Baseline Switch 2226-SFP Plus
Baseline Switch 2426-PWR Plus
Baseline Switch 2250-SFP Plus
User Guide

3CBLSF26H
3CBLSF26PWRH
3CBLSF50H

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ENVIRONMENTAL STATEMENT

It is the policy of 3Com Corporation to be environmentally-friendly in all operations. To uphold our policy, we are committed to:

Establishing environmental performance standards that comply with national legislation and regulations.

Conserving energy, materials and natural resources in all operations.

Reducing the waste generated by all operations. Ensuring that all waste conforms to recognized environmental standards. Maximizing the recyclable and reusable content of all products.

Ensuring that all products can be recycled, reused and disposed of safely.

Ensuring that all products are labelled according to recognized environmental standards.

Improving our environmental record on a continual basis.

End of Life Statement

3Com processes allow for the recovery, reclamation and safe disposal of all end-of-life electronic components.

Regulated Materials Statement

3Com products do not contain any hazardous or ozone-depleting material.

Environmental Statement about the Documentation

The documentation for this product is printed on paper that comes from sustainable, managed forests; it is fully biodegradable and recyclable, and is completely chlorine-free. The varnish is environmentally-friendly, and the inks are vegetable-based with a low heavy-metal content.

About This Manual

Organization

3Com Baseline Switch User Guide is organized as follows:

Chapter	Contents
1 Getting Started	This chapter contains introductory information about the installation of the switch and how they can be used in your network.
2 Connecting To the Web Interface	This chapter introduces the setting the menu items and buttons that are available on the Web interface.
3 Configuring the Switch	This chapter introduces how to configure the switch in detail.
4 Troubleshooting	This chapter lists some issues that you may encounter while installing, using, and managing the switch, with suggested courses of corrective action to take.
5 CLI Reference Guide	This chapter describes using the Command Line Interface (CLI) to manage the switch.
6 Obtaining Support for Your Product	This chapter introduces how to get support for your product.
7 Safety Information	This chapter describes the important safety information for you product.
8 Regulatory Notices	This chapter describes the important regulatory notices for you product.
9 Glossary	This chapter lists the main glossaries for the manual.

Conventions

The manual uses the following conventions:

Command conventions

Convention	Description
Boldface	The keywords of a command line are in **Boldface**.
italic	Command arguments are in *italic*.
[ ]	Items (keywords or arguments) in square brackets [ ] are optional.
{ x | y | ... }	Alternative items are grouped in braces and separated by vertical bars. One is selected.
[x | y | ...]	Optional alternative items are grouped in square brackets and separated by vertical bars. One or none is selected.
{ x | y | ... } *	Alternative items are grouped in braces and separated by vertical bars. A minimum of one or a maximum of all can be selected.
[x | y | ...] *	Optional alternative items are grouped in square brackets and separated by vertical bars. Many or none can be selected.
&<1-n>	The argument(s) before the ampersand (&) sign can be entered 1 to n times.

Convention	Description
#	A line starting with the # sign is comments.

GUI conventions

Convention	Description
Boldface	Window names, button names, field names, and menu items are in Boldface. For example, the **New User** window appears; click **OK**.
>	Multi-level menus are separated by angle brackets. For example, **File** > **Create** > **Folder**.

Symbols

Convention	Description
 **Caution**	Means reader be careful. Improper operation may cause data loss or damage to equipment.
 **Note**	Means a complementary description.

Obtaining Documentation

You can access the most up-to-date 3Com product documentation on the World Wide Web at this URL: http://www.3com.com.

Table of Contents

1 Getting Started

Note

- This manual applies to the Baseline Switch 2250-SFP Plus, Baseline Switch 2226-SFP Plus, and Baseline Switch 2426-PWR Plus, which are hereinafter referred to as the switch.
- This manual takes the Web interfaces of the Baseline Switch 2426-PWR Plus as an example.

This chapter contains introductory information about the installation of the switch and how they can be used in your network. It covers the following topics:

- Introducing the Switch
- Installing the Switch
- Configuring IP Address

Introducing the Switch

This chapter covers summary information about the hardware and the following topics:

- Overview of the Switch
- Summary of Hardware Features
- Front View Detail
- LED Status Indicators
- System Specifications

Overview of the Switch

- The Baseline Switch 2226-SFP Plus is a versatile, easy-to-use configurable switch.
- The Baseline Switch 2426-PWR Plus is a versatile, easy-to-use configurable Power-over-Ethernet (PoE) Switch.
- The Baseline Switch 2250-SFP Plus is a versatile, easy-to-use configurable switch.

Each Switch is ideal for users who want the high-speed performance of 10/100 switching with the added functionality of Gigabit copper and fiber links, but do not need sophisticated management capabilities. The Switch is shipped ready for use. No configuration is necessary.

Summary of Hardware Features

Table 1-1 Summarizes the hardware features supported by the Switch.

Table 1-1 Hardware Features

Feature	Description
Addresses	Up to 8192 supported.
Auto-negotiation	Supported on all ports.

Feature	Description
Forwarding Modes	Store and Forward.
Duplex Modes	Half and full duplex on all front panel ports.
Auto MDI/MDIX	Supported on all ports. If fiber SFP transceivers are used, Auto MDIX is not supported.
Flow Control	In full duplex operation all ports are supported.
Traffic Prioritization	Four traffic queues per port.
Ethernet Ports	10/100 Mbps ports. Each port automatically determines the speed and duplex mode of the connected equipment and provides a suitable switched connection. The 10/100 Mbps ports can operate in either half-duplex or full-duplex mode.
Gigabit Combo Ports	The 2 Gigabit combo ports support fiber Gigabit Ethernet short-wave (SX) and long-wave (LX) SFP transceivers in any combination. This offers you the flexibility of using SFP transceivers to provide connectivity between the Switch and a 1000 Mbps core network. When an SFP port is in operation, the corresponding 1000BASE-T port is disabled. The 1000 Mbps connections can only operate in full duplex mode.
Mounting	19-inch rack or standalone mounting.
Fanless design (supported by Baseline Switch 2226-SFP Plus and Baseline Switch 2250-SFP Plus)	Silent operation whether used in a rack or desktop situation.
PoE (Only supported by Baseline Switch 2426-PWR Plus)	Each RJ-45 port supports the IEEE 802.3af PoE standard. Any 802.3af compliant device attached to a port can directly draw power from the switch over the Ethernet cable without requiring its own separate power source. This capability gives network administrators centralized power control for devices such as IP phones and wireless access points, which translates into greater network availability.

Front View Detail

Figure 1-1 shows the front panel of the Baseline Switch 2226-SFP Plus 26-Port unit.

Figure 1-1 Baseline Switch 2226-SFP Plus 26-Port—front panel.

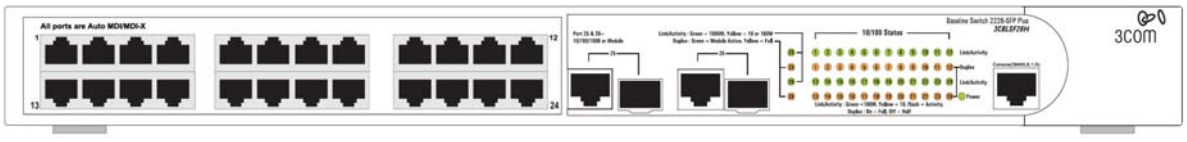


Figure 1-2 Shows the front panel of the Baseline Switch 2426-PWR Plus 26-Port unit.

Figure 1-2 Baseline Switch 2426-PWR Plus 26-Port—front panel.

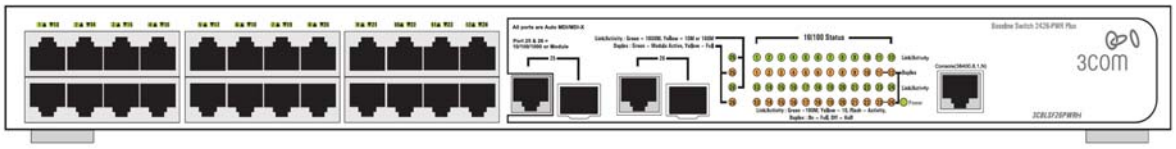


Figure 1-3 shows the front panel of the Baseline Switch 2250-SFP Plus 50-Port unit.

Figure 1-3 Baseline Switch 2250-SFP Plus 50-Port—front panel.

LED Status Indicators

The Switch provides LED indicators on the front panel for your convenience to monitor the switch. Table 1-2 describes the meanings of the LEDs.

Table 1-2 Description on the LEDs of the Switch

LED		Status	Description
Power		Green	The switch starts normally. The LED flashes when the system is performing Power-On Self-Test (POST).
		Yellow	The system has failed the POST.
		OFF	The switch is powered off.
Link/Activity	10/100BASE-T port	Green	The port works at the rate of 100 Mbps; the LED flashes quickly when the port is sending or receiving data.
		Yellow	The port works at the rate of 10 Mbps; the LED flashes quickly when the port is sending or receiving data.
		OFF	The link has not been established, either nothing is connected to the port, or there is a problem: • Check that the attached device is powered on. • Check that the cable is the correct type and is not faulty. If these checks do not identify the cause of the problem, it may be that the unit or the device connected to the port is faulty. Contact your supplier for further advice.
	10/100/1000BASE-T port	Green	The port works at the rate of 1000 Mbps; the LED flashes quickly when the port is sending or receiving data.
		Yellow	The port works at the rate of 10/100 Mbps; the LED flashes quickly when the port is sending or receiving data.

LED		Status	Description
		OFF	The link has not been established, either nothing is connected to the port, or there is a problem: • Check that the attached device is powered on. • Check that the cable or fiber is the correct type and is not faulty. • For fiber connections, ensure that the receive (RX) and transmit (TX) cable connectors are not swapped. If these checks do not identify the cause of the problem, it may be that the unit or the device connected to the port is faulty. Contact your supplier for further advice.
Duplex	10/100/1000BASE-T port	Yellow	The port is in full duplex mode.
		OFF	The port is not connected, or is in half duplex mode.
Module Active	SFP port	Green	The SFP module is inserted.
		OFF	The SFP module is not inserted or is not recognized.
PoE Power (Only supported by Baseline Switch 2426-PWR Plus)		Green	The port is supplying power to the device connected to it.
		OFF	The port is not supply power to the device connected to it or not connected.

System Specifications

Table 1-3 contains the system specifications of the Switch.

Table 1-3 System specifications of the Switch.

Specification	2226-SFP	2426-PWR	2250-SFP
Physical dimensions (H×W×D)	44 mm×440 mm×170 mm	44 mm×440 mm×238 mm	44 mm×440 mm×238 mm
Weight	1.6 kg	3.2 kg	2.9 kg
Console port	1	1	1
Ethernet port	24	24 (Each port can provide a power supply of 25 W)	48
Gigabit Combo port	2	2	2
AC Input voltage	Rated voltage range: 100–240V AC, 50/60 Hz	Rated voltage range: 100–240V AC, 50/60 Hz	Rated voltage range: 100–240V AC, 50/60 Hz
Power consumption (full load)	17 W	205 W	26 W
Operating temperature	0°C to 40°C (32°F to 113°F)		
Storage temperature	–10°C to +70°C (14°F to 158°F)		

Specification	2226-SFP	2426-PWR	2250-SFP
Operating humidity (noncondensing)	20% to 85%		
Storage humidity (noncondensing)	10% to 90%		

Installing the Switch

This section contains information that you need to install and set up the switch. It covers the following topics:

- Before You Begin
- Package Contents
- Positioning the Switch
- Rack-Mounting or Free-Standing
- Supplying Power to the Switch
- Checking for Correct Operation
- Using SFP Transceivers
- Performing Spot Checks

Before You Begin

Before installing or removing any components from the switch or carrying out any maintenance procedures, read the safety information provided in Safety Information of this guide.

Package Contents

The Baseline Switch packaging contains the following for all units:

- One product sealed in a plastic bag
- One CD
- One Safety and Regulatory Information manual
- One warranty card
- One Mounting Kit
- One DB-9 to RJ-45 cable

Positioning the Switch

The switch is suitable for use in an office environment where it can be free-standing or mounted in a standard 19-inch equipment rack.

Alternatively, the switch can be rack-mounted in a wiring closet or equipment room. A mounting kit, containing two mounting brackets and four screws, is supplied with the switch.

When deciding where to position the switch, ensure that:

- It is accessible and cables can be connected easily.
- Cabling is away from sources of electrical noise. These include lift shafts, microwave ovens, and air conditioning units. Electromagnetic fields can interfere with the signals on copper cabling and introduce errors, therefore slowing down your network.
- Water or moisture cannot enter the case of the unit.

- Air flow around the unit and through the vents on the side of the case is not restricted (3Com recommends that you provide a minimum of 25 mm (1 in.) clearance).
- The air is as free from dust as possible.
- Temperature operating limits are not likely to be exceeded. It is recommended that the unit is installed in a clean, air conditioned environment.

Note

It is always good practice to wear an anti-static wrist strap when installing network equipment, connected to a ground point. If one is not available, try to keep in contact with a grounded rack and avoid touching the unit's ports and connectors, if possible. Static discharge can cause reliability problems in your equipment.

Rack-Mounting or Free-Standing

The unit can be mounted in a 19-inch equipment rack using the mounting kit or it can be free standing. Do not place objects on top of the unit or stack.

Caution

If installing the switch in a free-standing stack of different size Baseline or Super stack 3 units, the smaller units must be installed above the larger ones. Do not have a free-standing stack of more than six units.

Using the Mounting Kit

The switch is supplied with two mounting brackets and four screws. These are used for rack mounting the unit. When mounting the unit, you should take note of the guidelines given in Positioning the Switch.

The switch is 1U (1.7 inches) high and will fit in a standard 19-inch rack.

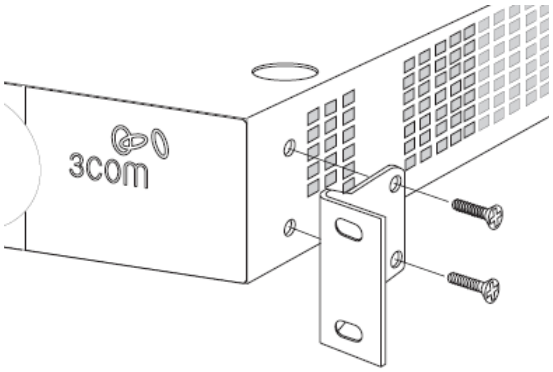
Caution

Disconnect all cables from the unit before continuing. Remove the self-adhesive pads from the underside of unit, if already fitted.

To rack-mount the switch:

1) Place the unit the right way up on a hard, flat surface with the front facing towards you.
2) Locate a mounting bracket over the mounting holes on one side of the unit.
3) Insert the two screws supplied in the mounting kit and fully tighten with a suitable screwdriver.

Figure 1-4 Rack Mounting the Unit



4) Repeat steps 2 and 3 for the other side of the unit.
5) Insert the unit into the 19-inch rack and secure with suitable screws (not provided).
6) Reconnect the cables.

Placing Units On Top of Each Other

If the switch units are free-standing, up to six units can be placed one on top of the other. If you are mixing a variety of Baseline and Super Stack units, the smaller units must be positioned at the top.

If you are placing switch units one on top of the other, you must use the self-adhesive rubber pads supplied. Apply the pads to the underside of each switch, sticking one in the marked area at each corner.

Place the switch units on top of each other, ensuring that the pads of the upper unit line up with the recesses of the lower unit.

Supplying Power to the Switch

Power problems can be the cause of serious failures and downtime in your network. Ensure that the power input to your system is clean and free from sags and surges to avoid unforeseen network outages. 3Com recommends that you install power conditioning, especially in areas prone to blackout, power dips and electrical storms.

The unit is intended to be grounded. Ensure it is connected to earth ground during normal use. Installing proper grounding helps to avoid damage from lightning and power surges.

Caution

Before powering on the switch, verify that the network cables and the power cable are securely connected.

To power on the switch:

1) Plug the power cord into the power socket on the rear panel of the switch.
2) Plug the other end of the power cord into a power outlet.

Checking for Correct Operation

After you power on the switch, it automatically performs a power-on self-test (POST). During POST, the Power LED on the front panel of the switch flashes green.

When POST is complete, the Power LED turns green. If the Power LED turns yellow after POST, it means that POST failed and the switch has entered fail-safe mode.

The following summarizes the possible colors for the Power LED after POST.

Table 1-4 Summarizes the possible colors for the Power LED after POST

Status	Meaning
Green	The unit is powered on and ready for use.
Yellow	Power-on self-test or loop back test failed. The switch is in fail-safe mode. This can happen if a port or ports fail when the switch was powered on.
Off	The unit is not receiving power. • Verify that the power cord is connected correctly, and then try powering on the switch again • If the switch still does not operate, contact your 3Com network supplier

If POST fails, try the following:

- Power off the switch, and then power it on again. Check the Power LED and see if POST was successfully completed.
- Reset the switch. See Resetting to Factory Defaults.

Caution

Resetting the switch to its factory default erases all your settings. You will need to reconfigure the switch after you reset it.

If these do not resolve the issue:

- Check the 3Com Knowledgebase for a solution. To visit the 3Com Knowledgebase Web site, start your Web browser, and then enter http://knowledgebase.3com.com.
- Contact your 3Com network supplier for assistance.

Using SFP Transceivers

The following sections describe how to insert an SFP transceiver into an SFP slot.

Note

SFP transceivers are hot-insertable and hot-swappable. You can remove them from and insert them into any SFP port without having to power down the switch.

Approved SFP Transceivers

The following list of approved SFP transceivers is correct at the time of publication:

- 3CSFP91 SFP (SX)
- 3CSFP92 SFP (LX)

To access the latest list of approved SFP transceivers for the switch on the 3Com Web site, enter this URL into your Internet browser: http://www.3com.com

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Note

3Com recommends using 3Com SFPs on the switch. If you insert an SFP transceiver that is not supported, the switch will not recognize it.

Inserting an SFP Transceiver

To be recognized as valid, the SFP transceiver must have the following characteristics:

1000BASE-SX or 1000BASE-LX media type:

- 1000BASE-SX SFP transceiver

Use this transceiver to connect the switch directly to a multimode fiber-optic cable.

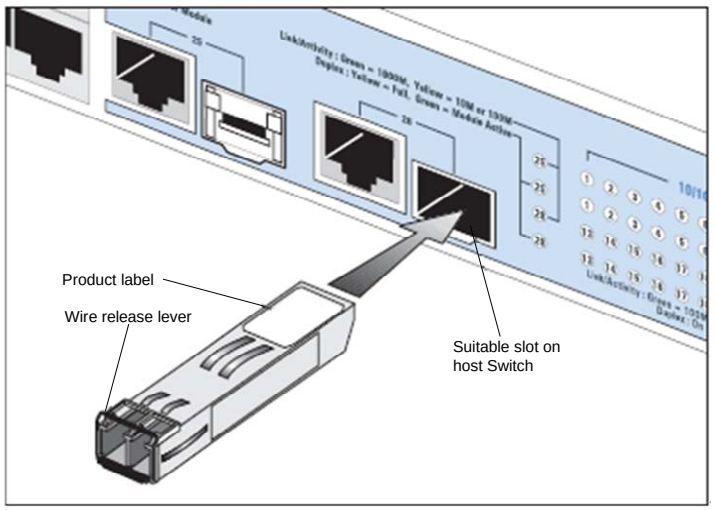
- 1000BASE-LX SFP transceiver

Use this transceiver to connect the switch directly to a single mode fiber-optic cable or to multi-mode fiber using a conditioned launch cable.

To activate the SFP port:

1) Hold the transceiver so that the fiber connector is toward you and the product label is visible, as shown in Figure 1-5.Ensure the wire release lever is closed (in the upright position).

Figure 1-5 Inserting an SFP Transceiver



2) Gently slide the transceiver into the SFP slot until it clicks into place.

Caution

SFP transceivers are keyed and can be properly inserted only one way. If the transceiver does not click when you insert it, remove it, turn it over, and reinsert it.

3) Remove the plastic protective cover, if fitted.
4) Connect the fiber cable.
5) Attach a male duplex LC connector on the network cable into the duplex LC connector on the transceiver.
6) Connect the other end of the cable to a device fitted with an appropriate Gigabit Ethernet connection.
7) Check the Module Active LEDs on the front of the switch to ensure that the SFP transceiver is operating correctly.

Removing an SFP Transceiver

To remove an SFP transceiver:

1) Disconnect the cable from the transceiver.
2) Move the wire release lever downwards until it is pointing toward you.
3) Pull the wire release lever toward you to release the catch mechanism.

The SFP transceiver should slide out easily.

Performing Spot Checks

At frequent intervals, you should visually check the switch. Regular checks can give you an early warning of a possible failure; any problems can then be attended to when there will be least effect on users.

3Com recommends periodically checking the items listed in Table 1-5.

Table 1-5 Items to Check

Item	Operation
Cooling fan	Where possible, check that the cooling fan is operating by listening to the unit. The fan is fitted near to the front right hand side of the unit (when viewed from the front).
Cabling	Check that all external cabling connections are secure and that no cables are pulled taut.

Configuring IP Address

The switch's IP configuration is determined automatically using DHCP, or manually using values you assign.

By default, the switch will use its default IP information. The default IP address is 169.254.xxx.xxx. If the MAC address is 08004E000102, the IP address would be 169.254.1.2.

Automatic IP Configuration using DHCP

When you use the automatic IP configuration method, the switch tries to obtain its IP information without requesting user intervention from a DHCP server on the network.

You should use the automatic IP configuration method if:

- Your network uses DHCP to allocate IP information, or
- Flexibility is needed. If the switch is deployed onto a different subnet, it will automatically reconfigure itself with an appropriate IP address, instead of you having to manually reconfigure the switch.

You can use **ip address dhcp-alloc** command to define automatic IP configuration method and use **display ip** command to view the automatically allocated IP Information through the Console Port (see CLI Reference Guide).

Manual IP Configuration

When you configure the IP information manually, the switch remembers the information that you enter until you change it again.

You should use the manual IP configuration method if:

- You do not have a DHCP server on your network, or
- You want to remove the risk of the IP address ever changing, or
- Your DHCP server does not allow you to allocate static IP addresses.

Note

For most installations, 3Com recommends that you configure the switch IP information manually. This makes management simpler and more reliable as it is not dependent on a DHCP server, and eliminates the risk of the IP address changing.

You can use **ip address** command to configure the static IP for your switch through the Console Port (see CLI Reference Guide).

2 Connecting To the Web Interface

The switch has a built-in Web interface that you can use to set the user password, change the IP address that is assigned to the switch, and configure its advanced settings.

This chapter introduces the setting the menu items and buttons that are available on the Web interface. The following topics are covered:

- Requirements for Accessing the Web Interface
- Choosing a Web Browser
- Default User and Password
- Logging On to the Web Interface
- Navigating the Web Interface

Requirements for Accessing the Web Interface

To connect to the Web interface, you need the following:

- Ensure that the switch is connected to the network using a Category 5 twisted pair Ethernet cable with RJ-45 connectors.
- Ensure that you know your switch's IP address. See Configuring IP Address.
- Check that your management workstation is on the same subnet as your switch.
- Choose a suitable Web browser.

Choosing a Web Browser

To display the Web interface correctly, use one of the following Web browsers and platform combinations:

Table 2-1 Supported Web Browsers and Platforms

Platform / Browser	Windows 2000	Windows XP	Windows Vista
Internet Explorer 6	Yes	Yes	Yes
Internet Explorer 7	Yes	Yes	Yes
Firefox 1.5	Yes	Yes	Yes
Firefox 2	Yes	Yes	Yes
Netscape 8	Yes	Yes	Yes

For the browser to operate the Web interface correctly, JavaScript and Cascading Style Sheets must be enabled on your browser. These features are enabled on a browser by default. You will only need to enable them if you have changed your browser settings.

Default User and Password

If you intend to manage the switch or to change the default password, you must log in with a valid user name and password. The switch has one default user name. The default user is listed in Table 2-2.

Table 2-2 Default User and Password

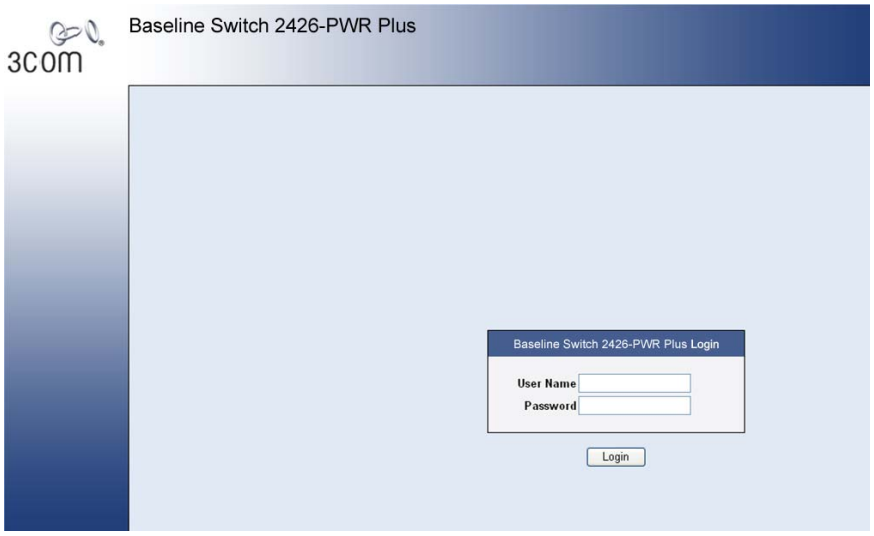
User Name	Default Password	Access Level
admin	-	Management: The user can access and change all manageable parameters

Logging On to the Web Interface

To log on to the Web interface, do the following:

1) Open your Web browser and enter the IP address of the switch that you wish to manage in the URL locator (For example, in the following format: http://xxx.xxx.xxx.xxx). The Login Page appears:

Figure 2-1 Login Page



2) Enter admin as your user name and leave the password field blank.
3) Click Login, The main Web interface page is displayed.

Navigating the Web Interface

The Web interface has been designed to enable you to easily perform advanced configuration tasks and view information about the switch.

Menu

The menu is located on the left side of the Web interface. When you click an item on the menu, the related screen appears in the main part of the interface. Some menu items will give you sub-menu tabs to choose from.

Figure 2-2 Switch Screen Layout

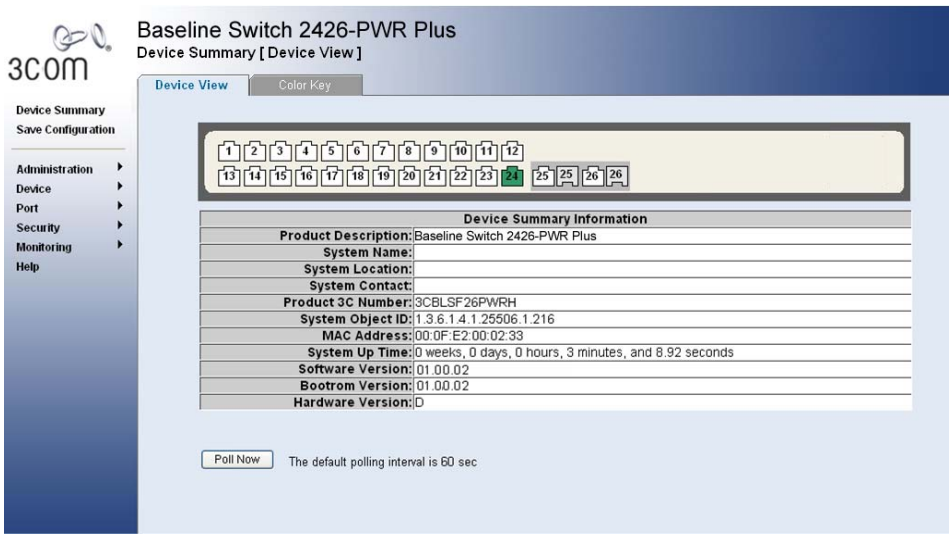


Table 2-3 Available Menu Items

Menu Item		Description
Device Summary		Contains tabs that allow you to: • Provide a summary of the switch's basic settings and versions of current components. • Display the description for each color coded port.
Save Configuration		Saves the switch's configuration
Administration	IP Setup	Allows you to setup, modify, or view the IP configuration parameters.
	ARP Setting	Allows a host to communicate with other hosts when only the IP address of its neighbors is known.
	Backup & Restore	Allows you to backup and restore the switch's configuration.
	Firmware Upgrade	Allows you to upgrade the current firmware via HTTP
	Reset	Allows you to reset the switch to factory default settings
	System Access	Contains tabs that allow you to: • Display user summary information. • Create a new user. • Modify existing users. • Remove existing users.
	System Name	Allows you to set the system name.
	System Time	Allows you to set the system time.
	Logging	System Logs record and manage events and report errors and informational messages
	SNMP	Contains tabs that allow you to: • Add community strings. • Remove community strings.

Menu Item		Description
Device	VLAN	Contains tabs that allow you to: • Create a VLAN. • Modify a VLAN. • Modify VLAN membership for a port. • Rename a VLAN. • Remove a VLAN. • Display VLAN membership for a port. • Display VLAN information.
	Spanning Tree	Allows you to configure a Spanning Tree Protocol. Contains tabs that allow you to: • Display selected spanning tree information for every port. • Display individual port spanning tree information. • Modify the spanning tree settings for a port.
	IGMP Snooping	Allows you to enable or disable IGMP snooping and IGMP query modes.
	Broadcast Storm	Allows you to enable or disable broadcast control.
	ACL	Configures the ACL.
	MAC Based ACL	Configures MAC Based ACL on the switch.
	IP Based ACL	Configures IP Based ACL on the switch.
	ACL Binding	Configures ACL Binding on the switch.
	QoS	Configures QoS settings.
	CoS	Contains tabs that allow you to: • Displays CoS default settings assigned to ports. • Defines CoS
	Queue	Configures Queue Setting.
	CoS to Queue	Displays and defines CoS to Queue.
	DSCP to Queue	Contains fields for mapping DSCP settings to traffic queues.
	Trust	Configures Trust Settings.
	Bandwidth	Displays and defines Bandwidth Settings.
	VoIP Traffic Setting	Contains tabs that allow you to: • Display Voice VLAN summary. • Configure Voice VLAN global settings. • Configure Voice VLAN port settings. • Display port information for Voice VLAN. • Display OUI summary. • Add or remove OUI.
	LLDP	Allows you to configure LLDP global and port settings.

Menu Item		Description
Port	Administration	Contains tabs that allow you to: • Display selected port information for the entire switch. • Display individual port information. • Modify the port settings.
	Link Aggregation	Contains tabs that allow you to: • Display link aggregation summary. • Create an aggregation group. • Modify the port memberships. • Remove an aggregation group.
	LACP	Configures the LACP.
	Statistics	Display statistics for a selected port.
	PoE(Only supported by 2426-PWR Plus)	Contains tabs that allow you to: • Display PoE summary. • Configure PoE settings.
Security	Radius Client	Contains tabs that allow you to: • Display Radius Client information. • Configure Radius Client settings and set authentication parameters.
	802.1X	Contains tabs that allow you to: • Display system authentication summary. • Display detailed information per port. • Configure system authentication settings.
Monitoring	Address Table	Displays MAC address table information for ports and VLANs.
	Port Mirroring	Monitor traffic going in or out of ports.
	Cable Diagnostics	Contains tabs that allow you to: • Display selected cable diagnostics information for all ports. • Display all cable diagnostics information for a single port.
Help		Displays 3Com contact information and describes how to use the online help system.
Logout		Allows you to securely log off the Web interface.

Buttons

Depending on the screen that is currently displayed, the following buttons may appear:

- Apply: Click to apply any changes that you have made.
- Cancel: Click to discard any unsaved changes.
- Select All: Allows the user to select all ports.
- Select None: Removes the ports selected.
- Help: Click to display the context-sensitive help information for the screen that is currently displayed. The help pages provide information on the tasks that you can perform on each screen.

3 Configuring the Switch

Configuring System Access

Network administrators can define user name, password, and access level for users using the System Access Interface. The Multi-Session Web feature is enabled on switch and allows 10 users to be created and access the switch concurrently. Access levels provide read or read/write permissions to users for configuring the switch. Login information is managed in the local database. A unique password is required of each user. Two access levels exist on the Web Interface:

- Management access level: Provides the user with read/write access rights. There is always one management level user configured for the switch.
- Monitor access level: Provides the user with read-only system access rights.

This section contains the following topics:

- Defining System Access
- Modifying System Access
- Removing System Access
- Viewing System Access Settings

Caution

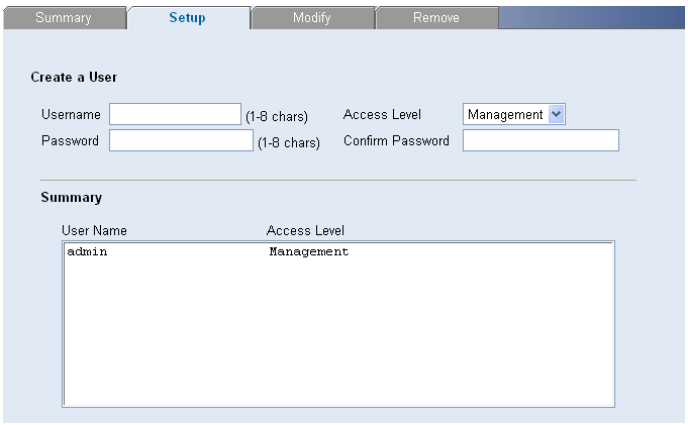
To ensure that unauthorized users do not access the Web interface, 3Com recommends that you set an admin password when you first configure the switch.

