3.3.4.1 Create VLAN

This page allow user to add, edit or delete VLAN settings.

Click **Switching** > **VLAN Management** > **Create VLAN** to access this screen below to configure and view VLAN parameters for the switch**.**



The following table describes the related labels in this screen.

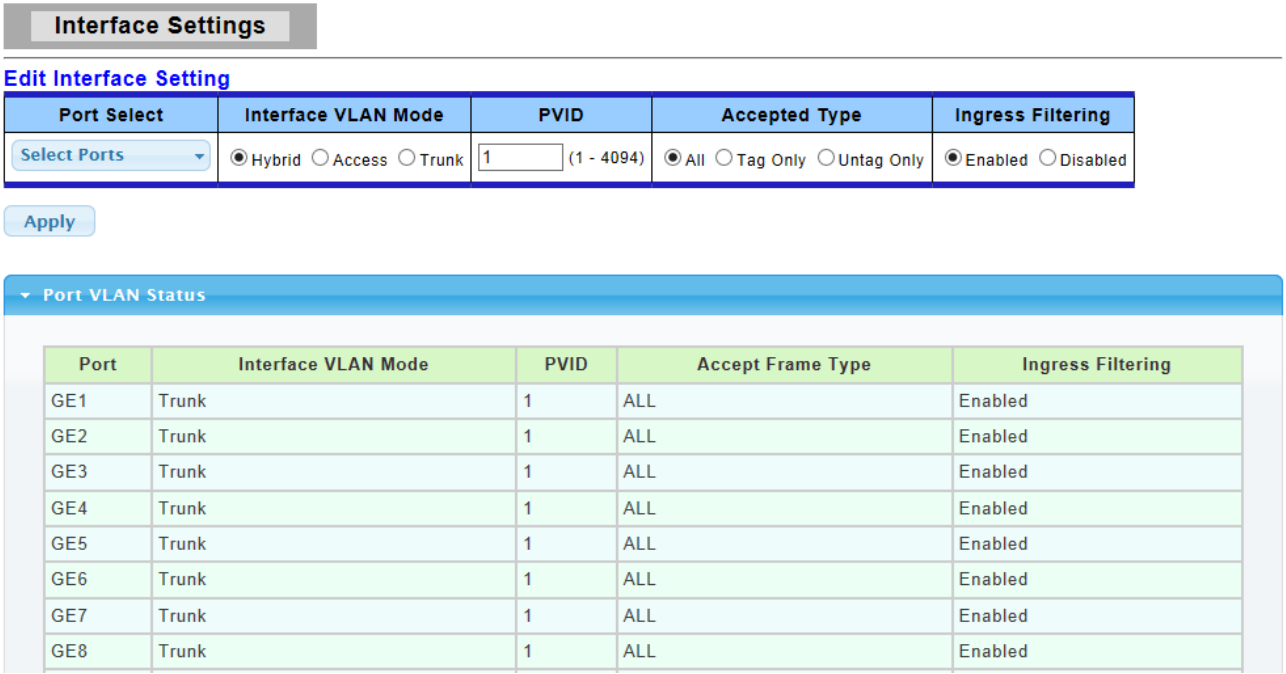
LABEL	DESCRIPTION
VLAN LIST	Specify the VLAN list to apply the operation (add/delete/edit).
VLAN Action	Select the action of operation, To add/delete/edit the VLANs
VLAN Name Prefix	Specify the prefix string of the VLAN name for new created VLANs. This field is only available with add action.
Apply	Click **Apply** to save your changes to the Switch.

3.3.4.2 Interface Settings

This page allow user to configure VLAN Interface related settings.

Click **Switching** > **VLAN Management** > **Interface Settings** to access the screen below.

A PVID (Port VLAN ID) is a tag that adds to incoming untagged frames received on a port so that the frames are forwarded to the VLAN group that the tag defines.



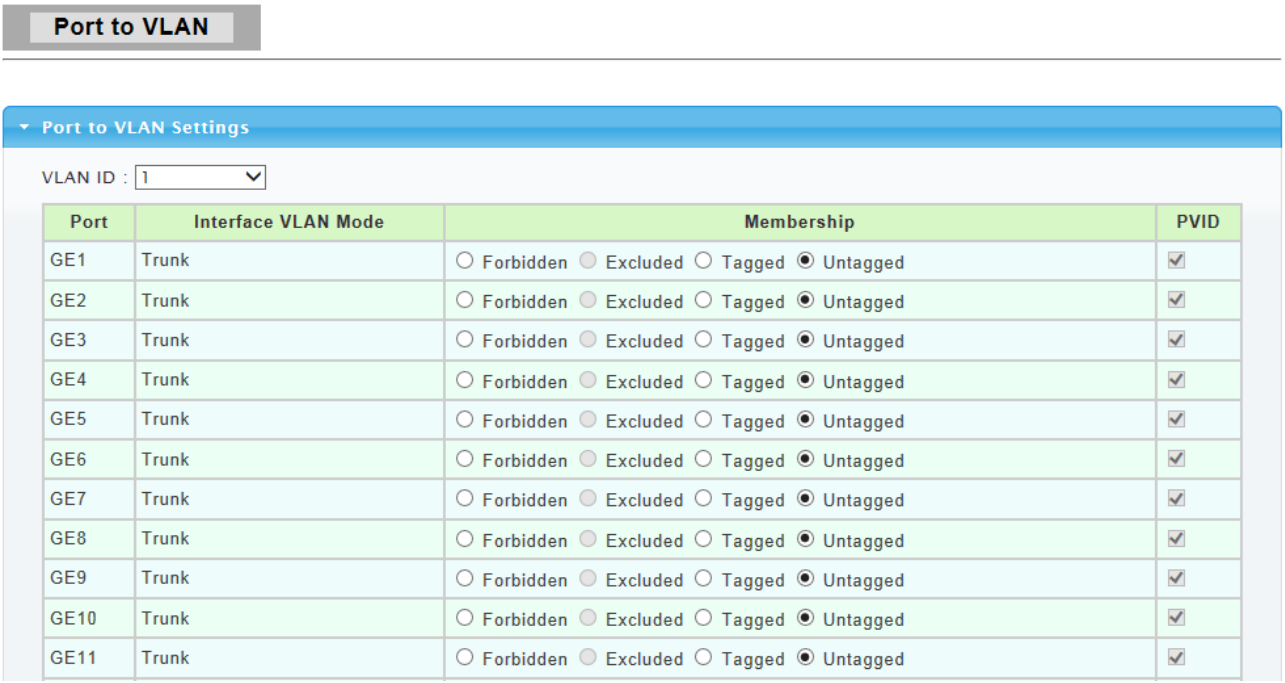
The following table describes the labels in this screen.

LABEL	DESCRIPTION
Port Select	Select specified port or all ports to configure Interface Settings.
Interface VLAN Mode	Select the VLAN mode of the interface. ■ **Hybrid**: Support all functions as defined in IEEE 802.1Q specification. ■ **Access**: Accepts only untagged frames and join an untagged VLAN. ■ **Trunk**: An untagged member of one VLAN at most, and is a tagged member of zero or more VLANs.
PVID	Specify the port-based VLAN ID (1-4094). It's only available with Hybrid and Trunk mode.
Accepted Type	Specify the acceptable-frame-type of the specified interfaces. It's only available with Hybrid mode.
Ingress Filtering	Specify the status of ingress filtering. It's only available with Hybrid mode.
Apply	Click **Apply** to save your changes to the Switch.

3.3.4.3 Port to VLAN

This page allow user to configure VLAN port setting.

Click **Switching** > **VLAN Management** > **Port to VLAN** to access the screen below.



The following table describes the labels in this screen.

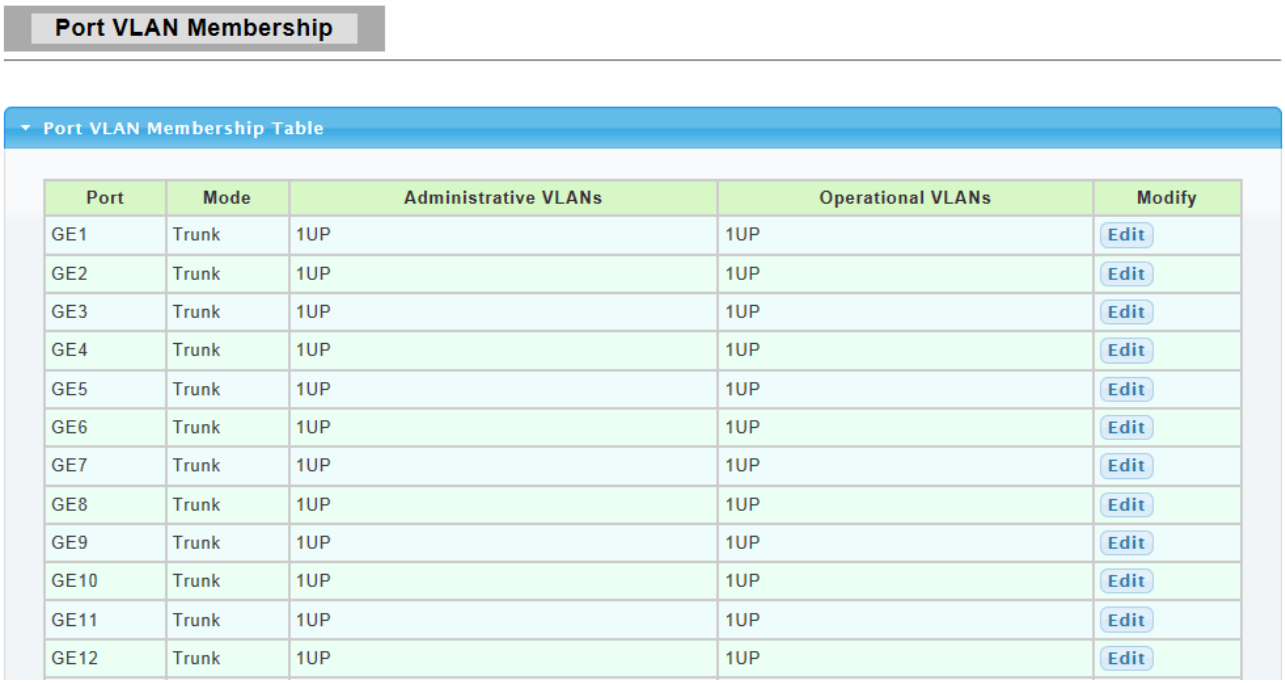
LABEL	DESCRIPTION
VLAN ID	Select specified VLAN ID to configure Port to VLAN Settings.
Interface VLAN Mode	Display the interface VLAN mode of this port.
Membership	Select the membership for this port with the specified VLAN ID. ■ **Forbidden**: Specify the port is forbidden in the VLAN. ■ **Excluded**: Specify the port is excluded in the VLAN. ■ **Tagged**: Specify the port is tagged in the VLAN. ■ **Untagged**: Specify the port is untagged in the VLAN.
PVID	Check this checkbox to select the VLAN ID to be the port-based VLAN ID for this port.

3.3.4.4 Port VLAN Membership

This page allow user to configure Port VLAN Membership setting.

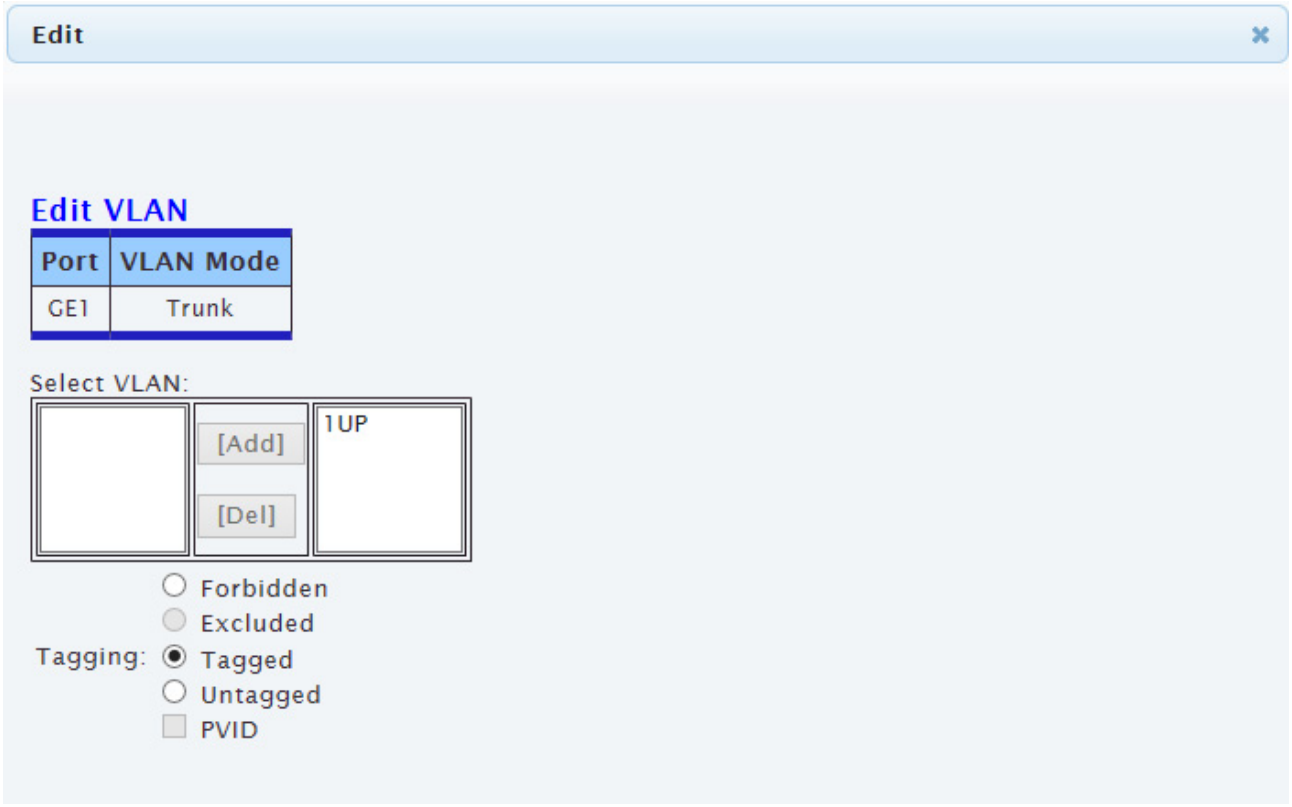
Click **Switching** > **VLAN Management** > **Port VLAN Membership** to access the screen below.

Use the Port VLAN Membership page to view membership information. Click "**Edit**" to edit selected port to modify the membership.



The following table describes the labels in this screen.

LABEL	DESCRIPTION
Port	Display the interface of this port entry.
Mode	Display the interface VLAN mode of this port.
Administrative VLANs	Display the administrative VLAN list of this port.
Operational VLANs	Display the operational VLAN list of this port.
Modify	Click the `Edit` Button to edit the VLAN membership of this port.



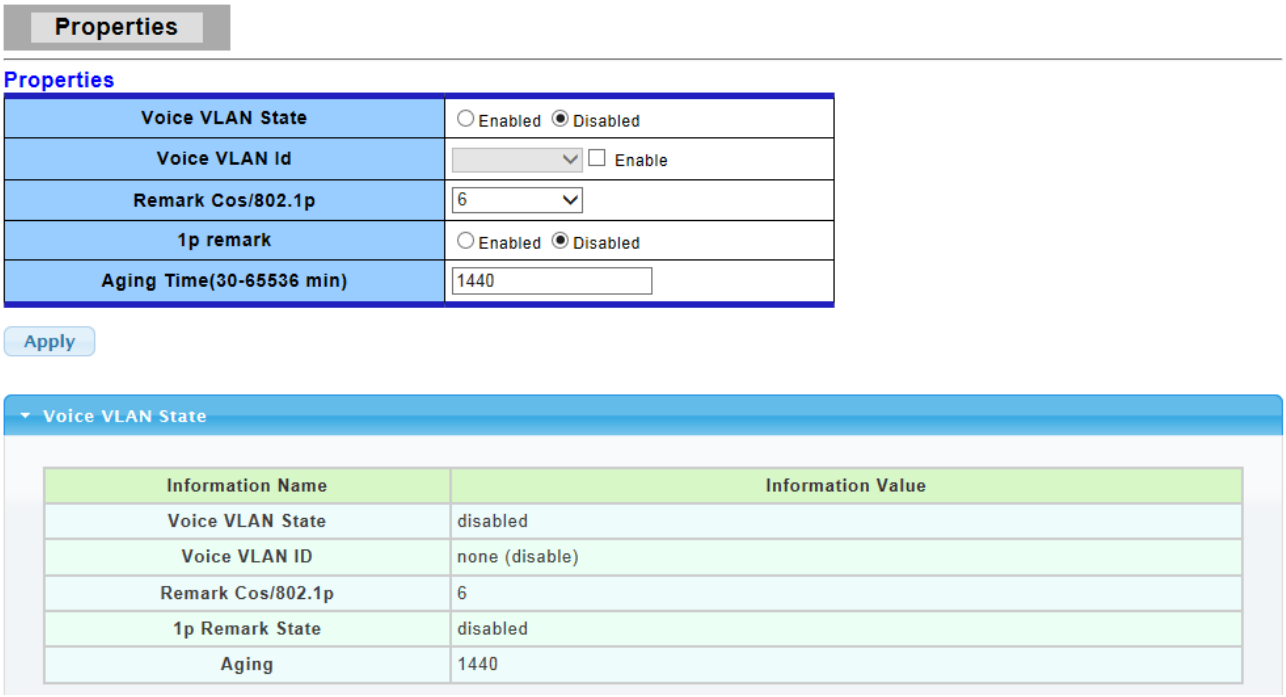
The following table describes the labels in "**Edit**" screen.

LABEL	DESCRIPTION
Select VLAN	Select the left available VLANs to add or the right used VLANs to delete for this port.
Tagging	Select the VLAN membership of the specified left VLANs for this port.
PVID	Check this checkbox to select the VLAN ID to be the port-based VLAN ID for this port.

3.3.4.5 Voice VLAN

This page allow user to configure Voice VLAN Properties setting.

Click **Switching** > **VLAN Management** > **Voice VLAN** > **Properties** to access the screen below.



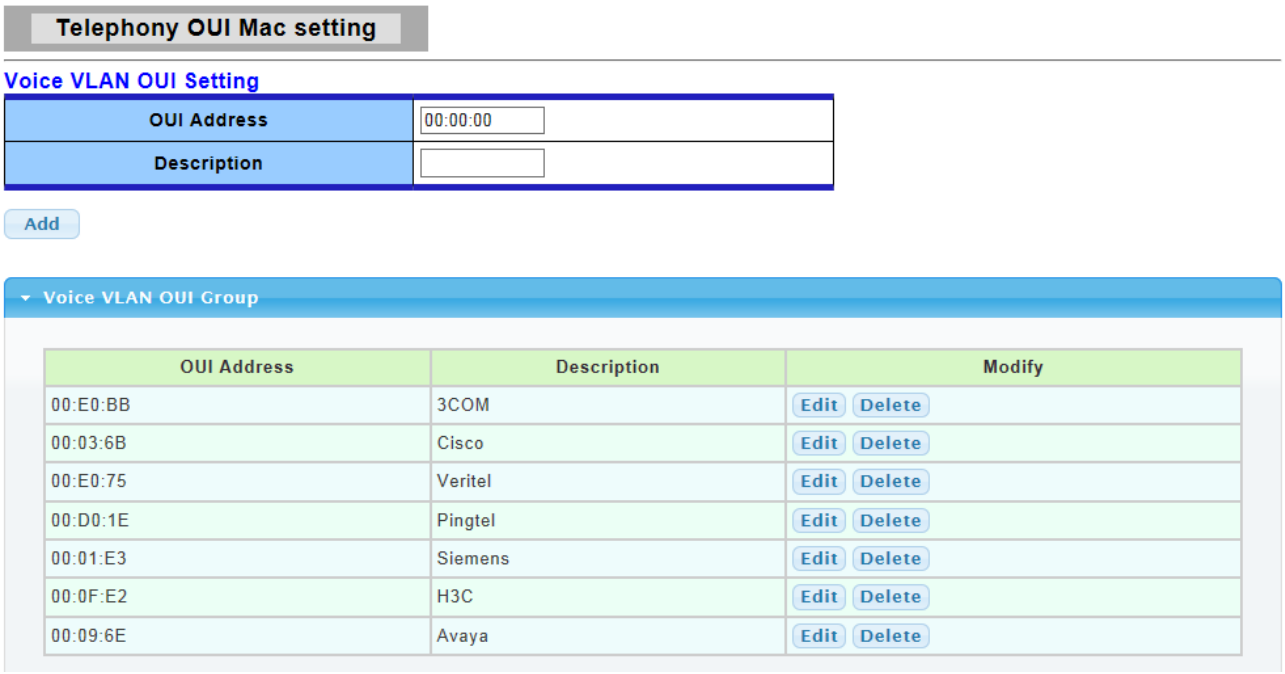
The following table describes the labels in this screen.

LABEL	DESCRIPTION
State	Select Voice VLAN state Enable –Voice VLAN is enabled Disable –Voice VLAN is disabled
Voice VLAN ID	Select Voice VLAN ID
Cos/802.1p	Select a value of vpt that will be advertised by LLDP-MED
1p remark	Select 1p remark state
Aging Time	Select value of aging time

3.3.4.6 Telephony OUI Mac setting

This page allow user to configure Voice VLAN Properties setting.

Click **Switching** > **VLAN Management** > **Voice VLAN** > **Telephony OUI Mac setting** to access the screen below.



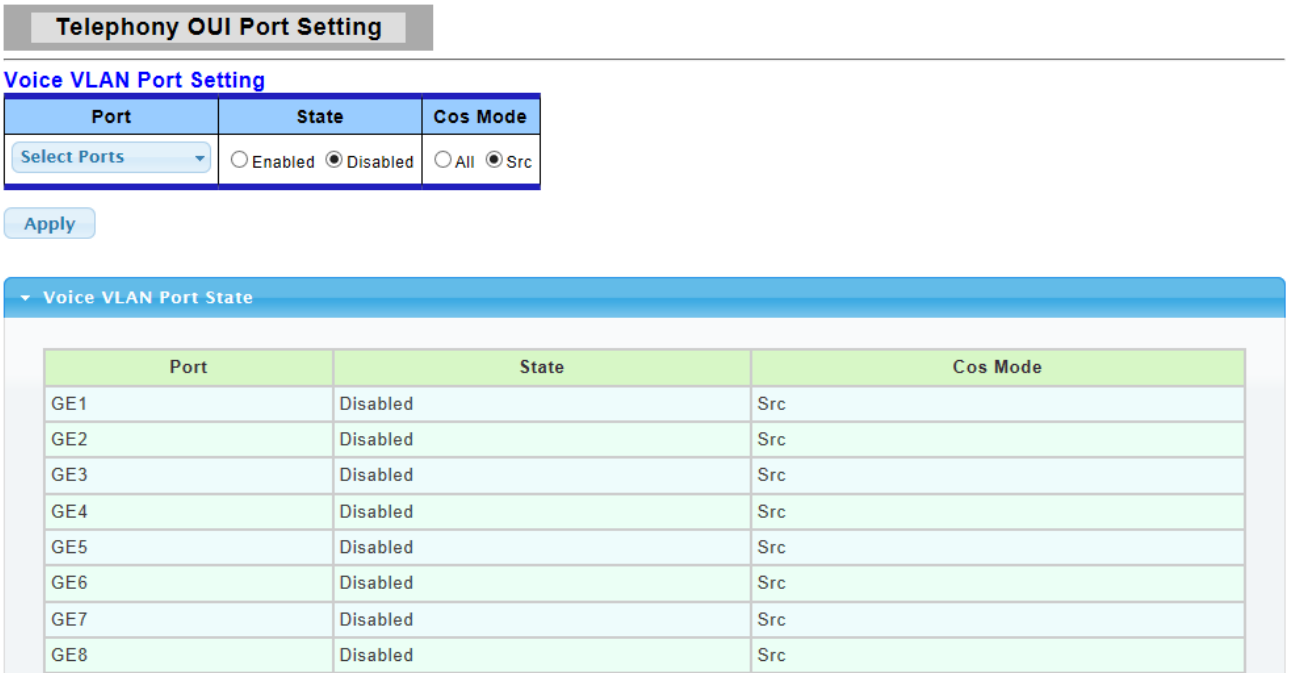
The following table describes the labels in this screen.

LABEL	DESCRIPTION
OUI Address	Select oui address
Description	description of the specified MAC address to the voice VLAN OUI table

3.3.4.7 Telephony OUI Port Setting

This page allow user to configure Voice VLAN Properties setting.

Click **Switching** > **VLAN Management** > **Voice VLAN** > **Telephony OUI Port Setting** to access the screen below.



The following table describes the labels in this screen.

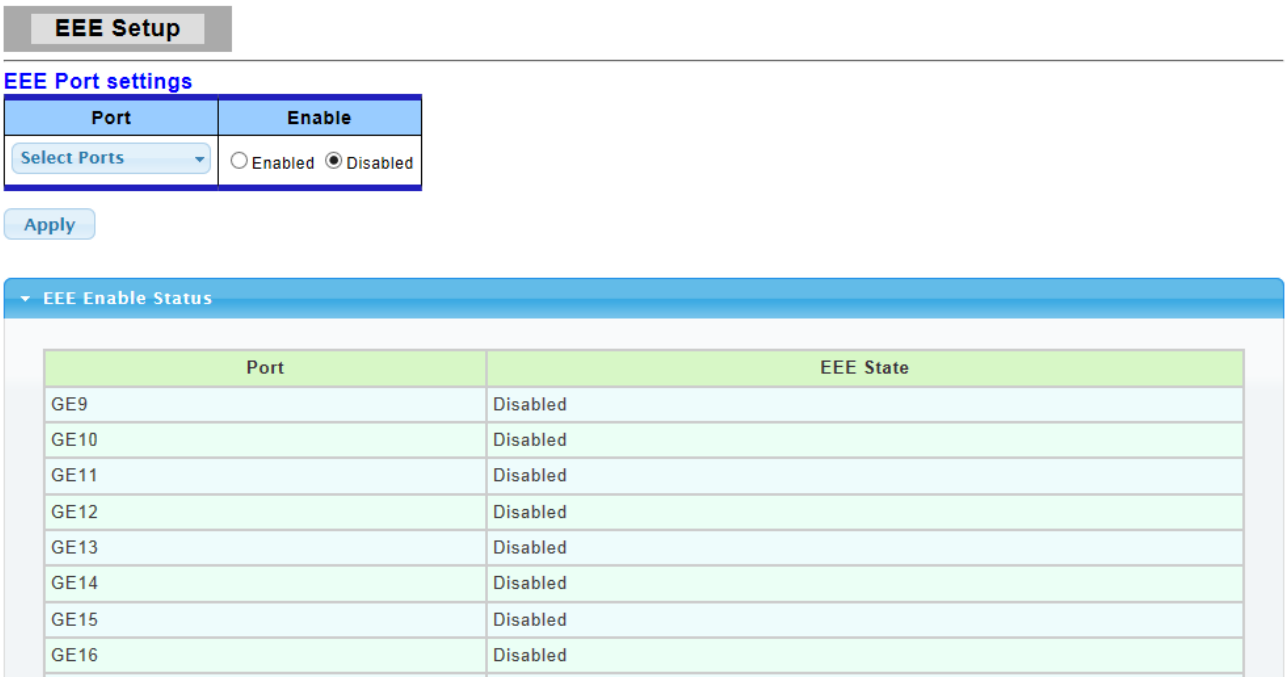
LABEL	DESCRIPTION
Port	Select one or multiple ports to configure
State	Ingress/Egress type value
Cos Mode	Select port cos mode Src QoS attributes are applied to packets with OUIs in the source MAC address. All QoS attributes are applied to packets that are classified to the Voice VLAN.

3.3.5 EEE

3.3.5.1 SVLAN Setting

This page allow user to enable or disable port EEE (Energy Efficient Ethernet) function.

Click **Switching** > **EEE** to access the screen below.



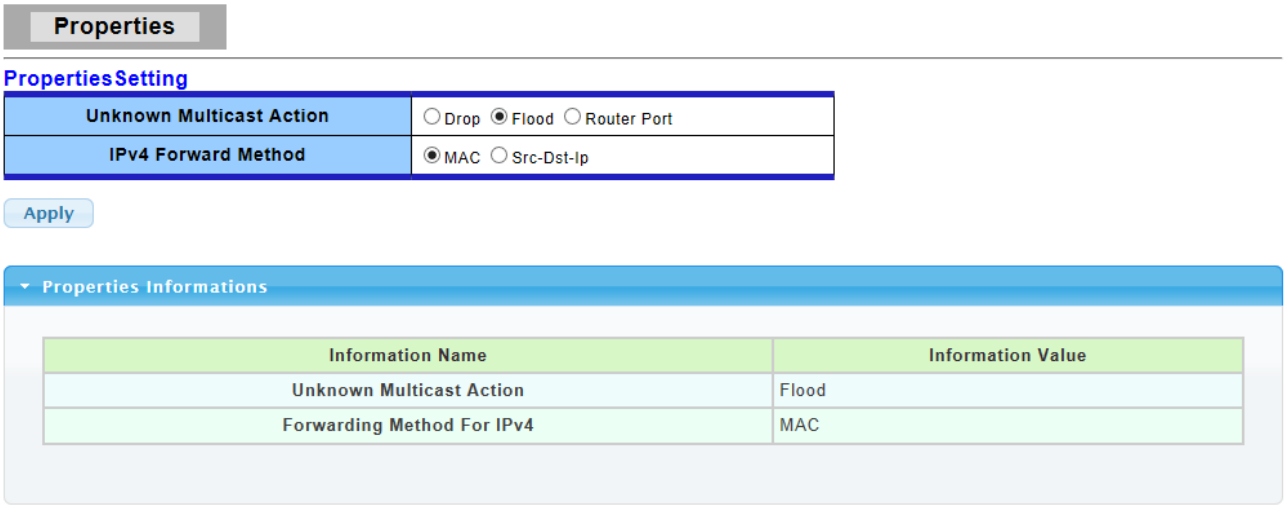
The following table describes the labels in this screen.

