



SM24TAT2DPA

Managed Switch, 24-port Gigabit PoE+, 2-port SFP/RJ-45 Combo

The screenshot displays the web interface for the SM24TAT2DPA switch. The left sidebar shows navigation options: Configuration, Monitor, System, Information, IP Status, Log, Detailed Log, Overview, Green Ethernet, Ports, DHCP, Security, LACP, Loop Protection, Spanning Tree, MVR, IPMC, LLDP, PoE, and MAC Table. The main content area is titled 'System Information' and contains the following data:

Model Name	SM24TAT2DPA
System Description	Managed Switch, 24-port Gigabit PoE+, 2-port SFP/RJ-45 Combo
Location	
Contact	
System Name	SM24TAT2DPA
System Date	2011-01-03T18:09:37+00:00
System Uptime	2d 18:09:37
Bootloader Version	V.
Firmware Version	VI
Hardware Version	V.
Mechanical Version	V.
Serial Number	A/
MAC Address	0/
Memory	T/
FLASH	0x40000000-0x41fffff, 512 x 0x10000 blocks
CPU Load (100ms, 1s, 10s)	4%, 8%, 7%

Below the table is a diagram of the physical switch with the following labels: System LED, Console Port, 10/100/1000 RJ45 Ports, 100/1000 RJ45/SFP Combo Ports, Mode LEDs, Mode/Reset Button, and Port Status LEDs.

Web User Guide

33703 Rev. A

Safety Warnings and Cautions

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NOTE: Emphasizes important information or calls your attention to related features or instructions.



WARNING: Alerts you to a potential hazard that could cause personal injury.



CAUTION: Alerts you to a potential hazard that could cause loss of data, or damage the system or equipment.

SM24TAT2DPA Web User Guide - TN PN 33703 Rev. A

Record of Revisions

Rev	Date	Description of Changes
A	10/7/16	Initial release for software v6.48.

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About This Manual

Purpose This manual gives specific information on how to operate and use the management functions of the SM24TAT2DPA.

Audience The Manual is intended for use by network administrators who are responsible for operating and maintaining network equipment; consequently, it assumes a basic working knowledge of general switch functions, the Internet Protocol (IP), and Simple Network Management Protocol (SNMP).

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NOTE: Emphasizes important information or calls your attention to related features or instructions.



WARNING: Alerts you to a potential hazard that could cause personal injury.



CAUTION: Alerts you to a potential hazard that could cause loss of data, or damage the system or equipment.

Related Manuals

These manuals give specific information on how to operate the management functions of the switch:

- SM24TAT2DPA Quick Start Guide, 33701
- SM24TAT2DPA Install Guide, 33702
- SM24TAT2DPA Web User Guide, 33703
- SM24TAT2DPA CLI Reference, 33704 (this manual)

For Transition Networks Drivers, Firmware, Manual, etc. go to the [Product Support](#) webpage (no logon required). For Transition Networks Application Notes, Brochures, Data Sheets, Specifications, etc. go to the [Support Library](#) (no registration required). Note that this manual provides links to third part web sites for which Transition Networks is not responsible.

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Introduction

Overview

This manual describes how to install and connect to your network system and how to configure and monitor the SM24TAT2DPA via the Web interface.

Transition Networks SM24TAT2DPA L2+ Managed PoE+ Switch is a next-generation Ethernet Switch offering a full suite of L2 features, better PoE functionality and usability, and advanced L3 features such as Static Route. It delivers better cost performance and lower total cost of ownership (TCO) in Enterprise networks via fiber or copper connections.

The SM24TAT2DPA delivers 24 (10M/100M/1G) RJ45/PoE+ (supports 802.3at/af and total up to 370W) ports, two Combo GbE RJ45/SFP ports and one RJ45 Console port. SM24TAT2DPA provides high HW performance and environment flexibility for SMBs and Enterprises.

Key Features

- L2+ Managed features provide easier manageability, robust security, and QoS.
- L2+ Managed features provide easier manageability, robust security and QoS.
- DHCP Server and DHCP per Port
- Provides ease of use features such as DMS, Server Reports, and Traceroute
- IPv4/IPv6 L3 Static routing
- PoE Port configuration and scheduling
- 802.3at high power PoE plus standard
- IEEE 802.3az EEE Energy Efficient Ethernet standard for green Ethernet

Benefits

Feature-rich Ethernet Switch for Enterprise-class: delivers advanced functionality in L2+ managed switch including Layer 3 static route, DHCP server, IPv6 support, LLDP, etc. Comprehensive security features include IP source guard and ACL to guard your network from unauthorized access. It builds on market-leading price/performance with L2+ Managed GbE PoE switch, and is secure, reliable and easy to use for enterprise/SMB deployments.

Lower TCO with Energy-efficient Design: helps reduce power consumption and lower the TCO by Energy Efficient Ethernet (IEEE 802.3az) features. It can be used to build a green Ethernet network environment.

Advanced Power over Ethernet Management: includes PoE+ options to power IP devices with power-saving features like Power scheduling and PoE configuration.

Overview of this manual

- Chapter 1 Operation of Web-based Management
- Chapter 2 System Configuration
- Chapter 3 Configuration
- Chapter 4 Security
- Chapter 5 Maintenance
- Chapter 6 DMS (Diagnostic Management System)
- Chapter 7 Troubleshooting
- Appendix A DHCP Per Port
- Appendix B Service, Warranty & Tech Support
- Appendix C Compliance Information

Chapter 1

Operation of Web-based Management

Initial Configuration

This chapter tells you how to configure and manage the SM24TAT2DPA via the web user interface. The Web UI lets you easily access and monitor from any port of the switch all switch status, including port activity, Spanning tree status, port aggregation status, multicast traffic, VLAN and priority status, illegal access records, etc.

The default values are listed below:

IP Address	192.168.1.77
Subnet Mask	255.255.255.0
Default Gateway	192.168.1.254
Username	admin
Password	admin

After the SM24TAT2DPA interface configuration is finished, you can browse it. For instance, type <http://192.168.1.1> in the address row in a browser; the Login screen displays prompting you to enter a username and password in order to login and access authentication.

The default username is “**admin**” and password is “**admin**”. For first time use, enter the default username and password, and then click the **<Login>** button. The login process now is completed. In this login menu, you must enter the complete username and password respectively; the SM24TAT2DPA will not give you a shortcut to the username automatically.

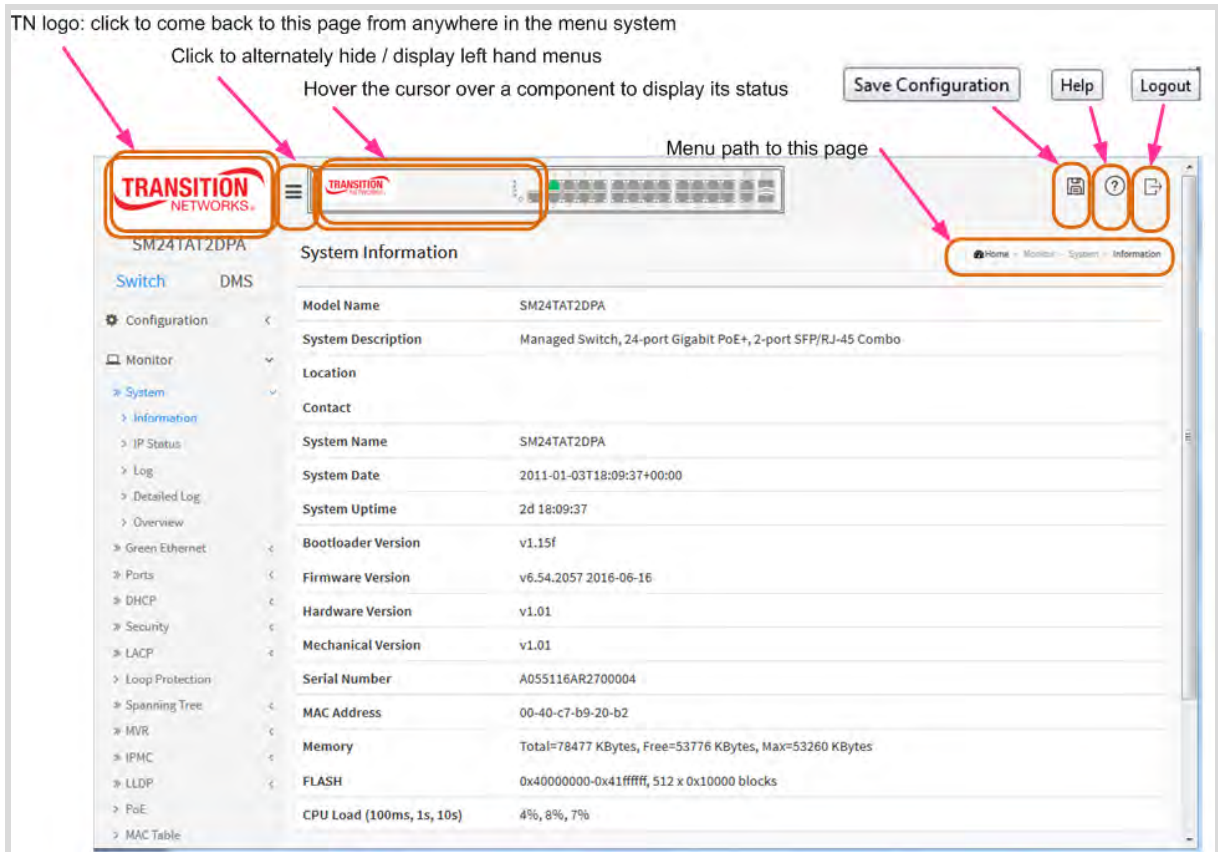
The SM24TAT2DPA allows two or more admin users to manage this switch; the last configuration settings will be the configuration used by the system.

i **NOTE:** When you login to manage the switch via Web/CLI, you must first type the Username of **admin** and Password **admin**, and then press Enter to access the Management page. When you login to SM24TAT2DPA Web UI management, you can use either IPv4 or IPv6.

i **NOTE:** The SM24TAT2DPA DHCP function is enabled, so if you do not have a DHCP server to provide IP addresses to the switch, the switch uses default IP address **192.168.1.77**. The Login page is shown below:



The SM24TAT2DPA startup page (**Switch > Monitor > System > Information**) is shown below:



1-1.1 Web UI Icons

You can click the Transition Networks logo in the Web UI top left corner to come back to this page from anywhere in the menu system.

The Web UI top left corner displays an icon (☰) that alternately hides and displays the left hand menus.



The Web UI top left corner also displays a switch icon that lets you hover the cursor over a front panel component to display the status / description for that component (shown below). You can also click on a port to display that port's Detailed Port Statistics.



The Web UI top right corner displays a set of three icons (💾 ? 🗑️) that let you Save Configuration, display online Help, and Logout. You can hover the cursor over any icon to display its function (Save Configuration Help Logout).

The Web UI top right corner also displays the currently displayed page's menu path (e.g., Home > Monitor > System > Information) as shown below:

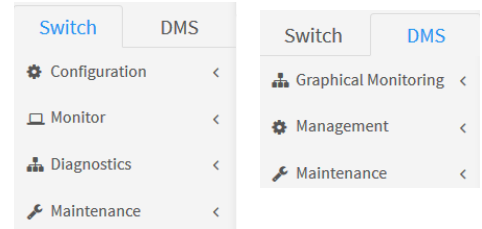


1-1.2 Web UI Modules

The SM24TAT2DPA Web UI management modules include:

Switch: Configuration, Monitor, Diagnostics, and Maintenance.

DMS: Graphical Monitoring, Management, and Maintenance.



The SM24TAT2DPA Web UI management modules are described in the following chapters.

Chapter 2

System Configuration

This chapter describes the entire basic configuration tasks which includes the System Information and any Switch management (e.g. Time, Account, IP, Syslog and NTP.)

2-1 System

You can identify the switch by configuring the contact information, name, and location.

2-1.1 Information

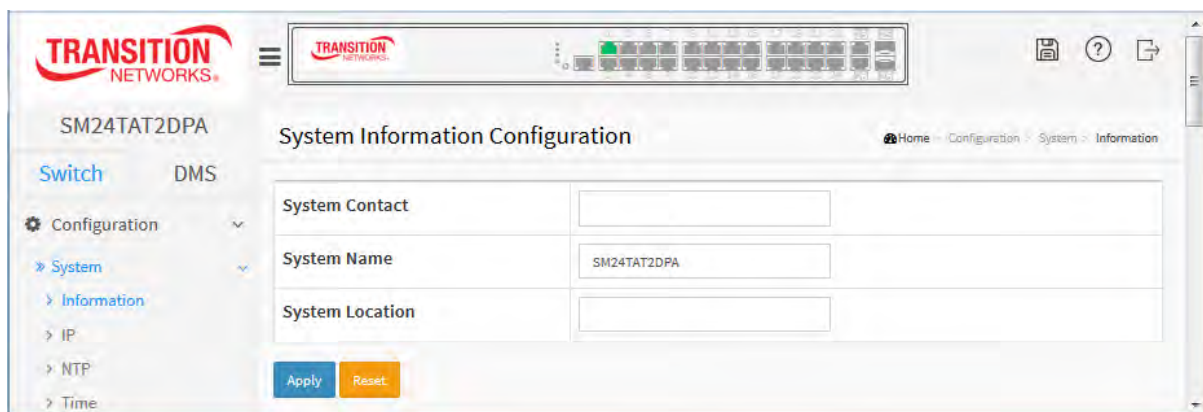
The switch system's contact information is provided here.

Web interface

To configure System Information in the web interface:

1. Click Configuration, System, Information.
2. Enter System Contact, System Name, and System Location information.
3. Click Apply.

Figure 2-1.1: The System Information Configuration page



System Contact	
System Name	SM24TAT2DPA
System Location	

Parameter descriptions:

System Contact: The textual identification of the contact person for this managed node, together with information on how to contact this person. The allowed string length is 0 to 128, and the allowed content is ASCII characters from 32 to 126.

System name: An administratively assigned name for this managed node. By convention, this is the node's fully-qualified domain name. A domain name is a text string drawn from the alphabet (A-Za-z), digits (0-9), minus sign (-). No space characters are permitted as part of a name. The first character must be an alpha character, and the first or last character must not be a minus sign. The allowed string length is 0 to 128.

System Location: The physical location of this node (e.g., telephone closet, 3rd floor). The allowed string length is 0 to 128, and the allowed content is ASCII characters from 32 to 126.

2-1.2 IP

The IPv4 address for the switch could be obtained via DHCP Server for VLAN 1. To manually configure an address, you must change the switch's default settings to values compatible with your network. You may also need to establish a default gateway between the switch and management stations that exist on another network segment.

Configure the switch-managed IP information on this page (IP basic settings, control IP interfaces and IP routes).

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

Web Interface

To configure an IP address in the web interface:

1. Click Configuration, System, IP.
2. Click Add Interface then you can create a new Interface on the switch.
3. Click Add Route then you can create a new Route on the switch.
4. Click Apply.

Figure2-1.2: IP Configuration page

The screenshot displays the IP Configuration page for a Transition Networks switch. The interface includes a navigation menu on the left and a main configuration area. The IP Configuration section is active, showing the following settings:

- Mode:** Host
- DNS Server:** Configured (8.8.8.8)
- DNS Proxy:** Disabled

The IP Interfaces section is expanded to show DHCP Per Port settings:

- Mode:** Enabled
- IP:** 0.0.0.1 (Subnet: 255.255.255.255)

Below the DHCP settings is a table for IP DHCP and IP4 configurations:

Delete	VLAN	Enable	Fallback	Current Lease	IPv4 Address	Mask Length	IPv6 Address	Mask Length
<input type="checkbox"/>	1	<input type="checkbox"/>	0		192.168.1.77	24		

Below the DHCP table is a table for IP Routes:

Delete	Network	Mask Length	Gateway	Next Hop VLAN
<input type="checkbox"/>	0.0.0.0	0	192.168.1.254	0
	169.254.0.0	16	192.168.1.77	0
	192.168.1.0	24	192.168.1.77	0

Buttons for 'Add Interface', 'Add Route', 'Apply', and 'Reset' are visible at the bottom of the configuration area.

Parameter descriptions:

IP Configuration

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

DNS Server: This setting controls the DNS name resolution done by the switch. The modes are:

- **From any DHCP interfaces:** The first DNS server offered from a DHCP lease to a DHCP-enabled interface will be used.
- **No DNS server:** No DNS server will be used.
- **Configured:** Explicitly provide the IP address of the DNS Server in dotted decimal notation.
- **From this DHCP interface:** Specify from which DHCP-enabled interface a provided DNS server should be preferred.

DNS Proxy: When DNS proxy is enabled, system will relay DNS requests to the currently configured DNS server, and reply as a DNS resolver to the client devices on the network.

IP Interfaces

Delete: Select this option to delete an existing IP interface.

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

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

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

IPv4 DHCP Current Lease: For DHCP interfaces with an active lease, this column shows the current interface address, as provided by the DHCP server.

IPv4 Address: The IPv4 address of the interface in dotted decimal notation. If DHCP is enabled, this field is not used. The field may also be left blank if IPv4 operation on the interface is not desired.

IPv4 Mask: The IPv4 network mask, in number of bits (prefix length). Valid values are between 0 and 30 bits for a IPv4 address. If DHCP is enabled, this field is not used. The field may also be left blank if IPv4 operation on the interface is not desired.

IPv6 Address: The IPv6 address of the interface. A IPv6 address is in 128-bit records represented as eight fields of up to four hexadecimal digits with a colon separating each field (:). For example, fe80::215:c5ff:fe03:4dc7. The symbol :: is a special syntax that can be used as a shorthand way of representing multiple 16-bit groups of contiguous zeros; but it can appear only once. It can also represent a legally valid IPv4 address. For example, ::192.1.2.34. The field may be left blank if IPv6 operation on the interface is not desired.

IPv6 Mask: The IPv6 network mask, in number of bits (prefix length). Valid values are between 1 and 128 bits for a IPv6 address. The field may be left blank if IPv6 operation on the interface is not desired.

DHCP Per Port: The assign an IP address based on the switch port the device is connected to. This will speed up installations of IP cameras, cameras can be configured after they are on the network. The per-port assignment allows you to know which IP was assigned to which camera. The parameters are:

Mode: Disabled or Enabled. The default is Disabled.

IP range: Enter the assignable range (e.g., 192.168.1.78 - 192.168.1.93).

See [Appendix A](#) of this manual for DHCP Per Port details.

IP Routes

Delete: Select this option to delete an existing IP route.

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

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

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

Next Hop VLAN (Only for IPv6): The VLAN ID (VID) of the specific IPv6 interface associated with the gateway. The given VID ranges from 1 to 4094 and will be effective only when the corresponding IPv6 interface is valid.

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

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

Buttons

Add Interface: Click to add a new IP interface. A maximum of 8 interfaces is supported.

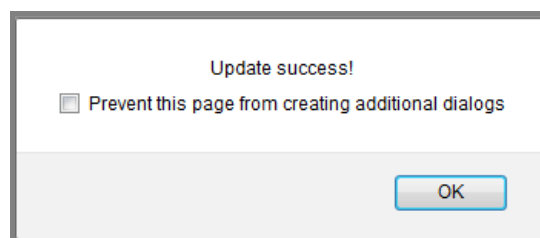
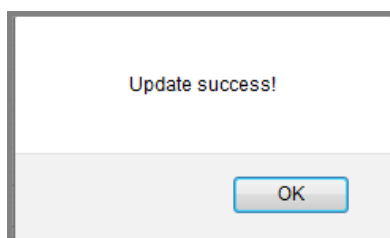
Add Route: Click to add a new IP route. A maximum of 32 routes is supported.

Apply: Click to save changes. At the Update success! dialog click the **OK** button.

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

Messages:

Update success! displays to indicate the on-screen change was applied (saved). After a series of applied changes, a checkbox (Prevent this page from creating additional dialogs) also displays; check the checkbox to apply changes without displaying this dialog box at each update. Click the **OK** button to close the dialog box.



2-1.3 NTP

NTP (Network Time Protocol) is used to sync the network time based Greenwich Mean Time (GMT). If you select NTP mode and select a built-in NTP time server or manually specify an user-defined NTP server and Time Zone, the switch will sync the time shortly after pressing <Apply> button. Though it synchronizes the time automatically, NTP does not update the time periodically without manual processing.

Time Zone is an offset time of GMT. You select the time zone first and then perform time sync via NTP because the switch will combine this time zone offset and updated NTP time to come out the local time, otherwise, you will not able to get the correct time. The switch supports configurable time zones from -12 to +13 in 1 hour steps.

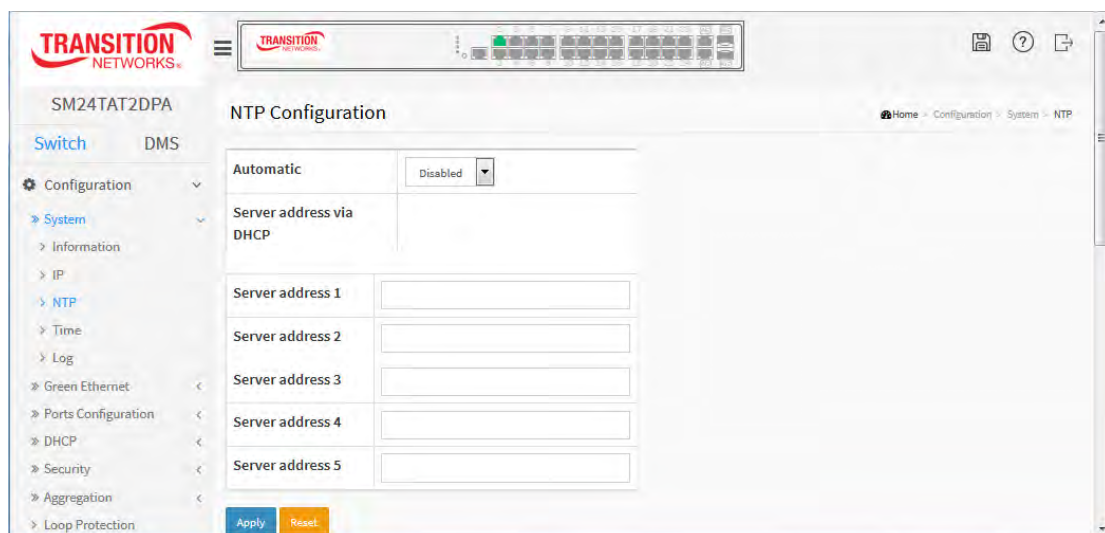
Default Time zone: +8 Hrs.

Web Interface

To configure NTP in the web interface:

1. Click Configuration, System, NTP.
2. Specify the Time parameter in manual parameters.
3. Click Apply.

Figure 2-1.3: The NTP Configuration page



Parameter descriptions:

Mode : Indicates the NTP mode operation. Possible modes are:

Enabled: Enable NTP client mode operation.

Disabled: Disable NTP client mode operation.

Server 1 to 5 : Provide the NTP IPv4 or IPv6 address of this switch. IPv6 address is in 128-bit records represented as eight fields of up to four hexadecimal digits with a colon separating each field (:). For example, 'fe80::215:c5ff:fe03:4dc7'. The symbol '::' is a special syntax that can be used as a shorthand way of representing multiple 16-bit groups of contiguous zeros; but it can only appear once. It can also represent a legally valid IPv4 address. For example, '::192.1.2.34'.

Buttons : These buttons are displayed on the NTP page:

Apply – Click to save changes.

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

2-1.4 Time

The switch provides manual and automatic ways to set the system time via NTP. Manual setting is simple and you just input "Year", "Month", "Day", "Hour" and "Minute" within the valid value range indicated in each item.

Web Interface

To configure Time in the web interface:

1. Click Configuration, System, and Time.
2. Specify the Time parameter.
3. Click Apply.

Figure 2-1.4: The Time Configuration page

Parameter descriptions:

Time Configuration

Clock Source: There are two modes for configuring how the Clock Source from. Select "Use Local Settings" : Clock Source from Local Time, or select "Use NTP Server" : Clock Source from NTP Server.

System Date: Show the current time of the settings. The year of system date limits between 2011 and 2037.

Time Zone Configuration

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

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

Daylight Saving Time Configuration

Daylight Saving Time: This is used to set the clock forward or backward according to the configurations set below for a defined Daylight Saving Time duration. Select 'Disable' to disable the Daylight Saving Time configuration. Select 'Recurring' and configure the Daylight Saving Time duration to repeat the configuration every year. Select 'Non-Recurring' and configure the Daylight Saving Time duration for single time configuration. (Default: Disabled).

Recurring Configuration

Start time settings:

Week - Select the starting week number.

Day - Select the starting day.

Month - Select the starting month.

Hours - Select the starting hour.

Minutes - Select the starting minute.

End time settings:

Week - Select the ending week number.

Day - Select the ending day.

Month - Select the ending month.

Hours - Select the ending hour.

Minutes - Select the ending minute.

Offset settings: Offset - Enter the number of minutes to add during Daylight Saving Time. (Range: 1 to 1440)



NOTE: The entry under "Start Time Settings" and "End Time Settings" displays what you set on the "Start Time Settings" and "End Time Settings" field information.

Buttons : These buttons are displayed on the NTP page:

Apply – Click to save changes.

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

2-1.5 Log

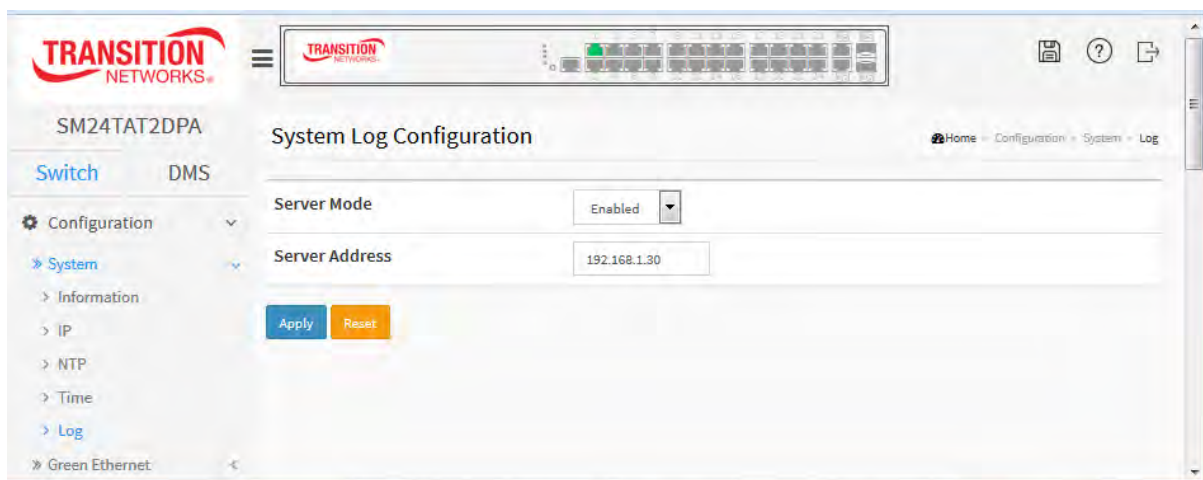
The log is a standard for logging program messages . It allows separation of the software that generates messages from the system that stores them and the software that reports and analyzes them. It can also be used for generalized informational, analysis and debugging messages. It is supported by a wide variety of devices and receivers across multiple platforms.

Web Interface

To configure log configuration in the web interface:

1. Click Configuration, System, and Log.
2. Specify the syslog server IP Address.
3. At the Server Mode dropdown, select Enabled to enable Syslog Server mode.
4. Click the Apply button.

Figure2-1.5: The System Log Configuration page



Parameter descriptions:

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

Enabled: Enable server mode operation.

Disabled: Disable server mode operation.

Server Address : Enter the IPv4 hosts address of syslog server. If the switch provides the DNS feature, it can also be a host name.

Buttons : These buttons are displayed on the System Log configuration page:

Apply – Click to save changes.

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

You can view the logged messages at the **Monitor > System > Log** page.

2-2 Green Ethernet

EEE is a power saving option that reduces the power usage when there is low or no traffic utilization. EEE works by powering down circuits when there is no traffic. When a port gets data to be transmitted all circuits are powered up. The time it takes to power up the circuits is named wakeup time. The default wakeup time is 17 us for 1Gbit links and 30 us for other link speeds. EEE devices must agree upon the value of the wakeup time in order to make sure that both the receiving and transmitting device has all circuits powered up when traffic is transmitted. The devices can exchange wakeup time information using the LLDP protocol.

EEE works for ports in auto-negotiation mode, where the port is negotiated to either 1G or 100 Mbit full duplex mode. For ports that are not EEE-capable the corresponding EEE checkboxes are grayed out and thus impossible to enable EEE for.

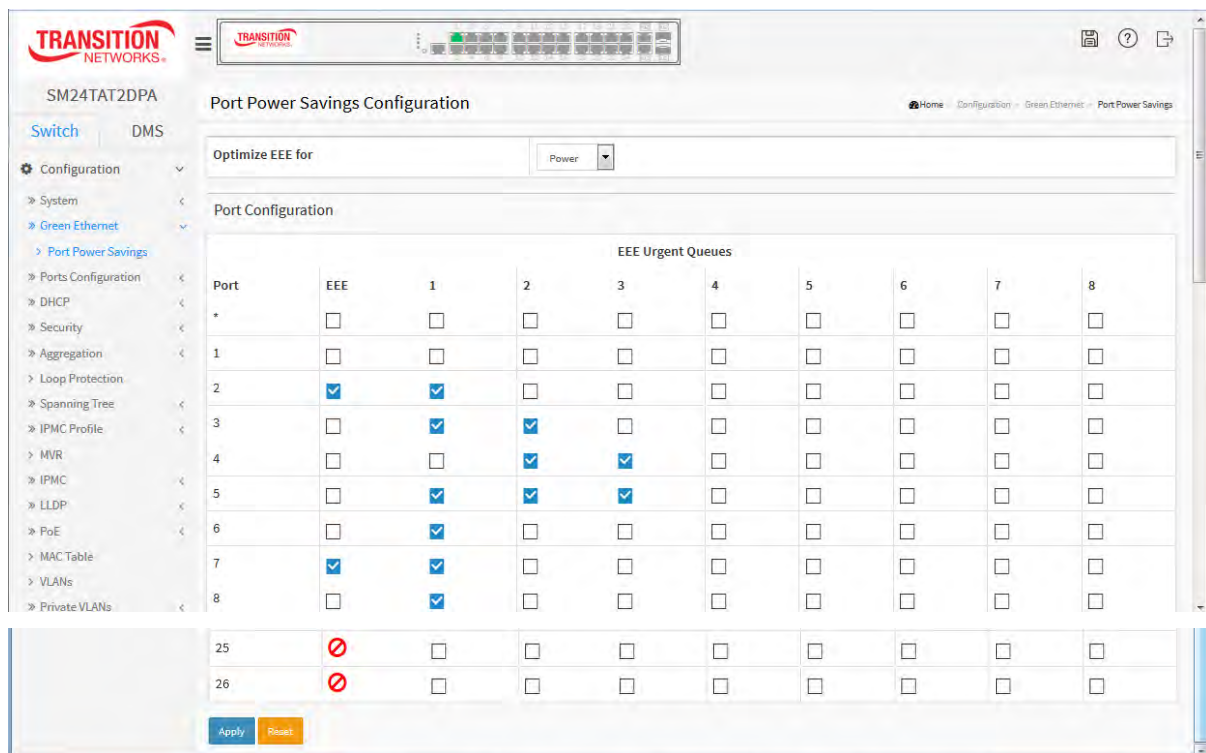
When a port is powered down for saving power, outgoing traffic is stored in a buffer until the port is powered up again. Because there are some overhead in turning the port down and up, more power can be saved if the traffic can be buffered up until a large burst of traffic can be transmitted. Buffering traffic will give some latency in the traffic.

Web Interface

To configure a Port Power Saving Configuration in the web interface:

1. Click Configuration, Green Ethernet, Port Power Savings.
2. At the dropdown, select to optimize EEE for either Latency or Power.
3. Enable or disable the EEE and EEE Urgent Queues for each port.
4. Click the Apply button.

Figure 2-2.1: Port Power Savings Configuration page



Parameter descriptions:

Optimize EEE for : The switch can be set to optimize EEE for either best power saving or least traffic latency.

Port: The switch port number of the logical port.

EEE : Controls whether EEE is enabled for this switch port. For maximizing power savings, the circuit isn't started at once transmit data is ready for a port, but is instead queued until a burst of data is ready to be transmitted. This will give some traffic latency.

If desired it is possible to minimize the latency for specific frames, by mapping the frames to a specific queue (done with QOS), and then mark the queue as an urgent queue. When an urgent queue gets data to be transmitted, the circuits will be powered up at once and the latency will be reduced to the wakeup time.

EEE Urgent Queues : Queues set will activate transmission of frames as soon as data is available. Otherwise the queue will postpone transmission until a burst of frames can be transmitted.

Buttons : These buttons are displayed on the System Log configuration page:

Apply – Click to save changes.

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

2-3 Ports Configuration

The section describes how to configure the Port detail parameters of the switch. Others you could using the Port configure to enable or disable the Port of the switch. Monitor the ports content or status in the function.

2-3.1 Ports

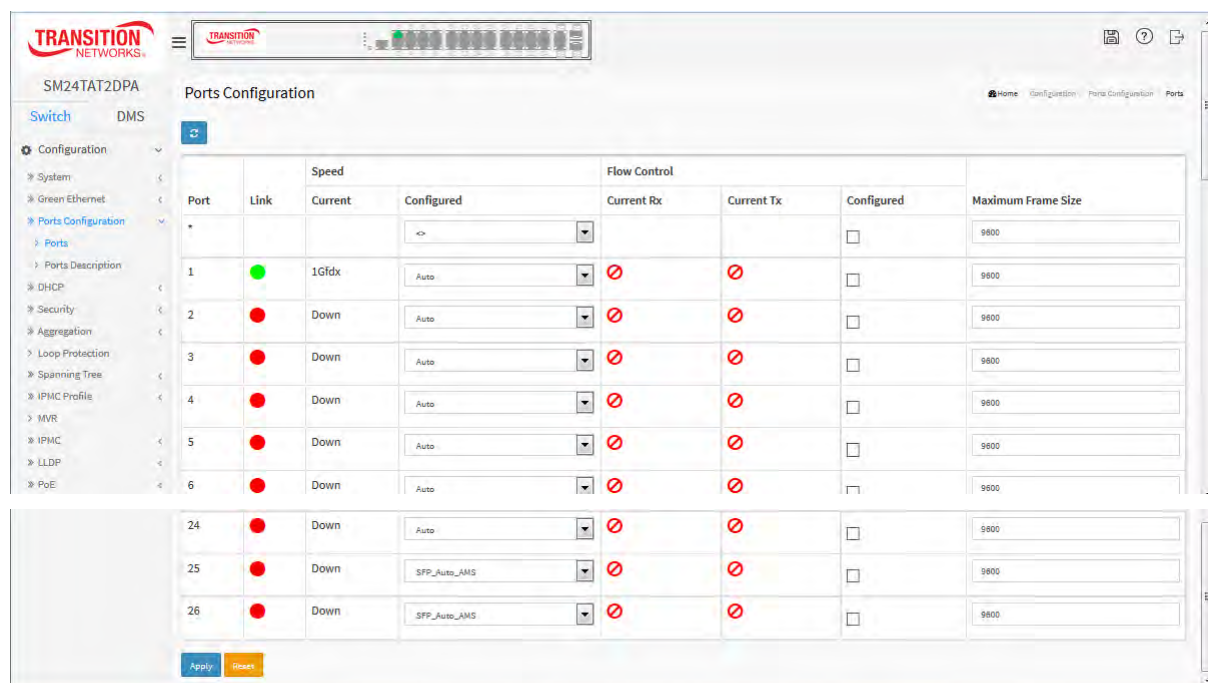
This page displays current port configurations. Ports can also be configured here.

Web Interface

To configure a Current Port Configuration in the web interface:

1. Click Configuration, Ports Configuration, and Ports.
2. Specify Speed Configured, Flow Control, Maximum Frame size, Excessive Collision Mode.
3. Click Apply.

Figure 2-3.1: The Ports Configuration page



Parameter descriptions:

Port : This is the logical port number for this row.

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

Current Link Speed : Provides the current link speed of the port.

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

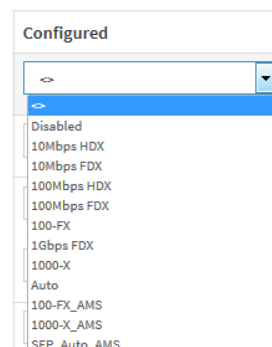
Disabled - Disables the switch port operation.

Auto - Port auto negotiating speed with the link partner and selects the highest speed that is compatible with the link partner.

10Mbps HDX - Forces the cu port in 10Mbps half-duplex mode.

10Mbps FDX - Forces the cu port in 10Mbps full duplex mode.

100Mbps HDX - Forces the cu port in 100Mbps half-duplex mode.



100Mbps FDX - Forces the cu port in 100Mbps full duplex mode.

1Gbps FDX - Forces the port in 1Gbps full duplex

2.5Gbps FDX - Forces the Serdes port in 2.5Gbps full duplex mode.

SFP_Auto_AMS - Automatically determines the speed of the SFP. Note: There is no standardized way to do SFP auto detect, so here it is done by reading the SFP rom. Due to the missing standardized way of doing SFP auto detect some SFPs might not be detectable. The port is set in AMS mode. Cu port is set in Auto mode.

100-FX - SFP port in 100-FX speed. Cu port disabled.

100-FX_AMS - Port in AMS mode. SFP port in 100-FX speed. Copper port in Auto mode.

1000-X - SFP port in 1000-X speed. Copper port disabled.

1000-X_AMS - Port in AMS mode. SFP port in 1000-X speed. Cu port in Auto mode. Ports in AMS mode with 1000-X speed has Cu port preferred. Ports in AMS mode with 100-FX speed has fiber port preferred.

Flow Control : When Auto Speed is selected on a port, this section indicates the flow control capability that is advertised to the link partner. When a fixed-speed setting is selected, that is what is used. The Current Rx column indicates whether pause frames on the port are obeyed, and the Current Tx column indicates whether pause frames on the port are transmitted. The Rx and Tx settings are determined by the result of the last Auto-Negotiation.

Check the configured column to use flow control. This setting is related to the setting for Configured Link Speed.

Maximum Frame Size : Enter the maximum frame size allowed for the switch port, including FCS. Must be an integer value between 1518 and 9600 bytes.

Excessive Collision Mode : Configure port transmit collision behavior.

Discard: Discard frame after 16 collisions (default).

Restart: Restart backoff algorithm after 16 collisions.

Buttons :

Apply – Click to save changes.

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

Upper right icon (Refresh) : You can click them to refresh the Port link Status manually.

2-3.2 Ports Description

The section describes how to configure the Port's alias or any descriptions for the Port Identity. It lets you write alphanumeric string describing the full name and version identification for the system's hardware type, software version, and networking application.

Web Interface

To configure a Port Description in the web interface:

1. Click Configuration, Port, Port Description
2. Specify the detail Port alias or description an alphanumeric string describing the full name and version identification for the system's hardware type, software version, and networking application.
3. Click Apply.

Figure 2-3.1: Port Description for Switch page

The screenshot shows the web interface for configuring a switch. The page title is "Port Description for Switch". The interface includes a navigation menu on the left with options like Configuration, System, Green Ethernet, Ports Configuration, Ports, Ports Description, DHCP, Security, Aggregation, Loop Protection, Spanning Tree, IPMC Profile, and MVR. The main content area is a table with two columns: "Port" and "Description". The table has 8 rows, with the first 8 rows numbered 1 through 8, and the last three rows numbered 24, 25, and 26. Each row has a text input field for the description. At the bottom of the table, there are two buttons: "Apply" and "Reset".

Port	Description
1	<input type="text"/>
2	<input type="text"/>
3	<input type="text"/>
4	<input type="text"/>
5	<input type="text"/>
6	<input type="text"/>
7	<input type="text"/>
8	<input type="text"/>
24	<input type="text"/>
25	<input type="text"/>
26	<input type="text"/>

Parameter descriptions:

Port : This is the logical port number for this row.

Description : Enter up to 47 characters for a descriptive name that identifies this port.

Buttons

Apply – Click to save changes.

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

2-4DHCP

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

DHCP Snooping can prevent attackers from adding their own DHCP servers to the network. A **DHCP Server** is used to allocate network addresses and deliver configuration parameters to dynamically configured hosts called DHCP clients.

2-4.1 Server

2-4.1.1 Mode

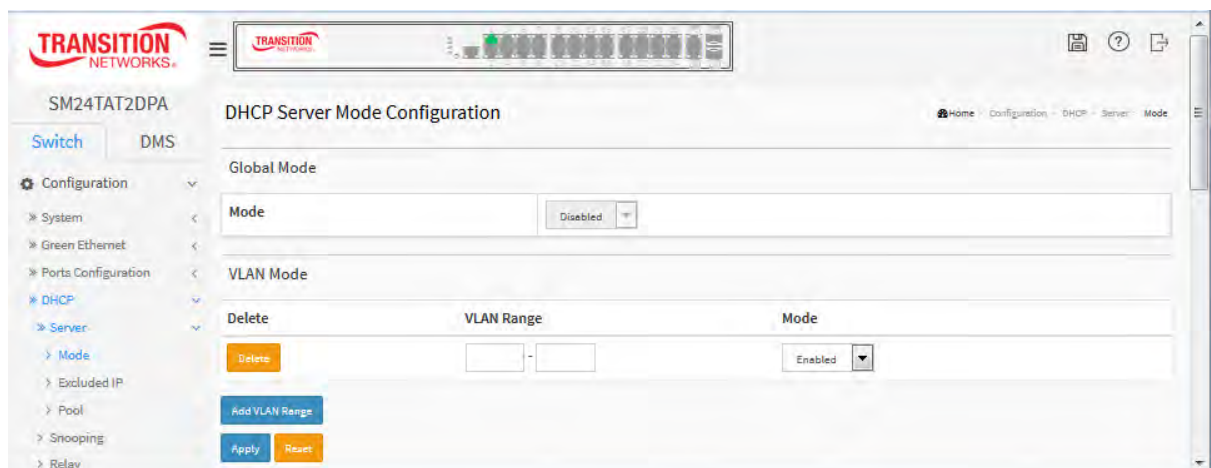
This page configures global mode and VLAN mode to enable/disable DHCP server per system and per VLAN.

Web Interface

To configure DHCP server mode in the web interface:

1. Click Configuration, DHCP, Server, Mode.
2. Select "Enabled" in the Global Mode of DHCP Server Mode Configuration.
3. Add VLAN Range.
4. Click Apply.

Figure 2-4.1.1: DHCP Server Mode Configuration page



Parameter descriptions:

Mode : Configure the operation mode per system. Possible modes are:

Enable: Enable DHCP server per system.

Disable: Disable DHCP server per system.

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

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

1. Press "Add VLAN Range" to add a new VLAN range.
2. Input the VLAN range that you want to disable.
3. Choose Mode to be Disabled.
4. Press Apply to apply the change. The disabled VLAN range is removed from the DHCP Server mode configuration page.

Mode : Indicate the operation mode per VLAN. Possible modes are:

Enable: Enable DHCP server per VLAN.

Disable: Disable DHCP server per VLAN.

Buttons

Add VLAN Range - Click to add a new VLAN range.

Apply – Click to save changes.

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

2-4.1.2 Excluded IP

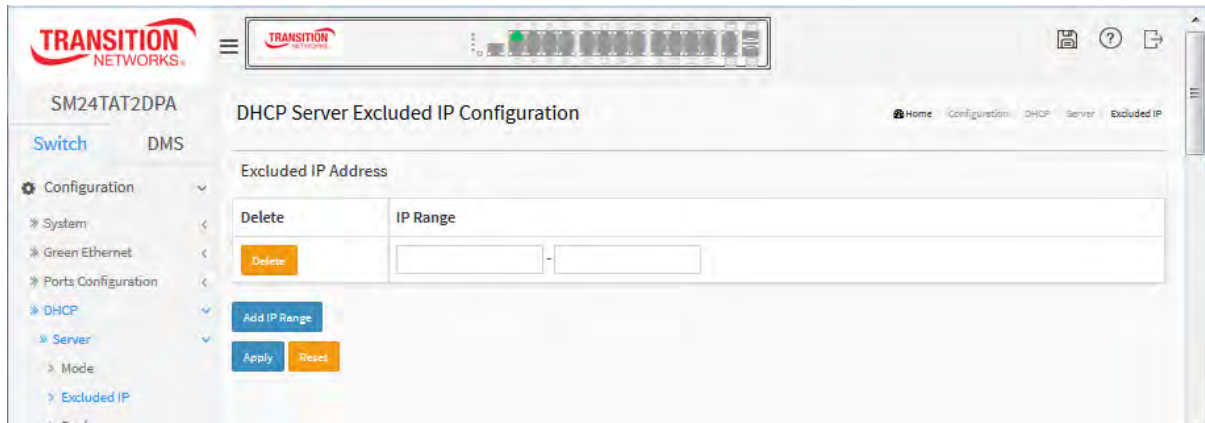
This page configures excluded IP addresses. DHCP server will not allocate these excluded IP addresses to DHCP client.

Web Interface

To configure DHCP server excluded IP in the web interface:

1. Click Configuration, DHCP, Server, Excluded IP
2. Click Add IP Range then you can create new IP Range on the switch.
3. Click Apply.

Figure 2-4.1.2: DHCP Server Excluded IP Configuration page



Parameter descriptions:

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

Buttons

Add IP Range - Click to add a new excluded IP range.

Apply – Click to save changes.

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

2-4.1.3 Pool

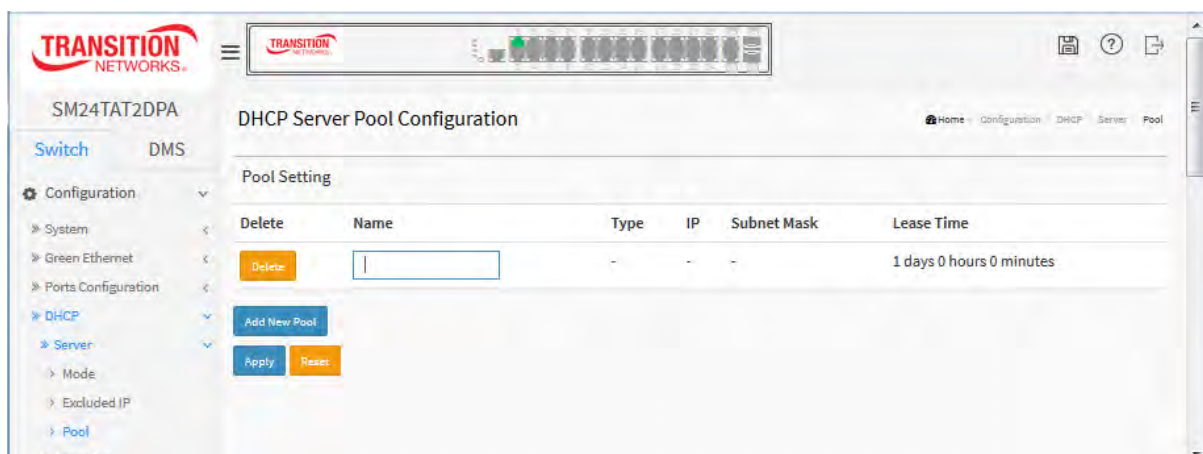
This page manages DHCP pools. According to the DHCP pool, DHCP server will allocate IP address and deliver configuration parameters to DHCP client.

Web Interface

To configure DHCP server pool in the web interface:

1. Click Configuration, DHCP, Server, Pool.
2. Click Add New Pool then you can create a new Pool on the switch.
3. Click Apply.

Figure 2-4.1.1: DHCP Server Pool Configuration page



Parameter descriptions:

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

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

Type : Display which type of the pool is.

Network: the pool defines a pool of IP addresses to service more than one DHCP client.

Host: the pool services for a specific DHCP client identified by client identifier or hardware address.

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

IP : Display network number of the DHCP address pool. If "-" is displayed, it means not defined.

Subnet Mask : Display subnet mask of the DHCP address pool. If "-" is displayed, it means not defined.

Lease Time : Display lease time of the pool.

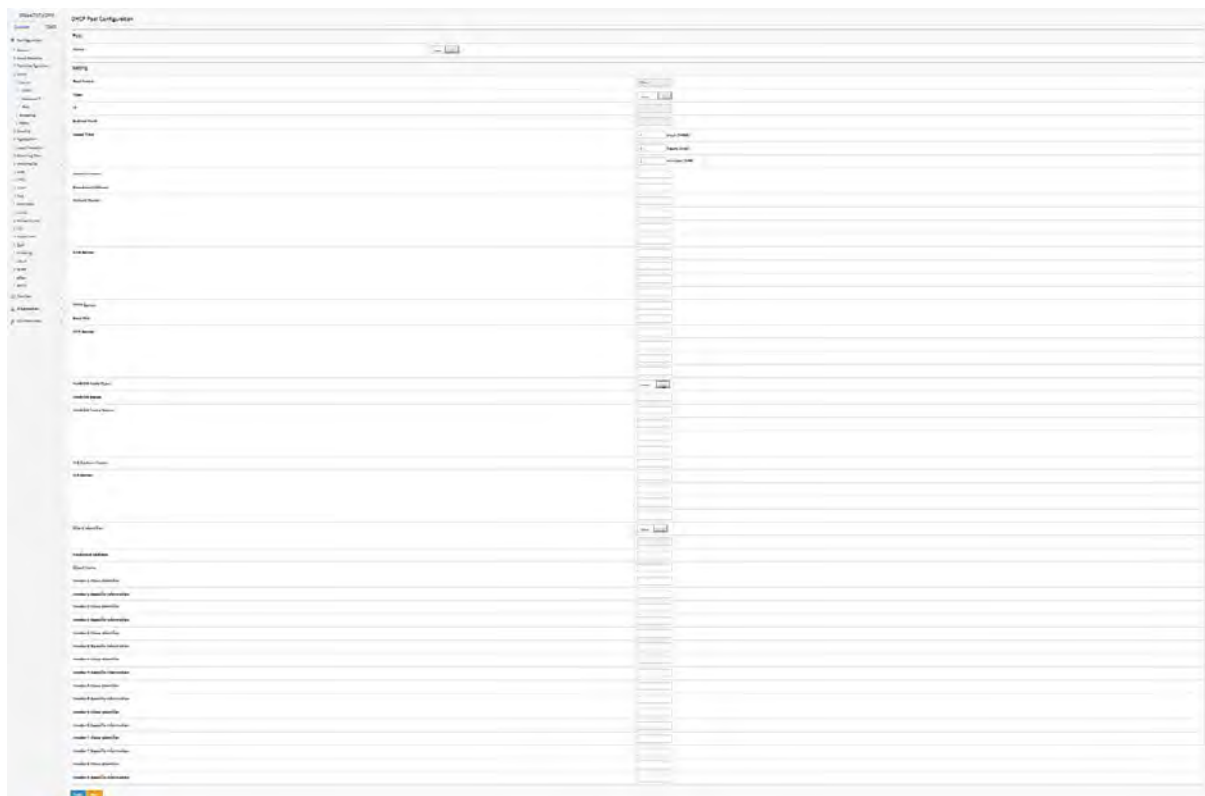
Buttons

Add New Pool - Click to add a new DHCP pool.

Apply – Click to save changes.

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

Click on a Pool Setting Name from the **Configuration > DHCP > Server > Pool** menu path to display the DHCP Pool Configuration page. See the [Internet Assigned Numbers Authority \(IANA\)](#) webpage



DHCP Pool Configuration Parameter descriptions:

Setting : Configure pool settings.

Name : Displays the selected pool name.

Type : Specify which type of the pool is.

None : no pool type.

Network: the pool defines a pool of IP addresses to service more than one DHCP client.

Host: the pool services for a specific DHCP client identified by client identifier or hardware address.

IP : Specify network number of the DHCP address pool.

Subnet Mask : DHCP option 1. Specify subnet mask of the DHCP address pool.

Lease Time : DHCP option 51, 58 and 59. Specify lease time that allows the client to request a lease time for the IP address. If all are 0's, then it means the lease time is infinite.

Domain Name : DHCP option 15. Specify domain name that client should use when resolving hostname via DNS.

Broadcast Address : DHCP option 28. Specify the broadcast address in use on the client's subnet.

Default Router : DHCP option 3. Specify a list of IP addresses for routers on the client's subnet.

DNS Server : DHCP option 6. Specify a list of Domain Name System name servers available to the client.

TFTP Server : DHCP option 66. Specify a list of TFTP servers available to the client.

Boot File : DHCP option 67. Specify a bootfile Name available to the client.

NTP Server : DHCP option 42. Specify a list of IP addresses indicating NTP servers available to the client.

NetBIOS Node Type : DHCP option 46. Specify NetBIOS node type option to allow Netbios over

TCP/IP clients which are configurable to be configured as described in RFC 1001/1002.

NetBIOS Scope : DHCP option 47. Specify the NetBIOS over TCP/IP scope parameter for the client as specified in RFC 1001/1002.

NetBIOS Name Server : DHCP option 44. Specify a list of NBNS name servers listed in order of preference.

NIS Domain Name : DHCP option 40. Specify the name of the client's NIS domain.

NIS Server : DHCP option 41. Specify a list of IP addresses indicating NIS servers available to the client.

Client Identifier : DHCP option 61. Specify client's unique identifier to be used when the pool is the type of host.

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

Client Name : DHCP option 12. Specify the name of client to be used when the pool is the type of host.

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

Vendor i Specific Information : DHCP option 43. Specify vendor specific information according to option 60 vendor class identifier.

2-4.2 Snooping

DHCP Snooping is used to block intruder on the untrusted ports of the switch device when it tries to intervene by injecting a bogus DHCP reply packet to a legitimate conversation between the DHCP client and server.

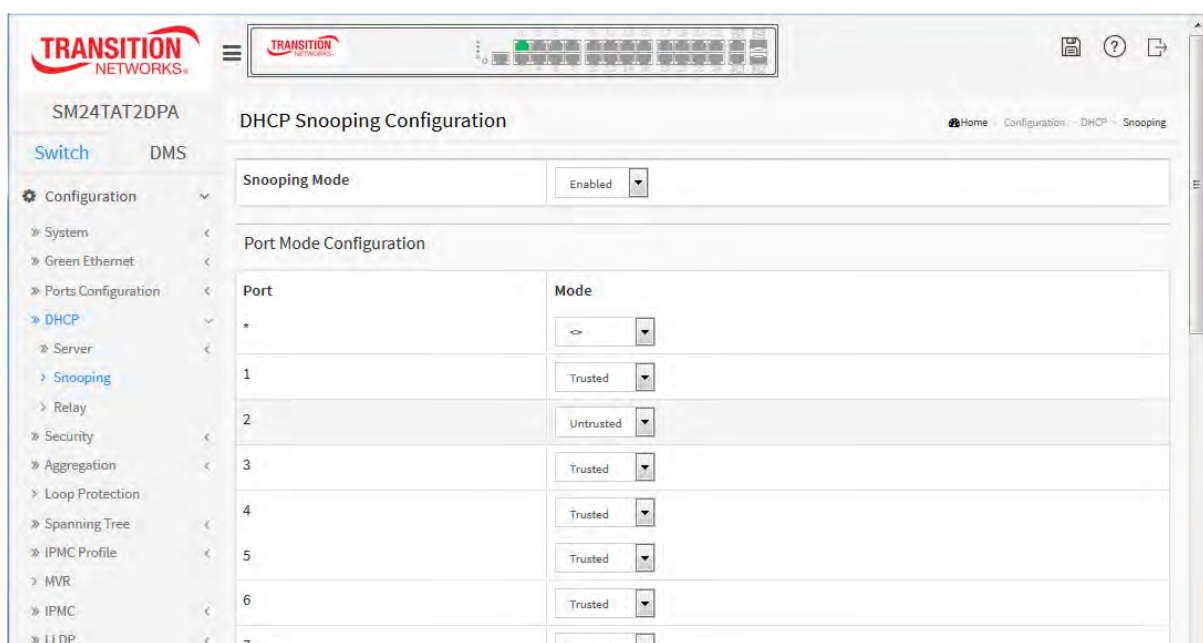
The section describes how to configure the DHCP Snooping parameters of the switch. DHCP Snooping can prevent attackers from adding their own DHCP servers to the network.

Web Interface

To configure DHCP snooping in the web interface:

1. Click Configuration, DHCP, Snooping.
2. Select "Enabled" in the Mode of DHCP Snooping Configuration.
3. Select "Trusted" for the specific port in the Mode of Port Mode Configuration.
4. Click Apply.

Figure 2-4.2: DHCP Snooping Configuration page



Parameter descriptions:

Snooping Mode : Indicates the DHCP snooping mode operation. Possible modes are:

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

Disabled: Disable DHCP snooping mode operation.

Port Mode Configuration : Indicates the DHCP snooping port mode. Possible port modes are:

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

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

Buttons

Apply – Click to save changes.

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

2-4.3 Relay

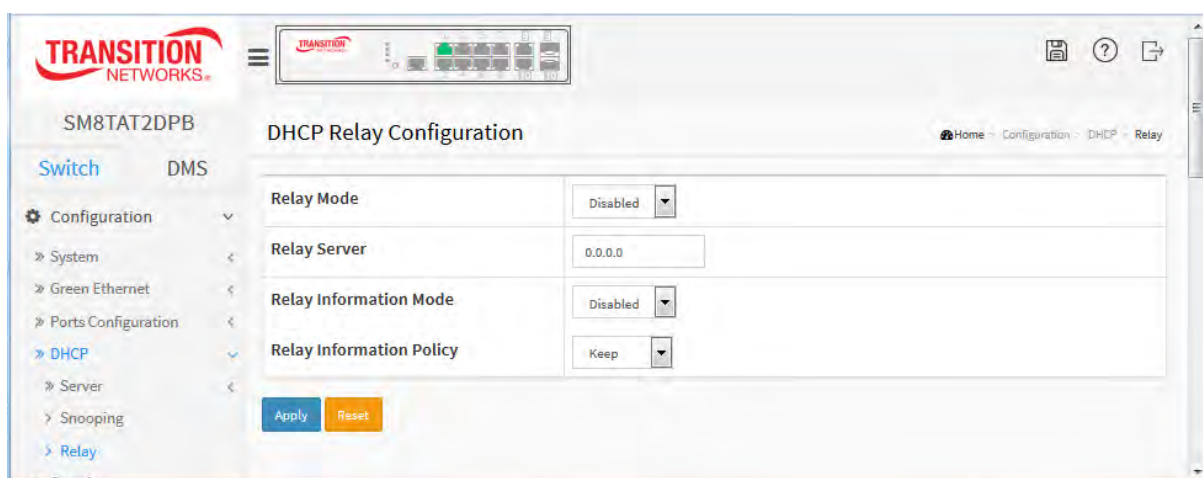
A DHCP relay agent is used to forward and to transfer DHCP messages between clients and the server when they are not in the same subnet domain. It stores the incoming interface IP address in the GIADDR field of the DHCP packet. The DHCP server can use the value of GIADDR field to determine the assigned subnet. For such condition, please make sure the switch configuration of VLAN interface IP address and PVID (Port VLAN ID) correctly.

Web Interface

To configure DHCP Relay in the web interface:

1. Click Configuration, DHCP, Relay.
2. Specify the Relay Mode, Relay server, Relay Information Mode, Relay Information polce.
3. Click Apply.

Figure 2-4.3: DHCP Relay Configuration page



Parameter descriptions:

Relay Mode : Indicates the DHCP relay mode operation. Possible modes are:

Enabled: Enable DHCP relay mode operation. When DHCP relay mode operation is enabled, the agent forwards and transfers DHCP messages between the clients and the server when they are not in the same subnet domain. And the DHCP broadcast message won't be flooded for security considerations.

Disabled: Disable DHCP relay mode operation.

Relay Server : Indicates the DHCP relay server IP address.

Relay Information Mode : Indicates the DHCP relay information mode option operation. The option 82 circuit ID format as "[vlan_id][module_id][port_no]". The first four characters represent the VLAN ID, the fifth and sixth characters are the module ID(in standalone device it always equal 0, in stackable device it means switch ID), and the last two characters are the port number. For example, "00030108" means the DHCP message receive form VLAN ID 3, switch ID 1, port No 8. And the option 82 remote ID value is equal the switch MAC address.

Possible modes are:

Enabled: Enable DHCP relay information mode operation. When DHCP relay information mode operation is enabled, the agent inserts specific information (option 82) into a DHCP message when forwarding to DHCP server and removes it from a DHCP message when transferring to DHCP client. It only works when DHCP relay operation mode is enabled.

Disabled: Disable DHCP relay information mode operation.

Relay Information Policy : Indicates the DHCP relay information option policy. When DHCP relay information mode operation is enabled, if the agent receives a DHCP message that already contains relay agent information it will enforce the policy. The 'Replace' policy is invalid when relay information mode is disabled. Possible policies are:

Replace: Replace the original relay information when a DHCP message that already contains it is received.

Keep: Keep the original relay information when a DHCP message that already contains it is received.

Drop: Drop the package when a DHCP message that already contains relay information is received.

Buttons

Apply – Click to save changes.

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

Message: *Please make sure the DHCP server connected on trust port?* displays to ensure the DHCP server is connected to a trusted port on the switch. Verify that is the case and click the **OK** button.

Please make sure the DHCP server connected on trust port?



2-5 Security

This section shows you to configure the Port Security settings of the Switch. You can use the Port Security feature to restrict input to an interface by limiting and identifying MAC addresses.

2-5.1 Switch

2-5.1.1 Users

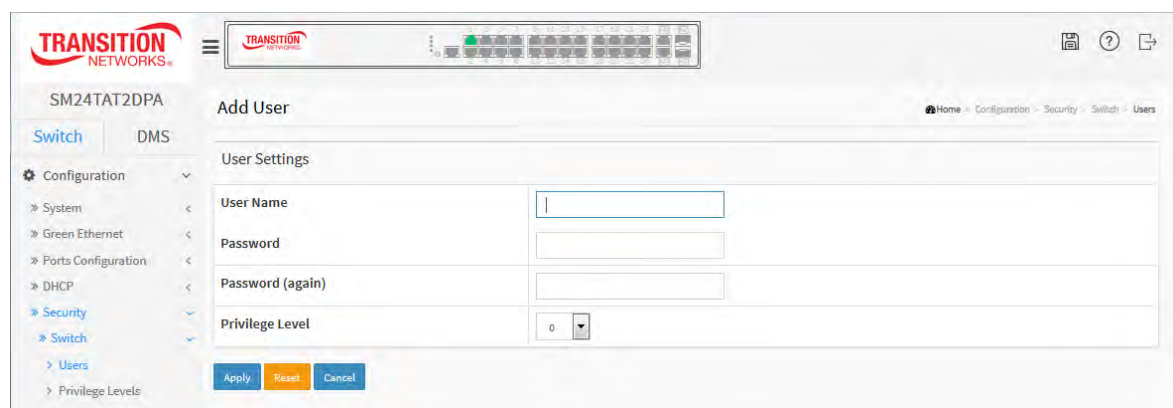
This page provides an overview of the current users. Currently the only way to login as another user on the web server is to close and reopen the browser.

Web Interface

To configure User in the web interface:

1. Click Configuration, Security, Switch, Users.
2. Click Add New User.
3. Specify the User Name parameter.
4. Click Apply.

Figure 2-5.1.1: Users Configuration page



The screenshot displays the 'Add User' configuration page in the Transition Networks web interface. The page title is 'SM24TAT2DPA Add User'. The navigation menu on the left shows the path: Configuration > Security > Switch > Users. The main content area is titled 'Add User' and contains a 'User Settings' form with the following fields:

- User Name:
- Password:
- Password (again):
- Privilege Level:

At the bottom of the form are three buttons: 'Apply' (orange), 'Reset' (yellow), and 'Cancel' (blue).

Parameter descriptions:

User Name : The name identifying the user. This is also a link to Add/Edit User.

Password : To type the password. The allowed string length is 0 to 255, and the allowed content is the ASCII characters from 32 to 126.

Password (again) : Type the password again. You must type the same password again in the field.

Privilege Level : The privilege level of the user. The allowed range is 1 to 15. If the privilege level value is 15, it can access all groups, i.e. that is granted the fully control of the device. But others value need to refer to each group privilege level. User's privilege should be same or greater than the group privilege level to have the access of that group. By default setting, most groups privilege level 5 has the read-only access and privilege level 10 has the read-write access. And the system maintenance (software upload, factory defaults and etc.) need user privilege level 15. Generally, the privilege level 15 can be used for an administrator account, privilege level 10 for a standard user account and privilege level 5 for a guest account.

Buttons

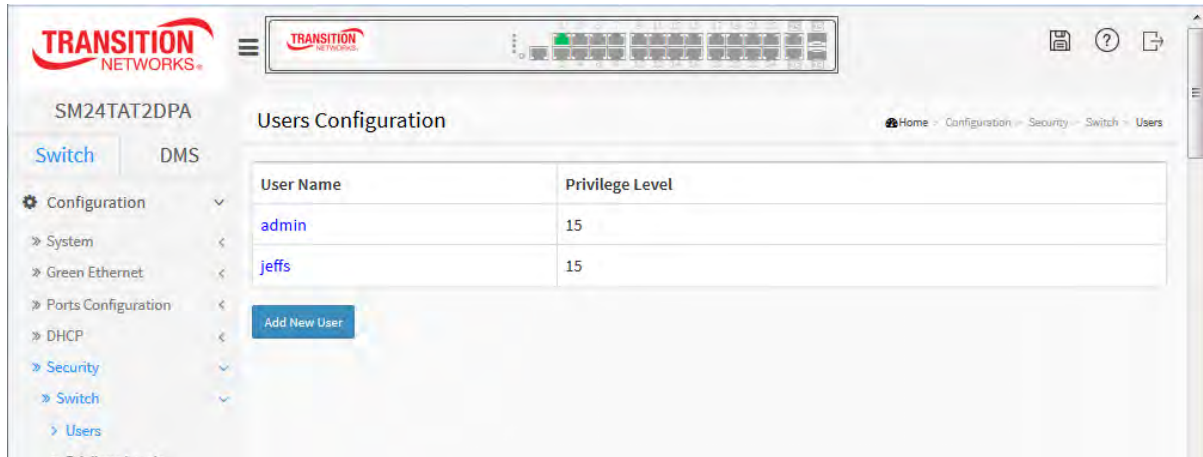
Apply – Click to save changes. You are logged out of the system and can then log in again as any valid user.

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

Cancel - Click to undo any changes made locally and return to the Users.

Delete User - Delete current user. This button is not available for new configurations (Add New User).

Users Configuration page: - new user added



The screenshot shows the Transition Networks web interface for the SM24TAT2DPA device. The main content area is titled "Users Configuration" and contains a table with the following data:

User Name	Privilege Level
admin	15
jeffs	15

Below the table is a blue button labeled "Add New User". The left sidebar shows a navigation menu with "Users" selected under the "Switch" section. The breadcrumb trail at the top right reads "Home > Configuration > Security > Switch > Users".

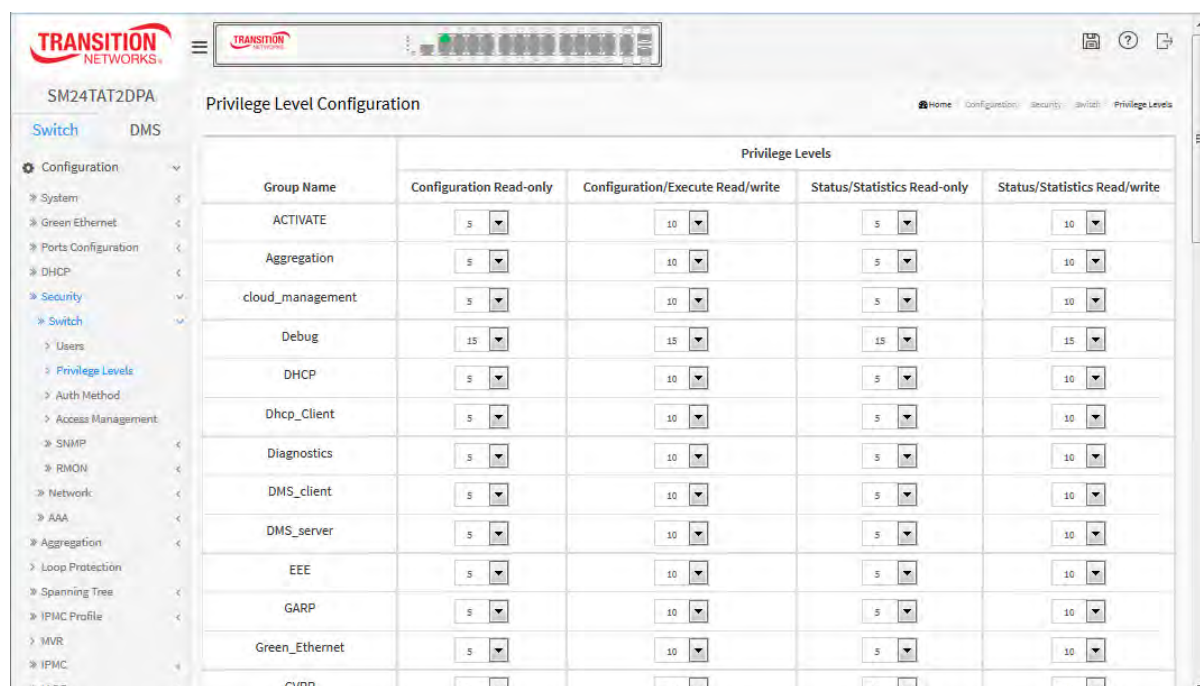
2-5.1.2 Privilege Level

This page provides an overview of the privilege levels. The switch provides user set Account, Aggregation, Diagnostics, EEE, GARP, GVRP, IP, IPMC Snooping LACP LLDP LLDP MED MAC Table MRP MVR MVRP Maintenance Mirroring POE Ports Private VLANs QoS SMTP SNMP Security Spanning Tree System Trap Event VCL VLANs Voice VLAN Privilege Levels from 1 to 15 .

Web Interface

- To configure Privilege Level in the web interface:
1. Click Configuration, Security, Switch, Privilege Level.
 2. Specify the Privilege parameter.
 3. Click Apply.

Figure2-5.1.2: Privilege Level Configuration page



Parameter descriptions:

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

System: Contact, Name, Location, Timezone, Daylight Saving Time, Log.

Security: Authentication, System Access Management, Port (contains Dot1x port, MAC based and the MAC Address Limit), ACL, HTTPS, SSH, ARP Inspection, IP source guard.

IP: Everything except 'ping'.

Port: Everything except Cable Diagnostics.

Diagnostics: 'ping' and Cable Diagnostics.

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

Debug: Only present in CLI.

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

Buttons

Apply – Click to save changes.

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

2-5.1.3 Authentication Method

This page shows how to configure a user with authentication when they log into the switch via one of the management client interfaces. **SSH** (Secure SHell) is used to securely access the Switch. SSH is a secure communication protocol that combines authentication and data encryption to provide secure encrypted communication. **HTTPS** is used to securely access the Switch. HTTPS is a secure communication protocol that combines authentication and data encryption to provide secure encrypted communication via the browser. HTTP has no built-in security. Use http redirect if you want all the requests (both HTTP and HTTPS) to be redirected on HTTPS.

Web Interface

To configure an Authentication Method in the web interface:

1. Specify the Client (console, telnet, ssh, http, https) which you want to monitor.
2. Specify the Authentication Method (none,local, radius, tacacs+)
3. Check Fallback.
4. Click Apply.

Figure 2-4.1.3: Authentication Method Configuration page

Client	Methods			Service Port
console	local	no	no	
telnet	local	no	no	23
ssh	local	no	no	22
http	local	no	no	80
https	no	no	no	443

Parameter descriptions:

Client : The management client for which the configuration below applies (console, telnet, ssh, http, https).

type dropdown: select no, local, radius, or tacacs. You can also select redirect for http.

Methods : Authentication Method can be set to one of the following values:

no : authentication is disabled and login is not possible.

local : use the local user database on the switch for authentication.

radius : use a remote RADIUS server for authentication.

tacacs : use a remote TACACS+ server for authentication.

redirect: enables HTTP to redirect to secure HTTP (HTTPS). This setting is for HTTP client only.

Authentication methods that involve remote servers are timed out if the remote servers are offline. In this case the next method is tried. Each method is tried from left to right and continues until a method either approves or rejects a user. If a remote server is used for primary authentication it is recommended to configure secondary authentication as 'local'. This will enable the management client to login via the local user database if none of the configured authentication servers are alive.

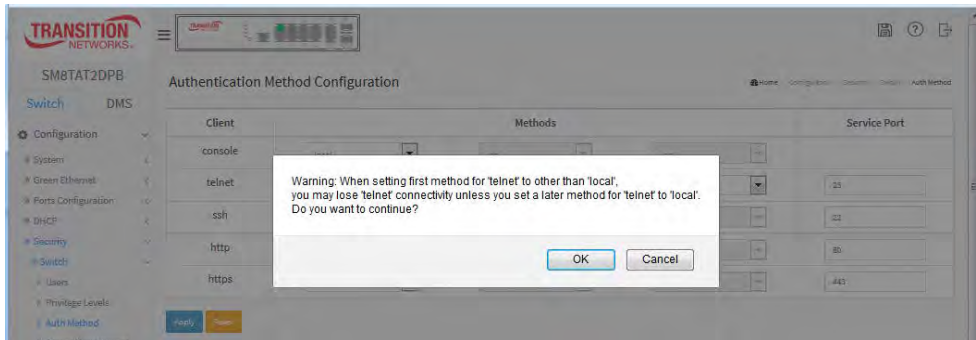
Service Port: The TCP port for each client service. The valid port number is 1 ~ 65534. The port numbers displayed are the commonly-used port numbers for the client types.

Buttons:

Apply – Click to save changes.

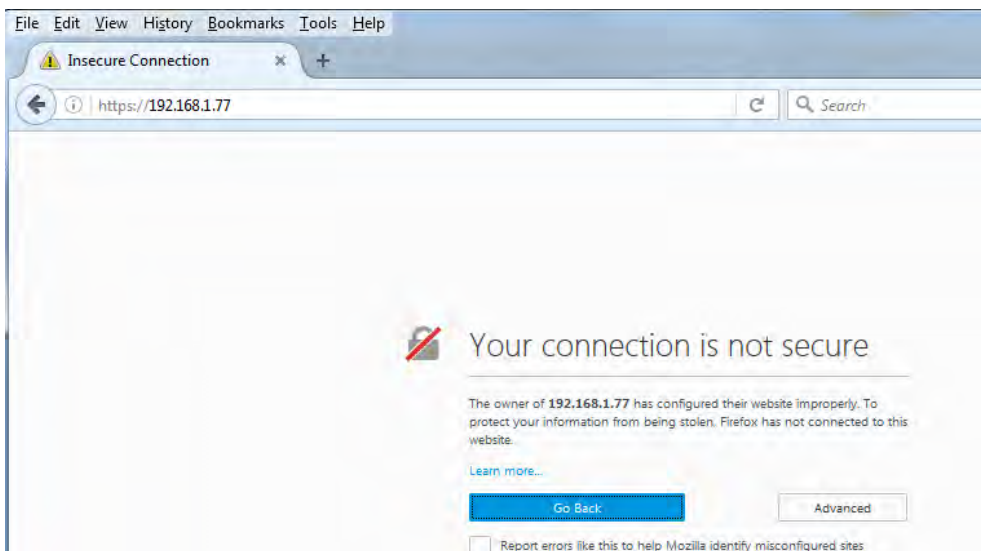
Reset- Click to undo any changes made locally and revert to previously saved values.

Messages: *Warning: When setting first method for 'telnet' to other than 'local', you may lose 'telnet' connectivity unless you set a later method for 'telnet' to 'local'. Do you want to continue?*



Similar messages display for other client type selections (console, telnet, ssh, http, and https).

Message: *Your connection is not secure* displays if you selected redirect as the http client login method.



