ALLOY

24-Port Gigabit Web Smart Switch

GSS-24T2SFP

(24x 10/100/1000Mbps ports + 2 paired SFP Ports)

GSS-8T16SFP

(8x 10/100/1000Mbps ports + 16 SFP Ports)

User's Manual

Version: 1.1.0

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1 Introduction

The **GSS-24T2SFP** web smart switch is a high performance web-smart Layer 2 switch that provides users with switched 24 10/100/1000Mbps Ethernet ports, and 2 paired mini-GBIC ports. The mini GBIC ports are paired with ports 1 and 2 on the switch. This pairing is configured to ensure that fibre connections get higher priority over copper if both fibre and copper media exist. Single-mode or multi-mode fiber SFP transceivers can be utilized to provide high speed backbone connectivity. A Web based management interface provides control for the various switch functions and enables easy management either locally of remotely with any industry standard web browser.

The **GSS-8T16SFP** web smart switch is a high performance web-smart Layer 2 switch that provides users with switched 8 10/100/1000Mbps Ethernet ports, and 16 mini-GBIC ports.

The Switch provides Non-blocking, Maximum wire speed performance on all switched ports, while also supporting auto-negotiation and MDI/-MDIX functions.

This switch supports both port-based VLAN and 802.1q (tag-based) VLAN. For high bandwidth applications, the switch supports 4 trunk groups with up to 8 ports per trunk group. These trunks enable port failover within their group for redundant links.

In addition to in-band management through the switches RJ-45 ports, also provided is a RS-232 terminal port with CLI (Command Line Interface) for system administrators to perform initial configuration or modify operational modes independently from the in-band network.

NOTE:

This document will refer to the GSS-24T2SFP from this point forward.
The Feature set is the same between the two switches – they are based on the same switch controller.
The only differing points are:
GSS-24T2SFP has 2 SFP ports that are **paired** with ports 23 and 24.
GSS-8T16SFP has 16 SFP ports, these are not paired with any copper ports.

Main Features

- Utilizes Latest Broadcom® chipset
- Non-blocking, full-line speed, store-and-forward operation
- Support normal Ethernet frames and jumbo frames from 64 bytes to 9216 bytes
- Auto-negotiation and auto-MDIX on all 10/100/1000M copper ports
- 24x 10/100/1000 RJ-45 ports, 2 ports being shared with SFP mini-GBIC slots
- Auto-detection for copper/fibre media link on 2 combo ports
- 512 K bytes packet buffer
- 8K MAC entries, 4K VLAN entries
- Web-based interface for system management via the Ethernet connection
- Provide the command line interface (CLI) for simple system setup via the RS-232 port
- Support port-based VLAN and 4K 802.1q (tag-based) VLAN
- Up to 4 trunk groups, maximum 8 member ports for each trunk, more over, with fail-over function
- Supports flow control for both half- or full-duplex operation
- Supports port mirror
- Provide port statistics
- Supports 802.1p QoS (Quality of Service) with 4 queues
- Supports broadcast storm control
- Supports rate control
- Supports port security to prevent traffic flooding
- Supports firmware update via BOOTP/TFTP
- LED display for each port to show link and activity status
- Wall mount, Rack mount or desktop

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1.1 Managing The Switch

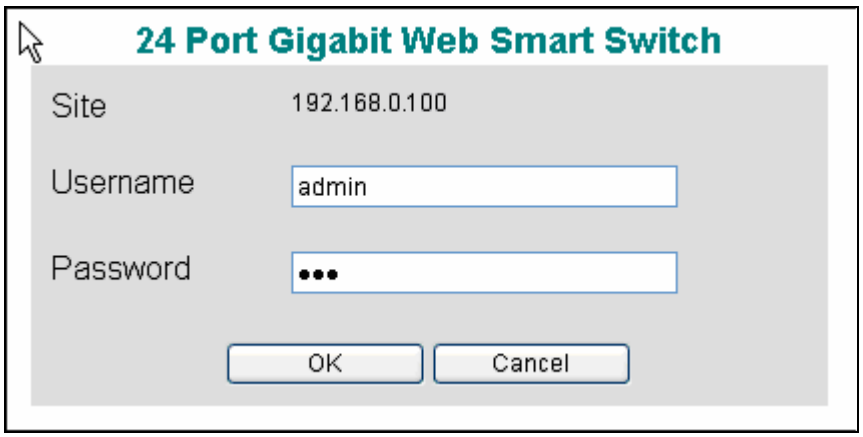
Plug-in the power source to power-up the switch. After the switch is powered-on and in a ready state (both the LED indicators POWER and DIAG are lit), you can use any in-band Ethernet port to remotely manage the system through a web browser, or use the RS-232 cable to plug-in the console port (on the rear panel) to locally perform simple system configuration (CLI).
The **default IP and related settings** for this switch are shown as following:

- IP address: **192.168.0.100**
- Network mask: **255.255.255.0**
- Default gateway:**192.168.0.1**

Try to use the default IP shown above to PING the switch from your PC to make sure the network connection is successful. The default IP address on this switch can be modified later if you need. If you encounter problems accessing the switch via this IP address, then you can optionally connect to the switch via the RS-232 Console port to confirm the switches IP address.

Now you can use your internet browser to access the web based management interface.

The login dialog box (shown as below) will display when the switch's IP address is provided through your browser.



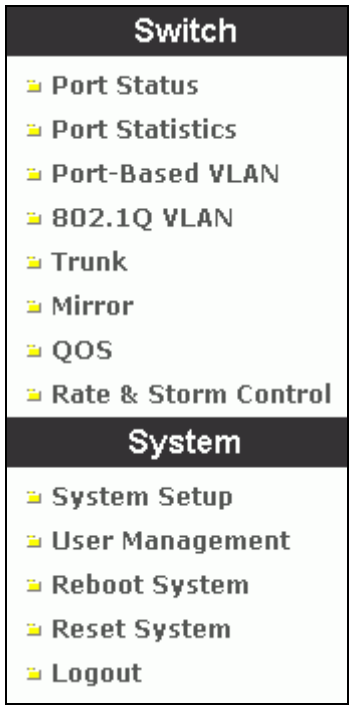
Use the **default username and password** shown as below to complete the login procedure:

- Username: **admin**
- Password: **admin**

This username/password can be modified from within the management interface.

1.2 Configuration Functions for the Switch

After the login is successfully validated, the switch's home page will display. The left part of the page provides *function menu options* (shown as below). Select one of these options to activate to the individual configuration page.



The function menu contains two parts: **Switch** for setting up the switch functions and **System** for maintaining system parameters.

Switch functions include:

- **Port Status –** shows port link status and configuration parameters
- **Port Statistics –** shows packet statistics for each port
- **Port-based VLAN –** to setup the port-based VLAN
- **802.1Q VLAN –** to configure the tag-based VLAN
- **Trunk –** to implement port aggregation features
- **Mirror –** to implement port mirroring features
- **QOS –** to configure Quality of Service features
- **Rate & Storm Control –** to configure traffic limit settings and suppress broadcast storms

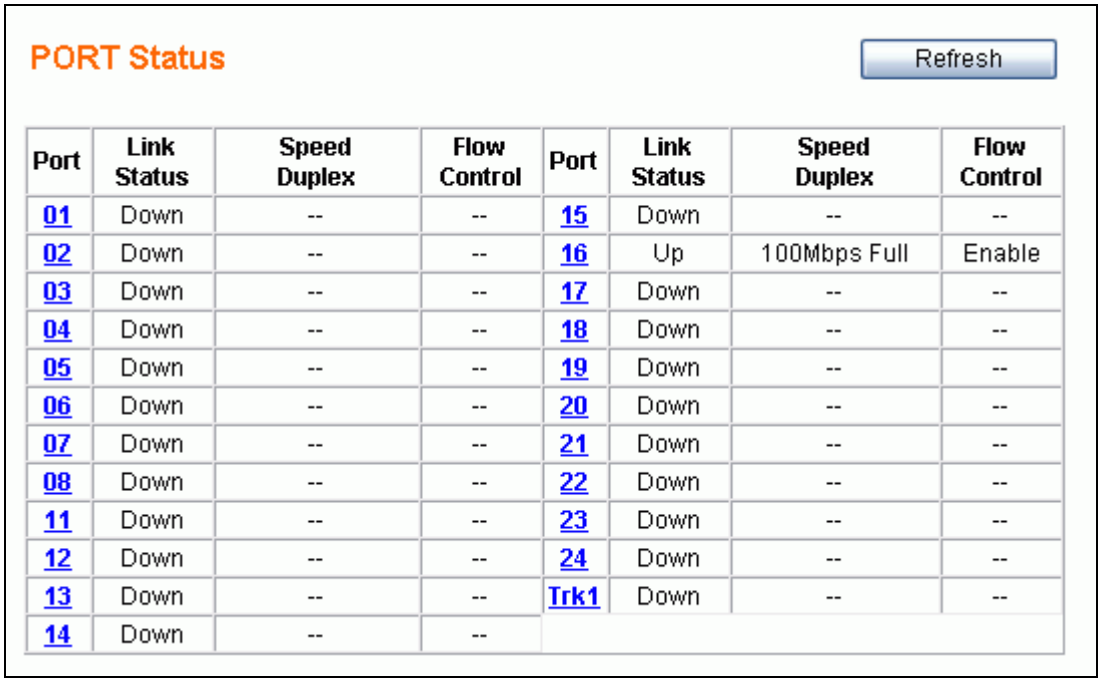
System functions include:

- **System Setup** – configure system information (such as IP address, etc.)
- **User Management –** maintain the login information that enables access to the switch
- **Reboot System –** reboot the switch without re-writing default configuration
- **Reset System –** reboot the switch after re-writing default configuration
- **Logout** – log off the current admin user

2 Configuration

2.1 Port Status

The Port Status page provides link status information.



Port	Link Status	Speed Duplex	Flow Control	Port	Link Status	Speed Duplex	Flow Control
01	Down	--	--	15	Down	--	--
02	Down	--	--	16	Up	100Mbps Full	Enable
03	Down	--	--	17	Down	--	--
04	Down	--	--	18	Down	--	--
05	Down	--	--	19	Down	--	--
06	Down	--	--	20	Down	--	--
07	Down	--	--	21	Down	--	--
08	Down	--	--	22	Down	--	--
11	Down	--	--	23	Down	--	--
12	Down	--	--	24	Down	--	--
13	Down	--	--	Trk1	Down	--	--
14	Down	--	--				

This page provides the following information:

- **Port –** to specify a port on the switch
- **Link Status –** displays the port link status: **Up / Down**
- **Speed / Duplex –** displays the current link speed **(1G / 100M / 10M bps)** and duplex mode **(Full / Half)** when the port is active.
  NOTE: Only full duplex mode is supported on links whose speed is 1Gbps.
- **Flow Control** – displays the flow control capability as **Enable / Disable** for the port.

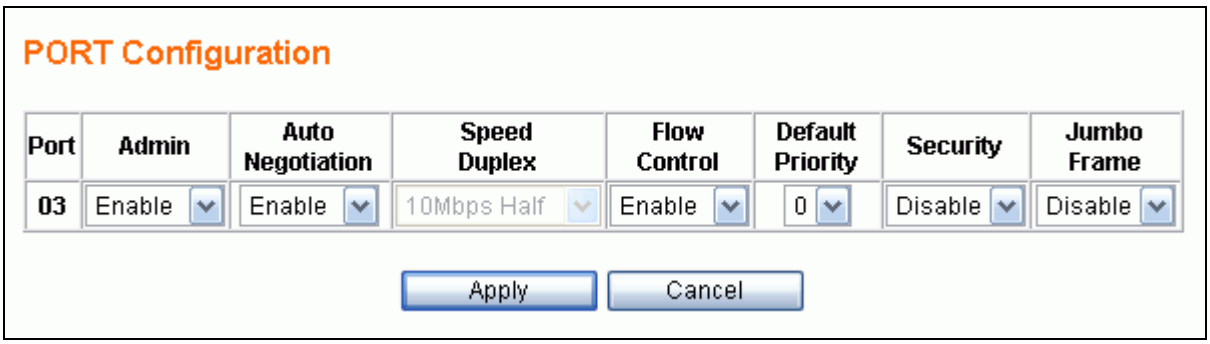
The status for columns: **Speed/Duplex** and **Flow Control** will not display while the port link is down. (The sign '-' represents the status is unavailable to display.)

If any *trunk* groups have been defined then that group should be regarded as one logical port (e.g. Trk1 in above figure contains Ports9 & 10 in one logical grouping). The trunk member ports will not display individually. Section 2.7 (Trunk) describes port trunking in detail.

Click the Refresh button to manually get the most current link status for all ports.

2.2 Port Configuration

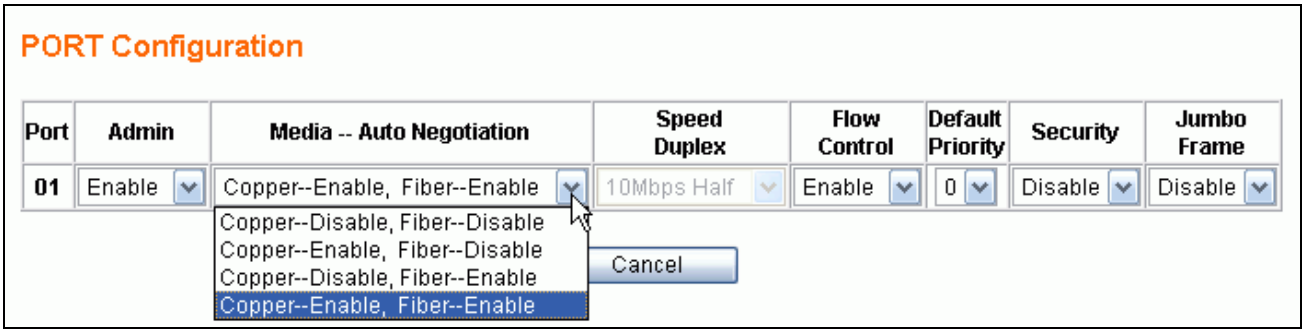
If you need to configure port parameters, then select the desired port by clicking the Port number in the **Port Status** page. The **Port Configuration** page (shown as below) for the selected port (e.g. port3) will be displayed:



The following parameters will be provided and configured in the **Port Configuration** page:

- **Port –** the selected port number to be configured (read only)
- **Admin –** to enable/disable reception/transmission of traffic for the port
  - **Disable –** to block all traffic for the port
  - **Enable –** to enable bi-directional traffic for the port
- **(Media --) Auto Negotiation –** to enable/disable the capability of auto negotiation on the selected port. The options provided by this function, depends on the port type – *combo ports* (Port1 & Port2) which are shared with fibre media using the mini-GBIC interfaces, or *ordinary ports* (from Port3 to Port24) for copper media only.
  - **4 Options for combo ports (Port1 and Port2)**
    - ✓ **Copper – Disable, Fiber – Disable –** to disable both media
    - ✓ **Copper – Enable, Fiber – Disable –** to enable the copper but disable the fiber media
    - ✓ **Copper – Disable, Fiber – Enable –** to disable the copper but enable the fiber media
    - ✓ **Copper –Enable, Fiber –Enable –** to enable both media
  - **2 Options for ordinary ports (Port3 to Port24, copper media only)**
    - ✓ **Disable –** to disable auto mode this port (forced mode)
    - ✓ **Enable –** to enable auto mode this port

The following figure shows the port configuration page for a combo port. (e.g. Port1)



- **Speed / Duplex –** to setup the link speed and duplex mode while in forced mode
  The options for this function can be selected only when the **Auto Negotiation is Disabled (in forced mode) for copper media**. There are 4 options for this parameter:
  - **100Mbps Full –** to set the speed 100Mbps in full duplex mode
  - **100Mbps Half –** to set the speed 100Mbps in half duplex mode
  - **10Mbps Full –** to set the speed 10Mbps in full duplex mode
  - **10Mbps Half –** to set the speed 10Mbps in half duplex mode

  NOTE: The switch supports linking in 1Gbps full duplex mode for both copper and fiber ports while the auto-negotiation is enabled (auto mode). When in forced mode (i.e. auto-negotiation is disabled), 1Gbps full duplex mode is supported for fiber media only, not for copper.
- **Flow Control –** to enable/disable flow control function
  - **Disable --** to disable for the port
  - **Enable –** to enable for the port
- **Default Priority –** to setup the priority of frames which will be referenced in **QOS** function
  - **0 – 7 –** to set the priority level (range = 0 ~ 7)
- **Security –** to enable/disable port security function
  If per-port security is enabled and if a received frame contains a source MAC address that has already been learned in another port's address table but not aged out, then the received frame will be dropped. Otherwise, the address table entry is updated with the new port's information and the previous entry is released.
  - **Disable --** to disable port security
  - **Enable –** to enable port security
- **Jumbo Frame –** to enable/disable jumbo frames function
  If the per-port jumbo frame feature is enabled, the maximum frame size is 9216 bytes. In 100 Mbps mode, the maximum jumbo frame size supported is 9000 bytes
  - **Disable --** to disable jumbo frame support
  - **Enable –** to enable jumbo frame support

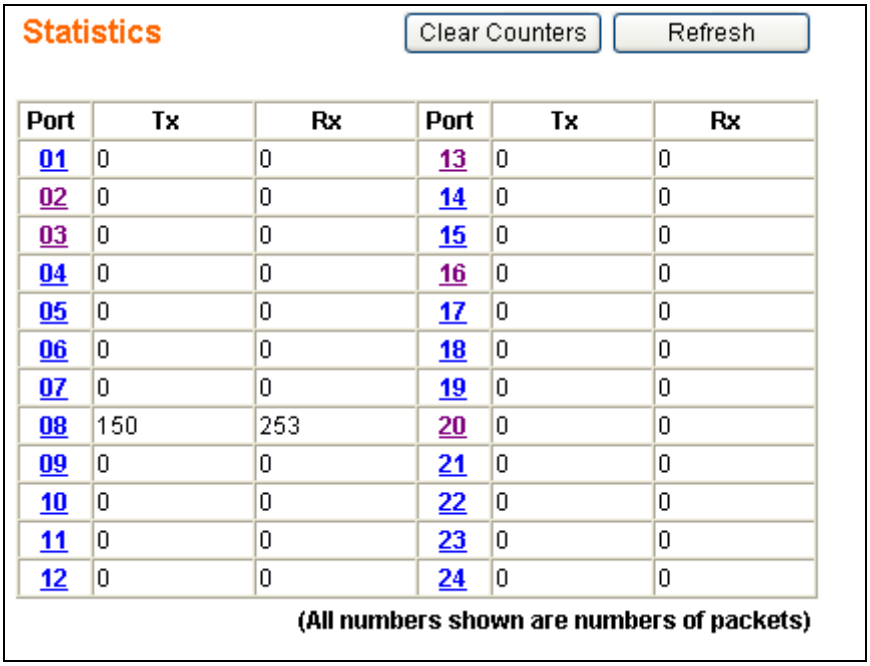
After the desired options are selected for the above functions, click the Apply button to save the current settings to the switch and revert back to the **Port Status** Page. Click the Cancel button to revert back to **Port Status** page without saving changes.

