

# *NetAtlas Workgroup*

*Ethernet Switch Manager*

## ***User's Guide***

Version 1.02  
Edition 1  
3/2006

The logo for ZyXEL, featuring the word "ZyXEL" in a bold, blue, sans-serif font. The "Zy" is lowercase and the "XEL" is uppercase.

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## Notice 1

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Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

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- 1 Select your product from the drop-down list box on the ZyXEL home page to go to that product's page.
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For your safety, be sure to read and follow all warning notices and instructions.

- To reduce the risk of fire, use only No. 26 AWG (American Wire Gauge) or larger telecommunication line cord.
- Do NOT open the device or unit. Opening or removing covers can expose you to dangerous high voltage points or other risks. ONLY qualified service personnel can service the device. Please contact your vendor for further information.
- Use ONLY the dedicated power supply for your device. Connect the power cord or power adaptor to the right supply voltage (110V AC in North America or 230V AC in Europe).
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- If the power supply is damaged, remove it from the power outlet.
- Do NOT attempt to repair the power supply. Contact your local vendor to order a new power supply.
- Place connecting cables carefully so that no one will step on them or stumble over them. Do NOT allow anything to rest on the power cord and do NOT locate the product where anyone can walk on the power cord.
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- Do NOT expose your device to dampness, dust or corrosive liquids.
- Do NOT use this product near water, for example, in a wet basement or near a swimming pool.
- Make sure to connect the cables to the correct ports.
- Do NOT obstruct the device ventilation slots, as insufficient airflow may harm your device.
- Do NOT store things on the device.
- Connect ONLY suitable accessories to the device.



# ZyXEL Limited Warranty

ZyXEL warrants to the original end user (purchaser) that this product is free from any defects in materials or workmanship for a period of up to two years from the date of purchase. During the warranty period, and upon proof of purchase, should the product have indications of failure due to faulty workmanship and/or materials, ZyXEL will, at its discretion, repair or replace the defective products or components without charge for either parts or labor, and to whatever extent it shall deem necessary to restore the product or components to proper operating condition. Any replacement will consist of a new or re-manufactured functionally equivalent product of equal value, and will be solely at the discretion of ZyXEL. This warranty shall not apply if the product is modified, misused, tampered with, damaged by an act of God, or subjected to abnormal working conditions.

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- Product model and serial number.
- Warranty Information.
- Date that you received your device.
- Brief description of the problem and the steps you took to solve it.

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a. "+" is the (prefix) number you enter to make an international telephone call.

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# Preface

Congratulations on your purchase of the NetAtlas Workgroup Ethernet Switch Manager for the supported ZyXEL Ethernet switches. The Ethernet Switch Manager is an Element Management System (EMS) that retrieves management information from ZyXEL switches using SNMP.

**Note:** Register your product online to receive e-mail notices of firmware upgrades and information at [www.zyxel.com](http://www.zyxel.com) for global products, or at [www.us.zyxel.com](http://www.us.zyxel.com) for North American products.

## About This User's Guide

This manual is designed to guide you through the configuration of your EMS for its applications.

## Syntax Conventions

- “Enter” means for you to type one or more characters. “Select” or “Choose” means for you to use one of the predefined choices.
- The SMT menu titles and labels are in **Bold Times New Roman** font. Predefined field choices are in **Bold Arial** font. Command and arrow keys are enclosed in square brackets. [ENTER] means the Enter, or carriage return key; [ESC] means the Escape key and [SPACE BAR] means the Space Bar.
- Mouse action sequences are denoted using an angle bracket “>”. For example, “click the Apple icon, **Control Panels** and then **Modem**” means first click the Apple icon, then point your mouse pointer to **Control Panels** and then click **Modem**.
- For brevity’s sake, we will use “e.g.,” as a shorthand for “for instance”, and “i.e.,” for “that is” or “in other words” throughout this manual.
- The NetAtlas Workgroup Ethernet Switch Manager may be referred to as “the EMS” in this User’s guide.
- Unless otherwise specified, the supported ZyXEL Ethernet switches being managed by the EMS will be referred to as “the switch” or “the device” in this User’s Guide.

## Related Documentation

- Supporting Disk  
Refer to the included CD for support documents.
- Switch User’s Guide  
Refer to your switch User’s Guide for directions on installation, connections, maintenance, hardware troubleshooting and safety warnings.
- ZyXEL Glossary and Web Site  
Please refer to [www.zyxel.com](http://www.zyxel.com) for an online glossary of networking terms and additional support documentation.

## **User Guide Feedback**

Help us help you. E-mail all User Guide-related comments, questions or suggestions for improvement to [techwriters@zyxel.com.tw](mailto:techwriters@zyxel.com.tw) or send regular mail to The Technical Writing Team, ZyXEL Communications Corp., 6 Innovation Road II, Science-Based Industrial Park, Hsinchu, 300, Taiwan. Thank you.

# CHAPTER 1

## Introduction

This chapter introduces and shows you how to access the EMS (Element Management System).

### 1.1 Overview

The Element Management System (EMS) retrieves management information from switches using SNMP protocol.

An EMS is composed of Network Elements (NE) that represent resources in a Network Management System (NMS). The network elements can represent a physical piece of equipment on the network, the components of a device on the network, or parts of the network itself.

**Note:** Example EMS screens are shown. EMS screens vary depending on your switch models.

#### 1.1.1 SNMPc Network Manager

SNMPc is network management software produced by Castle Rock.

You must have SNMPc properly installed before you can use the EMS. You can install SNMPc separately or together with NetAtlas Workshop. Refer to the appendix in this User's Guide; go to the Castle Rock web site at [www.castlerock.com](http://www.castlerock.com) or see your SNMPc user's guide.

### 1.2 System Requirements

These are the system requirements for the Windows version of the EMS.

**Table 1** System Requirements

HARDWARE	SOFTWARE
CPU: Intel Pentium 4, 1.6 GHz or above	Operating System using NTFS file system: Windows 2000 (with service pack 1), Windows XP or Windows Server 2003.
Memory (RAM): 1 GB or more	Database Program: PostgreSQL 8.0 or later versions.
Hard Disk free space: 20 GB or more	Castle Rock's SNMPc 6.

**Table 1** System Requirements (continued)

HARDWARE	SOFTWARE
Screen Resolution: 1024x768 pixels	
Ethernet Adaptor: 10/100 Mbps	

## 1.2.1 Device Firmware Versions Supported

The EMS supports the devices and device firmware versions as listed in the following table.

**Table 2** Device Firmware Versions Supported

MODEL	FIRMWARE VERSION
ES-2108	360ABK1C0 or later versions
ES-2108G	360ABL1C0 or later versions
ES-2024A	360TX1C0 or later versions
GS-2024	360LT0C0 or later versions
ES-3124	360TP1C0 or later versions
ES-3124PWR	360TY1C0 or later versions
GS-4012F	360TS2C0 or later versions
GS-4024	360LL2C0 or later versions

## 1.3 NetAtlas Workshop Installation

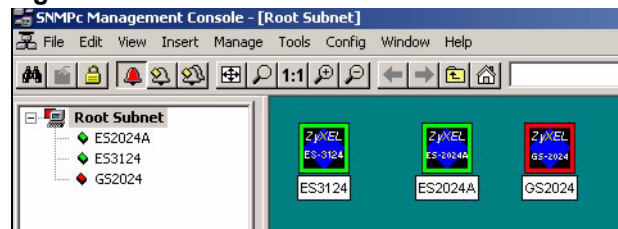
Refer to the Quick Start Guide for the installation procedure.

## 1.4 Accessing EMS

Follow the steps below to access EMS.

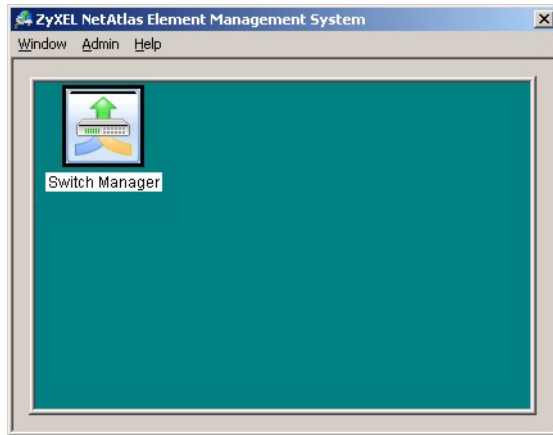
- 1 In the SNMPc main screen, double-click the switch icon.

**Figure 1** SNMPc: Switch Device List Icon

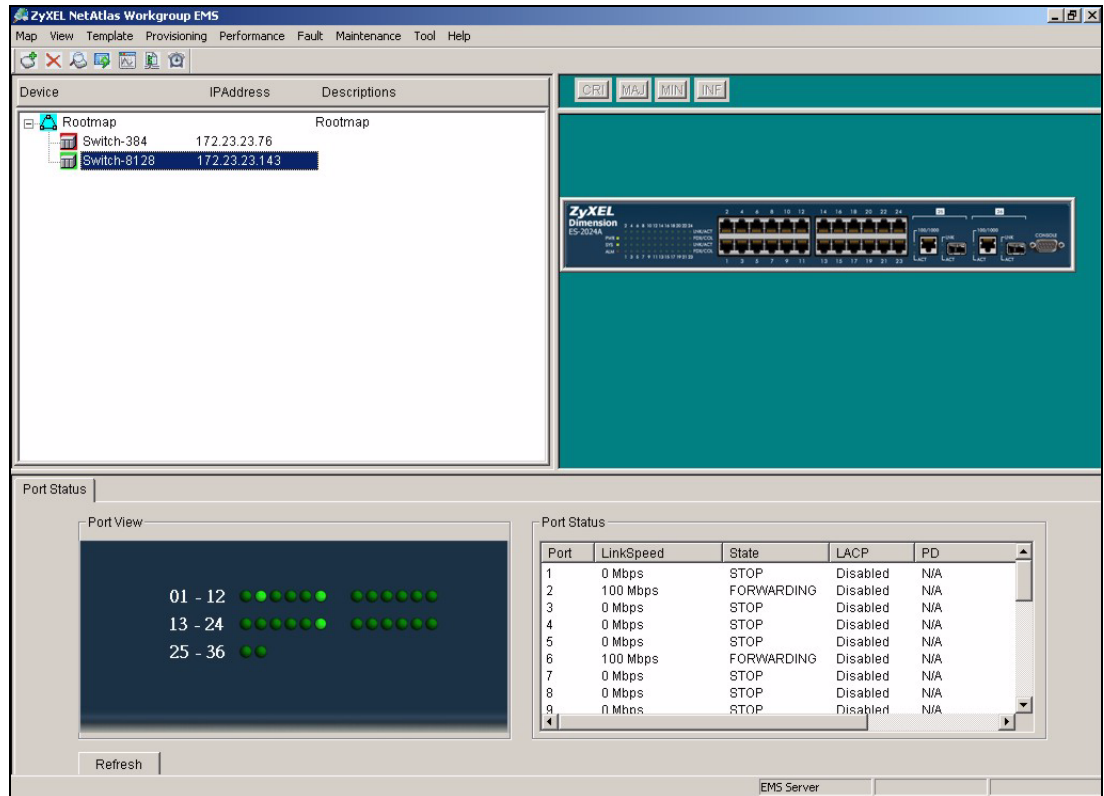


- 2 Click the **Switch Manager** icon to display the main EMS screen.

**Figure 2** NetAtlas Main Screen



**Figure 3** EMS: Main Screen





# CHAPTER 2

## Switch Manager

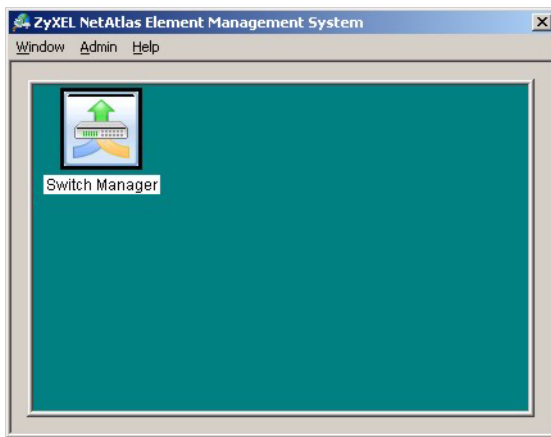
This chapter describes the Switch Manager screens.

### 2.1 Switch Manager Overview

Use the Switch Manager screens to view EMS and device logs and database management.

In SNMPc, double-click on a device icon to display the main Switch Manager screen as shown.

**Figure 4** Switch Manager



The following table describes the options in the switch manager screen.

**Table 3** Switch Manager Menus Overview

LABEL	SUB-MENU	DESCRIPTION
Window	Exit	Click <b>Exit</b> to close the switch manager screen.
Admin	Access Log	Use this screen to display logs.
	Database Management	Backup and Restore (EMS DB) Use this screen to backup or restore a switch's configuration.
		Log Storage Configuration Use this screen to enable logging and specify how many logs to store in the database.



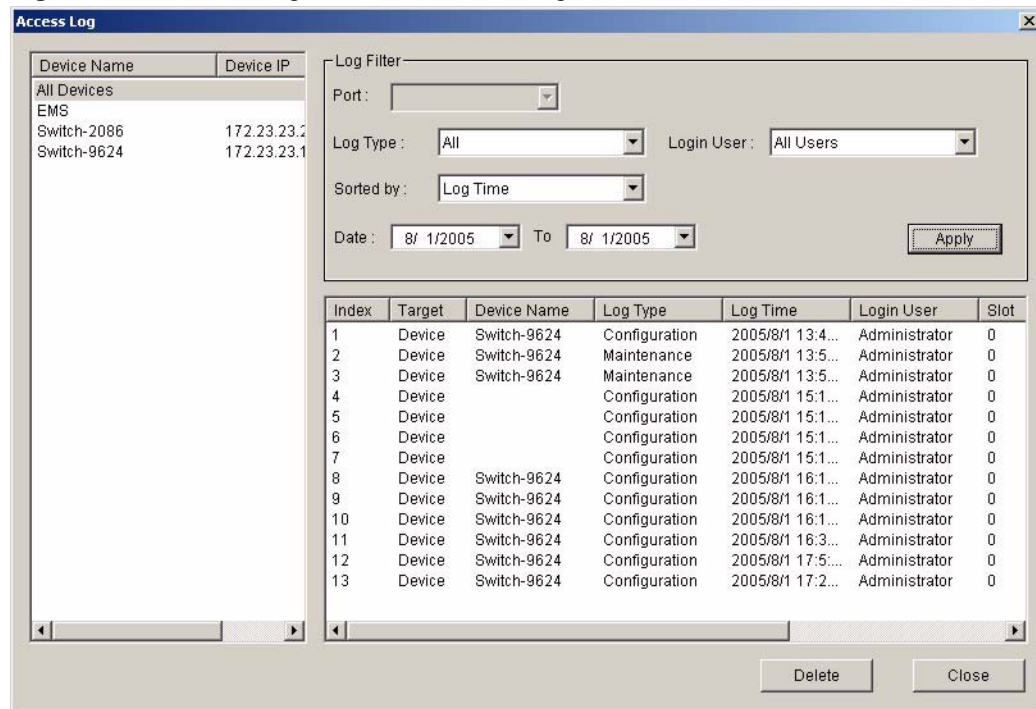
**Table 3** Switch Manager Menus Overview (continued)

LABEL	SUB-MENU	DESCRIPTION
		Scheduled Backup Configuration (EMS DB)
		Use this screen to specify when to store logs in the database.
Help	On-line Help	Click <b>On-line Help</b> to display an EMS help file.

## 2.2 Access Log

To view access logs, click **Admin > Access Log**.

**Figure 5** Switch Manager: Admin: Access Log



The following table describes the fields in this screen.

**Table 4** Switch Manager: Admin: Access Log

LABEL	DESCRIPTION
Log Filter	
Port	Select a port or <b>All Ports</b> for which you want to view switch login data via the EMS.
Log Type	Select the type of logs which you want to view for the selected switch and port(s).
Login User	Select <b>All Users</b> to view logs for all access attempts to a switch via the EMS. Select <b>Administrator</b> to view only the EMS administrator access attempts.

**Table 4** Switch Manager: Admin: Access Log (continued)

LABEL	DESCRIPTION
Sorted by	Select <b>By Device Name</b> to sort the logs displayed in alphabetical order according to the names of the switch(es). Select <b>Log Time</b> to sort the logs displayed according to the times received on the switch(es).
Date	Select a start date and end date from the list boxes to display logs for that period.
Apply	Click <b>Apply</b> to display logs with the criteria set above.
Index	This field displays the log number.
Target	This field displays a reason for the generated log.
Device Name	This field displays name of the switch that generated the log(s).
Log Type	This field displays the type of log the switch generated.
Log Time	This field displays the time a log was generated by a switch.
Login User	This field displays the EMS user that logged into the switch
Slot	This field is currently not supported.
Port	This field displays the selected switch port number on which the log was generated.
Description	This field displays further information about the log.
Delete	Click <b>Delete</b> to delete a selected log from the list of log entries.
Close	Click <b>Close</b> to close this screen.

## 2.3 Database Management

The EMS-related event and access logs information and various configuration settings are stored in the database. The database management features enable you to back up all logs and configurations and restore selected backed up files.

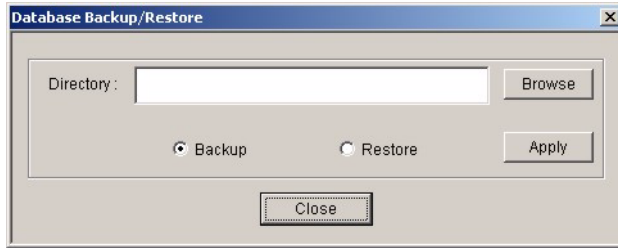
### 2.3.1 Filename Convention

The EMS follows a pre-defined naming convention for the backup data. The backup data is stored in plain text format with a “txt” filename extension. The general structure of the filename is <type>.txt (for example, AccessLog.txt).

