XSNet C6108SW

Hardened Managed Gigabit Switch
User Manual

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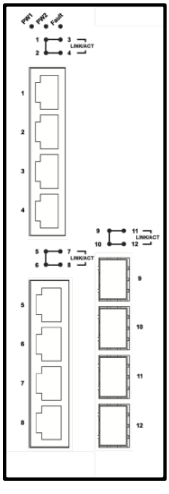
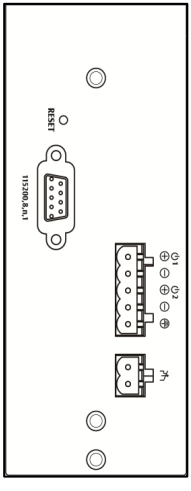
Quick Start Guide

This quick start guide describes the basic steps needed to install and start using the switch.





LED	State	Indication
Power 1 Power 2	Steady	Power on
	Off	Power off
10/100/1000Base-TX		
LINK/ACT	Steady	Valid network connection established
	Flashing	Transmitting or receiving data ACT stands for ACTIVITY
100	Steady	Connection at 100Mbps
1000Base SFP		
LINK/ACT	Steady	Valid network connection established
	Flashing	Transmitting or receiving data ACT stands for ACTIVITY
1000	Steady	Connection at 1000Mbps speed

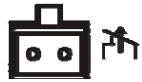
Power Input Assignment			
Power 2	+	12-48VDC	5-Pin Terminal Block
	−	Power Ground	
Power 1	+	12-48VDC	
	−	Power Ground	
⏚		Earth Ground	
Relay Output Rating			1A @ 250VAC
Relay Alarm Assignment			
FAULT	Normal state is relay open, alarm state is closed. Alarm relay can be configured to power input or port failure. See: Diagnostics/Alarm Setting in web interface.		

Power Consumption: Max 17.3 Watts

The Fault LED indicator will light up to if either Power 1 or Power 2 ceases to function. However, the switch will continue to work normally even if the fault LED is lit, as long as the other power source is functioning.

Relay Output Alarm

The switch provides relay output contacts for signaling of a user-defined power or port failure. The relay output can be connected to an alarm signaling device. Current is 1A at 250VAC.

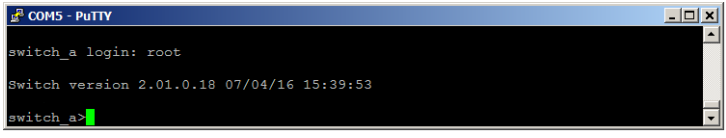


Console Configuration / Setting IP Address

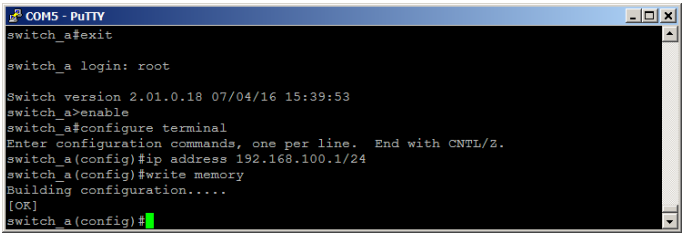
- Connect to the switch console:
  Connect the DB9 straight cable to the RS-232 serial port of the device and the RS-232 serial port of the terminal or computer running the terminal emulation application. Direct access to the administration console is achieved by

directly connecting a terminal or a PC equipped with a terminal-emulation program (such as HyperTerminal or Putty) to the switch console port.

- Configuration settings of the terminal-emulation program:
  Baud rate: 115,200bps
  Data bits: 8
  Parity: none
  Stop bit: 1
  Flow control: none
- Press the “Enter” key. The Command Line Interface (CLI) screen should appear.
- Logon to Exec Mode (View Mode):
  At the “switch_a login:” prompt, enter “root” and press <Enter> to log on to Exec Mode (also called View Mode). The “switch_a>” prompt will be displayed.

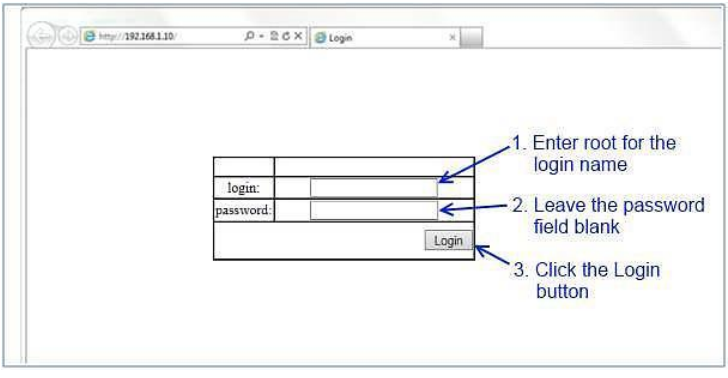


- Logon to Privileged Exec Mode (Enable Mode):
  At the “switch_a>” prompt type in “enable” and press <Enter>. The “switch_a#” prompt will show on the screen.
- Logon to Global Configuration Mode (Configure Terminal Mode):
  At the “switch_a#” prompt type in “configure terminal” and press <Enter>. The “switch_a(config)#” prompt will show on the screen.
- Set new IP address and subnet mask for Switch:
  At the “switch_a(config)#” prompt enter “ip address A.B.C.D/M”, where “A.B.C.D” specifies the IP address and “M” specifies the subnet mask. “M”= 8: 255.0.0.0, 16:255.255.0.0, and 24: 255.255.255.0.
  Example: Enter IP address of 192.168.100.1/24 to set a new IP address of 192.168.100.1 with a subnet mask of 255.255.255.0. (See example image below)
- Save changes with the “write memory” command.

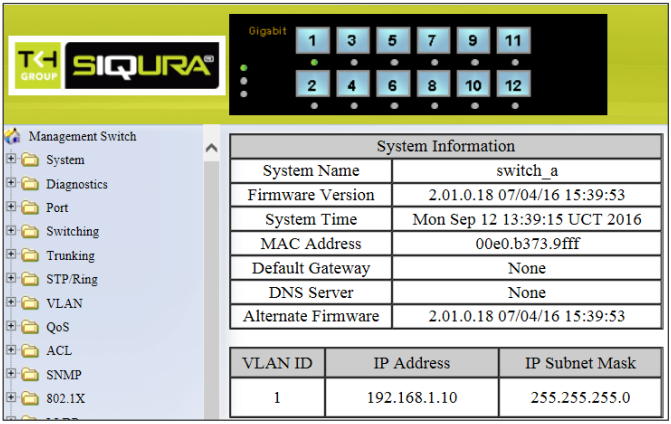


Web Configuration

- Log in to the switch:
  Specify the default IP address (192.168.1.10) of the switch in the web browser. A login window will be shown (see below).



- Enter the factory default login ID: root.
  Enter the factory default password (no password).
  Click on the “Login” button to log on to the switch. The System Information screen will display (see figure below).


Gigabit
1 3 5 7 9 11
2 4 6 8 10 12
Management Switch
System
Diagnostics
Port
Switching
Trunking
STP/Ring
VLAN
QoS
ACL
SNMP
802.1X
System Information
System Name switch_a
Firmware Version 2.01.0.18 07/04/16 15:39:53
System Time Mon Sep 12 13:39:15 UCT 2016
MAC Address 00e0.b373.9fff
Default Gateway None
DNS Server None
Alternate Firmware 2.01.0.18 07/04/16 15:39:53
VLAN ID IP Address IP Subnet Mask
1 192.168.1.10 255.255.255.0

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Introduction

This manual describes how to install and use the Hardened Managed Ethernet Switch. This switch is a light Layer 3 full Gigabit hardened managed switch in din-rail form factor, featuring 8 ports of 10/100/1000BASE TX and 4 x 1000BASE SFP/SC/ST ports.

To get the most out of this manual, you should have an understanding of Ethernet networking concepts.

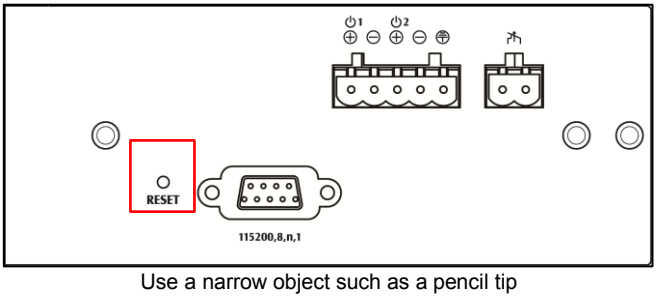
Product Highlights

- Manageable via SNMP, Web-based, Telnet, and RS-232 console port.
- Supports 802.3/802.3u/802.3ab/802.3z/802.3x. Auto-negotiation: 10/100/1000Mbps, full/half-duplex. Auto MDI/MDIX
- Equipped with 8x 10/100/1000BASE-TX slots
- Equipped with 4x 1000Base- SFP slots
- Supports 16K MAC addresses. Provides 12M bits packet memory buffer
- Alarms for power and port link failure by relay output
- Power Supply: Redundant DC Terminal Block power inputs
- Operating Temperature: -40° to 75°C (-40° to 167°F)
- Storage Temperature: -40° to 85°C (-40° to 185°F)
- Supports DIN-Rail and Panel Mounting installation

Switch Password Reset

If the password to the switch is forgotten or lost, it can be reset through the reset button

Press and hold the reset button, located next to the console port, for ten seconds. The switch will reboot and reset the switch password to the default: “root”. Other settings will not be affected.



Use a narrow object such as a pencil tip
to press and hold the reset button.

Installation

Selecting a Site for the Switch

As with any electric device, you should place the switch where it will not be subjected to extreme temperatures, humidity, or electromagnetic interference. Specifically, the site you select should meet the following requirements:

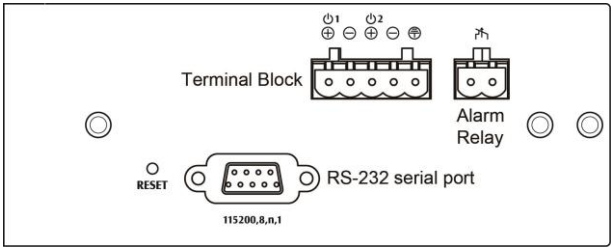
- The relative humidity should be less than 95 percent, non-condensing.
- Surrounding electrical devices should not exceed the electromagnetic field (RFC) standards.
- Make sure that the switch receives adequate ventilation. Do not block the ventilation holes on each side of the switch.

Connecting to Power

Redundant DC Terminal Block Power Inputs

There are two pairs of power inputs for use with redundant power sources. Only one power input is needed to run the switch.

Connect the DC power cord to the plug-able terminal block on the switch, and then plug it into a standard DC outlet.



Switch Top View

Power Input Assignment			
Power2	+	12-48VDC	Terminal Block
	−	Power Ground	
Power1	+	12-48VDC	
	−	Power Ground	
⏚		Earth Ground	
Relay Output Rating			1A @ 250VAC
Relay Alarm Assignment			
FAULT	Normal state is relay open, alarm state is closed. Alarm relay can be configured to power input or port failure. See: Diagnostics/Alarm Setting in web interface.		

Relay Alarm for Power or Port Failure

The switch provides relay output contacts for signaling of a user-defined power or port failure. The relay output can be connected to an alarm signaling device. Current is 1A at 250VAC.

Special note:
Do not connect a power source to relay output terminal. Doing so may result in shorting out the power supply.

Connecting to a Network

Cable Type & Length

Follow the cable specifications below when connecting the switch to your network. Use appropriate cables that meet your speed and cabling requirements.

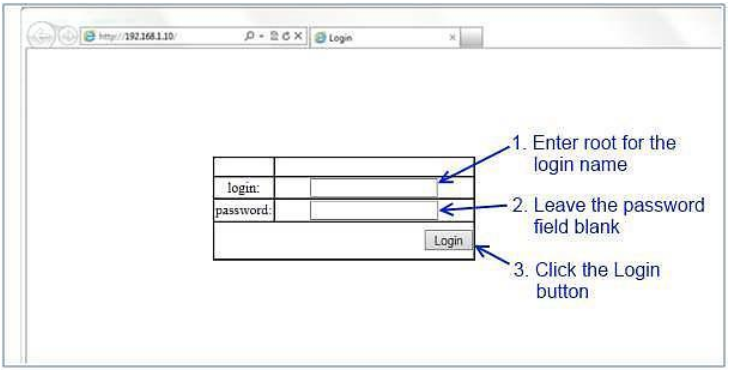
Cable Specifications

Speed	Connector	Port Speed Half/Full Duplex	Cable	Max. Distance
10Base-T	RJ-45	10/20 Mbps	2-pair UTP/STP Cat. 3, 4, 5	100 m
100Base-TX	RJ-45	100/200 Mbps	2-pair UTP/STP Cat. 5	100 m
1000Base-T	RJ-45	2000 Mbps	4-pair UTP/STP Cat. 5	100 m
SFP				
100Base-FX	Duplex LC	200 Mbps	MMF (62.5μm)	2 km
100Base-FX	Duplex LC	200 Mbps	SMF (10μm)	20, 40, 75, 100 km
100Base-BX	Duplex LC	200 Mbps	MMF (62.5μm)	2, 5 km
100Base-BX	Duplex LC	200 Mbps	SMF (10μm)	20, 40 km
1000Base-SX	Duplex LC	2000 Mbps	MMF (62.5μm)	550 m 2 km
1000Base-LX	Duplex LC	2000 Mbps	SMF (9μm)	10, 40, 60 km
1000Base-BX	Duplex LC	2000 Mbps	SMF (9μm)	70 km

Web-Based Browser Management

The switch provides a web-based browser interface for configuring and managing the switch. This interface allows you to access the switch using a preferred web browser.

Logging on to the switch



SWITCH IP ADDRESS
In your web browser, specify the IP address of the switch. Default IP address is 192.168.1.10.

LOGIN
Enter the factory default login ID: **root**.

PASSWORD
Enter the factory default password (no password).
Or enter a user-defined password if you followed the instructions later and changed the factory default password.

Switch Management Using Browser Interface

The web browser interface provides groups of point-and-click buttons at the left field of the screen for configuring and managing the switch.

System

System Information	
System Name	C6108SW
Firmware Version	2.01.0.18 07/04/16 15:39:53
System Time	Fri Aug 19 13:25:35 UCT 2016
MAC Address	00e0.b378.90cc
Default Gateway	None
DNS Server	None
Alternate Firmware	2.01.0.5R 04/29/16 15:15:51

VLAN ID	IP Address	IP Subnet Mask
1	192.168.1.10	255.255.255.0

System Information

The System information page that shows the following:

System Name — The System name is typically used by network administrators. If SNMP is enabled on the switch, the system name can be found using MIB II (RFC1213) in the sysName property.

Firmware Version — This displays the primary firmware version and date of last update

System Time — System time can be changed using NTP

MAC Address — The hardware (MAC) address of the Management interface

Default Gateway — The IP address of your networks Gateway (Typically a Router on your network)

DNS Server — The Dynamic Name Server (DNS) for your network

Alternate Firmware — This shows the firmware version mirrored on the switch. If the switch becomes unbootable from the primary firmware image, it will boot to this version on the next boot.

VLAN ID — One or more listings depending on the number of VLANs defined on the switch. Lists VLAN ID, IP address, and subnet mask of the VLAN Interface(s)

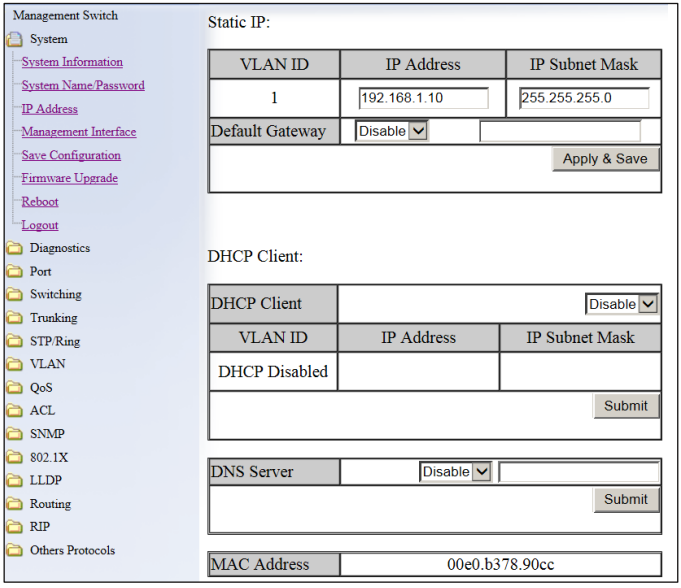
System Name :	Test_switch_30
	Update Setting

Password:	
Retype Password :	
	Update Setting

System Name/Password

By default there is no password assigned to the switch. To add or change a password:

1. System Name: Enter the new system name.
2. Update Setting: Click “Update Setting” button to save the new system name.
3. Password: Enter new password, and re-enter in “Retype Password” text box.
4. Update Setting: Click “Update Setting” button to update your settings.



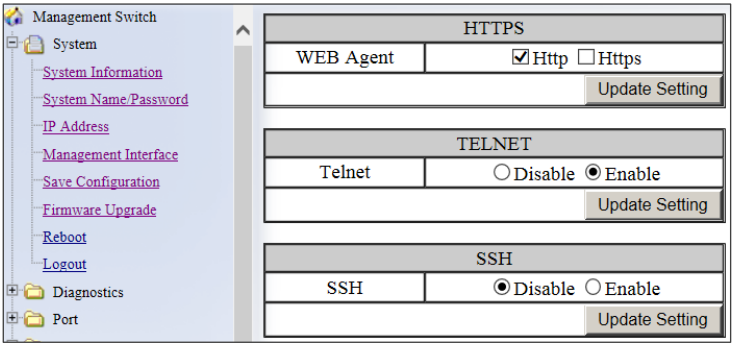
IP Address

1. Enter the desired IP address and subnet mask in the IP Address/Subnet Mask fields associated with VLAN 1
2. You will need to enter the new IP address in the browser and reconnect to the switch after IP or subnet mask are changed.
3. DHCP Client: Click “DHCP Client” drop-down menu to choose “Disable,” “VLAN1,” or other VLAN group from the “DHCP Client” drop-down list to disable or enable DHCP Client Setting for the switch. The management VLAN is VLAN 1 by default. The managed IP Address will be assigned by DHCP Server when VLAN 1 is chosen as DHCP Client. DHCP Server can assign the Switch another managed IP Address by choosing another VLAN besides VLAN 1 as DHCP Client when Switch has multiple VLANs. Then click “Submit.”
4. Default Gateway: Click “Default Gateway” drop-down menu to choose “Disable” or “Enable” from the “Default Gateway” drop-down list to disable or enable Default

Gateway Setting for the switch. Enter the address for the Default Gateway. Then click “Submit.”

5. DNS Server: Click “DNS Server” drop-down menu to choose “Disable” or “Enable” from the “DNS Server” drop-down list to disable or enable DNS Server Setting for the switch.
   Click the text box and type a new address to change the DNS Server. (Need to choose “Enable” from the “DNS Server” drop-down menu.)
6. Submit: Click “Submit” button when finished.

Note: After making changes to settings in the IP address section, the configuration needs to be saved using the System/Save configuration page (See Save Configuration below).



Management Interface

The Management Interface configuration page has three settings that allow the user to configure the methods available to manage the switch.

HTTPS (Hypertext Transfer Protocol Secure) allows the user to determine what method, if any, is used to configure the switch. The default is unencrypted HTTP.

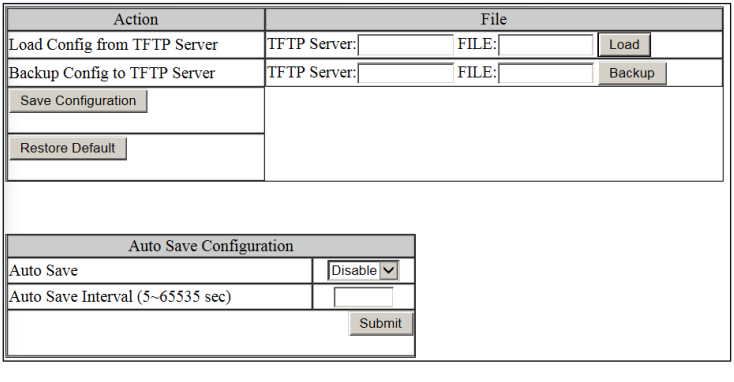
To disable the Web interface:

1. Uncheck Http and Https.
2. Click on the Update setting button.

Warning! Once the Submit button is pressed, the Web Console will no longer function. As a safety precaution, the configuration is not saved by default. Rebooting the switch will restore the Web Console. To save the configuration, connect using the new IP address.

Telnet is a network protocol that allows a remote computer to log into the switch to access its CLI (Command Line Interface). The CLI can be access using Telnet, SSH and the serial port on the switch. The secure method of accessing the CLI over a network is SSH.

Secure Shell or **SSH** is a network protocol that allows data to be exchanged using a secure channel between two networked devices such as a computer and the switch. SSH is disabled by default on the Switch.



Save Configuration

1. **To load a configuration from a TFTP server:**
   Click in “TFTP Server” text box and type the TFTP server IP address from where the file will be obtained.
   Click in “FILE” text box and type the name of the file that will be obtained.
   Click “Load” button to load the file from the TFTP server.
2. **To back up a configuration to TFTP server:**

Click in “TFTP Server” text box and type the TFTP server IP address to where the file will be backupped.
Click in “FILE” text box and type the name of the file that will be backupped.
Click “Backup” button to backup the file to the TFTP server.

3. **To save current switch configuration**: Click “Save Configuration” button to save your configuration settings.
4. **Restore default configuration:** Click “Restore Default” button to restore the default settings of the switch.
5. **Auto save settings**: Choose “Disable” or “Enable” from the “Auto save” drop-down list to disable or enable Auto save for the switch.
6. Auto save interval (5~65536 seconds): Click in “Auto save interval” text box and enter a number between 5 and 65536.
7. Submit: Click “Submit” button when you have finished Auto save configuration.

Firmware Version	2.01.0.18 07/04/16 15:39:53
Filename	flash73-1.94.2.1-siqura.tgz
TFTP Server IP	192.168.1.100 ×
	Upgrade

Firmware Upgrade

To upgrade the firmware, a TFTP server is required. The firmware file for the switch is in a .TGZ or .IMG format. This is a compressed file; however, it should not be decompressed before updating the switch.

To update the firmware

1. Copy the firmware file to the correct directory for your TFTP server. The correct directory depends on your TFTP server settings
2. Enter the filename of the firmware in the Filename text box.

3. Enter the IP Address of your TFTP server in the TFTP Server IP text box, then click the Upgrade button.
4. During the firmware upgrade you will see the following messages. Do not reboot or unplug the switch until the final message is received.
   a. `Downloading now, please wait...`
   b. `tftp <filename>.img from ip <ip address> success!! Install now. This may take several minutes, please wait...`
   c. `Firmware upgrade success!`

Reboot the switch after the firmware has been updated.

Note: If a Firewall is running on the PC that is running the TFTP server it may need to be temporarily disabled.

Reboot
Reboot: Click “Reboot” button to restart the switch.

Logout
Logout: Click “Logout” button to logout of the switch.

Diagnostics

CPU Utilization	
Current utilization	17%
Max utilization	17%

Memory Utilization		
Total	Used	Free
124492 KB	93376 KB	31116 KB

Utilization
The Utilization page is a read-only page that shows the switch’s CPU and memory utilization.

System Log	
1	At Jan 10 2009 18:49:49 (00:01:13) : Power supply US1 is connected now.
2	At Jan 10 2009 18:49:49 (00:01:13) : Link up on Port ge8
3	At Jan 10 2009 20:44:13 (01:55:38) : Link down on Port ge8
4	At Jan 10 2009 20:44:17 (01:55:42) : Link up on Port ge7

System Log

The System Log shows the data and time of port links going up or down.