2.3 About the Copper/Fiber Media Auto-Detection

This switch provides an option to use either copper or fiber media for the first two combo ports - **Port1 and Port2**. This enables port configuration using either copper media or fiber media via use of the mini-GBIC ports and optional SFP (mini-GBIC) modules. The switch will automatically detect the media type that is plugged into the switch and configure the port as required. If both copper and fiber media are plugging-in, **the fiber media has higher priority than copper and will initially be used to setup the link. The copper media link will be down**. The link for the copper media will be re-established once the fiber media is un-plugged. The **Port Status** page will show the current link status according to the active media type.

2.4 Port Statistics

Port Statistics function will let you to see the TX/RX packet counters for each port.



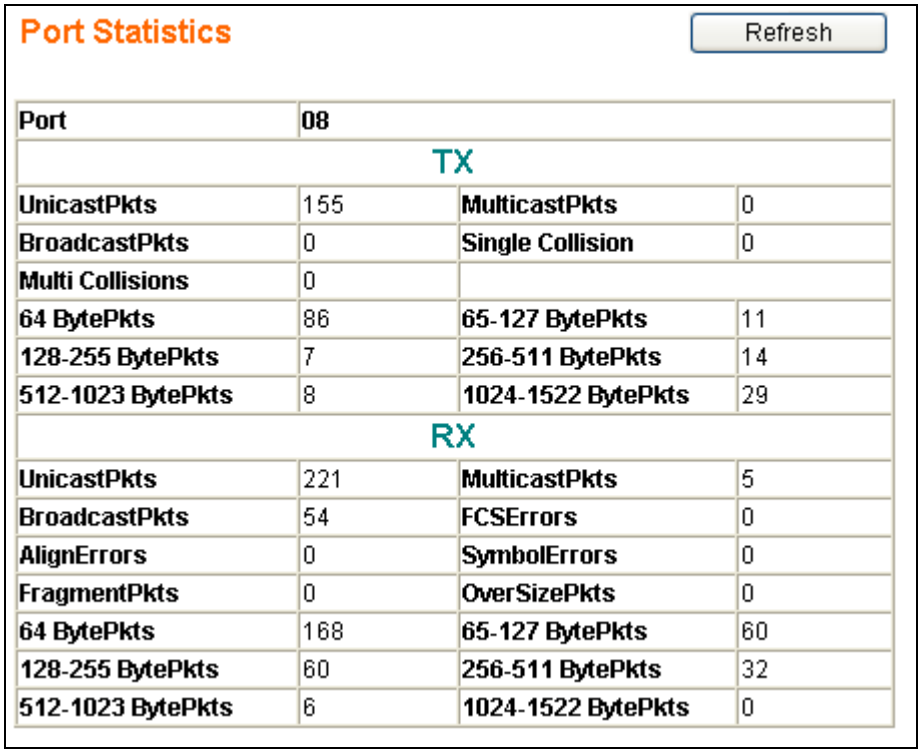
Statistics

Clear Counters | Refresh

Port	Tx	Rx	Port	Tx	Rx
01	0	0	13	0	0
02	0	0	14	0	0
03	0	0	15	0	0
04	0	0	16	0	0
05	0	0	17	0	0
06	0	0	18	0	0
07	0	0	19	0	0
08	150	253	20	0	0
09	0	0	21	0	0
10	0	0	22	0	0
11	0	0	23	0	0
12	0	0	24	0	0

(All numbers shown are numbers of packets)

Clear Counters button will clear all packet counters to 0. Refresh button will get port statistics again. You can drill down into more detailed port statistics by clicking the Port number.



Port Statistics

Refresh

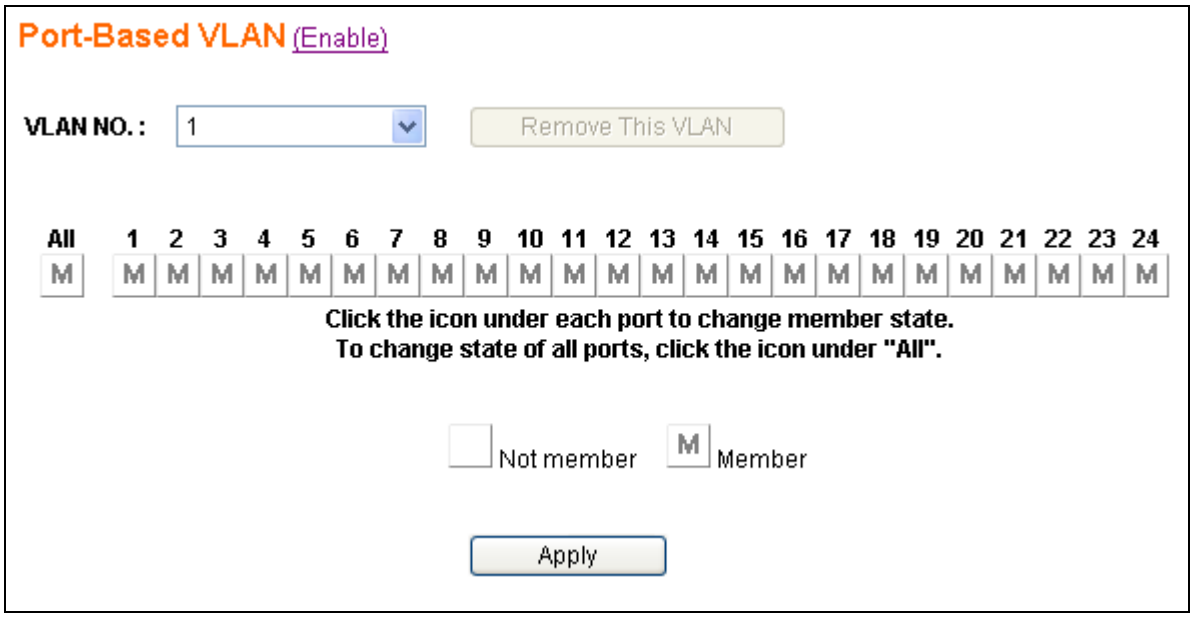
Port	08		
TX			
UnicastPkts	155	MulticastPkts	0
BroadcastPkts	0	Single Collision	0
Multi Collisions	0		
64 BytePkts	86	65-127 BytePkts	11
128-255 BytePkts	7	256-511 BytePkts	14
512-1023 BytePkts	8	1024-1522 BytePkts	29
RX			
UnicastPkts	221	MulticastPkts	5
BroadcastPkts	54	FCSErrors	0
AlignErrors	0	SymbolErrors	0
FragmentPkts	0	OverSizePkts	0
64 BytePkts	168	65-127 BytePkts	60
128-255 BytePkts	60	256-511 BytePkts	32
512-1023 BytePkts	6	1024-1522 BytePkts	0

The table shown below provides a description for each column.

UnicastPkts	Number of good unicast packets transmitted.
MulticastPkts	Number of good multicast packets transmitted.
BroadcastPkts	Number of good broadcast packets transmitted.
Single Collision	Number of packets in which the transmission experienced one collision
Multi Collisions	Number of packets in which the transmission experienced over two collisions
64 BytePkts	Number of packets(including bad ones) transmitted that were 64 Bytes in length
65-127 BytePkts	Number of packets(including bad ones) transmitted that were 65-127 Bytes in length
128-255 BytePkts	Number of packets(including bad ones) transmitted that were 128-255 Bytes in length
256-511 BytePkts	Number of packets(including bad ones) transmitted that were 256-511 Bytes in length
512-1023 BytePkts	Number of packets(including bad ones) transmitted that were 512-1023 Bytes in length
1024-1522 BytePkts	Number of Non-Jumbo packets(including bad ones) transmitted that were 1024-1522 Bytes in length
FCSErrors	Number of packets received of proper-size with CRC error and integral octets
AlignErrors	Number of packets received of proper-size with CRC error and non-integral octets
SymbolErrors	Number of packets received of proper-size that experienced symbol error during reception
FragmentPkts	Number of packets received that were less than 64 bytes without CRC or alignment error
OverSizePkts	Number of packets received that were greater than the maximum length without CRC or alignment error

2.5 Port-Based VLAN

Port-based VLAN divides the switches ports into different Virtual LAN domain groups. After setting up port -based VLAN, ports allocated into different VLAN groups can not access each other. This is like creating virtual switches that do not connect to each other.
The VLAN initial setting page is shown as below:



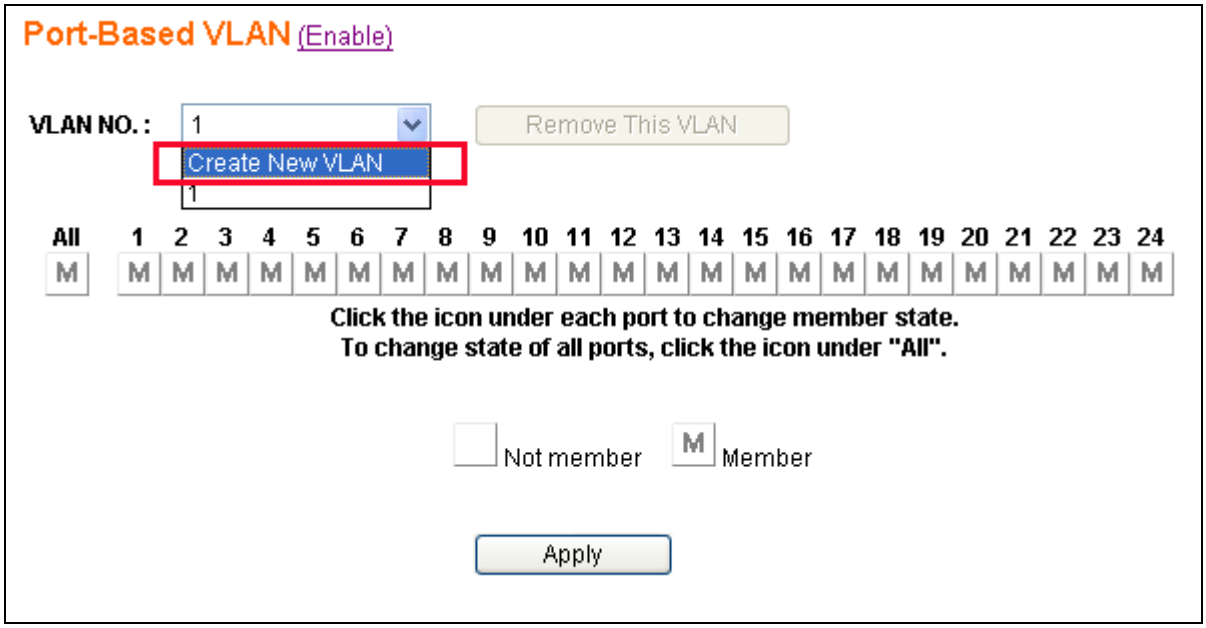
Of course, you need to click the Enable/Disable link text to enable/disable port-based VLAN. When port-based VLAN is enabled, the 802.1Q VLAN will be disabled automatically. **Both port-based VLAN and 802.1Q VLAN can not co-exist at the same time**.

You can add, delete and modify port-based VLAN as required. Currently the switch supports **up to 32** port-based VLAN groups for manual entry. The next few pages will described in detail, how to configure port-based VLAN.

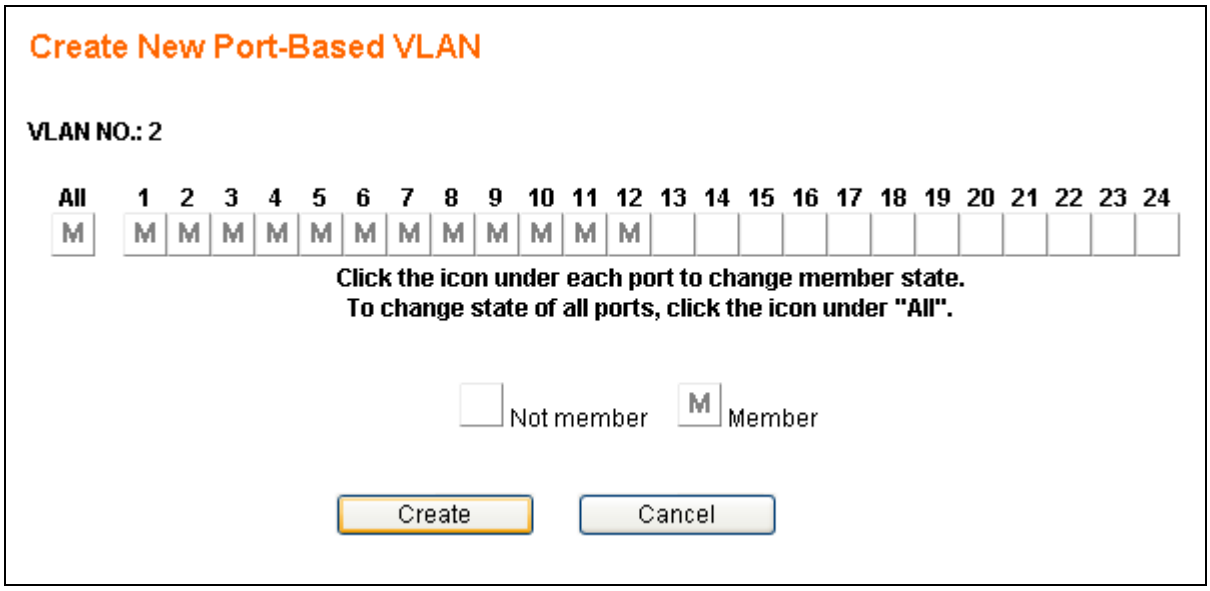
NOTE: A default port-based VLAN entry (No=1) is initially created by the system. This VLAN entry contains all ports as member and can be regarded as a non operational VLAN, as all ports are in the same group and no traffic isolation exists between any two ports. If new port-based VLAN groups are created, then VLAN No. 1 will contain no members. Group No. 1 is a read-only VLAN group. There are only 2 situations for this VLAN – all ports are member ports, or all ports are not members.

Add Port-Based VLAN Groups

To add a port-based VLAN group, select the ***Create New VLAN*** in **VLAN NO** dropdown of the **Port-Based VLAN** page shown as below:

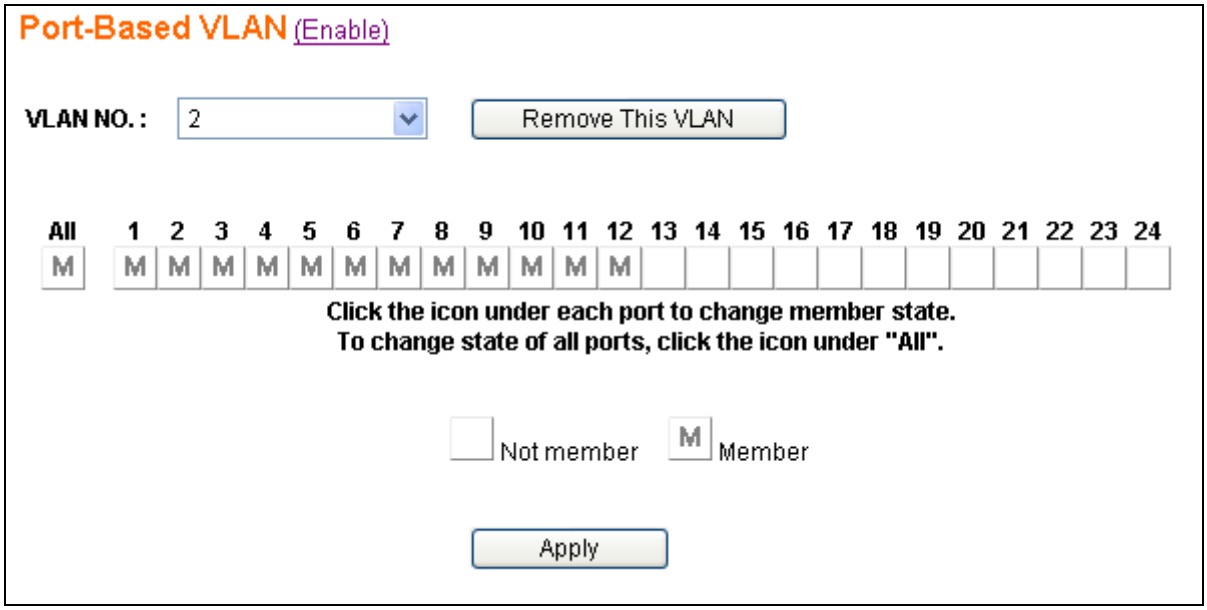


After selecting ***Create New VLAN***, the page will change to the following:



In the example page, **VLAN NO** will be auto assigned. The administrator simply needs to set VLAN Port Members. After completing the settings, press the Create button. The screen will then revert back to the VLAN initial settings page. The Cancel button can be used to back out without saving.

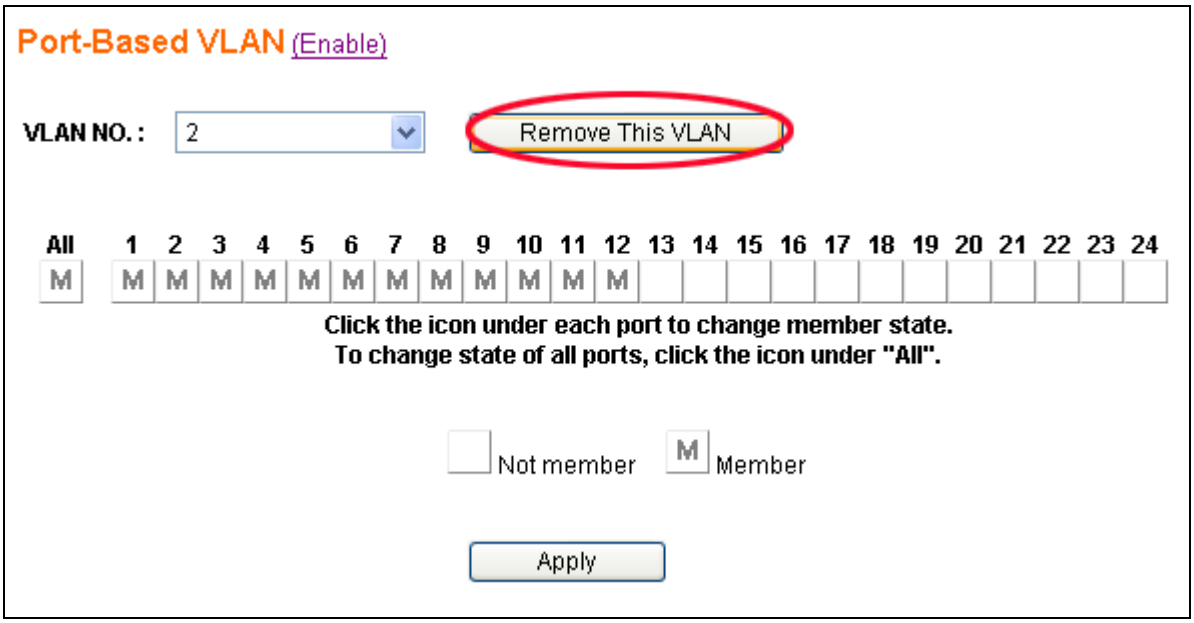
Below is an example page where the Administrator has set Ports1-12 to VLAN Group2 after clicking the Create button. There now exists a VLAN group No.2 with member Ports1-12.