### 2.3.2 Database Backup and Restore

Click **Admin > Database Management > Backup/Restore** to display the following screen.

**Figure 6** Switch Manager: Admin: Database Management: Backup/Restore



The following table describes the fields in this screen.

**Table 5** Switch Manager: Admin: Database Management: Backup/Restore

LABEL	DESCRIPTION
Directory	Specify the location you wish the EMS to restore from or back up to on your computer or click <b>Browse</b> to locate it.
Backup	Select <b>Backup</b> to transfer the database file from the EMS to the computer.
Restore	Select <b>Restore</b> to transfer the backed up files from your computer to the EMS.
Apply	Click <b>Apply</b> to backup or restore the database files.
Close	Click <b>Close</b> to close the screen.

### 2.3.3 Database Log Storage Configuration

Click **Admin > Database Management > Log Storage Configuration** to display the following screen.

**Figure 7** Switch Manager: Admin: Database Management: Log Storage



The following table describes the fields in this screen.

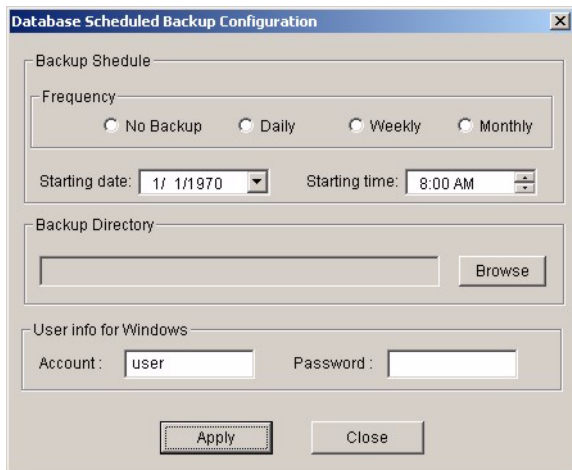
**Table 6** Switch Manager: Admin: Database Management: Log Storage

LABEL	DESCRIPTION
Storage Configuration	Configure the following fields to retain daily records. Select the first radio button and a number (in thousands) from the drop-down list box to retain that number of records. All records prior to these records are cleared every 24 hours. Or Select the second radio button and a number (from 7 to 365) in the field provided. All records up to the start of the period selected are cleared every 24 hours.
Cleared Records Backup	If you do not configure this section, all records (excluding the latest reserved records) will be cleared after 24 hours and therefore cannot be retrieved later.
Backup the cleared records	Select the check box and type the path and file name or click <b>Browse</b> to locate the folder you wish to save all records after 24 hours. The records are cleared but saved in the backup file.
Backup Directory	Type the path and file name of the record file you wish to back up to your computer in the <b>Backup Directory</b> text box or click <b>Browse</b> to locate it.
User info for Windows	
Account	Enter the account user name to log into your Windows computer.
Password	Enter a password in this field for the administrator <b>Account</b> above.
Apply	Click <b>Apply</b> to save changes to the EMS.
Close	Click <b>Close</b> to close the screen.

### 2.3.4 Database Scheduled Backup Configuration

Click **Admin > Database Management > Backup and Restore (EMS DB)** to display the following screen.

**Figure 8** Switch Manager: Admin: Database Management: Scheduled Backup



The following table describes the fields in this screen.

**Table 7** Switch Manager: Admin: Database Management: Scheduled Backup

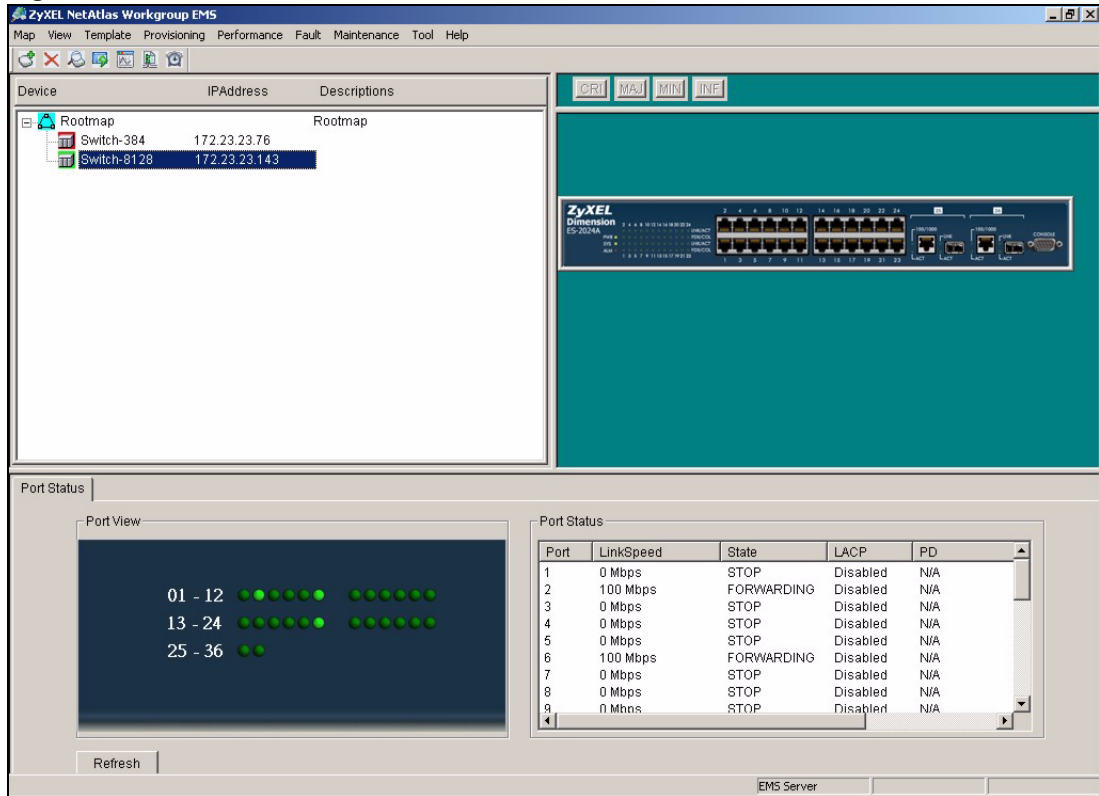
LABEL	DESCRIPTION
Backup Schedule	
Frequency	Scheduled backups can be performed <b>Daily</b> , <b>Weekly</b> or <b>Monthly</b> . Select a radio button to schedule database backups starting from the date and time specified below. The default setting is <b>No Backup</b> .
Starting date	Specify the starting date to begin database backup for the selected device(s). Select a date from the drop-down list box.
Starting time	Specify the starting time to begin database backup for the selected device(s). Select a time from the selection box or enter a time (hh:mm:ss AM/PM format).
Backup Directory	Type the path to which you wish to back up the database files on your computer in the <b>Backup Directory</b> text box or click <b>Browse</b> to locate it.
User info for Windows	
Account	Specify a Windows administrator login account user name.
Password	Enter a password in this field for the administrator <b>Account</b> above.
Apply	Click <b>Apply</b> to save changes to the EMS.
Close	Click <b>Close</b> to close the screen.

## 2.4 Accessing the EMS Main Screen

To display the EMS main screen, click on the device icon in the Switch Manager screen.

The EMS polls for all the available switches. Select a device icon to display a graphic of the switch in the Device Panel. You can only display one switch in the Device Panel at one time.

**Figure 9 EMS: Main Screen**





# CHAPTER 3

## EMS Main Window

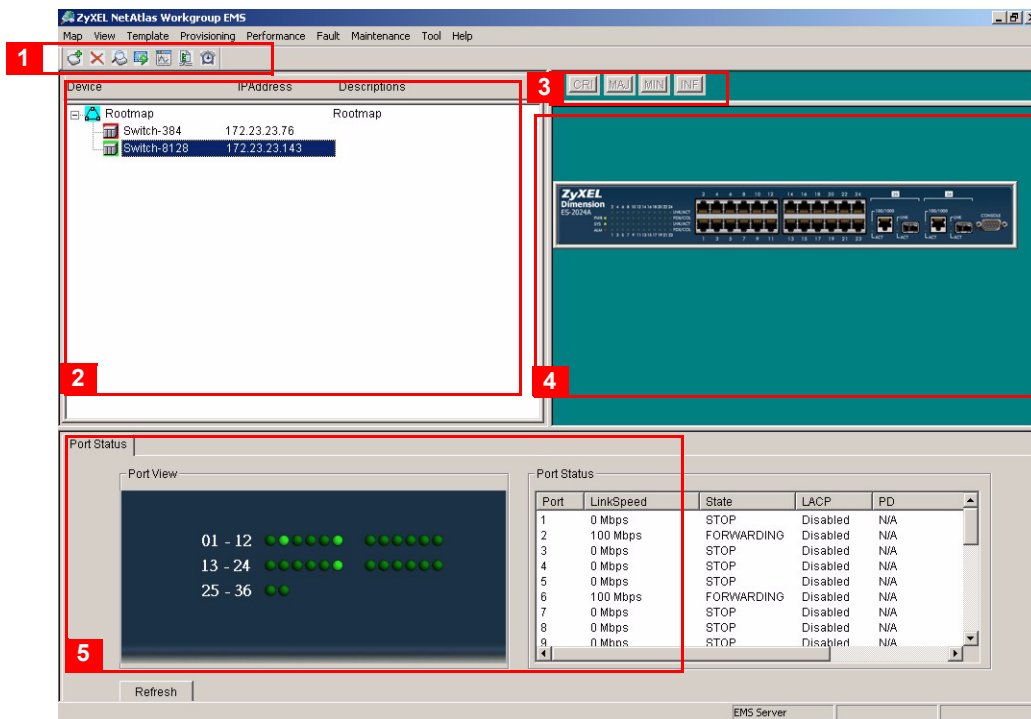
This chapter describes the EMS main window.

### 3.1 Introduction

After you have accessed the EMS, double-click the switch device icon in the Device List Panel to display the EMS main screen. The EMS retrieves device information from the switch (using SNMP protocol).

The EMS main screen varies depending on the selected switch model.

**Figure 10** EMS Main Screen Overview



The following table describes the elements in the EMS screen.



**Table 8** EMS Main Screen Overview

	ELEMENT	FUNCTION
1	Menu Shortcut Bar	Use these buttons to execute common commands quickly. Hold the cursor over an icon to see a tool tip.
2	Device List Panel	View devices in a tree structure. The colors of the device icons indicate the time status of the represented devices.
3	Alarm Severity Icons	These icons indicate the presence of any alarm/event logs. Click on an active icon to view the <b>Event Log</b> screen.
4	Device Panel	This is a graphical device display. Double-click on a switch to display the EMS GUI management window for the switch.
5	System Message Panel	View the alarm status <sup>a</sup> and port status of the selected switch.

a. Not available on all models at the time of writing.

### 3.2 Device Icon Colors

The colors of the device icons (in the Device List Panel) indicate the status of the represented devices stored in the database. To update the device status, double-click on a device icon. The following table describes the colors used.





**Table 9** Device Icon Colors

COLOR	DESCRIPTION
Green	The device is working and is responding to polling.
Red	There is no response from the device or the device is not turned on.





### 3.3 System Message Panel Alarm Status

The colors of the alarm icons (in the System Message Panel) indicate the real-time status of the current selected device. The following table describes the alarm states used.

**Table 10** System Message Panel Alarm Status

PANEL ALARMS	ALARM OFF	ALARM ON
ALARM	When this icon is gray out, the device fan, temperature or voltage alarm is off. 	The fan, temperature and voltage alarms are all on. A serious hardware problem exists. 
FAN	When this icon is gray out, the device fans are functioning properly. 	One or more of the device fans has a problem. 

**Table 10** System Message Panel Alarm Status (continued)

PANEL ALARMS	ALARM OFF	ALARM ON
TEMP	When this icon is gray out, temperatures at all sensor points in the switch are within the threshold temperature range. 	The temperature at a sensor point in the switch has risen above or below the threshold temperature range. 
VOL	When this icon is gray out, the power supply at all sensor points in the switch is within the tolerance range. 	The power supply at a sensor point in the switch has fallen out of the tolerance range. 

If an alarm turns on, click the **Port Status** tab in the System Message Panel or proceed to [Section 5.1 on page 50](#) for hardware troubleshooting.

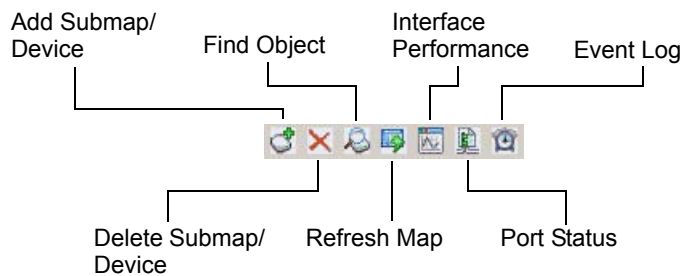
### 3.4 System Message Panel Port Status

Proceed to [Section 5.4 on page 55](#) for information on the details displayed in this screen.

### 3.5 Menu Shortcut Buttons

The following is a brief overview of the menu shortcut buttons.

**Figure 11** EMS Main Screen Shortcut Bar



### 3.6 EMS Main Menu Summary

This is a summary of the EMS menus in the main screen.

**Note:** Screens, screen labels and fields vary depending on your switch model.

**Table 11** EMS Menu Summary

MAP	VIEW	TEMPLATE	PROVISIONING	PERFORMANCE	FAULT	MAINTENANCE	TOOL	HELP
Add Submap /Device	Hardware Status	VLAN Template	IGMP Filtering Provisioning	Interface	Event Log	Firmware Upgrade	Telnet	About
Edit Node	STP Status	IGMP Filtering Profile Template			Loopback Test	Device Reset	Web Access	On-line Help
Search Node	VLAN Status	Multicast Template				NE (Network Element) Configuration Backup and Restore	Ping	
Delete	Port Status					Load Factory Default		
Refresh	802.1d					Scheduled NE Config Backup		
Exit	Multicast Status							
	IP Application Status							
	Interface Status							

The following table summarizes these sub-links in the navigation panel.

**Table 12** EMS Navigation Panel Sub-link Descriptions

DESCRIPTION	LABEL
MAP Screens	
Add Submap/Device	This link takes you to a screen where you can add a device or a submap folder to the EMS Device List Panel.
Edit Node	This link takes you to a screen where you can edit device properties.
Search Node	This link takes you to a screen where you can search for a device or a submap folder.
Delete	Click this link to delete a submap folder or devices within a folder.
Refresh	Click this link to update the screen with the most recently saved settings.
View	
Hardware Status	This link takes you to a screen where you can view the hardware status of a device.
STP Status	This link takes you to a screen where you can view the Spanning Tree Protocol (STP) status of a device.
VLAN Status	This link takes you to a screen where you can view the VLAN status of a device.

**Table 12** EMS Navigation Panel Sub-link Descriptions (continued)

DESCRIPTION	LABEL
Port Status	This link takes you to a screen where you can view the port status of a device.
802.1d	This link takes you to a screen where you can view the MAC addresses (and types) of devices attached to what ports and VLAN IDs or view the MAC addresses – IP address resolution table.
Multicast Status	This link takes you to a screen where you can view the multicast traffic status of a device.
IP Application Status	This link takes you to screens where you can view IP routing domain status.
Interface Status	This link takes you to a screen where you can IP routing interface status.
Template	
VLAN Template	This link takes you to a screen where you can pre-configure a VLAN template for upload to multiple devices.
IGMP Filtering Profile Template	This link takes you to screens where you can pre-configure an IGMP filter template for upload to multiple devices.
Multicast Template	This link takes you to a screen where you can configure a multicast template for upload to multiple devices.
Provisioning	
IGMP Filtering Provisioning	This link takes you to screens where you can apply IGMP filtering templates.
Performance	
Interface	This link takes you to a screen where you can configure interface performance graphs and tables.
Fault Screens	
Event Log	This link takes you to a screen where you can configure an alarm filter.
Loopback Test	This link takes you to a screen where you can perform a loopback test.
Maintenance	
Firmware Upgrade	This link takes you to a screen where you can perform a device firmware upgrade.
Device Reset	This link takes you to a screen where you can reset a device.
NE (Network Element) Configuration Backup and Restore	This link takes you to a screen where you can backup or restore configuration files.
Load Factory Default	This link takes you to a screen where you can load the factory default settings.
Scheduled NE Config Backup	This link takes you to a screen where you can schedule when you want to backup a device configuration file.
Tool Screens	
Telnet	This link takes you to a screen where you can access a device Telnet service.
Web Access	This link takes you to a screen where you can access a device Web configurator.
Ping	This link takes you to a screen where you can ping a device directly through the EMS.
Help	

**Table 12** EMS Navigation Panel Sub-link Descriptions (continued)

DESCRIPTION	LABEL
About	This link takes you to a screen where you can view the version number of the EMS.
On-line Help	This link opens the EMS user's guide in PDF format.

### 3.7 Common EMS Command Buttons

The following table shows common command buttons found on most EMS screens.

**Table 13** Common EMS Command Buttons

LABEL	DESCRIPTION
Apply	Click <b>Apply</b> to save the changes back to the switch.
OK	Click <b>OK</b> to save your changes and close the screen.
Cancel	Click <b>Cancel</b> to discard all changes and close the screen.
Close	Click <b>Close</b> to close the screen.