Similar messages display for other web browsers. Click *Learn more*, *Go Back*, *Advanced*, or *Report errors like this*

If you select *Advanced*, then a screen displays requiring parameter entries; you must then log in again, only this time the login is at the secure site (e.g., <https://192.168.1.77/login.htm>).

2-5.1.6 Access Management

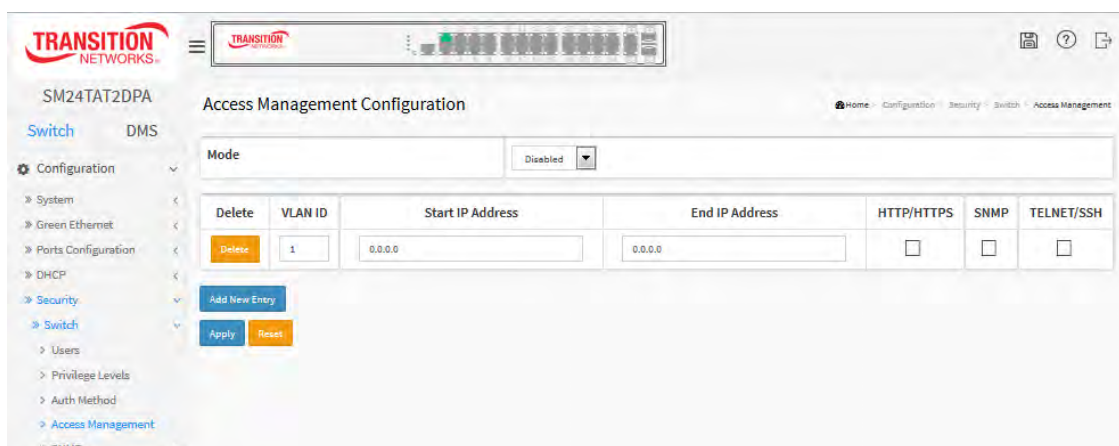
This section shows you to configure access management table of the Switch including HTTP/HTTPS, SNMP, and TELNET/SSH. You can manage the Switch over an Ethernet LAN, or over the Internet.

Web Interface

To configure an Access Management Configuration in the web interface:

1. Select "Enabled" in the Mode of Access Management Configuration.
2. Click "Add new entry".
3. Specify the Start IP Address, End IP Address.
4. Check Access Management method (HTTP/HTTPS, SNMP, and TELNET/SSH) in the entry.
5. Click Apply.

Figure 2-5.1.6: Access Management Configuration page



Parameter descriptions:

Mode : Indicates the access management mode operation. Possible modes are:

Enabled: Enable access management mode operation.

Disabled: Disable access management mode operation.

VLAN ID : Indicates the VLAN ID for the access management entry.

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

Start IP address : Indicates the start IP address for the access management entry.

End IP address : Indicates the end IP address for the access management entry.

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

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

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

Buttons:

Add New Entry – Click to add a new access management entry.

Apply – Click to save changes.

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

2-5.1.7 SNMP

Any Network Management System (NMS) running the Simple Network Management Protocol (SNMP) can manage the Managed devices equipped with SNMP agent, provided that the Management Information Base (MIB) is installed correctly on the managed devices. The SNMP is a protocol that is used to govern the transfer of information between SNMP manager and agent and traverses the Object Identity (OID) of the management Information Base (MIB), described in the form of SMI syntax. SNMP agent is running on the switch to response the request issued by SNMP manager.

Basically, it is passive except issuing the trap information. The switch supports a switch to turn on or off the SNMP agent. If you set the field SNMP "Enable", SNMP agent will be started up. All supported MIB OIDs, including RMON MIB, can be accessed via SNMP manager. If the field SNMP is set "Disable", SNMP agent will be de-activated, the related Community Name, Trap Host IP Address, Trap and all MIB counters will be ignored.

2-5.1.7.1 System

This section describes how to configure SNMP System on the switch. This function is used to configure SNMP settings, community name, trap host and public traps as well as the throttle of SNMP. A SNMP manager must pass the authentication by identifying both community names, then it can access the MIB information of the target device. So both parties must have the same community name. To complete the setting, click the **Apply** button; the setting takes affect.

Web Interface

To display and configure SNMP System in the web interface:

1. Click Configuration, Security, Switch, SNMP, System.
2. At the Mode dropdown, select Enabled or Disabled for the SNMP function.
3. Specify the Engine ID
4. Click Apply.

Figure2-5.1.7.1: SNMP System Configuration page

The screenshot displays the 'SNMP System Configuration' page. On the left is a navigation menu with 'Switch' selected and 'SNMP' expanded. The main content area contains the following configuration fields:

Mode	Enabled
Version	SNMP v2c
Read Community	public
Write Community	private
Engine ID	800007e5017f000001

At the bottom of the configuration area are two buttons: 'Apply' (blue) and 'Reset' (orange).

Parameter descriptions:

Mode : Indicates the SNMP mode operation. Possible modes are:

Enabled: Enable SNMP mode operation.

Disabled: Disable SNMP mode operation.

Version : Indicates the SNMP supported version. Possible versions are:

SNMP v1: Set SNMP support to version 1.

SNMP v2c: Set SNMP support to version 2c (default).

SNMP v3: Set SNMP support to version 3.

Read Community : Indicates the community read access string to permit access to SNMP agent. The allowed string length is 0 to 255, and the allowed content is the ASCII characters from 33 to 126.

The field is applicable only when SNMP version is SNMPv1 or SNMPv2c. If SNMP version is SNMPv3, the community string will be associated with SNMPv3 communities table. It provides more flexibility to configure security name than a SNMPv1 or SNMPv2c community string. In addition to community string, a particular range of source addresses can be used to restrict source subnet.

Write Community : Indicates the community write access string to permit access to SNMP agent. The allowed string length is 0 to 255, and the allowed content is the ASCII characters from 33 to 126. The field is applicable only when SNMP version is SNMPv1 or SNMPv2c. If SNMP version is SNMPv3, the community string will be associated with SNMPv3 communities table. It provides more flexibility to configure security name than a SNMPv1 or SNMPv2c community string. In addition to community string, a particular range of source addresses can be used to restrict source subnet.

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

2-5.1.7.2 Trap

Configure SNMP trap on this page.

Global Settings

Configure SNMP trap in this section.

Web Interface

To display the configure SNMP Trap Configuration in the web interface:

1. Click Configuration, Security, Switch, SNMP, Trap.
2. Click Add New Entry then you can create new SNMP Trap on the switch.
3. Click Apply

Figure2-5.1.7.2: SNMP Trap Configuration page

The screenshot displays the 'SNMP Trap Configuration' page in the Transition Networks web interface. The page is titled 'SM24TAT2DPA' and 'SNMP Trap Configuration'. The left sidebar shows a navigation menu with 'Security' expanded to 'Switch' and 'SNMP' selected. The main content area contains a configuration form with the following fields and values:

Trap Config Name	<input type="text"/>
Trap Mode	Enabled
Trap Version	SNMP v3
Trap Community	public
Trap Destination Address	<input type="text"/>
Trap Destination Port	162
Trap Inform Mode	Disabled
Trap Inform Timeout (seconds)	3
Trap Inform Retry Times	5
Trap Probe Security Engine ID	Enabled
Trap Security Engine ID	Probe Fail
Trap Security Name	None

At the bottom of the form, there are 'Apply' and 'Reset' buttons.

Parameter descriptions

Trap Mode : Indicates the trap mode operation. Possible modes are:

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

Trap Destination Configurations : Configure trap destinations on this page.

Name : Indicates the trap Configuration's name. Indicates the trap destination's name.

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

Version : Indicates the SNMP trap supported version. Possible versions are:

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

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

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

It also allow a valid hostname. A valid hostname is a string drawn from the alphabet (A-Za-z), digits (0-9), dot (.), dash (-). Spaces are not allowed, the first character must be an alpha character, and the first and last characters must not be a dot or a dash.

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

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

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

Enabled: Enable SNMP trap inform mode operation.

Disabled: Disable SNMP trap inform mode operation.

Trap Inform Timeout (seconds) : Indicates the SNMP trap inform timeout. The allowed range is 0 to 2147.

Trap Inform Retry Times : Indicates the SNMP trap inform retry times. The allowed range is 0 to 255.

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

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

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

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

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

2-5.1.7.3 Communities

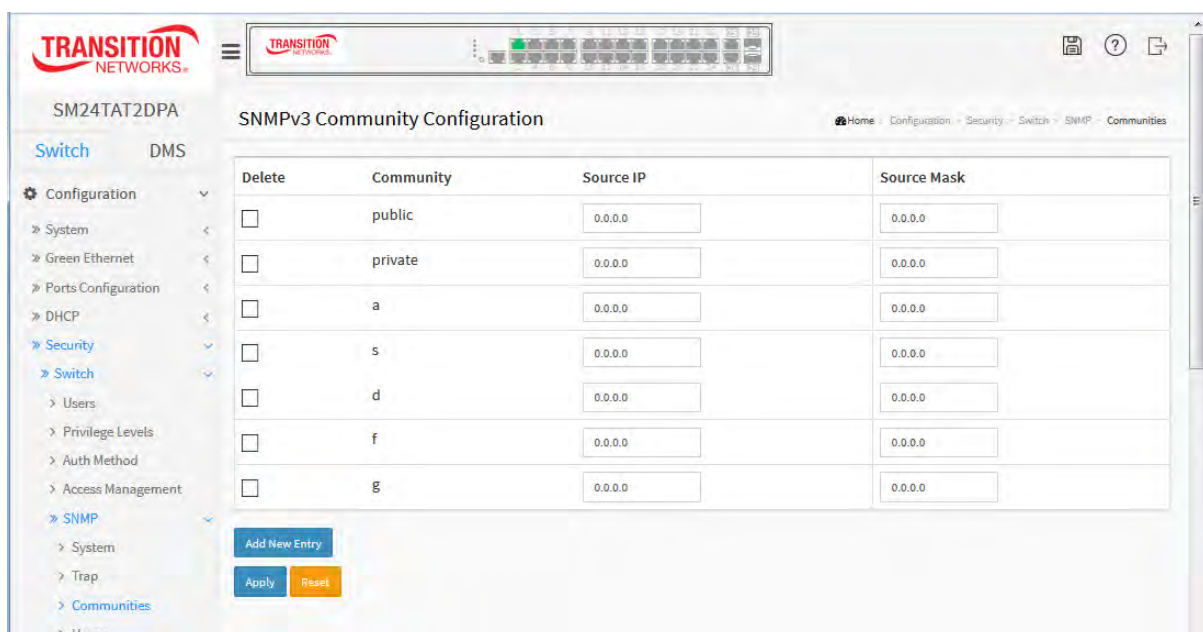
The function is used to configure SNMPv3 communities. The Community and UserName is unique. To create a new community account, click the **Add New Entry** button, enter the account information, then check <Save>.

Web Interface

To display the configure SNMP Communities in the web interface:

1. Click Configuration, Security, Switch, SNMP, Communities.
2. Click the Add New Community button.
3. Specify the SNMP communities parameters.
4. Click Apply.
5. If you want to modify or clear the setting then click Reset.

Figure2-4.1.7.3: SNMPv3 Communities Configuration page



Parameter descriptions:

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

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

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

Source Mask : Indicates the SNMP access source address mask

2-5.1.7.4 Users

The function is used to configure SNMPv3 user. The Entry index key is UserName. To create a new UserName account, please check <Add new user> button, and enter the user information then check <Save>. Max Group Number: 10.

Web Interface

To display the configure SNMP Users in the web interface:

1. Click Configuration, Security, Switch, SNMP, Users.
2. Specify the Privilege parameter.
3. Click Apply.

Figure 2-5.1.7.4: SNMPv3 User Configuration page

Delete	Engine ID	User Name	Security Level	Authentication Protocol	Authentication Password	Privacy Protocol	Privacy Password
<input type="checkbox"/>	800007e5017f000001	default_user	NoAuth, NoPriv	None	None	None	None
<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	Auth, Priv	MDS	<input type="text"/>	DES	<input type="text"/>

Buttons: Add New Entry, Apply, Reset

Parameter descriptions:

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

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

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

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

NoAuth, NoPriv: No authentication and no privacy.

Auth, NoPriv: Authentication and no privacy.

Auth, Priv: Authentication and privacy.

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

Authentication Protocol : Indicates the authentication protocol that this entry should belong to. Possible authentication protocols are:

None: No authentication protocol.

MD5: An optional flag to indicate that this user uses MD5 authentication protocol.

SHA: An optional flag to indicate that this user uses SHA authentication protocol.

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

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

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

None: No privacy protocol.

DES: An optional flag to indicate that this user uses DES authentication protocol.

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

2-5.1.7.5 Group

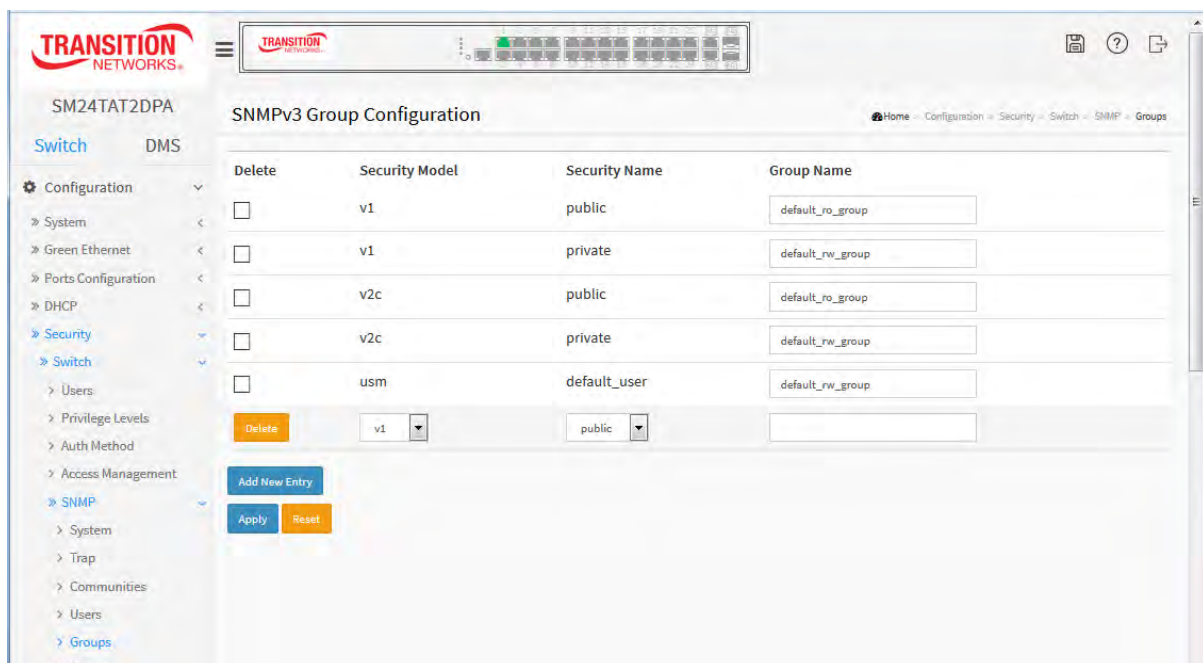
The function is used to configure SNMPv3 group. The Entry index key are Security Model and Security Name. To create a new group account, please check <Add new group> button, and enter the group information then check <Save>. Max Group Number: v1: 2, v2: 2, v3:10.

Web Interface

To display the configure SNMP Groups in the web interface:

1. Click Configuration, Security, Switch, SNMP, Groups.
2. Specify the Privilege parameter.
3. Click Apply.

Figure 2-5.1.7.5: SNMP Group Configuration page



Parameter descriptions:

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

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

v1: Reserved for SNMPv1.

v2c: Reserved for SNMPv2c.

usm: User-based Security Model (USM).

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

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

2-5.1.7.6 Views

The function is used to configure SNMPv3 view. The Entry index keys are OID Subtree and View Name. To create a new view account, please check <Add new view> button, and enter the view information then check <Save>. Max Group Number: 28.

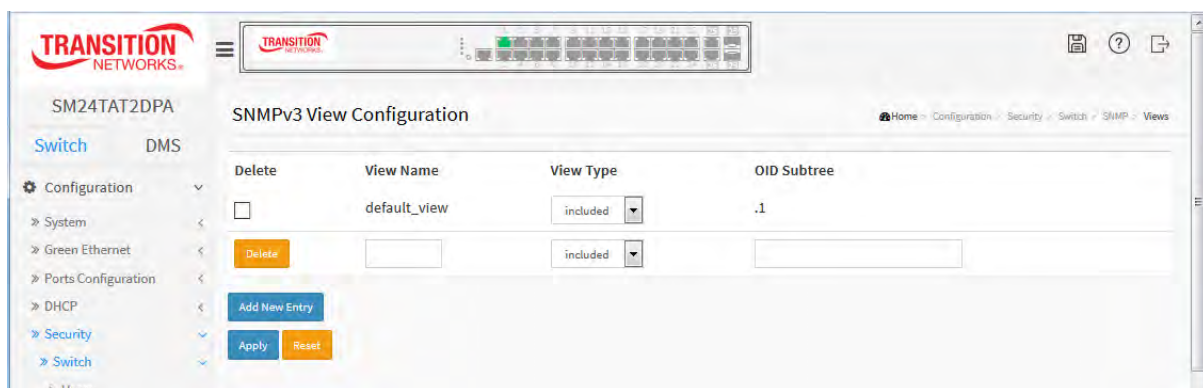
Configure SNMPv3 view table on this page. The entry index keys are View Name and OID Subtree.

Web Interface

To display the configure SNMP views in the web interface:

1. Click Configuration, Security, Switch, SNMP, Views.
2. Click Add New Entry.
3. Specify the SNMP View parameters.
4. Click Apply.
5. If you want to modify or clear the setting then click Reset.

Figure 2-5.1.7.6: SNMP View Configuration page



Parameter descriptions:

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

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

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

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

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

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

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

2-5.1.7.7 Access

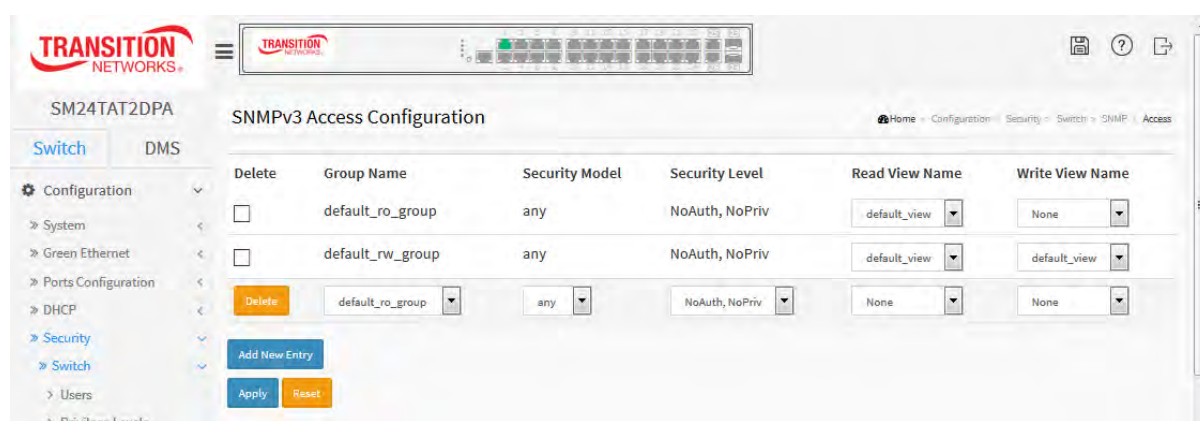
The function is used to configure SNMPv3 accesses. The Entry index key are Group Name, Security Model and Security level. To create a new access account, please check <Add New Entry> button, and enter the access information then check <Save>. Max Group Number : 14

Web Interface

To display the configure SNMP Access in the web interface:

1. Click Configuration, Security, Switch, SNMP, Accesses.
2. Click Add new Access.
3. Specify the SNMP Access parameters.
4. Click Apply.
5. If you want to modify or clear the setting then click Reset.

Figure 2-5.1.7.7: The SNMP Accesses Configuration page



Parameter descriptions:

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

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

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

Any: Any security model accepted(v1|v2c|usm).

v1: Reserved for SNMPv1.

v2c: Reserved for SNMPv2c.

usm: User-based Security Model (USM).

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

NoAuth, NoPriv: No authentication and no privacy.

Auth, NoPriv: Authentication and no privacy.

Auth, Priv: Authentication and privacy.

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

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

2-5.1.7.8 Trap Event Severity

This page displays and lets you configure trap event severity configurations.

Web Interface

To display the configure Trap Event Severity in the web interface:

1. Click Configuration, Security, Switch, SNMP, Trap Event Severity.
2. Scroll to the Group Name and select a Severity Level.
3. Click the Apply to save the setting.
4. To cancel the setting, click the **Reset** button. The page will revert to previously saved values.

Figure 2-5.1.7.8: Trap Event Severity Configuration page

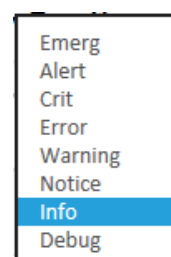
Group Name	Severity Level	Syslog	Trap	SMTP
ACL	Info	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
ACL-Log	Info	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
AUTO-SAVING	Info	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Access-Mgmt	Info	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Auth-Failed	Warning	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cold-Start	Warning	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Config-Info	Info	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
DMS	Info	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Firmware-Upgrade	Info	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Import-Export	Info	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
LACP	Info	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Link-Status	Warning	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Login	Info	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Logout	Info	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Loop-Protect	Info	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Mgmt-IP-Change	Info	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Module-Change	Warning	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
NAS	Info	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Password-Change	Info	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Poe Auto Power Reset	Warning	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Port-Security	Info	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Spanning-Tree	Info	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Warm-Start	Warning	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Parameter descriptions:

Group Name : The name identifying the severity group.

Severity Level : Every group has a severity level. These level types are supported:

- <0> **Emerg**: System is unusable (Emergency).
- <1> **Alert**: Action must be taken immediately.
- <2> **Crit**: Critical conditions.
- <3> **Error**: Error conditions.
- <4> **Warning**: Warning conditions.
- <5> **Notice**: Normal but significant conditions.
- <6> **Info**: Information messages.
- <7> **Debug**: Debug-level messages.



Syslog : Enable - Select this Group Name in Syslog.

Trap : Enable - Select this Group Name in Trap.

SMTP : Enable - Select this Group Name in SMTP.

2-5.1.8 RMON

An RMON implementation typically operates in a client/server model. Monitoring devices contain RMON software agents that collect information and analyze packets. These probes act as servers and the Network Management applications that communicate with them act as clients.

2-5.1.8.1 Statistics

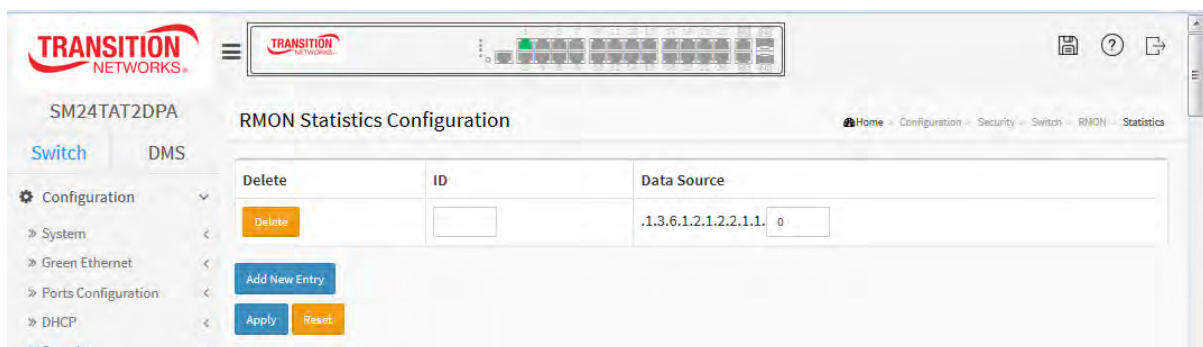
Configure RMON Statistics table on this page. The entry index key is **ID**.

Web Interface

To display the configure RMON configuration in the web interface:

1. Click RMON, Statistics.
2. Click Add New Entry.
3. Specify the ID parameters.
4. Click Apply.

Figure 2-5.1.8.1: RMON Statistics Configuration page



Parameter descriptions: These parameters are displayed on the RMON Statistics Configuration page:

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

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

Data Source : Indicates the port ID which wants to be monitored. If in stacking switch, the value must add 1000*(switch ID-1), for example, if the port is switch 3 port 5, the value is 2005

Interval : Indicates the interval in seconds for sampling the history statistics data. The range is 1 - 3600; the default value is 1800 seconds.

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

Buckets Granted : The number of data to be saved in the RMON.

2-5.1.8.2 History

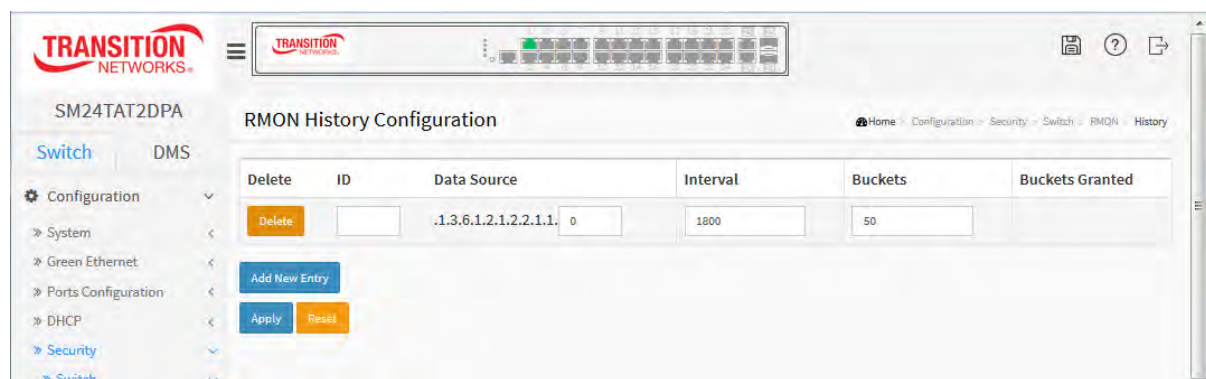
Configure RMON History table on this page. The entry index key is **ID**.

Web Interface

To display the configure RMON History in the web interface:

1. Click RMON, History.
2. Click Add New Entry.
3. Specify the ID parameters.
4. Click Apply.

Figure 2-5.1.8.2: The RMON History Configuration page



Parameter descriptions: These parameters are displayed on the RMON History Configuration page:

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

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

Data Source : Indicates the port ID which wants to be monitored. If in stacking switch, the value must add 1000*(switch ID-1), for example, if the port is switch 3 port 5, the value is 2005

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

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

Buckets Granted : The number of data to be saved in the RMON.

2-5.1.8.3 Alarm

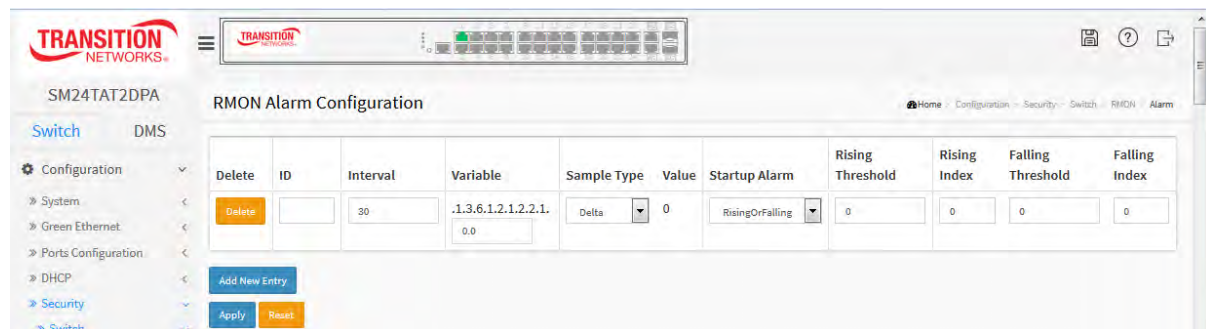
Configure RMON Alarm table on this page. The entry index key is **ID**.

Web Interface

To display the configure RMON Alarm in the web interface:

1. Click RMON, Alarm.
2. Click Add New Entry.
3. Specify the ID parameters.
4. Click Apply.

Figure 2-5.1.8.3: RMON Alarm Configuration page



Parameter descriptions: These parameters are displayed on the RMON Alarm Configuration page:

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

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

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

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

InOctets: The total number of octets received on the interface, including framing characters.

InUcastPkts: The number of uni-cast packets delivered to a higher-layer protocol.

InNUcastPkts: The number of broad-cast and multi-cast packets delivered to a higher-layer protocol.

InDiscards: The number of inbound packets that are discarded even the packets are normal.

InErrors: The number of inbound packets that contained errors preventing them from being deliverable to a higher-layer protocol.

InUnknownProtos: the number of the inbound packets that were discarded because of the unknown or un-support protocol.

OutOctets: The number of octets transmitted out of the interface , including framing characters.

OutUcastPkts: The number of uni-cast packets that request to transmit.

OutNUcastPkts: The number of broad-cast and multi-cast packets that request to transmit.

OutDiscards: The number of outbound packets that are discarded event the packets is normal.

OutErrors: The The number of outbound packets that could not be transmitted because of errors.

OutQLen: The length of the output packet queue (in packets).

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

Absolute: Get the sample directly.

Delta: Calculate the difference between samples (default).

Value : The value of the statistic during the last sampling period.

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

RisingTrigger alarm when the first value is larger than the rising threshold.

FallingTrigger alarm when the first value is less than the falling threshold.

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

Rising Threshold : Rising threshold value (-2147483648-2147483647).

Rising Index : Rising event index (1-65535).

Falling Threshold : Falling threshold value (-2147483648-2147483647)

Falling Index : Falling event index (1-65535).

2-5.1.8.4 Event

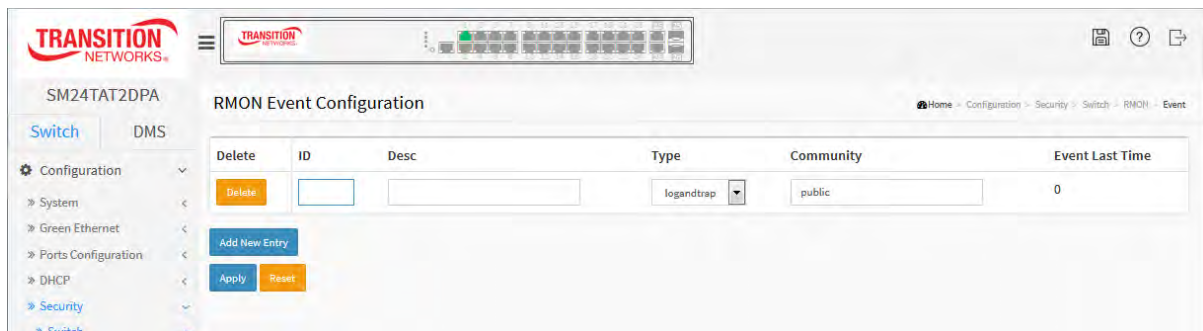
Configure RMON Event table on this page. The entry index key is **ID**.

Web Interface

To display the configure RMON Event in the web interface:

1. Click RMON, Event.
2. Click Add New Entry.
3. Specify the ID parameters.
4. Click Apply.

Figure 2-5.1.8.4: RMON Event Configuration page



Parameter descriptions: These parameters are displayed on the RMON History Configuration page:

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

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

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

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

None: No SNMP log is created, no SNMP trap is sent.

Log: Create SNMP log entry when the event is triggered.

Snmp trap: Send SNMP trap when the event is triggered.

Log and trap: Create SNMP log entry and sent SNMP trap when the event is triggered.

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

Event Last Time : Indicates the value of sysUpTime at the time this event entry last generated an event.

2-5.2 Network

2-5.2.1 Limit Control

This section shows you to configure the Port Security settings of the Switch. You can use the Port Security feature to restrict input to an interface by limiting and identifying MAC addresses.

Web Interface

To configure a Configuration of Limit Control in the web interface:

1. Select "Enabled" in the Mode of System Configuration.
2. Check Aging Enabled.
3. Set Aging Period (Default is 3600 seconds).

To configure a Port Configuration of Limit Control in the web interface:

1. Select "Enabled" in the Mode of Port Configuration.
2. Specify the maximum number of MAC addresses in the Limit of Port Configuration.
3. Set Action (Trap, Shutdown, Trap & Shutdown)
4. Click Apply.

Figure 2-5.2.1: Port Security Limit Control Configuration page

The screenshot displays the 'Port Security Limit Control Configuration' page. The left sidebar shows a navigation tree with 'Security' > 'Switch' > 'Network' > 'Limit Control' selected. The main content area is divided into 'System Configuration' and 'Port Configuration'.

System Configuration:

- Mode: Disabled (dropdown)
- Aging Enabled:
- Aging Period: 3600 seconds

Port Configuration Table:

Port	Mode	Limit	Action	State	Re-open
*	Disabled	4	None	Disabled	Reopen
1	Disabled	4	None	Disabled	Reopen
2	Disabled	4	None	Disabled	Reopen
3	Disabled	4	None	Disabled	Reopen
4	Disabled	4	None	Disabled	Reopen
5	Disabled	4	None	Disabled	Reopen
6	Disabled	4	None	Disabled	Reopen
7	Disabled	4	None	Disabled	Reopen

Parameter descriptions:

System Configuration

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

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

Aging Period : If Aging Enabled is checked, then the aging period is controlled with this input. If other modules are using the underlying port security for securing MAC addresses, they may have other requirements to the aging period. The underlying port security will use the shorter requested aging period of all modules that use the functionality.

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

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

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

Port : The port number to which the configuration below applies.

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

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

None: Do not allow more than Limit MAC addresses on the port, but take no further action.

Trap: If Limit + 1 MAC addresses is seen on the port, send an SNMP trap. If Aging is disabled, only one SNMP trap will be sent, but with Aging enabled, new SNMP traps will be sent every time the limit gets exceeded.

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

- 1) Boot the switch,
- 2) Disable and re-enable Limit Control on the port or the switch,
- 3) Click the Reopen button.

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

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

Disabled: Limit Control is either globally disabled or disabled on the port.

Ready: The limit is not yet reached. This can be shown for all actions.

Limit Reached: Indicates that the limit is reached on this port. This state can only be shown if Action is set to none or Trap.

Shutdown: Indicates that the port is shut down by the Limit Control module. This state can only be shown if Action is set to shut down or Trap & Shutdown.

Re-open Button : If a port is shut down by this module, you may reopen it by clicking this button, which will only be enabled if this is the case. For other methods, refer to shut down in the Action section.



NOTE: That clicking the reopen button causes the page to be refreshed, so non-committed changes will be lost.

Upper right icon (Refresh): You can click them for refresh the Port Security information manually.

Buttons:

Apply – Click to save changes.

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

2-5.2.2 NAS

The section describes how to configure the NAS parameters of the switch. The NAS server can be employed to connect users to a variety of resources including Internet access, conference calls, printing documents on shared printers, or by simply logging on to the Internet.

Web Interface

To configure a Network Access Server in the web interface:

1. Select "Enabled" in the Mode of Network Access Server Configuration.
2. Check Reauthentication Enabled.
3. Set Reauthentication Period (Default is 3600 seconds).
4. Set EAPOL Timeout (Default is 30 seconds).
5. Set Aging Period (Default is 300 seconds).
6. Set Hold Time (Default is 10 seconds).
7. Check RADIUS-Assigned QoS Enabled.
8. Check RADIUS-Assigned VLAN Enabled.
9. Check Guest VLAN Enabled.
10. Specify Guest VLAN ID.
11. Specify Max. Reauth. Count.
12. Check Allow Guest VLAN if EAPOL Seen.
13. Click Apply.

Figure 2-5.2.2: Network Access Server Configuration page

The screenshot shows the 'NAS Configuration' page with the following settings:

Parameter	Value
Reauthentication Period	3600 seconds
EAPOL Timeout	30 seconds
Aging Period	300 seconds
Hold Time	10 seconds
RADIUS-Assigned QoS Enabled	<input type="checkbox"/>
RADIUS-Assigned VLAN Enabled	<input type="checkbox"/>
Guest VLAN Enabled	<input type="checkbox"/>
Guest VLAN ID	1
Max. Reauth. Count	2
Allow Guest VLAN if EAPOL Seen	<input type="checkbox"/>

The 'Port Configuration' section is a table with the following columns: Port, Admin State, RADIUS-Assigned QoS Enabled, RADIUS-Assigned VLAN Enabled, Guest VLAN Enabled, Port State, and Restart.

Port	Admin State	RADIUS-Assigned QoS Enabled	RADIUS-Assigned VLAN Enabled	Guest VLAN Enabled	Port State	Restart
*	<>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Globally Disabled	Reauthenticate Reinitialize
1	Force Authorized	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Globally Disabled	Reauthenticate Reinitialize
2	Force Authorized	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Globally Disabled	Reauthenticate Reinitialize
3	Force Authorized	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Globally Disabled	Reauthenticate Reinitialize
4	Force Authorized	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Globally Disabled	Reauthenticate Reinitialize
5	Force Authorized	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Globally Disabled	Reauthenticate Reinitialize
6	Force Authorized	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Globally Disabled	Reauthenticate Reinitialize
7	Force Authorized	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Globally Disabled	Reauthenticate Reinitialize
8	Force Authorized	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Globally Disabled	Reauthenticate Reinitialize
9	Force Authorized	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Globally Disabled	Reauthenticate Reinitialize
10	Force Authorized	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Globally Disabled	Reauthenticate Reinitialize

At the bottom of the page, there are 'Apply' and 'Reset' buttons.

Parameter descriptions:

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

Reauthentication Enabled : If checked, successfully authenticated supplicants/clients are reauthenticated after the interval specified by the Reauthentication Period. Reauthentication for

802.1X-enabled ports can be used to detect if a new device is plugged into a switch port or if a supplicant is no longer attached.

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

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

EAPOL Timeout : Determines the time for retransmission of Request Identity EAPOL frames. Valid values are in the range 1 to 255 seconds. This has no effect for MAC-based ports.

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

Single 802.1X

Multi 802.1X

MAC-Based Auth.

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

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

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

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

• **Single 802.1X**

• **Multi 802.1X**

• **MAC-Based Auth.**

If a client is denied access - either because the RADIUS server denies the client access or because the RADIUS server request times out (according to the timeout specified on the "Configuration → Security → AAA" page) - the client is put on hold in the Un-authorized state. The hold timer does not count during an on-going authentication. In MAC-based Auth. mode, the switch will ignore new frames coming from the client during the hold time. The Hold Time can be set to a number between 10 and 1000000 seconds.

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

Port : The port number for which the configuration below applies.

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

Force Authorized : In this mode, the switch will send one EAPOL Success frame when the port link comes up, and any client on the port will be allowed network access without authentication.

Force Unauthorized : In this mode, the switch will send one EAPOL Failure frame when the port link comes up, and any client on the port will be disallowed network access.

Port-based 802.1X : In the 802.1X-world, the user is called the supplicant, the switch is the authenticator, and the RADIUS server is the authentication server. The authenticator acts as the man-in-the-middle, forwarding requests and responses between the supplicant and the authentication server. Frames sent between the supplicant and the switch are special 802.1X frames, known as EAPOL (EAP Over LANs) frames. EAPOL frames encapsulate EAP PDUs (RFC3748). Frames sent between the switch and the RADIUS server are RADIUS packets. RADIUS packets also encapsulate EAP PDUs together with other attributes like the switch's IP address, name, and the supplicant's port number on the switch. EAP is very flexible, in that it allows for different authentication methods, like MD5-Challenge, PEAP, and TLS. The important thing is that the authenticator (the switch) doesn't need to know which authentication method the supplicant and the authentication server are using, or how many information exchange frames are needed for a particular method. The switch simply encapsulates the EAP part of the frame into the relevant type (EAPOL or RADIUS) and forwards it.

When authentication is complete, the RADIUS server sends a special packet containing a success or failure indication. Besides forwarding this decision to the supplicant, the switch uses it to open up or block traffic on the switch port connected to the supplicant



NOTE: Suppose two backend servers are enabled and that the server timeout is configured to X seconds (using the AAA configuration page), and suppose that the first server in the list is currently down (but not considered dead).

Now, if the supplicant retransmits EAPOL Start frames at a rate faster than X seconds, then it will never get authenticated, because the switch will cancel on-going backend authentication server requests whenever it receives a new EAPOL Start frame from the supplicant.

And since the server hasn't yet failed (because the X seconds haven't expired), the same server will be contacted upon the next backend authentication server request from the switch. This scenario will loop forever. Therefore, the server timeout should be smaller than the supplicant's EAPOL Start frame retransmission rate.

Single 802.1X : In port-based 802.1X authentication, once a supplicant is successfully authenticated on a port, the whole port is opened for network traffic. This allows other clients connected to the port (for instance through a hub) to piggy-back on the successfully authenticated client and get network access even though they really aren't authenticated. To overcome this security breach, use the Single 802.1X variant. Single 802.1X is really not an IEEE standard, but features many of the same characteristics as does port-based 802.1X. In Single 802.1X, at most one supplicant can get authenticated on the port at a time. Normal EAPOL frames are used in the communication between the supplicant and the switch. If more than one supplicant is connected to a port, the one that comes first when the port's link comes up will be the first one considered. If that supplicant doesn't provide valid credentials within a certain amount of time, another supplicant will get a chance. Once a supplicant is successfully authenticated, only that supplicant will be allowed access. This is the most secure of all the supported modes. In this mode, the Port Security module is used to secure a supplicant's MAC address once successfully authenticated.

Multi 802.1X : In port-based 802.1X authentication, once a supplicant is successfully authenticated on a port, the whole port is opened for network traffic. This allows other clients connected to the port (for instance through a hub) to piggy-back on the successfully authenticated client and get network access even though they really aren't authenticated. To overcome this security breach, use the Multi 802.1X variant.

Multi 802.1X is really not an IEEE standard, but features many of the same characteristics as does port-based 802.1X. Multi 802.1X is - like Single 802.1X - not an IEEE standard, but a variant that features many of the same characteristics. In Multi 802.1X, one or more supplicants can get authenticated on the same port at the same time. Each supplicant is authenticated individually and secured in the MAC table using the Port Security module.

In Multi 802.1X it is not possible to use the multicast BPDU MAC address as destination MAC address for EAPOL frames sent from the switch towards the supplicant, since that would cause all supplicants attached to the port to reply to requests sent from the switch. Instead, the switch uses the supplicant's MAC address, which is obtained from the first EAPOL Start or EAPOL Response Identity frame sent by the supplicant. An exception to this is when no supplicants are attached. In this case, the switch sends EAPOL Request Identity frames using the BPDU multicast MAC address as destination - to wake up any supplicants that might be on the port.

The maximum number of supplicants that can be attached to a port can be limited using the Port Security Limit Control functionality.

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

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

The advantage of MAC-based authentication over port-based 802.1X is that several clients can be connected to the same port (e.g. through a 3rd party switch or a hub) and still require individual authentication, and that the clients don't need special supplicant software to authenticate. The advantage of MAC-based authentication over 802.1X-based authentication is that the clients don't need special supplicant software to authenticate. The disadvantage is that MAC addresses can be spoofed by malicious users - equipment whose MAC address is a valid RADIUS user can be used by anyone. Also, only the MD5-Challenge method is supported. The maximum number of clients that can be attached to a port can be limited using the Port Security Limit Control functionality.

RADIUS-Assigned QoS Enabled : When RADIUS-Assigned QoS is both globally enabled and enabled (checked) on a given port, the switch reacts to QoS Class information carried in the RADIUS Access-Accept packet transmitted by the RADIUS server when a supplicant is successfully authenticated. If present and valid, traffic received on the supplicant's port will be classified to the given QoS Class. If (re-)authentication fails or the RADIUS Access-Accept packet no longer carries a QoS Class or it's invalid, or the supplicant is otherwise no longer present on the port, the port's QoS Class is immediately reverted to the original QoS Class (which may be changed by the administrator in the meanwhile without affecting the RADIUS-assigned). This option is only available for single-client modes, i.e.

Port-based 802.1X

Single 802.1X

RADIUS attributes used in identifying a QoS Class:

Refer to the written documentation for a description of the RADIUS attributes needed in order to successfully identify a QoS Class. The User-Priority-Table attribute defined in RFC4675 forms the basis for identifying the QoS Class in an Access-Accept packet.

Only the first occurrence of the attribute in the packet will be considered, and to be valid, it must follow this rule:

All 8 octets in the attribute's value must be identical and consist of ASCII characters in the range '0' - '3', which translates into the desired QoS Class in the range [0; 3].

RADIUS-Assigned VLAN Enabled : When RADIUS-Assigned VLAN is both globally enabled and

enabled (checked) for a given port, the switch reacts to VLAN ID information carried in the RADIUS Access-Accept packet transmitted by the RADIUS server when a supplicant is successfully authenticated. If present and valid, the port's Port VLAN ID will be changed to this VLAN ID, the port will be set to be a member of that VLAN ID, and the port will be forced into VLAN unaware mode. Once assigned, all traffic arriving on the port will be classified and switched on the RADIUS-assigned VLAN ID.

If (re-)authentication fails or the RADIUS Access-Accept packet no longer carries a VLAN ID or it's invalid, or the supplicant is otherwise no longer present on the port, the port's VLAN ID is immediately reverted to the original VLAN ID (which may be changed by the administrator in the meanwhile without affecting the RADIUS-assigned).

This option is only available for single-client modes, i.e.

- **Port-based 802.1X**

- **Single 802.1X**

For trouble-shooting VLAN assignments, use the "Monitor→VLANs→VLAN Membership and VLAN Port" pages. These pages show which modules have (temporarily) overridden the current Port VLAN configuration.

RADIUS attributes used in identifying a VLAN ID:

RFC2868 and RFC3580 form the basis for the attributes used in identifying a VLAN ID in an Access-Accept packet. The following criteria are used:

- The Tunnel-Medium-Type, Tunnel-Type, and Tunnel-Private-Group-ID attributes must all be present at least once in the Access-Accept packet.
- The switch looks for the first set of these attributes that have the same Tag value and fulfil the following requirements (if Tag == 0 is used, the Tunnel-Private-Group-ID does not need to include a Tag):
 - Value of Tunnel-Medium-Type must be set to "IEEE-802" (ordinal 6).
 - Value of Tunnel-Type must be set to "VLAN" (ordinal 13).
 - Value of Tunnel-Private-Group-ID must be a string of ASCII chars in the range '0' - '9', which is interpreted as a decimal string representing the VLAN ID. Leading '0's are discarded. The final value must be in the range [1; 4095].

Guest VLAN Enabled : When Guest VLAN is both globally enabled and enabled (checked) for a given port, the switch considers moving the port into the Guest VLAN according to the rules outlined below.

This option is only available for EAPOL-based modes, i.e.:

- **Port-based 802.1X**

- **Single 802.1X**

- **Multi 802.1X**

For trouble-shooting VLAN assignments, use the "Monitor→VLANs→VLAN Membership and VLAN Port" pages. These pages show which modules have (temporarily) overridden the current Port VLAN configuration.

Guest VLAN Operation:

When a Guest VLAN enabled port's link comes up, the switch starts transmitting EAPOL Request Identity frames. If the number of transmissions of such frames exceeds Max. Reauth. Count and no EAPOL frames have been received in the meanwhile, the switch considers entering the Guest VLAN. The interval between transmissions of EAPOL Request Identity frames is configured with EAPOL Timeout. If Allow Guest VLAN if EAPOL Seen is enabled, the port will now be placed in the Guest VLAN. If disabled, the switch will first check its history to see if an EAPOL frame has previously been received on the port (this history is cleared if the port link goes down or the port's Admin State is changed), and

if not, the port will be placed in the Guest VLAN. Otherwise it will not move to the Guest VLAN, but continue transmitting EAPOL Request Identity frames at the rate given by EAPOL Timeout.

Once in the Guest VLAN, the port is considered authenticated, and all attached clients on the port are allowed access on this VLAN. The switch will not transmit an EAPOL Success frame when entering the Guest VLAN.

While in the Guest VLAN, the switch monitors the link for EAPOL frames, and if one such frame is received, the switch immediately takes the port out of the Guest VLAN and starts authenticating the supplicant according to the port mode. If an EAPOL frame is received, the port will never be able to go back into the Guest VLAN if the "Allow Guest VLAN if EAPOL Seen" is disabled.

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

Globally Disabled: NAS is globally disabled.

Link Down: NAS is globally enabled, but there is no link on the port.

Authorized: The port is in Force Authorized or a single-supplicant mode and the supplicant is authorized.

Unauthorized: The port is in Force Unauthorized or a single-supplicant mode and the supplicant is not successfully authorized by the RADIUS server.

X Auth/Y Unauth: The port is in a multi-supplicant mode. Currently X clients are authorized and Y are unauthorized.

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

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

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

The button only has effect for successfully authenticated clients on the port and will not cause the clients to get temporarily unauthorized.

Reinitialize: Forces a re-initialization of the clients on the port and thereby a re-authentication immediately. The clients will transfer to the unauthorized state while the re-authentication is in progress.

Buttons:

Apply – Click to save changes.

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

Upper right icon (Refresh): You can click them for refresh the NAS Configuration manually.

Message: *NAS Error The 802.1X Admin State must be set to Authorized for ports that are enabled for Spanning Tree*

2-5.2.3 ACL

The SM24TAT2DPA Series switch access control list (ACL) is probably the most commonly used object in the IOS. It is used for packet filtering but also for selecting types of traffic to be analyzed, forwarded, or influenced in some way. The ACLs are divided into Ether Types, IPv4, ARP protocol, MAC and VLAN parameters etc. Here we will just go over the standard and extended access lists for TCP/IP. As you create ACEs for ingress classification, you can assign a policy for each port, the policy number is 1-8, and however, each policy can be applied to any port. This makes it very easy to determine what type of ACL policy you will be working with.

2-5.2.3.1 Ports

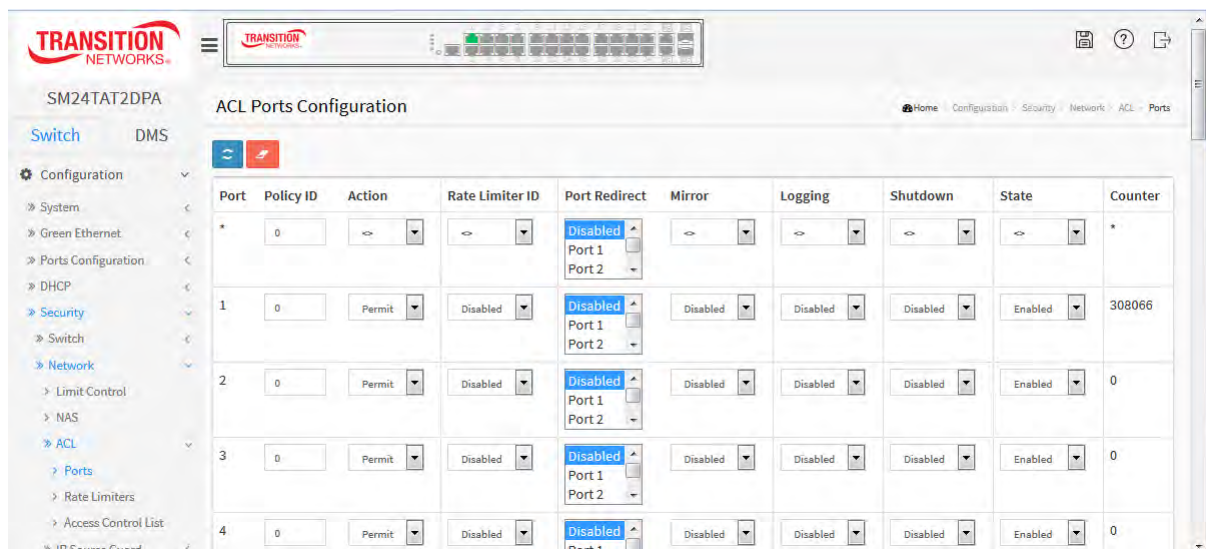
The section describes how to configure the ACL parameters (ACE) of the each switch port. These parameters will affect frames received on a port unless the frame matches a specific ACE.

Web Interface

To configure the ACL Ports Configuration in the web interface:

1. Click Configuration, ACL, then Ports.
2. To scroll the specific parameter value to select the correct value for port ACL setting.
3. Click the Save button to save the settings.
4. To cancel the setting click the Reset button. The page will revert to previously saved values.
5. After configuration is complete, you can see the port Counters. Click **Refresh** to update the counters or click Clear to reset the counters.

Figure 2-5.2.3.1: ACL Ports Configuration page



Parameter descriptions:

Port : The logical port for the settings contained in the same row.

Policy ID : Select the policy to apply to this port. The allowed values are 1 - 8. The default value is 1.

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

Rate Limiter ID : Select which rate limiter to apply on this port. The allowed values are Disabled or the values 1 - 16. The default value is "Disabled".

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

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

Enabled: Frames received on the port are stored in the System Log.

Disabled: Frames received on the port are not logged.

The default value is "Disabled". Please note that the System Log memory size and logging rate is limited.

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

Enabled: If a frame is received on the port, the port will be disabled.

Disabled: Port shut down is disabled. The default value is "Disabled".

State : Specify the port state of this port. The default value is "Enabled". The allowed values are:

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

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

Counter : Counts the number of frames that match this ACE.

Buttons

Apply – Click to save changes.

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

Upper right icon (Refresh, clear) : You can click them for refresh the ACL Port Configuration or clear them manually.

2-5.2.3.2 Rate Limiters

The section describes how to configure the switch's ACL Rate Limiter parameters. The Rate Limiter Level from 1 to 16 that allow user to set rate limiter value and units with pps or kbps.

Web Interface

To configure ACL Rate Limiter in the web interface:

1. Click Configuration, ACL, then Rate Limiter
2. To specific the Rate field and the range from 0 to 3276700.
3. To scroll the Unit with pps or kbps
4. Click the Apply to save the setting
5. To cancel the setting click the Reset button. The page will revert to previously saved values.

Figure 2-5.2.3.2: ACL Rate Limiter Configuration page

Rate Limiter ID	Rate	Unit
*	1	pps
1	1	pps
2	1	pps
3	1	pps
4	1	pps
5	1	pps
6	1	pps
7	1	pps
8	1	pps

Parameter descriptions:

Rate Limiter ID : The rate limiter ID for the settings contained in the same row.

Rate : The allowed values are: 0-3276700 in pps or 0, 100, 200, 300, ..., 1000000 in kbps.

Unit : Specify the rate unit. The allowed values are:

pps: packets per second.

kbps: Kbits per second.

Buttons

Apply – Click to save changes.

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

2-5.2.3.3 Access Control List

The section describes how to configure Access Control List rule. An Access Control List (ACL) is a sequential list of permit or deny conditions that apply to IP addresses, MAC addresses, or other more specific criteria. This switch tests ingress packets against the conditions in an ACL one by one. A packet will be accepted as soon as it matches a permit rule, or dropped as soon as it matches a deny rule. If no rules match, the frame is accepted. Other actions can also be invoked when a matching packet is found, including rate limiting, copying matching packets to another port or to the system log, or shutting down a port.

Configure an ACE (Access Control Entry) on this page. An ACE consists of several parameters. These parameters vary according to the frame type that you select. First select the ingress port for the ACE, and then select the frame type. Different parameter options are displayed depending on the frame type selected. A frame that hits this ACE matches the configuration that is defined here. Each row describes the ACE that is defined. The maximum number of ACEs is 256 on each switch. Click on the lowest plus sign to add a new ACE to the list. The reserved ACEs used for internal protocol, cannot be edited or deleted, the order sequence cannot be changed the priority is highest.

Web Interface

To configure Access Control List in the web interface:


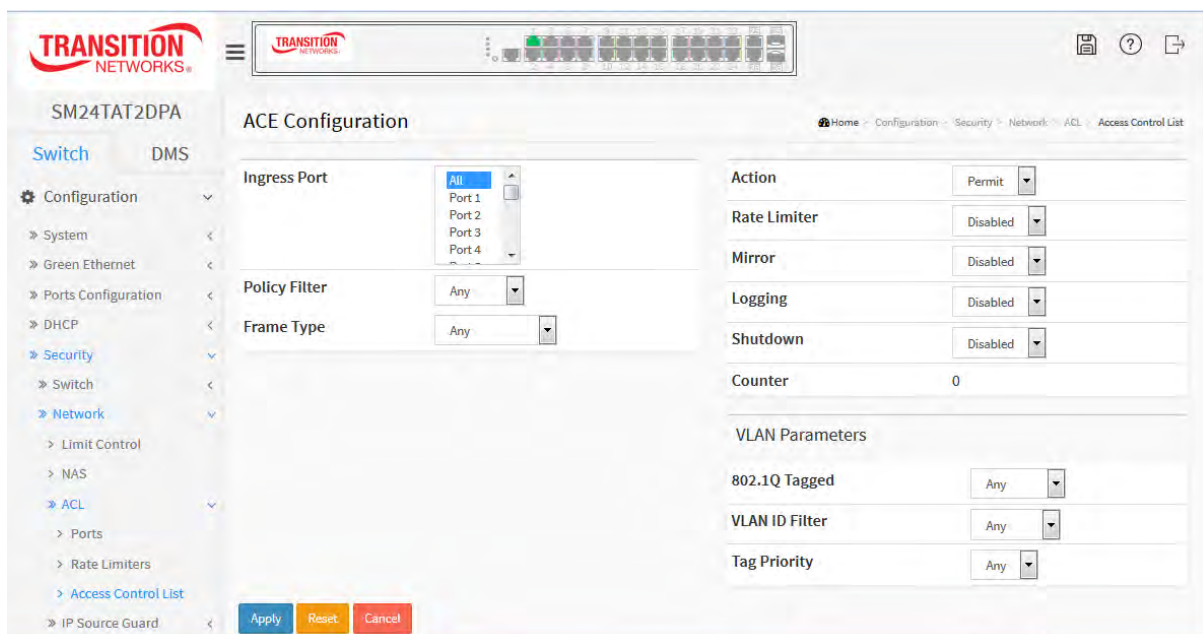
1. Click Configuration > Security > Network > ACL > Access Control List.
2. Click the  button to add a new ACL, or use the other ACL modification buttons to specify the editing action (edit, delete, or move the position of entry in the list).
3. To specific the parameter of the ACE
4. Click the save to save the setting
5. To cancel the setting click the **Reset** button. The page will revert to previously saved values.
6. When editing an entry on the ACE Configuration page, note that the Items displayed depend on various selections, such as Frame Type and IP Protocol Type. Specify the relevant criteria to be matched for this rule, and set the actions to take when a rule is matched (such as Rate Limiter, Port, Copy, Logging, and Shutdown).

Figure 2-5.2.3.3: ACE Configuration page



The screenshot displays the 'ACE Configuration' page for a Transition Networks switch (SM24TAT2DPA). The interface includes a navigation menu on the left with 'Security' > 'Network' > 'ACL' > 'Access Control List' selected. The main configuration area is divided into several sections:

- Ingress Port:** A dropdown menu showing 'All', 'Port 1', 'Port 2', 'Port 3', and 'Port 4'.
- Policy Filter:** A dropdown menu set to 'Any'.
- Frame Type:** A dropdown menu set to 'Any'.
- Action:** A dropdown menu set to 'Permit'.
- Rate Limiter:** A dropdown menu set to 'Disabled'.
- Mirror:** A dropdown menu set to 'Disabled'.
- Logging:** A dropdown menu set to 'Disabled'.
- Shutdown:** A dropdown menu set to 'Disabled'.
- Counter:** A text input field containing the value '0'.
- VLAN Parameters:**
 - 802.1Q Tagged:** A dropdown menu set to 'Any'.
 - VLAN ID Filter:** A dropdown menu set to 'Any'.
 - Tag Priority:** A dropdown menu set to 'Any'.

At the bottom of the configuration area, there are three buttons: 'Apply' (blue), 'Reset' (orange), and 'Cancel' (red).

Parameter descriptions:

Ingress Port: Select the ingress port for which this ACE applies.

All: The ACE applies to all port.

Port n: The ACE applies to this port number, where *n* is the number of the switch port.

Policy Filter: Specify the policy number filter for this ACE.

Any: No policy filter is specified. (policy filter status is "don't-care".)

Specific: If you want to filter a specific policy with this ACE, choose this value. Two field for entering an policy value and bitmask appears.

Policy Value: When "Specific" is selected for the policy filter, you can enter a specific policy value. The allowed range is 0 to 255.

Policy Bitmask: When "Specific" is selected for the policy filter, you can enter a specific policy bitmask. The allowed range is 0x0 to 0xff. Notice the usage of bitmask, if the binary bit value is "0", it means this bit is "don't-care". The real matched pattern is [policy_value & policy_bitmask]. For example, if the policy value is 3 and the policy bitmask is 0x10(bit 0 is "don't-care" bit), then policy 2 and 3 are applied to this rule.

Frame Type: Select the frame type for this ACE. These frame types are mutually exclusive.

Any: Any frame can match this ACE.

Ethernet Type: Only Ethernet Type frames can match this ACE. The IEEE 802.3 describes the value of Length/Type Field specifications to be greater than or equal to 1536 decimal (equal to 0600 hexadecimal).

ARP: Only ARP frames can match this ACE. Notice the ARP frames won't match the ACE with ethernet type.

IPv4: Only IPv4 frames can match this ACE. Notice the IPv4 frames won't match the ACE with ethernet type.

IPv6: Only IPv6 frames can match this ACE. Notice the IPv6 frames won't match the ACE with Ethernet type.

Action: Specify the action to take with a frame that hits this ACE.

Permit: The frame that hits this ACE is granted permission for the ACE operation.

Deny: The frame that hits this ACE is dropped.

Filter: Frames matching the ACE are filtered.

Rate Limiter: Specify the rate limiter in number of base units. The allowed range is 1 to 16. Disabled indicates that the rate limiter operation is disabled.

Port Redirect: Frames that hit the ACE are redirected to the port number specified here. The rate limiter will affect these ports. The allowed range is the same as the switch port number range. Disabled indicates that the port redirect operation is disabled and the specific port number of 'Port Redirect' can't be set when action is permitted.

Mirror: Specify the mirror operation of this port. Frames matching the ACE are mirrored to the destination mirror port. The rate limiter will not affect frames on the mirror port. The allowed values are:
Enabled: Frames received on the port are mirrored.

Disabled: Frames received on the port are not mirrored.

The default value is "Disabled".

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

Enabled: Frames matching the ACE are stored in the System Log.

Disabled: Frames matching the ACE are not logged.

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

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

Enabled: If a frame matches the ACE, the ingress port will be disabled.

Disabled: Port shut down is disabled for the ACE.

Note: The shutdown feature only works when the packet length is less than 1518(without VLAN tags).

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

MAC Parameters

SMAC Filter: *(Only displayed when the frame type is Ethernet Type or ARP.)*

Specify the source MAC filter for this ACE.

Any: No SMAC filter is specified. (SMAC filter status is "don't-care".)

Specific: If you want to filter a specific source MAC address with this ACE, choose this value. A field for entering an SMAC value appears.

SMAC Value: When "Specific" is selected for the SMAC filter, you can enter a specific source MAC address. The legal format is "xx-xx-xx-xx-xx-xx" or "xx.xx.xx.xx.xx.xx" or "xxxxxxxxxxxx" (x is a hexadecimal digit). A frame that hits this ACE matches this SMAC value.

DMAC Filter: Specify the destination MAC filter for this ACE.

Any: No DMAC filter is specified. (DMAC filter status is "don't-care".)

MC: Frame must be multicast.

BC: Frame must be broadcast.

UC: Frame must be unicast.

Specific: If you want to filter a specific destination MAC address with this ACE, choose this value. A field for entering a DMAC value appears.

DMAC Value: When "Specific" is selected for the DMAC filter, you can enter a specific destination MAC address. The legal format is "xx-xx-xx-xx-xx-xx" or "xx.xx.xx.xx.xx.xx" or "xxxxxxxxxxxx" (x is a hexadecimal digit). A frame that hits this ACE matches this DMAC value.

VLAN Parameters

802.1Q Tagged: Specify whether frames can hit the action according to the 802.1Q tagged. The allowed values are:

Any: Any value is allowed ("don't-care").

Enabled: Tagged frame only.

Disabled: Untagged frame only.

The default value is "Any".

VLAN ID Filter: Specify the VLAN ID filter for this ACE.

Any: No VLAN ID filter is specified. (VLAN ID filter status is "don't-care".)

Specific: If you want to filter a specific VLAN ID with this ACE, choose this value. A field for entering a VLAN ID number appears.

VLAN ID: When "Specific" is selected for the VLAN ID filter, you can enter a specific VLAN ID number. The allowed range is 1 to 4095. A frame that hits this ACE matches this VLAN ID value.

Tag Priority: Specify the tag priority for this ACE. A frame that hits this ACE matches this tag priority. The allowed number range is 0 to 7 or range 0-1, 2-3, 4-5, 6-7, 0-3 and 4-7. The value **Any** means that no tag priority is specified (tag priority is "don't-care".)

ARP Parameters

The ARP parameters can be configured when Frame Type "ARP" is selected.

ARP/RARP: Specify the available ARP/RARP opcode (OP) flag for this ACE.

Any: No ARP/RARP OP flag is specified. (OP is "don't-care".)

ARP: Frame must have ARP opcode set to ARP.

RARP: Frame must have RARP opcode set to RARP.

Other: Frame has unknown ARP/RARP Opcode flag.

Request/Reply: Specify the available Request/Reply opcode (OP) flag for this ACE.

Any: No Request/Reply OP flag is specified. (OP is "don't-care".)

Request: Frame must have ARP Request or RARP Request OP flag set.

Reply: Frame must have ARP Reply or RARP Reply OP flag.

Sender IP Filter: Specify the sender IP filter for this ACE.

Any: No sender IP filter is specified. (Sender IP filter is "don't-care".)

Host: Sender IP filter is set to Host. Specify the sender IP address in the SIP Address field that appears.

Network: Sender IP filter is set to Network. Specify the sender IP address and sender IP mask in the SIP Address and SIP Mask fields that appear.

Sender IP Address: When "Host" or "Network" is selected for the sender IP filter, you can enter a specific sender IP address in dotted decimal notation.

Sender IP Mask: When "Network" is selected for the sender IP filter, you can enter a specific sender IP mask in dotted decimal notation.

Target IP Filter: Specify the target IP filter for this specific ACE.

Any: No target IP filter is specified. (Target IP filter is "don't-care".)

Host: Target IP filter is set to Host. Specify the target IP address in the Target IP Address field that appears.

Network: Target IP filter is set to Network. Specify the target IP address and target IP mask in the Target IP Address and Target IP Mask fields that appear.

Target IP Address: When "Host" or "Network" is selected for the target IP filter, you can enter a specific target IP address in dotted decimal notation.

Target IP Mask: When "Network" is selected for the target IP filter, you can enter a specific target IP mask in dotted decimal notation.

ARP Sender MAC Match: Specify whether frames can hit the action according to their sender hardware address field (SHA) settings.

0: ARP frames where SHA is not equal to the SMAC address.

1: ARP frames where SHA is equal to the SMAC address.

Any: Any value is allowed ("don't-care").

RARP Target MAC Match: Specify whether frames can hit the action according to their target hardware address field (THA) settings.

0: RARP frames where THA is not equal to the target MAC address.

1: RARP frames where THA is equal to the target MAC address.

Any: Any value is allowed ("don't-care").

IP/Ethernet Length: Specify whether frames can hit the action according to their ARP/RARP hardware address length (HLN) and protocol address length (PLN) settings.

0: ARP/RARP frames where the HLN is not equal to Ethernet (0x06) or the (PLN) is not equal to IPv4 (0x04).

1: ARP/RARP frames where the HLN is equal to Ethernet (0x06) and the (PLN) is equal to IPv4 (0x04).

Any: Any value is allowed ("don't-care").

Ethernet: Specify whether frames can hit the action according to their ARP/RARP hardware address space (HRD) settings.

0: ARP/RARP frames where the HLD is not equal to Ethernet (1).

1: ARP/RARP frames where the HLD is equal to Ethernet (1).

Any: Any value is allowed ("don't-care").

IP: Specify whether frames can hit the action according to their ARP/RARP protocol address space (PRO) settings.

0: ARP/RARP frames where the PRO is not equal to IP (0x800).

1: ARP/RARP frames where the PRO is equal to IP (0x800).

Any: Any value is allowed ("don't-care").

IP Parameters

The IP parameters can be configured when Frame Type "IPv4" is selected.

IP Protocol Filter: Specify the IP protocol filter for this ACE.

Any: No IP protocol filter is specified ("don't-care").

Specific: If you want to filter a specific IP protocol filter with this ACE, choose this value. A field for entering an IP protocol filter appears.

ICMP: Select ICMP to filter IPv4 ICMP protocol frames. Extra fields for defining ICMP parameters will appear. These fields are explained later in this help file.

UDP: Select UDP to filter IPv4 UDP protocol frames. Extra fields for defining UDP parameters will appear. These fields are explained later in this help file.

TCP: Select TCP to filter IPv4 TCP protocol frames. Extra fields for defining TCP parameters will appear. These fields are explained later in this help file.

IP Protocol Value: When "Specific" is selected for the IP protocol value, you can enter a specific value. The allowed range is 0 to 255. A frame that hits this ACE matches this IP protocol value.

IP TTL: Specify the Time-to-Live settings for this ACE.

zero: IPv4 frames with a Time-to-Live field greater than zero must not be able to match this entry.

non-zero: IPv4 frames with a Time-to-Live field greater than zero must be able to match this entry.

Any: Any value is allowed ("don't-care").

IP Fragment: Specify the fragment offset settings for this ACE. This involves the settings for the More Fragments (MF) bit and the Fragment Offset (FRAG OFFSET) field for an IPv4 frame.

No: IPv4 frames where the MF bit is set or the FRAG OFFSET field is greater than zero must not be able to match this entry.

Yes: IPv4 frames where the MF bit is set or the FRAG OFFSET field is greater than zero must be able to match this entry.

Any: Any value is allowed ("don't-care").

IP Option: Specify the options flag setting for this ACE.

No: IPv4 frames where the options flag is set must not be able to match this entry.

Yes: IPv4 frames where the options flag is set must be able to match this entry.

Any: Any value is allowed ("don't-care").

SIP Filter: Specify the source IP filter for this ACE.

Any: No source IP filter is specified. (Source IP filter is "don't-care".)

Host: Source IP filter is set to Host. Specify the source IP address in the SIP Address field that appears.

Network: Source IP filter is set to Network. Specify the source IP address and source IP mask in the SIP Address and SIP Mask fields that appear.

SIP Address: When "Host" or "Network" is selected for the source IP filter, you can enter a specific SIP address in dotted decimal notation.

SIP Mask: When "Network" is selected for the source IP filter, you can enter a specific SIP mask in dotted decimal notation.

DIP Filter: Specify the destination IP filter for this ACE.

Any: No destination IP filter is specified. (Destination IP filter is "don't-care".)

Host: Destination IP filter is set to Host. Specify the destination IP address in the DIP Address field that appears.

Network: Destination IP filter is set to Network. Specify the destination IP address and destination IP mask in the DIP Address and DIP Mask fields that appear.

DIP Address: When "Host" or "Network" is selected for the destination IP filter, you can enter a specific DIP address in dotted decimal notation.

DIP Mask: When "Network" is selected for the destination IP filter, you can enter a specific DIP mask in dotted decimal notation.

IPv6 Parameters

The IPv6 parameters can be configured when Frame Type "IPv6" is selected.

Next Header Filter: Specify the IPv6 next header filter for this ACE.

Any: No IPv6 next header filter is specified ("don't-care").

Specific: If you want to filter a specific IPv6 next header filter with this ACE, choose this value. A field for entering an IPv6 next header filter appears.

ICMP: Select ICMP to filter IPv6 ICMP protocol frames. Extra fields for defining ICMP parameters will appear. These fields are explained later in this help file.

UDP: Select UDP to filter IPv6 UDP protocol frames. Extra fields for defining UDP parameters will appear. These fields are explained later in this help file.

TCP: Select TCP to filter IPv6 TCP protocol frames. Extra fields for defining TCP parameters will appear. These fields are explained later in this help file.

Next Header Value: When "Specific" is selected for the IPv6 next header value, you can enter a specific value. The allowed range is 0 to 255. A frame that hits this ACE matches this IPv6 protocol value.

SIP Filter: Specify the source IPv6 filter for this ACE.

Any: No source IPv6 filter is specified. (Source IPv6 filter is "don't-care".)

Specific: Source IPv6 filter is set to Network. Specify the source IPv6 address and source IPv6 mask in the SIP Address fields that appear.

SIP Address: When "Specific" is selected for the source IPv6 filter, you can enter a specific SIPv6 address. The field only supported last 32 bits for IPv6 address.

SIP BitMask: When "Specific" is selected for the source IPv6 filter, you can enter a specific SIPv6 mask. The field only supported last 32 bits for IPv6 address. Notice the usage of bitmask, if the binary bit value is "0", it means this bit is "don't-care". The real matched pattern is [sipv6_address & sipv6_bitmask] (last 32 bits). For example, if the SIPv6 address is 2001::3 and the SIPv6 bitmask is 0xFFFFFFF (bit 0 is "don't-care" bit), then SIPv6 address 2001::2 and 2001::3 are applied to this rule.

Hop Limit: Specify the hop limit settings for this ACE.

zero: IPv6 frames with a hop limit field greater than zero must not be able to match this entry.

non-zero: IPv6 frames with a hop limit field greater than zero must be able to match this entry.

Any: Any value is allowed ("don't-care").

ICMP Parameters

ICMP Type Filter: Specify the ICMP filter for this ACE.

Any: No ICMP filter is specified (ICMP filter status is "don't-care").

Specific: If you want to filter a specific ICMP filter with this ACE, you can enter a specific ICMP value. A field for entering an ICMP value appears.

ICMP Type Value: When "Specific" is selected for the ICMP filter, you can enter a specific ICMP value. The allowed range is 0 to 255. A frame that hits this ACE matches this ICMP value.

ICMP Code Filter: Specify the ICMP code filter for this ACE.

Any: No ICMP code filter is specified (ICMP code filter status is "don't-care").

Specific: If you want to filter a specific ICMP code filter with this ACE, you can enter a specific ICMP code value. A field for entering an ICMP code value appears.

ICMP Code Value: When "Specific" is selected for the ICMP code filter, you can enter a specific ICMP code value. The allowed range is 0 to 255. A frame that hits this ACE matches this ICMP code value.

TCP/UDP Parameters

TCP/UDP Source Filter: Specify the TCP/UDP source filter for this ACE.

Any: No TCP/UDP source filter is specified (TCP/UDP source filter status is "don't-care").

Specific: If you want to filter a specific TCP/UDP source filter with this ACE, you can enter a specific TCP/UDP source value. A field for entering a TCP/UDP source value appears.

Range: If you want to filter a specific TCP/UDP source range filter with this ACE, you can enter a specific TCP/UDP source range value. A field for entering a TCP/UDP source value appears.

TCP/UDP Source No.: When "Specific" is selected for the TCP/UDP source filter, you can enter a specific TCP/UDP source value. The allowed range is 0 to 65535. A frame that hits this ACE matches this TCP/UDP source value.

TCP/UDP Source Range: When "Range" is selected for the TCP/UDP source filter, you can enter a specific TCP/UDP source range value. The allowed range is 0 to 65535. A frame that hits this ACE matches this TCP/UDP source value.

TCP/UDP Destination Filter: Specify the TCP/UDP destination filter for this ACE.

Any: No TCP/UDP destination filter is specified (TCP/UDP destination filter status is "don't-care").

Specific: If you want to filter a specific TCP/UDP destination filter with this ACE, you can enter a specific TCP/UDP destination value. A field for entering a TCP/UDP destination value appears.

Range: If you want to filter a specific range TCP/UDP destination filter with this ACE, you can enter a specific TCP/UDP destination range value. A field for entering a TCP/UDP destination value appears.