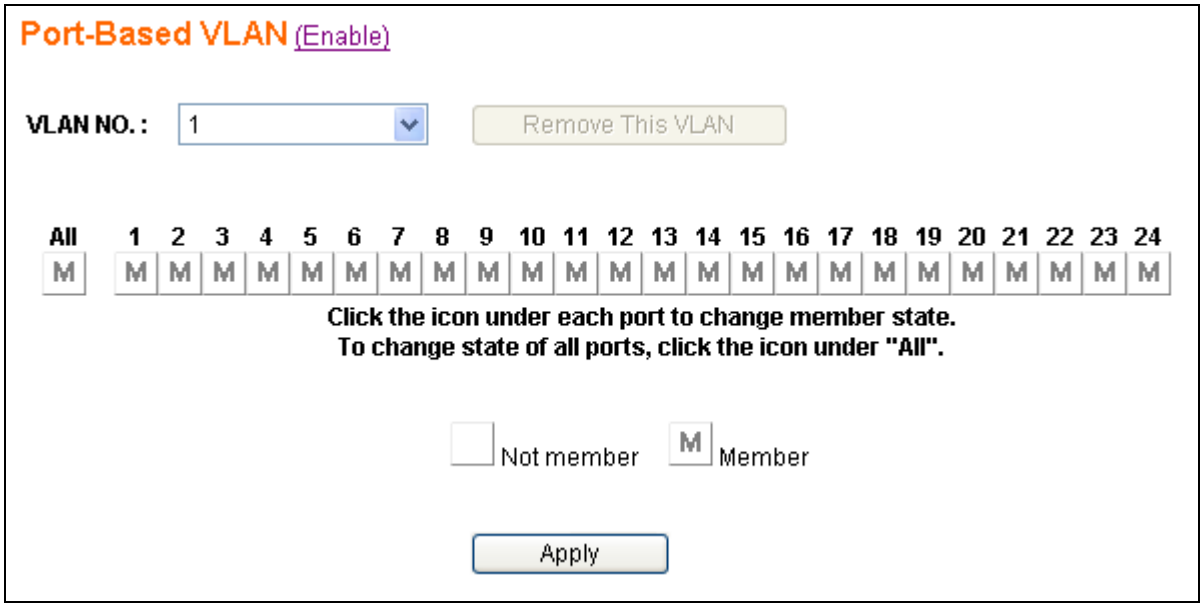
When group No.2 was created, all the members in group No.1 are removed ensure correct operation of the VLAN function.

2.5.1 Delete Port-Based VLAN Groups

To delete a port-based VLAN group, just select a desired group (e.g. No.2) to be removed and click the Remove This VLAN button to do the deletion.



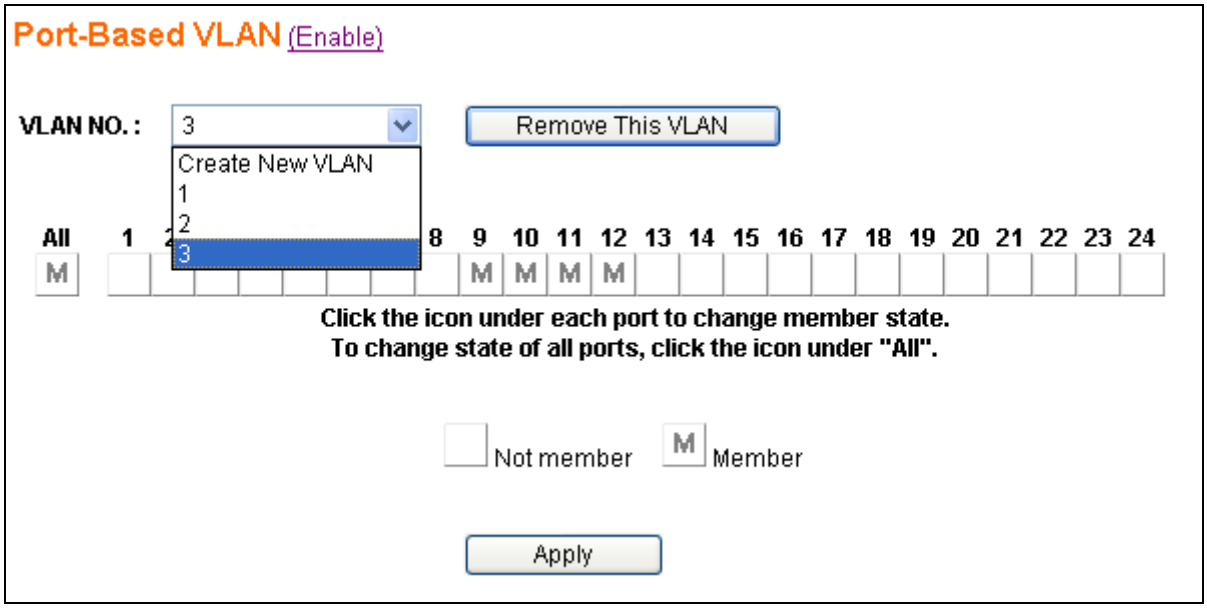
In this example after selecting the Remove This VLAN button, the resultant is all VLANs deleted, and the Default VLAN 1 - enabled. (see below)



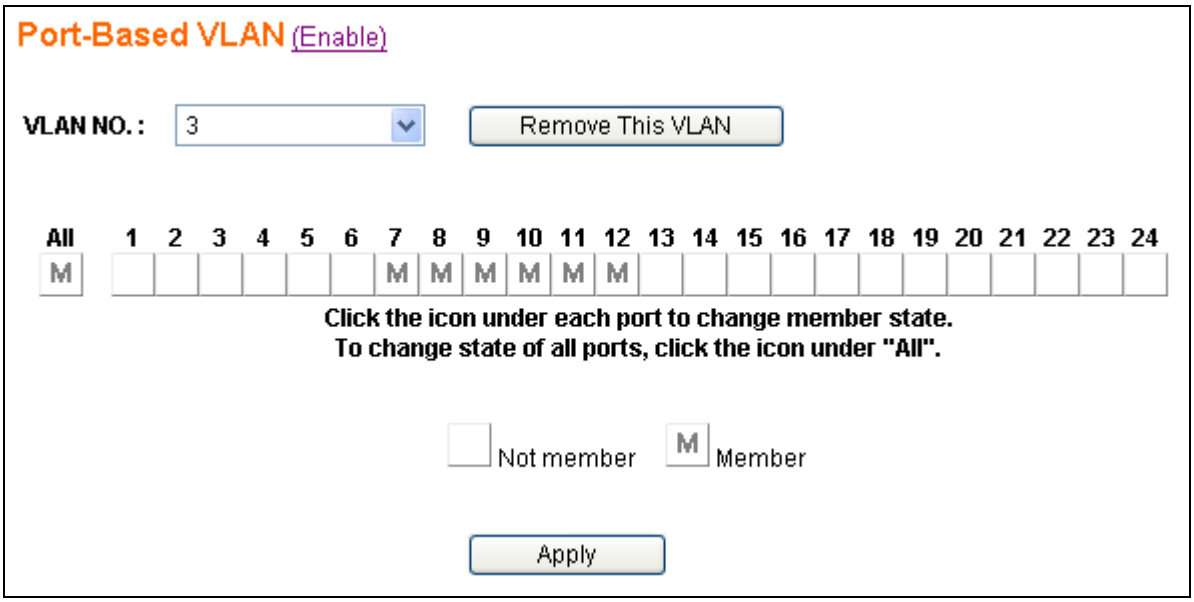
Now all ports are set to be members of VLAN group No.1.

2.5.2 Edit Port-Based VLAN Groups

To edit the current port-based VLAN group, first select the group (e.g. group No. 3) that you want to edit. To add Port7 & Port8 as members, select these ports and click the Apply button to activate the setting.

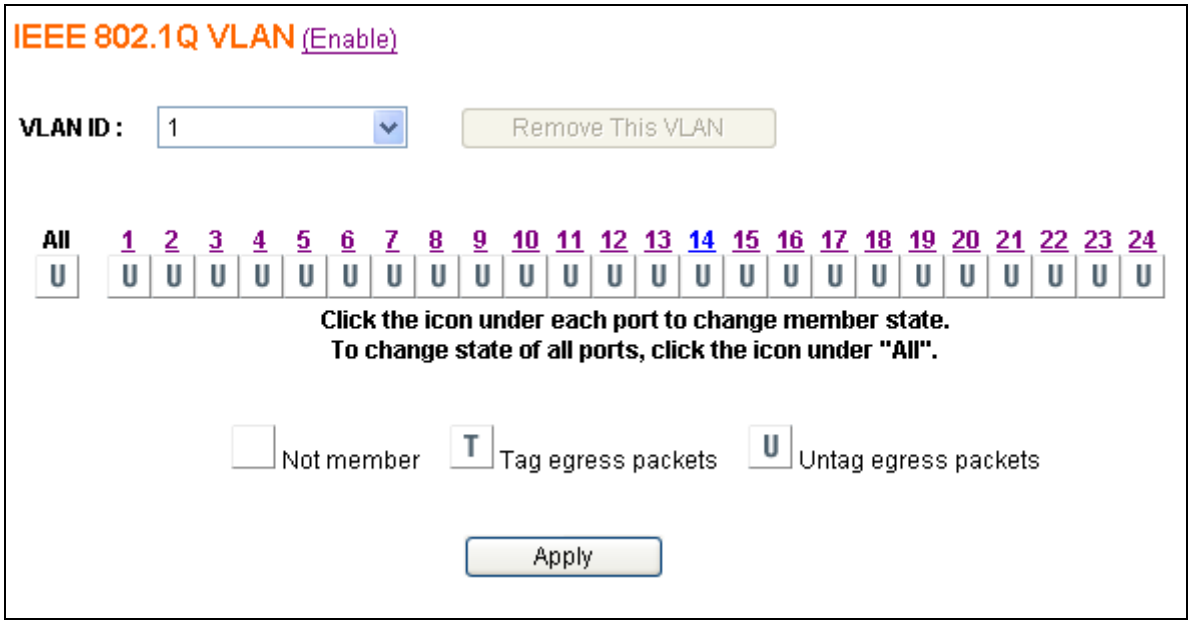


The following figure shows the latest configuration for the selected group (e.g. No.3).



2.6 802.1Q VLAN

IEEE 802.1q (tag-based) VLAN's can add or strip 802.1q tags based on your parameters set for each transmitting port. Select the **802.1Q VLAN** menu to activate the following page where this function can be configured.



Currently the switch supports **up to 32** tag-based VLAN groups for manual entry.
The following pages will described in detail how to configure this feature.

Warning !!!

Incorrect configuration of Tagged VLAN can create a situation where the web interface of the switch cannot be accessed. This can occur when the PVID of the port you are using or the VID of the VLAN group the port belongs to is not on the same as the CPU PVID, and the port is configured to drop untagged ingress frames.
The CPU port (this is not a physical port) is a member of PVID 1 by default.
To adjust the CPU port PVID settings, select the port via port number 25. (Console only option)
ie. VP then 25 will display PVID = 1

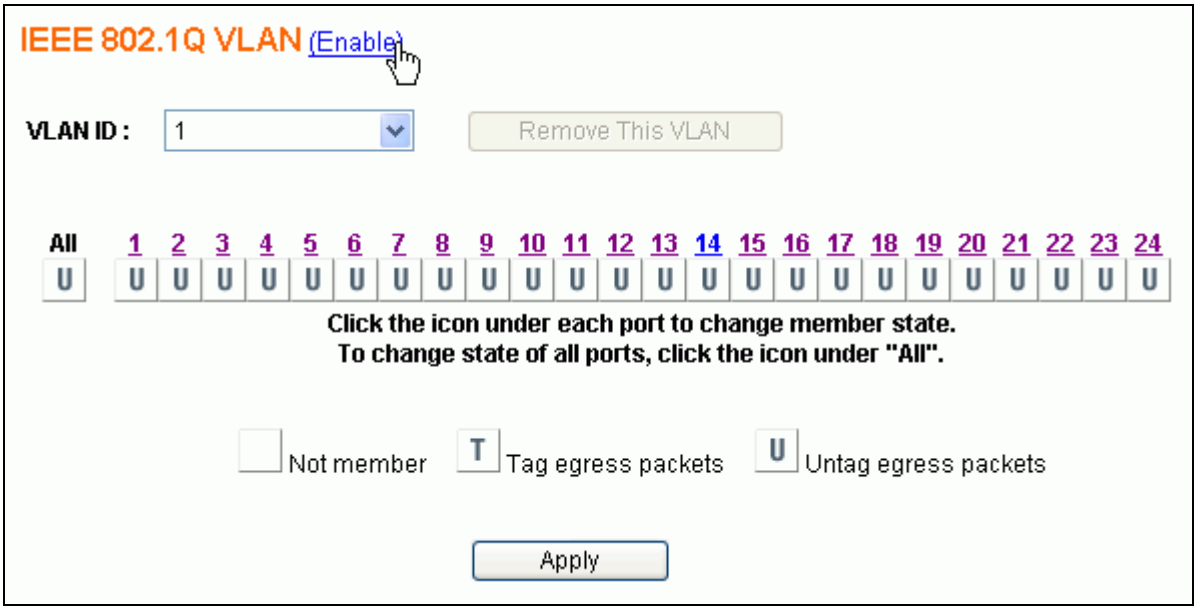
In the case that you do configure this state and lock the web interface out, then you can recover by connecting to the RS-232 console port and either disabling Tagged VLAN, or adjust the settings via the following options.

VE - Enable/Disable 802.1Q VLAN
VF – Get 802.1Q VLAN Enable Setting
VV – Set PVID
VP – Get PVID

2.6.1 Enable/Disable VLAN

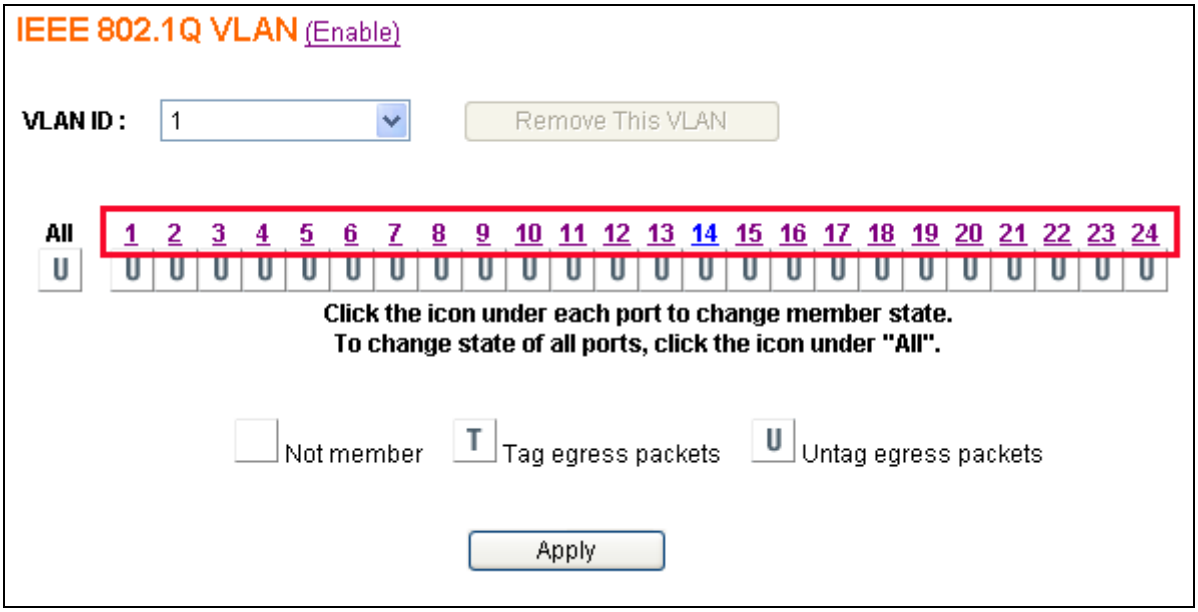
In the **802.1Q VLAN** page, you can enable/disable the tag-based VLAN function by clicking the (Enable) or (Disable) hyperlink beside the page header:

- **Enable** – to activate the tag-based VLAN function (this will disable the port-based VLAN function).
- **Disable** – to de-activate the tag-based VLAN function. (Any existing tag-based VLAN entries will be retained although tag-based VLAN functions will be disabled. Any retained port-based VLAN entries will auto enable.)

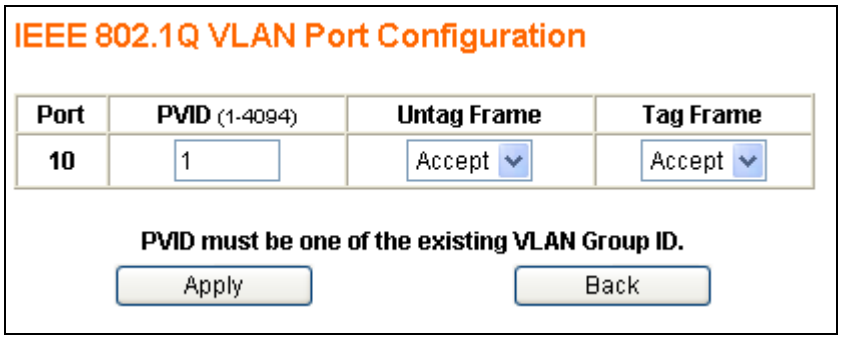


2.6.2 802.1Q VLAN Port Configuration

Click the **Port** number to configure the port for 802.1q VLAN.