Remote Logging	
Status	○ Enable ◉ Disable
	Update Setting

Syslog Server IP	
	Add Syslog Server

Syslog Server IP List	
	Delete Syslog Server

Remote Logging

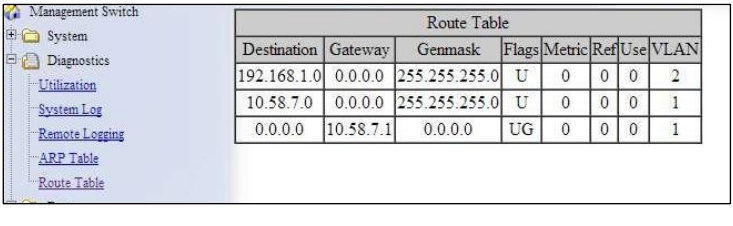
Remote Logging to a Syslog server allows administrators to log important system and debugging information. The Remote Logging configuration page allows reporting to a Syslog server to be enabled or disabled as well as management of a list of Syslog servers to report to.

ARP Table					
IP Address	Hardware Type	Flags	Hardware Address	Mask	VLAN
192.168.100.1	1	2	3065.ec91.9820	*	1

ARP Table

The ARP Table page shows ARP (Address Resolution Protocol) entries that are stored in the Switches ARP Table. This is useful for troubleshooting purposes. The information shown is:

- IP Address of the listed device
- Hardware Type – For Ethernet devices this will always be 1.
- Flags
  2 = Device responded to ARP Request
  0 = No response to ARP Request
- Hardware Type – MAC Address of the listed device
- VLAN – The VLAN that the listed device is on



Route Table							
Destination	Gateway	Genmask	Flags	Metric	Ref	Use	VLAN
192.168.1.0	0.0.0.0	255.255.255.0	U	0	0	0	2
10.58.7.0	0.0.0.0	255.255.255.0	U	0	0	0	1
0.0.0.0	10.58.7.1	0.0.0.0	UG	0	0	0	1

Route Table

Route Table lists the routes to network destinations. And metrics (distances) are associated with those routes. The Route Table contains information about the topology of the network around it.

Alarm Trigger Setting	
Name	ge1
Trigger Enabled	YES
Update Setting	

Name	Trigger Enabled	Status
ge1	No	Link-down
ge2	No	Link-down
ge3	No	Link-down
ge4	No	Link-down
ge5	No	Link-down
ge6	No	Link-down
ge7	No	Link-up
ge8	No	Link-down
ge9	No	Link-down
ge10	No	Link-down
ge11	No	Link-down
ge12	No	Link-down
Power1	No	Up
Power2	No	Down

Alarm Setting

The Alarm Setting page allows users to define Ethernet port Link-down and Power failure alarms for triggering an alarm using the relay on the switch.

To configure an Ethernet port or power input:

1. Select an Ethernet port or Power input from the dropdown box.
2. Select YES or NO from the dropdown box next to Trigger Enabled.
3. Click Update Setting to save any changes made.

NOTE: The initial normal state of the relay is open, and if switch loses *all* power, then this state will come into effect. This is important to remember when using the relay to indicate a power failure. The relay will close in an alarm state when there is redundant power input and an alarmed input fails.

Port

Port	Link Status	Port Description	Port type	IP address (A.B.C.D/M)	Admin Setting	Speed	Flow Control
ge1	Down		Router port	172.16.0.200/24	Link Up	Auto	Enable
ge2	Down		Switch port		Link Up	Auto	Enable
ge3	Down		Switch port		Link Up	Auto	Enable
ge4	Down		Switch port		Link Up	Auto	Enable
ge5	Down		Switch port		Link Up	Auto	Enable
ge6	Down		Switch port		Link Up	Auto	Enable
ge7	Running		Switch port		Link Up	Auto	Enable
ge8	Down		Router port	192.168.3.200/24	Link Up	Auto	Enable
ge9	Down		Switch port		Link Up	Auto	Enable
ge10	Down		Switch port		Link Up	Auto	Enable
ge11	Down		Switch port		Link Up	Auto	Enable
ge12	Down		Switch port		Link Up	Auto	Enable

Submit

Configuration

To provide a description to a port:

1. Click in the Description text box for the appropriate port.
2. Type in the description of the port.
3. Click on the Submit button.

To enable or disable a port:

1. Click on the drop-down box under Admin Setting and select either Link Up or Link Down.
2. Click on the Submit button.

To set the Port Speed and/or Port Duplex Settings:

1. Click on the drop-down box under Speed and select the desired port speed / duplex settings for that port. Please note, not all port types will have the same options. For example, 100Mb fiber ports will typically be limited to a single option of 100M/FD (100Mbps and Full Duplex) while running 1Gb UTP ports will have six options for speed/duplex.
2. Click on the Submit button.

To enable or disable a port's Flow Control:

1. Click on the drop-down box under Flow Control and select either Enable or Disable.
2. Click on the Submit button.

Port	Link Status	Port Description	Port type	IP address	Speed	Duplex	Flow Control
ge1	Down		Router port	172.16.0.200/24	1000M	Auto	Enable
ge2	Down		Switch port	-	1000M	Auto	Enable
ge3	Down		Switch port	-	1000M	Auto	Enable
ge4	Down		Switch port	-	1000M	Auto	Enable
ge5	Down		Switch port	-	1000M	Auto	Enable
ge6	Down		Switch port	-	1000M	Auto	Enable
ge7	Running		Switch port	-	1000M	Auto	Enable
ge8	Down		Router port	192.168.3.200/24	1000M	Auto	Enable
ge9	Down		Switch port	-	1000M	Auto	Enable
ge10	Down		Switch port	-	1000M	Auto	Enable
ge11	Down		Switch port	-	1000M	Auto	Enable
ge12	Down		Switch port	-	1000M	Auto	Enable

Port Status

View the Link Status, Port Description, Speed, Duplex, and Flow control status for all ports.

Port	Ingress	Egress
ge2	0 kbps	0 kbps
ge3	0 kbps	0 kbps
ge4	0 kbps	0 kbps
ge5	0 kbps	0 kbps
ge6	0 kbps	0 kbps
ge7	0 kbps	0 kbps
ge9	0 kbps	0 kbps
ge10	0 kbps	0 kbps
ge11	0 kbps	0 kbps
ge12	0 kbps	0 kbps
ge13	0 kbps	0 kbps
ge14	0 kbps	0 kbps
ge15	0 kbps	0 kbps
ge16	0 kbps	0 kbps
		Update Setting

Rate Control

The Rate Control page allows the user to set the maximum throughput on a port or ports on both packets entering the port (from the connected device) or packets leaving the port.
The Ingress text box controls the rate of data traveling into the port while the Egress text box controls the rate of data leaving the port.
Note: Entries will be rounded down to the nearest acceptable rate value. If the value entered is below the lowest acceptable value then the lowest acceptable value will be used.
To provide either an ingress or egress rate control for a port:

1. Click in the Ingress or Egress Text Box for the appropriate port.
2. Type in the ingress/egress rate for the port according to the values listed above.
3. Click on the Update Setting button.

ge1	ge2	ge3	ge4	ge5	ge6	ge7	ge8
ge9	ge10	ge11	ge12	ge13	ge14	ge15	ge16

Port 1/ge1 Statistics

Drop Events	0
Broadcast Packets Received	6185
Multicast Packets Received	840
Undersize Packets Received	0
Oversize Packets Received	0
Fragments Packets Received	0
64-byte Packets Received	7520
65 to 127-byte Packets Received	626
128 to 255-byte Packets Received	574
256 to 511-byte Packets Received	684
512 to 1023-byte Packets Received	0
1024 to Maximum Packets Received	0
Jabber Packets	0
Bytes Received	963952
Packets Received	9404
Collisions	0
CRC/Alignment Errors Received	0
TX No Errors	42921
RX No Errors	9404
Statistics will be refreshed every 30 seconds after Clear clicked.	
	Clear

RMON Statistics

Click ports to view corresponding RMON Statistics.

ge1	ge2	ge3	ge4	ge5	ge6
ge7	ge8	ge9	ge10	ge11	ge12

Port 1/ge1 status

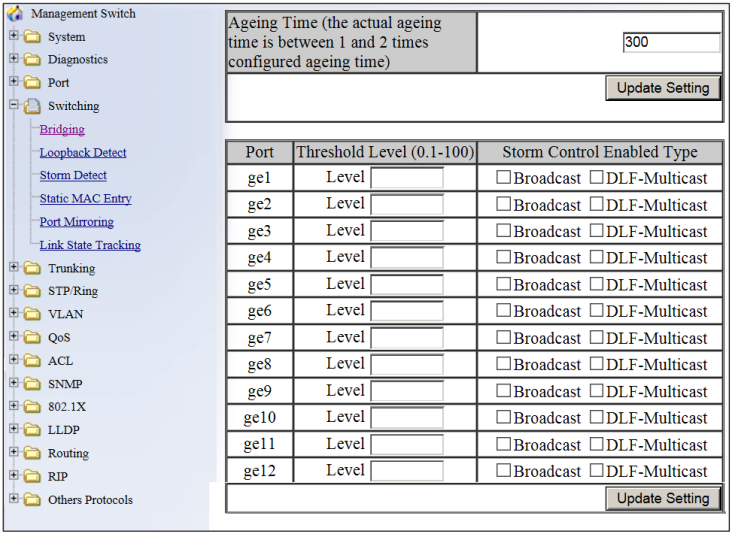
Total VLAN Count	1
Total MAC Address Count	1
VLAN Membership	**MAC Address**
VLAN1	3065.ec91.9820

Clear MAC

Per Port VLAN Activities

Click ports to view corresponding VLAN activities.

Switching



Bridging

Ageing Time

The Ageing Time value is a global value and represents the time that a networked device's MAC address will live in the switch's memory before being removed. The default value is 300 seconds (5 minutes)

To update the Ageing Time value:

1. Click in the Error Disable Recovery text box at the top of the Port Security Dynamic-MAC page.
2. Type in the desired value. Values can be from 0 to 65535 seconds. A value of 0 indicates that the port is not to return to normal operating condition until an administrator resets the port or the switch is restarted.
3. Click on the Update Setting button.

Threshold Level

The Threshold Level setting is a per port value. A traffic storm occurs when packets flood the LAN, creating excessive traffic and degrading network performance. The traffic storm control

feature prevents LAN ports from being disrupted by a broadcast or multicast traffic storm on physical interfaces. A Threshold is set to determine when the switch will react to Broadcasts and/or Multicasts.

To set the Threshold level per port:

1. Type in the desired value. Values can be from 0.1 to 100. This value is a percentage of allowable broadcast traffic for this port. Once this percentage of traffic is exceeded, all broadcast traffic beyond this percentage is dropped.
2. Click on the Update Setting button.

Storm Control Type

The Storm Control Enabled Type setting is a per port value. The Storm Control Enabled Type allows users to determine the type of storm control to be used by the switch.

To set the Storm Control Enabled Type:

1. Select the check box next to Broadcast and/or DFL-Multicast for the port that needs to be changed
2. Click on the Update Setting button.

General Setting	
LoopBack Detect	Disable (default)
LoopBack Detect Action	None (default)
Error Disable Recovery (0-65535 seconds, Default:0)	0
Interval (1-30 seconds, Default:1)	1
NOTE:Error disable recovery must be at least two times the interval.	Update Setting

Port	Mode	State
ge1	Disable (default)	--
ge2	Disable (default)	--
ge3	Disable (default)	--
ge4	Disable (default)	--
ge5	Disable (default)	--
ge6	Disable (default)	--
ge7	Disable (default)	--
ge8	Disable (default)	--
ge9	Disable (default)	--
ge10	Disable (default)	--
ge11	Disable (default)	--
ge12	Disable (default)	--
		Update Setting

Loopback Detect

(Global)

To globally enable the **Loopback Detect** feature of the switch:

1. Click on the **Loopback Detect** drop-down box.
2. Select **Enable** from the drop down list.
3. Click on the **Update Setting** button.

Loopback Detect Action

To change the action that the switch takes when a loopback condition is detected:

1. Choose an action from the **Loopback Detect Action** dropdown list. The available options are **None** and **Error Disable**.

2. Click on the **Update Setting** button.

Loopback Detect Recovery Time

To change the length of time that the **Loopback Detect Action** will stay in effect:

1. Enter a value in the text box next to **Error Disable Recovery**. Valid values range from **0 to 65535 seconds**.
2. Click on the **Update Setting** button.

Polling Interval

To change the polling interval of the Loopback Detect function:

1. Enter a value in the text box next to **Interval**. Valid values range from **1 to 65535** seconds.
2. Click on the **Update Setting** button.

Loopback Detection (Per Port)

To enable **Loopback Detection** for a particular port or ports on the switch:

1. Select the value **Enable** from the **Mode** drop down list for a port on the Loopback Detect page.
2. Click on the **Update Setting** button.

Bridge Storm-Detect Configuration	
Storm-Detect configuration	Disable
Storm-Detect interval (2..65535 sec), Default: 10	10
Storm-Detect errdisable-recovery time (0..65535 sec), 0:no recovery	0
Storm-Detect state of action	None

Storm-Detect Per Port Configuration				
Port	State / Recovery time remains	By Utilization(%) (0-100) 0: not limited	By Broadcast / Multicast+Broadcast Packets Per Second (0-100000) 0: not limited	
ge1	No Detecting	0	BC	0
ge2	No Detecting	0	BC	0
ge3	No Detecting	0	BC	0
ge4	No Detecting	0	BC	0
ge5	No Detecting	0	BC	0
ge6	No Detecting	0	BC	0
ge7	No Detecting	0	BC	0
ge8	No Detecting	0	BC	0
ge9	No Detecting	0	BC	0
ge10	No Detecting	0	BC	0
ge11	No Detecting	0	BC	0
ge12	No Detecting	0	BC	0

Submit

Storm Detect

The **Storm Detect** feature allows the switch to be configured to disable a port that is receiving a large number of Broadcast and/or Multicast packets. The switch can monitor for packets and take action based on percentage of bandwidth utilization or number of packets per second.

Enable/Disable Storm Detection

1. **Enable** or **Disable** Storm Detection by Clicking on the drop down box in the **Storm-Detect Configuration** box.
2. Set the **Storm Detect interval** to a number between **2 and 65535** seconds. The default value is 10 seconds.
3. Set the **Storm-Detect errdisable-recovery time** to value between **0 and 65535 seconds**. The Default is 0 (disabled). This value determines if the switch should

re-enable the port after the specified value or leave the port disabled.

4. Set the **By Utilization**(%) for each port in the **Storm-Detect Per Port Configuration** box. The default is 0 (not limited). Setting this to a value between 1 and 100 will cause the port to be disabled when the defined percentage of bandwidth is reached.
5. Set the type of packet to be monitored in the Drop-down box under **By Broadcast / Multicast+Broadcast Packets Per Second**. Set the value to **BC** to monitor Broadcast packets and **BC-MC** to monitor both Broadcast and Multicast packets.

Static-MAC-Entry Forward

Port	Add MAC Address (Ex: 0000.1111.2222)	VLAN ID	Delete MAC Address
ge1			
ge2			
ge3			
ge4			
ge5			
ge6			
ge7			
ge8			
ge9			
ge10			
ge11			
ge12			

Submit

Static-MAC-Entry Discard

Add MAC Address (Ex: 0000.1111.2222)	VLAN ID	Delete MAC Address

Submit

Static MAC Entry

Static-MAC-Entry Forward:

1. Add MAC address: Click in “Add MAC address” text box and type a locked forwarding MAC address for the port.

2. VLAN ID: Click “VLAN ID” drop-down menu and choose a VLAN ID from the “VLAN ID” drop-down list.
3. Delete MAC address: Click “Delete MAC address” drop-down menu and choose a locked forwarding MAC address from the “Delete MAC address” drop-down list to be deleted from the port.
4. Submit: Click “Submit” button when you have finished Static-MAC-Entry Forward settings.

Static-MAC-Entry Discard:

1. Add MAC address: Click in “Add MAC address” text box and type a MAC address to be discarded for the VLAN.
2. VLAN ID: VLAN ID: Click “VLAN ID” drop-down menu and choose a VLAN ID from the “VLAN ID” drop-down list.
3. Delete MAC address: Click “Delete MAC address” drop-down menu and choose a MAC address from the “Delete MAC address” drop-down list to be discarded from the VLAN.
4. Submit: Click “Submit” button when you have finished Static-MAC-Entry Discard settings.

Current Settings

Mirror From	Mirror To	Mirror Mode

Port Mirror Setup

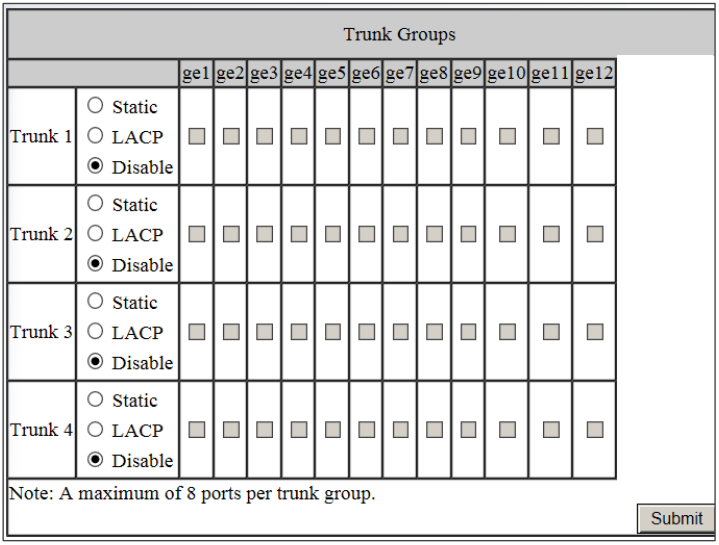
Mirror From	Mirror To	Mirror Mode
☐ ge1 ☐ ge2 ☐ ge3 ☐ ge4 ☐ ge5 ☐ ge6 ☐ ge7 ☐ ge8 ☐ ge9 ☐ ge10 ☐ ge11 ☐ ge12	ge1	Tx/Rx

Submit

Port Mirroring

1. Mirror From: Choose Mirror From port from Port 1 ~ Port 12.
2. Mirror To: Click “Mirror To” drop-down menu to Choose Mirror To port (Port 1 ~ Port 12) from “Mirror To” drop-down list.
3. Mirror Mode: Click “Mirror Mode” drop-down menu to Choose “Tx/Rx”, “Tx”, or “Rx” from “Mirror Mode” drop-down list.
4. Submit: Click “Submit” button when you have finished Port Mirroring settings.

Trunking



Trunk Groups

		ge1	ge2	ge3	ge4	ge5	ge6	ge7	ge8	ge9	ge10	ge11	ge12
Trunk 1	○ Static ○ LACP ◉ Disable	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Trunk 2	○ Static ○ LACP ◉ Disable	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Trunk 3	○ Static ○ LACP ◉ Disable	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Trunk 4	○ Static ○ LACP ◉ Disable	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Note: A maximum of 8 ports per trunk group.

Submit

Port Trunking

To create a trunk consisting of 1000Mbps ports:

1. Select **Static, LACP,** or **Disable** for each trunk that is being configured.
2. Click on the corresponding checkbox for each desired port to be included in the **Trunk Group**. A maximum of eight ports can be assigned to each trunk group.
3. Click on the **Submit** button.

Port	Trunk Type	Admin Key	LACP Mode	LACP Port Priority	LACP Timeout	LACP Sync	LACP Sync Port
ge1	None	None	None	None	None	None	None
ge2	None	None	None	None	None	None	None
ge3	None	None	None	None	None	None	None
ge4	None	None	None	None	None	None	None
ge5	None	None	None	None	None	None	None
ge6	None	None	None	None	None	None	None
ge7	None	None	None	None	None	None	None
ge8	None	None	None	None	None	None	None
ge9	None	None	None	None	None	None	None
ge10	None	None	None	None	None	None	None
ge11	None	None	None	None	None	None	None
ge12	None	None	None	None	None	None	None

Trunk Configuration :

Port	Trunk Type	Admin Key (1-4)	LACP Mode	LACP Port Priority (Set 0 for None)	LACP Timeout
ge1	None		Active		Long

Note: A maximum of 8 ports per trunk group

Update Setting

LACP System Priority (1-65535, default:32768)

32768

Submit

LACP Trunking

Trunk Configuration:

To create a LACP trunk:

1. In the Trunk Configuration section, select a port in the LACP trunk.
2. Select LACP from the Trunk Type dropdown box for this port.
3. Enter an admin key for this port in the Admin Key textbox. 100Mbps ports admin keys must be 1 and 1Gbps ports must be 3.
4. Select the LACP Mode to either Active or Passive.
5. Enter a value in the Port Priority textbox.
6. Select a Timeout value of Short or Long.
7. Click on the Submit button.
8. Repeat steps 1-7 for each additional port that is to be used in the trunk.

To set the LACP System Priority

1. Enter a value between 1 and 65535. The default value is 32768.
2. Click on the Submit button.

STP / Ring

Status	
Bridge ID	800000e0b3739fff
Designated Root	800000e0b3739fff
Reg Root ID	
Root Port	0
Root Path Cost	0
Current Max Age (sec)	20
Current Hello Time (sec)	2
Current Forward Delay (sec)	15
Topology Change Count	4
Time Since Last Topology Change	Fri Sep 23 08:32:05 2016
Setting	
Spanning Tree Protocol	Enable
Bridge Priority (0..61440)	32768
Hello Time (1..10 sec)	2
Max Age (6..40 sec)	20
Forward Delay (4..30 sec)	15
STP Version	RSTP
	Update Setting

Global Configuration

1. Spanning Tree Protocol: Click “Spanning Tree Protocol” drop-down menu to choose “Enable” or “Disable” from “Spanning Tree Protocol” drop-down list to enable or disable Spanning Tree Protocol.
2. Bridge Priority (0..61440): Click in “Bridge Priority” text box and type a decimal number between 0 and 61440.
3. Hello Time (sec) (1..9): Click in “Hello Time” text box and type a decimal number between 1 and 9.
4. Max Age (sec) (6..28): Click in “Max Age” text box and type a decimal number between 6 and 28.
5. Forward Delay (sec) (4..30): Click in “Forward Delay” text box and type a decimal number between 4 and 30.
6. STP Version: Click “STP Version” drop-down menu to choose “MSTP”, “RSTP”, or “STP compatible” from “STP

Version” drop-down list.