TCP/UDP Destination Number: When "Specific" is selected for the TCP/UDP destination filter, you can enter a specific TCP/UDP destination value. The allowed range is 0 to 65535. A frame that hits this ACE matches this TCP/UDP destination value.

TCP/UDP Destination Range: When "Range" is selected for the TCP/UDP destination filter, you can enter a specific TCP/UDP destination range value. The allowed range is 0 to 65535. A frame that hits this ACE matches this TCP/UDP destination value.

TCP FIN: Specify the TCP "No more data from sender" (FIN) value for this ACE.

0: TCP frames where the FIN field is set must not be able to match this entry.

1: TCP frames where the FIN field is set must be able to match this entry.

Any: Any value is allowed ("don't-care").

TCP SYN: Specify the TCP "Synchronize sequence numbers" (SYN) value for this ACE.

0: TCP frames where the SYN field is set must not be able to match this entry.

1: TCP frames where the SYN field is set must be able to match this entry.

Any: Any value is allowed ("don't-care").

TCP RST: Specify the TCP "Reset the connection" (RST) value for this ACE.

0: TCP frames where the RST field is set must not be able to match this entry.

1: TCP frames where the RST field is set must be able to match this entry.

Any: Any value is allowed ("don't-care").

TCP PSH: Specify the TCP "Push Function" (PSH) value for this ACE.

0: TCP frames where the PSH field is set must not be able to match this entry.

1: TCP frames where the PSH field is set must be able to match this entry.

Any: Any value is allowed ("don't-care").

TCP ACK: Specify the TCP "Acknowledgment field significant" (ACK) value for this ACE.

0: TCP frames where the ACK field is set must not be able to match this entry.

1: TCP frames where the ACK field is set must be able to match this entry.

Any: Any value is allowed ("don't-care").

TCP URG: Specify the TCP "Urgent Pointer field significant" (URG) value for this ACE.

0: TCP frames where the URG field is set must not be able to match this entry.

1: TCP frames where the URG field is set must be able to match this entry.

Any: Any value is allowed ("don't-care").

Ethernet Type Parameters

The Ethernet Type parameters can be configured when Frame Type "Ethernet Type" is selected.

EtherType Filter: Specify the Ethernet type filter for this ACE.

Any: No EtherType filter is specified (EtherType filter status is "don't-care").

Specific: If you want to filter a specific EtherType filter with this ACE, you can enter a specific EtherType value. A field for entering a EtherType value appears.

Ethernet Type Value: When "Specific" is selected for the EtherType filter, you can enter a specific EtherType value. The allowed range is 0x600 - 0xFFFF but excluding 0x800(IPv4), 0x806(ARP) and 0x86DD(IPv6). A frame that hits this ACE matches this EtherType value.

Modification Buttons

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



: Inserts a new ACE before the current row.



: Edits the ACE row.



: Moves the ACE up the list.



: Moves the ACE down the list.



: Deletes the ACE.



: The lowest plus sign adds a new entry at the bottom of the ACE listings.

Buttons

Apply – Click to save changes.

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

Auto-refresh: Check the checkbox to refresh the information automatically.

Upper right icon (Refresh, clear, Remove All) : You can click them for refresh the ACL configuration or clear them manually. Others remove all to clean up all ACL configurations on the table.

2-5.2.4 IP Source Guard

The section describes how to configure the IP Source Guard detail parameters of the switch. You could use the IP Source Guard configure to enable or disable with the Port of the switch.

2-5.2.4.1 Configuration

This section describes how to configure IP Source Guard settings including Mode (Enabled and Disabled) and Maximum Dynamic Clients (0, 1, 2, Unlimited).

Web Interface

To configure an IP Source Guard Configuration in the web interface:

1. Select "Enabled" in the Mode of IP Source Guard Configuration.
2. Select "Enabled" of the specific port in the Mode of Port Mode Configuration.
3. Select Maximum Dynamic Clients (0, 1, 2, Unlimited) of the specific port in the Mode of Port Mode Configuration.
4. Click Apply.

Figure 2-5.2.4. 1: IP Source Guard Configuration page

The screenshot shows the web interface for IP Source Guard Configuration. The 'Mode' is set to 'Enabled'. Below it is a 'Port Mode Configuration' table with 8 rows, each representing a port. Each row has a 'Port' number, a 'Mode' dropdown menu, and a 'Max Dynamic Clients' dropdown menu. The 'Mode' for all ports is 'Disabled' and 'Max Dynamic Clients' is 'Unlimited'.

Port	Mode	Max Dynamic Clients
*	Enabled	Unlimited
1	Disabled	Unlimited
2	Disabled	Unlimited
3	Disabled	Unlimited
4	Disabled	Unlimited
5	Disabled	Unlimited
6	Disabled	Unlimited
7	Disabled	Unlimited
8	Disabled	Unlimited

Parameter descriptions:

Mode of IP Source Guard Configuration : Enable the Global IP Source Guard or disable the Global IP Source Guard. All configured ACEs will be lost when the mode is enabled.

Port Mode Configuration : Specify IP Source Guard is enabled on which ports. Only when both Global Mode and Port Mode on a given port are enabled, IP Source Guard is enabled on this given port.

Max Dynamic Clients : Specify the maximum number of dynamic clients that can be learned on given port. This value can be 0, 1, 2 or unlimited. If the port mode is enabled and the value of max dynamic client is equal to 0, it means only allow the IP packets forwarding that are matched in static entries on the specific port.

2-5.2.4.2 Static Table

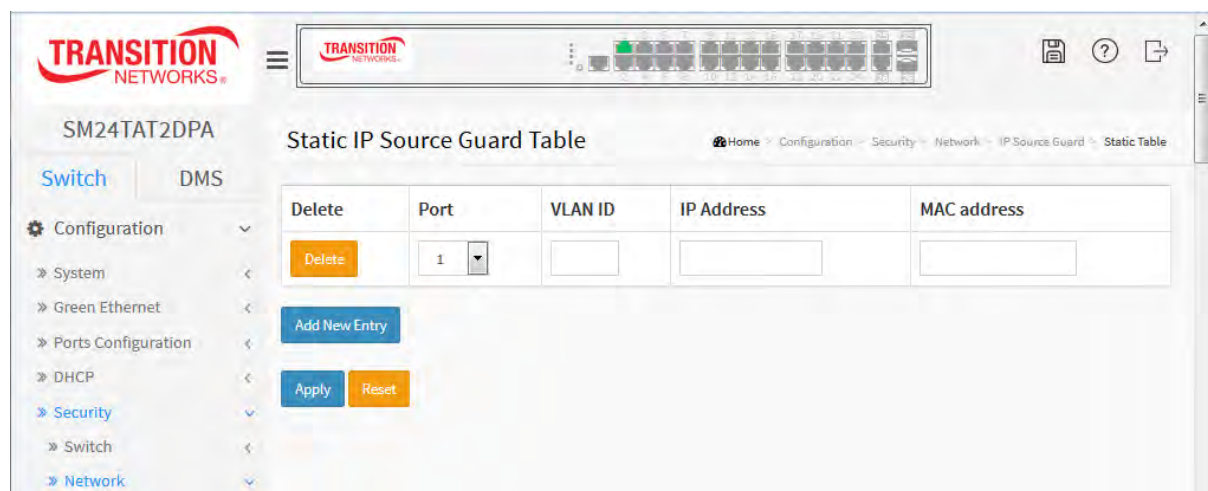
The section describes how to configure the Static IP Source Guard Table parameters of the switch. You could use the Static IP Source Guard Table configure to manage the entries.

Web Interface

To configure a Static IP Source Guard Table Configuration in the web interface:

1. Click "Add new entry".
2. Specify the Port, VLAN ID, IP Address, and MAC address in the entry.
3. Click Apply.

Figure 2-4.2.5.2: Static IP Source Guard Table



Parameter descriptions:

Delete : Click to delete the entry. It will be deleted during the next save.

Port : The logical port for the settings.

VLAN ID : The VLAN id for the settings.

IP Address : Allowed Source IP address.

MAC address : Allowed Source MAC address.

Adding new entry : Click to add a new entry to the Static IP Source Guard table. Specify the Port, VLAN ID, IP address, and IP Mask for the new entry. Click "Save".

Buttons:

Apply – Click to save changes.

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

Add New Entry : Click to add a new entry to the Static IP Source Guard table.

2-5.2.5 ARP Inspection

The section describes how to configure the ARP Inspection parameters of the switch. You could use the ARP Inspection configure to manage the ARP table.

2-5.2.5.1 Configuration

This section describes how to configure ARP Inspection setting including Mode (Enabled and Disabled) and Port (Enabled and Disabled).

Web Interface

To configure an ARP Inspection Configuration in the web interface::

1. Select "Enabled" in the Mode of ARP Inspection Configuration.
2. Select "Enabled" of the specific port in the Mode of Port Mode Configuration.
3. Click Apply.

Figure 2-4.2.6.1: ARP Inspection Configuration page

The screenshot displays the ARP Inspection Configuration page. At the top, the 'Mode' is set to 'Disabled'. Below this is a 'Translate dynamic to static' button. The 'Port Mode Configuration' table is as follows:

Port	Mode	Check VLAN	Log Type
*	<>	<>	<>
1	Disabled	Disabled	None
2	Disabled	Disabled	None
3	Disabled	Disabled	None
4	Disabled	Disabled	None
5	Disabled	Disabled	None

Parameter descriptions:

Mode of ARP Inspection Configuration : Enable the Global ARP Inspection or disable the Global ARP Inspection.

Port Mode Configuration : Specify ARP Inspection is enabled on which ports. Only when both Global Mode and Port Mode on a given port are enabled, ARP Inspection is enabled on this given port. Possible modes are:

Enabled: Enable ARP Inspection operation.

Disabled: Disable ARP Inspection operation.

If you want to inspect the VLAN configuration, you have to enable the setting of "Check VLAN". The default setting of "Check VLAN" is disabled. When the setting of "Check VLAN" is disabled, the log type of ARP Inspection will refer to the port setting. And the setting of "Check VLAN" is enabled, the log type of ARP Inspection will refer to the VLAN setting.

Possible setting of "Check VLAN" are:

Enabled: Enable check VLAN operation.

Disabled: Disable check VLAN operation.

Only the Global Mode and Port Mode on a given port are enabled, and the setting of "Check VLAN" is disabled, the log type of ARP Inspection will refer to the port setting.

There are four log types and possible types are:

None: Log nothing.

Deny: Log denied entries.

Permit: Log permitted entries.

ALL: Log all entries.

Buttons:

Apply – Click to save changes.

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

2-5.2.5.2 VLAN Mode Configuration

Each page shows up to 9999 entries from the VLAN table, default being 20, selected through the "entries per page" input field. When first visited, the web page will show the first 20 entries from the beginning of the VLAN Table. The first displayed will be the one with the lowest VLAN ID found in the VLAN Table.

The "VLAN" input fields let you select the starting point in the VLAN Table. Clicking the **First entry** button will update the displayed table starting from that or the closest next VLAN Table match. The **Next entry** button will use the next entry of the currently displayed VLAN entry as a basis for the next lookup. When the end is reached the warning message is shown in the displayed table. Use the **Refresh** button to start over.

Web Interface

To configure a VLAN Mode Configuration in the web interface:

1. Click "Add New Entry".
2. Specify the VLAN ID, and Log Type.
3. Click Apply.

Figure 2-4.2.6.2: VLAN Mode Configuration page

Parameter descriptions:

VLAN Mode Configuration : Specify ARP Inspection is enabled on which VLANs. First, you have to enable the port setting on Port mode configuration web page. Only when both Global Mode and Port Mode on a given port are enabled, ARP Inspection is enabled on this given port. Second, you can specify which VLAN will be inspected on VLAN mode configuration web page. The log type also can be configured on per VLAN setting. Possible types are:

None: Log nothing.

Deny: Log denied entries.

Permit: Log permitted entries.

ALL: Log all entries.

Buttons

Add New Entry: Click to add a new VLAN to the ARP Inspection VLAN table.

Apply: Click to save changes.

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

2-5.2.5.3 Static Table

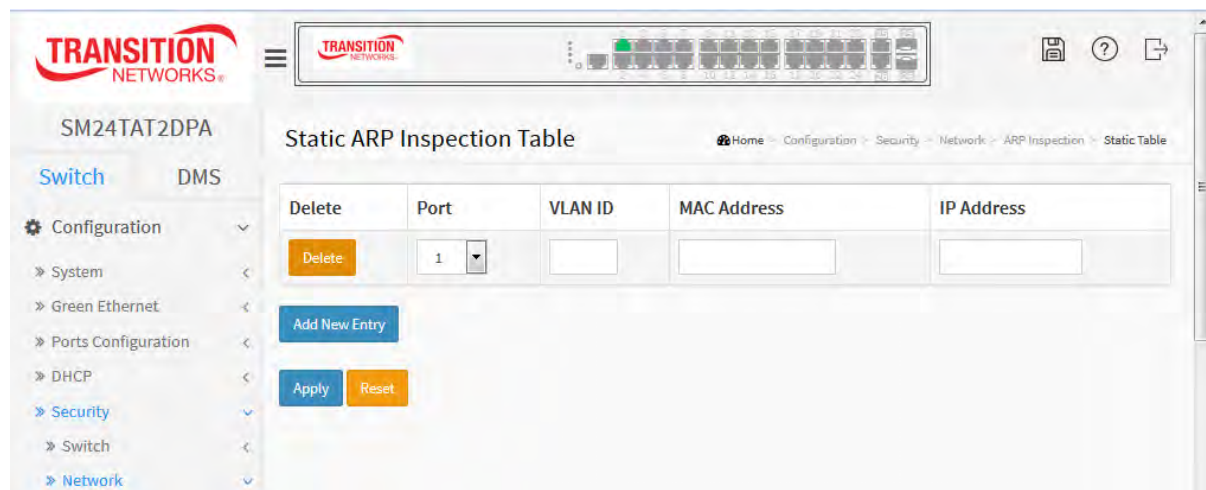
The section describes how to configure the Static ARP Inspection Table parameters of the switch. You could use the Static ARP Inspection Table configure to manage the ARP entries.

Web Interface

To configure a Static ARP Inspection Table Configuration in the web interface:

1. Click "Add new entry".
2. Specify the Port, VLAN ID, IP Address, and MAC address in the entry.
3. Click Apply.

Figure 2-4.2.6.3: Static ARP Inspection Table



Parameter descriptions:

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

Port : The logical port for the settings.

VLAN ID : The vlan id for the settings.

MAC Address : Allowed Source MAC address in ARP request packets.

IP Address : Allowed Source IP address in ARP request packets.

Add New Entry : Click to add a new entry to the Static ARP Inspection table. Specify the Port, VLAN ID, MAC address, and IP address for the new entry. Click "Save".

Buttons:

Apply – Click to save changes.

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

2-5.2.5.4 Dynamic Table

Entries in the Dynamic ARP Inspection Table are shown on this page. The Dynamic ARP Inspection Table contains up to 1024 entries, and is sorted first by port, then by VLAN ID, then by MAC address, and then by IP address.

Navigating the ARP Inspection Table

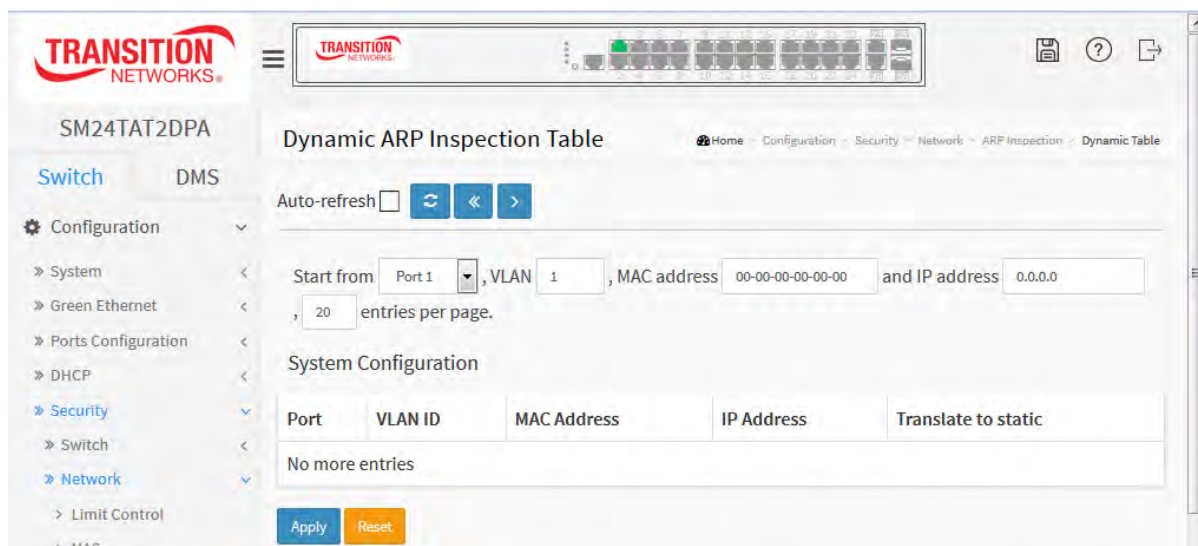
Each page shows up to 99 entries from the Dynamic ARP Inspection table, default being 20, selected through the "entries per page" input field. When first visited, the web page will show the first 20 entries from the beginning of the Dynamic ARP Inspection Table.

The "Start from port address", "VLAN", "MAC address" and "IP address" input fields lets you select the starting point in the Dynamic ARP Inspection Table. Clicking the **First entry** button will update the displayed table starting from that or the closest next Dynamic ARP Inspection Table match. In addition, the two input fields will - upon a **First entry** button click - assume the value of the first displayed entry, allowing for continuous refresh with the same start address. Clicking the **Next entry** button will use the last entry of the currently displayed table as a basis for the next lookup. When the end is reached the text "No more entries" is shown in the displayed table. Use the **Refresh** button to start over.

Web Interface

To configure a Dynamic ARP Inspection Table Configuration in the web interface:

Figure 2-5.2.5.4: Dynamic ARP Inspection Table



Parameter descriptions:

ARP Inspection Table Columns

Port : Switch Port Number for which the entries are displayed.

VLAN ID : VLAN-ID in which the ARP traffic is permitted.

MAC Address : User MAC address of the entry.

IP Address : User IP address of the entry.

Translate to static : Select the checkbox to translate the entry to static entry.

Buttons:

Apply – Click to save changes.

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

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

Refresh: Refreshes the displayed table starting from the input fields.

Save: Click to save changes.

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

<<: Updates the table starting from the first entry in the Dynamic ARP Inspection Table.

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

2-5.3 AAA

This section shows you to use an AAA (Authentication, Authorization, and Accounting) server to provide access control to your network. The AAA server can be a TACACS+ or RADIUS server to create and manage objects that contain settings for using AAA servers.

2-5.3.1 RADIUS

Web Interface

To configure a Common Configuration of AAA, RADIUS in the web interface:

Figure 2-4.3.2: RADIUS Server Configuration page

The screenshot displays the RADIUS Server Configuration page. The left sidebar shows the navigation tree with 'Security' > 'AAA' > 'RADIUS' selected. The main content area is titled 'RADIUS Server Configuration' and is divided into two sections: 'Global Configuration' and 'Server Configuration'.

Global Configuration:

- Timeout: 5 seconds
- Retransmit: 3 times
- Deadtime: 0 minutes
- Key: [Text Input]
- NAS-IP-Address: [Text Input]
- NAS-IPv6-Address: [Text Input]
- NAS-Identifier: [Text Input]

Server Configuration:

Delete	Hostname	Auth Port	Acct Port	Timeout	Retransmit	Key
<input type="button" value="Delete"/>	[Text Input]	1812	1813	[Text Input]	[Text Input]	[Text Input]

Below the table are buttons for 'Add New Server', 'Apply', and 'Reset'.

Parameter descriptions:

Global Configuration : These setting are common for all of the RADIUS servers.

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

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

Deadtime : Deadtime, which can be set to a number between 0 to 1440 minutes, is the period during which the switch will not send new requests to a server that has failed to respond to a previous request. This will stop the switch from continually trying to contact a server that it has already determined as dead. Setting the Deadtime to a value greater than 0 (zero) will enable this feature, but only if more than one server has been configured.

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

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

NAS-IPv6-Address (Attribute 95) : The IPv6 address to be used as attribute 95 in RADIUS Access-Request packets. If this field is left blank, the IP address of the outgoing interface is used.

NAS-Identifier (Attribute 32) : The identifier - up to 255 characters long - to be used as attribute 32 in RADIUS Access-Request packets. If this field is left blank, the NAS-Identifier is not included in the packet.

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

Delete : To delete a RADIUS server entry, check this box. The entry is deleted at the next Save.

Hostname : The IP address or hostname of the RADIUS server.

Auth Port : The UDP port to use on the RADIUS server for authentication.

Acct Port : The UDP port to use on the RADIUS server for accounting.

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

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

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

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

The **Reset** button can be used to undo the addition of the new server.

Buttons

Apply: Click to save changes.

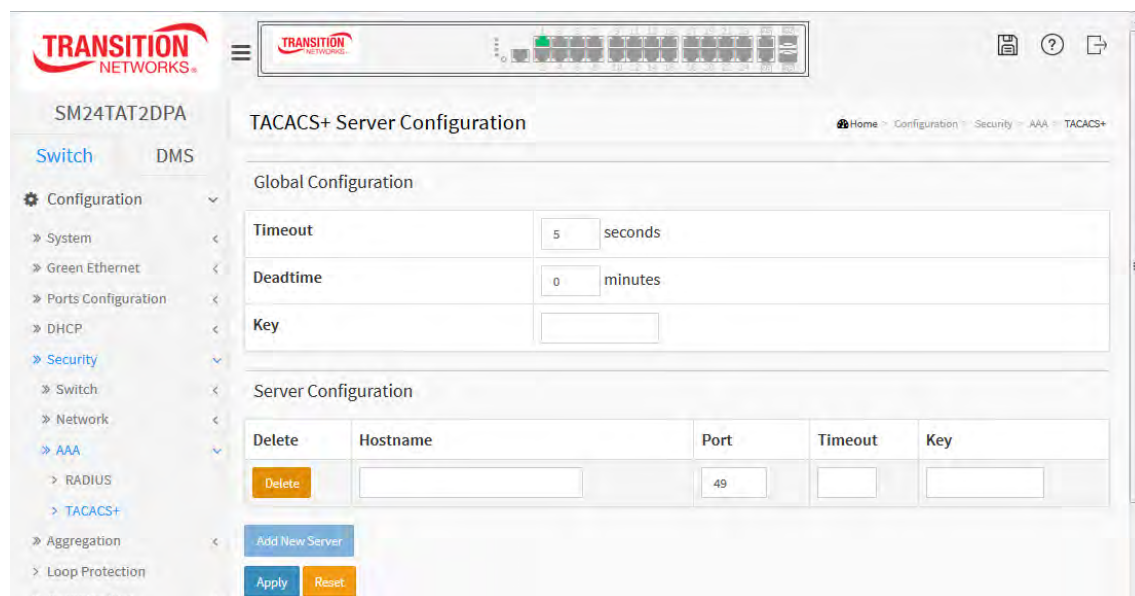
Reset: Click to undo any changes made locally and revert to previously saved values.

2-5.3.2 TACACS+

Web Interface

To configure a Common Configuration of AAA, TACACS+ in the web interface:

Figure 2-5.3.2: TACACS+ Server Configuration page

**Parameter descriptions:**

Global Configuration: These settings are common for all of the TACACS+ servers.

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

Deadtime : Deadtime, which can be set to a number 0 - 1440 minutes, is the period during which the switch will not send new requests to a server that has failed to respond to a previous request. This will stop the switch from continually trying to contact a server that it has already determined as dead. Setting the Deadtime to a value greater than 0 (zero) will enable this feature, but only if more than one server has been configured.

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

Server Configuration : The table has one row for each TACACS+ server and a number of columns:

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

Hostname : The IP address or hostname of the TACACS+ server.

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

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

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

Adding a New Server : Click to add a new TACACS+ server. An empty row is added to the table, and the TACACS+ server can be configured as needed. Up to 5 servers are supported. The **Reset** button can be used to undo the addition of the new server.

Buttons

Apply: Click to save changes.

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

2-6 Aggregation

The Aggregation is used to configure the settings of Link Aggregation. You can bundle more than one port with the same speed, full duplex and the same MAC to be a single logical port, thus the logical port aggregates the bandwidth of these ports. This means you can apply your current Ethernet equipment's to build the bandwidth aggregation. For example, if there are three Fast Ethernet ports aggregated in a logical port, then this logical port has bandwidth three times as high as a single Fast Ethernet port.

2-6.1 Static

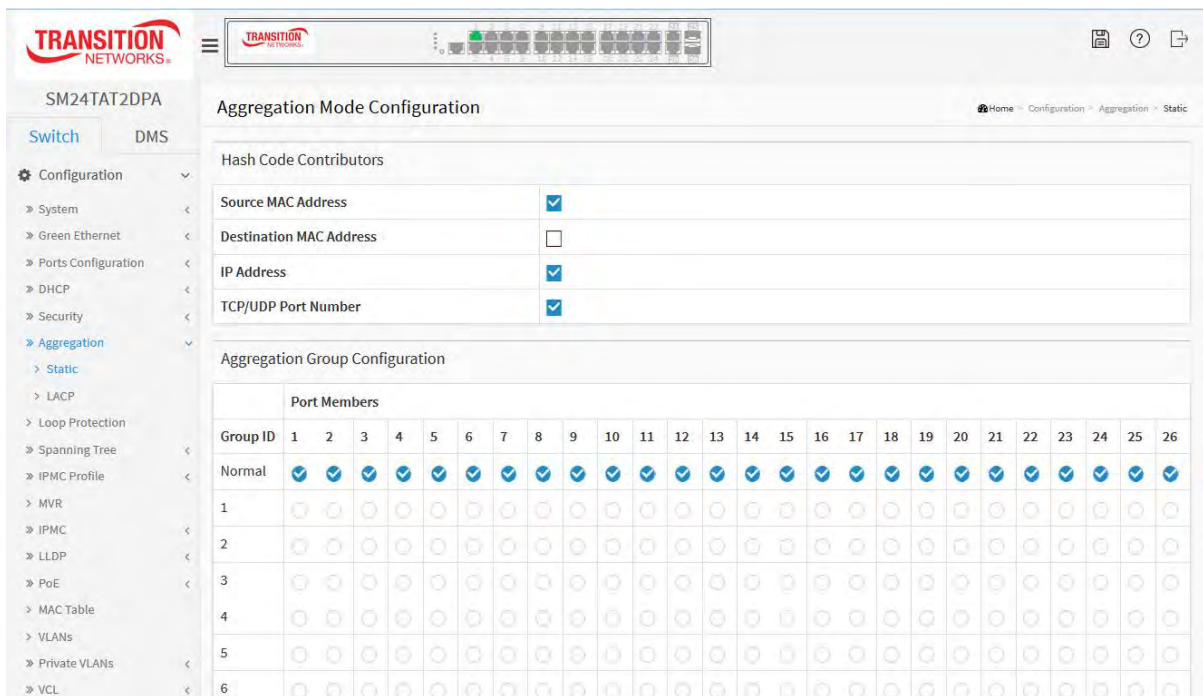
Ports using Static Trunk as their trunk method can choose their unique Static GroupID to form a logic "trunked port". The benefit of using Static Trunk method is that a port can immediately become a member of a trunk group without any handshaking with its peer port. This is also a disadvantage because the peer ports of your static trunk group may not know that they should be aggregate together to form a "logic trunked port". Using Static Trunk on both end of a link is strongly recommended. Please also note that low speed links will stay in "not ready" state when using static trunk to aggregate with high speed links.

Web Interface

To configure the Trunk Aggregation Hash mode and Aggregation Group in the web interface:

1. Click Configuration, Aggregation, and then Static to display the Aggregation Mode Configuration.
2. Enable or disable the Aggregation mode function. Select Aggregation Group ID and Port members.
3. Click the **Save** button to save the settings.
4. To cancel the settings, click the **Reset** button. The page will revert to previously saved values.

Figure 2-5.1: Aggregation Mode Configuration page



Parameter descriptions:**Hash Code Contributors**

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

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

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

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

Aggregation Group Configuration

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

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

Buttons

Apply – Click to save changes.

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

Messages

Message: *Group 1 member counts error!! Local aggregation must include 2-16 ports* displays if you tried to configure an aggregation of less than 2 or more than 16 ports. Click **OK** and re-configure the settings.

Message: *Aggregation Error To many members in the aggregation group* displays if an aggregation was mis-configured. Click the **Previous** button and re-configure the settings.

2-6.2 LACP

This page lets you inspect and change the current LACP port configurations. An LACP trunk group with more than one ready member-ports is a “real trunked” group. An LACP trunk group with one or less ready member-ports is not a “real trunked” group.

Web Interface

To configure the Trunk Aggregation LACP parameters in the web interface:

1. Click Configuration, Aggregation, LACP.
2. Enable or disable LACP on the port of the switch.
3. Select the Key parameter (Auto or Specific). The default is Auto.
3. Select the Role (Active or Passive). The default is Active.
4. Click the **Save** button to save the setting.
5. To cancel the settings, click the **Reset** button. It will revert to previously saved values.

Figure 2-5.2: LACP Port Configuration page

Port	LACP Enabled	Key	Role	Timeout	Prio
*	<input type="checkbox"/>	<>	<>	<>	32768
1	<input type="checkbox"/>	Auto	Active	Fast	32768
2	<input type="checkbox"/>	Auto	Active	Fast	32768
3	<input type="checkbox"/>	Auto	Active	Fast	32768
4	<input type="checkbox"/>	Auto	Active	Fast	32768
5	<input type="checkbox"/>	Auto	Active	Fast	32768
6	<input type="checkbox"/>	Auto	Active	Fast	32768
7	<input type="checkbox"/>	Auto	Active	Fast	32768
8	<input type="checkbox"/>	Auto	Active	Fast	32768
9	<input type="checkbox"/>	Auto	Active	Fast	32768
10	<input type="checkbox"/>	Auto	Active	Fast	32768

Parameter descriptions:

Port : The switch port number.

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

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

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

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

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

Buttons

Apply – Click to save changes.

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

2-7 Loop Protection

Loop Protection is used to detect the presence of traffic. When switch receives packet's (looping detection frame) MAC address the same as oneself from port, show Loop Protection happens. The port will be locked when it received the looping Protection frames. If you want to resume the locked port, please find out the looping path and take off the looping path, then select the resume the locked port and click on "Resume" to turn on the locked ports.

Web Interface

To configure the Loop Protection parameters in the web interface:

1. Click Configuration, Loop Protection.
2. Enable or disable the port loop Protection.
3. Click the save to save the setting.
4. To cancel the settings, click the **Reset** button. The page will revert to previously saved values.

Figure 2-7: Loop Protection Configuration.

The screenshot shows the 'Loop Protection Configuration' page in the SM24TAT2DPA web interface. The page is titled 'Loop Protection Configuration' and includes a navigation menu on the left. The main content area is divided into 'Global Configuration' and 'Port Configuration' sections.

Global Configuration:

- Enable Loop Protection:** A dropdown menu set to 'Disable'.
- Transmission Time:** A text input field containing '5' followed by 'seconds'.
- Shutdown Time:** A text input field containing '180' followed by 'seconds'.

Port Configuration:

Port	Enable	Action	Tx Mode
*	<input checked="" type="checkbox"/>	<	<
1	<input checked="" type="checkbox"/>	Shutdown Port	Enable
2	<input checked="" type="checkbox"/>	Shutdown Port	Enable
3	<input checked="" type="checkbox"/>	Shutdown Port	Enable
4	<input checked="" type="checkbox"/>	Shutdown Port	Enable
5	<input checked="" type="checkbox"/>	Shutdown Port	Enable

Parameter descriptions:

Enable Loop Protection: Controls whether loop protections is enabled (as a whole).

Transmission Time: The interval between each loop protection PDU sent on each port. Valid values are 1 to 10 seconds.

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

Port No: The switch port number of the port.

Enable : Controls whether loop protection is enabled on this switch port

Action: Configures the action performed when a loop is detected on a port. Valid values are Shutdown Port, Shutdown Port and Log or Log Only.

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

Buttons:

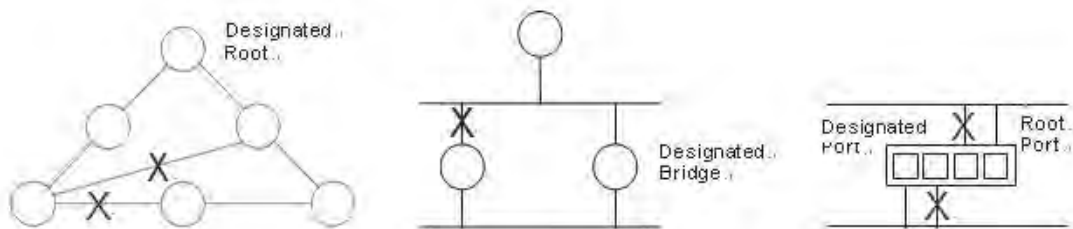
Apply – Click to save changes.

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

2-8 Spanning Tree

The Spanning Tree Protocol (STP) can be used to detect and disable network loops, and to provide backup links between switches, bridges or routers. This allows the switch to interact with other bridging devices (that is, an STP-compliant switch, bridge or router) in your network to ensure that only one route exists between any two stations on the network, and provide backup links which automatically take over when a primary link goes down.

STP uses a distributed algorithm to select a bridging device (STP-compliant switch, bridge or router) that serves as the root of the spanning tree network. It selects a root port on each bridging device (except for the root device) which incurs the lowest path cost when forwarding a packet from that device to the root device. Then it selects a designated bridging device from each LAN which incurs the lowest path cost when forwarding a packet from that LAN to the root device. All ports connected to designated bridging devices are assigned as designated ports. After determining the lowest cost spanning tree, it enables all root ports and designated ports, and disables all other ports. Network packets are therefore only forwarded between root ports and designated ports, eliminating any possible network loops.



Once a stable network topology has been established, all bridges listen for Hello BPDUs (Bridge Protocol Data Units) transmitted from the Root Bridge. If a bridge does not get a Hello BPDU after a predefined interval (Maximum Age), the bridge assumes that the link to the Root Bridge is down. This bridge will then initiate negotiations with other bridges to reconfigure the network to reestablish a valid network topology.

2-8.1 Bridge Setting

The section describes that how to configure the Spanning Tree Bridge and STP System settings. It allows you to configure STP System settings are used by all STP Bridge instance in the switch.

Web Interface

To configure the Spanning Tree Bridge Settings parameters in the web interface:

1. Click Configuration, Spanning Tree, Bridge Settings.
2. Scroll to select the parameters and write down available value of parameters in blank field in Basic Settings
3. Enable or disable the parameters and enter available value of parameters in blank field in Advanced settings
4. Click the Apply button to save the settings.
5. To cancel the settings, click the Reset button. The page will revert to previously saved values.

» Spanning Tree

> Bridge Settings

> MSTI Mapping

> MSTI Priorities

> CIST Port

> MSTI Ports

Figure 2-8.1: STP Bridge Configuration page

The screenshot shows the 'STP Bridge Configuration' page. The left sidebar contains a navigation menu with 'Spanning Tree' expanded to 'Bridge Settings'. The main content area has a breadcrumb trail: Home > Configuration > Spanning Tree > Bridge Settings. The 'Basic Settings' section contains the following fields:

Protocol Version	MSTP
Bridge Priority	32768
Forward Delay	15
Max Age	20
Maximum Hop Count	20
Transmit Hold Count	6

The 'Advanced Settings' section contains the following fields:

Edge Port BPDU Filtering	<input type="checkbox"/>
Edge Port BPDU Guard	<input type="checkbox"/>
Port Error Recovery	<input type="checkbox"/>
Port Error Recovery Timeout	<input type="text"/>

At the bottom of the form are 'Apply' and 'Reset' buttons.

Parameter descriptions:**Basic Settings**

Protocol Version : The STP protocol version setting. Valid values are STP, RSTP and MSTP.

Bridge Priority : Controls the bridge priority. Lower numeric values have better priority. The bridge priority plus the MSTI instance number, concatenated with the 6-byte MAC address of the switch forms a Bridge Identifier. For MSTP operation, this is the priority of the CIST. Otherwise, this is the priority of the STP/RSTP Bridge.

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

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

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

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

Advanced Settings

Edge Port BPDU Filtering : Control whether a port explicitly configured as Edge will transmit and receive BPDUs.

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

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

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

Buttons

Apply – Click to save changes.

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

2-8.2 MSTI Mapping

When you implement a Spanning Tree protocol on the switch that the bridge instance. The CIST is not available for explicit mapping, as it will receive the VLANs not explicitly mapped. Due to the reason that you need to set the list of VLANs mapped to the MSTI. The VLANs must be separated with comma and/or space. A VLAN can only be mapped to one MSTI. An unused MSTI should just be left empty. (I.e. not having any VLANs mapped to it.)

This section describes it lets you inspect the current STP MSTI bridge instance priority configurations, and possibly change them as well.

Web Interface

To configure the Spanning Tree MSTI Mapping parameters in the web interface:

1. Click Configuration, Spanning Tree, MSTI Mapping
2. Specify the configuration identification parameters in the field. Specify the VLANs Mapped blank field.
3. Click the save to save the setting
4. To cancel the settings click the **Reset** button. The page will revert to previously saved values.

Figure 2-9.2: MSTI Configuration page

The screenshot shows the 'MSTI Configuration' page. On the left is a navigation menu with 'Spanning Tree' expanded to 'MSTI Mapping'. The main content area has two sections: 'Configuration Identification' and 'MSTI Mapping'. The 'Configuration Identification' section has two input fields: 'Configuration Name' with the value '00-40-c7-b9-20-b2' and 'Configuration Revision' with the value '0'. The 'MSTI Mapping' section contains instructions: 'Add VLANs separated by spaces or comma.' and 'Unmapped VLANs are mapped to the CIST. (The default bridge instance)'. Below the instructions is a table with two columns: 'MSTI' and 'VLANs Mapped'. The table has three rows for MSTI1, MSTI2, and MSTI3, each with an empty text input field for mapping VLANs.

Parameter descriptions:

Configuration Identification

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

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

MSTI : The bridge instance. The CIST is not available for explicit mapping, as it will receive the VLANs not explicitly mapped.

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

2-8.3 MSTI Priorities

When you implement a Spanning Tree protocol on the switch that the bridge instance. The CIST is the default instance which is always active. For controls the bridge priority. Lower numeric values have better priority. The bridge priority plus the MSTI instance number, concatenated with the 6-byte MAC address of the switch forms a Bridge Identifier

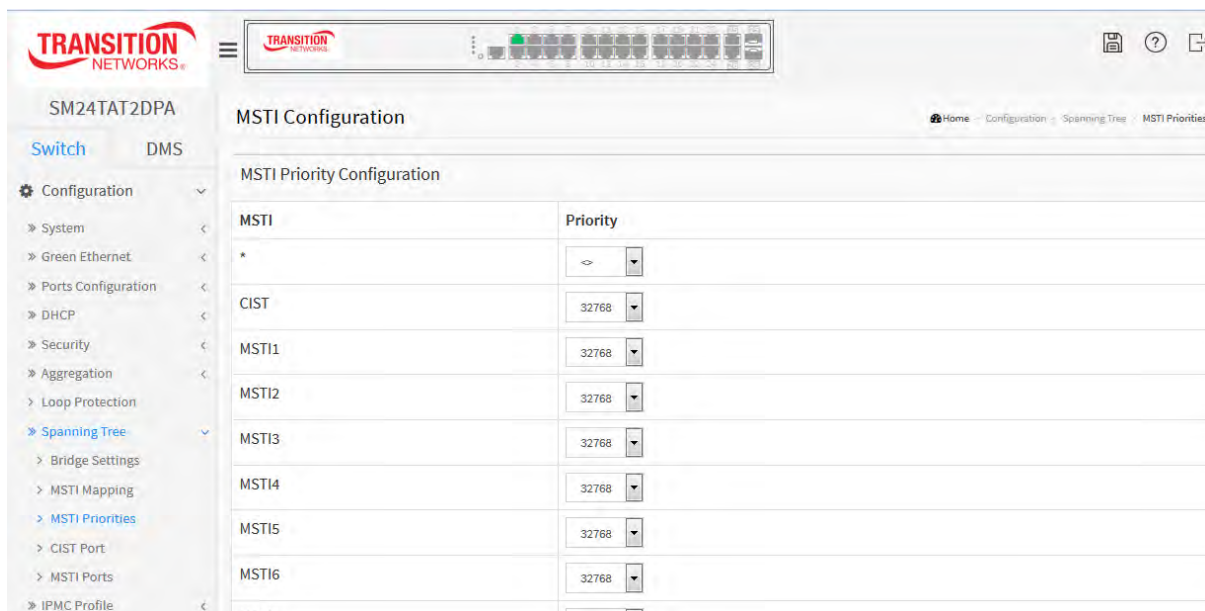
The section describes it lets you inspect the current STP MSTI bridge instance priority configurations, and possibly change them as well.

Web Interface

To configure the Spanning Tree MSTI Priorities parameters in the web interface:

1. Click Configuration, Spanning Tree, MSTI Priorities
2. Scroll the Priority maximum is 240. Default is 128.
3. Click the save to save the setting
4. To cancel the setting click the **Reset** button. The page will revert to previously saved values.

Figure 2-8.3: MSTI Configuration page



Parameter descriptions:

MSTI : The bridge instance. The CIST is the default instance, which is always active.

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

Buttons

Apply – Click to save changes.

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

2-8.4 CIST Ports

When you implement a Spanning Tree protocol on the switch that the bridge instance. You need to configure the CIST Ports. The section describes how to inspect the current STP CIST port configurations, and possibly change them as well.

Web Interface

To configure the Spanning Tree CIST Ports parameters in the web interface:

1. Click Configuration, Spanning Tree, CIST Ports.
2. Set all parameters of CIST Aggregated Port Configuration.
3. Enable or disable the STP, then set all parameters of the CIST normal Port configuration.
4. Click the Apply button to save the settings.
5. To cancel the settings, click the **Reset** button. The page will revert to previously saved values.

Figure 2-8.4: STP CIST Port Configuration page

The screenshot displays the 'STP CIST Port Configuration' page. It features a left-hand navigation menu with options like Configuration, System, Green Ethernet, Ports Configuration, DHCP, Security, Aggregation, Loop Protection, Spanning Tree, Bridge Settings, MSTI Mapping, MSTI Priorities, CIST Port, MSTI Ports, IPMC Profile, MVR, IPMC, LLD, PoE, MAC Table, VLANs, and Private VLS & M. The main content area is divided into two sections:

CIST Aggregated Port Configuration

Port	STP Enabled	Path Cost	Priority	Admin Edge	Auto Edge	Restricted			Point-to-point
						Role	TCN	BPDU Guard	
-	<input checked="" type="checkbox"/>	Auto	128	Non-Edge	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Forced True

CIST Normal Port Configuration

Port	STP Enabled	Path Cost	Priority	Admin Edge	Auto Edge	Restricted			Point-to-point
						Role	TCN	BPDU Guard	
*	<input checked="" type="checkbox"/>	<	<	<	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<
1	<input checked="" type="checkbox"/>	Auto	128	Non-Edge	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Auto
2	<input checked="" type="checkbox"/>	Auto	128	Non-Edge	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Auto
3	<input checked="" type="checkbox"/>	Auto	128	Non-Edge	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Auto
4	<input checked="" type="checkbox"/>	Auto	128	Non-Edge	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Auto
5	<input checked="" type="checkbox"/>	Auto	128	Non-Edge	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Auto
6	<input checked="" type="checkbox"/>	Auto	128	Non-Edge	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Auto
7	<input checked="" type="checkbox"/>	Auto	128	Non-Edge	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Auto

Parameter descriptions:

Port : The switch port number of the logical STP port.

STP Enabled : Controls whether STP is enabled on this switch port.

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

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

operEdge (state flag) : Operational flag describing whether the port is connecting directly to edge devices. (No Bridges attached). Transition to the forwarding state is faster for edge ports (having operEdge true) than for other ports. The value of this flag is based on AdminEdge and AutoEdge fields. This flag is displayed as Edge in Monitor > Spanning Tree > STP Detailed Bridge Status.

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

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

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

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

BPDU Guard : If enabled, causes the port to disable itself upon receiving valid BPDU's. Contrary to the similar bridge setting, the port Edge status does not affect this setting. A port entering error-disabled state due to this setting is subject to the bridge Port Error Recovery setting as well.

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

Buttons

Apply – Click to save changes.

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

2-8.5 MSTI Ports

The section describes it lets you inspect the current STP MSTI port configurations, and possibly change them as well.

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

Web Interface

To configure the Spanning Tree MSTI Port Configuration parameters in the web interface:

1. Click Configuration, Spanning Tree, MSTI Ports
2. Scroll to select the MST1 or other MSTI Port
3. Click Get to set the detail parameters of the MSTI Ports.
4. Scroll to set all parameters of the MSTI Port configuration.
5. Click the save to save the setting
6. To cancel the settings click the **Reset** button. The page will revert to previously saved values.

Figure 2-8.5: MSTI Port Configuration page

STP CIST Port Configuration Home > Configuration > Spanning Tree > MSTI Ports

Select MSTI

MST1

STP MSTI Port Configuration Home > Configuration > Spanning Tree > MSTI Ports

MSTI Aggregated Ports Configuration

Port	Path Cost	Priority
-	Auto	128

MSTI Normal Ports Configuration - MST1

Port	Path Cost	Priority
*	<>	<>
1	Auto	128
16	Auto	128
17	Auto	128
18	Auto	128

Parameter descriptions:

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

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

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

Buttons

Apply – Click to save changes.

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

2-9 IPMC Profile

This page provides IPMC Profile related configurations.

2-9.1 Profile Table

The IPMC profile is used to deploy the access control on IP multicast streams. It is allowed to create at maximum 64 Profiles with at maximum 128 corresponding rules for each.

Web Interface

To configure the IPMC Profile Configuration in the web interface:

Figure 2-9.1: IPMC Profile Configurations page



The screenshot illustrates the web interface for IPMC Profile Configurations, showing the navigation from global settings to profile table settings and then to rule settings.

IPMC Profile Configurations (Home > Configuration > IPMC Profile > Profile Table)

IPMC Profile Global Setting





Global Profile Mode: Disabled

IPMC Profile Table Setting

Delete	Profile Name	Profile Description	Rule
<input type="checkbox"/>	ABC	ABCDE	 

Buttons: Add New IPMC Profile, Apply, Reset

IPMC Profile [ABC] Rule Settings (In Precedence Order) (Home > Configuration > IPMC Profile > Profile Table)

Profile Name & Index	Entry Name	Address Range	Action	Log	
ABC	1	~	Deny	Disable	   

Buttons: Add Last Rule, Commit, Reset

Parameter descriptions:

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

Global Profile Mode : Enable/Disable the Global IPMC Profile.

System starts to do filtering based on profile settings only when the global profile mode is enabled.

Delete : Check to delete the entry.

The designated entry will be deleted during the next save.

Profile Name : The name used for indexing the profile table.

Each entry has the unique name which is composed of at maximum 16 alphabetic and numeric characters. At least one alphabet must be present.

Profile Description : Additional description, which is composed of at maximum 64 alphabetic and numeric characters, about the profile.

No blank or space characters are permitted as part of description. Use "_" or "-" to separate the description sentence.

Rule : When the profile is created, click the edit button to enter the rule setting page of the designated profile. Summary about the designated profile will be shown by clicking the view button. You can manage or inspect the rules of the designated profile by using the following buttons:



: List the rules associated with the designated profile.



: Adjust the rules associated with the designated profile.

Buttons

Add New IPMC Profile – Click to add new IPMC profile. Specify the name and configure the new entry. Click "Save".

Apply – Click to save changes.

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

2-9.1.1.1 IPMC Profile Rule Settings Table

This page provides the filtering rule settings for a specific IPMC profile. It displays the configured rule entries in precedence order. First rule entry has highest priority in lookup, while the last rule entry has lowest priority in lookup.

Profile Name : The name of the designated profile to be associated. This field is not editable.

Entry Name : The name used in specifying the address range used for this rule.

Only the existing profile address entries will be chosen in the selected box. This field is not allowed to be selected as none ("-") while the Rule Settings Table is committed.

Address Range : The corresponding address range of the selected profile entry. This field is not editable and will be adjusted automatically according to the selected profile entry.

Action : Indicates the learning action upon receiving the Join/Report frame that has the group address matches the address range of the rule.

Permit: Group address matches the range specified in the rule will be learned.

Deny: Group address matches the range specified in the rule will be dropped.


Log : Indicates the logging preference upon receiving the Join/Report frame that has the group address matches the address range of the rule.


Enable: Corresponding information of the group address, that matches the range specified in the rule, will be logged.


Disable: Corresponding information of the group address, that matches the range specified in the rule, will not be logged.

Rule Management Buttons : You can manage rules and the corresponding precedence order by using the following buttons:

: Insert a new rule before the current entry of rule.

: Delete the current entry of rule.

: Moves the current entry of rule up in the list.

: Moves the current entry of rule down in the list.

Buttons

Add Last Rule – Click to add a new rule in the end of the specific profile's rule list. Specify the address entry and configure the new entry. Click "Commit".

Commit – Click to commit rule changes for the designated profile.

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

2-9.2 Address Entry

This page provides address range settings used in IPMC profile.

The address entry is used to specify the address range that will be associated with IPMC Profile. It is allowed to create at maximum 128 address entries in the system.

Web Interface

To configure the IPMC Profile Address Configuration in the web interface:

Figure 2-9.2: IPMC Profile Address Configuration page

The screenshot displays the 'IPMC Profile Address Configuration' web interface. It features a breadcrumb trail: Home > Configuration > IPMC Profile > Address Entry. Below the title, there is a navigation bar with a text input '20' for 'entries per page' and three buttons: a refresh icon, a left arrow, and a right arrow. The main content area contains a table with the following structure:

Delete	Entry Name	Start Address	End Address
<input type="checkbox"/>			

Below the table, there is a blue button labeled 'Add New Address (Range) Entry', followed by 'Apply' and 'Reset' buttons. The bottom panel is identical but has a red box around the 'Add New Address (Range) Entry' button, with a red arrow pointing to it from the top panel.

Parameter descriptions:

Delete : Check to delete the entry. The designated entry will be deleted during the next save.

Entry Name : The name used for indexing the address entry table. Each entry has the unique name which is composed of at maximum 16 alphabetic and numeric characters. At least one alphabet must be present.

Start Address : The starting IPv4/IPv6 Multicast Group Address that will be used as an address range.

End Address : The ending IPv4/IPv6 Multicast Group Address that will be used as an address range.

Buttons

Add New Address (Range) Entry – Click to add new address range. Specify the name and configure the addresses. Click "Save"

Apply – Click to save changes.

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

Refresh – Refreshes the displayed table starting from the input fields.

<< – Updates the table starting from the first entry in the IPMC Profile Address Configuration.

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

2-10MVR

The MVR feature enables multicast traffic forwarding on the Multicast VLAN. In a multicast television application, a PC or a television with a set-top box can receive the multicast stream. Multiple set-top boxes or PCs can be connected to one subscriber port, which is a switch port configured as an MVR receiver port. When a subscriber selects a channel, the set-top box or PC sends an IGMP join message to Switch A to join the appropriate multicast. Uplink ports that send and receive multicast data to and from the multicast VLAN are called MVR source ports.

Web Interface

To configure the MVR Configuration in the web interface:

1. Click Configuration, MVR.
2. At the dropdown select the MVR mode (enable or disable) and scroll to set all parameters.
3. Click the **Add New MVR VLAN** button and configure.
4. Click the **Save** button to save the setting
5. To cancel settings, click the **Reset** button. The page will revert to previously saved values

Figure 2-10: MVR Configurations page

The screenshot displays the MVR Configurations page. The 'Global Setting' section has 'MVR Mode' set to 'Disabled'. The 'VLAN Interface Setting' section includes a table with columns: Delete, MVR VID, MVR Name, IGMP Address, Mode, Tagging, and Priority. Below this is a table for 26 ports, each with a 'Role' indicator. An 'Add New MVR VLAN' button is present. The 'Immediate Leave Setting' table shows ports 1, 2, and 3, all with 'Immediate Leave' set to 'Disabled'.

Parameter descriptions:

MVR Mode : Enable/Disable the Global MVR.

The Unregistered Flooding control depends on the current configuration in IGMP/MLD Snooping. It is suggested to enable Unregistered Flooding control when the MVR group table is full.

Delete : Check to delete the entry. The designated entry will be deleted during the next save.

MVR VID : Specify the Multicast VLAN ID.

Be Caution: MVR source ports are not recommended to be overlapped with management VLAN ports.

MVR Name : MVR Name is an optional attribute to indicate the name of the specific MVR VLAN. Maximum length of the MVR VLAN Name string is 32. MVR VLAN Name can only contain alphabets or numbers. When the optional MVR VLAN name is given, it should contain at least one alphabet. MVR VLAN name can be edited for the existing MVR VLAN entries or it can be added to the new entries.

IGMP Address : Define the IPv4 address as source address used in IP header for IGMP control frames. The default IGMP address is not set (0.0.0.0). When the IGMP address is not set, system uses IPv4 management address of the IP interface associated with this VLAN. When the IPv4 management address is not set, system uses the first available IPv4 management address. Otherwise, system uses a pre-defined value. By default, this value will be 192.0.2.1.

Mode : Specify the MVR mode of operation. In Dynamic mode, MVR allows dynamic MVR membership reports on source ports. In Compatible mode, MVR membership reports are forbidden on source ports. The default is Dynamic mode.

Tagging : Specify whether the traversed IGMP/MLD control frames will be sent as Untagged or Tagged with MVR VID. The default is tagged.

Priority : Specify how the traversed IGMP/MLD control frames will be sent in prioritized manner. The default Priority is 0.

LLQI : Define the maximum time to wait for IGMP/MLD report memberships on a receiver port before removing the port from multicast group membership. The value is in units of tenths of a seconds. The range is from 0 to 31744. The default LLQI is 5 tenths or one-half second.

Interface Channel Setting : When the MVR VLAN is created, click the Edit symbol to expand the corresponding multicast channel settings for the specific MVR VLAN. Summary about the Interface Channel Setting (of the MVR VLAN) will be shown besides the Edit symbol.

Port : The logical port for the settings.

Port Role : Configure an MVR port of the designated MVR VLAN as one of the following roles.

Inactive: The designated port does not participate MVR operations.

Source: Configure uplink ports that receive and send multicast data as source ports. Subscribers cannot be directly connected to source ports.

Receiver: Configure a port as a receiver port if it is a subscriber port and should only receive multicast data. It does not receive data unless it becomes a member of the multicast group by issuing IGMP/MLD messages.

Be Caution: MVR source ports are not recommended to be overlapped with management VLAN ports. Select the port role by clicking the Role symbol to switch the setting. I indicates Inactive; S indicates Source; R indicates Receiver. The default Role is Inactive.

Immediate Leave : Enable the fast leave on the port.

Buttons

Add New MVR VLAN – Click to add new MVR VLAN. Specify the VID and configure the new entry. Click "Apply".

Apply – Click to save changes.

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

2-11 IPMC

ICMP is an acronym for Internet Control Message Protocol. It is a protocol that generated the error response, diagnostic or routing purposes. ICMP messages generally contain information about routing difficulties or simple exchanges such as time-stamp or echo transactions.

2-11.1 IGMP Snooping

The function is used to establish the multicast groups to forward the multicast packet to the member ports, and, in nature, avoids wasting the bandwidth while IP multicast packets are running over the network. This is because a switch that does not support IGMP or IGMP Snooping cannot tell the multicast packet from the broadcast packet, so it can only treat them all as the broadcast packet. Without IGMP Snooping, the multicast packet forwarding function is plain and nothing is different from broadcast packet.

A switch supported IGMP Snooping with the functions of query, report and leave, a type of packet exchanged between IP Multicast Router/Switch and IP Multicast Host, can update the information of the Multicast table when a member (port) joins or leaves an IP Multicast Destination Address. With this function, once a switch receives an IP multicast packet, it will forward the packet to the members who joined in a specified IP multicast group before.

The packets will be discarded by the IGMP Snooping if the user transmits multicast packets to the multicast group that had not been built up in advance. IGMP mode enables the switch to issue IGMP function that you enable IGMP proxy or snooping on the switch, which connects to a router closer to the root of the tree. This interface is the upstream interface. The router on the upstream interface should be running IGMP.

2-11.1.1 Basic Configuration

The section describes how to set the basic IGMP snooping on the switch, which connects to a router closer to the root of the tree. This interface is the upstream interface. The router on the upstream interface should be running IGMP.

Web Interface

To configure the IGMP Snooping parameters in the web interface:

1. Click Configuration, IPMC, IGMP Snooping, Basic Configuration.
2. Enable or disable IPMC globally.
3. Select which port is to become a Router Port or enable/ disable the Fast Leave function..
4. At the Throttling dropdown, select the Throtting parameter.
5. Click the Apply button to save the settings.
6. To cancel the settings, click the Reset button. The page will revert to previously saved values.

Figure 2-12.1.1: IGMP Snooping Configuration page

The screenshot shows the IGMP Snooping Configuration page. The left sidebar contains a navigation menu with 'IGMP Snooping' selected. The main content area is titled 'IGMP Snooping Configuration' and is divided into two sections: 'Global Configuration' and 'Port Related Configuration'.

Global Configuration:

Snooping Enabled	<input type="checkbox"/>
Unregistered IPMCv4 Flooding Enabled	<input checked="" type="checkbox"/>
IGMP SSM Range	232.0.0.0 / 8
Leave Proxy Enabled	<input type="checkbox"/>
Proxy Enabled	<input type="checkbox"/>

Port Related Configuration:

Port	Router Port	Fast Leave	Throttling
*	<input type="checkbox"/>	<input type="checkbox"/>	<
1	<input type="checkbox"/>	<input type="checkbox"/>	unlimited
2	<input type="checkbox"/>	<input type="checkbox"/>	unlimited
3	<input type="checkbox"/>	<input type="checkbox"/>	unlimited
4	<input type="checkbox"/>	<input type="checkbox"/>	unlimited
5	<input type="checkbox"/>	<input type="checkbox"/>	unlimited
6	<input type="checkbox"/>	<input type="checkbox"/>	unlimited

Parameter descriptions:

Snooping Enabled: Enable the Global IGMP Snooping.

Unregistered IPMCv4 Flooding enabled : Enable unregistered IPMCv4 traffic flooding.

IGMP SSM Range : SSM (Source-Specific Multicast) Range allows the SSM-aware hosts and routers run the SSM service model for the groups in the address range. Format: (IP address/ sub mask)

Leave Proxy Enable: Enable IGMP Leave Proxy. This feature can be used to avoid forwarding unnecessary leave messages to the router side.

Proxy Enabled : Enable IGMP Proxy. This feature can be used to avoid forwarding unnecessary join and leave messages to the router side.

Port : It shows the physical Port index of switch.

Router Port : Specify which ports act as router ports. A router port is a port on the Ethernet switch that leads towards the Layer 3 multicast device or IGMP querier. If an aggregation member port is selected as a router port, the whole aggregation will act as a router port.

Fast Leave : Enable the fast leave on the port.

Throttling : Enable to limit the number of multicast groups to which a switch port can belong.

Buttons

Apply – Click to save changes.

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

2-11.1.2 VLAN Configuration

The section describes the VLAN configuration setting process integrated with IGMP Snooping function. For Each setting page shows up to 99 entries from the VLAN table, default being 20, selected through the "entries per page" input field. When first visited, the web page will show the first 20 entries from the beginning of the VLAN Table. The first displayed will be the one with the lowest VLAN ID found in the VLAN Table. The "VLAN" input fields lets you select the starting point in the VLAN Table. Clicking the button will update the displayed table starting from that or the next closest VLAN Table match.

Web Interface

To configure the IGMP Snooping VLAN Configuration in the web interface:

1. Click Configuration, IPMC, IGMP Snooping, VLAN Configuration
2. Enable or disable Snooping, IGMP Querier. Specify the parameters in the blank field.
3. Click the **Add New IGMP VLAN** button or click **Refresh** to update the data or click << or >> to display previous entry or next entry.
4. Click **Save** to save the setting
5. To cancel the settings, click the **Reset** button. The page will revert to previously saved values.

Figure 2-11.1.2: IGMP Snooping VLAN Configuration page

Delete	VLAN ID	Snooping Enabled	Querier Election	Querier Address	Compatibility	PRI	RV	QI (sec)	QRI (0.1 sec)	LLQI (0.1 sec)	URI (sec)
<input type="checkbox"/>	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0.0.0.0	IGMP-Auto	0	2	125	100	10	1

Parameter descriptions:

Delete : Check to delete the entry. The designated entry will be deleted during the next save.

VLAN ID : It displays the VLAN ID of the entry.

IGMP Snooping Enabled : Enable the per-VLAN IGMP Snooping. Only up to 32 VLANs can be selected. .

Querier Election : Enable to join IGMP Querier election in the VLAN. Disable to act as an IGMP Non-Querier.

Querier Address : Define the IPv4 address as source address used in IP header for IGMP Querier election. When the Querier address is not set, system uses IPv4 management address of the IP interface associated with this VLAN. When the IPv4 management address is not set, system uses the first available IPv4 management address. Otherwise, system uses a pre-defined value. By default, this value will be 192.0.2.1.

Compatibility : Compatibility is maintained by hosts and routers taking appropriate actions depending on the versions of IGMP operating on hosts and routers within a network. The allowed selection is IGMP-Auto, Forced IGMPv1, Forced IGMPv2, Forced IGMPv3, default compatibility value is IGMP-Auto.

PRI : Priority of Interface. It indicates the IGMP control frame priority level generated by the system. These values can be used to prioritize different classes of traffic. The allowed range is 0 (best effort) to 7 (highest), default interface priority value is 0.

Rv : Robustness Variable. The Robustness Variable allows tuning for the expected packet loss on a network. The allowed range is 1 to 255; default robustness variable value is 2.

QI : Query Interval. The Query Interval is the interval between General Queries sent by the Querier. The allowed range is 1 to 31744 seconds; default query interval is 125 seconds.

QRI : Query Response Interval. The Max Response Time used to calculate the Max Resp Code inserted into the periodic General Queries. The allowed range is 0 to 31744 in tenths of seconds; default query response interval is 100 in tenths of seconds (10 seconds).

LLQI (LMQI for IGMP) : Last Member Query Interval. The Last Member Query Time is the time value represented by the Last Member Query Interval, multiplied by the Last Member Query Count. The allowed range is 0 to 31744 in tenths of seconds; default last member query interval is 10 in tenths of seconds (1 second).

URI : Unsolicited Report Interval. The Unsolicited Report Interval is the time between repetitions of a host's initial report of membership in a group. The allowed range is 0 to 31744 seconds, default unsolicited report interval is 1 second.

Buttons:

Add New IGMP VLAN - Click to add new IGMP VLAN. Specify the VID and configure the new entry. Click "Apply". The specific IGMP VLAN starts working after the corresponding static VLAN is also created.

Apply – Click to save changes.

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

Upper right icon (Refresh, <<, >) : You can click them to refresh the displayed table starting from the "VLAN" input fields. Or click "<<" to update the table starting from the first entry in the VLAN table, i.e. the entry with the lowest VLAN ID. Others click ">" to update the table, starting with the entry after the last entry currently displayed.

2-11.1.3 Port Filtering Profile

The section describes how to set the IGMP Port Group Filtering? With the IGMP filtering feature, a user can exert this type of control. In some network Application environments, as like the metropolitan or multiple-dwelling unit (MDU) installations, a user might want to control the multicast groups to which a user on a switch port can belong. It lets you control the distribution of multicast services, such as IP/TV, based on some type of subscription or service plan.

With this feature, you can filter multicast joins on a per-port basis by configuring IP multicast profiles and associating them with individual switch ports. An IGMP profile can contain one or more multicast groups and specifies whether access to the group is permitted or denied. If an IGMP profile denying access to a multicast group is applied to a switch port, the IGMP join report requesting the stream of IP multicast traffic is dropped, and the port is not allowed to receive IP multicast traffic from that group. If the filtering action permits access to the multicast group, the IGMP report from the port is forwarded for normal processing.

IGMP filtering controls only IGMP membership join reports and has no relationship to the function that directs the forwarding of IP multicast traffic.

Web Interface

To configure the IGMP Snooping Port Group Configuration in the web interface:

1. Click Configuration, IPMC, IGMP Snooping, Port Group Filtering
2. Click Add new Filtering Group
3. Scroll the Port to enable the Port Group Filtering. Specify the Filtering Groups in the blank field.
4. Click the save to save the setting
5. To cancel the settings click the Reset button. The page will revert to previously saved values.

Figure 2-11.1.3: IGMP Snooping Port Filtering Profile Configuration page

Port	Filtering Profile
1	-
2	SdCC
3	SdCC
4	SdCC
5	-
6	-
7	-
8	-
9	-
10	-

Parameter descriptions:

Port : The logical port for the settings.

Filtering Profile : Select the IPMC Profile as the filtering condition for the specific port. Summary about the designated profile will be shown by clicking the view button.

Profile Management Button : You can inspect the rules of the designated profile by using the following button:



: List the rules associated with the designated profile.

Buttons:

Apply – Click to save changes.

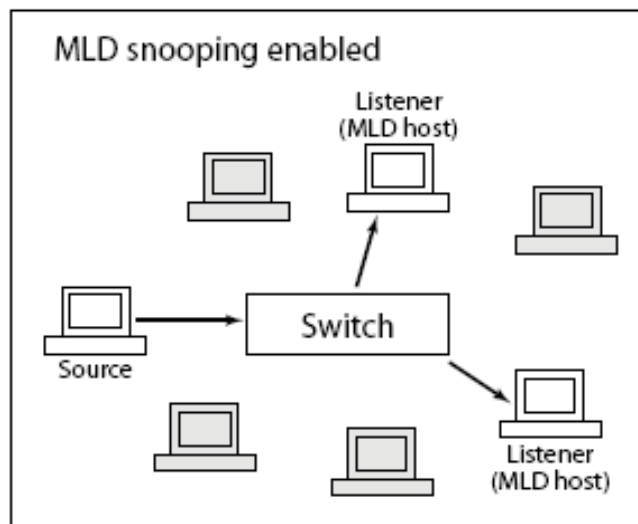
Reset- Click to undo any changes made locally and revert to previously saved values.

2-11.2 MLD Snooping

Curiously enough, a network node that acts as a source of IPv6 multicast traffic is only an indirect participant in MLD snooping—it just provides multicast traffic, and MLD doesn't interact with it. (Note, however, that in an application like desktop conferencing a network node may act as both a source and an MLD host; but MLD interacts with that node only in its role as an MLD host.)

A source node creates multicast traffic by sending packets to a multicast address. In IPv6, addresses with the first eight bits set (that is, "FF" as the first two characters of the address) are multicast addresses, and any node that listens to such an address will receive the traffic sent to that address. Application software running on the source and destination systems cooperates to determine what multicast address to use. (Note that this is a function of the application software, not of MLD.)

When MLD snooping is enabled on a VLAN, the switch acts to minimize unnecessary multicast traffic. If the switch receives multicast traffic destined for a given multicast address, it forwards that traffic only to ports on the VLAN that have MLD hosts for that address. It drops that traffic for ports on the VLAN that have no MLD hosts.



2-11.2.1 Basic Configuration

This section describes how to configure the MLD Snooping basic configuration parameters.

Web Interface

To configure the MLD Snooping Configuration in the web interface:

1. Click Configuration, IPMC, MLD Snooping, Basic Configuration.
2. Enable or disable the Global configuration parameters. Set the port to join Router port and Fast Leave.
3. Select the Throttling mode with unlimited or 1 - 10.
4. Click Save to save the settings.
5. To cancel the settings, click the **Reset** button. The page will revert to previously saved values.

Figure 2-11.2.1: MLD Snooping Configuration page

The screenshot shows the MLD Snooping Configuration page. The left sidebar contains a navigation menu with 'IPMC' expanded to show 'MLD Snooping' and 'Basic Configuration'. The main content area is titled 'MLD Snooping Configuration' and includes a breadcrumb trail: Home > Configuration > IPMC > MLD Snooping > Basic Configuration.

Global Configuration

Snooping Enabled	<input type="checkbox"/>
Unregistered IPMCv6 Flooding Enabled	<input checked="" type="checkbox"/>
MLD SSM Range	ff3e:: / 96
Leave Proxy Enabled	<input type="checkbox"/>
Proxy Enabled	<input type="checkbox"/>

Port Related Configuration

Port	Router Port	Fast Leave	Throttling
*	<input type="checkbox"/>	<input type="checkbox"/>	< >
1	<input type="checkbox"/>	<input type="checkbox"/>	unlimited
2	<input type="checkbox"/>	<input type="checkbox"/>	unlimited

Parameter descriptions:

Snooping Enabled : Enable the Global MLD Snooping.

Unregistered IPMCv6 Flooding Enabled : Enable unregistered IPMCv6 traffic flooding. The flooding control takes effect only when MLD Snooping is enabled. When MLD Snooping is disabled, unregistered IPMCv6 traffic flooding is always active in spite of this setting.

MLD SSM Range : SSM (Source-Specific Multicast) Range allows the SSM-aware hosts and routers run the SSM service model for the groups in the address (Using IPv6 Address) range.

Leave Proxy Enabled : Enable MLD Leave Proxy. This feature can be used to avoid forwarding unnecessary leave messages to the router side.

Proxy Enabled : Enable MLD Proxy. This feature can be used to avoid forwarding unnecessary join and leave messages to the router side.

Fast Leave : Check to enable Fast leave on the port.

Router Port : Specify which ports act as router ports. A router port is a port on the Ethernet switch that leads towards the Layer 3 multicast device or MLD querier. If an aggregation member port is selected as a router port, the whole aggregation will act as a router port.

Throttling : Enable to limit the number of multicast groups to which a switch port can belong (1-10 or unlimited).

Buttons:

Apply – Click to save changes.

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

2-11.2.2 VLAN Configuration

When MLD snooping is enabled on a VLAN, the switch acts to minimize unnecessary multicast traffic. If the switch receives multicast traffic destined for a given multicast address, it forwards that traffic only to ports on the VLAN that have MLD hosts for that address. It drops that traffic for ports on the VLAN that have no MLD hosts.

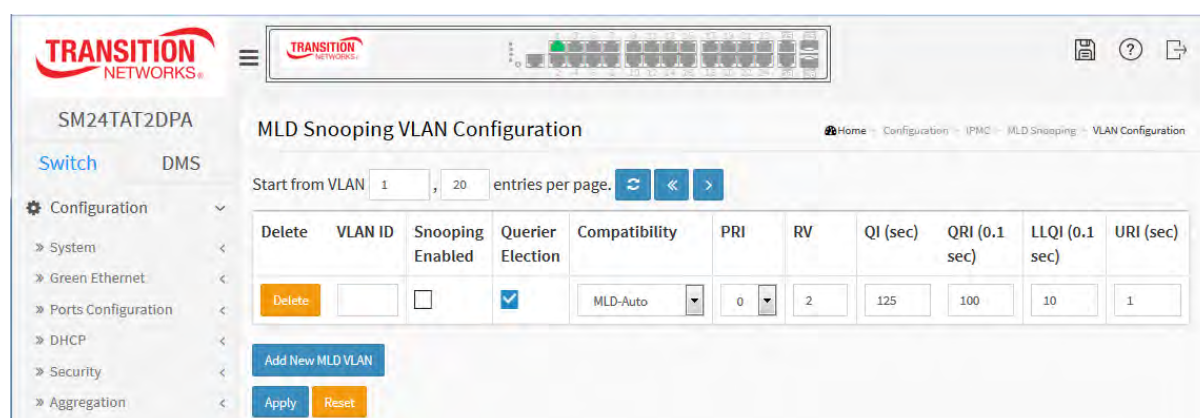
Clicking the Next entry button will use the last entry of the currently displayed entry as a basis for the next lookup. When the end is reached the text "No more entries" is shown in the displayed table. Use the Refresh button to start over.

Web Interface

To configure the MLD Snooping VLAN Configuration in the web interface:

1. Click Configuration, IPMC, MLD Snooping, VLAN Configuration
2. Specify the VLAN ID with entries per page.
3. Click "Refresh" to refresh an entry of the MLD Snooping VLAN Configuration Information.
4. Click "<< or >>" to move to previous or next entry.

Figure 2-11.2.2: MLD Snooping VLAN Configuration page



Parameter descriptions:

Delete : Check to delete the entry. The designated entry will be deleted during the next save.

VLAN ID : It displays the VLAN ID of the entry.

IGMP Snooping Enabled : Enable the per-VLAN IGMP Snooping. Up to 32 VLANs can be selected.

Querier Election : Enable to join IGMP Querier election in the VLAN. Disable to act as an IGMP Non-Querier.

Querier Address : Define the IPv4 address as source address used in IP header for IGMP Querier election. When the Querier address is not set, system uses IPv4 management address of the IP interface associated with this VLAN. When the IPv4 management address is not set, system uses the first available IPv4 management address. Otherwise, system uses a pre-defined value. By default, this value will be 192.0.2.1.

Compatibility : Compatibility is maintained by hosts and routers taking appropriate actions depending on the versions of IGMP operating on hosts and routers within a network. The allowed selection is IGMP-Auto, Forced IGMPv1, Forced IGMPv2, Forced IGMPv3, default compatibility value is IGMP-Auto.

PRI : Priority of Interface. It indicates the IGMP control frame priority level generated by the system. These values can be used to prioritize different classes of traffic. The allowed range is 0 (best effort) to 7 (highest), default interface priority value is 0.

Rv : Robustness Variable. The Robustness Variable allows tuning for the expected packet loss on a network. The allowed range is 1 to 255; default robustness variable value is 2.

QI : Query Interval. The Query Interval is the interval between General Queries sent by the Querier. The allowed range is 1 to 31744 seconds; default query interval is 125 seconds.

QRI : Query Response Interval. The Max Response Time used to calculate the Max Resp Code inserted into the periodic General Queries. The allowed range is 0 to 31744 in tenths of seconds; default query response interval is 100 in tenths of seconds (10 seconds).

LLQI (LMQI for IGMP) : Last Member Query Interval. The Last Member Query Time is the time value represented by the Last Member Query Interval, multiplied by the Last Member Query Count. The allowed range is 0 to 31744 in tenths of seconds; default last member query interval is 10 in tenths of seconds (1 second).

URI : Unsolicited Report Interval. The Unsolicited Report Interval is the time between repetitions of a host's initial report of membership in a group. The allowed range is 0 to 31744 seconds, default unsolicited report interval is 1 second. .

Buttons:

Add New MLD VLAN : Click to add new MLD VLAN. Specify the VID and configure the new entry. Click "Apply". The specific MLD VLAN starts working after the corresponding static VLAN is also created.

Apply – Click to save changes.

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

Upper right icon (Refresh, <<, >) : You can click them Refreshes the displayed table starting from the "VLAN" input fields. Or click "<<" to update the table starting from the first entry in the VLAN table, i.e. the entry with the lowest VLAN ID. Others click ">" to update the table, starting with the entry after the last entry currently displayed.

2-11.2.3 Port Group Filtering

The section describes that you could to set the Port Group Filtering in the MLD Snooping function. On the UI that you could add new filtering group and safety policy.

Web Interface

To configure the MLD Snooping Port Group Configuration in the web interface:

1. Click Configuration, IPMC, MLD Snooping, Port Group Filtering Configuration.
2. Click the Add new Filtering Group.
3. Specify the Filtering Groups with entries per page.
4. Click the Apply to save the setting.
5. To cancel the setting click the **Reset** button. The page will revert to previously saved values.

Figure 2-11.2.3: MLD Snooping Port Filtering Configuration page

Port	Filtering Profile
1	[dropdown]
2	SdCC [dropdown]
3	SdCC [dropdown]
4	SdCC [dropdown]
5	[dropdown]
6	[dropdown]
7	[dropdown]
8	[dropdown]
9	[dropdown]
10	[dropdown]
11	[dropdown]

Parameter descriptions:

Port : The logical port for the settings.