The following figure shows the **802.1Q VLAN Port Configuration** page by port. (e.g. Port10)



You can select an individual port for configuring the 802.1q settings in the following fields:

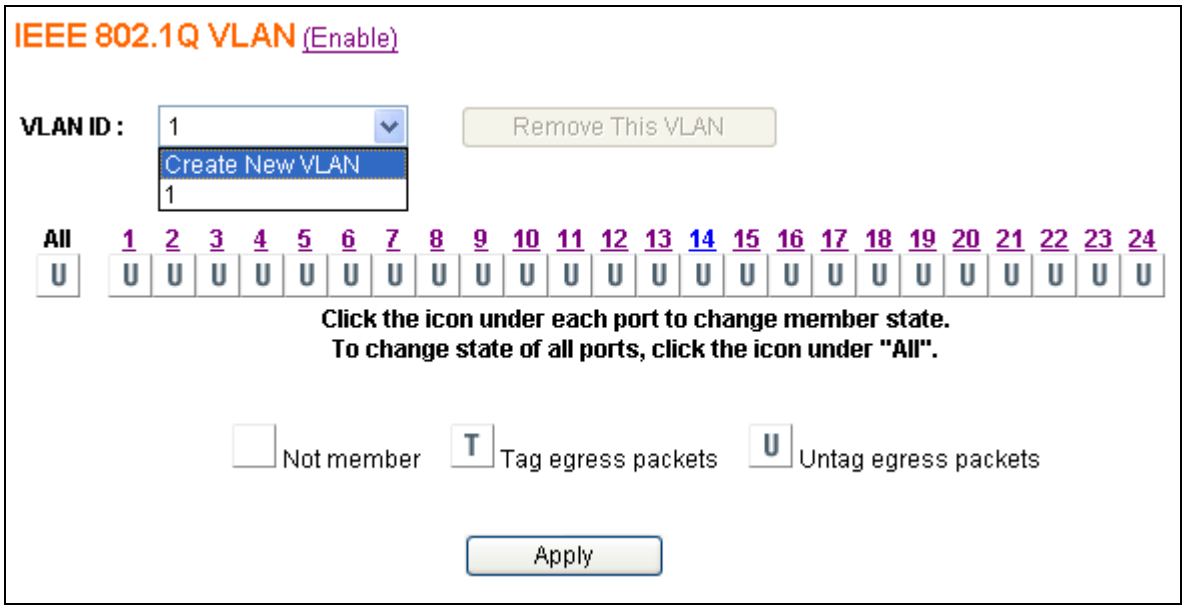
- **PVID** – enter a valid VLAN ID(1-4094), the PVID must be one of the existing VLAN group ID.
- **UnTag Frame –** Accept or drop incoming untagged frames.
- **Tag Frame –** Accept or drop incoming tagged frames.

Finally, there are 2 buttons to select:

Apply: To submit the port configuration settings to the switch.
Back: To revert back to the 802.1q main setting page without saving.

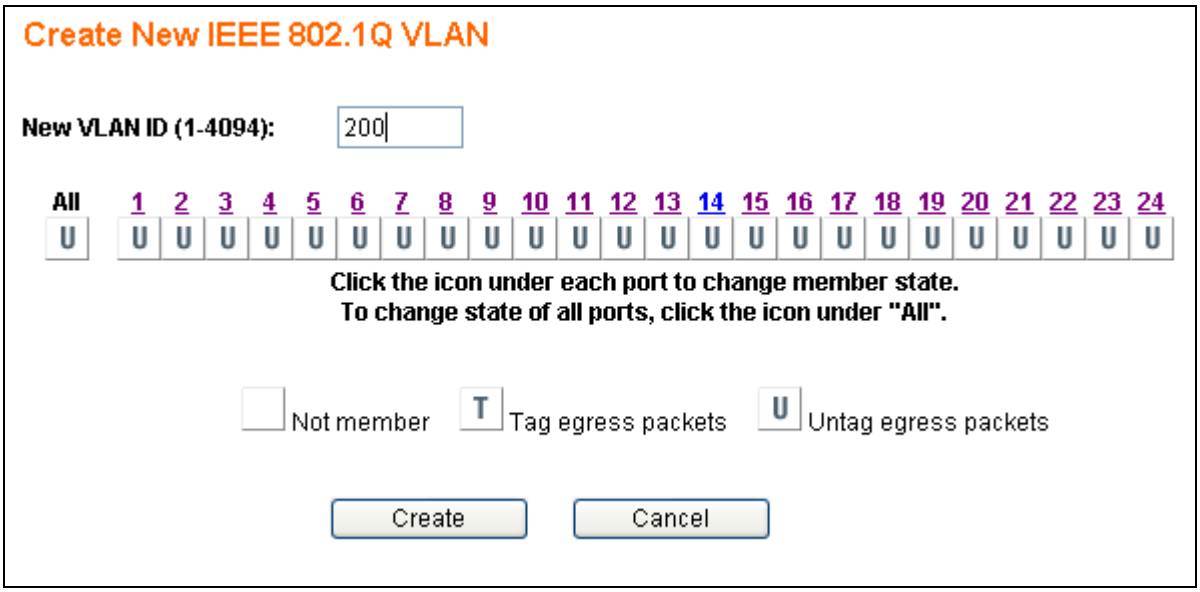
2.6.3 802.1Q VLAN Config

The following figure displays the add/delete/edit function for 802.1q VLAN entries. Each VLAN entry has 3 parameters, **VID, Tag Members and UnTag Members** to be assigned.



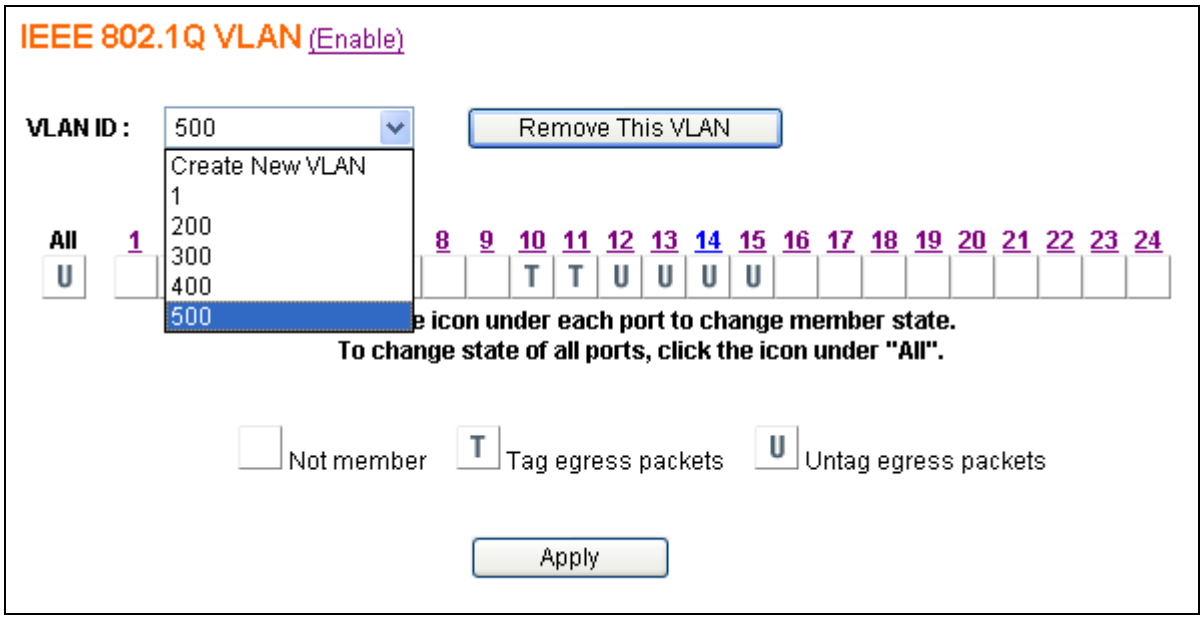
After selecting the Create New VLAN, the figure shown as below will display:

- **VID** – a unique VLAN ID, range is from 1 to 4094
- **Tag Members & UnTag Members** – Click the U/T icon to switch between **Non** Member, **Tag** Member or **Untag** Member.



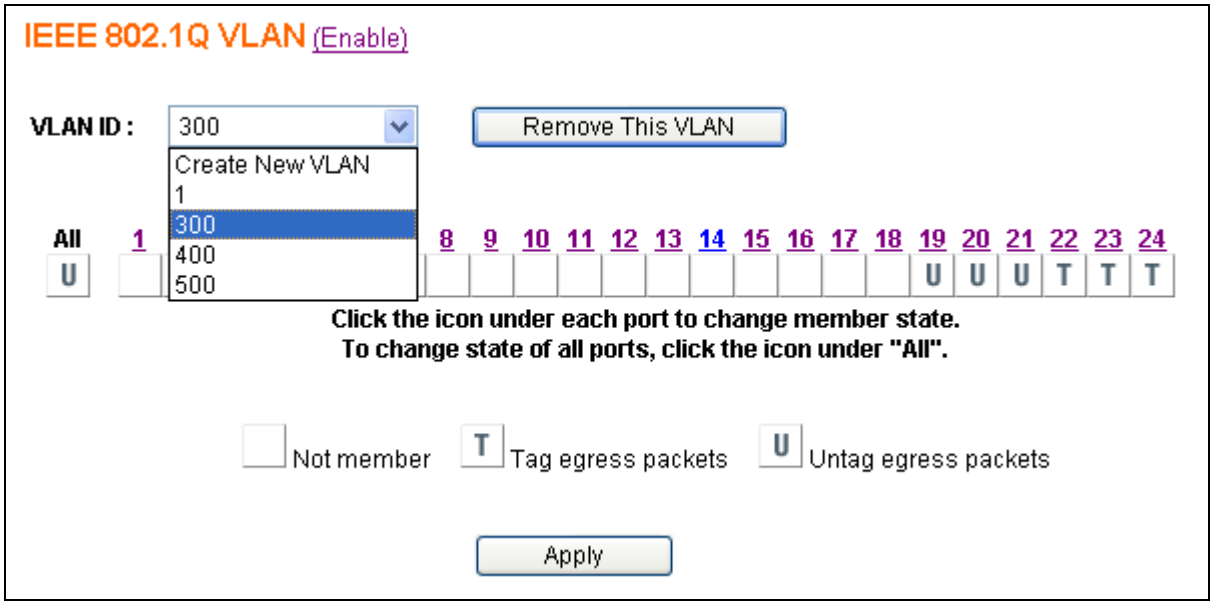
Select the **VID** (1-4094) and within the member row select the ports which will belong to this VLAN group. After these settings are completed, click the Create button to submit the data to the switch. Click the Cancel button to abort the actions and revert back to the **VLAN Config** page.

Here is an example on how to configure the 802.1q VLAN. Now there are four existing 802.1q VLAN entries shown as below.



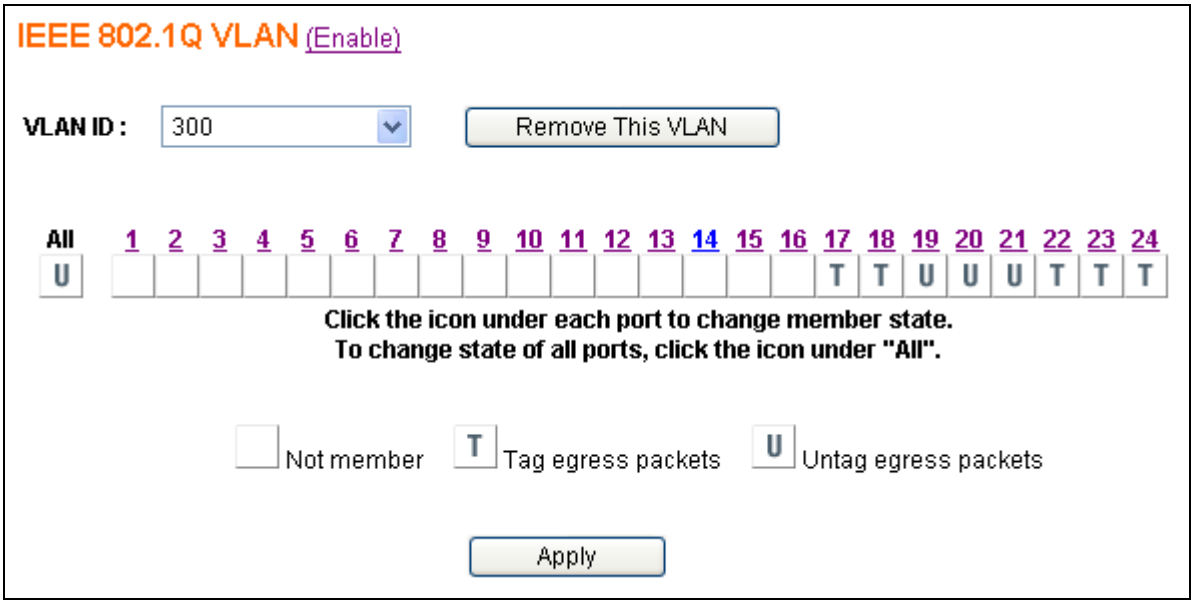
Note: You can delete 802.1q VLAN entries via the selecting the Vlan from the dropdown list and (e.g. VID = 200), then click the Remove This VLAN button to perform the deletion.

Note the 802.1q VLAN table now shows the following entries:



The VID entry (VID=200) is successfully deleted.

If you would like to edit the parameters of an 802.1q VLAN, just select a VID to be changed (e.g. VID =300), then make the required changes and click the Apply button : Port 17 and Port18 are selected to be the tag members of this group.



2.7 Trunking

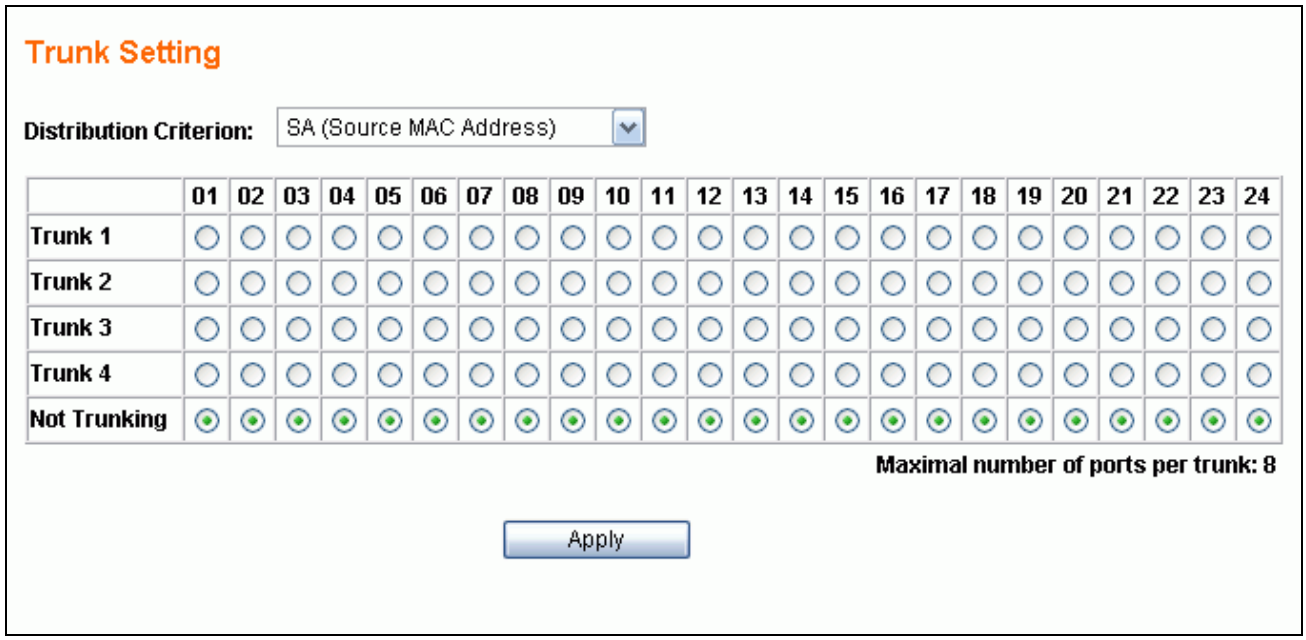
The GSS-24T2SFP web smart switch supports MAC-based trunking. This allows more than one port to be grouped together as a single link connection between two switch devices. This is also useful for switch-to-server and switch-to-router applications. The GSS-24T2SFP web smart switch allows four trunk groups that can accommodate up to eight trunk members in each group. A port in one trunk group cannot be a member of another trunk simultaneously. This feature provides redundancy and increases the effective bandwidth through a link. Traffic patterns are balanced between the ports within a trunk group by dynamically performing a MAC-based load balancing algorithm. This is supported only on point-to-point links with MACs operating in full duplex mode. All links in the same trunk group must operate at the same rate.

The GSS-24T2SFP web smart switch provides dynamic failover support within the trunk group. If a port within the trunk group fails, the other ports of the trunk group automatically assume the extra traffic load currently running through the link. Under normal operating modes, the links within the trunk group should have an equal amount of traffic. To achieve this, this switch performs load balancing based on a distribution algorithm.

The following parameters should be configured to enable this:

- **Distribution Criterion** – Select a distribution algorithm from which the switch will perform load balancing:
  - **SA (Source MAC Address)**
  - **DA (Destination MAC Address)**
  - **SA + DA (both SA and DA)**
- **Member** – the member port(s) of trunk group(s)

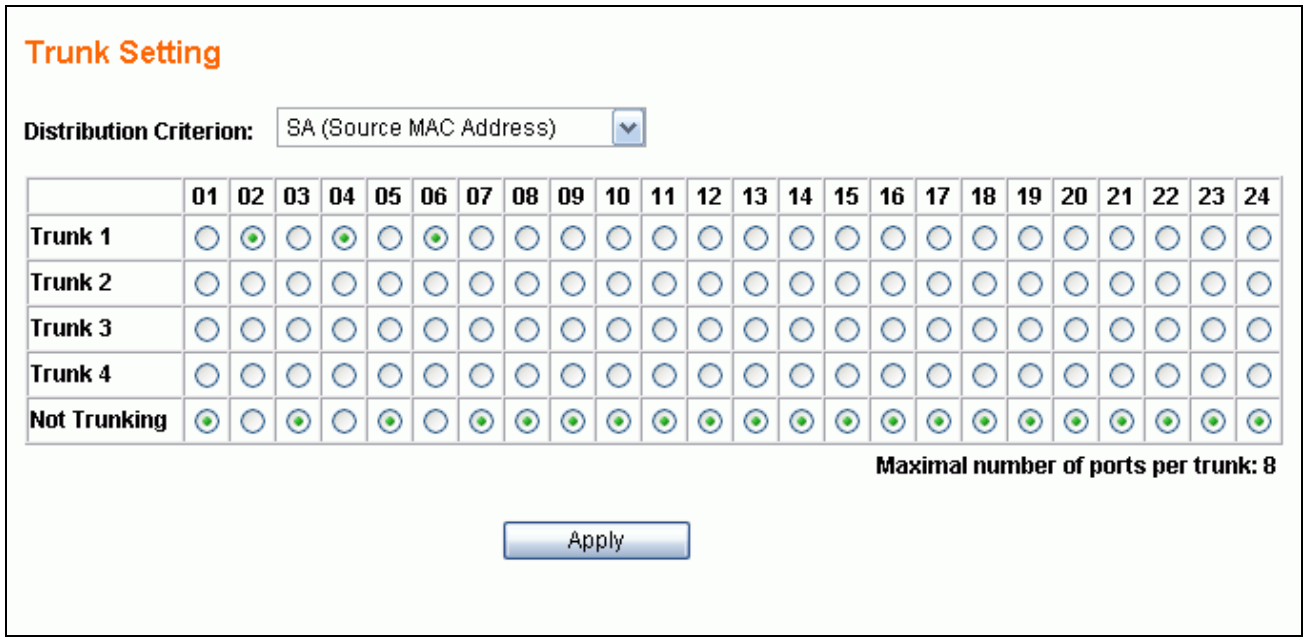
Select the **Trunk** menu on the web page to activate the page shown as below.