LABEL	DESCRIPTION
Port	Select one or multiple ports to configure
State	Port EEE function. ■ **Enabled**: Enable EEE function ■ **Disabled**: Disable EEE function
Apply	Click **Apply** to save your changes to the switch.

3.3.6 Multicast

3.3.6.1 Properties

Click **Switching** > **Multicast** > **Properties** in the navigation panel to bring up the screen as shown next.



The following table describes the labels in this screen.

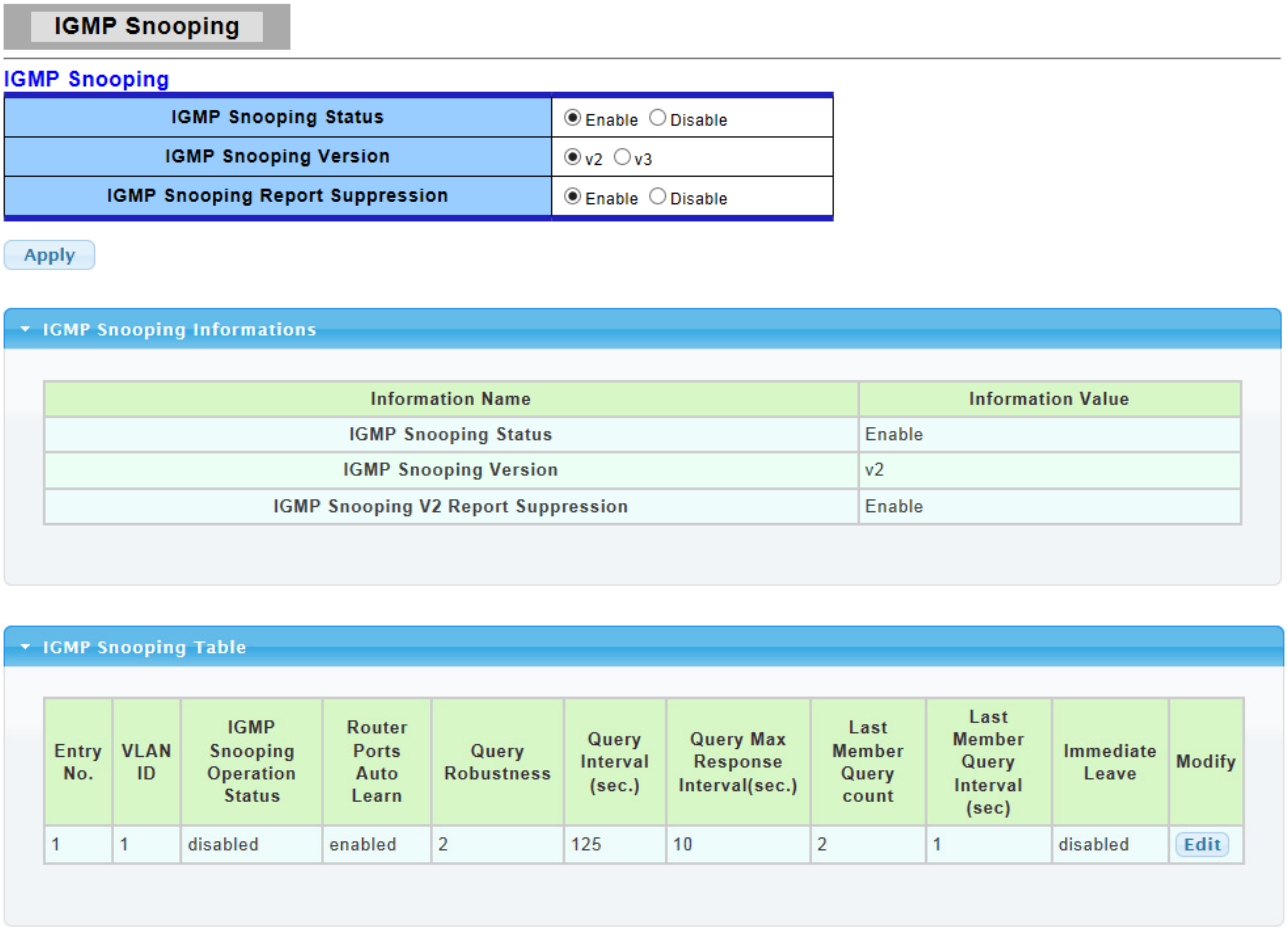
LABEL	DESCRIPTION
Unknown Multicast Action	Set the unknown multicast action ■ **Drop**: drop the unknown multicast data. ■ **Flood**: flood the unknown multicast data. ■ **Router port**: forward the unknown multicast data to router port.
IPv4 Forward Method	Set the ipv4 multicast forward method. ■ **MAC**: forward method dmac+vid. ■ **Src-Dst-Ip**: forward method dip+sip.
Apply	Click **Apply** to save your changes to the switch.

3.3.6.2 IGMP Snooping

Use the Switching pages to configure settings for the switch network interface and how the switch connects to a remote server to get services.

3.3.6.2.1 IGMP Setting

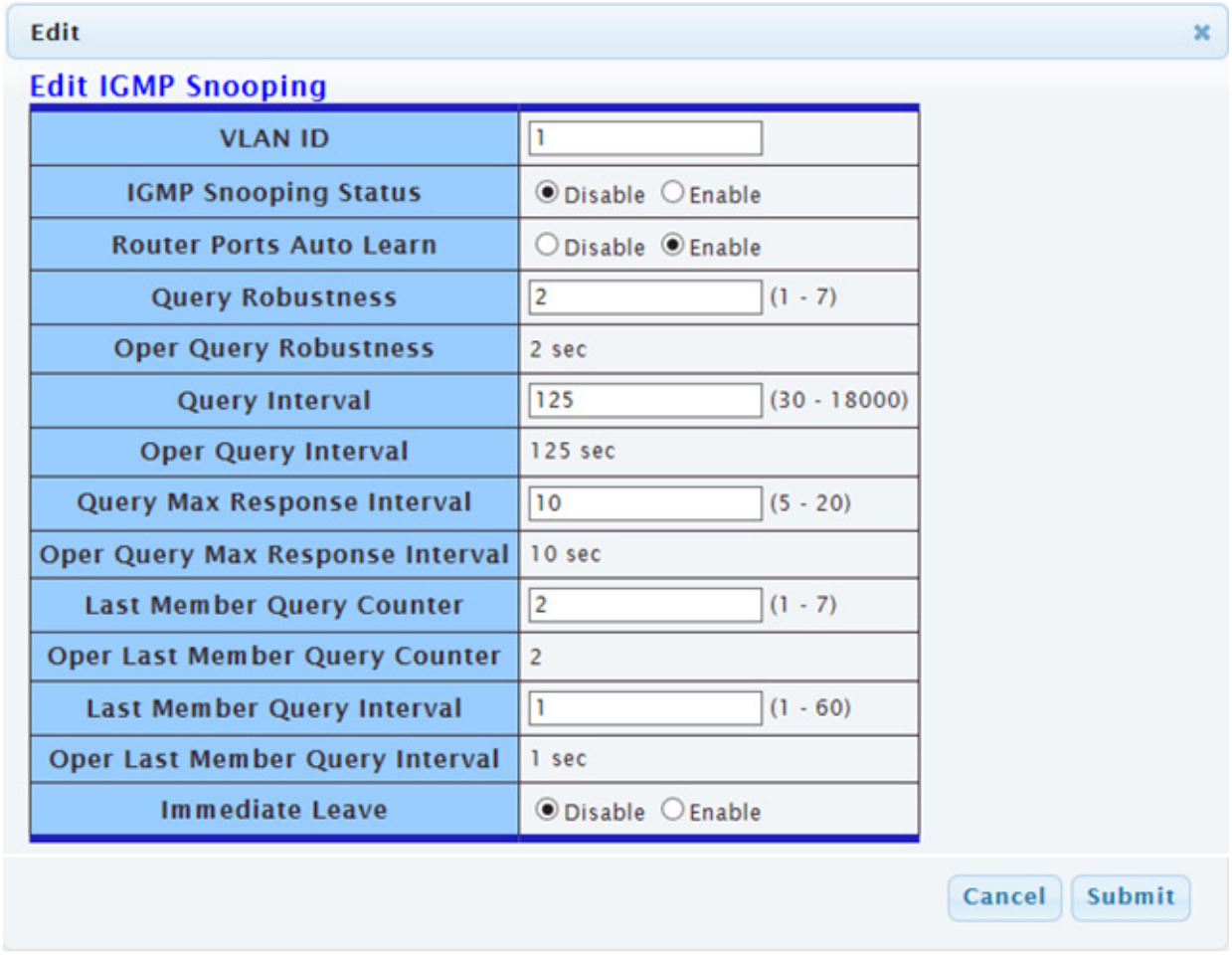
Click **Switching** > **Multicast** > **IGMP Snooping** > **IGMP Setting** to access the screen below.



The following table describes the labels in this screen.

LABEL	DESCRIPTION
IGMP Snooping Status	Set the enabling status of IGMP functionality ■ **Enable**: Enable IGMP Snooping. ■ **Disable**: Disable IGMP Snooping.
IGMP Snooping Version	Set the igmp snooping version ■ **v2**: Only support process igmp v2 packet. ■ **v3**: Support v3 basic and v2.
IGMP Snooping Report Suppression	Set the enabling status of IGMP v2 report suppression ■ **Enable**: Enable IGMP Snooping v2 report suppression. ■ **Disable**: Disable IGMP Snooping v2 report suppression.
Apply	Click **Apply** to save your changes to the switch.
Entry No	The IGMP entry number.
VLAN ID	The IGMP entry VLAN ID
IGMP Snooping Operation Status	The enable status of IGMP VLAN functionality ■ **Enabled**: when IGMP Snooping enable and IGMP VLAN enable and multicast filtering enable. ■ **Disabled**: when IGMP Snooping disable or IGMP VLAN disable or multicast filtering disable.
Router Ports Auto Learn	Set the enabling status of IGMP router port learning ■ **Enable**: Enable learning router port by query and PIM, DVRMP.

	■ **Disable**: Disable learning dynamic router port.
Robustness Variable	The Robustness Variable allows tuning for the expected packet loss on a subnet.
Query Interval	The interval of querier send general query
Query Max Response Interval	In Membership Query Messages, it specifies the maximum allowed time before sending a responding report in units of 1/10 second.
Last Member Query count	The count that Querier-switch sends Group-Specific Queries when it receives a Leave Group message for a group.
Last Member Query Interval	The interval that Querier-switch sends Group-Specific Queries when it receives a Leave Group message for a group.
Immediate leave	Leave the group when receive IGMP Leave message. ■ **Enable**: Enable Fastleave. ■ **Disable**: Disable Fastleave.
Edit	Click **Edit** to edit the IGMP Snooping Table.



The following table describes the labels in "**Edit**" screen.

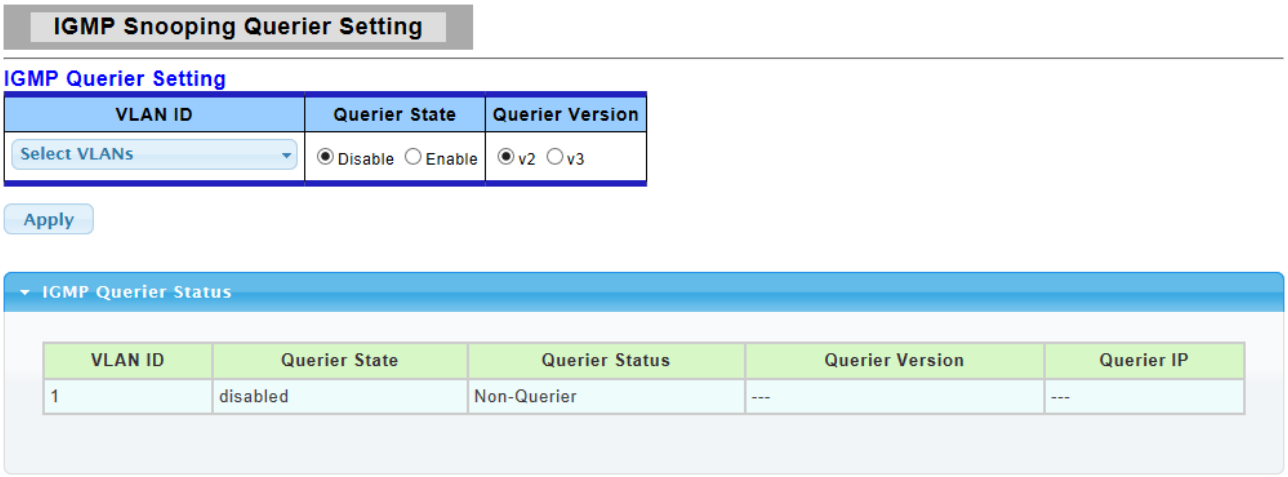
LABEL	DESCRIPTION
VLAN ID	The IGMP VLAN ID

IGMP Snooping Status	The admin enable status of IGMP VLAN functionality ■ **Enable**: IGMP VLAN enable. ■ **Disable**: IGMP VLAN disable.
Router Ports Auto Learn	Set the enabling status of IGMP router port learning ■ **Enable**: Enable learning router port by query and PIM, DVRMP. ■ **Disable**: Disable learning dynamic router port.
Robustness Variable	The Robustness Variable allows tuning for the expected packet loss on a subnet.
Query Interval	The admin query interval
Oper Query Interval	The operation query interval
Query Max Response Interval	The admin query max response interval
Oper Query Max Response Interval	The operating query max response interval
Last Member Query count	The admin last member query count
Oper Last Member Query count	The operating last member query count
Last Member Query Interval	The admin last member query interval.
Oper Last Member Query Interval	The operation last member query interval.
Immediate leave	Leave the group when receive IGMP Leave message. ■ **Enable**: Enable Fastleave. ■ **Disable**: Disable Fastleave.
Cancel	Click **Cancel** to cancel the change to switch.
Submit	Click **Submit** to submit the change to switch.

3.3.6.2.2 IGMP Querier Setting

This page allow user to configure querier settings on specific VLAN of IGMP Snooping.

Click **Switching** > **Multicast** > **IGMP Snooping** > **IGMP Querier Setting** to access the screen below.



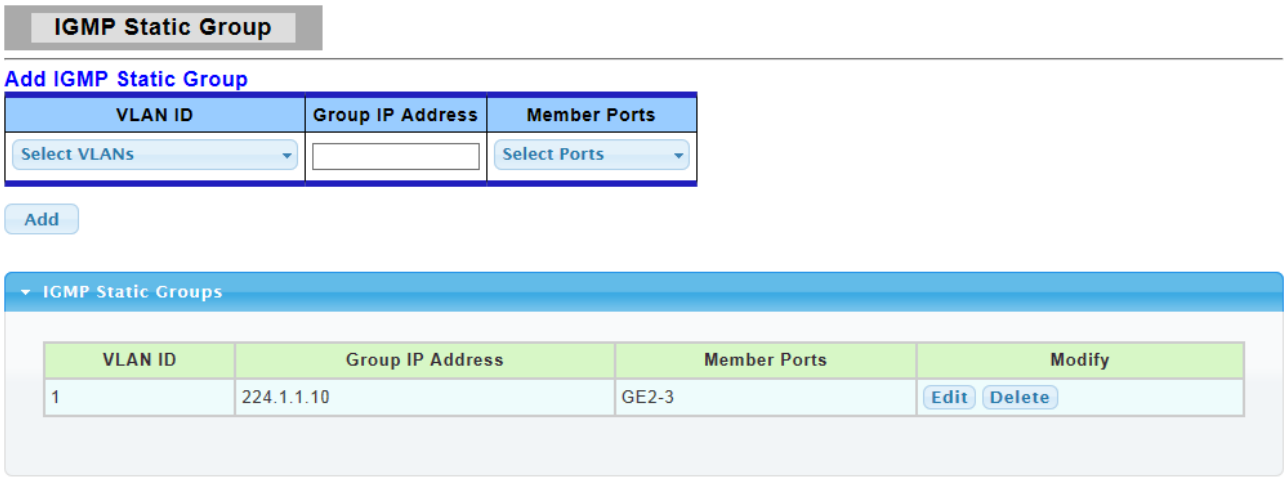
The following table describes the labels in this screen.

LABEL	DESCRIPTION
VLAN ID	Select the VLANs to configure.
Querier State	Set the enabling status of IGMP Querier Election on the chose VLANs ■ **Enable**: Enable IGMP Querier. ■ **Disable**: Disable IGMP Querier.
Snooping State	Set the query version of IGMP Querier Election on the chose VLANs ■ **v2**: Querier version 2. ■ **v3**: Querier version 3.
Apply	Click **Apply** to save your changes to the switch.

3.3.6.2.3 IGMP Static Group

This page allow user to set static group for IGMP.

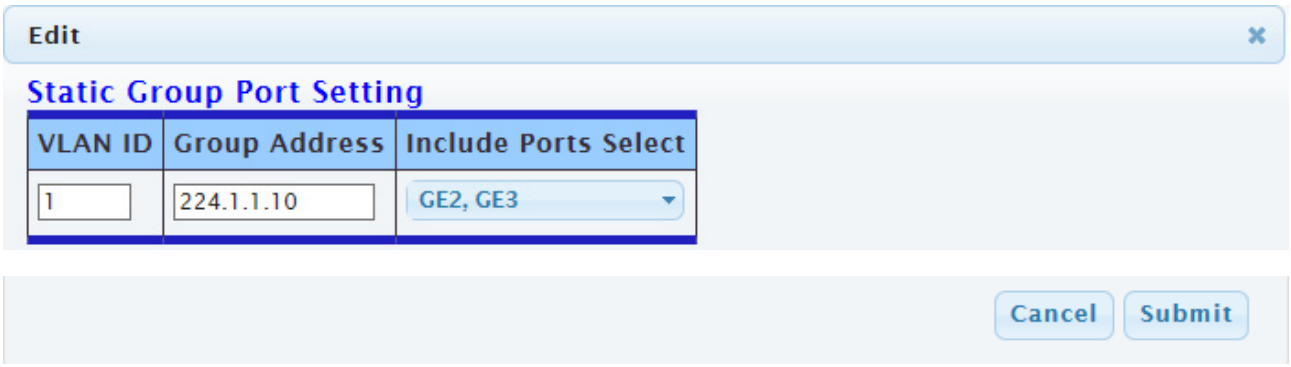
Click **Switching** > **Multicast** > **IGMP Snooping** > **IGMP Static Group** to access the screen below.



The following table describes the labels in this screen.

LABEL	DESCRIPTION

VLAN ID	Select the VLANs to configure.
Group IP Address	The IP address of this group.
Member Ports	The member ports of this group.
Add	Click **Add** to add IGMP Group to the switch.
Edit	Click **Edit** to edit the IGMP Static Group.
Delete	Click **Delete** to edit the IGMP Static Group.



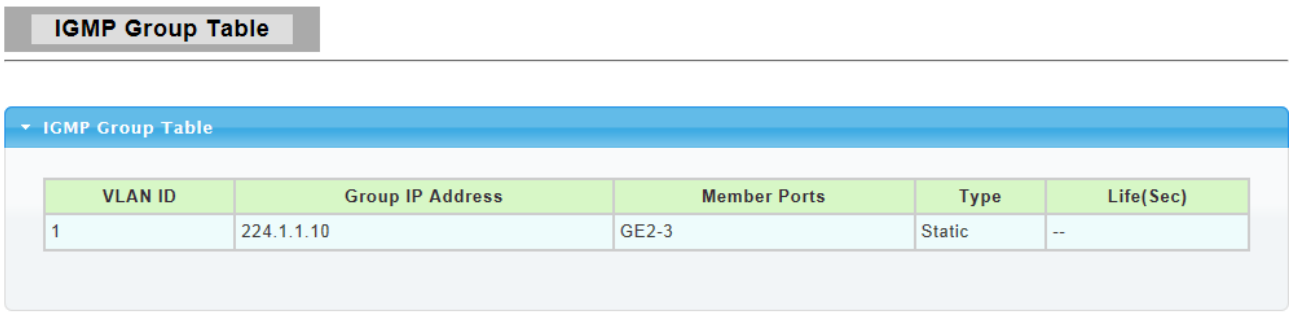
The following table describes the labels in "**Edit**" screen.

LABEL	DESCRIPTION
VLAN ID	The VLAN ID of static group.
Group Address	The group address
Include Ports Select	The static member ports
Cancel	Click Cancel to cancel the change to switch.
Submit	Click Submit to submit the change to switch.

3.3.6.2.4 IGMP Group Table

This page allow user to browse IGMP group information of IGMP Snooping.

Click **Switching** > **Multicast** > **IGMP Snooping** > **IGMP Group Table** to access the screen below.



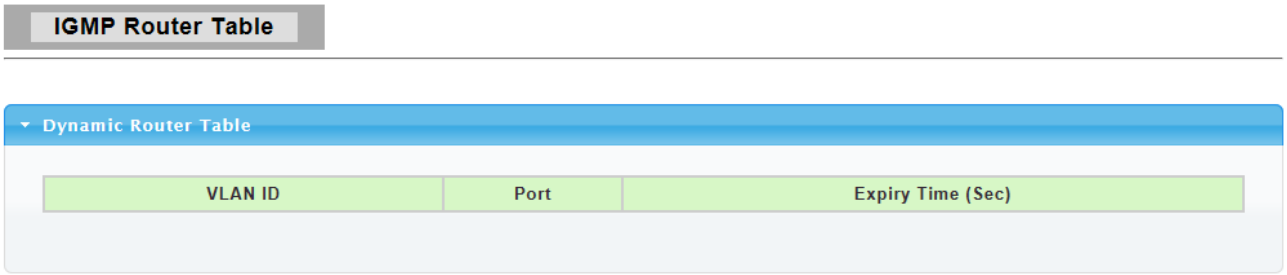
The following table describes the labels in this screen.

LABEL	DESCRIPTION
VLAN ID	The VLAN ID of this group.
Group IP Address	The group IP address of this group.
Member Port	The member ports of this group.
Type	The type of this group. Static or Dynamic.
Life(Sec)	The life time of this group.

3.3.6.2.4 IGMP Router Table

This page allow user to browse IGMP group information of IGMP Snooping.

Click **Switching** > **Multicast** > **IGMP Snooping** > **IGMP Router Table** to access the screen below.



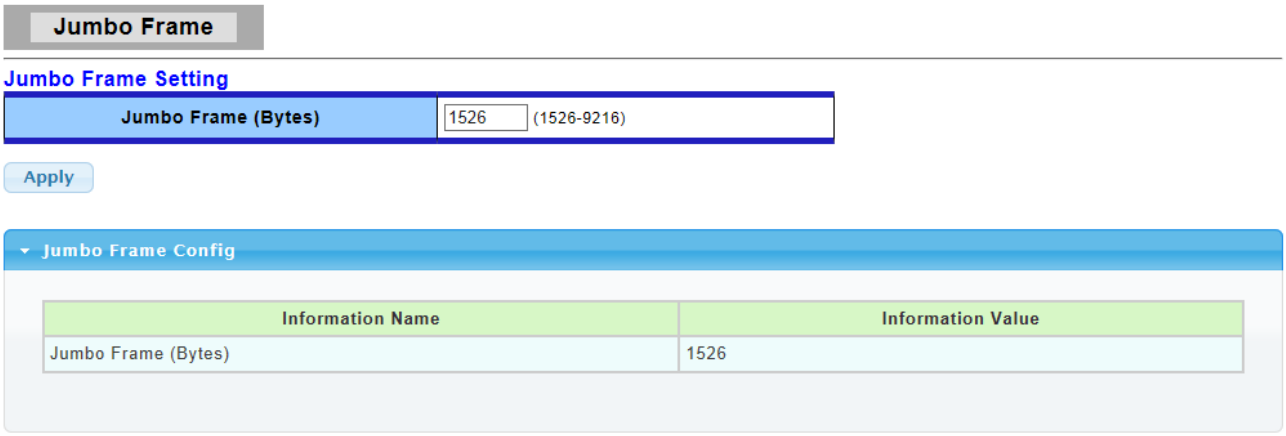
The following table describes the labels in this screen.

LABEL	DESCRIPTION
VLAN ID	The VLAN ID of this group.
Port	The member ports of this group.
Expiry Time(Sec)	The expiry time of this group.

3.3.7 Jumbo Frame

This page allow user to configure switch port jumbo frame settings.

Click **Switching** > **Jumbo Frame** in the navigation panel to bring up the screen as shown next.



The following table describes the labels in this screen.

LABEL	DESCRIPTION
Jumbo Frame (Bytes)	Jumbo frame size. The valid range is 1526 bytes – 9216 bytes.
Apply	Click **Apply** to save any changes to the switch.

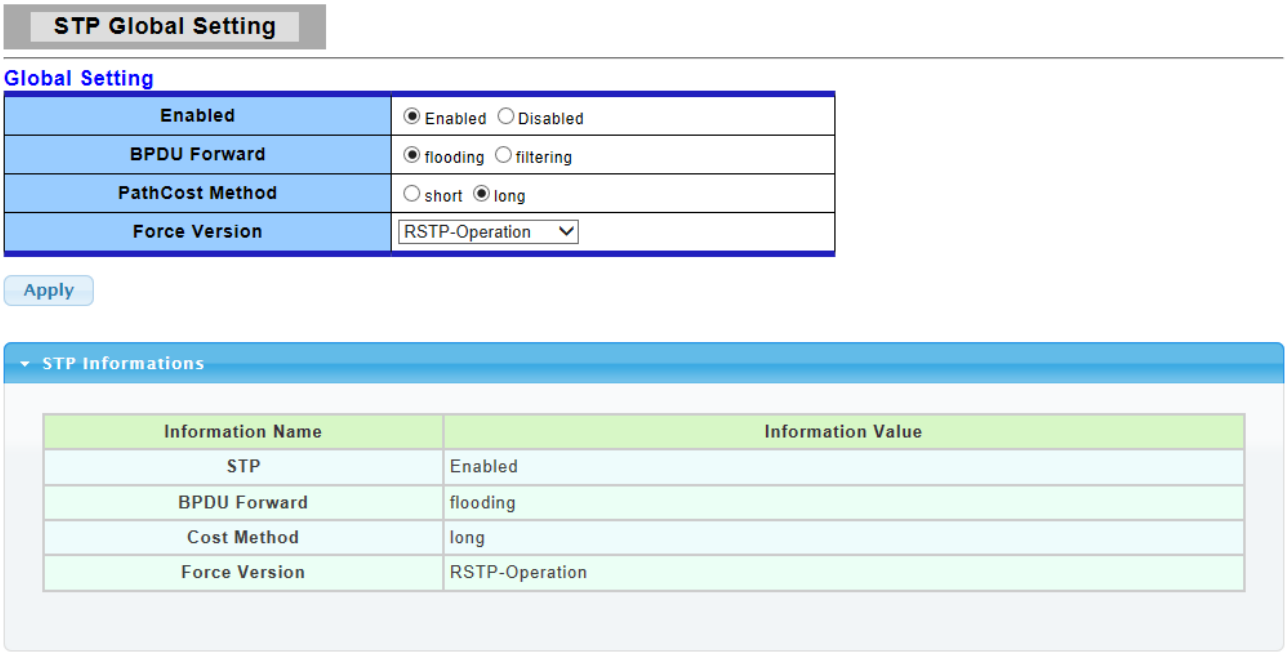
3.3.8 STP

The Spanning Tree Protocol (STP) is a network protocol that ensures a loop-free topology for any bridged Ethernet local area network.

3.3.8.1 STP Global Setting

Use the **SPT Global Setting** screen to activate one of the STP modes on the switch.

Click **Switching** > **STP** > **STP Global Setting**.



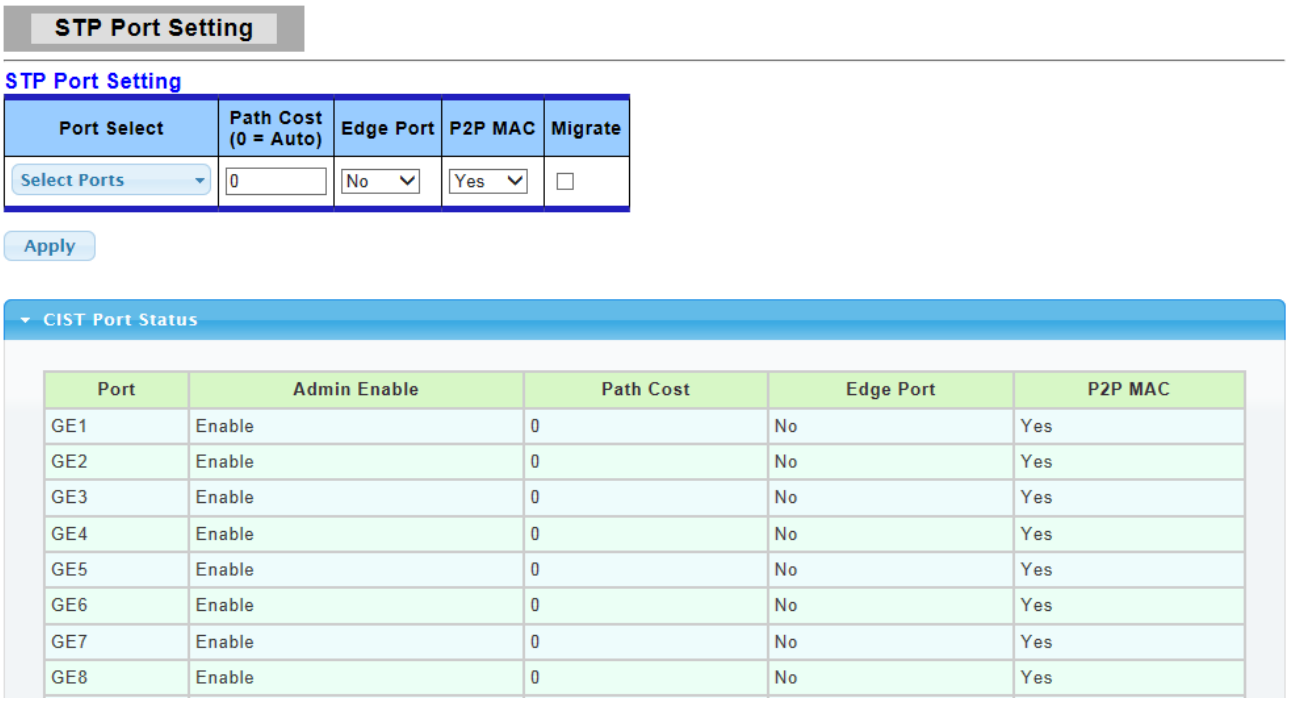
The following table describes the labels in this screen.