Filtering Profile : Select the IPMC Profile as the filtering condition for the specific port. Summary about the designated profile will be shown by clicking the view button.

Profile Management Button : You can inspect the rules of the designated profile by using the following button:



: List the rules associated with the designated profile.

Buttons:

Apply – Click to save changes.

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

2-12 LLDP

The switch supports the LLDP. For current information on your switch model, The Link Layer Discovery Protocol (LLDP) provides a standards-based method for enabling switches to advertise themselves to adjacent devices and to learn about adjacent LLDP devices. The Link Layer Discovery Protocol (LLDP) is a vendor-neutral Link Layer protocol in the Internet Protocol Suite used by network devices for advertising their identity, capabilities, and neighbors on a IEEE 802 local area network, principally wired Ethernet. The protocol is formally referred to by the IEEE as Station and Media Access Control Connectivity Discovery specified in standards document IEEE 802.1AB.

2-12.1 LLDP Configuration

You can per port to do the LLDP configuration and the detail parameters, the settings will take effect immediately. This page lets you inspect and configure the current LLDP port settings.

Web Interface

To configure LLDP:

1. Click LLDP configuration
2. Modify LLDP timing parameters
3. Set the required mode for transmitting or receiving LLDP messages
4. Specify the information to include in the TLV field of advertised messages
5. Click Apply

Figure 2-13.1: LLDP Configuration page

The screenshot shows the LLDP Configuration page in the Transition Networks web interface. The page is titled "LLDP Configuration" and includes a breadcrumb trail: Home > Configuration > LLDP > LLDP. The interface is divided into two main sections: "LLDP Parameters" and "LLDP Port Configuration".

LLDP Parameters:

Tx Interval	30	seconds
Tx Hold	4	times
Tx Delay	2	seconds
Tx Reinit	2	seconds

LLDP Port Configuration:

Port	Mode	CDP aware	Optional TLVs				
			Port Descr	Sys Name	Sys Descr	Sys Capa	Mgmt Addr
*	<input type="radio"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
1	Enabled	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
2	Enabled	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Parameter descriptions:

LLDP Parameters

Tx Interval : The switch periodically transmits LLDP frames to its neighbours for having the network discovery information up-to-date. The interval between each LLDP frame is determined by the Tx Interval value. Valid values are restricted to 5 - 32768 seconds.

Tx Hold : Each LLDP frame contains information about how long the information in the LLDP frame will be considered valid. The LLDP information valid period is set to Tx Hold multiplied by Tx Interval seconds. Valid values are restricted to 2 - 10 times.

Tx Delay : If some configuration is changed (e.g. the IP address) a new LLDP frame is transmitted, but the time between the LLDP frames will always be at least the value of Tx Delay seconds. Tx Delay cannot be larger than 1/4 of the Tx Interval value. Valid values are restricted to 1 - 8192 seconds.

Tx Reinit : When a port is disabled, LLDP is disabled or the switch is rebooted, an LLDP shutdown frame is transmitted to the neighboring units, signaling that the LLDP information isn't valid anymore. Tx Reinit controls the amount of seconds between the shutdown frame and a new LLDP initialization. Valid values are restricted to 1 - 10 seconds.

LLDP Port Configuration : The LLDP port settings relate to the currently selected, as reflected by the page header.

Port : The switch port number of the logical LLDP port.

Mode : Select LLDP mode.

Rx only The switch will not send out LLDP information, but LLDP information from neighbor units is analyzed.

Tx only The switch will drop LLDP information received from neighbors, but will send out LLDP information.

Disabled The switch will not send out LLDP information, and will drop LLDP information received from neighbors.

Enabled the switch will send out LLDP information, and will analyze LLDP information received from neighbors.

CDP Aware : Select CDP awareness.

The CDP operation is restricted to decoding incoming CDP frames (The switch doesn't transmit CDP frames). CDP frames are only decoded if LLDP on the port is enabled.

Only CDP TLVs that can be mapped to a corresponding field in the LLDP neighbors' table are decoded. All other TLVs are discarded (Unrecognized CDP TLVs and discarded CDP frames are not shown in the LLDP statistics.). CDP TLVs are mapped onto LLDP neighbors' table as shown below.

CDP TLV "Device ID" is mapped to the LLDP "Chassis ID" field.

CDP TLV "Address" is mapped to the LLDP "Management Address" field. The CDP address TLV can contain multiple addresses, but only the first address is shown in the LLDP neighbors' table.

CDP TLV "Port ID" is mapped to the LLDP "Port ID" field.

CDP TLV "Version and Platform" is mapped to the LLDP "System Description" field.

Both the CDP and LLDP support "system capabilities", but the CDP capabilities cover capabilities that are not part of the LLDP. These capabilities are shown as "others" in the LLDP neighbors' table.

If all ports have CDP awareness disabled the switch forwards CDP frames received from neighbor devices. If at least one port has CDP awareness enabled all CDP frames are terminated by the switch.



NOTE: When CDP awareness on a port is disabled the CDP information isn't removed immediately, but gets when the hold time is exceeded.

Port Descr : Optional TLV: When checked the "port description" is included in LLDP information transmitted.

Sys Name : Optional TLV: When checked the "system name" is included in LLDP information transmitted.

Sys Descr : Optional TLV: When checked the "system description" is included in LLDP information transmitted.

Sys Capa : Optional TLV: When checked the "system capability" is included in LLDP information transmitted.

Mgmt Addr : Optional TLV: When checked the "management address" is included in LLDP information transmitted.

Buttons:

Apply – Click to save changes.

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

2-12.2 LLDP-MED Configuration

Media Endpoint Discovery is an enhancement of LLDP, known as LLDP-MED that provides the following facilities:

- Auto-discovery of LAN policies (such as VLAN, Layer 2 Priority and Differentiated services (Diffserv) settings) enabling plug and play networking.
- Device location discovery to allow creation of location databases and, in the case of Voice over Internet Protocol (VoIP), Enhanced 911 services.
- Extended and automated power management of Power over Ethernet (PoE) end points.
- Inventory management, allowing network administrators to track their network devices, and determine their characteristics (manufacturer, software and hardware versions, and serial or asset number).

This page lets you configure LLDP-MED. This function applies to VoIP devices which support LLDP-MED.

Web Interface

To configure LLDP-MED:

1. Click LLDP-MED Configuration.
2. Modify Fast start repeat count parameter, default is 4.
3. Modify Coordinates Location parameters.
4. Fill Civic Address Location parameters.
5. Add New Policy.
6. Click Apply, will show following Policy Port Configuration.
7. Select Policy ID for each port.
8. Click Apply.

Figure 2-12.2: LLDP-MED Configuration page

The screenshot displays the LLDP-MED Configuration page. The left sidebar shows the navigation menu with 'LLDP-MED' selected. The main content area includes the following sections:

- Fast Start Repeat Count:** A text input field containing the value '4'.
- Coordinates Location:** Fields for Latitude (0), Longitude (0), Altitude (0), and Map Datum (WGS84).
- Civic Address Location:** A grid of fields for Country code, State/Province, County, City, City district, Block (Neighborhood), Street, Leading street direction, Trailing street suffix, Street suffix, House no., House no. suffix, Landmark, Additional location info, Name, Zip code, Building, Apartment, Floor, Room no., Place type, Postal community name, and P.O. Box.
- Emergency Call Service:** A text input field for the Emergency Call Service.
- Policies:** A table with columns for Delete, Policy ID, Application Type, Tag, VLAN ID, L2 Priority, and DSCP. The table is currently empty, showing 'No entries present'.

At the bottom of the page, there are buttons for 'Add New Policy', 'Apply', and 'Reset'.

Parameter descriptions:

Fast start repeat count : Rapid startup and Emergency Call Service Location Identification Discovery of endpoints is a critically important aspect of VoIP systems in general. In addition, it is best to advertise only those pieces of information which are specifically relevant to particular endpoint types (for example only advertise the voice network policy to permitted voice-capable devices), both in order to conserve the limited LLDPDU space and to reduce security and system integrity issues that can come with inappropriate knowledge of the network policy.

With this in mind LLDP-MED defines an LLDP-MED Fast Start interaction between the protocol and the application layers on top of the protocol, in order to achieve these related properties. Initially, a Network Connectivity Device will only transmit LLDP TLVs in an LLDPDU. Only after an LLDP-MED Endpoint Device is detected, will an LLDP-MED capable Network Connectivity Device start to advertise LLDP-MED TLVs in outgoing LLDPDUs on the associated port. The LLDP-MED application will temporarily speed up the transmission of the LLDPDU to start within a second, when a new LLDP-MED neighbour has been detected in order share LLDP-MED information as fast as possible to new neighbours.

Because there is a risk of an LLDP frame being lost during transmission between neighbours, it is recommended to repeat the fast start transmission multiple times to increase the possibility of the neighbours receiving the LLDP frame. With Fast start repeat count it is possible to specify the number of times the fast start transmission would be repeated. The recommended value is 4 times, given that 4 LLDP frames with a 1 second interval will be transmitted, when an LLDP frame with new information is received.

It should be noted that LLDP-MED and the LLDP-MED Fast Start mechanism is only intended to run on links between LLDP-MED Network Connectivity Devices and Endpoint Devices, and as such does not apply to links between LAN infrastructure elements, including Network Connectivity Devices, or other types of links.

Coordinates Location

Latitude : Latitude SHOULD be normalized to within 0-90 degrees with a maximum of 4 digits. It is possible to specify the direction to either North of the equator or South of the equator.

Longitude : Longitude SHOULD be normalized to within 0-180 degrees with a maximum of 4 digits. It is possible to specify the direction to either East of the prime meridian or West of the prime meridian.

Altitude : Altitude SHOULD be normalized to within -32767 to 32767 with a maximum of 4 digits.

It is possible to select between two altitude types (floors or meters).

Meters: Representing meters of Altitude defined by the vertical datum specified.

Floors: Representing altitude in a form more relevant in buildings which have different floor-to-floor dimensions. An altitude = 0.0 is meaningful even outside a building, and represents ground level at the given latitude and longitude. Inside a building, 0.0 represents the floor level associated with ground level at the main entrance.

Map Datum : The Map Datum is used for the coordinates given in these options:

WGS84: (Geographical 3D) - World Geodesic System 1984, CRS Code 4327, and Prime Meridian Name: Greenwich.

NAD83/NAVD88: North American Datum 1983, CRS Code 4269, Prime Meridian Name: Greenwich; the associated vertical datum is the North American Vertical Datum of 1988 (NAVD88). This datum pair is to be used when referencing locations on land, not near tidal water (which would use Datum = NAD83/MLLW).

NAD83/MLLW: North American Datum 1983, CRS Code 4269, Prime Meridian Name: Greenwich; the associated vertical datum is Mean Lower Low Water (MLLW). This datum pair is to be used when referencing locations on water/sea/ocean.

Civic Address Location : IETF Geopriv Civic Address based Location Configuration Information (Civic Address LCI).

Country code : The two-letter ISO 3166 country code in capital ASCII letters - Example: DK, DE or US.

State : National subdivisions (state, canton, region, province, prefecture).

County : County, parish, gun (Japan), district.

City : City, township, shi (Japan) - Example: Copenhagen.

City district : City division, borough, city district, ward, chou (Japan).

Block (Neighbourhood) : Neighbourhood, block.

Street : Street - Example: Poppelvej.

Leading street direction : Leading street direction - Example: N.

Trailing street suffix : Trailing street suffix - Example: SW.

Street suffix : Street suffix - Example: Ave, Platz.

House no. : House number - Example: 21.

House no. suffix : House number suffix - Example: A, 1/2.

Landmark : Landmark or vanity address - Example: Columbia University.

Additional location info : Additional location info - Example: South Wing.

Name : Name (residence and office occupant) - Example: Flemming Jahn.

Zip code : Postal/zip code - Example: 2791.

Building : Building (structure) - Example: Low Library.

Apartment : Unit (Apartment, suite) - Example: Apt 42.

Floor : Floor - Example: 4.

Room no. : Room number - Example: 450F.

Place type : Place type - Example: Office.

Postal community name : Postal community name - Example: Leonia.

P.O. Box : Post office box (P.O. BOX) - Example: 12345.

Additional code : Additional code - Example: 1320300003.

Emergency Call Service: Emergency Call Service (e.g. E911 and others), such as defined by TIA or NENA.

Emergency Call Service : Emergency Call Service ELIN identifier data format is defined to carry the ELIN identifier as used during emergency call setup to a traditional CAMA or ISDN trunk-based PSAP. This format consists of a numerical digit string, corresponding to the ELIN to be used for emergency calling.

Policies : Network Policy Discovery enables the efficient discovery and diagnosis of mismatch issues with the VLAN configuration, along with the associated Layer 2 and Layer 3 attributes, which apply for a set of specific protocol applications on that port. Improper network policy configurations are a very significant issue in VoIP environments that frequently result in voice quality degradation or loss of service.

Policies are only intended for use with applications that have specific 'real-time' network policy requirements, such as interactive voice and/or video services.

The network policy attributes advertised are:

1. Layer 2 VLAN ID (IEEE 802.1Q-2003)
2. Layer 2 priority value (IEEE 802.1D-2004)
3. Layer 3 Diffserv code point (DSCP) value (IETF RFC 2474); This network policy is potentially advertised and associated with multiple sets of application types supported on a given port. The application types specifically addressed are:
 1. Voice
 2. Guest Voice
 3. Softphone Voice
 4. Video Conferencing
 5. Streaming Video
 6. Control / Signalling (conditionally support a separate network policy for the media types above)

A large network may support multiple VoIP policies across the entire organization, and different policies per application type. LLDP-MED allows multiple policies to be advertised per port, each corresponding to a different application type. Different ports on the same Network Connectivity Device may advertise different sets of policies, based on the authenticated user identity or port configuration.

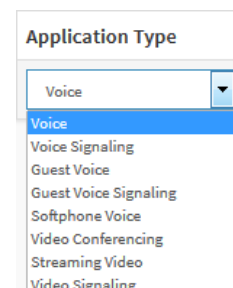
It should be noted that LLDP-MED is not intended to run on links other than between Network Connectivity Devices and Endpoints, and therefore does not need to advertise the multitude of network policies that frequently run on an aggregated link interior to the LAN.

Delete : Check to delete the policy. It will be deleted during the next save.

Policy ID : ID for the policy. This is auto generated and is used when selecting the polices that will be mapped to the specific ports.

Application Type : Intended use of the application types:

1. **Voice** - for use by dedicated IP Telephony handsets and other similar appliances supporting interactive voice services. These devices are typically deployed on a separate VLAN for ease of deployment and enhanced security by isolation from data applications.
2. **Voice Signalling** (conditional) - for use in network topologies that require a different policy for the voice signalling than for the voice media. This application type should not be advertised if all the same network policies apply as those advertised in the Voice application policy.
3. **Guest Voice** - support a separate 'limited feature-set' voice service for guest users and visitors with their own IP Telephony handsets and other similar appliances supporting interactive voice services.
4. **Guest Voice Signalling** (conditional) - for use in network topologies that require a different policy for the guest voice signalling than for the guest voice media. This application type should not be advertised if all the same network policies apply as those advertised in the Guest Voice application policy.
5. **Softphone Voice** - for use by softphone applications on typical data centric devices, such as PCs or laptops. This class of endpoints frequently does not support multiple VLANs, if at all, and are typically configured to use an 'untagged' VLAN or a single 'tagged' data specific VLAN. When a network policy is defined for use with an 'untagged' VLAN (see Tagged flag below), then the L2 priority field is ignored and only the DSCP value has relevance.
6. **Video Conferencing** - for use by dedicated Video Conferencing equipment and other similar appliances supporting real-time interactive video/audio services.
7. **Streaming Video** - for use by broadcast or multicast based video content distribution and other similar applications supporting streaming video services that require specific network policy treatment. Video applications relying on TCP with buffering would not be an intended use of this application type.



8. **Video Signalling** (conditional) - for use in network topologies that require a separate policy for the video signalling than for the video media. This application type should not be advertised if all the same network policies apply as those advertised in the Video Conferencing application policy.

Tag : Tag indicating whether the specified application type is using a 'tagged' or an 'untagged' VLAN.

Untagged indicates that the device is using an untagged frame format and as such does not include a tag header as defined by IEEE 802.1Q-2003. In this case, both the VLAN ID and the Layer 2 priority fields are ignored and only the DSCP value has relevance.

Tagged indicates that the device is using the IEEE 802.1Q tagged frame format, and that both the VLAN ID and the Layer 2 priority values are being used, as well as the DSCP value. The tagged format includes an additional field, known as the tag header. The tagged frame format also includes priority tagged frames as defined by IEEE 802.1Q-2003.

VLAN ID : VLAN identifier (VID) for the port as defined in IEEE 802.1Q-2003.

L2 Priority : L2 Priority is the Layer 2 priority to be used for the specified application type. L2 Priority may specify one of eight priority levels (0 through 7), as defined by IEEE 802.1D-2004. A value of 0 represents use of the default priority as defined in IEEE 802.1D-2004.

DSCP : DSCP value to be used to provide Diffserv node behaviour for the specified application type as defined in IETF RFC 2474. DSCP may contain one of 64 code point values (0 through 63). A value of 0 represents use of the default DSCP value as defined in RFC 2475.

Adding a new policy : Click to add a new policy. Specify the Application type, Tag, VLAN ID, L2 Priority and DSCP for the new policy. Click "Save".

Port Policies Configuration : Every port may advertise a unique set of network policies or different attributes for the same network policies, based on the authenticated user identity or port configuration.

Port : The port number to which the configuration applies.

Policy Id : The set of policies that will apply to a given port. The set of policies is selected by check marking the checkboxes that corresponds to the policies.

Buttons:

Apply – Click to save changes.

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

- » PoE
- » Configuration
- » Power Delay
- » Schedule Profile
- » Auto Power Reset
- » Chip Reset Schedule

2- 13 PoE

PoE (Power over Ethernet) is used to transmit electrical power to remote devices over standard Ethernet cable. It could for example be used for powering IP telephones, wireless LAN access points and other equipment, where it would be difficult or expensive to connect the equipment to main power supply.

The PoE detect function is described in the table below:

Stages of Powering up a PoE Link

Stage	Action	Volts specified [V]	
		802.3af	802.3at
Detection	PSE detects if the PD has the correct signature resistance of 19–26.5 kΩ	2.7-10.1	
Classification	PSE detects resistor indicating power range	14.5-20.5	
Mark 1	Signals PSE is 802.3at capable. PD presents a 0.25–4 mA load.	–	7-10
Class 2	PSE outputs classification voltage again to indicate 802.3at capability	–	14.5-20.5
Mark 2	Signals PSE is 802.3at capable. PD presents a 0.25–4 mA load.	–	7-10
Startup	Startup voltage	>42	>42
Normal operation	Supply power to device	37-45	42.5-57

Power levels available

Class	Usage	Power range [Watt]	Class description
0	Default	15.4	Classification unimplemented
1	Optional	4	Very Low power
2	Optional	7	Low power
3	Optional	15.4	Mid power
4	Valid for 802.3at (Type 2) devices, not allowed for 802.3af devices	30	High power

Compliant with 802.3at in Environment A when using an isolated power supply. For 802.3at Environment B applications: 1) use an isolated AC/DC power source, e.g. TN 25080, and/or 2) use mid-span injector (s), e.g. MIL-L100i, L1000i-at, between this switch’s PSE port and link partner PD port.

2- 13.1 Configuration

This page lets you view and configure the current PoE port settings.

Web Interface

To configure Power over Ethernet in the web interface:

1. Click Configuration, PoE, Configuration.
2. Specify the Reserved Power determined and Power Management Mode.
3. Specify the PoE or PoE+ and Priority.
4. Click Apply.

Figure 2-13.1: PoE Configuration page

Port	PoE Mode	PoE Schedule	Priority	Maximum Power [W]
*	<-	<-	<-	30
1	Enabled	Disabled	Low	30
2	Enabled	Disabled	Low	30
3	Enabled	Disabled	Low	30
4	Enabled	Disabled	Low	30
5	Enabled	Disabled	Low	30
6	Enabled	Disabled	Low	30

Parameter descriptions:

Power Supply Configuration

Reserved Power determined by : There are three modes for configuring how the ports/PDs may reserve power.

1. **Class** mode: In this mode each port automatically determines how much power to reserve according to the class the connected PD belongs to, and reserves the power accordingly. Four different port classes exist and one for 4, 7, 15.4 or 30 Watts. In this mode the Maximum Power fields have no effect.
2. **Allocation** mode: In this mode the user allocates the amount of power that each port may reserve. The allocated/reserved power for each port/PD is specified in the Maximum Power fields.
3. **LLDP-MED** mode: This mode is similar to the Class mode expect that each port determine the amount power it reserves by exchanging PoE information using the LLDP protocol and reserves power accordingly. If no LLDP information is available for a port, the port will reserve power using the class mode In this mode the Maximum Power fields have no effect for all modes: If a port uses more power than the reserved power for the port, the port is shut down.

Power Management Mode : There are two modes for configuring when to shut down the ports:

1. **Actual Consumption**: In this mode the ports are shut down when the actual power consumption for all ports exceeds the amount of power that the power supply can deliver or if the actual power consumption for a given port exceeds the reserved power for that port. The ports are shut down according to the ports priority. If two ports have the same priority the port with the highest port number is shut down.
2. **Reserved Power**: In this mode the ports are shut down when total reserved powered exceeds the amount of power that the power supply can deliver. In this mode the port power is not turned on if the PD requests more power than available from the power supply.

Primary and Backup Power Source : Some switches support having two PoE power supplies. One is used as primary power source, and one as backup power source. If the switch doesn't support backup power supply only the primary power supply settings will be shown. In case that the primary power source fails the backup power source will take over. For being able to determine the amount of power the PD may use, it must be defined what amount of power the primary and backup power sources can deliver. Valid values are in the range 0 to 2000 Watts.

Port : This is the logical port number for this row. Ports that are not PoE-capable are grayed out and thus impossible to configure PoE for.

PoE Mode : The PoE Mode represents the PoE operating mode for the port.

Disabled: PoE disabled for the port.

Enabled : Enables PoE IEEE 802.3at (Class 4 PDs limited to 30W).

Priority : The Priority represents the ports priority. There are three levels of power priority: Low, High and Critical.

The priority is used in the case where the remote devices requires more power than the power supply can deliver. In this case the port with the lowest priority will be turn off starting from the port with the highest port number.

Maximum Power : Contains a numerical value that indicates the maximum power in watts that can be delivered to a remote device. The maximum allowed value is 30 W.

Buttons:

Apply – Click to save changes.

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

2- 13.2 Power Delay

The PoE Power Delay page lets you set the delay time of power providing after device rebooted.

Web Interface

To Display Power over Ethernet Status in the web interface:

1. Click Configuration, PoE, and Power delay.
2. Enable the port to the power device.
3. Specify the power providing delay time when reboot.
4. Click Apply to apply the change.

Figure 2-13.2: PoE Power Delay page

Port	Delay Mode	Delay Time(0-300 sec)
*	☺	0
1	Disabled	0
2	Disabled	0
3	Disabled	0
4	Disabled	0
5	Disabled	0
6	Disabled	0
7	Disabled	0
8	Disabled	0
9	Disabled	0
10	Disabled	0

Parameter descriptions:

Power Supply Configuration

Port : This is the logical port number for this row.

Delay Mode : Turn on / off the power delay function.

Enabled: Enable POE Power Delay.

Disabled: Disable POE Power Delay.

Delay Time(0~300sec) : When rebooting, the PoE port will start to provide power to the PD when it is out of delay time. Default: 0; range: 0-300 sec.

Buttons:

Apply – Click to save changes.

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

2- 13.3 PoE Schedule Profile

The **PoE Schedule Profile** page lets you make a schedule of PoE power supply. PoE Scheduling makes PoE management easier and saves energy.

Web Interface

To Display Power Over Ethernet Scheduling in the web interface:

1. Click Configuration, PoE, and PoE Schedule Profile.
2. Select the local port and enable.
3. Select time and day to supply power.
4. Click Apply to apply the change.

Figure 2-13.3: PoE Schedule Profile page

The screenshot shows the PoE Schedule Profile configuration page. The interface includes a navigation menu on the left with options like Configuration, System, Green Ethernet, Ports Configuration, DHCP, Security, Aggregation, Loop Protection, Spanning Tree, IPMC Profile, MVR, IPMC, LLDP, PoE, Configuration, Power Delay, Schedule Profile, Auto Power Reset, and Chip Reset Schedule. The main content area is titled 'PoE Schedule Profile' and contains the following fields and table:

Profile: 1 (dropdown)
 Name: Profile 1 (text input)

Week Day	Start Time		End Time	
	HH	MM	HH	MM
*	5	30	6	30
Monday	5	30	6	30
Tuesday	0	0	0	0
Wednesday	0	0	0	0
Thursday	0	0	0	0
Friday	0	0	0	0
Saturday	0	0	0	0
Sunday	0	0	0	0

Buttons: Apply (blue), Reset (orange)

Parameter descriptions:

Profile: The index of profile. There are 16 profiles in the configuration.

Name: The name of profile. The default name is "Profile #". User can define the name for identifying the profile.

Week Day: The day to schedule PoE.

Start Time: The time to start PoE. The time 00:00 means the first second of this day.

End Time: The time to stop PoE. The time 00:00 means the last second of this day.

Buttons:

Apply – Click to save changes.

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

2- 13.4 PoE Auto Checking (Auto Power Reset)

This page lets you specify the auto detection parameters to check the linking status between PoE ports and PDs. When it detected the fail connect, will reboot remote PD automatically.

Web Interface

To Display Power over Ethernet Auto Checking in the web interface:

1. Click Configuration, PoE, Auto Power Reset.
2. At the dropdown, enable the Ping Check function.
3. Specify the PD's IP address, startup time, interval, retry time, failure action, reboot time.
4. Click Apply to apply the change.

Figure 2-13.4: PoE Auto Checking page

Port	Ping IP Address	Startup Time	Interval Time(sec)	Retry Time	Failure Log	Failure Action	Reboot Time(sec)
1	0.0.0.0	60	30	3	error=0, total=11	Nothing	15
2	192.168.1.30	6	3	3	error=0, total=0	Reboot Remote PD	15
3	0.0.0.0	60	30	3	error=0, total=0	Nothing	15
4	0.0.0.0	60	30	3	error=0, total=0	Nothing	15
5	0.0.0.0	60	30	3	error=0, total=0	Nothing	15
6	0.0.0.0	60	30	3	error=0, total=0	Nothing	15
7	0.0.0.0	60	30	3	error=0, total=0	Nothing	15
8	0.0.0.0	60	30	3	error=0, total=0	Nothing	15
9	0.0.0.0	60	30	3	error=0, total=0	Nothing	15
10	0.0.0.0	60	30	3	error=0, total=0	Nothing	15
11	0.0.0.0	60	30	3	error=0, total=0	Nothing	15

Parameter descriptions:

Ping Check : Enable Ping Check function can detects the connection between the PoE port and the powered device. Disable will turn off the detection.

Port : This is the logical port number for this row.

Ping IP Address : The PD's IP Address the system should ping.

Startup Time(sec) : When PD has been start up, the Switch will wait Start up time to do PoE Auto Power Reset. Default: 60; range: 30-600 seconds.

Interval Time(sec) : Device will send checking message to PD each interval time. Default: 30; range: 10-120 seconds.

Retry Time : When PoE port can't ping the PD, it will retry to send detection again. When the third time, it will trigger failure action. Default: 3; range: 1-5.

Failure Log : Failure loggings counter (e.g., *error=0, total=11*).

Failure Action : The action when the third fail detection.

Nothing: Keep Ping the remote PD but does nothing further.

Reboot Remote PD: Cut off the power on the PoE port, make PD reboot.

Reboot time(sec) : When the PD has been rebooted, the PoE port restores power after the specified time. Default: 15, range: 3-120 seconds.

Buttons:

Apply – Click to save changes.

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

2- 13.5 PoE Chip Reset Schedule

This page lets you schedule when to reset the PoE chip.

Web Interface

To configure PoE Chip Reset Scheduling in the web interface:

1. Click Configuration, PoE, POE Chip Reset Schedule.
2. At the **Mode** dropdown, select Enable POE Chip Reset Scheduling to display the parameters.
3. Click **Apply** to apply the change.
4. Select the Week Day and PoE Chip Reset Time parameters.
5. Click **Apply** to apply the changes.

Figure 2-13.5: PoE Chip Reset Schedule page

Week Day	PoE Chip Reset Time	
	HH	MM
*	-	-
Monday	-	-
Tuesday	-	-
Wednesday	-	-
Thursday	-	-
Friday	-	-
Saturday	-	-
Sunday	-	-

Parameter descriptions: (only displayed when Mode is Enabled)

Mode : Indicates the chip reset scheduling mode operation. Possible modes are:

Enabled: Enable PoE chip reset.

Disabled: Disable PoE chip reset.

Week Day: The day to reset PoE chip (*, Monday, Tuesday, Wednesday, Thursday, Friday, or Saturday).

PoE Chip Reset Time: The time to reset PoE chip, in hours and minutes per day.

At the **HH** (hour) dropdown select 0-23 as the time in hours for one or more of the Days.

At the **MM** (minute) dropdown select 0-55 (in 5 minute increments) as the time in hours for one or more of the Days.

Buttons:

Apply : Click to save changes.

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

2-14 MAC Table

Switching of frames is based upon the DMAC address contained in the frame. The switch builds up a table that maps MAC addresses to switch ports for knowing which ports the frames should go to (based upon the DMAC address in the frame). This table contains both static and dynamic entries. The static entries are configured by the network administrator if the administrator wants to do a fixed mapping between the DMAC address and switch ports.

The frames also contain a MAC address (SMAC address), which shows the MAC address of the equipment sending the frame. The SMAC address is used by the switch to automatically update the MAC table with these dynamic MAC addresses. Dynamic entries are removed from the MAC table if no frame with the corresponding SMAC address have been seen after a configurable age time

Web Interface

To configure MAC Address Table in the web interface:

Aging Configuration

1. Click Configuration.
2. Specify the Disable Automatic Aging and Aging Time.
3. Click Apply.

MAC Table Learning

1. Click Configuration.
2. Specify the Port Members (Auto, Disable, Secure).
3. Click Apply.

Static MAC Table Configuration

1. Click Configuration and Add New Static Entry.
2. Specify the VLAN IP and Mac address, Port Members.
3. Click Apply.

Figure 2-14: MAC Address Table Configuration page

The screenshot shows the 'MAC Address Table Configuration' page. The 'Aging Configuration' section includes a 'Disable Automatic Aging' checkbox and an 'Aging Time' field set to 300 seconds. The 'MAC Table Learning' section features a 'Port Members' table with columns for ports 1-26 and rows for 'Auto', 'Disable', and 'Secure'. The 'Static MAC Table Configuration' section includes a table with columns for 'Delete', 'VLAN ID', 'MAC Address', and 'Port Members' (1-26). A 'Delete' button is next to the 'Delete' column. Below the table are 'Add New Static Entry', 'Apply', and 'Reset' buttons.

Parameter descriptions:

Aging Configuration : By default, dynamic entries are removed from the MAC table after 300 seconds. This removal is also called aging. Configure aging time by entering a value here in seconds; for example, Age time seconds. The allowed range is 10 to 1000000 seconds. Disable the automatic aging of dynamic entries by checking Disable automatic aging.

MAC Table Learning : If the learning mode for a given port is greyed out, another module is in control of the mode, so that it cannot be changed by the user. An example of such a module is the MAC-Based Authentication under 802.1X. Each port can do learning based upon the following settings:

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

Disable : No learning is done.

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



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

Static MAC Table Configuration : The static entries in the MAC table are shown in this table. The static MAC table can contain 64 entries. The maximum of 64 entries is for the whole stack, and not per switch. The MAC table is sorted first by VLAN ID and then by MAC address.

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

VLAN ID : The VLAN ID of the entry.

MAC Address : The MAC address of the entry.

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

Adding a New Static Entry : Click the **Add New Static Entry** button to add a new entry to the static MAC table. Specify the VLAN ID, MAC address, and port members for the new entry. Click "Apply".

Buttons:

Apply – Click to save changes.

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

Add New Static Entry - Click to add a new entry to the static MAC table.

2-15 VLANs

To assign a specific VLAN for management purpose. The management VLAN is used to establish an IP connection to the switch from a workstation connected to a port in the VLAN. This connection supports a VSM, SNMP, and Telnet session. By default, the active management VLAN is VLAN 1, but you can designate any VLAN as the management VLAN using the Management VLAN window. Only one management VLAN can be active at a time.

When you specify a new management VLAN, your HTTP connection to the old management VLAN is lost. For this reason, you should have a connection between your management station and a port in the new management VLAN or connect to the new management VLAN through a multi-VLAN route.

Web Interface

To configure VLAN membership configuration in the web interface:

1. Click Configuration and then click VLANs.
2. Specify Existing VLANs, Ether type for Custom S-ports.
3. Click Apply.

Figure 2-15.1: VLAN Configuration page

The screenshot displays the VLAN Configuration page. The top navigation bar includes the Transition Networks logo and the device name 'SM24TAT2DPA'. The left sidebar shows a menu with 'Configuration' expanded to 'VLANs'. The main content area is titled 'VLAN Configuration' and is divided into two sections:

- Global VLAN Configuration:** Contains two input fields: 'Allowed Access VLANs' with the value '1' and a hint '(e.g., 1,2,10-13,15)', and 'Ethertype for Custom S-ports' with the value '05Ad'.
- Port VLAN Configuration:** A table with columns: Port, Mode, Port VLAN, Port Type, Ingress Filtering, Ingress Acceptance, Egress Tagging, Allowed VLANs, and Forbidden VLANs. The table lists ports 1 through 9 with their respective configurations.

Port	Mode	Port VLAN	Port Type	Ingress Filtering	Ingress Acceptance	Egress Tagging	Allowed VLANs	Forbidden VLANs
1	Access	1	C-Port	<input checked="" type="checkbox"/>	Tagged and Untagged	Untag Port VLAN	1	
2	Access	2	C-Port	<input type="checkbox"/>	Tagged and Untagged	Untag Port VLAN	2	
3	Trunk	3	C-Port	<input type="checkbox"/>	Tagged Only	Tag All	1-4095	
4	Trunk	4	C-Port	<input type="checkbox"/>	Tagged and Untagged	Untag Port VLAN	1-4095	
5	Hybrid	1	C-Port	<input checked="" type="checkbox"/>	Tagged and Untagged	Untag All	1-4095	
6	Access	1	C-Port	<input type="checkbox"/>	Tagged and Untagged	Untag Port VLAN	1	
7	Access	1	C-Port	<input type="checkbox"/>	Tagged and Untagged	Untag Port VLAN	1	
8	Access	1	C-Port	<input type="checkbox"/>	Tagged and Untagged	Untag Port VLAN	1	
9	Access	1	C-Port	<input type="checkbox"/>	Tagged and Untagged	Untag Port VLAN	1	

Parameter descriptions:

Global VLAN Configuration

Existing VLANs : This field shows the VLANs that are created on the switch. By default, only VLAN 1 exists. More VLANs may be created by using a list syntax where the individual elements are separated by commas. Ranges are specified with a dash separating the lower and upper bound.

The following example will create VLANs 1, 10, 11, 12, 13, 200, and 300: 1,10-13,200,300. Spaces are allowed in between the delimiters.

Ethertype for Custom S-ports : This field specifies the ethertype/TPID (specified in hexadecimal) used for Custom S-ports. The setting is in force for all ports whose Port Type is set to S-Custom-Port.

Port VLAN Configuration

Port : This is the logical port number of this row.

Mode : The port mode (default is Access) determines the fundamental behavior of the port in question. A port can be in one of three modes as described below.

Whenever a particular mode is selected, the remaining fields in that row will be either grayed out or made changeable depending on the mode in question.

Grayed out fields show the value that the port will get when the mode is applied.

Access : Access ports are normally used to connect to end stations. Dynamic features like Voice VLAN may add the port to more VLANs behind the scenes. Access ports have the following characteristics:

- Member of exactly one VLAN, the Port VLAN (a.k.a. Access VLAN), which by default is 1,
- accepts untagged frames and C-tagged frames,
- discards all frames that are not classified to the Access VLAN,
- on egress all frames are transmitted untagged.

Trunk: Trunk ports can carry traffic on multiple VLANs simultaneously, and are normally used to connect to other switches. Trunk ports have the following characteristics:

- By default, a trunk port is member of all existing VLANs. This may be limited by the use of Allowed VLANs,
- unless VLAN Trunking is enabled on the port, frames classified to a VLAN that the port is not a member of will be discarded,
- by default, all frames but frames classified to the Port VLAN (a.k.a. Native VLAN) get tagged on egress. Frames classified to the Port VLAN do not get C-tagged on egress,
- egress tagging can be changed to tag all frames, in which case only tagged frames are accepted on ingress,
- VLAN trunking may be enabled.

Hybrid: Hybrid ports resemble trunk ports in many ways, but adds additional port configuration features. In addition to the characteristics described for trunk ports, hybrid ports have these abilities:

- Can be configured to be VLAN tag unaware, C-tag aware, S-tag aware, or S-custom-tag aware,
- ingress filtering can be controlled,
- ingress acceptance of frames and configuration of egress tagging can be configured independently.

Port VLAN : Determines the port's VLAN ID (a.k.a. PVID). Allowed VLANs are in the range 1 through 4095, default being 1.

On ingress, frames get classified to the Port VLAN if the port is configured as VLAN unaware, the frame is untagged, or VLAN awareness is enabled on the port, but the frame is priority tagged (VLAN ID = 0).

On egress, frames classified to the Port VLAN do not get tagged if Egress Tagging configuration is set to untag Port VLAN.

The Port VLAN is called an "Access VLAN" for ports in Access mode and Native VLAN for ports in Trunk or Hybrid mode.

Port Type : Ports in hybrid mode allow for changing the port type, that is, whether a frame's VLAN tag is used to classify the frame on ingress to a particular VLAN, and if so, which TPID it reacts on. Likewise, on egress, the Port Type determines the TPID of the tag, if a tag is required.

Unaware: On ingress, all frames, whether carrying a VLAN tag or not, get classified to the Port VLAN, and possible tags are not removed on egress.

C-Port: On ingress, frames with a VLAN tag with TPID = 0x8100 get classified to the VLAN ID embedded in the tag. If a frame is untagged or priority tagged, the frame gets classified to the Port VLAN. If frames must be tagged on egress, they will be tagged with a C-tag.

S-Port: On ingress, frames with a VLAN tag with TPID = 0x8100 or 0x88A8 get classified to the VLAN ID embedded in the tag. If a frame is untagged or priority tagged, the frame gets classified to the Port VLAN. If frames must be tagged on egress, they will be tagged with an S-tag.

S-Custom-Port:

On ingress, frames with a VLAN tag with a TPID = 0x8100 or equal to the Ethertype configured for Custom-S ports get classified to the VLAN ID embedded in the tag. If a frame is untagged or priority tagged, the frame gets classified to the Port VLAN. If frames must be tagged on egress, they will be tagged with the custom S-tag.

Ingress Filtering : Hybrid ports allow for changing ingress filtering. Access and Trunk ports always have ingress filtering enabled.

If ingress filtering is enabled (checkbox is checked), frames classified to a VLAN that the port is not a member of get discarded.

If ingress filtering is disabled, frames classified to a VLAN that the port is not a member of are accepted and forwarded to the switch engine. However, the port will never transmit frames classified to VLANs that it is not a member of.

VLAN Trunking : Trunk and Hybrid ports allow for enabling VLAN trunking.

When VLAN trunking is enabled, frames classified to unknown VLANs are accepted on the port whether ingress filtering is enabled or not.

This is useful in scenarios where a cloud of intermediary switches must bridge VLANs that haven't been created. By configuring the ports that connect the cloud of switches as trunking ports, they can seamlessly carry those VLANs from one end to the other.

Ingress Acceptance : Hybrid ports allow for changing the type of frames that are accepted on ingress.

Tagged and untagged

both tagged and untagged frames are accepted.

Tagged Only

Only tagged frames are accepted on ingress. Untagged frames are discarded.

Untagged Only

Only untagged frames are accepted on ingress. Tagged frames are discarded.

Egress Tagging : Ports in Trunk and Hybrid mode may control the tagging of frames on egress.

Untag Port VLAN

Frames classified to the Port VLAN are transmitted untagged. Other frames are transmitted with the relevant tag.

Tag All

All frames, whether classified to the Port VLAN or not, are transmitted with a tag.

Untag All

All frames, whether classified to the Port VLAN or not, are transmitted without a tag.

This option is only available for ports in Hybrid mode.

Allowed VLANs : Ports in Trunk and Hybrid mode may control which VLANs they are allowed to become members of. Access ports can only be member of one VLAN, the Access VLAN.

The field's syntax is identical to the syntax used in the Existing VLANs field. By default, a port may become member of all possible VLANs, and is therefore set to 1-4095.

The field may be left empty, which means that the port will not be member of any of the existing VLANs, but if it is configured for VLAN Trunking **it will** Still be able to carry all unknown VLANs.

Forbidden VLANs : A port may be configured to never be member of one or more VLANs. This is particularly useful when dynamic VLAN protocols like MVRP and GVRP must be prevented from dynamically adding ports to VLANs.

The trick is to mark such VLANs as forbidden on the port in question. The syntax is identical to the syntax used in the Existing VLANs field.

By default, the field is left blank, which means that the port may become a member of all possible VLANs.

2-16 Private VLANs

- » Private VLANs
- > Membership
- > Port Isolation

In a private VLAN, communication between ports in that private VLAN is not permitted. A VLAN can be configured as a private VLAN.

2-16.1 Private VLAN Membership Configuration

The Private VLAN Membership Configuration for the switch can be monitored and modified here. Private VLANs can be added or deleted here. Port members of each Private VLAN can be added or removed here.

Private VLANs are based on the source port mask, and there are no connections to VLANs. This means that VLAN IDs and Private VLAN IDs can be identical.

A port must be a member of both a VLAN and a Private VLAN to be able to forward packets. By default, all ports are VLAN unaware and members of VLAN 1 and Private VLAN 1.

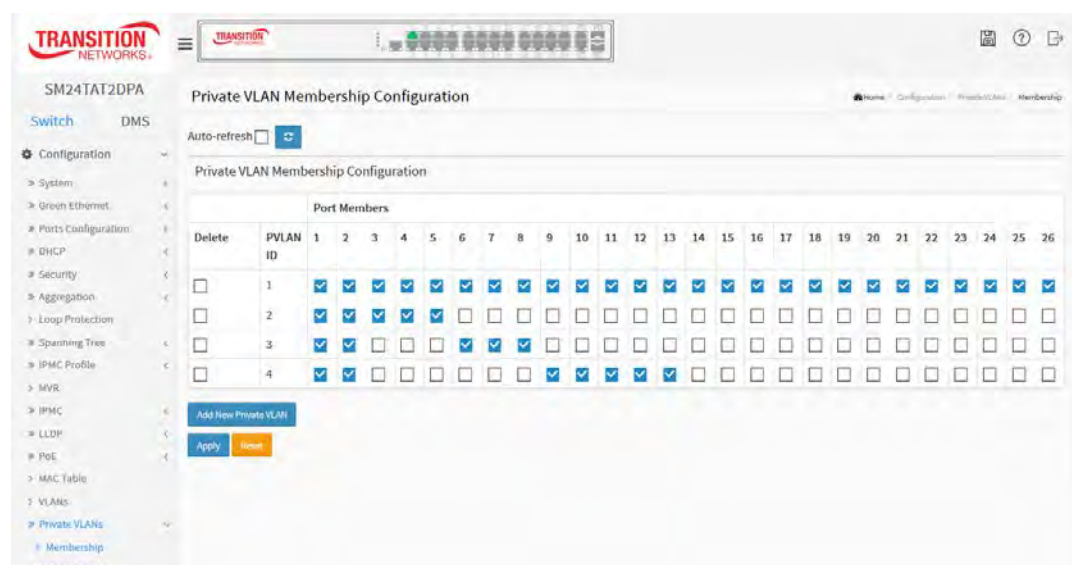
A VLAN unaware port can only be a member of one VLAN, but it can be a member of multiple Private VLANs.

Web Interface

To configure Private VLAN Membership Configuration in the web interface:

1. Click Configuration, Private VLANs, Membership.
2. Select the ports you want to enable VLAN membership.
3. Click Apply.

Figure 2-16.1: Private VLAN Membership Configuration page



Parameter descriptions:

Delete: To delete a private VLAN entry, check this box. The entry will be deleted during the next save.

Private VLAN ID: Indicates the ID of this particular private VLAN.

Port Members: A row of check boxes for each port is displayed for each private VLAN ID. To include a port in a Private VLAN, check the box. To remove or exclude the port from the Private VLAN, make sure the box is unchecked. By default, no ports are members, and all boxes are unchecked.

Adding a New Private VLAN: Click the **Add New Private VLAN** button to add a new private VLAN ID. An empty row is added to the table, and the private VLAN can be configured as needed. The allowed range for a private VLAN ID is the same as the switch port number range.

Any values outside this range are not accepted, and a warning message appears. Click "**OK**" to discard the incorrect entry, or click "**Cancel**" to return to the editing and make a correction. The Private VLAN is enabled when you click "**Save**".

The **Delete** button can be used to undo the addition of new Private VLANs.

Buttons

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

Refresh: Click to refresh the page immediately.

Save: Click to save changes.

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

Add New Private VLAN: Click the button to add a new private VLAN ID. An empty row is added to the table, and the private VLAN can be configured as needed.

2-16.2 Port Isolation

Port Isolation provides for an apparatus and method to isolate ports on layer 2 switches on the same VLAN to restrict traffic flow. The apparatus comprises a switch having said plurality of ports, each port configured as a protected port or a non-protected port. An address table memory stores an address table having a destination address and port number pair. A forwarding map generator generates a forwarding map which is responsive to a destination address of a data packet. The method for isolating ports on a layer 2 switch comprises configuring each of the ports on the layer 2 switch as a protected port or a non-protected port. A destination address on a data packet is matched with a physical address on said layer 2 switch and a forwarding map is generated for the data packet based upon the destination address on the data packet. The data packet is then sent to the plurality of ports pursuant to the forwarding map generated based upon whether the ingress port was configured as a protected or non-protected port.

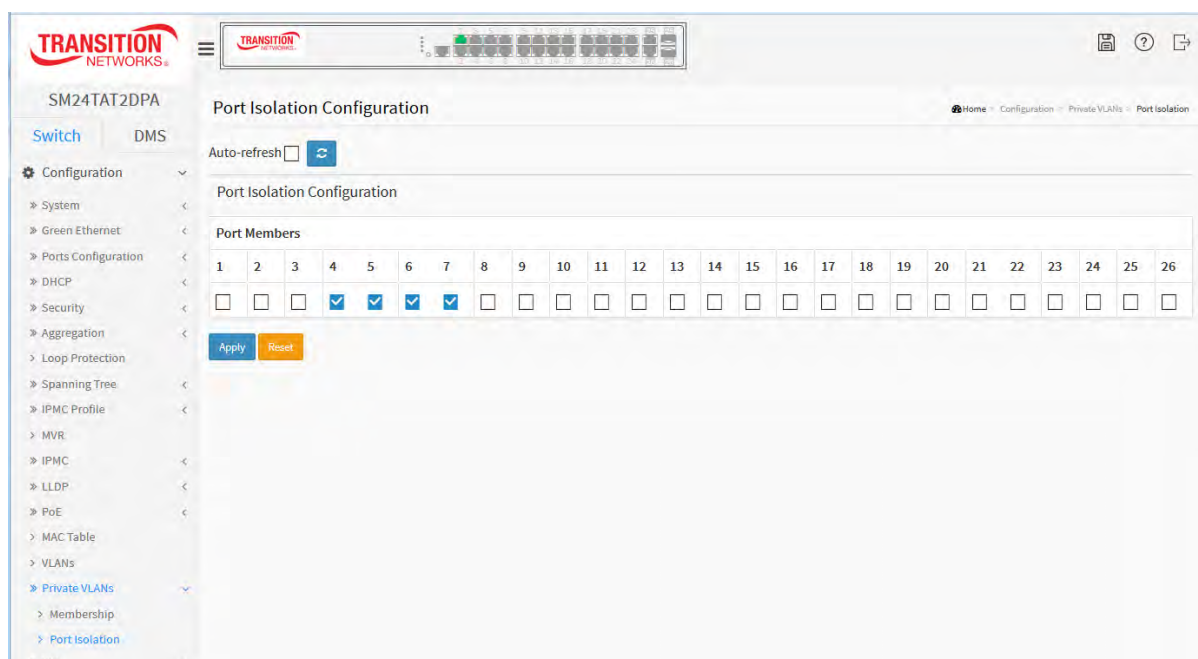
This page is used for enabling or disabling port isolation on ports in a Private VLAN. A port member of a VLAN can be isolated to other isolated ports on the same VLAN and Private VLAN.

Web Interface

To configure Port Isolation configuration in the web interface:

4. Click Configuration, Private VLANs, Port Isolation.
5. Select which ports you want to enable Port Isolation.
6. Click Apply.

Figure 2-16.1: Port Isolation Configuration page



Parameter descriptions:

Port Members : A check box is provided for each port of a private VLAN. When checked, port isolation is enabled on that port. When unchecked, port isolation is disabled on that port. By default, port isolation is disabled (unchecked) on all ports.

Buttons:

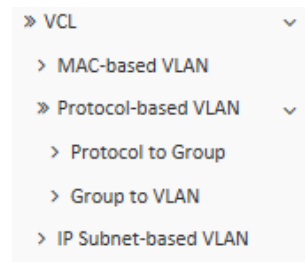
Apply – Click to save changes.

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

2-17 VCL

2-17.1 MAC-based VLAN

MAC address-based VLAN decides the VLAN for forwarding an untagged frame based on the source MAC address of the frame.



A most common way of grouping VLAN members is by port, hence the name port-based VLAN. Typically, the device adds the same VLAN tag to untagged packets that are received through the same port. Later on, these packets can be forwarded in the same VLAN. Port-based VLAN is easy to configure, and applies to networks where the locations of terminal devices are relatively fixed. As mobile office and wireless network access gain more popularity, the ports that terminal devices use to access the networks are very often non-fixed. A device may access a network through Port A this time, but through Port B the next time. If Port A and Port B belong to different VLANs, the device will be assigned to a different VLAN the next time it accesses the network. As a result, it will not be able to use the resources in the old VLAN. On the other hand, if Port A and Port B belong to the same VLAN, after terminal devices access the network through Port B, they will have access to the same resources as those accessing the network through Port A do, which brings security issues. To provide user access and ensure data security in the meantime, the MAC-based VLAN technology is developed.

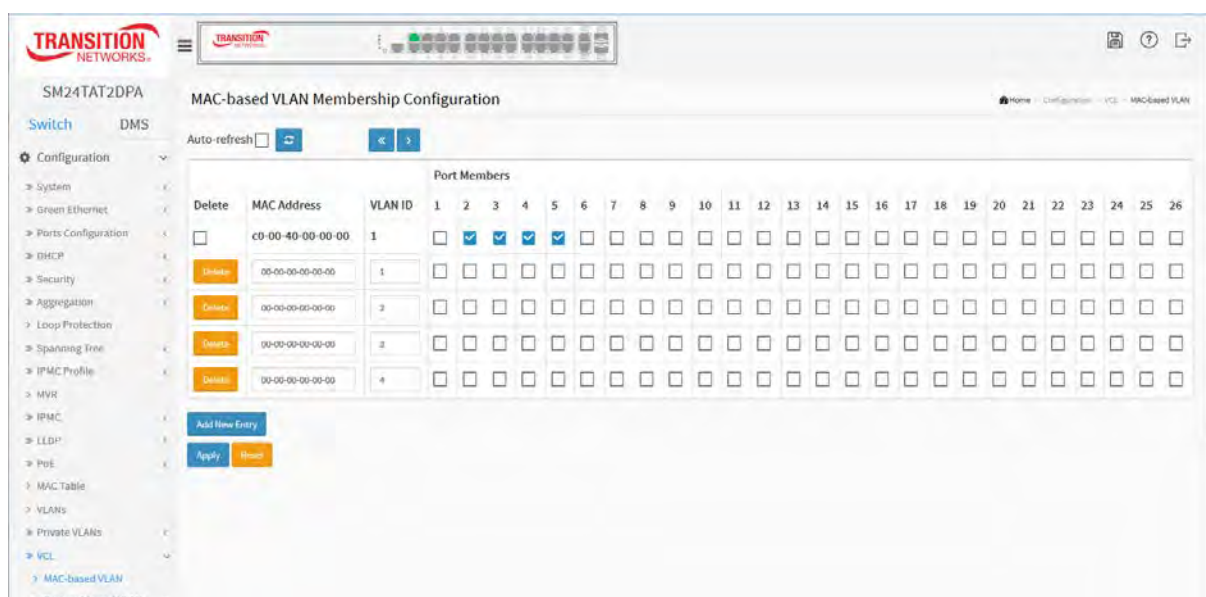
MAC-based VLANs group VLAN members by MAC address. With MAC-based VLAN configured, the device adds a VLAN tag to an untagged frame according to its source MAC address. MAC-based VLANs are mostly used in conjunction with security technologies such as 802.1X to provide secure, flexible network access for terminal devices.

Web Interface

To configure MAC address-based VLAN configuration in the web interface:

1. Click Configuration, VCL, MAC-based VLAN, and Add New Entry.
2. Specify the MAC address and VLAN ID.
3. Select the Port Members.
4. Click Apply.

Figure 2-17.1: MAC-based VLAN Membership Configuration page



Parameter descriptions:

Delete : To delete a MAC-based VLAN entry, check this box and press save. The entry will be deleted on the selected switch in the stack.

MAC Address : Indicates the MAC address.

VLAN ID : Indicates the VLAN ID.

Port Members : A row of check boxes for each port is displayed for each MAC-based VLAN entry. To include a port in a MAC-based VLAN, check the box. To remove or exclude the port from the MAC-based VLAN, make sure the box is unchecked. By default, no ports are members, and all boxes are unchecked.

Adding a New MAC-based VLAN : Click to add a new MAC-based VLAN entry. An empty row is added to the table, and the MAC-based VLAN entry can be configured as needed. Any unicast MAC address can be configured for the MAC-based VLAN entry. No broadcast or multicast MAC addresses are allowed. Legal values for a VLAN ID are 1 through 4095.

The MAC-based VLAN entry is enabled on the selected stack switch unit when you click on "Save". A MAC-based VLAN without any port members on any stack unit will be deleted when you click "Save".

The Reset button can be used to undo the addition of new MAC-based VLANs.

Buttons:

Apply – Click to save changes.

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

Add New Entry - Click to add another entry to the table.

2-17.2 Protocol -based VLAN

This page lets you add new protocols to Group Name (unique for each Group) mapping entries as well as allow you to see and delete already mapped entries for the switch. The switch Protocol support includes Ethernet, LLC, and SNAP Protocols.

LLC

The Logical Link Control (LLC) data communication protocol layer is the upper sub-layer of the Data Link Layer (which is itself layer 2, just above the Physical Layer) in the seven-layer OSI reference model. It provides multiplexing mechanisms that make it possible for several network protocols (IP, IPX, Decnet and Appletalk) to coexist within a multipoint network and to be transported over the same network media, and can also provide flow control and automatic repeat request (ARQ) error management mechanisms.

SNAP

The Subnetwork Access Protocol (SNAP) is a mechanism for multiplexing, on networks using IEEE 802.2 LLC, more protocols than can be distinguished by the 8-bit 802.2 Service Access Point (SAP) fields. SNAP supports identifying protocols by Ethernet type field values; it also supports vendor-private protocol identifier spaces. It is used with IEEE 802.3, IEEE 802.4, IEEE 802.5, IEEE 802.11 and other IEEE 802 physical network layers, as well as with non-IEEE 802 physical network layers such as FDDI that use 802.2 LLC.

2-17.2.1 Protocol to Group

This page lets you add new protocols to Group Name (unique for each Group) mapping entries and lets you to see and delete already mapped entries for the selected switch.

Web Interface

To configure Protocol -based VLAN configuration in the web interface:

1. Click Configuration, VCL, Protocol-based VLAN, and Protocol to Group.
2. Click the **Add New Entry** button.
3. Specify the Frame Type, Value, and Group Name parameters.
4. Click the **Apply** button.

Figure 2-21.2.1: Protocol to Group Mapping Table

The screenshot shows the 'Protocol to Group Mapping Table' configuration page in the Transition Networks web interface. The page has a navigation menu on the left with options like Configuration, System, Green Ethernet, Ports Configuration, DHCP, Security, Aggregation, Loop Protection, Spanning Tree, IPMC Profile, and MVR. The main content area displays a table with the following structure:

Delete	Frame Type	Value	Group Name
<input type="button" value="Delete"/>	Ethernet	Etype: 0x 0800	<input type="text"/>
<input type="button" value="Delete"/>	SNAP	OUI: 0x 00-E0-2B PID: 0x 0001	<input type="text"/>
<input type="button" value="Delete"/>	LLC	DSAP: 0x FF SSAP: 0x FF	<input type="text"/>

Below the table, there are buttons for 'Add New Entry', 'Apply', and 'Reset'. The page also includes an 'Auto-refresh' checkbox and a refresh icon.

Parameter descriptions:

Delete : To delete a Protocol to Group Name map entry, check this box. The entry will be deleted on the switch during the next Save.

Frame Type : Frame Type can have one of the following values:

1. **Ethernet**
2. **SNAP**
3. **LLC**



NOTE: On changing the Frame type field, valid value of the following text field will vary depending on the new frame type you selected.

Value : Valid value that can be entered in this text field depends on the option selected from the the preceding Frame Type selection menu. Below is the criteria for the three Frame Types:

1. **For Ethernet:** Values in the text field when Ethernet is selected as a Frame Type is called etype. Valid values for etype ranges from 0x0600-0xffff
2. **For LLC:** Valid value in this case is comprised of two different sub-values.
 - a. DSAP: 1-byte long string (0x00-0xff)
 - b. SSAP: 1-byte long string (0x00-0xff)
3. **For SNAP:** Valid value in this case also is comprised of two different sub-values.
 - a. OUI: OUI (Organizationally Unique Identifier) is value in format of xx-xx-xx where each pair (xx) in string is a hexadecimal value ranges from 0x00-0xff.
 - b. PID: If the OUI is hexadecimal 000000, the protocol ID is the Ethernet type (EtherType) field value for the protocol running on top of SNAP; if the OUI is an OUI for a particular organization, the protocol ID is a value assigned by that organization to the protocol running on top of SNAP. In other words, if value of OUI field is 00-00-00 then value of PID will be etype (0x0600-0xffff) and if value of OUI is other than 00-00-00 then valid value of PID will be any value from 0x0000 to 0xffff.

Group Name : A valid Group Name is a unique 16-character long string for every entry which consists of a combination of alphabets (a-z or A-Z) and integers (0-9).



NOTE: Special characters and underscore () are not allowed.

Adding a New Group to VLAN mapping entry : Click **Add New Entry** to add a new entry in mapping table. An empty row is added to the table; Frame Type, Value, and the Group Name can be configured as needed.

The **Reset** button can be used to undo the addition of new entry.

Buttons:

Apply – Click to save changes.

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

Upper right icon (Refresh): You can click them for refresh the Protocol Group Mapping information manually.

2-17.2.2 Group to VLAN

This section allows you to map an already configured Group Name to a VLAN for the selected stack switch unit switch.

Web Interface

To Display Group Name to VLAN mapping table configured in the web interface:

1. Click Configuration, VCL, Protocol-based VLAN, Group to VLAN.
2. Click the **Add New Entry** button.
2. Specify the Group Name and VLAN ID.
3. Click the **Apply** button.

Figure 2-21.2.2: Group Name of VLAN Mapping Table

Group Name to VLAN mapping Table			Port Members																									
Delete	Group Name	VLAN ID	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
<input type="checkbox"/>	Grp2	2	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	Grp1	1	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Parameter descriptions:

Delete : To delete a Group Name to VLAN map entry, check this box. The entry will be deleted on the switch during the next Save

Group Name : A valid Group Name is a string of almost 16 characters which consists of a combination of alphabets (a-z or A-Z) and integers (0-9), no special character is allowed. Whichever Group name you try map to a VLAN must be present in Protocol to Group mapping table and must not be perused by any other existing mapping entry on this page.

VLAN ID : Indicates the ID to which Group Name will be mapped. A valid VLAN ID ranges from 1-4095.

Port Members : A row of check boxes for each port is displayed for each Group Name to VLAN ID mapping. To include a port in a mapping, check the box. To remove or exclude the port from the mapping, make sure the box is unchecked. By default, no ports are members, and all boxes are unchecked.

Adding a New Group to VLAN mapping entry : Click to add a new entry in mapping table. An empty row is added to the table, the Group Name, VLAN ID and port members can be configured as needed. Legal values for a VLAN ID are 1 through 4095. The Reset button can be used to undo the addition of a new entry.

Buttons:

Apply – Click to save changes.

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

Auto-refresh : Check to refresh the page information automatically.

Upper right icon (Refresh): Click for refresh the Protocol Group Mapping information manually.

2-18 Voice VLAN

Voice VLAN is VLAN configured specially for voice traffic. By adding the ports with voice devices attached to voice VLAN, we can perform QoS-related configuration for voice data, ensuring the transmission priority of voice traffic and voice quality.

2-18.1 Configuration

The Voice VLAN feature enables voice traffic forwarding on the Voice VLAN, then the switch can classify and schedule network traffic. It is recommended that there be two VLANs on a port - one for voice, one for data. Before connecting the IP device to the switch, the IP phone should configure the Voice VLAN ID correctly. It should be configured through its own GUI.

Web Interface

To configure Voice VLAN in the web interface:

1. Select "Enabled" in the Voice VLAN Configuration.
2. Specify VLAN ID Aging Time Traffic Class.
3. Specify (Port Mode, Security, Discovery Protocol) in the Port Configuration.
4. Click Apply.

Figure 2-18.1: Voice VLAN Configuration page

Port	Mode	Security	Discovery Protocol
*	Disabled	⊖	⊖
1	Disabled	Disabled	OUI
2	Disabled	Enabled	OUI
3	Disabled	Enabled	LLDP
4	Disabled	Disabled	OUI
5	Disabled	Disabled	OUI

Parameter descriptions:

Mode : Indicates the Voice VLAN mode operation. You must disable MSTP feature before you enable Voice VLAN, to avoid the conflict of ingress filtering. Possible modes are:

Enabled: Enable Voice VLAN mode operation.

Disabled: Disable Voice VLAN mode operation.

VLAN ID : Indicates the Voice VLAN ID. It should be a unique VLAN ID in the system and cannot equal each port PVID. It is a conflict in configuration if the value equals management VID, MVR VID, PVID etc. The allowed range is 1 to 4095.

Aging Time : Indicates the Voice VLAN secure learning aging time. The allowed range is 10 to 10000000 seconds. It is used when security mode or auto detect mode is enabled. In other cases, it will be based on hardware aging time. The actual aging time will be situated between the [age_time; 2 * age_time] interval.

Traffic Class : Indicates the Voice VLAN traffic class. All traffic on the Voice VLAN will apply this class.

Port Mode : Indicates the Voice VLAN port mode. When the port mode isn't equal disabled, we must disable MSTP feature before we enable Voice VLAN. It can avoid the conflict of ingress filtering. Possible port modes are:

Disabled: Disjoin from Voice VLAN.

Auto: Enable auto detect mode. It detects whether there is VoIP phone attached to the specific port and configures the Voice VLAN members automatically.

Forced: Force join to Voice VLAN.

Port Security : Indicates the Voice VLAN port security mode. When the function is enabled, all non-telephonic MAC addresses in the Voice VLAN will be blocked for 10 seconds. Possible port modes are:

Enabled: Enable Voice VLAN security mode operation.

Disabled: Disable Voice VLAN security mode operation.

Port Discovery Protocol : Indicates the Voice VLAN port discovery protocol. It will only work when auto detect mode is enabled. We should enable LLDP feature before configuring discovery protocol to "LLDP" or "Both". Changing the discovery protocol to "OUI" or "LLDP" will restart auto detect process. Possible discovery protocols are:

OUI: Detect telephony device by OUI (Organizationally Unique Identifier) address.

LLDP: Detect telephony device by LLDP (Link Level Discovery Protocol).

Both: Both OUI and LLDP.

Buttons:

Apply – Click to save changes.

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

2-18.2 OUI

The section describes how to Configure Voice VLAN OUI table. The maximum entry number is 16. Modifying the OUI table will restart auto detection of the OUI process.

Web Interface

To configure Voice VLAN OUI Table in the web interface:

1. Select "Add New Entry", "delete" in the Voice VLAN OUI table.
2. Specify Telephony OUI, Description.
3. Click Apply.

Figure 2-18.2: Voice VLAN OUI Table

The screenshot shows the 'Voice VLAN OUI Table' configuration page. At the top right, there is a breadcrumb trail: Home > Configuration > Voice VLAN > OUI. The main content area features a table with three columns: 'Delete', 'Telephony OUI', and 'Description'. The 'Delete' column contains an orange 'Delete' button. The 'Telephony OUI' and 'Description' columns each contain an empty text input field. Below the table, there are three buttons: a blue 'Add New Entry' button, a blue 'Apply' button, and an orange 'Reset' button.

Parameter descriptions:

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

Telephony OUI : A telephony OUI address is a globally unique identifier assigned to a vendor by IEEE. It must be 6 characters long and the input format is "xx-xx-xx" (x is a hexadecimal digit).

Description : The description of OUI address. Normally, it describes which vendor telephony device it belongs to. The allowed string length is 0 to 32.

Add New entry : Click to add a new entry in Voice VLAN OUI table. An empty row is added to the table, the Telephony OUI, Description.

Buttons:

Apply – Click to save changes.

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

2-19 QoS

The switch support four QoS queues per port with strict or weighted fair queuing scheduling. It supports QoS Control Lists (QCL) for advance programmable QoS classification, based on IEEE 802.1p, Ethertype, VID, IPv4/IPv6 DSCP and UDP/TCP ports and ranges.

High flexibility in the classification of incoming frames to a QoS class.

The QoS classification looks for information up to Layer 4, including IPv4 and IPv6 DSCP, IPv4 TCP/UDP port numbers, and user priority of tagged frames. This QoS classification mechanism is implemented in a QoS control list (QCL). The QoS class assigned to a frame is used throughout the device for providing queuing, scheduling, and congestion control guarantees to the frame according to what was configured for that specific QoS class.

The switch supports advanced memory control mechanisms providing excellent performance of all QoS classes under any traffic scenario, including jumbo frame. A super priority queue with dedicated memory and strict highest priority in the arbitration. The ingress super priority queue allows traffic recognized as CPU traffic to be received and queued for transmission to the CPU even when all the QoS class queues are congested.

- » QoS
 - » Port Classification
 - » Port Policing
 - » Port Scheduler
 - » Port Shaping
 - » Port Tag Remarking
 - » Port DSCP
 - » DSCP-Based QoS
 - » DSCP Translation
 - » DSCP Classification
 - » QoS Control List
 - » Storm Control

2-19.1 Port Classification

The section allows you to configure the basic QoS Ingress Classification settings for all switch ports. and the settings relate to the currently selected stack unit, as reflected by the page header.

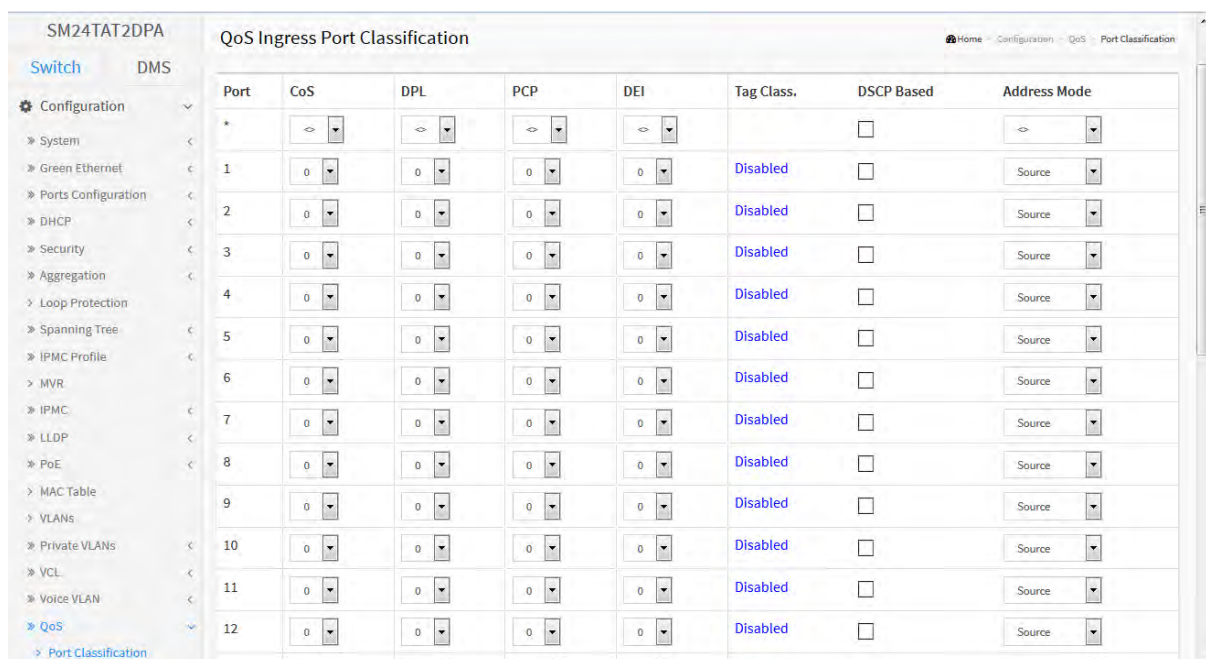
Web Interface

To configure the QoS Port Classification parameters in the web interface:

1. Click Configuration, QoS, Port Classification
2. Scroll to select QoS class, DP Level, PCP and DEI parameters
3. Click the save to save the setting
4. To cancel the setting click the Reset button.

The page will revert to previously saved values.

Figure 2-19.1: QoS Ingress Port Classification page



Parameter descriptions:

Port : The port number for which the configuration below applies.

CoS : Controls the default Class of Service. All frames are classified to a CoS. There is a one to one mapping between CoS, queue and priority. A CoS of 0 (zero) has the lowest priority. If the port is VLAN aware, the frame is tagged and Tag Class. is enabled, then the frame is classified to a CoS that is mapped from the PCP and DEI value in the tag. Otherwise the frame is classified to the default CoS. The classified CoS can be overruled by a QCL entry. Note: If the default CoS has been dynamically changed, then the actual default CoS is shown in parentheses after the configured default CoS.

DPL : Controls the default Drop Precedence Level. All frames are classified to a drop precedence level. If the port is VLAN aware, the frame is tagged and Tag Class. is enabled, then the frame is classified to a DPL that is mapped from the PCP and DEI value in the tag. Otherwise the frame is classified to the default DPL. The classified DPL can be overruled by a QCL entry.

PCP : Controls the default PCP value. All frames are classified to a PCP value. If the port is VLAN aware and the frame is tagged, then the frame is classified to the PCP value in the tag. Otherwise the frame is classified to the default PCP value.

DEI : Controls the default DEI value. All frames are classified to a DEI value. If the port is VLAN aware and the frame is tagged, then the frame is classified to the DEI value in the tag. Otherwise the frame is classified to the default DEI value.

Tag Class. : Shows the classification mode for tagged frames on this port.

Disabled: Use default QoS class and DP level for tagged frames.

Enabled: Use mapped versions of PCP and DEI for tagged frames.

Click on the mode in order to configure the mode and/or mapping.



NOTE: This setting has no effect if the port is VLAN unaware. Tagged frames received on VLAN unaware ports are always classified to the default CoS and DPL.

DSCP Based : Click to Enable DSCP Based QoS Ingress Port Classification.

Address Mode : The IP/MAC address mode specifying whether the QCL classification must be based on source (SMAC/SIP) or destination (DMAC/DIP) addresses on this port. The allowed values are:

Source: Enable SMAC/SIP matching.

Destination: Enable DMAC/DIP matching.

Buttons:

Apply – Click to save changes.

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

2-19.2 Port Policing

This section provides an overview of f QoS Ingress Port Policers for all switch ports. The Port Policing is useful in constraining traffic flows and marking frames above specific rates. Policing is primarily useful for data flows and voice or video flows because voice and video usually maintains a steady rate of traffic.

Web Interface

To display the QoS Port Schedulers in the web interface:

1. Click Configuration, QoS, Port Policing.
2. Select which ports to enable the QoS Ingress Port Policers and type the Rate limit condition.
3. Scroll to select the Rate limit Unit with kbps, Mbps, fps and kfps.
4. Click Apply to save the configuration.

Figure 2-19.2: QoS Ingress Port Policers page

Port	Enabled	Rate	Unit	Flow Control
*	<input type="checkbox"/>	500	<>	<input type="checkbox"/>
1	<input type="checkbox"/>	500	kbps	<input type="checkbox"/>
2	<input type="checkbox"/>	500	kbps	<input type="checkbox"/>
3	<input type="checkbox"/>	500	kbps	<input type="checkbox"/>
4	<input type="checkbox"/>	500	kbps	<input type="checkbox"/>
5	<input type="checkbox"/>	500	kbps	<input type="checkbox"/>
6	<input type="checkbox"/>	500	kbps	<input type="checkbox"/>
7	<input type="checkbox"/>	500	kbps	<input type="checkbox"/>
8	<input type="checkbox"/>	500	kbps	<input type="checkbox"/>
9	<input type="checkbox"/>	500	kbps	<input type="checkbox"/>
10	<input type="checkbox"/>	500	kbps	<input type="checkbox"/>
11	<input type="checkbox"/>	500	kbps	<input type="checkbox"/>
12	<input type="checkbox"/>	500	kbps	<input type="checkbox"/>
13	<input type="checkbox"/>	500	kbps	<input type="checkbox"/>

Parameter descriptions:

Port : The logical port for the settings contained in the same row. Click on the port number in order to configure the schedulers.

Enabled : Select which Port you need to enable the QoS Ingress Port Policers function.

Rate : To set the Rate limit value for this port, the default is 500.

Unit : To scroll to select what unit of rate includes kbps, Mbps, fps and kfps. The default is kbps.

Flow Control : If flow control is enabled and the port is in flow control mode, then pause frames are sent instead of discarding frames.

Buttons:

Apply – Click to save changes.

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

2-19.4 Port Schedulers

This section provides an overview of QoS Egress Port Schedulers for all switch ports. and the ports belong to the currently selected stack unit, as reflected by the page header.

Web Interface

To display the QoS Port Schedulers in the web interface:

1. Click Configuration, QoS, Port Schedulers
2. Display the QoS Egress Port Schedulers

Figure 2-19.4: QoS Egress Port Schedules page

QoS Egress Port Schedulers

Home > Configuration > QoS > Port Scheduler

Port	Mode	Q0	Q1	Q2	Q3	Q4	Q5
1	Strict Priority	-	-	-	-	-	-
2	Strict Priority	-	-	-	-	-	-
3	Strict Priority	-	-	-	-	-	-

QoS Egress Port Scheduler and Shapers Port 1

Home > Configuration > QoS > Port Scheduler

Port: Port 1

Scheduler Mode: Strict Priority

Queue Shaper

Queue	Enable	Rate	Unit	Excess
*	<input type="checkbox"/>	500	<>	<input type="checkbox"/>
0	<input type="checkbox"/>	500	kbps	<input type="checkbox"/>
1	<input type="checkbox"/>	500	kbps	<input type="checkbox"/>
2	<input type="checkbox"/>	500	kbps	<input type="checkbox"/>
3	<input type="checkbox"/>	500	kbps	<input type="checkbox"/>
4	<input type="checkbox"/>	500	kbps	<input type="checkbox"/>
5	<input type="checkbox"/>	500	kbps	<input type="checkbox"/>
6	<input type="checkbox"/>	500	kbps	<input type="checkbox"/>
7	<input type="checkbox"/>	500	kbps	<input type="checkbox"/>

Port Shaper

Enable	Rate	Unit
<input type="checkbox"/>	500	kbps

Apply Reset Cancel

QoS Egress Port Scheduler and Shapers Port 1 Home > Configuration > QoS > Port Scheduler

Port: Port 1

Scheduler Mode: **Weighted**

Queue Shaper					Queue Scheduler	
Queue	Enable	Rate	Unit	Excess	Weight	Percent
*	<input type="checkbox"/>	500	<>	<input type="checkbox"/>	17	
0	<input type="checkbox"/>	500	kbps	<input type="checkbox"/>	17	
1	<input type="checkbox"/>	500	kbps	<input type="checkbox"/>	17	
2	<input type="checkbox"/>	500	kbps	<input type="checkbox"/>	17	
3	<input type="checkbox"/>	500	kbps	<input type="checkbox"/>	17	17%
4	<input type="checkbox"/>	500	kbps	<input type="checkbox"/>	17	17%
5	<input type="checkbox"/>	500	kbps	<input type="checkbox"/>	17	17%
6	<input type="checkbox"/>	500	kbps	<input type="checkbox"/>		
7	<input type="checkbox"/>	500	kbps	<input type="checkbox"/>		

Port Shaper

Enable	Rate	Unit
<input type="checkbox"/>	500	kbps

Apply Reset Cancel

If you select the scheduler mode with **Weighted** then the screen will change as the figure.