### 3.8 View the Switch

To display the selected switch, double-click the appropriate switch in the Device List Panel or on the switch icon in the Device Panel. You can only display one switch in the device Panel window at a time. Refer to the appropriate chapters or sections for the descriptions of each menu screen.

**Figure 12** Switch View

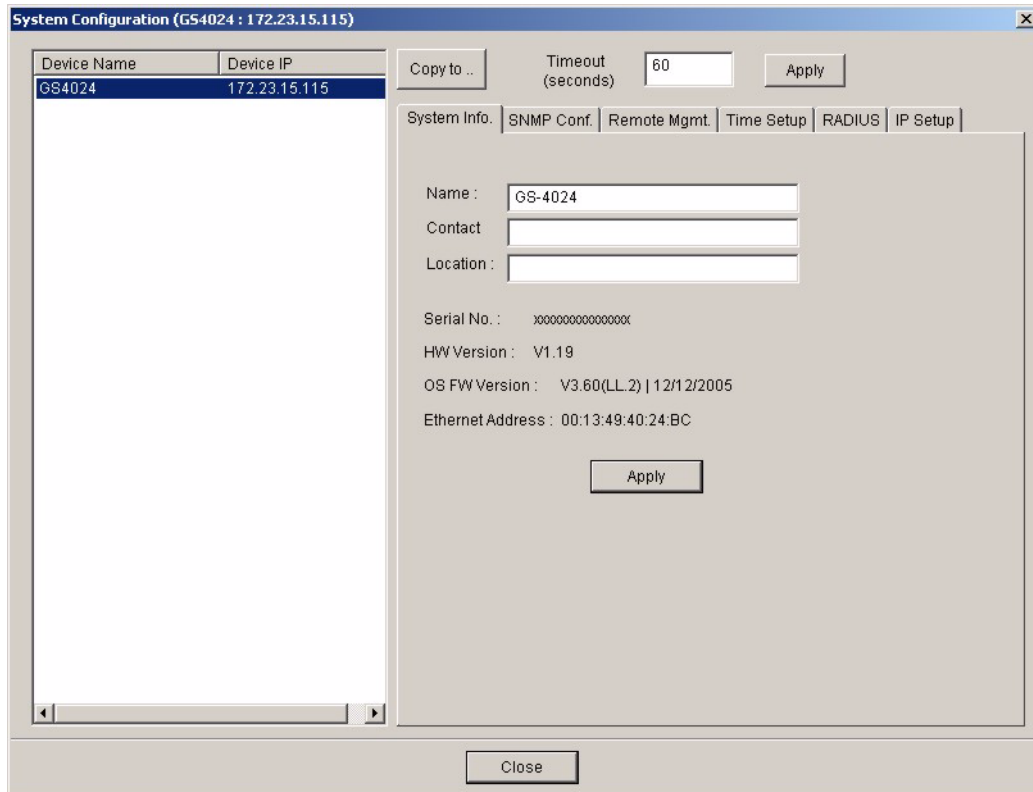


### 3.9 Switch Information

Follow the steps to display information on a switch.

- 1 Right-click on the switch icon in the Device List Panel.
- 2 Click **Configuration > System > System Info**. The switch information window displays as shown next.
- 3 Choose a switch from the list located on the left-hand side of the screen.

**Figure 13** Configuration: System Configuration: System Info.



The following table describes the labels in this screen.

**Table 14** Configuration: Switch Configuration: System Info.

LABEL	DESCRIPTION
Device Name	This field displays the descriptive name of a device.
IP Address	This field displays the IP address of a device
Timeout (seconds)	Enter the time interval for refreshing the information in this screen.
Apply	Click <b>Apply</b> to set the poll interval specified.
Name	Enter a descriptive name for identification purposes. If you want to change the name, enter up to 32 printable characters; spaces are not allowed.
Contact	Enter the name (up to 32 characters) of the person in charge of the selected switch.
Location	Enter the geographic location (up to 32 characters) of the selected switch.
Serial No.	This field displays the serial number of the selected switch.
HW Version	This field displays the hardware version of the selected switch.
OS FW Version	This field displays the firmware version of the selected switch.
Ethernet Address	This field displays the switch Ethernet MAC address in six hexadecimal character pair format.
Apply	Click <b>Apply</b> to save the changes back to the switch.
Close	Click <b>Close</b> to close the screen.

## 3.10 Configuration Save

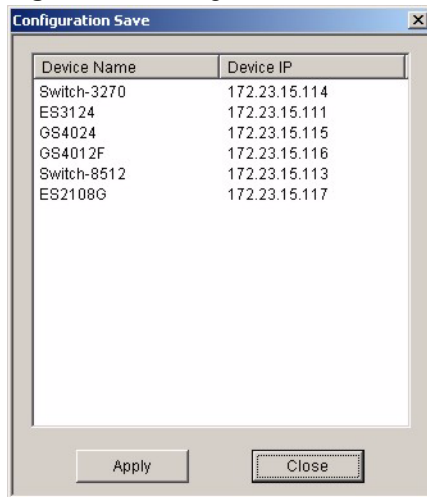
You must save the current configuration in the EMS to the selected switch(es) to make the changes take effect.

**Note:** If an administrator is currently logged into the device via the console port or the CLI (Command Line Interface), you cannot save the device settings from the EMS.

Do NOT turn off the switch during the updating process, as it may corrupt the firmware and make your switch unusable.

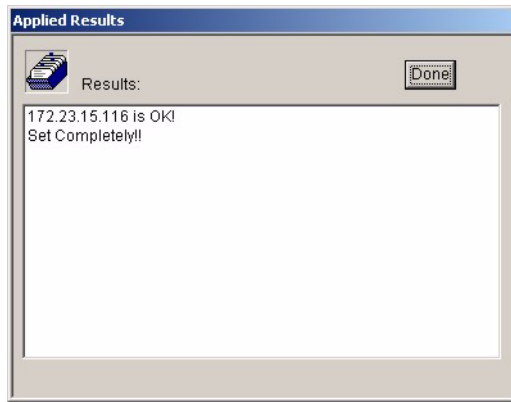
- 1 To save the current switch configuration, select and right-click on the switch icon in the Device List Panel.
- 2 Click **Configuration Save**.
- 3 Choose a switch from the list in the screen.

**Figure 14** Configuration Save



- 4 Click **Apply** to save the current configuration. All settings configured on the EMS will be saved to the selected switch.
- 5 A screen displays showing the configuration save result. Click **Done** to close the screen.

**Figure 15** Configuration Save: Result







# CHAPTER 4

## Map

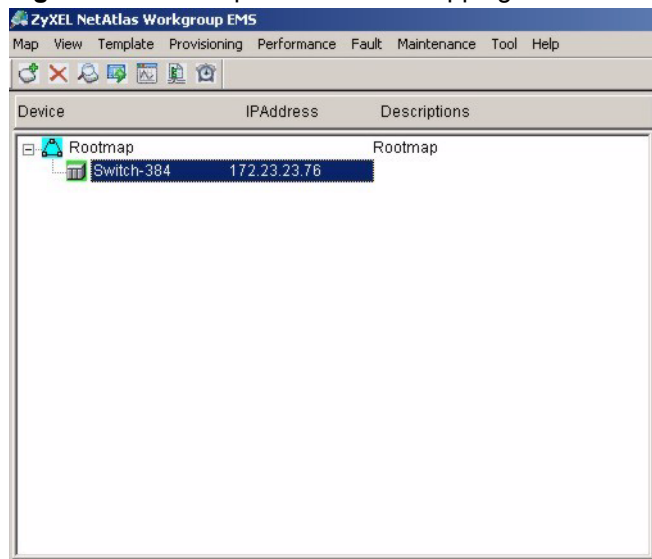
This chapter describes the Map screens you use to add, edit or delete device mappings in the EMS.

### 4.1 Submap and Device Mapping

The EMS mapping displays logical hierarchy for the switch in the EMS. When you first start the EMS, the default Root Map and an icon for your switch device are created in the Device List Panel automatically. Both devices and submaps (or folders) can be added below the rootmap. Devices can also be added to submap folders.

The following figure shows the “Rootmap” folder. The managed devices are mapped to the “Rootmap” folder.

**Figure 16** Submaps and Device Mapping



**Note:** You cannot create, edit or delete the Rootmap.

#### 4.1.1 Adding a Submap or Device

To add a new submap or a new device, select the Root Map or a submap icon in the Device List Panel.

Click **Map** > **Add Submap/Device** to display the following screen.

**Figure 17** Map: Add Submap/Device



The following table describes the labels in this screen.

**Table 15** Map: Add Submap/Device

LABEL	DESCRIPTION
Properties	Select the <b>Submap</b> or <b>Device</b> radio button to add a new submap or device icon to the Device List Panel. If you select <b>Submap</b> , only the <b>Name</b> and <b>Description</b> fields display are applicable; all other fields appear as read-only.
Name	Enter a descriptive name (up to 30 characters) for this node for identification purposes.
IP Address	Enter the IP address of the device.
Password	Enter the administrative password (up to 30 characters) you use to log in to the switch. This password is used by the EMS administrator for device firmware upload.
Description	Enter a description (up to 30 characters) about the device.
Get Community	Enter the get community, which is the password for the incoming Get- and GetNext-requests from the management station.
Set Community	Enter the set community, which is the password for incoming Set- requests from the management station.
Trap Community	Enter the trap community, which is the password sent with each trap to the SNMP manager.
OK	Click <b>OK</b> to save the changes and close the screen.
Cancel	Click <b>Cancel</b> to discard the changes and close the screen.

### 4.1.2 Editing a Node

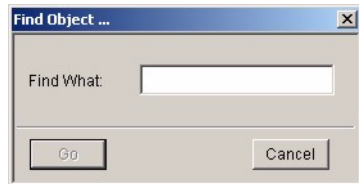
Select a submap icon in the Device List Panel and then click **Map > Edit Node**.

**Figure 18** Map: Edit Node

Refer to [Table 15 on page 47](#) for the field descriptions.

### 4.1.3 Finding an Object

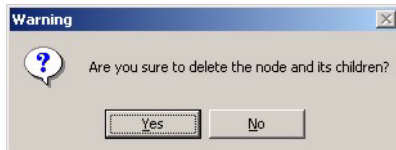
To find or locate a device (or node), click **Map > Find Object**.

**Figure 19** Map: Find Object

Enter a descriptive text (for example, the node name) in the **Find What** field and click **OK** to start the search.

### 4.1.4 Deleting a Submap

To delete a submap, select the submap icon in the Device List Panel and click **Map > Delete**.

**Figure 20** Map: Delete Warning

**Note:** If you delete a submap, all devices under a submap will be removed.

### 4.1.5 Deleting a Device

To remove a device from the Device List Panel, select the device icon and click **Map > Delete**.

## 4.2 Exit

Click **Map > Exit** to close the EMS screen.

# CHAPTER 5

## View

This chapter describes the various **View** screens.

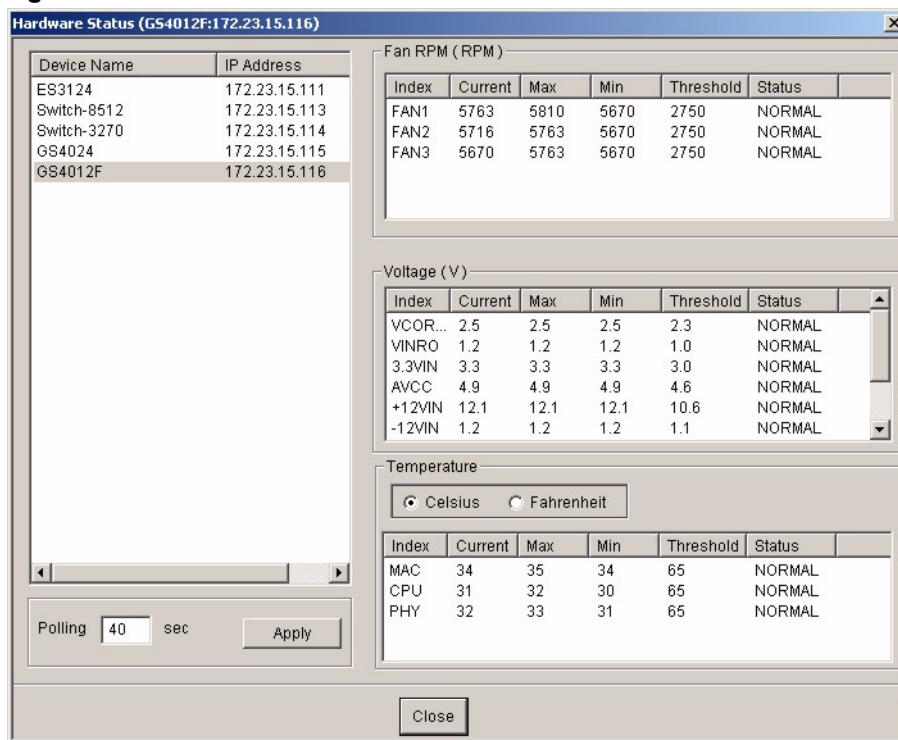
### 5.1 Hardware Status

View fan speeds, voltage levels and temperatures of a selected switch in the **Hardware Monitor** screen.

Click **View > Hardware Status** and select a switch from the device list located on the left-hand side of the screen. The device hardware status displays.

**Note:** It may take a few seconds to update the screen.

**Figure 21** View: Hardware Status



The following table describes the labels in this screen.

**Table 16** Status: Hardware Status

LABEL	DESCRIPTION
Fan RPM (RPM)	A properly functioning fan is an essential component (along with a sufficiently ventilated, cool operating environment) in order for the device to stay within the temperature threshold. Each fan has a sensor that is capable of detecting and reporting if the fan speed falls below the threshold shown.
Index	This field displays the fan number.
Current	This field displays this fan's current speed in Revolutions Per Minute (RPM).
Max	This field displays this fan's maximum speed recorded in Revolutions Per Minute (RPM).
Min	This field displays this fan's minimum speed recorded in Revolutions Per Minute (RPM).
Threshold	This field displays the minimum speed at which a normal fan should work.
Status	<b>NORMAL</b> indicates that this fan is functioning above the minimum speed. <b>ERROR</b> indicates that this fan is functioning below the minimum speed.
Voltage (V)	The power supply for each voltage has a sensor that is capable of detecting and reporting if the voltage falls out of the tolerance range.
Index	This field displays the first voltage sensor number.
Current	This is the current voltage reading in volts.
Max	This field displays the maximum voltage recorded at this sensor in volts.
Min	This field displays the minimum voltage recorded at this sensor in volts.
Threshold	This field displays the minimum voltage percentage at which the switch should work.
Status	<b>NORMAL</b> indicates that the voltage is within an acceptable operating range at this point; otherwise <b>ERROR</b> is displayed. <b>ABSENT</b> indicates that there is no power reading at a sensor(s).
Temperature	The switch has temperature sensors that are capable of detecting and reporting if the temperature rises above the threshold. You may choose the temperature unit (in degrees Celsius or Fahrenheit).
Celsius	Select this option to display the temperature in degrees Centigrade.
Fahrenheit	Select this option to display the temperature in degrees Fahrenheit.
Index	This field displays the temperature sensor number.
Current Value	This shows the current temperature at this sensor.
Max	This field displays the maximum temperature recorded at this sensor.
Min	This field displays the minimum temperature recorded at this sensor.
Threshold	This field displays the upper temperature limit at this sensor.
Status	This field displays <b>NORMAL</b> for temperatures below the threshold and <b>ERROR</b> for those above.
Polling	The text box displays how often (in seconds) this screen refreshes. You may change the refresh interval by typing a new number in the text box and then clicking the <b>Apply</b> button.
Close	Click <b>Close</b> to close the screen.

## 5.2 STP/RSTP

(R)STP detects and breaks network loops and provides backup links between switches, bridges or routers. It allows a switch to interact with other (R)STP -compliant switches in your network to ensure that only one path exists between any two stations on the network.

**Note:** In this user's guide, "STP" refers to both STP and RSTP.

### 5.2.1 STP Terminology

The root bridge is the base of the spanning tree; it is the bridge with the lowest identifier value (MAC address).

Path cost is the cost of transmitting a frame onto a LAN through that port. It is assigned according to the speed of the link to which a port is attached. The slower the media, the higher the cost - see the next table.

**Table 17** STP Path Costs

LINK SPEED	RECOMMENDED VALUE	RECOMMENDED RANGE	ALLOWED RANGE
4Mbps	250	100 to 1000	1 to 65535
10Mbps	100	50 to 600	1 to 65535
16Mbps	62	40 to 400	1 to 65535
100Mbps	19	10 to 60	1 to 65535
1Gbps	4	3 to 10	1 to 65535
10Gbps	2	1 to 5	1 to 65535

On each bridge, the root port is the port through which this bridge communicates with the root. It is the port on this switch with the lowest path cost to the root (the root path cost). If there is no root port, then this switch has been accepted as the root bridge of the spanning tree network.

For each LAN segment, a designated bridge is selected. This bridge has the lowest cost to the root among the bridges connected to the LAN.

### 5.2.2 How STP Works

After a bridge determines the lowest cost-spanning tree with STP, it enables the root port and the ports that are the designated ports for connected LANs, and disables all other ports that participate in STP. Network packets are therefore only forwarded between enabled ports, eliminating any possible network loops.

STP-aware switches exchange Bridge Protocol Data Units (BPDUs) periodically. When the bridged LAN topology changes, a new spanning tree is constructed.



Once a stable network topology has been established, all bridges listen for Hello BPDUs (Bridge Protocol Data Units) transmitted from the root bridge. If a bridge does not get a Hello BPDU after a predefined interval (Max Age), the bridge assumes that the link to the root bridge is down. This bridge then initiates negotiations with other bridges to reconfigure the network to re-establish a valid network topology.

