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Ether-GSH2416W

Pure Gigabit Web Managed Switch

User's Manual



Powered by OvisLink Corp.

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1 Introduction

The Ether-2416W web smart switch is a high performance web-smart Layer 2 switch that provides users with switched 16 mini-GBIC fiber ports and 8 10/100/1000Mbps copper ports for building up Ethernet network. This is specially designed for the use at the environment that needs high-density fiber ports and copper gigabit ports simultaneously, such as big enterprise, big ISP and telephone companies. When user adopts proper fiber transceivers, single-mode or multi-mode, he may contracture a high speed backbone for large traffic data center or service center.

Web interface management provides control capability over TCP/IP, this make user convenient and easy to manage switch with browser no matter at local or remote side.

Non-blocking and maximum wire speed performance are designed on all switched ports, and it also supports auto-negotiation and MDI/-MDIX function on all switched 8 10/100/1000M RJ-45 Gigabit ports, these function make user really easy to use and reduce the matching effort on straight and cross-over line issues and on different speed setting.

This system supports both port-based VLAN and 802.1Q (tag-based) VLAN to catch-up the application needed incoming VLAN age. To increase bandwidth application, it supports 4 trunk groups with up to 8 member ports, and moreover, these trunk ports are with fair-over function to provide redundant back-up when one or some ports are malfunctioned in that trunk group. In addition to in-band management through RJ-45 ports, it also provides RS-232 terminal port with command line interface (CLI) for user to do initial setting or operation while in-band domain is malfunctioned.

Main Features

- Broadcom[®] chipset inside
- 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
- 16 mini-GBIC ports with optional fiber transceivers and 8 10/100/1000 RJ-45 ports
- 512 K bytes packet buffer, 8K MAC 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 802.1Q (tag-based) VLAN
- Up to 4 trunk groups, maximum 8 member ports for each trunk with fail-over function
- Support flow control for both half- or full-duplex operation
- Support port mirror
- Provide port statistics
- Support 802.1P QoS (Quality of Service) with 4 queues
- Support rate and broadcast storm control
- Support port security to prevent flooded traffic
- Support firmware update via TFTP transaction
- Support configuration backup and restore via TFTP transactions*
- LED display for each port to show link and activity status
- Wall mount, Rack mount or desktop

[®] Broadcom is registered trademark of Broadcom Corporation

* Some models don't support this function

1.1 Start to Manage This Switch

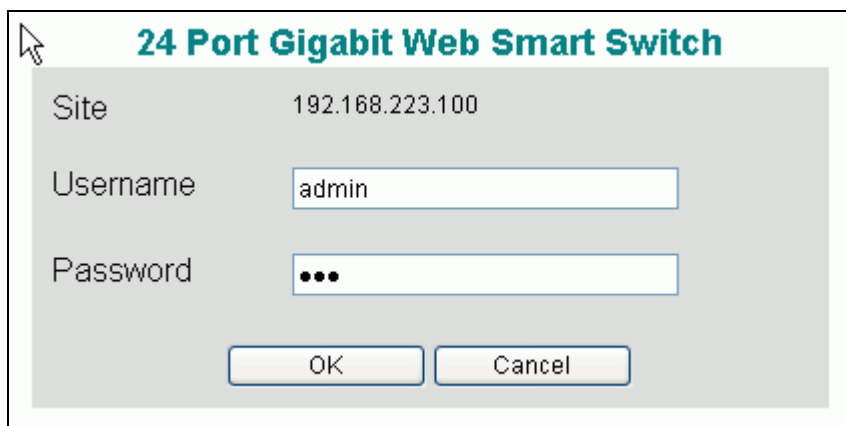
Plug-in the power source to power-up the switch. After the switch is powered-on and in ready state (both the LED indicators POWER and DIAG are lighting), you can use any in-band Ethernet port to remotely manage this system through the web browser, or use the RS-232 cable to plug-in the console port (on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

- IP address: **192.168.223.100**
- Network mask: **255.255.255.0**
- Default gateway: **192.168.223.254**

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 for your need. If you encounter the access problem by using wrong IP addresses, just locally connect to console port to get the correct IP address in this system.

Now you can use the browser to start to launch to the user-friendly web-managed interface for this switch.

The login dialog box (shown as below) will show up first 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: **123**

This username/password can be modified for your need.

1.2 Configuration Functions for the Switch

After the login is successfully validated, the switch's home page – **System** page will show up. The left part on the page provides the *function menus* (shown as below) to activate to the individual configuration page.

Switch
Port Status
Port Statistics
VLAN
Trunk
Mirror
QOS
Rate & Storm Control
System
System Setup
User Management
Reboot System
Reset System
Logout

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

Switch functions contain:

- **Port Status** – to show port link status and configure port parameters
- **Port Statistics** – to show packet statistic results passed through each port
- **VLAN** – to configure port-based or 802.1Q (tag-based) VLAN
- **Trunk** – to build up the trunk function
- **Mirror** – to setup the port mirroring function
- **QOS** – to configure the Quality of Service function
- **Rate / Storm Control** – to limit the traffic rate and suppress the broadcast storm

System functions contain:

- **System Setup** – to configure the required system information (such as IP address, etc.)
- **User Management** – to maintain the login information to access to the switch
- **Backup / Restore*** – to backup/restore configurations to/from TFTP server
- **Reboot / Reset** – to reboot the switch or reset configuration to default values
- **Logout** – to log off the system

* Some models don't support this function

2 Configurations

2.1 Port Status

This page provides the current link status for all ports. You can select the **Port Status** menu to activate this page and to **refresh** the current port status.

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

This page provides the following information:

- **Port** – to specify a port on the switch
- **Link Status** – to show the port link status: **Up / Down**
- **Speed / Duplex** – to show the current link speed (**1G / 100M / 10M bps**) and duplex mode (**Full / Half**) while the port is linkup.

NOTE: Only the full duplex mode is supported while the link speed is 1Gbps.

- **Flow Control** – to show the flow control capability is **Enable / Disable** for this port.

The status for the two columns: **Speed/Duplex** and **Flow Control** won't show up while the port link is down. (The dash sign ('--') indicates the status is unavailable to display.) Click the **Refresh** button to manually get the most current link status for all ports.

If any *trunk* group is setup, a trunk group can be regarded as one logical port (e.g. Trk1 in above figure is grouped by Port9 & Port10) which will show up just like the others. All the trunk member ports won't be displayed. Section 2.5 (Trunk) describes the port trunking in detail.

2.2 Port Configuration

If you need to do the port configuration, just select one desired port by clicking the **Port** number in the **Port Status** page. Then the **Port Configuration** page (shown as below) for the selected port (e.g. port3) will be opened:

Port	Admin	Auto Negotiation	Speed Duplex	Flow Control	Default Priority	Security	Jumbo Frame
14	Enable	Disable	100Mbps Full	Disable	0	Disable	Disable

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 unblock/block the traffic for the port
 - **Disable** – to block all traffic for the port
 - **Enable** – to enable the bi-directional traffic for the port
- **Auto Negotiation** – to enable/disable the capability of auto negotiation for setting up the link
 - **Disable** – to disable for the port (force mode)
 - **Enable** – to enable for the port (auto mode)
- **Speed / Duplex** – to setup the link speed and duplex mode in force mode

The options for this function can be selected only when the **Auto-Negotiation is Disabled (in force mode) for copper ports (Port17 to Port24)**. At this moment, 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

The following figure shows the options of Speed / Duplex while Disable is selected in auto-negotiation field for copper port (e.g. Port17).

Port	Admin	Auto Negotiation	Speed Duplex	Flow Control	Default Priority	Security	Jumbo Frame
17	Enable	Disable	10Mbps Half	Enable	0	Disable	Disable

NOTE: Only full duplex mode is supported in 1Gbps link speed. For copper medium, this system doesn't support 1Gbps link speed in force mode; for fiber medium, only the 1Gbps link speed is supported, but either auto or force mode can be set to build up the link.

- **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 referenced in QOS function
 - **0 – 7** – to set the priority level (range = 0 ~ 7)
- **Security** – to enable/disable port security function

If the 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 frame is dropped. Otherwise, the address table entry is updated with the new port's information and the entry is updated.