Parameter descriptions:

Port : The logical port for the settings contained in the same row. Click on the port number in order to configure the schedulers.

Mode : Shows the scheduling mode for this port (Strict Priority or Weighted).

Weight (Qn) : Shows the weight for this queue and port.

Scheduler Mode : Controls whether the scheduler mode is "Strict Priority" or "Weighted" on this switch port.

Queue Shaper Enable : Controls whether the queue shaper is enabled for this queue on this switch port.

Queue Shaper Rate : Controls the rate for the queue shaper. The default value is 500. This value is restricted to 100-1000000 when the "Unit" is "kbps", and it is restricted to 1-13200 when the "Unit" is "Mbps".

Queue Shaper Unit : Controls the unit of measure for the queue shaper rate as "kbps" or "Mbps". The default value is "kbps".

Queue Shaper Excess : Controls whether the queue is allowed to use excess bandwidth.

Queue Scheduler Weight : Controls the weight for this queue. The default value is "17". This value is restricted to 1-100. This parameter is only shown if "Scheduler Mode" is set to "Weighted".

Queue Scheduler Percent : Shows the weight in percent for this queue. This parameter is only shown if "Scheduler Mode" is set to "Weighted"

Port Shaper Enable : Controls whether the port shaper is enabled for this switch port.

Port Shaper Rate : Controls the rate for the port shaper. The default value is 500. This value is restricted to 100-1000000 when the "Unit" is "kbps", and it is restricted to 1-13200 when the "Unit" is "Mbps".

Port Shaper Unit : Controls the unit of measure for the port shaper rate as "kbps" or "Mbps". The default value is "kbps".

Buttons:

Apply – Click to save changes.

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

Cancel - Click to undo any changes made locally and return to the previous page.

2-19.5 Port Shaping

This section provides an overview of QoS Egress Port Shapers for all switch ports.

Web Interface

To display the QoS Port Shapers in the web interface:

1. Click Configuration, QoS, Port Shapers.
2. Display the QoS Egress Port Shapers.

Figure 2-19.5: QoS Egress Port Shapers page

QoS Egress Port Shapers Home > Configuration > QoS > Port Shaping

Port	Shapers								Port
	Q0	Q1	Q2	Q3	Q4	Q5	Q6	Q7	
1	disabled	disabled	disabled	disabled	disabled	disabled	disabled	disabled	disabled
2	disabled	disabled	disabled	disabled	disabled	disabled	disabled	disabled	disabled
3	disabled	disabled	disabled	disabled	disabled	disabled	disabled	disabled	disabled

Click the Port index to set the QoS Egress Port Shapers

QoS Egress Port Scheduler and Shapers Port 1 Home > Configuration > QoS > Port Scheduler

Port: Port 1

Scheduler Mode: Strict Priority

Queue Shaper

Queue	Enable	Rate	Unit	Excess
*	<input type="checkbox"/>	500	<>	<input type="checkbox"/>
0	<input type="checkbox"/>	500	kbps	<input type="checkbox"/>
1	<input type="checkbox"/>	500	kbps	<input type="checkbox"/>
2	<input type="checkbox"/>	500	kbps	<input type="checkbox"/>
3	<input type="checkbox"/>	500	kbps	<input type="checkbox"/>
4	<input type="checkbox"/>	500	kbps	<input type="checkbox"/>
5	<input type="checkbox"/>	500	kbps	<input type="checkbox"/>
6	<input type="checkbox"/>	500	kbps	<input type="checkbox"/>
7	<input type="checkbox"/>	500	kbps	<input type="checkbox"/>

Port Shaper

Enable	Rate	Unit
<input type="checkbox"/>	500	kbps

Apply Reset Cancel

QoS Egress Port Scheduler and Shapers Port 1 Home > Configuration > QoS > Port Scheduler

Port: Port 1

Scheduler Mode: **Weighted**

Queue Shaper					Queue Scheduler	
Queue	Enable	Rate	Unit	Excess	Weight	Percent
*	<input type="checkbox"/>	500	<->	<input type="checkbox"/>		
0	<input type="checkbox"/>	500	kbps	<input type="checkbox"/>		
1	<input type="checkbox"/>	500	kbps	<input type="checkbox"/>	17	17%
2	<input type="checkbox"/>	500	kbps	<input type="checkbox"/>	17	17%
3	<input type="checkbox"/>	500	kbps	<input type="checkbox"/>	17	17%
4	<input type="checkbox"/>	500	kbps	<input type="checkbox"/>	17	17%
5	<input type="checkbox"/>	500	kbps	<input type="checkbox"/>	17	17%
6	<input type="checkbox"/>	500	kbps	<input type="checkbox"/>		
7	<input type="checkbox"/>	500	kbps	<input type="checkbox"/>		

Port Shaper

Enable	Rate	Unit
<input type="checkbox"/>	500	kbps

Apply Reset Cancel

If you select the scheduler mode with wighted then the screen will change as the figure.

Parameter descriptions:

Port : The logical port for the settings contained in the same row. Click on the port number in order to configure the shapers.

Shapers (Qn) : Shows "disabled" or actual queue shaper rate - e.g. "800 Mbps".

Scheduler Mode : Controls whether the scheduler mode is "Strict Priority" or "Weighted" on this switch port.

Queue Shaper Enable : Controls whether the queue shaper is enabled for this queue on this switch port.

Queue Shaper Rate : Controls the rate for the queue shaper. The default value is 500. This value is restricted to 100-1000000 when the "Unit" is "kbps", and it is restricted to 1-13200 when the "Unit" is "Mbps".

Queue Shaper Unit : Controls the unit of measure for the queue shaper rate as "kbps" or "Mbps". The default value is "kbps".

Queue Shaper Excess : Controls whether the queue is allowed to use excess bandwidth.

Queue Scheduler Weight : Controls the weight for this queue. The default value is "17". This value is restricted to 1-100. This parameter is only shown if "Scheduler Mode" is set to "Weighted".

Queue Scheduler Percent : Shows the weight in percent for this queue. This parameter is only shown if "Scheduler Mode" is set to "Weighted"

Port Shaper Enable : Controls whether the port shaper is enabled for this switch port.

Port Shaper Rate : Controls the rate for the port shaper. The default value is 500. This value is restricted to 100-1000000 when the "Unit" is "kbps", and it is restricted to 1-13200 when the "Unit" is "Mbps".

Port Shaper Unit : Controls the unit of measure for the port shaper rate as "kbps" or "Mbps". The default value is "kbps".

Buttons:

Apply – Click to save changes.

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

Cancel: Click to undo any changes made locally and return to the previous page.

2-19.6 Port Tag Remarking

This page provides an overview of QoS Egress Port Tag Remarking for all switch ports.

Web Interface

To display the QoS Port Tag Remarking in the web interface:

1. Click Configuration, QoS, Port Tag Remarking.
2. Click the linked Port number.
3. At the dropdown select the Tag Remarking Mode for that port.

Figure 2-19.6: Port Tag Remarking page

The screenshot displays the 'QoS Egress Port Tag Remarking' web interface. At the top, a breadcrumb trail reads 'Home > Configuration > QoS > Port Tag Remarking'. Below this is a table with two columns: 'Port' and 'Mode'. The table contains four rows, with the first row (Port 1) highlighted in grey. A red box is drawn around the number '1' in the 'Port' column of the first row. A blue arrow points from this box to a callout box containing the text 'Click the Port index to set the QoS Port Tag Remarking'. A red arrow points from the callout box to the 'Port' dropdown menu in the configuration page below. The configuration page is titled 'QoS Egress Port Tag Remarking Port 1' and has a breadcrumb trail 'Home > Configuration > QoS > Port Tag Remarking'. It features two dropdown menus: 'Port' (set to 'Port 1') and 'Tag Remarking Mode' (set to 'Classified'). Below these are 'Apply' and 'Reset' buttons. The bottom section of the page is titled 'PCP/DEI Configuration' and contains two dropdown menus: 'Default PCP' (set to '0') and 'Default DEI' (set to '0'), with 'Apply' and 'Reset' buttons at the bottom.

QoS Egress Port Tag Remarking Port 1 Home > Configuration > QoS > Port Tag Remarking

Port Port 1 ▼

Tag Remarking Mode Mapped ▼

(QoS class, DP level) to (PCP, DEI) Mapping

QoS class	DP level	PCP	DEI
*	*	<> ▼	<> ▼
0	0	1 ▼	0 ▼
0	1	1 ▼	1 ▼
1	0	0 ▼	0 ▼
1	1	0 ▼	1 ▼
2	0	2 ▼	0 ▼
2	1	2 ▼	1 ▼
3	0	3 ▼	0 ▼
3	1	3 ▼	1 ▼
4	0	4 ▼	0 ▼
4	1	4 ▼	1 ▼
5	0	5 ▼	0 ▼
5	1	5 ▼	1 ▼
6	0	6 ▼	0 ▼
6	1	6 ▼	1 ▼
7	0	7 ▼	0 ▼
7	1	7 ▼	1 ▼

Apply Reset

Parameter descriptions:

Mode : Controls the tag remarking mode for this port.

Classified: Use classified PCP/DEI values.

Default: Use default PCP/DEI values.

Mapped: Use mapped versions of QoS class and DP level.

PCP/DEI Configuration : Controls the default PCP and DEI values used when the mode is set to Default.

(QoS class, DP level) to (PCP, DEI) Mapping : Controls the mapping of the classified (QoS class, DP level) to (PCP, DEI) values when the mode is set to Mapped.

Buttons:

Apply – Click to save changes.

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

Cancel – Click to cancel the changes.

2-19.7 Port DSCP

This section describes how to set the QoS Port DSCP configuration that was allowed you to configure the basic QoS Port DSCP Configuration settings for all switch ports. Others the settings relate to the currently selected stack unit, as reflected by the page header.

Web Interface

To configure the QoS Port DSCP parameters in the web interface:

1. Click Configuration, QoS, Port DSCP.
2. Enable or disable the Ingress Translate and Scroll the Classify Parameter configuration.
3. Scroll to select Egress Rewrite parameters.
4. Click the save to save the settings.
5. To cancel the settings click the Reset button. The page will revert to previously saved values.

Figure 2-19.7: QoS Port DSCP Configuration page

Port	Ingress		Egress
	Translate	Classify	Rewrite
*	<input type="checkbox"/>	<input type="button" value="⊖"/>	<input type="button" value="⊖"/>
1	<input type="checkbox"/>	Disable	Disable
2	<input type="checkbox"/>	Disable	Disable
3	<input type="checkbox"/>	Disable	Disable
4	<input type="checkbox"/>	Disable	Disable
5	<input type="checkbox"/>	Disable	Disable
6	<input type="checkbox"/>	Disable	Disable
7	<input type="checkbox"/>	Disable	Disable
8	<input type="checkbox"/>	Disable	Disable
9	<input type="checkbox"/>	Disable	Disable
10	<input type="checkbox"/>	Disable	Disable
11	<input type="checkbox"/>	Disable	Disable
12	<input type="checkbox"/>	Disable	Disable
13	<input type="checkbox"/>	Disable	Disable
14	<input type="checkbox"/>	Disable	Disable
15	<input type="checkbox"/>	Disable	Disable

Parameter descriptions:

Port : The Port column shows the list of ports for which you can configure dscp ingress and egress settings.

Ingress : In Ingress settings you can change ingress translation and classification settings for individual ports. There are two configuration parameters available in Ingress:

1. **Translate** : To Enable the Ingress Translation click the checkbox
2. **Classify**: Classification for a port have 4 different values.
 - Disable**: No Ingress DSCP Classification.
 - DSCP=0**: Classify if incoming (or translated if enabled) DSCP is 0.
 - Selected**: Classify only selected DSCP for which classification is enabled as specified in DSCP Translation window for the specific DSCP.
 - All**: Classify all DSCP.

Egress : Port Egress Rewriting can be one of below parameters

Disable: No Egress rewrite.

Enable: Rewrite enable without remapped.

Remap: DSCP from analyzer is remapped and frame is remarked with remapped DSCP value.

Buttons:

Apply – Click to save changes.

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

Auto-refresh : Check the auto-refresh checkbox to refresh the page information automatically.

Upper right icon (Refresh): Click to refresh the QoS Port DSCP information manually.

2-19.8 DSCP-Based QoS

This section describes how to configure the basic QoS DSCP based QoS Ingress Classification settings for all switches.

Web Interface

To configure the DSCP –Based QoS Ingress Classification parameters in the web interface:

1. Click Configuration, QoS, DSCP-Based QoS.
2. Enable or disable the DSCP for Trust.
3. Scroll to select QoS Class and DPL parameters.
4. Click Save to save the settings.
5. To cancel the settings, click the Reset button. The page will revert to previously saved values.

Figure 2-19.8: DSCP-Based QoS Ingress Classification page

DSCP	Trust	QoS Class	DPL
*	<input type="checkbox"/>	0	0
0 (BE)	<input type="checkbox"/>	0	0
1	<input type="checkbox"/>	0	0
2	<input type="checkbox"/>	0	0
3	<input type="checkbox"/>	0	0
4	<input type="checkbox"/>	0	0
5	<input type="checkbox"/>	0	0
6	<input type="checkbox"/>	0	0
7	<input type="checkbox"/>	0	0
8 (CS1)	<input type="checkbox"/>	0	0
9	<input type="checkbox"/>	0	0
10 (AF11)	<input type="checkbox"/>	0	0
11	<input type="checkbox"/>	0	0
12 (AF12)	<input type="checkbox"/>	0	0
13	<input type="checkbox"/>	0	0
14 (AF13)	<input type="checkbox"/>	0	0
15	<input type="checkbox"/>	0	0
16 (CS2)	<input type="checkbox"/>	0	0

Parameter descriptions:

DSCP : Maximum number of supported DSCP values are 64.

Trust : Click to check if the DSCP value is trusted.

QoS Class : QoS Class value can be any of (0-7).

DPL : Drop Precedence Level (0-3).

Buttons:

Apply – Click to save changes.

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

2-19.9 DSCP Translation

The section describes the switch allows you to configure the basic QoS DSCP Translation settings for all switches. DSCP translation can be done in Ingress or Egress.

Web Interface

To configure the DSCP Translation parameters in the web interface:

1. Click Configuration, QoS, DSCP Translation.
2. Scroll to set the Ingress Translate and Egress Remap DP0 and Remap DP1 Parameters.
3. Enable or disable Classify.
4. Click Save to save the settings.
5. To cancel the settings, click the Reset button. The page will revert to previously saved values.

Figure 2-19.9: DSCP Translation Configuration page

DSCP	Ingress		Egress	
	Translate	Classify	Remap DP0	Remap DP1
*	<input type="text" value="0"/>	<input type="checkbox"/>	<input type="text" value="0"/>	<input type="text" value="0"/>
0 (BE)	0 (BE)	<input type="checkbox"/>	0 (BE)	0 (BE)
1	1	<input type="checkbox"/>	1	1
2	2	<input type="checkbox"/>	2	2
3	3	<input type="checkbox"/>	3	3
4	4	<input type="checkbox"/>	4	4
5	5	<input type="checkbox"/>	5	5
6	6	<input type="checkbox"/>	6	6
7	7	<input type="checkbox"/>	7	7
8 (CS1)	8 (CS1)	<input type="checkbox"/>	8 (CS1)	8 (CS1)
9	9	<input type="checkbox"/>	9	9
10 (AF11)	10 (AF11)	<input type="checkbox"/>	10 (AF11)	10 (AF11)
11	11	<input type="checkbox"/>	11	11
12 (AF12)	12 (AF12)	<input type="checkbox"/>	12 (AF12)	12 (AF12)
13	13	<input type="checkbox"/>	13	13
14 (AF13)	14 (AF13)	<input type="checkbox"/>	14 (AF13)	14 (AF13)
15	15	<input type="checkbox"/>	15	15

Parameter descriptions:

DSCP : Maximum number of supported DSCP values are 64 and valid DSCP value ranges from 0 to 63.

Ingress : Ingress side DSCP can be first translated to new DSCP before using the DSCP for QoS class and DPL map. There are two configuration parameters for DSCP Translation –

Translate : DSCP at Ingress side can be translated to any of (0-63) DSCP values.

Classify : Click to enable Classification at Ingress side.

Egress : There configurable parameters for Egress side are:

Remap DP0 : Select the DSCP value from select menu to which you want to remap. DSCP value ranges from 0 to 63

Remap DP1 : Select the DSCP value from select menu to which you want to remap. DSCP value ranges from 0 to 63.

The configurable parameter for Egress side is:

Remap: Select the DSCP value from select menu to which you want to remap. DSCP value ranges from 0 to 63.

Buttons:

Apply – Click to save changes.

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

Auto-refresh : Check the auto-refresh checkbox to refresh the page information automatically.

Upper right icon (Refresh): Click to refresh the DSCP Translation information manually.

2-19.10 DSCP Classification

The section describes how to teach user to configure and allows you to map DSCP value to a QoS Class and DPL value. Others the settings relate to the currently selected stack unit, as reflected by the page header.

Web Interface

To configure the DSCP Classification parameters in the web interface:

1. Click Configuration, QoS, DSCP Translation.
2. Scroll to set the DSCP Parameters.
3. Click the save to save the setting.
4. To cancel the settings click the **Reset** button. The page will revert to previously saved values.

Figure 2-19.10: DSCP Classification Configuration page

The screenshot shows the 'DSCP Classification' configuration page in the SM24TAT2DPA web interface. The page title is 'DSCP Classification' and the breadcrumb is 'Home > Configuration > QoS > DSCP Classification'. The left sidebar shows a navigation menu with 'QoS' expanded to 'DSCP Classification'. The main content area contains a table with three columns: 'QoS Class', 'DPL', and 'DSCP'. The table has 10 rows, each representing a QoS class from 0 to 7. The 'DSCP' column contains a dropdown menu with '0 (BE)' selected. At the bottom of the table are 'Apply' and 'Reset' buttons.

QoS Class	DPL	DSCP
*	*	<>
0	0	0 (BE)
0	1	0 (BE)
1	0	0 (BE)
1	1	0 (BE)
2	0	0 (BE)
2	1	0 (BE)
3	0	0 (BE)
3	1	0 (BE)
4	0	0 (BE)
4	1	0 (BE)
5	0	0 (BE)
5	1	0 (BE)
6	0	0 (BE)
6	1	0 (BE)
7	0	0 (BE)
7	1	0 (BE)

Parameter descriptions:

QoS Class : Available QoS Class value ranges from 0 to 7. QoS Class (0-7) can be mapped to followed parameters.

DPL : The DPL (actual Drop Precedence Level).

DSCP : Select DSCP value (0-63) from DSCP menu to map DSCP to corresponding QoS Class and DPL value.

2-19.11 QoS Control List Configuration

The section shows the QoS Control List (QCL), which is made up of the QCEs. Each row describes a QCE that is defined. The maximum number of QCEs is 256 on each switch. Click on the lowest plus sign to add a new QCE to the list.

Web Interface

To configure the QoS Control List parameters in the web interface:



1. Click Configuration, QoS, QoS Control List.
2. Click the  icon to add a new QoS Control List.
3. Scroll all parameters and select the Port Member to join the QCE rules.
4. Click **Save** to save the settings.
5. To cancel the settings, click the **Reset** button. The page will revert to previously saved values.

Figure 2-19.11: QoS Control List Configuration page

QoS Control List Configuration

QCE	Port	DMAC	SMAC	Tag Type	VID	PCP	DEI	Frame Type	Action			
									CoS	DPL	DSCP	
												

QCE Configuration

Port Members

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

DMAC: Any

SMAC: Any

Tag: Any

VID: Any

PCP: Any

DEI: Any

Frame Type: Any

Action Parameters

CoS: 0

DPL: Default

DSCP: Default

Apply Reset Cancel

Parameter descriptions:

QCE# : Indicates the index of QCE.

Port : Indicates the list of ports configured with the QCE.

DMAC : Indicates the destination MAC address. Possible values are:

Any: Match any DMAC. The default value is 'Any'.

Unicast: Match unicast DMAC.

Multicast: Match multicast DMAC.

Broadcast: Match broadcast DMAC.

<MAC>: Match specific DMAC.

SMAC : Match specific source MAC address or 'Any'. If a port is configured to match on DMAC/DIP, this field indicates the DMAC.

Tag Type : Indicates tag type. Possible values are:

Any: Match tagged and untagged frames. The default value is 'Any'.

Untagged: Match untagged frames.

Tagged: Match tagged frames.

C-Tagged: Match C-tagged frames.

S-Tagged: Match S-tagged frames.

VID : Indicates (VLAN ID), either a specific VID or range of VIDs. VID can be in the range 1-4095 or 'Any'

PCP : Priority Code Point: Valid values of PCP are specific (0, 1, 2, 3, 4, 5, 6, 7) or range(0-1, 2-3, 4-5, 6-7, 0-3, 4-7) or 'Any'.

DEI : Drop Eligible Indicator: Valid value of DEI are 0, 1 or 'Any'.

Frame Type : Indicates the type of frame to look for incoming frames. Possible frame types are:

Any: The QCE will match all frame type.

Ethernet: Only Ethernet frames (with Ether Type 0x600-0xFFFF) are allowed.

LLC: Only (LLC) frames are allowed.

SNAP: Only (SNAP) frames are allowed

IPv4: The QCE will match only IPV4 frames.

IPv6: The QCE will match only IPV6 frames.

Action : Indicates the classification action taken on ingress frame if parameters configured are matched with the frame's content. There are three action fields: Class, DPL and DSCP.


Class: Classified QoS Class; if a frame matches the QCE it will be put in the queue.


DPL: Drop Precedence Level; if a frame matches the QCE then DP level will set to value displayed under DPL column.


DSCP: If a frame matches the QCE then DSCP will be classified with the value displayed under DSCP column.


Modification Buttons : You can modify each QCE (QoS Control Entry) in the table using the following buttons:


 : Inserts a new QCE before the current row.

 : Edits the QCE.

 : Moves the QCE up the list.

 : Moves the QCE down the list.

 : Deletes the QCE.

 : The lowest plus sign adds a new entry at the bottom of the QCE listings.

Port Members : Check the checkbox button in case you want to make any port a member of the QCL entry. By default all ports will be checked

Key Parameters : Key configuration are described as below:

Tag Value of Tag field can be 'Any', 'Untag' or 'Tag'.

VID Valid value of VLAN ID can be any value in the range 1-4095 or 'Any'; user can enter either a specific value or a range of VIDs.

PCP Priority Code Point: Valid value PCP are specific (0, 1, 2, 3, 4, 5, 6, 7) or range (0-1, 2-3, 4-5, 6-7, 0-3, 4-7) or 'Any'.

DEI Drop Eligible Indicator: Valid value of DEI can be any of values between 0, 1 or 'Any'

SMAC Source MAC address: 24 MS bits (OUI) or 'Any'.

DMAC Type Destination MAC type: possible values are unicast (UC), multicast (MC), broadcast (BC) or 'Any'. Frame Type Frame Type can have any of the following values:

1. Any
2. Ethernet
3. LLC
4. SNAP
5. IPv4
6. IPv6



NOTE: All frame types are explained below:

1. Any: Allow all types of frames.

2. Ethernet: Ethernet Type Valid Ethernet type can have value within 0x600-0xFFFF or 'Any', default value is 'Any'.

3. LLC: SSAP Address Valid SSAP(Source Service Access Point) can vary from 0x00 to 0xFF or 'Any', the default value is 'Any'

DSAP Address Valid DSAP(Destination Service Access Point) can vary from 0x00 to 0xFF or 'Any', the default value is 'Any'

Control Address Valid Control Address can vary from 0x00 to 0xFF or 'Any', the default value is 'Any'

4. SNAP : PID Valid PID(a.k.a Ethernet type) can have value within 0x00-0xFFFF or 'Any', default value is 'Any'

5. IPv4: Protocol IP protocol number: (0-255, TCP or UDP) or 'Any' Source IP Specific Source IP address in value/mask format or 'Any'. IP and Mask are in the format x.y.z.w where x, y, z, and w are decimal numbers between 0 and 255. When Mask is converted to a 32-bit binary string and read from left to right, all bits following the first zero must also be zero DSCP Diffserv Code Point value (DSCP): It can be specific value, range of value or 'Any'. DSCP values are in the range 0-63 including BE, CS1-CS7, EF or AF11-AF43

IP Fragment IPv4 frame fragmented option: yes|no|any

Sport Source TCP/UDP port:(0-65535) or 'Any', specific or port range applicable for IP protocol UDP/TCP

Dport Destination TCP/UDP port:(0-65535) or 'Any', specific or port range applicable for IP protocol UDP/TCP

6. IPv6 :Protocol IP protocol number: (0-255, TCP or UDP) or 'Any'

Source IP IPv6 source address: (a.b.c.d) or 'Any', 32 LS bits

DSCP Diffserv Code Point value (DSCP): It can be specific value, range of value or 'Any'.

DSCP values are in the range 0-63 including BE, CS1-CS7, EF or AF11-AF43

Sport Source TCP/UDP port:(0-65535) or 'Any', specific or port range applicable for IP protocol UDP/TCP

Dport Destination TCP/UDP port:(0-65535) or 'Any', specific or port range applicable for IP protocol UDP/TCP

Action Configuration :

- Class QoS Class: "class (0-7)", default- basic classification
- DP Valid DP Level can be (0-3)", default- basic classification
- DSCP Valid dscp value can be (0-63, BE, CS1-CS7, EF or AF11-AF43)

Buttons

Apply – Click to save changes.

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

Example

The example below shows a QoS Control List (QCL) made up of the two QCEs (two rows each of which describes a defined QCE).

QoS Control List Configuration Home > Configuration > QoS > QoS Control List

QCE	Port	DMAC	SMAC	Tag Type	VID	PCP	DEI	Frame Type	Action			
									CoS	DPL	DSCP	
1	All	Any	00-00-00-00-00-00	Tagged	Any	Any	Any	Ethernet	0	0	14 (AF13)	⊕ ⊖ ⊗ ⊘
2	1,3,6-26	Multicast	00-00-00-00-00-00	Tagged	10	2	1	IPv4	0	Default	Default	⊕ ⊖ ⊗ ⊘
												⊕

2-19.12 Storm Control

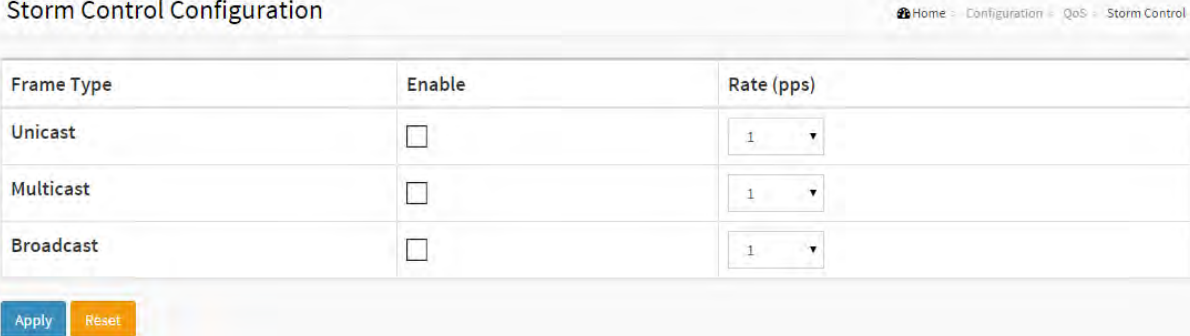
The section lets you configure the Storm control for the switch. There is a unicast storm rate control, multicast storm rate control, and a broadcast storm rate control. These only affect flooded frames, i.e. frames with a (VLAN ID, DMAC) pair not present on the MAC Address table. The configuration indicates the permitted packet rate for unicast, multicast or broadcast traffic across the switch.

Web Interface

To configure the Storm Control Configuration parameters in the web interface:

1. Click Configuration, QoS, Storm Control.
2. Select the Frame Type to enable storm control.
3. Scroll to set the Rate Parameters.
4. Click Save to save the settings.
5. To cancel the setting, click the Reset button. The page will revert to previously saved values.

Figure 2-19.12: Storm Control Configuration page



Frame Type	Enable	Rate (pps)
Unicast	<input type="checkbox"/>	1
Multicast	<input type="checkbox"/>	1
Broadcast	<input type="checkbox"/>	1

Apply Reset

Parameter descriptions:

Frame Type : The settings in a particular row apply to the frame type listed here: Unicast, Multicast or Broadcast.

Enable : Enable or disable the storm control status for the given frame type.

Rate : The rate unit is packets per second (pps). Valid values are: 1, 2, 4, 8, 16, 32, 64, 128, 256, 512, 1K, 2K, 4K, 8K, 16K, 32K, 64K, 128K, 256K, 512K, 1024K, 2048K, 4096K, 8192K, 16384K or 32768K. , 1024K, 2048K, 4096K, 8192K, 16384K or 32768K.

The 1 kpps is actually 1002.1 pps.

Buttons:

Apply – Click to save changes.

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

2-20 Mirror

You can mirror traffic from any source port to a target port for real-time analysis. You can then attach a logic analyzer or RMON probe to the target port and study the traffic crossing the source port in a completely unobtrusive manner.

Mirror Configuration is to monitor the traffic of the network. For example, we assume that Port A and Port B are Monitoring Port and Monitored Port respectively, thus, the traffic received by Port B will be copied to Port A for monitoring.

Web Interface

To configure the Mirror in the web interface:

1. Click Configuration, Mirroring.
2. Scroll to select Port to mirror on which port.
3. Scroll to disabled, enable, TX Only and RX only to set the Port mirror mode.
4. Click the save to save the setting.
5. To cancel the settings click the **Reset** button. The page will revert to previously saved values.

Figure 2-20: Mirror Configuration page

The screenshot shows the web interface for SM24TAT2DPA. The left sidebar contains a navigation menu with 'Configuration' expanded to 'Mirroring'. The main content area is titled 'Mirror Configuration' and includes the following elements:

- Port to mirror to:** A dropdown menu set to '12'.
- Mirror Port Configuration:** A table with two columns: 'Port' and 'Mode'.

Port	Mode
*	⊖
1	Disabled
2	Disabled
3	Disabled
4	Disabled
5	Disabled
6	Disabled
7	Disabled
8	Disabled
9	Disabled
10	Disabled

Parameter descriptions:

Port to mirror on : Port to mirror also known as the mirror port. Frames from ports that have either source (rx) or destination (tx) mirroring enabled are mirrored on this port. Disabled disables mirroring.

Mirror Port Configuration : The following table is used for Rx and Tx enabling.

Port : The logical port for the settings contained in the same row.

Mode : Select mirror mode.

Rx only Frames received on this port are mirrored on the mirror port. Frames transmitted are not mirrored.

Tx only Frames transmitted on this port are mirrored on the mirror port. Frames received are not mirrored.

Disabled: Neither frames transmitted nor frames received are mirrored.

Enabled: Frames received and frames transmitted are mirrored on the mirror port.



NOTE: For a given port, a frame is only transmitted once. It is therefore not possible to mirror Tx frames on the mirror port. Because of this, mode for the selected mirror port is limited to Disabled or Rx only.

Buttons:

Apply – Click to save changes.

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

2-21 UPnP

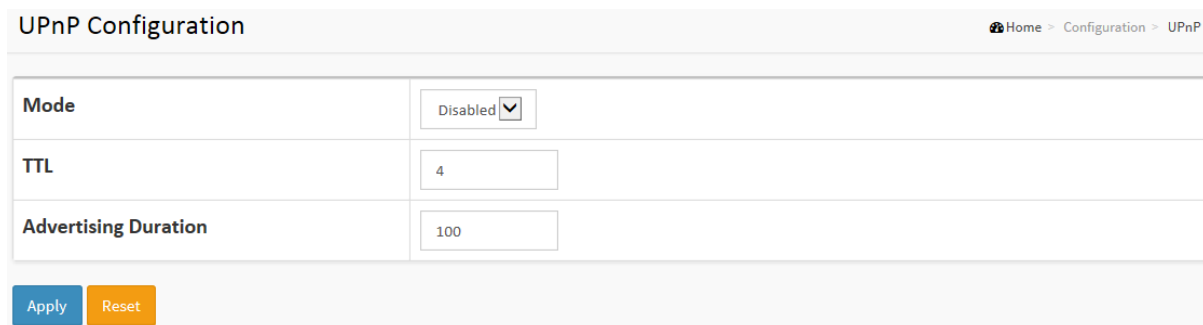
UPnP is an acronym for Universal Plug and Play. The goals of UPnP are to allow devices to connect seamlessly and to simplify the implementation of networks in the home (data sharing, communications, and entertainment) and in corporate environments for simplified installation of computer components. **Caution:** UPnP allows clients in the local network to automatically configure the device. UPnP should only be used (enabled) if necessary and with preventive measures as it can result in high security risks for your network.

Web Interface

To configure the UPnP Configuration in the web interface:

1. Click Configuration, UPnP.
2. Scroll to select the mode to enable or disable
3. Specify the parameters in each blank field.
4. Click the save to save the setting
5. To cancel the settings click the **Reset** button. The page will revert to previously saved values.

Figure 2-21: UPnP Configuration page



UPnP Configuration	
Mode	Disabled ▾
TTL	4
Advertising Duration	100

Apply Reset

Parameter descriptions: These parameters are displayed on the UPnP Configuration page:

Mode : Indicates the UPnP operation mode. Possible modes are:

Enabled: Enable UPnP mode operation.

Disabled: Disable UPnP mode operation.

When the mode is enabled, two ACEs are added automatically to trap UPNP related packets to CPU. The ACEs are automatically removed when the mode is disabled.

TTL : The TTL value is used by UPnP to send SSDP advertisement messages. Valid values are 1 - 255.

Advertising Duration : The duration, carried in SSDP packets, is used to inform a control point or control points how often it or they should receive an SSDP advertisement message from this switch. If a control point does not receive any message within the duration, it will think that the switch no longer exists. Due to the unreliable nature of UDP, in the standard it is recommended that such refreshing of advertisements be done at less than one-half of the advertising duration. In the implementation, the switch sends SSDP messages periodically at the interval one-half of the advertising duration minus 30 seconds. Valid values are in the range 100 - 86400.

Buttons:

Apply – Click to save changes.

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

2-22. GVRP

The Generic Attribute Registration Protocol (GARP) provides a generic framework whereby devices in a bridged LAN, e.g. end stations and switches, can register and de-register attribute values, such as VLAN Identifiers, with each other. In doing so, the attributes are propagated to devices in the bridged LAN, and these devices form a "reachability" tree that is a subset of an active topology. GARP defines the architecture, rules of operation, state machines and variables for the registration and de-registration of attribute values.

A GARP participation in a switch or an end station consists of a GARP application component, and a GARP Information Declaration (GID) component associated with each port or the switch. The propagation of information between GARP participants for the same application in a bridge is carried out by the GARP Information Propagation (GIP) component. Protocol exchanges take place between GARP participants by means of LLC Type 1 services, using the group MAC address and PDU format defined for the GARP application concerned.

2-22.1 Global Config

The switch stores its configuration in a number of text files in CLI format. The files are either virtual (RAM-based) or stored in flash on the switch.

There are three system files:

- Running-config: A virtual file that represents the currently active configuration on the switch. This file is volatile.
- Startup-config: The startup configuration for the switch, read at boot time.
- Default-config: A read-only file with vendor-specific configuration. This file is read when the system is restored to default settings.

It is also possible to store up to two other files and apply them to running-config, thereby switching configuration.

Web Interface

To configure the GVRP in the web interface:

1. Click Configuration, GVRP, Global Config.
2. Specify Join-time, Leave-time, Leave All-time, and Max VLANs.
3. Click Apply.

Figure 2-22.1: The GVRP Configuration page

Parameter	Value
Enable GVRP	<input checked="" type="checkbox"/>
Join-time:	20 (1-20)
Leave-time:	60 (60-300)
LeaveAll-time:	1000 (1000-5000)
Max VLANs:	20

Apply Reset

Enable GVRP: The GVRP feature is enabled globally by checking the Enable GVRP checkbox.

GVRP protocol timers

Join-time is a value in the range 1-20 in the units of centi seconds, i.e. in units of one hundredth of a second. The default is 20.

Leave-time is a value in the range 60-300 in the units of centi seconds, i.e. in units of one hundredth of a second. The default is 60.

Leave All-time is a value in the range 1000-5000 in the units of centi seconds, i.e. in units of one hundredth of a second. The default is 1000.

Max VLANs

When GVRP is enabled a maximum number of VLANs supported by GVRP is specified. By default this number is 20. This number can only be changed when GVRP is turned off.

Buttons:

Apply – Click to save changes.

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

2-22.2 Port Config

This page allows you to enable a port for GVRP. Here you can configure the basic GVRP configuration settings for all switch ports.

Web Interface

To configure GVRP in the web interface:

1. Click Configuration, GVRP, Port Config.
2. Specify the Mode for one or more Ports.
3. Click the Apply button.

Figure 2-22.2: GVRP Configuration page

Port	Mode
*	<input type="text"/>
1	Disabled
2	GVRP enabled
3	GVRP enabled
4	GVRP enabled
5	Disabled
6	Disabled
7	Disabled
8	Disabled
9	Disabled
10	Disabled
11	Disabled
12	Disabled
13	Disabled
14	GVRP enabled
15	GVRP enabled
16	

Parameter descriptions:

GVRP Mode : This configuration is to enable/disable GVRP Mode on particular port locally.

Disabled: Select to Disable GVRP mode on this port.

GVRP enabled: Select to Enable GVRP mode on this port.

Buttons:

Apply – Click to save changes.

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

2-23. sFlow

The sFlow Collector configuration for the switch can be monitored and modified here. The configuration is divided into two parts: Configuration of the sFlow receiver (a.k.a. sFlow collector) and configuration of per-port flow and counter samplers.

sFlow configuration is not persisted to non-volatile memory, which means that a reboot or master change will disable sFlow sampling.

Web Interface

To configure the sFlow Agent in the web interface:

1. Click Configuration, sFlow.
2. Set the parameters.
3. Click the save to save the setting.
4. To cancel the settings click the **Reset** button. The page will revert to previously saved values.

Figure 2-23: sFlow Configuration page

sFlow Configuration
Home > Configuration > sFlow

Agent Configuration

IP Address

Receiver Configuration

Owner <none> Release

IP Address/Hostname

UDP Port

Timeout seconds

Max. Datagram Size bytes

Port Configuration

Port	Flow Sampler				Counter Poller	
	Enabled	Sampler Type	Sampling Rate	Max. Header	Enabled	Interval
*	<input type="checkbox"/>	↔	<input type="text" value="0"/>	128	<input type="checkbox"/>	0
1	<input type="checkbox"/>	Tx	<input type="text" value="0"/>	128	<input type="checkbox"/>	0
2	<input type="checkbox"/>	Tx	<input type="text" value="0"/>	128	<input type="checkbox"/>	0
16	<input type="checkbox"/>	Tx	<input type="text" value="0"/>	128	<input type="checkbox"/>	0
17	<input type="checkbox"/>	Tx	<input type="text" value="0"/>	128	<input type="checkbox"/>	0
18	<input type="checkbox"/>	Tx	<input type="text" value="0"/>	128	<input type="checkbox"/>	0

Apply
Reset

Parameter descriptions:**Agent Configuration**

IP Address : The IP address used as Agent IP address in sFlow datagrams. It serves as a unique key that will identify this agent over extended periods of time. Both IPv4 and IPv6 addresses are supported.

Receiver Configuration

Owner : Basically, sFlow can be configured in two ways: Through local management using the Web or CLI interface or through SNMP. This read-only field shows the owner of the current sFlow configuration and assumes values as follows:

- If sFlow is currently unconfigured/unclaimed, Owner contains <none>.
- If sFlow is currently configured through Web or CLI, Owner contains <Configured through local management>.
- If sFlow is currently configured through SNMP, Owner contains a string identifying the sFlow receiver. If sFlow is configured through SNMP, all controls - except for the Release-button - are disabled to avoid inadvertent reconfiguration.

The button allows for releasing the current owner and disable sFlow sampling. The button is disabled if sFlow is currently unclaimed. If configured through SNMP, the release must be confirmed (a confirmation request will appear).

IP Address/Hostname : The IP address or hostname of the sFlow receiver. Both IPv4 and IPv6 addresses are supported.

UDP Port : The UDP port on which the sFlow receiver listens to sFlow datagrams. If set to 0 (zero), the default port (6343) is used.

Timeout : The number of seconds remaining before sampling stops and the current sFlow owner is released. While active, the current time left can be updated with a click on the Refresh-button. If locally managed, the timeout can be changed on the fly without affecting any other settings.

Max. Datagram Size : The maximum number of data bytes that can be sent in a single sample datagram. This should be set to a value that avoids fragmentation of the sFlow datagrams. Valid range is 200 to 1468 bytes with default being 1400 bytes.

Port Configuration

Port : The port number for which the configuration below applies.

Flow Sampler Enabled : Enables/disables flow sampling on this port.

Flow Sampler Sampling Rate : The statistical sampling rate for packet sampling. Set to N to sample on average 1/Nth of the packets transmitted/received on the port.

Not all sampling rates are achievable. If an unsupported sampling rate is requested, the switch will automatically adjust it to the closest achievable. This will be reported back in this field.

Flow Sampler Max. Header : The maximum number of bytes that should be copied from a sampled packet to the sFlow datagram. Valid range is 14 to 200 bytes with default being 128 bytes.

If the maximum datagram size does not take into account the maximum header size, samples may be dropped.

Counter Poller Enabled : Enables/disables counter polling on this port.

Counter Poller Interval : With counter polling enabled, this specifies the interval - in seconds - between counter poller samples.

Buttons:

Apply – Click to save changes.

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

2-25 SMTP Configuration

Configure SMTP (Simple Mail Transfer Protocol) on this page. Simple Mail Transfer Protocol is the message-exchange standard for the Internet. The switch can be configured as a client of SMTP while the server is a remote device that will receive messages from the switch that alarm events occurred.

Web Interface

To configure the SMTP Configuration in the web interface:

1. Click Configuration, SMTP Configuration.
2. Specify the parameters in each blank field.
3. Click the **Apply** button to save the setting.
4. To cancel the settings click the **Reset** button. It will revert to previously saved values

Figure 2-25: SMTP Configuration page

Mail Server	192.168.1.77
User Name	jeffs
Password	••••••
Sender	Admin
Return Path	Server Admin
Email Address 1	jeffs@transition.com
Email Address 2	svt@transition.com
Email Address 3	
Email Address 4	
Email Address 5	
Email Address 6	

Parameter descriptions: These parameters are displayed on the SMTP Configuration page:

Mail Server : Specify the IP Address of the server transferring your email.

Username : Specify the username on the mail server.

Password : Specify the password on the mail server.

Sender : To set the mail sender name.

Return-Path : To set the mail return-path as sender mail address.

Email Address 1-6 : Email address that would like to receive the alarm message.

Buttons:

Apply – Click to apply changes.

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

Chapter 3. Monitor

This chapter describes all of the basic network statistics which includes the Ports, Layer 2 network protocol (e.g. NAS, ACL, DHCP, AAA and RMON etc.) and any setting of the Switch.

3-1 System

After you login, the switch shows you the system information. This page tells you the basic information of the system, including "Model Name", "System Description", "Contact", "Location", "System Up Time", "Firmware Version", "Host Mac Address", "Device Port". With this information, you will know the software version used, MAC address, serial number, how many ports good and so on. This is helpful for correcting malfunctions.

3-1.1 Information

The switch system information is provided here.

Web interface

To configure System Information in the web interface:

1. Click Monitor, System, and Information.
2. Check the contact information for the system administrator as well as the name and location of the switch. Also check the system date, firmware version, serial number, etc.
3. Click the "Refresh" button.

Figure 3-1.1: System Information page

Parameter	Value
Model Name	SM24TAT2DPA
System Description	Managed Switch, 24-port Gigabit PoE+, 2-port SFP/RJ-45 Combo
Location	
Contact	
System Name	SM24TAT2DPA
System Date	2011-01-04T02:18:03+00:00
System Uptime	3d 02:18:12
Bootloader Version	v1.15f
Firmware Version	v6.54.2057 2016-06-16
Hardware Version	v1.01
Mechanical Version	v1.01
Serial Number	A055116AR2700004
MAC Address	00-40-c7-b9-20-b2
Memory	Total=78477 KBytes, Free=53755 KBytes, Max=53260 KBytes
FLASH	0x40000000-0x41ffffff, 512 x 0x10000 blocks
CPU Load (100ms, 1s, 10s)	2%, 14%, 8%

Parameter descriptions:

Model Name: Displays the factory defined model name for identification purposes (*SM24TAT2DPA*).

System Description: Displays the system description (e.g., *Managed Switch, 24-port Gigabit PoE+, 2-port SFP/RJ-45 Combo*).

Location: The system location configured at Configuration > System > Information > System Location.

Contact: The system contact configured at Configuration > System > Information > System Contact.

System Name: Displays the user-defined system name that was configured at Configuration > System > Information > System Name (e.g., *SM24TAT2DPA*).

System Date: The current (GMT) system time and date. The system time is obtained through the Timing server running on the switch, if any (e.g., *2011-01-01T02:43:31+00:00*).

System Uptime: The period of time the device has been operational (e.g., *02:43:31*).

Bootloader Version: Displays the current boot loader version number. (e.g., *v1.15f*)

Firmware Version: The software version of this switch (e.g., *v6.48.2057 2016-06-16*).

Hardware-Mechanical Version: The hardware and mechanical versions of this switch (e.g., *v1.01*).

Serial Number: The serial number of this switch (e.g., *A065116AR2600011*).

MAC Address: The MAC Address of this switch (e.g., in the format *00-40-c7-fe-07-df*).

Memory: Displays the memory size of the system (e.g., *Total=84115 KBytes, Free=66067 KBytes, Max=65535 Kbytes*).

FLASH: Displays the flash size of the system (e.g., *0x40000000-0x41ffffff, 512 x 0x10000 blocks*).

CPU Load (100ms, 1s, 10s): (e.g., *1%, 10%, 9%*).

3-1.2 IP Status

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

Web Interface

To display the log configuration in the web interface:

1. Click Monitor, System, and IP Status.
2. View the IP address information.

Figure 3- 1.2: IP Status page

The screenshot shows the SM24TAT2DPA web interface. The left sidebar contains a navigation menu with categories like Configuration, Monitor, Diagnostics, and Maintenance. The main content area is titled 'IP Interfaces' and includes an 'Auto-refresh' toggle. It displays four tables: 'IP Interfaces', 'IP Routes', 'Neighbour cache', and 'DNS Server'.

Interface	Type	Address	Status
VLAN1	LINK	00-40-c7-b9-20-b2	<UP BROADCAST RUNNING MULTICAST>
VLAN1	IPv4	169.254.0.1/16	
VLAN1	IPv4	192.168.1.77/24	
VLAN1	IPv6	fe80::240:c7ff:feb9:20b2/64	
VLAN4096	LINK	00-40-c7-b9-20-b2	<BROADCAST MULTICAST>
VLAN4097	LINK	00-40-c7-b9-20-b2	<BROADCAST MULTICAST>

Network	Gateway	Status
0.0.0.0/0	192.168.1.254	<UP GATEWAY HW_RT>
127.0.0.0/8	127.0.0.1	<UP>
127.0.0.1/32	127.0.0.1	<UP HOST>
169.254.0.0/16	VLAN1	<UP HW_RT>
192.168.1.0/24	VLAN1	<UP HW_RT>
::1/128	::1	<UP HOST>

IP Address	Link Address
192.168.1.77	VLAN1:00-40-c7-b9-20-b2
192.168.1.99	VLAN1:00-1b-11-b2-6d-4b
fe80::240:c7ff:feb9:20b2	VLAN1:00-40-c7-b9-20-b2

Type	IP Address	Interface
Static	8.8.8.8	

Parameter descriptions:

IP Interfaces

Interface: Show the name of the interface.

Type: Show the address type of the entry. This may be LINK or IPv4.

Address: Show the current address of the interface (of the given type).

Status: Show the status flags of the interface (and/or address).

IP Routes

Network: Show the destination IP network or host address of this route.

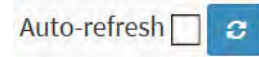
Gateway: Show the gateway address of this route.

Status: Show the status flags of the route.

Neighbour cache

IP Address: Show the IP address of the entry.

Link Address: Show the Link (MAC) address for which a binding to the IP address given exist.

Buttons

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

Refresh: Click to refresh the page immediately.

3-1.3 Log

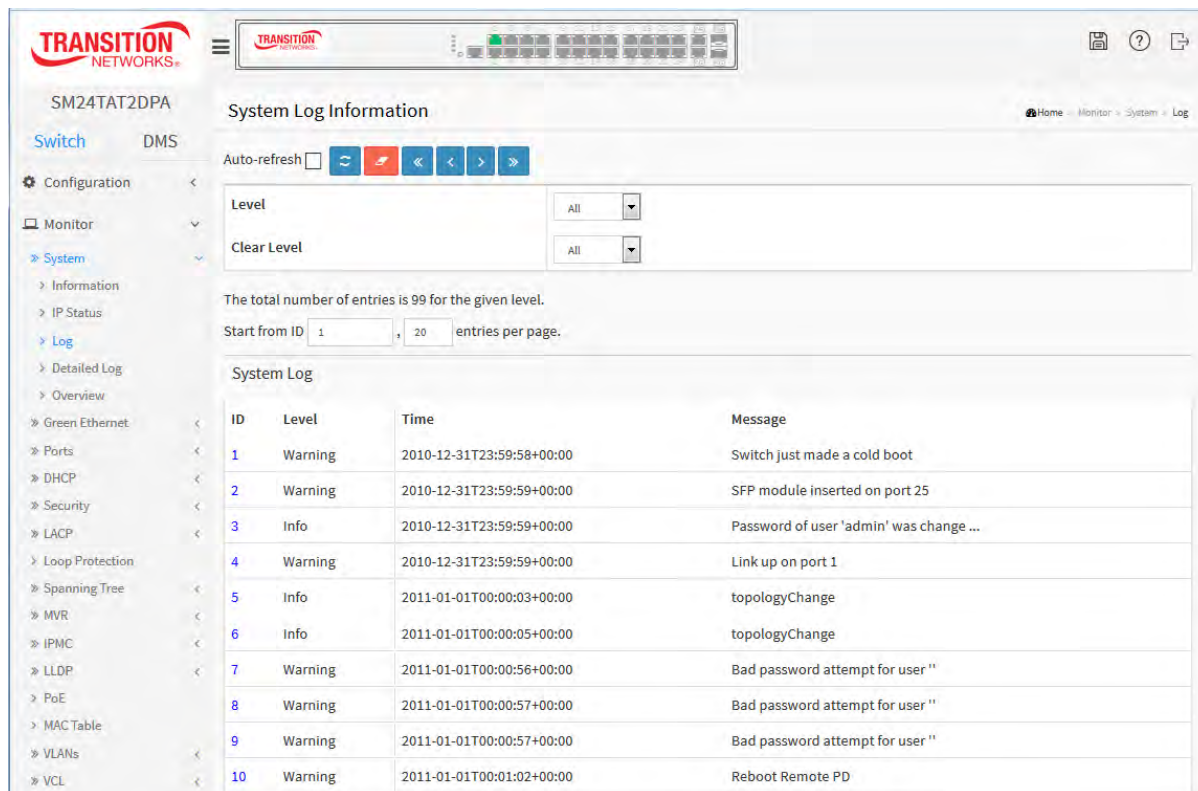
This section describes the system log information of the switch.

Web Interface

To display the log configuration in the web interface:

1. Click Monitor, System, and Log.
2. View the log information.

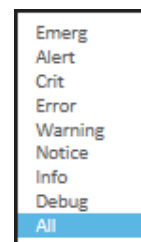
Figure 3- 1.3: System Log Information page



Parameter descriptions:

Level : The level of the system log entry. These level types are supported:

- Emerg**: Emergency level of the system log.
- Alert**: Alert level of the system log.
- Crit**: Critical level of the system log.
- Error**: Error level of the system log.
- Warning**: Warning level of the system log.
- Info**: Information level of the system log.
- Debug**: Debug level of the system log.
- All**: All levels logged and displayed.



Clear Level : The clear level of the system log entry. The level types supported are listed above.

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

Time : Displays the log record by device time. The time of the system log entry.

Message : Displays the log detail message. The message of the system log entry. For example: *Link up on port 1*, or *Switch just made a warm boot*, or *Password of user 'admin' was change ...*, or *topologyChange*, etc.

Buttons



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



Refresh: Updates the system log entries, starting from the current entry ID.



Clear: Flushes the selected log entries.



<<: First entry; updates the system log entries, starting from the first available entry ID.



< : Previous entry; updates the system log entries, ending at the last entry currently displayed.



> : Next entry; updates the system log entries, starting from the last entry currently displayed.



>>: Last entry; updates the system log entries, ending at the last available entry ID.

3-1.4 Detailed Log

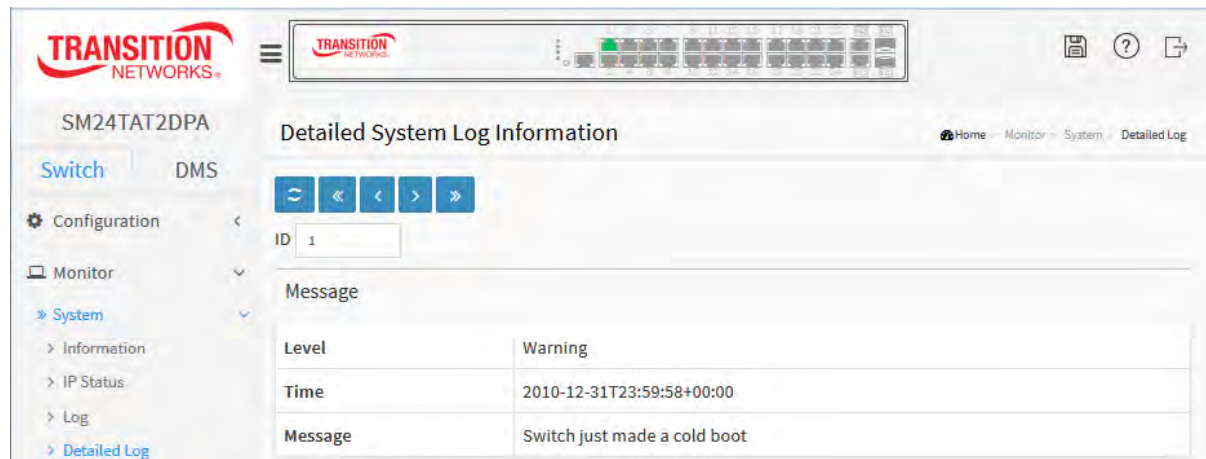
This page display more detailed log information of the switch.

Web Interface

To display the detailed log configuration in the web interface:

1. Click Monitor, System, and Detailed Log.
2. View the log information.

Figure 3- 1.4: Detailed System Log Information page



Parameter descriptions:

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

Message : The detailed message of the system log entry (the level, time, and message displayed).

Upper left icon (Refresh, clear...) : You can click them to refresh the system log or clear them by manual, others for next/up page or entry.

Buttons

Refresh: Updates the system log entries, starting from the current entry ID.



<<: Updates the system log entries to the first available entry ID

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

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

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

3-1.5 Overview

This section describes that display the detailed log information of the switch.

Web Interface

To display the detailed log configuration in the web interface:

1. Click Monitor, System, and Overview.
2. View the system information.

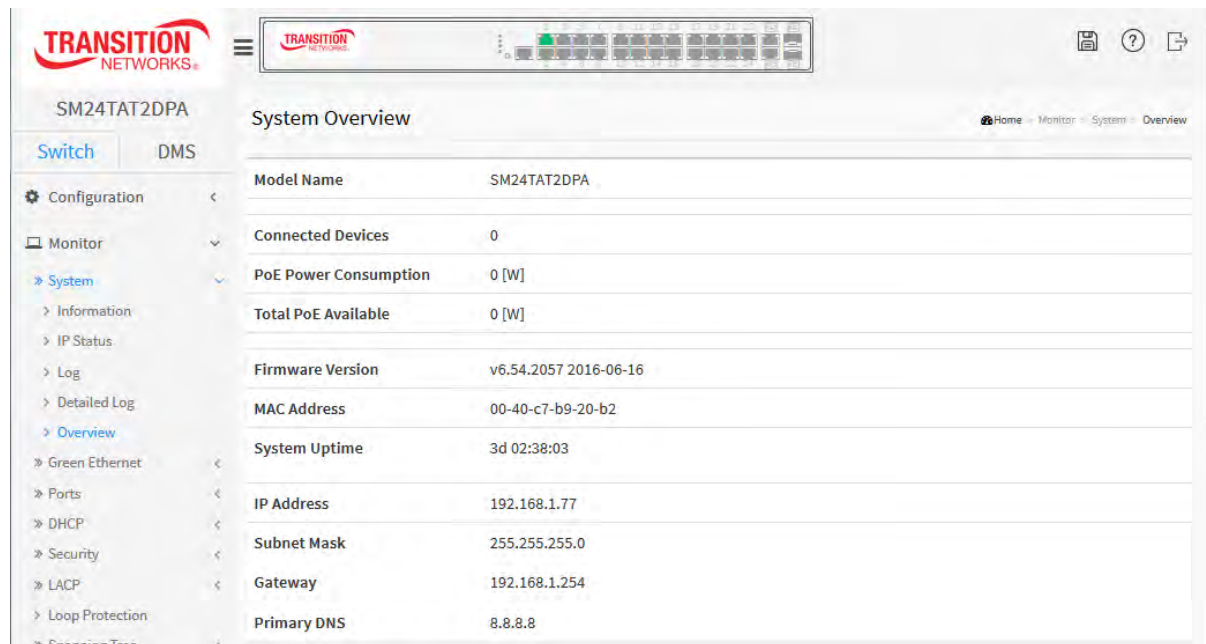


Figure 3- 1.4: Detailed System Log Information page

Parameter descriptions:

Model Name: e.g., SM24TAT2DPA.

Connected Devices: e.g., 0.

PoE Power Consumption: e.g., 0 [W].

Total PoE Available: e.g., 0 [W].

Firmware Version: e.g., v6.48.2057 2016-06-16.

MAC Address: e.g., 00-40-c7-b9-20-b2.

System Uptime: 3d 02:43:24.

IP Address: e.g., 192.168.1.77.

Subnet Mask: e.g., 255.255.255.0.

Gateway: 192.168.1.254.

Primary DNS: e.g., 8.8.8.8.

3-2 Green Ethernet

3-2.1 Port Power Savings

This page provides the current status for EEE.

Web Interface

To display the power Saving in the web interface:

1. Click Monitor, Green Ethernet, Port Power Savings.

Figure 3- 2.1: Port Power Savings Status page

Port	Link	EEE	LP EEE Cap	EEE Savings
1	●	✘	✘	✘
2	●	✔	✘	✘
3	●	✘	✘	✘
4	●	✘	✘	✘
5	●	✘	✘	✘
6	●	✘	✘	✘
7	●	✔	✘	✘
8	●	✘	✘	✘
9	●	✘	✘	✘
10	●	✘	✘	✘

Parameter descriptions:

Port : This is the logical (local) port number for this row.

Link : Shows if the link is up for the port (green = link up, red = link down).

EEE : Shows if EEE is enabled for the port (reflects the settings at the Port Power Savings configuration page).

LP EEE cap : Shows if the link partner is EEE capable.

EEE Savings : Shows if the system is currently saving power due to EEE. When EEE is enabled, the system will power down if no frame has been received or transmitted in 5 uSeconds.

Buttons

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

Refresh: Click to refresh the page immediately.

3-3 Ports

The section describes how to configure the Port detail parameters of the switch. Others you could using the Port configure to enable or disable the Port of the switch. Monitor the ports content or status in the function.

- » Ports
 - > Traffic Overview
 - > QoS Statistics
 - > QCL Status
 - > Detailed Statistics
 - > SFP Port Info

3-3.1 Traffic Overview

The section describes how to show the Port statistics information and provides an overview of general traffic statistics for all switch ports.

Web Interface

To Display the Port Statistics Overview in the web interface:

1. Click Monitor, Port, then Traffic Overview.
2. To auto-refresh, check the "Auto-refresh" checkbox.
3. Click "Refresh" to refresh the port statistics or clear all information when you click "Clear".

Figure 3-3.1: Port Statistics Overview page

Port	Packets		Bytes		Errors		Drops		Filtered
	Received	Transmitted	Received	Transmitted	Received	Transmitted	Received	Transmitted	Received
1	574057	5372591	125392221	696695217	0	0	0	0	0
2	0	293614	0	442161440	0	0	0	0	0
3	0	294040	0	442235814	0	0	0	0	0
4	0	292017	0	441874814	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0

Parameter descriptions:

Port : The logical port for the settings contained in the same row.

Packets : The number of received and transmitted packets per port.

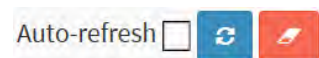
Bytes : The number of received and transmitted bytes per port.

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

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

Filtered : The number of received frames filtered by the forwarding.

Buttons



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

Refresh: Click to refresh the page immediately.

Clear: Clears the counters for all ports.

3-3.2 QoS Statistics

The section describes that switch could display the QoS detailed Queuing counters for a specific switch port. for the different queues for all switch ports.

Web Interface

To Display the Queuing Counters in the web interface:

1. Click Monitor, Ports, then QoS Statistics.
2. To auto-refresh the information check "Auto-refresh".
3. Click "Refresh" to refresh the Queuing Counters or clear all information when you click "Clear".

Figure 3-3.2: Queuing Counters page

Port	Q0		Q1		Q2		Q3		Q4		Q5		Q6		Q7		
	Rx	Tx	Rx	Tx	Rx	Tx	Rx	Tx	Rx	Tx	Rx	Tx	Rx	Tx	Rx	Tx	
1	346401	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4875128
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6919
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6919
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6897
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Parameter descriptions:

Port : The logical port for the settings contained in the same row.

Qn : Qn is the Queue number, There are 8 QoS queues per port. Q0 is the lowest priority queue.

Rx/Tx : The number of received and transmitted packets per queue.

Buttons



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

Refresh: Click to refresh the page immediately.

Clear: Clears the counters for all ports.

3-3.3 QCL Status

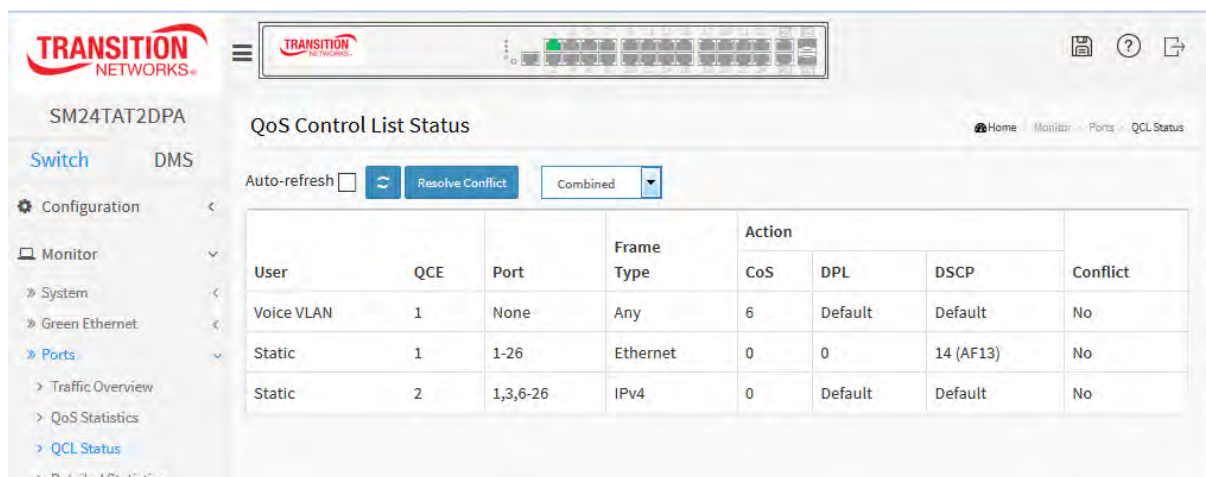
The section will let you know how to configure and shows the QCL status by different QCL users. Each row describes the QCE that is defined. It is a conflict if a specific QCE is not applied to the hardware due to hardware limitations. The maximum number of QCEs is 256 on each switch.

Web Interface

To display the QoS Control List Status in the web interface:

1. Click Monitor, Ports, QCL Status.
2. To auto-refresh the information check the "Auto-refresh" checkbox.
3. Scroll to select the combined, static, Voice VLAN and Conflict.
4. Click the "Refresh" icon to refresh an entry of the MVR Statistics Information.

Figure 3-3.3: QoS Control List Status page



User	QCE	Port	Frame Type	Action			
				CoS	DPL	DSCP	Conflict
Voice VLAN	1	None	Any	6	Default	Default	No
Static	1	1-26	Ethernet	0	0	14 (AF13)	No
Static	2	1,3,6-26	IPv4	0	Default	Default	No

Parameter descriptions:

User : Indicates the QCL user.

QCE# : Indicates the index of QCE.

Frame Type : Indicates the type of frame to look for incoming frames. Possible frame types are:

Any: The QCE will match all frame type.

Ethernet: Only Ethernet frames (with Ether Type 0x600-0xFFFF) are allowed.

LLC: Only (LLC) frames are allowed

LLC: Only (SNAP) frames are allowed.

IPv4: The QCE will match only IPV4 frames.

IPv6: The QCE will match only IPV6 frames.

Port : Indicates the list of ports configured with the QCE.

Action : Indicates the classification action taken on ingress frame if parameters configured are matched with the frame's content. There are three action fields: Class, DPL and DSCP.

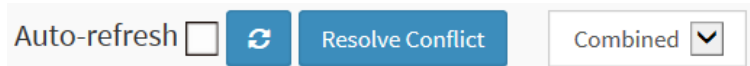
Class: Classified QoS Class; if a frame matches the QCE it will be put in the queue.

DPL: Drop Precedence Level; if a frame matches the QCE then DP level will set to value displayed under DPL column.

DSCP: If a frame matches the QCE then DSCP will be classified with the value displayed under DSCP column.

Conflict : Displays Conflict status of QCL entries. It may happen that resources required to add a QCE may not available, in that case it shows conflict status as 'Yes', otherwise it is always 'No'. Please note that conflict can be resolved by releasing the H/W resources required to add QCL entry on pressing 'Resolve Conflict' button.

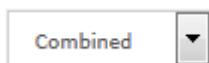
Buttons



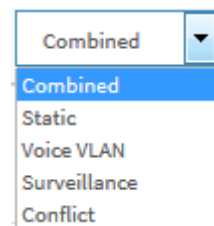
Auto-refresh: Check this box to refresh the page automatically every 3 seconds.

Refresh: Click to refresh the page immediately.

Resolve Conflict: Click to release the resources required to add QCL entry, incase conflict status for any QCL entry is 'yes'.



: Select the QCL status from this drop down list.



3-3.4 Detailed Statistics

The section describes how to provide detailed traffic statistics for a specific switch port. Use the port select box to select which switch port details to display.

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

Web Interface

To Display per port detailed Statistics Overview in the web interface:

1. Click Monitor, Ports, then Detailed Statistics.
2. Scroll the Port Index to select which port you want to show the detailed Port statistics overview”.
3. To auto-refresh the information check the “Auto-refresh” checkbox.
4. Click “Refresh” to refresh the port detailed statistics or clear all information when you click “Clear”.

Figure 3-3.4: Detailed Port Statistics page

The screenshot shows the web interface for the SM24TAT2DPA switch. The main content area is titled "Detailed Port Statistics Port 1". It includes an "Auto-refresh" checkbox, a refresh button, a clear button, and a port selection dropdown menu currently set to "Port 1". The statistics are presented in a table format:

Receive Total		Transmit Total	
Rx Packets	346757	Tx Packets	4875647
Rx Octets	73786451	Tx Octets	526891791
Rx Unicast	314405	Tx Unicast	312454
Rx Multicast	3656	Tx Multicast	218517
Rx Broadcast	28696	Tx Broadcast	4344676
Rx Pause	0	Tx Pause	0
Receive Size Counters		Transmit Size Counters	
Rx 64 Bytes	234122	Tx 64 Bytes	4069357
Rx 65-127 Bytes	13511	Tx 65-127 Bytes	436235
Rx 128-255 Bytes	12	Tx 128-255 Bytes	137718
Rx 256-511 Bytes	363	Tx 256-511 Bytes	91540
Rx 512-1023 Bytes	98711	Tx 512-1023 Bytes	49188
Rx 1024-1526 Bytes	38	Tx 1024-1526 Bytes	91609
Rx 1527- Bytes	0	Tx 1527- Bytes	0
Receive Queue Counters		Transmit Queue Counters	
Rx Q0	346757	Tx Q0	0
Rx Q1	0	Tx Q1	0

Parameter descriptions:

Auto-refresh: Check to refresh the Port Statistics information automatically.

Upper left scroll bar: To scroll which port to display the Port statistics with “Port-0”, “Port-1...”

Receive Total and Transmit Total

Rx and Tx Packets : The number of received and transmitted (good and bad) packets.

Rx and Tx Octets : The number of received and transmitted (good and bad) bytes. Includes FCS, but excludes framing bits.

Rx and Tx Unicast : The number of received and transmitted (good and bad) unicast packets.

Rx and Tx Multicast : The number of received and transmitted (good and bad) multicast packets.

Rx and Tx Broadcast : The number of received and transmitted (good and bad) broadcast packets.

Rx and Tx Pause : A count of the MAC Control frames received or transmitted on this port that have an opcode indicating a PAUSE operation.

Receive and Transmit Size Counters : The number of received and transmitted (good and bad) packets split into categories based on their respective frame sizes.

Receive and Transmit Queue Counters : The number of received and transmitted packets per input and output queue.

Receive Error Counters

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

Rx CRC/Alignment : The number of frames received with CRC or alignment errors.

Rx Undersize : The number of short 1 frames received with valid CRC.

Rx Oversize : The number of long 2 frames received with valid CRC.

Rx Fragments : The number of short 1 frames received with invalid CRC.

Rx Jabber : The number of long 2 frames received with invalid CRC.

Rx Filtered : The number of received frames filtered by the forwarding process.

Short frames are frames that are smaller than 64 bytes.

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

Transmit Error Counters

Tx Drops : The number of frames dropped due to output buffer congestion.

Tx Late/Exc. Coll. : The number of frames dropped due to excessive or late collisions.

Auto-refresh: Check to refresh the Queuing Counters automatically.

Upper right icon (Refresh, clear) : You can click them for refresh the Port Detail Statistics or clear them manually.



Buttons

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

Clear: Clears the counters for the selected port.

Refresh: Click to refresh the page immediately.

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

3-3.5 SFP Port Info

The section describes that switch could display the SFP module detail information which you connect it to the switch. The information includes Connector type, Fiber type, wavelength, baud rate, Vendor OUI, etc.

Web Interface

To display the SFP information in the web interface, click Monitor, Ports, SFP Port Info.

Figure 3-3.5: SFP Information Overview page

SFP Information for Port 25	
Connector Type	SFP or SFP Plus - LC
Fiber Type	Multi-mode (MM)
Tx Central Wavelength	850
Bit Rate	1000 Mbps
Vendor OUI	00-c0-f2
Vendor Name	Transition
Vendor P/N	TN-SFP-SXD
Vendor Revision	0000
Vendor Serial Number	8672257
Date Code	100623
Temperature	35.47 C
Vcc	3.35 V
Mon1 (Bias)	4 mA
Mon2 (TX PWR)	-6.80 dBm
Mon3 (RX PWR)	none

Parameter descriptions:

Connector Type: Displays the connector type, e.g., SFP or SFP Plus-UTP, SC, ST, LC, etc.

Fiber Type: Displays the fiber mode, e.g., Multi-Mode (MM), Single-Mode (SM), SFP or SFP Plus - LC.

Tx Central Wavelength: Displays the fiber optical transmitting central wavelength, e.g., 850nm, 1310nm, 1550nm, etc.

Bit Rate: Displays the nominal bit rate of the transceiver (e.g., 1000 Mbps or 10 Gbps).

Vendor OUI: Displays the Transition Networks OUI code which is assigned by IEEE (00-c0-f2).

Vendor Name: Displays the company name of the SFP module manufacturer (Transition Networks).

Vendor P/N: Displays the Transition Networks vendor part number (e.g., TN-SFP-SXD, TN-10GSFP-SR).

Vendor Revision: Displays the SFP module revision.

Vendor Serial Number: Shows the SFP serial number assigned by Transition Networks (e.g., 102201101).

Date Code: Shows the date this SFP module was made (e.g., 100527).

Temperature: Shows the current temperature of the SFP module (e.g., 27.13 C). Displays the internally measured transceiver temperature. Temperature accuracy is vendor specific but must be better than 3 degrees Celsius over specified operating temperature and voltage.

Vcc: Shows the working DC voltage of the SFP module (e.g., 3.33 V). Displays the internally measured transceiver supply voltage. Accuracy is vendor specific but must be better than 3 percent of the manufacturer's nominal value over specified operating temperature and voltage. Note that in some transceivers, transmitter supply voltage and receiver supply voltage are isolated. In that case, only one supply is monitored. Refer to the device specification for more detail.

Mon1(Bias) mA: Shows the Bias current of the SFP module (e.g., 6 mA). Displays the measured TX bias current in uA. Accuracy is vendor specific but must be better than 10 percent of the manufacturer's nominal value over specified operating temperature and voltage.

Mon2(TX PWR): Shows the transmit power of the SFP module (e.g., -2.30 dBm). Displays the measured coupled TX output power in mW. Accuracy is vendor specific but must be better than 3dB over specified operating temperature and voltage. Data is assumed to be based on measurement of a laser monitor photodiode current. Data is not valid when the transmitter is disabled.

Mon3(RX PWR): Shows the receiver power of the SFP module (e.g., none). Displays the measured received optical power in mW. Absolute accuracy is dependent upon the exact optical wavelength. For the vendor specified wavelength, accuracy should be better than 3dB over specified temperature and voltage. This accuracy should be maintained for input power levels up to the lesser of maximum transmitted or maximum received optical power per the appropriate standard. It should be maintained down to the minimum transmitted power minus cable plant loss (insertion loss or passive loss) per the appropriate standard. Absolute accuracy beyond this minimum required received input optical power range is vendor specific.

Buttons

: The port select box determines which port is affected by clicking the buttons on a page.

Refresh: Click to refresh the page immediately. Any changes made locally will be undone.

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

3-4 DHCP

3-4.1 Server

DHCP Server is used to allocate network addresses and deliver configuration parameters to dynamically configured hosts called DHCP client.