Defining System Access

The System Access Setup Page allows network administrators to define users, passwords, and access levels for users using the System Access Interface.

Click **Administration** > **System Access** > **Setup**. The System Access Setup Page opens.

Figure 3-1 System Access Setup Page



The System Access Setup Page contains the following fields:

Table 3-1 System Access Setup Page item description

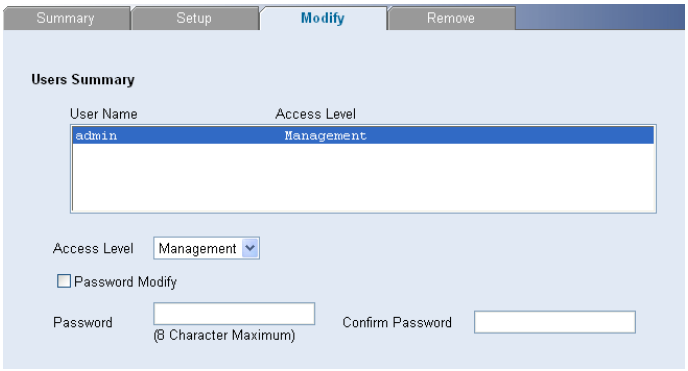
Item	Description
User Name	Defines the user name. The default value is admin.
Access Level	Defines the user access level. The lowest user access level is Monitor and the highest is Management. • Management: Provides the user with read and write access rights. This is the default. • Monitor: Provides the user with read access rights.
Password	Defines the local user password. The default is blank.
Confirm Password	Verifies the password.

Modifying System Access

The System Access Modify Page allows network administrators to modify users, passwords, and access levels for users using the System Access Interface.

Click **Administration** > **System Access** > **Modify**. The System Access Modify Page opens.

Figure 3-2 System Access Modify Page



The System Access Modify Page contains the following fields:

Table 3-2 System Access Modify Page item description

Item	Description
Access Level	Defines the user access level. The lowest user access level is Monitor and the highest is Management. • Management: Provides the user with read and write access rights. • Monitor: Provides the user with read access rights.
Password Modify	Enables modifying a password for an existing user.
Password	Modifies the local user password.
Confirm Password	Verifies the password.

Removing System Access

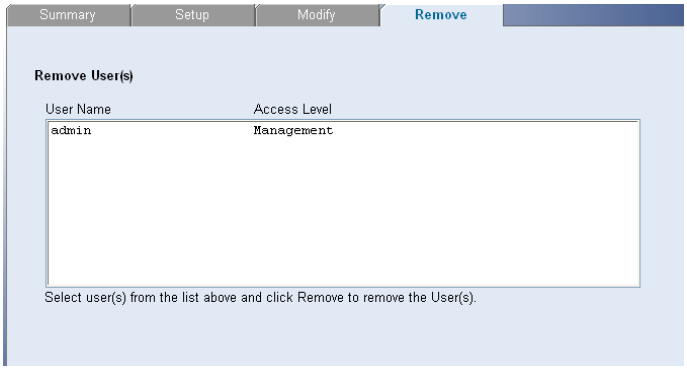
The System Access Remove Page allows network administrators to remove users from the System Access Interface.

Caution

The last user with management access may not be deleted.

Click **Administration** > **System Access** > **Remove**. The System Access Remove Page opens.

Figure 3-3 System Access Remove Page

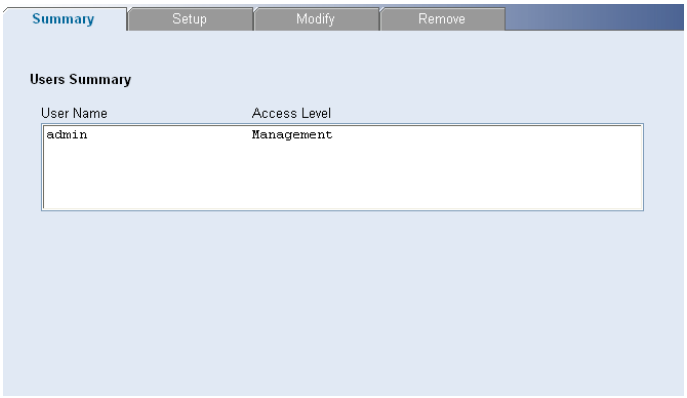


Viewing System Access Settings

The System Access Summary Page displays the current users and access levels defined on the switch.

Click **Administration** > **System Access** > **Summary**. The System Access Summary Page opens.

Figure 3-4 System Access Summary Page



The System Access Summary Page contains the following fields:

Table 3-3 System Access Summary Page item description

Item	Description
User Name	Displays the user name.
Access Level	Displays the user access level.

Configuring IP and MAC Address Information

This section contains information for defining IP interfaces, and includes the following sections:

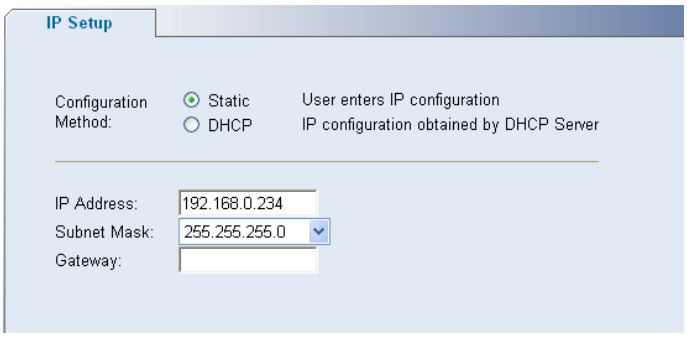
- Defining IP Address
- Configuring ARP Settings
- Configuring MAC Address Table

Defining IP Address

To enable the other devices on the network to communicate with the switch, you need to assign an IP address to it: either by DHCP or by assigning a static IP address.

Click **Administration** > **IP Setup**. The IP Setup Page opens.

Figure 3-5 IP Setup Page



The IP Setup Page contains the following fields:

Table 3-4 IP Setup Page item description

Item	Description
Configuration Method	Defines whether the IP address is configured statically or dynamically. The possible field values are: • Static: Specifies that the IP address is configured by the user. • DHCP: Specifies that the IP address is dynamically obtained by DHCP Server.
IP Address	Defines the IP address. The default value is 169.254.xxx.xxx. If the MAC address is 08004E000102, the IP address would be 169.254.1.2.
Subnet Mask	Defines the subnet mask. The default value is 255.255.0.0.
Gateway	Defines the gateway address. The default value is blank.

Configuring ARP Settings

The Address Resolution Protocol (ARP) converts IP addresses into physical addresses, and maps the IP address to a MAC address. ARP allows a host to communicate with other hosts when only the IP addresses of its neighbors are known.

This section includes the following topics:

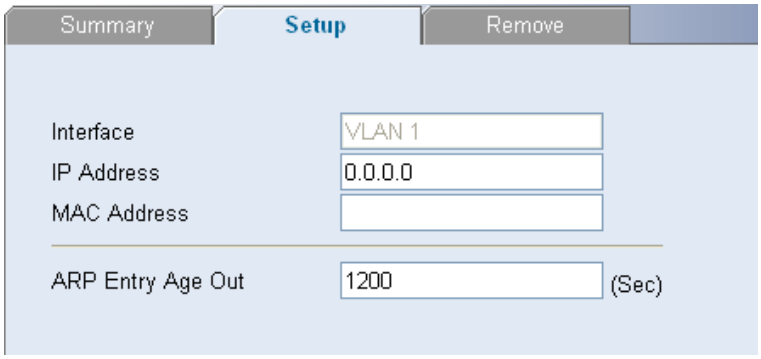
- Defining ARP Settings
- Removing ARP Entries
- Viewing ARP Settings

Defining ARP Settings

The ARP Settings Setup Page allows network managers to define ARP parameters for specific interfaces.

Click **Administration** > **ARP Settings** > **Setup**. The ARP Settings Setup Page opens.

Figure 3-6 ARP Settings Setup Page



The ARP Settings Setup Page contains the following fields:

Table 3-5 ARP Settings Setup Page item description

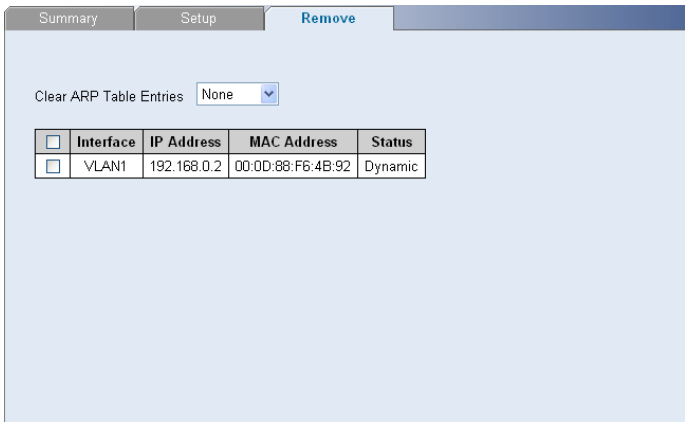
Item	Description
Interface	Indicates the management VLAN (VLAN 1) for which ARP parameters are defined.
IP Address	Defines the static IP address, which is associated with the static MAC address.
MAC Address	Defines the static MAC address, which is associated with the static IP address.
ARP Entry Age Out	Specifies the aging time for dynamic ARP entries. After the ARP Entry Age, dynamic ARP entries are deleted from the table. The range is 1-40000000. The default value is 1200 seconds.

Removing ARP Entries

The ARP Entries Remove Page provides parameters for removing ARP entries from the ARP Table.

Click **Administration** > **ARP Settings** > **Remove**. The ARP Entries Remove Page opens.

Figure 3-7 ARP Entries Remove Page



The ARP Entries Remove Page contains the following fields:

Table 3-6 ARP Entries Remove Page item description

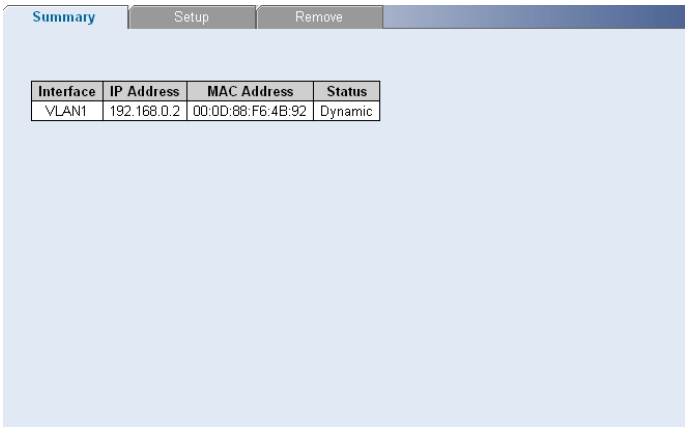
Item	Description
Clear ARP Table Entries	Specifies the types of ARP entries that are cleared. The possible values are: • None: Maintains the ARP entries. • All: Clears all ARP entries. • Dynamic: Clears only dynamic ARP entries. • Static: Clears only static ARP entries.
Interface	Indicates the VLAN for which ARP parameters are defined.
IP Address	Indicates the IP address which is associated with the MAC address.
MAC Address	Displays the MAC address, which is associated in the ARP table with the IP address.
Status	Displays the ARP table entry type. Possible field values are: • Dynamic: Indicates the ARP entry is learned dynamically. • Static: Indicates the ARP entry is a static entry.

Viewing ARP Settings

The ARP Settings Summary Page displays the current ARP settings.

Click **Administration** > **ARP Settings** > **Summary**. The ARP Settings Summary Page opens.

Figure 3-8 ARP Settings Summary Page



The ARP Settings Summary Page contains the following fields:

Table 3-7 ARP Settings Summary Page item description

Item	Description
Interface	Indicates the VLAN for which ARP parameters are defined.
IP Address	Indicates the IP address, which is associated with the MAC Address.
MAC Address	Displays the station MAC address, which is associated in the ARP table with the IP address.
Status	Displays the ARP table entry type. Possible field values are: • Dynamic: Indicates the ARP entry is learned dynamically. • Static: Indicates the ARP entry is a static entry.

Configuring MAC Address Table

MAC addresses are stored in either the static address or the dynamic address databases. A packet addressed to a destination stored in one of the databases is forwarded immediately to the port.

The Dynamic Address Table can be sorted by interface, VLAN, and MAC address. MAC addresses are dynamically learned as packets from sources arrive at the switch. MAC addresses are associated with ports by learning the ports from the frames source address. Frames addressed to a destination MAC address that is not associated with any port are flooded to all ports of the relevant VLAN.

Static addresses are manually configured. In order to prevent the bridging table from overflowing, dynamic MAC addresses, from which no traffic is seen for a certain period, are erased.

This section includes the following sections:

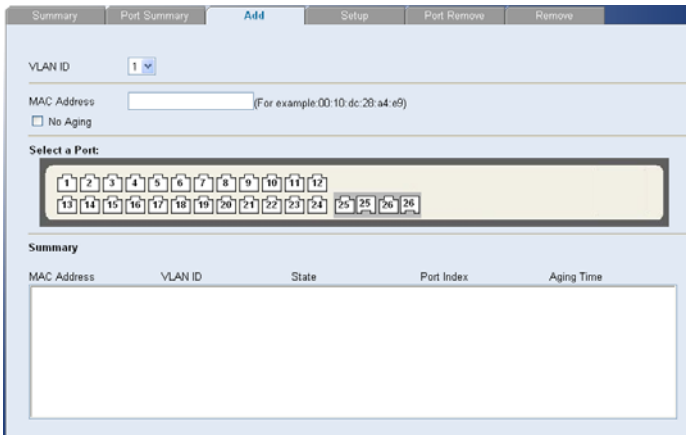
- Adding MAC Addresses to the Address Table
- Defining Aging Time
- Removing MAC Addresses for the specific port
- Removing MAC Addresses from the Address Table
- Viewing Address Table Settings
- Viewing Port Summary Settings

Adding MAC Addresses to the Address Table

The Address Table Add Page allows the network manager to assign MAC addresses to ports with VLANs.

Click **Monitoring** > **Address Table** > **Add**. The Address Table Add Page opens.

Figure 3-9 Address Table Add Page



The Address Table Add Page contains the following fields:

Table 3-8 Address Table Add Page item description

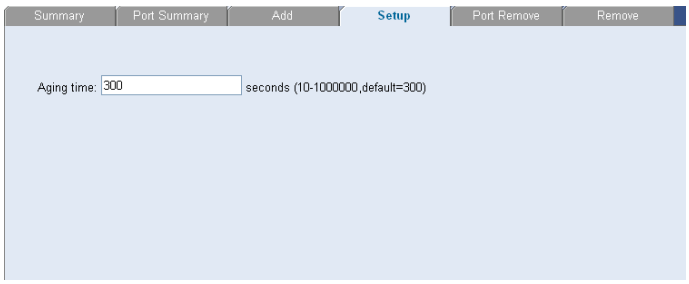
Item	Description
VLAN ID	Selects a VLAN ID.
MAC Address	Defines a MAC address to be assigned to the specific port and VLAN ID.
No Aging	Marks the aging status of the MAC address assigned by the user. The possible values are: • Checked: Indicates that the Address Table entry assigned by the user is not aged out. • Unchecked: Indicates that the Address Table entry assigned by the user is aged out.

Defining Aging Time

The Address Table Aging Time Setup Page allows the network manager to define the Address Table Aging Time. The Aging Time is the amount of time the MAC addresses remain in the Dynamic Address table before they are timed out if no traffic from the source is detected. The default value is 300 seconds.

Click **Monitoring** > **Address Table** > **Setup**. The Address Table Aging Time Setup Page opens.

Figure 3-10 Address Table Aging Time Setup Page

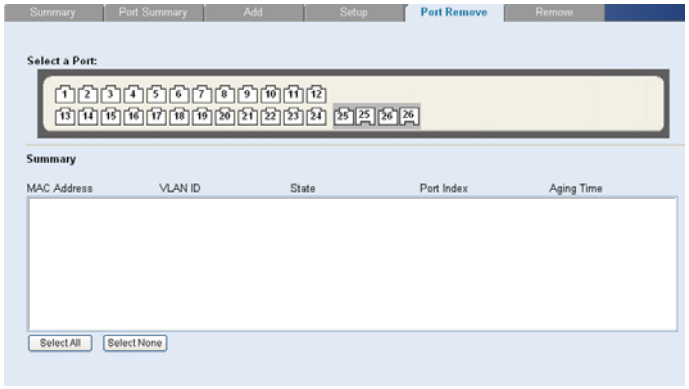


Removing MAC Addresses for the specific port

The Port Remove Page allows the network manager to remove MAC Addresses for the specific port from the Address Table.

Click **Monitoring** > **Address Table** > **Port Remove**. The Port Remove Page opens.

Figure 3-11 Port Remove Page



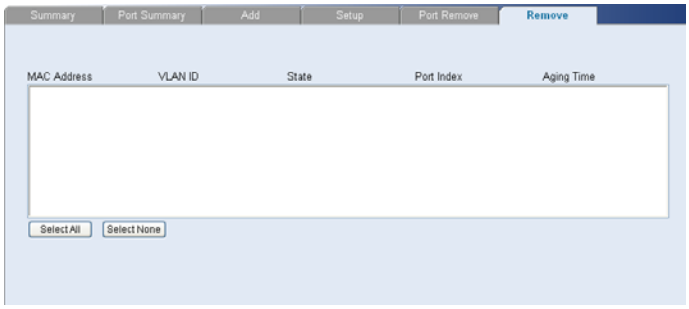
1) Select a port to remove MAC Addresses.
2) Select entries from the address table to be removed.
3) Click **Remove**.

Removing MAC Addresses from the Address Table

The Address Table Remove Page allows the network manager to remove current MAC addresses from the Address Table.

Click **Monitoring** > **Address Table** > **Remove**. The Address Table Remove Page opens.

Figure 3-12 Address Table Remove Page



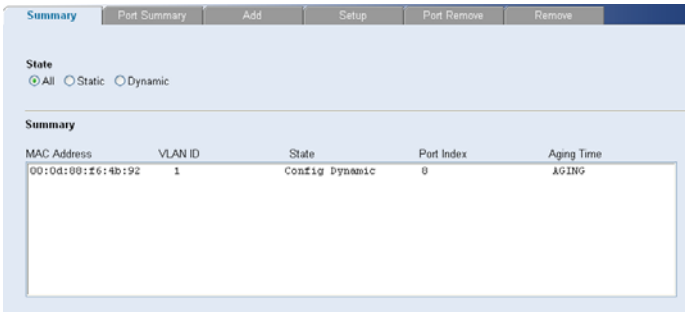
1) Select entries from the address table to be removed.
2) Click **Remove**.

Viewing Address Table Settings

The Address Table Summary Page displays the current MAC address table configuration.

Click **Monitoring** > **Address Table** > **Summary**. The Address Table Summary Page opens.

Figure 3-13 Address Table Summary Page



The Address Table Summary Page contains the following fields:

Table 3-9 Address Table Summary Page item description

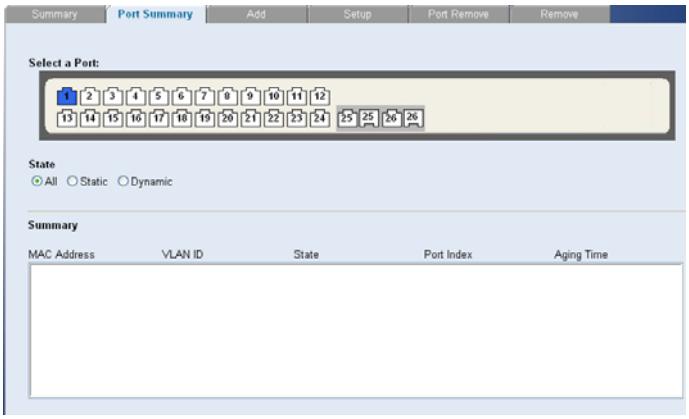
Item	Description
State	Filters the list of MAC addresses displayed according to the type of MAC address configuration. Possible values are: • All: Displays all MAC addresses. • Static: Displays the statically configured MAC addresses. • Dynamic: Displays the dynamically learned MAC addresses.
MAC Address	Displays the current MAC addresses listed in the MAC address table, filtered by the selected value of the State field.
VLAN ID	Displays the VLAN ID associated with the port and MAC address.
State	Displays the MAC address configuration method. Possible values are: • Config Static: Displays the statically configured MAC address. • Config Dynamic: Displays the dynamically learned MAC address.
Port Index	Displays the port through which the address was learned.
Aging Time	Displays that the MAC address is aged out or not.. Possible values are: • NOAGED: Indicates that the MAC address is not aged out. • AGING: Indicates that the MAC address is aged out.

Viewing Port Summary Settings

The Port Summary Page allows the network administrator to view the MAC addresses assigned to specific ports.

Click **Monitoring** > **Address Table** > **Port Summary**. The Port Summary Page opens.

Figure 3-14 Port Summary Page



The Port Summary Page contains the following fields:

Table 3-10 Port Summary Page item description

Item	Description
State	Filters the list of MAC addresses displayed according to the type of MAC address configuration. Possible values are: • All: Displays all MAC addresses. • Static: Displays the statically configured MAC addresses. • Dynamic: Displays the dynamically learned MAC addresses.
MAC Address	Displays the current MAC addresses listed in the MAC address table, filtered by the selected value of the State field.
VLAN ID	Displays the VLAN ID associated with the port and MAC address.
State	Displays the MAC address configuration method. Possible values are: • Config Static: Displays the statically configured MAC address. • Config Dynamic: Displays the dynamically learned MAC address.
Port Index	Displays the port through which the address was learned.
Aging Time	Displays that the MAC address is aged out or not.. Possible values are: • NOAGED: Indicates that the MAC address is not aged out. • AGING: Indicates that the MAC address is aged out.

Configuring Port

This section includes the following topics:

- Configuring Port Basic Settings
- Configuring PoE
- Viewing Port Statistics

Configuring Port Basic Settings

This section contains information for configuring Port Basic Settings, and includes the following topics:

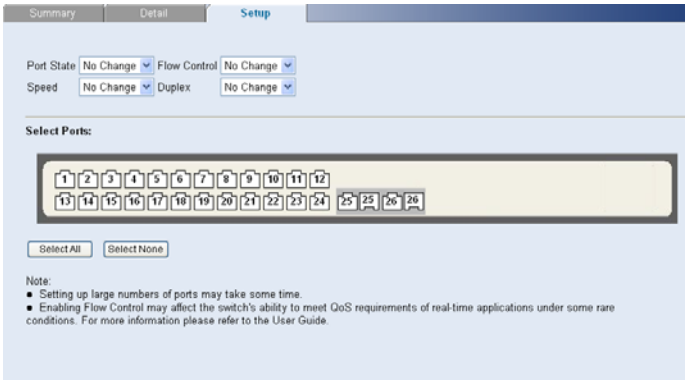
- Defining Port Settings
- Viewing Port Settings
- Viewing Port Details

Defining Port Settings

The Port Setup Page allows network managers to configure port parameters for specific ports.

Click **Port** > **Administration** > **Setup**. The Port Setup Page opens.

Figure 3-15 Port Setup Page



The Port Setup Page contains the following fields:

Table 3-11 Port Setup Page item description

Item	Description
Port State	Enables and disables the port. The possible field values are: • No Change: Retains the current port status. • Enabled: Enables the port. • Disabled: Disables the port.
Flow Control	Enables and disables flow control on the port. When flow control is enabled for the port, the switch regulates the packet flow so that a sending device does not transmit more packets than a receiving device can process. If flow control is disabled, packets may be dropped under certain periods of high traffic. The possible values are: • No Change: Retains the current flow control status on the port. • Enabled: Enables flow control on the port. • Disabled: Disables flow control on the port.
Speed	Specifies the configured rate for the port. The port speed determines what speed setting options are available. Port speeds can only be configured when auto-negotiation is disabled. The possible field values are: • No Change: Retains the current port speed. • Auto: Use to automatically configure the port. • 10: Indicates the port is currently operating at 10 Mbps. • 100: Indicates the port is currently operating at 100 Mbps. • 1000: Indicates the port is currently operating at 1000 Mbps.
Duplex	Specifies the port duplex mode. The possible field values are: • No Change: Retains the current port duplex mode. • Auto: Use to automatically configure the port. • Full: The interface supports transmission between the switch and its link partner in both directions simultaneously. • Half: The interface supports transmission between the switch and its link partner in only one direction at a time.

Caution

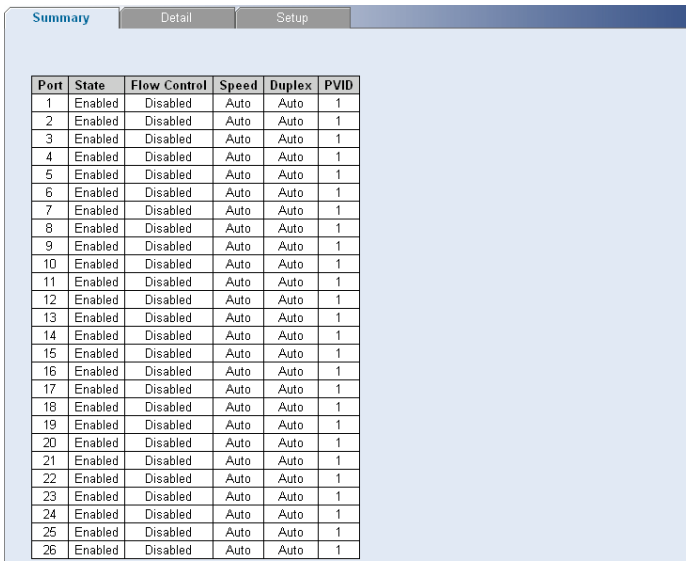
- Before manually setting a port to full-duplex mode, verify that the device connected to the port is also manually set to the same speed and duplex setting. If connecting link partners are left to auto-negotiate for a link manually set on this switch to full-duplex, they will always negotiate to half-duplex, resulting in a duplex mismatch. This can result in a significant reduction in network performance. If you are unsure of how to configure the speed/duplex setting, simply enable auto-negotiation for the port.
- 1000 Mbps connections are always full-duplex. Half-duplex connections are only available for 10 Mbps and 100 Mbps settings.

Viewing Port Settings

The Port Summary Page permits the network manager to view the current configuration for all the ports.

Click **Port** > **Administration** > **Summary**. The Port Summary Page opens.

Figure 3-16 Port Summary Page



Port	State	Flow Control	Speed	Duplex	PVID
1	Enabled	Disabled	Auto	Auto	1
2	Enabled	Disabled	Auto	Auto	1
3	Enabled	Disabled	Auto	Auto	1
4	Enabled	Disabled	Auto	Auto	1
5	Enabled	Disabled	Auto	Auto	1
6	Enabled	Disabled	Auto	Auto	1
7	Enabled	Disabled	Auto	Auto	1
8	Enabled	Disabled	Auto	Auto	1
9	Enabled	Disabled	Auto	Auto	1
10	Enabled	Disabled	Auto	Auto	1
11	Enabled	Disabled	Auto	Auto	1
12	Enabled	Disabled	Auto	Auto	1
13	Enabled	Disabled	Auto	Auto	1
14	Enabled	Disabled	Auto	Auto	1
15	Enabled	Disabled	Auto	Auto	1
16	Enabled	Disabled	Auto	Auto	1
17	Enabled	Disabled	Auto	Auto	1
18	Enabled	Disabled	Auto	Auto	1
19	Enabled	Disabled	Auto	Auto	1
20	Enabled	Disabled	Auto	Auto	1
21	Enabled	Disabled	Auto	Auto	1
22	Enabled	Disabled	Auto	Auto	1
23	Enabled	Disabled	Auto	Auto	1
24	Enabled	Disabled	Auto	Auto	1
25	Enabled	Disabled	Auto	Auto	1
26	Enabled	Disabled	Auto	Auto	1

The Port Summary Page contains the following fields:

Table 3-12 Port Summary Page item description

Item	Description
State	Indicates whether the port is currently operational or non-operational. The possible field values are: • Enabled: Indicates the port is currently operating. • Disabled: Indicates the port is currently not operating.
Flow Control	Displays the flow control status on the port. The possible field values are: • Enabled: Enables flow control on the port. • Disabled: Disables flow control on the port.

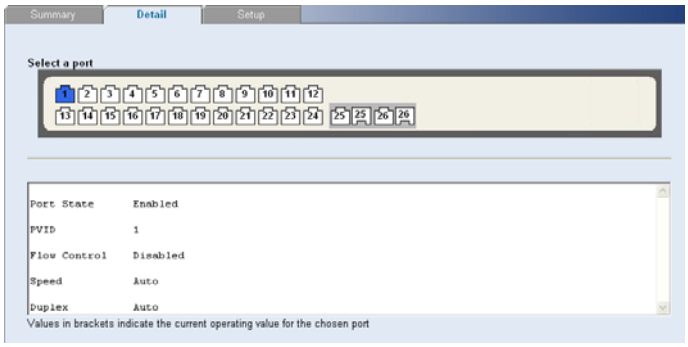
Item	Description
Speed	Displays the configured rate for the port. The port type determines what speed setting options are available. Port speeds can only be configured when auto negotiation is disabled. The possible field values are: • Auto: Use to automatically configure the port. • 10M: Indicates the port is currently operating at 10 Mbps. • 100M: Indicates the port is currently operating at 100 Mbps. • 1000M: Indicates the port is currently operating at 1000 Mbps.
Duplex	Displays the port duplex mode. The port speed is set to 10M or 100M or 1000M per second. The possible field values are: • Auto: Use to automatically configure the port. • Full: The interface supports transmission between the switch and its link partner in both directions simultaneously. • Half: The interface supports transmission between the switch and the client in only one direction at a time.
PVID	Indicates VLAN ID of this port for untagged packets.

Viewing Port Details

The Port Detail Page displays the current port configuration for specific ports.

Click **Port** > **Administration** > **Detail**. The Port Detail Page opens.

Figure 3-17 Port Detail Page



Configuring PoE

Power over Ethernet (PoE) provides power to devices over existing LAN cabling, without updating or modifying the network infrastructure. Power over Ethernet removes the necessity of placing network devices next to power sources.

Caution

PoE is only supported by 2426-PWR Plus.

This section contains the following topics:

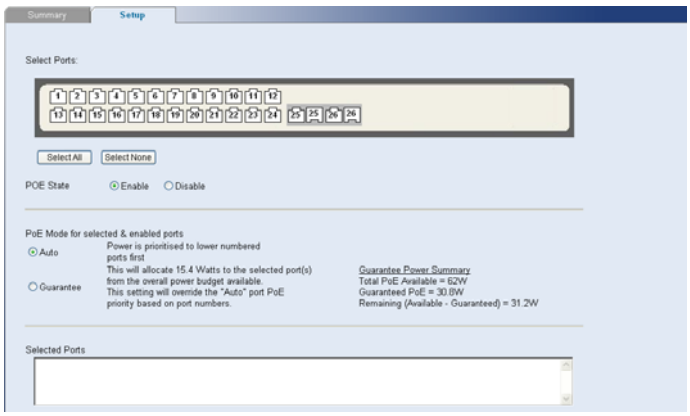
- Defining Port PoE
- Viewing PoE

Defining Port PoE

The Port PoE Setup Page allows the network manager to configure port PoE settings.

Click **Port** > **PoE** > **Setup**. The Port PoE Setup Page opens.

Figure 3-18 Port PoE Setup Page



The Port PoE Setup Page contains the following fields:

Table 3-13 Port PoE Setup Page item description

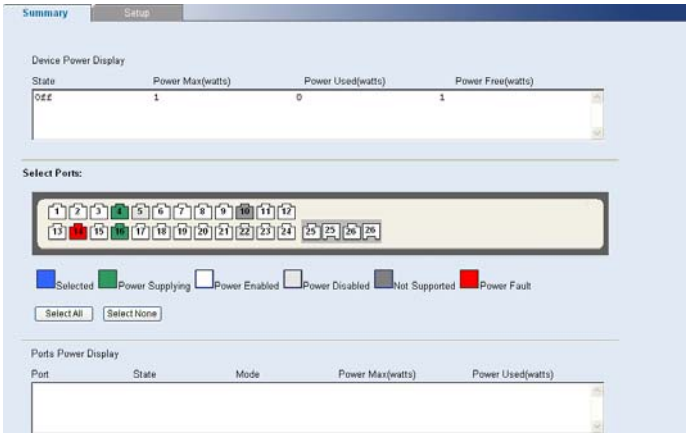
Item	Description
PoE State	Defines the port PoE state. The possible values are: • Enable: Enables the port for PoE. • Disable: Disables the port for PoE.
PoE Mode for selected & enabled ports	Defines the PoE mode for the selected port.
Guarantee Power Summary	Displays guaranteed and total PoE power: • Total PoE Available: The total amount of PoE power that can be provided by the switch. • Guarantee PoE: The maximum amount of PoE power that has been guaranteed for selected ports. This value is defined by the number of ports you have set to Guarantee. • Remaining (Available - Guarantee): The minimum amount of non-guaranteed PoE power left over after allocating the Guarantee PoE power. This value is a guideline for assigning guarantee ports. The actual amount of power used and available is displayed on the Port PoE Summary page.
Selected Ports	Displays the PoE configuration for the selected ports.