 - **Disable** -- to disable port security
 - **Enable** – to enable port security
- **Jumbo Frame** – to enable/disable jumbo frame 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 back to the **Port Status** Page. Click the **Cancel** button to back to **Port Status** page.

2.3 Port Statistics

Port Statistics function will let you to see the TX/RX packets through each port.

Port Statistics					
Port	Tx	Rx	Port	Tx	Rx
01	0	0	13	515	0
02	0	0	14	515	0
03	0	0	15	515	0
04	0	0	16	515	0
05	0	0	17	0	0
06	0	0	18	0	0
07	0	0	19	0	0
08	0	0	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	429	985

All numbers shown are numbers of packets

button will clear all packet counters to 0. button will get port statistics again. You can check each port statistics more precisely. Just click the [Port](#) number to see the detailed information.

Port Statistics			
Port	24		
TX Packets			
Unicast	459	Multicast	0
Broadcast	0	Single Collision	0
Multi Collisions	0		
64 Bytes	258	65-127 Bytes	23
128-255 Bytes	1	256-511 Bytes	22
512-1023 Bytes	54	1024-1522 Bytes	101
RX Packets			
Unicast	519	Multicast	0
Broadcast	517	FCSErrors	0
AlignErrors	0	SymbolErrors	0
Fragments	0	OverSize	0
64 Bytes	736	65-127 Bytes	232
128-255 Bytes	232	256-511 Bytes	41
512-1023 Bytes	5	1024-1522 Bytes	1

The table shown as below is description for each column.

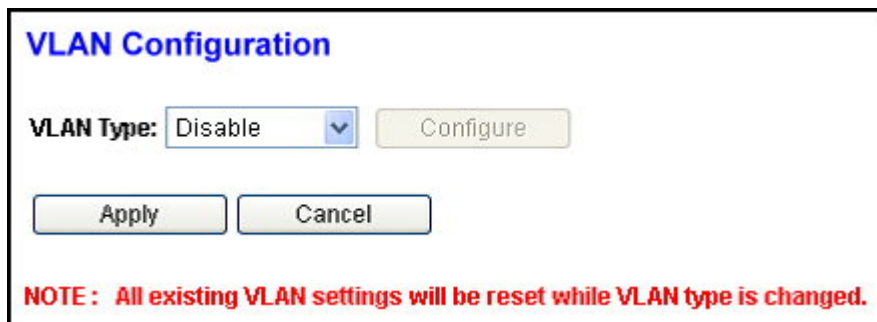
UnicastPkts	Number of good unicast packets transmitted.
MulticastPkts	Number of good multicast packets transmitted.
BroadcastPkts	Number of good broadcast packets transmitted.
Single Collision	Number of packets in which the transmission experienced one collision
Multi Collisions	Number of packets in 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

2.4 VLAN

VLAN function provides the capability of creating virtual LAN groups for network group management, security and performance considerations. The main purpose of setting VLAN is to limit the traffic only flow within the port members which belong to the same VLAN group. The traffic including broadcast packets in a VLAN group will be isolated from different groups.

This system supports both port-based VLAN and IEEE 802.1Q (tag-based) VLAN. Port-based VLAN provides the VLAN function only for local switch. Tag-based VLAN is capable of working with other switches to achieve the VLAN function by tagged traffic.

Just click the **VLAN** menu item, the **VLAN Configuration** page is displayed shown as blow. This page provides the current VLAN type and the place to do advanced VLAN configuration if the **Configure** button is available.



VLAN Configuration

VLAN Type:

NOTE: All existing VLAN settings will be reset while VLAN type is changed.

Three options of VLAN type are provided:

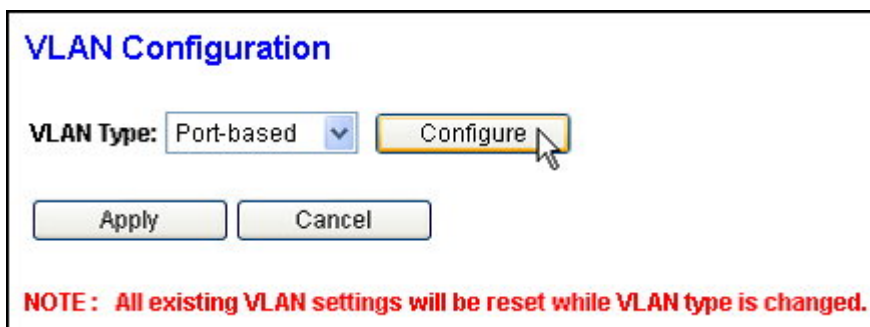
- **Disable** – to disable VLAN function. All existing VLAN groups will be removed. PVID for all ports will be reset.
- **Port-based VLAN** – to enable port-based VLAN. All existing tag-based VLAN group will be removed. PVID for all ports will be reset.
- **IEEE 802.1Q VLAN** – to enable tag-based VLAN. All existing port-based VLAN groups will be removed.

The VLAN type can be either port-based or tag-based. That is, **both the port-based VLAN and 802.1Q VLAN can't co-exist at the same time.**

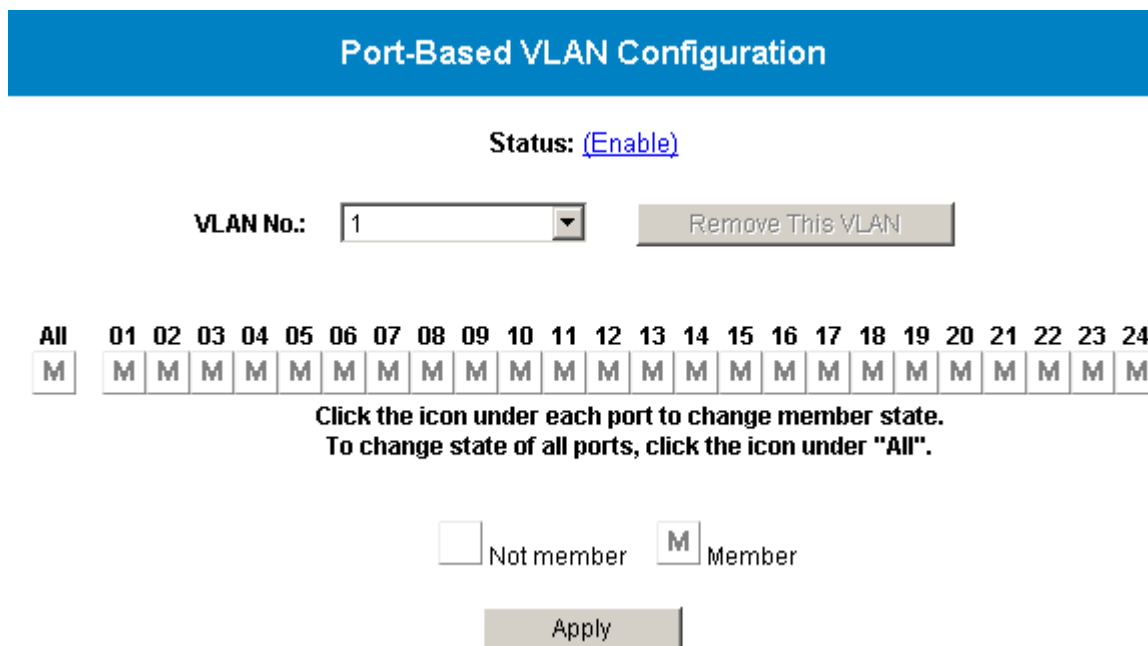
The **Configure** button will be enabled to click for advanced VLAN configuration only when the current VLAN type is activated to port-based or tag-based VLAN; otherwise, this button will be disabled.

2.4.1 Port-based VLAN Configuration

The port-based VLAN divides the ports into different Virtual LAN domain groups. After setting the port-based VLAN, the different VLAN groups can't access each other. Like the different real LAN can't access each other. Before starting this configuration, it is required to set the VLAN type to port-based VLAN first. Then click the **Configure** button after the port-based VLAN type is activated (shown as figure below).