3-4.1.1 Statistics

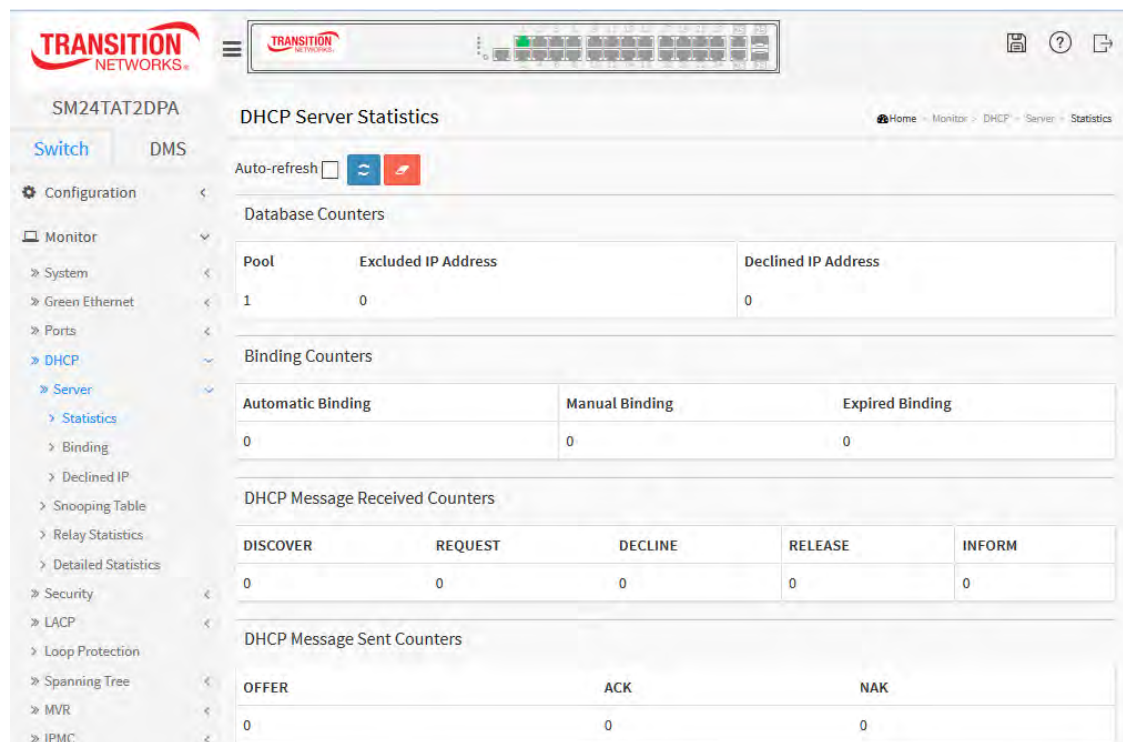
This page displays the database counters and the number of DHCP messages sent and received by DHCP server.

Web Interface

To display the DHCP Server Statistics in the Web interface:

1. Click Monitor, DHCP, Server, Statistics.
2. View the DHCP Server Statistics.

Figure 3-4.1.1: DHCP Server Statistics page



Parameter descriptions:

Database Counters

Pool : Number of pools.

Excluded IP Address : Number of excluded IP address ranges.

Declined IP Address : Number of declined IP addresses.

Database Counters

Automatic Binding : Number of bindings with network-type pools.

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

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

DHCP Message Received Counters

DISCOVER : Number of DHCP DISCOVER messages received.

REQUEST : Number of DHCP REQUEST messages received.

DECLINE : Number of DHCP DECLINE messages received.

RELEASE : Number of DHCP RELEASE messages received.

INFORM : Number of DHCP INFORM messages received.

DHCP Message Sent Counters

OFFER : Number of DHCP OFFER messages sent.

ACK : Number of DHCP ACK messages sent.

NAK : Number of DHCP NAK messages sent.

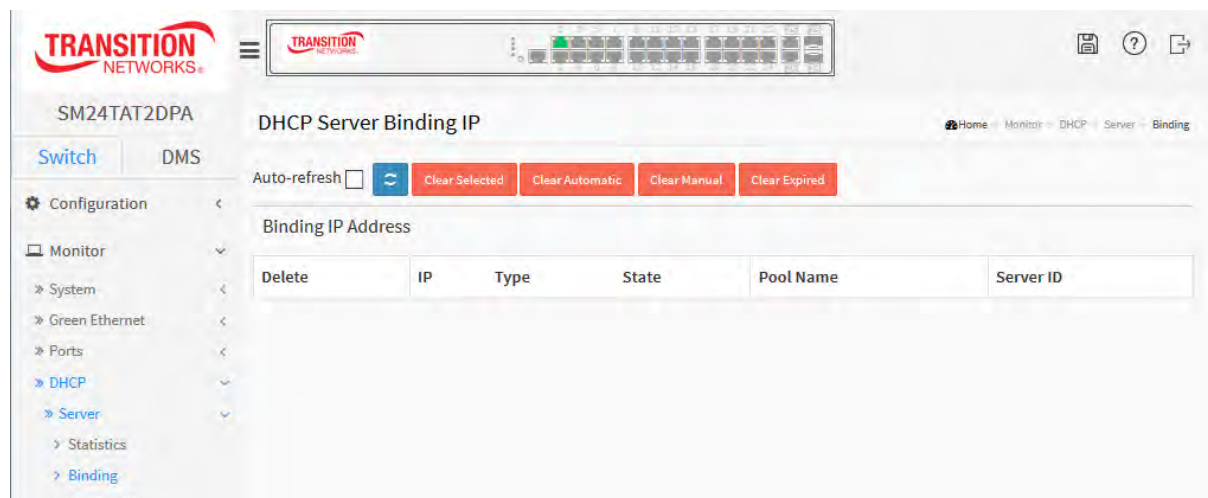
3-4.1.2 Binding

This page displays bindings generated for DHCP clients.

Web Interface

To Display DHCP Server Binding IP in the web interface:
Click Monitor, DHCP, Server and Binding.

Figure 3-4.1.2: DHCP Server Binding IP page



Parameter descriptions:

IP : IP address allocated to DHCP client.

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

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

Pool Name : The pool that generates the binding.

Server ID : Server IP address to service the binding.

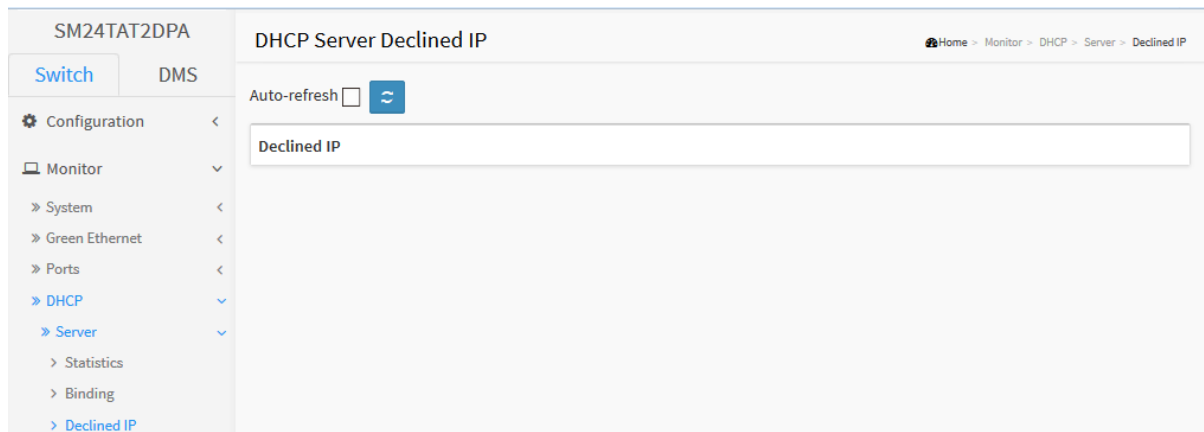
3-4.1.3 Declined IP

This page displays declined IP addresses.

Web Interface

To Display DHCP Server Declined IP in the web interface:
Click Monitor, DHCP, Server, and Declined IP.

Figure 3-4.1.3: DHCP Server Declined IP page



Parameter descriptions:

IP : IP address allocated to DHCP client.

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

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

Pool Name : The pool that generates the binding.

Server ID : Server IP address to service the binding.

Buttons

Auto-refresh: Check this box to refresh the page automatically every three seconds.

Refresh: Click to refresh the page immediately.

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

Clear Automatic: Click to clear all Automatic bindings and Change them to Expired bindings.

Clear Manual: Click to clear all Manual bindings and Change them to Expired bindings.

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

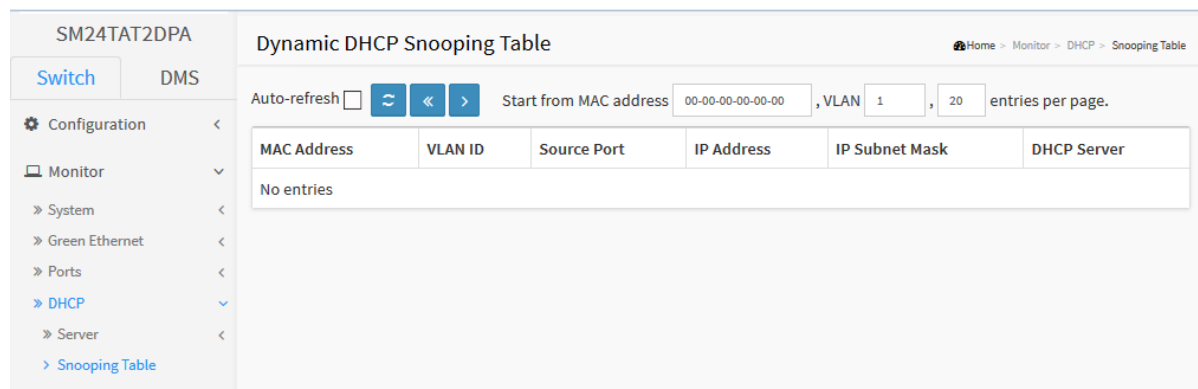
3-4.2 Snooping Table

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

Web Interface

To monitor a DHCP in the web interface: click Monitor, DHCP, and Snooping Table

Figure 3-4.2: Dynamic DHCP Snooping Table page



The screenshot shows the web interface for the SM24TAT2DPA switch. The left sidebar contains a navigation menu with 'Snooping Table' selected. The main content area is titled 'Dynamic DHCP Snooping Table'. At the top right of the main area, there is a breadcrumb trail: 'Home > Monitor > DHCP > Snooping Table'. Below the title, there are controls for 'Auto-refresh' (checkbox), a refresh button, and navigation arrows. The 'Start from MAC address' field is set to '00-00-00-00-00-00', the 'VLAN' field is set to '1', and the 'entries per page' field is set to '20'. The table below has the following columns: 'MAC Address', 'VLAN ID', 'Source Port', 'IP Address', 'IP Subnet Mask', and 'DHCP Server'. The table currently displays 'No entries'.

Parameter descriptions:

MAC Address : User MAC address of the entry.

VLAN ID : VLAN-ID in which the DHCP traffic is permitted.

Source Port: Switch Port Number for which the entries are displayed.

IP Address : User IP address of the entry.

IP Subnet Mask : User IP subnet mask of the entry.

DHCP Server Address : DHCP Server address of the entry.

3-4.3 Relay Statistics

This page provides statistics for DHCP relay.

Web Interface

To monitor a DHCP Relay statistics in the web interface:

1. Click Monitor, DHCP, Relay Statistics.

Figure 3-4.3: DHCP Relay Statistics page

Server Statistics							
Transmit to Server	Transmit Error	Receive from Server	Receive Missing Agent Option	Receive Missing Circuit ID	Receive Missing Remote ID	Receive Bad Circuit ID	Receive Bad Remote ID
0	0	0	0	0	0	0	0

Client Statistics						
Transmit to Client	Transmit Error	Receive from Client	Receive Agent Option	Replace Agent Option	Keep Agent Option	Drop Agent Option
0	0	0	0	0	0	0

Parameter descriptions:

Server Statistics

Transmit to Server : The number of packets that are relayed from client to server.

Transmit Error : The number of packets that resulted in errors while being sent to clients.

Receive from Server : The number of packets received from server.

Receive Missing Agent Option: The number of packets received without agent information options.

Receive Missing Circuit ID : The number of packets received with the Circuit ID option missing.

Receive Missing Remote ID : The number of packets received with the Remote ID option missing.

Receive Bad Circuit ID: The number of packets whose Circuit ID option did not match known circuit ID.

Receive Bad Remote ID : The number of packets whose Remote ID option did not match known Remote ID.

Client Statistics

Transmit to Client : The number of relayed packets from server to client.

Transmit Error : The number of packets that resulted in error while being sent to servers.

Receive from Client : The number of received packets from server.

Receive Agent Option : The number of received packets with relay agent information option.

Replace Agent Option : The number of packets which were replaced with relay agent information option.

Keep Agent Option : The number of packets whose relay agent information was retained.

Drop Agent Option : The number of packets that were dropped which were received with relay agent information.

3-4.4 Detailed Statistics

This page provides statistics for DHCP snooping. Notice that the normal forward per-port TX statistics isn't increased if the incoming DHCP packet is done by L3 forwarding mechanism. And clear the statistics on specific port may not take effect on global statistics since it gathers the different layer overview.

Web Interface

To monitor DHCP Relay statistics in the web interface, click Monitor, DHCP, Detailed Statistics

Figure 3-4.4: DHCP Detailed Statistics page

Receive Packets		Transmit Packets	
Rx Discover	0	Tx Discover	0
Rx Offer	0	Tx Offer	0
Rx Request	0	Tx Request	0
Rx Decline	0	Tx Decline	0
Rx ACK	0	Tx ACK	0
Rx NAK	0	Tx NAK	0
Rx Release	0	Tx Release	0
Rx Inform	0	Tx Inform	0
Rx Lease Query	0	Tx Lease Query	0
Rx Lease Unassigned	0	Tx Lease Unassigned	0
Rx Lease Unknown	0	Tx Lease Unknown	0
Rx Lease Active	0	Tx Lease Active	0
Rx Discarded Checksum Error	0		
Rx Discarded from Untrusted	0		

Parameter descriptions:

Server Statistics

Rx and Tx Discover : The number of discover (option 53 with value 1) packets received and transmitted.

Rx and Tx Offer : The number of offer (option 53 with value 2) packets received and transmitted.

Rx and Tx Request : The number of request (option 53 with value 3) packets received and transmitted.

Rx and Tx Decline: The number of decline (option 53 with value 4) packets received and transmitted.

Rx and Tx ACK: The number of ACK (option 53 with value 5) packets received and transmitted.

Rx and Tx NAK: The number of NAK (option 53 with value 6) packets received and transmitted.

Rx and Tx Release: The number of release (option 53 with value 7) packets received and transmitted.

Rx and Tx Inform: The number of inform (option 53 with value 8) packets received and transmitted.

Rx and Tx Lease Query: The number of lease query (option 53 with value 10) packets received and transmitted.

Rx and Tx Lease Unassigned: The number of lease unassigned (option 53 with value 11) packets received and transmitted.

Rx and Tx Lease Unknown: The number of lease unknown (option 53 with value 12) packets received and transmitted. Rx and Tx Lease Active

Rx and Tx Lease Active: The number of lease active (option 53 with value 13) packets received and transmitted.

Rx Discarded checksum error: The number of discard packet that IP/UDP checksum is error.

Rx Discarded from Untrusted: The number of discarded packet that are coming from untrusted port.

3-5 Security

3-5.1 Access Management Statistics

This section shows you a detailed statistics of the Access Management including HTTP, HTTPS, TELNET, and SSH.

Web Interface

To configure an Assess Management Statistics in the web interface:

1. Click Monitor, Security, Access Management Statistics.
2. Check "Auto-refresh".
3. Click "Refresh" to refresh the port detailed statistics or clear all information when you click "Clear".

Figure 3-5.1: Access Management Statistics page

The screenshot shows the web interface for SM24TAT2DPA. The main content area is titled "Access Management Statistics". Below the title, there is an "Auto-refresh" checkbox which is currently unchecked, followed by a blue circular refresh icon and a red square clear icon. Below these controls is a table with the following data:

Interface	Received Packets	Allowed Packets	Discarded Packets
HTTP	0	0	0
HTTPS	0	0	0
SNMP	0	0	0
TELNET	0	0	0
SSH	0	0	0

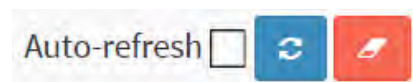
Parameter descriptions:

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

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

Allowed Packets : Number of allowed packets from the interface when access management mode is enabled

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



Buttons

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

Refresh: Click to refresh the page immediately.

Clear: Clears the counters for the selected port.

3-5.2 Network

3-5.2.1 Port Security

3-5.2.1.1 Switch

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

Web Interface

To configure a Port Security Switch Status Configuration in the web interface:

1. Click Monitor, Security, Network, Port Security, then Switch.
2. Check "Auto-refresh".
3. Click "Refresh" to refresh the port detailed statistics.

Figure 3-5.2.1.1: Port Security Switch Status page

The screenshot displays the 'Port Security Switch Status' page. At the top, there is a navigation breadcrumb: Home > Monitor > Security > Network > Port Security > Switch. The page title is 'Port Security Switch Status'. Below the title, there is an 'Auto-refresh' checkbox and a refresh icon. The main content is divided into two sections: 'User Module Legend' and 'Port Status'.

User Module Legend

User Module Name	Abbr
Limit Control	L
802.1X	8
Voice VLAN	V

Port Status

Port	Users	State	MAC Count	
			Current	Limit
1	---	Disabled	-	-
2	---	Disabled	-	-
3	---	Disabled	-	-
4	---	Disabled	-	-
5	---	Disabled	-	-
6	---	Disabled	-	-

Parameter descriptions:

User Module Legend : The legend shows all user modules that may request Port Security services.

User Module Name : The full name of a module that may request Port Security services.

Abbr : A one-letter abbreviation of the user module. This is used in the Users column in the port status table.

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

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

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

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

Disabled: No user modules are currently using the Port Security service.

Ready: The Port Security service is in use by at least one user module, and is awaiting frames from unknown MAC addresses to arrive.

Limit Reached: The Port Security service is enabled by at least the Limit Control user module, and that module has indicated that the limit is reached and no more MAC addresses should be taken in.

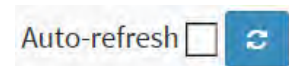
Shutdown: The Port Security service is enabled by at least the Limit Control user module, and that module has indicated that the limit is exceeded. No MAC addresses can be learned on the port until it is administratively re-opened on the Limit Control configuration Web-page.

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

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

If the Limit Control user module is not enabled on the port, the Limit column will show a dash (-).

Buttons



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

Refresh: Click to refresh the page immediately.

3-5.2.1.2 Port

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

Web Interface

To configure a Port Security Switch Status Configuration in the web interface:

1. Click Monitor, Security, Network, Port Security, and then Port.
2. Specify the Port which you want to monitor.
3. Check "Auto-refresh".
4. Click "Refresh" to refresh the port detailed statistics.

Figure 3-5.2.1.2: Port Security Port Status page

Parameter descriptions:

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

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

Time of Addition : Shows the date and time when this MAC address was first seen on the port.

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

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

Buttons



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

Refresh: Click to refresh the page immediately.

3-5.2.2 NAS

3-5.2.2.1 Switch

The section describes how to show the each port NAS status information of the switch. The status includes Admin State Port State, Last Source, Last ID, QoS Class, and Port VLAN ID.

Web Interface

To configure a NAS Switch Status Configuration in the web interface:

1. Click Monitor, Security, Network, NAS, Port.
2. Check "Auto-refresh".
3. Click "Refresh" to refresh the port detailed statistics.

Figure 3-5.2.2.1: Network Access Server Switch Status page

Port	Admin State	Port State	Last Source	Last ID	QoS Class	Port VLAN ID
1	Force Authorized	Authorized			-	
2	Force Authorized	Link Down			-	
3	Force Authorized	Link Down			-	
4	Force Authorized	Link Down			-	
5	Force Authorized	Link Down			-	
6	Force Authorized	Link Down			-	
7	Force Authorized	Link Down			-	
8	Force Authorized	Link Down			-	
9	Force Authorized	Link Down			-	
10	Force Authorized	Link Down			-	
11	Force Authorized	Link Down			-	

Parameter descriptions:

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

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

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

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

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

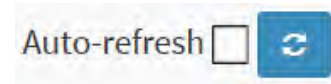
QoS Class : QoS Class assigned to the port by the RADIUS server if enabled.

Port VLAN ID : The VLAN ID that NAS has put the port in. The field is blank, if the Port VLAN ID is not overridden by NAS.

If the VLAN ID is assigned by the RADIUS server, "(RADIUS-assigned)" is appended to the VLAN ID. Read more about RADIUS-assigned VLANs here.

If the port is moved to the Guest VLAN, "(Guest)" is appended to the VLAN ID. Read more about Guest VLANs here.

Buttons



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

Refresh: Click to refresh the page immediately.

3-5.2.2.2 Port

The section describes how to provide detailed NAS statistics for a specific switch port running EAPOL-based IEEE 802.1X authentication. For MAC-based ports, it shows selected backend server (RADIUS Authentication Server) statistics, only.

Web Interface

To configure a NAS Port Status Configuration in the web interface:

1. Click Monitor, Security, Network, NAS, and then Port.
2. Check "Auto-refresh".
3. Click "Refresh" to refresh the port detailed statistics.

Figure 3-5.2.2.2: NAS Statistics page

The screenshot shows the 'NAS Statistics Port 1' page in the Transition Networks web interface. The page has a navigation menu on the left with 'Security' > 'Network' > 'NAS' > 'Port' selected. The main content area includes an 'Auto-refresh' checkbox, a 'Clear' button, and a dropdown menu for 'Port 1'. Below this, there are sections for 'Port State' (Admin State: Force Authorized, Port State: Authorized) and 'Port Counters' (Receive EAPOL Counters and Transmit EAPOL Counters).

Receive EAPOL Counters		Transmit EAPOL Counters	
Total	0	Total	1
Response ID	0	Request ID	0
Responses	0	Requests	0
Start	0		
Logoff	0		

Parameter descriptions:

Port State

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

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

QoS Class : The QoS class assigned by the RADIUS server. The field is blank if no QoS class is assigned.

Port VLAN ID : The VLAN ID that NAS has put the port in. The field is blank, if the Port VLAN ID is not overridden by NAS.

If the VLAN ID is assigned by the RADIUS server, "(RADIUS-assigned)" is appended to the VLAN ID. Read more about RADIUS-assigned VLANs here.

If the port is moved to the Guest VLAN, "(Guest)" is appended to the VLAN ID. Read more about Guest VLANs here.

Port Counters

EAPOL Counters : These supplicant frame counters are available for the following administrative states:

- Force Authorized
- Force Unauthorized
- Port-based 802.1X
- Single 802.1X
- Multi 802.1X

Backend Server Counters : These backend (RADIUS) frame counters are available for the following administrative states:

- Port-based 802.1X
- Single 802.1X
- Multi 802.1X
- MAC-based Auth.

Last Supplicant/Client Info : Information about the last supplicant/client that attempted to authenticate. This information is available for the following administrative states:

- Port-based 802.1X
- Single 802.1X
- Multi 802.1X
- MAC-based Auth.

Selected Counters

Selected Counters : The Selected Counters table is visible when the port is in one of the following administrative states:

- Multi 802.1X
- MAC-based Auth.

The table is identical to and is placed next to the Port Counters table, and will be empty if no MAC address is currently selected. To populate the table, select one of the attached MAC Addresses from the table below.

Attached MAC Addresses

Identity : Shows the identity of the supplicant, as received in the Response Identity EAPOL frame. Clicking the link causes the supplicant's EAPOL and Backend Server counters to be shown in the Selected Counters table. If no supplicants are attached, it shows No supplicants attached.

This column is not available for MAC-based Auth.

MAC Address : For Multi 802.1X, this column holds the MAC address of the attached supplicant. For MAC-based Auth., this column holds the MAC address of the attached client.

Clicking the link causes the client's Backend Server counters to be shown in the Selected Counters table. If no clients are attached, it shows No clients attached.

VLAN ID : This column holds the VLAN ID that the corresponding client is currently secured through the Port Security module.

State : The client can either be authenticated or unauthenticated. In the authenticated state, it is allowed to forward frames on the port, and in the unauthenticated state, it is blocked. As long as the backend server hasn't successfully authenticated the client, it is unauthenticated. If an authentication fails for one or the other reason, the client will remain in the unauthenticated state for Hold Time seconds.

Last Authentication : Shows the date and time of the last authentication of the client (successful as well as unsuccessful).

Port 1 ▾ Auto-refresh Refresh

Buttons

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

Refresh: Click to refresh the page immediately.

Clear: This button is available in the following modes:

- Force Authorized
- Force Unauthorized
- Port-based 802.1X
- Single 802.1X

Clear All: Click to clear the counters for the selected port. This button is available in these modes:

- Multi 802.1X
- MAC-based Auth.X

Clear This: Click to clear both the port counters and all of the attached client's counters. The "Last Client" will not be cleared, however. This button is available in these modes:

- Multi 802.1X
- MAC-based Auth.X

Click to clear only the currently selected client's counters.

3-5.2.3 ACL Status

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

Web Interface

To display the ACL status in the web interface:

1. Click Monitor, Security, Network, and then ACL Status.
2. To auto-refresh the information check the "Auto-refresh" checkbox.
3. Click "Refresh" to refresh the ACL Status.

Figure 3-5.2.3: ACL Status page

User	Ingress Port	Frame Type	Action	Rate Limiter	Port Redirect	Mirror	CPU	CPU Once	Counter	Conflict
DMS mDNS	All	IPv4/UDP 5353	Permit	Disabled	Disabled	Disabled	Yes	No	0	No
DMS Onvif	All	IPv4/UDP 10100	Permit	Disabled	Disabled	Disabled	Yes	No	0	No
DMS SSDP	All	IPv4/UDP 1900	Permit	Disabled	Disabled	Disabled	Yes	No	0	No
DMS CLIENT	All	IPv4/UDP 10012	Permit	Disabled	Disabled	Disabled	Yes	No	0	No
DHCP	All	IPv4/UDP 67 DHCP Client	Deny	Disabled	Disabled	Disabled	Yes	No	0	No
DHCP	All	IPv4/UDP 68 DHCP Server	Deny	Disabled	Disabled	Disabled	Yes	No	0	No
ARP Inspection	All	ARP	Deny	Disabled	Disabled	Disabled	Yes	No	1649	No

Parameter descriptions:

User : Indicates the ACL user. (e.g., DMS mDNS, DMS Onvif, DMS SSDP, DMS CLIENT, DHCP, ARP Inspection). Onvif is Open Network Video Interface Forum.

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

All: The ACE will match any ingress port.

Port: The ACE will match a specific ingress port.

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

Any: The ACE will match any frame type.

EType: The ACE will match Ethernet Type frames. Note that an Ethernet Type based ACE will not get matched by IP and ARP frames.

ARP: The ACE will match ARP/RARP frames.

IPv4: The ACE will match all IPv4 frames.

IPv4: The ACE will match all IPv4 frames.

IPv4/ICMP: The ACE will match IPv4 frames with ICMP protocol.

IPv4/UDP: The ACE will match IPv4 frames with UDP protocol.

IPv4/TCP: The ACE will match IPv4 frames with TCP protocol.

IPv4/Other: The ACE will match IPv4 frames, which are not ICMP / UDP / TCP.

IPv6: The ACE will match all IPv6 standard frames.

Action : Indicates the forwarding action of the ACE.

Permit: Frames matching the ACE may be forwarded and learned.

Deny: Frames matching the ACE are dropped.

Filter: Frames matching the ACE are filtered.

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

Port Redirect : Indicates the port copy operation of the ACE. Frames matching the ACE are copied to the port number. The allowed values are Disabled or a specific port number. When Disabled is displayed, the port copy operation is disabled.

CPU : Forward packet that matched the specific ACE to CPU.

CPU Once : Forward first packet that matched the specific ACE to CPU.

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

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


Auto-refresh  Combined 

Buttons

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

Refresh: Click to refresh the page immediately.

The select box determines which ACL user's statistics are displayed on this page.

Combined 

- Combined
- Static
- IP Source Guard
- IPMC
- ARP Inspection
- UPnP
- DHCP
- Loop Protect
- DMS CLIENT
- DMS Server
- DMS SSDP
- DMS Onvif
- DMS mDNS
- Conflict

3-5.2.4 ARP Inspection

The section describes how to configure the Dynamic ARP Inspection Table parameters of the switch. The Dynamic ARP Inspection Table contains up to 1024 entries, and is sorted first by port, then by VLAN ID, then by MAC address, and then by IP address.

Web Interface

To configure a Dynamic ARP Inspection Table Configuration in the web interface:

1. Click Monitor, Security, Network, ARP Inspection.
2. Check "Auto-refresh".
3. Click "Refresh" to refresh the port detailed statistics.
4. Specify the Start from port, VLAN ID, MAC Address, IP Address, and entries per page.

Figure 3-5.2.4: Dynamic ARP Inspection Table page

Parameter descriptions:

Navigating the ARP Inspection Table:

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

The "Start from port address", "VLAN", "MAC address" and "IP address" input fields lets you select the starting point in the Dynamic ARP Inspection Table. Clicking the button will update the displayed table starting from that or the closest next Dynamic ARP Inspection Table match. In addition, the two input fields will - upon a First entry button click - assume the value of the first displayed entry, allowing for continuous refresh with the same start address.

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

Port : Switch Port Number for which the entries are displayed.

VLAN ID : VLAN-ID in which the ARP traffic is permitted.

MAC Address : User MAC address of the entry.

IP Address : User IP address of the entry.

Buttons

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

Refresh: Click to refresh the page immediately.

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

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

3-5.2.5 IP Source Guard

Entries in the Dynamic IP Source Guard Table are shown on this page. The Dynamic IP Source Guard Table is sorted first by port, then by VLAN ID, then by IP address, and then by MAC address.

Web Interface

To configure a Dynamic IP Source Guard Table Configuration in the web interface:

1. Click Monitor, Security, Network, IP Source Guard.
2. Check "Auto-refresh".
3. Click "Refresh" to refresh the port detailed statistics.
4. Specify the Start from port, VLAN ID, IP Address, and entries per page.

Figure 3-5.2.5: Dynamic IP Source Guard Table page

Parameter descriptions:

Port : Switch Port Number for which the entries are displayed.

VLAN ID : VLAN-ID in which the IP traffic is permitted.

IP Address : User IP address of the entry.

MAC Address : Source MAC address.

Buttons

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

Refresh: Click to refresh the page immediately.

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

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

3-5.3 AAA

3-5.3.1 RADIUS Overview

This section shows you an overview of the RADIUS Authentication and Accounting servers' status to ensure the function is workable.

Web Interface

To configure a RADIUS Overview Configuration in the web interface:

1. Click Monitor, Security, AAA, RADIUS Overview.
2. Check "Auto-refresh".
3. Click "Refresh" to refresh the port detailed statistics.

Figure 3-5.3.1: RADIUS Server Status Overview page

RADIUS Authentication Server Status Overview		
#	IP Address	Status
1	0.0.0.0:0	Disabled
2	0.0.0.0:0	Disabled
3	0.0.0.0:0	Disabled
4	0.0.0.0:0	Disabled
5	0.0.0.0:0	Disabled

RADIUS Accounting Server Status Overview		
#	IP Address	Status
1	0.0.0.0:0	Disabled
2	0.0.0.0:0	Disabled
3	0.0.0.0:0	Disabled
4	0.0.0.0:0	Disabled
5	0.0.0.0:0	Disabled

Parameter descriptions: for the RADIUS Authentication Server and the Accounting Server:

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

IP Address : The IP address and UDP port number (in <IP Address>:<UDP Port> notation) of this server.

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

Disabled: The server is disabled.

Not Ready: The server is enabled, but IP communication is not yet up and running.

Ready: The server is enabled, IP communication is up and running, and the RADIUS module is ready to accept access attempts.

Dead (X seconds left): Access attempts were made to this server, but it did not reply within the configured timeout. The server has temporarily been disabled, but will get re-enabled when the dead-time expires. The number of seconds left before this occurs is displayed in parentheses. This state is only reachable when more than one server is enabled.

3-5.3.2 RADIUS Details

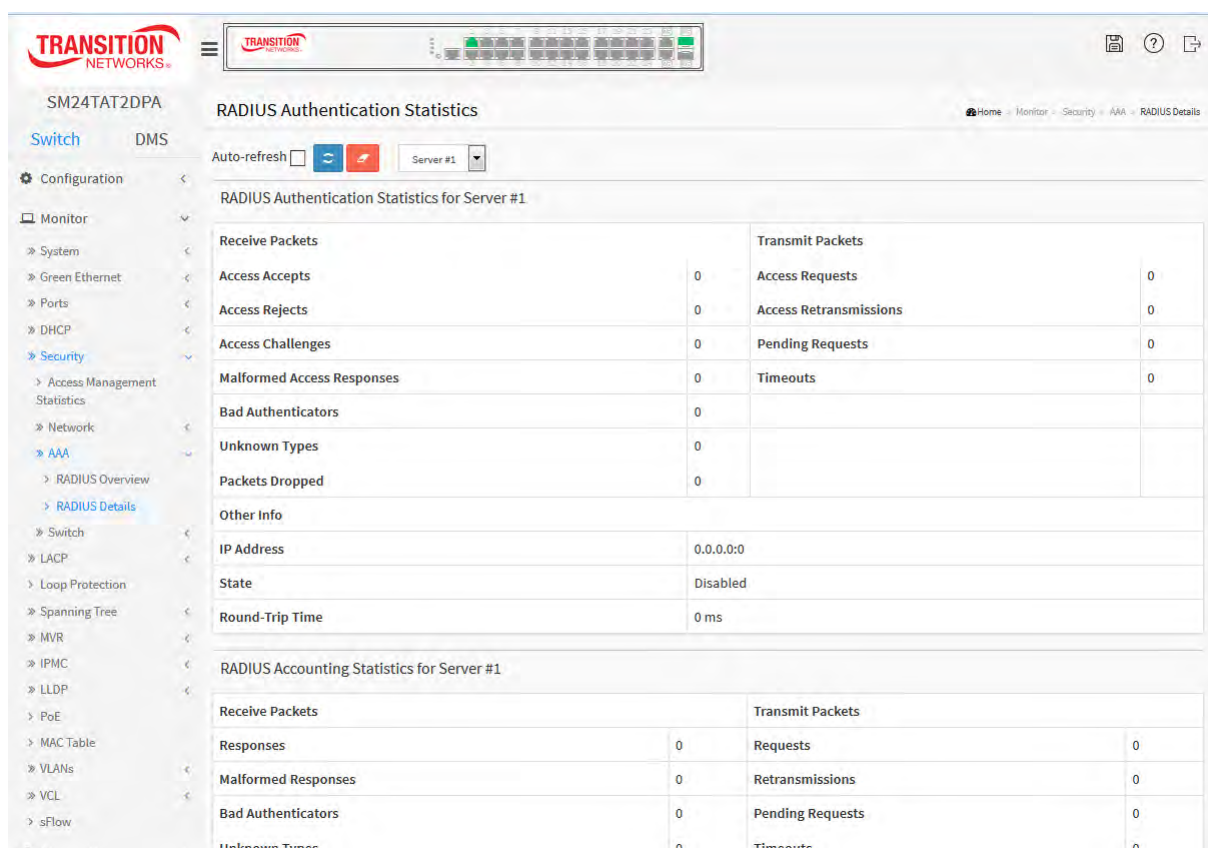
This section shows you a detailed statistics for a particular RADIUS server. These statistics map closely to those specified in [RFC4668 - RADIUS Authentication Client MIB](#). Use the server select box to switch between the backend servers to show details for.

Web Interface

To display RADIUS Details Configuration in the web interface:

1. Specify the Server # to check.
2. Click Monitor, Security, AAA, RADIUS Overview.
3. Check "Auto-refresh".
4. Click "Refresh" to refresh the port detailed statistics or clear all information when you click "Clear".

Figure 3-5.3.2: RADIUS Authentication Statistics page



Parameter descriptions:

RADIUS Authentication Statistics

The statistics map closely to those specified in RFC4668 - RADIUS Authentication Client MIB. Use the server select box to switch between the backend servers to show details for.

Packet Counters

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

Direction	Name	RFC4668 Name	Description
Rx	Access Accepts	radiusAuthClientExtAccessAccepts	The number of RADIUS Access-Accept packets (valid or invalid) received from the server.
Rx	Access Rejects	radiusAuthClientExtAccessRejects	The number of RADIUS Access-Reject packets (valid or invalid) received from the server.
Rx	Access Challenges	radiusAuthClientExtAccessChallenges	The number of RADIUS Access-Challenge packets (valid or invalid) received from the server.
Rx	Malformed Access Responses	radiusAuthClientExtMalformedAccessResponses	The number of malformed RADIUS Access-Response packets received from the server. Malformed packets include packets with an invalid length. Bad authenticators or Message Authenticator attributes or unknown types are not included as malformed access responses.
Rx	Bad Authenticators	radiusAuthClientExtBadAuthenticators	The number of RADIUS Access-Response packets containing invalid authenticators or Message Authenticator attributes received from the server.
Rx	Unknown Types	radiusAuthClientExtUnknownTypes	The number of RADIUS packets that were received with unknown types from the server on the authentication port and dropped.
Rx	Packets Dropped	radiusAuthClientExtPacketsDropped	The number of RADIUS packets that were received from the server on the authentication port and dropped for some other reason.
Tx	Access Requests	radiusAuthClientExtAccessRequests	The number of RADIUS Access-Request packets sent to the server. This does not include retransmissions.
Tx	Access Retransmissions	radiusAuthClientExtAccessRetransmissions	The number of RADIUS Access-Request packets retransmitted to the RADIUS authentication server.
Tx	Pending Requests	radiusAuthClientExtPendingRequests	The number of RADIUS Access-Request packets destined for the server that have not yet timed out or received a response. This variable is incremented when an Access-Request is sent and decremented due to receipt of an Access-Accept, Access-Reject, Access-Challenge, timeout, or retransmission.
Tx	Timeouts	radiusAuthClientExtTimeouts	The number of authentication timeouts to the server. After a timeout, the client may retry to the same server, send to a different server, or give up. A retry to the same server is counted as a retransmit as well as a timeout. A send to a different server is counted as a Request as well as a timeout.

Other Info

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

Name	RFC4668 Name	Description
IP Address	-	IP address and UDP port for the authentication server in question.
State	-	Shows the state of the server. It takes one of the following values: Disabled: The selected server is disabled. Not Ready: The server is enabled, but IP communication is not yet up and running. Ready: The server is enabled, IP communication is up and running, and the RADIUS module is ready to accept access attempts. Dead (X seconds left): Access attempts were made to this server, but it did not reply within the configured timeout. The server has temporarily been disabled, but will get re-enabled when the dead-time expires. The number of seconds left before this occurs is displayed in parentheses. This state is only reachable when more than one server is enabled.
Round-Trip Time	radiusAuthClientExtRoundTripTime	The time interval (measured in milliseconds) between the most recent Access-Reply/Access-Challenge and the Access-Request that matched it from the RADIUS authentication server. The granularity of this measurement is 100 ms. A value of 0 ms indicates that there hasn't been round-trip communication with the server yet.

RADIUS Accounting Statistics

The statistics map closely to those specified in RFC4670 - RADIUS Accounting Client MIB. Use the server select box to switch between the backend servers to show details for.

Packet Counters

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

Direction	Name	RFC4670 Name	Description
Rx	Responses	radiusAccClientExtResponses	The number of RADIUS packets (valid or invalid) received from the server.
Rx	Malformed Responses	radiusAccClientExtMalformedResponses	The number of malformed RADIUS packets received from the server. Malformed packets include packets with an invalid length. Bad authenticators or unknown types are not included as malformed access responses.
Rx	Bad Authenticators	radiusAcctClientExtBadAuthenticators	The number of RADIUS packets containing invalid authenticators received from the server.
Rx	Unknown Types	radiusAccClientExtUnknownTypes	The number of RADIUS packets of unknown types that were received from the server on the accounting

			port.
Rx	Packets Dropped	radiusAccClientExtPacketsDropped	The number of RADIUS packets that were received from the server on the accounting port and dropped for some other reason.
Tx	Requests	radiusAccClientExtRequests	The number of RADIUS packets sent to the server. This does not include retransmissions.
Tx	Retransmissions	radiusAccClientExtRetransmissions	The number of RADIUS packets retransmitted to the RADIUS accounting server.
Tx	Pending Requests	radiusAccClientExtPendingRequests	The number of RADIUS packets destined for the server that have not yet timed out or received a response. This variable is incremented when a Request is sent and decremented due to receipt of a Response, timeout, or retransmission.
Tx	Timeouts	radiusAccClientExtTimeouts	The number of accounting timeouts to the server. After a timeout, the client may retry to the same server, send to a different server, or give up. A retry to the same server is counted as a retransmit as well as a timeout. A send to a different server is counted as a Request as well as a timeout.

Other Info

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

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

Buttons:

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

Refresh - Click to refresh the page immediately.

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

3-5.4 Switch

3-5.4.1 RMON

3-5.4.1.1 Statistics

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

The "Start from Control Index" lets you select the starting point in the Statistics table. Clicking the button will update the displayed table starting from that or the next closest Statistics table match.

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

Web Interface

To display an RMON Statistics in the web interface:

1. Click Monitor, Security, Switch, RMON, Statistics.
2. Specify "Start from Control Index" and "entries per page".
3. Check "Auto-refresh".
4. Click "Refresh" to refresh the port detailed statistics.

Figure 3-5.4.1.1: RMON Statistics Status Overview page

Data Source ID (ifIndex)	Drop	Octets	Pkts	Broadcast	Multicast	CRC Errors	Under-size	Over-size	Frag.	Jabb.	Coll.	64 Bytes	65 ~ 127	128 ~ 255	256 ~ 511	512 ~ 1023	1024 ~ 1588
No more entries																	

Parameter descriptions:

ID : Indicates the index of Statistics entry.

Data Source(if Index) : The port ID which wants to be monitored.

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

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

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

Broad-cast : The total number of good packets received that were directed to the broadcast address.

Multi-cast : The total number of good packets received that were directed to a multicast address.

CRC Errors : The total number of packets received that had a length (excluding framing bits, but including FCS octets) of between 64 and 1518 octets, inclusive, but had either a bad Frame Check Sequence (FCS) with an integral number of octets (FCS Error) or a bad FCS with a non-integral number of octets (Alignment Error).

Under-size : The total number of packets received that were less than 64 octets.

Over-size : The total number of packets received that were longer than 1518 octets.

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

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

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

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

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

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

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

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

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

Buttons



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

Refresh: Click to refresh the page immediately.

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

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

3-5.4.1.2 History

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

The "Start from History Index and Sample Index" lets you select the starting point in the History table.

The "Start from History Index and Sample Index" lets you select the starting point in the History table. Clicking the First Entry button will update the displayed table starting from that or the next closest History table match.

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

Web Interface

To monitor an RMON history Configuration in the web interface:

1. ClickMonitor, Security, Switch, RMON, History.
2. Specify "Start from Control index" and "Sample Index".
3. Check "Auto-refresh".
4. Click "Refresh" to refresh the port detailed statistics or clear all information when you click "Clear".

Figure 3-5.4.1.2: RMON History Overview page

History Index	Sample Index	Sample Start	Drop	Octets	Pkts	Broadcast	Multicast	CRC Errors	Under-size	Over-size	Frag.	Jabb.	Coll.	Utilization
No more entries														

Parameter descriptions:

History Index : Indicates the index of History control entry.

Sample Index : Indicates the index of the data entry associated with the control entry.

Sample Start : The value of sysUpTime at the start of the interval over which this sample was measured.

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

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

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

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

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

CRC Errors : The total number of packets received that had a length (excluding framing bits, but including FCS octets) of between 64 and 1518 octets, inclusive, but had either a bad Frame Check Sequence (FCS) with an integral number of octets (FCS Error) or a bad FCS with a non-integral number of octets (Alignment Error).

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

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

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

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

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

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

Buttons



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

Refresh: Click to refresh the page immediately.

<< : Updates the table starting from the first entry in the History table, i.e., the entry with the lowest History Index and Sample Index

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

3-5.4.1.3 Alarm

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

The "Start from Control Index" lets you select the starting point in the Alarm table.

Clicking the First Entry button will update the displayed table starting from that or the next closest Alarm table match.

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

Web Interface

To monitor an RMON Alarm Overview in the web interface:

1. Click Monitor, Security, Switch, RMON, Alarm.
2. Check "Auto-refresh".
3. Click "Refresh" to refresh the port detailed statistics.

Figure 3-5.4.1.3: RMON Alarm Overview page

ID	Interval	Variable	Sample Type	Value	Startup Alarm	Rising Threshold	Rising Index	Falling Threshold	Falling Index
No more entries									

Parameter descriptions:

ID : Indicates the index of Alarm control entry.

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

Variable : Indicates the particular variable to be sampled

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

Value : The value of the statistic during the last sampling period.

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

Rising Threshold : Rising threshold value.

Rising Index : Rising event index.

Falling Threshold : Falling threshold value.

Falling Index : Falling event index.

**Buttons**

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

Refresh: Click to refresh the page immediately.

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

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

3-5.4.1.4 Event

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

The "Start from Control Index and Sample Index" lets you select the starting point in the Event table. Clicking the First Entry button will update the displayed table starting from that or the next closest Event table match.

The Last Entry button will use the last entry of the currently displayed entry as a basis for the next lookup. When the end is reached the text "*No more entries*" is shown in the displayed table. Use the Refresh button to start over.

Web Interface

To monitor an RMON Event Overview in the web interface:

1. Click Monitor, Security, Switch, RMON, Event.
2. Check "Auto-refresh".
3. Click " Refresh" to refresh the port detailed statistics
4. Specify Port which wants to check.

Figure 3-5.4.1.4: RMON Event Overview page

Parameter descriptions:

Event Index : Indicates the index of the event entry.

Log Index : Indicates the index of the log entry.

LogTime : Indicates Event log time

LogDescription : Indicates the Event description.

Buttons

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

Refresh: Click to refresh the page immediately.

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

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

3-6 LACP

3-6.1 System Status

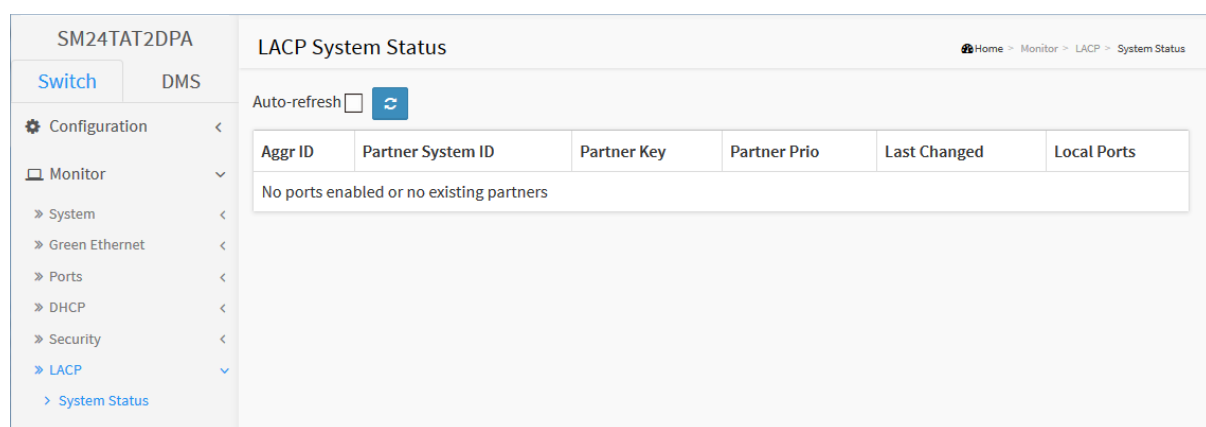
This section describes that when you complete to set LACP function on the switch then it provides a status overview for all LACP instances.

Web Interface

To display the LACP System status in the web interface:

1. Click Monitor, LACP, System Status
2. Check "Auto-refresh".
3. Click "Refresh" to refresh the port detailed statistics.

Figure 3-6.1 LACP System Status page



Parameter descriptions:

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

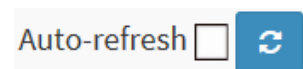
Partner System ID : The system ID (MAC address) of the aggregation partner.

Partner Key : The Key that the partner has assigned to this aggregation ID.

Last changed : The time since this aggregation changed.

Local Ports : Shows which ports are a part of this aggregation for this switch. The format is: "Switch ID:Port".

Buttons



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

Refresh: Click to refresh the page immediately.

3-6.2 Port Status

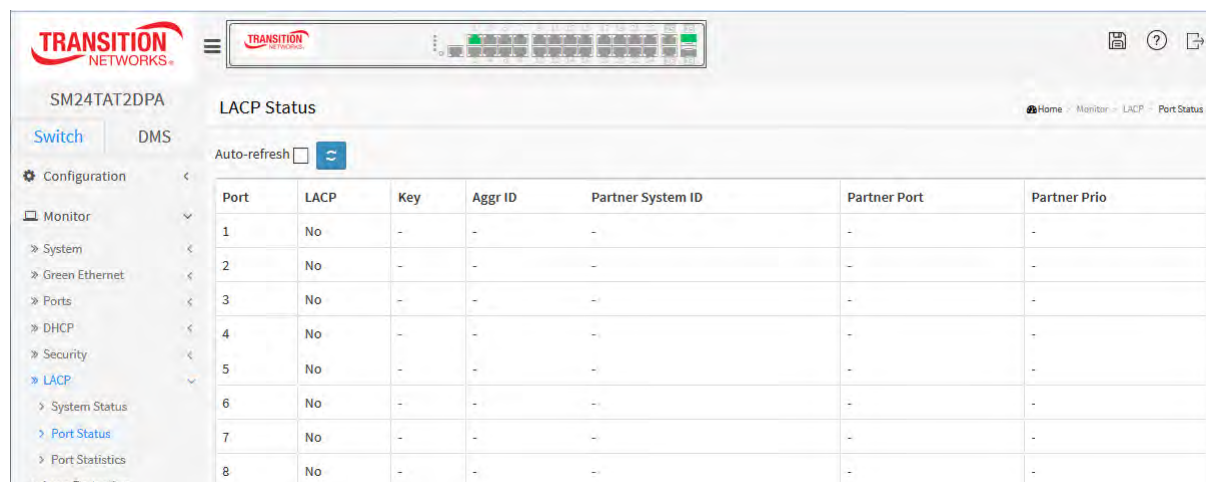
This section describes that when you complete to set LACP function on the switch then it provides a Port Status overview for all LACP instances

Web Interface

To display the LACP Port status in the web interface:

1. Click Monitor, LACP, Port Status.
2. To auto-refresh the information check the "Auto-refresh" checkbox.
3. Click "Refresh" to refresh the LACP Port Status.

Figure 3-6.2: LACP Status page



Port	LACP	Key	Aggr ID	Partner System ID	Partner Port	Partner Prio
1	No	-	-	-	-	-
2	No	-	-	-	-	-
3	No	-	-	-	-	-
4	No	-	-	-	-	-
5	No	-	-	-	-	-
6	No	-	-	-	-	-
7	No	-	-	-	-	-
8	No	-	-	-	-	-

Parameter descriptions:

Port : The switch port number.

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

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

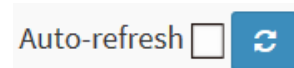
Aggr ID : The Aggregation ID assigned to this aggregation group. IDs 1 and 2 are GLAGs while IDs 3-14 are LLAGs.

Partner System ID : The partner's System ID (MAC address).

Partner Port : The partner's port number connected to this port.

Partner Prio: The partner's port priority.

Buttons



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

Refresh: Click to refresh the page immediately.

3-6.3 Port Statistics

This section describes that when you complete to set LACP function on the switch then it provides a Port Statistics overview for all LACP instances

Web Interface

To display the LACP Port status in the web interface:

1. Click Monitor, LACP, Port Statistics
2. To auto-refresh the information check the "Auto refresh" checkbox.
3. Click "Refresh" to refresh the LACP Statistics.

Figure 3-6.3: LACP Statistics page

Port	LACP Received	LACP Transmitted	Discarded	
			Unknown	Illegal
1	0	0	0	0
2	0	0	0	0
3	0	0	0	0
4	0	0	0	0
5	0	0	0	0
6	0	0	0	0
7	0	0	0	0
8	0	0	0	0
9	0	0	0	0
10	0	0	0	0

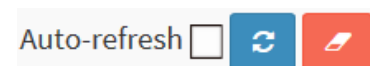
Parameter descriptions:

Port : The switch port number.

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

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

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



Buttons

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

Clear: Clears the counters for the selected port.

Refresh: Click to refresh the page immediately.

3-7 Loop Protection

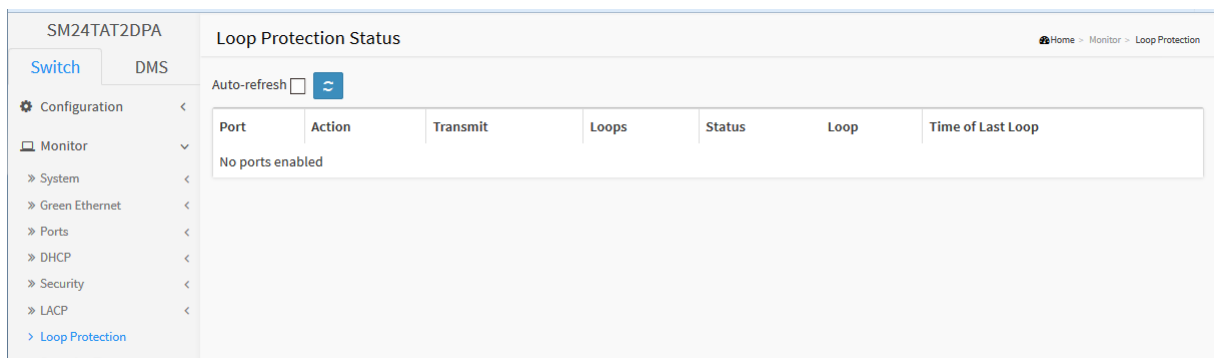
This section displays the loop protection port status for the ports of the switch.

Web Interface

To display the Loop Protection status in the web interface:

1. Click Monitor, Loop Protection.
2. To auto-refresh the information check the "Auto refresh" checkbox.
3. Click "Refresh" to refresh the LACP Statistics.

Figure 3-7: Loop Protection Status page



Parameter descriptions:

Port : The switch port number of the logical port.

Action : The currently configured port action.

Transmit : The currently configured port transmit mode.

Loops : The number of loops detected on this port.

Status : The current loop protection status of the port.

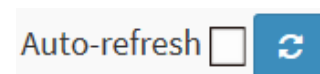
Loop : Whether a loop is currently detected on the port.

Time of Last Loop : The time of the last loop event detected.

Buttons

Refresh: Click to refresh the page immediately.

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



3-8 Spanning Tree

3-8.1 Bridge Status

After you complete the MSTI Port configuration then you could to ask the switch display the Bridge Status. The Section provides a status overview of all STP bridge instances. The displayed table contains a row for each STP bridge instance, where the column displays the following information:

Web Interface

To display the STP Bridges status in the web interface:

1. Click Monitor, Spanning Tree, STP Bridges
2. Click "Refresh" to refresh the STP Bridges.
3. Click "CIST" to next page "STP Detailed Bridge Status".

Figure 3-8.1: STP Bridges status page

MSTI	Bridge ID	Root			Topology Flag	Topology Change Last
		ID	Port	Cost		
CIST	32768.00-40-C7-B9-20-B2	32768.00-40-C7-B9-20-B2	-	0	Steady	0d 00:20:46

Parameter descriptions:

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

Bridge ID : The Bridge ID of this Bridge instance.

Root ID : The Bridge ID of the currently elected root bridge.

Root Port : The switch port currently assigned the root port role.

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

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

Topology Change Last : The time since last Topology Change occurred.

Buttons

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

Refresh: Click to refresh the page immediately.

3-8.2 Port Status

After you complete the STP configuration then you could to ask the switch display the STP Port Status. The Section provides you to ask switch to display the STP CIST port status for physical ports of the currently selected switch.

Web Interface

To display the STP Port status in the web interface:

1. Click Monitor, Spanning Tree, STP Port Status
2. To auto-refresh the information check the "Auto-refresh" checkbox..
3. Click "Refresh" to refresh the STP Bridges.

Figure 3-8.2: STP Port Status page

Port	CIST Role	CIST State	Uptime
1	DesignatedPort	Forwarding	3d 03:44:51
2	Disabled	Discarding	-
3	Disabled	Discarding	-
4	Disabled	Discarding	-
5	Disabled	Discarding	-
6	Disabled	Discarding	-
7	Disabled	Discarding	-
8	Disabled	Discarding	-
9	Disabled	Discarding	-
10	Disabled	Discarding	-

Parameter descriptions:

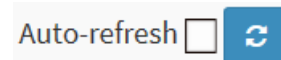
Port : The switch port number of the logical STP port.

CIST Role : The current STP port role of the CIST port. The port role can be one of the following values: AlternatePort, Backup Port, RootPort, DesignatedPort Disabled.

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

Uptime : The time since the bridge port was last initialized.

Buttons



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

Refresh: Click to refresh the page immediately.

3-8.3 Port Statistics

After you complete the STP configuration then you could to let the switch display the STP Statistics. The Section provides you to ask switch to display the STP Statistics detail counters of bridge ports in the currently selected switch.

Web Interface

To display the STP Port status in the web interface:

1. Click Monitor, Spanning Tree, Port Statistics
2. To auto-refresh the information check the "Auto-refresh" checkbox..
3. Click "Refresh" to refresh the STP Bridges.

Figure 3-8.3: STP Statistics page

Port	Transmitted				Received				Discarded	
	MSTP	RSTP	STP	TCN	MSTP	RSTP	STP	TCN	Unknown	Illegal
1	131447	0	0	0	0	0	0	0	0	0
25	635	0	0	0	4	0	0	0	0	0

Parameter descriptions:

Port : The switch port number of the logical STP port.

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

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

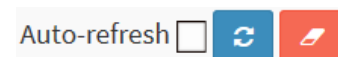
STP : The number of legacy STP Configuration BPDU's received/transmitted on the port.

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

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

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

Buttons



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

Clear: Clears the counters for the selected port.

Refresh: Click to refresh the page immediately.

3-9 MVR

3-9.1 Statistics

The section describes the switch will display the MVR detail Statistics after you had configured MVR on the switch. It provides the detail MVR Statistics Information

Web Interface

To display the MVR Statistics Information in the web interface:

1. Click Monitor, MVR, Statistics
2. To auto-refresh the information check the "Auto-refresh" checkbox..
3. To click the "Refresh" to refresh an entry of the MVR Statistics Information.

Figure 3-9.1: MVR Statistics page

The screenshot shows the 'MVR Statistics' page. On the left is a navigation menu with 'MVR' selected. The main area has an 'Auto-refresh' checkbox, a refresh button, and a table with the following columns: VLAN ID, IGMP/MLD Queries Received, IGMP/MLD Queries Transmitted, IGMPv1 Joins Received, IGMPv2/MLDv1 Reports Received, IGMPv3/MLDv2 Reports Received, and IGMPv2/MLDv1 Leaves Received. The table content is 'No more entries'.

Parameter descriptions:

VLAN ID : The Multicast VLAN ID.

IGMP/MLD Queries Received : The number of Received Queries for IGMP and MLD, respectively.

IGMP/MLD Queries Transmitted : The number of Transmitted Queries for IGMP and MLD, respectively.

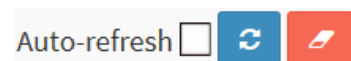
IGMPv1 Joins Received : The number of Received IGMPv1 Join's.

IGMPv2/MLDv1 Report's Received : The number of Received IGMPv2 Join's and MLDv1 Report's, respectively.

IGMPv3/MLDv2 Report's Received : The number of Received IGMPv1 Join's and MLDv2 Report's, respectively.

IGMPv2/MLDv1 Leave's Received : The number of Received IGMPv2 Leave's and MLDv1 Done's, respectively.

Buttons



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

Clear: Clears the counters for the selected port.

Refresh: Click to refresh the page immediately.

3-9.2 MVR Channels Groups

The section describes user could display the MVR Groups detail information on the switch. Entries in the MVR Group Table are shown on this page. The MVR Group Table is sorted first by VLAN ID, and then by group

Web Interface

To display the MVR Groups Information in the web interface:

1. Click Monitor, MVR, Groups Information
2. To auto-refresh the information check the "Auto-refresh" checkbox..
3. To click the "Refresh" to refresh an entry of the MVR Groups Information.
4. Click "<< or >>" to move to previous or next entry.

Figure 3-9.2: MVR Channels (Groups) Information page

The screenshot shows the web interface for 'MVR Channels (Groups) Information'. The left sidebar contains a navigation menu with 'MVR' expanded to show 'MVR Channel Groups'. The main content area has a header 'MVR Channels (Groups) Information' and a breadcrumb 'Home > Monitor > MVR > MVR Channel Groups'. Below the header are controls: 'Auto-refresh' checkbox, navigation buttons (first, previous, next, last), and input fields for 'Start from VLAN' (value 1) and 'and Group Address' (value ::), with a '20 entries per page.' label. A table titled 'Port Members' has columns for 'VLAN ID' and 'Groups', and 26 numbered columns for ports. The table content is 'No more entries'.

Parameter descriptions:

Navigating the MVR Channels (Groups) Information Table

Each page shows up to 99 entries from the MVR Group table, default being 20, selected through the "entries per page" input field. When first visited, the web page will show the first 20 entries from the beginning of the MVR Channels (Groups) Information Table.

The "Start from VLAN", and "Group Address" input fields lets you select the starting point in the MVR Channels (Groups) Information Table. Clicking the button will update the displayed table starting from that or the closest next MVR Channels (Groups) Information Table match. In addition, the two input fields will - upon a First entry button click - assume the value of the first displayed entry, allowing for continuous refresh with the same start address.

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

VLAN ID : VLAN ID of the group.

Groups : Group ID of the group displayed.

Port Members : Ports under this group.



Buttons

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

Refresh: Click to refresh the page immediately.

<<: Updates the system log entries to the first available entry ID

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

3-9.3 MVR SFM Information

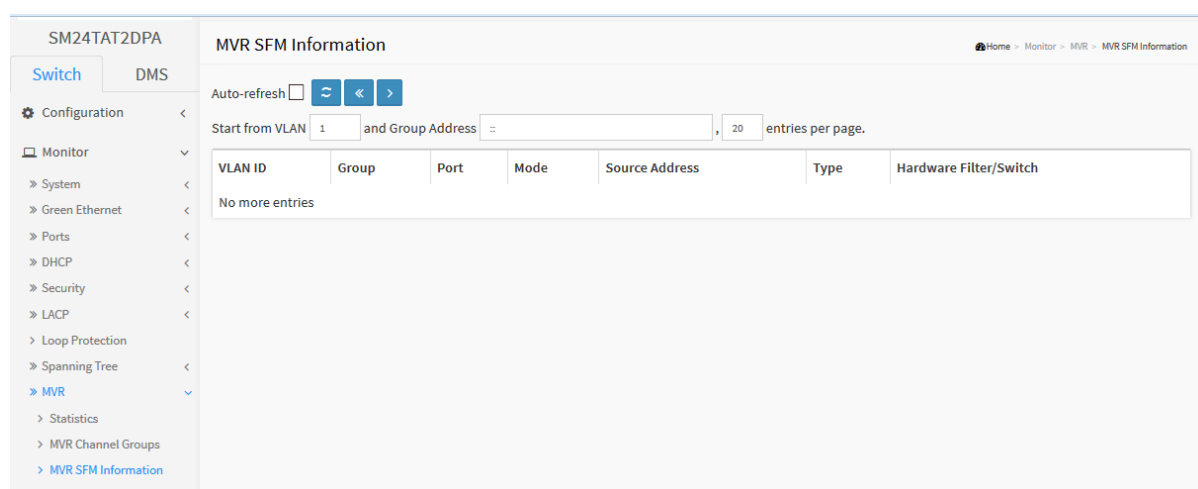
The MVR SFM (Source-Filtered Multicast) Information Table also contains the SSM (Source-Specific Multicast) information. This table is sorted first by VLAN ID, then by group, and then by Port. Different source addresses belong to the same group are treated as single entry.

Web Interface

To display the MVR SFM Information in the web interface:

1. Click Monitor, MVR, MVR SFM Information
2. To auto-refresh the information check the "Auto-refresh" checkbox..
3. To click the "Refresh" to refresh an entry of the MVR Groups Information.
4. Click "<< or >>" to move to previous or next entry.

Figure 3-9.2: MVR SFM Information page



Parameter descriptions:

Navigating the MVR SFM Information Table

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

The "Start from VLAN", and "Group Address" input fields lets you select the starting point in the MVR SFM Information Table. Clicking the button will update the displayed table starting from that or the closest next MVR SFM Information Table match. In addition, the two input fields will - upon a First entry button click - assume the value of the first displayed entry, allowing for continuous refresh with the same start address.

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

MVR SFM Information Table Columns

VLAN ID : VLAN ID of the group.

Group : Group address of the group displayed.

Port : Switch port number.

Mode : Indicates the filtering mode maintained per (VLAN ID, port number, Group Address) basis. It can be either Include or Exclude.

Source Address : IP Address of the source. Currently, system limits the total number of IP source addresses for filtering to be 128. When there is no any source filtering address, the text "None" is shown in the Source Address field.

Type : Indicates the Type. It can be either Allow or Deny.

Hardware Filter/Switch : Indicates whether data plane destined to the specific group address from the source IPv4/IPv6 address could be handled by the onboard chip or not.

Buttons



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

Refresh: Click to refresh the page immediately.

<<: Updates the system log entries to the first available entry ID

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

3-10 IPMC

3-10.1 IGMP Snooping

3-10.1.1 Status

After you complete the IGMP Snooping configuration, then you could to let the switch display the IGMP Snooping Status. The Section provides you to let switch to display the IGMP Snooping detail status.

Web Interface

To display the IGMP Snooping status in the web interface:

1. Click Monitor, IGMP Snooping, Status
2. To auto-refresh the information check the "Auto-refresh" checkbox..
3. Click "Refresh" to refresh the IGMP Snooping Status.
4. Click "Clear "to clear the IGMP Snooping Status.

Figure 3-10.1.1: IGMP Snooping Status page

VLAN ID	Querier Version	Host Version	Querier Status	Queries Transmitted	Queries Received	V1 Reports Received	V2 Reports Received	V3 Reports Received	V2 Leaves Received
No entries									

Port	Status
1	--
2	--
3	--
4	--
5	--
6	--

Parameter descriptions:

VLAN ID : The VLAN ID of the entry.

Querier Version : Working Querier Version currently.

Host Version : Working Host Version currently.

Querier Status : Shows the Querier status is "ACTIVE" or "IDLE". "DISABLE" denotes the specific interface is administratively disabled.

Queries Transmitted : The number of Transmitted Queries.

Queries Received : The number of Received Queries.

V1 Reports Received : The number of Received V1 Reports.

V2 Reports Received : The number of Received V2 Reports.

V3 Reports Received : The number of Received V3 Reports.

V2 Leaves Received : The number of Received V2 Leaves.

Router Port : Display which ports act as router ports. A router port is a port on the Ethernet switch that leads towards the Layer 3 multicast device or IGMP querier.

Static denotes the specific port is configured to be a router port.

Dynamic denotes the specific port is learnt to be a router port.

Both denote the specific port is configured or learnt to be a router port.

Port : Switch port number.

Status : Indicate whether specific port is a router port or not.



Buttons

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

Clear: Clears the counters for the selected port.

Refresh: Click to refresh the page immediately.

3-10.1.2 Group Information

After you complete to set the IGMP Snooping function then you could let the switch to display the IGMP Snooping Group Information. Entries in the IGMP Group Table are shown on this page. The IGMP Group Table is sorted first by VLAN ID, and then by group. Clicking the Next entry button will use the last entry of the currently displayed table as a basis for the next lookup. When the end is reached the text "No more entries" is shown in the displayed table. Use the Refresh button to start over.

Web Interface

To display the IGMP Snooping Group Information in the web interface:

1. Click Monitor, IGMP Snooping, Group Information
2. To auto-refresh the information check the "Auto-refresh" checkbox..
3. Click "Refresh" to refresh an entry of the IGMP Snooping Groups Information.
4. Click "<< or >>" to move to previous or next entry.

Figure 3-10.1.2: IGMP Snooping Group Information page

Parameter descriptions:

Navigating the IGMP Group Table

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

The "Start from VLAN", and "group" input fields lets you select the starting point in the IGMP Group Table. Clicking the button will update the displayed table starting from that or the closest next IGMP Group Table match. In addition, the two input fields will - upon a First entry button click - assume the value of the first displayed entry, allowing for continuous refresh with the same start address.

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

IGMP Group Table Columns

VLAN ID : VLAN ID of the group.

Groups : Group address of the group displayed.

Port Members : Ports under this group.

Buttons

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

Refresh: Click to refresh the page immediately.

<<: Updates the system log entries to the first available entry ID

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



3-10.1.3 IPv4 SFM Information

Entries in the IGMP SFM Information Table are shown on this page. The IGMP SFM (Source-Filtered Multicast) Information Table also contains the SSM (Source-Specific Multicast) information. This table is sorted first by VLAN ID, then by group, and then by Port. Different source addresses belong to the same group are treated as single entry.

Web Interface

To display the IPv4 SSM Information in the web interface:

1. Click Monitor, IGMP Snooping, IPv4 SSM Information
2. To auto-refresh the information check the "Auto-refresh" checkbox..
3. Click "Refresh" to refresh an entry of the IPv4 SFM Information.
4. Click "<< or >>" to move to previous or next entry.

Figure 3-10.1.3: IGMP SFM Information page

Parameter descriptions:

Navigating the IGMP SFM Information Table

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

The "Start from VLAN", and "group" input fields lets you select the starting point in the IGMP SFM Information Table. Clicking the button will update the displayed table starting from that or the closest next IGMP SFM Information Table match. In addition, the two input fields will - upon a First entry button click - assume the value of the first displayed entry, allowing for continuous refresh with the same start address.

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

IGMP SFM Information Table Columns

VLAN ID : VLAN ID of the group.

Group : Group address of the group displayed.

Port : Switch port number.

Mode : Indicates the filtering mode maintained per (VLAN ID, port number, Group Address) basis. It can be either Include or Exclude.

Source Address : IP Address of the source. Currently, system limits the total number of IP source addresses for filtering to be 128.

Type : Indicates the Type. It can be either Allow or Deny.

Hardware Filter/Switch : Indicates whether data plane destined to the specific group address from the source IPv4 address could be handled by chip or not.

Buttons

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

Refresh: Click to refresh the page immediately.

<<: Updates the system log entries to the first available entry ID

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

3-10.2 MLD Snooping

3-10.2.1 Status

The section describes when you complete the MLD Snooping and how to display the MLD Snooping Status and detail information. It will help you to find out the detail information of MLD Snooping status.

Web Interface

To display the MLD Snooping Status in the web interface:

1. Click Monitor, MLD Snooping, Status
2. To auto-refresh the information check the "Auto-refresh" checkbox.
3. Click "Refresh" to refresh an entry of the MLD Snooping Status Information.
4. Click "Clear" to clear the MLD Snooping Status.

Figure 3-10.2.1: MLD Snooping Status page

The screenshot shows the web interface for the MLD Snooping Status page. The page title is 'MLD Snooping Status' and the breadcrumb trail is 'Home > Monitor > IPMC > MLD Snooping > Status'. The interface includes an 'Auto-refresh' checkbox and two buttons (refresh and clear). Below this is a 'Statistics' table with the following data:

VLAN ID	Querier Version	Host Version	Querier Status	Queries Transmitted	Queries Received	V1 Reports Received	V2 Reports Received	V1 Leaves Received
10	v2	v2	DISABLE	0	0	0	0	0
20	v1	v1	DISABLE	0	0	0	0	0
30	v2	v2	DISABLE	0	0	0	0	0

Below the statistics table is a 'Router Port' table with the following data:

Port	Status
1	-
2	-
3	-
4	-
5	-

Parameter descriptions:

VLAN ID : The VLAN ID of the entry.

Querier Version : Working Querier Version currently.

Host Version : Working Host Version currently.

Querier Status : Show the Querier status is "ACTIVE" or "IDLE". "DISABLE" denotes the specific interface is administratively disabled.

Queries Transmitted : The number of Transmitted Queries.

Queries Received : The number of Received Queries.

V1 Reports Received : The number of Received V1 Reports.

V2 Reports Received : The number of Received V2 Reports.

V1 Leaves Received : The number of Received V1 Leaves.

Router Port : Display which ports act as router ports. A router port is a port on the Ethernet switch that leads towards the Layer 3 multicast device or MLD querier.

Static denotes the specific port is configured to be a router port.

Dynamic denotes the specific port is learnt to be a router port.

Both denote the specific port is configured or learnt to be a router port.

Port : Switch port number.

Status : Indicate whether specific port is a router port or not.



Buttons

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

Clear: Clears the counters for the selected port.

Refresh: Click to refresh the page immediately.

3-10.2.2 Group Information

The section describes user could set the MLD Snooping Groups Information. The "Start from VLAN", and "group" input fields lets you select the starting point in the MLD Group Table

Web Interface

To display the MLD Snooping Group information in the web interface:

1. Click Monitor, MLD Snooping, Group Information
2. To auto-refresh the information check the "Auto-refresh" checkbox.
3. Click "Refresh" to refresh an entry of the MLD Snooping Group Information.
4. Click "Clear "to clear the MLD Snooping Groups information..

Figure 3-10.2.2: MLD Snooping Groups Information page

Parameter descriptions:

Navigating the MLD Group Table

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

The "Start from VLAN", and "group" input fields lets you select the starting point in the MLD Group Table. Clicking the button will update the displayed table starting from that or the closest next MLD Group Table match. In addition, the two input fields will - upon a First entry button click - assume the value of the first displayed entry, allowing for continuous refresh with the same start address.

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

MLD Snooping Information Table Columns

VLAN ID : VLAN ID of the group.

Groups : Group address of the group displayed.

Port Members : Ports under this group.

Buttons



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

Refresh: Click to refresh the page immediately.

<<: Updates the system log entries to the first available entry ID

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

3-10.2.3 IPv6 SFM Information

Entries in the MLD SFM Information Table are shown on this page. The MLD SFM (Source-Filtered Multicast) Information Table also contains the SSM (Source-Specific Multicast) information. This table is sorted first by VLAN ID, then by group, and then by Port. Different source addresses belong to the same group are treated as single entry.

Web Interface

To display the MLDv2 IPv6 SSM Information in the web interface:

1. Click Monitor, MLD Snooping, IPv6 SFM Information.
2. To auto-refresh the information check the "Auto-refresh" checkbox..
3. Click "Refresh" to refresh an entry of the MLDv2 IPv6 SSM Information.
4. Click "<< or >>" to move to previous or next entry.

Figure 3-10.2.3: MLD SFM Information page

Parameter descriptions:

Navigating the MLD SFM Information Table

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

The "Start from VLAN", and "group" input fields lets you select the starting point in the MLD SFM Information Table. Clicking the button will update the displayed table starting from that or the closest next MLD SFM Information Table match. In addition, the two input fields will - upon a First entry button click - assume the value of the first displayed entry, allowing for continuous refresh with the same start address.

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

MLD SFM Information Table Columns

VLAN ID : VLAN ID of the group.

Group : Group address of the group displayed.

Port : Switch port number.

Mode : Indicates the filtering mode maintained per (VLAN ID, port number, Group Address) basis. It can be either Include or Exclude.

Source Address : IP Address of the source. Currently, system limits the total number of IP source addresses for filtering to be 128.

Type : Indicates the Type. It can be either Allow or Deny.

Hardware Filter/Switch : Indicates whether data plane destined to the specific group address from the source IPv6 address could be handled by chip or not.

Buttons

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

Refresh: Click to refresh the page immediately.