### 5.2.3 STP Port States

STP assigns five port states (see next table) to eliminate packet looping. A bridge port is not allowed to go directly from blocking state to forwarding state so as to eliminate transient loops.

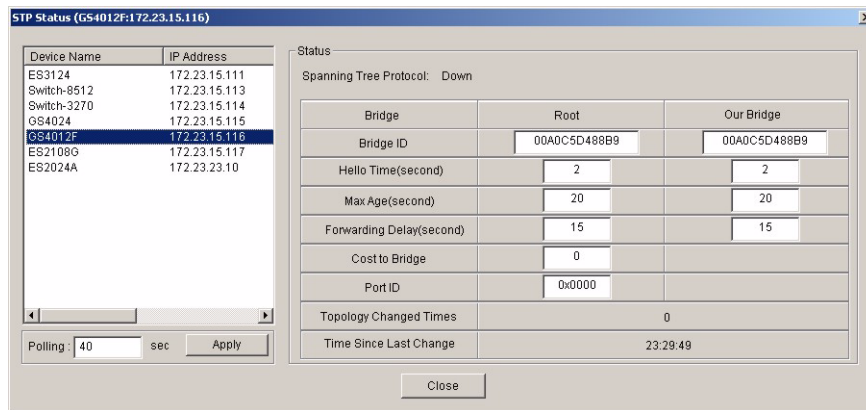
**Table 18** STP Port States

PORT STATE	DESCRIPTION
Disabled	STP is disabled (default).
Blocking	Only configuration and management BPDUs are received and processed.
Listening	All BPDUs are received and processed.
Learning	All BPDUs are received and processed. Information frames are submitted to the learning process but not forwarded.
Forwarding	All BPDUs are received and processed. All information frames are received and forwarded.

### 5.2.4 STP Status

View current STP information in the **STP Status** screen. Click **Status > STP Status** and select a switch from the device list located on the left-hand side of the screen. The STP status displays in the table on the right.

**Figure 22** View: STP Status



The following table describes the labels in this screen.

**Table 19** View: STP Status

LABEL	DESCRIPTION
Spanning Tree Protocol	This field displays <b>Running</b> if STP is activated; otherwise, it displays <b>Down</b> .
Bridge	<b>Root</b> refers to the base of the spanning tree (the root bridge).
Bridge ID	This is the unique identifier for this bridge, consisting of bridge priority plus MAC address.
Hello Time (second)	This is the time interval (in seconds) at which the root device transmits a configuration message. The root bridge determines Hello Time, Max Age and Forwarding Delay
Max Age (second)	This is the maximum time (in seconds) a switch can wait without receiving a configuration message before attempting to reconfigure.
Forwarding Delay (second)	This is the time (in seconds) the root switch will wait before changing states (that is, listening to learning to forwarding).
Cost to Bridge	This is the path cost from the root port on this switch to the root switch.
Port ID	This is the priority and number of the port on the switch through which this switch must communicate with the root of the spanning tree.
Topology Changed Times	This is the number of times the spanning tree has been reconfigured.
Time Since Last Change	This is the time since the spanning tree was last reconfigured.
Polling	The text box displays how often (in seconds) this screen refreshes. You may change the refresh interval by typing a new number in the text box and then clicking the <b>Apply</b> button.
Close	Click <b>Close</b> to close the screen.

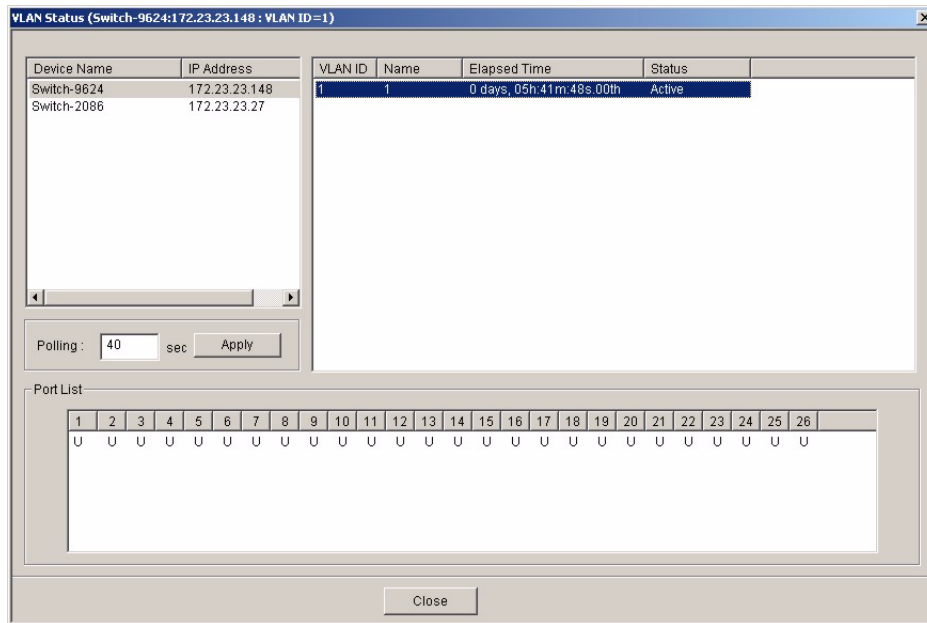
## 5.3 VLAN Status

Follow the steps below to view the VLAN status of a switch.

**Note:** The VLAN Status screen only displays static IEEE 802.1q VLAN information.

- 1 Click **View > VLAN Status**.
- 2 Choose a switch from the list located on the left-hand side of the screen.

**Figure 23** View: VLAN Status



The following table describes the labels in this screen.

**Table 20** View: VLAN Status

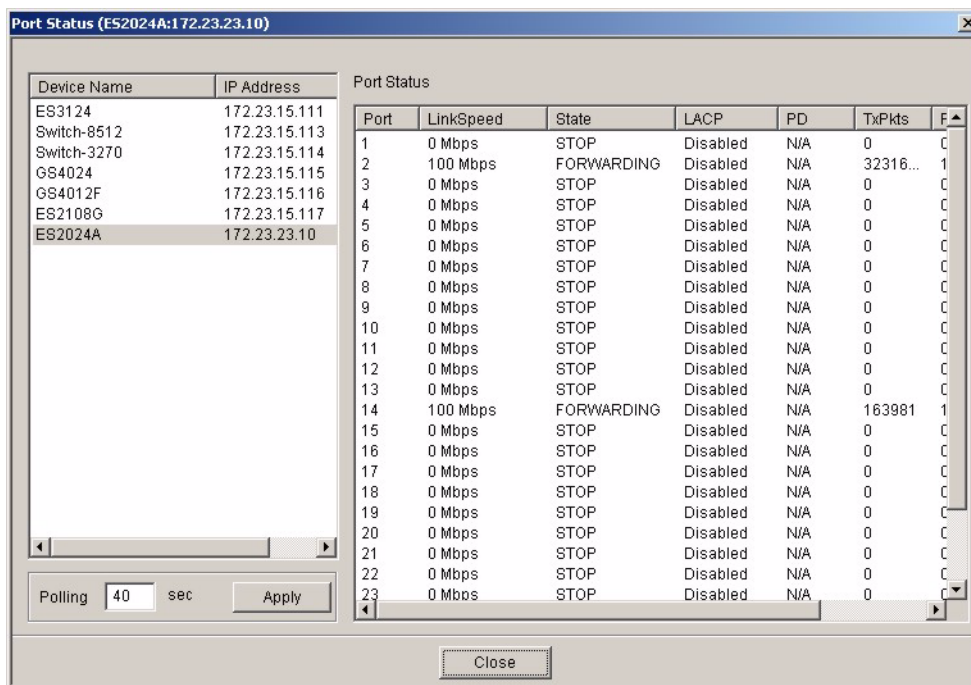
LABEL	DESCRIPTION
VLAN ID	This field displays the identification number of the VLAN.
Name	This field displays a unique number for identification purposes.
Elapsed Time	This field displays the time since the VLAN was created.
Status	This field displays <b>Static</b> if the VLAN is active and will remain so after the next reset of the device. This field displays <b>GVRP</b> if the VLAN is active and will remain so until removed by GVRP. This field is <b>Other</b> if the VLAN is active, but is not permanent or created by GVRP.
Port List	This table displays port VLAN settings. A tagged port is marked <b>T</b> , an untagged port is marked <b>U</b> and a port not participating in a VLAN is marked <b>-</b> .
Polling	The text box displays how often (in seconds) this screen refreshes. You may change the refresh interval by typing a new number in the text box and then clicking the <b>Apply</b> button.
Close	Click <b>Close</b> to close the screen.

## 5.4 Port Status

Follow the steps below to view the port status of a switch.

- 1 Click **View > Port Status**.
- 2 To view the port status of a switch choose a switch from the list located on the left-hand side of the screen.

**Figure 24** View: Port Status



The following table describes the labels in this screen.

**Table 21** View: Port Status

LABEL	DESCRIPTION
Port	This identifies the Ethernet port.
Link Speed	This field displays the speed (either 10M for 10Mbps, 100M for 100Mbps or 1000M for 1000Mbps).
State	This field displays the STP state of the port. See the Spanning Tree Protocol chapter for details on STP port states.
LACP	This field displays whether LACP is activated.
PD	This field displays the power device (PD) module status on the switch. If <b>N/A</b> is displayed, the switch does not have a PD. This field displays <b>On</b> if the switch has a PD and it is in use. This field displays <b>Off</b> if the switch has a PD, but it is not in use.
TxPkts	This field shows the number of transmitted frames on this port.
RxPkts	This field shows the number of received frames on this port.
Errors	This field shows the number of received errors on this port.
Polling	The text box displays how often (in seconds) this screen refreshes. You may change the refresh interval by typing a new number in the text box and then clicking the <b>Apply</b> button.
Close	Click <b>Close</b> to close the screen.

## 5.5 802.1D

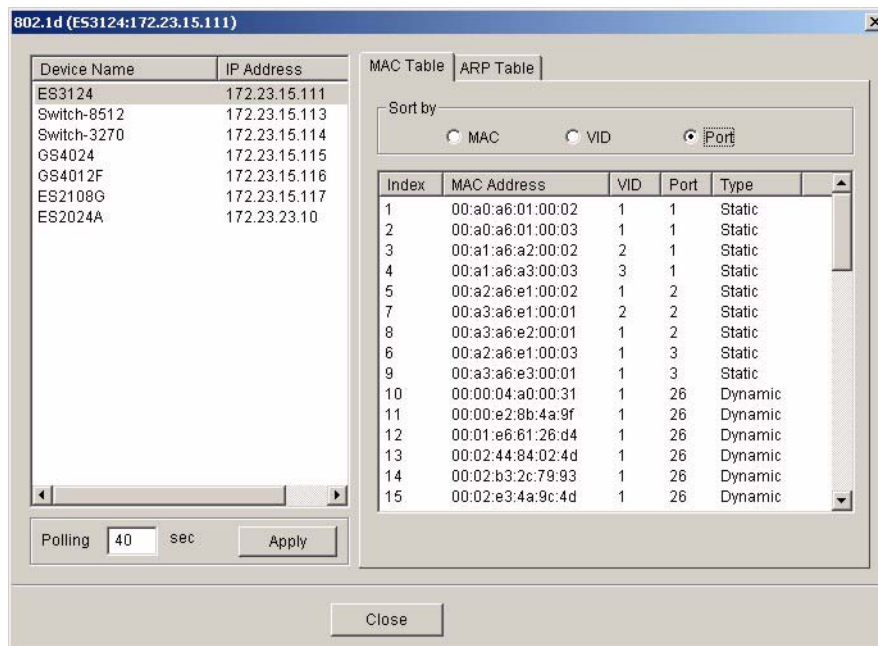
Use the following screens to view a table of MAC address entries or to view a table of IP address mappings.

### 5.5.1 MAC Table

Follow the steps below to view the MAC table.

- 1 Click **View > 802.1d**.
- 2 To view the MAC table of a switch choose a switch from the list located on the left-hand side of the screen.
- 3 Click the **MAC Table** tab.

**Figure 25** View: 802.1d: MAC Table



The following table describes the labels in this screen.

**Table 22** View: 802.1d: MAC Table

LABEL	DESCRIPTION
Sort by	Click one of the following buttons to display and arrange the data according to that button type. The information is then displayed in the summary table below.
MAC	Click this button to display and arrange the data according to MAC address.
VID	Click this button to display and arrange the data according to VLAN group.
Port	Click this button to display and arrange the data according to port number.
Index	This is the incoming frame index number.
MAC Address	This is the MAC address of the device from which this incoming frame came.

**Table 22** View: 802.1d: MAC Table (continued)

LABEL	DESCRIPTION
VID	This is the VLAN group to which this MAC address belongs.
Port	This is the port from which the above MAC address was learned.
Type	This shows whether the MAC address is dynamic (learned by the switch) or static (manually entered in the <b>Static MAC Forwarding</b> screen).
Polling	The text box displays how often (in seconds) this screen refreshes. You may change the refresh interval by typing a new number in the text box and then clicking the <b>Apply</b> button.
Close	Click <b>Close</b> to close the screen.

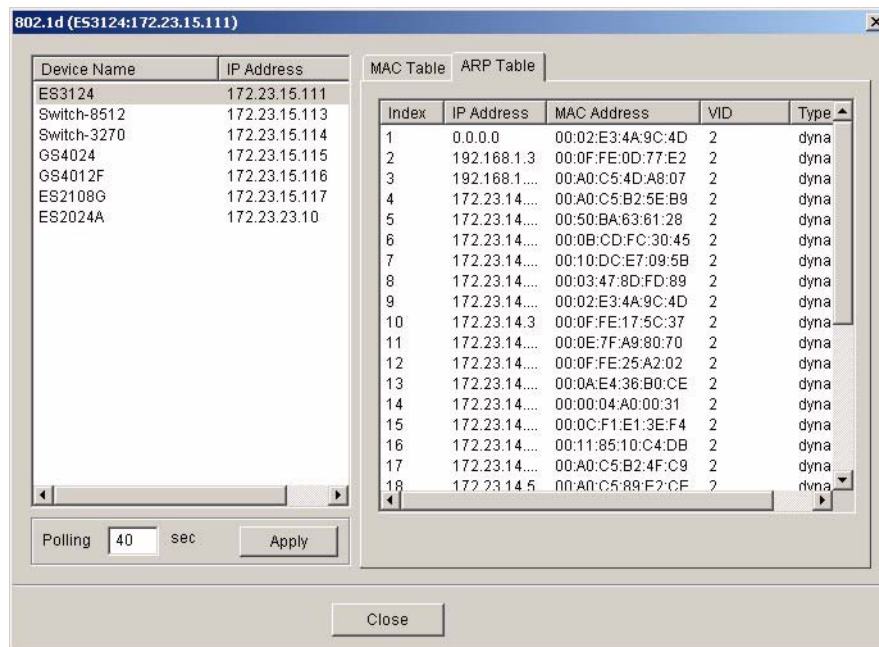
## 5.5.2 ARP Table

Address Resolution Protocol (ARP) is a protocol for mapping an Internet Protocol address (IP address) to a physical machine address, also known as a Media Access Control or MAC address, on the local area network.

Follow the steps below to view the ARP table.

- 1 Click **View > 802.1d**.
- 2 To view the ARP table of a switch choose a switch from the list located on the left-hand side of the screen.
- 3 Click the **ARP Table** tab.

**Figure 26** View: 802.1d: ARP Table



The following table describes the labels in this screen.

**Table 23** View: 802.1d: ARP Table

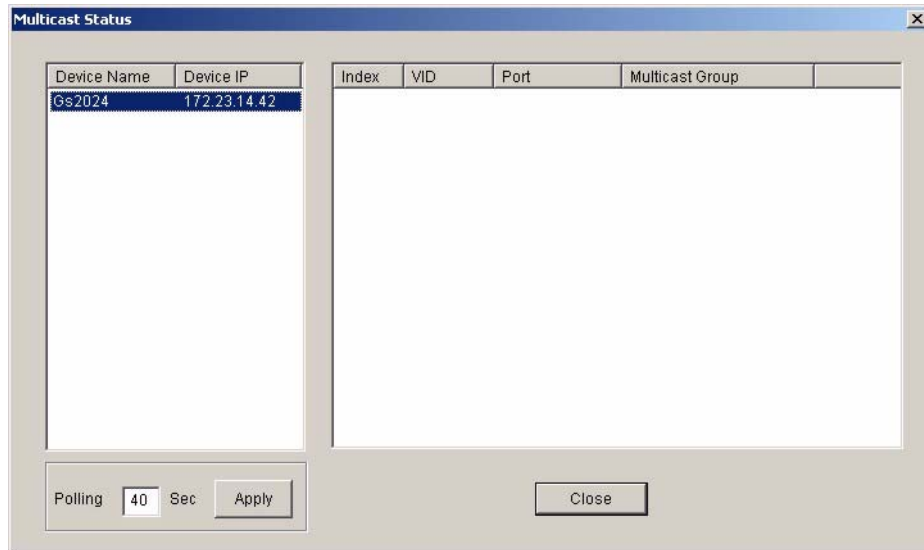
LABEL	DESCRIPTION
Index	This is the ARP table entry number.
IP Address	This is the learned IP address of a device connected to a switch port with corresponding MAC address below.
MAC Address	This is the MAC address of the device with corresponding IP address above.
VID	This is the VLAN group to which this ARP entry belongs.
Type	This shows whether the MAC address is dynamic (learned by the switch) or static (manually entered in the <b>Static MAC Forwarding</b> screen).
Polling	The text box displays how often (in seconds) this screen refreshes. You may change the refresh interval by typing a new number in the text box and then clicking the <b>Apply</b> button.
Close	Click <b>Close</b> to close the screen.