VLAN initial setting page is shown as below:



You can add, delete, and modify the port-based VLAN for your need. Currently this system supports up to 32 port-based VLAN groups for manual entry. The next pages will be described in detail how to configure the port-based VLAN.

NOTE: The default port-based VLAN group (No.1) always exists and can't be removed. This group needs to be manually maintained to make this function work properly. Initially, the default group contains members for all ports. If a new group is created (e.g. port 1, 2, 3 as members of group No.2) and this group wants to be isolated from the other ports, port 1, 2 and 3 in default group need to be manually set to "Not member" to make port-based VLAN group No.2 available. Of course, manually set responsive port(s) to "Member" in default group as your need if a group wants to be removed.

2.4.1.1 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 Configuration** page shown as below:

Port-Based VLAN Configuration

Status: [\(Enable\)](#)

VLAN No.: 1 Remove This VLAN

Create New VLAN

1

All	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M

Click the icon under each port to change member state.
To change state of all ports, click the icon under "All".

Not member Member

Apply

After selecting the *Create New VLAN* in the dropdown, the page will be changed like this:

Create New Port-Based VLAN

VLAN No.: 2

All	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
M																								

Click the icon under each port to change member state.
To change state of all ports, click the icon under "All".

Not member Member

Create Cancel

In the above page, **VLAN NO** will auto setup. Users just need to set VLAN Port Members. After setting complete, press the **Create** button will come back to the VLAN initial setting page. The **Cancel** button can let user to give up the settings and back to the VLAN initial setting page.

Below is the example page when user sets Port1-12 to the VLAN Group2 after clicking the **Create** button. Now there is a VLAN group No.2 created with the member Port1-12.

Port-Based VLAN Configuration

Status: [\(Enable\)](#)

VLAN No.:

All	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
M																								

**Click the icon under each port to change member state.
To change state of all ports, click the icon under "All".**

Not member Member

While the group No.2 is created, all the members in group No.1 are removed to availably operate the VLAN function.

2.4.1.2 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.

Port-Based VLAN Configuration

Status: [\(Enable\)](#)

VLAN No.:

All	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
<input checked="" type="checkbox"/> M	<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"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Click the icon under each port to change member state.
To change state of all ports, click the icon under "All".

Not member M Member

After pressing the **Remove This VLAN** button and this action is confirmed, the result is in the following figure.

Port-Based VLAN Configuration

Status: [\(Enable\)](#)

VLAN No.:

All	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
<input checked="" type="checkbox"/> M	<input checked="" type="checkbox"/> M	<input checked="" type="checkbox"/> M	<input checked="" type="checkbox"/> M	<input checked="" type="checkbox"/> M	<input checked="" type="checkbox"/> M	<input checked="" type="checkbox"/> M	<input checked="" type="checkbox"/> M	<input checked="" type="checkbox"/> M	<input checked="" type="checkbox"/> M	<input checked="" type="checkbox"/> M	<input checked="" type="checkbox"/> M	<input checked="" type="checkbox"/> M	<input checked="" type="checkbox"/> M	<input checked="" type="checkbox"/> M	<input checked="" type="checkbox"/> M	<input checked="" type="checkbox"/> M	<input checked="" type="checkbox"/> M	<input checked="" type="checkbox"/> M	<input checked="" type="checkbox"/> M	<input checked="" type="checkbox"/> M	<input checked="" type="checkbox"/> M	<input checked="" type="checkbox"/> M	<input checked="" type="checkbox"/> M	

Click the icon under each port to change member state.
To change state of all ports, click the icon under "All".

Not member M Member

Now all ports are set to the members in VLAN group No.1 to retain the system back to the normal operation.

2.4.1.3 Edit Port-Based VLAN Groups

To edit the current port-based VLAN group, first select the existing group (e.g. group No.3 with members from Port9 to Port12) you want to edit (to add Port7 & Port8 as members) and click the **Apply** button to activate the setting.

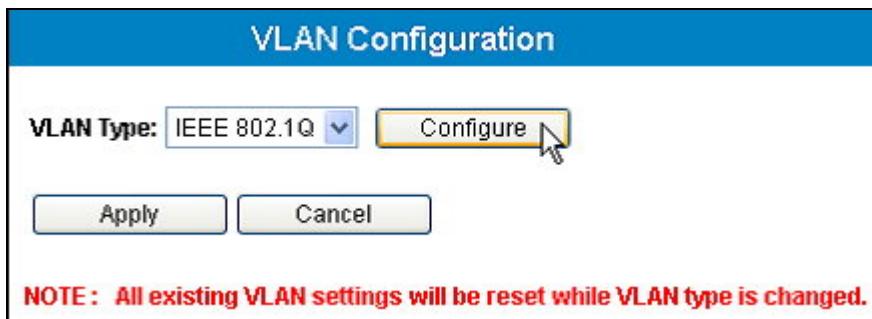
The screenshot shows the 'Port-Based VLAN Configuration' interface. At the top, the status is '(Enable)'. Below this, the 'VLAN No.' is set to 3, with a 'Remove This VLAN' button to its right. A dropdown menu is open, showing options: 'Create New VLAN', '1', '2', and '3'. Below the dropdown is a row of 24 port status icons, labeled 'All' and '01' through '24'. The 'All' icon contains an 'M' (Member), and ports 03 through 12 also contain an 'M'. Below the icons, there is a legend: an empty box for 'Not member' and a box with 'M' for 'Member'. An 'Apply' button is at the bottom.

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

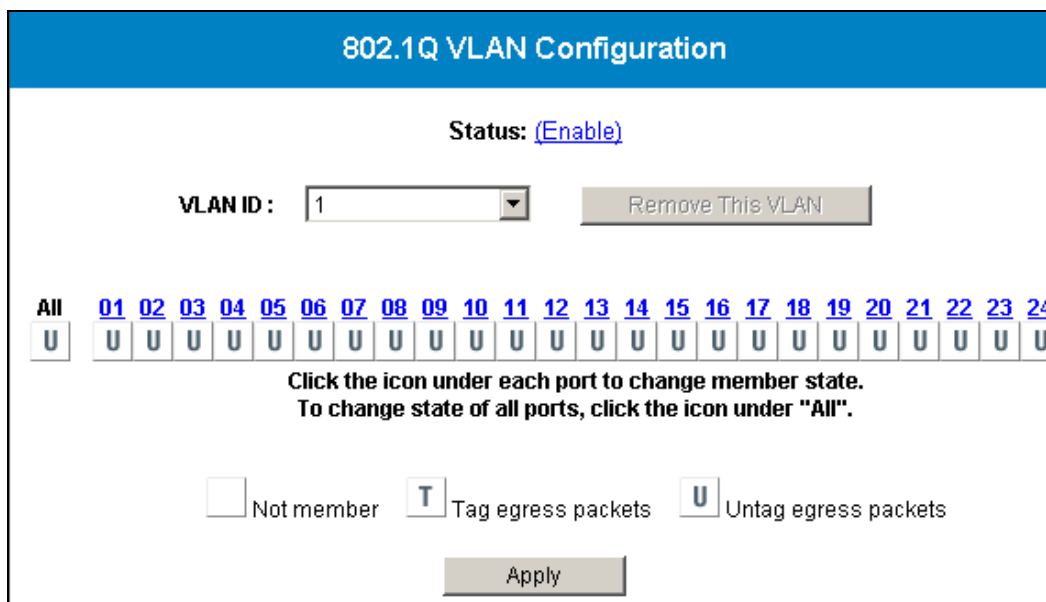
This screenshot shows the 'Port-Based VLAN Configuration' interface after configuration. The 'VLAN No.' is still 3, and the 'Remove This VLAN' button is present. The port status icons now show 'M' (Member) for ports 03 through 12, and an empty box for 'Not member' for all other ports (01, 02, 04-06, 07-08, 09-11, 13-24). The 'All' icon also shows an 'M'. The legend and 'Apply' button remain the same.