<<: Updates the system log entries to the first available entry ID

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

3-11 LLDP

3-11.1 Neighbours

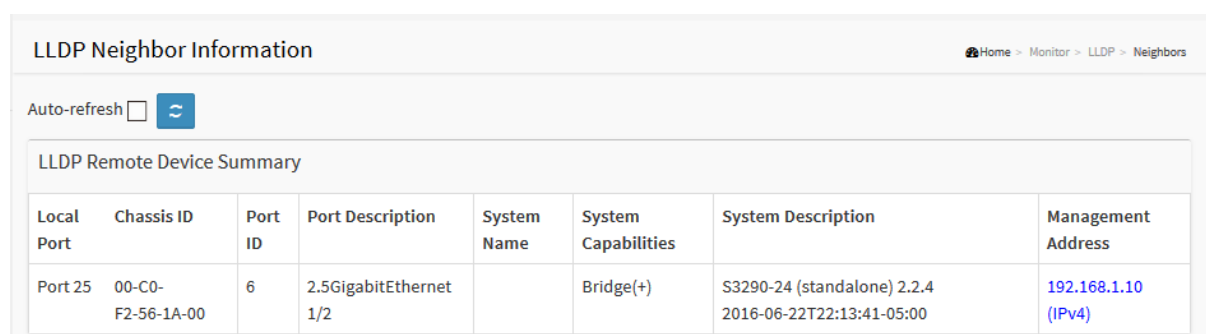
This page provides a status overview for all LLDP neighbours. The displayed table contains a row for each port on which an LLDP neighbour is detected. The columns hold the following information:

Web Interface

To show LLDP neighbours:

1. Click Monitor, LLDP, Neighbours.
2. Click Refresh for manual update web screen
3. Click Auto-refresh for auto-update web screen

Figure 3-11.1: LLDP Neighbours Information page



Local Port	Chassis ID	Port ID	Port Description	System Name	System Capabilities	System Description	Management Address
Port 25	00-C0-F2-56-1A-00	6	2.5GigabitEthernet 1/2		Bridge(+)	S3290-24 (standalone) 2.2.4 2016-06-22T22:13:41-05:00	192.168.1.10 (IPv4)



NOTE: If your network without any device supports LLDP then the table will show "No LLDP neighbour information found".

Parameter descriptions:

Local Port : The port on which the LLDP frame was received.

Chassis ID : The Chassis ID is the identification of the neighbour's LLDP frames.

Port ID : The Remote Port ID is the identification of the neighbour port.

Port Description : Port Description is the port description advertised by the neighbour unit.

System Name : System Name is the name advertised by the neighbour unit.

System Capabilities : System Capabilities describes the neighbour unit's capabilities. The possible capabilities are:

- Other
- Repeater
- Bridge
- WLAN Access Point
- Router
- Telephone
- DOCSIS cable device
- Station only
- Reserved

When a capability is enabled, the capability is followed by (+). If the capability is disabled, the capability is followed by (-).

Management Address : Management Address is the neighbour unit's address that is used for higher layer entities to assist discovery by the network management. This could for instance hold the neighbour's IP address.

Buttons

Auto-refresh

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

Refresh: Click to refresh the page immediately.

3-11.2 LLDP-MED Neighbour

This page provides a status overview of all LLDP-MED neighbours. The displayed table contains a row for each port on which an LLDP neighbour is detected. This function applies to VoIP devices which support LLDP-MED. The columns hold the following information:

Web Interface

To show LLDP-MED neighbor:

1. Click Monitor, LLDP, LLDP-MED Neighbor.
2. Click Refresh for manual update web screen
3. Click Auto-refresh for auto-update web screen

Figure 3-11.2: LLDP-MED Neighbor Information page



NOTE: If your network without any device supports LLDP-MED then the table will show "No LLDP-MED neighbour information found".

Parameter descriptions:

Port : The port on which the LLDP frame was received.

Device Type : LLDP-MED Devices are comprised of two primary Device Types: Network Connectivity Devices and Endpoint Devices.

■ LLDP-MED Network Connectivity Device Definition

LLDP-MED Network Connectivity Devices, as defined in TIA-1057, provide access to the IEEE 802 based LAN infrastructure for LLDP-MED Endpoint Devices. An LLDP-MED Network Connectivity Device is a LAN access device based on any of the following technologies:

1. LAN Switch/Router
2. IEEE 802.1 Bridge
3. IEEE 802.3 Repeater (included for historical reasons)
4. IEEE 802.11 Wireless Access Point
5. Any device that supports the IEEE 802.1AB and MED extensions defined by TIA-1057 and can relay IEEE 802 frames via any method.

■ LLDP-MED Endpoint Device Definition :

LLDP-MED Endpoint Devices, as defined in TIA-1057, are located at the IEEE 802 LAN network edge, and participate in IP communication service using the LLDP-MED framework.

Within the LLDP-MED Endpoint Device category, the LLDP-MED scheme is broken into further Endpoint Device Classes, as defined in the following.

Each LLDP-MED Endpoint Device Class is defined to build upon the capabilities defined for the previous Endpoint Device Class. For-example will any LLDP-MED Endpoint Device claiming compliance as a Media Endpoint (Class II) also support all aspects of TIA-1057 applicable to Generic Endpoints (Class I), and any LLDP-MED Endpoint Device claiming compliance as a Communication Device (Class III) will also support all aspects of TIA-1057 applicable to both

Media Endpoints (Class II) and Generic Endpoints (Class I).

■ **LLDP-MED Generic Endpoint (Class I) :**

The LLDP-MED Generic Endpoint (Class I) definition is applicable to all endpoint products that require the base LLDP discovery services defined in TIA-1057, however do not support IP media or act as an end-user communication appliance. Such devices may include (but are not limited to) IP Communication Controllers, other communication related servers, or any device requiring basic services as defined in TIA-1057.

Discovery services defined in this class include LAN configuration, device location, network policy, power management, and inventory management.

■ **LLDP-MED Media Endpoint (Class II) :**

The LLDP-MED Media Endpoint (Class II) definition is applicable to all endpoint products that have IP media capabilities however may or may not be associated with a particular end user. Capabilities include all of the capabilities defined for the previous Generic Endpoint Class (Class I), and are extended to include aspects related to media streaming. Example product categories expected to adhere to this class include (but are not limited to) Voice / Media Gateways, Conference Bridges, Media Servers, and similar.

Discovery services defined in this class include media-type-specific network layer policy discovery.

■ **LLDP-MED Communication Endpoint (Class III) :**

The LLDP-MED Communication Endpoint (Class III) definition is applicable to all endpoint products that act as end user communication appliances supporting IP media. Capabilities include all of the capabilities defined for the previous Generic Endpoint (Class I) and Media Endpoint (Class II) classes, and are extended to include aspects related to end user devices. Example product categories expected to adhere to this class include (but are not limited to) end user communication appliances, such as IP Phones, PC-based softphones, or other communication appliances that directly support the end user.

Discovery services defined in this class include provision of location identifier (including ECS / E911 information), embedded L2 switch support, inventory management.

LLDP-MED Capabilities : LLDP-MED Capabilities describes the neighborhood unit's LLDP-MED capabilities. The possible capabilities are:

1. LLDP-MED capabilities
2. Network Policy
3. Location Identification
4. Extended Power via MDI - PSE
5. Extended Power via MDI - PD
6. Inventory
7. Reserved

Application Type : Application Type indicating the primary function of the application(s) defined for this network policy, advertised by an Endpoint or Network Connectivity Device. The possible application types are shown below.

1. Voice - for use by dedicated IP Telephony handsets and other similar appliances supporting interactive voice services. These devices are typically deployed on a separate VLAN for ease of deployment and enhanced security by isolation from data applications.
2. Voice Signalling - for use in network topologies that require a different policy for the voice signalling than for the voice media.
3. Guest Voice - to support a separate limited feature-set voice service for guest users and visitors

with their own IP Telephony handsets and other similar appliances supporting interactive voice services.

4. Guest Voice Signalling - for use in network topologies that require a different policy for the guest voice signalling than for the guest voice media.

5. Softphone Voice - for use by softphone applications on typical data centric devices, such as PCs or laptops.

6. Video Conferencing - for use by dedicated Video Conferencing equipment and other similar appliances supporting real-time interactive video/audio services.

7. Streaming Video - for use by broadcast or multicast based video content distribution and other similar applications supporting streaming video services that require specific network policy treatment. Video applications relying on TCP with buffering would not be an intended use of this application type.

8. Video Signalling - for use in network topologies that require a separate policy for the video signalling than for the video media.

Policy : Policy indicates that an Endpoint Device wants to explicitly advertise that the policy is required by the device. Can be either Defined or Unknown. Unknown: The network policy for the specified application type is currently unknown. Defined: The network policy is defined.

TAG : TAG is indicative of whether the specified application type is using a tagged or an untagged VLAN. Can be Tagged or Untagged.

Untagged: The device is using an untagged frame format and as such does not include a tag header as defined by IEEE 802.1Q-2003.

Tagged: The device is using the IEEE 802.1Q tagged frame format.

VLAN ID : VLAN ID is the VLAN identifier (VID) for the port as defined in IEEE 802.1Q-2003. A value of 1 through 4094 is used to define a valid VLAN ID. A value of 0 (Priority Tagged) is used if the device is using priority tagged frames as defined by IEEE 802.1Q-2003, meaning that only the IEEE 802.1D priority level is significant and the default PVID of the ingress port is used instead.

Priority : Priority is the Layer 2 priority to be used for the specified application type. One of the eight priority levels (0 through 7).

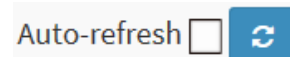
DSCP : DSCP is the DSCP value to be used to provide Diffserv node behavior for the specified application type as defined in IETF RFC 2474. Contain one of 64 code point values (0 through 63).

Auto-negotiation identifies if MAC/PHY auto-negotiation is supported by the link partner.

Auto-negotiation status identifies if auto-negotiation is currently enabled at the link partner. If **Auto-negotiation** is supported and **Auto-negotiation status** is disabled, the 802.3 PMD operating mode will be determined the operational MAU type field value rather than by auto-negotiation.

Auto-negotiation Capabilities shows the link partners MAC/PHY capabilities.

Buttons



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

Refresh: Click to refresh the page immediately.

3-11.3 PoE

This page lets you inspect the current status for all PoE ports. The section show all port Power Over Ethernet Status.

Web Interface

To show LLDP EEE neighbors:

1. Click Monitor ,LLDP, PoE
2. Display Power Over Ethernet Status Information
3. Click Auto-refresh for auto-update web screen

Figure 3-11.3: LLDP Neighbor PoE Information

Local Port	Power Type	Power Source	Power Priority	Maximum Power
No PoE neighbor information found				

Parameter descriptions:

Local Port : The port for this switch on which the LLDP frame was received.

Power Type : The Power Type represents whether the device is a Power Sourcing Entity (PSE) or Power Device (PD). If the Power Type is unknown it is represented as "Reserved".

Power Source : The Power Source represents the power source being utilized by a PSE or PD device. If the device is a PSE device it can either run on its Primary Power Source or its Backup Power Source. If it is unknown whether the PSE device is using its Primary Power Source or its Backup Power Source it is indicated as "Unknown"

If the device is a PD device it can either run on its local power supply or it can use the PSE as power source. It can also use both its local power supply and the PSE.

If it is unknown what power supply the PD device is using it is indicated as "Unknown"

Power Priority : Power Priority represents the priority of the PD device, or the power priority associated with the PSE type device's port that is sourcing the power. There are three levels of power priority. The three levels are: Critical, High and Low. If the power priority is unknown it is indicated as "Unknown"

Maximum Power : The Maximum Power Value contains a numerical value that indicates the maximum power in watts required by a PD device from a PSE device, or the minimum power a PSE device is capable of sourcing over a maximum length cable based on its current configuration. The maximum allowed value is 102.3 W. If the device indicates value higher than 102.3 W, it is represented as "reserved"

Buttons

Auto-refresh

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

Refresh: Click to refresh the page immediately.

3-11.4EEE

By using EEE power savings can be achieved at the expense of traffic latency. This latency occurs due to that the circuits EEE turn off to save power, need time to boot up before sending traffic over the link. This time is called "wake up time". To achieve minimal latency, devices can use LLDP to exchange information about their respective tx and rx "wake up time ", as a way to agree upon the minimum wake up time they need.


This page provides an overview of EEE information exchanged by LLDP.

Web Interface

To show LLDP EEE neighbors:

1. Click Monitor ,LLDP, then click EEE to show discover EEE devices
2. Click Refresh for manual update web screen
3. Click Auto-refresh for auto-update web screen

Figure 3-11.4: LLDP Neighbors EEE information

LLDP Neighbors EEE Information								
Home > Monitor > LLDP > EEE								
Auto-refresh <input type="checkbox"/> 								
Local Port	Tx Tw	Rx Tw	Fallback Receive Tw	Echo Tx Tw	Echo Rx Tw	Resolved Tx Tw	Resolved Rx Tw	EEE in Sync
No LLDP EEE information found								



NOTE: If your network has no devices with EEE enabled then the table will show "No LLDP EEE information found".

Parameter descriptions:

Local Port : The port on which LLDP frames are received or transmitted.

Tx Tw : The link partner's maximum time that transmit path can hold off sending data after reassertion of LPI.

Rx Tw : The link partner's time that receiver would like the transmitter to hold off to allow time for the receiver to wake from sleep.

Fallback Receive Tw : The link partner's fallback receive Tw. A receiving link partner may inform the transmitter of an alternate desired Tw_sys_tx. Since a receiving link partner is likely to have discrete levels for savings, this provides the transmitter with additional information that it may use for a more efficient allocation. Systems that do not implement this option default the value to be the same as that of the Receive Tw_sys_tx.

Echo Tx Tw : The link partner's Echo Tx Tw value. The respective echo values will be defined as the local link partner's reflection (echo) of the remote link partners respective values. When a local link partner receives its echoed values from the remote link partner it can determine whether or not the remote link partner has received, registered and processed its most recent values. For example, if the local link partner receives echoed parameters that do not match the values in its local MIB, then the local link partner infers that the remote link partners request was based on stale information.

Echo Rx Tw : The link partner's Echo Rx Tw value.

Resolved Tx Tw : The resolved Tx Tw for this link. Note: NOT the link partner. The resolved value that is the actual "tx wakeup time" used for this link (based on EEE information exchanged via LLDP).

Resolved Rx Tw : The resolved Rx Tw for this link. Note: NOT the link partner. The resolved value that is the actual "tx wakeup time" used for this link (based on EEE information exchanged via LLDP).

EEE in Sync : Shows whether the switch and the link partner have agreed on wake times.

Red - Switch and link partner have not agreed on wakeup times.

Green - Switch and link partner have agreed on wakeup times.

Buttons

Auto-refresh

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

Refresh: Click to refresh the page immediately.

3-11.5 Port Statistics

Two types of counters are shown. Global counters are counters that refer to the whole switch, while local counters refer to per port counters for the currently selected switch

Web Interface

To show LLDP Statistics:

1. Click Monitor ,LLDP, then click Port Statistics to show LLDP counters
2. Click Refresh for manual update web screen
3. Click Auto-refresh for auto-update web screen
4. Click Clear to clear all counters

Figure 3-11.5: LLDP Counters page

Local Port	Tx Frames	Rx Frames	Rx Errors	Frames Discarded	TLVs Discarded	TLVs Unrecognized	Org. Discarded	Age-Outs
1	9137	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0

Parameter descriptions:

Global Counters

Neighbour entries were last changed at : Shows the time when the last entry was last deleted or added. It also shows the time elapsed since the last change was detected.

Total Neighbours Entries Added : Shows the number of new entries added since switch reboot.

Total Neighbours Entries Deleted : Shows the number of new entries deleted since switch reboot.

Total Neighbours Entries Dropped : Shows the number of LLDP frames dropped due to the entry table being full.

Total Neighbours Entries Aged Out : Shows the number of entries deleted due to Time-To-Live expiring.

Local Counters

The displayed table contains a row for each port. The columns hold the following information:

Local Port : The port on which LLDP frames are received or transmitted.

Tx Frames : The number of LLDP frames transmitted on the port.

Rx Frames : The number of LLDP frames received on the port.

Rx Errors : The number of received LLDP frames containing some kind of error.

Frames Discarded : If an LLDP frame is received on a port, and the switch's internal table has run full, the LLDP frame is counted and discarded. This situation is known as "Too Many Neighbours" in the LLDP standard. LLDP frames require a new entry in the table when the Chassis ID or Remote Port ID is not already contained within the table. Entries are removed from the table when a given port's link is down, an LLDP shutdown frame is received, or when the entry ages out.

TLVs Discarded : Each LLDP frame can contain multiple pieces of information, known as TLVs (TLV is short for "Type Length Value"). If a TLV is malformed, it is counted and discarded.

TLVs Unrecognized : The number of well-formed TLVs, but with an unknown type value.

Org. Discarded : The number of organizationally received TLVs.

Age-Outs : Each LLDP frame contains information about how long time the LLDP information is valid (age-out time). If no new LLDP frame is received within the age out time, the LLDP information is removed, and the Age-Out counter is incremented.

Buttons



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

Clear: Clears the counters for the selected port.

Refresh: Click to refresh the page immediately.

3-12 PoE

This page displays the current status for all PoE ports.

Web Interface

To Display PoE Status via the web interface:

1. Click Monitor, PoE.
2. Check "Auto-refresh".
3. Click "Refresh" to refresh the port detailed statistics.

Figure 3-12: Power Over Ethernet Status page

Local Port	PD class	Power Requested	Power Allocated	Power Used	Current Used	Priority	Port Status
1	-	0 [W]	0 [W]	0 [W]	0 [mA]	Low	No PD detected
2	1	30 [W]	30 [W]	1.2 [W]	22 [mA]	High	PoE turned ON
3	1	30 [W]	30 [W]	1.8 [W]	33 [mA]	Critical	PoE turned ON
4	-	0 [W]	0 [W]	0 [W]	0 [mA]	Low	No PD detected
5	-	0 [W]	0 [W]	0 [W]	0 [mA]	Low	No PD detected
6	-	0 [W]	0 [W]	0 [W]	0 [mA]	Low	No PD detected
7	-	0 [W]	0 [W]	0 [W]	0 [mA]	Low	No PD detected
8	-	0 [W]	0 [W]	0 [W]	0 [mA]	Low	No PD detected
9	-	0 [W]	0 [W]	0 [W]	0 [mA]	Low	No PD detected
10	-	0 [W]	0 [W]	0 [W]	0 [mA]	Low	No PD detected

Parameter descriptions:

Local Port: This is the logical port number for this row.

PD Class: Each PD is classified according to a class that defines the maximum power the PD will use. The PD Class shows the PDs class. Five Classes are defined:

Class 0: Max. power 15.4 W

Class 1: Max. power 4.0 W

Class 2: Max. power 7.0 W

Class 3: Max. power 15.4 W

Class 4: Max. power 30.0 W

Power Requested: The Power Requested shows the requested amount of power the PD wants to be reserved.

Power Allocated: The Power Allocated shows the amount of power the switch has allocated for the PD.

Power Used: The Power Used shows how much power the PD currently is using.

Current Used: The Current Used shows how much current the PD currently is using.

Priority: The Priority shows the port's priority configured (Low, High, Critical).

Port Status: The Port Status shows the port's status. The status can be one of the following values:

PoE not available - No PoE chip found - PoE not supported for the port.

PoE turned OFF - PoE disabled : PoE is disabled by user.

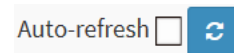
PoE turned OFF - Power budget exceeded - The total requested or used power by the PDs exceeds the maximum power the Power Supply can deliver, and port(s) with the lowest priority is/are powered down.

No PD detected - No PD detected for the port.

PoE turned OFF - PD overload - The PD has requested or used more power than the port can deliver, and is powered down.

PoE turned OFF - PD is off.

Invalid PD - PD detected, but is not working correctly.



Buttons

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

Refresh: Click to refresh the page immediately.

3-13 MAC Table

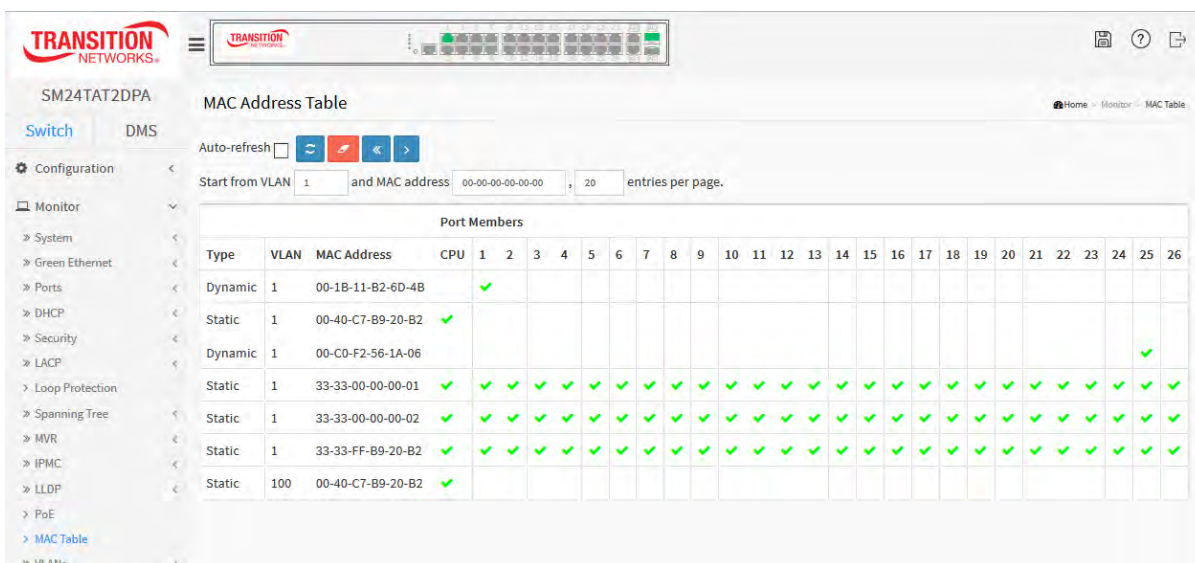
Entries in the MAC Table are shown on this page. The MAC Table contains up to 8192 entries, and is sorted first by VLAN ID, then by MAC address.

Web Interface

To Display MAC Address Table in the web interface:

1. Click Monitor, Dynamic MAC Table.
2. Specify the VLAN and MAC Address.
3. Display MAC Address Table.

Figure 3- 12: MAC Address Table



Parameter descriptions: Navigating the MAC Table

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

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

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

MAC Table Columns

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

VLAN : The VLAN ID of the entry.

MAC address : The MAC address of the entry.

Port Members : The ports that are members of the entry.

Buttons

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

Refresh: Click to refresh the page immediately.

Clear: Clears the counters for the selected port.



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

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

NOTE:

00-40-C7-73-01-29 : your switch MAC address (for IPv4)

33-33-00-00-00-01 : Destination MAC (for IPv6 Router Advertisement) (reference IPv6 RA.JPG)

33-33-00-00-00-02 : Destination MAC (for IPv6 Router Solicitation) (reference IPv6 RS.JPG)

33-33-FF-73-01-29 : Destination MAC (for IPv6 Neighbor Solicitation) (reference IPv6 DAD.JPG)

33-33-FF-A8-01-01: your switch MAC address (for IPv6 global IP)

FF-FF-FF-FF-FF-FF: for Broadcast.

3-14 VLANs

3-14.1 VLAN Membership

This page provides an overview of membership status of VLAN users.

Web Interface

To configure VLAN membership configuration in the web interface:

1. Click Monitor, VLANs, VLAN membership.
2. Scroll the bar to choice which VLANs would like to show up.
3. Click Refresh to update the state.

Figure 3-14.1: VLAN Membership Status for Combined users

VLAN ID	Port Members																										
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	
1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
2		✓	✓	✓	✓																						
3		✓	✓	✓	✓																						
4		✓	✓	✓	✓																						
5		✓	✓	✓	✓																						
6		✓	✓	✓	✓																						
7		✓	✓	✓	✓																						
8		✓	✓	✓	✓																						
9		✓	✓	✓	✓																						
10		✓	✓	✓	✓																						
11		✓	✓	✓	✓																						

Parameter descriptions:

VLAN USER : VLAN User module uses services of the VLAN management functionality to configure VLAN memberships and VLAN port configurations such as PVID and UVID. Currently we support the following VLAN user types:

CLI/Web/SNMP : These are referred to as static.

NAS : NAS provides port-based authentication, which involves communications between a Supplicant, Authenticator, and an Authentication Server.

MVRP : Multiple VLAN Registration Protocol (MVRP) allows dynamic registration and deregistration of VLANs on ports on a VLAN bridged network.


Voice VLAN : Voice VLAN is a VLAN configured specially for voice traffic typically originating from IP phones.


MVR : MVR is used to eliminate the need to duplicate multicast traffic for subscribers in each VLAN. Multicast traffic for all channels is sent only on a single (multicast) VLAN.


MSTP : The 802.1s Multiple Spanning Tree protocol (MSTP) uses VLANs to create multiple spanning trees in a network, which significantly improves network resource utilization while maintaining a loop-free environment.

VLAN ID : VLAN ID for which the Port members are displayed.

Port Members : A row of check boxes for each port is displayed for each VLAN ID.

If a port is included in a VLAN, an image  will be displayed.

If a port is included in a Forbidden port list, an image  will be displayed.

If a port is included in a Forbidden port list and dynamic VLAN user register VLAN on same Forbidden port, then conflict port will be displayed as .

VLAN Membership : The VLAN Membership Status Page shows the current VLAN port members for all VLANs configured by a selected VLAN User (selection will be allowed by a Combo Box). When ALL VLAN Users are selected, it will show this information for all the VLAN Users, and this is by default. VLAN membership allows the frames classified to the VLAN ID to be forwarded on the respective VLAN member ports.

Navigating the VLAN Monitor page

Each page shows up to 99 entries from the VLAN table, default being 20, selected through the "entries per page" input field. When first visited, the web page will show the first 20 entries from the beginning of the VLAN Table. The first displayed will be the one with the lowest VLAN ID found in the VLAN Table. The "VLAN" input fields lets you select the starting point in the VLAN Table. Clicking the **"Refresh"** button will update the displayed table starting from that or the closest next VLAN Table match. The " > " will use the last entry of the currently displayed VLAN entry as a basis for the next lookup. When the end is reached the text "No more entries" is shown in the displayed table. Use the " << " button to start over.

Buttons

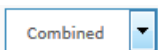


Auto-refresh: Check this box to refresh the page automatically. Automatic refresh occurs every 3 seconds.

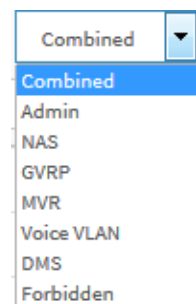
Refresh: Click to refresh the page immediately.

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

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



: Select VLAN Users from this drop down list (shown right).



3-13.2 VLAN Port

The function Port Status gathers the information of all VLAN status and reports it by the order of Static NAS MVRP MVP Voice VLAN MSTP GVRP Combined.

Web Interface

To Display VLAN Port Status in the web interface:

1. Click Monitor, VLAN Port Status.
2. Specify the Static NAS MVRP MVP Voice VLAN MSTP GVRP Combined.
3. Display Port Status information.

Figure 3-13.2: VLAN Port Status for Combined users

Port	Port Type	Ingress Filtering	Frame Type	Port VLAN ID	Tx Tag	Untagged VLAN ID	Conflicts
1	C-Port	<input checked="" type="checkbox"/>	All	1	Untag PVID		No
2	C-Port	<input checked="" type="checkbox"/>	All	2	Untag All		No
3	C-Port	<input checked="" type="checkbox"/>	Tagged	3	Untag All		No
4	C-Port	<input checked="" type="checkbox"/>	All	4	Untag All		No
5	C-Port	<input checked="" type="checkbox"/>	All	1	Untag All		No
6	C-Port	<input checked="" type="checkbox"/>	All	1	Untag PVID		No
7	C-Port	<input checked="" type="checkbox"/>	All	1	Untag PVID		No
8	C-Port	<input checked="" type="checkbox"/>	All	1	Untag PVID		No
9	C-Port	<input checked="" type="checkbox"/>	All	1	Untag PVID		No
10	C-Port	<input checked="" type="checkbox"/>	All	1	Untag PVID		No
11	C-Port	<input checked="" type="checkbox"/>	All	1	Untag PVID		No
12	C-Port	<input checked="" type="checkbox"/>	All	1	Untag PVID		No
13	C-Port	<input checked="" type="checkbox"/>	All	1	Untag PVID		No

Parameter descriptions:

VLAN USER : VLAN User module uses services of the VLAN management functionality to configure VLAN memberships and VLAN port configuration such as PVID, UVID. The following VLAN User types are currently supported:

CLI/Web/SNMP : These are referred to as static.

NAS : NAS provides port-based authentication, which involves communications between a Supplicant, Authenticator, and an Authentication Server.

Voice VLAN : Voice VLAN is a VLAN configured specially for voice traffic typically originating from IP phones.

MVR : MVR is used to eliminate the need to duplicate multicast traffic for subscribers in each VLAN. Multicast traffic for all channels is sent only on a single (multicast) VLAN.

MSTP : The 802.1s Multiple Spanning Tree protocol (MSTP) uses VLANs to create multiple spanning trees in a network, which significantly improves network resource utilization while maintaining a loop-free environment.

Port : The logical port for the settings contained in the same row.

Port Type : Shows the Port Type. Port type can be any of Unaware, C-port, S-port, Custom S-port. If Port Type is Unaware, all frames are classified to the Port VLAN ID and tags are not removed. C-port is Customer Port. S-port is Service port. Custom S-port is S-port with Custom TPID.

Ingress Filtering : Shows the ingress filtering on a port. This parameter affects VLAN ingress processing. If ingress filtering is enabled and the ingress port is not a member of the classified VLAN, the frame is discarded.

Frame Type : Shows whether the port accepts all frames or only tagged frames. This parameter affects VLAN ingress processing. If the port only accepts tagged frames, untagged frames received on that port are discarded.

Port VLAN ID : Shows the Port VLAN ID (PVID) that a given user wants the port to have. The field is empty if not overridden by the selected user.

Tx Tag : Shows egress filtering frame status whether tagged or untagged.

UVID : Shows UVID (untagged VLAN ID). Port's UVID determines the packet's behavior at the egress side.

Conflicts : Shows status of Conflicts whether exists or not. When a Volatile VLAN User requests to set VLAN membership or VLAN port configuration, the following conflicts can occur:

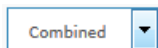
- Functional Conflicts between features.
- Conflicts due to hardware limitation.
- Direct conflict between user modules.

Buttons

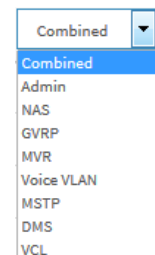


Auto-refresh: Check this box to refresh the page automatically every 3 seconds.

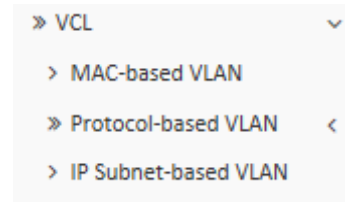
Refresh: Click to refresh the page immediately.



: Select VLAN Users from this drop down list (shown right).



3-15 VCL



3-15.1 MAC-based VLAN

This section shows MAC-based VLAN entries configured by various MAC-based VLAN users. Currently we support following VLAN User types:

CLI/Web/SNMP: These are referred to as static.

NAS: NAS provides port-based authentication, which involves communications between a Supplicant, Authenticator, and an Authentication Server.

Web Interface

To display MAC-based VLAN configuration via the web interface:

1. Click Monitor, MAC-based VLAN Status.
2. Specify the Static, NAS, Combined.
3. Display MAC-based information.

Figure 3-15.1: MAC-based VLAN Membership Status for User Static

MAC-based VLAN Membership Status for User Static		Port Members																										
MAC Address	VLAN ID	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	
c0-00-40-00-00-00	1	✓	✓	✓	✓	✓																						

Parameter descriptions:

MAC Address : Indicates the MAC address.

VLAN ID : Indicates the VLAN ID.

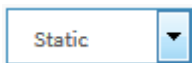
Port Members : Port members of the MAC-based VLAN entry.

Buttons

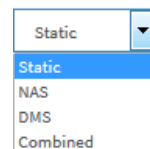


Auto-refresh: Check this box to refresh the page automatically every 3 seconds.

Refresh: Click to refresh the page immediately.



: Select VLAN Users from this drop down list (shown right).



3-15.2 Protocol-based VLAN

3-15.2.1 Protocol to Group

This page shows you the protocols to Group Name (unique for each Group) mapping entries for the switch.

Web Interface

To Display Protocol-based VLAN configuration in the web interface:

1. Click Monitor, VCL, Protocol to Group.
2. Check "Auto-refresh".
3. Click "Refresh" to refresh the port detailed statistics.

Figure 3-15.1.1: Protocol to Group Mapping Table Status page

Frame Type	Value	Group Name
No Group entry found!		

Parameter descriptions:

Frame Type : Frame Type can have one of the following values:

1. Ethernet
2. LLC
3. SNAP



NOTE:

On changing the Frame type field, valid value of the following text field will vary depending on the new frame type you selected.

Value : Valid value that can be entered in this text field depends on the option selected from the preceding Frame Type selection menu. Below is the criteria for three different Frame Types:


1. For Ethernet: Values in the text field when Ethernet is selected as a Frame Type is called etype. Valid values for etype ranges from 0x0600-0xffff
2. For LLC: Valid value in this case is comprised of two different sub-values.
 - a. DSAP: 1-byte long string (0x00-0xff)
 - b. SSAP: 1-byte long string (0x00-0xff)
3. For SNAP: Valid value in this case also is comprised of two different sub-values.
 - a. OUI: OUI (Organizationally Unique Identifier) is value in format of xx-xx-xx where each pair (xx) in string is a hexadecimal value ranges from 0x00-0xff.
 - b. PID: If the OUI is hexadecimal 000000, the protocol ID is the Ethernet type (EtherType) field value for the protocol running on top of SNAP; if the OUI is an OUI for a particular organization, the protocol ID is a value assigned by that organization to the protocol running on top of SNAP. In other words, if value of OUI field is 00-00-00 then value of PID will be etype (0x0600-0xffff) and if value of OUI is other than 00-00-00 then valid value of PID will be any value from 0x0000 to 0xffff.

Group Name : A valid Group Name is a unique 16-character long string for every entry which consists of a combination of alphabets (a-z or A-Z) and integers (0-9).



NOTE: special character and underscore (_) are not allowed.

Buttons

Auto-refresh 

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

Refresh: Click to refresh the page immediately.

3-15.2.2 Group to VLAN

This page displays the configured Group Name to a VLAN for the switch.

Web Interface

To Display Group to VLAN configuration in the web interface:

1. Click Monitor, VCL, Group to VLAN.
2. Check "Auto-refresh".
3. Click "Refresh" to refresh the port detailed statistics.

Figure 3-15.2.2: Group Name to VLAN mapping Table Status page

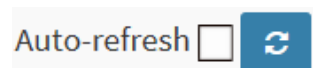
Group Name to VLAN mapping Table Status		Port Members																									
Group Name	VLAN ID	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
Grp2	2		✓				✓	✓	✓																		
Grp1	1		✓	✓	✓	✓																					

Parameter descriptions:

Group Name : A valid Group Name is a string at the most 16 characters which consists of a combination of alphabets (a-z or A-Z) and integers(0-9), no special character is allowed. Whichever Group name you try map to a VLAN must be present in Protocol to Group mapping table and must not be pre-used by any other existing mapping entry on this page.

VLAN ID : Indicates the ID to which Group Name will be mapped. A valid VLAN ID ranges from 1-4095.

Port Members : A row of check boxes for each port is displayed for each Group Name to VLAN ID mapping. To include a port in a mapping, check the box. To remove or exclude the port from the mapping, make sure the box is unchecked. By default, no ports are members, and all boxes are unchecked.



Buttons

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

Refresh: Click to refresh the page immediately.

3-15.3 IP Subnet-based VLAN

The page shows IP subnet-based VLAN entries. This page shows only static entries.

Web Interface

To Display MAC-based VLAN configuration in the web interface:

1. Click Monitor, VCL, and IP Subnet-based VLAN.
2. Check "Auto-refresh".
3. Click "Refresh" to refresh the port detailed statistics.

Figure 3-15.3: IP Subnet-based VLAN Membership Status page

VCE ID	IP Address	Mask Length	VLAN ID	Port Members																									
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
1	192.168.1.100	24	1	✓	✓		✓		✓																				
2	192.168.1.100	24	2	✓		✓	✓	✓		✓																			

Parameter descriptions:

VCE ID : Indicates the index of the entry. It is user configurable. Its value ranges from 0-128. If a VCE ID is 0, application will auto-generate the VCE ID for that entry. Deletion and lookup of IP subnet-based VLAN are based on VCE ID.

IP Address : Indicates the IP address.

Mask Length : Indicates the network mask length.

VLAN ID : Indicates the VLAN ID. VLAN ID can be changed for the existing entries.

Port Members : A row of check boxes for each port is displayed for each IP subnet-based VLAN entry. To include a port in a IP subnet-based VLAN, check the box. To remove or exclude the port from the IP subnet-based VLAN, make sure the box is unchecked. By default, no ports are members, and all boxes are unchecked.

Buttons

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

Refresh: Click to refresh the page immediately.

3-16 sFlow

This session shows receiver and per-port sFlow statistics

Web Interface

To display MAC-based VLAN configuration in the Web interface:

1. Click Monitor, sFlow.
2. View sFlow information.

Figure 3-16: sFlow Statistics page

Receiver Statistics	
Owner	<none>
IP Address/Hostname	0.0.0.0
Timeout	0
Tx Successes	0
Tx Errors	0
Flow Samples	0
Counter Samples	0

Port Statistics			
Port	Rx Flow Samples	Tx Flow Samples	Counter Samples
1	0	0	0
2	0	0	0
3	0	0	0
4	0	0	0
5	0	0	0
6	0	0	0
7	0	0	0
8	0	0	0
9	0	0	0
10	0	0	0
11	0	0	0
12	0	0	0
13	0	0	0
14	0	0	0
15	0	0	0
16	0	0	0
17	0	0	0
18	0	0	0
19	0	0	0
20	0	0	0
21	0	0	0
22	0	0	0
23	0	0	0
24	0	0	0
25	0	0	0
26	0	0	0

Parameter descriptions:

Owner : This field shows the current owner of the sFlow configuration. It assumes one of three values as follows:

1. If sFlow is currently unconfigured/unclaimed, Owner contains <none>.
2. If sFlow is currently configured through Web or CLI, Owner contains <Configured through local management>.
3. If sFlow is currently configured through SNMP, Owner contains a string identifying the sFlow receiver.

IP Address/Hostname : The IP address or hostname of the sFlow receiver.

Timeout : The number of seconds remaining before sampling stops and the current sFlow owner is released.

Tx Successes : The number of UDP datagrams successfully sent to the sFlow receiver.

Tx Errors : The number of UDP datagrams that has failed transmission.

The most common source of errors is invalid sFlow receiver IP/hostname configuration. To diagnose, paste the receiver's IP address/hostname into the Ping Web page (Diagnostics > Ping/Ping6).

Flow Samples : The total number of flow samples sent to the sFlow receiver.

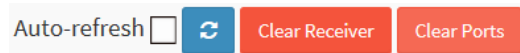
Counter Samples : The total number of counter samples sent to the sFlow receiver.

Port Statistics

Port : The port number for which the following statistics applies.

Rx and Tx Flow Samples : The number of flow samples sent to the sFlow receiver originating from this port. Here, flow samples are divided into Rx and Tx flow samples, where Rx flow samples contains the number of packets that were sampled upon reception (ingress) on the port and Tx flow samples contains the number of packets that were sampled upon transmission (egress) on the port.

Counter Samples : The total number of counter samples sent to the sFlow receiver originating from this port.



Buttons

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

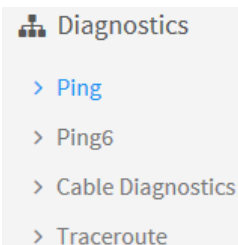
Refresh: Click to refresh the page immediately.

Clear Receiver: Clears the sFlow receiver counters.

Clear Ports: Clears the per-port counters.

Chapter 4. Diagnostics

This chapter provides a set of basic system diagnosis. It lets you know that if the system is healthy or needs to be fixed. The basic system checks include ICMP Ping, Ping6, Cable Diagnostics, and Traceroute.



4-1 Ping

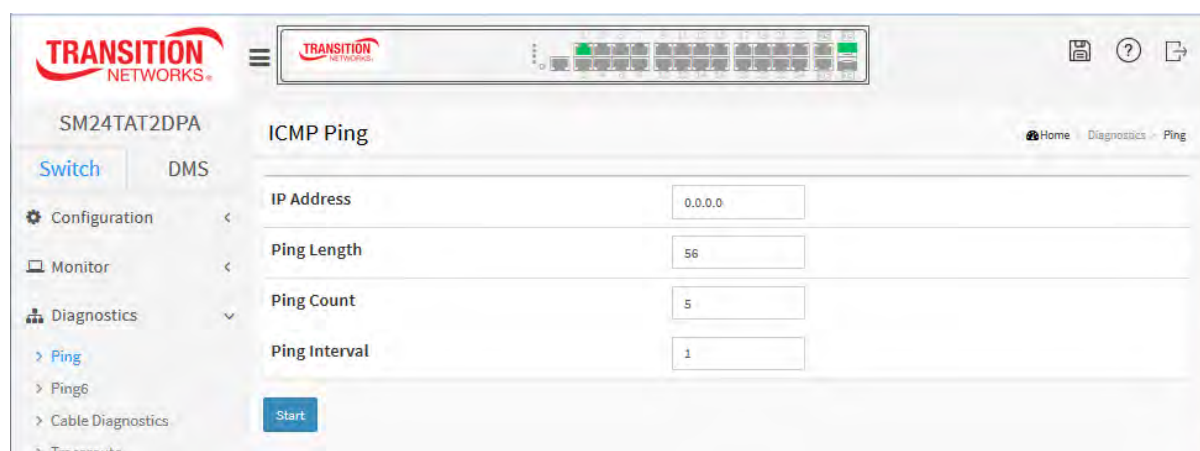
This section lets you issue ICMP PING packets to troubleshoot IPv6 connectivity issues.

Web Interface

To configure an ICMP PING Configuration in the web interface:

1. Specify ICMP PING IP Address.
2. Specify ICMP PING Size.
3. Click Start.

Figure 4-1: ICMP Ping page



Parameter descriptions:

IP Address : To set the IP Address of device what you want to ping it.

Ping Length: The payload size of the ICMP packet. Values range from 2 bytes to 1452 bytes.

Ping Count: The count of the ICMP packet. Values range from 1 time to 60 times.

Ping Interval: The interval of the ICMP packet. Values range from 0 second to 30 seconds.

Egress Interface (Only for IPv6): The VLAN ID (VID) of the specific egress IPv6 interface which ICMP packet goes. The given VID ranges from 1 to 4094 and will be effective only when the corresponding IPv6 interface is valid. When the egress interface is not given, PING6 finds the best match interface for destination. Do not specify egress interface for loopback address. Do specify egress interface for link-local or multicast address.

Start: Click the "Start" button and the switch will start to ping the device using ICMP packet size what set on the switch.

After you press Start, five ICMP packets are transmitted, and the sequence number and roundtrip time are displayed upon reception of a reply. The page refreshes automatically until responses to all packets are received, or until a timeout occurs.

PING6 server ::10.10.132.20

64 bytes from ::10.10.132.20: icmp_seq=0, time=0ms

64 bytes from ::10.10.132.20: icmp_seq=1, time=0ms

64 bytes from ::10.10.132.20: icmp_seq=2, time=0ms

64 bytes from ::10.10.132.20: icmp_seq=3, time=0ms

64 bytes from ::10.10.132.20: icmp_seq=4, time=0ms

Sent 5 packets, received 5 OK, 0 bad

4-2 Ping6

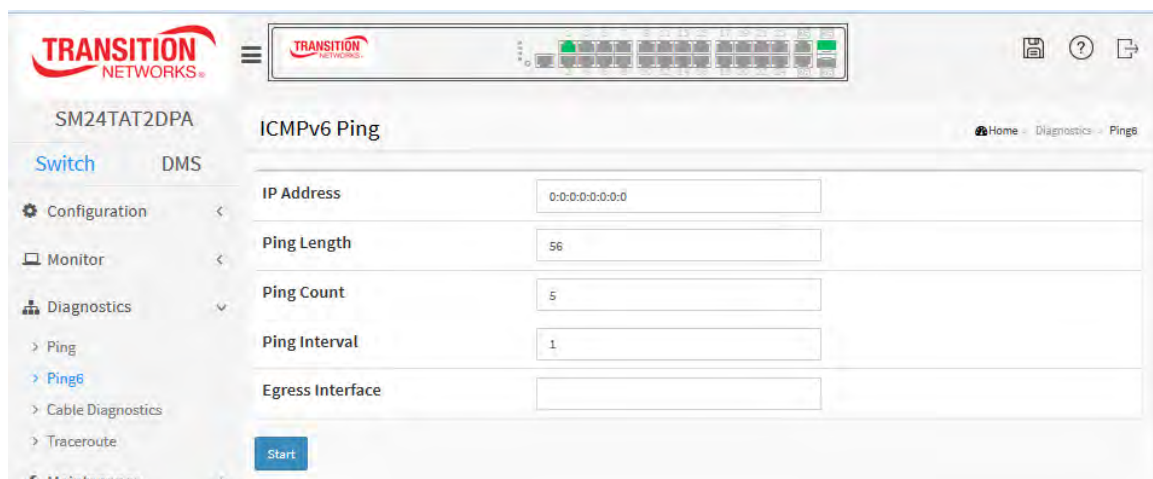
This section lets you issue ICMPv6 PING packets to troubleshoot IPv6 connectivity issues.

Web Interface

To configure an ICMPv6 PING Configuration in the web interface:

1. Specify ICMPv6 PING IP Address.
2. Specify ICMPv6 PING Size.
3. Click Start.

Figure 4-2: ICMPv6 Ping page



Parameter descriptions:

IP Address : The destination IP Address with IPv6

Ping Length : The payload size of the ICMP packet. Values range from 2 bytes to 1452 bytes.

Ping Count : The count of the ICMP packet. Values range from 1 time to 60 times.

Ping Interval : The interval of the ICMP packet. Values range from 0 second to 30 seconds.

Egress Interface (Only for IPv6) : The VLAN ID (VID) of the specific egress IPv6 interface which ICMP packet goes. The given VID ranges from 1 to 4094 and will be effective only when the corresponding IPv6 interface is valid. When the egress interface is not given, PING6 finds the best match interface for destination. Do not specify egress interface for loopback address. Do specify egress interface for link-local or multicast address.

Start: Click the "Start" button and the switch will start to ping the device using ICMPv6 packet size what set on the switch. After you press Start, five ICMPv6 packets are transmitted, and the sequence number and roundtrip time are displayed upon reception of a reply. The page refreshes automatically until responses to all packets are received, or until a timeout occurs.

PING server 10.10.132.20

64 bytes from 10.10.132.20: icmp_seq=0, time=0ms

64 bytes from 10.10.132.20: icmp_seq=1, time=0ms

64 bytes from 10.10.132.20: icmp_seq=2, time=0ms

64 bytes from 10.10.132.20: icmp_seq=3, time=0ms

64 bytes from 10.10.132.20: icmp_seq=4, time=0ms

Sent 5 packets, received 5 OK, 0 bad

You can configure the properties of the issued ICMP packets.

4-3 Cable Diagnostics

This section is used for running the Cable Diagnostics. Press the **Start** button to run the diagnostics. This will take approximately 5 seconds. If all ports are selected, this can take approximately 15 seconds. When completed, the page refreshes automatically, and you can view the cable diagnostics results in the cable status table. Note that Cable Diagnostics is only accurate for cables of length 7 -140 meters. 10 and 100 Mbps ports will be linked down while running the diagnostic. Therefore, running Cable Diagnostics on a 10 or 100 Mbps management port will cause the switch to stop responding until Cable Diagnostics is complete.

Web Interface

To configure a Cable Diagnostics check via the web interface:

1. At the **Port** dropdown, specify the Port which you want to check.
2. Click the **Start** button.

Figure 4-3: Cable Diagnostics page

Port	Pair A	Length A	Pair B	Length B	Pair C	Length C	Pair D	Length D
1	--	--	--	--	--	--	--	--
2	--	--	--	--	--	--	--	--
3	--	--	--	--	--	--	--	--
4	--	--	--	--	--	--	--	--
5	--	--	--	--	--	--	--	--
6	--	--	--	--	--	--	--	--
7	--	--	--	--	--	--	--	--
8	--	--	--	--	--	--	--	--
9	--	--	--	--	--	--	--	--
10	--	--	--	--	--	--	--	--
11	--	--	--	--	--	--	--	--

Parameter descriptions:

Port : At the dropdown, select the port for which you are requesting Cable Diagnostics (1-26).

Cable Status :

Port: The Port number.

Pair: The status of the cable pair (OK, Open, Short, Cross-pair short, Abnormal cross-pair coupling).

Length: The length (in meters) of the cable pair. The resolution is 3 meters.

4-4 Traceroute

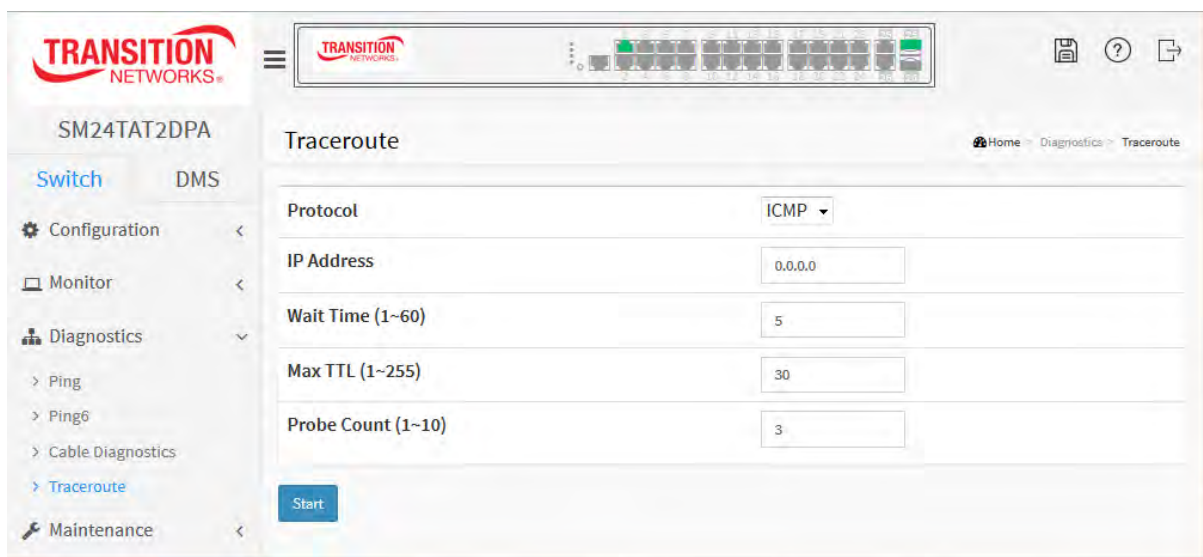
This page allows you to issue ICMP, TCP, or UDP packets to diagnose network connectivity issues.

Web Interface

To configure an ICMPv6 PING Configuration in the web interface:

1. Specify traceroute IP Address.
2. Specify traceroute Size.
3. Click Start.

Figure 4-4: Traceroute page



Parameter descriptions:

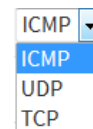
Protocol : The protocol (ICMP, UDP, TCP) packets to send.

IP Address : The destination IP Address.

Wait Time : Set the time (in seconds) to wait for a response to a probe (default 5.0 sec). Values range from 1 to 60. The payload size of the ICMP packet. Values range from 2 - 1452 bytes.

Max TTL : Specifies the maximum number of hops (max time-to-live value) traceroute will probe. Values range from 1 to 255. The default is 30.

Probe Count : Sets the number of probe packets per hop. Values range from 1 - 10. The default is 3.



Chapter 5.

Maintenance

- 🔑 Maintenance
 - > Restart Device
 - > Reboot Schedule
 - > Factory Defaults
 - » Firmware
 - » Configuration
 - > Server Report

This chapter describes the entire switch Maintenance configuration tasks to enhance the performance of local network including Restart Device, Reboot Schedule, Factory Defaults, Firmware Upgrade, Configuration, and Server Report.

5-1 Restart Device

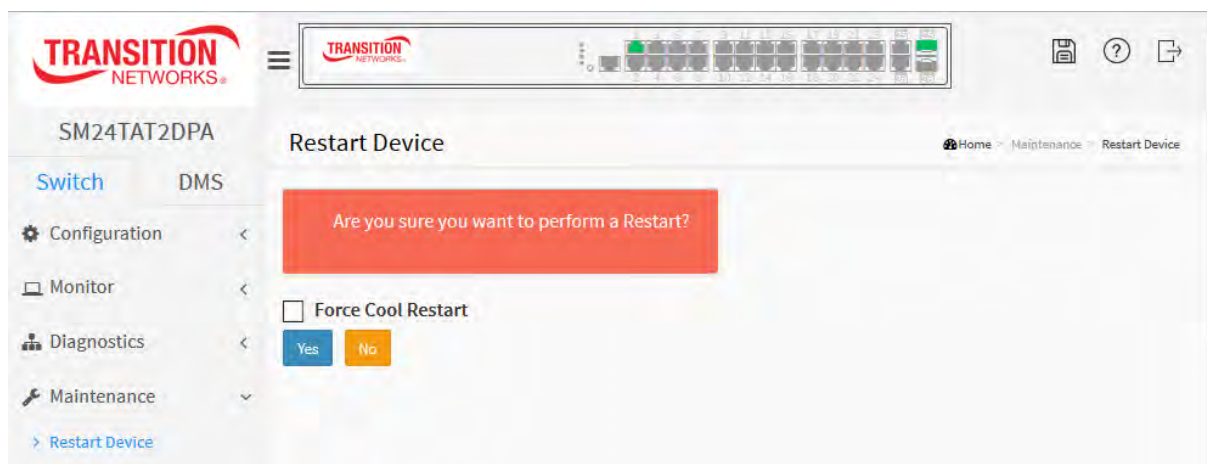
This section describes how to restart switch for any maintenance needs. Any configuration files or scripts that you saved in the switch should still be available afterwards.

Web Interface

To configure a Restart Device Configuration in the web interface:

1. Click Maintenance, Restart Device.
2. At the "Are you sure..?" prompt, click Yes.

Figure 5-1: Restart Device page



Parameter descriptions:

Restart Device: You can restart the switch on this page. After restart, the switch will boot normally.

Force Cool Restart: Warning: Forcing a cool restart will affect the traffic going through the switch. Uncheck "Force Cool Restart" if you want to perform a warm restart of the switch.

Check "Force Cool Restart" if you want to simulate a power-on (cold restart) of the switch.

Buttons:

Yes – Click to restart the device.

No – Click to return to the Port State page without restarting.

5-2 Reboot Schedule

This page lets you schedule the day and time to reboot the switch.

Web Interface

To configure a Restart Device Configuration in the web interface:

1. Click Maintenance, Reboot Schedule.
2. At the Mode dropdown select Enabled to display the reboot schedule parameters.
3. Enter the reboot schedule parameters and click Apply.
4. At the "Are you sure..?" prompt, click Yes.

Figure 5-2: Reboot Schedule page

Week Day	Reboot Time	
	HH	MM
*	-	-
Monday	-	-
Tuesday	-	-
Wednesday	-	-
Thursday	-	-
Friday	-	-
Saturday	-	-
Sunday	-	-

Parameter descriptions:

Mode: Indicates the reboot scheduling mode operation. Possible modes are:

Enabled: Enable switch reboot scheduling.

Disabled: Disable switch reboot scheduling.

Week Day : The day to reboot this switch.

Reboot Time : The time to reboot the switch in hours (HH) and minutes (MM).

Buttons

Apply : Click to save changes.

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

5-3 Factory Defaults

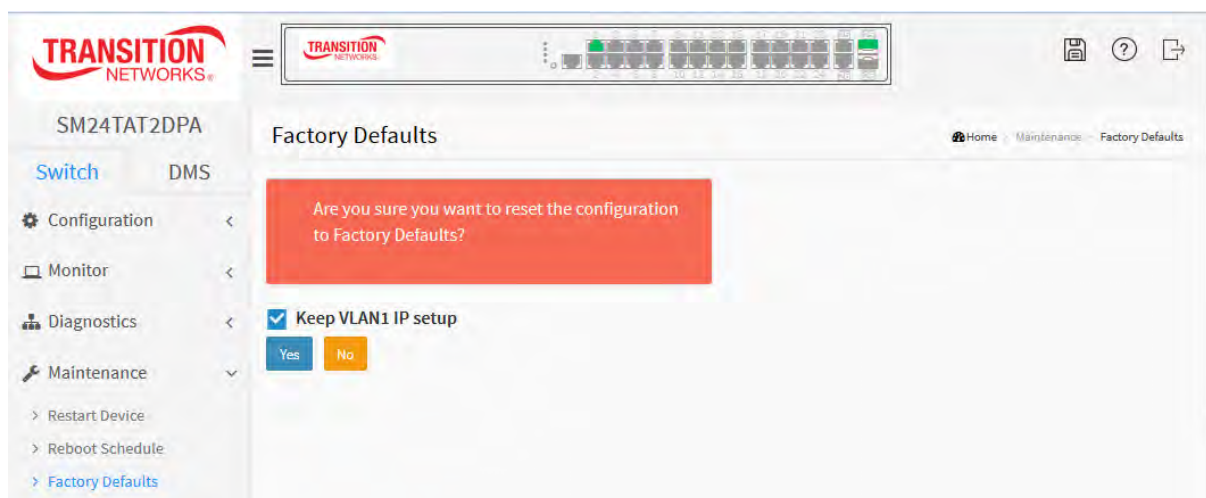
You can reset the configuration of the switch on this page. The IP configuration is retained if desired. The new configuration is available immediately, which means that no restart is necessary.

Web Interface

To configure a Factory Defaults Configuration in the web interface:

1. Click Maintenance, Factory Defaults.
2. Check or uncheck the "Keep VLAN1 IP setup" checkbox if you want to retain the current VLAN1 IP setting.
3. At the "Are you sure...?" prompt, click Yes.

Figure 5-3: Factory Defaults page



Parameter descriptions:

Keep VLAN1 IP setup : Check if you want to keep current VLAN1 IP setting.

Yes : Click to reset the configuration to Factory Defaults.

No : Click to return to the Port State page without resetting the configuration.

Note: Restoring factory default can also be performed by making a physical loopback between port 1 and port 2 within the first minute from switch reboot. In the first minute after boot, 'loopback' packets will be transmitted at port 1. If a 'loopback' packet is received at port 2 the switch will do a restore to default values.

5-4 Firmware

This section describes how to upgrade Firmware. The Switch can be enhanced with more value-added functions by installing firmware upgrades.

5-4.1 Firmware Upgrade

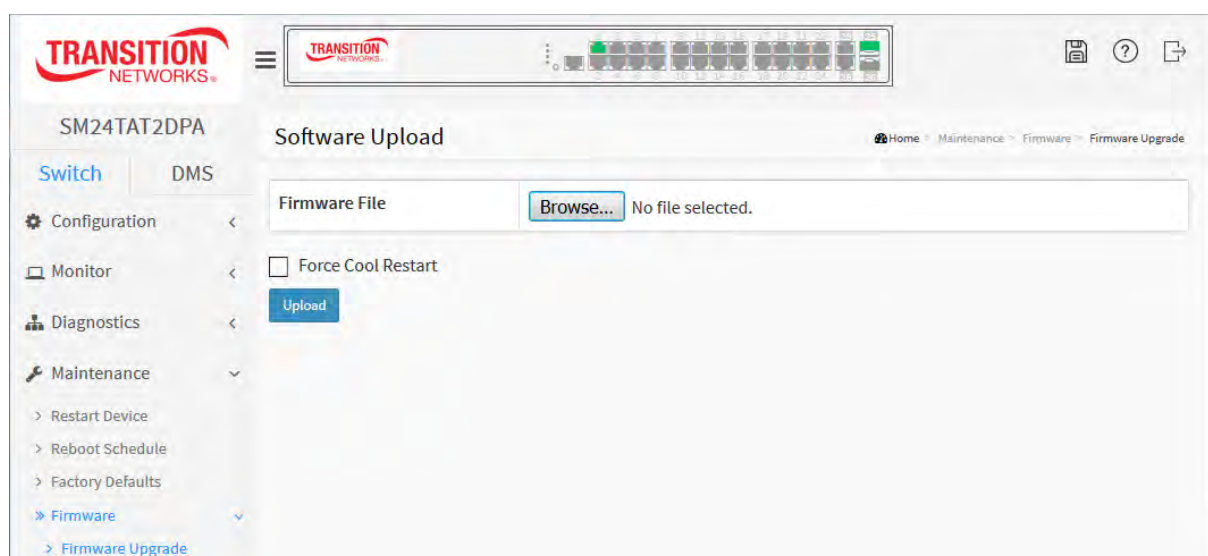
The Software Upload page facilitates an update of the firmware controlling the switch.

Web Interface

To configure a Firmware Upgrade via the web interface:

1. Click Browse... to select the firmware file to upgrade your switch.
2. Click the Upload button.

Figure 5-3.1 Software Upload page



Parameter descriptions:

Browse : Click the "Browse..." button to search for the Firmware filename.

Force Cool Restart: Uncheck "Force Cool Restart" if you want to perform a warm restart of the switch after the software upload. Check "Force Cool Restart" if you want to simulate a power-on (cold restart) of the switch after the software upload. **Warning:** Forcing a cool restart will affect the traffic going through the switch.



NOTE: This page facilitates an update of the firmware controlling the switch. Uploading software will update all managed switches to the location of a software image and click. After the software image is uploaded, a page announces that the firmware update is initiated. After about a minute, the firmware is updated and the switch restarts.

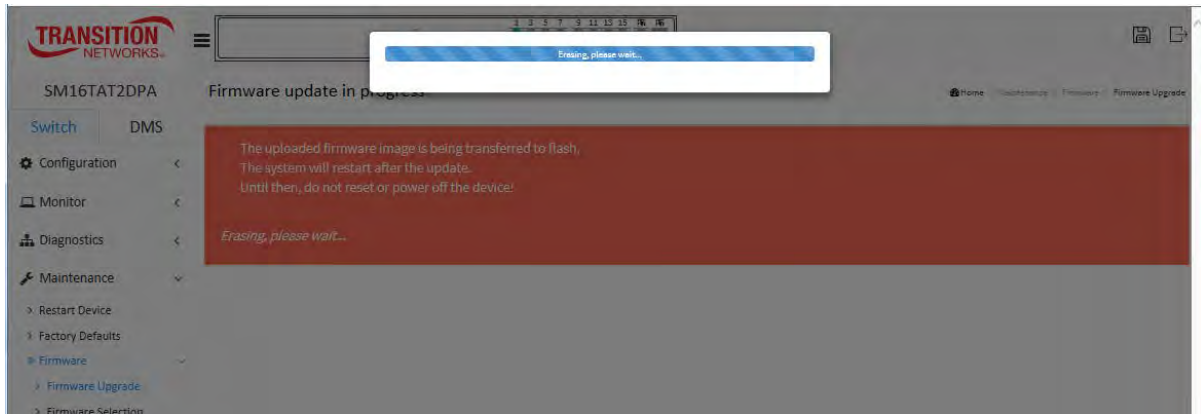


WARNING: While the firmware is being updated, Web access appears to be defunct. The front LED flashes Green/Off with a frequency of 10 Hz while the firmware update is in progress. Do not restart or power off the device at this time or the switch may fail to function afterwards.

After the software image is uploaded, a page announces that the firmware update is initiated. After about a minute, the firmware is updated and the switch restarts.

Warning: While the firmware is being updated, Web access appears to be defunct. The front LED flashes Green/Off with a frequency of 10 Hz while the firmware update is in progress. Do not restart or power off the device at this time or the switch may fail to function afterwards.

The Firmware update in progress screen is shown below.



When done, the startup page (**Monitor > System > Information**) displays.

5-3.2 Firmware Selection

This page provides information about the active and alternate (backup) firmware images in the device, and allows you to revert to the alternate image. The page displays two tables with information about the active and alternate firmware images.

Note:

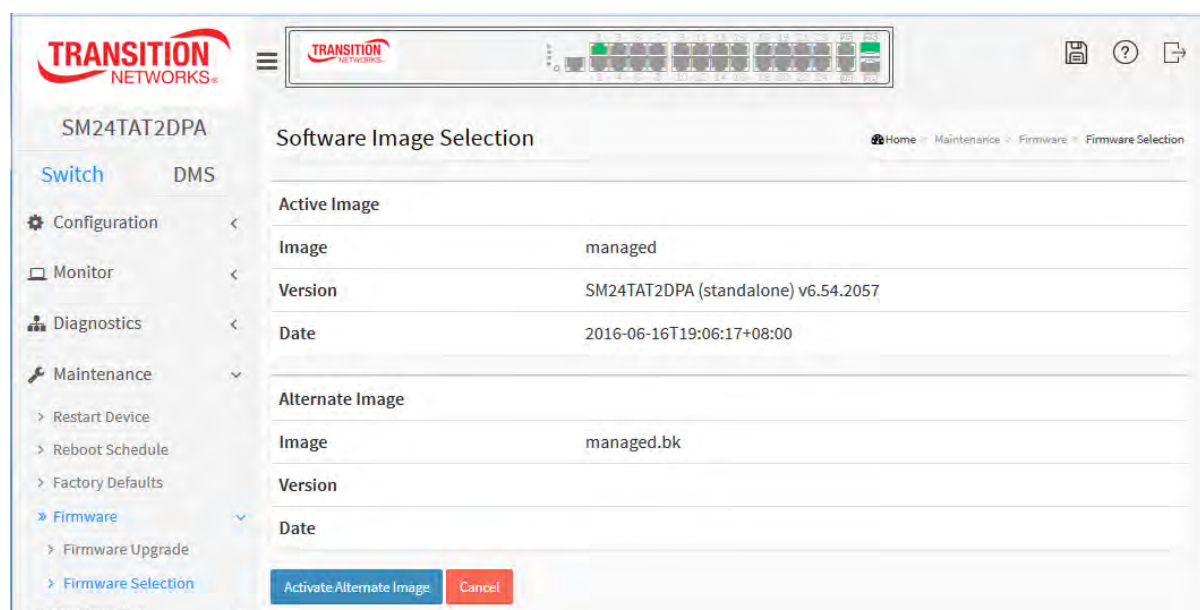
1. In case the active firmware image is the alternate image, only the "Active Image" table is shown. In this case, the **Activate Alternate Image** button is also disabled.
2. If the alternate image is active (due to a corruption of the primary image or by manual intervention), uploading a new firmware image to the device will automatically use the primary image slot and activate this.
3. The firmware version and date information may be empty for older firmware releases. This does not constitute an error.

Web Interface

To configure a Firmware Upgrade Configuration in the web interface:

1. At **Maintenance > Firmware > Firmware Selection** verify the displayed version.
2. Click the **Activate Alternate Image** button.

Figure 5-3.2 Software Image Selection page



Parameter descriptions:

Image: The flash index name of the firmware image. The name of the active (current) image is *managed*, the alternate image is named *managed.bk*.

Version: The version of the firmware image (e.g., *SM24TAT2DPA (standalone) v6.48.2057*).

Date: The date and time when the firmware was produced (e.g., *2016-06-16T19:06:17+08:00*).

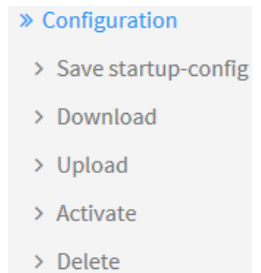
Buttons:

Activate Alternate Image: Click to activate the "Alternate Image". This button may be disabled depending on system state.

Cancel: Cancel activating the backup image. Navigates away from this page.

5-4 Configuration

This section lets you save, download, upload, activate, and/or delete a config file. The switch stores its configuration in a number of text files in CLI format. The files are either virtual (RAM-based) or stored in flash on the switch. There are three system files:



running-config: A virtual file that represents the currently active configuration on the switch. This file is volatile.

startup-config: The startup configuration for the switch, read at boot time.

default-config: A read-only file with vendor-specific configuration. This file is read when the system is restored to default settings.

It is also possible to store up to two other files and apply them to running-config, thereby switching configuration. **Note:** The generation of the configuration file may be time consuming, depending on the amount of non-default configuration.

5-4.1 Save startup-config

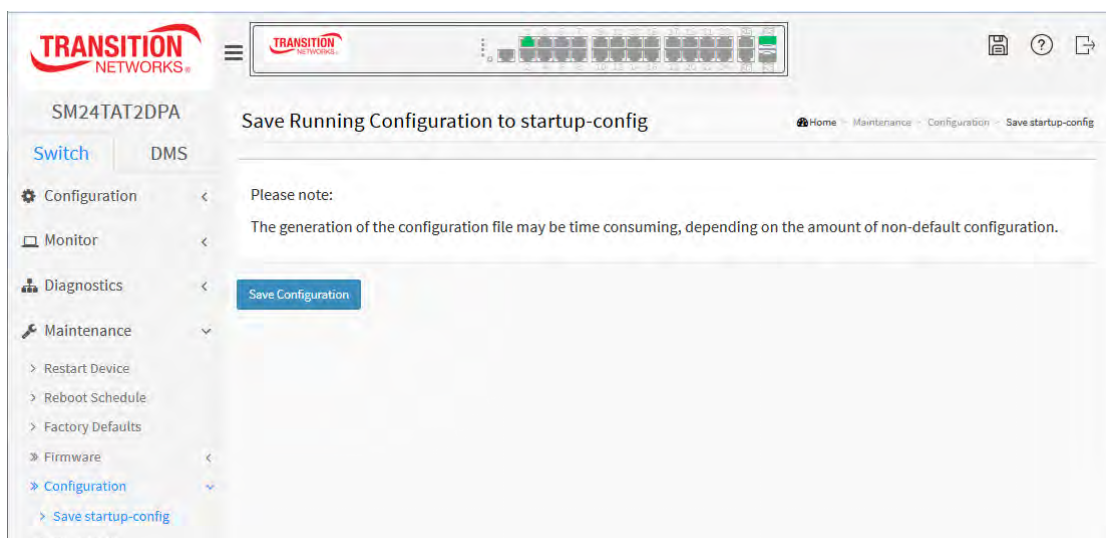
This copies the running-config to startup-config, thereby ensuring that the currently active configuration will be used at the next reboot.

Web Interface

To save running configuration in the web interface:

1. Navigate to **Switch > Maintenance > Configuration > Save Startup-config**.
2. Click the **Save Configuration** button.

Figure 5-4.1: Save Startup Configuration page



Buttons :

Save Configuration: Click to save configuration; the running configuration will be written to flash memory for system boot up to load this startup configuration file.

5-4.2 Upload

It is possible to upload a file from the web browser to all the files on the switch, except default-config, which is read-only. If the destination is running-config, the file will be applied to the switch configuration. This can be done in two ways:

Replace: The current configuration is fully replaced with the configuration in the uploaded file.

Merge: The uploaded file is merged into running-config.

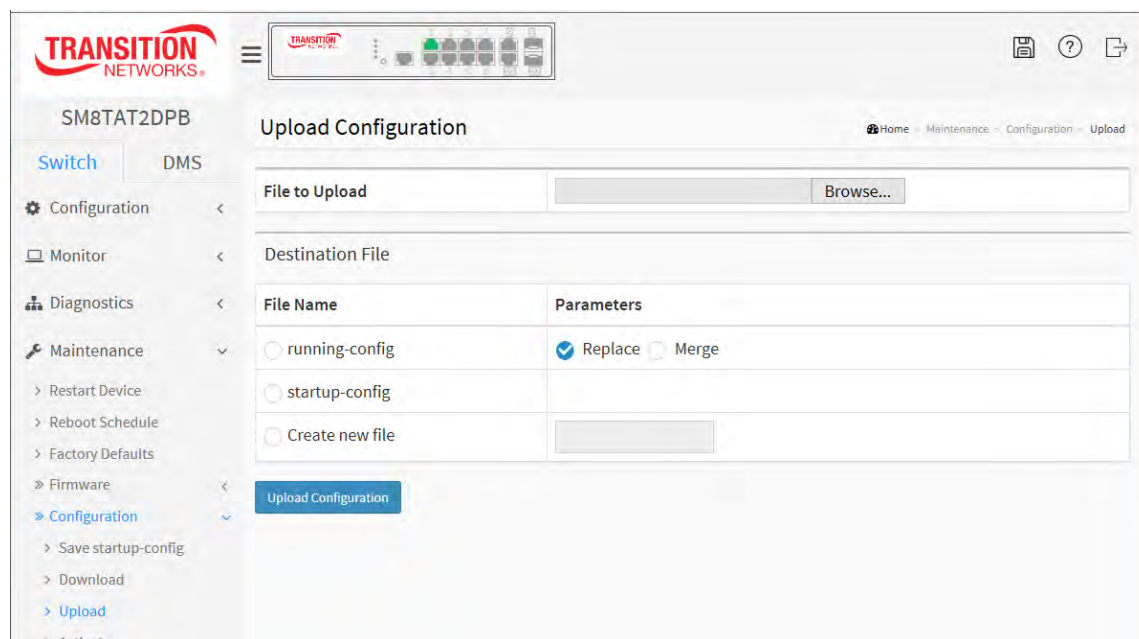
If the file system is full (i.e., contains the three system files mentioned above plus two other files), it is not possible to create new files, but an existing file must be overwritten or another deleted first.

Web Interface

To upload configuration in the web interface:

1. Navigate to **Switch > Maintenance > Configuration > Upload**.
2. Browse to and select the file to upload.
3. Select the destination file on the target.
4. Select *Replace* or *Merge*.
5. Click the **Upload Configuration** button.

Figure 5-4.2: Upload Configuration page



Parameter descriptions: There are three system files:

running-config : A virtual file that represents the currently active configuration on the switch. This file is volatile.

startup-config : The startup configuration for the switch, read at boot time.

Create new file : Select and enter a filename to upload.

Buttons

Upload Configuration: Click the **“Upload Configuration”** button then the running web management PC will start to upload the configuration from the managed switch configuration into the location PC, user can configure web browser’s upload file path to keep configuration file.

5-4.3 Download

It is possible to download any of the files on the switch to the web browser. Select the file and click the **Download Configuration** button.

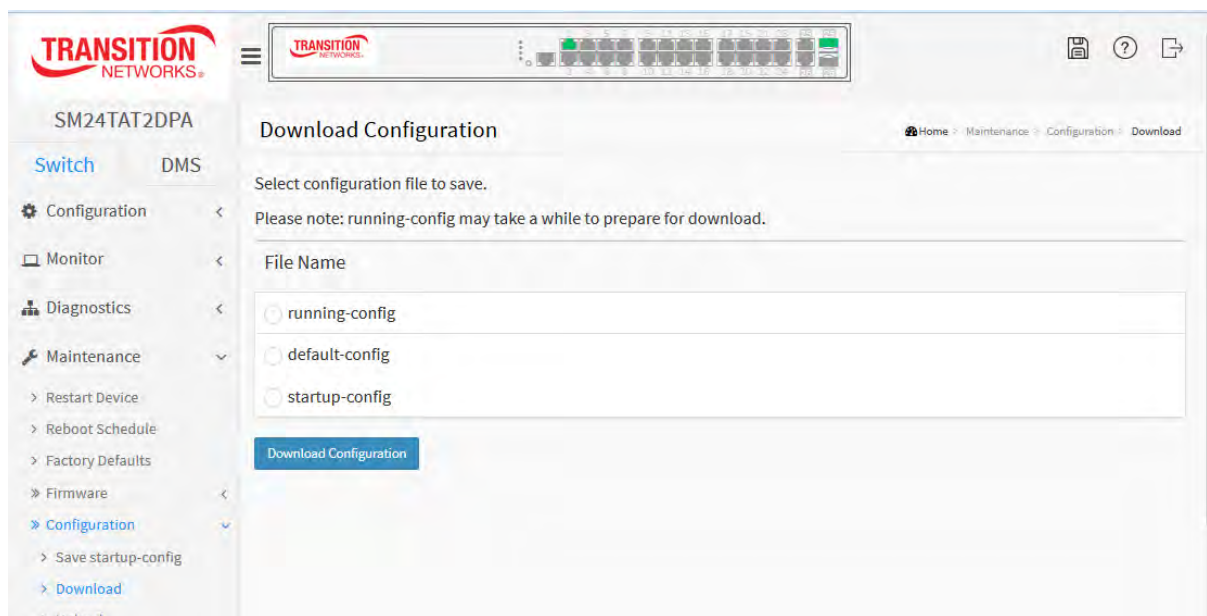
Download of running-config may take a little while to complete, as the file must be prepared for download.