LABEL	DESCRIPTION
Enabled	Specify the STP status to be enabled/disabled on the switch.
BPDU Forward	Specify the BPDU forwarding action when the global STP is disabled.
Path Cost Method	Specify the Cost Method of STP.
Force Version	Set the operating mode of STP: ■ **STP**-Compatible: IEEE 802.1D STP operation. ■ **RSTP**-Operation: IEEE 802.1w operation.
Apply	Click **Apply** to save your changes to the switch.

3.3.8.2 STP Port Setting

This page allow user to configure general setting of STP port and browser CIST port status.

Click **Switching** > **STP** > **STP Port Setting**.

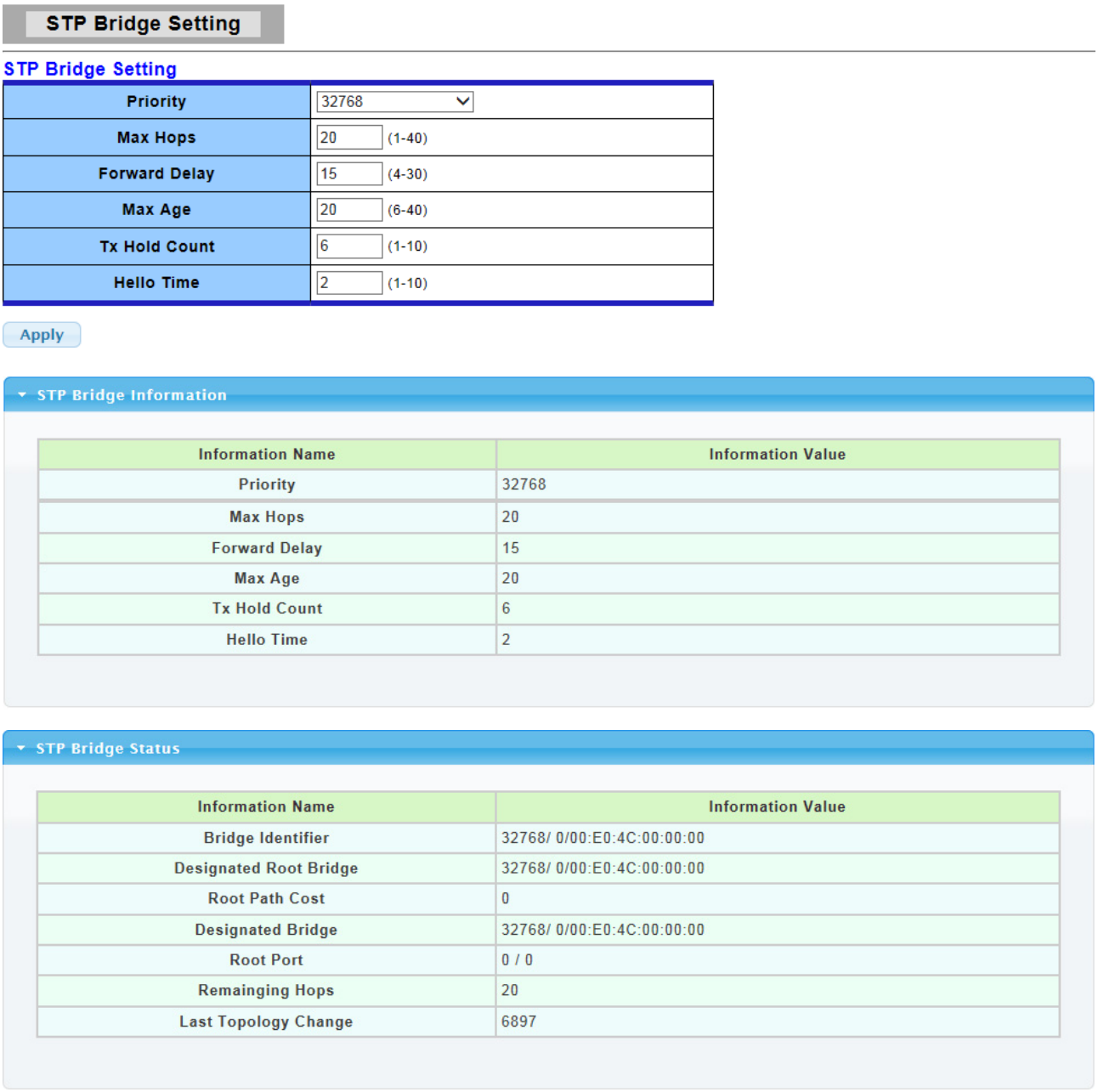


The following table describes the labels in this screen.

LABEL	DESCRIPTION
Port Select	Select the port(s) to change spanning tree protocol settings for.
Path Cost	Path cost is the cost of transmitting a frame on to a LAN through that port. It is recommended to assign this value according to the speed of the bridge. The slower the media, the higher the cost. Entering 0 means the switch will automatically assign a value.
Edge Port	Set the edge port configuration: ■ **No:** Force to false state (as link to a bridge). ■ **Yes:** Force to true state (as link to a host).
P2P MAC	Set the Point-to-Point port configuration: ■ **No:** Force to false state. ■ **Yes:** Force to true state.
Migrate	Force to try to use the new MST/RST BPDUs, and hence to test the hypothesis that all legacy systems that do not understand the new BPDU formats have been removed from the LAN segment on the port(s).
Apply	Click **Apply** to save your changes to the switch.

3.3.8.3 STP Bridge Setting

Click **Switching** > **STP** > **STP Bridge Setting**.



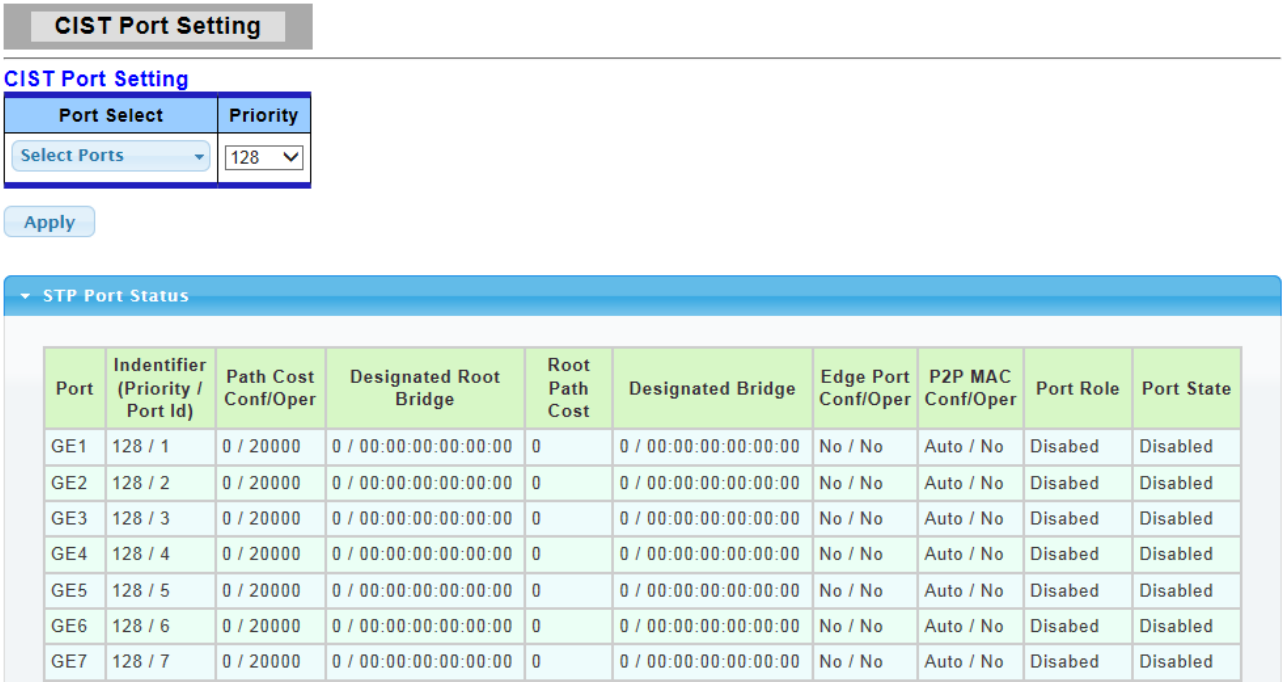
The following table describes the labels in this screen.

LABEL	DESCRIPTION
Priority	Set the STP Bridge Priority in the instance.
Max Hops	Set the value of the maximum number of hops in the region.
Forward Delay	Set the delay time an interface takes to converge from blocking state to forwarding state.
Max Age	Set the time any switch should wait before trying to change the STP topology after unhearing Hello BPUD.
Tx Hold Count	Set the Transmit Hold Count used to limit BPDU transmission rate.
Hello Time	Set the interval between periodic transmissions of BPDU by Designated Ports.
Apply	Click Apply to save your changes to the switch.

3.3.8.4 STP Port Advanced (CIST Port) Setting

This page allow user to configure gener setting of STP CIST port and browser CIST port status.

Click **Switching** > **STP** > **STP Port Advanced Setting**.



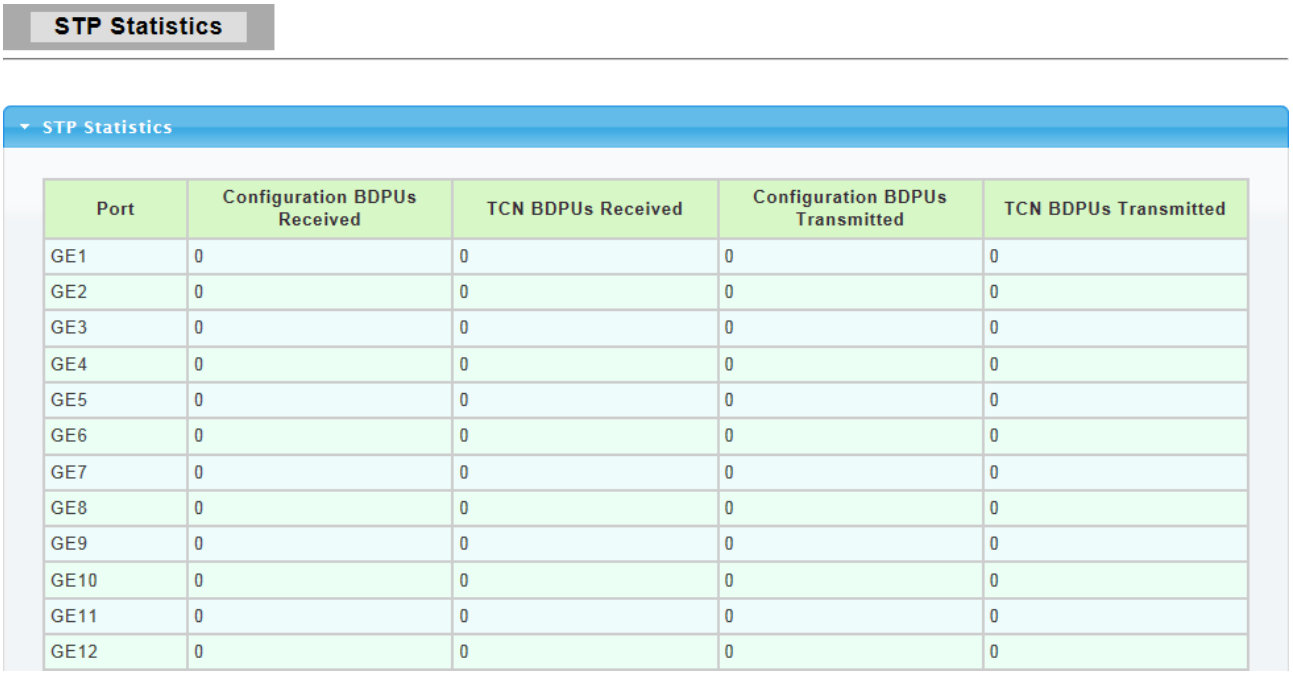
The following table describes the labels in this screen.

LABEL	DESCRIPTION
Port Select	Select the port list to specify which ports should apply this setting.
Priority	Set the Port Priority to the selected ports in the CIST instance.
Apply	Click Apply to save your changes to the switch.

3.3.8.5 STP Statistics

This page allow user to browser general statistics of STP.

Click **Switching** > **STP** > **STP Statistics.**



The following table describes the labels in this screen.

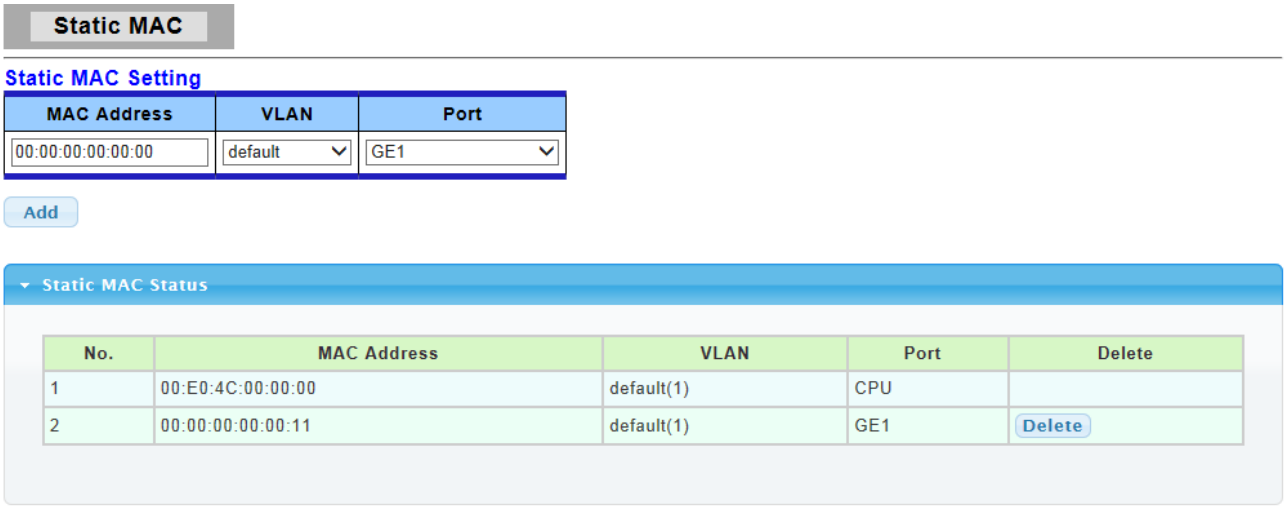
LABEL	DESCRIPTION
Port	It displays the port number.
Configuration BDPUs Received	It displays the configuration BDPUs received.
TCN BDPUs Received	It displays the TCN BDPUs received.
Configuration BDPUs Transmitted	It displays the configuration BDPUs transmitted.
TCN BDPUs Transmitted	It displays the Multiple Spanning Tree Protocol (MSTP) BDPUs transmitted.

3.4 MAC Address Table

Use the MAC Address Table pages to show dynamic MAC table and configure settings for static MAC entries.

3.4.1 Static MAC Setting

Click **Status > MAC Address Table > Static MAC Setting** in the navigation panel to bring up the screen as shown next.

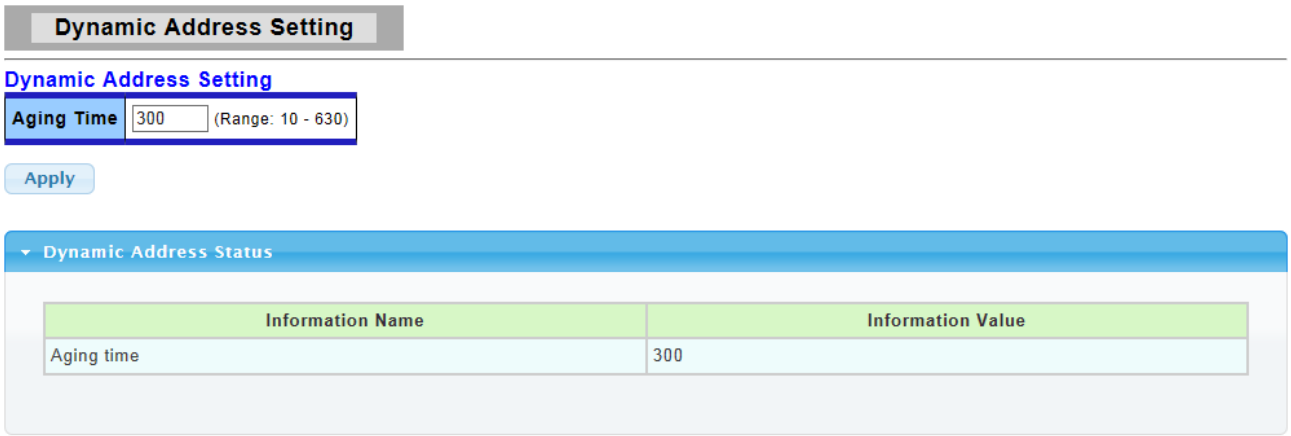


The following table describes the labels in this screen.

LABEL	DESCRIPTION
MAC Address	Enter the MAC address in valid MAC address format, that is, six hexadecimal character pairs. Static MAC addresses do not age out.
VLAN	Enter the VLAN identification number the MAC address belongs to.
Type	There are two types of MAC entry: ■ **Unicast:** add a unicast MAC entry. ■ **Multicast:** add a multicast MAC entry.
Port	If Type is unicast, select the port number of the MAC entry; If Type is multicast, select the port list of the MAC entry.
Add	Click **Add** to add any port into the static MAC address table.
No.	This is the index number for the MAC address forwarding entries.
Delete	To delete any selected MAC address entries.

3.4.2 Dynamic Address Setting

Click **Status > MAC Address Table > Dynamic Address Setting** in the navigation panel to bring up the screen as shown next.

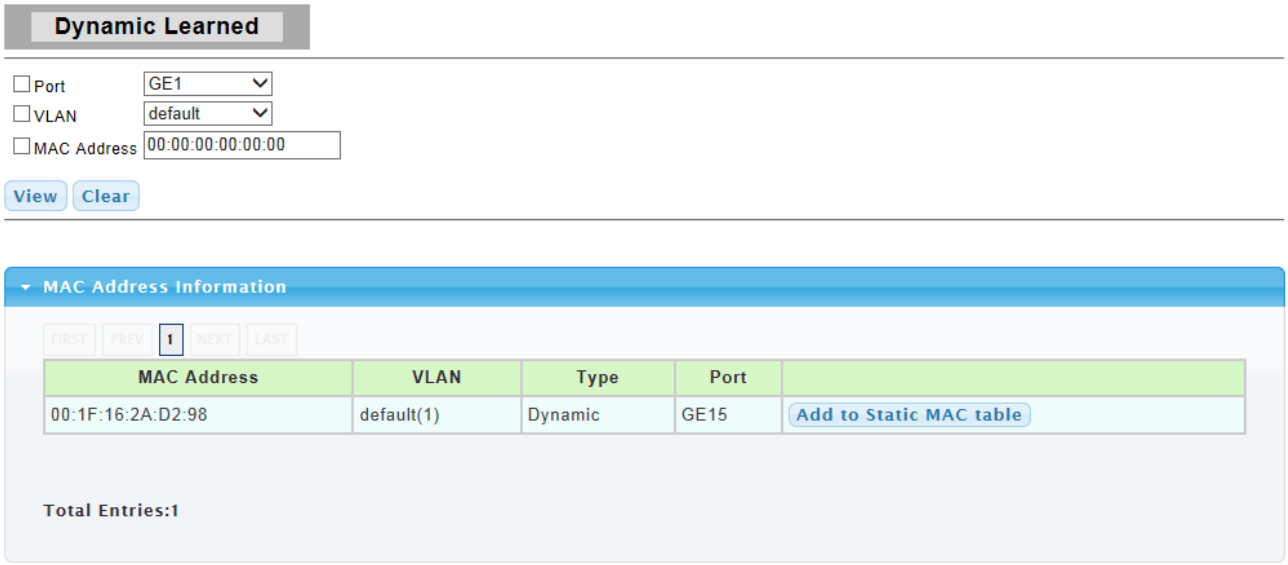


The following table describes the labels in this screen.

LABEL	DESCRIPTION
Aging Time	<10-630> The Dynamic MAC address aging out value
Apply	Click Apply to save your changes to the switch.

3.4.3 Dynamic Learned

Click **Status > MAC Address Table > Dynamic Learned** in the navigation panel to bring up the screen as shown next.



The following table describes the labels in this screen.

LABEL	DESCRIPTION
Port	Select the port number to show or clear dynamic MAC entries. If not select any port, VLAN and MAC address, the whole dynamic MAC table will be displayed or cleared.
VLAN	This is the VLAN group to which the MAC address belongs. Select the VLAN to show or clear dynamic MAC entries. If not select any port, VLAN and MAC address, the whole dynamic MAC table will be displayed or cleared.
MAC Address	This field displays the MAC address that will be forwarded. Select the MAC address to show or clear dynamic MAC entries. If not select any port, VLAN and MAC address, the whole dynamic MAC table will be displayed or cleared.
View	Click the View button to display the logs according the criteria specified in the fields above.
Clear	Click this button to remove any dynamically learned MAC address forwarding entries.
Type	This shows whether the MAC address is **Dynamic** (learned by the Switch) or **Static Unicast** (manually entered in the **Static MAC Forwarding** screen).
Port	This field displays the port where the MAC address will be forwarded.
Add to Static MAC table	Click this button to add any port into the static MAC table.

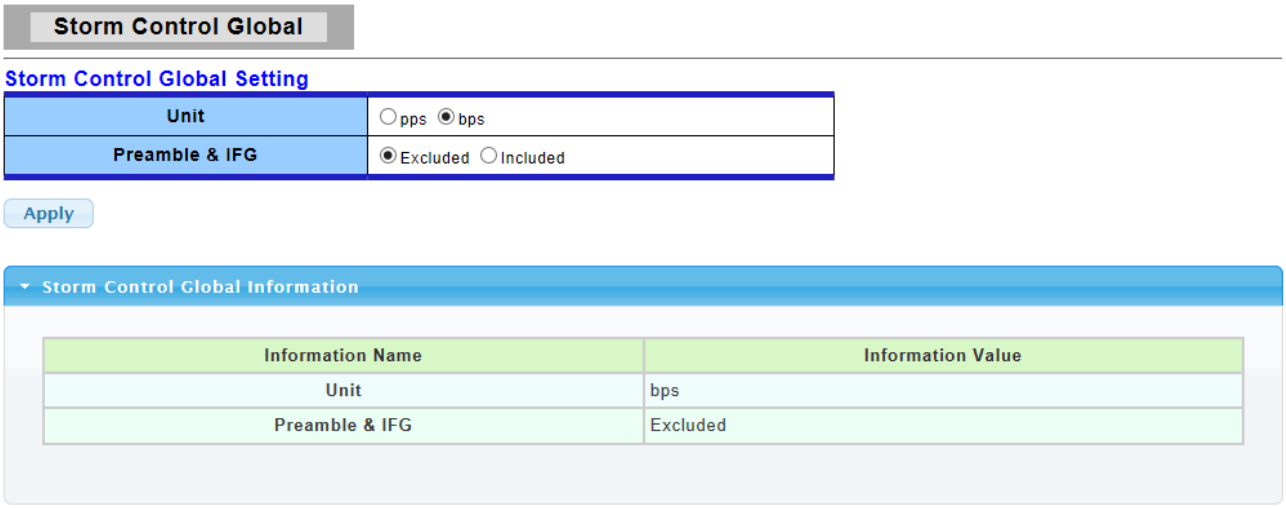
3.5 Security

Use the Security pages to configure settings for the switch security features.

3.5.1 Storm Control

3.5.1.1 Global Setting

Click **Security** > **Storm Control** > **Global Setting** to display the configuration screen as shown.

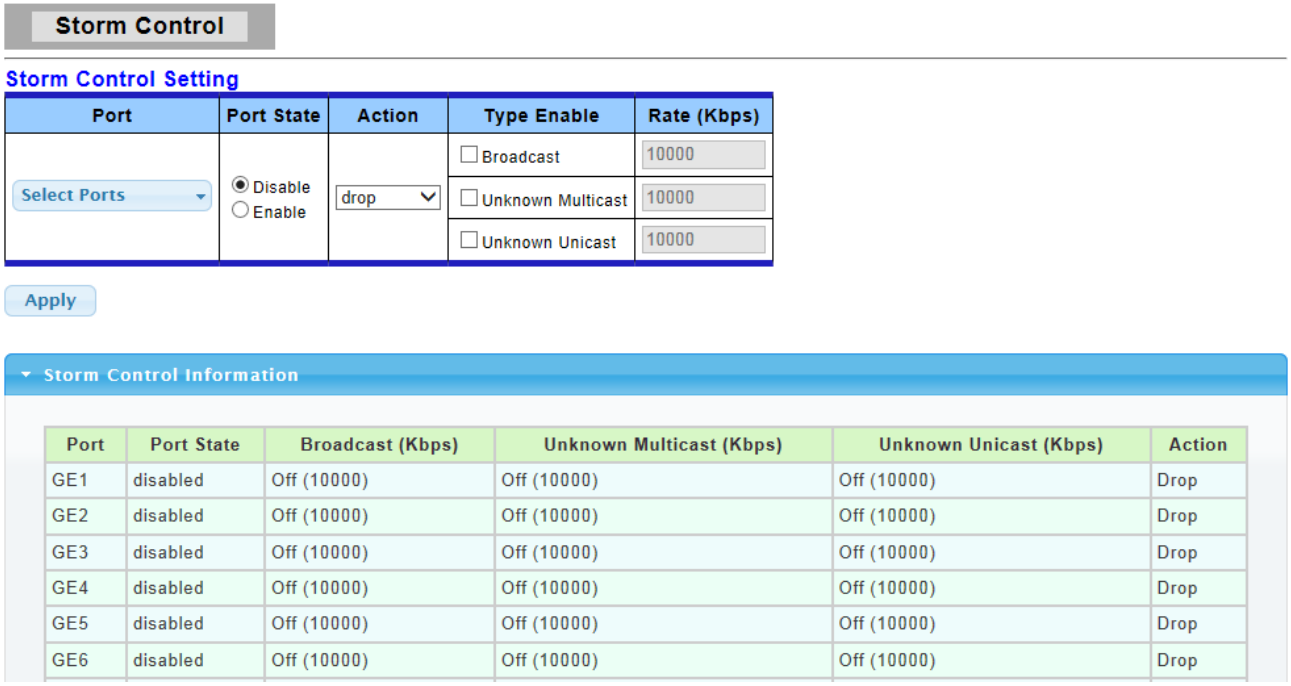


The following table describes the labels in this screen.

LABEL	DESCRIPTION
Mode	Select the mode of storm control ■ pps: storm control rate calculates by packet-based ■ bps: storm control rate calculates by octet-based
Preamble & IFG	Select the rate calculates w/o preamble & IFG (20 bytes) ■ Excluded: exclude preamble & IFG (20 bytes) when count ingress storm control rate. ■ Included: include preamble & IFG (20 bytes) when count ingress storm control rate.
Apply	Click **Apply** to save your changes to the Switch.

3.5.1.2 Port Setting

Click **Security** > **Storm Control** > **Port Setting** to display the configuration screen as shown.



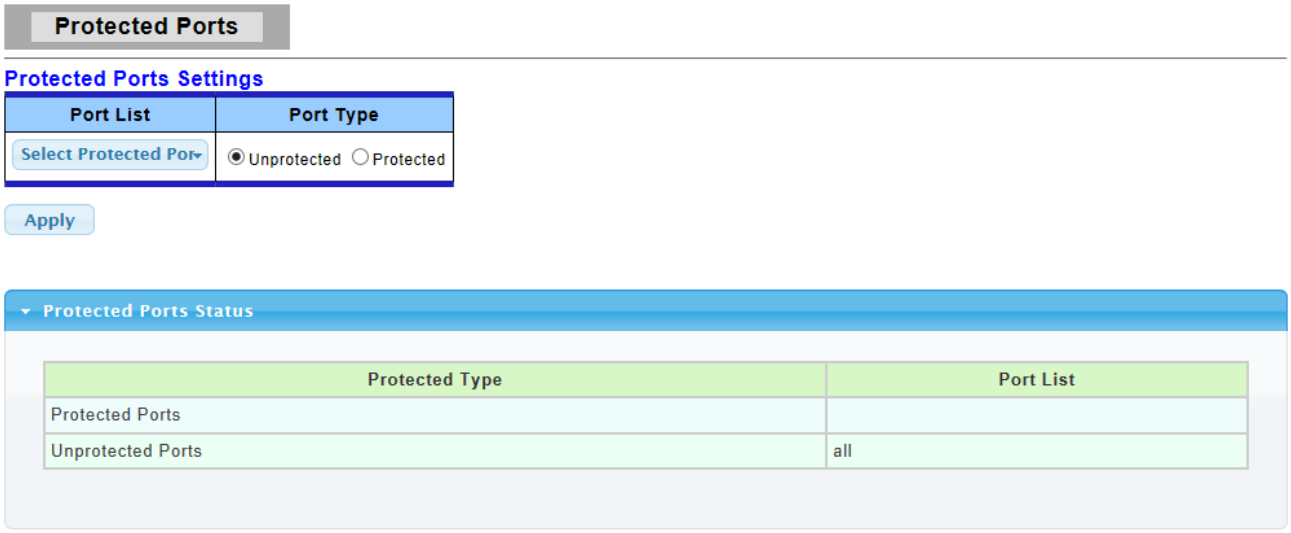
The following table describes the labels in this screen.