Viewing PoE

The Port PoE Summary Page displays the switch and port PoE settings.

Click **Port** > **PoE**. The PoE Summary Page opens.

Figure 3-19 Port PoE Summary Page



The Port PoE Summary Page contains the following fields:

Table 3-14 Port PoE Summary Page item description

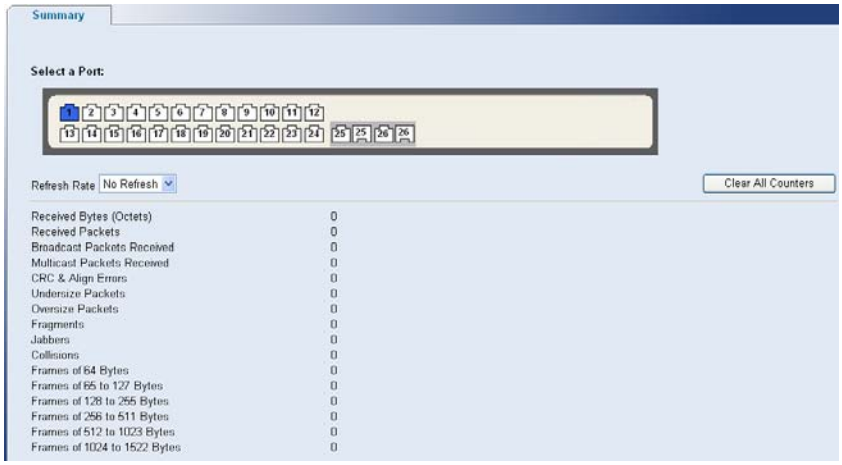
Item		Description
Device Power Display	State	Indicates the power source status. The possible field values are: • On: Indicates that the power supply unit is functioning. • Off: Indicates that the power supply unit is not functioning. • Faulty: Indicates that the power supply unit is functioning, but an error has occurred. For example, a power overload or a short circuit.
	Power Max(watts)	Indicates the maximum amount of power the switch can supply. The field value is displayed in Watts.
	Power Used(watts)	Indicates the actual amount of power currently used by the switch. The field value is displayed in Watts.
	Power Free(watts)	Indicates the amount of additional power currently available to the switch. The field value is displayed in Watts.
Ports Power Display	State	Indicates if the port is enabled to deliver power to powered devices. The possible field values are: • Enable: Indicates the switch is delivering power. This is the default. • Disabled: Indicates the switch is not delivering power.
	Mode	Indicates the port power mode. The possible field values are: • Auto: Power is automatically allocated to the port, according to port number. Lower numbered ports are assigned a higher priority for power delivery. This is the default. • Guarantee: Power is guaranteed to the selected port, provided that the power is available. This setting overrides the priority assigned to lower port numbers by the auto mode.
	Power Max(watts)	Indicates the maximum amount of power available to the interface. The field value is displayed in Watts.
	Power Used(watts)	Indicates the actual amount of power currently used by the interface. The field value is displayed in Watts.

Viewing Port Statistics

The Port Statistics Summary Page contains fields for viewing information about switch utilization and errors that occurred on the switch.

Click **Port** > **Statistics** > **Summary**. The Port Statistics Summary Page opens.

Figure 3-20 Port Statistics Summary Page



The Port Statistics Summary Page contains the following fields:

Table 3-15 Port Statistics Summary Page item description

Item	Description
Refresh Rate	Defines the amount of time that passes before the interface statistics are refreshed. The possible field values are: • No Refresh: Indicates that the port statistics are not refreshed. • 15 Sec: Indicates that the port statistics are refreshed every 15 seconds. • 30 Sec: Indicates that the port statistics are refreshed every 30 seconds. • 60 Sec: Indicates that the port statistics are refreshed every 60 seconds.
Clear All Counters	Clears the port statistics counters and the new statistics are displayed.
Received Bytes (Octets)	Displays the number of octets received on the interface since the switch was last refreshed. This number includes bad packets and FCS octets, but excludes framing bits.
Received Packets	Displays the number of packets received on the interface, including bad packets, Multicast and broadcast packets, since the switch was last refreshed.
Broadcast Packets Received	Displays the number of good broadcast packets received on the interface since the switch was last refreshed. This number does not include Multicast packets.
Multicast Packets Received	Displays the number of good Multicast packets received on the interface since the switch was last refreshed.
CRC & Align Errors	Displays the number of CRC and Align errors that have occurred on the interface since the switch was last refreshed.
Undersize Packets	Displays the number of undersized packets (less than 64 octets) received on the interface since the switch was last refreshed.
Oversize Packets	Displays the number of oversized packets (over 9216 octets) received on the interface since the switch was last refreshed.
Fragments	Displays the number of fragments (packets with less than 64 octets, excluding framing bits, but including FCS octets) received on the interface since the switch was last refreshed

Item	Description
Jabbers	Displays the total number of received packets that were longer than 9216 octets. This number excludes frame bits, but includes FCS octets that had either a bad Frame Check Sequence (FCS) with an integral number of octets (FCS Error) or a bad FCS with a non-integral octet (Alignment Error) number. The field range to detect jabbers is between 20 ms and 150 ms.
Collisions	Displays the number of collisions received on the interface since the switch was last refreshed.
Frames of 64 Bytes	Displays the number of 64-byte frames received on the interface since the switch was last refreshed.
Frames of 65 to 127 Bytes	Displays the number of 65 to 127 byte frames received on the interface since the switch was last refreshed
Frames of 128 to 255 Bytes	Displays the number of 128 to 255 byte frames received on the interface since the switch was last refreshed.
Frames of 256 to 511 Bytes	Displays the number of 256 to 511 byte frames received on the interface since the switch was last refreshed.
Frames of 512 to 1023 Bytes	Displays the number of 512 to 1023 byte frames received on the interface since the switch was last refreshed.
Frames of 1024 to 1522 Bytes	Displays the number of 1024 to 1522 byte frames received on the interface since the switch was last refreshed.

Configuring VLAN

VLANs are logical subgroups with a Local Area Network (LAN) which combine user stations and network devices into a single unit, regardless of the physical LAN segment to which they are attached. VLANs allow network traffic to flow more efficiently within subgroups. VLANs use software to reduce the amount of time it takes for network changes, additions, and moves to be implemented. VLANs restrict traffic within the VLAN.

VLANs have no minimum number of ports, and can be created per unit, per device, or through any other logical connection combination, since they are software-based and not defined by physical attributes.

VLANs function at Layer 2. Since VLANs isolate traffic within the VLAN, a Layer 3 router working at a protocol level is required to allow traffic flow between VLANs. Layer 3 routers identify segments and coordinate with VLANs. VLANs are Broadcast and Multicast domains. Broadcast and Multicast traffic is transmitted only in the VLAN in which the traffic is generated.

VLAN tagging provides a method of transferring VLAN information between VLAN groups. VLAN1 is the default VLAN and always contains untagged ports. All ports are members of VLAN1 by default. If the untagged port is moved to a new VLAN, the port is removed from VLAN1. For example: If an untagged port 24 is moved to VLAN 5. The port will no longer be a member of VLAN1. However, if the port is added to VLAN5 as a tagged port it then remains untagged in VLAN1.

This section contains the following topics:

- Creating VLANs
- Modifying VLAN
- Modifying Port VLAN Settings
- Renaming VLANs
- Removing VLANs
- Viewing VLAN Details

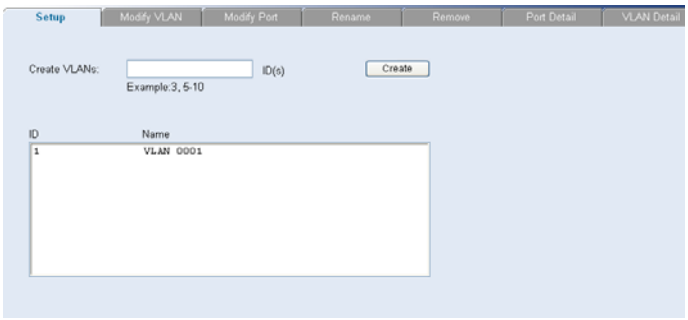
- Viewing VLAN Port Details

Creating VLANs

The VLAN Setup Page allows the network administrator to create or rename VLANs.

Click **Device** > **VLAN** > **Setup**. The VLAN Setup Page opens.

Figure 3-21 VLAN Setup Page



The VLAN Setup Page contains the following fields:

Table 3-16 VLAN Setup Page item description

Item	Description
Create VLANs	Enter ID of configured VLANs.
Create	Creates the VLAN ID(s).
ID	Displays the VLAN ID.
Name	Displays the user-defined VLAN name.

Modifying VLAN

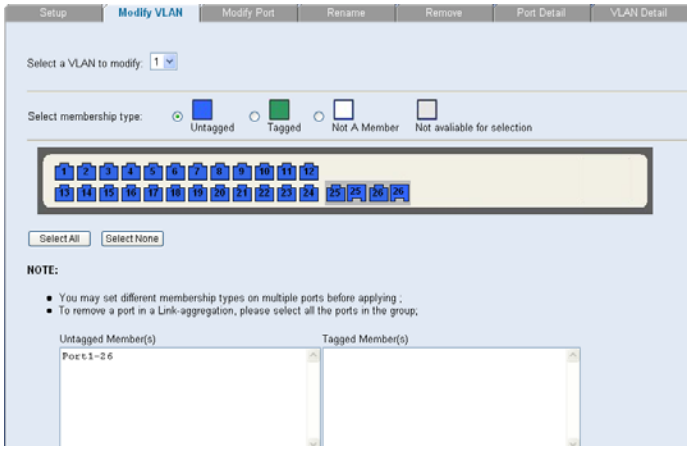
The Modify VLAN Page allows the network manager to change VLAN membership.

Caution

At least one port must always be an untagged member of VLAN 1 (the management VLAN). If you choose to connect all ports to VLANs other than VLAN 1, you will no longer be able to access the Web interface. If this happens, you will need to reset the switch to factory settings.

Click **Device** > **VLAN** > **Modify VLAN**. The Modify VLAN Page opens.

Figure 3-22 Modify VLAN Page



The Modify VLAN Page contains the following fields:

Table 3-17 Modify VLAN Page item description

Item	Description
Select a VLAN to modify	Selects a VLAN to modify its settings.
Select membership type	Selects the membership type for each port on the VLAN. The possible field values are: • Untagged: Indicates the interface is an untagged member of the VLAN. • Tagged: Indicates the interface is a tagged member of a VLAN. VLAN tagged frames are forwarded by the interface. The frames contain VLAN information. • Not A Member: Indicates the interface is not a member of the VLAN. • Not available for selection: Indicates the interface is not available for selection.
Untagged membership	Indicates the port is an untagged member of the VLAN.
Tagged membership	Indicates the port is a tagged member of a VLAN. VLAN tagged frames are forwarded by the interface. The frames contain VLAN information.

Note

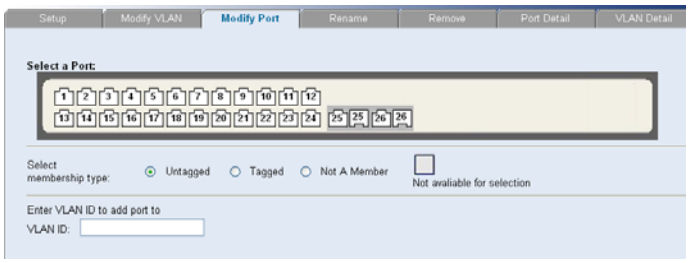
By default, all ports belong to VLAN 1 as an untagged member. However, they can belong to multiple VLANs as a tagged member. Also, newly created VLANs will initially have no ports associated with them.

Modifying Port VLAN Settings

The Modify Port VLAN Page allows the network manager to modify port VLAN settings.

Click **Device** > **VLAN** > **Modify Port**. The Modify Port VLAN Page opens.

Figure 3-23 Modify Port VLAN Page



The Modify Port VLAN Page contains the following fields:

Table 3-18 Modify Port VLAN Page item description

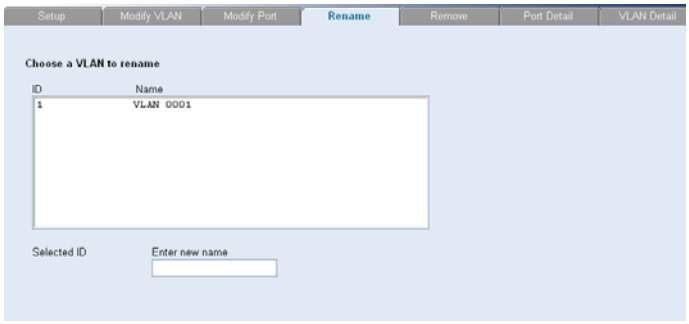
Item	Description
Select membership type	Selects the membership type for each port on the VLAN. The possible field values are: • Untagged: Indicates the interface is an untagged member of the VLAN. • Tagged: Indicates the interface is a tagged member of a VLAN. VLAN tagged frames are forwarded by the interface. The frames contain VLAN information. • Not A Member: Indicates the interface is not a member of the VLAN. • Not available for selection: Indicates the interface is not available for selection.
VLAN ID	Defines the VLAN ID to which the port is to be assigned.

Renaming VLANs

The VLAN Rename Page allows the network manager to select a VLAN from the list to be renamed.

Click **Device** > **VLAN** > **Rename**. The VLAN Rename Page opens.

Figure 3-24 VLAN Rename Page



Removing VLANs

The VLAN Remove Page allows the network administrator to remove VLANs.

Click **Device > VLAN > Remove**. The VLAN Remove Page opens.

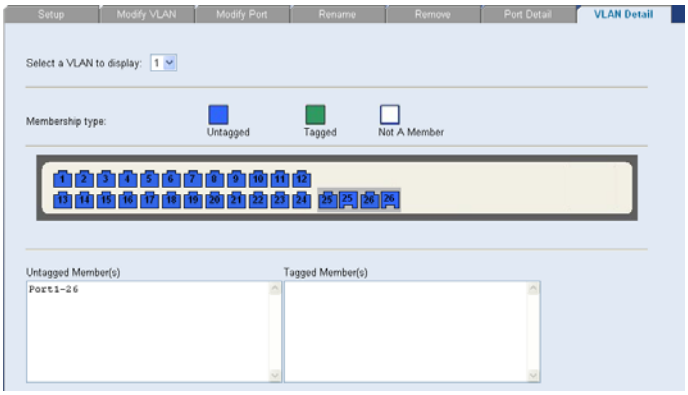
Figure 3-25 VLAN Remove Page

Viewing VLAN Details

The VLAN Detail Page provides information and global parameters on VLANs configured on the system.

Click **Device** > **VLAN** > **VLAN Detail**. The VLAN Detail Page opens.

Figure 3-26 VLAN Detail Page



The VLAN Detail Page contains the following information:

Table 3-19 VLAN Detail Page item description

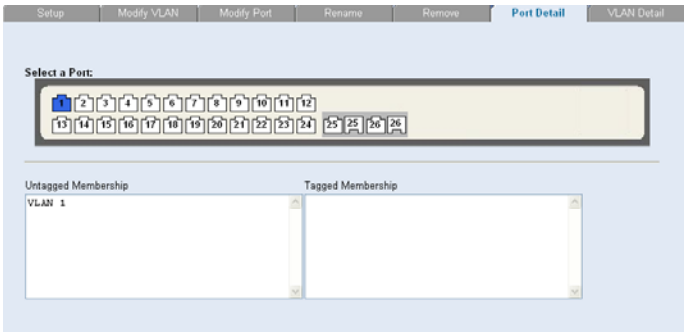
Item	Description
Select a VLAN to Display	Selects a VLAN to be display its settings
Membership type	Displays the membership type for each VLAN. The possible field values are: • Untagged: Indicates the interface is an untagged member of the VLAN. • Tagged: Indicates the interface is a tagged member of a VLAN. VLAN tagged frames are forwarded by the interface. The frames contain VLAN information. • Not A Member: Indicates the interface is not a member of the VLAN Each port on the switch is capable of passing tagged or untagged frames. The following describes how the switch will handle tagged and untagged frames. • When a port receives a tagged frame with a VLAN ID and the port is a member (untagged or tagged) of that VLAN, the frame is accepted. Otherwise if the port is not a member of that VLAN, the frame is discarded. • When a port receives an untagged frame and the port is an untagged member of a VLAN, the frame is accepted and assigned to that VLAN ID. Otherwise if the port is not an untagged member of any VLAN, the frame is discarded. The switch will only forward a frame to ports that are members (tagged or untagged) of the VLAN to which the frame is assigned. If the port is an untagged member, the egress frame will be stripped of the VLAN tag and forwarded as untagged. However, if the port is a tagged member, the egress frame is forwarded as tagged.

Viewing VLAN Port Details

The VLAN Port Detail Page provides information on VLAN configured ports.

Click **Device** > **VLAN** > **Port Detail**. The VLAN Port Detail Page opens.

Figure 3-27 VLAN Port Detail Page



The VLAN Port Detail Page contains the following information:

Table 3-20 VLAN Port Detail Page item description

Item	Description
Untagged Membership	Indicates the port is an untagged member of the VLAN.
Tagged membership	Indicates the port is a tagged member of a VLAN. VLAN tagged frames are forwarded by the interface. The frames contain VLAN information.

Aggregating Port

Overview

Link aggregation aggregates multiple physical Ethernet ports into one logical link, called a Link Aggregation Group (LAG).

It allows you to increase bandwidth by distributing traffic across the member ports in the aggregation group. In addition, it provides reliable connectivity because these member ports can dynamically back up each other.

LACP

Link Aggregation Control Protocol (LACP) based on the IEEE802.3ad standard can be used for dynamic link aggregation. An LACP-enabled port sends link aggregation control protocol data units (LACPDUs) to tell the peer about its system priority, system MAC address, port priority, port number and operation key. After receiving the information from the sender, the receiver compares it with the locally saved information about other ports, chooses member ports for the aggregation group and reaches agreement about whether a port can join or leave a dynamic aggregation group.

Note

During link aggregation, LACP generates a configuration mix according to the port configuration (rate, duplex, basic configuration, management key), which is called an operation key.

Link Aggregation Types

The switch supports two link aggregation types:

- Manual Aggregation
- Static LACP Aggregation

1) Manual Aggregation

Manual aggregation is configured manually, and cannot be added or removed automatically. A manual or static LACP aggregation group must contain at least a member port. Member ports in a manual aggregation are LACP-disabled.

A port in a manual aggregation group can be in one of the two states: selected or unselected. In a manual aggregation group, only the selected ports can forward user service packets.

In a manual aggregation group, the system sets the ports to selected or unselected state according to the following rules.

- Among the ports in an aggregation group that are in up state, the system determines the mater port with one of the following settings being the highest (in descending order) as the master port: full duplex/high speed, full duplex/low speed, half duplex/high speed, half duplex/low speed. The ports with their rate, duplex mode and link type being the same as that of the master port are selected ports, and the rest are unselected ports.
- There is a limit on the number of selected ports in an aggregation group. Therefore, if the number of the selected ports in an aggregation group exceeds the maximum number supported by the switch, those with lower port numbers operate as the selected ports, and others as unselected ports.

Among the selected ports in an aggregation group, the one with smallest port number operates as the master port. Other selected ports are the member ports.

2) Static LACP Aggregation

A static LACP aggregation group is also manually created. All its member ports are manually added and can be manually removed (it inhibits the system from automatically adding/removing ports to/from it). LACP is enabled on the member ports of static aggregation groups. When you remove a static aggregation group, all the member ports in up state form one or multiple dynamic aggregations with LACP enabled.

A port in a static aggregation group can be in one of the two states: selected or unselected.

- Both the selected and the unselected ports in the up state can receive/send LACP protocol packets.
- Only the selected ports can receive/send service packets; the unselected ports cannot.

In a static aggregation group, the system sets the ports to selected or unselected state according to the following rules.

- Among the ports in an aggregation group that are in up state, the system determines the master port with one of the following settings being the highest (in descending order) as the master port: full duplex/high speed, full duplex/low speed, half duplex/high speed, half duplex/low speed. The ports with their rate, duplex mode and link type being the same as that of the master port are selected port, and the rest are unselected ports.
- The ports connected to a peer device different from the one the master port is connected to, or those connected to the same peer device as the master port but to a peer port that is not in the same aggregation group as the peer port of the master port, are unselected ports.
- The system sets the ports with basic port configuration different from that of the master port to unselected state.
- There is a limit on the number of selected ports in an aggregation group. Therefore, if the number of the selected ports in an aggregation group exceeds the maximum number supported by the switch, those with lower port numbers operate as the selected ports, and others as unselected ports.

Configuring Link Aggregation

This section includes the following topics:

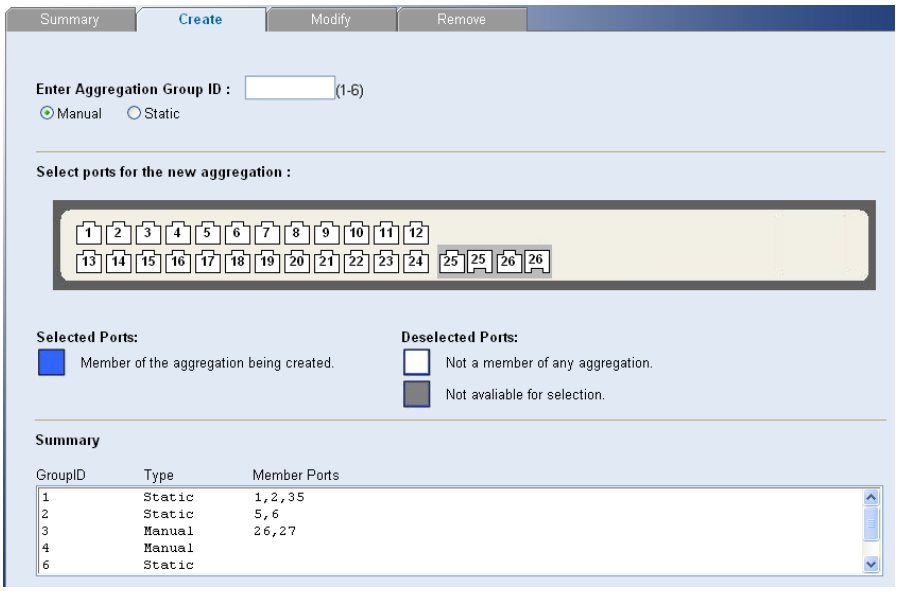
- Defining Link Aggregation
- Modifying Link Aggregation
- Removing Link Aggregation
- Viewing Link Aggregation

Defining Link Aggregation

The Link Aggregation Create Page allows network managers to create LAGs and add ports to a LAG.

Click **Port** > **Link Aggregation** > **Create**. The Link Aggregation Create Page opens.

Figure 3-28 Link Aggregation Create Page



The Link Aggregation Create Page includes the following fields:

Table 3-21 Link Aggregation Create Page item description

Item	Description
Enter Aggregation Group ID	Defines the group ID.
Manual	Defines Manual Aggregation
Static	Defines Static LACP Aggregation

To create a new link aggregation group:

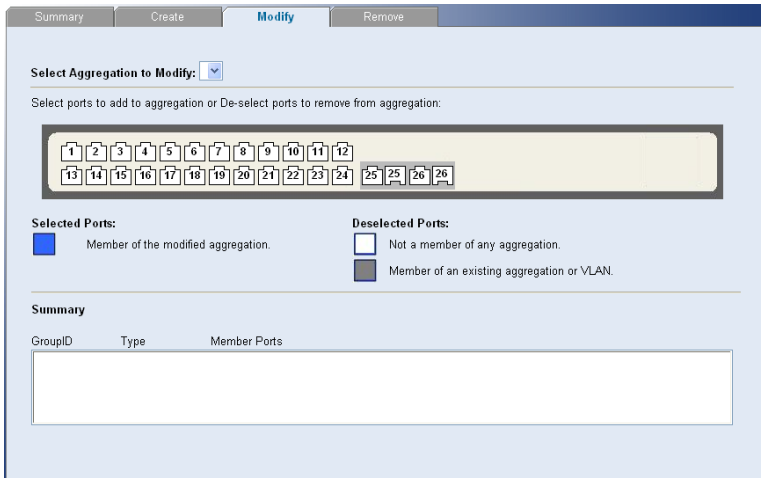
1) Enter a LAG ID in the box field.
2) Select Link Aggregation Type (Manual or Static)
3) Select the ports to add to the group.
4) Click **Apply**.

Modifying Link Aggregation

The Link Aggregation Modify Page allows network managers to select or deselect port for the specific LAG.

Click **Port** > **Link Aggregation** > **Modify**. The Link Aggregation Modify Page opens.

Figure 3-29 Link Aggregation Modify Page

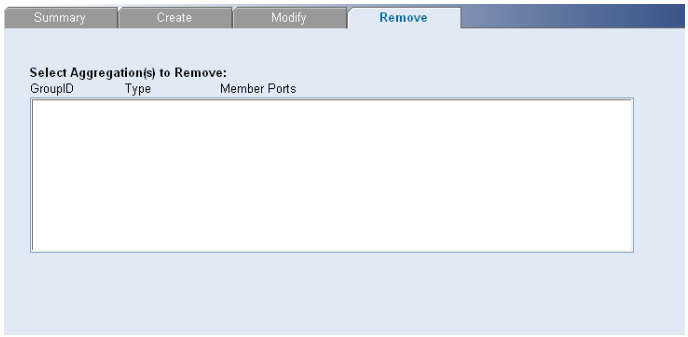


Removing Link Aggregation

The Link Aggregation Remove Page allows the network manager to remove group IDs containing member ports.

Click **Port** > **Link Aggregation** > **Remove**. The Link Aggregation Remove Page opens.

Figure 3-30 Link Aggregation Remove Page



Viewing Link Aggregation

The Link Aggregation Summary Page displays the state of the current link aggregation.

Click **Port** > **Link Aggregation** > **Summary**. The Link Aggregation Summary Page opens.

Figure 3-31 Link Aggregation Summary Page

The Link Aggregation Summary Page includes the following fields:

Table 3-22 Link Aggregation Summary Page item description

Item	Description
Group ID	Displays the Link Aggregated Group ID. The field range is 1-6.
Type	Displays the type of link aggregation for the Group ID. The possible field value is Static or LACP.
Ports	Displays the member ports included in the specified LAG.

Configuring LACP

This section includes the following topics:

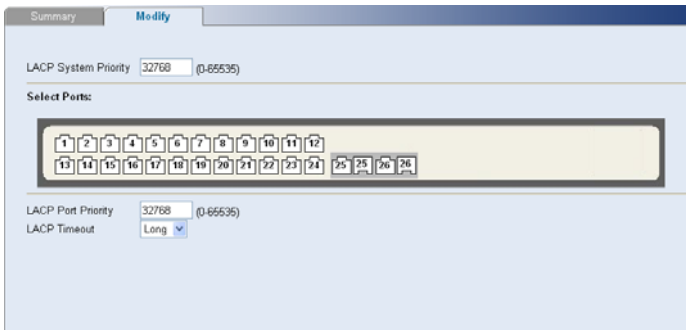
- Modify LACP
- Viewing LACP

Modify LACP

The Link Aggregation Modify Page allows the network manager to modify fields for LACP.

Click **Port** > **Link Aggregation** > **Modify**. The Link Aggregation Modify Page opens.

Figure 3-32 Link Aggregation Modify Page



The Link Aggregation Modify Page contains the following fields:

Table 3-23 Link Aggregation Modify Page item description

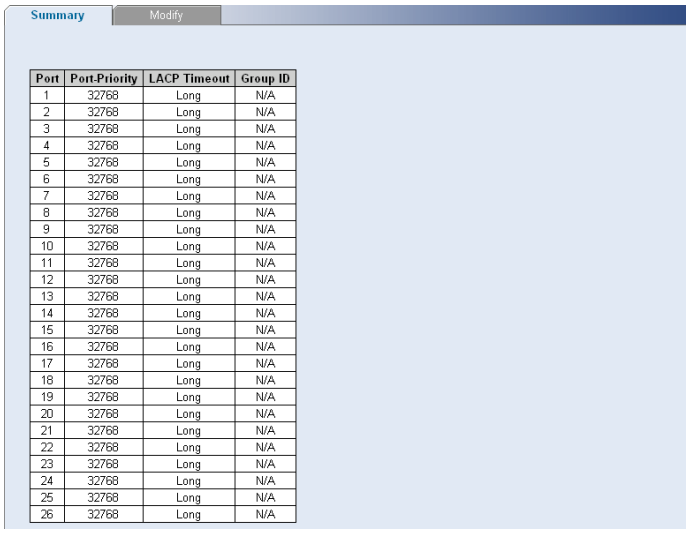
Item	Description
LACP System Priority	Specifies system priority value. The default value is 32768. The field range is 0-65535.
LACP Port Priority	Specifies the LACP priority value for the port. The default is 32768. The field range is 0-65535.
LACP Timeout	Selects the administrative LACP timeout. The possible field values are: • Long: Specifies the long timeout value. This is the default. • Short: Specifies the short timeout value.

Viewing LACP

The LACP Summary Page displays fields for LACP.

Click **Port** > **Link Aggregation** > **LACP**. The LACP Summary Page opens.

Figure 3-33 LACP Summary Page



The LACP Summary Page contains the following fields:

Table 3-24 LACP Summary Page item description

Item	Description
Port-Priority	Displays the LACP priority value for the port.
LACP Timeout	Displays the administrative LACP timeout. The possible field values are: • Long: Specifies the long timeout value. This is the default. • Short: Specifies the short timeout value.
Group ID	Display LAG ID which the port belongs to. N/A: unassigned.

Configuring STP

STP (Spanning Tree Protocol) is a bridge-based system for providing fault tolerance on networks and can be used to detect and disable network loops. The spanning tree ensures that the optimal path is maintained between spanning tree-compliant networked devices by:

- Disabling redundant paths when the main paths are operational.
- Enabling redundant paths if the main paths fail.

Spanning tree uses a distributed algorithm to select a bridging device that serves as the root of the spanning tree network.

The bridging device, known as the Root Bridge, generates bridge protocol data units (BPDUs) on all ports at a regular interval known as the Hello Time. All other spanning tree-compliant devices on the network have a designated Root Port. This is the Port nearest the Root Bridge and it is used for receiving the BPDUs initiated by the Root Bridge. If a bridge does not get a Hello BPDU after a predetermined interval, the bridge assumes that the link to the Root Bridge is down. This bridge will then initiate negotiations with other bridges to reconfigure the network to reestablish a valid network topology.

After all the bridges on the network have determined the configuration of their ports, each bridge only forwards traffic between the Root Port and the ports that are the Designated Bridge Ports for each

network segment. All other ports are blocked, which means that they are prevented from forwarding traffic.

The device supports the following STP versions:

- Classic STP: Provides a single path between end stations, avoiding and eliminating loops.
- Rapid STP: Detects and uses network topologies that provide faster convergence of the spanning tree, without creating forwarding loops. While Classic STP prevents Layer 2 forwarding loops in a general network topology, convergence can take between 30-60 seconds.

This section contains the following topics:

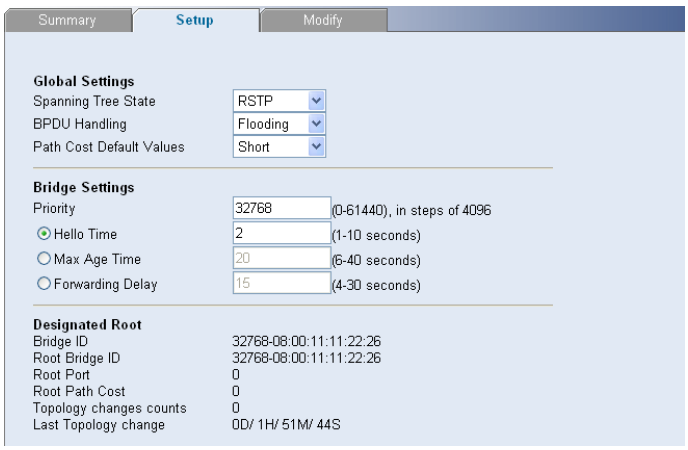
- Defining STP Global Parameters
- Modifying STP Interface Parameters
- Viewing STP

Defining STP Global Parameters

The STP Global Setup Page allows network managers to assign STP global settings.

Click **Device** > **Spanning Tree** > **Setup**. The STP Global Setup Page opens.