7. Update Setting: Click “Update Setting” button when you have finished Global Configuration.

Port	Port Status	Priority	Path Cost	Point to Point Link	Edge Port
ge1	Designated(Forwarding)	128	20000	Point to Point	Conf. Disabled / Curr. Edge off
ge2	Disabled(Discarding)	128	20000	Shared	Conf. Disabled / Curr. Edge off
ge3	Disabled(Discarding)	128	20000	Shared	Conf. Disabled / Curr. Edge off
ge4	Disabled(Discarding)	128	20000	Shared	Conf. Disabled / Curr. Edge off
ge5	Disabled(Discarding)	128	20000	Shared	Conf. Disabled / Curr. Edge off
ge6	Disabled(Discarding)	128	20000	Shared	Conf. Disabled / Curr. Edge off
ge7	Disabled(Discarding)	128	20000	Shared	Conf. Disabled / Curr. Edge off
ge8	Disabled(Discarding)	128	20000	Shared	Conf. Disabled / Curr. Edge off
ge9	Disabled(Discarding)	128	20000	Shared	Conf. Disabled / Curr. Edge off
ge10	Disabled(Discarding)	128	20000	Shared	Conf. Disabled / Curr. Edge off
ge11	Disabled(Discarding)	128	20000	Shared	Conf. Disabled / Curr. Edge off
ge12	Disabled(Discarding)	128	20000	Shared	Conf. Disabled / Curr. Edge off

RSTP Port Configuration

Port	Priority(Granularity 16)	Admin. Path Cost	Point to Point Link	Edge Port
ge1	128	20000	Enable	Disable

Update Setting

RSTP Port Setting

1. Port: Click “Port” drop-down menu to Choose Port 1 ~ Port 12 from “Port” drop-down list.
2. Priority (Granularity 16): Click in “Priority” text box and enter a value between 0 and 240 to set the priority for the port. A higher priority will designate the port to forward packets first. A lower number denotes a higher priority. This entry must be divisible by 16. The default priority setting is 128.
3. Admin. Path Cost: Click in “Admin. Path Cost” text box and enter a value between 0 and 2000000 to set the Admin. Path Cost for the port. 0 (auto) - Setting 0 for the Admin. Path Cost will automatically set the speed for forwarding packets to the port for optimal efficiency. Default port cost: 100Mbps port = 200000. Gigabit port = 20000.
4. Point to Point Link: Click “Point to Point Link” drop-down menu to Choose “Enable” or “Disable” from “Point to Point Link” drop-down list to enable or disable Point to

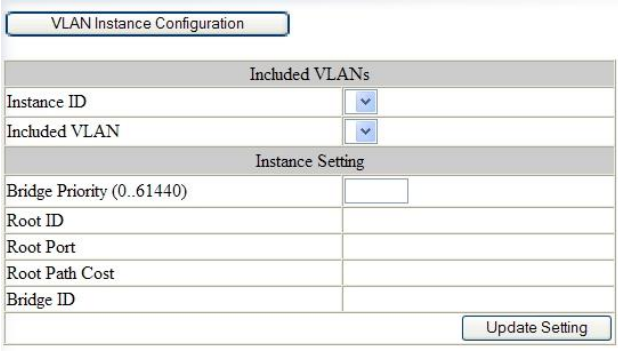
Point Link for the port.

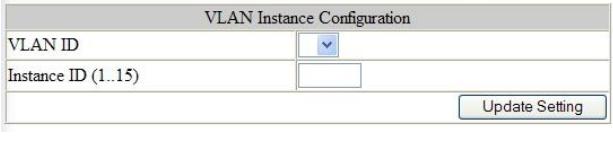
5. Edge Port: Click “Edge Port” drop-down menu to Choose “Enable”, “Disable”, or “Auto” from “Edge Port” drop-down list to set Enable, Disable, or Auto Edge Port for the port.
6. Update Setting: Click “Update Setting” button when you have finished RSTP Port Setting.

MSTP Properties	
Region Name	default
Revision Level	0
Max Hops	20
Digest	0xAC36177F50283CD4B83821D8AB26DE62
CIST Root ID	800000047e000001
CIST Reg Root ID	800000047e000001
CIST Bridge ID	800000047e000001
	Update Setting

MSTP Properties

1. Region Name: Click in “Region Name” text box to create an MST region and specify a name to it. MST bridges of a region form different spanning trees for different VLANs. By default, each MST bridge starts with the region name as its bridge address. This means each MST bridge is a region by itself, unless specifically added to one.
2. Revision Level: Click in “Revision Level” text box to specify the number for configuration information. The default value of revision number is 0.
3. Max Hops: Click in “Max Hops” text box to specify the maximum allowed hops for BPDU in an MST region. This parameter is used by all the instances of the MST. Specifying the max hops for a BPDU prevents the messages from looping indefinetely in the network. When a bridge receives a MST BPDU that has exceeded the allowed max-hops, it discards the BPDU.
4. Update Setting: Click “Update Setting” button when you have finished MSTP Properties setting.





MSTP Instance Setting

VLAN Instance Configuration

1. VLAN Instance Configuration: Click “VLAN Instance Configuration” button. The “VLAN Instance Configuration” window appears.
2. VLAN ID: Click “VLAN ID” drop-down menu to choose VLAN from “VLAN ID” drop-down list to simultaneously add multiple VLANs for the corresponding instance of a bridge.
3. Instance ID (1..15): Click in “Instance ID” text box to specify the instance ID.
4. Update Setting: Click “Update Setting” button when you have finished VLAN Instance Configuration.

Included VLANs

1. Instance ID: Click “Instance ID” drop-down menu to choose instance ID from “Instance ID” drop-down list.
2. Included VLAN: Click “Included VLAN” drop-down menu to choose VLAN from “Included VLAN” drop-down list.

Instance Setting

1. Bridge Priority (0..61440): Click in “Bridge Priority” text box to set the bridge priority for an MST instance to the value specified. The lower the priority of the bridge, the better the chances are the bridge becoming a root bridge or a designated bridge for the LAN.
2. Update Setting: Click “Update Setting” button when you have finished VLAN Instance Configuration.

Port Instance Configuration

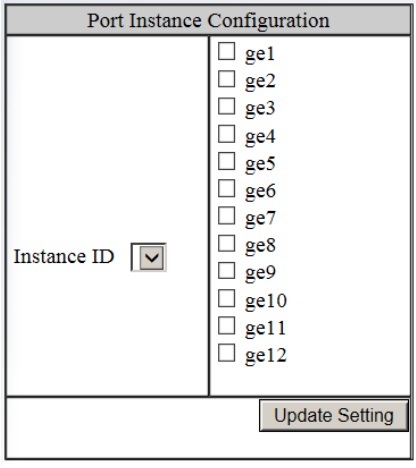
Instance ID

Port	Port State	Role	Priority	Path Cost	Designated Bridge ID	Designated Port ID	Designated Root ID	Designated Path Cost
ge1								
ge2								
ge3								
ge4								
ge5								
ge6								
ge7								
ge8								
ge9								
ge10								
ge11								
ge12								

MSTP Port Configuration

Port	Priority(Granularity 16)	Admin. Path Cost
ge1		

Update Setting



MSTP Port Setting

Port Instance Configuration

1. Instance ID: Click “Instance ID” drop-down menu to choose instance ID from “Instance ID” drop-down list.
2. Click Port 1 ~ Port 12 to assign ports to the corresponding instance ID.
3. Update Setting: Click “Update Setting” button when you have finished Port Instance Configuration.

Instance ID

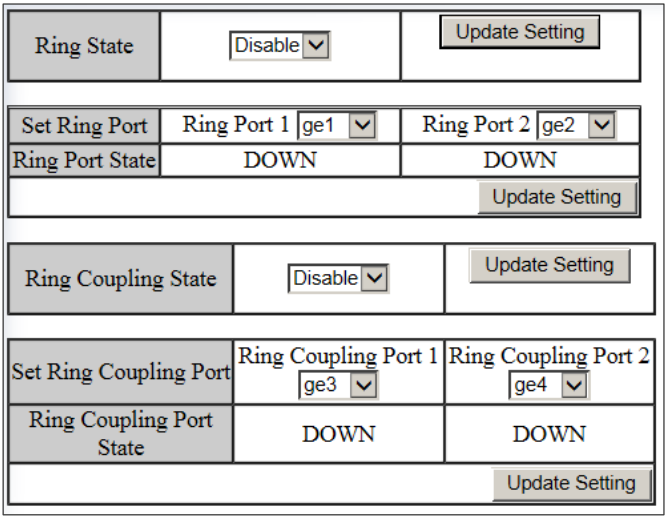
1. Instance ID: Click “Instance ID” drop-down menu to choose instance ID from “Instance ID” drop-down list.

MSTP Port Configuration

1. Port: Click “Port” drop-down menu to choose port from “Port” drop-down list.
2. Priority(Granularity 16): Click in “Priority” text box to set the port priority for a bridge group. The Multiple Spanning Tree Protocol uses port priority as a tiebreaker to determine which port should forward frames for a particular instance on a LAN, or which port should be the root port for an instance. A lower value implies a better priority. In the case of the same priority, the interface

index will serve as the tiebreaker, with the lower-numbered interface being preferred over others. The permitted range is 0-240. The priority values can only be set in increments of 16.

3. Admin. Path Cost: Click in “Admin. Path Cost” text box to set the cost of a path associated with an interface.
4. Update Setting: Click “Update Setting” button when you have finished MSTP Port Setting.



IQ Ring Setting

Ring state

1. Click “Ring state” drop-down menu from “Ring state” drop-down list to choose “Enable” or “Disable” to enable or disable Ring state.
2. Update Setting: Click “Update Setting” button when you have finished Ring state setting.

Set ring port

1. Ring port 1: Click “Ring port 1” drop-down menu to choose Ring port 1 from “Ring port 1” drop-down list.

2. Ring port 2: Click “Ring port 2” drop-down menu to choose Ring port 2 from “Ring port 2” drop-down list.
3. Update Setting: Click “Update Setting” button when you have finished Set ring port.

Ring-coupling state

1. Click “Ring-coupling state” drop-down menu from “Ring-coupling state” drop-down list to choose “Enable” or “Disable” to enable or disable Ring-coupling state.
2. Update Setting: Click “Update Setting” button when you have finished Ring-coupling state setting.

Set ring-coupling port

1. Ring-coupling port 1: Click “Ring-coupling port 1” drop-down menu to choose Ring-coupling port 1 from “Ring-coupling port 1” drop-down list.
2. Ring-coupling port 2: Click “Ring-coupling port 2” drop-down menu to choose Ring-coupling port 2 from “Ring-coupling port 2” drop-down list.
3. Update Setting: Click “Update Setting” button when you have finished Set ring-coupling port.

Chain Protocol			
Port	Enable	Role	State
ge1	☐	None	None
ge2	☐	None	None
ge3	☐	None	None
ge4	☐	None	None
ge5	☐	None	None
ge6	☐	None	None
ge7	☐	None	None
ge8	☐	None	None
ge9	☐	None	None
ge10	☐	None	None
ge11	☐	None	None
ge12	☐	None	None
			Submit

Global Setting	
VLAN (1-4094, default:1)	1
Priority (0-255, default:128)	128
Timeout Count (3-255, default:5)	5
Storm Control (broadcast and multicast)	Enable
	Submit

IQ Chain Setting

Chain Protocol

1. Click “Enable” to enable Chain Protocol for Port 1 ~ Port 12. The Chain Protocol supports up to total 8 ports.
2. Submit: Click “Submit” button when you have finished Chain Protocol setting.

Global Setting

1. Priority (1-255, default:128): Set the Switch priority for running chain protocol. Switch with lower priority will run as Master (forwarding) port.
2. Timeout count (3-255, default:5): Set the Switch timeout count for running chain protocol.
   Chain recovery time = (Chain Timeout Count – 1) x 200ms.
   Default Chain recovery time = (5 – 1) x 200ms = 800ms.

3. Submit: Click “Submit” button when you have finished Chain Protocol setting.

Set Chain Pass-Through Port	Chain Pass-Through Port 1 ----	Chain Pass-Through Port 2 ----
Chain Pass-Through Port State		
		Disable Update Setting

Chain Pass-Through Setting

To configure the IQ Chain Pass-Through ports:

1. From the drop-down list below the **Chain Pass-Through Port 1** heading, choose one of the daisy chained ports on the switch to be the Chain Pass-Through Port #1 for the switch.
2. Next, from the drop-down list below the **Chain Pass-Through Port 2** heading choose the remaining daisy chained port on the switch to be the Chain Pass-Through Port #2 for the switch.
3. To change the port number for either of the Chain pass-through ports on the switch, you must first click on the **Disable** button to clear the settings for both Chain Pass-Through ports. Repeat the previous steps to set the new port numbers to be Chain Pass-Through.
4. Click on the **Submit** button to load the changes into the running configuration.

Advanced Bridge Configuration	
Bridge BPDU-guard configuration	Disable
Error disable timeout configuration	Disable
Interval (10..1000000 sec), Default: 300	300

Advanced Per Port Configuration		
Port	Portfast configuration / status	BPDU-guard configuration
ge1	◉ Disable ○ Enable / Curr. OFF	Default
ge2	◉ Disable ○ Enable / Curr. OFF	Default
ge3	◉ Disable ○ Enable / Curr. OFF	Default
ge4	◉ Disable ○ Enable / Curr. OFF	Default
ge5	◉ Disable ○ Enable / Curr. OFF	Default
ge6	◉ Disable ○ Enable / Curr. OFF	Default
ge7	◉ Disable ○ Enable / Curr. OFF	Default
ge8	◉ Disable ○ Enable / Curr. OFF	Default
ge9	◉ Disable ○ Enable / Curr. OFF	Default
ge10	◉ Disable ○ Enable / Curr. OFF	Default
ge11	◉ Disable ○ Enable / Curr. OFF	Default
ge12	◉ Disable ○ Enable / Curr. OFF	Default
ge13	◉ Disable ○ Enable / Curr. OFF	Default
ge14	◉ Disable ○ Enable / Curr. OFF	Default
ge15	◉ Disable ○ Enable / Curr. OFF	Default
ge16	◉ Disable ○ Enable / Curr. OFF	Default
Note: Per port BPDU-guard configuration takes precedence over bridge configuration.		
		Submit

STP/Ring Page - Advanced Setting

The Advanced Setting Page contains several settings to determine how the switch will handle BPDU packets.

- **Bridge bpdu-guard configuration -** When the BPDU Guard feature is set for a bridge, all portfast-enabled ports of the bridge that have **bpdu-guard** set to default

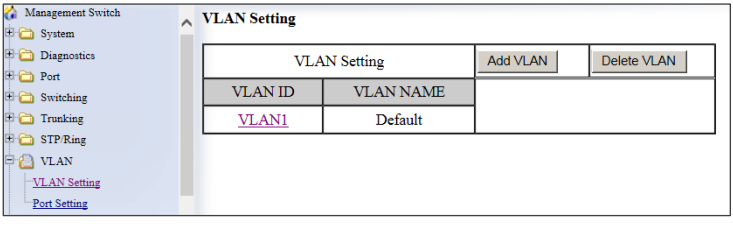
shut down the port on receiving a BPDU. In this case, the BPDU is not processed.

- **Error disable timeout configuration –** Enabling this allows a Disabled port to re-enable itself automatically after the specified Interval.
- **Interval –** Default is 300 seconds. This is the length of time a port will remain disabled after shutting down due to the **bpdu-guard**.

Advanced Per Port Configuration

- **Portfast Configuration / status –** Enabling this for Edge ports (ports connecting to an end device as opposed to another switch) protect the
- **BPDU-Guard Configuration –** When set to **Default** the port will default to the Advanced Bridge Configuration settings. **Enable** or **Disable** to override the Bridge BPDU-Guard

VLAN



VLAN 1 Setting

VLAN ID	1	VLAN Name	default
CPU Port	Attach		

PORT	VLAN Member	Tagged or Untagged
ge1	☑	Untagged
ge2	☑	Untagged
ge3	☑	Untagged
ge4	☑	Untagged
ge5	☑	Untagged
ge6	☑	Untagged
ge7	☑	Untagged
ge8	☑	Untagged
ge9	☑	Untagged
ge10	☑	Untagged
ge11	☑	Untagged
ge12	☑	Untagged

Submit

VLAN Setting

Port Based VLAN vs. Tagged Based VLAN

The switch can be configured to operate in one of two VLAN modes: Port based VLAN mode or Tagged based VLAN mode.

To configure the VLAN Database, do the following:

1. Click on the **Add VLAN** button.
2. Enter the **VLAN ID**.
3. Enter the **VLAN Name**.
4. Select **Attach** or **Detach** for the **CPU Port.** Attaching the CPU to a VLAN is typically done on the Management VLAN.
5. Select the ports to be a member of the VLAN.
6. Click on **Submit** button.
7. Repeat for all the VLANs that are needed.
8. Save the configuration.

VLAN Port Setting

Port	Mode	PVID	Priority Level
ge1	Hybrid	1	0
ge2	Hybrid	1	0
ge3	Hybrid	1	0
ge4	Trunk	1	0
ge5	Hybrid	1	0
ge6	Hybrid	1	0
ge7	Hybrid	1	0
ge8	Trunk	1	0
ge9	Hybrid	1	0
ge10	Hybrid	1	0
ge11	Hybrid	1	0
ge12	Hybrid	1	0

Update Setting

Port Setting

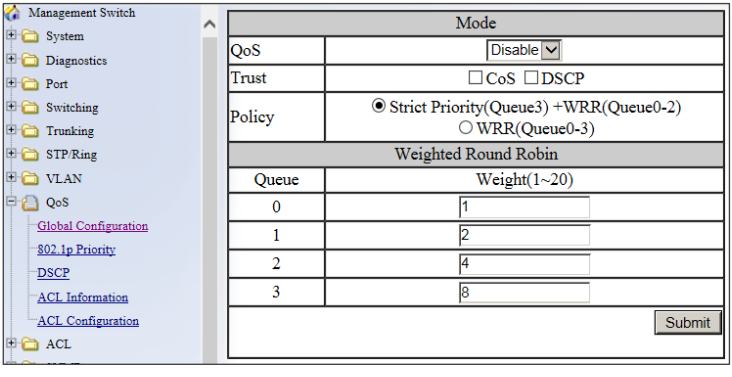
Configuring the Port Type and the PVID setting

To configure the proper port type and the PVID setting for each switch port:

1. Choose the port type for each port in the drop-down list.
2. Enter the **PVID VLAN** for each port.
3. Enter the **Priority Level** (optional).
4. Click on the **Update Setting** button.
5. Save the configuration.

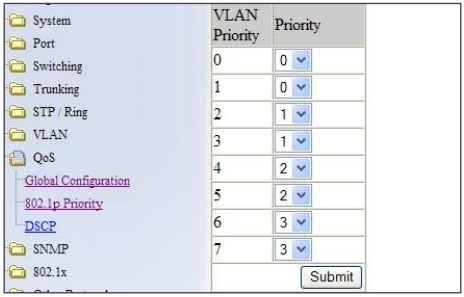
Warning: Modifying the Port Type using the Web GUI will cause that switch port to lose all its current VLAN membership and become a member port for the PVID VLAN only. You will lose your current connection to the switch, should you choose to modify the PVID of the port that connects your Computer to the switch.

QoS



Global Configuration

1. QoS: Click “QoS” drop-down menu from “QoS” drop-down list to choose “Enable” or “Disable” to enable or disable QoS.
2. Trust: Enable or disable the switch port to trust the CoS (Class of Service) labels of all traffic received on that port. Enable or disable a routed port to trust the DSCP (Differentiated Service Code Point) labels of all traffic received on that port.
3. Policy: Choose “Strict Priority(Queue3) + WRR(Queue0-2)” or “WRR(Queue0-3)”. A strict priority queue is always emptied first. The queues that are used in the WRR (Weighted Round Robin) are emptied in a round−robin fashion, and you can configure the weight for each queue.
4. Weighted Round Robin: Click in the “Weight(1~55)” textbox and specify a new number from 1 ~ 55 for Queue 0 ~ 3.
5. Submit: Click “Submit” button to save the configuration.



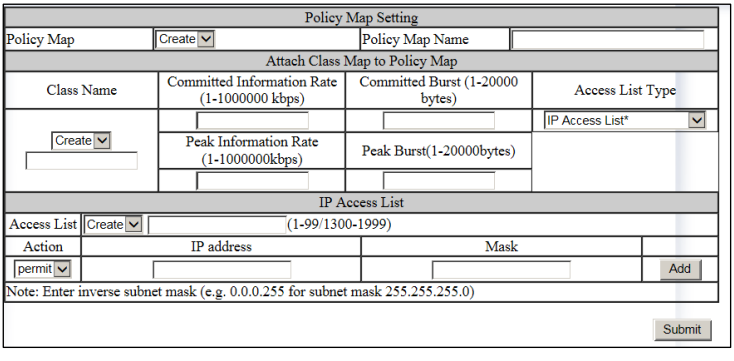
802.1p Priority

1. Priority: Click “Priority” drop-down menu from “Priority” drop-down list to choose 0 ~ 3 for VLAN Priority 0 ~ 7.
2. Submit: Click “Submit” button when you have finished 802.1p priority.

DSCP Priority	Priority	DSCP Priority	Priority	DSCP Priority	Priority	DSCP Priority	Priority
0	0	1	0	2	0	3	0
4	0	5	0	6	0	7	0
8	0	9	0	10	0	11	0
12	0	13	0	14	0	15	0
16	0	17	0	18	0	19	0
20	0	21	0	22	0	23	0
24	0	25	0	26	0	27	0
28	0	29	0	30	0	31	0
32	0	33	0	34	0	35	0
36	0	37	0	38	0	39	0
40	0	41	0	42	0	43	0
44	0	45	0	46	0	47	0
48	0	49	0	50	0	51	0
52	0	53	0	54	0	55	0
56	0	57	0	58	0	59	0
60	0	61	0	62	0	63	0
							Submit

DSCP

1. Priority: Click “Priority” drop-down menu from “Priority” drop-down list to choose 0 ~ 3 for DSCP Priority 0 ~ 63.
2. Submit: Click “Submit” button.



Configuring ACL

In order to enable the ACL feature on the switch, the QoS feature must be enabled on the switch as well. In order to apply the ACL packet filtering features on a port, you must:

1. Create and configure an ACL Access List first.
2. Next, you will need to create and configure an ACL Class Map,
3. Associate the previously created ACL Access Lists to this ACL Class Map.
4. Next, create and configure an ACL Policy Map
5. Associate all the appropriate and necessary ACL Classes into this ACL Policy Map.
6. Then apply this ACL Policy Map (and all the Access Lists that it contains) to a specific port.

ACL Policy Map

To create a new ACL Policy Map, follow the instructions below.

1. Make sure that the **Create** option is selected from the drop-down list next to **Policy Map.**

2. Next, make sure that the **Create** option is selected from the drop-down list under **Class Name**.

Next, you will be creating a new ACL Access List which is necessary to create an ACL Class Map. From the information listed below you will find the configuration steps necessary for all of the four available ACL Access Lists. You can choose one Access List from the below list and follow the steps there to complete the configuration for that Access List.

To configure an IP Access List:

1. Select the **IP Access List** option from the drop-down list below **Access List Type**.
2. If you have already created an IP Access List previously and would like to apply it to the new ACL Class, then select the Access List number from the drop-down list next to **Access List**.
3. If you want to create a new IP Access List, make sure that the **Create** option is selected from the drop-down list next to **Access List**.
4. To give the new IP access list an ID, enter a number in the range from 1 – 99, or from 1300 – 1999, into the entry field next to the “Create” option drop-down list.
5. You can enter a source IP address to allow an IP packet with that source IP to gain entry into the switch. To do this, choose the permit option from the drop-down list under the **Action** column.
6. Next, enter the source IP address into the entry field from the **IP address** column.
7. Next, enter the Comparison Mask for the source IP address in reverse logic, into the entry field from the **Mask** column. In reverse logic, 255.255.255.0 would be 0.0.0.255.
8. Next, click on the **Add** button.
9. You can enter a source IP address in order to deny an IP packet with that source IP to gain entry into the switch. To do so, you must choose the **deny** option from the drop-down list under the **Action** column. Next, enter the IP address and mask as described in step 6 and 7. You can also use the **any** wild card in lieu of entering a source

IP address in the entry field from the **IP address** column. You will need to do this if you wish to deny any additional IP packet from entry to the switch that did not match any of the previous rules from all the previous access control lists, otherwise these additional IP packets will also be allowed entry into the switch.