LABEL	DESCRIPTION
Port	Select the setting ports
State	Select the state of setting ■ **Disable**: Disable the storm control function. ■ **Enable**: Enable the storm control function.
Action	Select the state of setting ■ **Drop**: Packets exceed storm control rate will be dropped. ■ **Shutdown**: Port exceed storm control rate will be shutdown.
Storm Type	Select the type of storm control **Broadcast**: Broadcast packet ■ **Unknown Unicast**: Unknown unicast packet ■ **Unknown Multicast**: Unknown multicast packet
Rate	Value of storm control rate, Unit: pps (packet per-second) or Kbps (Kbits per-second) depends on global mode setting. The range is from 0 to 1000000.
Apply	Click Apply to save your changes to the Switch.

3.5.2 Protected Ports

This page allow user to configure protected port setting to prevent the selected ports from communicate with each other.

Click **Security** > **Protected Ports** to display the configuration screen as shown.



The following table describes the labels in this screen.

LABEL	DESCRIPTION
Port List	To select the port to be protected.
Port Type	Configure port protect type: ■ **Unprotected:** Unprotected port can communicate with all ports. ■ **Protected:** Prevent protected ports from communicate with each other.
Apply	Click **Apply** to save your changes to the Switch.

3.5.3 DoS

3.5.3.1 DoS Global Setting

This page allow user to configure DoS setting to enable/disable DoS function for Global Setting.

Click **Security** > **DoS** > **DoS Global Setting** to display the configuration screen as shown.

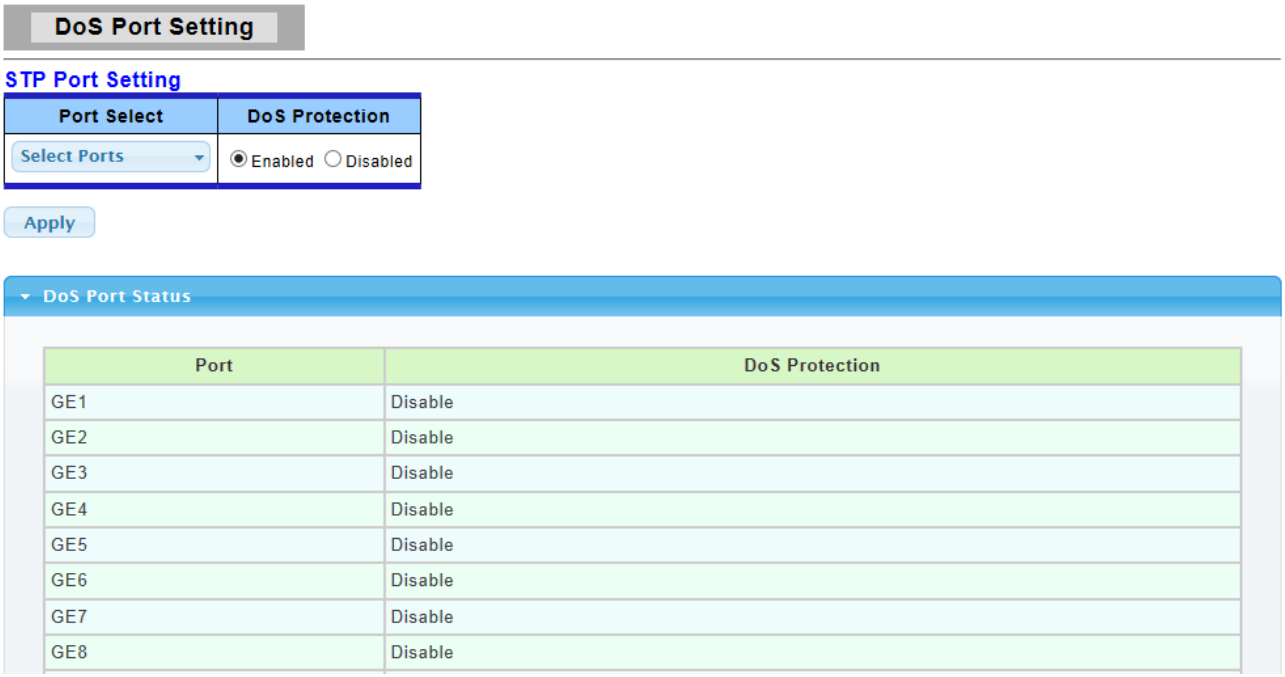
The following table describes the labels in this screen.

LABEL	DESCRIPTION
DMAC = SMAC	Both the source and the destination MAC addresses are the same. ■ **Disabled**: Disable the item DoS setting. ■ **Enabled**: Enable the item DoS setting.
Land	Both the source and the destination IPv4/IPv6 addresses are the same. ■ **Disabled**: Disable the item DoS setting. ■ **Enabled**: Enable the item DoS setting.

UDP Blat	Both the source and the destination UDP port are the same. ■ **Disabled**: Disable the item DoS setting. ■ **Enabled**: Enable the item DoS setting.
TCP Blat	Both the source and the destination TCP port are the same. ■ **Disabled**: Disable the item DoS setting. ■ **Enabled**: Enable the item DoS setting.
POD	Ping packets that length are larger than 65535 bytes. ■ **Disabled**: Disable the item DoS setting. ■ **Enabled**: Enable the item DoS setting.
IPv6 Min Fragment	IPv6 fragmented packets (not including the last one) that payload length less than 1240 bytes, and the Min length can be configured if needed. ■ **Disabled**: Disable the item DoS setting. ■ **Enabled**: Enable the item DoS setting.
ICMP Fragments	Fragmented ICMP packets. ■ **Disabled**: Disable the item DoS setting. ■ **Enabled**: Enable the item DoS setting.
IPv4 Ping Max Size	IPv4 PING packet with the length. ■ **Disabled**: Disable the item DoS setting. ■ **Enabled**: Enable the item DoS setting.
Ipv6 Ping Max Size	IPv6 PING packet with the length. ■ **Disabled**: Disable the item DoS setting. ■ **Enabled**: Enable the item DoS setting.
Ping Max Size Setting	Ping packet Max Size Setting. The default value is 512 Bytes, it can be configured if needed.
Smurf Attack	ICMP echo request packet that destination IPv4 address is broadcast address. The default Netmask length is 0, and it can be configured if needed. ■ **Disabled**: Disable the item DoS setting. ■ **Enabled**: Enable the item DoS setting.
TCP Min Hdr Size	TCP packet that header length is less than the configured value. The default TCP Min Hdr Size is 20, it can be configured if needed. ■ **Disabled**: Disable the item DoS setting. ■ **Enabled**: Enable the item DoS setting.
TCPSYN(SPORT< 1024)	TCP SYN packets with source port less than 1024. ■ **Disabled**: Disable the item DoS setting. ■ **Enabled**: Enable the item DoS setting.
Null Scan Attack	TCP sequence number is zero, and all control flags are zeroes. ■ **Disabled**: Disable the item DoS setting. ■ **Enabled**: Enable the item DoS setting.
X-Mas Scan Attack	TCP sequence number is zero, and the FIN/URG/PSH flags are set. ■ **Disabled**: Disable the item DoS setting. ■ **Enabled**: Enable the item DoS setting.
TCP SYN-FIN Attack	A TCP packet with the SYN and FIN flags set. ■ **Disabled**: Disable the item DoS setting. ■ **Enabled**: Enable the item DoS setting.
TCP SYN-RST Attack	A TCP packet with the SYN and RST flags set. ■ **Disabled**: Disable the item DoS setting. ■ **Enabled**: Enable the item DoS setting.
TCP Fragment(Offset=1)	Fragmented TCP packets. ■ **Disabled**: Disable the item DoS setting. ■ **Enabled**: Enable the item DoS setting.
Apply	Click **Apply** to save your changes to the Switch.

3.5.3.2 DoS Port Setting

Click **Security** > **DoS** > **DoS Port Setting** to display the configuration screen as shown.



The following table describes the labels in this screen.

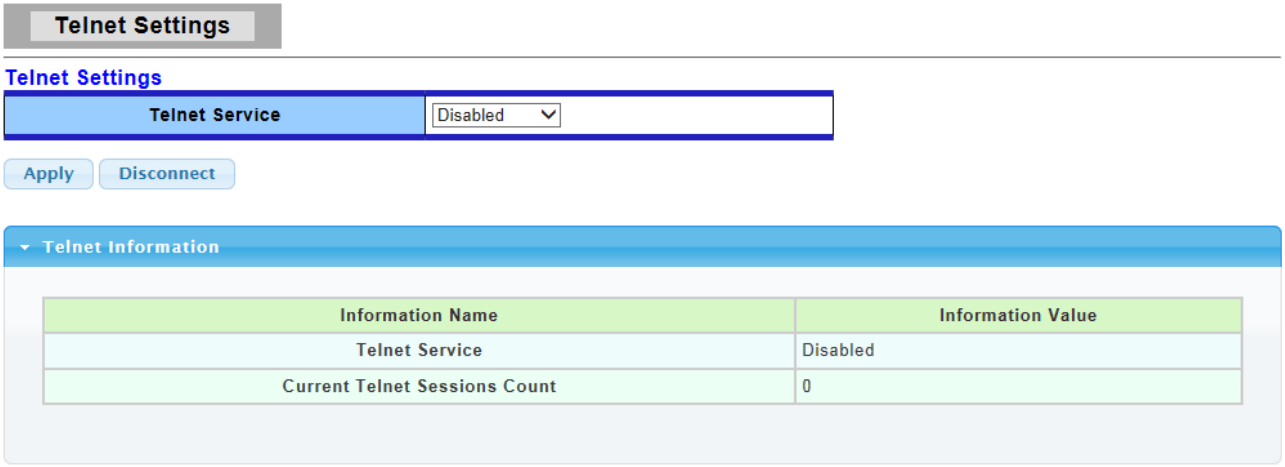
LABEL	DESCRIPTION
Port Select	Select one or multiple ports to configure.
DoS Protection	Configure port protect state ■ **Disabled**: Disable port DoS Protection function. ■ **Enabled**: Enable port DoS Protection function.
Apply	Click **Apply** to save your changes to the Switch.

3.5.4 Access

3.5.4.1 Telnet

Telnet is the TCP/IP standard protocol for remote terminal service. TELNET allows a user at one site to interact with a remote timesharing system at another site as if the user's keyboard and display connected directly to the remote machine.

To display Telnet web page, click **Security** > **Access** > **Telnet**



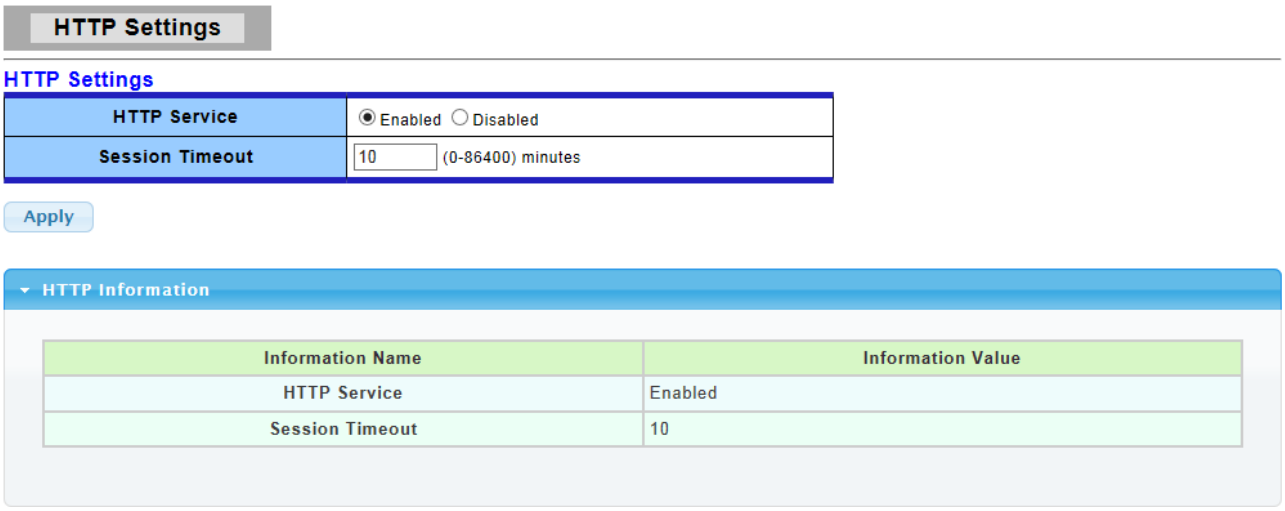
The following table describes the labels in this screen.

LABEL	DESCRIPTION
Telnet Service	Set Enabled to access telnet service or Disabled not to access telnet service.
Disconnect	Click **Disconnect** to disconnect Telnet connection.
Apply	Click **Apply** to save your changes to the Switch.

3.5.4.2 HTTP

HTTP is the acronym of Hyper Text Transfer Protocol.

To display HTTP web page, click **Security** > **Access** > **HTTP**



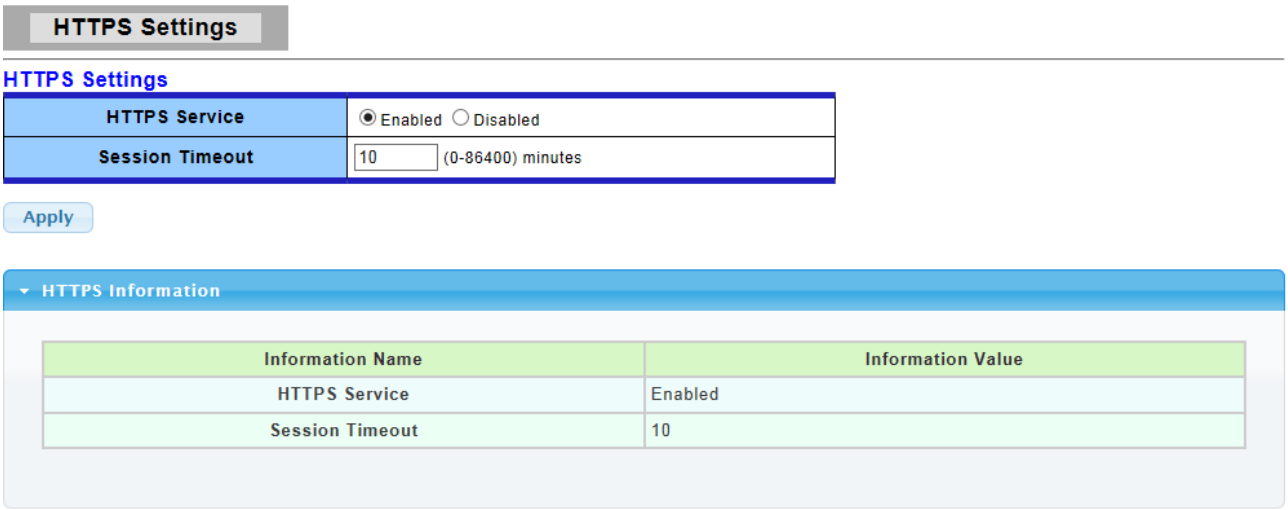
The following table describes the labels in this screen.

LABEL	DESCRIPTION
HTTP Service	Support HTTP service **Enable**: Enable HTTP service. **Disable**: Disable HTTP service.

Session Timeout	Set session timeout minutes for user access WEB from HTTP protocol. If user does not response after session timeout minute, WEBUI will logout automatically. 0 minutes means never timeout.
Apply	Click **Apply** to save your changes to the Switch.

3.5.4.3 HTTPS

HTTPS is the acronym of Hypertext Transfer Protocol over Secure Socket Layer.
To display HTTPS web page, click **Security** > **Access** > **HTTPS**



The following table describes the labels in this screen.

LABEL	DESCRIPTION
HTTP Service	Support HTTP service **Enable**: Enable HTTP service. **Disable**: Disable HTTP service.
Session Timeout	Set session timeout minutes for user access WEB from HTTPS protocol. If user does not response after session timeout minute, WEBUI will logout automatically. 0 minutes means never timeout.
Apply	Click **Apply** to save your changes to the Switch.

3.6 QoS

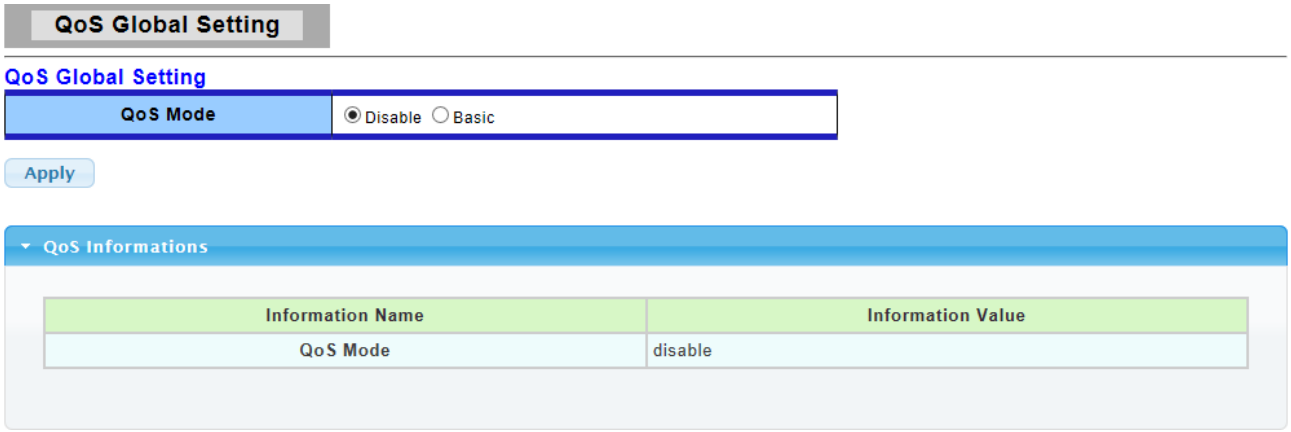
Use the QoS pages to configure settings for the switch QoS interface and how the switch connects to a remote server to get services.

3.6.1 General

3.6.1.1 QoS Properties

Use the QoS general pages to configure settings for both basic and advanced modes.

Click **QoS** > **General** > **QoS Properties** in the navigation panel to display the screen as shown below.

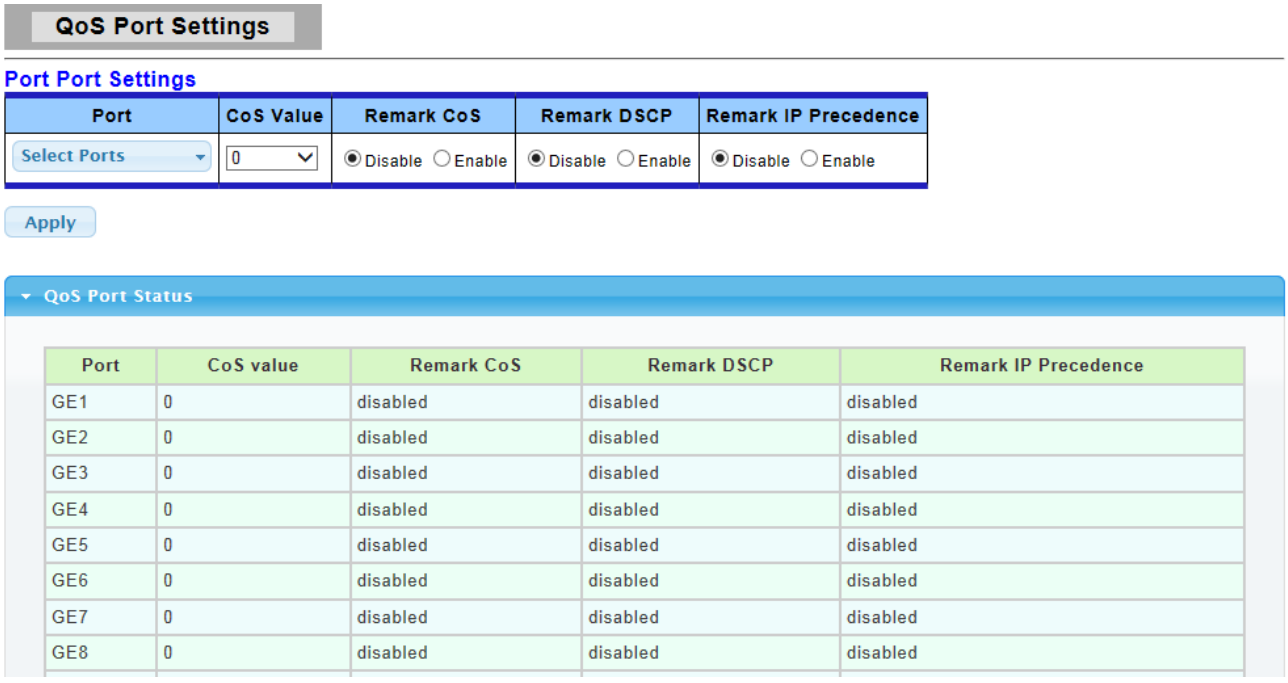


The following table describes the labels in this screen.

LABEL	DESCRIPTION
QoS Mode	Select the QoS operation mode. ■ **Disable**: Disable QoS ■ **Basic**: Set QoS to basic mode
Apply	Click **Apply** to save your changes to the switch.

3.6.1.2 Port Settings

Click **QoS** > **General** > **Port Settings** in the navigation panel to display the screen as shown below.

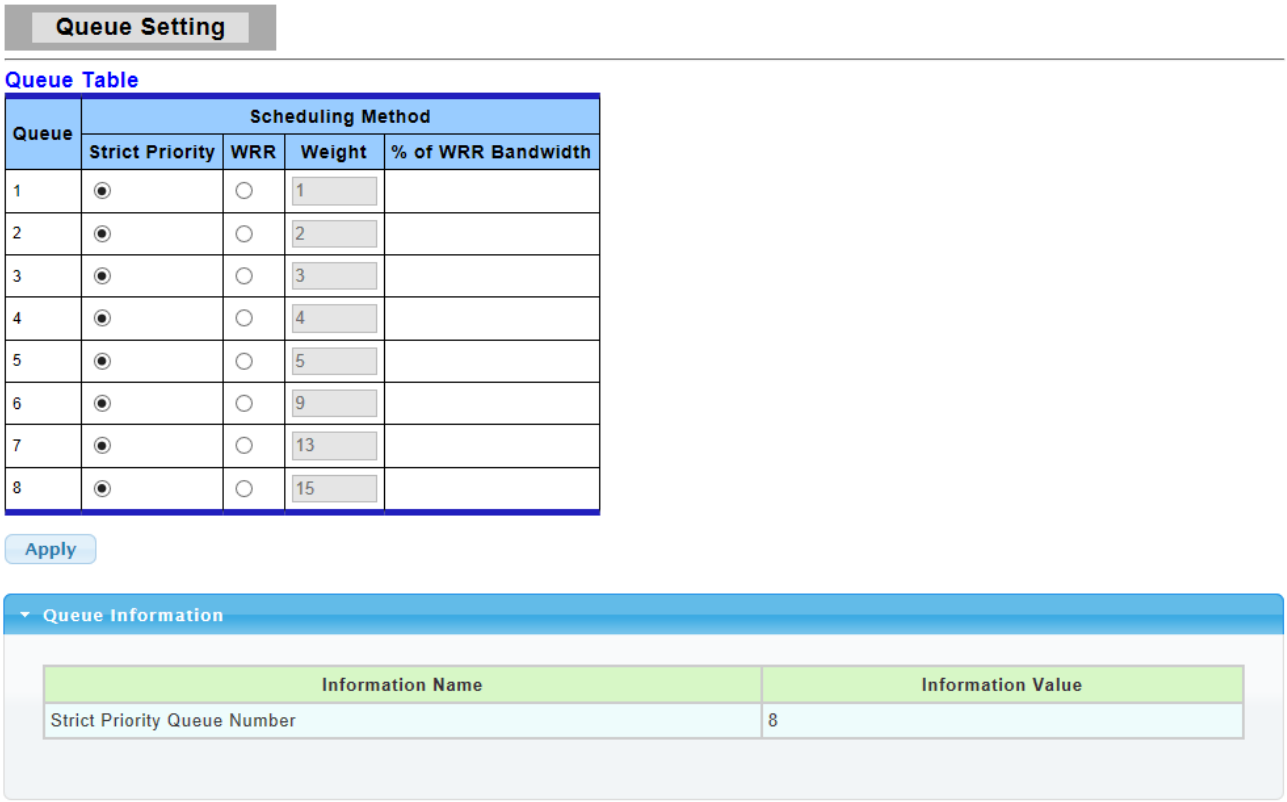


The following table describes the labels in this screen.

LABEL	DESCRIPTION
Port	Select one or multiple ports to configure
CoS Value	Set default CoS/802.1p priority value for the selected ports
Remark CoS	Enable/Disable CoS remark
Remark DSCP	Enable/Disable DSCP remark
Remark IP Precedence	Enable/Disable IP Precedence remark
Apply	Click **Apply** to save your changes to the switch.

3.6.1.3 Queue Settings

Click **QoS** > **General** > **Queue Settings** in the navigation panel to display the screen as shown below.



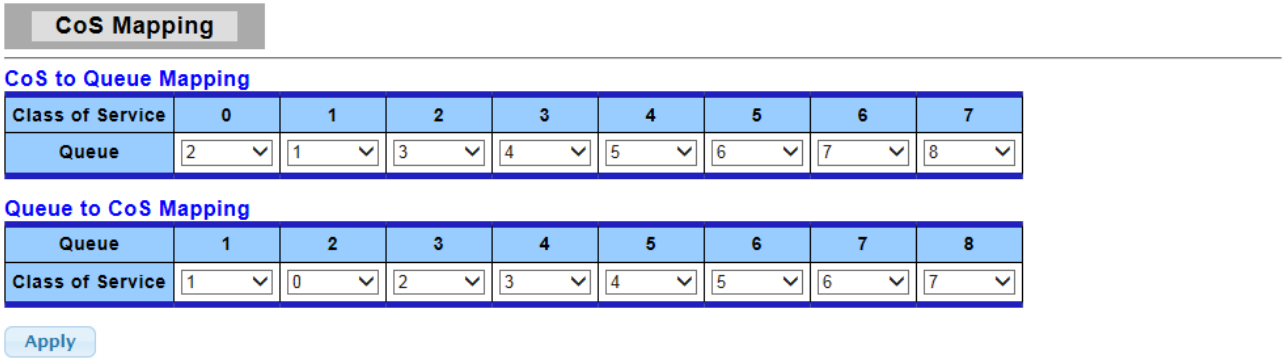
The following table describes the labels in this screen.

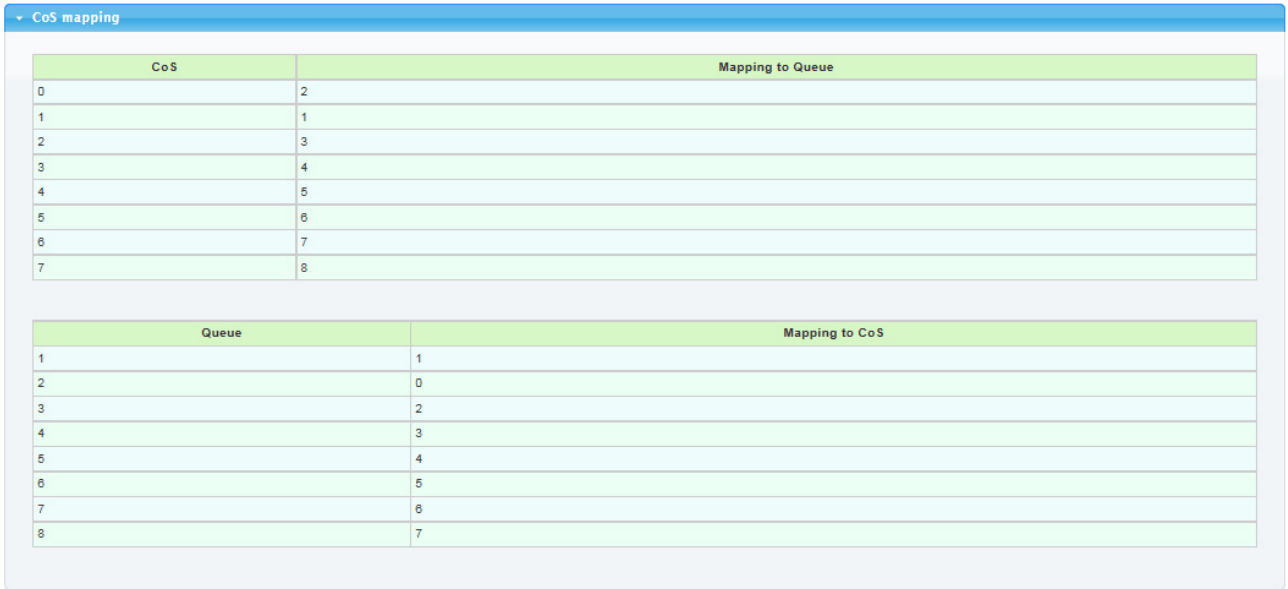
LABEL	DESCRIPTION
Queue	Queue ID to configure
Strict Priority	Set queue to strict priority type
WRR	Set queue to Weight round robin type
Weight	If the queue type is WRR, set the queue weight for the queue.

Apply	Click **Apply** to save your changes to the switch.

3.6.1.4 CoS Mapping

Click **QoS** > **General** > **CoS Mapping** in the navigation panel to display the screen as shown below.