2.4.2 802.1Q VLAN Configuration

IEEE 802.1Q (tag-based) VLAN can add or strip 802.1Q tag depending on the requirements of the individual transmitting port. It is required to click the **VLAN** menu item to set the VLAN type to IEEE 802.1Q VLAN in **VLAN Configuration** page before doing the advanced configuration.



Click the **Configure** button to open the configuration page after the IEEE 802.1Q VLAN type is activated (shown as figures below).



The group with VLAN ID 1 stands for the default 802.1Q VLAN group. This default group can't be deleted. However, the port members in this group can be modified. In default setting, all 24 ports are the untagged members of this group with port VID value 1. Currently this system supports **up to 32** tag-based VLAN groups for manual entry.

NOTE: Please be aware that this system currently has a constraint for web configuration in 802.1Q VLAN environment. This switch doesn't allow web configuration from multiple VLAN groups. That is, web configuration can be done through **ONLY ONE** specified VLAN group (default VLAN group with VID=1 in default). Specify one VLAN group (e.g. VID=2) for allowing to web-manage the switch and use console to set the PVID value (e.g. PVID=2) for admin port (Port25), then web management can be achieved only through VLAN group members with VID=2.

2.4.2.1 802.1Q VLAN Port Configuration

This page is to configure Port VID (PVID) for Untag port members and some ingress rules per port basis to manipulate the packets related to the tag-based VLAN. Click the **Port** number (e.g. Port10) to enter the **802.1Q VLAN Port Configuration** page (shown as below).

802.1Q VLAN Configuration

Status: [\(Enable\)](#)

VLAN ID:

All **01** **02** **03** **04** **05** **06** **07** **08** **09** **10** **11** **12** **13** **14** **15** **16** **17** **18** **19** **20** **21** **22** **23** **24**

U U

Click the icon under each port to change member state.
To change state of all ports, click the icon under "All".

Not member Tag egress packets Untag egress packets

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

802.1Q VLAN Port Setting

Port	PVID(1-4094)	Untag Frame	Tag Frame
10	<input type="text" value="1"/>	<input type="text" value="Accept"/>	<input type="text" value="Accept"/>

PVID must be one of the existing VLAN Group ID.

You can set the individual port for configuring the 802.1Q settings in the following fields:

- **PVID** – enter a valid VLAN ID (1-4094), and PVID must be one of the existing VLAN group ID. This parameter is useful for Untag port member.
- **UnTag Frame** – Accept or drop incoming frames without VLAN tag.
- **Tag Frame** – Accept or drop incoming frames with VLAN tag.

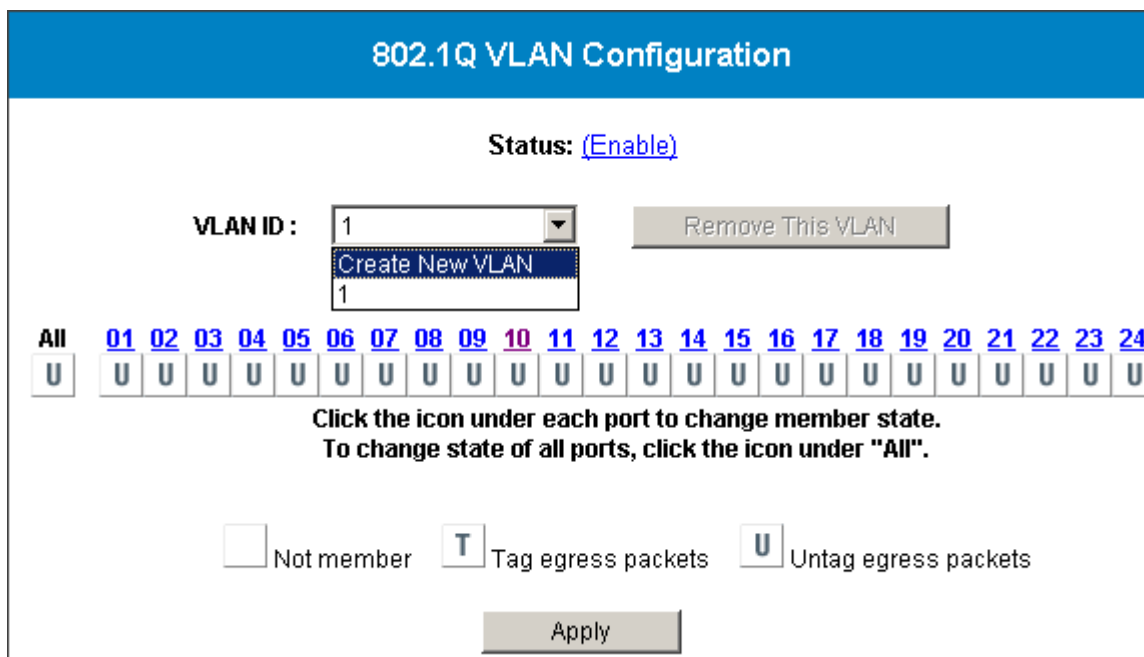
Finally, there are 2 buttons to select:

Apply: To submit the port configuration settings to the switch.

Back: To back to the 802.1q main setting page.

2.4.2.2 802.1Q VLAN Configuration

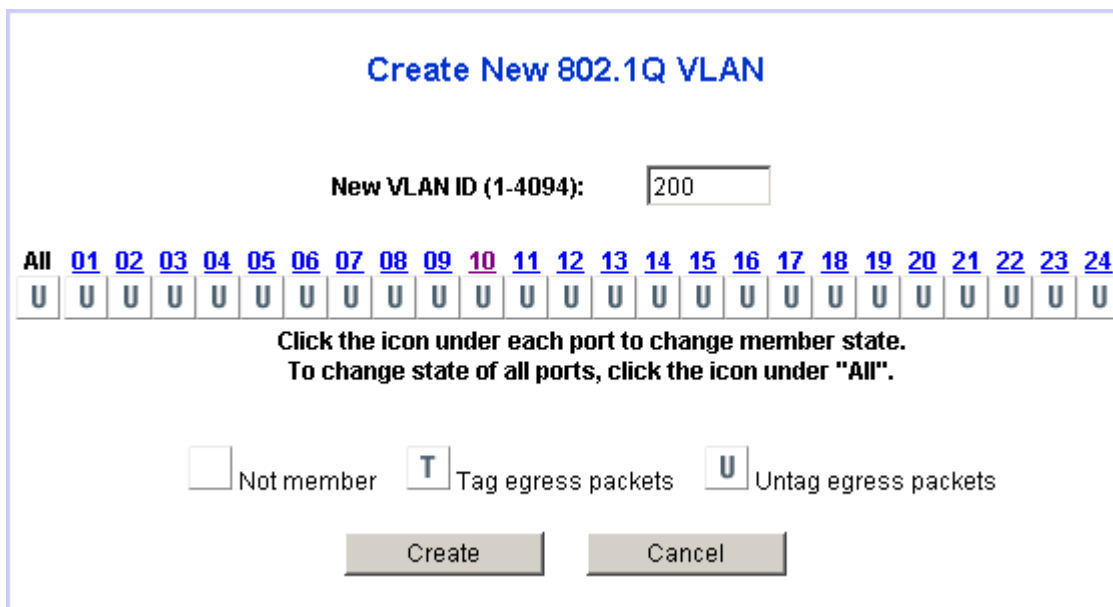
The following figures are the pages to add/delete/edit the 802.1Q VLAN entry. Each VLAN entry has 2 parameters, **VLAN ID (VID)** and **Port Member** to be assigned.



The screenshot shows the '802.1Q VLAN Configuration' page. At the top, the status is '(Enable)'. Below this, the 'VLAN ID' is set to '1' in a dropdown menu, with a 'Remove This VLAN' button to its right. A 'Create New VLAN' button is also visible. Below the dropdown, a list of ports from 01 to 24 is shown, each with a 'U' icon indicating it is currently untagged. The 'All' icon also shows a 'U'. Below the ports, there is a legend: an empty box for 'Not member', a box with 'T' for 'Tag egress packets', and a box with 'U' for 'Untag egress packets'. An 'Apply' button is at the bottom.