IP Access List (Extended)

1. Select the **IP Access List (Extended)** option from the drop-down list below **Access List Type.**
2. To apply an existing **Extended IP Access** to the new ACL Class, then select the Access List number for the previously configured **Extended IP Access** List from the drop-down list next to **Access List**.
3. if you want to create a new Extended IP Access List, verify that the **Create** option is selected from the drop-down list next to **Access List**.
4. To give this particular Extended IP access list an ID, enter a number in the range from 100 – 199, or from 2000 – 2699, into the entry field next to the **Create** option drop-down list.
5. You can enter a source and a destination IP address to allow an IP packet with these pair of IP addresses to gain entry into the switch. To do this, choose the **permit** option from the drop-down list under the **Action** column.
6. Next, enter the source IP address of the IP packet into the entry field under the **Source Address** column.
7. Next, enter the comparison Mask for the source IP address in reverse logic (a binary “0” in the mask means “this bit position needs to checked”, whereas a binary “1” in the mask means “this bit position does not need to be checked”) into the entry field from the **Source Wildcard Bits** column. In reverse logic, 255.255.255.0 is listed as 0.0.0.255.
8. Next, enter the destination IP address of the IP packet into the entry field under the **Destination Address** column.

9. Next, enter the comparison Mask for the destination IP address in reverse logic into the entry field from the **Destination Wildcard Bits** column.
10. Next, click on the **Add** button.
11. You can also filter the IP packet using the packet's source and destination Transport Layer protocol port numbers in addition to the source and destination IP addresses. enter the source Transport Layer protocol port number into the entry field under the **port (1-65535)** column following the source IP address comparison mask column. Next, enter the destination Transport Layer protocol port number into the entry field under the **port (1-65535)** column following the destination IP address comparison mask column.
12. To enter an extended IP access list entry in order to deny the entry of an IP packet into the switch, you must choose the **deny** option from the drop-down list under the **Action** column. Next, enter the IP addresses and Transport Layer protocol port numbers using the same steps as in the previous two bullets.
13. You can also use the **any** wild card in lieu of entering an IP address in the entry field from both the **Source Address** and **Destination Address** column. You will need to do this if you wish to deny any additional IP packet from entry to the switch that did not match any of the previous rules from all the previous access control lists, otherwise these additional IP packets will also be allowed entry into the switch.

Mac Access List

1. To configure a MAC access list, select the **MAC Access List** option from the drop-down list below **Access List Type**.
2. If a MAC Access List was previously created and you would like to apply it to the new ACL Class, then select the **Access List number** for the previously configured MAC Access List from the drop-down list next to **Access List**. If you want to create a new MAC Access List, insure that the **Create** option is selected from the drop-down list next to **Access List**.

3. To give this particular MAC Access List an ID, enter a number in the range from 2000 – 2699, into the entry field next to the **Create** option drop-down list.
4. You can enter a source and a destination Ethernet address to allow a specific Ethernet packet entry into the switch. To do so, you must choose the **permit** option from the drop-down list under the **Action** column.
5. Next, enter the source Ethernet address of the Ethernet packet into the entry field under the **Source MAC** column.
6. Next, enter the **Comparison Mask** for the source Ethernet address in reverse logic (Ex. 255.255.255.0 is 0.0.0.255 in reverse logic) into the entry field from the **Mask** column following the **Source MAC** column.
7. Next, enter the destination Ethernet address of the Ethernet packet into the entry field under the **Destination MAC** column.
8. Next, enter the comparison Mask for the destination Ethernet address in reverse logic into the entry field from the **Mask** column following the **Destination MAC** column. Next, choose the appropriate encapsulation format of the Ethernet packet that you want to allow entry into the switch from the drop-down list under the **Format** column.
9. Next, click on the **Add** button.
10. You can also filter the Ethernet packet using the Ethernet packet payload's **EtherType number** in addition to the source and destination Ethernet addresses. enter the **EtherType number** of the Ethernet packet into the entry field under the **Ether type** column.
11. Next, you can also enter a **comparison mask** for the EtherType number into the entry field under the **Mask** column next to the **Ether type** column.
12. To enter a MAC Access List entry in order to deny the entry of an Ethernet packet into the switch, you must choose the **deny** option from the drop-down list under the **Action** column.
13. Next, enter the Ethernet addresses and the EtherType number using the same steps as in steps 11 and 12. You can also use the **any** wild card in lieu of entering an Ethernet address in the entry field from both the **Source**

MAC and **Destination MAC** column. You will need to do this if at any time this Access List should become the very last Access List rule in a ACL Policy Map to serve as the catch all deny rule in order to deny any and all types of packets from entry into the switch that did not match any of the previous rules from all the previous access control lists.

Layer 4

1. To use the Layer 4 access list feature and apply it to the new ACL Class, select the **Layer 4** option from the drop-down list below **Access List Type**.
2. You can enter a source or destination Transport Layer protocol port number to allow any IP packet with this port number to gain entry into the switch. To do this, choose the appropriate port number type (Source port or Destination port) from the drop-down list next to **Option**.
3. Next, enter the correct port number into the entry field next to “TCP/UDP Port No.(1-65535)”.
4. After you have finished configuring one ACL Access List from the previous step, you must now create a name for the new ACL Class Map that will be associated with this Access List. To do this, enter a name for the new ACL Class Map into the text box under **Class Name**.

Note: Since this particular Access List type does not contain any deny rules, this Access List will have to be used in conjunction with another type of Access List, if you wish to filter any packet from entry to the switch that did not match the classification rules from this Access Lists. Otherwise all packets that did not match the classification rules of this Access List will also be allowed entry into the switch.

Bandwidth Limiting

1. The amount of bandwidth that is being allocated for the traffic that is being allowed under this new ACL Class can also be limited. To do this, enter the bandwidth amount that you want to allocate for the traffic in the entry fieldes in the Attach Class Map to Policy Map section.

Update the following fields:

- Committed Information Rate (1-1000000 kbps)
- Peak Information Rate(1-1000000kbps)
- Committed Burst (1-20000 bytes)
- Peak Burst (1-20000bytes)

Note: The Peak rates must be higher than the Committed Rate. Current firmware discards any packets that exceed the Committed Rate

2. Next, enter a name in the entry field next to “Policy Map Name” for the new ACL “Policy Map” that you are currently creating, and click on the submit button.

Applying a Policy Map to a Port

To apply an ACL **Policy Map** to a port:

1. Select the correct ACL **Policy Map** from the drop-down list next to **Policy Map**.
2. Next, check the boxes below **Attach Class Map to Policy Map** next to all the ports that you would like to apply this Policy Map to.
3. Click on the **Attach** button.

Add IP Access List	
Number	
Action	Permit
Type	
◉ Standard ○ Extended	
Source	
◉ Address ○ Any ○ Host	
Source Address	
Source Wildcard Mask	
Source Port ◉ any	(0-65535) ○ eq ○ gt ○ lt ○ neq
Source Port (Max)	○ range
Destination	
◉ Address ○ Any ○ Host	
Destination Address	
Destination Wildcard Mask	
Destination Port ◉ any	(0-65535) ○ eq ○ gt ○ lt ○ neq
Destination Port (Max)	○ range
IP Protocol	
◉ TCP(6) ○ UDP(17) ○ Other	(0-255) ○ Any
	Add
eq - Equal,gt - Greater Than,lt - Less Than,neq - Not Equal	

IP Access List			
Select	Number	Action	Rules
			Delete

Access Lists

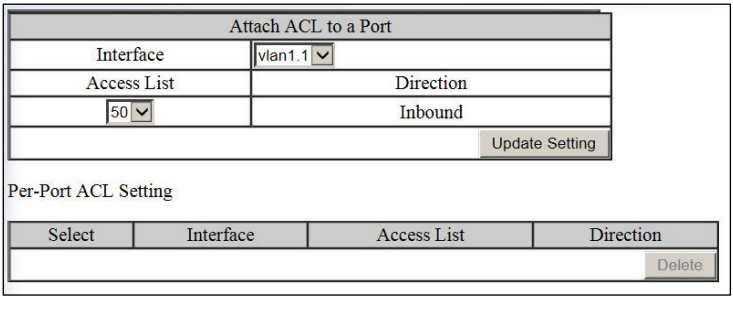
IP-based Access Control Lists give the network administrator control over network traffic, and make it easier to implement security policies. Note that under the current firmware version, only inbound Access Control Lists are supported. Note that standard access lists can filter a packet based on the source IP address only. Extended access lists can filter on both the source and destination IP addresses in the packet.

Creating an Access List

To create an Access List:

1. Enter the number of the Access List (1 – 199 or 1300 – 2699)
2. Select the type of action: either Permit or Deny.
3. Choose Standard or Extended access list

4. Enter the source IP address and the source wildcard bits.
5. Enter the destination IP address and destination wildcard bits.
6. Define the Source Ports by entering a number and selecting an operator: **eq** (equal to), **gt** (greater than), **lt** (less than), or **neq** (not equal to). You can also enter a range of source ports into the field below and clicking the “range” radio button.
7. Define the destination ports in the same way as described for the source ports above.
8. Select the IP protocol
9. Click Add to create the new list.



Port ACL Settings

To attach an existing Access List to a port, select the desired interface from the drop down menu, and then the Access List you wish to attach. Then click **Update Setting**. Remember to save the configuration before exiting the web interface.

SNMP

SNMP Status	Disable
SNMP General Setting	
Description	
Location	
Contact	
Trap Community Name 1	
Trap Community Name 2	
Trap Community Name 3	
Trap Community Name 4	
Trap Community Name 5	
Trap Host 1 IP Address	
Trap Host 2 IP Address	
Trap Host 3 IP Address	
Trap Host 4 IP Address	
Trap Host 5 IP Address	
Link Down Trap	Disable
Link Up Trap	Disable
MAC Notification Trap	Disable
MAC Notification Interval (1 to 65535 seconds)	1
MAC Notification History Size (1 to 500)	1
MAC Notification Added	ge1 ge2 ge3 ge4 ge5 ge6 ge7 ge8 ge9 ge10 ge11 ge12
MAC Notification Removed	ge1 ge2 ge3 ge4 ge5 ge6 ge7 ge8 ge9 ge10 ge11 ge12
	Update Setting

SNMP General Settings

To configure the general settings for the SNMP feature:

1. The SNMP server on the switch can be enabled or disabled by selecting the appropriate choice from the dropdown list next to SNMP Status.
2. Enter a short description (up to 256 characters) into the entry field next to Description, for the purpose of switch identification.

3. Enter a name into the entry field next to Location, for the purpose of identifying the location of the switch.
4. Enter a name (up to 256 characters) into the entry field next to Contact, to identify the entity that is responsible for this switch.
5. Enter a trap community name (up to 256 characters) into the entry field next to any one of the 5 Trap community name entry boxes from Trap Community Name 1 to Trap Community Name 5.
    a. Community names identify the SNMP Trap community group that the traps on this switch should be sending to. The identical Trap community names should also be set on the NMS hosts that will be receiving the traps. Each name defined corresponds with the **Trap host IP address** entry box with the same number. For example, **Trap Community Name 1** corresponds with **Trap Host 1 IP Address**.
6. Enter an IP address, for the NMS host(s) that should be receiving traps from this switch, into the entry field next to any one of the 5 Trap host IP address entry boxes from **Trap Host 1 IP Address to Trap Host 5 IP Address**
7. Enable or disable the link down trap by selecting the appropriate choice from the drop-down list next to **Link Down Trap**. This will allow or stop the switch from sending a trap to the identified trap community groups when any port on the switch moves from the link up state to the link down state.
8. Enable or disable the link up trap by selecting the appropriate choice from the drop-down list next **Link Up Trap**. This will allow or stop the switch from sending a trap to the identified trap community groups when any port on the switch moves from the link down state to the link up state.
9. Enable or disable the MAC notification trap by selecting the appropriate choice from the drop-down list next to **MAC Notification Trap**. This will allow or stop the switch from sending a trap to the identified trap community

groups anytime there is a change in the MAC table on certain selected ports of the switch.

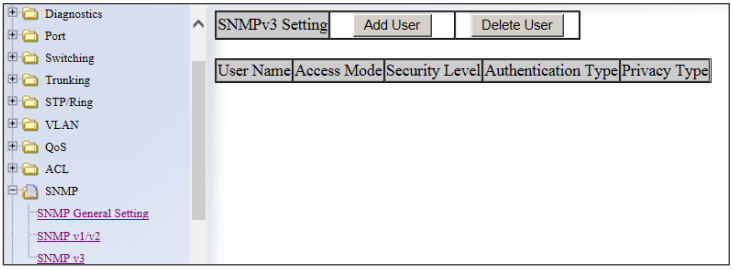
10. Set the interval between the MAC notification traps that you want the switch to send by entering the interval (in number of seconds from 1 to 65535) into the entry field next to **MAC Notification Interval (1 to 65535 seconds)**.
11. Set the size of the MAC notification history table by entering the total number of records (from 1 to 500) that the switch will keep for user to review at any one time into the entry field next to **MAC Notification History Size (1 to 500)**.
12. Select which ports on the switch for which traps should be sent when there is a new MAC address added to the MAC table for the port, by checking the appropriate check boxes for these ports in the **MAC Notification Added** section.
13. Select which ports on the switch for which traps should be sent when there is a MAC address being removed from the MAC table for the port, by checking the appropriate check boxes for these ports in the **MAC Notification Removed** section.
14. Click on the **Update** button after you have finished the configuration of the SNMP Server (Agent) General Settings.
15. Save the configuration.

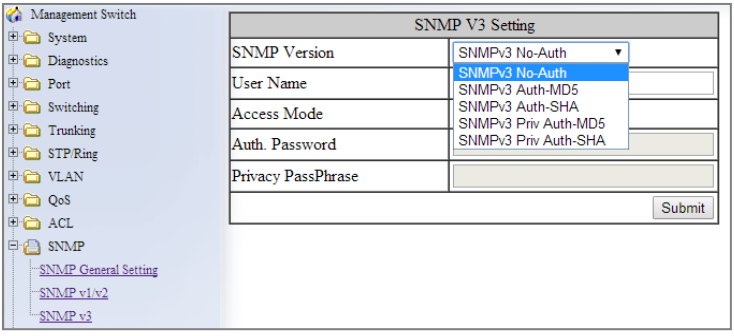
SNMP V1/V2c Setting	
Get Community Name	public
Set Community Name	private
	Update Setting

SNMP v1/v2c

1. Get Community Name: Click in the “Get Community Name” textbox and specify a get community name.
2. Set Community Name: Click in the “Set Community Name” textbox and specify a set community name.
3. Update Setting: Click “Update Setting” button when you

have finished SNMP V1/V2c Setting.





SNMP v3

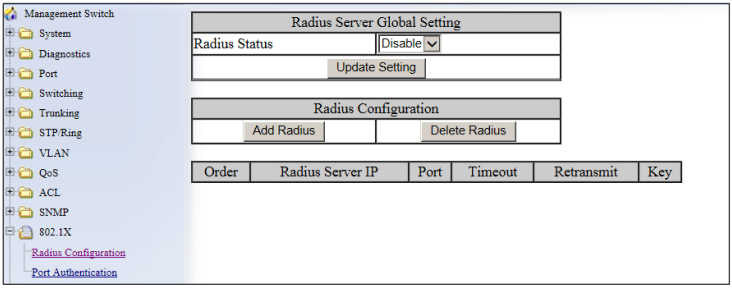
Add User:

1. Add User: Click “Add User” button. The “SNMP V3 Setting” window appears.
2. SNMP Version: Click “SNMP Version” drop-down menu from “SNMP Version” drop-down list to choose “SNMPv3 No-Auth”, “SNMPv3 Auth-MD5”, “SNMPv3 Auth-SHA”, “SNMPv3 Priv Auth-MD5”, or “SNMPv3 Priv Auth-SHA”.
   - SNMPv3 No-Auth: Add a user using SNMP v3 without authentication.
   - SNMPv3 Auth-MD5: Add a user using SNMP v3 with authentication. Click in the “Auth. Password” textbox and specify an authentication password.
   - SNMPv3 Auth-SHA: Add a user using SNMP v3 with authentication. Click in the “Auth. Password” textbox and specify an authentication password.

- SNMPv3 Priv Auth-MD5: Add a user using SNMP v3 with authentication and privacy. Click in the “Auth. Password” textbox and specify an authentication password. Click in the “Privacy PassPhrase” textbox and specify a privacy pass phrase.
- SNMPv3 Priv Auth-SHA: Add a user using SNMP v3 with authentication and privacy. Click in the “Auth. Password” textbox and specify an authentication password. Click in the “Privacy PassPhrase” textbox and specify a privacy pass phrase.

3. User Name: Click in the “User Name” textbox and specify a user name for user using SNMP v3.
4. Access Mode: Click “Access Mode” drop-down menu from “Access Mode” drop-down list to choose “Read Only” or “Read/Write”.
   - Read Only: Add a user using SNMP v3 with read-only access mode.
   - Read/Write: Add an user using SNMP v3 with read-write access mode
5. Sumit: Click “Sumit” button when you have finished SNMP V3 Setting.

802.1x

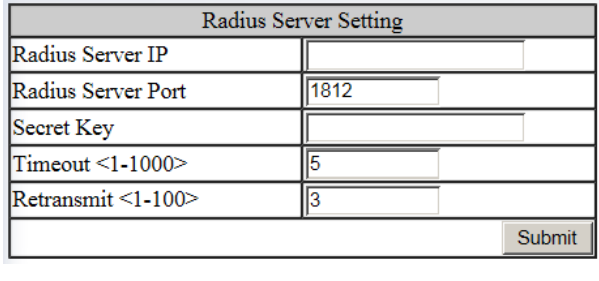


Radius Configuration

By default, the 802.1X function is globally disabled on the switch. If you want to use the 802.1X port based security on a port, you must enable it globally on the switch first, and then enable it on a per port basis.

To enable the 802.1X function globally on the switch:

1. Choose **enable** from the drop down list next to **Radius Status**
2. Click on the **Update Setting** button.



Adding a Radius Server

Next, you will need to configure the settings that the switch will need in order to connect to a RADIUS server.

1. Click on the **Add Radius** button (see **Error! Reference ource not found.**).

2. Next, enter the IP address of the RADIUS server that the switch will use in order to authenticate in the entry field next to **Radius Server IP**.
3. Enter the password for RADIUS server in the entry field next to **Secret Key**.
4. Optionally, the UDP port number for the RADIUS server (if it is different from the standard default 1812) can be changed. To do this, enter the port number in the entry field next to **Radius Server Port**.
5. Next, you can choose to configure the minimum time that the switch must wait, before it is allowed to retransmit a message to the RADIUS server due to no response. To do this, enter the number of seconds that the switch must wait (between 1 and 1000 seconds) into the entry field next to **Timeout <1-1000>** .
6. Next, you can choose to configure the maximum number of times that the switch can attempt to retransmit a message to the RADIUS server. To do this, please enter a number (from 1 to 100) into the entry field next to **Retransmit**.
7. Click on the **Submit** button.

802.1x Port Setting	
Interface	ge1
Authentication State	Enabled
Port Control	Auto
Periodic Reauthentication	Enable
Reauthentication Period <1-4294967295>	3600 (sec.)
Submit	

Port	Port Enabled	Port Control	Port Status	Periodic Reauthentication	Reauthentication Period
ge1					
ge2					
ge3					
ge4					
ge5					
ge6					
ge7					
ge8					
ge9					
ge10					
ge11					
ge12					

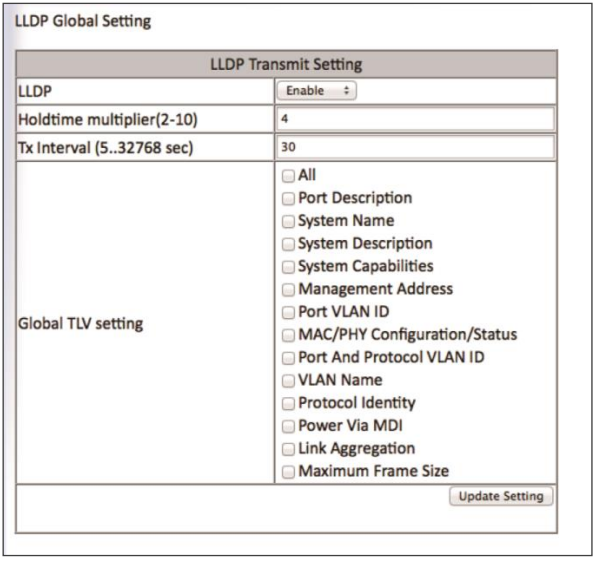
Port Authentication

1. Interface: Click “Interface” drop-down menu from “Interface” drop-down list to choose the port to be set port-based authentication.
2. Authentication State: Click “Authentication State” drop-down menu from “Authentication State” drop-down list to choose “Enable” or “Disable” to enable or disable authentication state.
3. Port Control: Click “Port Control” drop-down menu from “Port Control” drop-down list to choose “Auto”, “Force Authorized”, or “Force Unauthorized” to force a port state. “Auto” specifies to enable authentication on port. “Force Authorized” specifies to force a port to always be in an authorized state. “Force Unauthorized” specifies to force a port to always be in an unauthorized state.
4. Periodic Reauthentication: Click “Periodic Reauthentication” drop-down menu from “Periodic Reauthentication” drop-down list to choose “Enable” or “Disable” to enable or disable periodic reauthentication.
5. Reauthentication Period <1-4294967295>: Click in the

"Reauthentication Period" textbox and specify the seconds between reauthorization attempts. The default time is 3600 seconds.

6. Update Setting: Click "Update Setting" button when you have finished port-based authentication setting.

LLDP



Enable/Disable LLDP

To enable LLDP on the switch:

1. Select Enable or Disable from the Drop Down box in the **LLDP** field of the LLDP Transmit Settings box.
2. Click on the **Update Settings** button.
3. Save the configuration.

Holdtime Multiplier

The Holdtime multiplier for transmit TTL is used to compute the actual time-to-live (TTL) value used in an LLDP frame.

The TTL value is the length of time the receiving device should maintain the information in its MIB. To compute the TTL value, the system multiplies the LLDP transmit (TX) interval by the holdtime multiplier. For example, if the LLDP transmit (TX) interval is 30 and the holdtime multiplier for TTL is 4, then the value 120 is encoded in the TTL field in the LLDP header.

To adjust the Holdtime multiplier:

1. Enter a numeric value between 2 and 10 (default is 4) in the Holdtime Multiplier text box.
2. Click on the **Update Settings** button.

The TX Interval setting adjusts the time that LLDP information is transmitted by the switch. Values can range from 5 to 32768 seconds (default is 30 seconds).
To adjust the TX Interval setting:

1. Enter a numeric value between 5 and 32768 (default is 30) in the TX Interval text box.
2. Click on the **Update Settings** button.
3. Save the configuration.

Global TLV Setting

The global TLV (Time – Length – Value) settings are advertised by the switch to other LLDP devices.
To enable specific TLVs for the switch:

1. Select the check box for each TLV that is to be enabled or select the checkbox for the **All** option which will enable all TLVs for the switch.
2. Click on the **Update Settings** button.
3. Save the configuration.

Port	Link Status	Transmit	Receive	Notify
1	Down	Disabled	Disabled	Disabled
2	Down	Disabled	Disabled	Disabled
3	Down	Disabled	Disabled	Disabled
4	Down	Disabled	Disabled	Disabled
5	Down	Disabled	Disabled	Disabled
6	Down	Disabled	Disabled	Disabled
7	Down	Disabled	Disabled	Disabled
8	Down	Disabled	Disabled	Disabled
9	Down	Disabled	Disabled	Disabled
10	Down	Disabled	Disabled	Disabled
11	Down	Disabled	Disabled	Disabled
12	Down	Disabled	Disabled	Disabled
13	Down	Disabled	Disabled	Disabled
14	Down	Disabled	Disabled	Disabled
15	Down	Disabled	Disabled	Disabled
16	Down	Disabled	Disabled	Disabled
17	Down	Disabled	Disabled	Disabled
18	Down	Disabled	Disabled	Disabled

LLDP Ports Settings

LLDP Ports Settings allows the individual ports on the switch to be configured for LLDP independently of one another. Each port can be configured to transmit LLDP information, receive LLDP information, and notify (via SNMP or Syslog) if there are changes in the LLDP information received from neighboring devices.