## 5.6 Multicast Status

View the IGMP multicast group membership information in the **Multicast Status** screen.

Click **View > Multicast Status** to display the screen as shown. Select a switch model in the device list to display the multicast group membership information.

**Figure 27** View: Multicast Status



The following table describes the labels in this screen.

**Table 24** View: Multicast Status

LABEL	DESCRIPTION
Index	This field displays the index number.
VID	This field displays the multicast VLAN ID.
Port	This field displays the port number(s) that belongs to the multicast group.
Multicast Group	This field displays the multicast group address.
Polling	The text box displays how often (in seconds) this screen refreshes. You may change the refresh interval by typing a new number in the text box and then clicking the <b>Apply</b> button.
Close	Click <b>Close</b> to close the screen.

## 5.7 IP Application Status

Use the **IP Application Status** screens to view the routing table, IP table, DHCP server, VRRP and OSPF status.

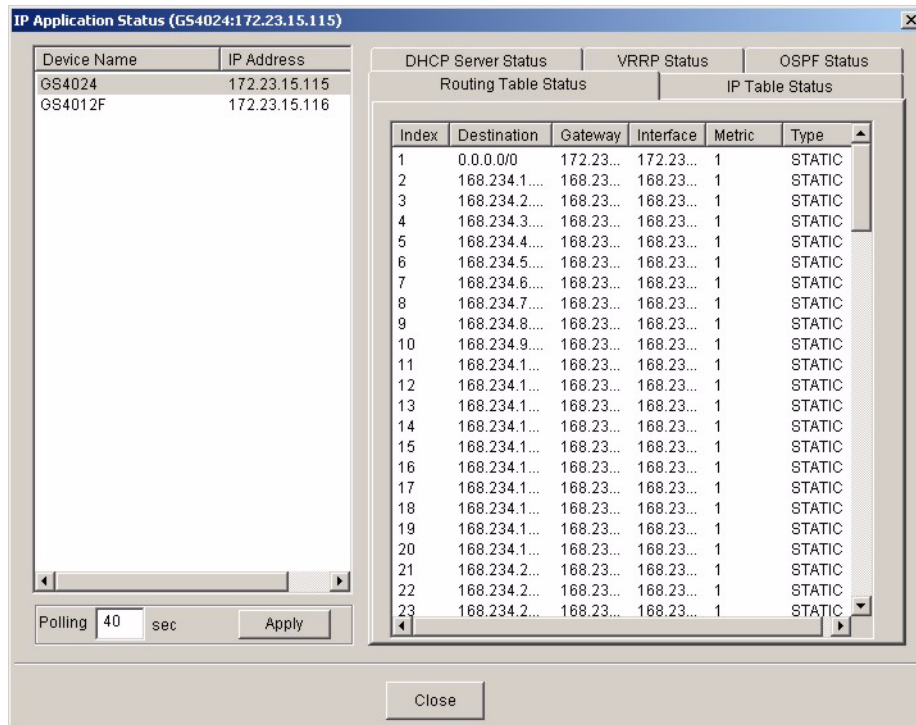
### 5.7.1 Routing Table Status

Follow the steps below to view the routing table of a selected device.

- 1** Click **View > IP Application Status**.
- 2** Select a switch from the list located on the left-hand side of the screen.
- 3** Click the **Routing Table Status** tab.



**Figure 28** View: IP Application Status: Routing Table Status



The following table describes the labels in this screen.

**Table 25** View: IP Application Status: Routing Table Status

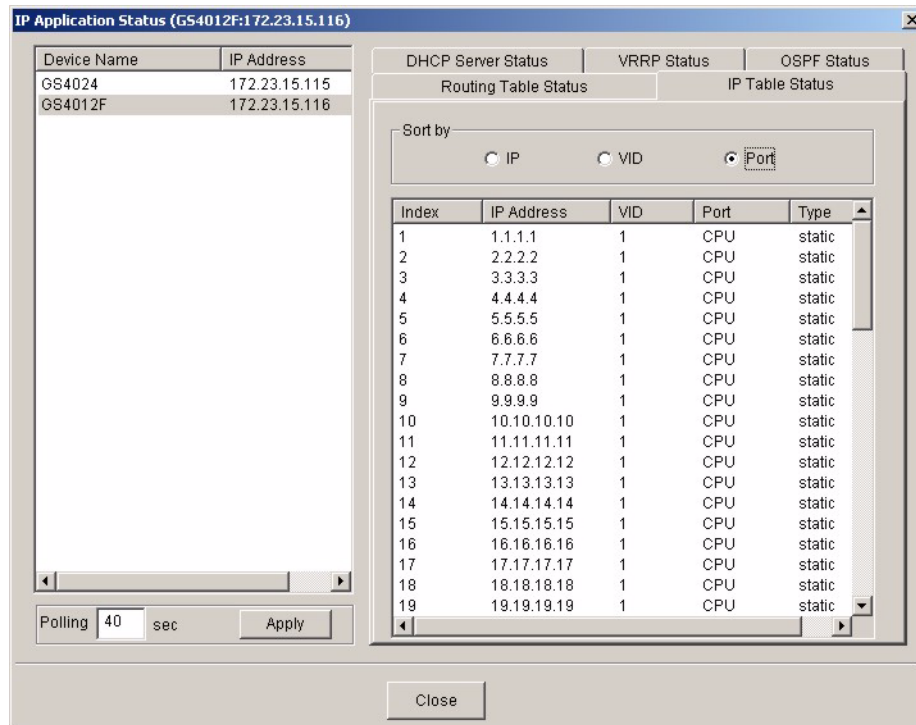
LABEL	DESCRIPTION
Index	This field displays the index number.
Destination	This field displays the destination IP routing domain.
Gateway	This field displays the IP address of the gateway device.
Interface	This field displays the IP interface to which this route belongs.
Metric	This field displays the cost of the route.
Type	This field displays the method used to learn the route.
Polling	The text box displays how often (in seconds) this screen refreshes. You may change the refresh interval by typing a new number in the text box and then clicking the <b>Apply</b> button.
Close	Click <b>Close</b> to close the screen.

### 5.7.2 IP Table Status

Follow the steps below to view the IP table of a selected device.

- 1** Click **View > IP Application Status**.
- 2** Select a switch from the list located on the left-hand side of the screen.
- 3** Click the **IP Table Status** tab.

**Figure 29** View: IP Application Status: IP Table Status



The following table describes the labels in this screen.

**Table 26** View: IP Application Status: IP Table Status

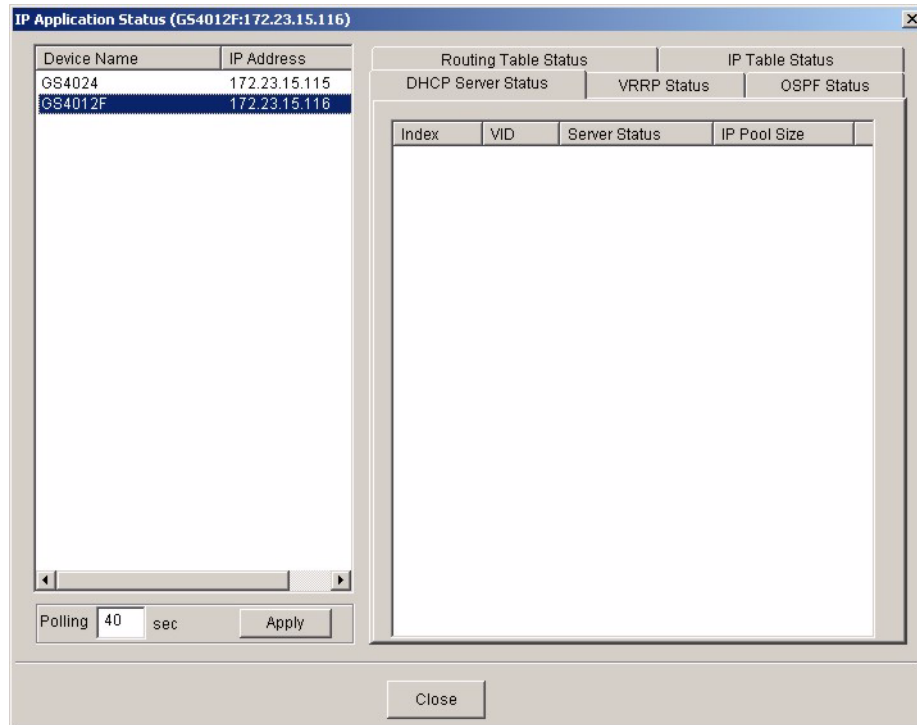
LABEL	DESCRIPTION
Sort by	Click one of the following buttons to display and arrange the data according to that button type. The information is then displayed in the summary table below.
IP	Click this button to display and arrange the data according to IP address.
VID	Click this button to display and arrange the data according to VLAN group.
Port	Click this button to display and arrange the data according to port number.
Index	This field displays the index number.
IP Address	This is the IP address of the device from which the incoming packets came.
VID	This is the VLAN group to which the packet belongs.
Port	This is the port from which the above IP address was learned. This field displays <b>CPU</b> to indicate the IP address belongs to the switch.
Type	This shows whether the IP address is <b>dynamic</b> (learned by the switch) or <b>static</b> (belonging to the switch).
Polling	The text box displays how often (in seconds) this screen refreshes. You may change the refresh interval by typing a new number in the text box and then clicking the <b>Apply</b> button.
Close	Click <b>Close</b> to close the screen.

### 5.7.3 DHCP Server Status

Follow the steps below to view the DHCP server status of a selected device.

- 1 Click **View > IP Application Status**.
- 2 Select a switch from the list located on the left-hand side of the screen.
- 3 Click the **DHCP Server Status** tab.

**Figure 30** View: IP Application Status: DHCP Server Status



The following table describes the labels in this screen.

**Table 27** View: IP Application Status: DHCP Server Status

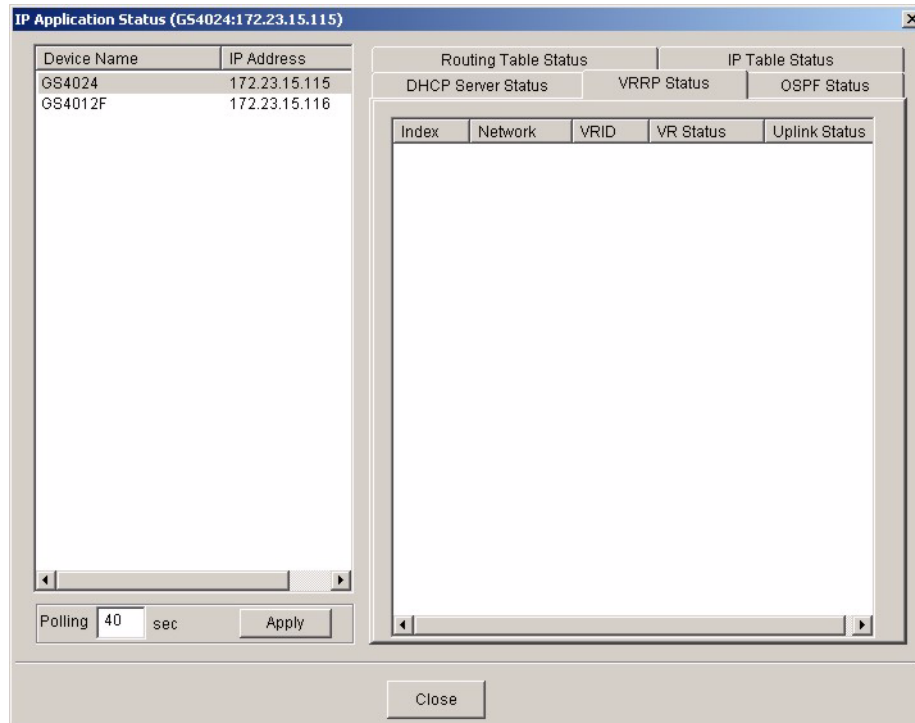
LABEL	DESCRIPTION
Index	This is the index number.
VID	This field displays the ID number of the VLAN group to which this DHCP settings apply.
Server Status	This field displays the starting DHCP client IP address.
IP Pool Size	This field displays the size of the DHCP client IP address pool.
Polling	The text box displays how often (in seconds) this screen refreshes. You may change the refresh interval by typing a new number in the text box and then clicking <b>Apply</b> .
Close	Click <b>Close</b> to close this screen.

## 5.7.4 VRRP Status

Follow the steps below to view the VRRP status of a selected device.

- 1 Click **View > IP Application Status**.
- 2 Select a switch from the list located on the left-hand side of the screen.
- 3 Click the **VRRP Status** tab.

**Figure 31** View: IP Application Status: VRRP Status



The following table describes the labels in this screen.

**Table 28** View: IP Application Status: VRRP Status

LABEL	DESCRIPTION
Index	This field displays the index number of a rule.
Network	This field displays the IP address and the subnet mask bits of an IP routing domain that is associated to a virtual router.
VRID	This field displays the ID number of the virtual router.
VR Status	This field displays the status of the virtual router. This field is <b>Master</b> indicating that this switch functions as the master router. This field is <b>Backup</b> indicating that this switch functions as a backup router. This field displays <b>Init</b> when this switch is initiating the VRRP protocol or when the <b>Uplink Status</b> field displays <b>Dead</b> .

**Table 28** View: IP Application Status: VRRP Status (continued)

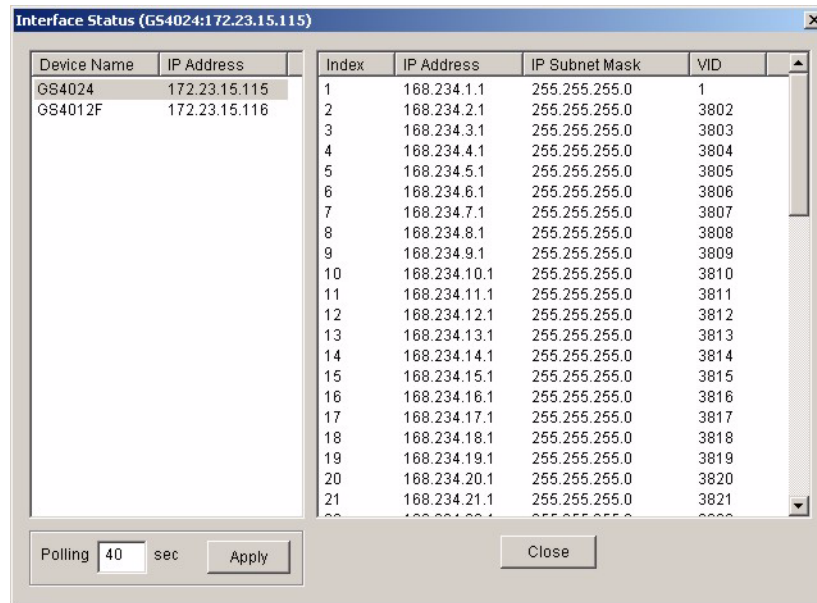
LABEL	DESCRIPTION
Uplink Status	This field displays the status of the link between this switch and the uplink gateway. This field is <b>Alive</b> indicating that the link between this switch and the uplink gateway is up. Otherwise, this field is <b>Dead</b> . This field displays <b>Probe</b> when this switch is check for the link state.
Polling	The text box displays how often (in seconds) this screen refreshes. You may change the refresh interval by typing a new number in the text box and then clicking <b>Apply</b> .
Close	Click <b>Close</b> to close this screen.

## 5.8 Interface Status

Follow the steps below to view the IP interface status of a selected device.

- 1 Click **View > Interface Status**.
- 2 Select a switch from the list located on the left-hand side of the screen.

**Figure 32** View: Interface Status



The following table describes the labels in this screen.

**Table 29** View: Interface Status

LABEL	DESCRIPTION
Index	This field displays the index number of an entry.
IP Address	This field displays IP address of the switch in the IP domain.
IP Subnet Mask	This field displays the subnet mask of the switch in the IP domain.
VID	This field displays the VLAN identification number of the IP domain on the switch.

**Table 29** View: Interface Status (continued)

LABEL	DESCRIPTION
Polling	The text box displays how often (in seconds) this screen refreshes. You may change the refresh interval by typing a new number in the text box and then clicking <b>Apply</b> .
Close	Click <b>Close</b> to close this screen.



# CHAPTER 6

## Template

This chapter describes how to configure VLAN, IGMP filtering and multicast templates.