Figure 3-34 STP Global Setup Page



The STP Global Setup Page contains the following fields:

Table 3-25 STP Global Setup Page item description

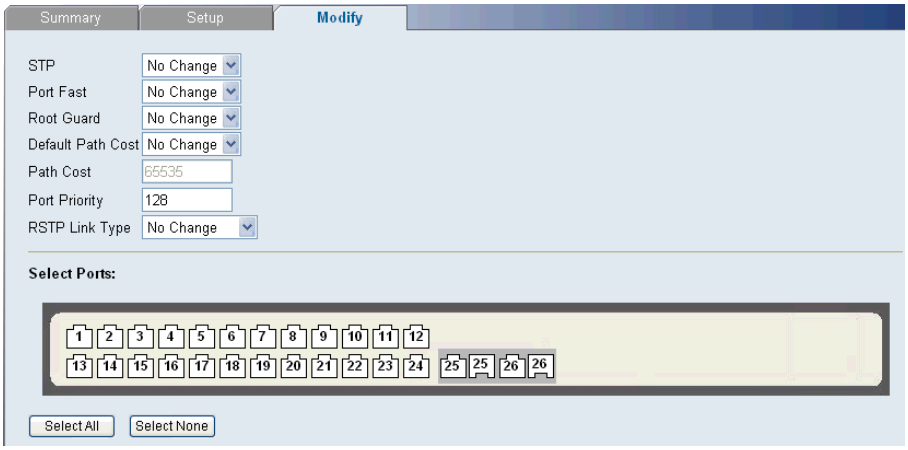
Item		Description
Global Settings	Spanning Tree State	Defines whether STP is enabled on the switch. The possible field values are: • Disable: Disables STP and RSTP on the switch. • Classic: Enables STP on the switch. • RSTP: Enables RSTP on the switch.
	BPDU Handling	Determines how BPDU packets are managed when STP is disabled on the port or switch. BPDUs are used to transmit spanning tree information. The possible field values are: • Filtering: Filters BPDU packets when spanning tree is disabled on an interface. • Flooding: Floods BPDU packets when spanning tree is disabled on an interface. This is the default value.
	Path Cost Default Values	Specifies the method used to assign default path cost to STP ports. The possible field values are: • Short: Specifies 1 through 65535 ranges for port path cost. This is the default value. • Long: Specifies 1 through 200000000 ranges for port path cost. The default path cost assigned to an interface varies according to the selected method (Hello Time, Max Age, or Forward Delay).
Bridge Settings	Priority	Specifies the bridge priority value. When switches or bridges are running STP, each is assigned a priority. After exchanging BPDUs, the switch with the lowest priority value becomes the Root Bridge. The field range is 0-61440. The default value is 32768. The port priority value is provided in increments of 4096.
	Hello Time	Specifies the switch Hello Time. The Hello Time indicates the amount of time in seconds a Root Bridge waits between configuration messages. The default is 2 seconds.
	Max Age	Specifies the switch Maximum Age Time. The Maximum Age Time is the amount of time in seconds a bridge waits before sending configuration messages. The default Maximum Age Time is 20 seconds.
	Forward Delay	Specifies the switch Forward Delay Time. The Forward Delay Time is the amount of time in seconds a bridge remains in a listening and learning state before forwarding packets. The default is 15 seconds.
Designated Root	Bridge ID	Identifies the Bridge priority and MAC address.
	Root Bridge ID	Identifies the Root Bridge priority and MAC address.
	Root Port	Indicates the port number that offers the lowest cost path from this bridge to the Root Bridge. This field is significant when the bridge is not the Root Bridge. The default is zero.
	Root Path Cost	Indicates the cost of the path from this bridge to the Root Bridge.
	Topology Changes Counts	Indicates the total amount of STP state changes that have occurred.
	Last Topology Change	Indicates the amount of time that has elapsed since the bridge was initialized or reset, and the last topographic change that occurred. The time is displayed in a day-hour-minute-second format, such as 2 days 5 hours 10 minutes and 4 seconds.

Modifying STP Interface Parameters

The STP Interface Parameters Modify Page allows network managers to modify STP parameters to specific interfaces.

Click **Device** > **Spanning Tree** > **Modify**. The STP Interface Parameters Modify Page opens.

Figure 3-35 STP Interface Parameters Modify Page



The STP Interface Parameters Modify Page contains the following fields:

Table 3-26 STP Interface Parameters Modify Page item description

Item	Description
STP	Specifies if STP is enabled on the port. The possible field values are: • No Change: Retains the current port status. • Enabled: Indicates that STP is enabled on the port. • Disabled: Indicates that STP is disabled on the port. This is the default value.
Port Fast	Specifies if Fast Link is enabled on the port. If Fast Link mode is enabled for a port, the port is automatically placed in the Forwarding state when the port link is up. Fast Link optimizes the STP protocol convergence. STP convergence takes 30 seconds and is not dependent on the number of switches in the network. The possible field values are: • No Change: Retains the current port status. • Enabled: Indicates fast link is enabled on the port. • Disabled: Indicates fast link is disabled on the port. This is the default value.
Root Guard	Restricts the interface from acting as the root port of the switch. The possible field values are: • No Change: Retains the current port status. • Enabled: Indicates Root Guard is enabled on the port. • Disabled: Indicates Root Guard is disabled on the port. This is the default value.
Default Path Cost	Specifies if Default Path Cost is enabled. The possible field values are: • No Change: Retains the current port status. • Enabled: Enables the default path cost on the port. This is the default value. • Disabled: Disables the default path cost on the port.

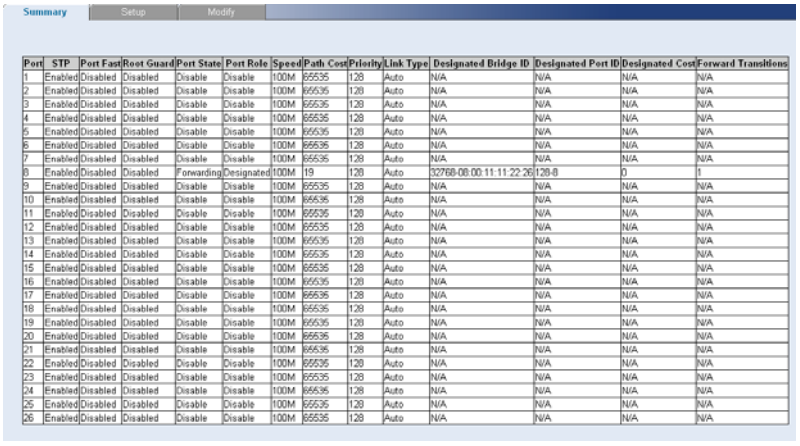
Item	Description
Path Cost	Defines the port contribution to the root path cost. When Default Path Cost is disabled, you can configure it; when Default Path Cost is enabled, you can not configure it , and the possible field values are: • 65535: Indicates Path Cost Default Values is short. This is the default value. • 200000000: Indicates Path Cost Default Value is long.
Port Priority	Defines the priority value of the port. The priority value influences the port choice when a bridge has two ports connected in a loop. The priority value is between 0-240. The default is 128.
RSTP Link Type	Specifies whether a Point-to-Point link is established, or if the switch is permitted to establish a Point-to-Point link. The possible field values are: • No Change: Retains the current port status. • Auto: Enables the switch to establish automatically Point-to-Point link. This is the default value. • Point to Point: Indicates if a Point-to-Point link is currently established on the port. Ports set to Full Duplex modes are considered Point-to-Point port links. • Shared: Enables the switch to establish a shared link.

Viewing STP

The STP Summary Page displays the current STP parameters for all ports.

Click **Device** > **Spanning Tree** > **Summary**. The STP Summary Page opens.

Figure 3-36 STP Summary Page



Port	STP	Port Fast	Root Guard	Port State	Port Role	Speed	Path Cost	Priority	Link Type	Designated Bridge ID	Designated Port ID	Designated Cost	Forward Transitions
1	Enabled	Disabled	Disabled	Disable	Disable	100M	65535	128	Auto	N/A	N/A	N/A	N/A
2	Enabled	Disabled	Disabled	Disable	Disable	100M	65535	128	Auto	N/A	N/A	N/A	N/A
3	Enabled	Disabled	Disabled	Disable	Disable	100M	65535	128	Auto	N/A	N/A	N/A	N/A
4	Enabled	Disabled	Disabled	Disable	Disable	100M	65535	128	Auto	N/A	N/A	N/A	N/A
5	Enabled	Disabled	Disabled	Disable	Disable	100M	65535	128	Auto	N/A	N/A	N/A	N/A
6	Enabled	Disabled	Disabled	Disable	Disable	100M	65535	128	Auto	N/A	N/A	N/A	N/A
7	Enabled	Disabled	Disabled	Disable	Disable	100M	65535	128	Auto	N/A	N/A	N/A	N/A
8	Enabled	Disabled	Disabled	Forwarding	Designated	100M	19	128	Auto	32768-00:00:11:11:22:26	128-8	0	1
9	Enabled	Disabled	Disabled	Disable	Disable	100M	65535	128	Auto	N/A	N/A	N/A	N/A
10	Enabled	Disabled	Disabled	Disable	Disable	100M	65535	128	Auto	N/A	N/A	N/A	N/A
11	Enabled	Disabled	Disabled	Disable	Disable	100M	65535	128	Auto	N/A	N/A	N/A	N/A
12	Enabled	Disabled	Disabled	Disable	Disable	100M	65535	128	Auto	N/A	N/A	N/A	N/A
13	Enabled	Disabled	Disabled	Disable	Disable	100M	65535	128	Auto	N/A	N/A	N/A	N/A
14	Enabled	Disabled	Disabled	Disable	Disable	100M	65535	128	Auto	N/A	N/A	N/A	N/A
15	Enabled	Disabled	Disabled	Disable	Disable	100M	65535	128	Auto	N/A	N/A	N/A	N/A
16	Enabled	Disabled	Disabled	Disable	Disable	100M	65535	128	Auto	N/A	N/A	N/A	N/A
17	Enabled	Disabled	Disabled	Disable	Disable	100M	65535	128	Auto	N/A	N/A	N/A	N/A
18	Enabled	Disabled	Disabled	Disable	Disable	100M	65535	128	Auto	N/A	N/A	N/A	N/A
19	Enabled	Disabled	Disabled	Disable	Disable	100M	65535	128	Auto	N/A	N/A	N/A	N/A
20	Enabled	Disabled	Disabled	Disable	Disable	100M	65535	128	Auto	N/A	N/A	N/A	N/A
21	Enabled	Disabled	Disabled	Disable	Disable	100M	65535	128	Auto	N/A	N/A	N/A	N/A
22	Enabled	Disabled	Disabled	Disable	Disable	100M	65535	128	Auto	N/A	N/A	N/A	N/A
23	Enabled	Disabled	Disabled	Disable	Disable	100M	65535	128	Auto	N/A	N/A	N/A	N/A
24	Enabled	Disabled	Disabled	Disable	Disable	100M	65535	128	Auto	N/A	N/A	N/A	N/A
25	Enabled	Disabled	Disabled	Disable	Disable	100M	65535	128	Auto	N/A	N/A	N/A	N/A
26	Enabled	Disabled	Disabled	Disable	Disable	100M	65535	128	Auto	N/A	N/A	N/A	N/A

The STP Summary Page contains the following fields:

Table 3-27 STP Summary Page item description

Item	Description
STP	Indicates if STP is enabled on the port. The possible field values are: • Enabled: Indicates that STP is enabled on the port. • Disabled: Indicates that STP is disabled on the port.
Port Fast	Indicates if Fast Link is enabled on the port. If Fast Link mode is enabled for a port, the port is automatically placed in the Forwarding state when the port link is up. Fast Link optimizes the STP protocol convergence. STP convergence takes 30 seconds and is not dependent on the number of switches in the network.

Item	Description
Root Guard	Indicates if the interface is acting as the root port of the switch. The possible field values are: • Enabled: Indicates Root Guard is enabled on the port • Disabled: Indicates Root Guard is disabled on the port.
Port State	Displays the current STP state of a port. If enabled, the port state determines what action is taken on traffic. Possible port states are: • Disable: Indicates that STP is currently disabled on the port. The port forwards traffic while learning MAC addresses. • Blocking: Indicates that the port is currently blocked and cannot forward traffic or learn MAC addresses. Blocking is displayed when Classic STP is enabled. • Listening: Indicates that the port is in listening mode. The port cannot forward traffic nor can it learn MAC addresses. • Learning: Indicates that the port is in learning mode. The port cannot forward traffic, however it can learn new MAC addresses. • Forwarding: Indicates that the port is in forwarding mode. The port can forward traffic and learn new MAC addresses. • Discarding: Indicates that the port is in discarding mode. The port is listening to BPDUs, and discards any other frames it receives.
Port Role	Displays the port role assigned by the STP algorithm to provide to STP paths. The possible field values are: • Disable: Indicates that the port or LAG is currently disabled on the port • Designated: The port or LAG through which the designated switch is attached to the LAN. • Alternate: Provides an alternate path to the root switch from the root interface. • Backup: With the designated port being blocked, the backup port becomes the new designated port fast and begins to forward data seamlessly. • Root: Provides the lowest cost path to forward packets to the root switch.
Speed	Indicates the speed at which the port is operating.
Path Cost	Indicates the port contribution to the root path cost. The path cost is adjusted to a higher or lower value, and is used to forward traffic when a path is re-routed.
Priority	Indicates the priority value of the port. The priority value influences the port choice when a bridge has two ports connected in a loop. The priority range is between 0-240.
Link Type	Indicates whether a Point-to-Point link is established, or if the switch is permitted to establish a Point-to-Point link. The possible field values are: • Auto: Enables the switch to establish automatically point-to-point link. • Point to Point: Indicates if a point-to-point link is currently established on the port. Ports set to Full Duplex modes are considered Point-to-Point port links. • Shared: Enables the switch to establish a shared link.
Designated Bridge ID	Indicates the bridge priority and the MAC Address of the designated bridge.
Designated Port ID	Indicates the selected port priority and interface.
Designated Cost	Indicates the cost of the port participating in the STP topology. Ports with a lower cost are less likely to be blocked if STP detects loops.
Forward Transitions	Indicates the number of times the port has changed from Forwarding state to Blocking state.

Configuring IGMP Snooping

This section contains information for configuring IGMP Snooping.

When IGMP Snooping is enabled, all IGMP packets are forwarded to the CPU. The CPU analyzes the incoming packets and determines:

- Which ports want to join which Multicast groups.
- Which ports have Multicast routers generating IGMP queries.
- Which routing protocols are forwarding packets and Multicast traffic.

Ports requesting to join a specific Multicast group issue an IGMP report, specifying that Multicast group is accepting members. This results in the creation of the Multicast filtering database.

This section contains the following topic:

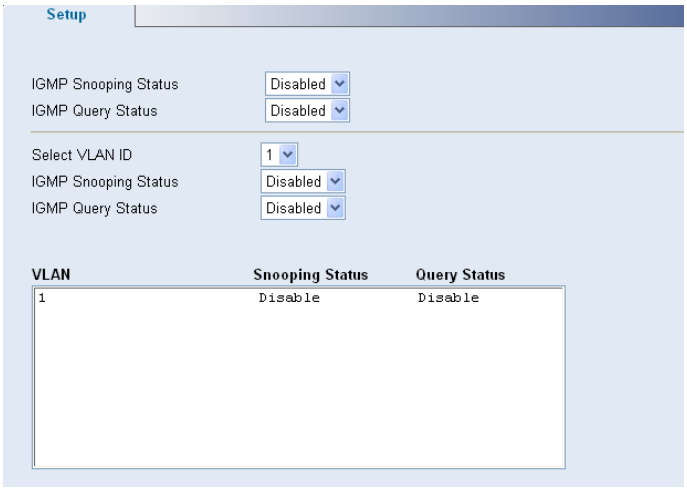
- Defining IGMP Snooping

Defining IGMP Snooping

The IGMP Snooping Setup Page allows network managers to define IGMP Snooping parameters for VLANs.

Click **Device** > **IGMP Snooping** > **Setup**. The IGMP Snooping Setup Page opens.

Figure 3-37 IGMP Snooping Setup Page



The IGMP Snooping Setup Page contains the following fields:

Table 3-28 IGMP Snooping Setup Page item description

Item	Description
IGMP Snooping Status	Defines whether IGMP Snooping is enabled on the switch. The possible field values are: • Enabled: Indicates that IGMP Snooping is enabled on the switch. • Disabled: Indicates that IGMP Snooping is disabled on the switch. This is the default value.
IGMP Query Status	Defines whether IGMP Query is enabled on the switch. The possible field values are: • Enabled: Indicates that IGMP Query is enabled on the switch. • Disabled: Indicates that IGMP Query is disabled on the switch. This is the default value.

Item	Description
Select VLAN ID	Specifies the VLAN ID
IGMP Snooping Status	Defines whether IGMP snooping is enabled on the VLAN. The possible field values are: • Enabled: Enables IGMP Snooping on the VLAN. • Disabled: Disables IGMP Snooping on the VLAN. This is the default value.
IGMP Query Status	Defines whether IGMP query is enabled on the VLAN. The possible field values are: • Enabled: Enables IGMP Query on the VLAN. • Disabled: Disables IGMP Query on the VLAN. This is the default value.

Configuring ACL

Access Control List (ACL) allow network managers to define classification actions and rules for specific ingress ports. A network manager can configure an ACL on an ingress port so that packets are either admitted or denied entry. The user can also specify that when packets are denied entry, the ingress port is also disabled.

This section includes the following topics:

- Configuring MAC Based ACL
- Configuring IP Based ACL
- Configuring ACL Binding

Configuring MAC Based ACL

This section includes the following topics:

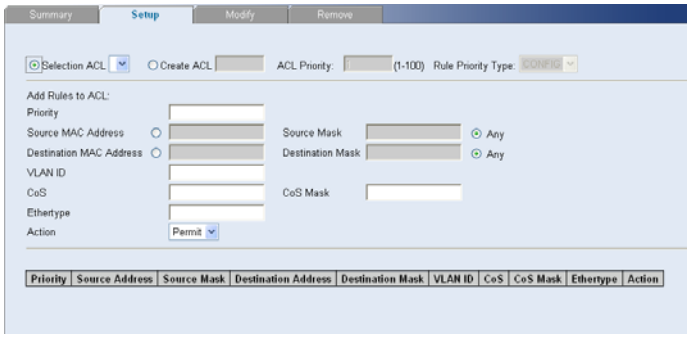
- Defining MAC Based ACL
- Modifying MAC Based ACL
- Removing MAC Based ACL
- Viewing MAC Based ACL

Defining MAC Based ACL

The MAC Based ACL Setup Page allows network managers to define MAC Based ACL.

Click **Device** > **ACL** > **MAC Based ACL** > **Setup**. The MAC Based ACL Setup Page opens.

Figure 3-38 MAC Based ACL Setup Page



The MAC Based ACL Setup Page contains the following fields:

Table 3-29 MAC Based ACL Setup Page item description

Item	Description
Selection ACL	Selects an existing MAC-based ACL to which rules are to be added.
Create ACL	Defines a new user-defined MAC-based Access Control List. The options are as follows: • ACL Priority: Sets the ACL priority. The possible field values are 1-100. • Rule Priority Type: Sets the rule priority type. CONFIG: You will have to configure the ACL rule priority by yourself, AUTO: the ACL rule priority will be configured automatically.
Priority	Sets the rule priority, which determines which rule is matched to a packet on a first-match basis. The possible field values are 1-65535.
Source MAC Address	Matches the source MAC address to which packets are addressed to the rule.
Source Mask	Defines the source MAC Address wildcard mask. Wildcards are used to mask all or part of a source MAC address. Wildcard masks specify which bits are used and which are ignored. A wildcard mask of FF:FF:FF:FF:FF:FF indicates that no bit is important. A wildcard of 00.00.00.00.00.00 indicates that all bits are important. For example, if the source MAC address is 00:AB:22:11:33:00 and the wildcard mask is 00:00:00:00:00:FF, the first five bytes of the MAC are used, while the last byte is ignored. For the source MAC address 00:AB:22:11:33:00, this wildcard mask matches all MAC addresses in the range 00:AB:22:11:33:00 to 00:AB:22:11:33:FF.
Destination MAC Address	Matches the destination MAC address to which packets are addressed to the rule.
Destination Mask	Defines the destination MAC Address wildcard mask. Wildcards are used to mask all or part of a destination MAC address. Wildcard masks specify which bits are used and which are ignored. A wildcard mask of FF:FF:FF:FF:FF:FF indicates that no bit is important. A wildcard mask of 00.00.00.00.00.00 indicates that all bits are important. For example, if the destination MAC address is 00:AB:22:11:33:00 and the wildcard mask is 00:00:00:00:00:FF, the first five bytes of the MAC are used, while the last byte is ignored. For the destination MAC address 00:AB:22:11:33:00, this wildcard mask matches all MAC addresses in the range 00:AB:22:11:33:00 to 00:AB:22:11:33:FF.
VLAN ID	Matches the packet's VLAN ID to the rule. The possible field values are 1 to 4094.
CoS	Classifies traffic based on the CoS tag value.
CoS Mask	Defines the CoS mask used to classify network traffic.
Ethertype	Provides an identifier that differentiates between various types of protocols.
Action	Specifies the ACL forwarding action. In addition, the port can be shut down, a trap can be sent to the network administrator, or packet is assigned rate limiting restrictions for forwarding. The options are as follows: • Permit: Forwards packets which meet the ACL criteria. • Deny: Drops packets which meet the ACL criteria.

To create a new MAC-based ACL:

1) Select Create ACL.
2) Enter the name of the new ACL.
3) Click **Create**. The new ACL is created, and the switch is updated.

To define a new MAC-based ACL rule:

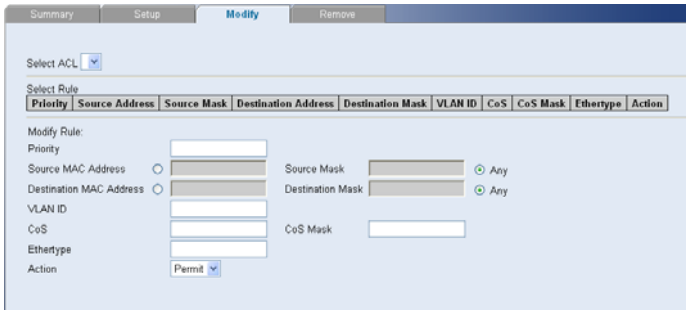
1) Select Selection ACL.
2) Select the ACL from the list.
3) Define the fields for the new ACL rule.
4) Click **Apply**.

Modifying MAC Based ACL

The MAC Based ACL Modify Page allows the network administrator to modify an existing MAC-based ACL rule.

Click **Device** > **ACL** > **MAC Based ACL** > **Modify**. The MAC Based ACL Modify Page opens.

Figure 3-39 MAC Based ACL Modify Page



Note

The description of parameters in the page refers to Defining MAC Based ACL.

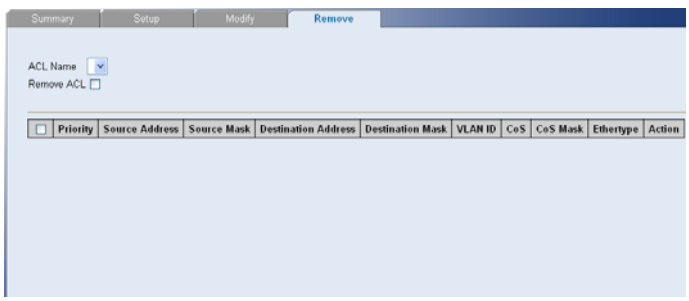
1) Selects the ACL to be modified.
2) Selects the Rule to be modified.
3) Modifies the fields of the Rule.
4) Click **Apply**.

Removing MAC Based ACL

The MAC Based ACL Remove Page allows the network administrator to remove MAC-based ACL or MAC-based ACL rules.

Click **Device** > **ACL** > **MAC Based ACL** > **Remove**. The MAC Based ACL Remove Page opens.

Figure 3-40 MAC Based ACL Remove Page



The MAC Based ACL Remove Page contains the following fields:

Table 3-30 MAC Based ACL Remove Page item description

Item	Description
ACL Name	Selects a MAC-based ACL for removal.
Remove ACL	Enables the ACL to be removed.

To remove MAC-based ACL:

1) Select the ACL Name to be removed
2) Check Remove ACL.
3) Click **Remove**.

To remove MAC-based ACL rules:

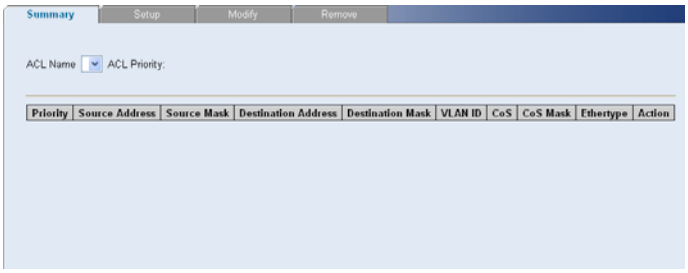
1) Select the ACL Name containing the rules to be deleted.
2) For each rule to be removed, check the box to the left of the row in the rules table. To remove all rules, the topmost box may be checked.
3) Click **Remove**.

Viewing MAC Based ACL

The MAC Based ACL Summary Page displays information regarding MAC Based ACL configured on the switch.

Click **Device** > **ACL** > **MAC Based ACL**. The MAC Based ACL Summary Page opens.

Figure 3-41 MAC Based ACL Summary Page



The MAC Based ACL Summary Page contains the following fields:

Table 3-31 MAC Based ACL Summary Page item description

Item	Description
ACL Name	Contains a list of the MAC-based ACL.
ACL Priority	Indicates the ACL Priority.
Priority	Indicates the rule priority, which determines which rule is matched to a packet on a first match basis.
Source Address	Indicates the source MAC address
Source Mask	Indicates the source MAC address Mask.
Destination Address	Indicates the destination MAC address.
Destination Mask	Indicates the destination MAC address Mask.
VLAN ID	Matches the packet's VLAN ID to the ACL rule. The possible field values are 1 to 4094.

Item	Description
CoS	Classifies traffic based on the CoS tag value.
CoS Mask	Displays the CoS mask used to filter CoS tags.
Ethertype	Provides an identifier that differentiates between various types of protocols.
Action	Indicates the ACL forwarding action. In addition, the port can be shut down, a trap can be sent to the network administrator, or packet is assigned rate limiting restrictions for forwarding. The possible field values are: • Permit: Forwards packets which meet the ACL criteria. • Deny: Drops packets which meet the ACL criteria.

Configuring IP Based ACL

This section includes the following topics:

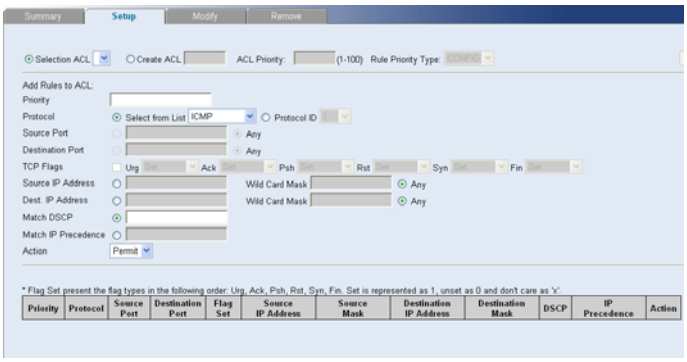
- Defining IP Based ACL
- Modifying IP Based ACL
- Removing IP Based ACL
- Viewing IP Based ACL

Defining IP Based ACL

The IP Based ACL Setup Page allows network managers to define IP Based ACL.

Click **Device** > **ACL** > **IP Based ACL** > **Setup**. The IP Based ACL Setup Page opens.

Figure 3-42 IP Based ACL Setup Page



The IP Based ACL Setup Page contains the following fields:

Table 3-32 IP Based ACL Setup Page item description

Item	Description
Selection ACL	Selects an existing IP-based ACL to which rules are to be added.
Create ACL	Defines a new user-defined IP-based Access Control List. The options are as follows: • ACL Priority: Sets the ACL priority. The possible field values are 1-100. • Rule Priority Type: Sets the rule priority type. CONFIG: You will have to configure the ACL rule priority by yourself, AUTO: the ACL rule priority will be configured automatically.
Priority	Sets the rule priority, which determines which rule is matched to a packet on a first-match basis. The possible field values are 1-65535.

Item	Description
Protocol	Defines the protocol in the rule to which the packet is matched. The possible fields are: • Select from List: Selects a protocol from a list by which packets are matched to the rule. • Protocol ID: Selects a protocol ID from a list by which packets are matched to the rule.
Source Port	Defines the source port that is used for matched packets. Enabled only when TCP or UDP are selected in the Protocol list. The field value is either user defined or Any. If Any is selected the IP based ACL is applied to any source port.
Destination Port	Defines the destination port that is used for matched packets. Enabled only when TCP or UDP are selected in the Protocol list. The field value is either user defined or Any. If Any is selected, the IP based ACL is applied to any destination port.
TCP Flags	If checked, enables configuration of TCP flags matched to the packet. The possible fields are: • Urg: Urgent pointer field significant. The urgent pointer points to the sequence number of the octet following the urgent data. • Ack: Acknowledgement field significant. The acknowledgement field is the byte number of the next byte that the sender expects to receive from the receiver. • Psh: Push (send) the data as soon as possible, without buffering. This is used for interactive traffic. • Rst: Reset the connection. This invalidates the sequence numbers and aborts the session between the sender and receiver. • Syn: Synchronize Initial Sequence Numbers (ISNs). This is used to initialize a new connection. • Fin: Finish. This indicates there is no more data from the sender. This marks a normal closing of the session between the sender and receiver.
Source IP Address	If selected, enables matching the source port IP address to which packets are addressed to the rule, according to a wildcard mask. The field value is either user defined or Any. If Any is selected, accepts any source IP address and disables wildcard mask filtering.
Dest IP Address	If selected, enables matching the destination port IP address to which packets are addressed to the rule, according to a wildcard mask. The field value is either user defined or Any. If Any is selected, accepts any destination IP address and disables wildcard mask filtering.
Match DSCP	If selected, matches the packet DSCP value to the ACL.
Match IP Precedence	If selected, Matches the packet IP Precedence value to the ACL.
Action	Defines the ACL forwarding action. In addition, a trap can be sent to the network administrator, or packet is assigned rate limiting restrictions for forwarding. The options are as follows: • Permit: Forwards packets which meet the ACL criteria. • Deny: Drops packets which meet the ACL criteria.

To create a new IP-based ACL:

1) Select Create ACL.
2) Enter the name of the new ACL.
3) Click **Create**.

To define a new IP-based ACL rule:

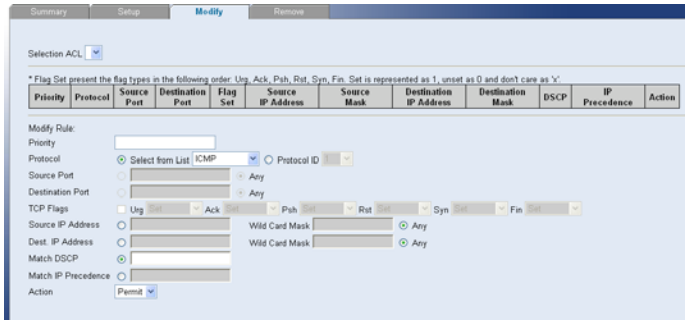
1) Select Selection ACL.
2) Select the ACL from the list.
3) Define the fields for the new ACL rule.
4) Click **Apply**.

Modifying IP Based ACL

The IP Based ACL Modify Page allows the network administrator to modify IP Based ACL rules.

Click **Device** > **ACL** > **IP Based ACL** > **Modify**. The IP Based ACL Modify Page opens.

Figure 3-43 IP Based ACL Modify Page



Note

The description of parameters in the page refers to Defining IP Based ACL.

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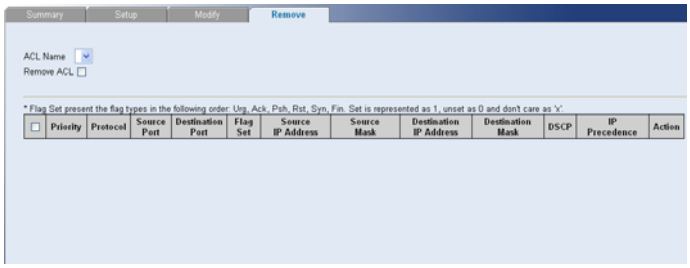
1) Selects the ACL to be modified.
2) Selects the Rule to be modified.
3) Modifies the fields of the Rule.
4) Click **Apply**.

Removing IP Based ACL

The IP Based ACL Remove Page allows the network administrator to remove IP-based ACL or IP-based ACL rules.

Click **Device** > **ACL** > **IP Based ACL** > **Remove**. The IP Based ACL Remove Page opens.

Figure 3-44 IP Based ACL Remove Page



The IP Based ACL Remove Page contains the following fields:

Table 3-33 IP Based ACL Remove Page item description

Item	Description
ACL Name	Selects an IP-based ACL for removal.
Remove ACL	Enables the ACL to be removed.

To remove an IP-based ACL:

1) Select an ACL Name to be removed.
2) Check Remove ACL.
3) Click **Remove**.

To remove IP-based ACL rules:

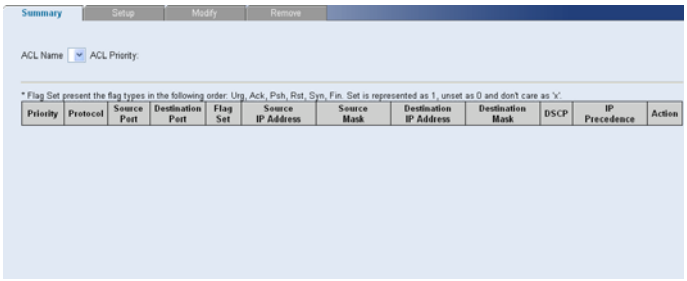
1) Select an ACL Name.
2) For each rule to be removed, check the box to the left of the row in the rules table. To remove all rules, the topmost box may be checked.
3) Click **Remove**.