After selecting the **Create New VLAN**, the figure shown as below will show up:

- **VID** – a unique VLAN ID, range is from 2 to 4094 (ID No.1 is reserved for default group)
- **Port Member** – Click the images just below the port number which wants to be grouped. Select one of three member options (**Not/Tag/ Untag**) by clicking the image.



The screenshot shows the 'Create New 802.1Q VLAN' page. The 'New VLAN ID (1-4094):' field contains the value '200'. Below this, a list of ports from 01 to 24 is shown, each with a 'U' icon. The 'All' icon also shows a 'U'. Below the ports, there is a legend: an empty box for 'Not member', a box with 'T' for 'Tag egress packets', and a box with 'U' for 'Untag egress packets'. At the bottom, there are 'Create' and 'Cancel' buttons.

Input the **VID** and check the member row to select the ports which belong to this VLAN group. After these settings are completed, click the **Create** button to submit these data to the switch. Click the **Cancel** button to abort the actions and back to the previous page.

If you would like to show or edit the port members of a specified 802.1Q VLAN group, use the **VLAN ID** dropdown to specify a VID (e.g. VID 300). Then the current settings for this group will be displayed. At this moment, edit the port members for the current group (e.g. VID 300): Port17 and Port18 are new joined to the group with Tag member option.

The image shows a web interface for configuring a VLAN. At the top, there is a blue header with the text "802.1Q VLAN Configuration". Below the header, the status is shown as "Status: (Enable)". The "VLAN ID" is set to "300" in a dropdown menu, and there is a "Remove This VLAN" button. Below this, there is a row of 25 icons representing ports. The first icon is labeled "All" and contains a "U". The next 15 icons are labeled "01" through "15" and are empty. The next two icons are labeled "17" and "18" and contain a "T". The next three icons are labeled "19", "20", and "21" and contain a "U". The last three icons are labeled "22", "23", and "24" and contain a "T". Below the icons, there is a text instruction: "Click the icon under each port to change member state. To change state of all ports, click the icon under 'All'". Below the instruction, there are three legend items: an empty box labeled "Not member", a box with "T" labeled "Tag egress packets", and a box with "U" labeled "Untag egress packets". At the bottom, there is an "Apply" button.

Finally, click the **Apply** button to activate and save the modifications.

2.5 Trunk

The Ether-2416W web smart switch supports MAC-based trunking, which 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 Ether-2416W web smart switch allows four trunk groups that can accommodate up to eight trunk members. 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. The traffic patterns can be more balanced between the ports within a trunk group by dynamically performing the MAC-based algorithm. It is supported only on point-to-point links with MACs operating full duplex mode. All links in the same trunk group must operate at the same rate.

The Ether-2416W web smart switch provides dynamic failover when trunk is enabled. If a port of a trunk group fails, the other ports of the trunk group assume traffics designated automatically for the trunk. The links within the trunk group should have an equal amount of traffics. To achieve this, this switch performs load balancing based on a distribution algorithm.

The following parameters are required to be set:

- **Distribution Criterion** – choose distribution algorithm which switch performs load balancing based on:
 - **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.

Trunk Configuration

Distribution Criterion: SA (Source MAC Address) ▼

	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Trunk 1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Trunk 2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Trunk 3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Trunk 4	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Not Trunking	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>

Maximal number of ports per trunk: 8

Because a trunk port can be aggregated by the member ports with the same configurations in most functions for each other, **there are some rules to limit the configurations of the trunking**. The following section will list the related rules for this function.

2.5.1 Trunking Rules

The following rules will limit the configurations 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 Mirror function.
- If any fiber port (from Port1 to Port16) and copper port (from Port17 to Port24) want to be grouped together, the **auto negotiation** option must be **enabled** for all member ports. And only the **1Gbps full duplex link mode** is available to setup the trunk.
- 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. Check the other page (Port Status) with port list, Trk1 port will be added after all normal ports and the member ports of this trunk group will disappeared.

Trunk Configuration

Distribution Criterion: SA (Source MAC Address) ▼

	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Trunk 1	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Trunk 2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Trunk 3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Trunk 4	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Not Trunking	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>

Maximal number of ports per trunk: 8

Apply

Port Status

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

Refresh

- 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 retained to the last settings while they were be member ports of trunk group. The following 3 figures show the port configurations (e.g. Port6) will be retained before and after the trunk (e.g. Trk1) is disabled.

PORT Configuration

Port	Admin	Media -- Auto Negotiation	Speed Duplex	Flow Control	Default Priority	Security	Jumbo Frame
Trk1	Enable	Copper--Enable, Fiber--Enable	10Mbps Half	Enable	6	Enable	Enable

Trunk Configuration

Distribution Criterion: SA (Source MAC Address)

	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Trunk 1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Trunk 2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Trunk 3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Trunk 4	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Not Trunking	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>

Maximal number of ports per trunk: 8

PORT Configuration

Port	Admin	Auto Negotiation	Speed Duplex	Flow Control	Default Priority	Security	Jumbo Frame
06	Enable	Enable	10Mbps Half	Enable	6	Enable	Enable

2.5.2 Get/Refresh the Latest Trunk Settings

Click the **Trunk** menu on the web page, the latest trunk settings on the switch will be displayed. This is also the page to configure the trunk function.

Trunk Configuration

Distribution Criterion: SA (Source MAC Address) ▼

	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Trunk 1	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Trunk 2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Trunk 3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Trunk 4	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Not Trunking	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>

Maximal number of ports per trunk: 8

Apply

2.5.3 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.

Trunk Configuration

Distribution Criterion: SA (Source MAC Address) ▼

	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Trunk 1	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Trunk 2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Trunk 3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Trunk 4	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Not Trunking	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>

Maximal number of ports per trunk: 8

Apply

2.5.4 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.

Trunk Configuration

Distribution Criterion: DA (Destination MAC Address) ▼

	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Trunk 1	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Trunk 2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Trunk 3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Trunk 4	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Not Trunking	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>

Maximal number of ports per trunk: 8

Apply

2.5.5 Disable Trunk

- **Step 1:** Click the **Not Trunking**.
- **Step 2:** Click the **Apply** button to disable trunk.

Trunk Configuration

Distribution Criterion: DA (Destination MAC Address) ▼

	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Trunk 1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Trunk 2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Trunk 3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Trunk 4	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Not Trunking	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>

Maximal number of ports per trunk: 8

Apply

2.6 Port Mirroring

Port mirroring allows ingress and/or egress traffics to be monitored by a single port. The single port is mirror capture port. The Ether-2416W web smart switch can be configured to mirror the ingress and/or egress traffics of another port. Port monitoring is independent of L2 switching. Networking manager can monitor all traffics sent/received through the Ether-2416W web smart switch.

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

Mirror Configuration

Setting: Disable Mirror ▼

	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Monitored Port	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Capture Port	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>

Apply

2.6.1 Get/Refresh the Latest Mirror Settings

Click the **Mirror** menu on the web page, the latest mirror settings on the switch will be displayed. This is also the page to configure port mirroring function.

Mirror Configuration

Setting: Mirror All Frames ▼

	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Monitored Port	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Capture Port	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Apply

The following parameters are required to 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 to be a monitored port to investigate bi-directional traffic.
 - **Mirror Incoming Frames** – to set the corresponding port to be a monitored port to investigate only ingress (receiving, Rx) traffic.
 - **Mirror Outgoing Frames** – to set the corresponding port to be a monitored port to investigate only egress (forwarding, Tx) traffic.
- **Monitored Port** – The port which is monitored.
- **Capture Port** – All traffic mirrored from monitored port are received on capture port.

2.6.2 Enable Mirror

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

Mirror Configuration

Setting: Mirror All Frames

	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Monitored Port	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Capture Port	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Apply

2.6.3 Modify Mirror Settings

- **Step 1:** Change Mirror option to be **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 mirroring settings.