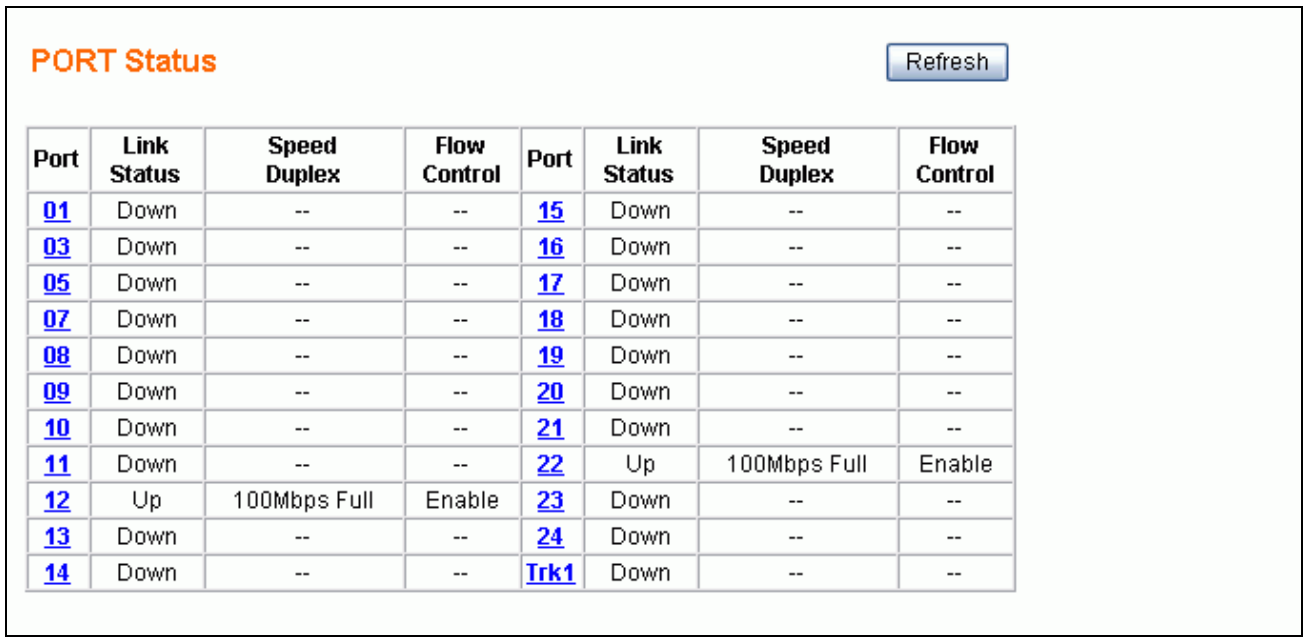


2.7.1 Trunking Rules

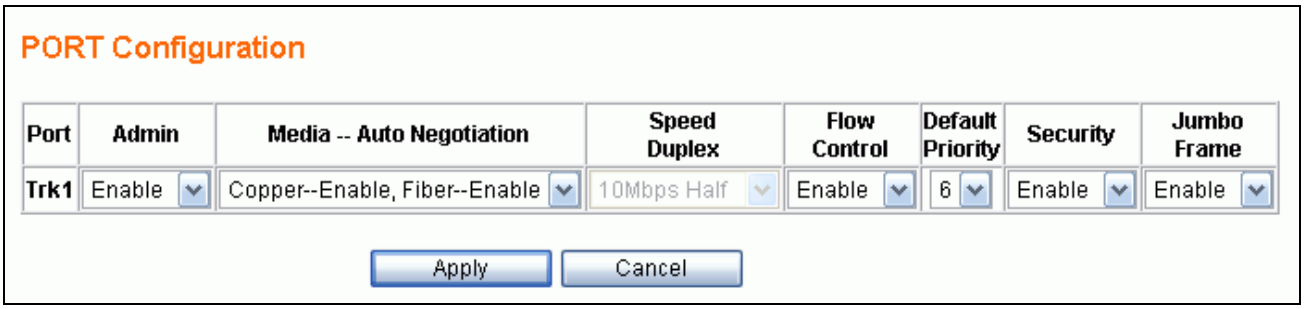
The following rules determine your configuration for port trunking:

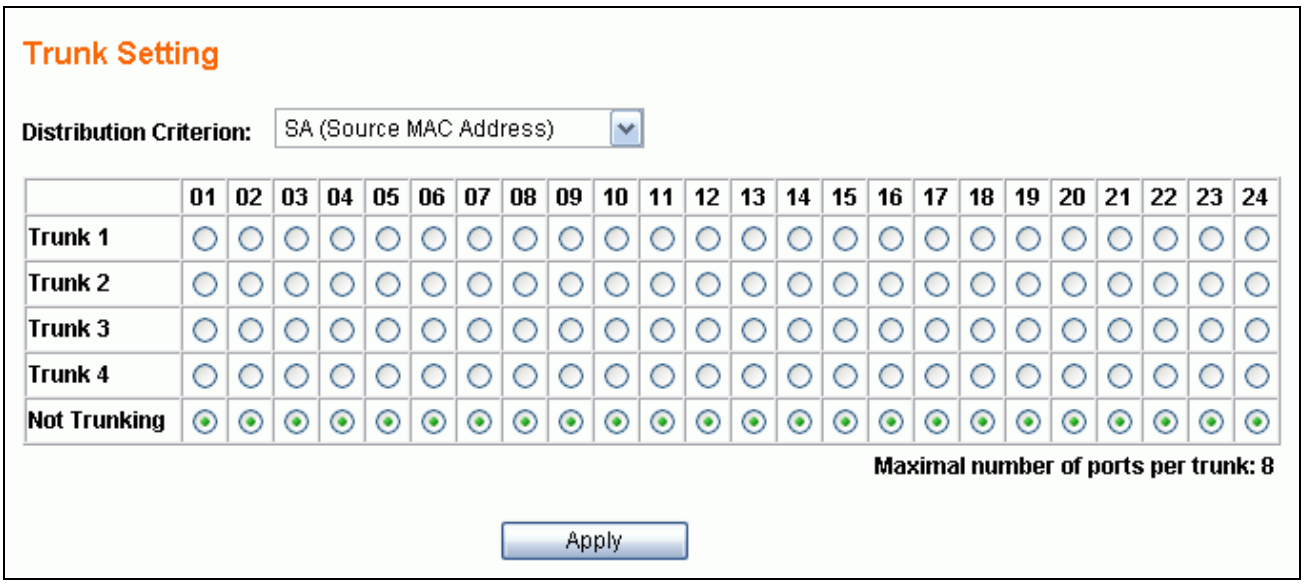
- The attributes of all trunk member ports in Port Configuration, Mirror, Rate Control, 802.1Q VLAN and Port-Based VLAN functions must be the same.
- All trunk member ports can not be a capture port or monitored port in the Mirror function.
- If Port1/Port2 is using fiber media and wants to be grouped with ports using copper (Port3 – Port24) as a trunk group, then the auto negotiation option **must be Enabled** for all member ports; If both Port1 & Port2 are the only trunk member ports and they are using fiber media, the auto negotiation option **can be Enabled or Disabled**.
- After enabling a trunk group, a new trunk port will be created in the port list. For example, Port2, Port4, and Port6 belong to Trunk 1. Checking the Port Status page will indicate the addition of Trk1 at the end of the list and the member ports of this trunk group will no be displayed.

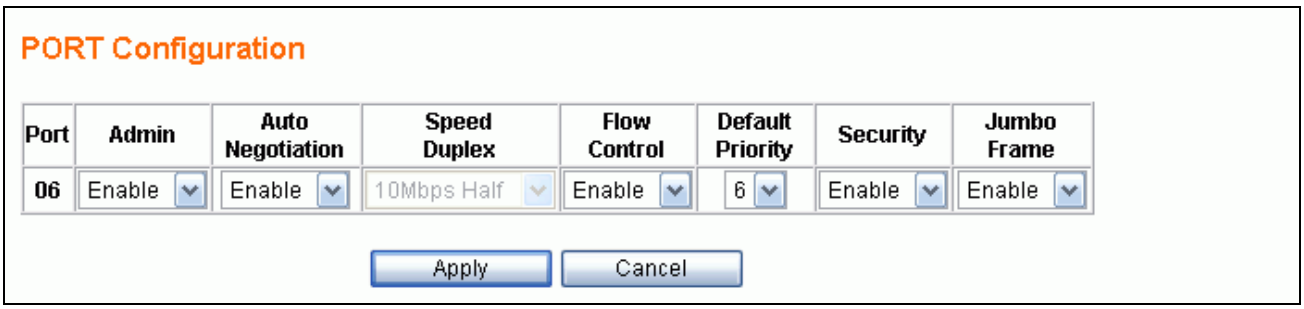




- When the enabled trunk group is set to disabled, all trunk member ports will be released to ordinary ports and their functions can be configured individually. At that moment, their configuration attributes will be returned to their previous state. The following 3 figures show that the settings of a port while in a trunk group can be reverted back to normal once not in the trunk group any more.

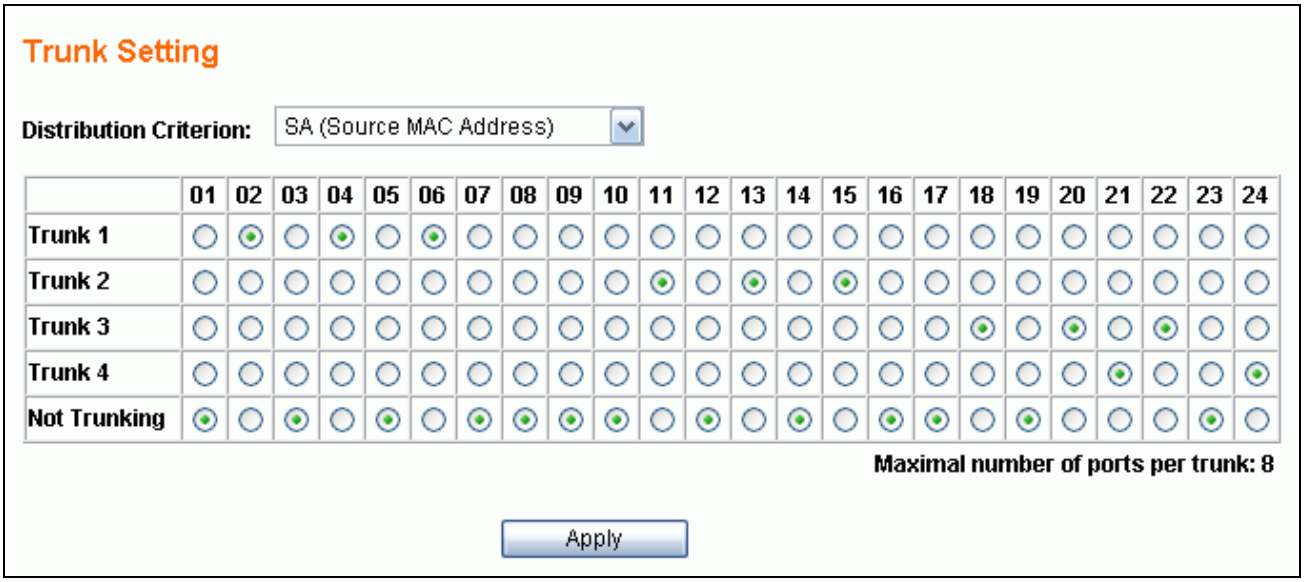






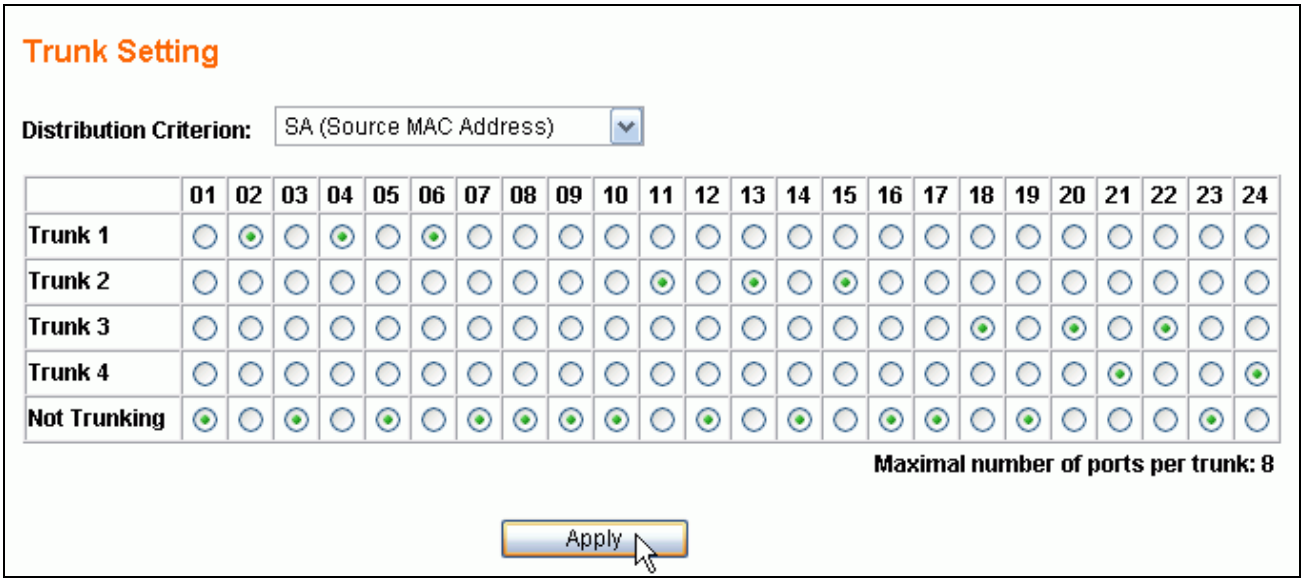
2.7.2 Get/Refresh the Latest Trunk Settings

Click the **Trunk** menu on the web page, the latest trunk settings on the switch will be displayed.



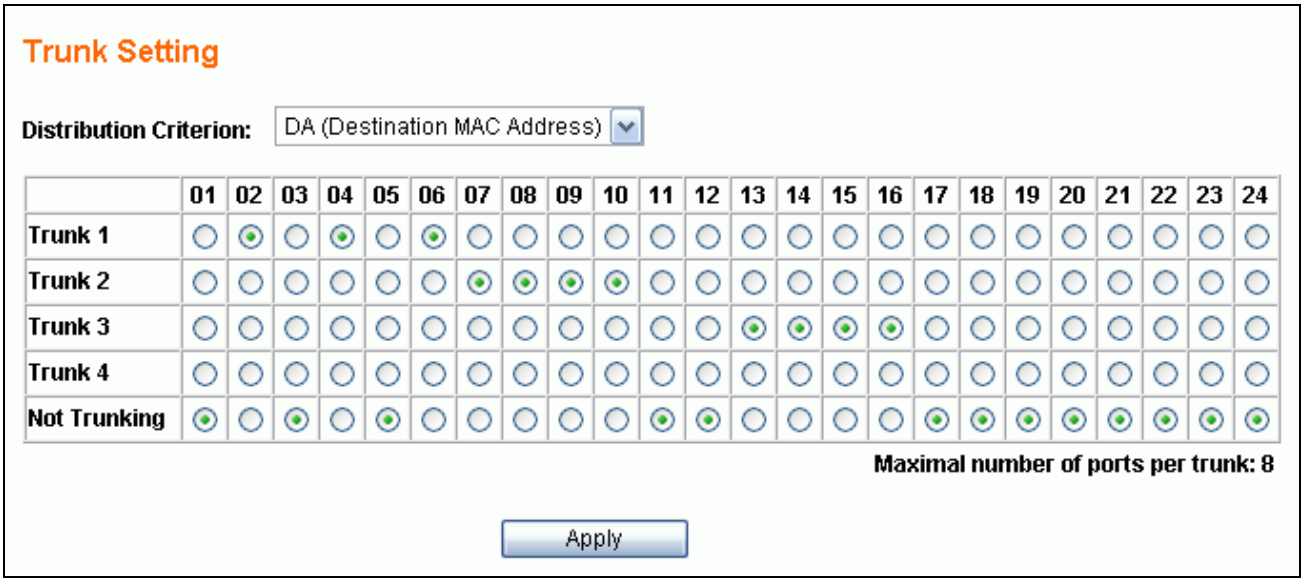
2.7.3 Enable Trunk

- ***Step 1***: Choose the Distribution Criterion.
- ***Step 2***: Choose the member port(s) up to 8 ports for each trunk group.
- ***Step 3***: Click the Apply button to enable trunk settings.



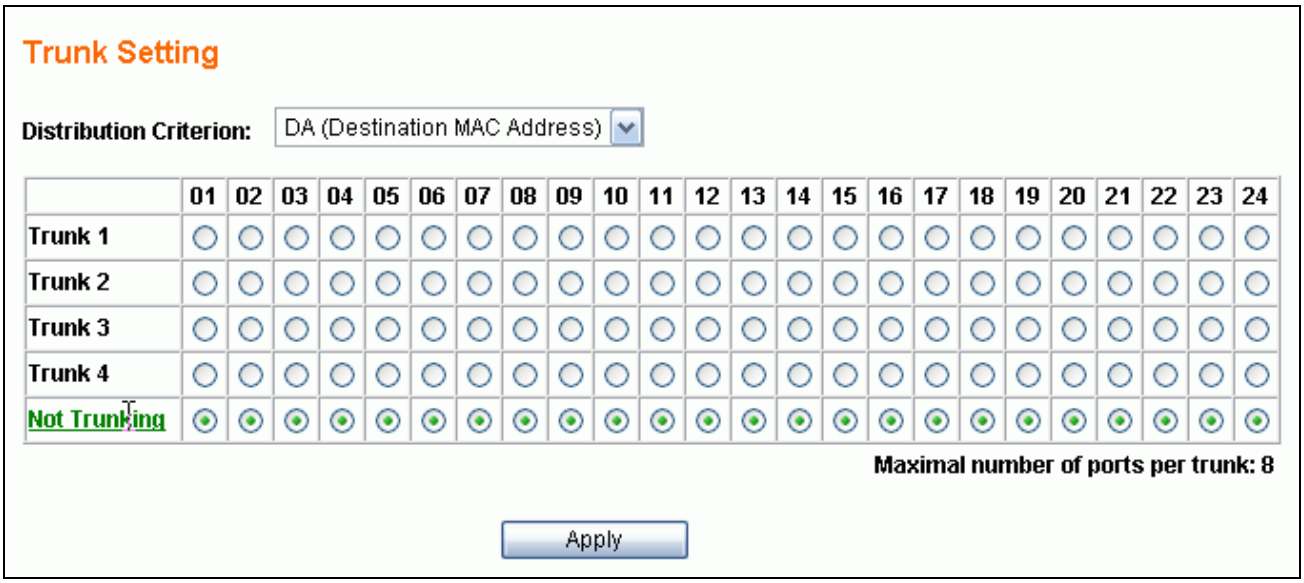
2.7.4 Modify Trunk Settings

- ***Step 1***: Choose the Distribution Criterion.
- ***Step 2***: Choose the member port(s) up to 8 ports for each trunk group.
- ***Step 3***: Click the Apply button to modify trunk settings.