Viewing IP Based ACL

The IP Based ACL Summary Page displays information regarding IP-based ACL configured on the switch.

Click **Device** > **ACL** > **IP Based ACL**. The IP Based ACL Summary Page opens.

Figure 3-45 IP Based ACL Summary Page



The IP Based ACL Summary Page contains the following fields:

Table 3-34 IP Based ACL Summary Page item description

Item	Description
ACL Name	Contains a list of the IP Based ACL
ACL Priority	Indicates the ACL Priority.
Priority	Indicates the rule priority, which determines which rule is matched to a packet on a first-match basis. The possible field values are 1-65535, with 1 being the highest priority.
Protocol	Indicates the protocol in the rule to which the packet is matched.
Source Port	Indicates the source port that is matched packets. Enabled only when TCP or UDP are selected in the Protocol list.
Destination Port	Indicates the destination port that is matched packets. Enabled only when TCP or UDP are selected in the Protocol list.
Flag Set	Indicates the TCP flag to which the packet is mapped.

Item	Description
Source IP Address	Matches the source IP address to which packets are addressed to the ACL.
Source Mask	Indicates the source IP address mask.
Destination IP Address	Matches the destination IP address to which packets are addressed to the ACL.
Destination Mask	Indicates the destination IP address mask.
DSCP	Matches the packet DSCP value to the ACL. Either the DSCP value or the IP Precedence value is used to match packets to ACLs.
IP Precedence	Indicates matching ip-precedence with the packet IP precedence value.
Action	Indicates the ACL forwarding action. In addition, the port can be shut down, a trap can be sent to the network administrator, or packet is assigned rate limiting restrictions for forwarding.

Configuring ACL Binding

This section includes the following topics:

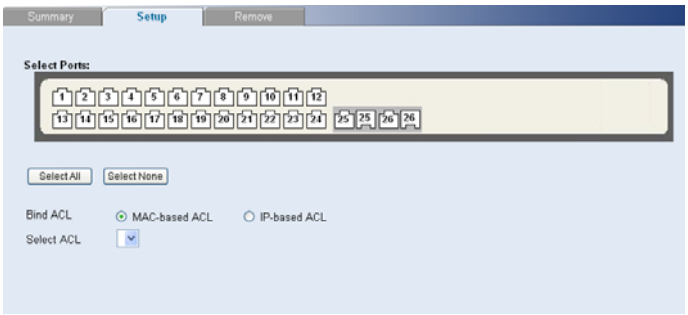
- Defining ACL Binding
- Removing ACL Binding
- Viewing ACL Binding

Defining ACL Binding

The ACL Binding Setup Page allows the network administrator to bind specific ports to MAC or IP based ACLs.

Click **Device** > **ACL** > **ACL Binding** > **Setup**. The ACL Binding Setup Page opens.

Figure 3-46 ACL Binding Setup Page



The ACL Binding Setup Page contains the following fields:

Table 3-35 ACL Binding Setup Page item description

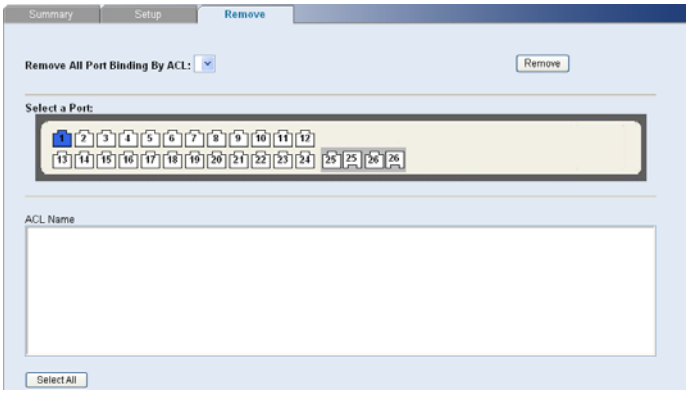
Item	Description
Bind ACL	Assigns ACL type
Select ACL	Selects the ACL from a list of previously defined ACLs to which the port can be bound.

Removing ACL Binding

The ACL Binding Remove Page allows the network administrator to remove user-defined ACLs from a selected interface.

Click **Device** > **ACL** > **ACL Binding** > **Remove**. The ACL Binding Remove Page opens.

Figure 3-47 ACL Binding Remove Page



The ACL Binding Remove Page contains the following fields:

Table 3-36 ACL Binding Remove Page item description

Item	Description
Remove All Port Binding By ACL	Remove all the port binding according to the current ACL.
ACL Name	Displays the name of ACL to be removed from the selected port.

To remove ACL Binding:

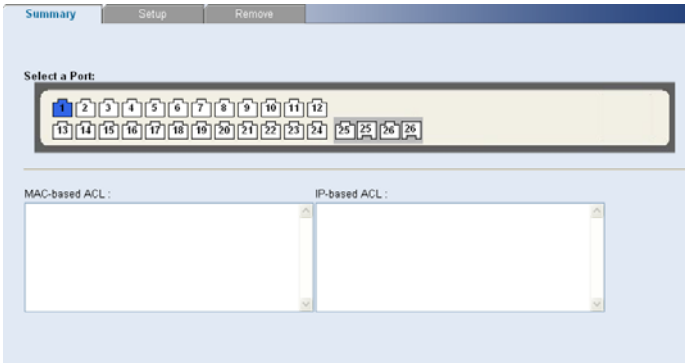
1) Select an ACL Name from “Remove All Port Binding By ACL” or “ACL Name”.
2) Click **Remove**.

Viewing ACL Binding

The ACL Binding Summary Page displays the user-defined ACLs mapped to the interfaces.

Click **Device** > **ACL** > **ACL Binding**. The ACL Binding Summary Page opens.

Figure 3-48 ACL Binding Summary Page



The ACL Binding Summary Page contains the following fields:

Table 3-37 ACL Binding Summary Page item description

Item	Description
MAC-based ACL	Displays the MAC based ACL to which the interface is assigned.
IP-based ACL	Displays the IP based ACL to which the interface is assigned

Configuring QoS

Quality of Service (QoS) provides the ability to implement QoS and priority queuing within a network. For example, certain types of traffic that require minimal delay, such as Voice, Video, and real-time traffic can be assigned a high priority queue, while other traffic can be assigned a lower priority queue. The result is an improved traffic flow for traffic with high demand.

This section contains information for configuring QoS, and includes the following topics:

- Configuring CoS
- Configuring Queue Algorithm
- Defining CoS to Queue
- Configuring DSCP to Queue
- Configuring Trust Mode
- Configuring Bandwidth Settings
- Configuring Voice VLAN

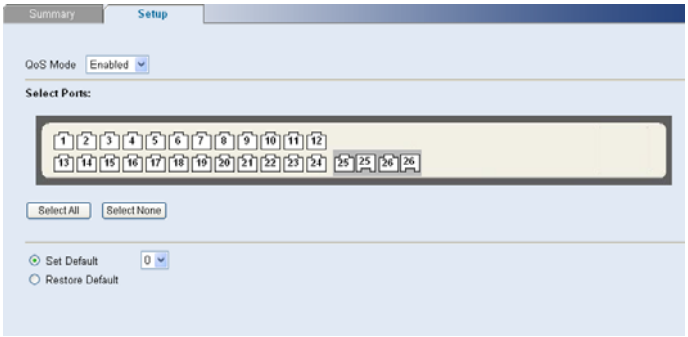
Configuring CoS

Defining CoS

The CoS Setup Page contains information for enabling QoS globally and setting default CoS value to the interfaces.

Click **Device** > **QoS** > **CoS Setup**. The CoS Setup Page opens.

Figure 3-49 CoS Setup Page



The CoS Setup Page contains the following fields:

Table 3-38 CoS Setup Page item description

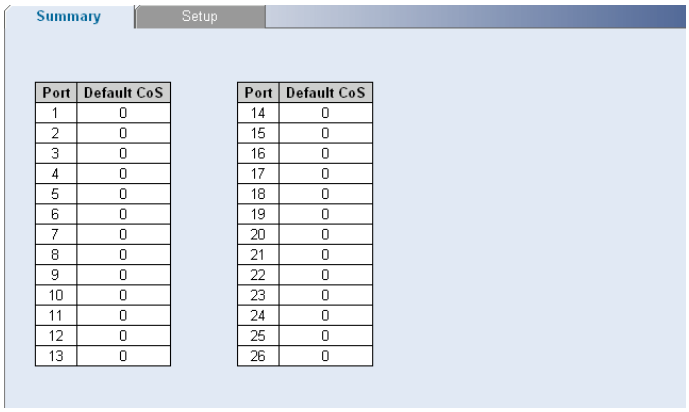
Item	Description
QoS Mode	Specifies if QoS is enabled on the switch. The possible values are: • Disabled: Restores the switch factory defaults for QoS values and disables configure QoS values on the switch. • Enabled: Enables configure QoS values on the switch.
Set Default	Sets the default user priority. The possible field values are 0-7, where 0 is the lowest and 7 is the highest priority.
Restore Default	Restores the switch factory defaults for CoS values.

Viewing CoS Settings

The CoS Summary Page displays CoS default settings assigned to ports.

Click **Device** > **QoS** > **CoS**. The CoS Summary Page opens.

Figure 3-50 CoS Summary Page



The CoS Summary Page contains the following fields:

Table 3-39 CoS Summary Page item description

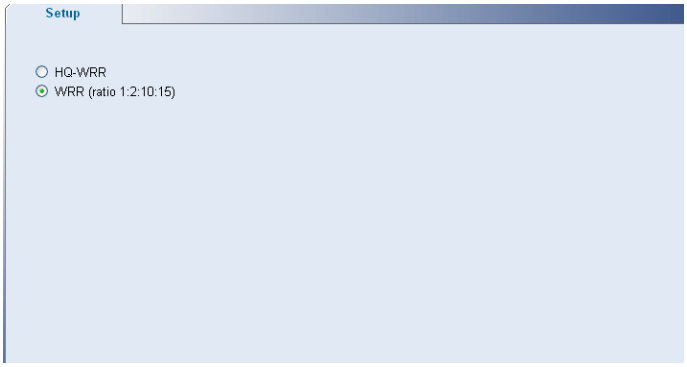
Item	Description
Port	Displays the interface for which the CoS default value is defined.
Default CoS	Displays the default CoS value for incoming packets for which a VLAN priority tag is not defined.

Configuring Queue Algorithm

The Queue Setup Page contains the queue algorithm information.

Click **Device** > **QoS** > **Queue**. The Queue Setup Page opens.

Figure 3-51 Queue Setup Page



The Queue Setup Page contains the following fields:

Table 3-40 Queue Setup Page item description

Item	Description
HQ-WRR	This highest queue is transmitted first if any packets are in the highest queue. When the highest queue is exhausted, the remaining queues are served by WRR.
WRR(ratio 1:2:10:15)	This queue algorithm specifies which port queue that each packet should be sent to. The actual bandwidth of each port queue is determined by the weight, whose values are 1,2,10 and 15.

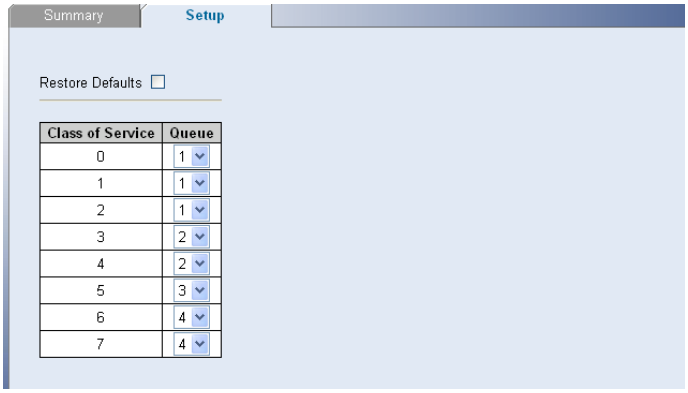
Configuring CoS to Queue

Defining CoS to Queue

The CoS to Queue Setup Page contains fields for mapping CoS values to traffic queues. Four traffic priority queues are supported on the switch, with 1 representing the lowest queue and four as the highest. The highest priority queue functions with strict priority while queues 1-3 function with WRR priority with the following weights (1, 2, 10 and 15) respectively.

Click **Device** > **QoS** > **CoS to Queue** > **Setup**. The CoS to Queue Setup Page opens.

Figure 3-52 CoS to Queue Setup Page



The CoS to Queue Setup Page contains the following fields:

Table 3-41 CoS to Queue Setup Page item description

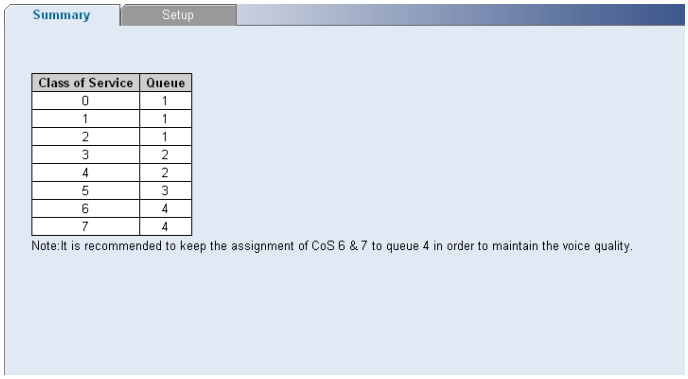
Item	Description
Restore Defaults	Restores the switch factory defaults for mapping CoS values to forwarding queues.
Class of Service	Specifies the CoS priority tag values, where 0 is the lowest and 7 is the highest.
Queue	Defines the traffic forwarding queue to which the CoS priority is mapped.

Viewing CoS to Queue

The CoS to Queue Summary Page contains a table that displays the CoS values mapped to traffic queues.

Click **Device** > **QoS** > **CoS to Queue**. The CoS to Queue Summary Page opens.

Figure 3-53 CoS to Queue Summary Page



The CoS to Queue Summary Page contains the following fields:

Table 3-42 CoS to Queue Summary Page item description

Item	Description
Class of Service	Displays the CoS priority tag values, where 0 is the lowest and 7 is the highest.
Queue	Indicates the traffic forwarding queue to which the CoS priority is mapped. Four traffic priority queues are supported.

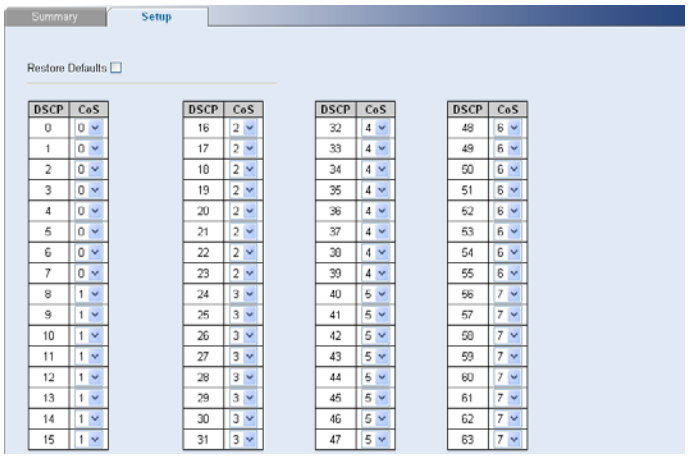
Configuring DSCP to Queue

Defining DSCP to Queue

The DSCP to CoS Setup Page contains fields for mapping DSCP settings to CoS priority tag values. For example, In default, a packet with a DSCP tag value of 3 can be assigned to queue 1.

Click **Device** > **QoS** > **DSCP to Queue** > **Setup**. The DSCP to Queue Setup Page opens.

Figure 3-54 DSCP to Queue Setup Page



The DSCP to Queue Setup Page contains the following fields:

Table 3-43 DSCP to Queue Setup Page item description

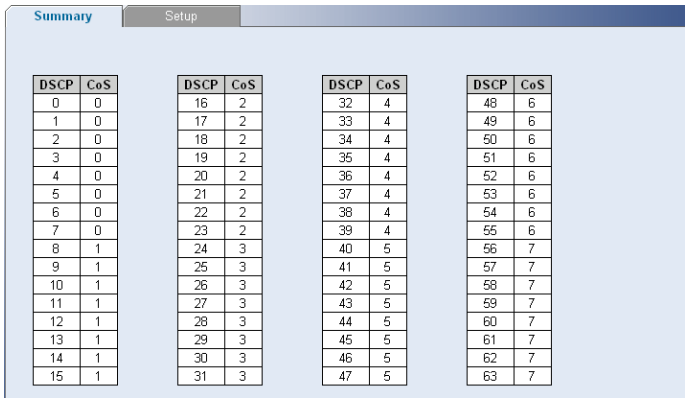
Item	Description
Restore Defaults	Restores the switch factory defaults for mapping DSCP values to a traffic forwarding queue.
DSCP	Displays the incoming packet's DSCP value.
CoS	Specifies the CoS value forwarding queue to which the DSCP priority is mapped.

Viewing DSCP to Queue

The DSCP to CoS Summary Page contains a table that displays the DSCP values mapped to CoS values.

Click **Device** > **QoS** > **DSCP to Queue**. The DSCP to Queue Summary Page opens.

Figure 3-55 DSCP to Queue Summary Page



The DSCP to Queue Summary Page contains the following fields:

Table 3-44 DSCP to Queue Summary Page item description

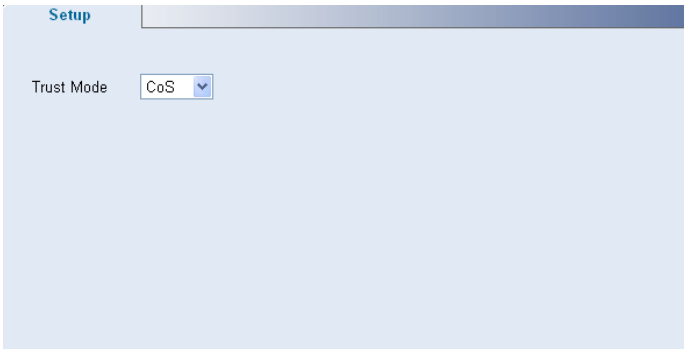
Item	Description
DSCP	Displays the incoming packet's DSCP value.
CoS	Indicates the CoS value forwarding queue to which the DSCP priority is mapped. The possible field values are 0-7.

Configuring Trust Mode

The Trust Setup Page contains information for configuring trust mode on the switch.

Click **Device** > **QoS** > **Trust** > **Setup**. The Trust Setup Page opens.

Figure 3-56 Trust Setup Page



The Trust Setup Page contains the following fields:

Table 3-45 Trust Setup Page item description

Item	Description
Trust Mode	Specifies which packet fields to use for classifying packets entering the switch. When no rules are defined, the traffic containing the predefined packet CoS field is mapped according to the relevant trust modes table. Traffic not containing a predefined packet field is mapped to "best effort". The possible Trust Mode field values are: • CoS: Classifies traffic based on the CoS tag value. • DSCP: Classifies traffic based on the DSCP tag value.

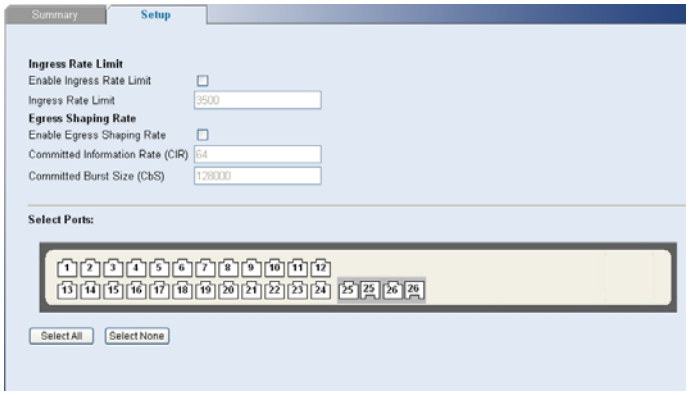
Configuring Bandwidth Settings

Defining Bandwidth Settings

The Bandwidth Setup Page allows network managers to define the bandwidth settings for a specified interface.

Click **Device** > **QoS** > **Bandwidth** > **Setup**. The Bandwidth Setup Page opens.

Figure 3-57 Bandwidth Setup Page



The Bandwidth Setup Page contains the following fields:

Table 3-46 Bandwidth Setup Page item description

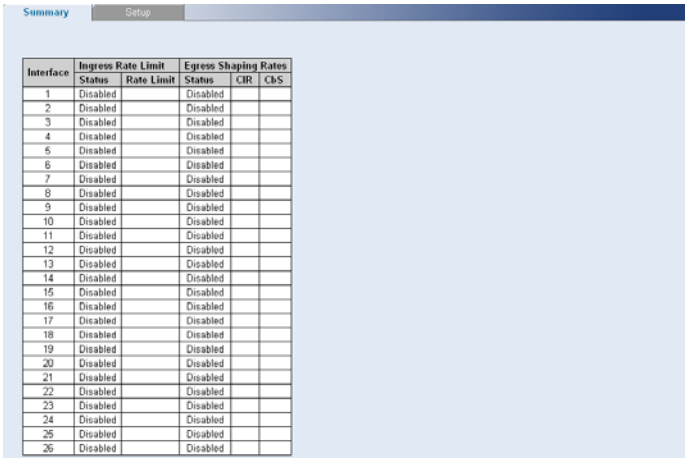
Item		Description
Ingress Rate Limit	Enable Ingress Rate Limit	Enables setting an Ingress Rate Limit.
	Ingress Rate Limit	Defines the ingress traffic limit for the port. The field range of nomal port is 3500 - 100,000 kbits per second, and the field range of combo port is 3500 - 1,000,000 kbits per second.
Egress Shaping Rates	Enable Egress Shaping Rate	Enables setting Egress Shaping Rates.
	Committed Information Rate (CIR)	Defines the CIR for the interface. The field range of nomal port is 64 - 100,000 kbits per second, and the field range of combo port is 64 - 1,000,000 kbits per second.
	Committed Burst Size (CbS)	Defines the CbS for the interface. The field range is 4,096 bytes - 133,120 bytes per second.

Viewing Bandwidth Settings

The Bandwidth Summary Page displays bandwidth settings for a specified interface.

Click **Device** > **QoS** > **Bandwidth** > **Summary**. The Bandwidth Summary Page opens.

Figure 3-58 Bandwidth Summary Page



The Bandwidth Summary Page contains the following fields:

Table 3-47 Bandwidth Summary Page item description

Item		Description
Ingress Rate Limit	Status	Indicates the ingress rate limiting status on the interface. The possible field values are: • Enabled: Ingress rate limiting is enabled on the interface. • Disabled: Ingress rate limiting is disabled on the interface. This is the default.
	Rate Limit	Indicates the ingress traffic limit for the port.
Egress Shaping Rates	Status	Indicates the egress traffic shaping status for the interface. The possible field values are: • Enabled: Egress traffic shaping is enabled for the interface. • Disabled: Egress traffic shaping is disabled for the interface. This is the default.
	CIR	Indicates the Committed Information Rate (CIR) for the interface.
	CbS	Indicates the Committed Burst Size (CbS) for the interface.

Configuring Voice VLAN

Voice VLAN allows network administrators to enhance VoIP service by configuring ports to carry IP voice traffic from IP phones on a specific VLAN. VoIP traffic has a preconfigured OUI prefix in the source MAC address. Network Administrators can configure VLANs on which voice IP traffic is forwarded. Non-VoIP traffic is dropped from the Voice VLAN in auto Voice VLAN secure mode. Voice VLAN also provides QoS to VoIP, ensuring that the quality of voice does not deteriorate if the IP traffic is received unevenly. The system supports one Voice VLAN.

Note

The Baseline Switch 2250-SFP Plus does not support improving the priority of voice streams.

There are two operational modes for IP Phones:

- IP phones are configured with VLAN-mode as enabled, ensuring that tagged packets are used for all communications.
- If the IP phone's VLAN-mode is disabled, the phone uses untagged packets. The phone uses untagged packets while retrieving the initial IP address through DHCP. The phone eventually uses the Voice VLAN and starts sending tagged packets.

This section contains the following topics:

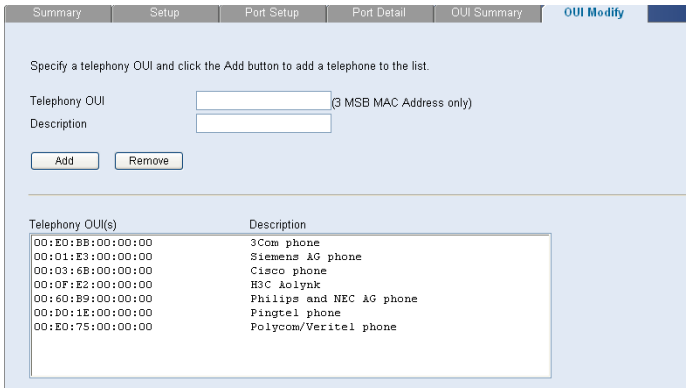
- Modifying OUI Definitions
- Defining Voice VLAN Global Settings
- Defining Voice VLAN Port Settings
- Viewing Voice VLAN Port Settings
- Viewing OUI Summaries
- Viewing Voice VLAN

Modifying OUI Definitions

The Voice VLAN OUI Modify Page allows network administrators to add new OUIs or to remove previously defined OUIs from the Voice VLAN. The packet priority derives from the source/destination MAC prefix. The packet gets higher priority when there is a match with the OUI list. Using the OUI, network managers can add a specific manufacturer's MAC addresses to the OUI table. Once the OUIs are added, all traffic received on the Voice VLAN ports from the specific IP phone with a listed OUI, is forwarded on the voice VLAN.

Click **Device** > **QoS** > **VoIP Traffic Setting** > **OUI Modify**. The Voice VLAN OUI Modify Page opens.

Figure 3-59 Voice VLAN OUI Modify Page



The Voice VLAN OUI Modify Page contains the following fields:

Table 3-48 Voice VLAN OUI Modify Page item description

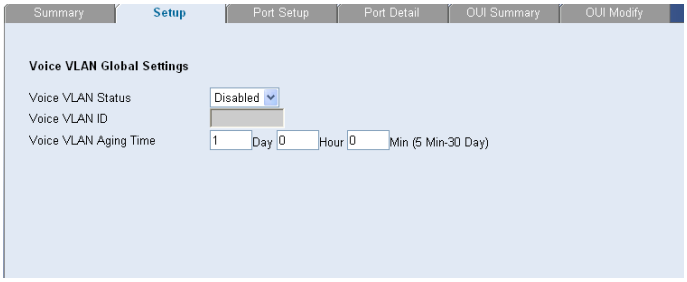
Item	Description
Telephony OUI	Defines a new or existing OUI on the Voice VLAN. The field contains the 3 most significant bytes of the MAC address.
Description	Enters a user-defined OUI description. The field may contain up to 32 characters.
Add	Allows the user to add a new OUI.
Remove	Allows the user to delete an existing OUI.

Defining Voice VLAN Global Settings

The Voice VLAN Setup Page provides information for enabling and defining Voice VLAN globally on the switch.

Click **Device** > **QoS** > **VoIP Traffic Setting** > **Setup**. The Voice VLAN Setup Page opens.

Figure 3-60 Voice VLAN Setup Page



The Voice VLAN Setup Page contains the following fields:

Table 3-49 Voice VLAN Setup Page item description

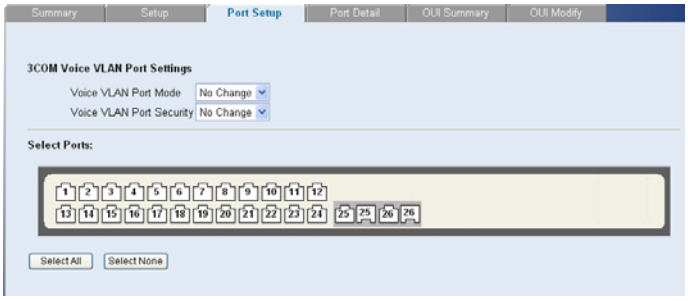
Item	Description
Voice VLAN State	Enables or disables Voice VLAN is enabled on the switch.
Voice VLAN ID	Defines the Voice VLAN ID number.
Voice VLAN Aging Time	Input the aging time. Defines the amount of time after the last IP phone's OUI is aged out for a specific port. The Voice VLAN aging time starts after the MAC Address is aged out from the Dynamic MAC Address table. The port will age out after the bridge and voice aging times. The default bridge aging time is 300 seconds. The default voice aging time is 1 day. The possible fields are: • Day: The field range is 0-30. • Hour: The field range is 0-23. • Minute: The field range is 0-59.

Defining Voice VLAN Port Settings

The Voice VLAN Port Setup Page contains information for defining Voice VLAN port mode and Security.

Click **Device** > **QoS** > **VoIP Traffic Setting** > **Port Setup**. The Voice VLAN Port Setup Page opens.

Figure 3-61 Voice VLAN Port Setup Page



The Voice VLAN Port Setup Page contains the following fields:

Table 3-50 Voice VLAN Port Setup Page item description

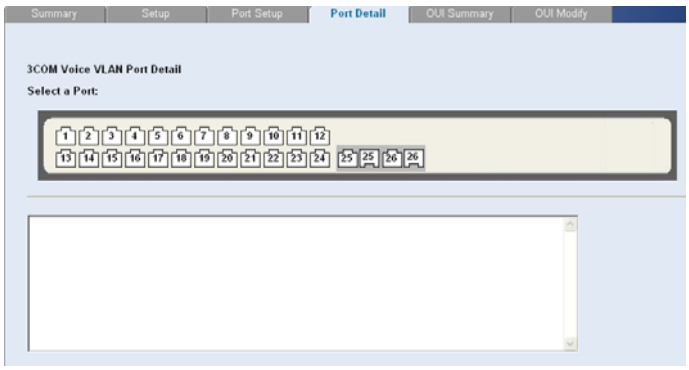
Item	Description
Voice VLAN Port Mode	Specifies the Voice VLAN mode. The possible field values are: • No Changes: Maintains the current Voice VLAN port settings. • None: Indicates that the selected port will not be added to a Voice VLAN. This is the default value. • Manual: Adding a selected port to a Voice VLAN. • Auto: Indicates that if traffic with an IP Phone MAC Address is transmitted on the port, the port joins the Voice VLAN. The port is aged out of the voice VLAN if the IP phone's MAC address (with an OUI prefix) is aged out and exceeds the defined voice VLAN aging time. If the MAC Address of the IP phones OUI was added manually to a port/LAG in the Voice VLAN, the user cannot add it to the Voice VLAN in Auto mode, only in Manual mode.
Voice VLAN Port Security	Specifies if port security is enabled on the Voice VLAN. Port security ensures that packets arriving with an unrecognized MAC address are dropped. Port Security is only applicable when Voice VLAN Port Mode is set to Auto. • No Changes: Maintains the current Voice VLAN port security settings. • Enable: Enables port security on the Voice VLAN. • Disable: Disables port security on the Voice VLAN. This is the default value.

Viewing Voice VLAN Port Settings

The Voice VLAN Port Details Page displays the Voice VLAN port settings for specific ports.

Click **Device** > **QoS** > **VoIP Traffic Setting** > **Port Detail**. The Voice VLAN Port Details Page opens.

Figure 3-62 Voice VLAN Port Details Page



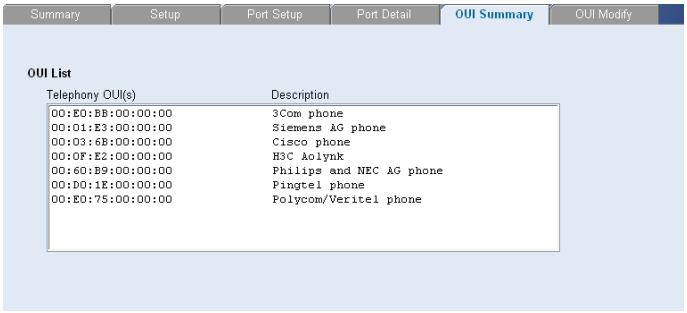
Select a port and the Voice VLAN port settings are displayed in the text box.

Viewing OUI Summaries

The Voice VLAN OUI Summary Page lists the Organizationally Unique Identifiers (OUIs) associated with the Voice VLAN. The first three bytes of the MAC Address contain a manufacturer identifier. While the last three bytes contain a unique station ID.

Click **Device** > **QoS** > **VoIP Traffic Setting** > **OUI Summary**. The Voice VLAN OUI Summary Page opens.

Figure 3-63 Voice VLAN OUI Summary Page

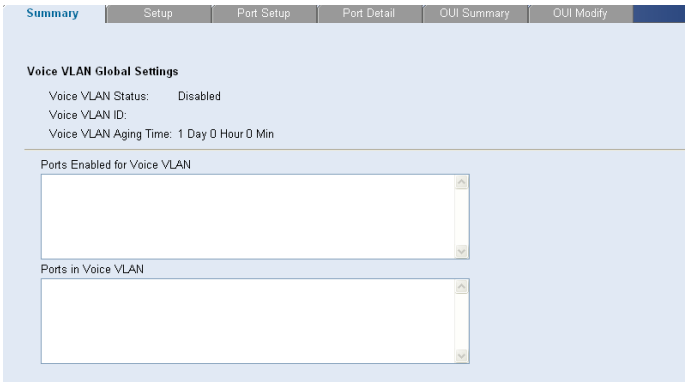


Viewing Voice VLAN

The Voice VLAN Summary Page contains information about the Voice VLAN currently enabled on the switch, including the ports enabled and included in the Voice VLAN.