Mirror Configuration

Setting: Mirror Outgoing Frames ▼

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Monitored Port	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Capture Port	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Apply

2.6.4 Disable Mirror

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

Mirror Configuration

Setting: Disable Mirror ▼

	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Monitored Port	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Capture Port	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>

Apply

2.7 QOS (Quality of Service)

The Ether-2416W web smart switch provides up to four internal transmit queues per port to support four different traffic priorities. The high-priority traffic experiences less delay in the switch than that of lower priority traffic under congested conditions. For sensitive traffic, to minimize latency of delay can be important. The Ether-2416W web smart switch provides three types of QOS. It can assign the packet to one of four transmit queues according to 802.1P QOS. If the incoming packet is untagged, the Ether-2416W web smart switch uses the priority field in the per-port Default Priority in Port Config page to assign the packet to one of four transmit queues. If the incoming packet is tagged or priority tagged, the Ether-2416W web smart switch uses the priority field in the incoming packet tag to assign the packet to one of four transmit queues.

The Ether-2416W web smart switch also provides to remap function. This switch always inserts the packet into Tx Queue by priority ID. User can assign the map between priority and queues. This switch handles the packets transmit by the Tx Queue Weight Setting when Weighted Round-Robin algorithm is selected.

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

QOS Configuration

Scheduling Method: Weighted Round Robin ▾

Priority	(Low)	0	1	2	3	4	5	6	(High)	7	Weight
Queue 0 (Low)	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input style="width: 30px;" type="text" value="1"/>
Queue 1	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input style="width: 30px;" type="text" value="4"/>
Queue 2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input style="width: 30px;" type="text" value="10"/>
Queue 3 (High)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input style="width: 30px;" type="text" value="15"/>

Weights: 1-15

Apply

2.7.1 Get/Refresh the Latest QOS Settings

Click the **QOS** menu on the web page, the latest QOS settings on the switch will be displayed. This is also the page to configure QOS.

QOS Configuration

Scheduling Method: Weighted Round Robin ▾

Priority	(Low)	0	1	2	3	4	5	6	(High)	7	Weight
Queue 0 (Low)	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input style="width: 30px;" type="text" value="1"/>
Queue 1	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input style="width: 30px;" type="text" value="4"/>
Queue 2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input style="width: 30px;" type="text" value="10"/>
Queue 3 (High)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input style="width: 30px;" type="text" value="15"/>

Weights: 1-15

Apply

The following parameters are provided to be set:

- **Scheduling Method**
 - **Strict Priority** – to set this switch to transmit packets with Strict Priority algorithm
 - **Weighted Round Robin** – to set this switch to transmit packets with 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 higher queue should not less than lower queue.

2.7.2 Enable QOS

- **Step 1:** Choose the **Scheduling Method** (ex: Weighted Round Robin).
- **Step 2:** Set Priority/Queue map (ex: Priority1, 2, 3 and 4 belong to Queue0, Priority4 and 5 belong to Queue1, Priority6 belong to Queue2, Priority7 belong to Queue4).
- **Step 3:** If 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 QOS settings.

QOS Configuration

Scheduling Method: Weighted Round Robin ▼

Priority	(Low)	0	1	2	3	4	5	6	(High)	7	Weight
Queue 0 (Low)	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input style="width: 40px;" type="text" value="1"/>
Queue 1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input style="width: 40px;" type="text" value="4"/>
Queue 2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input style="width: 40px;" type="text" value="10"/>
Queue 3 (High)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input style="width: 40px;" type="text" value="15"/>

Weights: 1-15

Apply

2.7.3 Modify QOS Settings

- **Step 1:** Change the **Scheduling Method** to be Strict Priority.
- **Step 2:** Change the Priority/Queue map (ex: Priority0 belong 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 QOS settings.

QOS Configuration

Scheduling Method: Strict Priority ▼

Priority	(Low) 0	1	2	3	4	5	6	(High) 7	Weight
Queue 0 (Low)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	1
Queue 1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	4
Queue 2	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	10
Queue 3 (High)	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	15

Weights: 1-15

Apply

2.8 Rate and Storm Control

To fulfill more efficient system performance, Ether-2416W web smart switch provides rate and storm control to limit the per-port traffic rate and to globally suppress the storm from unknown or broadcast frames received to the system.

2.8.1 Rate Control

This system 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 packet drops or flow control.

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

Rate and Storm Control

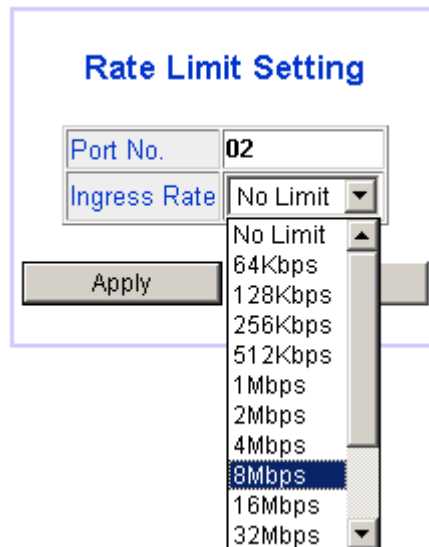
Rate Control

Port	Ingress Rate	Port	Ingress Rate
01	No Limit	12	No Limit
02	No Limit	13	No Limit
03	No Limit	14	No Limit
02	No Limit	13	No Limit
03	No Limit	14	No Limit
04	No Limit	15	No Limit
05	No Limit	16	No Limit
06	No Limit	17	No Limit
07	No Limit	19	No Limit
08	No Limit	23	No Limit
09	No Limit	Trk3	No Limit

Storm Control

Storm Control	Disabled
---------------	--------------------------

Select port number to setup the per-port rate control value. In the page of ingress rate limit shown as following figure (e.g. for Port2), select one (e.g. 8Mbps) of 14 different rates to limit the rate or select “No Limit” to un-limit the rate for this port.



After clicking the Apply button to activate the setting, the previous page will be back and shown up with the latest setting.

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	

2.8.2 Storm Control

In the **Rate Limit and Storm Control** page, the hyperlink (e.g. [Disabled](#)) on the row with **Storm Control** field shows the current setting of this function. This function will globally affect to all ports in the system. Just click this hyperlink to configure the setting.

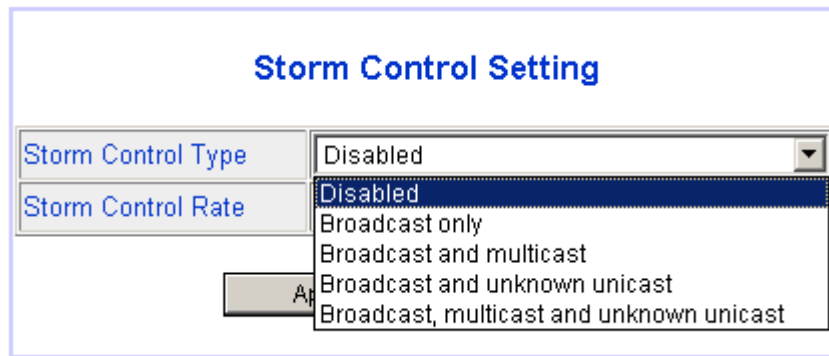
Rate and Storm Control			
Rate Control			
Port	Ingress Rate	Port	Ingress Rate
01	No Limit	12	No Limit
02	8Mbps	13	No Limit
03	No Limit	14	No Limit
04	No Limit	15	No Limit
05	No Limit	16	No Limit
06	No Limit	17	No Limit
07	No Limit	19	No Limit
08	No Limit	23	No Limit
09	No Limit	Trk3	No Limit

Storm Control	
Storm Control	Disabled

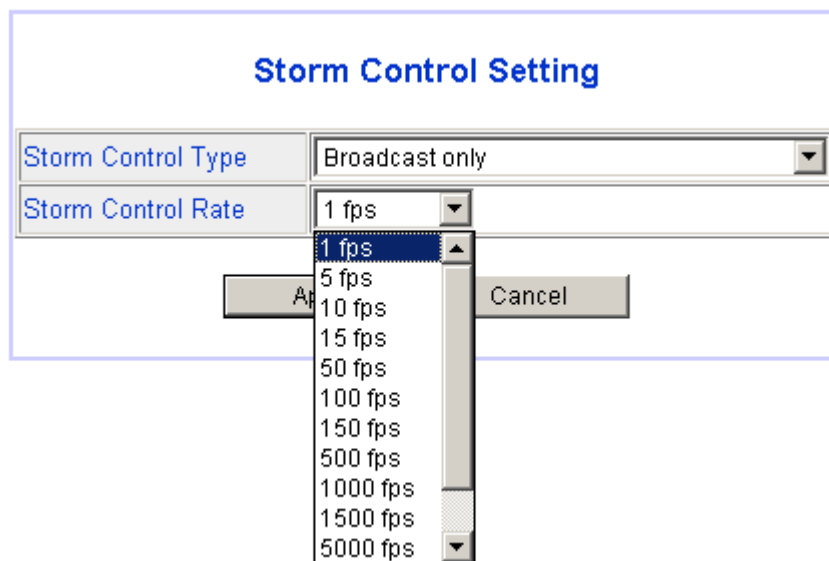
In the **Storm Control** page, there are 2 fields to configure this function:

- **Storm Control Type** – 5 options to provide 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 1 fps (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 type of broadcast only and limited rate of 15fps.