2.7.5 Disable Trunk

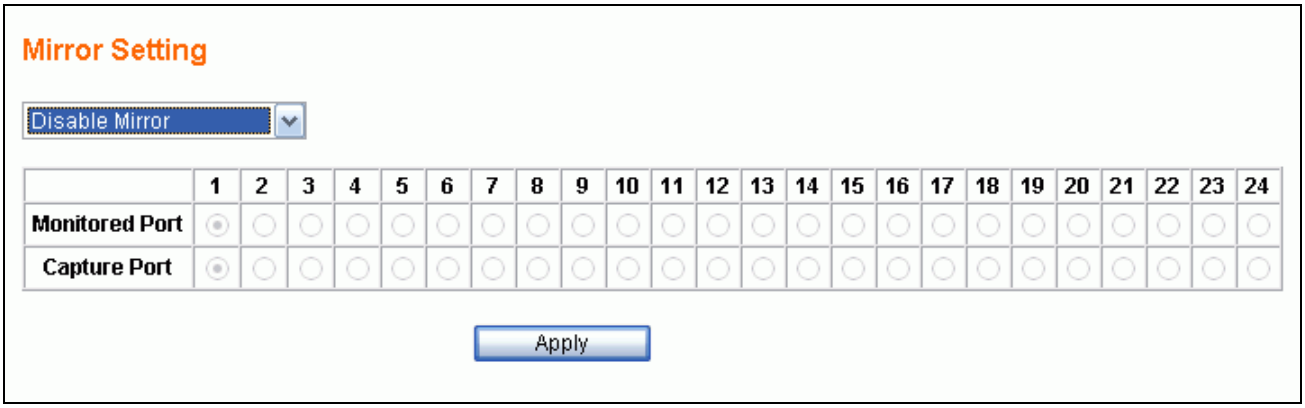
- ***Step 1***: Click the **Not Trunking** hyperlink (the baseline option)
- ***Step 2***: Click the Apply button to disable trunking.



2.8 Port Mirroring

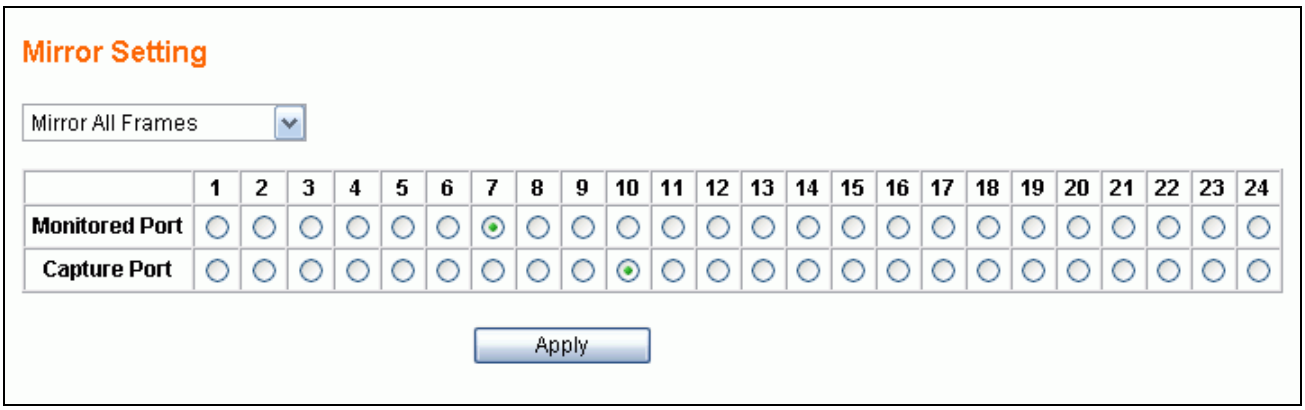
Port mirroring allows ingress and/or egress traffic to be monitored by a single port. The single port is defined as the mirror capture port. The GSS-24T2SFP web smart switch can be configured to mirror the ingress and/or egress traffics of another port. Port monitoring is independent of L2 switching.

Select the **Mirror** menu on the web page to activate the configuration page.



2.8.1 Get/Refresh the Latest Mirror Settings

Click the **Mirror** menu on the web page, the latest mirror settings on the switch will be displayed.

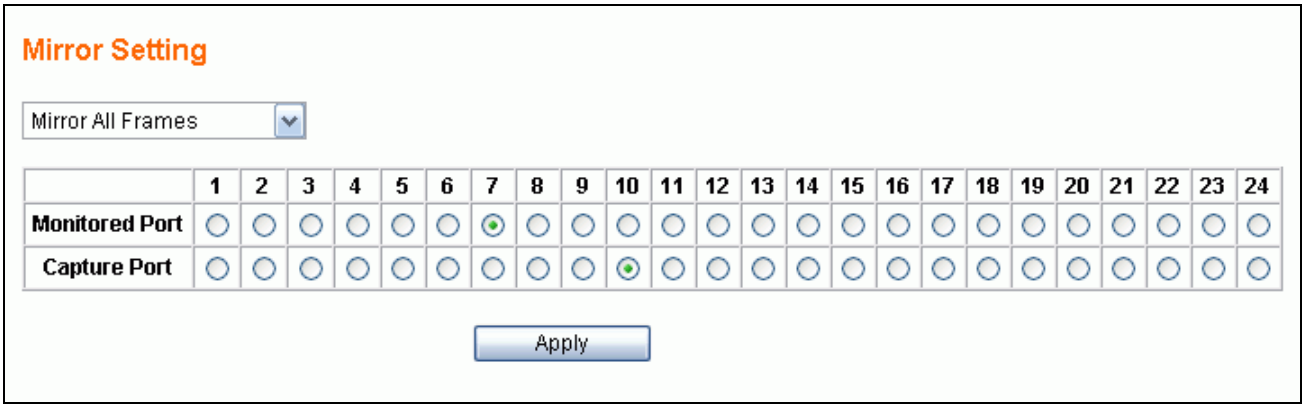


The following parameters can be set:

- **Mirroring Options** – There are four options for each port:
  - **Disable Mirror** – to disable mirror function.
  - **Mirror All Frames** – to set the corresponding port configuration to monitor bi-directional traffic.
  - **Mirror Incoming Frames** – to set the corresponding port configuration to monitor ingress traffic only (receiving, Rx).
  - **Mirror Outgoing Frames** – to set the corresponding port configuration to monitor egress traffic only (transmitting, Tx).
- **Monitored Port** – The port which is to be monitored. (more than one can be selected)
- **Capture Port** – All traffic mirrored from monitored port is sent to this port.

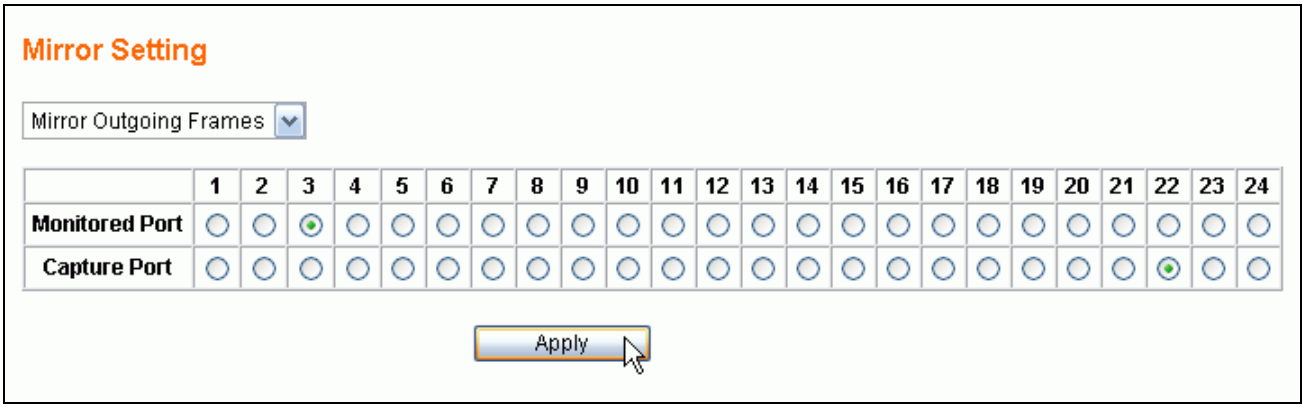
2.8.2 Enable Mirror

- ***Step 1***: Choose the Mirror option as **Mirror All Frames**.
- ***Step 2***: Choose the **Monitored Port** (ie Port16)
- ***Step 3***: Choose the **Capture Port** (ie Port8)
- ***Step 4***: Click the Apply button to enable the mirroring settings.



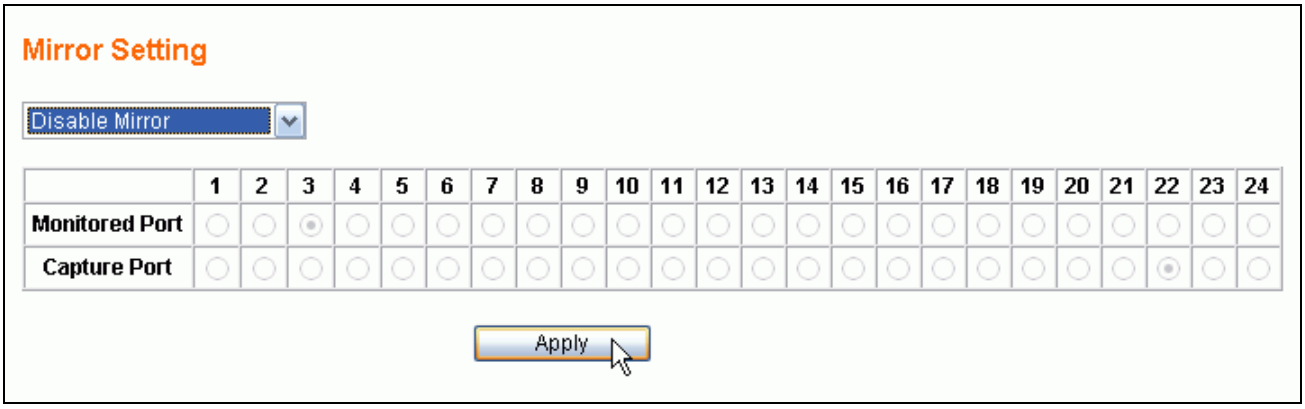
2.8.3 Modify Mirror Settings

- ***Step 1***: Change the Mirror option as **Mirror Outgoing Frames**.
- ***Step 2***: Change the **Monitored Port** to be Port3
- ***Step 3***: Change the **Capture Port** to be Port22.
- ***Step 4***: Click the Apply button to modify the mirroring settings.



2.8.4 Disable Mirror

- ***Step 1***: Choose the Mirror option as **Disable Mirror**.
- ***Step 2***: Click the Apply button to disable mirroring.

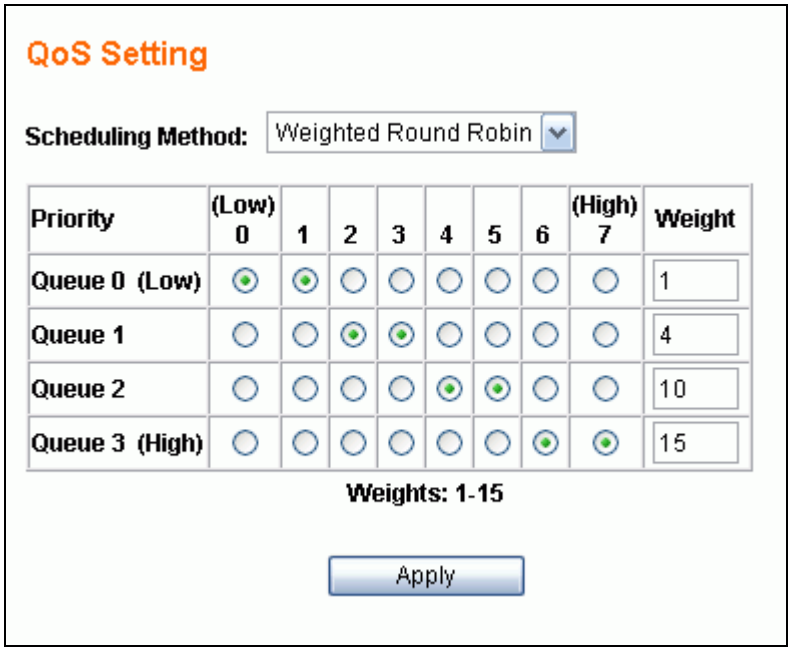


2.9 QOS (Quality of Service)

The 24G web smart switch provides up to four internal transmit queues per port to support four different traffic priorities. High-priority traffic experiences less delay in the switch than that of lower priority traffic under congested conditions. This can be critical for congestion sensitive traffic such as VOIP. The GSS-24T2SFP web smart switch provides three types of QOS. It can assign packets to one of four transmit queues according to 802.1P QOS. If the incoming packet is untagged, the GSS-24T2SFP web smart switch uses the priority field in the per-port **Default Priority** configuration screen (**Port Config** page) to assign the packet to one of four transmit queues. If the incoming packet is tagged or priority tagged, the 24G web smart switch uses the priority field in the incoming packet tag to assign the packet to one of four transmit queues.

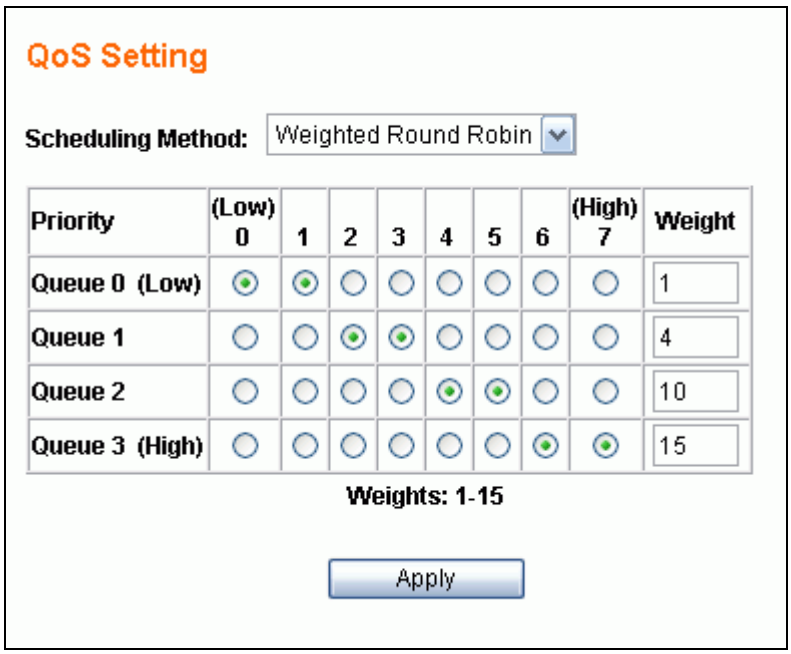
The GSS-24T2SFP web smart switch also provides a remap function. The switch inserts packets into the transmit queue based on the priority ID. To extend QOS functionality, administrators can assign a map between priority and queues. The switch can handle the packets transmit by the Tx Queue by a Weighted Round-Robin algorithm.

Select the **QOS** menu on the web page to activate the page shown as below.



2.9.1 Get/Refresh the Latest QOS Settings

Click the **QOS** menu on the web page, the latest QOS settings on the switch will be displayed.

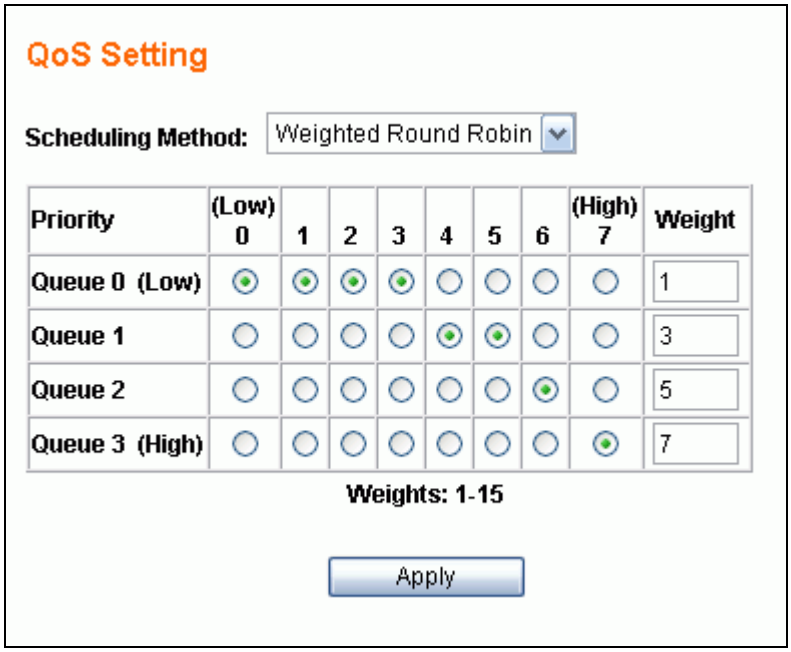


The following parameters can be configured:

- **Scheduling Method**
  - **Strict Priority** – Sets the switch to transmit packets with Strict Priority algorithm
  - **Weighted Round Robin** – Set the switch to transmit packets based on a Weighted Round Robin algorithm
- **Priority/Queue Map**
  - To set the Priority and Queue map.
- **Weight**
  - To set the weight for every transmit queue. (Weight range: 1 ~ 15)
  - The weight of a higher queue should not be less than the previous lower queue.

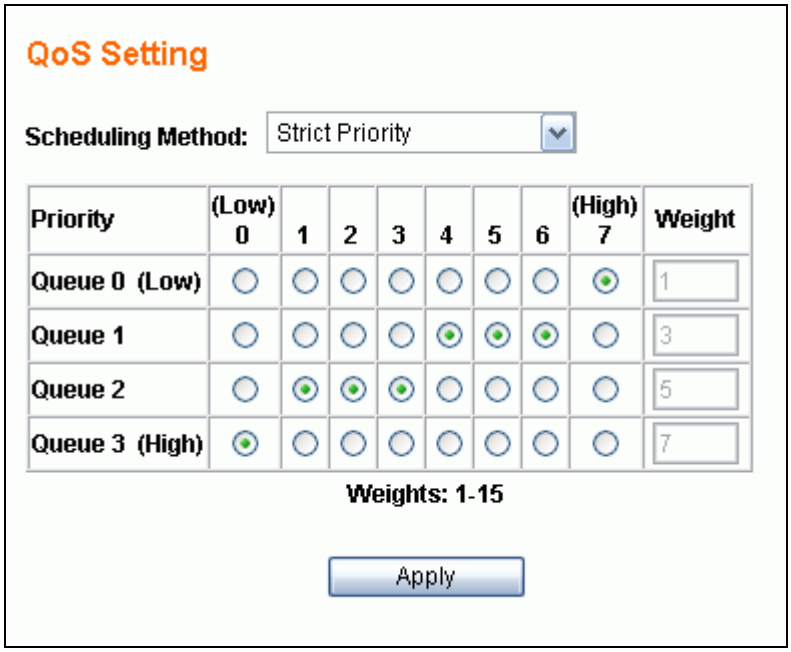
2.9.2 Enable QOS

- ***Step 1***: Choose the **Scheduling Method** (ie: Weighted Round Robin).
- ***Step 2***: Set Priority/Queue map (ie: Priority1, 2, 3 and 4 belong to Queue0, Priority4 and 5 belong to Queue1, Priority6 belongs to Queue2, Priority7 belongs to Queue4).
- ***Step 3***: If the scheduling method is Weighted Round Robin, assign a weight for every transmit queue (ex: Queue0 weight = 1, Queue1 weight = 3, Queue2 weight = 5, Queue3 weight = 7).
- ***Step 4***: Click the Apply button to enable the QOS settings.