Click **Device** > **QoS** > **VoIP Traffic Setting**. The Voice VLAN Summary Page opens.

Figure 3-64 QoS VoIP Summary Page



The Voice VLAN Summary Page contains the following fields:

Table 3-51 Voice VLAN Summary Page item description

Item	Description
Voice VLAN State	Indicates if Voice VLAN is enabled on the switch. The possible field values are: • Enabled: Voice VLAN is enabled on the switch. • Disabled: Voice VLAN is disabled on the switch. This is the default value.
Voice VLAN ID	Indicates the Voice VLAN ID number.
Voice VLAN Aging Time	Indicates the amount of time after the last IP phone's OUI is aged out for a specific port.
Ports Enabled for Voice VLAN	Displays the ports for which Voice VLAN is enabled.
Ports in the Voice VLAN	Displays the ports which are included in the Voice VLAN.

Configuring SNMP

Simple Network Management Protocol (SNMP) provides a method for managing network devices. The switch supports the following SNMP versions:

- SNMP version 1
- SNMP version 2c

The SNMP agents maintain a list of variables, which are used to manage the switch. The variables are defined in the Management Information Base (MIB). The SNMP agent defines the MIB specification format, as well as the format used to access the information over the network. Access rights to the SNMP agents are controlled by access strings.

This section contains the following topics:

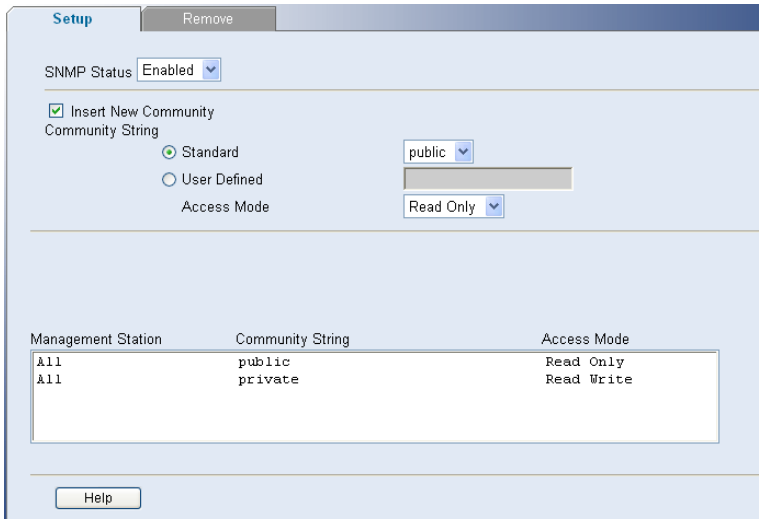
- Defining SNMP Communities
- Removing SNMP Communities
- Defining SNMP Traps
- Removing SNMP Traps

Defining SNMP Communities

Access rights are managed by defining communities in the SNMP Communities Setup Page. When the community names are changed, access rights are also changed. SNMP communities are defined only for SNMP v1 and SNMP v2c.

Click **Administration** > **SNMP** > **Communities** > **Setup**. The SNMP Communities Setup Page opens.

Figure 3-65 SNMP Communities Setup Page



The SNMP Communities Setup Page contains the following fields:

Table 3-52 SNMP Communities Setup Page item description

Item	Description
SNMP Status	Specifies if SNMP is enabled on the switch. The possible field values are: • Enabled: Enables SNMP on the switch. • Disabled: Disables SNMP on the switch.
Insert New Community	Enables adding an SNMP community.

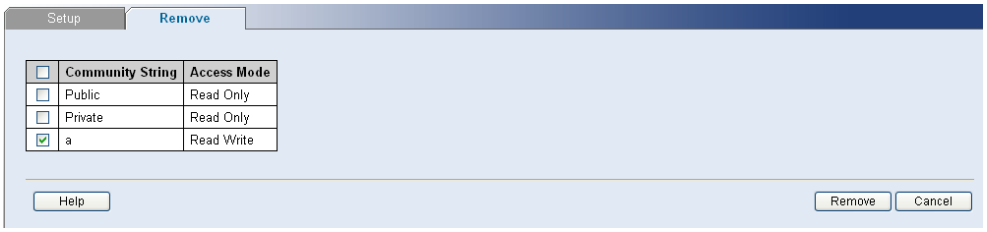
Item	Description
Standard	Selects pre-defined community strings. The possible field values are: • Public: Displays the pre-defined public community string name. • Private: Displays the pre-defined private community string name.
User Defined	Defines a user-defined community string name.
Access Mode	Defines the access rights of the community. The possible field values are: • Read Only: Management access is restricted to read-only, and changes cannot be made to the community. • Read Write: Management access is read-write and changes can be made to the switch configuration, but not to the community.

Removing SNMP Communities

The SNMP Communities Remove Page allows the system manager to remove SNMP Communities.

Click **Administration** > **SNMP** > **Communities** > **Remove**. The SNMP Communities Remove Page opens.

Figure 3-66 SNMP Communities Remove Page



To Remove SNMP Communities:

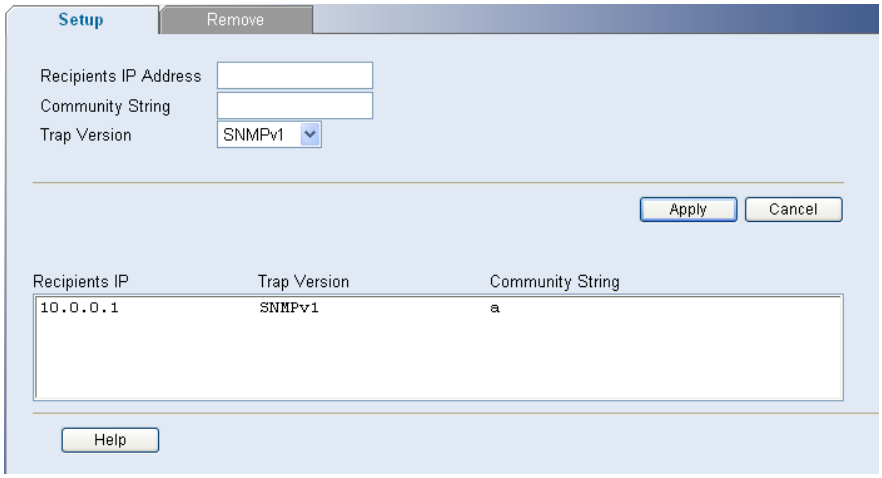
1) Select the SNMP Communities.
2) Click **Remove**.

Defining SNMP Traps

The SNMP Traps Setup Page allows the system manager to defining filters that determine whether traps are sent to specific users, and the trap type sent.

Click **Administration** > **SNMP** > **Traps** > **Setup**. The SNMP Traps Setup Page opens.

Figure 3-67 SNMP Traps Setup Page



The SNMP Traps Setup Page contains the following fields:

Table 3-53 SNMP Traps Setup Page item description

Item	Description
Recipients IP Address	Defines the IP address to which the traps are sent.
Community String	Defines the community string of the trap manager.
Trap Version	Defines the trap type. The possible field values are: • SNMP V1: Indicates that SNMP Version 1 traps are sent. • SNMP V2c: Indicates that SNMP Version 2 traps are sent.

Removing SNMP Traps

The SNMP Traps Remove Page allows the system manager to remove SNMP Traps.

Click **Administration** > **SNMP** > **Traps** > **Remove**. The SNMP Traps Remove Page opens.

Figure 3-68 SNMP Traps Remove Page

To Remove SNMP Traps:

1) Select the SNMP Traps.
2) Click **Remove**.

Configuring LLDP

LLDP Overview

The Link Layer Discovery Protocol (LLDP) operates on the data link layer. With LLDP, a device can store and maintain information about itself and the directly-connected neighbor devices for network administrators to check link status.

LLDP Operating Mode

LLDP can operate in one of the following modes:

- TxRx: A port in this mode sends and receives LLDPDUs.
- Tx: A port in this mode only sends LLDPDUs.
- Rx: A port in this mode only receives LLDPDUs.
- Disable: A port in this mode does not send or receive LLDPDUs.

TLV Types

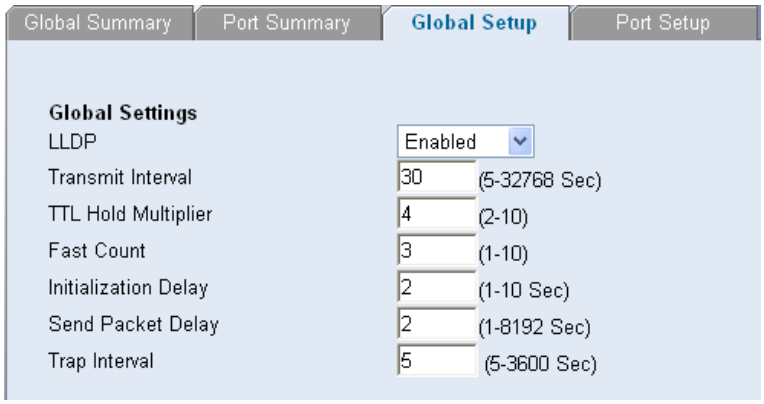
TLVs encapsulated in LLDPDUs fall into these categories: basic TLVs, organizationally specific TLVs, and media endpoint discovery (MED) related TLVs.

Basic TLVs are the base of network device management. Organizationally specific TLVs are defined by the standard organization, while MED related TLVs are vendor specific for enhanced device management and are optional to LLDPDUs.

Configuring Global LLDP Parameters

Click **Device** > **LLDP** > **Global Setup**. The Global LLDP Parameters Page opens.

Figure 3-69 Global LLDP Parameters Page



The Global LLDP Parameters Page contains the following fields:

Table 3-54 Global LLDP Parameter Page item description

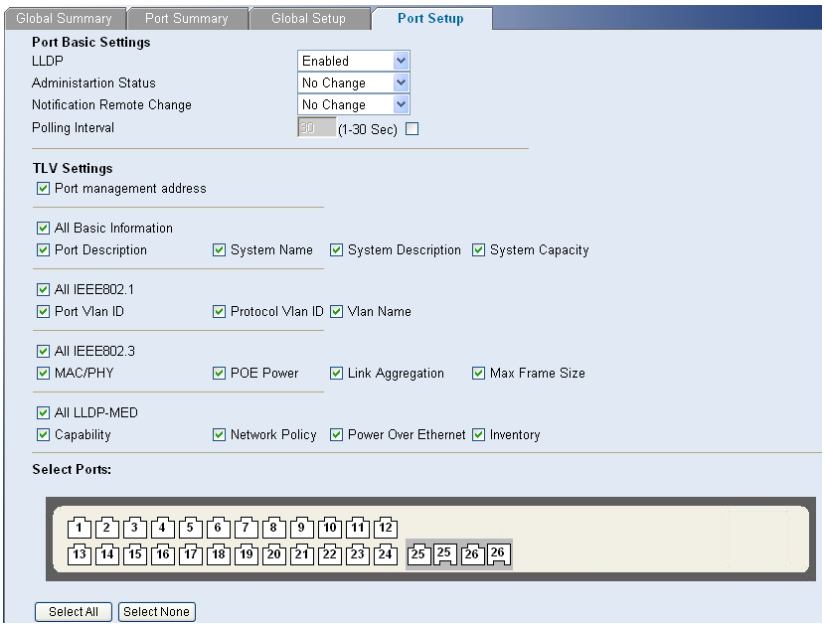
Item	Description
LLDP	Enable/disable LACP globally. Two options are available: • Enabled: Enables LLDP globally. • Disabled: Disables LLDP globally. By default, LLDP is disabled globally.

Item	Description
Transmit Interval	Set the interval for sending LLDPDUs. A port operating in TxRx mode or Tx mode sends LLDPDUs to its directly connected device periodically. By default, the interval is 30 seconds.
TLL Hold Multiplier	Set the TTL multiplier. You can configure the TTL of locally sent LLDPDUs to determine how long they can be saved on a neighbor device by setting the TTL hold multiplier. The TTL is expressed as: *TTL multiplier × LLDPDU sending interval* By default, the TTL multiplier is 4.
Fast Count	Set the number of successive fast-sent LLDPDUs. This fast sending mechanism allows your LLDPDU switch to be discovered by its neighbors quickly. After the specified numbers of LLDPDUs are sent, the normal sending interval restores. The default fast count is 3.
Initialization Delay	Set the delay time of an LLDP-enabled port to prevent frequent port LLDP initializations. The default delay of a port is 2 seconds.
Send packet Delay	Set the delay before sending next LLDPDUs. This parameter is introduced to avoid sending excessive number of LLDPDUs caused by frequent local configuration changes. By default, the delay is 2 seconds.
Trap Interval	Set the interval for sending LLDP remote change trap. By default, the interval for sending trap is 5 seconds.

Configuring Port-Level LLDP Parameters

Click **Device** > **LLDP** > **Port Setup**. The Port-Level LLDP Parameters Page opens.

Figure 3-70 Port-Level LLDP Parameters Page



The Port-Level LLDP Parameters Page contains the following fields:

Table 3-55 Port-Level LLDP Parameters Page item description

Item		Description
Port Basic Settings	LLDP	Enable/disable LLDP on a port. Two options are available: • Enabled: Enables LLDP on the port. • Disabled: Disables LLDP on the port. By default, LLDP is enabled on a port.
	Administrator Status	Set the LLDP operating mode. • Send Only: Sets the port LLDP to operate in Tx mode to send LLDPDUs only. • Receive Only: Sets the port LLDP to operate in Rx mode to receive LLDPDUs only. • Send&Receive: Sets the port LLDP to operate in TxRx mode to both send and receive LLDPDUs. • Disable: Sets the port LLDP to operate in disable mode to neither send nor receive LLDPDUs. By default, the port LLDP operating mode is Send&Receive, namely TxRx.
	Notification Remote Change	Enable/disable remote port up/down event reporting. By default, remote port up/down event reporting is enabled.
	Polling Interval	After checking the Polling Interval option, you can set the polling interval value. Device checks for the local configuration changes periodically within the polling interval. Upon detecting a configuration change, the device sends LLDPDUs to inform the neighboring devices of the change Polling is disabled by default.
TLV Settings	Port management address	Check the Port management address option to encapsulate the management IP address of the device in the LLDPDUs to be sent.
	Basic Information	The basic LLDP TLVs include the following: • Port Description: Description string of the Ethernet port. • System Name: Device name. • System Description: Description of the system. • System Capabilities: Primary function(s) of the system. If you check the option of All Basic Information, all the above basic TLVs will be sent within LLDPDUs.
	IEEE 802.1	The IEEE 802.1 defined LLDP TLVs supported by the device include the following: • Port Vlan ID: Checked to include the VLAN ID(s) on the port. • Protocol Vlan ID: Checked to include the IDs of the protocol VLAN(s) on the port. • Vlan Name: Checked to include the VLAN names on the port. Check the option of All IEEE802.1, all the above IEEE802.1 organizationally specific TLVs will be sent within LLDPDUs

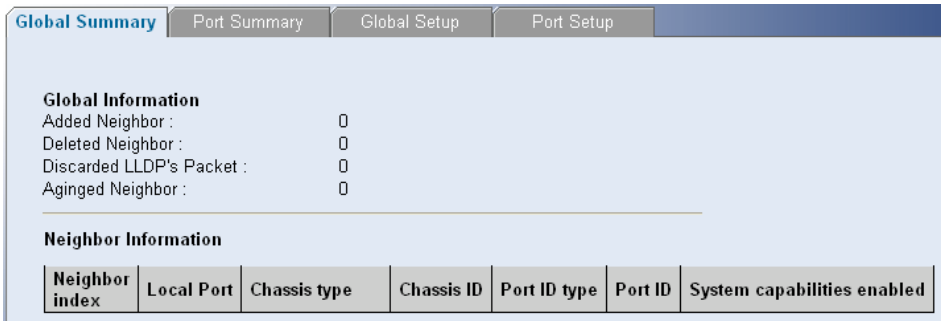
Item		Description
	IEEE 802.3	The IEEE 802.3 defined LLDP TLVs supported by the device include the following: • MAC/PHY: The rate, duplex mode, and speed auto-negotiation state of the port. • POE Power: Power supply capability of the port. • Link Aggregation: Indicates the support of the port for link aggregation, and the aggregation status (whether the link is in an aggregation). • Maximum Frame Size: Supported maximum frame size. Currently, it takes the MTU of the port. If you check the option of All IEEE802.3, all the above IEEE802.3 organizationally specific TLVs will be sent within LLDPDUs
	LLDP-MED	The MED related LLDP TLVs include the following • Capability: MED device type of the device, and types of LLDP MED TLVs that can be encapsulated in LLDPDUs. • Network Policy: VLAN ID of the port, supported applications (voice and video, for example), and priority and policy of each application. • Power Over Ethernet: Power supply capability of the port. • Inventory: Inventory information of the local device, including Hardware Revision TLV, Firmware Revision TLV, Software Revision TLV, Serial Number TLV, Manufacturer Name TLV, Model Name TLV, Asset ID TLV used for inventory management and asserting tracking. If you check the option of All LLDP-MED to encapsulate all LLDP-MED TLVs supported by the device

Viewing LLDP Information

Viewing Global LLDP Information and Received LLDP Information

Click **Device** > **LLDP** > **Global Summary**. The Global LLDP Information and Received LLDP Information Page opens.

Figure 3-71 Global LLDP Information and Received LLDP Information Page



The Global LLDP Information and Received LLDP Information Page contains the following fields:

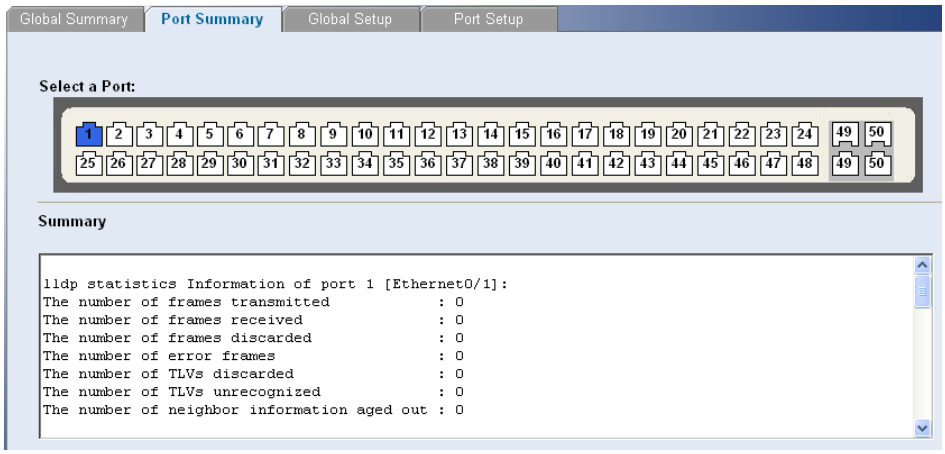
Table 3-56 Global LLDP Information and Received LLDP Information Page item description

Item	Description
Added Neighbor	Total number of discovered neighbors
Deleted Neighbor	Total number of deleted neighbors
Discarded LLDP's Packet	Total number of dropped LLDPDUs
Aginged Neighbor	Total number of aged LLDP neighbor entries
Neighbor index	Index of each discovered neighbor
Local Port	Local port name of each neighbor
Chassis type	Chassis ID type, including: • Chassis component • Interface alias • Port component • MAC address • Network address • Interface name • Locally assigned, namely, local configuration
Chassis ID	Chassis ID
Port ID type	Port ID type, including: • Interface alias • Port component • MAC address • Network address • Interface name • Agent circuit ID • Locally assigned, namely, the local configuration
Port ID	Port ID
System capabilities enabled	Functions enabled on the system, which an be: • Bridge, indicating the switching function is enabled. • Router, indicating the routing function is enabled. • Repeater, indicating the forwarding function is enabled.

Viewing Port-Level LLDP Information

Click **Device** > **LLDP** > **Port Summary**. The Port-Level LLDP Information Page opens.

Figure 3-72 Port-Level LLDP Information Page



Select a port, and then the LLDP information of the port will be displayed in the Summary box. The displayed information includes LLDP status and statistics of the port and the status of the TLVs sent by the port.

Managing Switch Security

The Management Security section provides information for defining RADIUS authentication and port-based authentication.

This section includes the following topics:

- Defining Port-Based Authentication (802.1X)
- Defining Radius Client
- Configuring LDB
- Configuring Broadcast Storm Control

Defining Port-Based Authentication (802.1X)

Port-based authentication authenticates users on a per-port basis via an external server. Only authenticated and approved system users can transmit and receive data. Ports are authenticated via the RADIUS server using the Extensible Authentication Protocol (EAP). Port-based authentication includes:

- Authenticators: Specifies the switch port which is authenticated before permitting system access.
- Supplicants: Specifies the host connected to the authenticated port requesting to access the system services.
- Authentication Server: Specifies the server that performs the authentication on behalf of the authenticator, and indicates whether the supplicant is authorized to access system services.

Port-based authentication creates two access states:

- Controlled Access: Permits communication between the supplicant and the system, if the supplicant is authorized.
- Uncontrolled Access: Permits uncontrolled communication regardless of the port state.

This section includes the following topics:

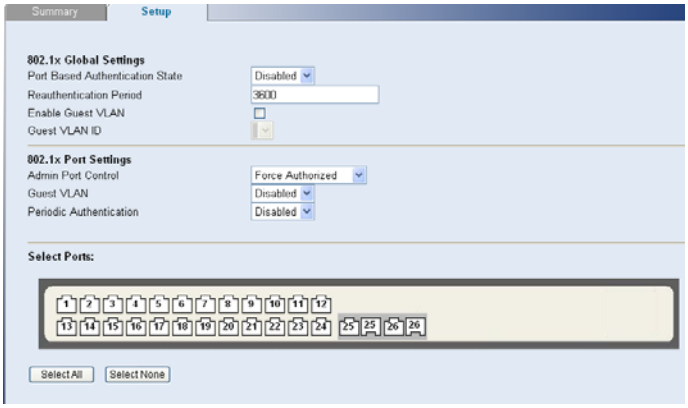
- Defining 802.1X Authentication
- Viewing 802.1X Authentication

Defining 802.1X Authentication

The 802.1X Setup Page contains information for configuring 802.1X global settings on the switch and defining specific 802.1X setting for each port individually.

Click **Security** > **802.1X** > **Setup**. The 802.1X Setup Page opens.

Figure 3-73 802.1X Setup Page



The 802.1X Setup Page contains the following fields:

Table 3-57 802.1X Setup Page item description

Item	Description
Port Based Authentication State	Specifies if Port Authentication is enabled on the switch. The possible field values are: • Enabled: Enables port-based authentication on the switch. • Disabled: Disables port-based authentication on the switch. This is the default value.
Reauthentication Period	Defines the time span (in seconds) in which the selected port is reauthenticated. The field default is 3600 seconds.
Enable Guest VLAN	Provides limited network access to authorized ports. If a port is denied network access via port-based authorization, but the Guest VLAN is enabled, the port receives limited network access. For example, a network administrator can use Guest VLANs to deny network access via port-based authentication, but grant Internet access to unauthorized users.
Guest VLAN ID	Specifies the guest VLAN ID.
Admin Port Control	Specifies the admin port authorization state. The possible field values are: • Auto: Enables port based authentication on the switch. The interface moves between an authorized or unauthorized state based on the authentication exchange between the switch and the client. • Force Authorized: Places the interface into an authorized state without being authenticated. The interface re-sends and receives normal traffic without client port based authentication. This is the default value. • Force Unauthorized: Denies the selected interface system access by moving the interface into unauthorized state. The switch cannot provide authentication services to the client through the interface.

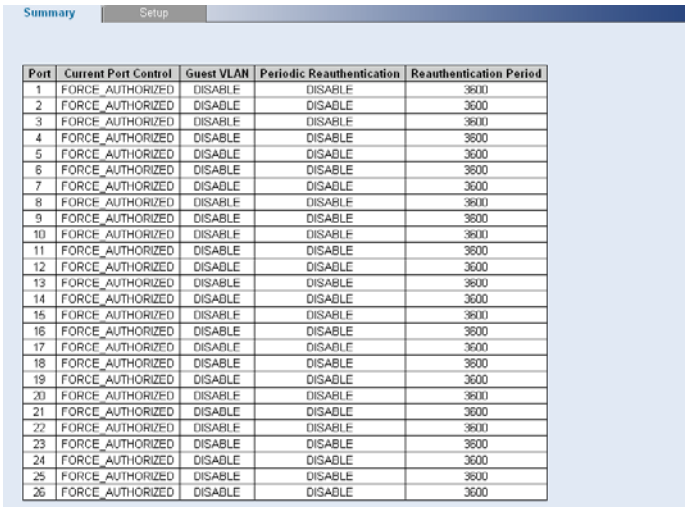
Item	Description
Guest VLAN	Specifies whether the Guest VLAN is enabled on the port. The possible field values are: • Enabled: Enables using a Guest VLAN for unauthorized ports. If a Guest VLAN is enabled, the unauthorized port automatically joins the VLAN selected from the Guest VLAN ID dropdown list. • Disabled: Disables Guest VLAN on the port. This is the default.
Periodic Reauthentication	Enables periodic reauthentication on the port. • Enabled: Enables the periodic reauthentication on the port. • Disabled: Disables the periodic reauthentication on the port. This is the default value.

Viewing 802.1X Authentication

The 802.1X Summary Page allows the network administrator to view port-based authentication settings.

Click **Security** > **802.1X** > **Summary**. The 802.1X Summary Page opens.

Figure 3-74 802.1X Summary Page



The 802.1X Summary Page contains the following fields:

Table 3-58 802.1X Summary Page item description

Item	Description
Current Port Control	Displays the current port authorization state.
Guest VLAN	Indicates whether an unauthorized port is allowed to join the Guest VLAN. The possible field values are: • Enable: Enables an unauthorized port to join the Guest VLAN. • Disable: Disables an unauthorized port to join the Guest VLAN.
Periodic Reauthentication	Indicates if periodic reauthentication is enabled on the port. The possible field values are: • Enable: Periodic reauthentication is enabled on the port. • Disable: Periodic reauthentication is disabled on the port. This is the default.

Item	Description
Reauthentication Period	Displays the time span (in seconds) in which the selected port is reauthenticated. The field default is 3600 seconds.

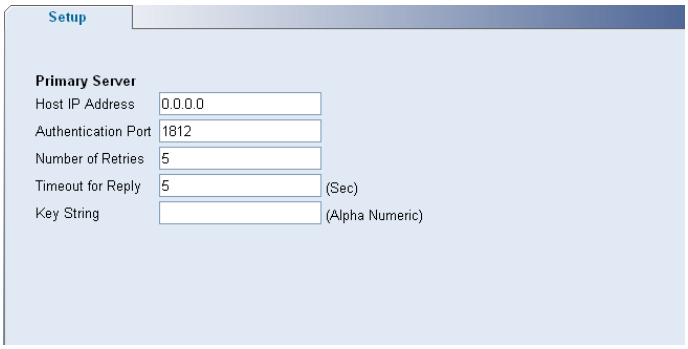
Defining Radius Client

Remote Authentication Dial-in User Service (Radius) is a logon authentication protocol that uses software running on a central server to control access to Radius-aware devices on the network. An authentication server contains a database of multiple user name/password pairs with associated privilege levels for each user or group that require management access to a switch.

The Radius Client Setup Page allows the administrator to configure the parameters for the switch acting as the RADIUS client.

Click **Security** > **RADIUS Client** > **Setup**. The Radius Client Setup Page opens.

Figure 3-75 Radius Client Setup Page



The Radius Client Setup Page contains the following fields:

Table 3-59 Radius Client Setup Page item description

Item	Description
Host IP Address	Defines the RADIUS Server IP address.
Authentication Port	Defines the authentication port. The authentication port is used to verify the RADIUS server authentication. The authentication port default is 1812.
Number of Retries	Defines the number of transmitted requests sent to the RADIUS server before a failure occurs. Possible field values are 1-20. The default value is 5.
Timeout for Reply	Defines the amount of time (in seconds) the switch waits for an answer from the RADIUS server before retrying the query, or switching to the next server. Possible field values are 1-20. The default value is 5.
Key String	Defines the default key string used for authenticating and encrypting all Radius-communication between the switch and the Radius server. This key must match the Radius encryption.

Configuring LDB

If your switch is not enabled with an advanced authentication method, like RADIUS, for authentication, you can use the local database (LDB) feature to perform local authentication (port-based authentication).After the switch is enabled with the LDB feature and related access rights are configured, a user trying to access an address through the switch will be authenticated. After successful authentication, the switch allows the user to use the corresponding port. Otherwise, the port is blocked.

Configuring LDB Parameters

On this page, you can enable or disable the LDB feature and configure the global LDB parameters.

Click **Security** > **LDB** > **Setup**. The LDB Setup Page opens.

Figure 3-76 Configure LDB parameters

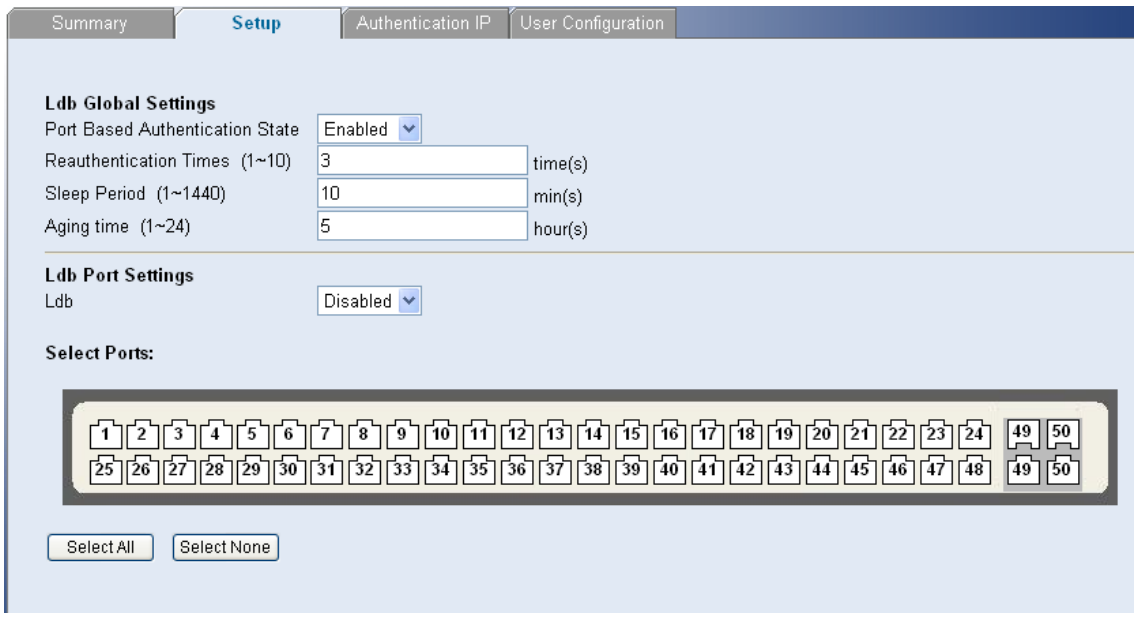


Table 3-60 LDB parameter description

Item	Description
Port Based Authentication State	Enable/disable port-based authentication globally. Disabled by default. *Note:* • *The enabled LDB feature is effective on a port only after this item is enabled.* • *After successful authentication, the port is in Normal state.*
Reauthentication Times	Set the maximum number of authentication attempts. 3 by default *Note:* *If the number of authentication attempts reaches the preset value but the authentication still fails, the port connected to the user enters the Sleep state for a period (sleep period).*

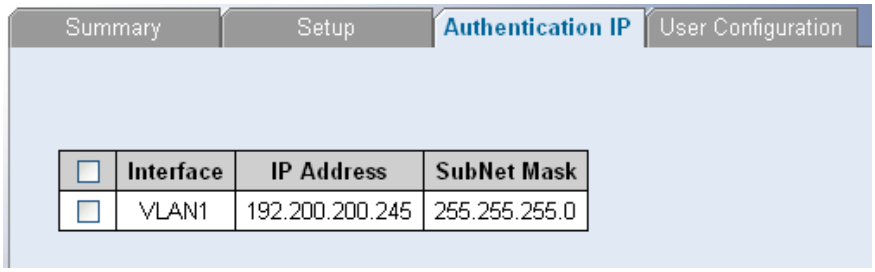
Item	Description
Sleep Period	Set the authentication sleep period. 5 minutes by default *Note:* *Within the authentication sleep period, no users on this port are allowed to try to pass authentication.*
Aging time	Set the aging time. 1 hour by default *Note:* *If there is no traffic of authenticated users through a port within the aging time, the port will be aged out and enters the Block state.*
Ldb	Enable/disable the LDB feature on a port. Disabled by default

Configuring an Authentication Server

On this page, you can configure different authentication servers for different VLANs.