Web Interface

To download configuration in the web interface:

1. Select the Configuration file to save.
2. Click the **Download Configuration** button.
3. Click the **Save** button.
4. Select Open, Open Folder, or View Downloads.

Figure 5-4.3: Configuration Download page



Parameter descriptions: There are three system files:

running-config: A virtual file that represents the currently active configuration on the switch. This file is volatile.

startup-config: The startup configuration for the switch, read at boot time.

default-config: A read-only file with vendor-specific configuration. This file is read when the system is restored to default settings.

Buttons :

Download Configuration : Select the file and click the **Download Configuration** button.



5-4.4 Activate

It is possible to activate any of the configuration files present on the switch, except for running-config which represents the currently active configuration.

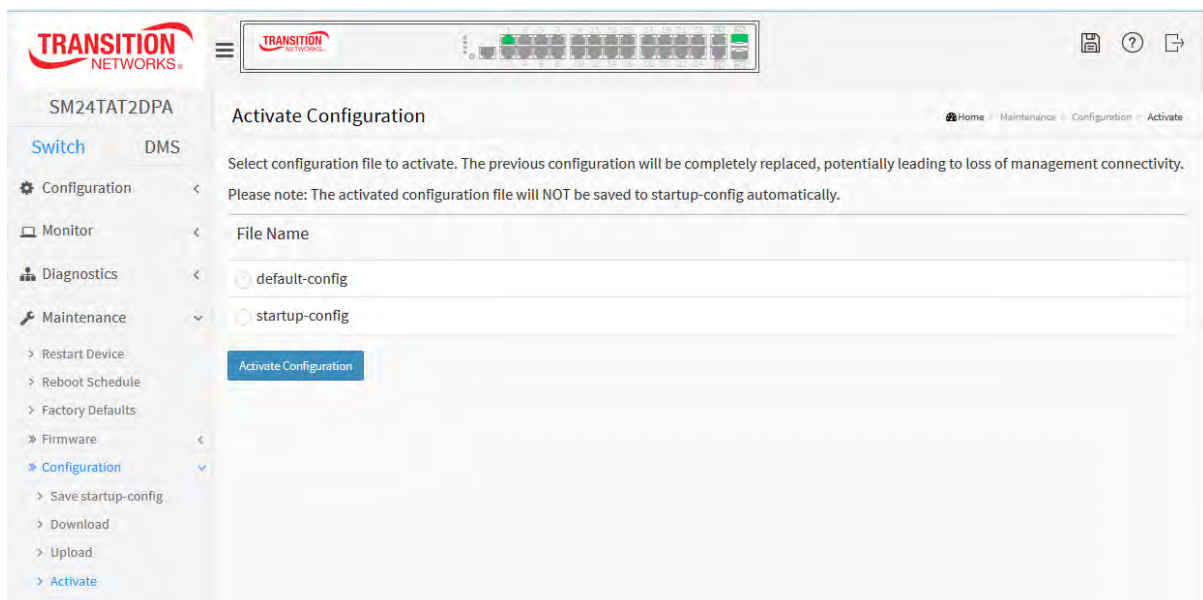
Select the file to activate and click the **Activate Configuration** button. This will initiate the process of completely replacing the existing configuration with that of the selected file.

Web Interface

To activate configuration in the web interface:

1. Select the configuration file to activate (*default-config* or *startup-config*).
2. Click the **Activate Configuration** button. The previous configuration will be completely replaced, potentially leading to loss of management connectivity. **Note:** The activated configuration file will NOT be saved to startup-config automatically.

Figure 5-4.4: Activate Configuration page



Parameter descriptions: There are two system files:

default-config: A read-only file with vendor-specific configuration. This file is read when the system is restored to default settings.

startup-config: The startup configuration for the switch, read at boot time.

Buttons:

Activate Configuration: Click the button and the *default-config* or *startup-config* file will be activated and will become this switch's running configuration.

5-4.5 Delete

It is possible to delete any of the writable files stored in flash, including startup-config. If this is done and the switch is rebooted without a prior Save operation, this effectively resets the switch to its default configuration.

Web Interface

To delete a configuration file via the web interface:

1. Select *startup-config*, or select the *filename* radio button and enter a filename to be deleted.
2. Click the **Delete Configuration File** button.
3. At the *Are you sure...?* prompt, select **Yes** to delete the file.

Figure 5-4.5: Delete Configuration File page

The screenshot shows a web interface for deleting a configuration file. The page title is "Delete Configuration File" and the breadcrumb is "Home > Maintenance > Configuration > Delete". The main content area says "Select configuration file to delete." Below this is a "File Name" input field. There are two radio buttons: "startup-config" and "filename". The "filename" radio button is selected, and there is an adjacent text input field. At the bottom left is a blue button labeled "Delete Configuration File".

Parameter descriptions: There is one system file and one optional file selection:

startup-config: The startup configuration for the switch, read at boot time.

filename: select the radio button and enter a valid (existing) filename to be deleted.

Buttons :

Delete Configuration File: Click this button to delete the startup-config file; this effectively resets the switch to default configuration.

5-5 Server Report

It is possible to download a system report file on the switch to the web browser.

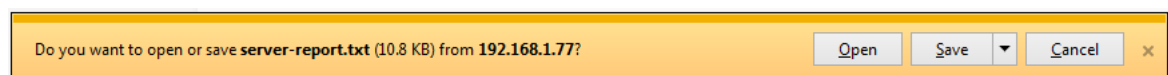
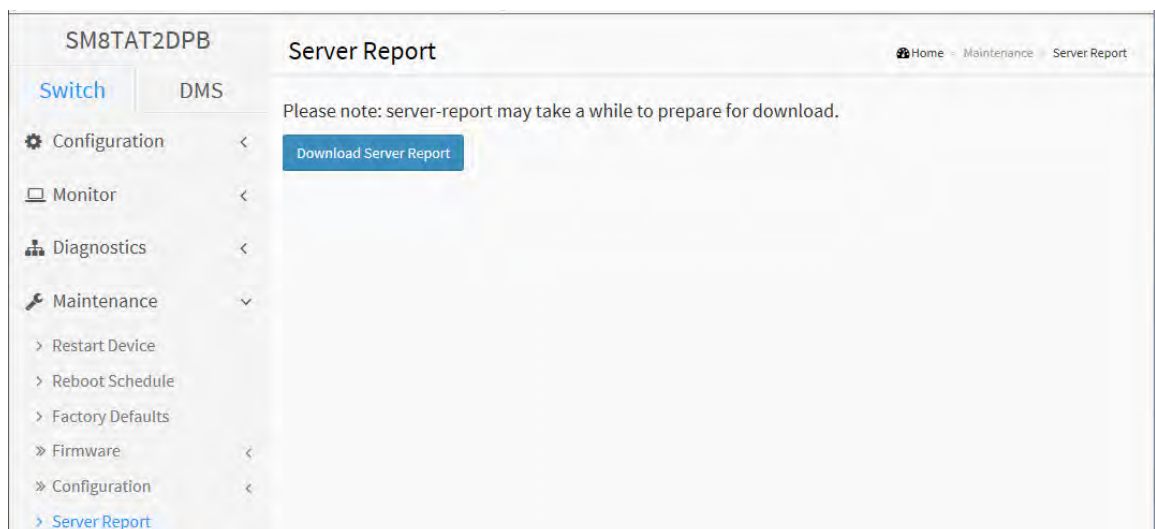
The *Server Report* includes system overview, running-config and log.

Download of *system-report* may take a little while to complete, as the file must be prepared for download.

1. Navigate to **Switch > Maintenance > Server Report** menu path.
2. Click the **Download Server Report** button.
3. Select **Open**, **Save**, or **Cancel**. If you select **Open**, the file opens in MS Word.

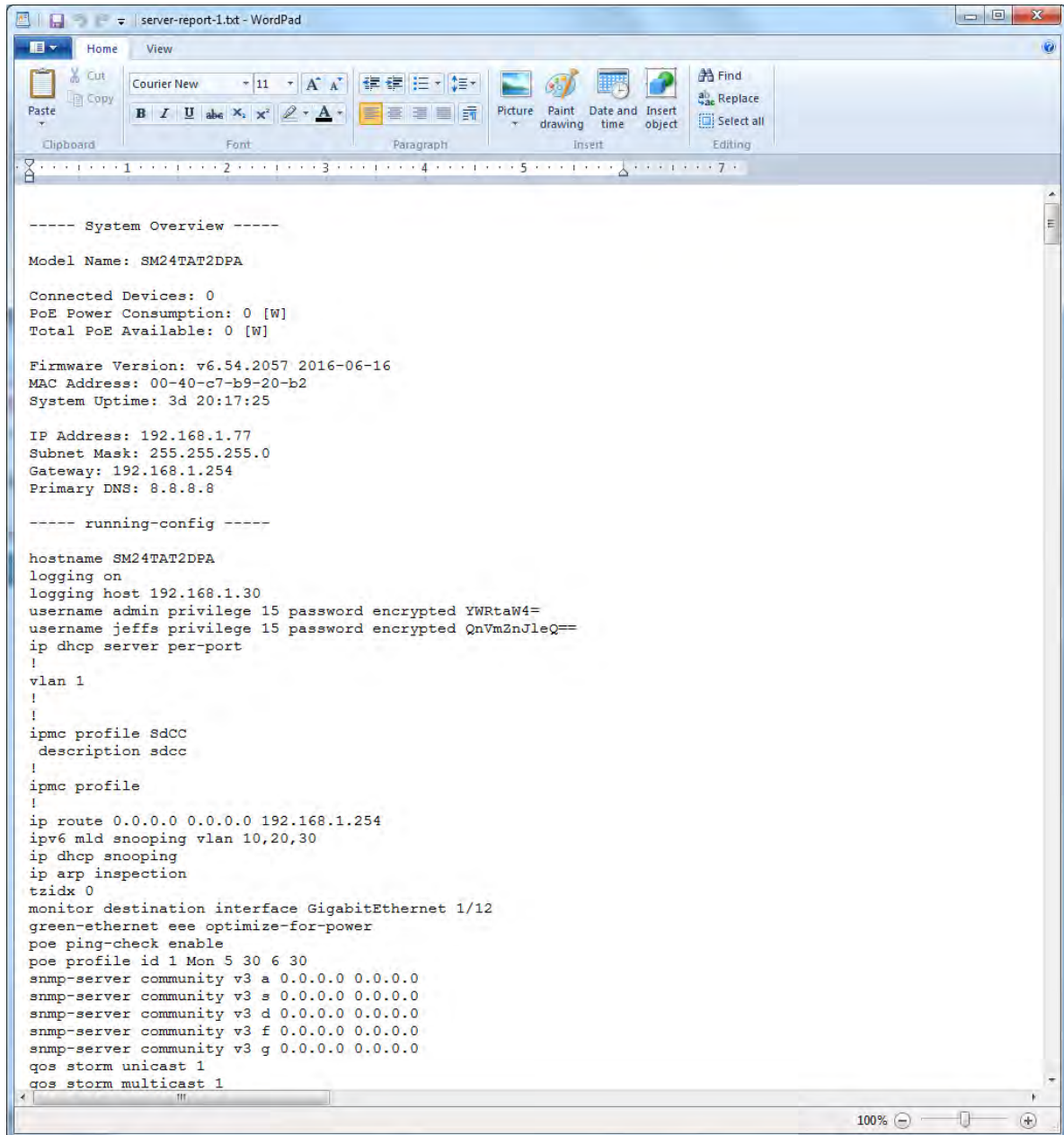
If you select **Save**, you have the options to Open, Open folder, or View downloads.

Figure 5-5.1: Delete Configuration File page



A sample downloaded Server Report page is shown below.

5-4.5 Sample Downloaded Server Report Page

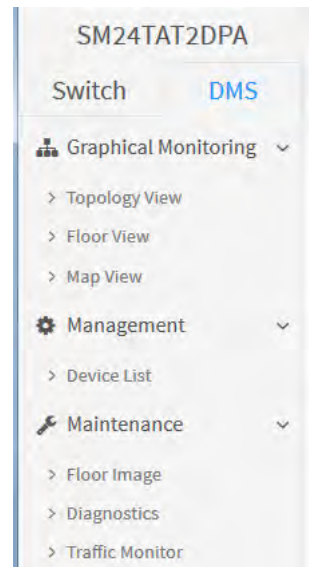


```
----- System Overview -----  
  
Model Name: SM24TAT2DPA  
  
Connected Devices: 0  
PoE Power Consumption: 0 [W]  
Total PoE Available: 0 [W]  
  
Firmware Version: v6.54.2057 2016-06-16  
MAC Address: 00-40-c7-b9-20-b2  
System Uptime: 3d 20:17:25  
  
IP Address: 192.168.1.77  
Subnet Mask: 255.255.255.0  
Gateway: 192.168.1.254  
Primary DNS: 8.8.8.8  
  
----- running-config -----  
  
hostname SM24TAT2DPA  
logging on  
logging host 192.168.1.30  
username admin privilege 15 password encrypted YWRtaW4=  
username jeffs privilege 15 password encrypted QnVmZnJleQ==  
ip dhcp server per-port  
!  
vlan 1  
!  
!  
ipmc profile SdCC  
  description sdcc  
!  
ipmc profile  
!  
ip route 0.0.0.0 0.0.0.0 192.168.1.254  
ipv6 mld snooping vlan 10,20,30  
ip dhcp snooping  
ip arp inspection  
tzidx 0  
monitor destination interface GigabitEthernet 1/12  
green-ethernet see optimize-for-power  
poe ping-check enable  
poe profile id 1 Mon 5 30 6 30  
snmp-server community v3 a 0.0.0.0 0.0.0.0  
snmp-server community v3 s 0.0.0.0 0.0.0.0  
snmp-server community v3 d 0.0.0.0 0.0.0.0  
snmp-server community v3 f 0.0.0.0 0.0.0.0  
snmp-server community v3 g 0.0.0.0 0.0.0.0  
qos storm unicast 1  
qos storm multicast 1
```

Chapter 6. DMS (Device Management System)

6-1 The DMS Tab

The Transition Networks DMS (Device Management System) is an intelligent management tool embedded in the switch to intuitively help IT/TS in reducing support time, cost, and effort. In the SM24TAT2DPA main menu pane on the left, navigate to the DMS tab to display the main DMS features: Graphical Monitoring, Management, and Maintenance.

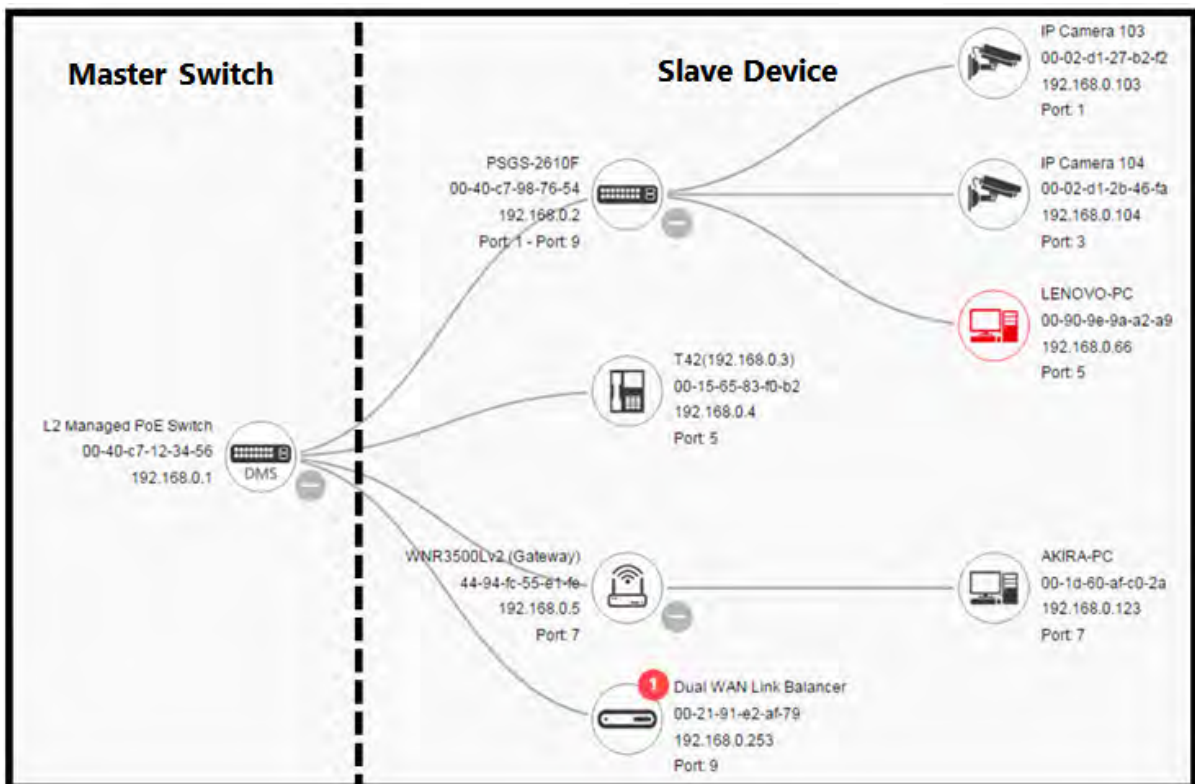


6-2 DMS Overview


The embedded Device Managed System is designed to be extremely easy-to-use/manage/install IP Phone, IP Cam, or Wifi-AP for enterprise applications.

The DMS operates by a master switch elected from one of the switches. The master switch automatically discovers all type of IP device information and diagnoses all cable and device status on topology. Any member of the DMS switch can be the master switch.

You can deploy IP devices via Topology/ Floor/ Map View to installation location, and through Diagnostics and Traffic Monitor, and also check link status and monitor throughput as well.





6-3 Graphical Monitoring

-  Graphical Monitoring
- [> Topology View](#)
- [> Floor View](#)
- [> Map View](#)

Navigate to the DMS tab > Graphical Monitoring, Topology View menu path to monitor Topology/ Floor/ Map view

The global buttons are described below.

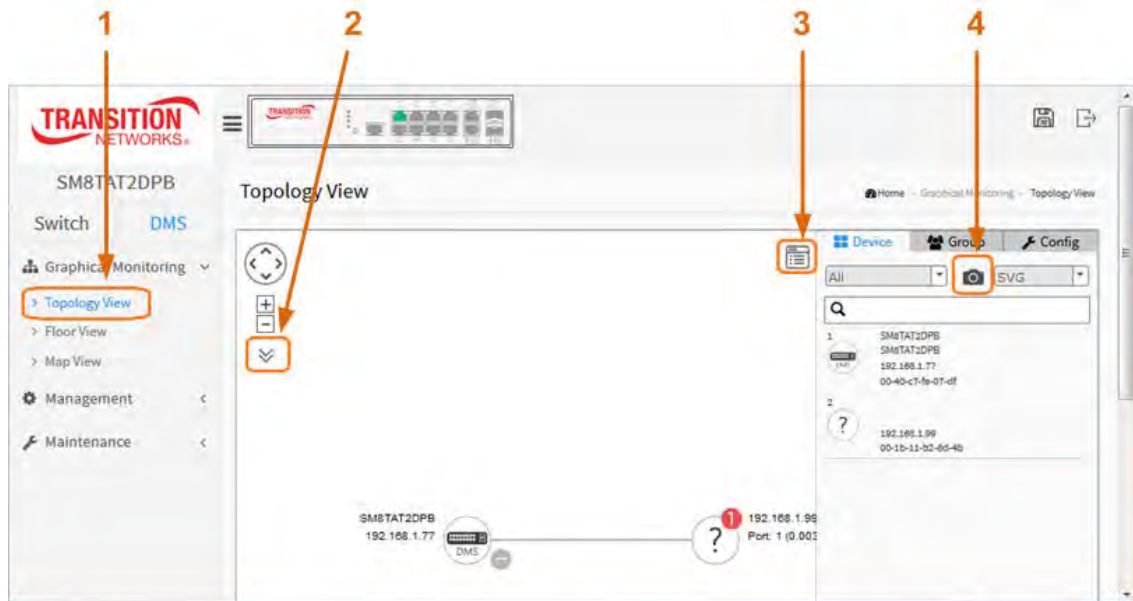
Button / Icon	Function
	Click to show or hide the pop up device list.
 SVG <input type="text"/>	Save the whole View to SVG, PNG or PDF.
All <input type="text"/>	Select the device you will like to show up.
<input type="text"/>	Type the key word you will like to search.

6-3.1 Topology View

DMS can automatically discover all IP devices and display the devices by graphic networking topology view. You can manage and monitor them in Topology View (e.g., remotely diagnose cable connection status, auto alarm notifications on critical events, remotely reboot PoE device when it's not alive, etc.). You can apply the DMS platform to solve abnormal issues anytime and anywhere by tablet or smart phone, and keep the network works smoothly.

In the DMS tab, click Graphical Monitoring, Topology View to display a visual representation of the

network topology. Click  to show the pop up device list.



Parameter Descriptions

Device picture



Icon with black mark: Device link up; you can select a function and check issues.




Icon with red mark: Device link down; you can diagnose the link status.






Icon with numbers: If issues on IP devices click picture to check event log.

Procedure

1. Click Topology View.

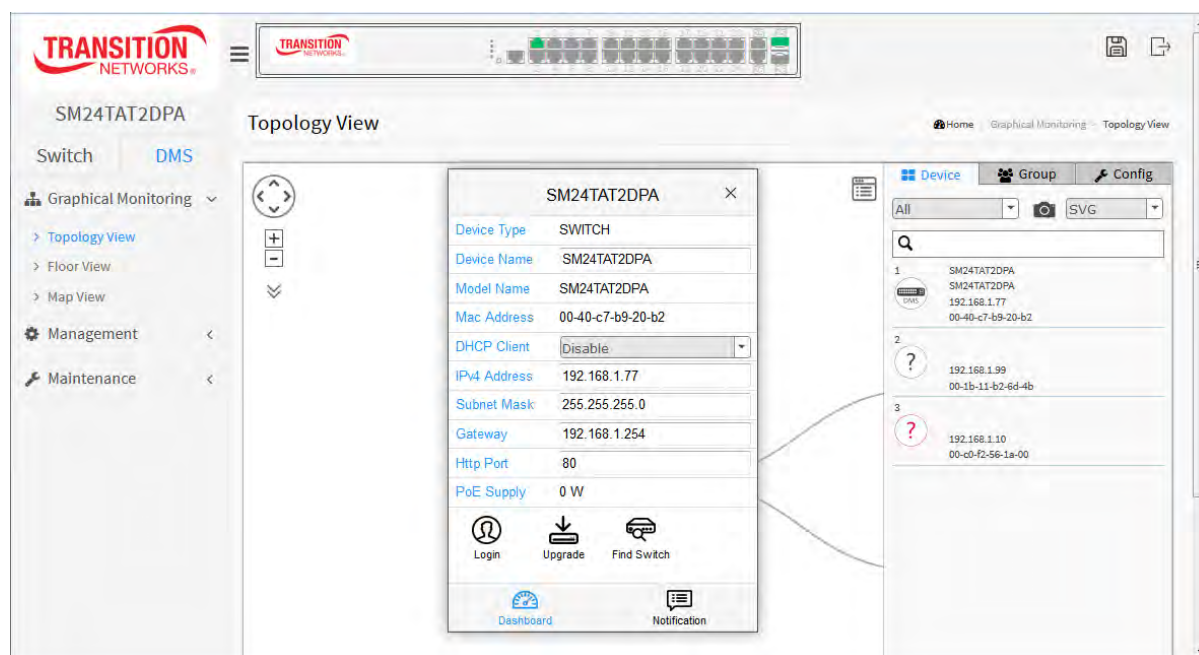
2. Click  to show the pop up device list.

3.. Click  to select each devices display information up to three Information can be selected.

4. Click   to save a copy of topology view and transfer the format to SVG, PNG or PDF file format.

Graphical Monitoring > Topology View > Device Tab

Click a device to display its parameters and icons.



The screenshot shows the Transition Networks web interface. The main area is titled "Topology View" and displays a network diagram. A pop-up window for the device "SM24TAT2DPA" is open, showing the following parameters:

Device Type	SWITCH
Device Name	SM24TAT2DPA
Model Name	SM24TAT2DPA
Mac Address	00-40-c7-b9-20-b2
DHCP Client	Disable
IPv4 Address	192.168.1.77
Subnet Mask	255.255.255.0
Gateway	192.168.1.254
Http Port	80
PoE Supply	0 W

Below the parameters are icons for Login, Upgrade, Find Switch, Dashboard, and Notification. The right-hand panel shows a list of devices with search and filter options.

Device Tab Parameters and Icons

Device Type: e.g., SWITCH

Device Name: e.g., SM24TAT2DPA

Model Name: e.g., SM24TAT2DPA

Mac Address: e.g., 00-40-c7-fe-07-df

DHCP Client: dropdown to select Disable or Enable. The default is disabled.

IPv4 Address: e.g., 192.168.1.77

Subnet Mask: e.g., 255.255.255.0

Gateway: e.g., 192.168.1.254

Http Port: e.g., 80

PoE Supply: e.g., 0 W

Login: click the button to return to the startup screen.

Upgrade: click the button to display the firmware upgrade dialog.

Find Switch: click the button to light the front panel port LEDs for 15 seconds.

Dashboard: click the button to display the dashboard data.

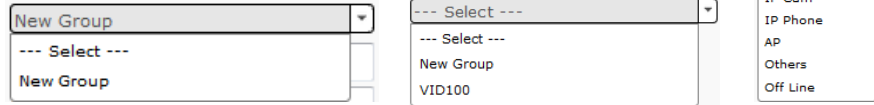
Notification: click the button to display notification messages, if any exist.

Lighting the switch for 15 seconds

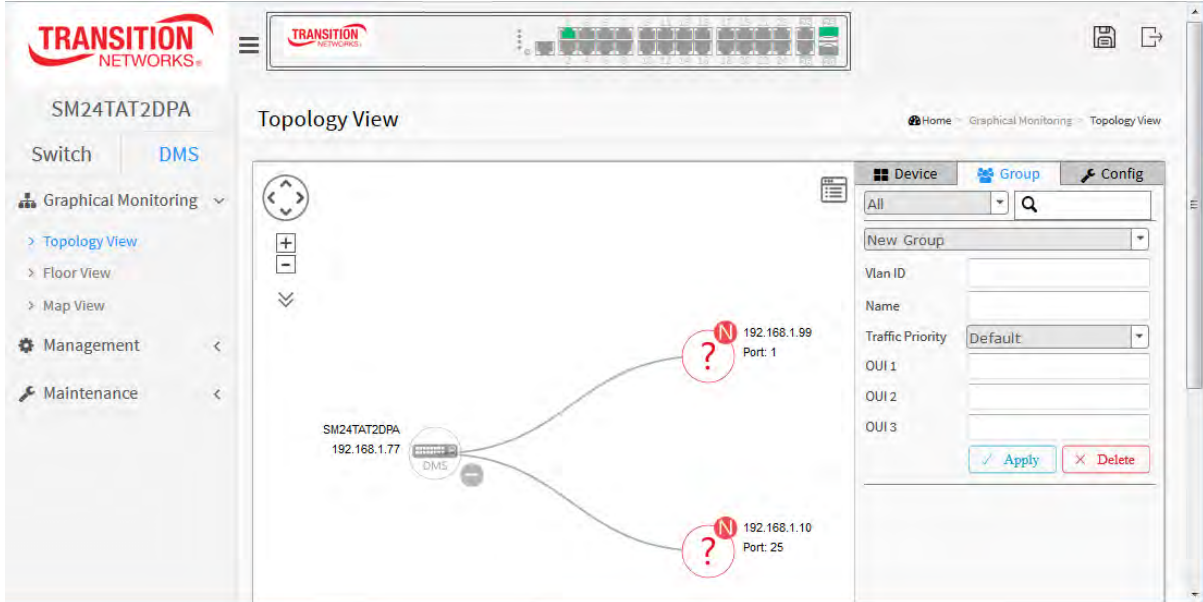
OK

Graphical Monitoring > Topology View > Group Tab

At the Groups dropdown, select a Group (ALL, SWITCH, PC, IP Cam, IP Phone, AP, Others, or Off Line).



At the New Group or Existing Groups dropdown, select New and enter a Vlan ID, Name, Traffic Priority, OUI(s), and then click the **Apply** button.



Group Tab Parameters and Icons

Vlan ID: enter the VLAN ID (VID; 1-4094).

Name: enter a Group name.

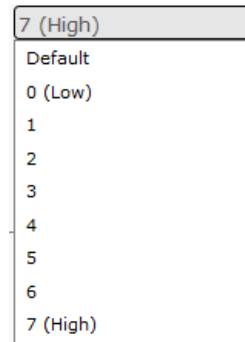
Traffic Priority: at the dropdown select Default, 0 (Low), 1, 2, 3, 4, 5, 6, or 7 (High) as the priority for traffic for this Group.

OUI 1 - 3: enter 1-3 Organizationally Unique Identifiers.

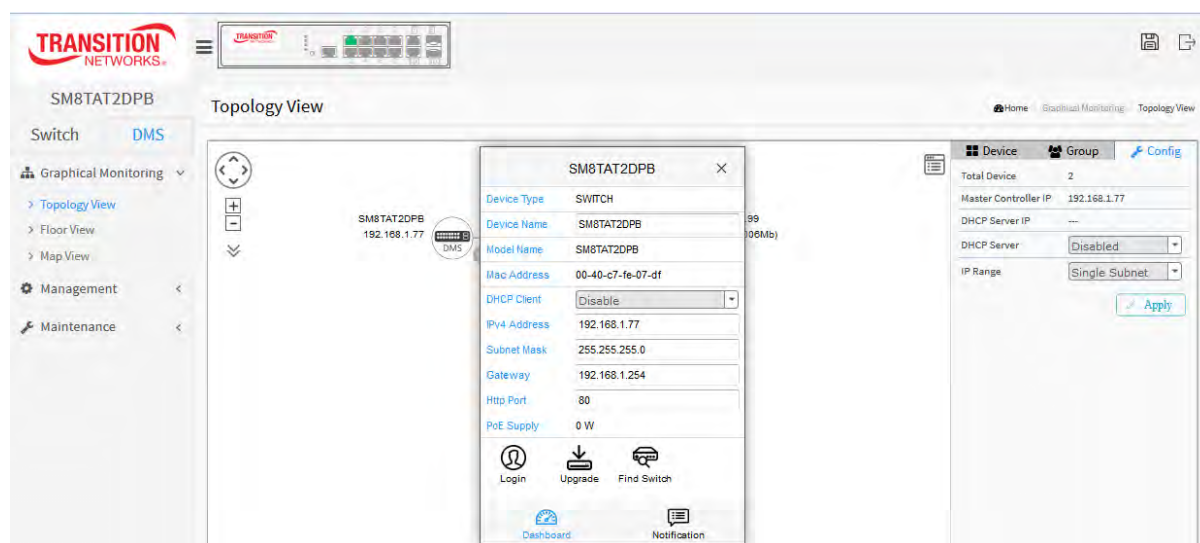
Buttons:

Apply : save the configured paramters.

Delete : delete the parameters.



Graphical Monitoring > Topology View > Config Tab

**Config Tab Parameters and Icons**

Device Type: e.g., SWITCH

Device Name: e.g., SM24TAT2DPA

Model Name: e.g., SM24TAT2DPA

Mac Address: e.g., 00-40-c7-fe-07-df

DHCP Client: dropdown to select *Disable* or *Enable*. The default is *Disabled*.

IPv4 Address: e.g., 192.168.1.77

Subnet Mask: e.g., 255.255.255.0

Gateway: e.g., 192.168.1.254

Http Port: e.g., 80

PoE Supply: e.g., 0 W

Login: click the button to return to the startup screen.

Upgrade: click the button to display the firmware upgrade dialog.

Find Switch: click the button to light the front panel port LEDs for 15 seconds.

Dashboard: click the button to display the dashboard data.

Notification: click the button to display notification messages, if any exist.

Total Device: the number of devices discovered (e.g., 2).

Master Controller IP: the master IP address (e.g., 192.168.1.77)

DHCP Server IP: if one is configured, otherwise displays "---".

DHCP Server: at the dropdown select *Disabled* or *Enabled*. The default is *Disabled*.

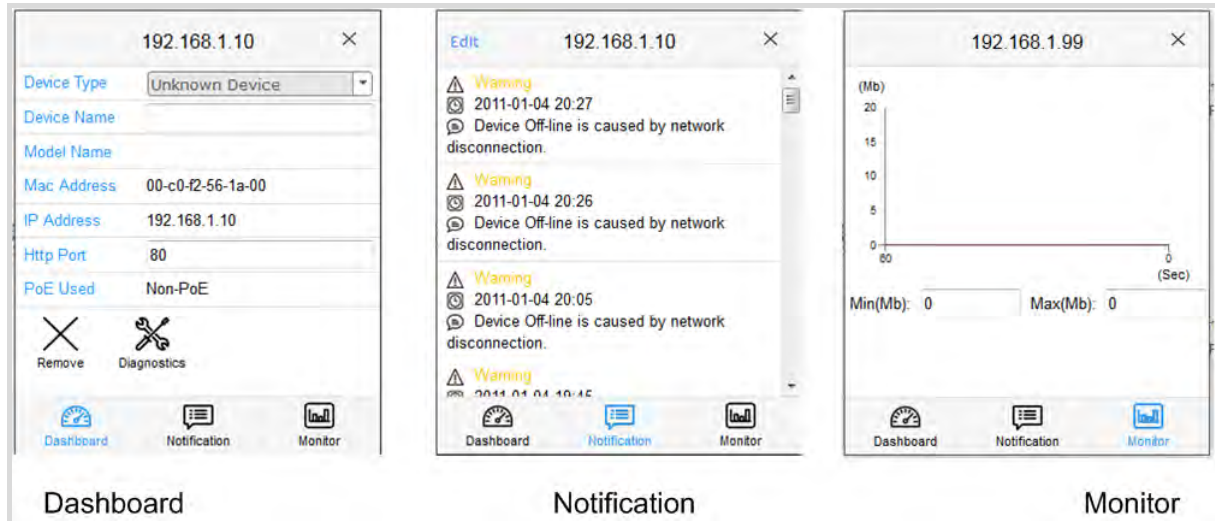
IP Range: at the dropdown select *Single Subnet* or *Multiple Subnet*. If you select *Multiple Subnets*, you must also enter one or more Range parameters.

Click the **Apply** button when done.

Lighting the switch for 15 seconds

OK

Sample Dashboard, Notification, and Monitor dialog boxes are shown below:




6-3.2 Floor View

This page lets you easily plan IP devices installation location onto the custom uploaded image by dragging-and-dropping markers in the Device list.

You can place the device icon on installed location, and print floor view for the maintenance. To place the icon, click the IP device from the Devices List then drag and drop into floor view.





Procedure

1. Click Floor View.
2. Click Device List.
3. Select and click a device.
4. Drag the device to the desired location.
5. Click  to save the floor view to SVG, PNG, or PDF file format.

Note: First go to “Maintenance” > “Floor Image” to add the Floor Image file; then it will be able for use in the “Floor View” page.

Entry Tab Parameters and Icons

- Click  to show or hide the pop up device list.
- Click  to Save the whole View to SVG, PNG or PDF.
- Click and select the device you will like to show up.
- Click and type the key word you will like to search.



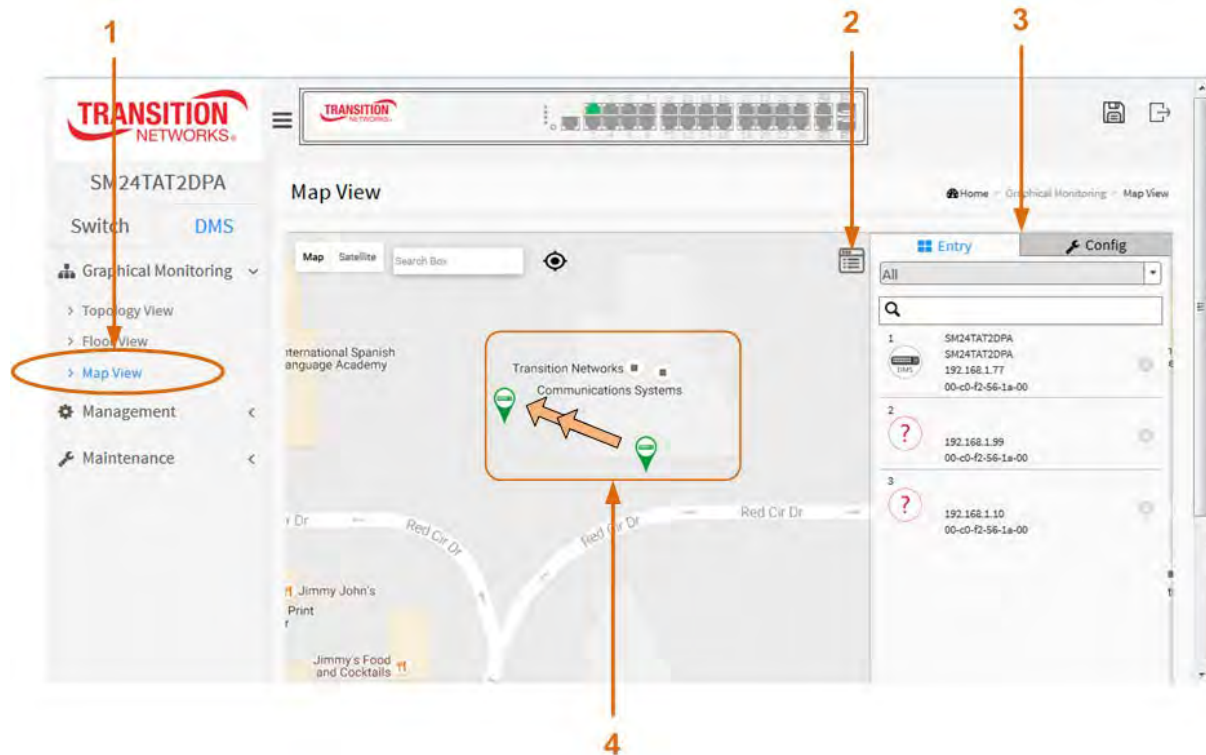
Config Tab Parameters and Icons

- Total Device:** the number of devices discovered (e.g., 2).
- Master Controller IP:** the master IP address (e.g., 192.168.1.77)
- DHCP Server IP:** if one is configured, otherwise displays “---”.
- DHCP Server:** at the dropdown select *Disabled* or *Enabled*. The default is *Disabled*.
- IP Range:** at the dropdown select *Single Subnet* or *Multiple Subnet*. If you select *Multiple Subnets*, you must also enter one or more Range parameters.



6-3.4 Map View

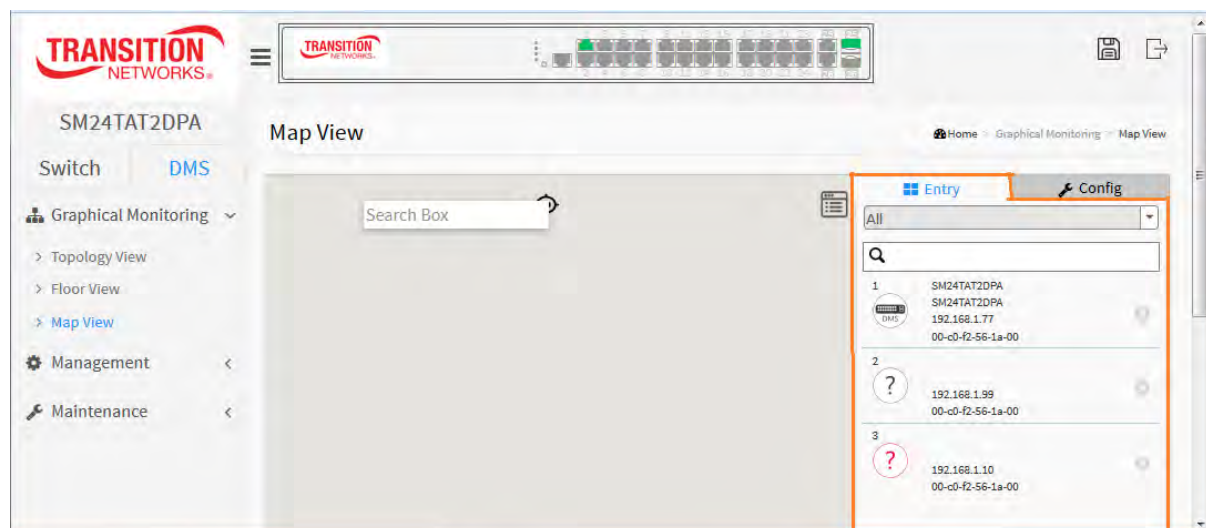
You can monitor and manage each device by DMS, and help the user find the location of the devices even they are installed in different building. You can place the device icon on the Map View which is navigated by Google Maps.



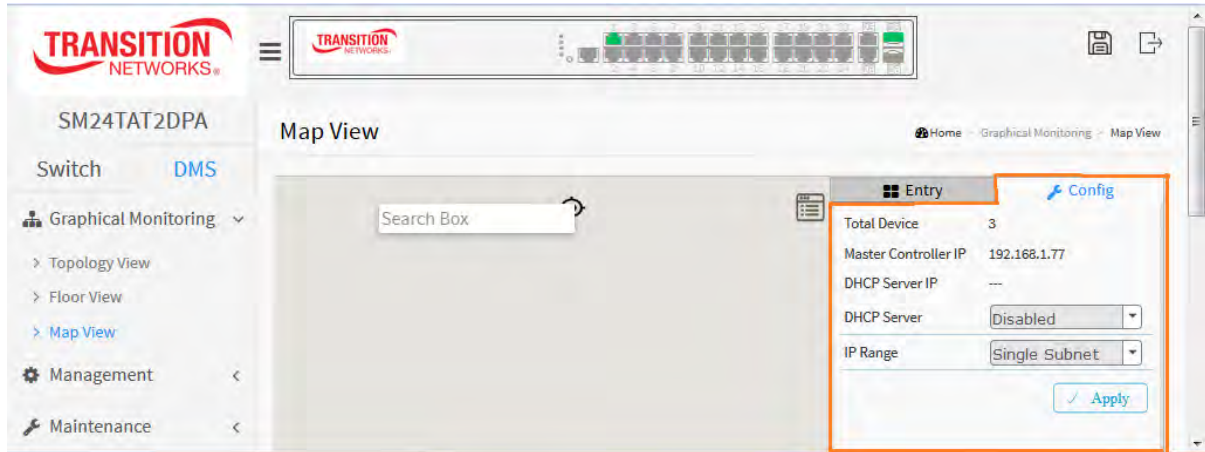
Procedure

1. Click Map View and click *Always*.
2. Click a device in the Entry tab list.
3. Select and click a device (📍).
4. Drag the device to the desired location.

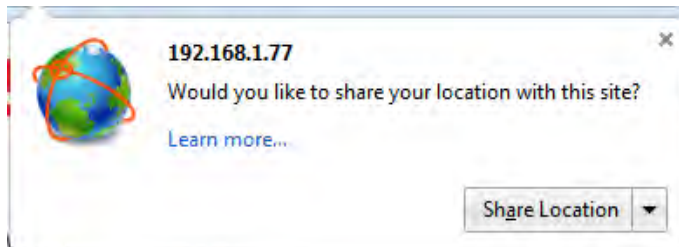
Entry Tab:



Config Tab:



Message: *Would you like to share your location with this site?*



Response: *Select Always, Never, or Not Now.*

6-4 Management

6-4.1 Device List

The devices in the same subnet with the DMS switch will be listed in the Devices List.

The screenshot shows the 'Devices List' page in the Transition Networks web interface. The interface includes a sidebar with navigation options like 'Management' and 'Device List'. The main content area displays a table of devices with columns for Remove, Status, Type, Model Name, Device Name, Edit Device Name, MAC, IP Address, and Edit Http Port. Two devices are listed: one of type 'Others' and one of type 'SWITCH'. An 'Apply' button is located at the bottom left of the table area. Orange arrows numbered 1 through 4 point to specific UI elements: 1 points to the 'Management > Device List' path in the sidebar; 2 points to the 'Edit Device Name' column header; 3 points to the search bar and the 'Edit Http Port' column header; 4 points to the 'Apply' button.

Procedure

1. Click **DMS > Management > Device List**. Select to remove a device if necessary.

2.. Click  to Edit Device Name or Http Port.

3. Edit the Device Name and/or Http Port.

4. Click Apply.

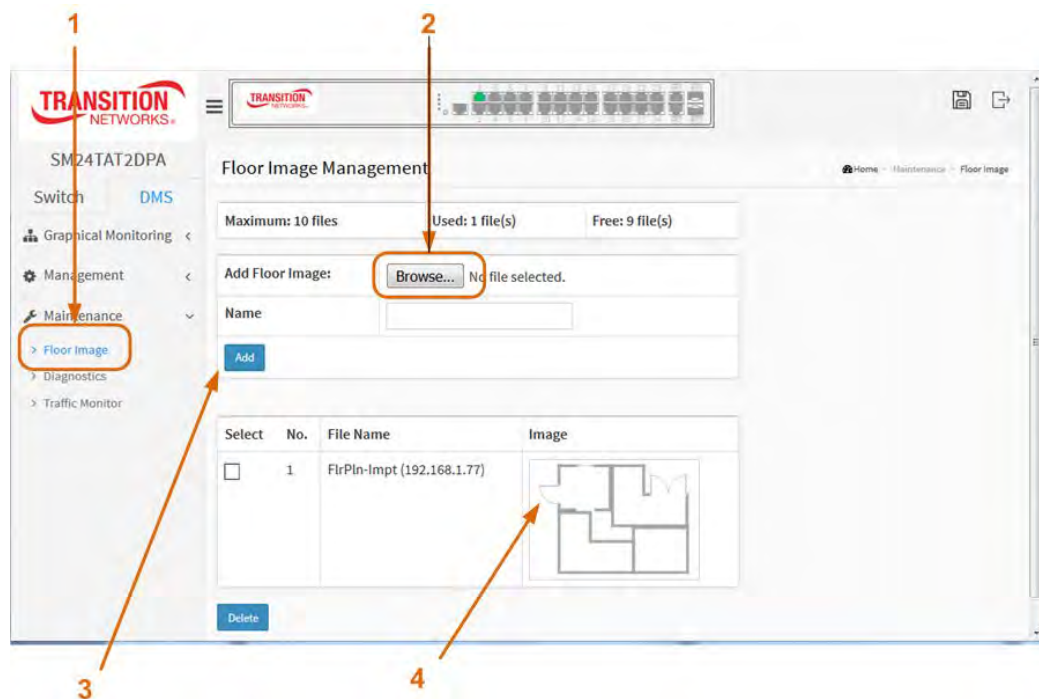


NOTE: Click title to sort by different Mac or IP address, etc.

6-5 Maintenance

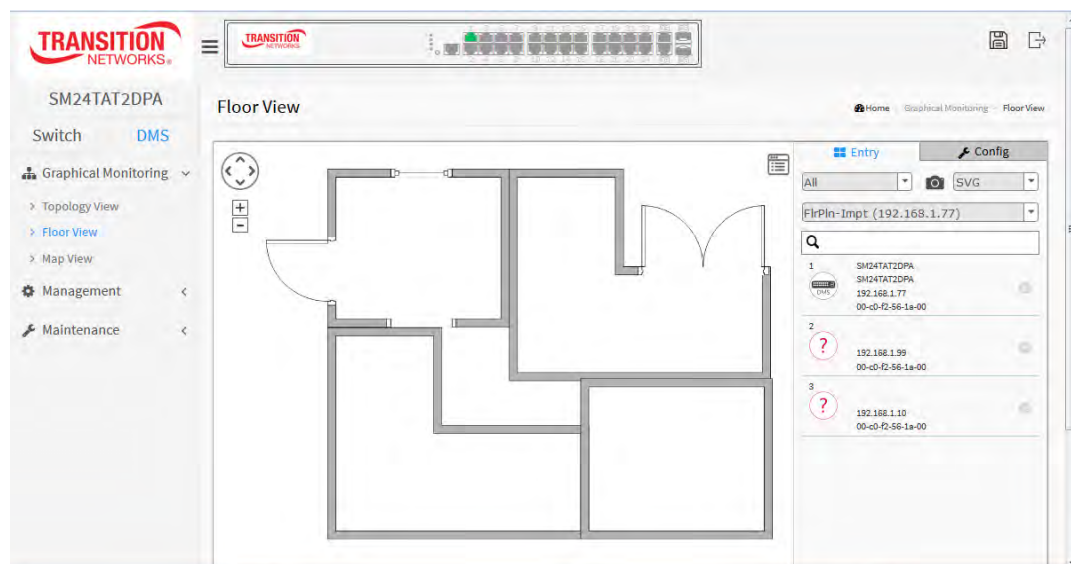
6-5.1 Floor Image

The Floor Image Management lets you manage and maintain the flow view image. Here you can add or delete a map or floor image.



Procedure

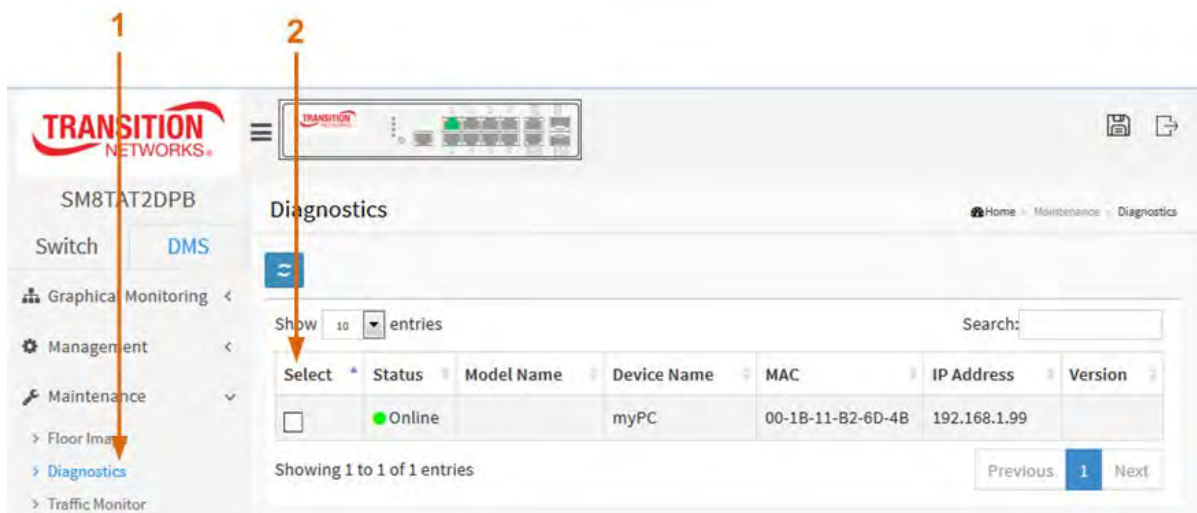
1. Click **DMS > Management > Floor View**.
2. Select a floor image (image size: 512KB, File type: .jpg or .png).
3. Click **Add** to add the new floor image.
4. To open the new floor image, you can navigate to **DMS > Graphical Monitoring > Floor View**:



6-5.1 Diagnostics

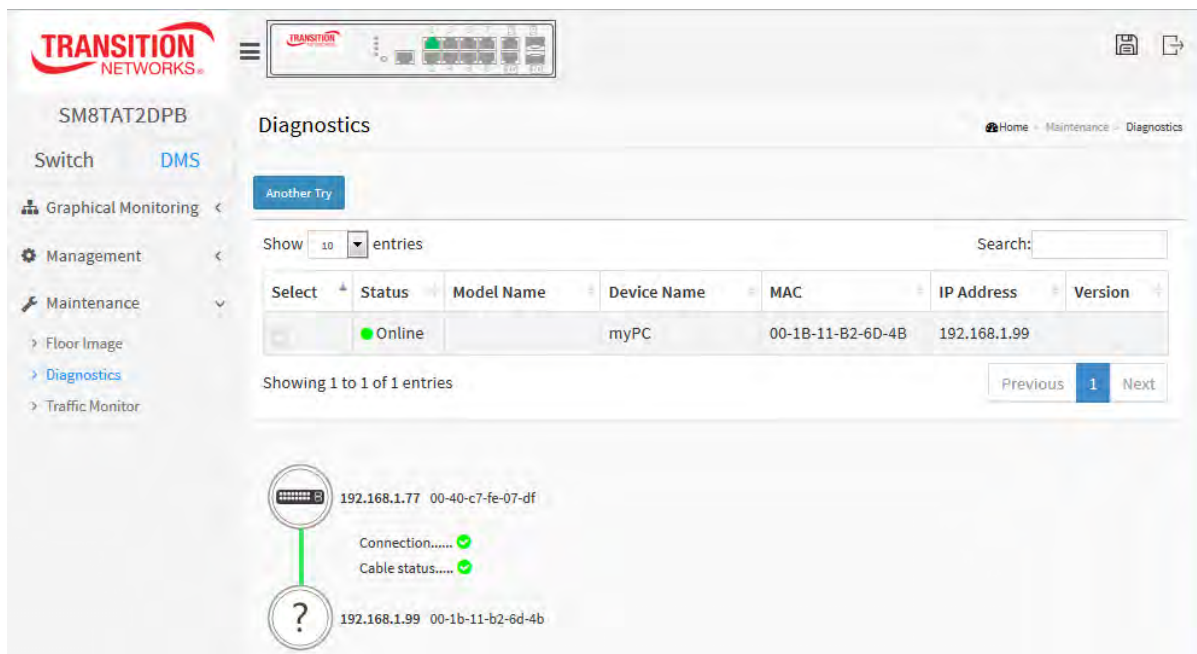
This feature lets you verify and test the link route between switches and devices. You can use this feature to remotely diagnose all IP device status and decrease troubleshooting time.

This page lets you diagnose the connection status of IP devices in the network.



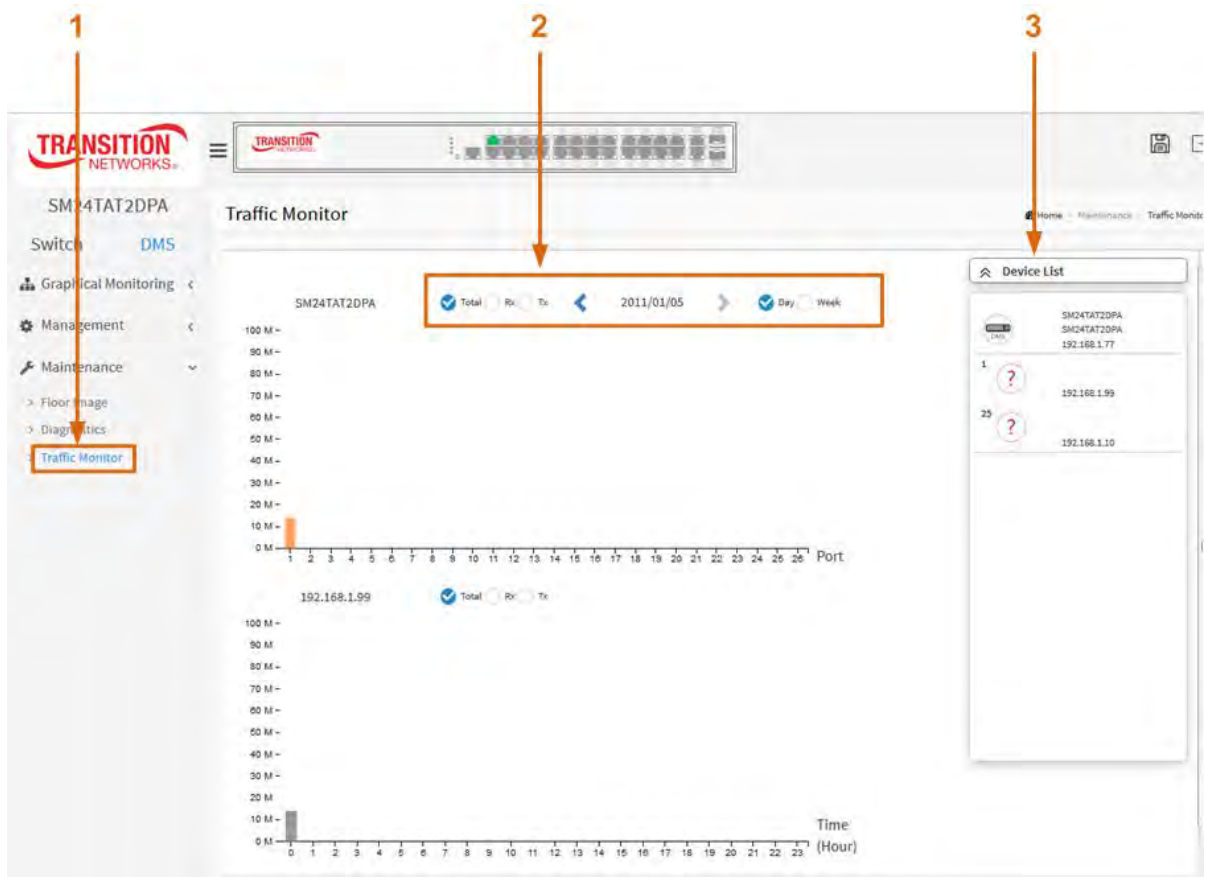
Procedure

1. Click **DMS > Maintenance > Diagnostics**.
2. Select a device to troubleshoot.
3. View the selected device's information (example below).



6-5.3 Traffic Monitor

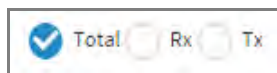
The DMS also supports traffic monitoring of each port and keeps a one week record that can be used to compare and analyze through a visual chart.



Procedure

1. Click **DMS > Maintenance > Traffic Monitor**.
2. Select the parameters to display.
3. Select the device to monitor.

Parameter descriptions:



: Use to select Tx, Rx or both information to display in this page.



: Use to select a day or week of information to display on this page.

Chapter 7 Troubleshooting

Most problems are caused by the following situations. Check for these items first when you start troubleshooting:

1. Verify the install procedures were performed correctly. See the related Install Guide.
2. Check if the SM24TAT2DPA POWER LED is Off:
 - Check connections between the switch, the power cord and the wall outlet.
 - Contact your dealer for assistance.
3. Check if the SM24TAT2DPA Link LED is Off:
 - Verify that the switch and attached device are powered on.
 - Be sure the cable is plugged into the switch and corresponding device.
 - If the switch is installed in a rack, check the connections to the punch-down block and patch panel.
 - Verify that the proper cable type is used and its length does not exceed specified limits.
 - Check the adapter on the attached device and cable connections for possible defects. Replace the defective adapter or cable if necessary.
 - Use the **Mode/Reset** button can to change LED mode, reset the switch, or restore to defaults. See the Install Guide for details.
4. Make sure all devices connected to the SM24TAT2DPA are configured to auto negotiate, or are configured to connect at half duplex (all hubs are configured this way, for example).
5. Check the cabling:
 - Look for faulty or loose cables.
 - Look for non-standard and miswired cables.
6. Make sure you have a valid network topology:
 - Check for improper Network Topologies.
 - Make sure that your network topology contains no data path loops.
7. Check the port configuration.
 - Make sure ports have not been put into a "blocking" state by Spanning Tree, GVRP, or LACP. The normal operation of the Spanning Tree, GVRP, and LACP features may put the port in a blocking state.
 - Verify that the port has not been configured as disabled via software.
8. Record any related error messages, conditions, configurations for your Tech Support Specialist to consider.
9. Contact Transition Networks Tech Support. See below.

Contact Us

Call us at 800-526-9267 or +1-952-941-7600. Telephone: +1-952-941-7600.

Toll Free: 800-526-9267 Fax: 952-941-2322 Web: <https://www.transition.com>

Address: 10900 Red Circle Drive, Minnetonka, MN 55343 USA

Email Us: customerservice@transition.com or techsupport@transition.com or sales@transition.com or info@transition.com.

Appendix A DHCP Per Port

You can configure DHCP Per Port via the CLI and Web UI as described below. The DHCP Per Port factory default mode is Disabled. See the *SM24TAT2DPA CLI Reference* for CLI mode operation.

Configure DHCP Per Port via the Web UI

The switch's DHCP server assigns IP addresses. Clients get IP addresses in sequence and the switch assigns IP addresses on a per-port basis starting from the configured IP range. For example, if the IP address range is configured as 192.168.10.20 - 192.168.10.37 with one DHCP device connected to port 1, the client will always get IP address 192.168.10.20, then port 3 is always distributed IP address 192.168.10.22, even if port 2 is an empty port (because port 2 is always distributed IP address 192.168.10.21).

The switch does not allow a DHCP per Port pool to include the switch's address.

IP address assigned range and VLAN 1 should stay in the same subnet mask.

The configurable IP address range is allowed to configure over 18 IP addresses, but the switch always assigns one IP address per port connecting device.

The DHCP Per Port function is only supported on VLAN 1.

When the DHCP Per Port function is enabled, the switch software will automatically create the related DHCP pool named "DHCP_Per_Port".

Once the DHCP Per Port function is enabled on one switch, IPv4 DHCP client at VLAN1 mode (DMS DHCP mode), DHCP server mode are all limited to be enabled at the same time (an error message displays if attempted).

If the DHCP server pool has been configured, once you enable the DHCP Per Port function, then that DHCP server pool configuration will be overwritten.

Only for VLAN 1, clients issued DHCP packets will not be broadcast/forwarded to other ports. DHCP packets in others VLANs will be broadcast/forwarded to others ports.

The DHCP Per Port function allows the switch to connect only one DHCP client device.

DHCP-Per-Port is configured entirely on the **Switch > Configuration > System > IP** page, IP Interfaces window.

The feature is enabled here and an IP range (pool) is entered. The "automatic" results of this action can be displayed in:

- **Switch > Configuration > System > DHCP > Server > Mode** (Global Mode – Enabled, VLAN Mode - VLAN 1 created)
- **Switch > Configuration > System > DHCP > Excluded** (Excluded range created based on range entered)
- **Switch > Configuration > System > DHCP > Pool** (Pool "DHCP_Per_Port" created based on range entered)

Actual DHCP operation is monitored as normal under **System > Monitor > DHCP**.

The DHCP Per Port pages and parameters are described below.

DHCP Per Port Mode Configuration

The DHCP Per Port function lets you assign an IP address based on the switch port the device is connected to. This will speed up installation of IP cameras, as the cameras can be configured after they are on the network. The DHCP Per Port assignment lets you know which IP was assigned to which camera.

Note: to prevent IP conflict, each switch can be allocated a different IP range.

To configure DHCP Per Port via the Web UI, navigate to the **Configuration > System > IP** menu path.

The screenshot shows the web interface for configuring DHCP Per Port. The left sidebar contains a navigation menu with 'Switch' highlighted. The main content area is titled 'IP Configuration' and includes the following sections:

- IP Configuration:** Mode (Host), DNS Server (Configured, 8.8.8.8), DNS Proxy (unchecked).
- IP Interfaces:** DHCP Per Port Mode (Enabled), IP (192.168.1.30 - 192.168.1.39).
- IPv4 DHCP:**

Delete	VLAN	Enable	Fallback	Current Lease	Address	Mask Length	IPv6 Address	Mask Length
<input type="checkbox"/>	1	<input type="checkbox"/>	0		192.168.1.77	24		
- IP Routes:**

Delete	Network	Mask Length	Gateway	Next Hop VLAN
<input type="checkbox"/>	0.0.0.0	0	192.168.1.254	0
	169.254.0.0	16	192.168.1.77	0
	192.168.1.0	24	192.168.1.77	0

Parameter descriptions: The DHCP Per Port parameters and buttons are described below.

DHCP Per Port Mode: at the dropdown select **Enable** or **Disable** the DHCP Per Port function globally. The default is **Disabled**.

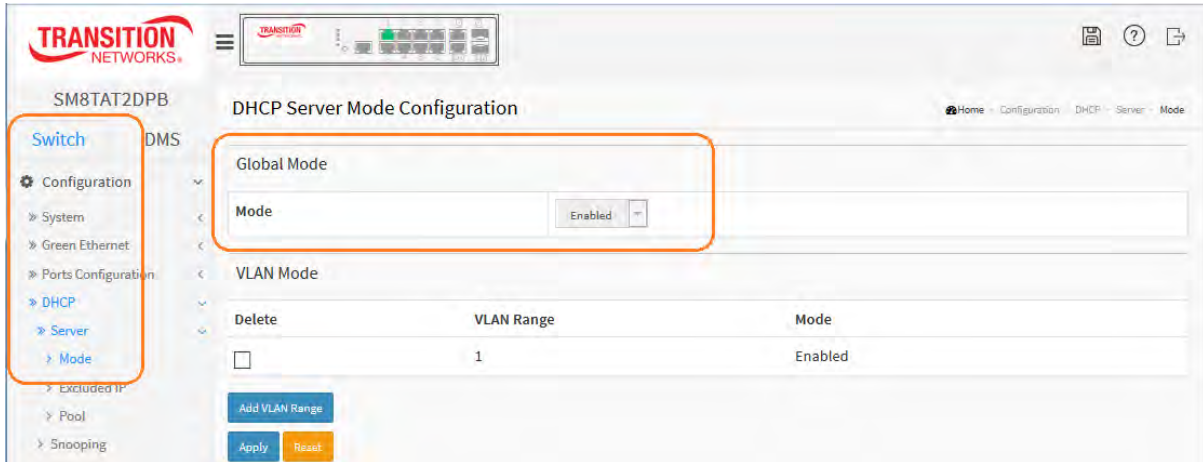
IP: enter the IPv4 IP address range to be used when the DHCP Per Port function is enabled (e.g., 192.168.10.20 - 192.168.10.37). The DHCP Per Port IP range must be within the interface subnet. Note that DHCP Per Port with IPv6 is not supported at this time. The DHCP Per Port IP range must equal the switch port number excluding uplink ports (16).

Apply: Click to save changes to the entries. If the entries are valid, the webpage message “*Update success!*” displays. Click the **OK** button to clear the message. If any entries are invalid, an error message displays. Click the **OK** button to clear the message and enter valid values, then click the **Apply** button again.

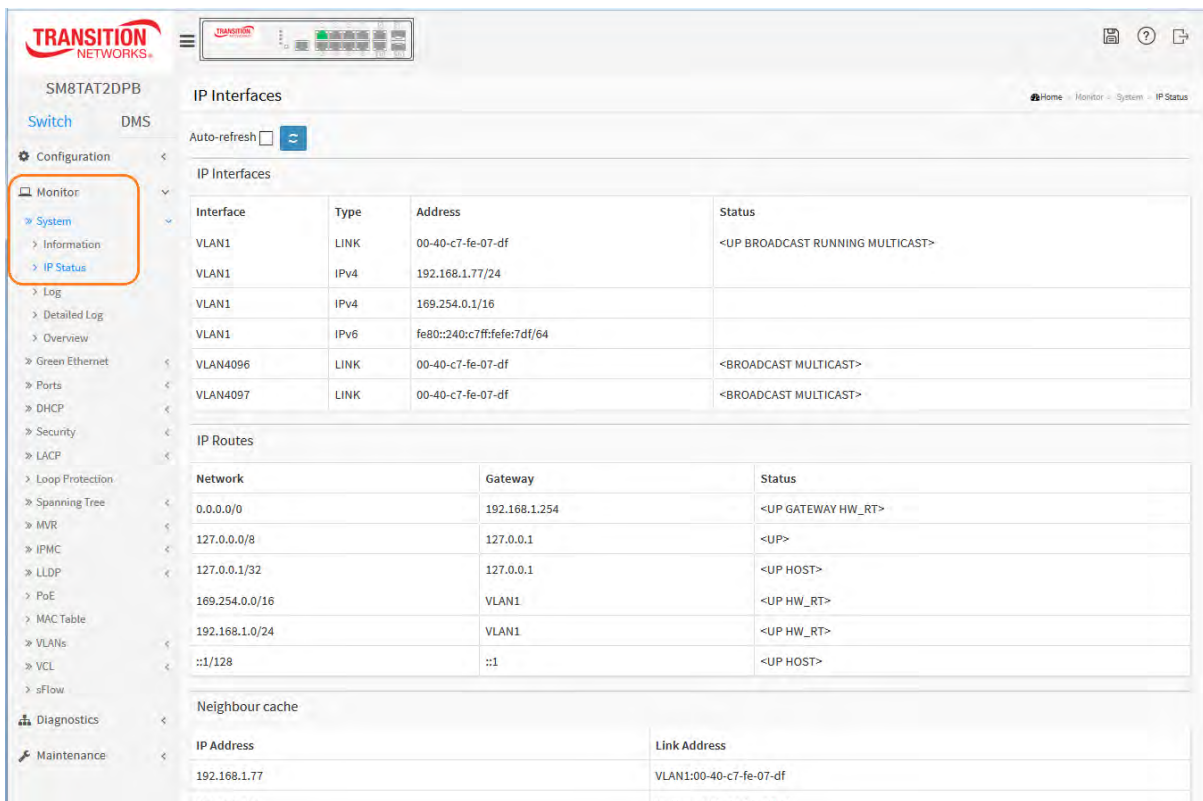
Reset: Click to undo any changes made locally and revert to previously saved values.

DHCP Server Mode Configuration

When DHCP Per Port is enabled and configured at **Configuration > System > IP**, the checkbox and selection in the DHCP Server Mode Configuration section at **Configuration > DHCP > Server > Mode** will become gray (can not be selected):



To monitor DHCP Per Port status, navigate to the **Monitor > System > IP Status** menu path.

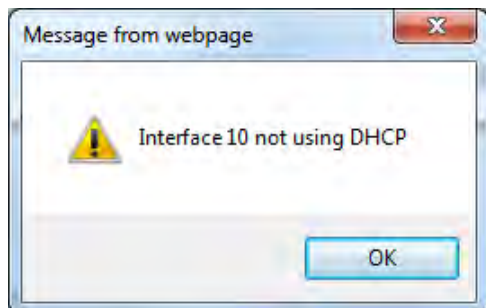


Web UI Messages

Message: *Interface xx not using DHCP*

Meaning: The Interface being configured does not have DHCP enabled and configured.

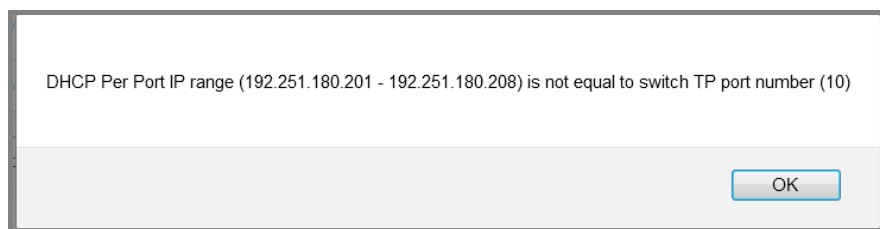
Recovery: **1.** Click the **OK** button to clear the webpage message. **2.** Enable and configure DHCP for the interface being configured. See “[DHCP Server Mode Configuration](#)” on page 303.



Message: *'DHCP Per Port IP range (192-168-1.80 - 192-168-1.99) is not equal to switch port number excluding uplink ports (10)*

Meaning: The IPv4 IP address range entered for the DHCP Per Port function was invalid.

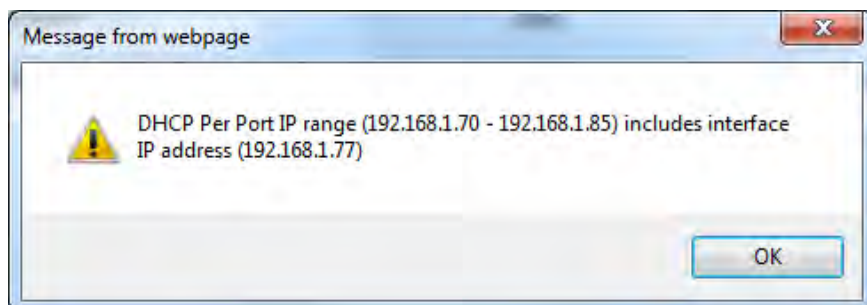
Recovery: **1.** Click the **OK** button to clear the webpage message. **2.** Re-configure DHCP Per Port. See the [DHCP Per Port Mode Configuration](#) section above.



Message: *'DHCP Per Port IP range (192-168-1.70 - 192-168-1.85) includes interface IP Address (192.168.1.77)*

Meaning: The IPv4 IP address range entered for the DHCP Per Port function was invalid.

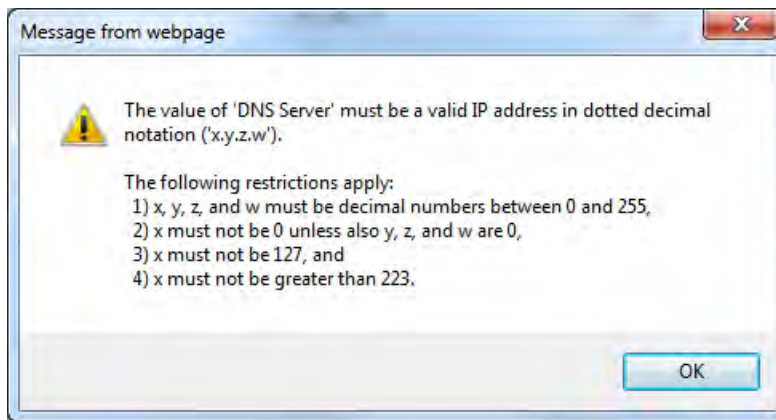
Recovery: **1.** Click the **OK** button to clear the webpage message. **2.** Re-configure DHCP Per Port. See the [DHCP Per Port Mode Configuration](#) section above. On the screen below, the range should be something like 192-168-1.80 - 192-168-1.85 to be valid.



Message: *The value of 'DNS Server' must be a valid IP address in dotted decimal notation ('x.y.z.w').*

Meaning: You entered an invalid IP address for the DNS Server being configured.

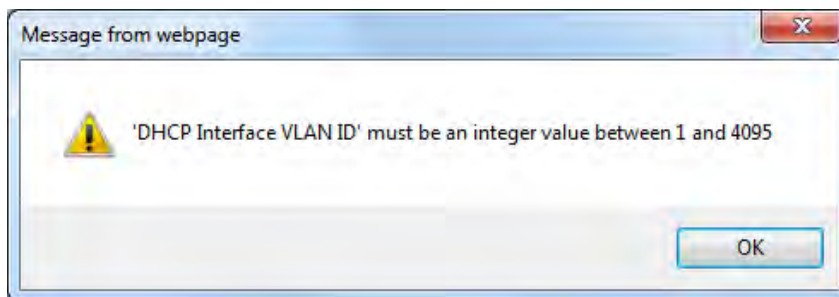
Recovery: **1.** Click the **OK** button to clear the webpage message. **2.** Enter a valid IP address in the format x.y.z.w per the on-screen restrictions. See “[DHCP Server Mode Configuration](#)” on page 303.



Message: 'DHCP Interface VLAN ID' must be an integer value between 1 and 4095.

Meaning: You entered an invalid VLAN ID for the DHCP Interface.

Recovery: 1. Click the **OK** button to clear the webpage message. 2. Enter a valid VLAN ID for the DHCP Interface (1-4095). See "[DHCP Server Mode Configuration](#)" on page 301.



Appendix B Service, Warranty & Tech Support

See the *SM24TAT2DPA Install Guide* for related information.

Appendix C Compliance Information

See the *SM24TAT2DPA Install Guide* for related information.



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SM24TAT2DPA Web User Guide 33703 Rev. A