2.9.3 Modify QOS Settings

- ***Step 1***: Change the **Scheduling Method** to be Strict Priority.
- ***Step 2***: Change the Priority/Queue map (ie: Prirotiy0 belongs to Queue3, Priority1, 2 and 3 belong to Queue2, Priority4, 5 and 6 belong to Queue1, and Priority7 belongs to Queue0).
- ***Step 3***: Click the Apply button to modify the QOS settings.



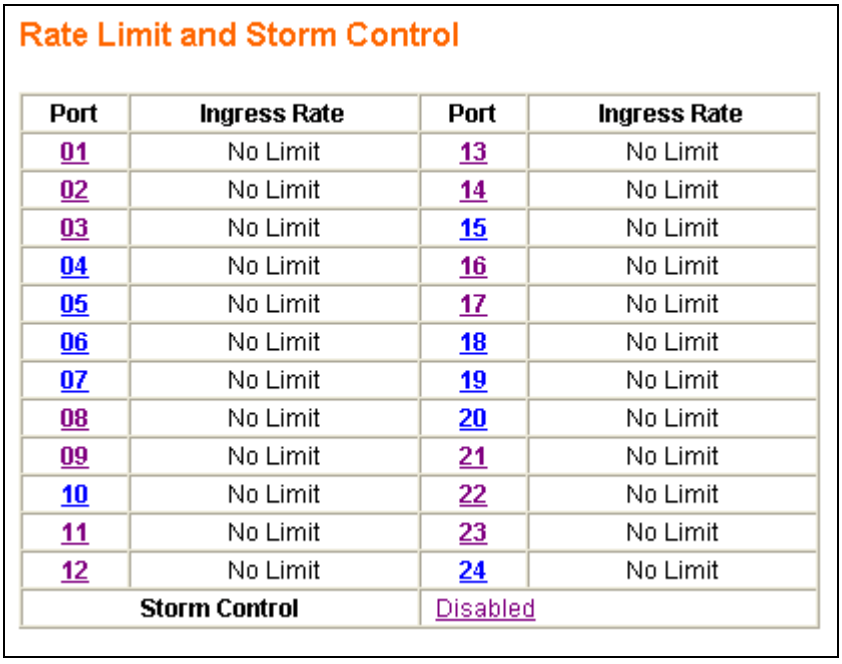
2.10 Rate and Storm Control

To improve overall system performance, the GSS-24T2SFP web smart switch provides rate and broadcast storm control. This can limit the per-port traffic rate and limit global broadcast storms from reducing the performance of the overall system.

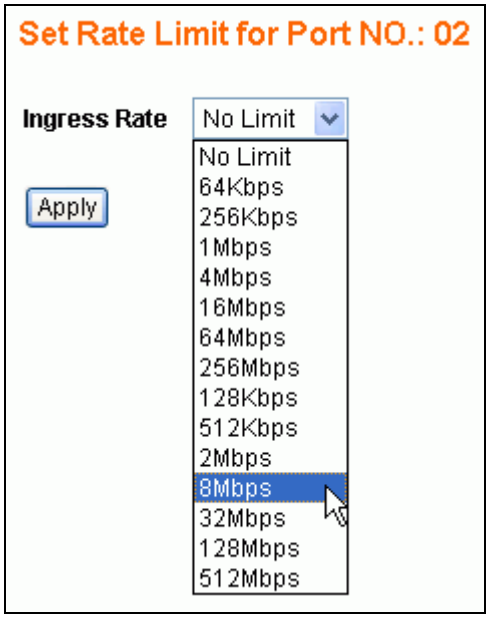
2.10.1 Rate Control

The switch supports per-port rate control. When the incoming frame rate of a particular port exceeds a selected rate, the excess frame traffic is subject to flow control through either packet droping or flow control.

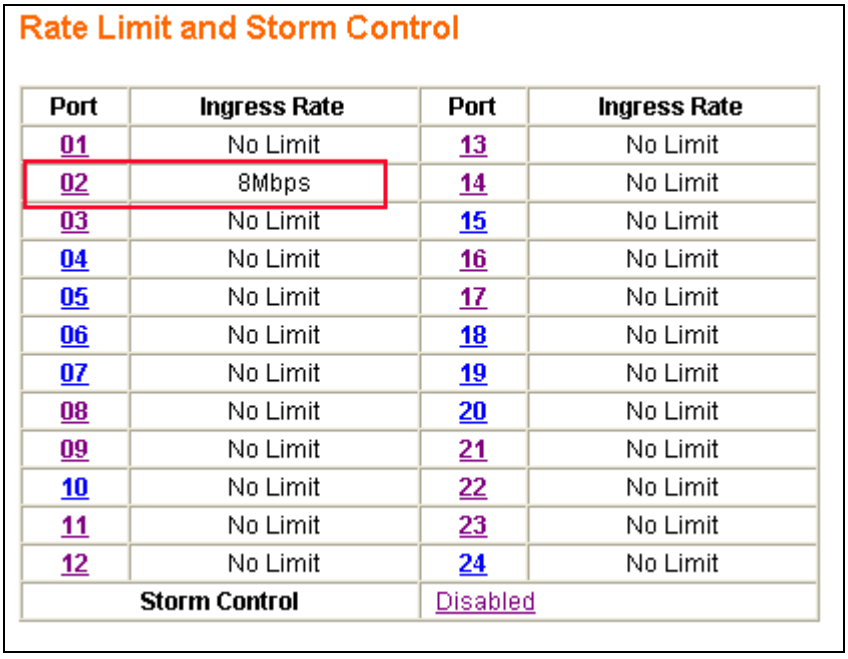
Click the **Rate & Storm Control** submenu to open the **Rate Limit and Storm Control** page to configure this function.



Select the port number to setup the per-port rate control value. In this page an ingress rate limit dropdown is shown as in the following figure, select one of 14 different rates to limit the rate or select "No Limit" to allow un-limited data rates for this port.



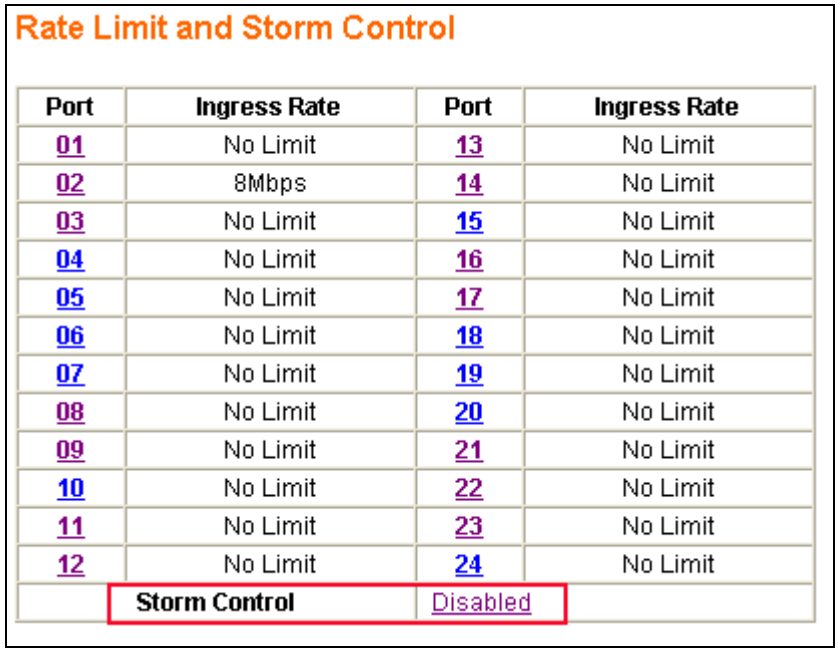
After clicking the Apply button to activate the setting, the previous page will be displayed and the latest settings activated.



Port	Ingress Rate	Port	Ingress Rate
01	No Limit	13	No Limit
02	8Mbps	14	No Limit
03	No Limit	15	No Limit
04	No Limit	16	No Limit
05	No Limit	17	No Limit
06	No Limit	18	No Limit
07	No Limit	19	No Limit
08	No Limit	20	No Limit
09	No Limit	21	No Limit
10	No Limit	22	No Limit
11	No Limit	23	No Limit
12	No Limit	24	No Limit
Storm Control		Disabled	

2.10.2 Storm Control

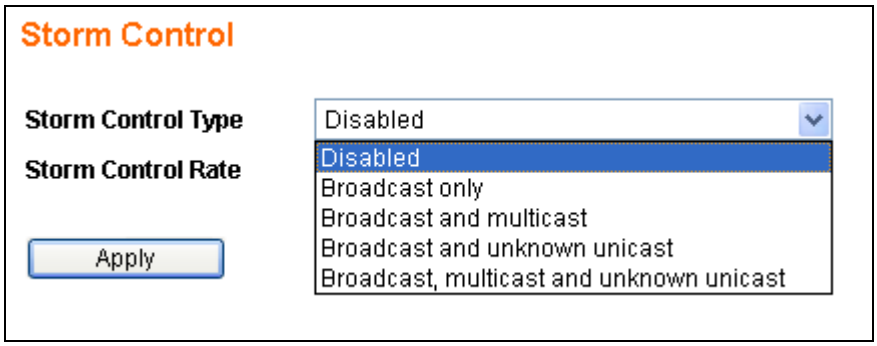
In the **Rate Limit and Storm Control** page, the hyperlink (e.g. Disabled) on the row labeled **Storm Control**, shows the current setting for this function. Enabling or Disabling this function will globally affect to all ports in the system. Click the hyperlink to configure.



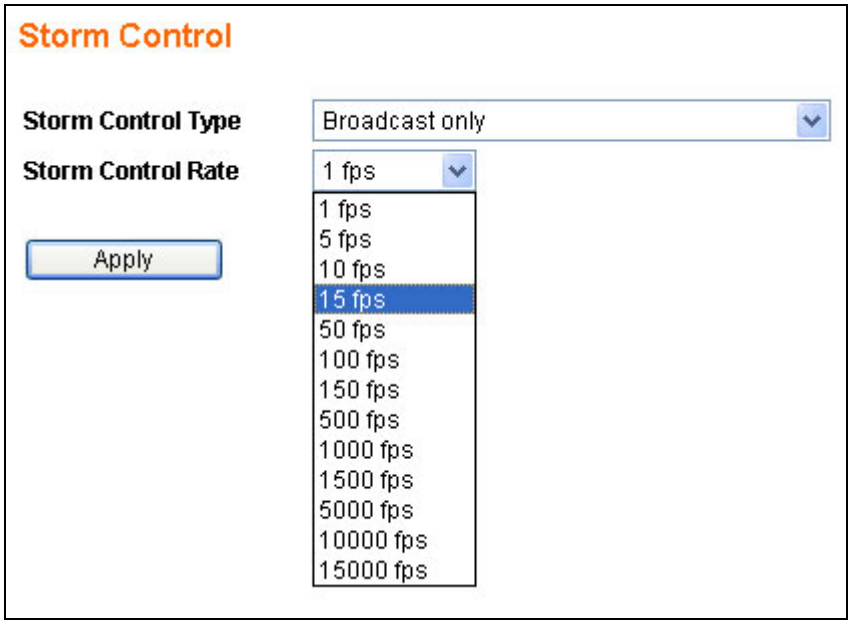
In the **Storm Control** page, there are 2 fields to configure:

- **Storm Control Type –** 5 options are provided in this dropdown
  - **Disabled** – to disable storm control. This option will disable the dropdown in the **Storm Control Rate** field
  - **Broadcast only** – to suppress the broadcast frames only
  - **Broadcast and multicast** – to suppress both the broadcast and multicast frames
  - **Broadcast and unknown unicast** – to suppress both the broadcast and unicast frames with unknown destination MAC address
  - **Broadcast, multicast and unicast** – to suppress broadcast, multicast and unicast frames with unknown destination MAC address

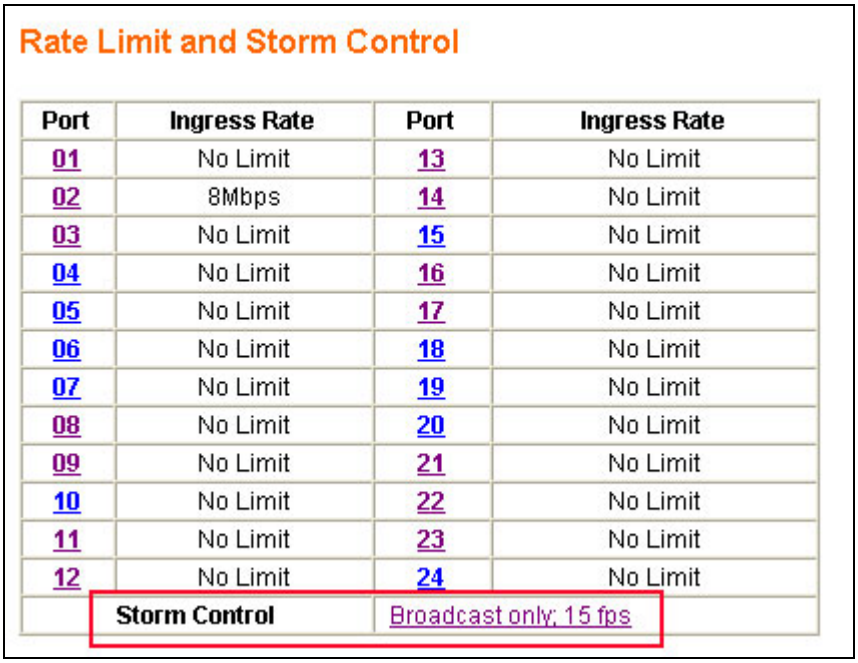
The following figure shows the options in the dropdown of the **Storm Control Type** field.



- **Storm Control Rate** – this field provides 13 different control rates from 1fps (frames per second) to 15,000fps. This dropdown will be disabled while the **Storm Control Type** is disabled.

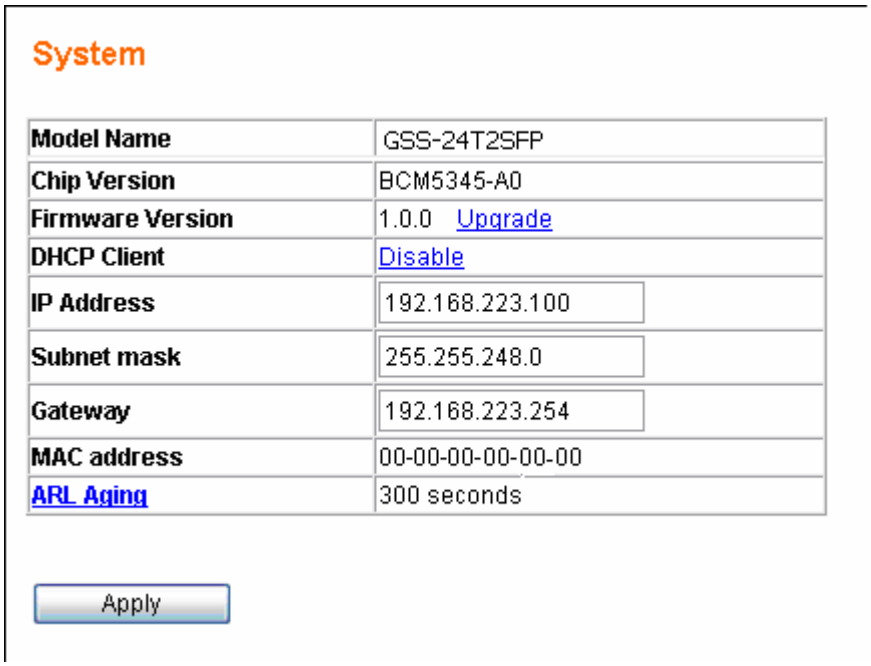


After selecting the storm control type and rate, click the Apply button to activate the settings for this function. The figure shown as below is an example of storm control configuration with a type selection of "broadcast only" and a limited rate of 15fps.



2.11 System Setup

System Setup page provides management information for the switch. The page shown below can be activated by clicking on the **System Setup** menu under the **System** section.

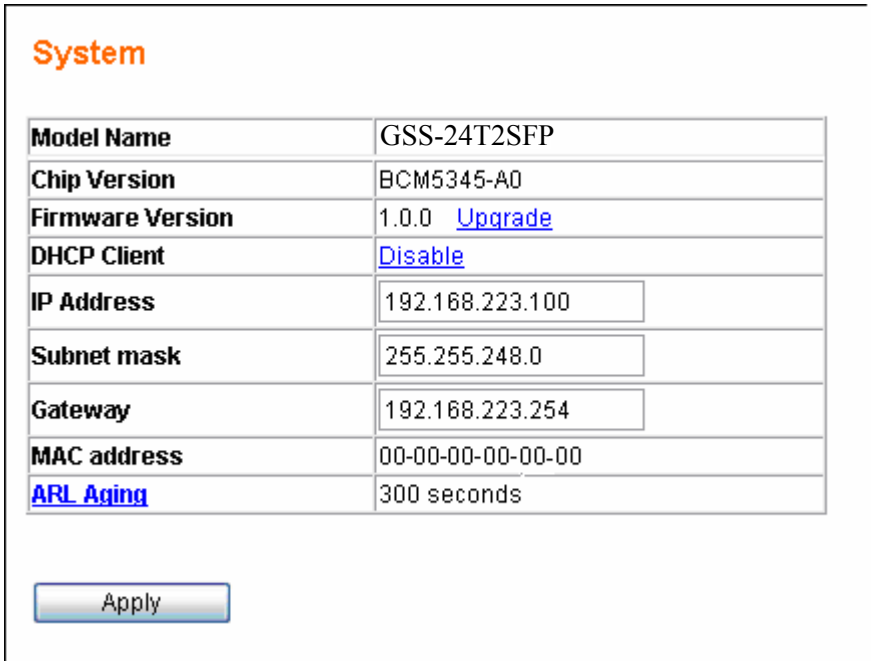


The following parameters can be configured / displayed:

- **Model Name** – the model name of this switch (read-only)
- **Chip Version** – the switch chipset version (read-only)
- **Firmware Version –** the current version running on the switch (read-only)
- **DHCP Client** – DHCP client status
- **IP Address** – the IP address to manage this switch.
- **Subnet mask** – the network mask to identify the sub-network address
- **Gateway** – the IP address of the default gateway
- **MAC address –** the MAC address for the configuration port interface (read-only)
- **ARL Aging –** the aging time of dynamic ARL entry in address table

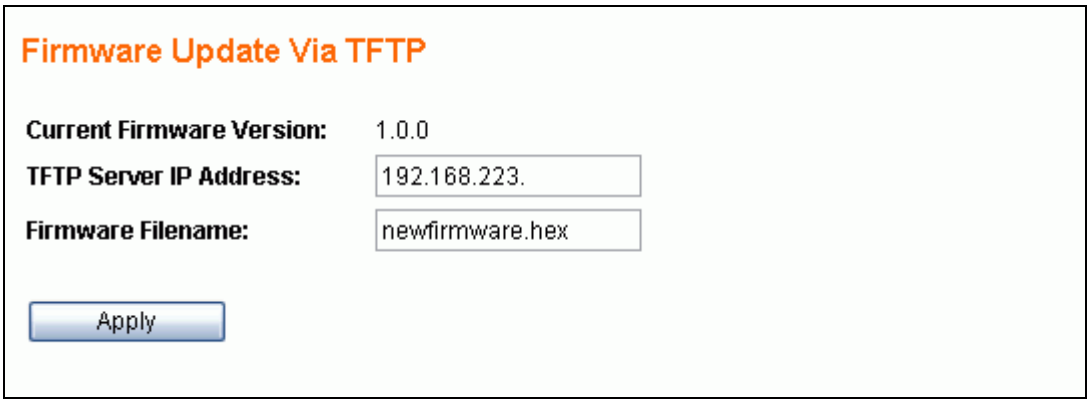
2.11.1 Firmware Update

The GSS-24T2SFP web smart switch provides a firmware update feature, customized requests and system fault recovery. The page for this is shown below can be activated by clicking the **Update** link in System Setup page.