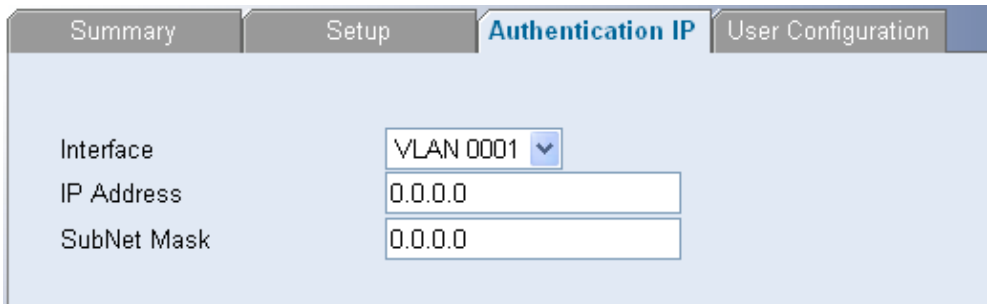
Select **Security** > **LDB** > **Authentication IP**. The Authentication Server Configuration Page Opens.

Figure 3-77 Authentication server configuration page



Click **Add**, select the VLAN interface, and specify the authentication server IP address and subnet mask to establish an association between a VLAN and an authentication server, as shown in 0.

Figure 3-78 Configure an authentication server

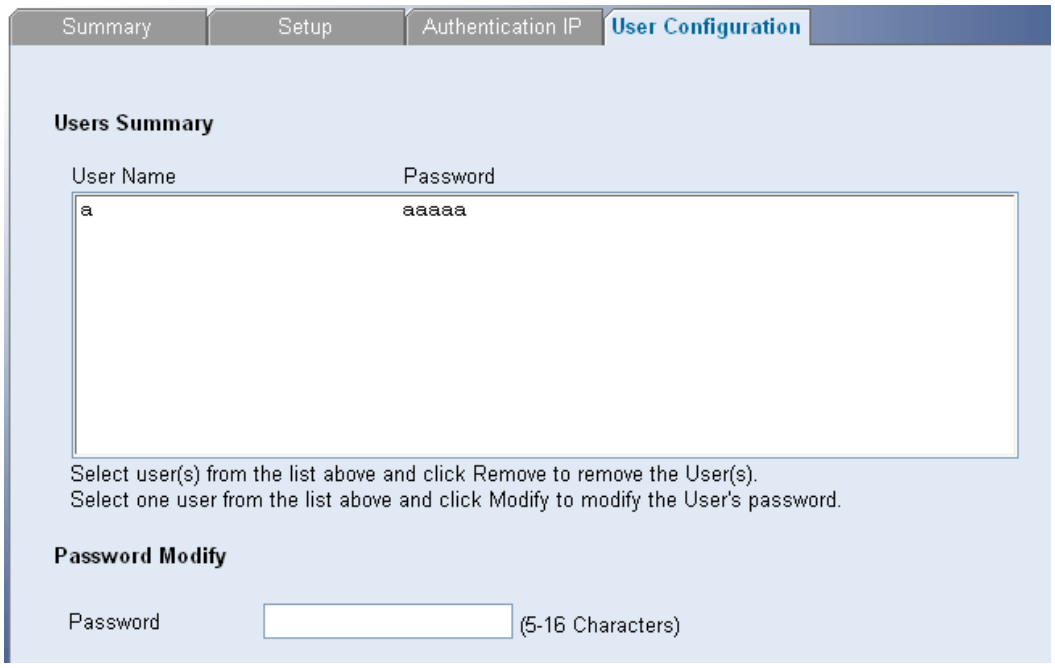


Configuring a User Account

On this page, you can configure user accounts for local authentication.

Select **Security** > **LDB** > **User Configuration**. The User Account Configuration Page Opens.

Figure 3-79 Configure a user account



- To add a user account, click **Add**.
- To modify the password of a user, select the user, enter a new password in the **Password** text box, and click **Modify**.

Displaying LDB

On this page, you can view the LDB mode, state and user passing authentication on each port.

Select **Security** > **LDB** > **Summary**. The LDB Related Information Page Opens.

Figure 3-80 Display LDB

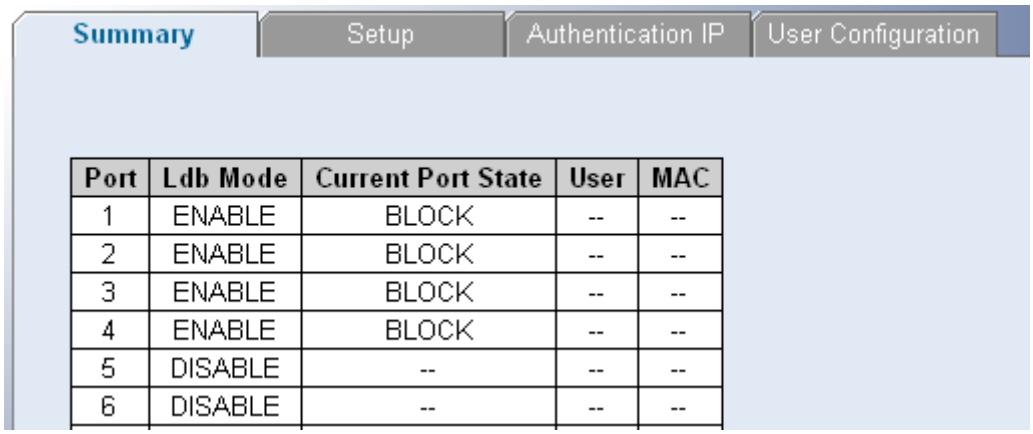


Table 3-61 LDB state parameter description

Item	Description
Ldb Mode	Displays whether the LDB feature is enabled on the port.

Item	Description
Current Port State	Displays the current state of the port. • NORMAL: The user on the port passed the authentication. • BLOCK: The port is in the initial state after the LDB feature is enabled or the port is aged out. • SLEEP: The number of the user's authentication attempts exceeded the preset maximum value.
User	Displays the user passing the authentication.
MAC	Displays the MAC address of the user passing the authentication.

Configuring Broadcast Storm Control

Broadcast Storm Control limits the amount of Multicast and Broadcast frames accepted and forwarded by the switch. When Layer 2 frames are forwarded, Broadcast and Multicast frames are flooded to all ports on the relevant VLAN. This occupies bandwidth, and loads all nodes on all ports.

A Broadcast Storm is a result of an excessive amount of broadcast messages simultaneously transmitted across a network by a single port. Forwarded message responses are heaped onto the network, straining network resources or causing the network to time out.

Broadcast Storm is enabled for all Gigabit ports by defining the packet type and the rate the packets are transmitted. The system measures the incoming Broadcast and Multicast frame rates separately on each port, and discards the frames when the rate exceeds a user-defined rate.

Packet threshold is ignored if Broadcast Storm Control is disabled.

This section contains the following topic:

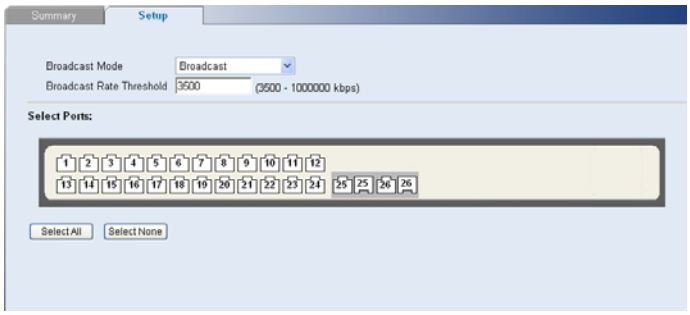
- Defining Broadcast Storm Control
- Viewing Broadcast Storm Control

Defining Broadcast Storm Control

The Broadcast Storm Setup Page allows network managers to define Broadcast Storm Traffic.

Click **Device** > **Broadcast Storm** > **Setup**. The Broadcast Storm Setup Page opens.

Figure 3-81 Broadcast Storm Setup Page



The Broadcast Storm Setup Page contains the following fields:

Table 3-62 Broadcast Storm Setup Page item description

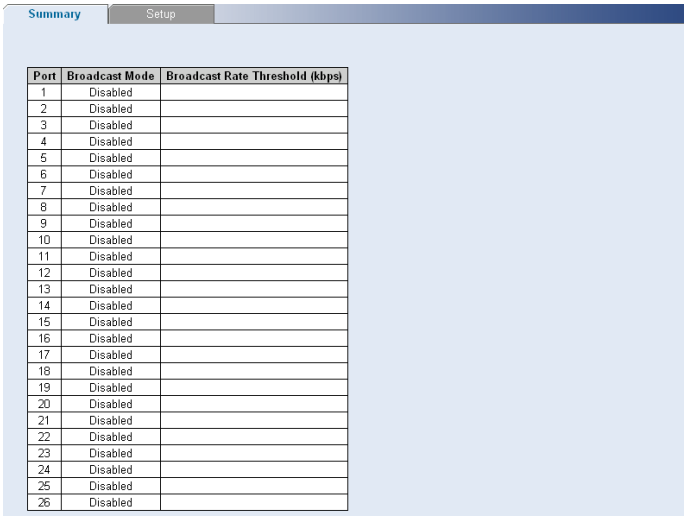
Item	Description
Broadcast Mode	Defines whether forwarding broadcast packet type is enabled on the interface. The possible field values are: • Disabled: Disables broadcast control on the selected port. This is the default. • Broadcast: Enables broadcast control on the selected port. • Broadcast&Multicast: Enables broadcast and multicast control on the selected port.
Broadcast Rate Threshold	Defines the maximum rate (kilobits per second) at which broadcast-only or broadcast and multicast packets are forwarded. The default value is 3500

Viewing Broadcast Storm Control

The Broadcast Storm Summary Page displays the current broadcast storm control parameters for all ports.

Click **Device** > **Broadcast Storm** > **Summary**. The Broadcast Storm Summary Page opens.

Figure 3-82 Broadcast Storm Summary Page



The Broadcast Storm Summary Page contains the following fields:

Table 3-63 Radius Client Setup Page item description

Item	Description
Broadcast Mode	Displays the broadcast storm control mode.
Broadcast Rate Threshold	Displays the broadcast storm threshold.

Managing System Information

This section contains information for configuring general system information, and includes the following:

- Viewing Basic Settings
- Configuring System Name

- Configuring System Time
- Save Configuration
- Resetting the Switch

Viewing Basic Settings

The Device Summary Page, which automatically loads after you log on to the Web interface, provides a snapshot of the switch's basic settings and versions of current components.

The Device Summary Section contains the following topics:

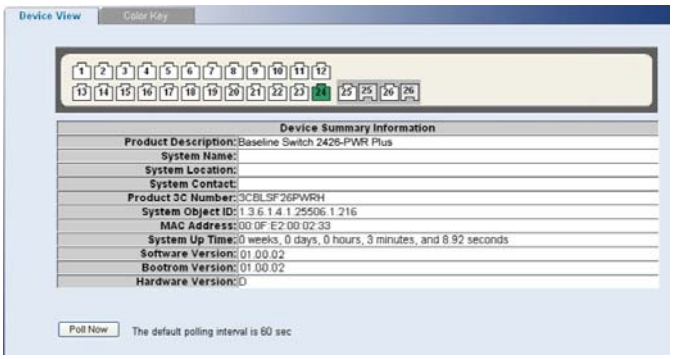
- Viewing Device Settings
- Viewing Color Keys

Viewing Device Settings

The Device View Page displays parameters for viewing general switch information, including the system name, location, and contact, the system MAC Address, System Object ID, and more.

Click **Device Summary** > **Device View**. The Device View Page opens.

Figure 3-83 Device View Page



The Device View Page contains the following fields:

Table 3-64 Device View Page item description

Item	Description
Product Description	Displays the switch model number and name.
System Name	Defines the user-defined switch name.
System Location	Defines the location where the system is currently running.
System Contact	Defines the name of the contact person.
Product 3C Number	Displays the 3Com switch 3C number
MAC Address	Displays the switch MAC address.
System Up Time	Displays the amount of time since the most recent switch reset. The system time is displayed in the following format: Weeks, Days, Hours, Minutes, and Seconds.
Software Version	Displays the installed software version number.
Bootrom Version	Displays the current bootrom version running on the switch.
Hardware Version	Displays the current hardware version of the switch.

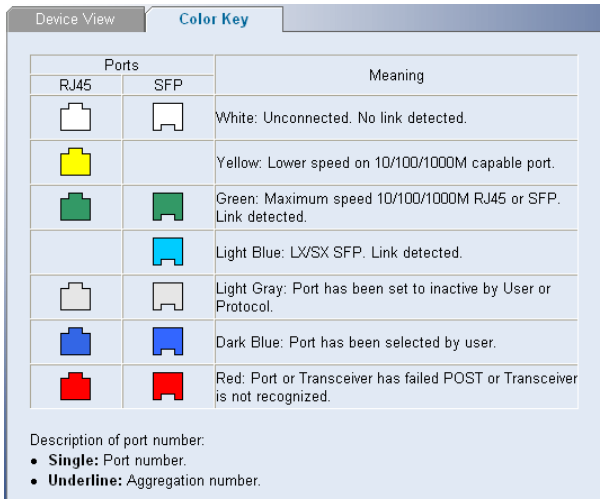
Item	Description
Poll Now	Enables polling the ports for port information including speed, utilization and port status.

Viewing Color Keys

The Color Key Page provides information regarding the RJ45 or SFP port status on the switch. The various colors key indicate the port status, speed and link of a selected port.

Click **Device Summary** > **Color Key**. The Color Key Page opens.

Figure 3-84 Color Key Page



The Color Key Page contains the following fields:

Table 3-65 Color Key Page item description

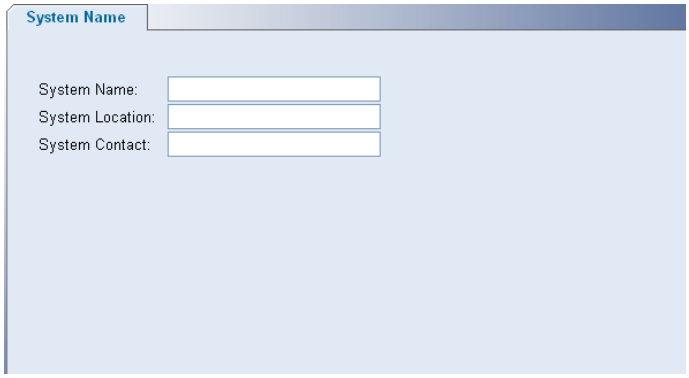
Item	Description
RJ45	Displays the port status of the Registered Jack 45 (RJ45) connections which are the physical interface used for terminating twisted pair type cable.
SFP	Displays the port status of the Small Form Factor (SFP) optical transmitter modules that combine transmitter and receiver functions.

Configuring System Name

The System Name Page allows the network administrator to provide a user-defined system name, location, and contact information for the switch.

Click **Administration** > **System Name**. The System Name Page opens.

Figure 3-85 System Name Page



The System Name Page includes the following fields:

Table 3-66 System Name Page item description

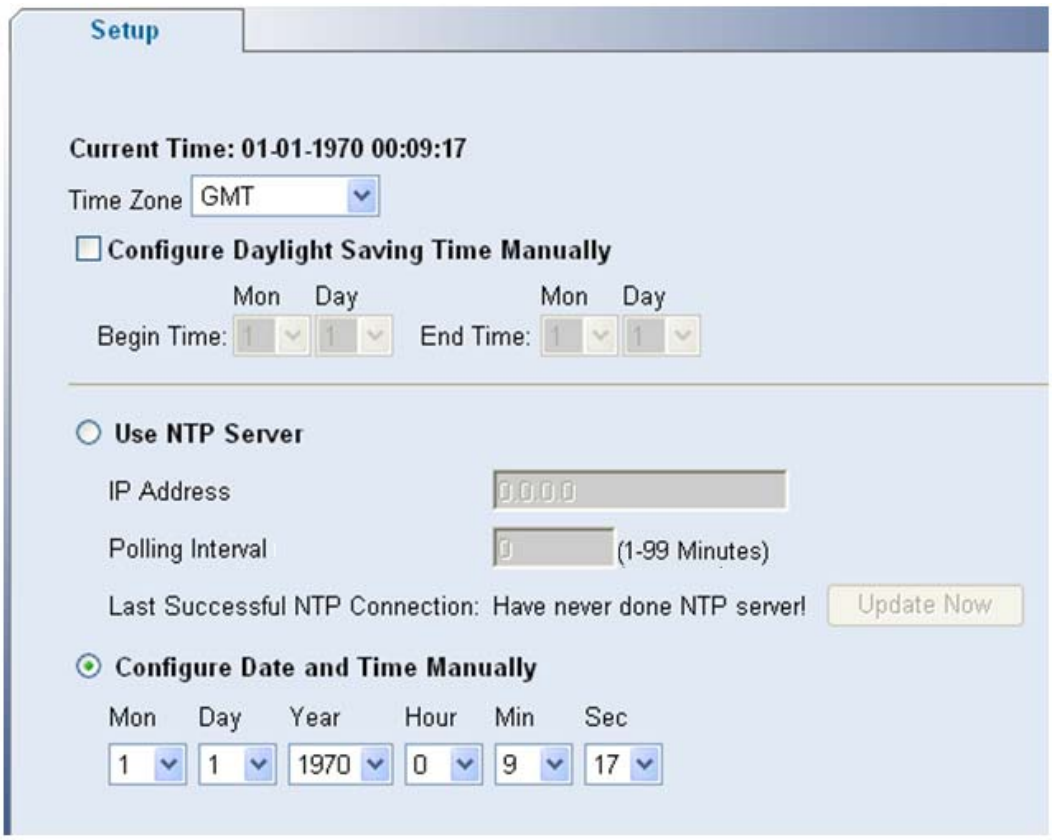
Item	Description
System Name	Defines the user-defined switch name. The field length is 0-30 characters
System Location	Defines the location where the system is currently running. The field length is 0-80 characters.
System Contact	Defines the name of the contact person. The field length is 0-80 characters.

Configuring System Time

The System Time Setup Page allows you to set the system time.. It also allows SNTP (Simple Network Time Protocol) to synchronize time across the network.

Click **Administration** > **System Time** > **Setup**. The System Time Setup Page opens.

Figure 3-86 System Time Setup Page



The System Time Setup Page contains the following fields:

Table 3-67 System Time Setup Page item description

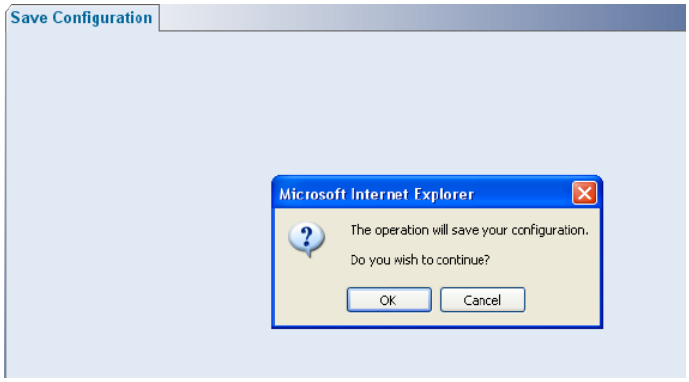
Item	Description
Current Time	Displays the current time in Mon-Day-Year Hour:Min:Sec.
Time zone	Local Time zone from GMT in which switch is operating.
Configure Daylight Saving Time Manually	When day light saving is enabled, one hour will be added to time zone offset value.
Use NTP Server	Radio option for user to set switch on using NTP/SNTP Time. • IP Address: IP Address of NTP/SNTP Server using which NTP/SNTP client synchronizes time. For example, 148.234.7.30 is a public NTP server IP address. • Polling Interval: Time Interval at which NTP/SNTP client polls for time. • Last successful SNTP connection: Display the time that get the system time successful from the NTP/SNTP server. • Update Now: Force switch to synchronize NTP/SNTP Time right away.
Configure Date and Time Manually	Radio option for user to set switch on using manual configuring time.

Save Configuration

Configuration changes are only saved to the switch once the user saves the changes to the flash memory. The Save Configuration tab allows the latest configuration to be saved to the flash memory.

Click **Save Configuration**. The Save Configuration Page opens.

Figure 3-87 Save Configuration Page



Click OK. The configuration is saved.

Resetting the Switch

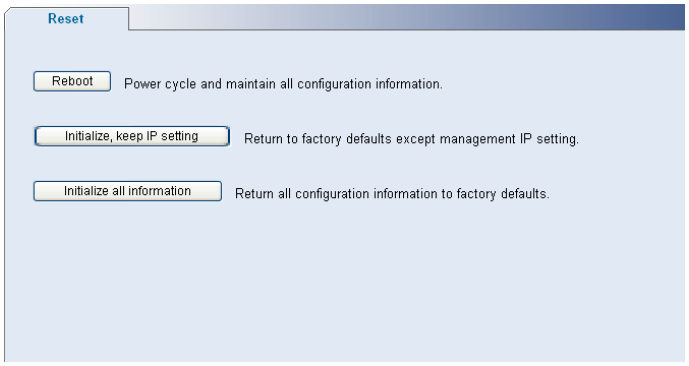
The Reset Page restores the switch factory defaults.

Caution

To prevent the current configuration from being lost, use the Save Configuration Page to save all user-defined changes to the flash memory before resetting the switch.

Click **Administration** > **Reset**. The Reset Page opens.

Figure 3-88 Reset Page



Managing System Files

The configuration file structure consists of the following configuration files:

- Startup Configuration File: Contains the commands required to reconfigure the switch to the same settings as when the switch is powered down or rebooted. The Startup file is created by copying the configuration commands from the running configuration file or by downloading the configuration file from via TFTP or HTTP.

- Running Configuration File: Contains all configuration file commands, as well as all commands entered during the current session. After the switch is powered down or rebooted, all commands stored in the Running Configuration file are lost.
- Image files: Software upgrades are used when a new version file is downloaded. The file is checked for the right format, and that it is complete. After a successful download, the new version is marked, and is used after the switch is reset.

Backup and restore of the configuration files are always done from and to the Startup Configuration file.

This section contains the following topics:

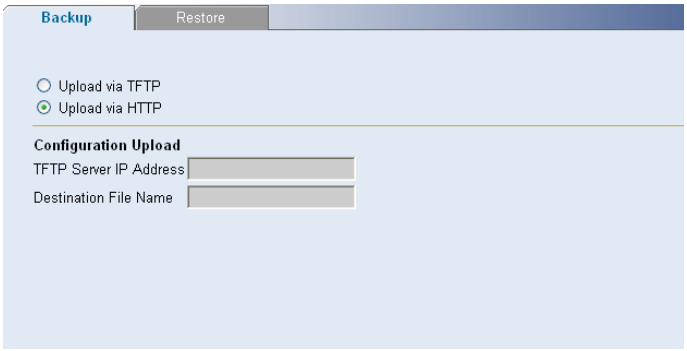
- Backing up System Files
- Restoring Files
- Restoring the Software Image
- Activating Image Files

Backing up System Files

The Backup Page permits the network administrator to backup the system configuration to a TFTP or HTTP server.

Click **Administration** > **Backup & Restore** > **Backup**. The Backup Page opens.

Figure 3-89 Backup Page



The Backup Page contains the following fields:

Table 3-68 Backup Page item description

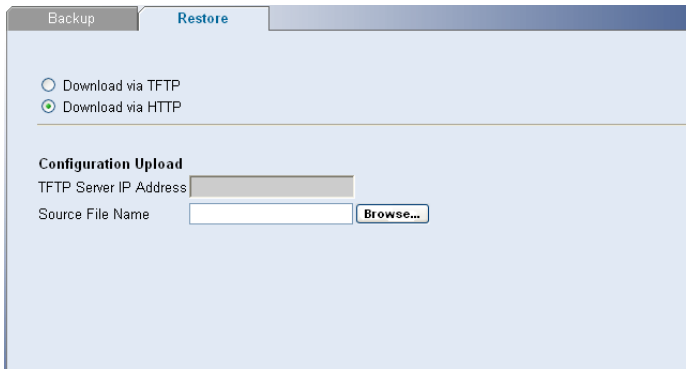
Item	Description
Upload via TFTP	Enables to upload files via TFTP.
Upload via HTTP	Enables to upload files via HTTP.
TFTP Server IP Address	Specifies the TFTP Server IP Address to which the configuration files are uploaded.
Destination File Name	Specifies file name for the uploaded configuration file.

Restoring Files

The Restore Page restores configuration settings that you previously saved to the TFTP or HTTP server.

Click **Administration** > **Backup & Restore** > **Restore**. The Restore Files Page opens.

Figure 3-90 Restore Files Page



The Restore Files Page contains the following fields:

Table 3-69 Restore Files Page item description

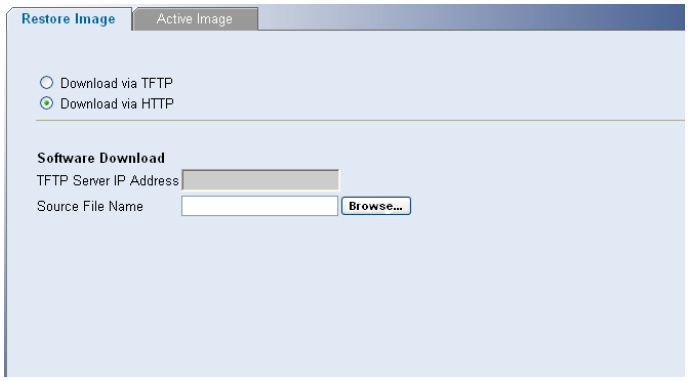
Item	Description
Download via TFTP	Enables to download files via TFTP.
Download via HTTP	Enables to download files via HTTP.
TFTP Server IP Address	Specifies the TFTP Server IP Address from which the configuration files are downloaded.
Source File Name	Specifies the file name for the downloaded configuration file Click **Browse** to locate the backup file on your computer to restore the configuration settings.

Restoring the Software Image

The Restore Image Page permits the network administrator to update the switch software.

Click **Administration** > **Firmware Upgrade** > **Restore Image**. The Restore Image Page opens.

Figure 3-91 Restore Image Page



The Restore Image Page contains the following fields:

Table 3-70 Restore Image Page item description

Item	Description
Download via TFTP	Enables to download files via TFTP.
Download via HTTP	Enables to download files via HTTP.

Item	Description
TFTP Server IP Address	Specifies the TFTP Server IP Address from which the image files are downloaded.
Source File Name	Specifies file name for the downloaded image file. Click **Browse** to locate the image file on your computer.

Activating Image Files

The Active Image Page allows network managers to select and reset the Image files.

Click **Administration** > **Firmware Upgrade** > **Active Image**. The Active Image Page opens.

Figure 3-92 Active Image Page

The Active Image Page contains the following fields:

Table 3-71 Active Image Page item description

Item	Description
Active Image After Reset	Selects the image file to be active on the unit after the switch is reset. The possible field values are: • Current Image: Activates the current image after the switch is reset. • Backup Image: Activates backup image after the switch is reset.

Managing System Logs

This section provides information for managing system logs. The system logs enable viewing switch events in real time, and recording the events for later usage. System Logs record and manage events and report errors and informational messages. Event messages have a unique format, as per the system Log protocols recommended message format for all error reporting. For example, system Log and local device reporting messages are assigned a severity code, and include a message mnemonic, which identifies the source application generating the message. It allows messages to be filtered based on their urgency or relevancy. Each message severity determines the set of event logging devices that are sent per each event message.

The following table lists the log severity levels:

Table 3-72 System Log Severity Levels

Severity	Level	Message
Emergency	Highest (0)	The system is not functioning.
Alert	1	The system needs immediate attention.
Critical	2	The system is in a critical state.
Error	3	A system error has occurred.
Warning	4	A system warning has occurred.
Notice	5	The system is functioning properly, but a system notice has occurred.
Informational	6	Provides device information.
Debug	7	Provides detailed information about the log. If a Debug error occurs, contact Customer Tech Support.

This section includes the following topics:

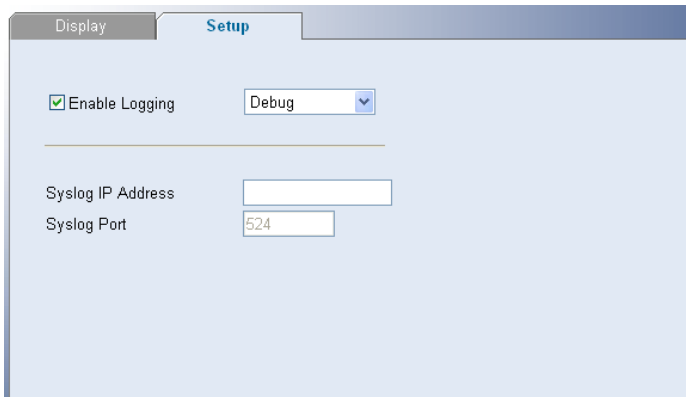
- Configuring Logging
- Viewing Logs

Configuring Logging

The Logging Setup Page contains fields for defining which events are recorded to which logs. It contains fields for enabling logs globally, and parameters for defining logs. Log messages are listed from the highest severity to the lowest severity level.

Click **Administration** > **Logging** > **Setup**. The Logging Setup Page opens.

Figure 3-93 Logging Setup Page



The Logging Setup Page contains the following fields:

Table 3-73 Logging Setup Page item description

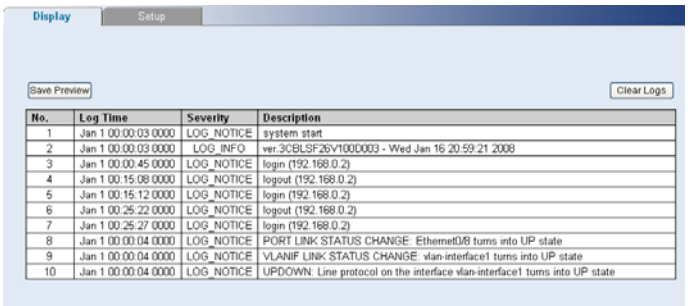
Item	Description
Enable Logging	Specifies if device local logs for Cache and servers are enabled. Console logs are enabled by default. Severity level: Specifies the minimum severity level for which a message will be logged. When a severity level is selected, all severity level choices above the selection are selected automatically. The possible field values are: • Emergency: The highest warning level. If the device is down or not functioning properly, an emergency log message is saved to the specified logging location. • Alert: The second highest warning level. An alert log is saved, if there is a serious device malfunction; for example, all device features are down. • Critical: The third highest warning level. A critical log is saved if a critical device malfunction occurs; for example, two device ports are not functioning, while the rest of the device ports remain functional. • Error: A device error has occurred, for example, if a single port is offline. • Warning: The lowest level of a device warning. The device is functioning, but an operational problem has occurred. • Notice: Provides device information. • Info: Provides device information. • Debug: Provides debugging messages.
Syslog IP Address	Defines the IP Address to upload system Log messages
Syslog Port	Defines the UDP Port through which system Log messages are uploaded. The field default is 524, and not be modified.

Viewing Logs

The Logging Display Page contains all system logs in a chronological order that are saved in RAM (Cache).

Click **Administration** > **Logging** > **Display**. The Logging Display Page opens.

Figure 3-94 Logging Display Page



The Logging Display Page contains the following fields and buttons:

Table 3-74 Logging Display Page item description

Item	Description
Save Preview	Saves the displayed Log table to a Web (html) page.
Clear Logs	Clears all logs
Log Time	Displays the time at which the log was generated.
Severity	Displays the log severity.
Description	Displays the log message text.

Managing Switch Diagnostics

This section contains information for viewing and configuring port and cable diagnostics, and includes the following topics:

- Configuring Port Mirroring
- Configuring Cable Diagnostics

Configuring Port Mirroring

Port mirroring monitors and mirrors network traffic by forwarding copies of incoming and outgoing packets from one port to a monitoring port. Port mirroring can be used as a diagnostic tool as well as a debugging feature. Port mirroring also enables switch performance monitoring.

Network administrators can configure port mirroring by selecting a specific port from which to copy all packets, and other ports to which the packets copied.

This section contains the following topics:

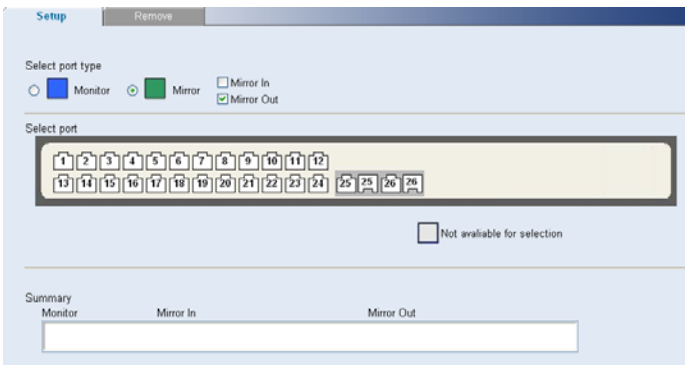
- Defining Port Mirroring
- Removing Port Mirroring

Defining Port Mirroring

The Port Mirroring Setup Page contains parameters for configuring port mirroring.

Click **Monitoring** > **Port Mirroring** > **Setup**. The Port Mirroring Setup Page opens.