Enabling LLDP transmission for a specific Port

To enable the transmission of LLDP information for a specific port:

1. Select Enable from the Drop Down box under the Transmit field for each port for which the transmission of LLDP information should be enabled.
2. Click on the **Submit** button.

Enabling LLDP Reception for a specific Port

To enable the reception of LLDP information for a specific port:

1. Select Enable from the Drop Down box under the Receive field for each port for which the reception of LLDP information should be enabled.
2. Click on the **Submit** button.

Enabling Notifications

To enable notification whenever a port receives changed LLDP information:

1. Select Enable from the Drop Down box under the Notify field for each port that should send a notification whenever received LLDP information changes.
2. Click on the **Submit** button
3. Save the configuration after making changes shown on this page.

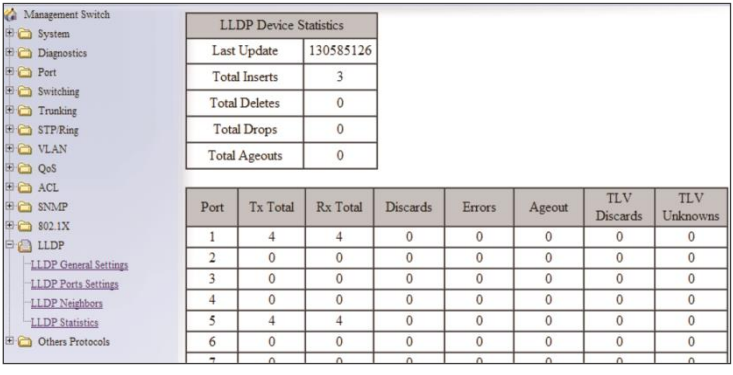
LLDP Neighbor Table

Port	System Name	Chassis ID	Port ID	IP Address	TTL
1	switch_a	00:e0:b3:33:07:bc	fe5	10.58.7.199	95
5	switch_a	00:e0:b3:33:07:bc	fe1	10.58.7.199	95
28	switch_a	00:e0:b3:32:01:a4	fe1	10.58.7.162	100

LLDP Neighbors

LLDP Neighbors is a read-only page (see **Error! Reference ource not found.**) that will display all the LLDP capable devices detected by the switch. The following information about connected LLDP-enabled devices is displayed in a tabular format. The columns displayed are:

- **Port** – The local switch port to which the remote device is connected.
- **Chassis ID** – The MAC address of the remote device.
- **Port ID** – The port number of the remote device.
- **IP Address** – The management IP address of the remote device.
- **TTL** – Time to Live, the amount time remaining before the remote device's LLDP is aged-out from the switch.



LLDP Device Statistics	
Last Update	130585126
Total Inserts	3
Total Deletes	0
Total Drops	0
Total Ageouts	0

Port	Tx Total	Rx Total	Discards	Errors	Ageout	TLV Discards	TLV Unknowns
1	4	4	0	0	0	0	0
2	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0
5	4	4	0	0	0	0	0
6	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0

LLDP Statistics

This is a read-only page that displays LLDP device statistics and LLDP statistics on a per-port basis. The information collected on this page includes:

- Port – switch port number.
- TX Total – Total LLDP packets sent.
- RX Total – Total LLDP packets received.
- Discards – Number of LLDP packets discarded.
- Errors – LLDP errors.
- Ageout – LLDP information that has been aged out by the switch.
- TLV Discards – TLV information discarded
- TLV Unknown – TLV information that is unknown

ROUTING

Add Static Route	
Destination Prefix	
Prefix ◉ Length ○ Mask	
Prefix Length	
Prefix Mask	
◉ Interface ○ Next Hop	
Interface	vlan1.1
Next Hop	
Administrative Distance	1 (1-255)
	Add

Static Route Entries			
Select	Destination Prefix	Interface/Next Hop	Administrative Distance
			Delete

Creating a Static Route

1. In the Destination field, enter the IP address of the final destination.
2. Choose either Prefix **Length** or **Mask**, and enter the corresponding number in the field below.
3. Select **Interface** or **Next Hop**. For interface, choose the switch VLAN port to be used for the static route. For Next Hop, enter the IP address of the closest router or switch to be used.
4. Enter the Administrative Distance.
5. Click Add to create the static route.

You can delete existing static routes by selecting an entry and clicking the Delete button.

Routing Table					
Code	Destination	Distance/Metric	Next Hop	Interface	Up Time
S	1.111.111.0/24	1/0	172.16.0.200	ge1	
S	2.111.111.0/24	1/0	172.16.0.200	ge1	
C	127.0.0.0/8		directly-connected	lo	
C	172.16.0.0/24		directly-connected	ge1	
C	192.168.2.0/24		directly-connected	ge8	
R	192.168.3.0/24	120/2	172.16.0.200	ge1	00:02:50
R	192.168.4.0/24	120/12	172.16.0.200	ge1	00:02:40
R	192.168.5.0/24	120/12	172.16.0.200	ge1	00:02:40
R	192.168.6.0/24	120/12	172.16.0.200	ge1	00:02:40
R	192.168.7.0/24	120/12	172.16.0.200	ge1	00:02:40
R	192.168.8.0/24	120/12	172.16.0.200	ge1	00:02:40
R	192.168.9.0/24	120/12	172.16.0.200	ge1	00:02:40
R	192.168.10.0/24	120/12	172.16.0.200	ge1	00:02:40
R	192.168.11.0/24	120/12	172.16.0.200	ge1	00:02:40
R	192.168.12.0/24	120/12	172.16.0.200	ge1	00:02:40
C	192.168.20.0/24		directly-connected	vlan1.1	

Codes:
R - RIP, K - Kernel, C - Connected,
S - Static, * - Candidate default

Refresh

Routing Table

The routing table is a read-only page that shows existing routes. The Routing Table shows:

- **Route Code** – (R)ip, (K)ernel, (C)onnected, (S)tatic, * Default
- **Destination** – Destination IP address
- **Distance/Metric** – Administrative distance/metric.
- **Next Hop** – Next closest router or Layer 3 switch on the route
- **Interface** – Interface used by defined route
- **Up Time** – Length of time the route is active

Add Route Map	
Name	
Permit/Deny	Permit
Sequence Number	
Match Clause	
◉ Interface ○ Metric ○ IP ○ None	
Interface	vlan1.1
Metric	
IP ◉ Address ◉ Next Hop ◉ None	
Access List	
Set Clause	
◉ Metric ○ Next Hop ○ None	
Metric	
Next Hop	
	Add

Route Map

Route Maps can be used for both redistribution and policy routing, and thus give you more control over the way packets move around the network.

To create a new Route Map:

1. Enter a descriptive name in the Name field.
2. Select the type of Route Map – **Permit** or **Deny**.
3. Under Match Clause, choose the data item that the map will match in order for the route to take effect: **Interface**, **Metric**, **IP address**, or **None**.
4. Select the destination network or next hop router address to match an ACL, in an ACL is to be used.
5. Select the Set Clause data type, and enter the metric or next hop results.
6. Click **Add** to create the Route Map.

Proxy ARP	
Interface	vlan1.1
Proxy ARP	Disable Enable
	Update Setting

Proxy ARP

Proxy ARP allows the switch to answer ARP queries for a network address that is not on that network. The ARP Proxy is aware of the location of the traffic's destination, and offers its own MAC address as the (seemingly) final destination. The "captured" traffic is then typically routed by the Proxy to the intended destination via another interface or via a tunnel. Proxy ARP should be used on networks where IP hosts are not configured with a default gateway.

To enable Proxy ARP:

1. Select the VLAN or layer 3 interface on which you want to enable Proxy ARP.
2. Select “enable” from the dropdown menu.
3. Click **Update Setting**.

RIP

Router RIP	Disable
RIP General Setting	
Version	2
Default-Information	Disable
Default-Metric (1~16)	1 Default: 1
Distance (1~255)	120 Default: 120
Times Routing Table Update Timer (5~2147483647) Routing Information Timeout Timer (5~2147483647) Garbage Collection Timer (5~2147483647)	 30 Default: 30s 180 Default: 180s 120 Default: 120s
	Update Setting

The Routing Information Protocol (RIP) is a distance-vector routing protocol that uses hop count as a routing metric. RIP prevents routing loops by setting a limit on the number of hops allowed in a path from source to destination.

RIP General Settings

To enable and configure RIP on the managed switch:

1. Set the Router RIP field to Enable.
2. Choose RIP version 1 or 2.
3. Set the Default Metric value in the range of 1 to 16.
4. Set the Distance from 1 to 255 (Default value is 120)
5. Set the timings for the Routing Table Update Timer, the Routing Information Timeout Timer, and the Garbage Collection Timer (Default values are 30, 180, and 120 seconds respectively).
6. Click Update Setting to start RIP with the set values.

RIP Port Setting	
Interface	--
Receive Version	
Receive Packet	Enable
Send Version	
Send Packet	Enable
Split Horizon	Poison Reverse
Authentication Mode	MD5
Authentication Key	(1-16 characters)
	Update Setting

RIP Port Settings

To configure RIP port settings:

1. Select the interface.
2. Set the RIP receive version (1, 2, or both)
3. Set Receive packets to enable or disable
4. Set the Send Version to 1, 2, 1-compatible, or both.
5. Set Send Packet to Enable or Disable.
6. For the Split Horizon Field, select enable, disable, or poison reverse.
7. Set the Authentication Mode to disable, MD5, or simple password.
8. If the Authentication Mode is MD5 or Simple Password, set the Authentication Key (1 – 16 characters).
9. Click Update Setting

RIP Route

The RIP route table is a read-only page that shows existing RIP routes. The Routing Table fields are:

- **Route Code** – (R)ip, (K)ernel, (C)onnected, (S)tatic
- **Network** – IP address of destination network
- **Next Hop** – Next closest router or Layer 3 switch towards destination
- **Metric** – Number of hops
- **From** – IP address of source router
- **I/F** – Interface
- **Time** – Duration of time since last update

RIP Network by Subnet		
Subnet Address	Prefix Length	Action
		Add
192.167.0.0	16	Delete

RIP Network by Interface	
Interface	Action
vlan1.1	Add
vlan1.1	Delete

RIP Network

On the RIP Network screen, you can add or delete subnet addresses and interfaces to be advertised by RIP.

To add subnets or interfaces:

1. Enter the subnet address and prefix length, or choose the interface from the drop-down menu.
2. Click Add button.

Add RIP Neighbor	
IP Address	
	Add

Neighbor List	
Select	Neighbor Address
	Delete

RIP Neighbor

The RIP Neighbor screen is used to add/delete RIP neighbor IP addresses. Add the IP address of neighboring routers and layer 3 switches, and click Add. Select existing neighbors from the list at the bottom and click Delete to remove them.

Add RIP Passive Interface	
Interface	vlan1.1
	Add

Passive Interface List	
Select	Passive Interface
	Delete

Add or Delete RIP Passive Interface

On the RIP Passive screen, you can select an interface to be “passive,” that is, to prevent the RIP routing process from sending multicast/broadcast updates on that interface. Select the desired interface from the drop-down menu and click Add to make that interface passive. You can select and delete passive interfaces from the Passive Interface List at the bottom. Doing so will return them to send multicast/broadcast updates normally.

Redistribute List			
Protocol	Route Map	Metric	Action
Connected		--	Add
Connected		1	Delete

RIP Redistribute

Redistribution is using a routing protocol to advertise routes that have been learned by another routing protocol, static routes, or directly connected routes. To add an item to the redistribute list, select the protocol (**connected** or **static**), a route map that has been previously defined, and the desired metric, then click the Add button.

Other Protocols

GVRP Global Setting

GVRP	Disable
Dynamic VLAN Creation	Disable
	Update Setting

Per Port Setting (include LAG)

Port	GVRP	GVRP Applicant	GVRP Registration
ge1	Disable	Normal	Normal
ge2	Disable	Normal	Normal
ge3	Disable	Normal	Normal
ge4	Disable	Normal	Normal
ge5	Disable	Normal	Normal
ge6	Disable	Normal	Normal
ge7	Disable	Normal	Normal
ge8	Disable	Normal	Normal
ge9	Disable	Normal	Normal
ge10	Disable	Normal	Normal
ge11	Disable	Normal	Normal
ge12	Disable	Normal	Normal
			Update Setting

GVRP

GVRP Global Setting:

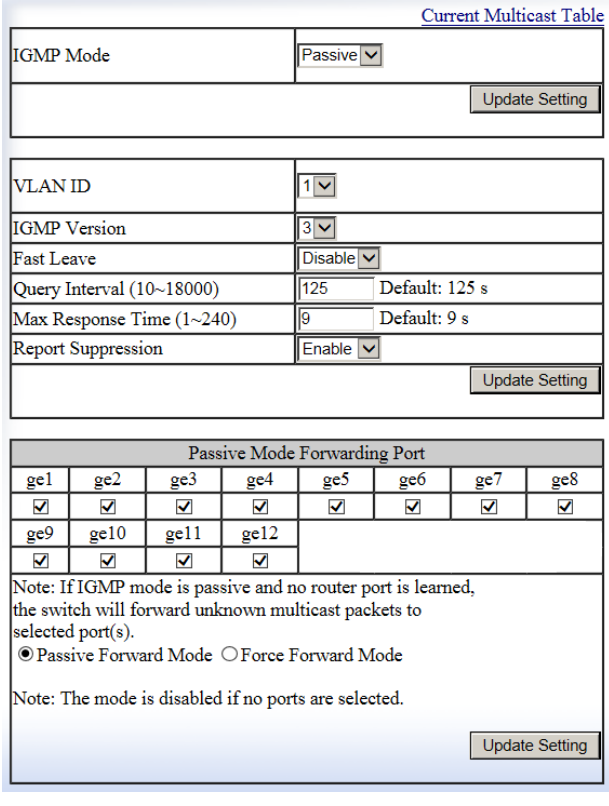
1. GVRP: Click “GVRP” drop-down menu from “GVRP” drop-down list to choose “Enable” or “Disable” to enable

or disable GVRP (GARP VLAN Registration Protocol).

2. Dynamic VLAN creation: Click “Dynamic VLAN creation” drop-down menu from “Dynamic VLAN creation” drop-down list to choose “Enable” or “Disable” to enable or disable Dynamic VLAN creation. GARP (Generic Attribute Registration Protocol) provides IEEE802.1Q compliant VLAN pruning and dynamic VLAN creation on IEEE802.1Q trunk ports.
3. Update Setting: Click “Update Setting” button when you have finished GVRP Global Setting.

Per port setting (include LAG):

1. GVRP: Click “GVRP” drop-down menu from “GVRP” drop-down list to choose “Enable” or “Disable” to enable or disable GVRP for the port.
2. GVRP applicant: Click “GVRP applicant” drop-down menu from “GVRP applicant” drop-down list to choose “Active” or “Normal” to the port. Ports in the GVRP active applicant state send GVRP VLAN declarations when they are in the STP (Spanning Tree Protocol) blocking state, which prevents the STP bridge protocol data units (BPDUs) from being pruned from the other port. Ports in the GVRP normal applicant state do not declare GVRP VLANs when in the STP blocking state.
3. GVRP registration: Click “GVRP registration” drop-down menu from “GVRP registration” drop-down list to choose “Enable” or “Disable” to enable or disable GVRP registration to the port. Configuring an IEEE802.1Q trunk port in registration mode allows dynamic creation (if dynamic VLAN creation is enabled), registration, and deregistration of VLANs on the trunk port.
4. Update Setting: Click “Update Setting” button when you have finished Per port setting.



IGMP Snooping

1. IGMP mode: Click “IGMP mode” drop-down menu from “IGMP mode” drop-down list to choose “Disable”, “Passive”, or “querier” for the switch. Disable: Disable IGMP on the switch. Passive: The switch with only multicast-data-forwarding capability. Querier: The switch acts as the querier for the network. There is only one querier on a network at any time.
2. Update Setting: Click “Update Setting” button when you have finished IGMP mode settings.
3. VLAN ID: Click “VLAN ID” drop-down menu from “VLAN ID” drop-down list to choose the VLAN under

configuration for the switch.

4. IGMP version: Click “IGMP version” drop-down menu from “IGMP version” drop-down list to choose “1”, “2”, or “3” for the switch.
5. Fast-leave: Click “fast-leave” drop-down menu from “fast-leave” drop-down list to choose “Enable” or “Disable” for the switch. Enable this function will allow members of a multicast group to leave the group immediately when an IGMP Leave Report Packet is received by the Switch.

IGMP querier:

1. Query-interval: Click in the “query-interval” textbox and specify a new number from 1 ~ 18000. The query-interval field is used to set the time (in seconds) between transmitting IGMP queries. Entries between 1 and 18000 seconds are allowed. Default = 125.
2. Max-response-time: Click in the “max-response-time” textbox and specify a new number from 1 ~ 124. This determines the maximum amount of time in seconds allowed before sending an IGMP response report. The max-response-time field allows an entry between 1 and 124 (seconds). Default = 10.

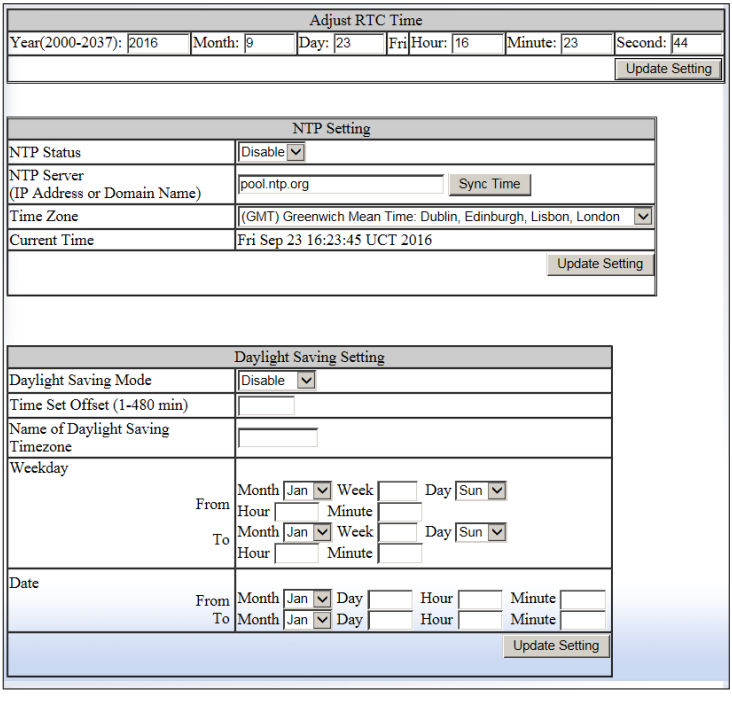
IGMP passive snooping:

1. Report suppression: Click “report suppression” drop-down menu from “report suppression” drop-down list to choose “Enable” or “Disable” for the switch. Use this command to enable report suppression for IGMP version 1 and version 2. Report suppression does not apply to IGMP version 3, and is turned off by default for IGMP version 1 and IGMP version 2 reports. The switch uses IGMP report suppression to forward only one IGMP report per multicast router query to multicast devices. When IGMP router suppression is enabled, the switch sends the first IGMP report from all hosts for a group to all the multicast routers. The switch does not send the remaining IGMP reports for the group to the multicast routers. This feature prevents duplicate reports from being sent to the multicast devices.

2. Update Setting: Click “Update Setting” button when you have finished IGMP Snooping.

Passive Mode Forwarding Port:

1. Port: Choose the port to set the port as passive mode forwarding port. The Switch (in IGMP passive mode) will forward unknown multicast packets to passive mode forwarding port before receiving IGMP query.
2. Update Setting: Click “Update Setting” button when you have finished Passive Mode Forwarding Port setting.



NTP

NTP Setting:

1. NTP Status: Click “NTP Status” drop-down menu from “NTP Status” drop-down list to choose “Enable” or

"Disable" to enable or disable NTP for the Switch.

2. NTP Server (IP Address or Domain name): Click in the "NTP Server" textbox and specify the IP address or Domain name of NTP server.
3. Sync Time: Click "Sync Time" button to synchronize time with NTP server.
4. Time Zone: Click "Tmie Zone" drop-down menu from "Tmie Zone" drop-down list to set time zone.
5. Polling Interval (1-10080 min): Click in the "Polling Interval" textbox and specify the polling interval.
6. Update Setting: Click "Update Setting" button when you have finished NTP Setting.

Daylight Saving Setting:

1. Daylight Saving Mode: Click "Daylight Saving Mode" drop-down menu from "Daylight Saving Mode" drop-down list to choose "Disable", "Weekday", or "Date" to choose disable, weekday, or date daylight saving for the Switch.
2. Time Set Offset (1-1440 min): Click in the "Time Set Offset" textbox and specify the offset time of daylight saving. For example enter 60 for one hour offset.
3. Name of Daylight Saving Tmiezone: Click in the "Name of Daylight Saving Tmiezone" textbox and specify the daylight saving timezone. This can be any given name in 14-character alpha-numeric characters. Enter the Name of Daylight Saving Timezone using the following example:
   EDT - East Daylight Saving Time Zone.
   CDT - Central Daylight-Saving Time Zone.
   MDT - Mountain Daylight-Saving Time Zone.
   PDT - Pacific Daylight-Saving Time Zone.
   ADT - Alaska Daylight-Saving Time Zone.
4. Weekday: Specify the daylight saving period.
   - Month: Click "Month" drop-down menu from "Month" drop-down list to choose from January to December.
   - Week: <1-5> Specifies starting/ending week of daylight savings time.
   - Day: Click "Day" drop-down menu from "Day"

drop-down list to choose from Sunday to Saturday.

- Hour: <0-23> Specifies from 0 to 23.
- Minute: <0-59> Specifies from 0 to 59.

5. Date: Specify the daylight saving period.
   - Month: Click "Month" drop-down menu from "Month" drop-down list to choose from January to December.
   - Day: <1-31> Specifies from 1 to 31.
   - Hour: <0-23> Specifies from 0 to 23.
   - Minute: <0-59> Specifies from 0 to 59.
6. Update Setting: Click "Update Setting" button when you have finished Daylight Saving Setting.

Note: The “Week”, “Hour”, “Minute”, and “Day” fields do not accept alphabetic characters (Like Jan, Feb, Sun, Mon). They only accept numerical input.

GMRP Global Setting

GMRP	Disable
	Update Setting

Per Port Setting (Include LAG)

Port	GMRP	GMRP Registration	GMRP Forward All
ge1	Disable	Normal	Disable
ge2	Disable	Normal	Disable
ge3	Disable	Normal	Disable
ge4	Disable	Normal	Disable
ge5	Disable	Normal	Disable
ge6	Disable	Normal	Disable
ge7	Disable	Normal	Disable
ge8	Disable	Normal	Disable
ge9	Disable	Normal	Disable
ge10	Disable	Normal	Disable
ge11	Disable	Normal	Disable
ge12	Disable	Normal	Disable
			Update Setting

GMRP

GMRP Global Setting:

1. GMRP: Click “GMRP” drop-down menu from “GMRP” drop-down list to choose “Enable” or “Disable” to enable or disable GMRP.
2. Update Setting: Click “Update Setting” button when you have finished GMRP Global Setting.

Per port setting (include LAG):

1. GMRP: Click “GMRP” drop-down menu from “GMRP”

drop-down list to choose “Enable” or “Disable” to enable or disable GMRP for the port.

2. GMRP registration: Click “GMRP registration” drop-down menu from “GMRP registration” drop-down list to choose “Normal”, “Fixed” or “Forbidden” to specify GMRP registration to the port.