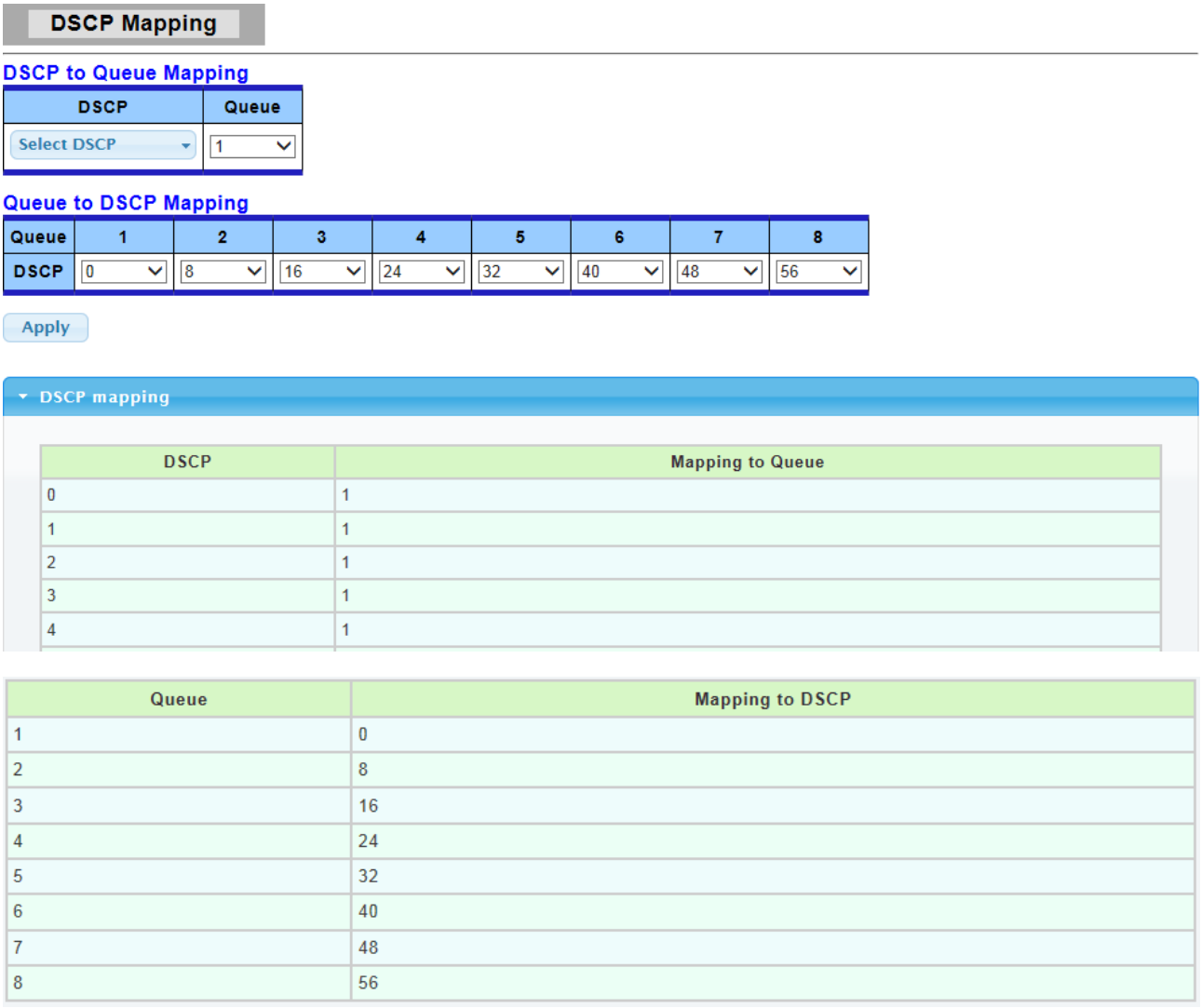


The following table describes the labels in this screen.

LABEL	DESCRIPTION
Class of service	Class of service value
Queue	Select queue ID for the CoS value
Apply	Click **Apply** to save your changes to the switch.
Queue	Queue ID
Class of service	Select CoS Value for the Queue ID

3.6.1.5 DSCP Mapping

Click **QoS** > **General** > **DSCP Mapping** in the navigation panel to display the screen as shown below.

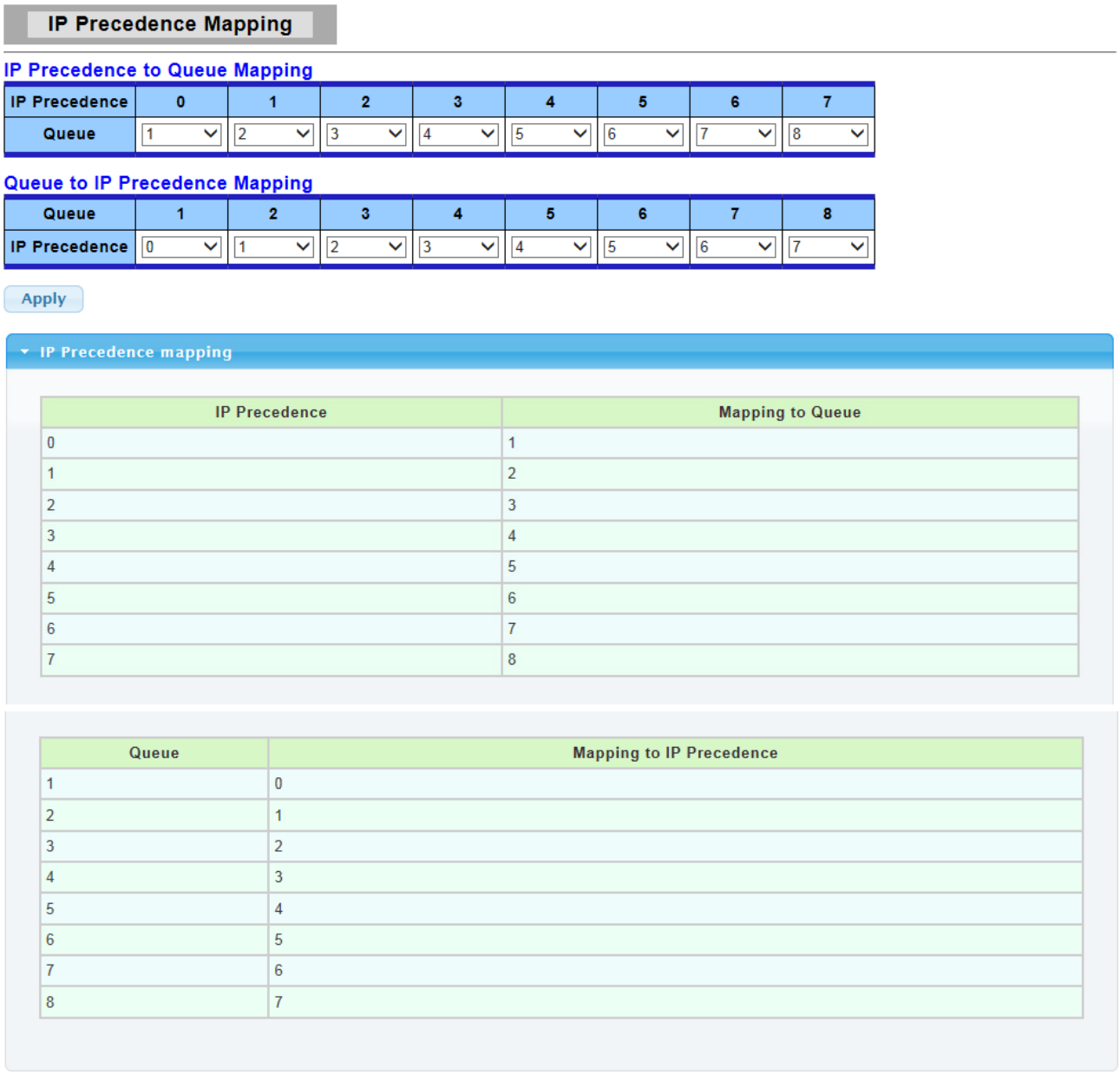


The following table describes the labels in this screen.

LABEL	DESCRIPTION
DSCP	Select the DSCP value to mapping to the priority and drop precedence. The DSCP range is 0 to 63.
Queue	Select queue ID for the DSCP value
Apply	Click **Apply** to save your changes to the switch.
Queue	Queue ID
DSCP	Select DSCP Value for the Queue ID

3.6.1.6 IP Precedence Mapping

Click **QoS** > **General** > **IP Precedence Mapping** in the navigation panel to display the screen as shown below.



The following table describes the labels in this screen.

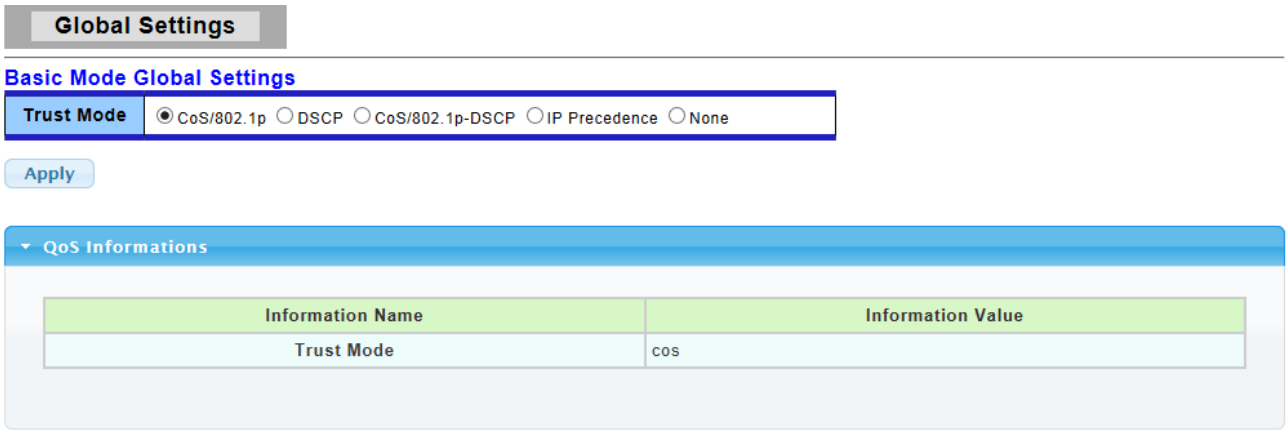
LABEL	DESCRIPTION
IP Precedence	IP Precedence value
Queue	Select queue ID for the IP Precedence value
Apply	Click **Apply** to save your changes to the switch.
Queue	Queue ID
IP Precedence	Select IP Precedence value for the queue ID

3.6.2 QoS Basic Mode

Use the QoS basic mode pages to configure settings for basic mode.

3.6.2.1 Global Settings

Click **QoS** > **QoS Basic Mode** > **Global settings** in the navigation panel to display the screen as shown below.

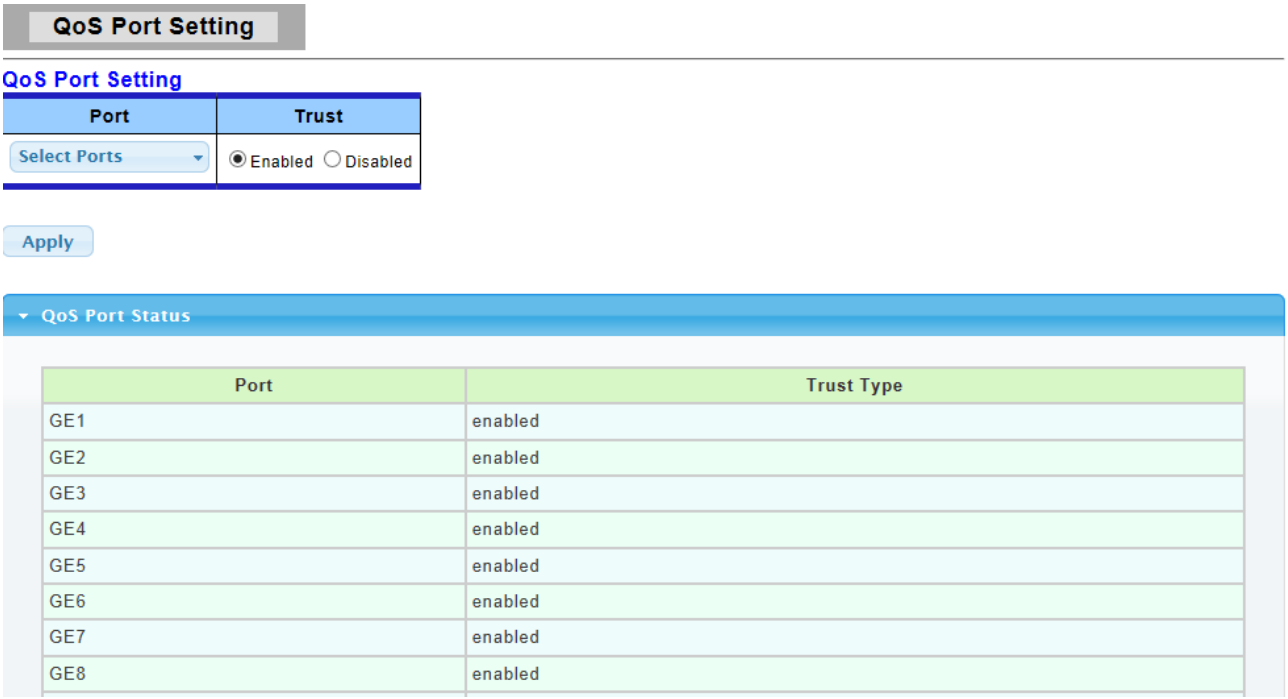


The following table describes the labels in this screen.

LABEL	DESCRIPTION
Trust Mode	Select the QoS operation mode. ■ **CoS/802.1p**: Traffic is mapped to queues based on the CoS field in the VLAN tag, or based on the per-port default CoS value if there is no VLAN tag on the incoming packet. ■ **DSCP**: All IP traffic is mapped to queues based on the DSCP field in the IP header. If traffic is not IP traffic, it is mapped to the lowest priority queue. ■ **CoS/802.1p-DSCP**: All IP traffic is mapped to queues based on the DSCP field in the IP header. If traffic is not IP but has VLAN tag, mapped to queues based on the CoS value in the VLAN tag. ■ **IP Precedence**: All IP traffic is mapped to queues based on the IP Precedence field in the IP header. If traffic is not IP traffic, it is mapped to the lowest priority queue. ■ **None**: All traffic is mapped to the lowest priority queue.
Apply	Click **Apply** to save your changes to the switch.

3.6.2.2 Port Settings

Click **QoS** > **QoS Basic Mode** > **Port settings** in the navigation panel to display the screen as shown below.



The following table describes the labels in this screen.

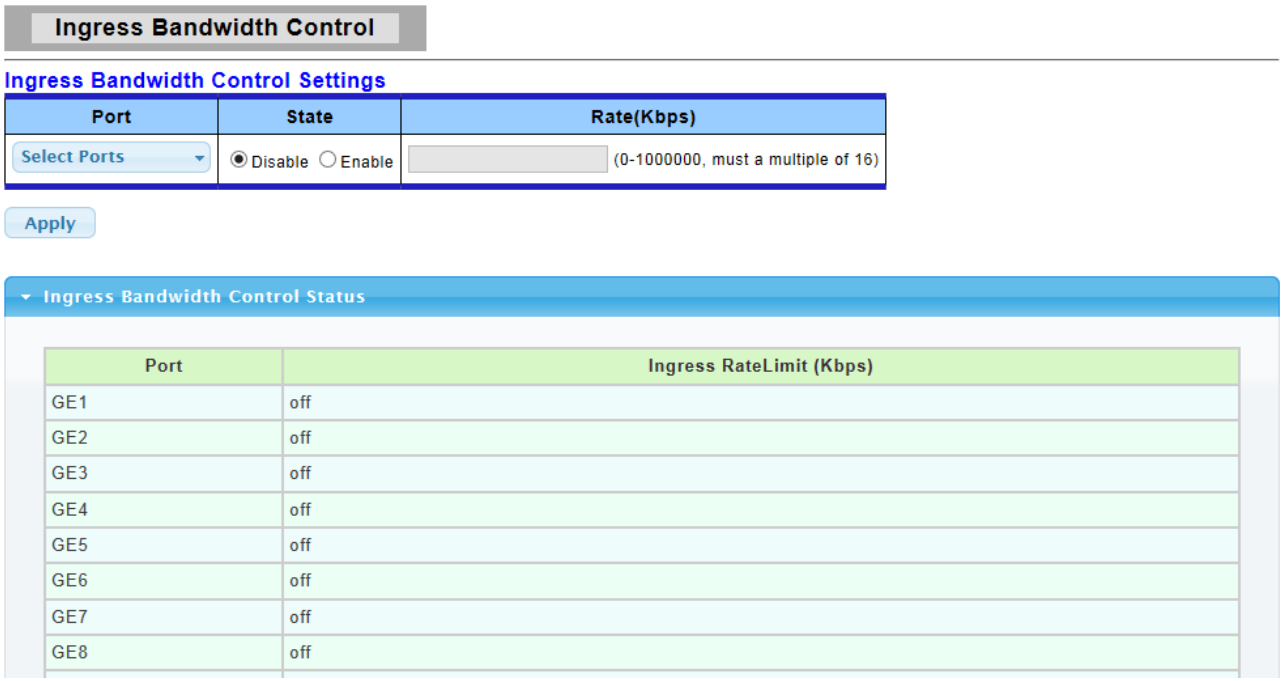
LABEL	DESCRIPTION
Port	Select one or multiple ports to configure
Apply	Click Apply to save your changes to the switch.
Trust	Select the port trust state. **Enabled**: Traffic from this port will follow the global trust type. **Disabled**: Traffic will always go to the lowest priority queue.

3.6.3 Rate Limit

Use the QoS basic mode pages to configure settings for basic mode.

3.6.3.1 Ingress Bandwidth Control Settings

Click **QoS** > **Rate Limit** > **Ingress Bandwidth Control Settings** in the navigation panel to display the screen as shown below.

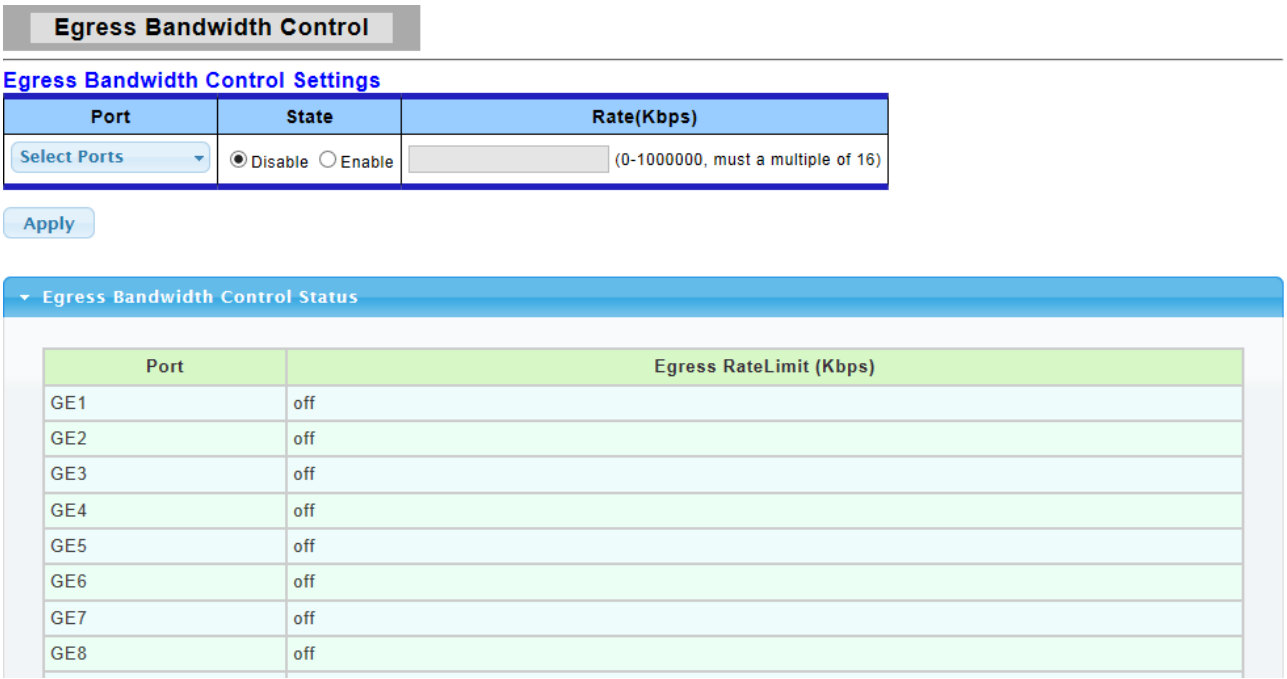


The following table describes the labels in this screen.

LABEL	DESCRIPTION
Port	Select one or multiple ports to configure
State	Enable/Disable ingress bandwidth control
Rate	Rate value,<0-1000000>,unit:16 Kbps
Apply	Click **Apply** to save your changes to the switch.

3.6.3.2 Egress Bandwidth Control Settings

Click **QoS** > **Rate Limit** > **Egress Bandwidth Control Settings** in the navigation panel to display the screen as shown below.

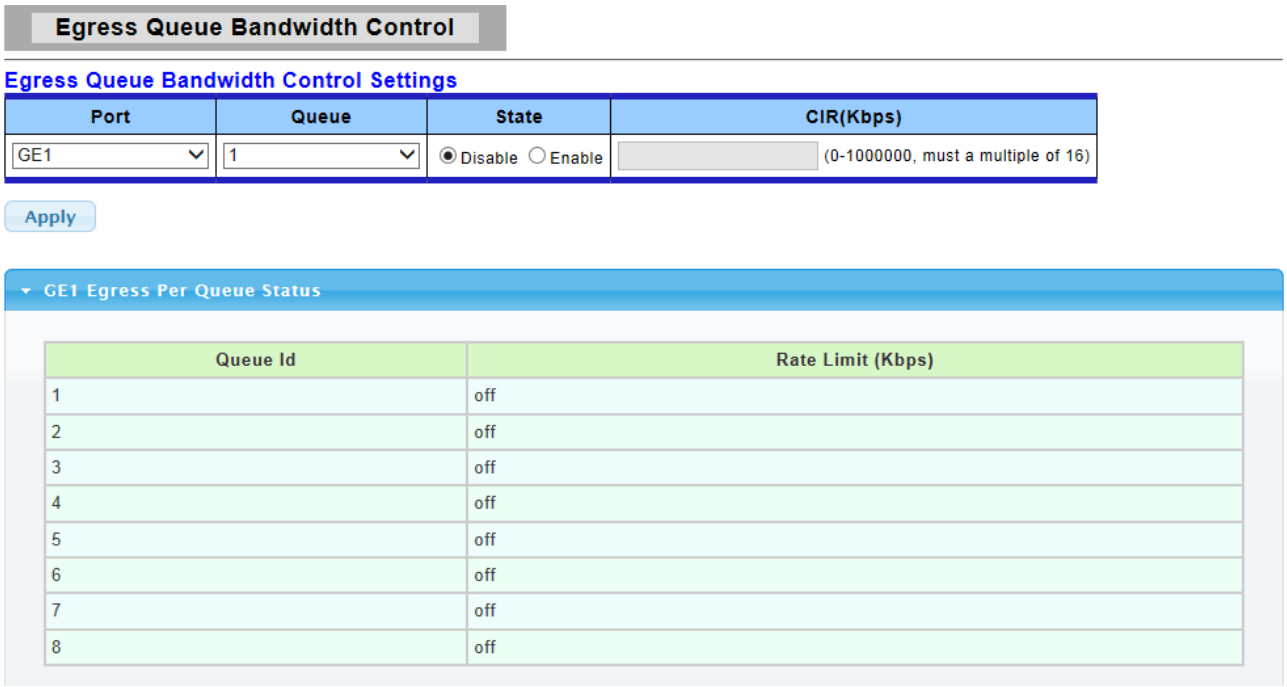


The following table describes the labels in this screen.

LABEL	DESCRIPTION
Port	Select one or multiple ports to configure
State	Enable/Disable ingress bandwidth control
Rate	Rate value,<0-1000000>,unit:16 Kbps
Apply	Click **Apply** to save your changes to the switch.

3.6.3.3 Egress Queue

Click **QoS** > **Rate Limit** > **Egress Queue** in the navigation panel to display the screen as shown below.



The following table describes the labels in this screen.

LABEL	DESCRIPTION
Port	Select one or multiple ports to configure
Queue	Select one queue to configure
State	Enable/Disable ingress bandwidth control
Rate	Rate value,<0-1000000>,unit:16 Kbps
Apply	Click **Apply** to save your changes to the switch.

3.7 Management

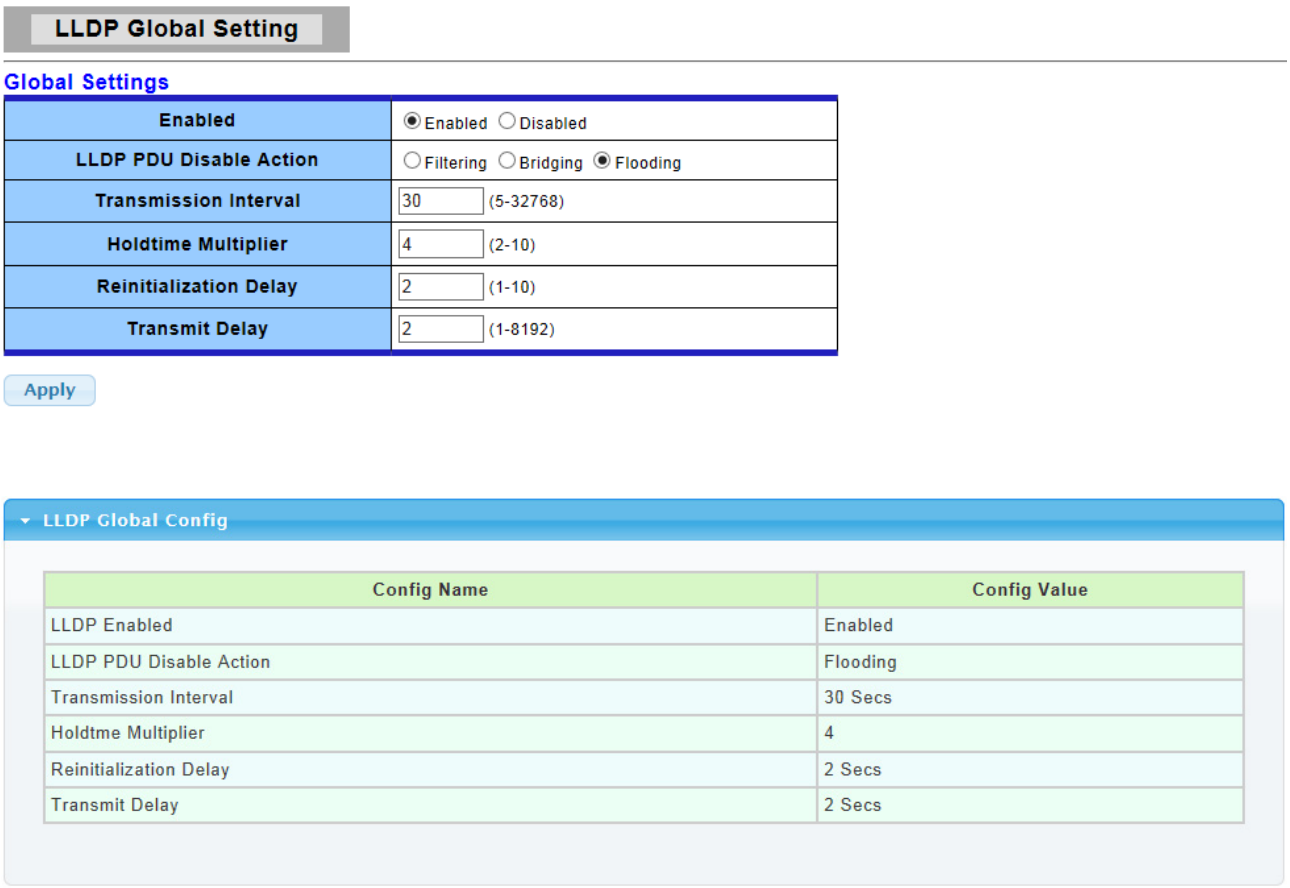
Use the Network pages to configure settings for the switch network interface and how the switch connects to a remote server to get services.

3.7.1 LLDP

LLDP is a one-way protocol; there are no request/response sequences. Information is advertised by stations implementing the transmit function, and is received and processed by stations implementing the receive function. The LLDP category contains LLDP and LLDP-MED pages.

3.7.1.1 LLDP Global Setting

Click **Management** > **LLDP** > **LLDP Global Setting** to display the screen as shown next.

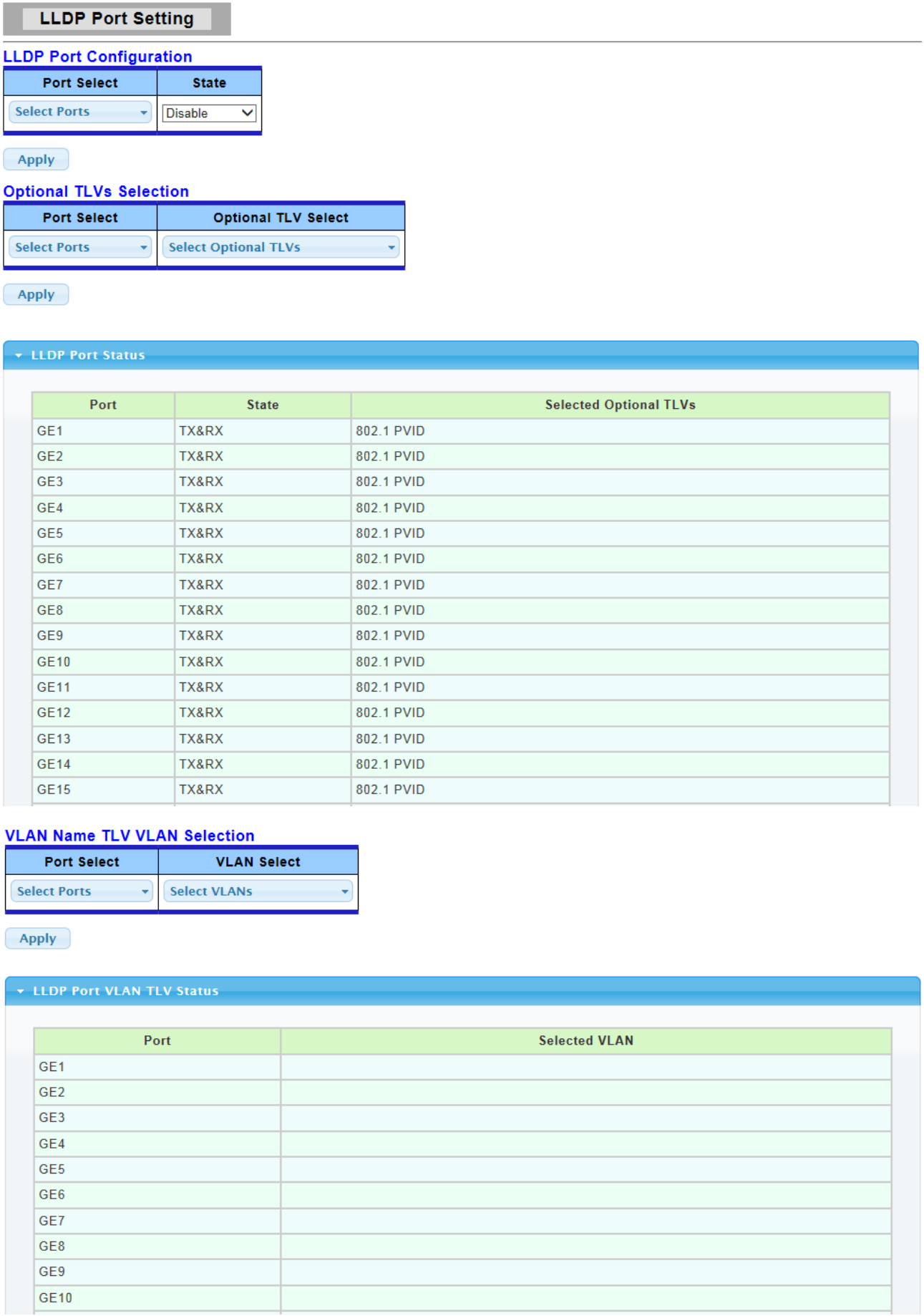


The following table describes the labels in this screen.