Figure 3-95 Port Mirroring Setup Page



The Port Mirroring Setup Page contains the following fields:

Table 3-75 Port Mirroring Setup Page item description

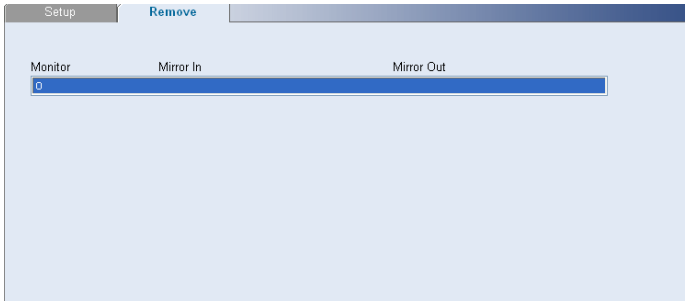
Item	Description
Select port type	Defines the monitor port (destination port) or mirror port (source port). The possible values are: • Monitor: Defines the port as the monitor port. • Mirror: Defines the port as the mirrored port to be monitored and indicates the traffic direction to be monitored. If selected, the possible values are: Mirror In (Enables port mirroring on the port RX), Mirror Out (Enables port mirroring on the port TX).

Removing Port Mirroring

The Port Mirroring Remove Page permits the network manager to terminate port mirroring or monitoring.

Click **Monitoring** > **Port Mirroring** > **Remove**. The Port Mirroring Remove Page opens.

Figure 3-96 Port Mirroring Remove Page



Configuring Cable Diagnostics

The switch provides cable diagnostic, which helps you detect and resolve issues with the attached cables.

This section contains the following topics:

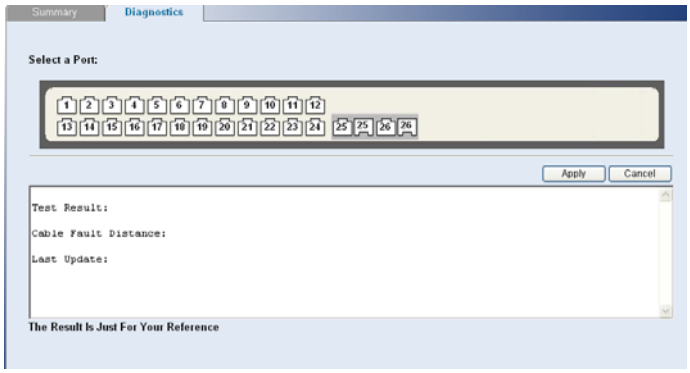
- Configuring Cable Diagnostics
- Viewing Cable Diagnostics

Configuring Cable Diagnostics

The Cable Diagnostics Page permits the network manager to perform tests for individual port.

Click **Monitoring** > **Cable Diagnostics** > **Diagnostics**. The Diagnostics Page opens.

Figure 3-97 Cable Diagnostic Page



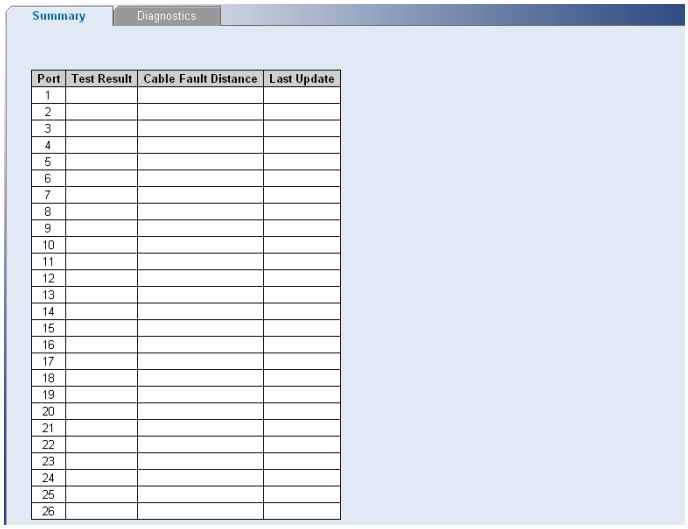
2) Select a port to be tested.
3) Click **Apply**. The test results of the port are displayed in the textbox.

Viewing Cable Diagnostics

The Cable Diagnostics Summary Page displays information on Test Result, Cable Fault Distance, or Last Update for every port on the switch.

Click **Monitoring** > **Cable Diagnostics** > **Summary**. The Cable Diagnostics Summary Page opens.

Figure 3-98 Cable Diagnostic Summary Page



The Cable Diagnostics Summary Page contains the following fields:

Table 3-76 Cable Diagnostics Summary Page item description

Item	Description
Test Result	Displays the cable test results.
Cable Fault Distance	Indicates the distance in meters from the port where the cable error occurred.
Last Update	Indicates the last time the port was tested.

4 Troubleshooting

This chapter lists some issues that you may encounter while installing, using, and managing the switch, with suggested courses of corrective action to take.

If you encounter an issue that is not listed here and you cannot solve it, check the 3Com Knowledgebase at http://knowledgebase.3com.com.before contacting your local technical support representative.

Resetting to Factory Defaults

If the switch does not operate normally or if the firmware becomes corrupted, you can reset the switch to factory defaults.

Caution

- Resetting the switch to factory defaults erases all your settings. You will need to reconfigure the switch after you reset it.
- The switch will perform automatic IP configuration after you reset it. See Configuring IP Address for more information.

To reset the switch to its factory defaults by the following ways:

- Web interface

Accessing the Web interface, and then pressing the "**RESET**" on the Initialize tab of the **Administration** menu. After you click "**Initialize all information**", a confirmation message appears, Click OK to confirm.

- CLI

Using the **restore** command through the Console Port (See CLI Reference Guide).

Forgotten Password

If you forget the password to the Web interface after you set it, you can regain access by the following ways:.

Reset the switch

See Resetting to Factory Defaults for instructions.

After resetting the switch, log on to the Web interface using the default admin account settings:

- User name: admin
- Password: blank (no password)

Configure a new user

You can use **localuser** command to configure a new user through the Console Port (see CLI Reference Guide).

Forgotten Static IP Address

If you forget the static IP address that you assigned to the switch, you can use **display ip** command through the Console Port (see CLI Reference Guide).

Solving LED Issues

This section lists some issues that are related to the LEDs on the front panel of the switch.

- Gigabit Combo Ports (RJ-45/SFP)
- Link/Activity Status LEDs
- Power LED

A link is connected, but the Link/Activity LED for the port is off

There is a problem with this connection. Verify that:

- The switch being connected to is powered on and operating correctly.
- The cable is connected at both ends.
- The cable is not damaged.
- If the connection is to a workstation, that the workstation's network interface is installed and configured correctly.
- The correct category of cable is being used for the required link speed. Category 3 cables can be used for 10BASE-T operation only. Category 5 cable is required for 100BASE-TX or 1000BASE-T. 3Com recommends Category 5e or 6 cables for 1000BASE-T operation.

A fiber cable is connected, but the Module Active LED is off

Verify that:

- The fiber cable is in good condition.
- The SFP module is correctly inserted.
- A 3Com SFP module is being used.
- The equipment at the far end is installed and correctly configured.

The Link/Activity LED is on, but network performance is poor

The switch supports full-duplex auto-negotiation. If the connected device does not support auto-negotiation, ensure that it is configured for half-duplex operation only. If the connected device has auto-negotiation disabled or overridden, and is configured as full-duplex, the switch will configure the link as half-duplex, causing a mismatch that will reduce network performance when data is transmitting and receiving simultaneously on the same link.

Ensure that the connected device has either:

- Auto-negotiation enabled, or
- The ports are configured for half-duplex operation

All ports appear to show continual activity.

There may be broadcast storms on the network. Remove port connections one at a time, waiting a few seconds between each port. If the LEDs go off after removing a port connection, the device that was connected to that port is introducing an excessive amount of broadcast frames to the network. Some pieces of network equipment operate by sending out broadcast frames regularly.

Refer to the documentation that accompanies the switch for information on disabling the broadcast operation.

If the problem persists and the unit still does not operate successfully, contact your 3Com network supplier with the following information before returning the unit:

- Product number and serial number (printed on a label supplied with the unit).
- A brief description of the issue.

5 CLI Reference Guide

This chapter describes using the Command Line Interface (CLI) to manage the switch. The switch is managed through the CLI from a direct connection to the switch console port.

Getting Started with the Command Line Interface

Using the CLI, network managers enter configuration commands and parameters to configure the switch.

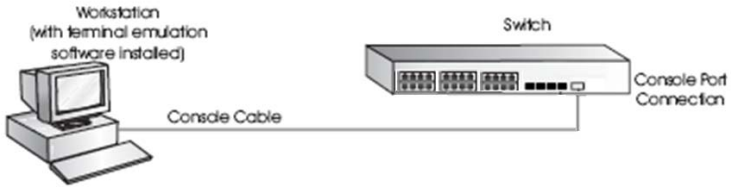
Prerequisites

- A workstation with terminal emulation software installed, such as Microsoft HyperTerminal. This software allows you to communicate with the switch using the console port directly.
- Documentation supplied with the terminal emulation software.
- The console cable (RJ-45) supplied with your switch.

Logging on to the CLI

1) Connect the workstation to the console port using the console cable as shown in Figure 5-1.

Figure 5-1 Connecting a Workstation to the switch using the Console Port



2) Open your terminal emulation software and configure the COM port settings to which you have connected the cable. The settings must be set to match the default settings for the switch, which are:

- 38,400 baud (bits per second)
- 8 data bits
- no parity
- 1 stop bit
- no hardware flow control

3) Turn on the switch. The user will be prompted to press the Enter key if the switch successfully completes POST (power-on self test). The prompt (such as < Command-Line >) appears after the user presses the Enter key.

CLI Features

Online Help

CLI provides two types of online help: complete online help and partial online help. They assist you with your configuration.

Complete online help

Enter a "?" character in any view on your terminal to display all the commands available in the view and their brief descriptions. The following takes user view as an example.

```
<Command-Line> ?
  display    Display current system information
  ip         IP configuration commands in an interface
  localuser  Configure WEB user manager
  ping       Ping function
  quit       Exit from current command view
  reboot     Reset device
  restore    Restore configuration
  save       Save current configuration
  undo       Cancel current setting
```

Enter a command, a space, and a "?" character (instead of a keyword available in this position of the command) on your terminal to display all the available keywords and their brief descriptions. The following takes the **display** command as an example.

```
<Command-Line> display ?
  ip                    IP status and configuration information
  version               System hardware and software version information
```

Enter a command, a space, and a "?" character (instead of an argument available in this position of the command) on your terminal to display all the available arguments and their brief descriptions. The following takes the **ip address** command as an example.

```
 [Command-Line] ip address dhcp-alloc ?
  <cr>
```

The string <cr> means no argument is available in the position occupied by the "?" character. You can execute the command without providing any other information.

Partial online help

Enter a string followed directly by a "?" character on your terminal to display all the commands beginning with the string. For example:

```
<Command-Line> p?
   ping
```

Enter a command, a space, and a string followed by a "?" character on your terminal to display all the keywords that belong to the command and begin with the string (if available). For example:

```
<Command-Line> display v?
   version
```

Enter the first several characters of a keyword in a command and then press <Tab>, the complete keyword will be displayed on the terminal screen if the input characters uniquely identify a keyword; all

the keywords that match the input characters will be displayed on the terminal screen if the input characters match more than one keyword.

Command History

CLI can store the latest executed commands as history commands so that users can recall and execute them again. By default, CLI can store 10 history commands for each user. Table 5-1 lists history command-related operations.

Table 5-1 Access history commands

Operation	Operation	Description
Access the previous history command	Press the up-arrow key or <Ctrl+P>	This operation recalls the previous history command (if available).
Access the next history command	Pressing the down-arrow key or <Ctrl+N>	This operation recalls the next history command (if available).

Note

- You may use arrow keys to access history commands in Windows 2000/XP/2003 Terminal or Telnet. However, the up-arrow and down-arrow keys are invalid in Windows 9X HyperTerminal, because they are defined in a different way. You can use <Ctrl+P> and <Ctrl+N> instead.
- When you enter the same command several times, only one command is saved by the CLI as a history command.

Error Messages

If the command you enter passes the syntax check, it will be successfully executed; otherwise an error message will appear. Table 5-2 lists the common error messages.

Table 5-2 Common error messages

Error message	Description
Unrecognized command	The command does not exist.
	The keyword does not exist.
	The parameter type is wrong.
	The parameter value is out of range.
Incomplete command	The command entered is incomplete.
Too many parameters	You have entered too many parameters.
Ambiguous command	The parameters entered are ambiguous.
Wrong parameter	A parameter entered is incorrect.

Error message	Description
found at '^' position.	An error is found at '^' position.

Command Edit

The CLI provides basic command edit functions and supports multi-line editing. The maximum number of characters a command can contain is 254. Table 5-3 lists the CLI edit operations.

Table 5-3 Edit operations

Press…	To…
A common key	If the command does not reach 254 characters, insert the character at the current cursor position and move the cursor one character to the right.
The Backspace key	Delete the character on the left of the cursor and move the cursor one character to the left.
The left arrow key or <Ctrl+B>	Move the cursor one character to the left.
The right arrow key or <Ctrl+F>	Move the cursor one character to the right.
The up arrow key or <Ctrl+P> The down arrow key or <Ctrl+N>	Access history commands.
The Tab key	Utilize the partial online help. That is, when you enter an incomplete keyword and the Tab key, if the entered keyword uniquely identifies an existing keyword, the system completes the keyword and displays the command on the next line; if the input keyword matches more than one keyword, the keywords are displayed in a new line in turn each time you press Tab key; if the input keyword matches no keyword, the system displays your original input on a new line without any change.

CLI Configuration

display ip

Syntax

display ip

View

User view

Parameter

None

Description

Use the **display ip** command to display the IP address information about the switch.

Example

Display the IP address information about the switch.

```
<Command-Line> display ip
Vlan-interface1 current state: UP
Line protocol current state : UP
Hardware address is 0800-1234-5656
Internet address is 192.168.0.234/24
```

display management-vlan

Syntax

display management-vlan

View

User view

Parameter

None

Description

Use the **display management-vlan** command to display the information of the management VLAN, including management VLAN ID, management VLAN IP address, and member ports in the management VLAN.

Example

Display the information of the management VLAN.

```
<Command-Line> display management-vlan
VLAN ID: 1
IP Address: 192.168.0.241
Subnet Mask: 255.255.255.0
Tagged Ports: none
Untagged Ports:
        Ethernet0/1     Ethernet0/2     Ethernet0/3
        Ethernet0/4     Ethernet0/5     Ethernet0/6
        Ethernet0/7     Ethernet0/8     Ethernet0/9
        Ethernet0/10    Ethernet0/11    Ethernet0/12
        Ethernet0/13    Ethernet0/14    Ethernet0/15
        Ethernet0/16    Ethernet0/17    Ethernet0/18
        Ethernet0/19    Ethernet0/20    Ethernet0/21
        Ethernet0/22    Ethernet0/23    Ethernet0/24
        Ethernet0/25    Ethernet0/26
```

display version

Syntax

display version

View

User view

Parameter

None

Description

Use the **display version** command to display the system information (such as the version information) about the switch.

Example

Display the system information about the switch.

```
<Command-Line> display version
```

ip address

Syntax

ip address *ip-address net-mask*

undo ip address

View

User view

Parameter

ip-address: IP address to be assigned to the switch.

net-mask: Mask of the IP address to be assigned to the management VLAN interface. The mask length is expressed as dotted decimal notation or integer in the range of 0 to 32.

Description

Use the **ip address** command to assign an static IP address (and mask) to the switch.

Use the **undo ip address** command to remove the static IP address.

Example

Assign a static IP address (and the mask) to the switch.

```
<Command-Line> ip address 192.168.0.234 255.255.255.0
```

ip address dhcp-alloc

Syntax

ip address dhcp-alloc

undo ip address dhcp-alloc

View

User view

Parameter

None

Description

Use the **ip address dhcp-alloc** command to configure the switch to obtain an IP address through DHCP.

Use the **undo ip address dhcp-alloc** command to cancel the configuration.

Example

Configure the switch to obtain an IP address through DHCP.

```
<Command-Line> ip address dhcp-alloc
```

ip gateway

Syntax

ip gateway *gateway-address*

undo ip gateway

View

User view

Parameter

gateway-address: gateway address to be assigned to the switch.

Description

Use the **ip gateway** command to assign an gateway address to the switch.

Use the **undo ip gateway** command to remove the gateway address.

Example

Assign an IP gateway to the switch.

```
<Command-Line> ip gateway 192.168.0.1
```

localuser

Syntax

localuser *name password level*

undo localuser *name*

View

User view

Parameter

name: Web user name, which ranges from 1 to 8.

password: Web user password, which ranges from 1 to 8.

level: Web user level, which ranges from 0 to 1.0 is guest, 1 is admin.

Description

Use the **localuser** command to configure a Web user for the switch.

Use the **undo localuser** command to remove the Web user.

Example

Configure a Web admin user for the switch.

```
<Command-Line> localuser test test 1
```

management-vlan

Syntax

management-vlan *vlan-id*

undo management-vlan

View

User view

Parameter

vlan-id: VLAN ID, in the range of 1 to 4094.

Description

Use the **management-vlan** command to configure a VLAN as the management VLAN of the switch.
Use the **undo management vlan** command to restore the default management VLAN.

By default, VLAN 1 operates as the management VLAN of the switch.

Example

Configure VLAN 10 as the management VLAN of the switch, and view the configuration result.

```
<Command-Line> management-vlan 10
<Command-Line> display management-vlan
VLAN ID: 2
IP Address: 192.168.0.241
Subnet Mask: 255.255.255.0
Tagged Ports: none
Untagged Ports: none
```

management-vlan port

Syntax

management-vlan port ethernet *interface-number* [*to* **ethernet** *interface-number*]

View

User view

Parameter

interface-number: Ethernet port number

Description

Use the **management-vlan port** command to add Ethernet ports of the switch to the management VLAN.

By default, all Ethernet ports of a switch belong to management VLAN 1.

Example

Configure VLAN 10 as the management VLAN, and add Ethernet 0/1 through Ethernet 0/5 of the switch to the management VLAN.

```
<Command-Line> management-vlan 10
<Command-Line> management-vlan port ethernet0/1 to ethernet0/10
<Command-Line> display management-vlan
VLAN ID: 10
IP Address: 192.168.0.241
Subnet Mask: 255.255.255.0
Tagged Ports: none
Untagged Ports:
        Ethernet0/1     Ethernet0/2     Ethernet0/3
        Ethernet0/4     Ethernet0/5     Ethernet0/6
        Ethernet0/7     Ethernet0/8     Ethernet0/9
        Ethernet0/10
```

ping

Syntax

ping [**-s** *packetsize*] [**-c** *count*] *ip-address*

View

User view

Parameter

ip-address: Sets the source IP address to send the ICMP ECHO-REQUEST packets.

-s *packetize*: Specifies the size (in bytes) of each ICMP ECHO-REQUEST packet (excluding the IP and ICMP headers), which ranges from 20 to 1,472 and defaults to 56 bytes.

-c *count*: Specifies how many times the ICMP ECHO-REQUEST packet will be sent. The *count* argument is the times, which ranges from 1 to 4,294,967,295 and defaults to 5.

Description

Use the **ping** command to check the IP network connectivity and the reachability of a host.

Example

Check the reachability of the host with IP address 192.168.0.100.

```
<Command-Line> ping 192.168.0.100
  PING 192.168.0.100: 56  data bytes, press CTRL_C to break
    Reply from 192.168.0.100 : bytes=56 sequence=1 ttl=255 time = 1ms
    Reply from 192.168.0.100 : bytes=56 sequence=2 ttl=255 time = 2ms
    Reply from 192.168.0.100 : bytes=56 sequence=3 ttl=255 time = 1ms
    Reply from 192.168.0.100 : bytes=56 sequence=4 ttl=255 time = 3ms
    Reply from 192.168.0.100 : bytes=56 sequence=5 ttl=255 time = 2ms

--- 192.168.0.100 ping statistics ---
5 packet transmitted
5 packet received
0% packet loss
round-trip min/avg/max = 1/2/3 ms
```

quit

Syntax

quit

View

User view

Parameter

None

Description

Use the **quit** command to exit the system.

Example

Exit the system.

```
<Command-Line> quit

User interface Aux0/0 is available

Please press ENTER.
```

reboot

Syntax

reboot

View

User view

Parameter

None

Description

Use the **reboot** command to restart the switch.

Example

Restart the switch.

```
<Command-Line> reboot
This will reboot device. Continue? [Y/N]
```

restore

Syntax

restore default

View

User view

Parameter

None

Description

Use the **restore** command to reset the switch to factory defaults.

Example

Reset the switch to factory defaults.

```
<Command-Line> restore default
This will restore the default configuration in the FLASH memory
Are you sure?[Y/N]
```

save

Syntax

save

View

User view

Parameter

None

Description

Use the **save** command to save current configuration of the switch.

Example

Save current configuration of the switch.

```
<Command-Line> save
This will save the configuration in the FLASH memory
Are you sure?[Y/N]y
Now saving current configuration to FLASH memory
Please wait for a while...
Current configuration saved to FLASH memory successfully
```

tftp update

Syntax

tftp update *ip-address filename*

View

User view

Parameter

ip-address: IP address of the TFTP server

filename: Name of the upgrade file

Description

Use the **tftp update** command to upgrade the switch software. After successful upgrade, the switch restarts automatically.

Before executing this command, configure the TFTP server well, and specify the corresponding upgrade file.

Example

Upgrade the switch software through TFTP.

```
<Command-Line> tftp update 192.168.0.100 test.bin
Are you sure to download file to flash?[Y/N]:y
```

6 Obtaining Support for Your Product

Register Your Product

Warranty and other service benefits start from the date of purchase, so it is important to register your product quickly to ensure you get full use of the warranty and other service benefits available to you.

Warranty and other service benefits are enabled through product registration. Register your product at http://eSupport.3com.com/. 3Com eSupport services are based on accounts that you create or have authorization to access. First time users must apply for a user name and password that provides access to a number of eSupport features including Product Registration, Repair Services, and Service Request. If you have trouble registering your product, please contact 3Com Global Services for assistance.

Purchase Value-Added Services

To enhance response times or extend warranty benefits, contact 3Com or your authorized 3Com reseller. Value-added services like 3Com ExpressSM and GuardianSM can include 24x7 telephone technical support, software upgrades, onsite assistance or advance hardware replacement. Experienced engineers are available to manage your installation with minimal disruption to your network. Expert assessment and implementation services are offered to fill resource gaps and ensure the success of your networking projects. More information on 3Com maintenance and Professional Services is available at www.3com.com.

Contact your authorized 3Com reseller or 3Com for a complete list of the value-added services available in your area.

Access Software Downloads

Software Updates are the bug fix/maintenance releases for the version of software initially purchased with the product. In order to access these Software Updates, You must first register your product on the 3Com Web site at http://eSupport.3com.com/.

First time users will need to apply for a user name and password. A link to software downloads can be found at http://eSupport.3com.com/, or under the Product Support heading at www.3com.com/

Software Upgrades are the feature releases that follow the software version included with your original product. In order to access upgrades and related documentation you must first purchase a service contract from 3Com or your reseller.

Telephone Technical Support and Repair

To obtain telephone support as part of your warranty and other service benefits, you must first register your product at http://eSupport.3com.com/

Warranty and other service benefits start from the date of purchase, so it is important to register your product quickly to ensure you get full use of the warranty and other service benefits available to you.

When you contact 3Com for assistance, please have the following information ready:

- Product model name, part number, and serial number.
- Proof of purchase, if you have not pre-registered your product.
- A list of system hardware and software, including revision level.
- Diagnostic error messages.
- Details about recent configuration changes, if applicable.

To send a product directly to 3Com for repair, you must first obtain a return authorization number (RMA). Products sent to 3Com, without authorization numbers clearly marked on the outside of the package, will be returned to the sender unopened, at the sender's expense. If your product is registered and under warranty, you can obtain an RMA number online at

http://eSupport.3com.com/. First time users will need to apply for a user name and password.

Contact Us

3Com offers telephone, e-mail and Internet access to technical support and repair services. To access these services for your region, use the appropriate telephone number, URL or e-mail address from the list below.

Telephone numbers are correct at the time of publication. Find a current directory of support telephone numbers posted on the 3Com Web site at http://csoweb4.3com.com/contactus/.

7 Safety Information

Important Safety Information

Please refer to the safety information found in the *3Com Switch Family Safety and Regulatory Information* manual included with this product.

You can find the *3Com Switch Family Safety and Regulatory Information* manual that was included with your switch. You can also download the safety manual from the 3Com Web site: www.3Com.com.

8 Regulatory Notices

FCC Statement

This equipment has been tested and found to comply with the limits for a Class digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a commerical environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference to radio communications, in which case the user will be required to correct the interference at their own expense.

Information to the User

If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient the receiving antenna.
- Relocate the equipment with respect to the receiver.
- Move the equipment away from the receiver.
- Plug the equipment into a different outlet so that equipment and receiver are on different branch circuits.

If necessary the user should consult the dealer or an experienced radio/television technician for additional suggestions. The user may find the following booklet prepared by the Federal Communications Commission helpful:

How to Identify and Resolve Radio-TV Interference Problems

This booklet is available from the U.S. Government Printing Office, Washington, DC 20402, Stock No. 004-000-00345-4. In order to meet FCC emissions limits, this equipment must be used only with cables which comply with IEEE 802.3.

ICES Statement

This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la Classe A est conforme à la norme NMB-003 du Canada.

CE Statement (Europe)

This product complies with the European Low Voltage Directive 73/23/EEC and EMC Directive 89/336/EEC as amended by European Directive 93/68/EEC.

VCCI Statement

この装置は、情報処理装置等電波障害自主規制協議会（ＶＣＣＩ）の基準に基づくクラスＡ情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

9 Glossary

Table 9-1 Glossary

Item	Description
10BASE-T	The IEEE specification for 10 Mbps Ethernet over Category 3, 4 or 5 twisted pair cable.
100BASE-TX	The IEEE specification for 100 Mbps Fast Ethernet over Category 5 twisted-pair cable.
1000BASE-LX	IEEE 802.3z specification for Gigabit Ethernet over 9/125 micron core single-mode fiber cable.
1000BASE-SX	IEEE 802.3z specification for Gigabit Ethernet over two strands of 50/125 or 62.5/125 micron core multimode fiber cable.
1000BASE-T	IEEE 802.3ab specification for Gigabit Ethernet over 100-ohm Category 5, 5e or 6 twisted-pair cable (using all four wire pairs).
Auto-negotiation	Auto-negotiation is where two devices sharing a link, automatically configure to use the best common speed. The order of preference (best first) is: 1000BASE-T full duplex, 100BASE-TX full duplex, 100BASE-TX half duplex, 10BASE-T full duplex, and 10BASE-T half duplex. Auto-negotiation is defined in the IEEE 802.3 standard for Ethernet and is an operation that takes place in a few milliseconds. Auto-negotiation must be enabled for the 1000BASE-T ports to operate at 1000 Mbps, full duplex.
Bandwidth	The information capacity, measured in bits per second, that a channel can transmit. The bandwidth of Ethernet is 10 Mbps, the bandwidth of Fast Ethernet is 100 Mbps and Gigabit Ethernet is 1000 Mbps.
BPDU	Bridge Protocol Data Unit. A type of information packet that ensures that data is efficiently exchanged between switches in a LAN. BPDU messages detect loops in a network, and remove them by shutting down the bridge causing the loop.
Category 3 Cables	One of five grades of Twisted Pair (TP) cabling defined by the EIA/TIA-568 standard. Category 3 is voice grade cable and can only be used in Ethernet networks (10BASE-T) to transmit data at speeds of up to 10 Mbps.
Category 5 Cables	One of five grades of Twisted Pair (TP) cabling defined by the EIA/TIA-568 standard. Category 5 can be used in Ethernet (10BASE-T) and Fast Ethernet networks (100BASE-TX) and can transmit data at speeds of up to 100 Mbps. Category 5 cabling is better to use for network cabling than Category 3, because it supports both Ethernet (10 Mbps) and Fast Ethernet (100 Mbps) speeds.
Category 5e Cables	One of five grades of Twisted Pair (TP) cabling defined by the EIA/TIA-568 standard. Category 5e can be used in Ethernet (10BASE-T), Fast Ethernet (100BASE-TX) and Gigabit Ethernet (1000BASE-T) networks, and can transmit data at speeds of up to 1000 Mbps.

Item	Description
Category 6 Cables	One of five grades of Twisted Pair (TP) cabling defined by the EIA/TIA-568-B standard. Category 6 can be used in Ethernet (10BASE-T), Fast Ethernet (100BASE-TX) and Gigabit Ethernet (1000BASE-T) networks, and can transmit data at speeds of up to 1000 Mbps.
Client	The term used to describe the desktop PC that is connected to your network.
DHCP	Dynamic Host Configuration Protocol. This protocol automatically assigns an IP address for every computer on your network
Ethernet	A LAN specification developed jointly by Xerox, Intel and Digital Equipment Corporation. Ethernet networks use CSMA/CD to transmit packets at a rate of 10 Mbps and 100 Mbps over a variety of cables.
Fast Ethernet	An Ethernet system that is designed to operate at 100 Mbps.
Gigabit Ethernet	An Ethernet system that is designed to operate at 1000 Mbps.
Full Duplex	A system that allows packets to be transmitted and received at the same time and, in effect, doubles the potential throughput of a link.
Half Duplex	A system that allows packets to be transmitted and received, but not at the same time. Half duplex is not supported for 1000 Mbps. Contrast with full duplex.
IEEE	Institute of Electrical and Electronics Engineers. This American organization was founded in 1963 and sets standards for computers and communications.
IEEE 802.1D	Specifies a general method for the operation of MAC bridges, including the Spanning Tree Protocol.
IEEE 802.1Q	VLAN Tagging - Defines Ethernet frame tags which carry VLAN information. It allows switches to assign end stations to different virtual LANs, and defines a standard way for VLANs to communicate across switched networks.
IEEE 802.3ad	A standard that defines link aggregation. 802.3ad is now incorporated into the relevant sections of the IEEE Std. 802.3-2002.
IETF	Internet Engineering Task Force. An organization responsible for providing engineering solutions for TCP/IP networks. In the network management area, this group is responsible for the development of the SNMP protocol.
IP	Internet Protocol. IP is a layer 3 network protocol that is the standard for sending data through a network. IP is part of the TCP/IP set of protocols that describe the routing of packets to addressed devices. An IP address consists of 32 bits divided into two or three fields: a network number and a host number or a network number, a subnet number, and a host number.
IP Address	Internet Protocol Address. A unique identifier for a device attached to a network using TCP/IP. The address is written as four octets separated with periods (full-stops), and is made up of a network section, an optional subnet section and a host section.
ISP	Internet Service Provider. An ISP is a business that provides connectivity to the Internet for individuals and other businesses or organizations.

Item	Description
LAN	Local Area Network. A network of end stations (such as PCs, printers, servers) and network devices (hubs and switches) that cover a relatively small geographic area (usually not larger than a floor or building). LANs are characterized by high transmission speeds over short distances (up to 1000 meters).
Layer 2	Data Link layer in the ISO 7-Layer Data Communications Protocol. This is related directly to the hardware interface for the network devices and passes on traffic based on MAC addresses.
MAC	Media Access Control. A protocol specified by the IEEE for determining which devices have access to a network at any one time.
MAC Address	Media Access Control Address. Also called the hardware, physical or Ethernet address. A layer 2 address associated with a particular network device. Most devices that connect to a LAN have a MAC address assigned to them as they are used to identify other devices in a network. MAC addresses are 6 bytes long.
Network	A Network is a collection of computers and other computer equipment that are connected for the purpose of exchanging information or sharing resources. Networks vary in size, some are within a single room, others span continents.
Ping	Packet Internet Groper. An Internet utility used to determine whether a particular IP address is online. It is used to test and debug a network by sending out a packet and waiting for a response.
Protocol	A set of rules for communication between devices on a network. The rules dictate format, timing, sequencing and error control.
RJ-45	A standard connector used to connect Ethernet networks. The "RJ" stands for "registered jack."
Server	A computer in a network that is shared by multiple end stations. Servers provide end stations with access to shared network services such as computer files and printer queues.
SFP	Small Form Factor Pluggable (SFP) Connectors are based on an open standard that enables hot swapping of various types of fiber optic and copper-based transceivers into the host equipment.
Subnet Address	An extension of the IP addressing scheme that allows a site to use a single IP network address for multiple physical networks.
Subnet Mask	A subnet mask, which may be a part of the TCP/IP information provided by your ISP, is a set of four numbers configured like an IP address. It is used to create IP address numbers used only within a particular network (as opposed to valid IP address numbers recognized by the Internet, which must assigned by InterNIC).
Subnets	A network that is a component of a larger network.
Switch	A device that interconnects several LANs to form a single logical LAN that comprises of several LAN segments. Switches are similar to bridges, in that they connect LANs of a different type; however they connect more LANs than a bridge and are generally more sophisticated.
TCP/IP	Transmission Control Protocol/Internet Protocol. This is the name for two of the most well-known protocols developed for the interconnection of networks. Originally a UNIX standard, TCP/IP is now supported on almost all platforms, and is the protocol of the Internet.

Item	Description
Traffic Monitoring	Enables the monitoring of port traffic by attaching a network analyzer to one switch port, in order to monitor the traffic of other ports on the switch.
VLAN	A Virtual LAN is a collection of network nodes that share the same collision domain regardless of their physical location or connection point in the network. A VLAN serves as a logical workgroup with no physical barriers, and allows users to share information and resources as though located on the same LAN.