### 6.1 Template Overview

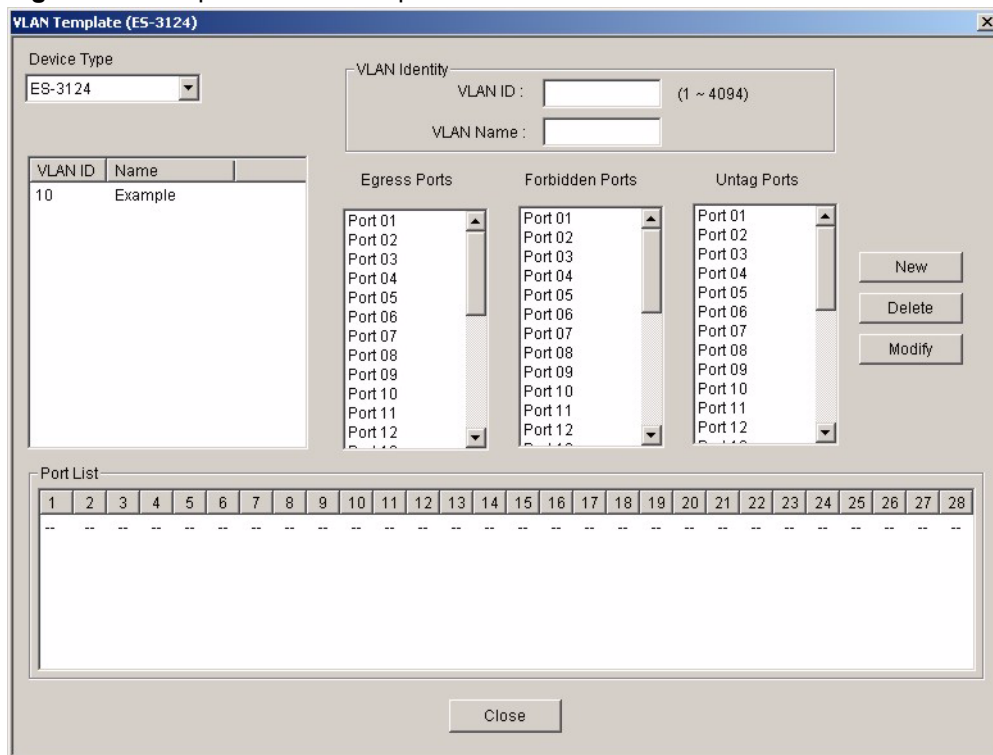
A template is a pre-configured set of configuration settings. Templates allow you to configure device VLANs, IGMP filters and multicast groups efficiently. The template can then be uploaded to one or more devices thus removing the need to configure the corresponding settings for each device.

### 6.2 VLAN Template

Refer to [Section 15.1 on page 134](#) for more background information on VLAN.

Click **Template > VLAN Template** to display the configuration screen. Use this screen to configure, delete or view a VLAN template.

**Figure 33** Template: VLAN Template





The following table describes the labels in this screen.

**Table 30** Template: VLAN

LABEL	DESCRIPTION
Device Type	Select a device for which you want to configure a VLAN template.
VLAN Identity	
VLAN ID	Enter a unique number to identify the VLAN.
VLAN Name	Enter a descriptive name for identification purposes.
Egress Ports	A port that is in the egress list in a VLAN. Only select this if the subscriber's DSL modem or router supports IEEE 802.1Q VLAN. Select the ports which you want to be egress ports from the list provided.
Forbidden Ports	A port that is blocked from joining a VLAN group. No frames are transmitted through this port. A forbidden port cannot be an egress port and cannot add tags to outgoing traffic. Select the ports which you want to be forbidden ports from the list provided.
Untag Ports	A port that does not tag all outgoing frames transmitted. An egress port can be untagged. Select the ports which you want to be untagged ports from the list provided.
New	Click <b>New</b> to create a new VLAN. You must enter a <b>VLAN ID</b> and a <b>VLAN Name</b> to create a new <b>VLAN</b> . The new VLAN and name is displayed in the left-hand column in this screen.
Delete	Click on a VLAN in the left-hand column of this screen and then click the <b>Delete</b> button to remove it from the VLAN template.
Modify	Click on a VLAN in the left-hand column of this screen. Change the <b>VLAN Name</b> or change the configuration of the egress, forbidden and untagged ports. Click the <b>Modify</b> button to save the changes to the switch. If you want to change the <b>VLAN ID</b> of a VLAN configuration, you can only delete the VLAN configuration or create a new VLAN configuration using a different <b>VLAN ID</b> .
Port List	Click on a port in the <b>Egress Ports</b> list to add the selected port to the port list. If a port is not selected from any of the three port lists, then it is a normal tagged port. This table displays port VLAN settings. A tagged port is marked <b>T</b> , an untagged port is marked <b>U</b> and a port not participating in a VLAN is marked <b>-</b> .
Close	Click <b>Close</b> to close the screen.

## 6.2.1 Creating a New VLAN Template

Follow the steps below to create a new VLAN template for a switch.

- 1** Click **Template > VLAN Template**.
- 2** A screen displays. Select a switch model in the **Device List** field.
- 3** Enter a unique number (between 1 and 4094) in the **VLAN ID** field.
- 4** Enter a descriptive name (up to 12 characters) in the **VLAN Name** field for identification purposes.
- 5** Configure the port VLAN settings. Select the port(s) in the **Egress Ports**, **Forbidden Ports** and **Untag Ports** fields. The VLAN port settings automatically displays in the **Port List** table.

6 Click **New**.

7 If the VLAN is created successfully, a screen displays. Click **OK**.

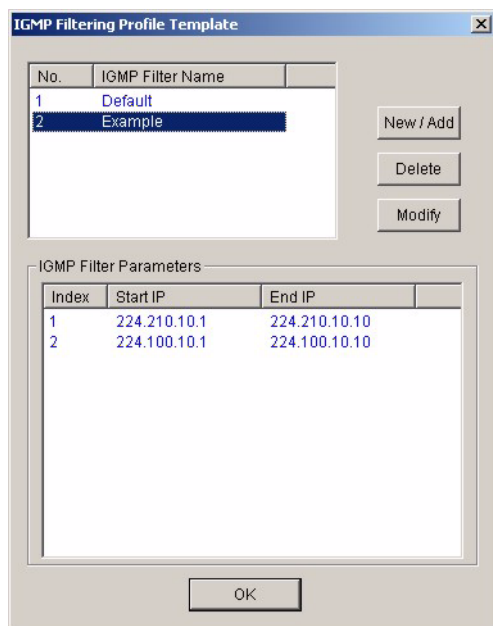
## 6.3 IGMP Filtering Profile Template

With IGMP filtering, you can control which IGMP groups a subscriber on a port can join. This allows you to control the distribution of multicast services (such as content information distribution) based on service plans and types of subscription.

You can set the switch to filter the multicast group join reports on a per-port basis by configuring an IGMP filtering profile and associating the profile to a port.

Click **Template > IGMP Filtering Profile Template** to display the screen as shown.

**Figure 34** Template: IGMP Filtering Profile Template



The following table describes the labels in this screen.

**Table 31** Template: IGMP Filter Template

LABEL	DESCRIPTION
No.	This field displays the index number.
IGMP Filter Name	This name identifies the IGMP filter profile.
New/Add	Click <b>New/Add</b> to create an IGMP filter profile.
Delete	Click <b>Delete</b> to remove one or more selected IGMP filter profiles.
Modify	Click <b>Modify</b> to edit a selected IGMP filter profile.

**Table 31** Template: IGMP Filter Template (continued)

LABEL	DESCRIPTION
IGMP Filter Parameters	This table displays the settings of the selected IGMP filter above.
Index	This is the number of the IGMP filter profile.
Start IP	This field displays the starting multicast IP address for a range of multicast IP addresses to which you want this IGMP filter profile to allow access.
End IP	This field displays the ending multicast IP address for a range of IP addresses to which you want this IGMP filter profile to allow access.
OK	Click <b>OK</b> to save your changes.

### 6.3.1 Configuring an IGMP Filter Template

Click **New/Add** in the **IGMP Filtering Template** screen to display the screen as shown.

**Figure 35** Template: New IGMP Filter

The following table describes the labels in this screen.

**Table 32** Template: New IGMP Filter

LABEL	DESCRIPTION
IGMP Filter Name	Type a name (up to 31 printable characters) to identify the IGMP filter profile.
Start Address	Enter the starting multicast IP address for a range of multicast IP addresses to which you want this IGMP filter profile to allow access.

**Table 32** Template: New IGMP Filter (continued)

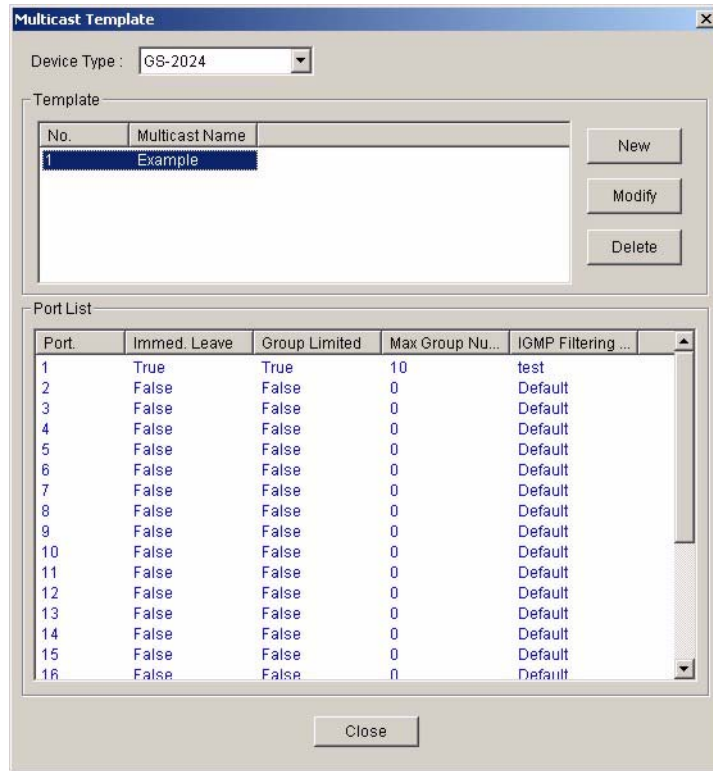
LABEL	DESCRIPTION
End Address	Enter the ending multicast IP address for a range of IP addresses to which you want this IGMP filter profile to allow access. If you want to add a single multicast IP address, enter it in both the <b>Start IP</b> and <b>End IP</b> fields.
Add	Click <b>Add</b> to create a new IGMP filter.
Clear	Click <b>Clear</b> to remove the selected IGMP filter template.
IGMP Filter Parameters	
Index	This is the number of the IGMP filter profile. Double-click a profile's index number to edit the profile.
Start Address	This field displays the starting multicast IP address for a range of multicast IP addresses to which you want this IGMP filter profile to allow access.
End Address	This field displays the ending multicast IP address for a range of IP addresses to which you want this IGMP filter profile to allow access.
Close	Click <b>Close</b> to close this screen.

## 6.4 Static Multicast Group Template

Use the static multicast filter to allow incoming frames based on multicast MAC address(es) that you specify. This feature can be used in conjunction with IGMP snooping to allow multicast MAC address(es) that are not learned by IGMP snooping. Use the static multicast filter to pass routing protocols, such as RIP and OSPF.

Click **Template** > **Multicast Template** to display the screen as shown.

**Figure 36** Template: Multicast Template



The following table describes the labels in this screen.

**Table 33** Template: Multicast

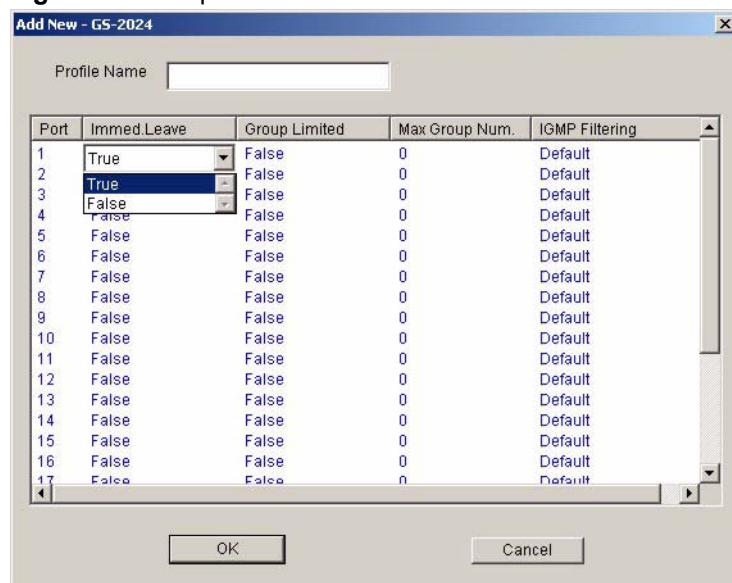
LABEL	DESCRIPTION
Device Type	Select a device from the drop-down list box to view the device's VLAN configuration.
Template	
No.	This field displays the index number.
Multicast Name	This field displays the descriptive name for the multicast template.
New	Click <b>New</b> to create a new multicast template.
Modify	Click <b>Modify</b> to change the settings of the selected multicast template.
Delete	Click <b>Delete</b> to remove the selected multicast template.
Port List	
Port	This field displays the port number.
Immed. Leave	This field displays <b>True</b> when the switch is set to remove this port from the multicast tree when an IGMP version 2 leave message is received on this port. This field displays <b>False</b> when the feature is disabled.
Group Limit	This field shows whether the switch limit the number of multicast groups this port is allowed to join or not. Once a port is registered in the specified number of multicast groups, any new IGMP join report frame(s) is dropped on this port.
Max. Group Number	This field displays the number of multicast groups this port is allowed to join.

**Table 33** Template: Multicast (continued)

LABEL	DESCRIPTION
IGMP Filtering	This field displays the name of the IGMP filtering profile to use for this port.
Close	Click <b>Close</b> to close this screen.

## 6.4.1 Configuring a Multicast Template

To create a new multicast template, click **New** in the **Multicast Template** screen.

**Figure 37** Template: New Multicast


The following table describes the labels in this screen.

**Table 34** Template: New Multicast

LABEL	DESCRIPTION
Profile Name	Enter a descriptive name for the new multicast template.
Port	This field displays the port number.
Immed. Leave	Double-click this field and specify whether the switch is to remove this port from the multicast tree when an IGMP version 2 leave message is received on this port. Select <b>True</b> from the drop-down list box to activate the immediate leave feature. Select <b>False</b> to disable this feature.
Group Limit	Double-click to configure this field. Select <b>True</b> to limit the number of multicast groups this port is allowed to join. Once a port is registered in the specified number of multicast groups, any new IGMP join report frame(s) is dropped on this port. Select <b>False</b> to disable this feature.
Max. Group Number	Double-click this field and enter a number to limit the number of multicast groups this port is allowed to join. Once a port is registered in the specified number of multicast groups, any new IGMP join report frame(s) is dropped on this port.

**Table 34** Template: New Multicast (continued)

LABEL	DESCRIPTION
IGMP Filter	Double-click this field to select the name of the IGMP filtering profile to use for this port.
OK	Click <b>OK</b> to save the settings and close this screen.
Cancel	Click <b>Cancel</b> to discard all changes and close this screen.

# CHAPTER 7

## Provisioning

This chapter shows you how to use the **Provisioning** screens to apply templates.

### 7.1 Overview

After you have created an IGMP filter profile (or template) in the Template screens, you can use the Provisioning screens to apply or delete IGMP filter profiles to or from a device.

**Note:** You must first create IGMP filtering templates before you can apply them using the Provisioning screen. Refer to the chapter on creating templates for more information.

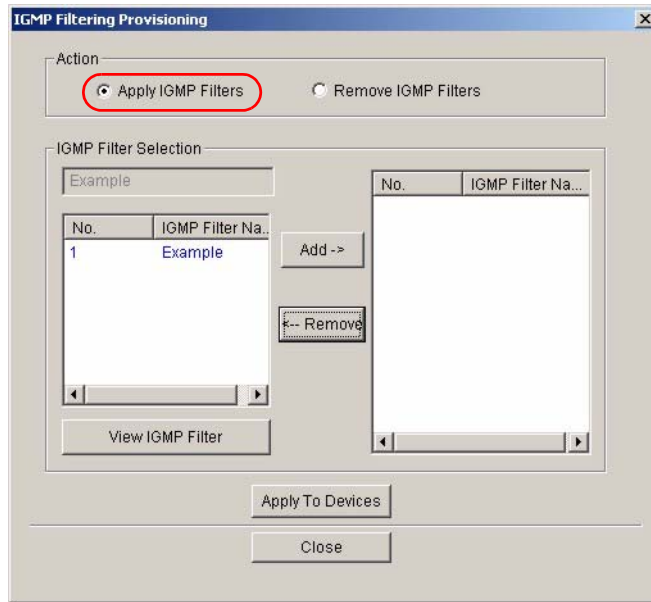
### 7.2 Applying an IGMP Filter Profile

Follow the steps below to apply an IGMP filter to a device.

- 1** Click **Provisioning** > **IGMP Filter Provisioning** to display the screen as shown.
- 2** Select **Apply IGMP Filters** under **Action**.
- 3** Select a profile you want to use on the left and click **Add**. You can view the profile settings by clicking **View IGMP Filter**. Refer to the chapter on IGMP filter template settings for field descriptions.

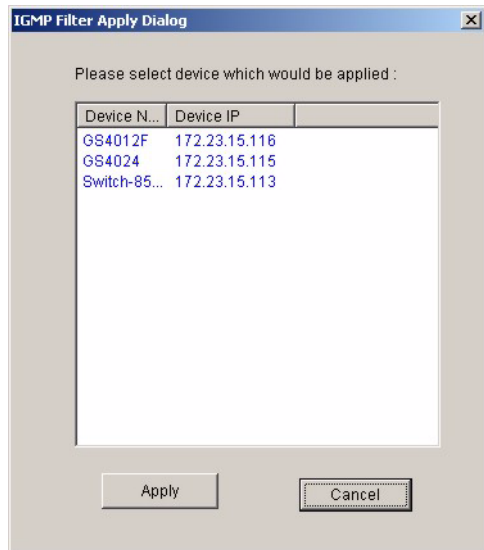


**Figure 38** Provisioning: IGMP Filter



- 4** Click **Apply To Devices** to apply the selected IGMP filter profile(s).
- 5** A screen displays as shown. Select the device(s) to which you want to apply the IGMP filter(s). To select more than one device, press [SHIFT] or [CTRL] and select at the same time.