LABEL	DESCRIPTION
Enabled	Enable/ Disable LLDP protocol on this switch.
LLDP PDU Disable Action	Select LLDP PDU handling action to be filtered, bridging or flooded when LLDP is globally disabled.
Transmission Interval	Select the interval at which frames are transmitted. The default is 30 seconds, and the valid range is 5–32768 seconds.
Holdtime Multiplier	Select the multiplier on the transmit interval to assign to TTL (range 2–10, default = 4).
Reinitialization Delay	Select the delay before a re-initialization (range 1–10 seconds, default = 2).
Transmit Delay	Select the delay after an LLDP frame is sent (range 1–8192 seconds, default = 3).
Apply	Click **Apply** to save your changes to the switch.

3.7.1.2 LLDP Port Setting

Click **Management** > **LLDP** > **LLDP Port Setting** to display the screen as shown next.



The following table describes the labels in this screen.

LABEL	DESCRIPTION
Port Select	Select specified port or all ports to configure LLDP state.
State	Select the transmission state of LLDP port interface. ■ **Disable**: Disable the transmission of LLDP PDUs. ■ **RX Only**: Receive LLDP PDUs only. ■ **TX Only**: Transmit LLDP PDUs only. ■ **TX And RX**: Transmit and receive LLDP PDUs both.
Apply	Click **Apply** to save your changes to the switch.
Port Select	Select specified port or all ports to configure optional TLVs.
Optional TLV Select	Select the LLDP optional TLVs to be carried (multiple selection is allowed). ■ **System Name** ■ **Port Description** ■ **System Description** ■ **System Capability** ■ **802.3 MAC-PHY** ■ **802.3 Link Aggregation** ■ **802.3 Maximum Frame Size** ■ **Management Address** ■ **802.1 PVID**
Apply	Click **Apply** to save your changes to the switch.
Port Select	Select specified port or all ports to configure VLAN Name.
VLAN Select	Select the VLAN Name ID to be carried (multiple selection is allowed).
Apply	Click **Apply** to save your changes to the switch.

3.7.1.3 LLDP Local Device

Use the LLDP Local Device page to view LLDP local device information. Click "detail" button on the page to view detail information of the selected port.

Click **Management** > **LLDP** > **LLDP Local Device** to display the screen as shown next.

LLDP Local Device

Local Device Summary

Chassis ID Subtype	MAC Address
Chassis ID	00:E0:4C:00:00:00
System Name	Switch
System Description	switch
Capabilities Supported	Bridge
Capabilities Enabled	Bridge
Port ID Subtype	Interface name

Port Status

Detail

	Interface	LLDP Status
○	GE1	TX & RX
○	GE2	TX & RX
○	GE3	TX & RX
○	GE4	TX & RX
○	GE5	TX & RX
○	GE6	TX & RX
○	GE7	TX & RX
○	GE8	TX & RX
○	GE9	TX & RX
○	GE10	TX & RX
○	GE11	TX & RX
○	GE12	TX & RX
○	GE13	TX & RX
○	GE14	TX & RX

LLDP Port Detail Local Information

Back

Global	
Chassis ID Subtype	MAC address
Chassis ID	00:E0:4C:00:00:00
System Name	Switch
System Description	switch
Supported System Capabilities	Bridge
Enabled System Capabilities	Bridge
Port ID Subtype	Interface name
Port ID	gi1
Port Description	
Management Address	192.168.1.1

MAC/PHY Details	
Auto-Negotiation Supported	N/A
Auto-Negotiation Enabled	N/A
Auto-Negotiation Advertised Capabilities	N/A
Operational MAU Type	N/A

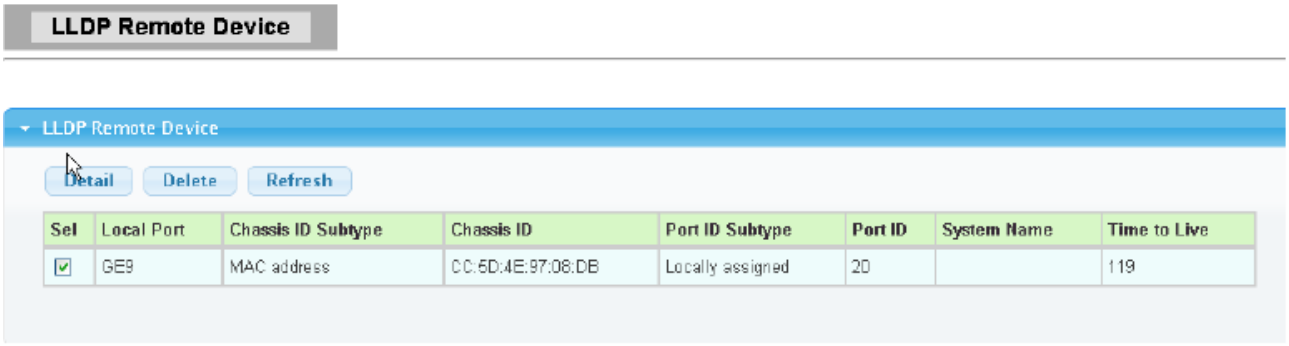
802.3 Details	
802.3 Maximum Frame Size	N/A

802.3 Link Aggregation	
Aggregation Capability	N/A
Aggregation Status	N/A
Aggregation Port ID	N/A

802.1 VLAN and Protocol	
PVID	1
VLAN Names	N/A

3.7.1.4 LLDP Remote Device

Click **Management** > **LLDP** > **LLDP Remote Device** to display the screen as shown next.



Use the LLDP Remote Device page to view LLDP neighbors information. Click “detail” to view selected neighbor detail information.

LLDP Remote Device Detail Information

LLDP Port Detail Remote Information

Back

Port Details	
Local Port	GE9
Entry Index	0

Basic Details	
Chassis ID Subtype	MAC address
Chassis ID	CC:5D:4E:87:08:DB
Port ID Subtype	Locally assigned
Port ID	20
Port Description	Port #20
System Name	
System Description	V1.00(AAAX.2) 2012-11-08T08:52:00+01:00
Supported System Capabilities	Bridge
Enabled System Capabilities	Bridge
Management Address	192.168.1.1

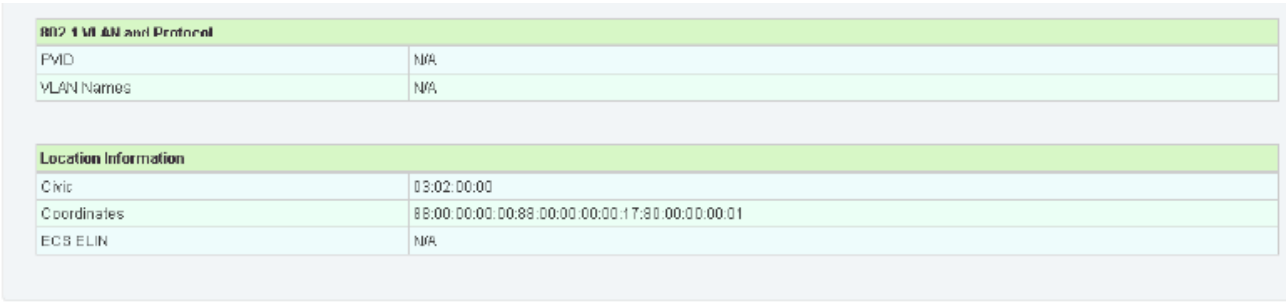
MAC/PHY Details	
Auto-Negotiation Supported	TRUE
Auto-Negotiation Enabled	TRUE
Auto-Negotiation Advertised Capabilities	10BASE-T half duplex, 10BASE-T full duplex, 100BASE-TX half duplex, 100BASE-TX full duplex, 1000BASE-T full duplex
Operational MAU Type	1000BASE-T full duplex mode

802.3 Power via MDI	
MDI Power Support Port Class	N/A
PSE MDI Power Support	N/A
PSE MDI Power State	N/A
PSE Power Pair Control Ability	N/A
PSE Power Pair	N/A
PSE Power Class	N/A

802.3 Details	
802.3 Maximum Frame Size	N/A

802.3 Link Aggregation	
Aggregation Capability	N/A
Aggregation Status	N/A
Aggregation Port ID	N/A

MED Details	
Capabilities Supported	Capabilities, Network Policy, Location
Current Capabilities	Capabilities, Network Policy, Location
Device Class	Network Connectivity
PoE Device Type	N/A
PoE Power Source	N/A
PoE Powr Priority	N/A
PoE Powr Value	N/A
Hardware Revision	N/A
Firmware Revision	N/A
Software Revision	N/A
Serial Number	N/A
Manufacturer Name	N/A
Model Name	N/A
Asset ID	N/A



802.1 VLAN and Protocol	
PVID	N/A
VLAN Names	N/A

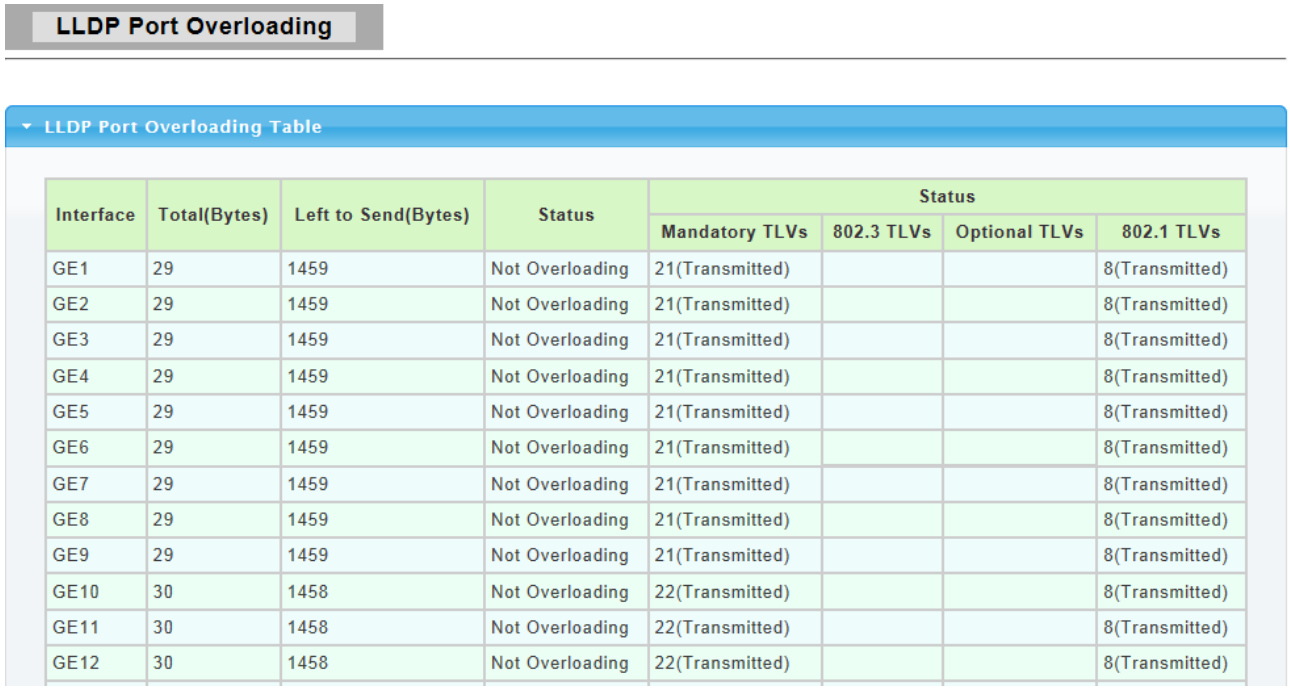
Location Information	
Civic	03:02:00:00
Coordinates	88:00:00:00:00:88:00:00:00:00:00:17:80:00:00:00:00:01
ECS ELIN	N/A

Network Policy Table

Application Type	VLAN ID	VLAN Type	User Priority	DSCP

3.7.1.5 LLDP Overloading

Click **Management** > **LLDP** > **LLDP Overloading** to display the screen as shown next.



LLDP Port Overloading

LLDP Port Overloading Table

Interface	Total(Bytes)	Left to Send(Bytes)	Status	Status			
				Mandatory TLVs	802.3 TLVs	Optional TLVs	802.1 TLVs
GE1	29	1459	Not Overloading	21(Transmitted)			8(Transmitted)
GE2	29	1459	Not Overloading	21(Transmitted)			8(Transmitted)
GE3	29	1459	Not Overloading	21(Transmitted)			8(Transmitted)
GE4	29	1459	Not Overloading	21(Transmitted)			8(Transmitted)
GE5	29	1459	Not Overloading	21(Transmitted)			8(Transmitted)
GE6	29	1459	Not Overloading	21(Transmitted)			8(Transmitted)
GE7	29	1459	Not Overloading	21(Transmitted)			8(Transmitted)
GE8	29	1459	Not Overloading	21(Transmitted)			8(Transmitted)
GE9	29	1459	Not Overloading	21(Transmitted)			8(Transmitted)
GE10	30	1458	Not Overloading	22(Transmitted)			8(Transmitted)
GE11	30	1458	Not Overloading	22(Transmitted)			8(Transmitted)
GE12	30	1458	Not Overloading	22(Transmitted)			8(Transmitted)

The following table describes the labels in this screen.

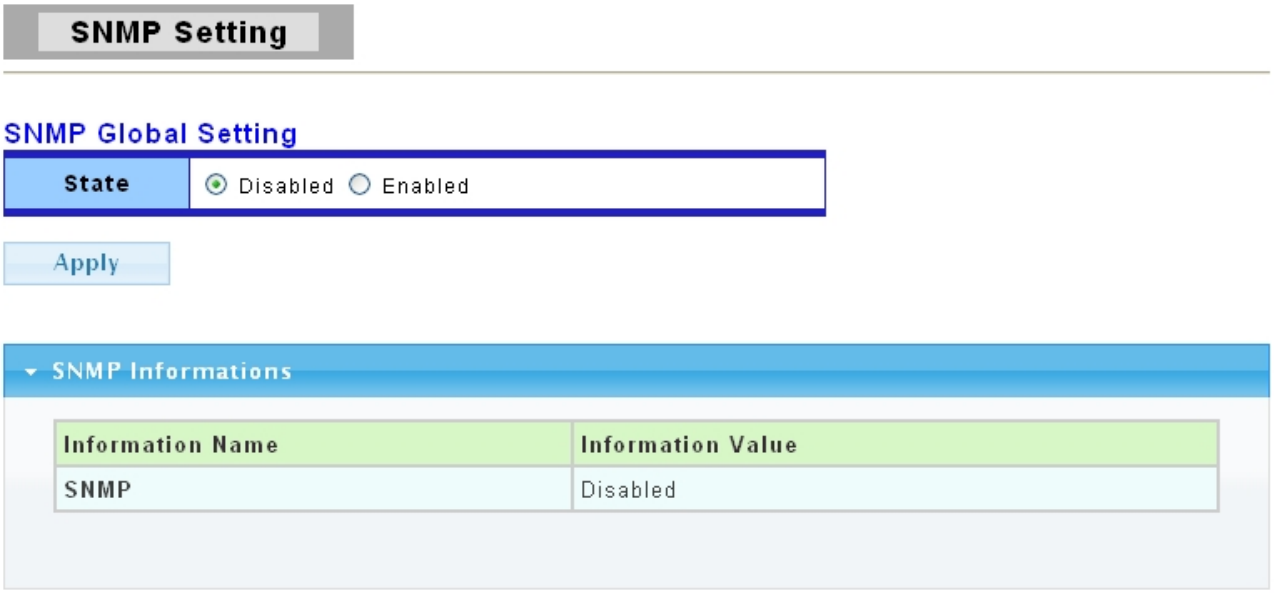
LABEL	DESCRIPTION
Interface	This label shows the port you are viewing.
Total (Bytes)	This field displays the total in bytes.
Left to Send (Bytes)	This field displays what is left to send in bytes.
Status	This field displays whether the Switch is overloading or not.

Mandatory TLVs	This field displays how many bytes used by mandatory TLVs.
802.3 TLVs	This field displays how many bytes used by 802.3 TLVs.
Optional TLVs	This field displays how many bytes used by optional TLVs.
802.1 TLVs	This field displays how many bytes used by 802.1 TLVs.

3.7.2 SNMP

3.7.2.1 SNMP Setting

Click **Management** > **SNMP**->**SNMP Setting** to display the screen as shown next.

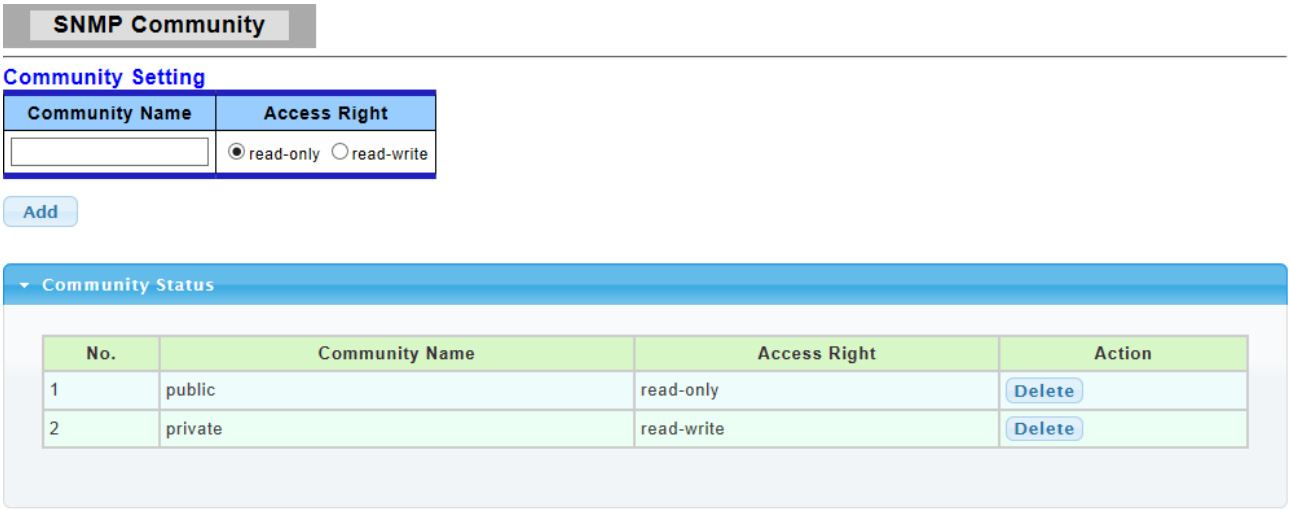


The following table describes the labels in this screen.

LABEL	DESCRIPTION
State	SNMP daemon state: Select **Enabled** to activate SNMP daemon. Select **Disabled** to not use SNMP daemon.
Apply	Click **Apply** to save your changes to the switch.

3.7.2.2 SNMP Community

Click **Management** > **SNMP**->**SNMP Community** to display the screen as shown next.



The following table describes the labels in this screen.

LABEL	DESCRIPTION
Community Name	Enter a Community string, this will act as a password for requests from the management station.
Access Right	SNMP community type: ■ **Read-Only:** Read all objects only, it can allow the SNMP manager using this string to collect information from the switch. ■ **Read-Write:** Read and write all objects, it can allow the SNMP manager using this string to create or edit MIBs (configure settings on the switch).
Add	Click **Add** to add any other community.
No	It displays the port number which in the community.
Community Name	This field displays the community strings.
Access Right	This field displays the community string's type. This will either be read-only or read-write.
Delete	Click **Delete** to remove any selected community strings.

3.7.2.3 SNMP Trap Host

This page allow user to add or delete SNMP trap receiver IP address and community name.

Click **Management** > **SNMP->SNMP Trap Host** to display the screen as shown next.

The following table describes the labels in this screen.

LABEL	DESCRIPTION
IP Address	Enter the IP addresses to send your SNMP traps to.
Community Name	Enter a Community string, which is the password sent with each trap to the SNMP manager.
Add	Click **Add** to add any trap receiver.
IP Address	This field displays the IP address where the traps from the switch are sent.
Community Name	This field displays the password which is sent with each trap to the SNMP manager.
Version	Indicates the SNMP trap supported version. Possible versions are: ■ **v1**: Set SNMP trap supported version 1. ■ **v2c**: Set SNMP trap supported version 2c.
Delete	Click **Delete** to remove any selected trap receiver entries.

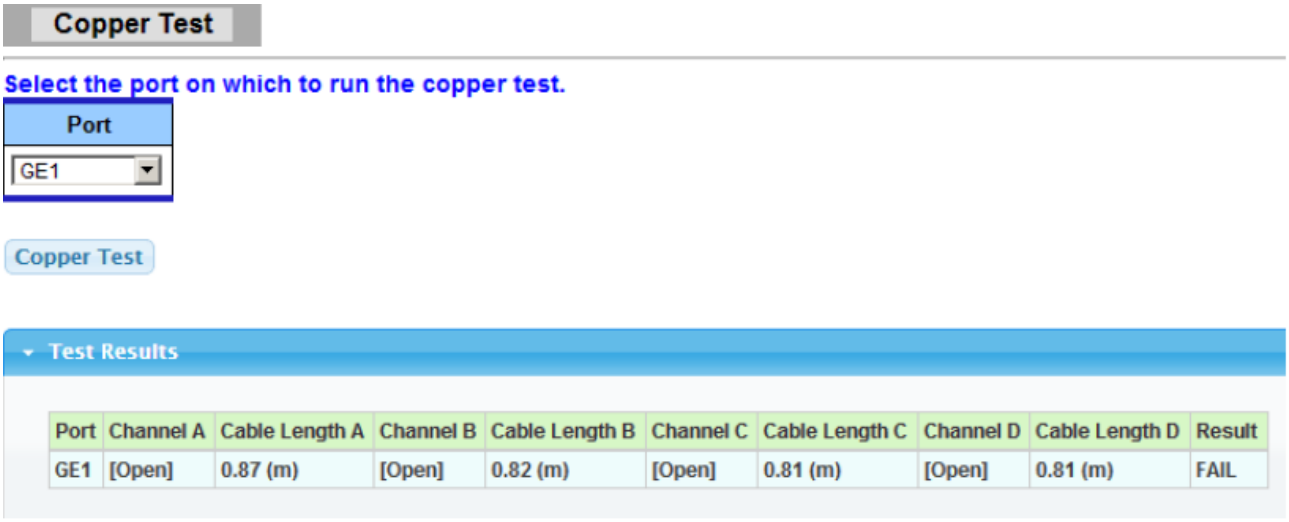
3.8 Diagnostics

Use the Diagnostics pages to configure settings for the switch diagnostics feature or operating diagnostic utilities.

3.8.1 Cable Diagnostics

3.8.1.1 Copper Test

Click **Diagnostics** > **Cable Diagnostics** > **Copper Test** to view the screen as shown next.

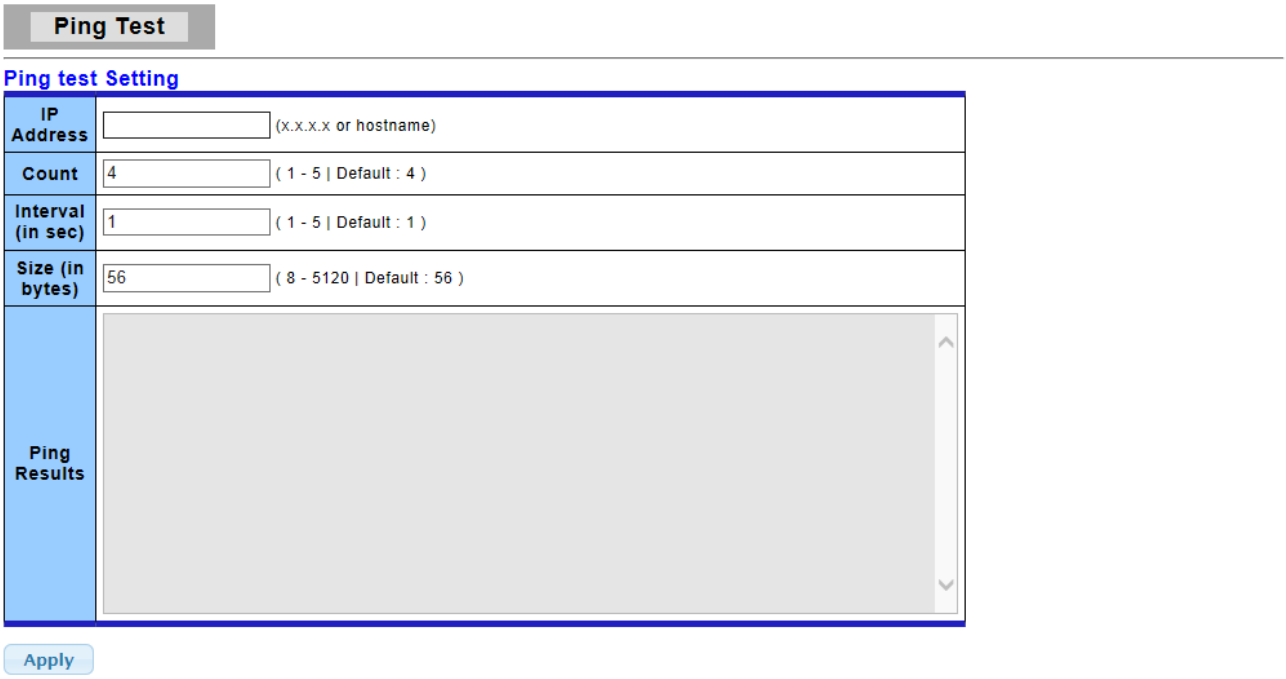


The following table describes the labels in this screen.

LABEL	DESCRIPTION
Port	The Selected Port ID.
Copper Test	Click **Copper** to start the test.

3.8.2 Ping Test

Click **Diagnostics** > **Ping Test** to view the screen as shown next.



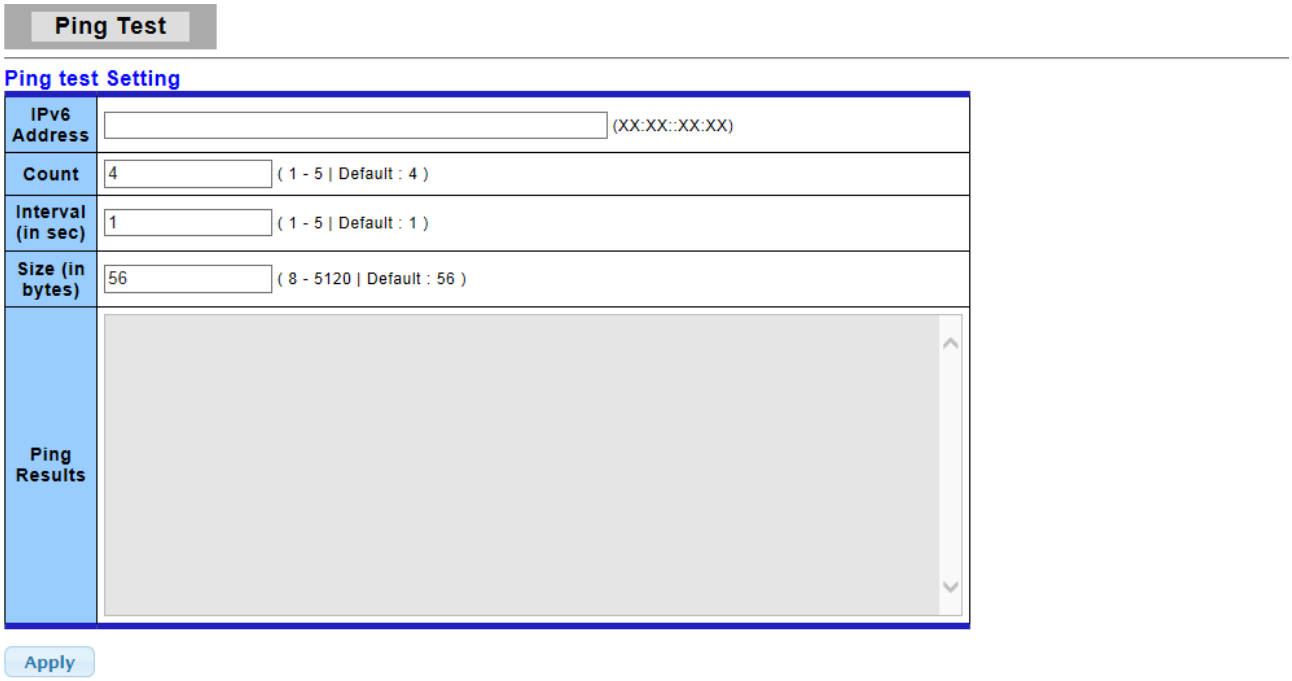
The following table describes the labels in this screen.