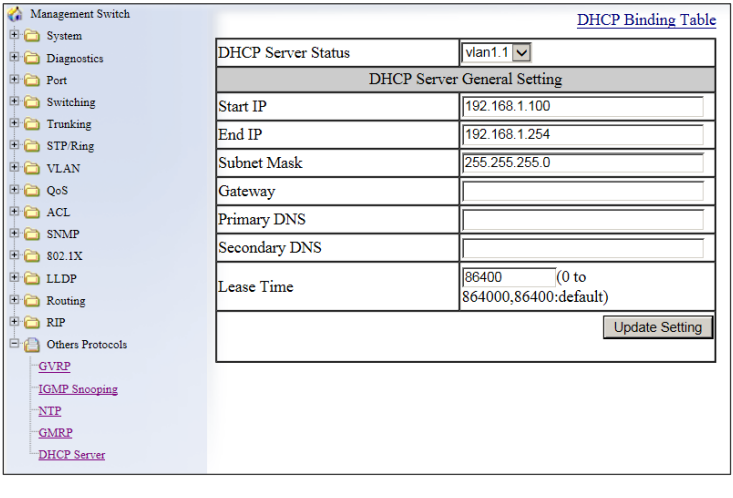
   Normal specifies dynamic GMRP multicast registration and deregistration on the port.

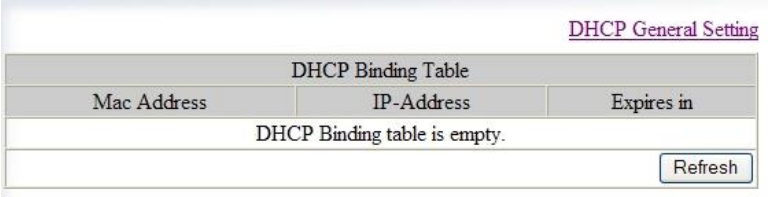
   Fixed specifies the multicast groups currently registered on the switch are applied to the port, but any subsequent registrations or deregistrations do not affect the port. Any registered multicast groups on the port are not deregistered based on the GARP timers.

   Forbidden specifies that all GMRP multicasts are deregistered, and prevent any further GMRP multicast registration on the port.

3. GMRP Forward All: Click “GMRP Forward All” drop-down menu from “GMRP Forward All” drop-down list to choose “Enable” or “Disable” to enable or disable GMRP forwarding to the port.

4. Update Setting: Click “Update Setting” button when you have finished Per port setting.





DHCP Server

1. DHCP Binding Table: Click on “DHCP Binding Table” to show DHCP Binding Table. Click “Refresh” button to refresh DHCP Binding Table. Click on “DHCP General Setting” to back to DHCP General Setting.
2. DHCP Server Status: Click “DHCP Server Status” drop-down menu from “DHCP Server Status” drop-down list to choose “Disable”, “Default VLAN 1”, or other VLAN.
3. Start IP: Click in the “Start IP” textbox and specify the default Start IP for the DHCP Server.
4. End IP: Click in the “End IP” textbox and specify the default End IP for the DHCP Server.
5. Subnet-mask: Click in the “Subnet-mask” textbox and specify the default subnet mask for the DHCP Server.
6. Gateway: Click in the “Gateway” textbox and specify the default gateway for the DHCP Server.
7. Primary DNS: Click in the “Primary DNS” textbox and specify the default primary DNS for the DHCP Server.
8. Secondary DNS: Click in the “Secondary DNS” textbox and specify the default secondary DNS for the DHCP Server.
9. Lease time: Click in the “Lease time” textbox and specify the default lease time for the DHCP Server.
10. Update Setting: Click “Update Setting” button when you have finished DHCP Server General Setting.

Note: You will need to disable and re-enable DHCP Server for any DHCP Server related changes to take effect.

Command Line Console Management

The switch provides a command line console interface for configuration purposes. The switch can be configured either locally through its RS-232 port or remotely via a Telnet session. For the later, you must specify an IP address for the switch first.

This chapter describes how to configure the switch using its console by Commend Line.

Administration Console

Connect the DB9 straight cable to the RS-232 serial port of the device to the RS-232 serial port of the terminal or computer running the terminal emulation application.

Direct access to the administration console is achieved by directly connecting a terminal or a PC equipped with a terminal-emulation program (such as Putty) to the switch console port.

When using the management method, configure the terminal-emulation program to use the following parameters (you can change these settings after login):

[Default parameters]
115,200bps
8 data bits
No parity
1 stop bit

Navigating the CLI Hierarchy

The CLI is organized into a hierarchy of command modes. The basic modes are User exec mode, Privileged exec mode, and Global configuration mode. There are also other modes, specific to certain configurations. Each mode has its own group of commands for a specific purpose. Below are the CLI commands needed to enter a specific mode:

```
switch_a> ← User exec mode
switch_a>enable
switch_a# ← Privileged exec mode
switch_a#configure terminal
switch_a(config) ← Global configuration mode
switch_a(config) spanning-tree mst configuration
switch_a(config-mst)# ← MSTP configuration mode
switch_a(config)# interface fe1
switch_a(config-if)# ← Interface configuration mode
switch_a(config)#vlan database
switch_a(config-vlan)# ← VLAN database configuration mode
```

Saving a Configuration from the CLI

Example:

```
switch_a>enable
switch_a#write memory
Building configuration.....
[OK]
switch_a#>
```

CLI Keyboard Shortcuts

Ctrl + a: place cursor at the beginning of a line

Ctrl + b: backspace one character

Ctrl + d: delete one character

Ctrl + e: place cursor at the end of the line

Ctrl + f: move cursor forward one character

Ctrl + k: delete from the current position to the end of the line

Ctrl + l: redraw the command line

Ctrl + n: display the next line in the history

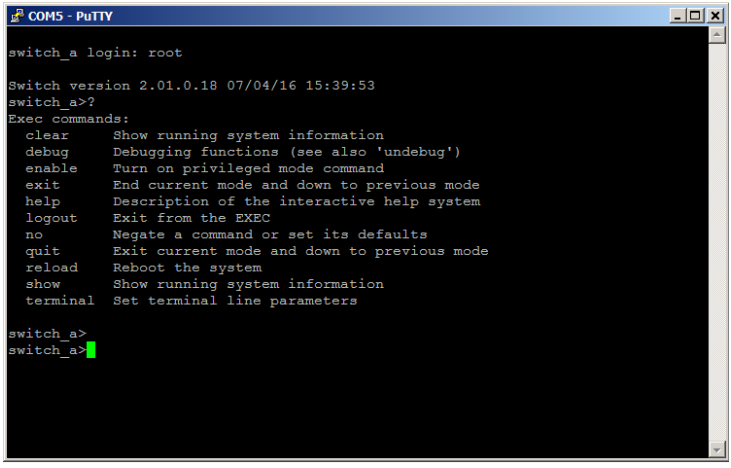
Ctrl + p: display the previous line in the history

Ctrl + u: delete entire line and place cursor at start of prompt

Ctrl + w: delete one word back

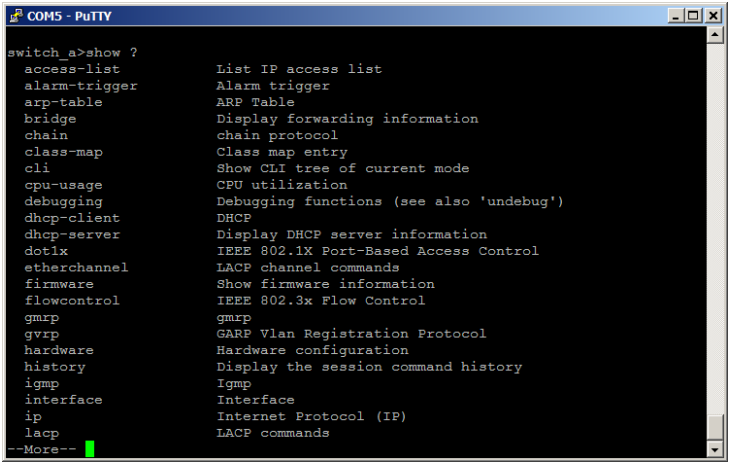
At any time, enter <?> to show a list of the commands available.

```
switch_a>?
```



Enter a full or partial command string followed by a question mark “?” to display the command keywords or parameters along with a short description.

```
switch_a>show ?
```



```
COM5 - PuTTY

switch_a>show ?
  access-list          List IP access list
  alarm-trigger        Alarm trigger
  arp-table            ARP Table
  bridge               Display forwarding information
  chain                chain protocol
  class-map            Class map entry
  cli                  Show CLI tree of current mode
  cpu-usage            CPU utilization
  debugging            Debugging functions (see also 'undebug')
  dhcp-client          DHCP
  dhcp-server          Display DHCP server information
  dot1x                IEEE 802.1X Port-Based Access Control
  etherchannel         LACP channel commands
  firmware             Show firmware information
  flowcontrol          IEEE 802.3x Flow Control
  gmrp                 gmrp
  gvrp                 GARP Vlan Registration Protocol
  hardware             Hardware configuration
  history              Display the session command history
  igmp                 Igmp
  interface            Interface
  ip                   Internet Protocol (IP)
  lacp                 LACP commands
--More--
```

Management Interface Configuration

Enabling/Disabling HTTP and/or HTTPS

To enable or disable HTTP or HTTPS, use the following CLI commands:
CLI Command Mode: **Global Configuration Mode**
CLI Command Syntax:
ip http server
ip http secure-server
no ip http server
no ip http secure-server

Enabling/Disabling Telnet

To enable or disable telnet, use the following CLI commands:
CLI Command Mode: **Global Configuration Mode**
CLI Command Syntax:
ip telnet
no ip telnet
Example: Enabling Telnet:

```
switch_a(config)#ip telnet
switch_a(config)#q
switch_a#write memory
Building configuration.....
[OK]
```

Note: If using Telnet to run the CLI Commands that disable telnet you will lose your connection. To Disable Telnet using the CLI, use SSH or the RS-232 Console port on the switch.

Enabling/Disabling SSH

To enable or disable SSH, use the following CLI commands:
CLI Command Mode: **Global Configuration Mode**
CLI Command Syntax:
ip ssh
no ip ssh
Note: If using SSH to run the CLI Commands that disable SSH you will lose your connection. To Disable SSH using the CLI, use Telnet or the RS-232 Console port on the switch.

System

System Name/Password

System Name
To set the system name on a switch, use the following CLI commands:
CLI Command Mode: **Global Configuration Mode**

CLI Command Syntax:
hostname *<name>*
no hostname
Example 1: Setting a Hostname to “switch_a”
```
switch_a(config)#hostname switch_a
```

Note: Using the **no hostname** command will reset the switch name to the default “switch_a.”

Password
To enable a password on a switch, use the following CLI commands:
CLI Command Mode: **Global Configuration Mode**
CLI Command Syntax:
enable password *<password>*
Example: Setting switch password to “mypassword”
```
switch_a(config)#enable password mypassword
```

IP Address
CLI Command Mode: **Global Configuration Mode**
CLI Command Syntax:
ip address *<A.B.C.D/M>* (IP Address/Mask e.g. 10.0.0.1/8)
no ip address
Example 1: Assigning an IP address of 192.168.1.1 with subnet mask of 255.255.255.0
```
switch_a(config)#ip address 192.168.1.1/24
```

Enable/Disable DHCP Client on a VLAN
CLI Command Mode: **Interface Configuration Mode**
CLI Command Syntax:
get ip dhcp enable
no get ip dhcp enable
Usage Example – Enable DHCP Client on VLAN2:
```
switch_a(config)#interface vlan1.2
switch_a(config-if)#get ip dhcp enable
switch_a(config-if)#q
```

Enable/Disable Static IP on a VLAN

To set the IP address, use the following CLI commands:
CLI Command Mode: **Interface Configuration Mode**
CLI Command Syntax:
ip address *<A.B.C.D>*
no ip address *<A.B.C.D>*
Usage Example 1 – Enable Static IP of 192.168.1.11 with subnet mask 255.255.255.0 on VLAN2:

```
switch_a(config)#interface vlan1.2
switch_a(config-if)#ip address 192.168.1.11/24
switch_a(config-if)#q
```

Usage Example 2 – Disable Static IP on VLAN2:

```
switch_a(config)#interface vlan1.2
switch_a(config-if)#no ip address
switch_a(config-if)#q
```

Default Gateway:
CLI Command Mode: **Global Configuration Mode**
CLI Command Syntax:
ip default-gateway *<A.B.C.D>*
no ip default gateway
Example 1: Setting the default gateway to 192.168.1.254

```
switch_a(config)#ip default-gateway
192.168.1.254
switch_a(config)#q
switch_a#write memory
Building configuration.....
[OK]
```

Example 2: Removing the Gateway

```
switch_a(config)#no ip default-gateway
switch_a(config)#q
switch_a#write memory
Building configuration.....
[OK]
```

DNS Server:
CLI Command Mode: **Global Configuration Mode**

CLI Command Syntax:
ip dns <*A.B.C.D*>
no ip dns
Example: Set Domain name server to 192.168.1.253

```
switch_a(config)#ip dns 192.168.1.253
switch_a(config)#q
switch_a#write memory
Building configuration.....
[OK]
```

Example 2: Remove a DNS IP Address

```
switch_a(config)#no ip dns
switch_a(config)#q
switch_a#write memory
Building configuration.....
[OK]
```

Save Configuration
CLI Command Mode: **Global Configuration Mode**
CLI Command Syntax:
write memory

Restore Default Settings
CLI Command Mode: **Global Configuration Mode**
CLI Command Syntax:
restore default

Load Configuration from a TFTP Server
CLI Command Mode: **Privileged Exec Mode**
CLI Command Syntax:
install config-file <*tftpserver_ipaddress*> <*filename*>
Example: Loading a Configuration from TFTP server on 192.168.1.100, where configuration file is file_name.tgz

```
switch_a#install config-file 192.168.1.100
file_name.tgz
```

Save Configuration to a TFTP Server
CLI Command Mode: **Privileged Exec Mode**
CLI Command Syntax:
write config-file <*tftpserver_ipaddress*> <*filename*>

Auto Save Configuration
CLI Command Mode: **Global Configuration Mode**
CLI Command Syntax:
service auto-config enable
no service auto-config enable
service auto-config interval <*number*>
Example 1: Enabling Auto Save with interval of 10 seconds
```
switch_a(config)#service auto-config enable
switch_a(config)#service auto-config interval
10
```

Firmware Upgrade
To display the current primary and alternate firmware versions:
CLI Command Mode: **Privileged Exec Mode**
CLI Command Syntax:
show firmware

To update firmware from a TFTP server:
CLI Command Mode: **Privileged Exec Mode**
CLI Command Syntax:
install image <*tftpserver_ipaddress*> <*filename*>

Note: Depending on the firmware being loaded, the extension may not be .tgz. The Switch does not use the extension to validate firmware.

Booting From Alternate (Backup) Firmware
Under certain circumstances, such as when there is a loss of power during an upgrade, the firmware build on the switch can become unstable. To prevent the switch from becoming unbootable in this situation, there are two firmware images stored on the switch: primary and backup. If the primary firmware image becomes unstable, the switch will detect it automatically and boot from the backup image on the next boot.
You can also manually boot from the backup firmware image. To do so, follow these steps:

1. Connect to the switch's RS-232 port with a terminal emulator.
2. Power cycle the switch (turn the power off and then on).
3. While the switch is rebooting, hold down **Ctrl + C**. This will cause the switch to enter CFE mode. The prompt should look like this:
   `CFE_1.5>`
4. Use the command **boot_image0** and **boot_image1** to manually boot from the primary and alternate firmware images respectively. Future boots will be from the image selected with this command.

Reboot Switch
CLI Command Mode: **Privileged Exec Mode**
CLI Command Syntax:
reload

Logout from the CLI
CLI Command Mode: **User Exec Mode or Privileged Exec Mode**
CLI Command Syntax:
logout

Diagnostics

System Log
CLI Command Mode: **User Exec Mode or Privileged Exec Mode**
CLI Command Syntax:
show system-log

Enable/Disable Remote Logging
CLI Command Mode: **Global Configuration Mode**
CLI Command Syntax:
remote-log enable
no remote-log enable

Add/Delete a Remote Logging Host

CLI Command Mode: **Global Configuration Mode**
CLI Command Syntax:
remote-log add <*ip_address*>
remote-log del <*ip_address*>
remote-log del all
Example 1: Add a Remote Logging Host at 192.168.1.100

```
switch_a(config)#remote-log add 192.168.1.100
```

ARP Table

CLI Command Mode: **Global Configuration Mode**
CLI Command Syntax:
show arp-table

Route Table

CLI Command Mode: **Privileged Exec Mode**
CLI Command Syntax:
show route-table

Dying Gasp

Show current primary and secondary Dying Gasp settings
CLI Command Mode: **Privileged Exec Mode**
CLI Command Syntax:
show dying-gasp status
Set primary and secondary Dying Gasp messages
CLI Command Mode: **Global Configuration Mode**
CLI Command Syntax:
dying-gasp primary <*delivery_method*> **secondary** <*delivery_method*>

Port

Setting the Port Description
CLI Command Mode: **Interface Configuration Mode**
CLI Command Syntax: **description *<description text>***

Enable or Disable a Port
CLI Command Mode: **Interface Configuration Mode**
CLI Command Syntax:
shutdown
no shutdown

Setting the Port Speed
CLI Command Mode: **Interface Configuration Mode**
CLI Command Syntax: **bandwidth *<1-10000000000 bits>***
(usable units : k, m, g)
Usage Example:
```
switch_a(config-if)#bandwidth 100m
```

Setting Port Duplex
CLI Command Mode: **Interface Configuration Mode**
CLI Command Syntax: **duplex *<full | half | auto>***
Usage Example:
```
switch_a(config-if)#duplex full
```

Enable or Disable Port Flow Control
CLI Command Mode: **Interface Configuration Mode**
CLI Command Syntax: **flowcontrol on**

Display Port Status
CLI Command Mode: **Privileged Exec Mode**
CLI Command Syntax: **show interface *<ifname>***

Set Port Rate Control
CLI Command Mode: **Interface Configuration Mode**
CLI Command Syntax: **rate-control *<ingress | egress>***
value *<value in kbps>*
Example:

```
switch_a(config-if)#rate-control ingress value
100000
```

Display Port RMON Statistics
CLI Command Mode: **Privileged Exec Mode**
CLI Command Syntax: **show interface statistics <*interface name*>**
Usage Example:

```
switch_a#show interface statistics ge1
```

Display Port VLAN Activities
CLI Command Mode: **Privileged Exec Mode**
CLI Command Syntax: **show bridge interface <*interface name*>**
Usage Example:

```
switch_a#show bridge interface fe1
```

Switching

Setting Ageing Time Value
CLI Command Mode: **Global Configuration Mode**
CLI Command Syntax: **bridge 1 ageing-time** (time in ms)
Example: Set ageing time to 300ms

```
switch_a(config)#bridge 1 ageing time 300
```

Enabling Port Isolation
CLI Command Mode: **Interface Configuration Mode**
CLI Command Syntax: **port-isolation enable**

Enabling Port Block Multicast
CLI Command Mode: **Interface Configuration Mode**
CLI Command Syntax: **switchport block multicast**

Setting Storm Control
CLI Command Mode: **Interface Configuration Mode**
CLI Command Syntax: **stormcontrol <*broadcast* | *dlf-multicast*> <*level*>**

Usage Example:

```
switch_a(config-if)#storm-control broadcast enable
switch_a(config-if)#storm-control level 20
```

Enabling Loopback Detect (Global)

CLI Command Mode: **Global Configuration Mode**

CLI Command Syntax: **bridge 1 loopback-detect <enable | disable>**

Example:

```
switch_a(config)#bridge 1 loopback-detect enable
```

Setting the Loopback Detect Action

CLI Command Mode: **Global Configuration Mode**

CLI Command Syntax: bridge 1 loopback-detect action <err-disable | none>

Example:

```
switch_a(config)#bridge 1 loopback-detect action errdisable
```

Setting the Loopback Detect Recovery Time

CLI Command Mode: **Global Configuration Mode**

CLI Command Syntax: **bridge 1 loopback-detect errdisable-recovery *<0-65535>***

Usage Example:

```
switch_a(config)#bridge 1 loopback-detect errdisable-recovery 30
```

Setting the Loopback Detect Polling Interval

CLI Command Mode: **Global Configuration Mode**

CLI Command Syntax: **bridge 1 loopback-detect interval *<1-65535>***

Usage Example:

```
switch_a(config)#bridge 1 loopback-detect interval 5
```

Enabling Loopback Detect (Port)

CLI Command Mode: **Interface Configuration Mode**

CLI Command Syntax: **loopback-detect enable**

Enable or Disable Storm-Detect
CLI Command Mode: **Global Configuration Mode**
CLI Command Syntax:
bridge 1 storm-detect errdisable
no bridge 1 storm-detect errdisable
Default: **Disabled**

Set Storm-Detect Interval
CLI Command Mode: **Global Configuration Mode**
CLI Command Syntax: **bridge 1 storm-detect interval *<2-65535>***
Default: **10**
Example:
```
switch_a(config)# bridge 1 storm-detect interval 10
```

Set Storm-Detect Recovery Time
CLI Command Mode: **Global Configuration Mode**
CLI Command Syntax: **bridge 1 storm-detect errdisable-recovery *<0-65535>***
Default: **0** No errdisable recovery.
Example:
```
switch_a(config)# bridge 1 storm-detect errdisable-recovery 60
```

Storm Detect Packet Type
Enable this port's storm detect by detect number of broadcast or broadcast plus multicast packets per second. Unit is packets per second. Set to 0 to disable this feature.
To set the storm-detect packet type use the following CLI commands:
CLI Command Mode: **Interface Configuration Mode**
CLI Command Syntax: **storm-detect (bc | mc-bc) pps *<0-100000>***
bc = broadcast only
mc-bc = count broadcast & multicast packets together.
Default: **0** (Disabled)

Usage Example 1 – Enabling Multicast + Broadcast:
```
switch_a(config-if)#storm-detect mc-bc pps 50000
```
Usage Example 2 – Enabling Multicast + Broadcast:
```
switch_a(config-if)#storm-detect bc pps 50000
```

Storm-Detect Utilization
CLI Command Mode: **Interface Configuration Mode**
CLI Command Syntax: **storm-detect utilization *<0-100>***
Default: **0** (Disabled)
Example:
```
switch_a(config-if)#storm-detect utilization 80
```

Disable Storm-Detect
CLI Command Mode: **Interface Configuration Mode**
CLI Command Syntax: **no storm-detect port enable**

Adding a MAC Address for Static-MAC-Entry Forwarding
CLI Command Mode: **Global Configuration Mode**
CLI Command Syntax:
bridge 1 address *<mac address>* forward *<interface>* vlan *<vlan id>*
Example:
```
switch_a(config)# bridge 1 address 00e0.abcd.1245 forward fe1 vlan 1
```

Discard a Static MAC Entry
CLI Command Mode: **Global Configuration Mode**
CLI Command Syntax: **bridge 1 address *<mac address>* discard vlan *<vlan id>***
Example:
```
switch_a(config)# bridge 1 address 00e0.abcd.1245 discard vlan 1
```

Configuring Port Mirroring
CLI Command Mode: **Interface Configuration Mode**
CLI Command Syntax: **mirror interface *<interface>* direction *<both | tx | rx>***

Example:
```
switch_a(config-if)#mirror interface fe2
direction both
```

Enabling a Link State Tracking Group
CLI Command Mode: **Global Configuration Mode**
CLI Command Syntax: **link state track *<group #>***
Example:
```
switch_a(config)# link state track 4
```

Assigning a Port to a Link State Tracking Group
CLI Command Mode: **Interface Configuration Mode**
CLI Command Syntax: **link state group *<group #>* *<upstream | downstream>***
Usage Example:
```
switch_a(config-if)# link state group 4
downstream
```