**Figure 39** Provisioning: IGMP Filter: Apply to Devices



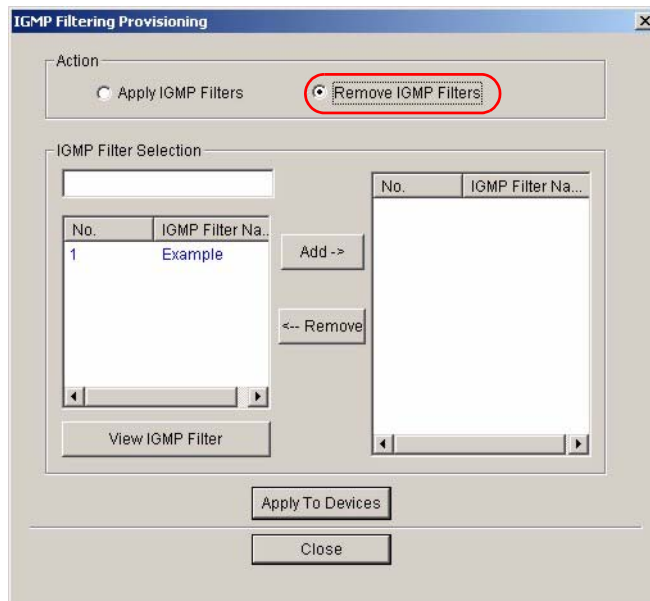
- 6** Click **Apply** to copy the IGMP filter profile settings to the selected device(s).
- 7** A screen displays showing the profile copy status. Click **OK** to close this screen.

**Figure 40** Provisioning: IGMP Filter: Apply to Devices: Successful

## 7.3 Removing an IGMP Filter Profile

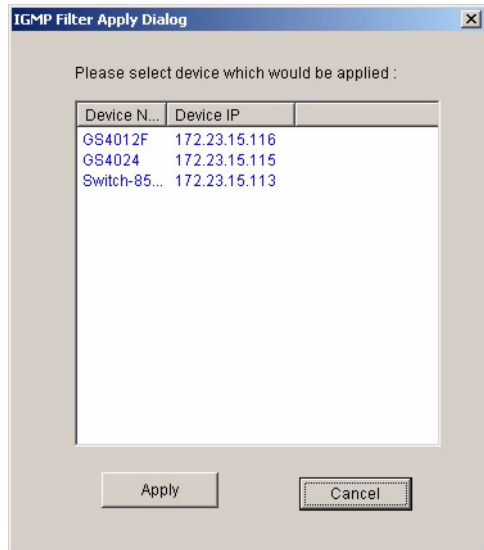
Follow the steps below to remove an IGMP filter from a device.

- 1 Click **Provisioning** > **IGMP Filter Provision** to display the screen as shown.
- 2 Select **Remove IGMP Filters** under **Action**.
- 3 Select a profile you want to remove and click **Add**. You can view the profile settings by clicking **View IGMP Filter**. Refer to the chapter on IGMP filter template settings for field

**Figure 41** Provisioning: IGMP Filter: Remove From Devices

- 4 Click **Apply To Devices**.
- 5 A screen displays as shown. Select the device(s) from which you want to remove the IGMP filter(s). To select more than one device, press [SHIFT] or [CTRL] and select at the same time.

**Figure 42** Provisioning: IGMP Filter: Remove From Devices: Select Device



- 6** Click **OK** to remove the IGMP filter profile settings from the selected device(s).
- 7** A **Result** screen displays showing the profile removal status. Click **Close** to close this screen.

**Figure 43** Provisioning: IGMP Filter: Remove From Devices: Successful



# CHAPTER 8

## Performance

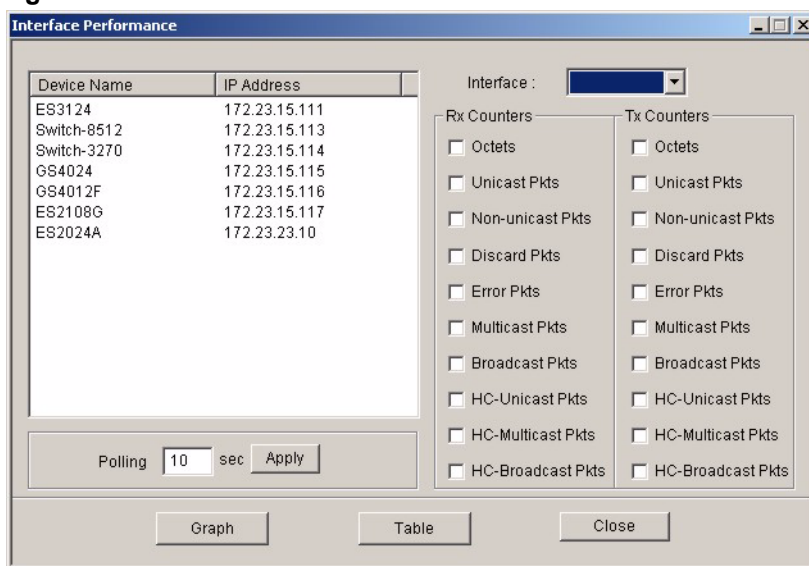
This chapter describes the interface performance screen, graph setup and table setup. View Ethernet history statistics for your switch network.

### 8.1 Interface Performance

This section shows you how to configure what you want to display in a performance table or graph.

Click **Performance > Interface** in the EMS main menu.

**Figure 44** Performance: Interface



The following table describes the labels in this screen.

**Table 35** Performance: Interface

LABEL	DESCRIPTION
Interface	Select an interface (or port) from the drop-down list box.
Rx Counters	The following fields display the types of packet counters received on this interface.
Tx Counters	This following fields display the types of packet counters transmitted on this interface.
Octets	Select this option to show the total number of octets received or transmitted.
Unicast Pkts	Select this option to show the total number of good unicast packets received or transmitted that were dropped.

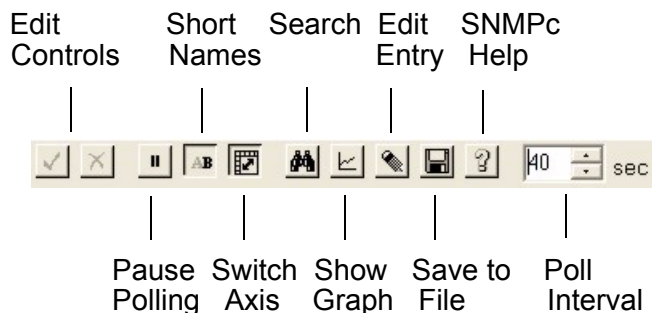
**Table 35** Performance: Interface (continued)

LABEL	DESCRIPTION
Non-unicast Pkts	Select this option to show the total number of good non-unicast packets received or transmitted that were dropped.
Discard Pkts	Select this option to show the total number of packets received or transmitted that were dropped.
Error Pkts	Select this option to show the total number of error packets received or transmitted.
Multicast Pkts	Select this option to show the total number of good multicast packets received or transmitted.
Broadcast Pkts	Select this option to show the total number of good broadcast packets received or transmitted.
HC-Unicast Pkts	Select this option to show the number of unicast packets (High Capacity (HC) 64 ~ 1518 octets long) dropped because they either had a bad Frame Check Sequence (FCS) or non-integer number of octets (alignment error).
HC-Multicast Pkts	Select this option to show the number of multicast packets (High Capacity (HC) 64 ~ 1518 octets long) dropped because they either had a bad Frame Check Sequence (FCS) or non-integer number of octets (alignment error).
HC-Broadcast Pkts	Select this option to show the number of broadcast packets (High Capacity (HC) 64 ~ 1518 octets long) dropped because they either had a bad Frame Check Sequence (FCS) or non-integer number of octets (alignment error).
Graph	Click the <b>Graph</b> button to create a graph based on the above selections.
Table	Click the <b>Table</b> button to create a table based on the above selections.
Close	Click <b>Close</b> to close the screen.

## 8.2 Table Menu Bar Icons


The following figure displays the table menu bar icons. These icons are common to all screens that display information in tabular format.

**Figure 45** Table Menu Bar Icons

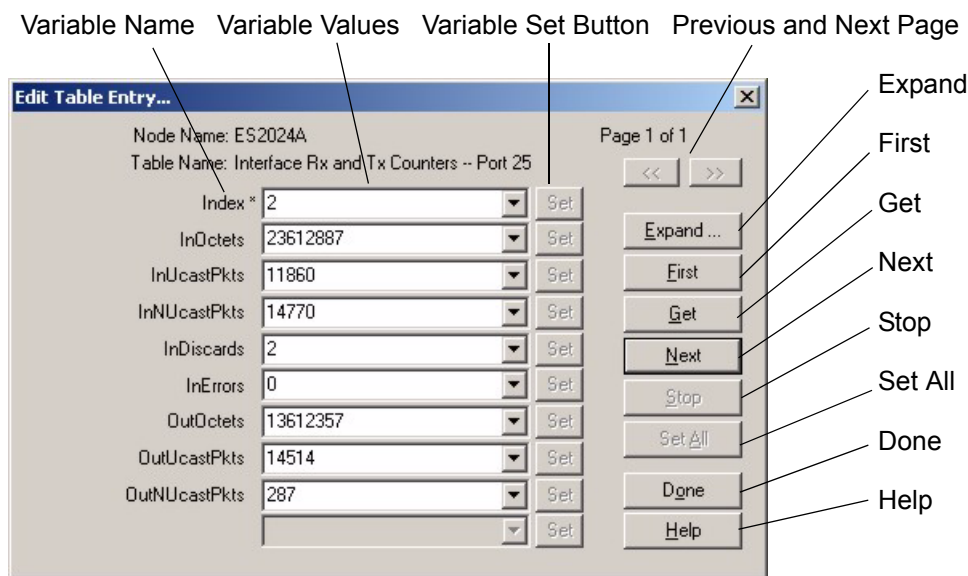


## 8.2.1 Editing a Table Entry

**Note:** You can edit a table entry in all screens that display information in tabular format.

In any tabulated screen display, click the **Edit** icon  in the menu bar icon to display the **Edit Table Entry** screen and edit any field in a table. There is a set of variable names, value and set button controls that operate on the fields of the selected table. There is also a set of function control buttons on the right. For tables that have more than ten entries, the **Edit Table Entry** screen supports multiple pages.

**Figure 46** Edit Table Entry



The following table describes the labels in this screen.

**Table 36** Edit Table Entry

COMMAND	DESCRIPTION
Variable Names	The first vertical column contains the variable names; these are the names of fields in the selected table. These names are set by SNMPc and cannot be changed. Some tables have variable names with an asterisk to the right of the name. These variables are used as indices into the table. All index variables must be specified to perform a Set operation.
Variable Values	The second vertical column contains the variable values in pull down list boxes. You can change the value by typing into the pull down edit box. If the variable has integer aliases defined in the MIB, you can select an alias by clicking on the down arrow and selecting an item from the drop down list. You must enter the variable value in the proper format. Use the expand button (see next section) to view the variable type.
Variable Set Button	Each variable value has a small Set button to the right. Click this <b>Set</b> button to perform an SNMP set on only one variable. Set buttons are grayed for variables that are read-only.

**Table 36** Edit Table Entry (continued)

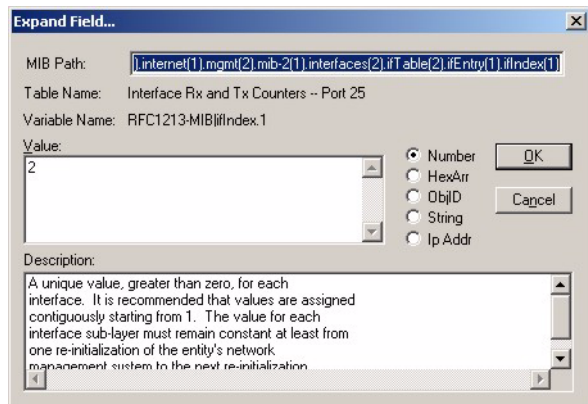
COMMAND	DESCRIPTION
Previous/Next Page Buttons	Each page shows up to ten variables. The page number and total number of pages are displayed in the top right corner. Use the >> button to move to the next page and click the << button to move to the previous page.
Expand	Click the <b>Expand</b> button to expand the view of the active variable value edit box. First click on the edit box, then select the <b>Expand</b> button.
First	Click the <b>First</b> button to obtain the first entry of the table from the node. The variable values will be updated. You do not need to enter index values - they will be ignored.
Get	Click the <b>Get</b> button to obtain the selected table entry. Enter all of the index values to select a table entry. If you have already displayed an entry, and perhaps modified the value boxes, you can Click the <b>Get</b> button to refresh the variable values.
Next	Click the <b>Next</b> button to obtain the next entry of the table from the node, using an SNMP GetNext operation. The variable values are updated. If there are no more entries in the table, a message is displayed. You can specify a starting point for the GetNext by entering index values. You do not need to enter all index values, but if you enter the Nth index value, you must also enter the 1st through (N-1)th index values.
Stop	Click the <b>Stop</b> button to abort the current SNMP operation. This button can be used to stop a command when a node is not responding and you don't want to wait for the timeout period.
Set All	Click the <b>Set All</b> button to set all writable variable values to the node. You must enter all of the index values (those with an asterisk to the right of the variable name) to select the table entry. If you do not know the proper index values, you can first find the entry you want to change by using the First and Get, Next buttons. Some nodes do not allow set operations to all variables that are defined as writable in the MIB. For these nodes, you will have to individually set table entry variables using the variable Set buttons.
Done	Click this button when you're done editing this dialog box.
Help	Click this button for online help.

**Note:** You can only use the variable Set button (via the EMS) to update system contact, system name, system location and the administrative status of each port.

## 8.2.2 Expand Dialog Box

In the **Edit Table Entry** screen click the **Expand** button to expand the view of the active variable value edit box. First click on the edit box, then click **Expand**.

**Figure 47** Expand Field



The **Expand** screen shows the variable value in a larger edit box, so you can more easily enter a long value. It also shows the variable type and a description from the MIB source file. Possible variable types are shown in the following table.

**Table 37** Variable Types

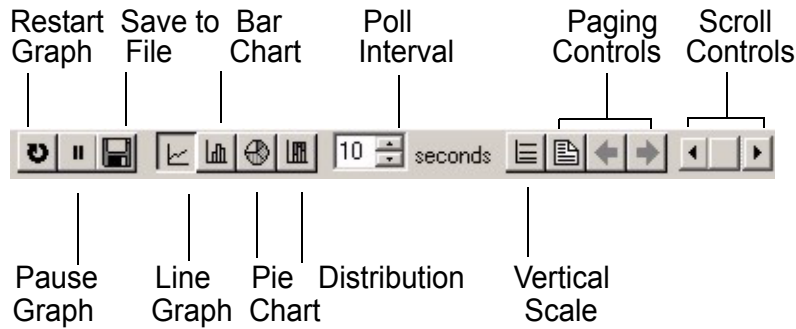
TYPE	DESCRIPTION
Number	This can be an INTEGER, COUNTER, GAUGE or Time Ticks. Data is normally represented as a decimal number. However, in cases where INTEGER aliases are defined in the MIB, an ASCII word will be displayed. For example, the value for ifOperStatus is displayed as UP or DOWN.
HexArr	OCTET PRIM TYPE. Data is formatted as a list of two digit hexadecimal numbers, representing one byte each, and separated by a single space, for example 22 3E 44 A1 10.
ObjID	OBJECT IDENTIFIER. Data is formatted in MIB dot format, optionally with a leading text identifier, for example sysObjectID.0 or 1.3.6.1.2.1.1.2.0.
String	This is OCTET PRIM TYPE with printable (ASCII string) data (DisplayString).
IP Addr	IP ADDRESS PRIM TYPE in dotted decimal notation, for example, 128.9.118.0.

### 8.3 Graph Menu Bar Icons

These graphical menu bar icons are common to all screens that display information in graphical format.



**Figure 48** Graph Menu Bar



### 8.3.1 Graph Styles

Use one of the style buttons to change the graph style to one of the following:

**Table 38** Edit Table Entry

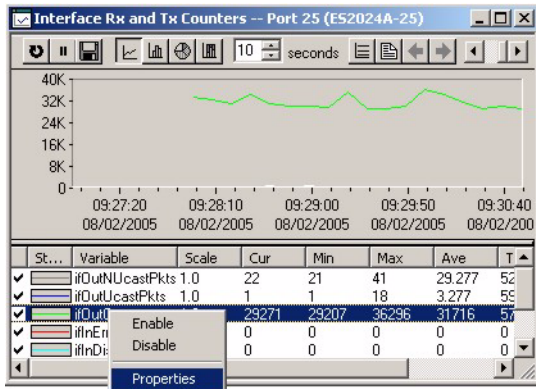
STYLE	DESCRIPTION
Line	Each variable is displayed as a line, with time as the horizontal axis. The vertical axis represents the size of each polled value for each poll interval.
Bar	The cumulative average value for each variable is displayed as a vertical bar.
Pie	All variables are displayed as relative sized portions of a pie diagram. The entire display represents a single poll interval.
Distribution	Each variable is displayed as a stacked vertical bar. Each segment of the bar represents the amount of time that the variable value is within a certain range (as a percent). The legend on the right side of the display shows the corresponding range for each color. The entire display represents a single poll interval.

### 8.3.2 Chart Format Display Variable

Choose which variables to display in chart format by doing one of the following:

- 1 Click a variable cell in a table and click the bar chart icon.
- 2 Display the chart menu and then deselect variables (all are displayed by default).
- 3 Right-click a variable's cell and select **Properties**.

**Figure 49** Cell Properties Select



4 A display properties dialog box opens. Select the **Display** check box.

**Figure 50** Chart Color Codes and Line Styles



You may also edit the color code and line style for a variable in the dialog box as described in the following table.