This system supports both **BOOTP/TFTP** and **TFTP** to update the firmware. The TFTP server IP address and firmware filename needs to be correctly provided to the switch to start the firmware updating if the TFTP method is selected.

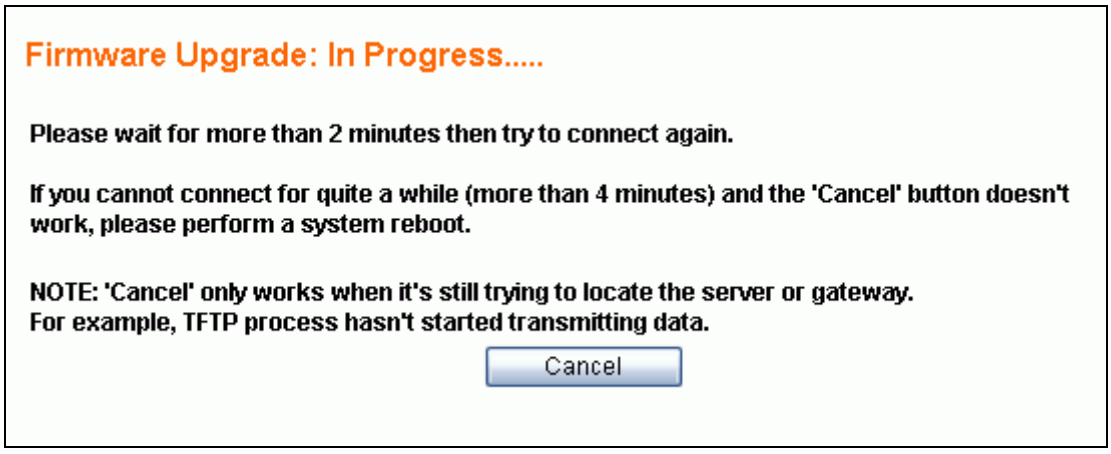
Firmware Update Via TFTP



To perform the firmware update process, it is necessary to correctly prepare a **TFTP server** and the **firmware file** which will be uploaded to the switch by the TFTP server. (Please refer to the TFTP software vendor's instruction guide for setting up the TFTP server)

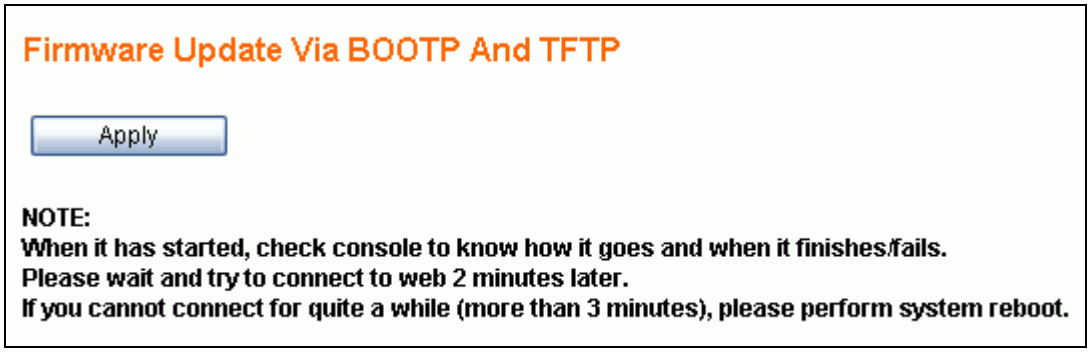
When the TFTP server and the firmware file are ready, enter the TFTP server IP address and firmware filename. Click the Apply button to start the firmware update through any RJ-45 port on the switch.

The time for processing the firmware update will be approximately 50 seconds.



NOTE: If the switch can not connect to the TFTP server then click the Cancel button to stop firmware update progress.

2.11.1.1 Firmware Update Via BOOTP/TFTP



Before performing the firmware update, please correctly prepare a **BOOTP/TFTP server** and the **firmware file** which will be uploaded to the switch by the TFTP server. (Please refer to the TFTP software vendor's instruction guide for setting up the TFTP server).

When the BOOTP/TFTP server and the firmware file are ready, click the Apply button to start the firmware update through the any RJ-45 port on the switch.

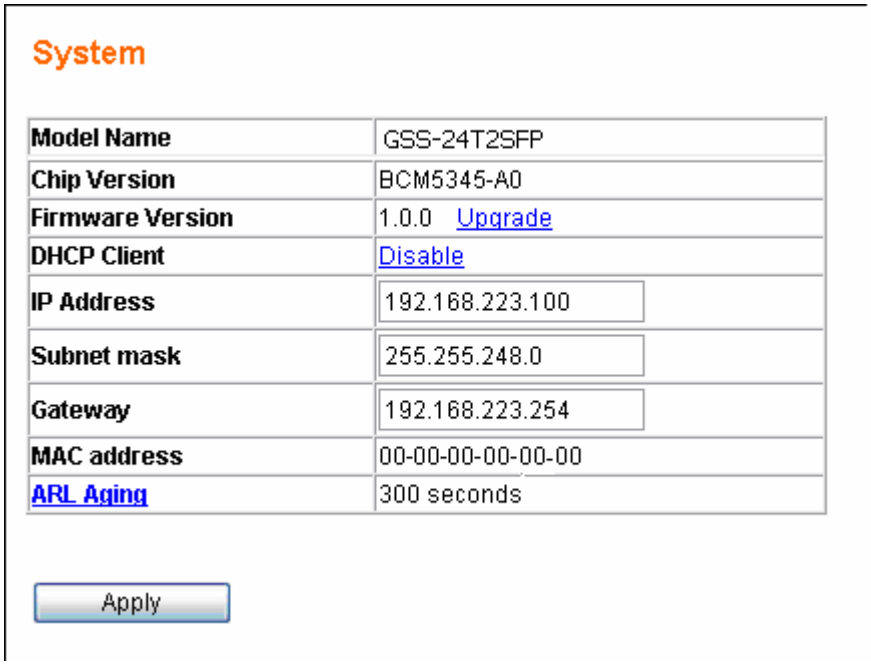
The time for processing the firmware update will be approximately 50 seconds.

2.11.2 DHCP Client

The IP address of the GSS-24T2SFP web smart switch can be statically assigned by the system administrator or dynamically assigned by a DHCP server.

2.11.2.1 Assign a fixed IP address

Change DHCP Client to be disabled. Enter a fixed IP address, Subnet mask and Gateway, and then click the Apply button.



2.11.2.2 Assign an IP address by DHCP server

Change DHCP Client to be enabled. The system's IP address, subnet mask anb gateway address will be assigned immediately by a LAN based DHCP server.

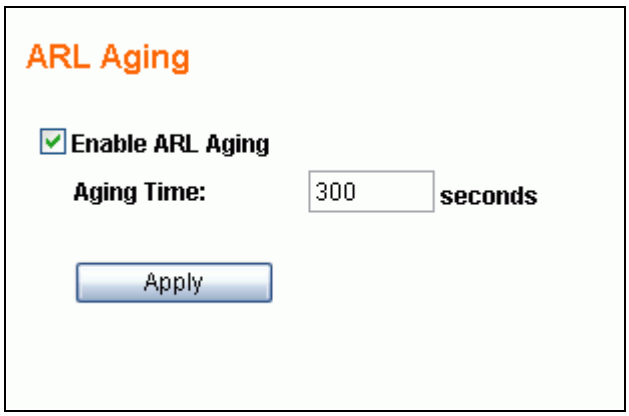
Note: Your web browser connection may be lost at this point, as the switch IP address may be reconfigured from the DHCP server – use the switch console port or interrogate the DHCP server to discover the new IP address.

The **IP address, Subnet mask and Gateway** fields will be in a read-only state when the DHCP client is set to Enabled.

2.11.3 ARL Aging

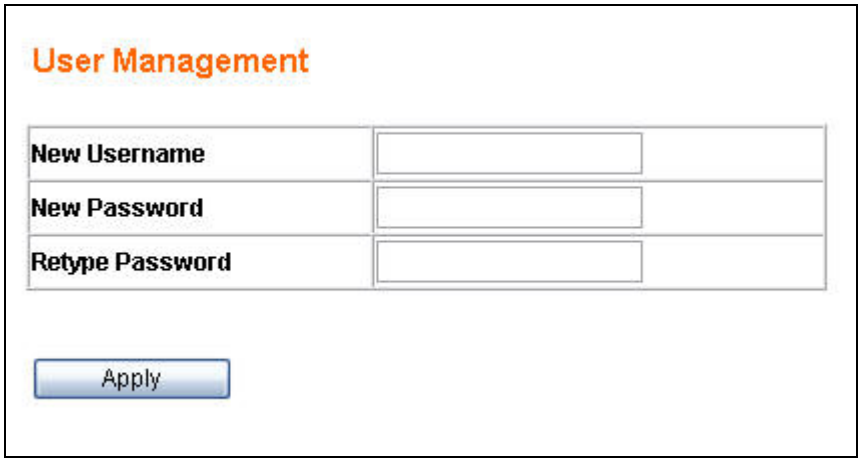
The GSS-24T2SFP web smart switch supports an auto aging timer for MAC address entries in address table. If ARL aging is enabled and aging time is 300 seconds, every MAC address entry learned from every front port will keep in the address table for 300 seconds. After 300 seconds, the switch will remove the MAC entry.

Click **ARL Aging** to modify aging time settings. Check **Enable ARL Aging** checkbox to enable it. Uncheck **Enable ARL Aging** to disable it. Enter aging timer and click Apply button to set aging time.



2.12 User Management

The User management screen is used to maintain the username and password for login validation to access to the switch. The switch provides only one login account for configuration management. Click the **User Management** menu to activate the **User Management** page shown as below:



- **New Username** – to set the username string (max. 10 characters)
- **New Password** – to set the password string (max. 10 characters)
- **Retype Password** – to confirm the password string (max 10 characters)

2.13 Reset System

The switch can be rebooted or factory defaulted via the following methods.

Click **Reboot System** menu to reboot the switch.

Click **Reset System** menu to reset the switch to its factory default settings.

- **Reboot System** –Reboot the system. All configuration settings will be retained. If you want to keep all your configurations then select this option.
- **Reset System** – Reset all configurations (including the username, password and IP address; only the MAC address will not be changed) to default settings before rebooting the system. Means that any customized configurations will be lost and can not be recovered.

The GSS-24T2SFP web smart switch also provides an alternative to **Reset System** by using the **Reset button** on the rear panel:

- While the system is running (the DIAG LED indicator is ON), ***pressing and holding the Reset button (over 5 seconds) until the DIAG LED indicator begins flashing,*** at any time will activate the **Write Default** procedure.

After this procedure is completed, the switch will be rebooted and initialized using the default settings automatically.

The GSS-24T2SFP switch takes approximatly10 seconds to reboot. You need to login the system again to enter the web management configuration.

2.14 Command Line Interface (CLI)

In addition to the web management interface, the GSS-24T2SFP web smart switch also provides a serial interface (RS-232) as a console port on the rear panel to manage the switch. A Windows **Hyper Terminal** session is recommended for use. This section will explain how to setup and use **Hyper Terminal** to manage this switch.

2.14.1 Hyper Terminal Setup Options

- Baud Rate: 19200 bps
- Data Bits: 8
- Parity: None
- Stop bits: 1
- Flow control: None

2.14.2 Switch Management Commands In Console

- **Login System**

  After the system has started, the following prompt will displayed on the Hyper Terminal session. The administrator needs a valid username and password to login this system. The username and password in CLI are the same as the ones using for login access through the web page.

```
Switch Login:
```

  After entering the username, the following prompt will be displayed. The Administrator should enter the correct password.

```
Switch Login: admin
Password: ***


Web Smart Switch

 H - Help menu

Switch>
```

Help Menu

Press “H”, “h” or “?” to show all management commands in console.

```
Switch> h
Help Menu:

 IG - Get System Information
 NG - Get Current Network Settings
 NS - Configure Network
 UM - User Management
 UF - Upgrade Firmware Via TFTP or BOOTP/TFTP
 RB - Reboot System
 RD - Reboot System After Write Default
 LO - Logout
```

Get System Information

Press “IG” or “ig” to show model name and firmware version.

```
Switch> IG
Model Name:   GSS-24T2S
Firmware Version: 1.0.0
```

Get Current Network Settings

Press “NG” or “ng” to show DHCP client status, system IP address, network mask, gateway and MAC address.

```
Switch> NG - Get Current Network Settings

DHCP Client: Disabled
IP: 192.168.223.100
Netmask: 255.255.248.0
Gateway: 192.168.223.254
MAC Address: 00-00-00-00-00-00
```

■ Configure Network

Press “NS” or “ns” to configure system network.

```
Switch> NS - Configure Network

Do you want to enable DHCP Client?
```

If the Administrator wants to assign the switch an IP address by DHCP server, then enter “Y” or “y” to start DHCP process.

```
Switch> NS - Configure Network

Do you want to enable DHCP Client? y

Switch>

IP got from DHCP Server: 192.168.223.151
```

If the Administrator wants to assign the switch a fixed IP address, then enter “N” or “n” to abort DHCP progress.

```
Switch> NS - Configure Network

Do you want to enable DHCP Client? n
IP: 192.168.223.206
Netmask: 255.255.248.0
Gateway: 192.168.223.234

IP Configuration Completed
```

■ User Management

Press “UM” or “um” to configure the admin account and password which is used to login the switch. Enter new username and password. After confirming the password, the system will ask you to re-login.

```
Switch> UM - User Management

New username: admin_user
New password: *********
Retype new password: *********

Switch Login:
```

■ Upgrade Firmware Via TFTP or BOOTP/TFTP

Press “UF” or “uf” to start firmware upgrade progress via TFTP server.

```
Switch> UF - Upgrade Firmware Via TFTP or BOOTP/TFTP
1.TFTP  2.BOOTP/TFTP:
```

Choose “**1**” to update firmware via TFTP. Enter TFTP server IP address and firmware filename.

```
Switch> UF - Upgrade Firmware Via TFTP or BOOTP/TFTP
1.TFTP  2.BOOTP/TFTP:1

TFTP Server IP: 192.168.223.118
Filename: newfirmware.hex

This will start automatic TFTP firmware update via TFTP.
Are you sure?y
Press ESC to cancel (before TFTP started).....
Boot: Start TFTP client(IP=192.168.223.206)
56K Sector-based Flash Erase (8 Banks)...                    OK
56K Blank(8 Banks) Checking...                    OK
Receiving TFTP Blocks .....................?
```

Choose “**2**” to update firmware via BOOTP/TFTP.

```
Switch> UF - Upgrade Firmware Via TFTP or BOOTP/TFTP
1.TFTP  2.BOOTP/TFTP:2

This will start automatic TFTP firmware update via BOOTP/TFTP.
Are you sure?y
Boot: Ver1.1.  Start BOOTP
Boot: Start TFTP client(IP=192.168.223.151)
56K Sector-based Flash Erase (8 Banks)...                    OK
56K Blank(8 Banks) Checking...                    OK
Receiving TFTP Blocks .....................?
```

After the GSS-24T2SFP firmware upgrade process is finished. Press “IG” or “ig” to check firmware version after login.

■ Reboot System

Press “RB” or “rb” to restart this system.

```
Switch> RB - Reboot System

This will reboot system.
Are you sure?y
Reboot system...
```

■ Reboot System After Write Default

Press “RD” or “rd” to reset the switch to factory default settings.

```
Switch> RD - Reboot System After Write Default

This will reboot system after write default.
Are you sure?y
Reset system to factory settings...
```

■ Logout

Press “LO” or “lo” to logout system.

3 Specifications

■ Standards Compliance

IEEE 802.3 10BaseT Ethernet

IEEE 802.3u 100BaseTX Fast Ethernet

IEEE 802.3ab 1000Base Gigabit Ethernet

IEEE 802.3x flow control both on half and full duplex

IEEE 802.1q Tag-based VLAN

■ Interfaces

24 1000BaseTX RJ-45 connector ports,

2 mini-GBIC ports

1 RS-232 terminal port

■ Buffer Memory

512MB for packet buffers

8K entries for MAC

4K entries for VLAN

■ Packet Forwarding and Filtering Rates

1Gbps Ethernet: 1,488,000 packets per second per port

100Mbps Ethernet: 148,800 packets per second per port

10Mbps Ethernet: 14,880 packets per second per port

■ Environment

Operation temperature: 5 to 45 centigrade

Operating humidity: 10%-90%, non-condensing

Storage temperature: -20 to 70 centigrade

■ LED Panel Display

1 power LED: Green (normal)

1 Diagnostics LED: Green (normal), Blinking (reset configuration)

Port LEDs: Port1 – 24, left corner of each RJ-45 port, Green (link ok), Blinking (activity)

Speed LEDs: Port1 – 24, right corner of each RJ-45 port, Green (1Gbps), Vanish (10Mbps or 100Mbps)

Fiber LEDs: Port1 – 2, Green (link ok), Blinking (activity)

■ Power

Input: 100-240VAC, 50/60Hz

Power consumption: 40 Watts max.

■ Dimensions

440mm (W) × 184mm (D) × 44mm (H)

■ Weight

2.3 Kg

■ Electromagnetic Emissions: Class A

FCC, CE, VCCI, C-Tick

■ Safety

CB