Trunking

Adding an Interface to a Static Trunk
CLI Command Mode: **Interface Configuration Mode**
CLI Command Syntax:
static-channel-group *<static channel>* (1-6 for 100Mbps, 7-8 for 1Gbps ports)
Usage Example:
```
switch_a(config-if)#static-channel-group 1
```

Adding an Interface to a LACP Trunk
CLI Command Mode: **Interface Configuration Mode**
CLI Command Syntax:
channel-group *<LACP Channel>* mode *<active | passive>*
(LACP Channel is 1-6 for 100Mbps, 7-8 for 1Gbps ports)
Usage Example:
```
switch_a(config-if)#channel-group 2 mode
passive
switch_a(config-if)#q
```

Setting the LACP Port Priority
CLI Command Mode: **Interface Configuration Mode**
CLI Command Syntax: **lacp port-priority <1 - 65535>**
sExample:
`switch_a(config-if)#lacp port-priority 1`

Setting the LACP Timeout
CLI Command Mode: **Interface Configuration Mode**
CLI Command Syntax: **lacp timeout *<long | short>***
Example:
`switch_a(config-if)#lacp timeout long`

STP / Ring

RSTP

Enabling the Spanning Tree Protocol
CLI Command Mode: **Global Configuration Mode**
CLI Command Syntax:
no bridge shutdown 1
bridge 1 protocol rstp vlan-bridge
Usage Example:`switch_a(config)#no bridge shutdown 1`
`switch_a(config)#bridge 1 protocol rstp vlan-bridge`

Bridge Priority, Max Age, Forward Delay, and Hello Time
CLI Command Mode: **Global Configuration Mode**
CLI Command Syntax:
bridge 1 priority *<0-61440>*
bridge 1 max-age *<6-40>*
bridge 1 forward-time *<4-30>*
bridge 1 hello-time *<1-10>*
Usage Example:
`switch_a(config)#bridge 1 priority 4096`

```
switch_a(config)#bridge 1 max-age 20
switch_a(config)#bridge 1 forward-time 15
switch_a(config)#bridge 1 hello-time 2
```

Modifying the Port Priority and Path Cost

CLI Command Mode: **Interface Configuration Mode**
CLI Command Syntax:
bridge-group 1 path-cost *<1-200000000>*
bridge-group 1 priority *<0-240>*
Usage Example:

```
switch_a(config-if)#bridge-group 1 path-cost
200000
switch_a(config-if)#bridge-group 1 priority 128
```

Manually Setting a Port to be a Shared or Point to Point Link

CLI Command Mode: **Interface Configuration Mode**
CLI Command Syntax:
spanning-tree link-type point-to-point
spanning-tree link-type shared
Example 1: Setting port 1 to be point-to-point:

```
switch_a(config-if)#spanning-tree link-type
point-to-point
```

Example 2: Setting port 1 to be shared:

```
switch_a(config-if)#spanning-tree link-type
shared
```

Enabling/Disabling a port to be an Edge Port

CLI Command Mode: **Interface Configuration Mode**
CLI Command Syntax:
spanning-tree edgeport
no spanning-tree edgeport
Example 1: Enabling edge port on port 1:

```
switch_a(config-if)#spanning-tree edgeport
```

Example 2: Disabling edge port on port 1:

```
switch_a(config-if)#no spanning-tree edgeport
```

MSTP - Enabling Spanning Tree for MSTP

CLI Command Mode: **Global Configuration Mode**
CLI Command Syntax:
no bridge shutdown 1
bridge 1 protocol mstp
Usage Example:

```
switch_a(config)#no bridge shutdown 1
switch_a(config)#bridge 1 protocol mstp
```

Bridge Priority, Max Age, Forward Delay, and Hello Time

CLI Command Mode: **Global Configuration Mode**
CLI Command Syntax:
bridge 1 priority *<0-61440>*
bridge 1 max-age *<6-40>*
bridge 1 forward-time *<4-30>*
bridge 1 hello-time *<1-10>*
Usage Example:

```
switch_a(config)#bridge 1 priority 4096
switch_a(config)#bridge 1 max-age 20
switch_a(config)#bridge 1 forward-time 15
switch_a(config)#bridge 1 hello-time 2
```

CIST MAX Hops

CLI Command Mode: **Global Configuration Mode**
CLI Command Syntax: **bridge 1 max-hops *<1-40>***
Usage Example:

```
switch_a(config)#bridge 1 max-hops 20
```

MSTP

MSTP Regional Configuration Name and Revision Level

CLI Command Mode: **MSTP Configuration Mode**
CLI Command Syntax:
bridge 1 region *<region_name>*
bridge 1 revision *<revision_number>*
Usage Example:

```
switch_a(config)#spanning-tree mst
configuration
```

```
switch_a(config-mst)#bridge 1 region R1
switch_a(config-mst)#bridge 1 revision 0
```

Creating an MSTP Instance

CLI Command Mode: **MSTP Configuration Mode**

CLI Command Syntax: **bridge 1 instance *<1-15>* vlan *<vlan_ID>***

Example:

```
switch_a(config)#spanning-tree mst
configuration
switch_a(config-mst)#bridge 1 instance 1 vlan 10
```

Setting MSTP Priority

CLI Command Mode: **Global Configuration Mode**

CLI Command Syntax: **bridge 1 instance *<1-15>* priority *<0-61440>***

Example:

```
switch_a(config)#bridge 1 instance 1 priority 0
```

Modifying CIST Port Priority and Port Path Cost

CLI Command Mode: **Interface Configuration Mode (port)**

CLI Command Syntax:

bridge-group 1 path-cost *<1-200000000>*;

bridge-group 1 priority *<0-240>*

Example:

```
switch_a(config-if)#bridge-group 1 path-cost
200000
switch_a(config-if)#bridge-group 1 priority 128
```

Modify the MSTP Port Priority and MSTP Port Path Cost

CLI Command Mode: **Interface Configuration Mode**

CLI Command Syntax:

bridge-group 1 instance *<1-15>* path-cost *<1-200000000>*

bridge-group 1 instance *<1-15>* priority *<0-240>*

Usage Example:

```
switch_a(config-if)# bridge-group 1 instance 1
path-cost 20000
switch_a(config-if)# bridge-group 1 instance 1
```

```
priority 128
```

Adding a Port to an MSTP Instance
CLI Command Mode: **Interface Configuration Mode**
CLI Command Syntax: **bridge-group 1 instance <*1-15*>**
Example:
```
switch_a(config-if)#bridge-group 1 instance 1
```

IQ-Ring Commands

Enable/disable IQ Ring
CLI Command Mode: **Global Configuration Mode**
CLI Command Syntax: **bridge 1 ring enable/disable**

Set Ring Ports
CLI Command Mode: **Global Configuration Mode**
CLI Command Syntax: **ring set-port <interface1> <interface2>**
(**interface1** and **interface2** will be set as **ring-port 1** and **ring-port 2**)
Example:
```
switch_a(config-if)# ring set-port fe2 fe3
```

Show Ring, Port, and All States
CLI Command Mode: **Privileged Exec Mode**
CLI Command Syntax:
show ring state
show ring port-state

Enable Ring Coupling
CLI Command Mode: **Global Configuration Mode**
CLI Command Syntax: **(no) ring-coupling enable**

Set Ring Coupling Ports
CLI Command Mode: **Global Configuration Mode**
CLI Command Syntax: **ring set-coupling-port <interface1> <interface2>**

Show Ring Coupling, Port Coupling, and Redundancy Pair States
CLI Command Mode: **Privileged Exec Mode**
CLI Command Syntax:
show ring-coupling state
show ring-coupling port-state

IQ-Chain Commands

Storm Control
CLI Command Mode: **Global Configuration Mode**
CLI Command Syntax: **no bridge 1 chain-storm**
Example:
```
switch_a(config)# no bridge 1 chain-storm
```

Configuring Chain Ports
CLI Command Mode: **Interface Configuration Mode**
CLI Command Syntax:
chain port enable
no chain port

Usage Example 1: Enabling a chain port
```
switch_a(config)#interface fe6
switch_a(config-if)#chain port enable
```

Configuring Chain Pass-Through Ports
CLI Command Mode: **Global Configuration Mode**
CLI Command Syntax:
chain pass-through *<port #1 port #2>*
no chain pass-through

Example 1: Enabling chain pass-through
```
switch_a(config)# chain pass-through fe3 fe4
```
Example 2: Disabling chain port pass-through
```
switch_a(config)# no chain pass-through
```

Configuring Spanning Tree Advanced Settings using CLI

commands

Enabling BPDU Guard Globally

CLI Command Mode: **Global Configuration Mode**

CLI Command Syntax: **bridge 1 spanning-tree portfast bpdu-guard**

Example:

```
switch_a(config)# bridge 1 spanning-tree
portfast bpdu-guard
```

Enabling BPDU Guard on a Port

CLI Command Mode: **Interface Configuration Mode**

CLI Command Syntax:

spanning-tree portfast;

spanning-tree portfast bpdu-guard enable

Usage Example:

```
switch_a(config-if)#spanning-tree portfast
switch_a(config-if)#spanning-tree portfast
bpdu-guard enable
```

Enabling BPDU Guard Error Disable-timeout

CLI Command Mode: **Global Configuration Mode**

CLI Command Syntax:

bridge 1 spanning-tree errdisable-timeout enable

bridge 1 spanning-tree errdisable-timeout interval 300

Usage Example:

```
switch_a(config)#bridge 1 spanning-tree
errdisable-timeout enable
switch_a(config)#bridge 1 spanning-tree
errdisable-timeout interval 300
```

VLAN

Configuring a 802.1Q VLAN

CLI Command Mode: **VLAN Database Configuration Mode**
CLI Command Syntax: **switchport portbase add vlan <1 – 16> vlan <1 – 4094> bridge 1 name VLAN NAME state enable**
Usage Example:

```
switch_a(config)#vlan database
switch_a(config-vlan)#vlan 100 bridge 1 name Management state enable
switch_a(config-vlan)#vlan 200 bridge 1 name Accounting state enable
switch_a(config-vlan)#vlan 300 bridge 1 name Sales state enable
```

Configuring an IP Address for a Management VLAN

CLI Command Mode: **Interface Configuration Mode**
CLI Command Syntax: **ip address IP_ADDRESS/PREFIX [e.g. 10.0.0.1/24]**
Usage Example:

```
switch_a(config)#interface vlan1.100
switch_a(config-if)#ip address 192.168.100.10/24
```

Removing an IP Address from a Management VLAN

CLI Command Mode: **Interface Configuration Mode**
CLI Command Syntax: **no ip address**
Usage Example:

```
switch_a(config)#interface vlan1.100
switch_a(config-if)#no ip address
```

Configuring an Access Port

CLI Command Mode: **Interface Configuration Mode**
CLI Command Syntax: **switchport mode access**
CLI Command Syntax: **switchport access vlan <1 – 4094>**
Usage Example:

```
switch_a(config-if)#switchport mode access
switch_a(config-if)#switchport access vlan 100
```

Configuring a Trunk Port

CLI Command Mode: **Interface Configuration Mode**
CLI Command Syntax: **switchport mode trunk**
CLI Command Syntax: **switchport trunk allowed vlan add 100,200,300**
CLI Command Syntax: **switchport trunk native vlan 1**
Usage Example:

```
switch_a(config)#interface fe7
switch_a(config-if)#switchport mode trunk
switch_a(config-if)#switchport trunk allowed
vlan add 100,200,300
switch_a(config-if)#switchport trunk native
vlan 1
```

QoS

Enabling/Disabling QoS
CLI Command Mode: **Global Configuration Mode**
CLI Command Syntax:
mls qos enable
no mls qos

Enable/Disable QoS Trust
CLI Command Mode: **Global Configuration Mode**
CLI Command Syntax:
mls qos trust <*cos/dscp*>
no qos trust
Example – Enable QoS Trust:
```
switch_a(config)# mls qos trust cos
```
Example – Disable QoS Trust:
```
switch_a(config)# no mls qos trust
```

Configuring the Egress Expedite Queue
CLI Command Mode: **Global Configuration Mode**
CLI Command Syntax:
priority-queue strict
priority-queue out
no priority-queue out
mls qos <*WRR_WTS*> (4 values separated by spaces. Range is 1-20 (See the Example).
Example 1 – Enable QoS Strict Priority (Queue 3) + WWR (Queue 0-2):
```
switch_a(config)# priority-queue out
```

Example 2 – Disable QoS Strict Priority:
```
switch_a(config)# no priority-queue
```

Example 3 – The following example specifies the bandwidth ratios of the four transmit queues, starting with queue 0, on the switch. WRR_WTS Weighted Round Robin (WRR) weights for the 4 queues (4 values separated by spaces). Range is 1-20.

```
switch_a(config)# wrr-queue bandwidth 1 2 4 8
```

802.1p Priority

CLI Command Mode: **Global Configuration Mode**
CLI Command Syntax:
wrr-queue cos-map *<QUEUE_ID> <COS_VALUE>*
Queue ID. Range is 0-3.
COS_VALUE CoS values. Up to 8 values (separated by spaces).
Example: The following example shows mapping CoS values 0 and 1 to queue 1 on the switch:

```
switch_a(config)#wrr-queue cos-map 1 0 1
```

DSCP

CLI Command Mode: **Global Configuration Mode**
CLI Command Syntax:
mls qos map dscp-queue <dscp_value> to <queue_ID>
dscp_value: Up to 8 values (separated by spaces). Range is 0-63.
queue_ID: Range is 0-3.
Example The following example shows mapping DSCP values 0 to 3 to queue 1 on the switch:

```
switch_a(config)# mls qos map dscp-queue 0 1 2
3 to 1
```

QoS Interface Commands

To assign a VLAN Priority to an Interface:
CLI Command Mode: **Interface Configuration Mode**
CLI Command Syntax: **user-priority *<0-7>***

ACL Configuration

Enabling QoS

CLI Command Mode: **Global Configuration Mode**
CLI Command Syntax: **mls qos enable**
Usage Example:

```
switch_a(config)# mls qos enable
```

Creating a Standard IP Access List

To create a new Standard IP Access List to allow or deny an IP address/range access to the switch, use the following CLI commands with the Access list ID in the range from 1 – 99, or from 1300 – 1999:

CLI Command Mode: **Global Configuration Mode**

CLI Command Syntax:

ip-access-list *<1-99, 1300-1999>* permit *<source IP> <source bit mask>*

ip-access-list *<1-99, 1300-1999>* deny *<source IP> <source bit mask>*

ip-access-list *<1-99, 1300-1999>* deny any

Usage Example:

```
switch_a(config)# ip-access-list 1 permit
192.168.1.224 0.0.0.31
switch_a(config)# ip-access-list 1 deny
192.168.1.224 0.0.0.31
switch_a(config)# ip-access-list 1 deny any
```

Creating an Extended IP Access List

To create a new Extended IP Access List to allow or deny an source IP address/range and destination IP address/range pair access to the switch, use the following CLI commands with the Access list ID in the range from 100 – 199, or from 2000 – 2699:

CLI Command Mode: **Global Configuration Mode**

CLI Command Syntax:

ip-access-list *<100-199, 2000-2699>* permit ip *<source IP> <source bit mask> <destination IP> <destination bit mask>*

ip-access-list *<100-199, 2000-2699>* deny ip *<source IP> <source bit mask> <destination IP> <destination bit mask>*

ip-access-list *<100-199, 2000-2699>* deny ip any any

Usage Example:

```
switch_a(config)#ip-access-list 100 permit ip
192.168.1.224 0.0.0.31 192.168.1.224 0.0.0.31
switch_a(config)#ip-access-list 100 deny ip
192.168.1.224 0.0.0.31 192.168.1.224 0.0.0.31
```

```
switch_a(config)#ip-access-list 100 deny ip any
any
```

Creating a MAC Access List

To create a new MAC Access List to allow or deny a source and destination Ethernet address pair access to the switch, use the CLI commands below with the Access list ID in the range from 100 – 199, or from 2000 – 2699.:

CLI Command Mode: **Global Configuration Mode**

CLI Command Syntax:

mac-access-list *<2000-2699>* permit *<source MAC address> <source bit mask> <destination MAC address> <destination bit mask> <encapsulation format: 1=Ethernet II, 2=SNAP, 4=802.3, 8=LLC>* ether-type *<EtherType> < EtherType bit mask>*

mac-access-list *<2000-2699>* deny *<source MAC address> <source bit mask> <destination MAC address> <destination bit mask> <encapsulation format: 1=Ethernet II, 2=SNAP, 4=802.3, 8=LLC>* ether-type *<EtherType> < EtherType bit mask>*

mac-access-list *<2000-2699>* deny any *any <encapsulation format: 1=Ethernet II, 2=SNAP, 4=802.3, 8=LLC>* ether-type *<EtherType> < EtherType bit mask>*

Usage Example:

```
switch_a(config)#mac-access-list 2000 permit
00e0.b321.03de 0000.0000.0000 00e0.b321.03df
0000.0000.0000 1 ether-type 800 0000
switch_a(config)#mac-access-list 2000 deny
00e0.b321.03de 0000.0000.0000 00e0.b321.03df
0000.0000.0000 1 ether-type 800 0000
switch_a(config)#mac-access-list 2000 deny any
any 1 ether-type 800 0000
```

Creating an ACL Class Map with Layer 4 Access List

In order to create a Layer 4 Access List you must create it within an ACL Class Map. Use the CLI commands below to create an ACL Class Map together with the Layer 4 Access

List. The Layer 4 Access List only classifies the ingress packets for the ACL Policy Map that it is associated with; therefore, all packets will be allowed entry to the switch with the Layer 4 Access List. You will have to use this Access List in conjunction with another type of Access List, if you wish to filter any packet that did not match the classification rules from this Access List.

Note: The bandwidth policing capabilities of the ACL Class cannot be configured here; it can only be configured during the ACL Policy Map creation or modification:

CLI Command Mode:

Global Configuration Mode

Class Map Configuration Mode

CLI Command Syntax:

class-map <*Class Map Name*>

match layer4 source-port <*TCP/UDP Port number*>

match layer4 destination-port <*TCP/UDP Port number*>

Usage Example:

```
switch_a(config)#class-map FTP
switch_a(config-cmap)#match layer4
destination-port 21
switch_a(config-cmap)#q
switch_a(config)#
switch_a(config)#class-map FTP_Download
switch_a(config-cmap)#match layer4 source-port
20
```

Creating a ACL Class Map with an IP or MAC Access List

To create a new ACL Class Map with a Standard/Extended IP Access List or a MAC Access List, you must have first created a Standard/Extended IP Access List or MAC Access List already. You can then use the CLI commands below to create a new ACL Class Map and assign one (you can only assign one Access List per Class Map) existing Standard/Extended IP Access List, or MAC Access List, to the ACL Class Map by referencing its Access list ID.

Note: The bandwidth policing capabilities of the ACL Class cannot be configured here; it can only be configured during the ACL Policy Map creation or modification:

CLI Command Mode:
Global Configuration Mode
Class Map Configuration Mode
CLI Command Syntax:
class-map *<ACL Class Name>*
match access-group *<Access List ID>*
Usage Example:

```
switch_a(config)#class-map Layer_2-3_Class
switch_a(config-cmap)#match access-group 1
```

Creating an ACL Policy Map

To create a new ACL Policy Map you must have first created the ACL Class Maps that you want to assign to the ACL Policy Map. You can then use the CLI commands below to create the new ACL Policy Map and assign one or multiple existing ACL Class Maps to the ACL Policy Map by referencing its ACL Class Map name. You can also complete or modify the bandwidth policing capabilities of the ACL Class Maps used during the ACL Policy Map creation process
CLI Command Mode:
Global Configuration Mode
Policy Map Configuration Mode
Policy Map Class Configuration Mode
CLI Command Syntax:
policy-map *<ACL Policy Name>*
class *<ACL Class Name>*
police *<1-1000000>* *<1-20000>* exceed-action drop

Usage Example:
switch_a>enable
switch_a#configure terminal

```
switch_a (config) #class IP_Class_1
switch_a(config-cmap)#policy-map IP_Policy_1
switch_a(config-pmap)#class IP_Class_1
switch_a(config-pmap-c)# police 50000 5000 5000
5000 exceed-action drop
switch_a(config-pmap-c)#q
switch_a(config-pmap)#class IP_Class_2
switch_a(config-pmap-c)# police 50000 5000 5000
```

```
5000 exceed-action drop
switch_a(config-pmap-c)#q
switch_a(config-pmap)#class IP_Class_3
switch_a(config-pmap-c)# police 50000 5000 5000
5000 exceed-action drop
```

Appling an Existing ACL Policy to a Port

To apply the ACL packet filtering features on a port, you must have first created an ACL Policy already. You can then use the CLI commands below to apply the existing ACL Policy to a port.

CLI Command Mode:

Global Configuration Mode

Interface Configuration Mode

CLI Command Syntax:

interface <Interface Name>

service-policy input <ACL Policy Name>

Usage Example:

```
switch_a(config)#interface fe1
switch_a(config-if)#service-policy input
IP_Policy_1
```

Deleting an ACL Class

You can use the CLI commands below to delete an existing ACL Class.

CLI Command Mode: **Global Configuration Mode**

CLI Command Syntax: **no class-map *<ACL Class Name>***

Usage Example:

```
switch_a(config)#no class-map IP_Class_1
```

Deleting an ACL Policy

You can use the below CLI commands to delete an existing ACL Policy:

CLI Command Mode: **Global Configuration Mode**

CLI Command Syntax: **no policy-map *<ACL Policy Name>***

Usage Example:

```
switch_a(config)#no policy-map IP_Policy_1
```

IP ACL

IP ACL Configuration

The CLI commands for creation of Layer 3 Access Control Lists (standard and extended) are similar to those for ACLs created under QoS. However, QoS ACLs are implemented with the **service-policy input** CLI command, Layer 3 ACLs use the **ip access-group** command (described below).

Creating a Standard or Extended IP Access List

To create a new Access List to allow or deny an IP address/range access to the switch, use the following CLI commands:

CLI Command Mode: **Global Configuration Mode**

CLI Command Syntax:

(no) access-list (<100-199>|<2000-2699>) (deny|permit) (ip|gre|igmp|pim|rsvp|ospf|vrrp|ipcomp|any|<0-255>) (A.B.C.D/M|A.B.C.D A.B.C.D|host A.B.C.D|any) (A.B.C.D/M|A.B.C.D A.B.C.D|host A.B.C.D|any)

(no) access-list (<100-199>|<2000-2699>) (deny|permit) (udp) (A.B.C.D/M|A.B.C.D A.B.C.D|host A.B.C.D|any) ((eq|gt|lt|neq) <0-65535> | range <0-65535> <0-65535>|) (A.B.C.D/M|A.B.C.D A.B.C.D|host A.B.C.D|any) ((eq|gt|lt|neq) (tftp|bootp|<0-65535>) | range <0-65535> <0-65535>|)

(no) access-list (<100-199>|<2000-2699>) (deny|permit) (tcp) (A.B.C.D/M|A.B.C.D A.B.C.D|host A.B.C.D|any) ((eq|gt|lt|neq) <0-65535> | range <0-65535> <0-65535>|) (A.B.C.D/M|A.B.C.D A.B.C.D|host A.B.C.D|any) ((eq|gt|lt|neq) (ftp|ssh|telnet|www|<0-65535>) | range <0-65535> <0-65535>|)

no access-list (<100-199>|<2000-2699>)

Usage Examples:

```
switch_a(config)# access-list 2000 permit ip
host 5.5.5.5 host 3.3.3.3
switch_a(config)# access-list 2000 permit tcp
host 1.1.1.1 host 5.5.5.5 eq www
switch_a(config)# access-list 2000 permit udp
host 6.6.6.6 10.10.10.0 0.0.0.255 eq tftp
switch_a(config)# access-list 2000 permit gre
host 4.4.4.4 host 8.8.8.8
```

Applying a Defined Access List

Once you have defined you standard or extended ACL, apply it to an interface using the **ip access-group command**:

CLI Command Mode: **Interface Configuration Mode**

CLI Command Syntax: **ip access-group (<1-199>|<1300-2699>) (in)**

no ip access-group (<1-199>|<1300-2699>) (in)

Usage Example:

```
switch_a(config-if)#ip access-group 100 in
```

Show Access Lists

You can view existing access lists with the **show access-list** command.