LABEL	DESCRIPTION

IP Address	Enter the IP addresses of the test destination.
Count	It displays how many times to send ping request packet. Enter a number between 1 and 5 as the count and the default configuration is 4.
Interval	It displays time interval between each ping request packet. Enter a number between 1 and 5 as the interval and the default configuration is 1.
Size	It displays the size of ping packet. Enter a number between 0 and 5120 as the size and the default configuration is 56.
Ping Results	After ping finished, results will show in this field.
Apply	Click **Apply** to save your changes to the switch.

3.8.3 IPv6 Ping Test

Click **Diagnostics** > **IPv6 Ping Test** to view the screen as shown next.



The following table describes the labels in this screen.

LABEL	DESCRIPTION
IPv6 Address	Enter the IPv6 addresses of the test destination.
Count	It displays how many times to send ping request packet. Enter a number between 1 and 5 as the count and the default configuration is 4.
Interval	It displays time interval between each ping request packet. Enter a number between 1 and 5 as the interval and the default configuration is 1.

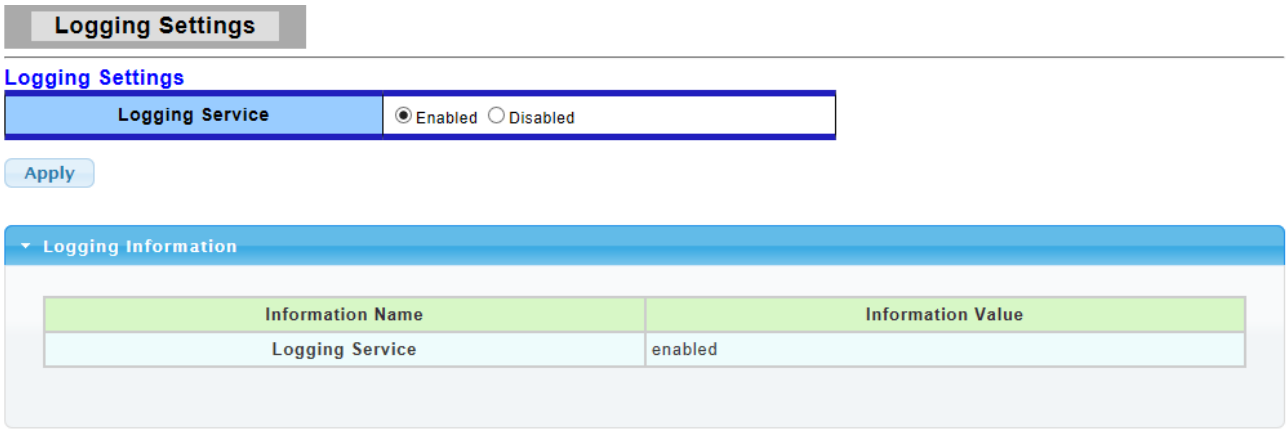
Size	It displays the size of ping packet. Enter a number between 0 and 5120 as the size and the default configuration is 56.
Ping Results	After ping finished, results will show in this field.
Apply	Click **Apply** to save your changes to the switch.

3.8.4 Logging Setting

3.8.4.1 Logging Service

Use this screen to display the switch logs.

Click **Diagnostics** > **Logging Setting** > **Logging Service** to view the screen as shown next.



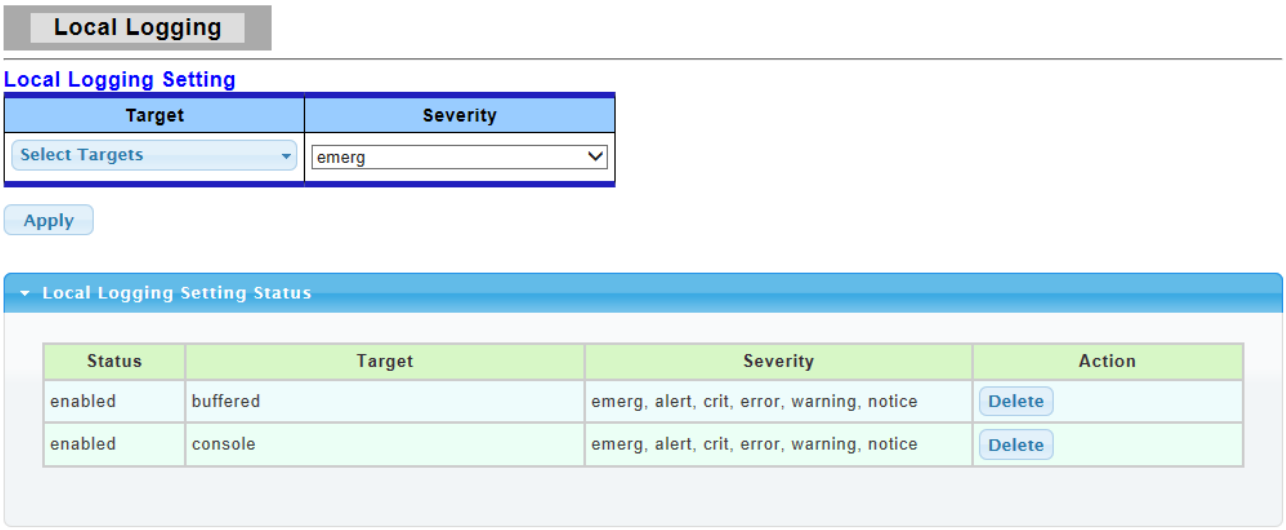
The following table describes the labels in this screen.

LABEL	DESCRIPTION
Logging Service	Enable / disable logging system
Apply	Click **Apply** to save your changes to the switch.

3.8.4.2 Local Logging

Use this screen to display the switch logs.

Click **Diagnostics** > **Logging Setting** > **Local Logging** to view the screen as shown next.



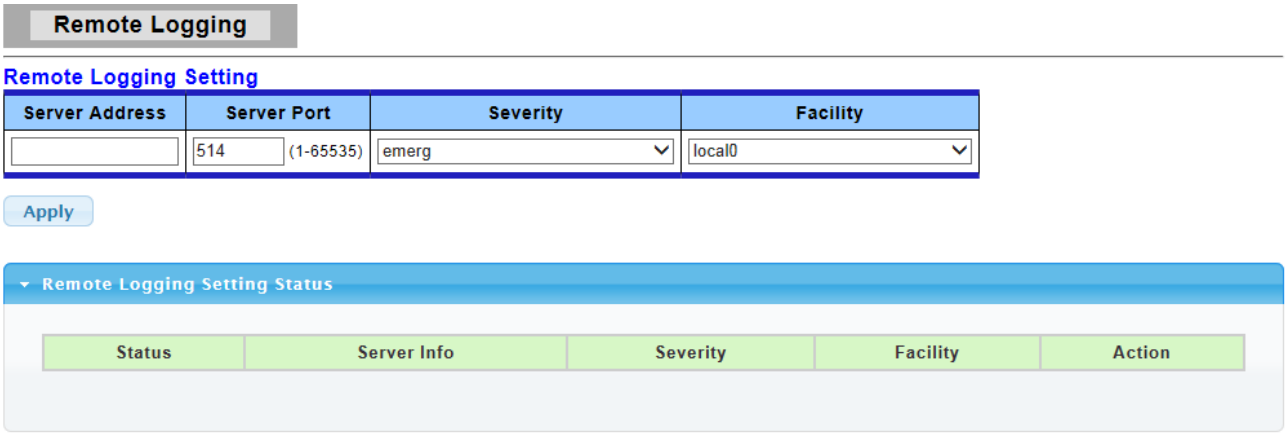
The following table describes the labels in this screen.

LABEL	DESCRIPTION
Target	Select the target to store log message **Buffered**: Store log messages in device buffer. All log messages will disappear after system reboot. **FLASH**: Store log messages in FLASH. All log messages will not disappear after system reboot.
Severity	Select severity of log messages which will be stored.
Apply	Click **Apply** to save your changes to the switch.
Status	It displays the status of local log settings.
Target	It displays the target you've chose.
Severity	It displays the severity status.
Delete	Click **Delete** to delete the target chose.

3.8.4.3 Remote Logging

This page allow user to configure remote logging server information

Click **Diagnostics** > **Logging Setting** > **Remote Logging** to view the screen as shown next.



The following table describes the labels in this screen.

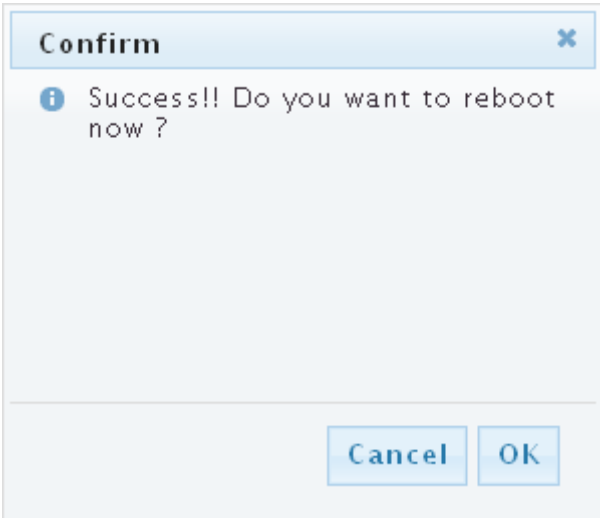
LABEL	DESCRIPTION
Server IP	The IP address of remote log server.
Server Port	Enter a number between 1 and 65535 as the server port.
Severity	Select severity of log messages which will be sent.
Facility	Select facility of log messages which will be sent.
Apply	Click **Apply** to save your changes to the switch.
Status	It displays the status of local log settings.
Server Info	It displays the server information.
Severity	It displays the severity status.
Facility	It displays the facility chose.
Action	It displays the action status.

3.8.5 Factory Default

Follow the steps below to restore the switch back to the factory defaults.

1. Click **Diagnostics**->**Factory Default** to view the screen as shown next.

2. Click the **Restore** button, then the **confirm** interface pops up.



3. Click **OK** to restore all switch configurations to the factory defaults and the switch will reboot.

3.8.6 Reboot Switch

Reboot allows you to restart the switch without physically turning the power off.

Follow the steps below to reboot the switch.

1. Click **Diagnostics**->**Reboot Switch** to view the screen as shown next.

2. Click **Reboot** button, then the following interface pops up.

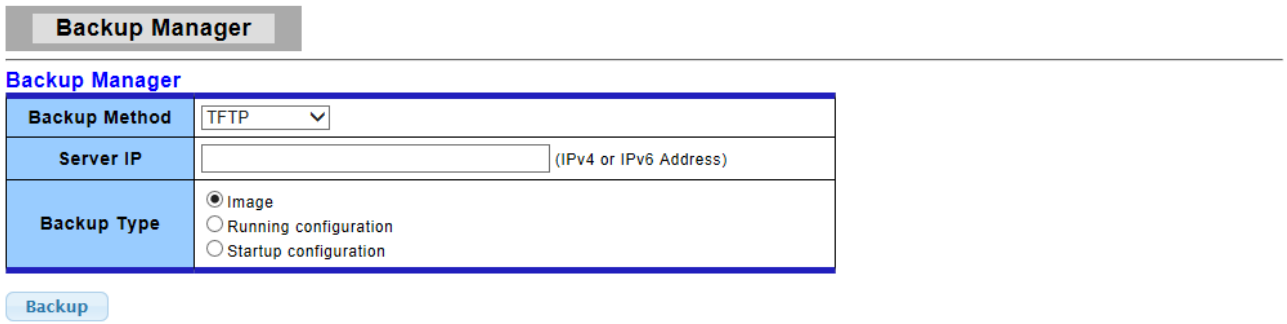
3. When it finished, the switch has been restarted.

3.9 Maintenance

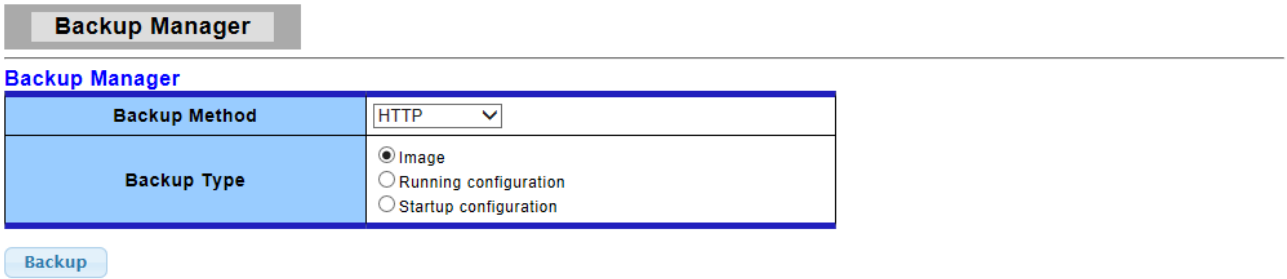
3.9.1 Backup Manager

This page allows user to backup the firmware image or configuration file on the switch to remote TFTP server or host file system through HTTP protocol.

Click **Maintenance** > **Backup Manager** to view the screen as shown next.



Backup files with TFTP Page



Backup files with HTTP Page

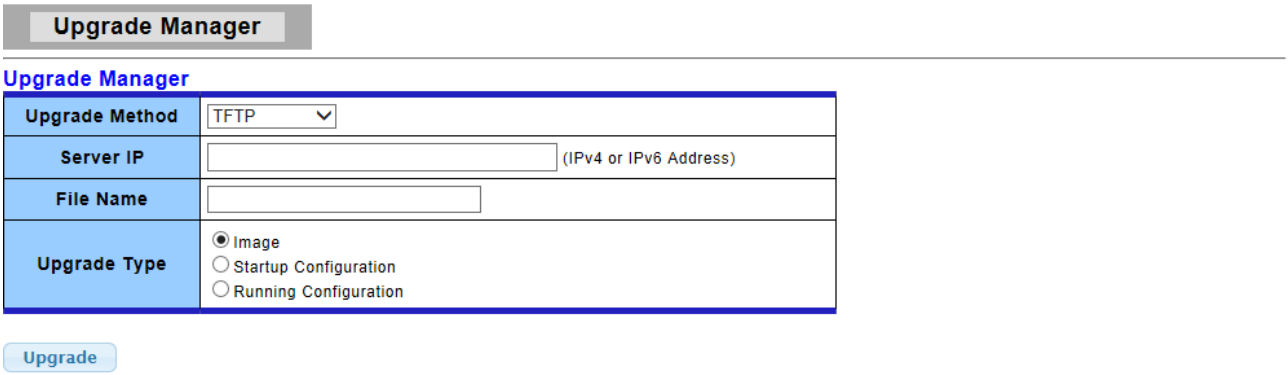
The following table describes the labels in this screen.

LABEL	DESCRIPTION
Backup Method	Select backup method: ■ **TFTP**: Use TFTP to backup. ■ **HTTP**: Use HTTP to backup.
Server IP	IP address of the TFTP server. If the TFTP backup method is selected, the IP address of the TFTP server must be assigned.
Backup Type	Select backup type: ■ **Image**: Firmware image of current system. ■ **Running Configuration**: Running Configuration file. ■ **Startup Configuration**: Startup Configuration file.
Backup	Click Backup to save the switch configuration/image to the local address specified.

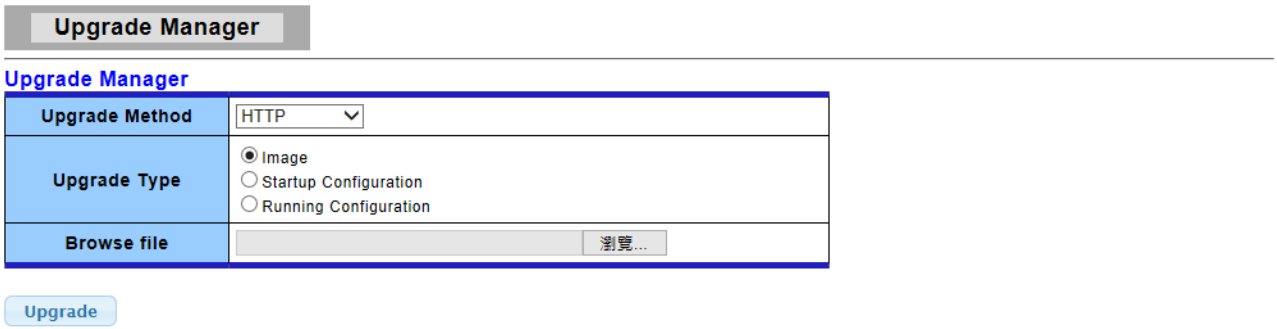
3.9.2 Upgrade Manager

This page allows user to upgrade new firmware image or configuration file to the switch from remote TFTP server or select file from web browser.

Click **Maintenance->Upgrade Manager** to view the screen as shown next.



Upgrade with TFTP Page



Upgrade with HTTP Page

The following table describes the labels in this screen.

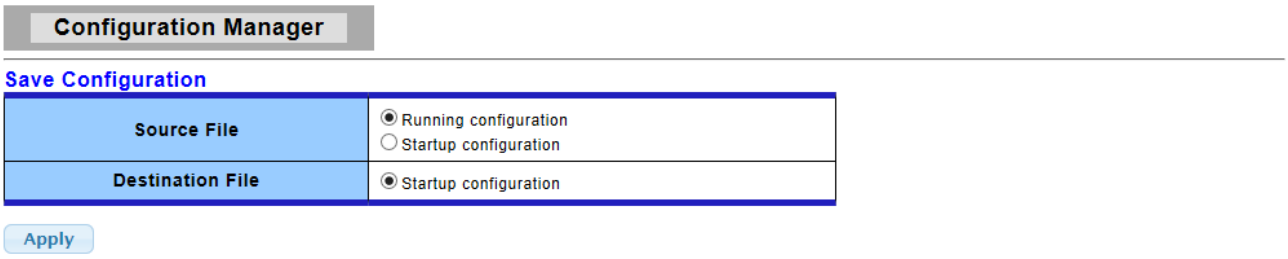
LABEL	DESCRIPTION
Upgrade Method	Select upgrade method: ■ **TFTP:** Use TFTP to upgrade.

	■ **HTTP:** Use HTTP to upgrade**.**
Server IP	IP address of the TFTP server. If the TFTP upgrade method is selected, the IP address of the TFTP server must be assigned.
File Name	Firmware image or configuration file name on remote TFTP server. If the TFTP upgrade method is selected, the file name must be specified.
Browse File	If the HTTP upgrade method is selected, the browse file field allows you to select any file on host operating system.
Upgrade Type	Select upgrade type: ■ **Image:** Firmware image of current system. ■ **Configuration:** Configuration file.
Upgrade	Click **Upgrade** to update the file specified above and install the new firmware.

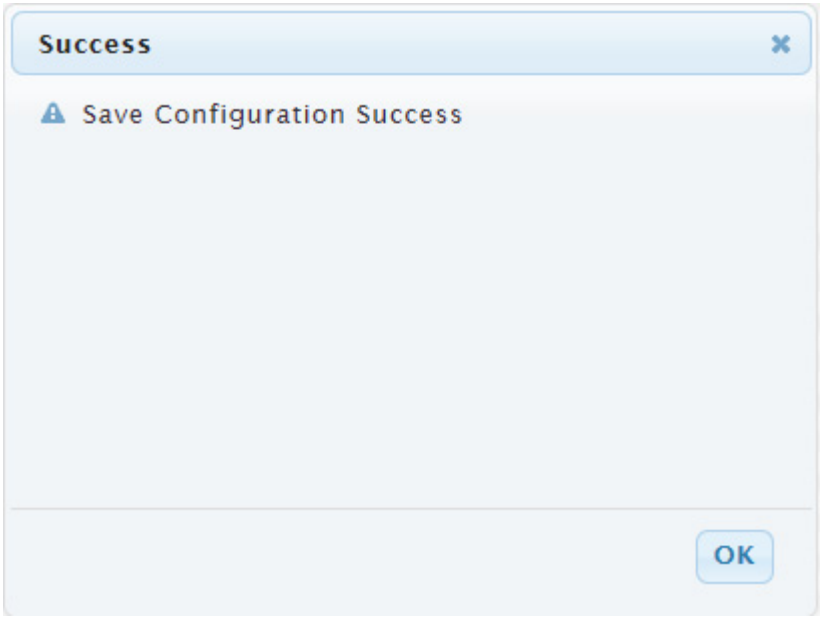
3.9.3 Configuration Manager

This page allows user to save either the running configuration or the startup configuration to the existing configuration file as the startup configuration.

Click **Maintenance**-> **Configuration Manager** to view the screen as shown next.



Configuration Manager Page



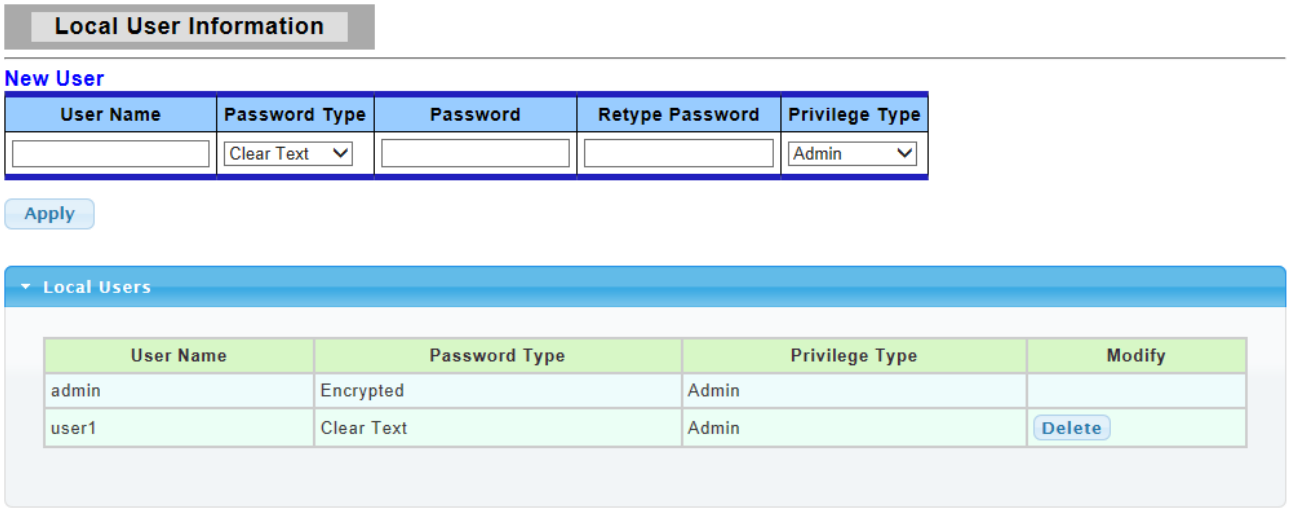
Configuration Manager Success Page

LABEL	DESCRIPTION
Source File	Select upgrade method ■ **Running configuration**: Running configuration file ■ **Startup configuration**: Startup configuration file
Destination File	Select Upgrade Type ■ **Startup Configuration**: Startup configuration file
Apply	Click **Apply** to save the running or the startup configuration to the startup configuration file.

3.9.4 Account Manager

This page allows user to add or delete switch local user database for authentication. The default user is "admin".

Click **Maintenance** > **Account Manager** in the navigation panel to display the screen as shown below.



The following table describes the labels in this screen.

LABEL	DESCRIPTION
User name	Enter your user name for new account.
Password Type	Select password type for new account: ■ **Clear Text:** Password without encryption. ■ **Encrypted:** Password with encryption. ■ **No Password:** No password for new account.
Password	If the password type is not "No Password", the password must be specified.
Retype Password	Retype password to make sure the password is exactly you typed before in "Password" field.
Privilege Type	Select privilege level for new account: ■ **Admin:** Allow to change switch settings. ■ **User:** See switch settings only. Not allow to change it.
Apply	Click **Apply** to save your changes to the switch.
Modify	Click **Delete** to delete the added users.

Product Specifications

Standard	IEEE802.3, IEEE802.3u, and IEEE802.3ab IEEE 802.3x flow control IEEE 802.1D spanning tree protocol IEEE 802.1p class of service, priority protocols IEEE 802.1Q VLAN tagging IEEE 802.3ad LACP aggregation IEEE 802.3az Energy Efficient Ethernet(EEE)
Interface	16* 10/100/1000Mbps ports
Transmission Mode	10/100Mbps: Full-duplex, Half-duplex 1000Mbps: Full-duplex
Memory	Flash: 16MB DDR2: 128MB
MAC Address Table	8K
Jumbo Frame	10K Bytes
Buffer Memory	524.8K Bytes
Temperature	Operating: 0°C ~ 50°C (32°F ~122°F) Storage: -40°C ~ 70°C (-40°F ~158°F)
Humidity	Operating: 10% ~ 90% RH, non-condensing
LED Indications	1*Power LED(Green) 1*System LED(Green) 16*Gigabit port LEDs(Link/Act: Green)
Power Supply	Internal power supply 12V/1.67A
Dimensions	216*133*42 mm
Case Material	Metal
Certification	EMC/FCC, CE Class A; Safety/LVD EN60950-1

Safety Warnings

For your safety, be sure to read and follow all warning notices and instructions.

- Do not open the device. Opening or removing the device cover can expose you to dangerous high voltage points or other risks. Only qualified service personnel can service the device. Please contact your vendor for further information.
- Do not use your device during a thunderstorm. There may be a risk of electric shock brought about by lightning.
- Do not expose your device to dust or corrosive liquids.
- Do not use this product near water sources.
- Make sure to connect the cables to the correct ports.
- Do not obstruct the ventilation slots on the device.

FCC Certifications

This Equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.

Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received; including interference that may cause undesired operation.

CE-Declaration of Conformity

For the following equipment:

Germering, 21st of August, 2014

Smart managed 16 Port Gigabit Switch

ALL-SG8316M

The safety advice in the documentation accompanying the products shall be obeyed. The conformity to the above directive is indicated by the CE sign on the device.
The ALLNET ALL-SG8316M conforms to the Council Directives of 2002/95/EC and 1999/519/EC and 2006/25/EC.

This equipment meets the following conformance standards:

EN 60950-1:2006+A11:2009+A1:2010+A12:2011 /

IEC 60950-1:2005 + A1:2009

This equipment is intended to be operated in all countries.

This declaration is made by

ALLNET GmbH Computersysteme
Maistraße 2
82110 Germering
Germany

Germering, 21.08.2014

Wolfgang Marcus Bauer
CEO

DISCLAIMER_OF_WARRANTY

This Program is free software; you can redistribute it and/or modify it under the terms of the GNU General Public License as published by the Free Software Foundation; version 2 of the License.

This Program is distributed in the hope that it will be useful, but WITHOUT ANY WARRANTY; without even the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the GNU General Public License for more details.

You should have received a copy of the GNU General Public License along with this Program; if not, write to the Free Software Foundation, Inc., 59 Temple Place, Suite 330, Boston, MA 02111-1307 USA.

The full text of the GNU General Public License version 2 is included with the software distribution in the file LICENSE.GPLv2

NO WARRANTY

BECAUSE THE PROGRAM IS LICENSED FREE OF CHARGE, THERE IS NO WARRANTY FOR THE PROGRAM, TO THE EXTENT PERMITTED BY APPLICABLE LAW. EXCEPT WHEN OTHERWISE STATED IN WRITING THE COPYRIGHT HOLDERS AND/OR OTHER PARTIES PROVIDE THE PROGRAM "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THE ENTIRE RISK AS TO THE QUALITY AND PERFORMANCE OF THE PROGRAM IS WITH YOU. SHOULD THE PROGRAM PROVE DEFECTIVE, YOU ASSUME THE COST OF ALL NECESSARY SERVICING, REPAIR OR CORRECTION. IN NO EVENT UNLESS REQUIRED BY APPLICABLE LAW OR AGREED TO IN WRITING WILL ANY COPYRIGHT HOLDER, OR ANY OTHER PARTY WHO MAY MODIFY AND/OR REDISTRIBUTE THE PROGRAM AS PERMITTED ABOVE, BE LIABLE TO YOU FOR DAMAGES, INCLUDING ANY GENERAL, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF THE USE OR INABILITY TO USE THE PROGRAM (INCLUDING BUT NOT LIMITED TO LOSS OF DATA OR DATA BEING RENDERED INACCURATE OR LOSSES SUSTAINED BY YOU OR THIRD PARTIES OR A FAILURE OF THE PROGRAM TO OPERATE WITH ANY OTHER PROGRAMS), EVEN IF SUCH HOLDER OR OTHER PARTY HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

Written Offer for Source Code

For binaries that you receive from ALLNET GmbH Computersysteme on physical media or within the download of the offered firmware that are licensed under any version of the GNU General Public License (GPL) or the GNU LGPL, you can receive a complete machine-readable copy of the source code by sending a written request to:

ALLNET GmbH Computersysteme
Maistrasse 2
82110 Germering

Your request should include: (i) the name of the covered binary, (ii) the version number of the ALLNET product containing the covered binary, (iii) your name, (iv) your company name (if applicable) and (v) your return mailing and email address (if available). We may charge you a nominal fee to cover the cost of the media and distribution. Your request must be sent within three (3) years of the date you received the GPL or LGPL covered code. For your convenience, some or all of the source code may also be found at:

http://www.allnet.de/gpl.html

LICENSE.GPLv2

GNU GENERAL PUBLIC LICENSE

Version 2, June 1991

Preamble

The licenses for most software are designed to take away your freedom to share and change it. By contrast, the GNU General Public License is intended to guarantee your freedom to share and change free software--to make sure the software is free for all its users. This General Public License applies to most of the Free Software Foundation's software and to any other program whose authors commit to using it. (Some other Free Software Foundation software is covered by the GNU Library General Public License instead.) You can apply it to your programs, too.

When we speak of free software, we are referring to freedom, not price. Our General Public Licenses are designed to make sure that you have the freedom to distribute copies of free software (and charge for this service if you wish), that you receive source code or can get it if you want it, that you can change the software or use pieces of it in new free programs; and that you know you can do these things.