Rate and Storm Control

Rate Control

Port	Ingress Rate	Port	Ingress Rate
01	No Limit	12	No Limit
02	8Mbps	13	No Limit
03	No Limit	14	No Limit
04	No Limit	15	No Limit
05	No Limit	16	No Limit
06	No Limit	17	No Limit
07	No Limit	19	No Limit
08	No Limit	23	No Limit
09	No Limit	Trk3	No Limit

Storm Control

Storm Control	Broadcast only, 15 fps
---------------	--

2.9 System Setup

System Setup page provides the management information to the switch. This page shown as below can be activated by clicking the **System Setup** menu under the **System** section.

System Setup	
Model Name	Ether-GSH2416W
Chip Version	BCM5345-A0
Firmware Version	1.2.0 Upgrade
DHCP Client	Disable
IP Address	<input type="text" value="192.168.223.100"/>
Subnet mask	<input type="text" value="255.255.255.0"/>
Gateway	<input type="text" value="192.168.223.254"/>
MAC address	00-4F-58-00-00-30
ARL Aging	300 seconds

The following parameters can be configured / displayed:

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

2.9.1 Firmware Update

The Ether-2416W web smart switch provides the capability of firmware update for new features, customized requests and system fault recovery. This page shown as below can be activated by clicking the **Update** link in System Setup page.

System Setup	
Model Name	Ether-GSH2416W
Chip Version	BCM5345-A0
Firmware Version	1.2.0 Upgrade
DHCP Client	Disable
IP Address	<input type="text" value="192.168.1.200"/>
Subnet mask	<input type="text" value="255.255.255.0"/>
Gateway	<input type="text" value="192.168.1.254"/>
MAC address	00-4F-58-00-00-30
ARL Aging	300 seconds

This system supports both **BOOTP/TFTP** and **pure 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 pure TFTP, the traditional way, is selected. Using the BOOTP/TFTP is much easier to do the firmware updating because no parameters needs to be input if the BOOTP/TFTP server is correctly setup.

2.9.1.1 Firmware Update Via TFTP

Firmware Update	
Using TFTP	
Current Firmware Version:	1.2.0
TFTP Server IP Address:	211.75.41.
Firmware Filename:	websmart.hex
<input type="button" value="Apply"/>	

Before to do the firmware update, it is required to correctly prepare **TFTP server** and the **firmware file** which will be uploaded to the switch by the TFTP server. (Please refer to the vendor's instruction guide for setting up the TFTP server you would like to use.

While the TFTP server and the firmware file are ready, please enter the TFTP server IP address and firmware filename. Click the button to start the firmware update through the any front port on the switch.

The time for processing the firmware update will approximately take 50 seconds if there is no communication problem between the switch and the TFTP server and the firmware file can be located by TFTP server.

<p>Please wait for more than 2 minutes then try to connect again.</p> <p>If you cannot connect for quite a while (more than 4 minutes) and the 'Cancel' button doesn't work, please perform a system reboot.</p> <p>NOTE: 'Cancel' only works when it's still trying to locate the server or gateway. For example, TFTP process hasn't started transmitting data.</p> <p style="text-align: center;"><input type="button" value="Apply"/></p>
--

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

2.9.1.2 Firmware Update Via BOOTP/TFTP



Apply


NOTE:

When it has started, check console to know how it goes and when it finishes/fails.

Please wait and try to connect to web 2 minutes later.

If you cannot connect for quite a while (more than 3 minutes), please perform system reboot.

Before to do the firmware update, it is required to correctly prepare **BOOTP/TFTP server** and the **firmware file** which will be uploaded to the switch by the TFTP server. (Please refer to the vendor's instruction guide for setting up the TFTP server you would like to use.

While the BOOTP/TFTP server and the firmware file are ready, click the  button to start the firmware update through the any front port on the switch.

The time for processing the firmware update will approximately take 55 seconds if there is no communication problem between the switch and the BOOTP/TFTP server and the firmware file can be located by TFTP server.

2.9.2 DHCP Client

The IP address of the Ether-2416W web smart switch could be statically assigned by manual entry or dynamically assigned by a DHCP server.

2.9.2.1 Assign a fixed IP address

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

System Setup	
Model Name	Ether-GSH2416W
Chip Version	BCM5345-A0
Firmware Version	1.2.0 Upgrade
DHCP Client	Disable
IP Address	<input type="text" value="192.168.1.200"/>
Subnet mask	<input type="text" value="255.255.255.0"/>
Gateway	<input type="text" value="192.168.1.254"/>
MAC address	00-4F-58-00-00-30
ARL Aging	300 seconds

2.9.2.2 Assign a IP address by DHCP server

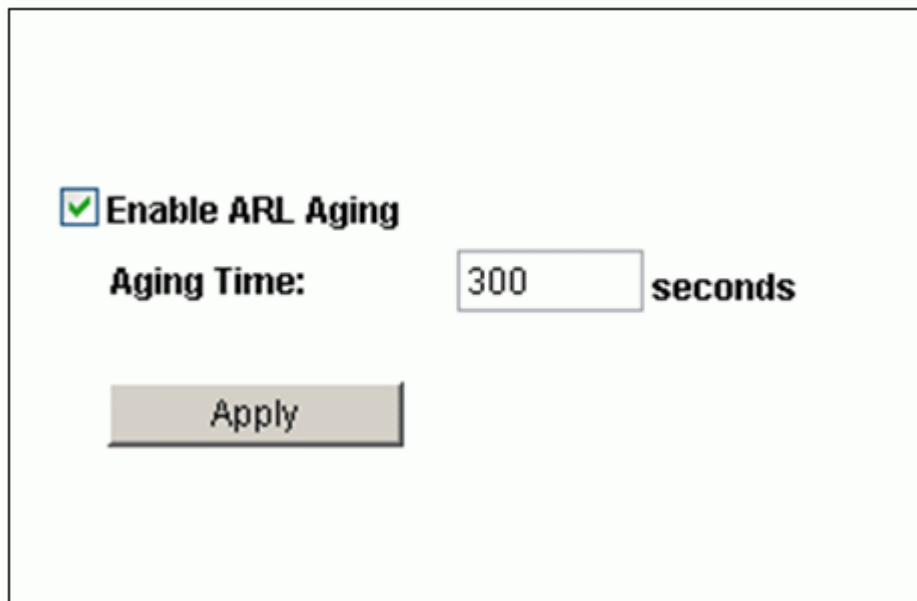
Change DHCP Client to be **Enable**. This system's IP address, subnet mask and gateway address and will be assigned and changed immediately by DHCP server. It may loss the web connection because of the changing of the system's IP. **Use the console port to get the most current network configurations after enabling the DHCP function.**

The **IP address, Subnet mask and Gateway** fields will be disabled (read-only) while the DHCP client is set to Enabled.

2.9.3 ARL Aging

The Ether-2416W web smart switch supports aging timer for MAC address entry 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 address table for 300 seconds. After 300 seconds, this switch will remove this 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.