CLI Command Mode: **Privileged Exec Mode**

CLI Command Syntax: **show access-list**

SNMP

Enabling SNMP and configuring general settings

To enable the SNMP feature of the switch, and configure its general settings (Description, Location, and Contact information), you must use the below CLI commands.
CLI Command Mode: **Global Configuration Mode**
CLI Command Syntax:
snmp-server enable
snmp-server description *<1 -256 characters>*
snmp-server location *<1 -256 characters>*
snmp-server contact *<1 -256 characters>*
Usage Example:

```
switch_a(config)# snmp-server enable
switch_a(config)# snmp-server description
Hub_Switch_1
switch_a(config)# snmp-server location
First_Floor_Closet
switch_a(config)# snmp-server contact
Administrator
```

Configuring SNMP Traps

To configure the Trap features of the SNMP protocol on the switch, you use the following CLI commands:
CLI Command Mode:
Global Configuration Mode
Interface Configuration Mode
CLI Command Syntax:
snmp-server trap-community 1 *<1 -256 characters >*
snmp-server trap-community 2 *<1 -256 characters >*
snmp-server trap-community 3 *<1 -256 characters >*
snmp-server trap-community 4 *<1 -256 characters >*
snmp-server trap-community 5 *<1 -256 characters >*
snmp-server trap-ipaddress 1 *<IP Address>*
snmp-server trap-ipaddress 2 *<IP Address>*
snmp-server trap-ipaddress 3 *<IP Address>*
snmp-server trap-ipaddress 4 *<IP Address>*
snmp-server trap-ipaddress 5 *<IP Address>*

snmp-server trap-type enable linkDown
snmp-server trap-type enable linkup
snmp-server trap-type enable mac-notification
snmp-server mac-notification interval *<1 to 65535 seconds>*
snmp-server mac-notification history-size *<1 to 500 entries>*
snmp-server trap mac-notification added
snmp-server trap mac-notification removed

Usage Example:

```
switch_a(config)# snmp-server trap-community 1
Trap_Group_1
switch_a(config)# snmp-server trap-community 2
Trap_Group_2
switch_a(config)# snmp-server trap-community 3
Trap_Group_3
switch_a(config)# snmp-server trap-community 4
Trap_Group_4
switch_a(config)# snmp-server trap-community 5
Trap_Group_5
switch_a(config)# snmp-server trap-ipaddress 1
192.168.1.100
switch_a(config)# snmp-server trap-ipaddress 2
192.168.2.100
switch_a(config)# snmp-server trap-ipaddress 3
192.168.3.100
switch_a(config)# snmp-server trap-ipaddress 4
192.168.4.100
switch_a(config)# snmp-server trap-ipaddress 5
192.168.5.100
switch_a(config)# snmp-server trap-type enable
linkDown
switch_a(config)# snmp-server trap-type enable
linkup
switch_a(config)# snmp-server trap-type enable
mac-notification
switch_a(config)# snmp-server mac-notification
interval 60
switch_a(config)# snmp-server mac-notification
```

```
history-size 100
switch_a(config)#interface fe1
switch_a(config-if)#snmp-server trap
mac-notification added
switch_a(config-if)#snmp-server trap
mac-notification removed
```

Configuring SNMP v1 & v2 Community Groups

To configure the SNMP v1 & v2 community groups to make the SNMP feature more secure, use the following CLI commands:

CLI Command Mode: **Global Configuration Mode**

CLI Command Syntax:

snmp-server enable

snmp-server community get *<1 -256 characters>*

snmp-server community set *<1 -256 characters>*

Usage Example:

```
switch_a(config)# snmp-server community get
public
switch_a(config)# snmp-server community set
private
```

Adding SNMP v3 Users

To add SNMP v3 Users to the switch and maximize the security for the SNMP feature, you must use the following CLI commands:

CLI Command Mode: **Global Configuration Mode**

CLI Command Syntax:

snmp-server v3-user <username> <ro|rw> noauth

snmp-server v3-user <username> <ro|rw> auth <md5|sha> <password>

snmp-server v3-user <username> <ro|rw> priv <md5|sha> <password> des <pass_phrase>

Usage Example:

```
switch_a(config)# snmp-server v3-user
SNMP_User_1 ro noauth
switch_a(config)# snmp-server v3-user
SNMP_User_2 ro auth md5 User2
```

```
switch_a(config)# snmp-server v3-user
SNMP_User_3 rw priv md5 User3 des Private_User
```

LLDP

Enable/Disable LLDP
CLI Command Mode: **Global Configuration Mode**
CLI Command Syntax:
lldp enable
no lldp enable

LLDP Holdtime Multiplier
CLI Command Mode: **Global Configuration Mode**
CLI Command Syntax: **lldp holdtime multiplier *<1-10>***
Usage Example:

```
switch_a(config)#lldp holdtime multiplier 4
```

LLDP Transmit Interval
CLI Command Mode: **Global Configuration Mode**
CLI Command Syntax: **lldp txinterval *<5-32768>***
Usage Example: Set LLDP Transmit interval to 30 seconds

```
switch_a(config)# lldp txinterval 30
```

Enable/Disable Global LLDP TLVs
CLI Command Mode: **Global Configuration Mode**
CLI Command Syntax: **lldp tlv-global *<TLV>***

TLV Parameters

TLV Parameter	Description
port-descr	Port Description
sys-name	System Name TLV
sys-descr	System Description TLV
sys-cap	System Capabilities
mgmt-addrs	Management Address
port-vlan-id	Port VLAN ID
mac-phy	MAC/PHY Configuration/Status

port-and-protocol	Port And Protocol VLAN ID
vlan-name	VLAN Name
protocol-identity	Protocol Identity
link-aggregation	(Link Aggregation
max-frame	Maximum Frame Size

Usage Example:
```
switch_a(config)# lldp tlv-global mgmt-addrs
```

Enabling LLDP Transmit on a Port
CLI Command Mode: **Interface Configuration Mode**
CLI Command Syntax: **lldp tx-pkt**
Example:
```
switch_a(config)# lldp tx-pkt
```

Enabling LLDP Receive on a Port
CLI Command Mode: **Interface Configuration Mode**
CLI Command Syntax: **lldp rcv-pkt**
Usage Example:
```
switch_a# interface fe1
switch_a(config)# lldp rcv-pkt
```

Enabling LLDP Notify
CLI Command Mode: **Interface Configuration Mode**
CLI Command Syntax: **lldp notification**

Enabling Transmission of the Management IP
CLI Command Mode: **Interface Configuration Mode**
CLI Command Syntax: **lldp mgmt-ip vlan <*vlan id*>**
Usage Example:
```
switch_a(config)# lldp mgmt-ip vlan 1
```

Enabling Specific TLV's on a Port
CLI Command Mode: **Interface Configuration Mode**
CLI Command Syntax: **lldp tlv-select <TLV ID>** (see **Error! eference source not found.**)
Usage Example:

```
switch_a(config)# lldp tlv-select mgmt-addrs
```

Routing

Create or Delete Static Route

CLI Command Mode: **Global Configuration Mode**

CLI Command Syntax:

ip route <destination_network>/<prefix-length> <next-hop_address or exit interface> [<admin_distance>]

no ip route <destination_network>/<prefix-length> <next-hop_address or exit interface> [<admin_distance>]

Example: Set a route to remote network 172.16.3.0 with mask /24 where 192.168.2.4 is the next hop and administrative distance is 150.

```
switch_a(config)# ip route 172.16.3.0/24
192.168.2.4 150
```

Show Existing IP Routes

CLI Command Mode: **Privileged Exec Mode**

CLI Command Syntax:

show ip route

example:

```
switch_a#show ip route
Codes: K - kernel, C - connected, S - static, R
- RIP
* - candidate default
S    1.111.111.0/24 [1/0] via 172.16.0.200, ge1
S    2.111.111.0/24 [1/0] via 172.16.0.200, ge1
C    127.0.0.0/8 is directly connected, lo
C    172.16.0.0/24 is directly connected, ge1
C    192.168.2.0/24 is directly connected, ge8
R    192.168.3.0/24 [120/2] via 172.16.0.200,
ge1, 00:03:33
R    192.168.4.0/24 [120/12] via 172.16.0.200,
ge1, 00:03:23
R    192.168.5.0/24 [120/12] via 172.16.0.200,
```

```
ge1, 00:03:23
```

Create or Delete Access List

CLI Command Mode: **Global Configuration Mode**

CLI Command Syntax:

access-list <number> <permit or **deny> <host_address> <mask>**

no access-list <number> <permit or **deny> <host_address> <mask>**

Usage Example 1: Deny packets from host 172.16.30.2

```
switch_a(config)#access-list 10 deny host
172.16.30.2
```

Usage Example 2: Deny packets from hosts with IP address 172.16.30.x, where x = any number

```
switch_a(config)#access-list 10 deny host
172.16.30.2 0.0.0.255
```

Configure Route Map

CLI Command Mode: **Global Configuration Mode, Route-Map Configuration Mode**

CLI Command Syntax:

route-map name <permit or deny> <sequence_number> match ip address access_list <acl_id]

Usage Example:

```
switch_a(config)#route-map FIRST_MAP permit 12
switch_a(config-route-map)#match ip address 12
switch_a(config-route-map)#Set ip next-hop
10.1.2.1
```

Enable Proxy ARP

CLI Command Mode: **Interface Configuration Mode**

CLI Command syntax:

ip proxy arp

no ip proxy arp

Usage Example:

```
switch_a(config)#vlan database
switch_a(config-vlan)#int vlan1.1
switch_a(config-if)#ip proxy-arp
```

RIP

Enable or Disable RIP
CLI Command Mode: **Global Configuration Mode, Router Rip Config**
CLI Command Syntax:
router rip
Version 2
No router rip
Usage Example: Enable RIP version 2

```
switch_a(config)# router rip
switch_a(config-router)#version 2
```

Enable RIP Routing on a Specific Network
CLI Command Mode: **Router Rip Config**
CLI Command Syntax:
network <submask>
Usage Example: Enable RIP on 2.2.2.0 255.255.255. 0 and 192.168.20.0 255.255.255.0

```
switch_a(config-router)#network 2.2.2.0/24
switch_a(config-router)#network
192.168.20.0/24
```

Show RIP Routing Table
CLI Command Mode: **Privileged Exec Mode**
CLI Command Syntax:
show ip rip
show ip interface brief

Define RIP Neighbor
CLI Command Mode: **Router Rip Config**
CLI Command Syntax:
neighbor <ip address>
no neighbor <ip address>

Set Interface to Passive
CLI Command Mode: **Router Rip Config**

CLI Command Syntax:
passive-interface <interface>
no passive-interface <interface>

RIP Default Metric
CLI Command Mode: **Router Rip Config**
CLI Command Syntax:
default-metric <value>
no default-metric

RIP Send Version
CLI Command Mode: **Interface Configuration Mode**
CLI Command Syntax:
ip rip send version <1,2>
no ip rip send version <1,2>

Redistribute
CLI Command Mode: **Router Rip Config**
CLI Command Syntax:
redistribute (connected | static) [metric <0-16>] [route-map map_name]
Usage Example:
```
switch_a(config-router)# redistribute static
metric 10
```

RIP Default Route
CLI Command Mode: **Router Rip Config**
CLI Command Syntax:
default-information originate
no default-information originate

Define RIP Administrative Distance
CLI Command Mode: **Router Rip Config**
CLI Command Syntax:
distance <admin-distance value>
no distance

Define RIP Timers
CLI Command Mode: **Router Rip Config**

CLI Command Syntax:
timers basic <update> <invalid> <flush>
no timers basic
Description of parameters:

- **Update**: Rate (in seconds) at which updates are sent. Default is 30 seconds.
- **Invalid**: Interval (in seconds) after which a route is declared invalid. The interval should be at least three times the value of update time. Default is 180 seconds.
- **Flush**: Number of seconds that must pass before route is removed from routing table. Default is 240 seconds.

Usage Example:
```
switch_a(config-router)# timers basic 30 180 120
```

RIP Authentication
CLI Command Mode: **Interface Configuration Mode**
CLI Command Syntax:
ip rip authentication mode <md5 | text>
Usage Example:
```
switch_a(config-if)#ip rip authentication mode
md5
```

Other Protocols

GVRP Configuration
CLI Command Mode: **Global Configuration Mode**
CLI Command Syntax:
set gvrp enable bridge 1
set gvrp disable bridge 1
Usage Examples:
```
switch_a(config)# set gvrp enable bridge 1
switch_a(config)# set gvrp disable bridge 1
```

Dynamic VLAN creation in GVRP
CLI Command Mode: **Global Configuration Mode**

CLI Command Syntax: **set gvrp dynamic-vlan-creation disable bridge 1**
Usage Example:
```
switch_a(config)# set gvrp
dynamic-vlan-creation disable bridge 1
```

Enable or disable GVRP locally on a port
CLI Command Mode: **Global Configuration Mode**
CLI Command Syntax:
set port gvrp enable <port id>
set port gvrp disable <port id>
Usage Examples:
```
switch_a(config)# set port gvrp enable fe1
switch_a(config)# set port gvrp disable fe1
```

By default, when GVRP is enabled on a port the **Applicant** runs in Normal mode, which means that the GVRP protocol will not send out any PDUs from a port if the port is being blocked by STP. When you enable the GVRP Applicant to run in Active mode on a port, the GVRP protocol will continue to send PDUs from a port even if the port is being blocked by STP.
The GVRP **Applicant** can be set to run in Normal or Active mode on a port by issuing the following CLI commands:
CLI Command Mode: **Global Configuration Mode**
CLI Command Syntax:
set gvrp applicant state normal <port id>
set gvrp applicant state active <port id>
Usage Examples:
```
switch_a(config)# set gvrp applicant state
normal fe1
switch_a(config)# set gvrp applicant state
active fe1
```

When you enable GVRP on a port, the **Registrar** is enabled on the port by default. You can enable or disable the GVRP **Registrar** on a port by issuing the following CLI commands:
CLI Command Mode: **Global Configuration Mode**

CLI Command Syntax:
set gvrp registration normal <port id>
set gvrp registration forbidden <port id>
Usage Examples:

```
switch_a(config)# set gvrp registration normal
fe1
switch_a(config)# set gvrp registration
forbidden fe1
```

IGMP Configuration

Disable IGMP Snooping

CLI Command Mode: **Global Configuration Mode**
CLI Command Syntax: **no ip igmp snooping**

Put IGMP Snooping in Passive Mode

CLI Command Mode: **Global Configuration Mode**
CLI Command Syntax:
ip igmp snooping enable
no ip igmp snooping querier
Usage Example:

```
switch_a(config)#ip igmp snooping enable
switch_a(config)#no ip igmp snooping querier
```

Put IGMP Snooping in Querier Mode

CLI Command Mode: **Global Configuration Mode**
CLI Command Syntax:
ip igmp snooping enable
ip igmp snooping querier
Usage Example:

```
switch_a(config)#ip igmp snooping enable
switch_a(config)#ip igmp snooping querier
```

Set IGMP version per VLAN

CLI Command Mode: **Global Configuration Mode**
CLI Command Syntax: **ip igmp version <1-3>**
Usage Example:

```
switch_a(config)#interface vlan1.1
switch_a(config-if)#ip igmp version 2
```

Enable/ disable IGMP fast-leave feature on a VLAN

CLI Command Mode: **VLAN Interface Configuration Mode**

CLI Command Syntax:

ip igmp snooping fast-leave

no ip igmp snooping fast-leave

Usage Example - **Enabling** the IGMP **fast-leave** feature:

```
switch_a(config)#interface vlan1.1
switch_a(config-if)#ip igmp snooping fast-leave
```

Usage Example - **Disabling** the IGMP **fast-leave** feature:

```
switch_a(config)#interface vlan1.1
switch_a(config-if)#no ip igmp snooping
fast-leave
```

Enable/disable IGMP Report Suppression on a VLAN

CLI Command Mode: **VLAN Interface Configuration Mode**

CLI Command Syntax:

ip igmp snooping report-suppression

no ip igmp snooping report-suppression

Usage Example - **Enabling** the IGMP **Report Suppression** feature:

```
switch_a(config)#interface vlan1.1
switch_a(config-if)# ip igmp snooping
report-suppression
```

Configure IGMP query-interval and max-response-time

CLI Command Mode: **VLAN Interface Configuration Mode**

CLI Command Syntax:

ip igmp query-interval <10-18000>

ip igmp query-max-response-time <1-240>

Usage Example - Configuring the IGMP **query-interval** parameter:

```
switch_a(config-if)# ip igmp query-interval 125
```

Usage Example - Configuring the IGMP **max-response-time** parameter:

```
switch_a(config-if)# ip igmp
query-max-response-time 10
```

Configure unknown multicast packets in IGMP Disabled mode

CLI Command Mode: **Global Configuration Mode**

CLI Command Syntax:

ip igmp snooping passive-forward all

ip igmp snooping passive-forward none

ip igmp snooping passive-forward *<ifname>,<ifname>,<ifname>*

Usage Example 1- Flood all unknown multicast packets:

```
switch_a(config)# ip igmp snooping
passive-forward all
```

Usage Example 2- Drop all unknown multicast packets:

```
switch_a(config)# ip igmp snooping
passive-forward none
```

Usage Example 3- Forward unknown multicast packets to the specified ports only:

```
switch_a(config)# ip igmp snooping
passive-forward fe1,fe2,fe3
```

Set forwarding for unknown multicast packets in IGMP Passive mode

(And without Querier Port present)

CLI Command Mode: **Global Configuration Mode**

CLI Command Syntax:

ip igmp snooping passive-forward all

ip igmp snooping passive-forward none

ip igmp snooping passive-forward *<ifname>,<ifname>,<ifname>*

Usage Example 1 - Flood all unknown multicast packets:

```
switch_a(config)# ip igmp snooping
passive-forward all
```

Usage Example 2 - Drop all unknown multicast packets:

```
switch_a(config)# ip igmp snooping
passive-forward none
```

Usage Example 3 - Forward unknown multicast packets to the specified ports only:

```
switch_a(config)# ip igmp snooping
passive-forward fe1,fe2,fe3
```

Set forwarding for unknown multicast packets in IGMP (with or without a Querier Port present)

CLI Command Mode: **Global Configuration Mode**

CLI Command Syntax:

ip igmp snooping force-forward all
ip igmp snooping force-forward none
ip igmp snooping force-forward ***<ifname>,<ifname>,<ifname>***

Usage Example 1 - Flood all unknown multicast packets:

```
switch_a(config)# ip igmp snooping
force-forward all
```

Usage Example 2 - Drop all unknown multicast packets:

```
switch_a(config)# ip igmp snooping
force-forward none
```

Usage Example 3 - Forward unknown multicast packets to the specified ports only:

```
switch_a(config)# ip igmp snooping
force-forward fe1,fe2,fe3
```

Set forwarding for unknown multicast packets in IGMP Querier mode

CLI Command Mode: **Global Configuration Mode**

CLI Command Syntax:

ip igmp snooping force-forward all
ip igmp snooping force-forward none
ip igmp snooping force-forward ***<ifname>,<ifname>,<ifname>***

Usage Example 1 - Flood all unknown multicast packets:

```
switch_a(config)# ip igmp snooping
force-forward all
```

Usage Example 2 - Drop all unknown multicast packets:

```
switch_a(config)# ip igmp snooping
force-forward none
```

Usage Example 3 - Forward unknown multicast packets to the specified ports only:

```
switch_a(config)# ip igmp snooping
force-forward fe1,fe2,fe3
```

Network Time Protocol (NTP)

Enable NTP

CLI Command Mode: Global Configuration Mode
CLI Command Syntax:
ntp enable

Set NTP Server

CLI Command Mode: Global Configuration Mode
CLI Command Syntax:
ntp server <IP Address or Host Name of NTP Server>
Example:

```
switch_a(config)# ntp server 192.168.1.126
```

Set NTP Polling Interval

CLI Command Mode: Global Configuration Mode
CLI Command Syntax:
ntp polling-interval <time in minutes, 1-10080>
Example:

```
switch_a(config)# ntp polling-interval 180
```

Set NTP Synchronization

CLI Command Mode: Global Configuration Mode
CLI Command Syntax: **ntp sync-time**

Set Current Time Zone

CLI Command Mode: Global Configuration Mode
CLI Command Syntax:
clock timezone <Name of Time Zone> <UTC Offset in hh:mm format>
Example:

```
switch_a(config)# clock timezone CDT -6:00
```

Set Daylight Savings Time (Weekday Mode)
CLI Command Mode: Global Configuration Mode
CLI Command Syntax:
clock summer-time <Name of Time Zone> weekday <start week number> <start day> <start month> <start hour> <start minute> <end week number> <end day> <end hour> <end minute> <time offset in minutes>
Example:
```
switch_a(config)#clock summer-time CDT weekday
2 Sun March 2 0 1 Sun November 2 0 60
```

Set Daylight Savings Time (Date Mode)
CLI Command Mode: Global Configuration Mode
CLI Command Syntax:
clock summer-time <Name of Time Zone> date <start date> <start month> <start hour> <start minute> <end date> <end month> <end hour> <end minute> <time offset in minutes>
Example:
```
switch_a(config)#clock summer-time CDT date 9
March 2 0 2 November 2 0 60
```

GMRP

Enable/disable GMRP Globally
CLI Command Mode: Global Configuration Mode
CLI Command Syntax:
set gmrp enable bridge 1
set gmrp disable bridge 1

Enable GMRP Locally on a Port
CLI Command Mode: Global Configuration Mode
CLI Command Syntax:
set port gmrp enable <port id>
set port gmrp enable <port id>

When you enable GMRP on a port, the **Registrar** is in

Normal mode by default.

Configure GMRP Registrar
CLI Command Mode: Global Configuration Mode
CLI Command Syntax:
set gmrp registration normal <port id>
set gmrp registration fixed fe1 <port id>
set gmrp registration forbidden <port id>

Enable/disable Forward All on a Port
CLI Command Mode: Global Configuration Mode
CLI Command Syntax:
set gmrp fwdall enable <port id>
set gmrp fwdall disable <port id>

DHCP

Set DHCP Server Parameters
CLI Command Mode: Global Configuration Mode
CLI Command Syntax:
dhcp-server range <start IP> <end IP>
dhcp-server subnet-mask <subnet mask in doted decimal notation>
dhcp-server gateway <IP address>
dhcp-server dns 1 <IP address>
dhcp-server dns 2 <IP address>
dhcp-server lease-time <0-864000>
Example:

```
switch_a(config)#dhcp-server range 192.168.7.100
192.168.7.107
switch_a(config)#dhcp-server subnet-mask
255.255.255.0
switch_a(config)#dhcp-server gateway 192.168.7.1
switch_a(config)#dhcp-server dns 1 1.2.3.4
switch_a(config)#dhcp-server dns 2 5.6.7.8
switch_a(config)#dhcp-server lease-time 86400
```

Enable/disable DHCP Server
CLI Command Mode: **Interface Configuration Mode**

CLI Command Syntax:
dhcp-server enable
no dhcp-server enable

Restart DHCP Server
CLI Command Mode: **Interface Configuration Mode**
CLI Command Syntax:
dhcp-server restart

Check IP Address Allocation
CLI Command Mode: **Privileged Exec Mode**
CLI Command Syntax: **show dhcp-server binding**

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