To protect your rights, we need to make restrictions that forbid anyone to deny you these rights or to ask you to surrender the rights. These restrictions translate to certain responsibilities for you if you distribute copies of the software, or if you modify it.

For example, if you distribute copies of such a program, whether gratis or for a fee, you must give the recipients all the rights that you have. You must make sure that they, too, receive or can get the source code. And you must show them these terms so they know their rights.

We protect your rights with two steps: (1) copyright the software, and (2) offer you this license which gives you legal permission to copy, distribute and/or modify the software.

Also, for each author's protection and ours, we want to make certain that everyone understands that there is no warranty for this free software. If the software is modified by someone else and passed on, we want its recipients to know that what they have is not the original, so that any problems introduced by others will not reflect on the original authors' reputations.

Finally, any free program is threatened constantly by software patents. We wish to avoid the danger that redistributors of a free program will individually obtain patent licenses, in effect making the program proprietary. To prevent this, we have made it clear that any patent must be licensed for everyone's free use or not licensed at all.

The precise terms and conditions for copying, distribution and modification follow.

GNU GENERAL PUBLIC LICENSE

TERMS AND CONDITIONS FOR COPYING, DISTRIBUTION AND MODIFICATION

0. This License applies to any program or other work which contains a notice placed by the copyright holder saying it may be distributed under the terms of this General Public License. The "Program", below, refers to any such program or work, and a "work based on the Program" means either the Program or any derivative work under copyright law: that is to say, a work containing the Program or a portion of it, either verbatim or with modifications and/or translated into another language. (Hereinafter, translation is included without limitation in the term "modification".) Each licensee is addressed as "you".

   Activities other than copying, distribution and modification are not covered by this License; they are outside its scope.

The act of running the Program is not restricted, and the output from the Program is covered only if its contents constitute a work based on the Program (independent of having been made by running the Program). Whether that is true depends on what the Program does.

1. You may copy and distribute verbatim copies of the Program's source code as you receive it, in any medium, provided that you conspicuously and appropriately publish on each copy an appropriate copyright notice and disclaimer of warranty; keep intact all the notices that refer to this License and to the absence of any warranty; and give any other recipients of the Program a copy of this License along with the Program.

You may charge a fee for the physical act of transferring a copy, and you may at your option offer warranty protection in exchange for a fee.

2. You may modify your copy or copies of the Program or any portion of it, thus forming a work based on the Program, and copy and distribute such modifications or work under the terms of Section 1 above, provided that you also meet all of these conditions:
   a) You must cause the modified files to carry prominent notices stating that you changed the files and the date of any change.
   b) You must cause any work that you distribute or publish, that in whole or in part contains or is derived from the Program or any part thereof, to be licensed as a whole at no charge to all third parties under the terms of this License.
   c) If the modified program normally reads commands interactively when run, you must cause it, when started running for such interactive use in the most ordinary way, to print or display an announcement including an appropriate copyright notice and a notice that there is no warranty (or else, saying that you provide a warranty) and that users may redistribute the program under these conditions, and telling the user how to view a copy of this License. (Exception: if the Program itself is interactive but does not normally print such an announcement, your work based on the Program is not required to print an announcement.)

These requirements apply to the modified work as a whole. If identifiable sections of that work are not derived from the Program, and can be reasonably considered independent and separate works in themselves, then this License, and its terms, do not apply to those sections when you distribute them as separate works. But when you distribute the same sections as part of a whole which is a work based on the Program, the distribution of the whole must be on the terms of this License, whose permissions for other licensees extend to the entire whole, and thus to each and every part regardless of who wrote it.

Thus, it is not the intent of this section to claim rights or contest your rights to work written entirely by you; rather, the intent is to exercise the right to control the distribution of derivative or collective works based on the Program.

In addition, mere aggregation of another work not based on the Program with the Program (or with a work based on the Program) on a volume of a storage or distribution medium does not bring the other work under the scope of this License.

3. You may copy and distribute the Program (or a work based on it, under Section 2) in object code or executable form under the terms of Sections 1 and 2 above provided that you also do one of the following:
   a) Accompany it with the complete corresponding machine-readable source code, which must be distributed under the terms of Sections and 2 above on a medium customarily used for software interchange; or,
   b) Accompany it with a written offer, valid for at least three years, to give any third party, for a charge no more than your cost of physically performing source distribution, a complete machine-readable copy of the corresponding

source code, to be distributed under the terms of Sections 1 and 2 above on a medium customarily used for software interchange; or,

c) Accompany it with the information you received as to the offer to distribute corresponding source code. (This alternative is allowed only for noncommercial distribution and only if you received the program in object code or executable form with such an offer, in accord with Subsection b above.)

The source code for a work means the preferred form of the work for making modifications to it. For an executable work, complete source code means all the source code for all modules it contains, plus any associated interface definition files, plus the scripts used to control compilation and installation of the executable. However, as a special exception, the source code distributed need not include anything that is normally distributed (in either source or binary form) with the major components (compiler, kernel, and so on) of the operating system on which the executable runs, unless that component itself accompanies the executable.

If distribution of executable or object code is made by offering access to copy from a designated place, then offering equivalent access to copy the source code from the same place counts as distribution of the source code, even though third parties are not compelled to copy the source along with the object code.

4. You may not copy, modify, sublicense, or distribute the Program except as expressly provided under this License. Any attempt otherwise to copy, modify, sublicense or distribute the Program is void, and will automatically terminate your rights under this License. However, parties who have received copies, or rights, from you under this License will not have their licenses terminated so long as such parties remain in full compliance.
5. You are not required to accept this License, since you have not signed it. However, nothing else grants you permission to modify or distribute the Program or its derivative works. These actions are prohibited by law if you do not accept this License. Therefore, by modifying or distributing the Program (or any work based on the Program), you indicate your acceptance of this License to do so, and all its terms and conditions for copying, distributing or modifying the Program or works based on it.
6. Each time you redistribute the Program (or any work based on the Program), the recipient automatically receives a license from the original licensor to copy, distribute or modify the Program subject to these terms and conditions. You may not impose any further restrictions on the recipients' exercise of the rights granted herein. You are not responsible for enforcing compliance by third parties to this License.
7. If, as a consequence of a court judgment or allegation of patent infringement or for any other reason (not limited to patent issues), conditions are imposed on you (whether by court order, agreement or otherwise) that contradict the conditions of this License, they do not excuse you from the conditions of this License. If you cannot distribute so as to satisfy simultaneously your obligations under this License and any other pertinent obligations, then as a consequence you may not distribute the Program at all. For example, if a patent license would not permit royalty-free redistribution of the Program by all those who receive copies directly or indirectly through you, then the only way you could satisfy both it and this License would be to refrain entirely from distribution of the Program.

If any portion of this section is held invalid or unenforceable under any particular circumstance, the balance of the section is intended to apply and the section as a whole is intended to apply in other circumstances.

It is not the purpose of this section to induce you to infringe any patents or other property right claims or to contest validity of any such claims; this section has the sole purpose of protecting the integrity of the free software distribution system, which is implemented by public license practices. Many people have made generous contributions to the wide range of software distributed through that system in reliance on consistent application of that system; it is up to the

author/donor to decide if he or she is willing to distribute software through any other system and a licensee cannot impose that choice.

This section is intended to make thoroughly clear what is believed to be a consequence of the rest of this License.

8. If the distribution and/or use of the Program is restricted in certain countries either by patents or by copyrighted interfaces, the original copyright holder who places the Program under this License may add an explicit geographical distribution limitation excluding those countries, so that distribution is permitted only in or among countries not thus excluded. In such case, this License incorporates the limitation as if written in the body of this License.
9. The Free Software Foundation may publish revised and/or new versions of the General Public License from time to time. Such new versions will be similar in spirit to the present version, but may differ in detail to address new problems or concerns.

Each version is given a distinguishing version number. If the Program specifies a version number of this License which applies to it and "any later version", you have the option of following the terms and conditions either of that version or of any later version published by the Free Software Foundation. If the Program does not specify a version number of this License, you may choose any version ever published by the Free Software Foundation.

10. If you wish to incorporate parts of the Program into other free programs whose distribution conditions are different, write to the author to ask for permission. For software which is copyrighted by the Free Software Foundation, write to the Free Software Foundation; we sometimes make exceptions for this. Our decision will be guided by the two goals of preserving the free status of all derivatives of our free software and of promoting the sharing and reuse of software generally.

NO WARRANTY

11. BECAUSE THE PROGRAM IS LICENSED FREE OF CHARGE, THERE IS NO WARRANTY FOR THE PROGRAM, TO THE EXTENT PERMITTED BY APPLICABLE LAW. EXCEPT WHEN OTHERWISE STATED IN WRITING THE COPYRIGHT HOLDERS AND/OR OTHER PARTIES PROVIDE THE PROGRAM "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THE ENTIRE RISK AS TO THE QUALITY AND PERFORMANCE OF THE PROGRAM IS WITH YOU. SHOULD THE PROGRAM PROVE DEFECTIVE, YOU ASSUME THE COST OF ALL NECESSARY SERVICING, REPAIR OR CORRECTION.
12. IN NO EVENT UNLESS REQUIRED BY APPLICABLE LAW OR AGREED TO IN WRITING WILL ANY COPYRIGHT HOLDER, OR ANY OTHER PARTY WHO MAY MODIFY AND/OR REDISTRIBUTE THE PROGRAM AS PERMITTED ABOVE, BE LIABLE TO YOU FOR DAMAGES, INCLUDING ANY GENERAL, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF THE USE OR INABILITY TO USE THE PROGRAM (INCLUDING BUT NOT LIMITED TO LOSS OF DATA OR DATA BEING RENDERED INACCURATE OR LOSSES SUSTAINED BY YOU OR THIRD PARTIES OR A FAILURE OF THE PROGRAM TO OPERATE WITH ANY OTHER PROGRAMS), EVEN IF SUCH HOLDER OR OTHER PARTY HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

END OF TERMS AND CONDITIONS

How to Apply These Terms to Your New Programs

If you develop a new program, and you want it to be of the greatest possible use to the public, the best way to achieve this is to make it free software which everyone can redistribute and change under these terms.

To do so, attach the following notices to the program. It is safest to attach them to the start of each source file to most

effectively convey the exclusion of warranty; and each file should have at least the "copyright" line and a pointer to where the full notice is found.

<one line to give the program's name and a brief idea of what it does.> Copyright (C) <year> <name of author>

This program is free software; you can redistribute it and/or modify it under the terms of the GNU General Public License as published by the Free Software Foundation; either version 2 of the License, or (at your option) any later version.
This program is distributed in the hope that it will be useful, but WITHOUT ANY WARRANTY; without even the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the GNU General Public License for more details.
You should have received a copy of the GNU General Public License along with this program; if not, write to the Free Software Foundation, Inc., 51 Franklin Street, Fifth Floor, Boston, MA 02110-1301, USA
Also add information on how to contact you by electronic and paper mail. If the program is interactive, make it output a short notice like this when it starts in an interactive mode:

Gnomovision version 69, Copyright (C) year name of author
Gnomovision comes with ABSOLUTELY NO WARRANTY; for details type `show w'.
This is free software, and you are welcome to redistribute it under certain conditions; type `show c' for details.

The hypothetical commands `show w' and `show c' should show the appropriate parts of the General Public License. Of course, the commands you use may be called something other than `show w' and `show c'; they could even be mouse-clicks or menu items--whatever suits your program.
You should also get your employer (if you work as a programmer) or your school, if any, to sign a "copyright disclaimer" for the program, if necessary. Here is a sample; alter the names:

Yoyodyne, Inc., hereby disclaims all copyright interest in the program
`Gnomovision' (which makes passes at compilers) written by James Hacker.

<signature of Ty Coon>, 1 April 1989
Ty Coon, President of Vice

This General Public License does not permit incorporating your program into proprietary programs. If your program is a subroutine library, you may consider it more useful to permit linking proprietary applications with the library. If this is what you want to do, use the GNU Lesser General Public License instead of this License.

LICENSE.LGPLv2.1

GNU LESSER GENERAL PUBLIC LICENSE

Version 2.1, February 1999

Copyright (C) 1991, 1999 Free Software Foundation, Inc. 51 Franklin Street, Fifth Floor, Boston, MA 02110-1301 USA
Everyone is permitted to copy and distribute verbatim copies of this license document, but changing it is not allowed.

[This is the first released version of the Lesser GPL. It also counts as the successor of the GNU Library Public License, version 2, hence the version number 2.1.]

Preamble

The licenses for most software are designed to take away your freedom to share and change it. By contrast, the GNU General Public Licenses are intended to guarantee your freedom to share and change free software--to make sure the software is free for all its users.

This license, the Lesser General Public License, applies to some specially designated software packages--typically libraries--of the Free Software Foundation and other authors who decide to use it. You can use it too, but we suggest you first think carefully about whether this license or the ordinary General Public License is the better strategy to use in any particular case, based on the explanations below.

When we speak of free software, we are referring to freedom of use, not price. Our General Public Licenses are designed to make sure that you have the freedom to distribute copies of free software (and charge for this service if you wish); that you receive source code or can get it if you want it; that you can change the software and use pieces of it in new free programs; and that you are informed that you can do these things.

To protect your rights, we need to make restrictions that forbid distributors to deny you these rights or to ask you to surrender these rights. These restrictions translate to certain responsibilities for you if you distribute copies of the library or if you modify it.

For example, if you distribute copies of the library, whether gratis or for a fee, you must give the recipients all the rights that we gave you. You must make sure that they, too, receive or can get the source code. If you link other code with the library, you must provide complete object files to the recipients, so that they can relink them with the library after making changes to the library and recompiling it. And you must show them these terms so they know their rights.

We protect your rights with a two-step method: (1) we copyright the library, and (2) we offer you this license, which gives you legal permission to copy, distribute and/or modify the library.

To protect each distributor, we want to make it very clear that there is no warranty for the free library. Also, if the library is modified by someone else and passed on, the recipients should know that what they have is not the original version, so that the original author's reputation will not be affected by problems that might be introduced by others.

Finally, software patents pose a constant threat to the existence of any free program. We wish to make sure that a company cannot effectively restrict the users of a free program by obtaining a restrictive license from a patent holder. Therefore, we insist that any patent license obtained for a version of the library must be consistent with the full freedom of use specified in this license.

Most GNU software, including some libraries, is covered by the ordinary GNU General Public License. This license, the GNU Lesser General Public License, applies to certain designated libraries, and is quite different from the ordinary General Public License. We use this license for certain libraries in order to permit linking those libraries into non-free programs.

When a program is linked with a library, whether statically or using a shared library, the combination of the two is legally speaking a combined work, a derivative of the original library. The ordinary General Public License therefore permits such linking only if the entire combination fits its criteria of freedom. The Lesser General Public License permits more lax criteria for linking other code with the library.

We call this license the "Lesser" General Public License because it does Less to protect the user's freedom than the ordinary General Public License. It also provides other free software developers Less of an advantage over competing non-free

programs. These disadvantages are the reason we use the ordinary General Public License for many libraries. However, the Lesser license provides advantages in certain special circumstances.

For example, on rare occasions, there may be a special need to encourage the widest possible use of a certain library, so that it becomes a de-facto standard. To achieve this, non-free programs must be allowed to use the library. A more frequent case is that a free library does the same job as widely used non-free libraries. In this case, there is little to gain by limiting the free library to free software only, so we use the Lesser General Public License.

In other cases, permission to use a particular library in non-free programs enables a greater number of people to use a large body of free software. For example, permission to use the GNU C Library in non-free programs enables many more people to use the whole GNU operating system, as well as its variant, the GNU/Linux operating system.

Although the Lesser General Public License is Less protective of the users' freedom, it does ensure that the user of a program that is linked with the Library has the freedom and the wherewithal to run that program using a modified version of the Library.

The precise terms and conditions for copying, distribution and modification follow. Pay close attention to the difference between a "work based on the library" and a "work that uses the library". The former contains code derived from the library, whereas the latter must be combined with the library in order to run.

GNU LESSER GENERAL PUBLIC LICENSE

TERMS AND CONDITIONS FOR COPYING, DISTRIBUTION AND MODIFICATION

0. This License Agreement applies to any software library or other program which contains a notice placed by the copyright holder or other authorized party saying it may be distributed under the terms of this Lesser General Public License (also called "this License"). Each licensee is addressed as "you".

A "library" means a collection of software functions and/or data prepared so as to be conveniently linked with application programs (which use some of those functions and data) to form executables.

The "Library", below, refers to any such software library or work which has been distributed under these terms. A "work based on the Library" means either the Library or any derivative work under copyright law: that is to say, a work containing the Library or a portion of it, either verbatim or with modifications and/or translated straightforwardly into another language. (Hereinafter, translation is included without limitation in the term "modification".)

"Source code" for a work means the preferred form of the work for making modifications to it. For a library, complete source code means all the source code for all modules it contains, plus any associated interface definition files, plus the scripts used to control compilation and installation of the library.

Activities other than copying, distribution and modification are not covered by this License; they are outside its scope. The act of running a program using the Library is not restricted, and output from such a program is covered only if its contents constitute a work based on the Library (independent of the use of the Library in a tool for writing it). Whether that is true depends on what the Library does and what the program that uses the Library does.

1. You may copy and distribute verbatim copies of the Library's complete source code as you receive it, in any medium, provided that you conspicuously and appropriately publish on each copy an appropriate copyright notice and disclaimer of warranty; keep intact all the notices that refer to this License and to the absence of any warranty; and distribute a copy of this License along with the Library.

You may charge a fee for the physical act of transferring a copy, and you may at your option offer warranty protection in exchange for a fee.

2. You may modify your copy or copies of the Library or any portion of it, thus forming a work based on the Library, and copy and distribute such modifications or work under the terms of Section 1 above, provided that you also meet all of these conditions:
   a) The modified work must itself be a software library.
   b) You must cause the files modified to carry prominent notices stating that you changed the files and the date of any change.
   c) You must cause the whole of the work to be licensed at no charge to all third parties under the terms of this License.
   d) If a facility in the modified Library refers to a function or a table of data to be supplied by an application program that uses the facility, other than as an argument passed when the facility is invoked, then you must make a good faith effort to ensure that, in the event an application does not supply such function or table, the facility still operates, and performs whatever part of its purpose remains meaningful.

   (For example, a function in a library to compute square roots has a purpose that is entirely well-defined independent of the application. Therefore, Subsection 2d requires that any application-supplied function or table used by this function must be optional: if the application does not supply it, the square root function must still compute square roots.)

   These requirements apply to the modified work as a whole. If identifiable sections of that work are not derived from the Library, and can be reasonably considered independent and separate works in themselves, then this License, and its terms, do not apply to those sections when you distribute them as separate works. But when you distribute the same sections as part of a whole which is a work based on the Library, the distribution of the whole must be on the terms of this License, whose permissions for other licensees extend to the entire whole, and thus to each and every part regardless of who wrote it.

   Thus, it is not the intent of this section to claim rights or contest your rights to work written entirely by you; rather, the intent is to exercise the right to control the distribution of derivative or collective works based on the Library.

   In addition, mere aggregation of another work not based on the Library with the Library (or with a work based on the Library) on a volume of a storage or distribution medium does not bring the other work under the scope of this License.

3. You may opt to apply the terms of the ordinary GNU General Public License instead of this License to a given copy of the Library. To do this, you must alter all the notices that refer to this License, so that they refer to the ordinary GNU General Public License, version 2, instead of to this License. (If a newer version than version 2 of the ordinary GNU General Public License has appeared, then you can specify that version instead if you wish.) Do not make any other change in these notices.

   Once this change is made in a given copy, it is irreversible for that copy, so the ordinary GNU General Public License applies to all subsequent copies and derivative works made from that copy.

   This option is useful when you wish to copy part of the code of the Library into a program that is not a library.

4. You may copy and distribute the Library (or a portion or derivative of it, under Section 2) in object code or executable form under the terms of Sections 1 and 2 above provided that you accompany it with the complete corresponding machine-readable source code, which must be distributed under the terms of Sections 1 and 2 above on a medium customarily used for software interchange.

   If distribution of object code is made by offering access to copy from a designated place, then offering equivalent access to copy the source code from the same place satisfies the requirement to distribute the source code, even though third parties are not compelled to copy the source along with the object code.

5. A program that contains no derivative of any portion of the Library, but is designed to work with the Library by being compiled or linked with it, is called a "work that uses the Library". Such a work, in isolation, is not a derivative work of the Library, and therefore falls outside the scope of this License.

However, linking a "work that uses the Library" with the Library creates an executable that is a derivative of the Library (because it contains portions of the Library), rather than a "work that uses the library". The executable is therefore covered by this License. Section 6 states terms for distribution of such executables.

When a "work that uses the Library" uses material from a header file that is part of the Library, the object code for the work may be a derivative work of the Library even though the source code is not. Whether this is true is especially significant if the work can be linked without the Library, or if the work is itself a library. The threshold for this to be true is not precisely defined by law.

If such an object file uses only numerical parameters, data structure layouts and accessors, and small macros and small inline functions (ten lines or less in length), then the use of the object file is unrestricted, regardless of whether it is legally a derivative work. (Executables containing this object code plus portions of the Library will still fall under Section 6.)

Otherwise, if the work is a derivative of the Library, you may distribute the object code for the work under the terms of Section 6. Any executables containing that work also fall under Section 6, whether or not they are linked directly with the Library itself.

6. As an exception to the Sections above, you may also combine or link a "work that uses the Library" with the Library to produce a work containing portions of the Library, and distribute that work under terms of your choice, provided that the terms permit modification of the work for the customer's own use and reverse engineering for debugging such modifications.

You must give prominent notice with each copy of the work that the Library is used in it and that the Library and its use are covered by this License. You must supply a copy of this License. If the work during execution displays copyright notices, you must include the copyright notice for the Library among them, as well as a reference directing the user to the copy of this License. Also, you must do one of these things:

a) Accompany the work with the complete corresponding machine-readable source code for the Library including whatever changes were used in the work (which must be distributed under Sections 1 and 2 above); and, if the work is an executable linked with the Library, with the complete machine-readable "work that uses the Library", as object code and/or source code, so that the user can modify the Library and then relink to produce a modified executable containing the modified Library. (It is understood that the user who changes the contents of definitions files in the Library will not necessarily be able to recompile the application to use the modified definitions.)

b) Use a suitable shared library mechanism for linking with the Library. A suitable mechanism is one that (1) uses at run time a copy of the library already present on the user's computer system, rather than copying library functions into the executable, and (2) will operate properly with a modified version of the library, if the user installs one, as long as the modified version is interface-compatible with the version that the work was made with.

c) Accompany the work with a written offer, valid for at least three years, to give the same user the materials specified in Subsection 6a, above, for a charge no more than the cost of performing this distribution.

d) If distribution of the work is made by offering access to copy from a designated place, offer equivalent access to copy the above specified materials from the same place.

e) Verify that the user has already received a copy of these materials or that you have already sent this user a copy.

For an executable, the required form of the "work that uses the Library" must include any data and utility programs needed for reproducing the executable from it. However, as a special exception, the materials to be distributed need not include anything that is normally distributed (in either source or binary form) with the major components (compiler, kernel, and so on) of the operating system on which the executable runs, unless that component itself accompanies the executable.

It may happen that this requirement contradicts the license restrictions of other proprietary libraries that do not normally accompany the operating system. Such a contradiction means you cannot use both them and the Library together in an executable that you distribute.

7. You may place library facilities that are a work based on the Library side-by-side in a single library together with other library facilities not covered by this License, and distribute such a combined library, provided that the separate distribution of the work based on the Library and of the other library facilities is otherwise permitted, and provided that you do these two things:
   a) Accompany the combined library with a copy of the same work based on the Library, uncombined with any other library facilities. This must be distributed under the terms of the Sections above.
   b) Give prominent notice with the combined library of the fact that part of it is a work based on the Library, and explaining where to find the accompanying uncombined form of the same work.
8. You may not copy, modify, sublicense, link with, or distribute the Library except as expressly provided under this License. Any attempt otherwise to copy, modify, sublicense, link with, or distribute the Library is void, and will automatically terminate your rights under this License. However, parties who have received copies, or rights, from you under this License will not have their licenses terminated so long as such parties remain in full compliance.
9. You are not required to accept this License, since you have not signed it. However, nothing else grants you permission to modify or distribute the Library or its derivative works. These actions are prohibited by law if you do not accept this License. Therefore, by modifying or distributing the Library (or any work based on the Library), you indicate your acceptance of this License to do so, and all its terms and conditions for copying, distributing or modifying the Library or works based on it.
10. Each time you redistribute the Library (or any work based on the Library), the recipient automatically receives a license from the original licensor to copy, distribute, link with or modify the Library subject to these terms and conditions. You may not impose any further restrictions on the recipients' exercise of the rights granted herein. You are not responsible for enforcing compliance by third parties with this License.
11. If, as a consequence of a court judgment or allegation of patent infringement or for any other reason (not limited to patent issues), conditions are imposed on you (whether by court order, agreement or otherwise) that contradict the conditions of this License, they do not excuse you from the conditions of this License. If you cannot distribute so as to satisfy simultaneously your obligations under this License and any other pertinent obligations, then as a consequence you may not distribute the Library at all. For example, if a patent license would not permit royalty-free redistribution of the Library by all those who receive copies directly or indirectly through you, then the only way you could satisfy both it and this License would be to refrain entirely from distribution of the Library.

If any portion of this section is held invalid or unenforceable under any particular circumstance, the balance of the section is intended to apply, and the section as a whole is intended to apply in other circumstances.

It is not the purpose of this section to induce you to infringe any patents or other property right claims or to contest validity of any such claims; this section has the sole purpose of protecting the integrity of the free software distribution

system which is implemented by public license practices. Many people have made generous contributions to the wide range of software distributed through that system in reliance on consistent application of that system; it is up to the author/donor to decide if he or she is willing to distribute software through any other system and a licensee cannot impose that choice.

This section is intended to make thoroughly clear what is believed to be a consequence of the rest of this License.

12. If the distribution and/or use of the Library is restricted in certain countries either by patents or by copyrighted interfaces, the original copyright holder who places the Library under this License may add an explicit geographical distribution limitation excluding those countries, so that distribution is permitted only in or among countries not thus excluded. In such case, this License incorporates the limitation as if written in the body of this License.
13. The Free Software Foundation may publish revised and/or new versions of the Lesser General Public License from time to time. Such new versions will be similar in spirit to the present version, but may differ in detail to address new problems or concerns.

Each version is given a distinguishing version number. If the Library specifies a version number of this License which applies to it and "any later version", you have the option of following the terms and conditions either of that version or of any later version published by the Free Software Foundation. If the Library does not specify a license version number, you may choose any version ever published by the Free Software Foundation.

14. If you wish to incorporate parts of the Library into other free programs whose distribution conditions are incompatible with these, write to the author to ask for permission. For software which is copyrighted by the Free Software Foundation, write to the Free Software Foundation; we sometimes make exceptions for this. Our decision will be guided by the two goals of preserving the free status of all derivatives of our free software and of promoting the sharing and reuse of software generally.

NO WARRANTY

15. BECAUSE THE LIBRARY IS LICENSED FREE OF CHARGE, THERE IS NO WARRANTY FOR THE LIBRARY, TO THE EXTENT PERMITTED BY APPLICABLE LAW. EXCEPT WHEN OTHERWISE STATED IN WRITING THE COPYRIGHT HOLDERS AND/OR OTHER PARTIES PROVIDE THE LIBRARY "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THE ENTIRE RISK AS TO THE QUALITY AND PERFORMANCE OF THE LIBRARY IS WITH YOU. SHOULD THE LIBRARY PROVE DEFECTIVE, YOU ASSUME THE COST OF ALL NECESSARY SERVICING, REPAIR OR CORRECTION.
16. IN NO EVENT UNLESS REQUIRED BY APPLICABLE LAW OR AGREED TO IN WRITING WILL ANY COPYRIGHT HOLDER, OR ANY OTHER PARTY WHO MAY MODIFY AND/OR REDISTRIBUTE THE LIBRARY AS PERMITTED ABOVE, BE LIABLE TO YOU FOR DAMAGES, INCLUDING ANY GENERAL, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF THE USE OR INABILITY TO USE THE LIBRARY (INCLUDING BUT NOT LIMITED TO LOSS OF DATA OR DATA BEING RENDERED INACCURATE OR LOSSES SUSTAINED BY YOU OR THIRD PARTIES OR A FAILURE OF THE LIBRARY TO OPERATE WITH ANY OTHER SOFTWARE), EVEN IF SUCH HOLDER OR OTHER PARTY HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

END OF TERMS AND CONDITIONS

How to Apply These Terms to Your New Libraries

If you develop a new library, and you want it to be of the greatest possible use to the public, we recommend making it free software that everyone can redistribute and change. You can do so by permitting redistribution under these terms (or,

alternatively, under the terms of the ordinary General Public License).

To apply these terms, attach the following notices to the library. It is safest to attach them to the start of each source file to most effectively convey the exclusion of warranty; and each file should have at least the "copyright" line and a pointer to where the full notice is found.

<one line to give the library's name and a brief idea of what it does.> Copyright (C) <year> <name of author>

This library is free software; you can redistribute it and/or modify it under the terms of the GNU Lesser General Public License as published by the Free Software Foundation; either version 2.1 of the License, or (at your option) any later version.

This library is distributed in the hope that it will be useful, but WITHOUT ANY WARRANTY; without even the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the GNU Lesser General Public License for more details.

You should have received a copy of the GNU Lesser General Public License along with this library; if not, write to the Free Software Foundation, Inc., 51 Franklin Street, Fifth Floor, Boston, MA 02110-1301 USA

Also add information on how to contact you by electronic and paper mail.

You should also get your employer (if you work as a programmer) or your school, if any, to sign a "copyright disclaimer" for the library, if necessary. Here is a sample; alter the names:

Yoyodyne, Inc., hereby disclaims all copyright interest in the library `Frob' (a library for tweaking knobs) written by James Random Hacker.

<signature of Ty Coon>, 1 April 1990 Ty Coon, President of Vice

That's all there is to it!