The screenshot shows a configuration panel for ARL Aging. It features a checked checkbox labeled "Enable ARL Aging". Below this, the text "Aging Time:" is followed by a text input field containing the number "300" and the word "seconds". At the bottom of the panel is a grey button labeled "Apply".

2.10 User Management

User management is to maintain the username and password for login validation to access to the switch. Currently this switch provides only one login account for configuration management. Just click the **User Management** menu to activate the **User Management** page shown as below:

New Username	<input type="text"/>
New Password	<input type="text"/>
Retype Password	<input type="text"/>

- **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)

2.11 Backup / Restore*

Except the username/password, all configurations including the optional IP/netmask/gateway can be backed up to or restored from the TFTP server if server IP and filename are assigned.

Click the **Backup/Restore** menu item to open the **Backup/Restore Configurations via TFTP** page to execute this function shown as below:

Backup / Restore Configuration via TFTP

TFTP Server IP Address:	<input type="text" value="192.168.223."/>
Configuration Filename:	<input type="text" value="config.bin"/>
Data to be Restored:	<input type="checkbox"/> Including IP / Netmask / Gateway

NOTE 1: Please ensure the specified TFTP server is standby and can be connected before the action.
NOTE 2: Username/password won't be restored; IP/netmask/gateway is optional for restoration.
NOTE 3: Only the completely received and verified configuration file will be restored to the system.

The following parameters need to be input for this function:

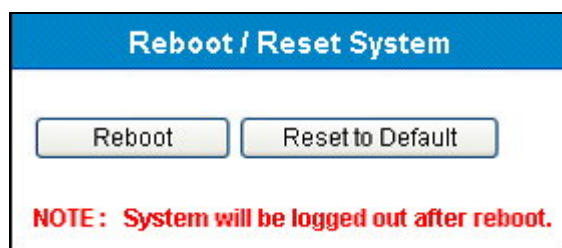
- **TFTP Server IP Address** – the IP address of TFTP server which provides the TFTP service and place for loading or saving configuration files. It is required.
- **Configuration Filename** – the configuration filename assigned to be backed up or restored. It is required.
- **Data to be Restored** – it is optional. If this option is checked, the system's current IP/netmask/gateway will be restored by the values in the assigned configuration file.

Press the **Backup** button to start the backup procedure. Press the **Restore** button to launch the procedure of restoration after confirmation. The status messages of process will be displayed for successful or failed result.

* Some models don't support this function

2.12 Reboot / Reset System

This switch can be rebooted or reset to default configurations through the web page for your request. Go to the **Reboot/Reset** menu item to open the **Reboot/Reset System** page for this action.



Click the **Reboot** button to reboot this system. The configurations will be retained to the same as before reboot procedure.

If this system's configurations need to be reset to default (factory) values, press the **Reset to Default** button to start the procedure. System will be automatically rebooted after configurations are already reset. All configuration changes before the reset procedure will be lost.

The Ether-2416W web smart switch also provides an alternative to do **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 is starting to flash** at any time will activate the **Write Default** procedure.

After the procedure mentioned above is done, the switch will be rebooted and initialized using the default settings automatically.

The time of system rebooting will take about 10 seconds. You need to login the system again to enter the web pages for continuous configurations.

2.13 Command Line Interface (CLI)

In addition to the web management, the Ether-2416W web smart switch also provides a serial interface (RS-232) as a console port on the rear panel to manage switch for system setup, user management, reset system and firmware update through the command line interface (CLI). Windows **Hyper Terminal** is recommended to use. This section will show how to setup and use **Hyper Terminal** to manage this switch.

2.13.1 Hyper Terminal Setup Options

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

2.13.2 Switch Management Commands In Console

- **Login System**

After the system started, the following prompt will displayed on Hyper Terminal. User 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. Please enter correct username now.

```
Switch Login:
```

After enter the username, the following prompt will be displayed. User should enter the correct password now, and then manage the Ether-2416W web smart switch.

```
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
VT - VLAN Type
VV - Set PVID
VP - Get PVID
CB - Backup Config via TFTP
CR - Restore Config via TFTP
RB - Reboot System
RD - Reboot System After Write Default
LO - Logout
```

NOTE: Some models don't support configuration backup/restore (CB/CR) function.

■ Get System Information

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

```
Switch> IG
Model Name: 24G+2F_Smart
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: 255.255.255.0
Gateway: 192.168.223.254
MAC Address: 00-0A-17-00-11-22
```

■ Configure Network

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

```
Switch> NS - Configure Network
Do you want to enable DHCP Client?
```

If user wants to assign this system an IP address by DHCP server, please enter “Y” or “y” to start DHCP progress right now.

```
Switch> NS - Configure Network
Do you want to enable DHCP Client? y
Switch>
IP got from DHCP Server: 192.168.223.151
```

If user wants to assign this system a fixed IP address manually, please 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 account and password which is used to login this system. Enter new username and password. After confirm the password, the system will ask user to re-login it.

```
Switch> UM - User Management
New username: admin_user
New password: *****
Retype new password: *****
Switch Login:
```


■ VLAN Type

Press “VT” or “vt” to get current VLAN type or set to different type.

```
Switch> VT - VLAN Type
Current VLAN type: 802.1Q
Set VLAN type (1.Disable 2.Port-based 3.802.1Q)? 2

Are you sure? y
VLAN type is updated!
```

If selected VLAN type is successfully changed from one to the other, the message “VLAN type is updated!” will be shown up. If selected VLAN type is the same as before or entry is invalid, this action won’t be executed.

■ Set PVID

Press “VV” or “vv” to set per-port PVID in 802.1Q VLAN function. The PVID of admin port (port 25) in 802.1Q VLAN function also can be modified. The PVID which user wants to set must be one of the existing VLAN group ID.

Admin port is the port you can manage the switch function. The Default Admin PVID is 1.

```
Switch> VV - Set PVID
Port number : 2
PVID(must be one of the existing VLAN group ID) : 1

ACTION SUCCESS !!
```

■ Get PVID

Press “VP” or “vp” to show per-port PVID in 802.1Q VLAN function. The PVID of admin port (port 25) in 802.1Q VLAN function also can be showed.

```
Switch> VP - Get PVID
Port number : 2

PVID : 1
ACTION SUCCESS !!
```

■ **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)...
56K Blank(8 Banks) Checking...
Receiving TFTP Blocks .....? OK
```

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)...
56K Blank(8 Banks) Checking...
Receiving TFTP Blocks .....? OK
```

After the Ether-2416W web smart switch is starting reboot, the firmware upgrade progress is finished correctly. Press “IG” or “ig” to check firmware version after login.

■ **Configuration Backup via TFTP**

Press “CB” or “cb” to backup configurations as a file to TFTP server. The TFTP server IP address and configuration filename need to be assigned properly.

```
Switch> cb
TFTP server IP: 192.168.223.151
Filename: config.bin
IP/Netmask/Gateway need to be restored? n
Are you sure?y
Now connecting to the TFTP server...
Switch>
Now backing up config data ... Done
```

■ **Configuration Restore via TFTP**

Press “CR” or “cr” to restore configurations from TFTP server. The TFTP server IP address and configuration filename need to be assigned properly. IP/Netmask/Gateway is an option to be restored to the current system or not.

```
Switch> cr
TFTP server IP: 192.168.223.151
Filename: config.bin
IP/Netmask/Gateway need to be restored? n
Are you sure?y
Now connecting to the TFTP server...
Switch>
Now tftping config data from server ... Done

Verifying data checksum ... Done
Now updating EEPROM ...
Boot: Check magic code... OK
Boot:Check Flash checksum=0xff OK
```

After this process is successfully finished, system will be automatically rebooted to reactivate the functions for restored configurations.

■ **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 this system to factory 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

8 1000BaseTX RJ-45 connector ports,

16 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: Port17 – 24, left corner of each RJ-45 port, Green (link ok), Blinking (activity)

Speed LEDs: Port17 – 24, right corner of each RJ-45 port, Green (1Gbps), Vanish (10Mbps or 100Mbps)

Fiber LEDs: Port1 – 16, 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