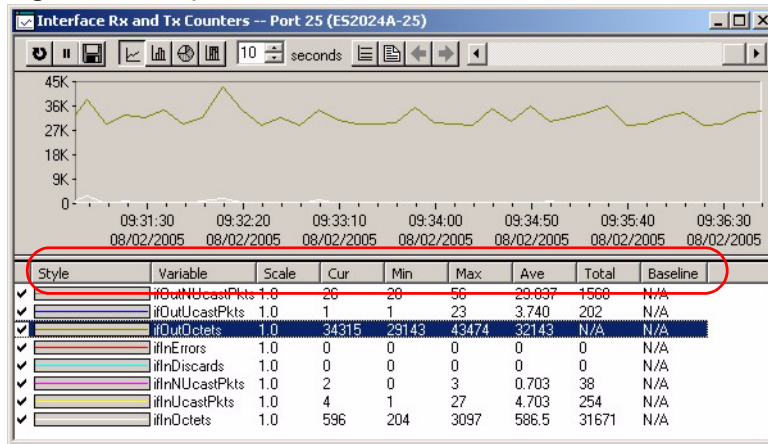
**Table 39** Edit Style Dialog Box

FIELD	DESCRIPTION
Display	Check Display to view information about this variable in chart format.
Color	Choose a color from this drop down list.
Style	Choose a line style from this drop down list.
Scale	Select the scaling multiplier from this drop down list. This factor is applied to each value in the line before it is displayed and can be used to keep all graph lines within a similar range of values. The range is from 0.0001 to 1000.0.

### 8.3.3 Graph Labels

In the **Interface** screen click the **Graph** button to display the following screen.

**Figure 51** Graph Variables



The following table describes the labels in this screen.

**Table 40** Graph Variables

LABEL	DESCRIPTION
Style	This is the line style discussed above.
Variable	This is the variable being represented by the line style discussed above.
Scale	This is the scaling multiplier.
Cur	This is the current value of the variable.
Min	This is the minimum value of the variable.
Max	This is the maximum value of the variable.
Ave	This is the average value of the variable.
Total	This is the total value of the variable.
Baseline	This is a measure of the typical variable behavior. After a learning period has transpired, SNMPc can automatically generate baseline alarms when variable values exceed the baseline.

# CHAPTER 9

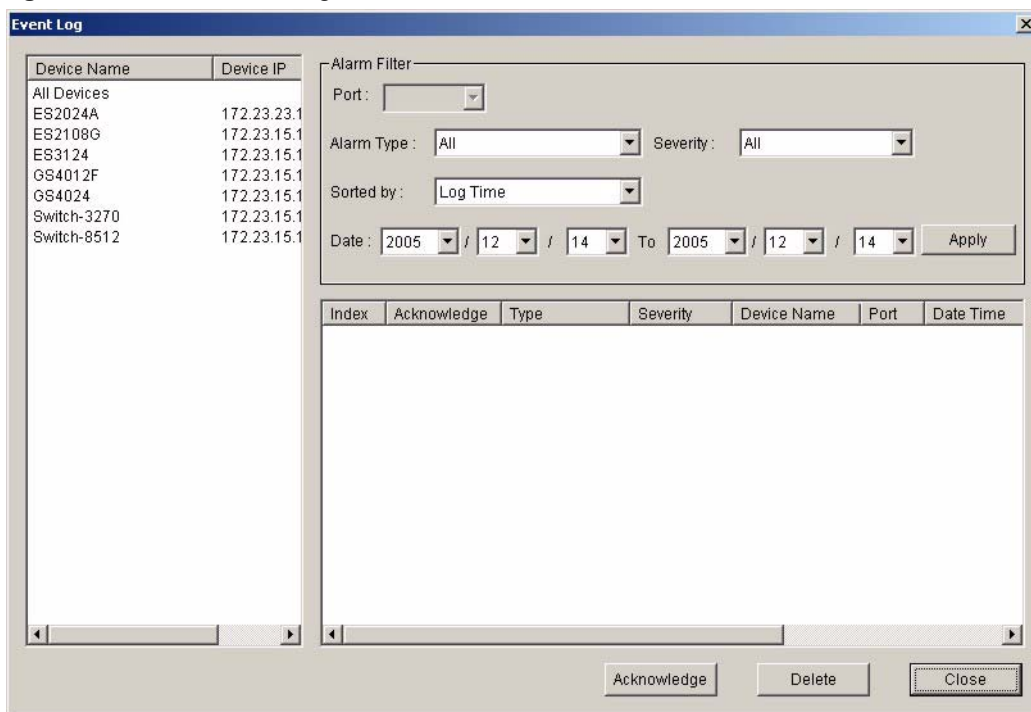
## Fault

This chapter describes the event logs and how to perform loopback tests using the Fault screens.

### 9.1 Event Log

To display system event logs click **Fault > Event Log** to view the following screen.

**Figure 52** Fault: Event Log



The following table describes the labels in this screen.

**Table 41** Fault: Event Log

LABEL	DESCRIPTION
Alarm Filter	
Port	To display event logs of a port, select the port from the drop-down list box.

**Table 41** Fault: Event Log (continued)

LABEL	DESCRIPTION
Alarm Type	Select the type of logs from the drop-down list box. Choices are <b>All</b> , <b>Communication</b> , <b>QualityOfService</b> , <b>ProcessingError</b> , <b>Equipment</b> and <b>Environmental</b> . Select <b>All</b> for system event logs generated by all alarm types. Select <b>Communication</b> for transmission and signal logs. Select <b>QualityOfService</b> for performance logs. Select <b>Processing Error</b> for software and configuration problem logs. Select <b>Equipment</b> for hardware-related logs. Select <b>Environmental</b> for environmental logs. See the appendix for a more detailed list of possible alarm causes.
Severity	Select the severity level of the logs you want to display from the drop-down list box. The choices and associated colors are as follows: <ul style="list-style-type: none"> <li>• Critical - Red</li> <li>• Major - Orange</li> <li>• Minor - Yellow</li> <li>• Information - Blue</li> <li>• Normal - Green</li> </ul>
Sorted by	Select <b>Log Time</b> to sort event logs by the time at which they were generated or select <b>Device Name</b> to sort event logs by the device from which they were generated.
Date / To	Specify the time range to display the event logs.
Apply	Click <b>Apply</b> to display event logs generated within the specified time period.
Alarm	
Index	This field displays the index number of the event logs.
Acknowledge	This field displays whether a log has been acknowledged so that EMS users will know when a log has been dealt with by an administrator.
Type	This field displays the type of the event log.
Severity	This field displays the severity of the event log.
Device Name	This field displays the name of the device on which the event log was generated.
Port	This field displays the port number on which the event log was generated.
Date Time	This field displays the date and time when the event log was generated.
Description	This field displays some information about the event log.
Acknowledge	Click <b>Acknowledge</b> to acknowledge any selected log messages.
Delete	Click <b>Delete</b> to remove the selected log.
Close	Click <b>Close</b> to close this screen.

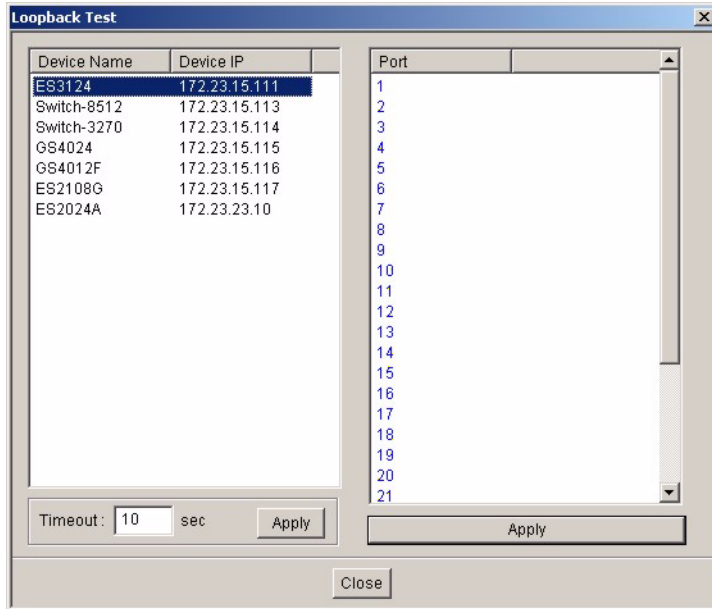
## 9.2 Loopback Test

Follow the steps below to perform an internal loopback test.

- 1 Click **Fault > Loopback Test**.
- 2 Choose a switch from the list located on the left-hand side of the screen.

- 3 Choose a port from the list located on the right-hand side of the screen.
- 4 In the **Timeout** field, accept the default or specify a connection timeout period (in seconds).
- 5 Click **Apply** to start the loopback test.

**Figure 53** Fault: Loopback Test



- 6 A screen displays showing the test result. Click **OK** to close the screen.

**Figure 54** fault: Loopback: Result





# CHAPTER 10

## Maintenance

This chapter tells you how to backup and restore your configuration file as well as upload new firmware and configuration files.

### 10.1 Firmware Upgrade

You must be logged in with system administrator rights to use this function.

**Note:** Do NOT turn off the switch during the updating process, as it may corrupt the firmware and make the selected switch unusable.

#### 10.1.1 Procedure to Update Firmware

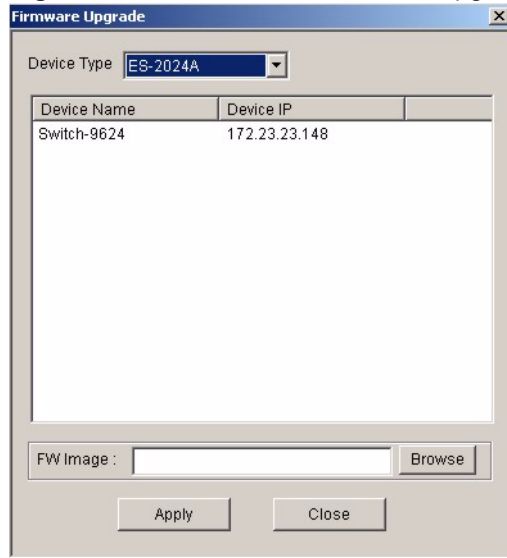
You can perform firmware upgrade on all switches of the same type simultaneously on the EMS. To update firmware, first download the latest firmware, then unzip and store it on your computer. You can use this EMS FTP client to connect to a selected switch.

**Note:** Do NOT turn off the switch during the updating process, as it may corrupt the firmware and make your switch unusable.

- 1** Click **Maintenance > Firmware Upgrade**.
- 2** Select a device type in the **Device Type** field.
- 3** The list displays the switches of the selected type. Select a switch or multiple switches on which you want to upgrade the firmware.
- 4** Type the path and file name of the firmware file you wish to upload to the switch in the **FW Image** text box or click **Browse** to locate it. After you have specified the file, click **Apply**.

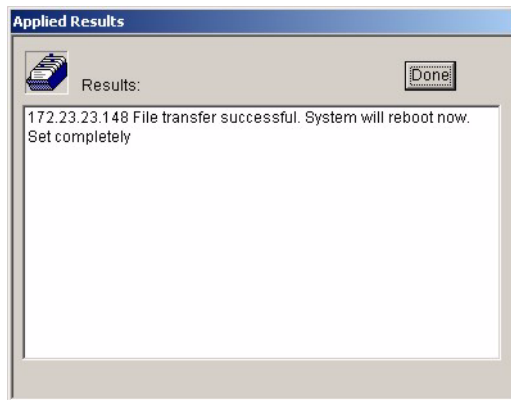


**Figure 55** Maintenance: Firmware Upgrade



- 5 After the file transfer is complete, a screen displays showing the result. Click **Done** to close the screen. When the firmware upgrade process is complete, the switch(es) automatically restarts (the **SYS** LED blinks).

**Figure 56** Maintenance: Firmware Upgrade: Result

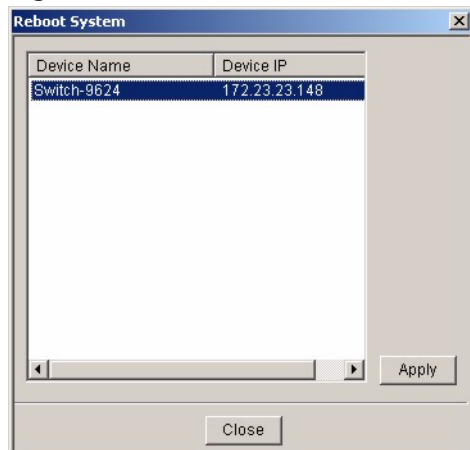


- 6 Wait until the switch(es) has finished rebooting before accessing it again. Check the firmware version on the switch to make sure that the firmware is updated successfully.

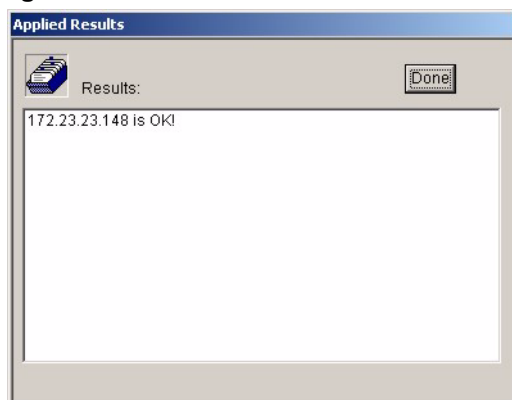
## 10.2 Device Reset

Use the **Reboot System** screen to restart a switch without physically turning the power off.

- 1 Click **Maintenance > Device Reset**.
- 2 Select a device from the list and click **Apply**.

**Figure 57** Maintenance: Device Reset

- 3 A screen displays. Click **Done**. The switch will restart. This takes up to two minutes. This does NOT affect the switch's configuration.

**Figure 58** Maintenance: Device Reset: Result

## 10.3 NE Configuration Backup and Restore

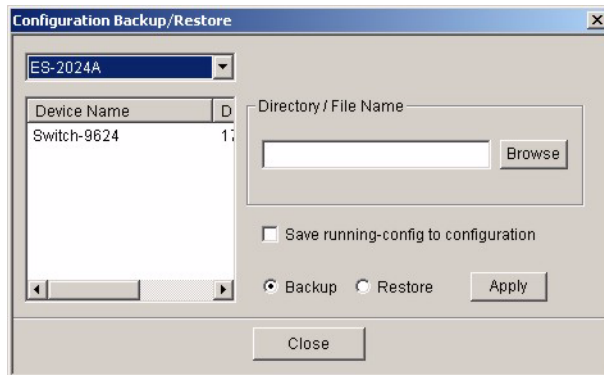
A Network Element (NE) is a network device that provides support or services to the user.

Follow the steps below to backup or restore a switch configuration file to your computer.

- 1 Click **Maintenance > NE Configuration Backup and Restore**.
- 2 Select **All Devices** or a device model from the drop-down list box and select a switch in the list box.
- 3 Under **Directory/File Name**, type the path and file name of the file you wish to restore to the switch or backup to your computer in the text box provided or click **Browse** to locate it.
- 4 Select the **Save running-config to configuration** check box to save the current switch configuration if you want to back up to your computer.

- 5 Select **Backup** to save the configuration to your computer. Or select **Restore** to restore the configuration file back to the switch.
- 6 Click **Apply**.
- 7 If you chose **Restore**, the switch automatically restarts when the configuration file upload is complete.
- 8 Click **Close** to close this screen.

**Figure 59** Maintenance: Configuration Backup/Restore



The following table describes the labels in this screen.

**Table 42** Maintenance: Configuration Backup/Restore

LABEL	DESCRIPTION
Directory/File Name	Type the path and file name of the configuration file you wish to restore to the switch or backup to your computer in the <b>Directory / File Name</b> text box or click <b>Browse</b> to locate it.
Save running-config to configuration	Select the <b>Save running-config to configuration</b> text box to save the most recently updated configuration to a file specified in the <b>Directory/File Name</b> field.
Backup	Click the <b>Backup</b> radio button to transfer the configuration file from your switch to a computer.
Restore	Click the <b>Restore</b> radio button to transfer the configuration file from your computer to a switch.
Apply	Click <b>Apply</b> to backup or restore the switch(es) configuration file.
Close	Click <b>Close</b> to close this screen.

## 10.4 Load Factory Default

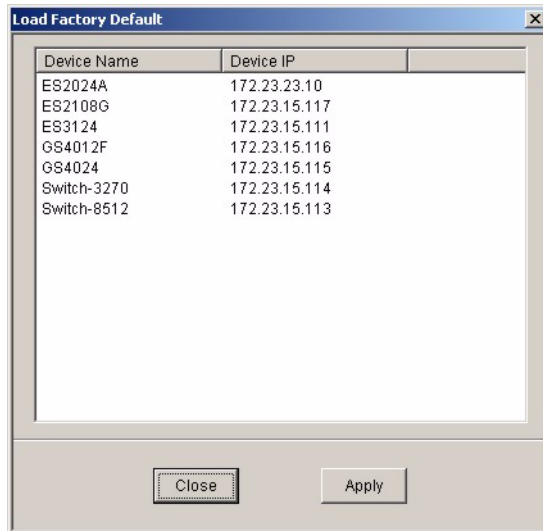
Follow the steps below to reset a switch configuration to the factory defaults.

- 1 Click **Maintenance > Load Factory Default**.
- 2 Select a switch from the list of devices shown.
- 3 Click **Apply** to clear all configuration information and return the switch to the factory defaults.

This may take up to two minutes. If you want to access the switch web configurator again, you may need to change the IP address of your computer to be in the same subnet as that of the default switch IP address.

- 4 Click **Close** to close this screen.

**Figure 60** Maintenance: Load Factory Defaults

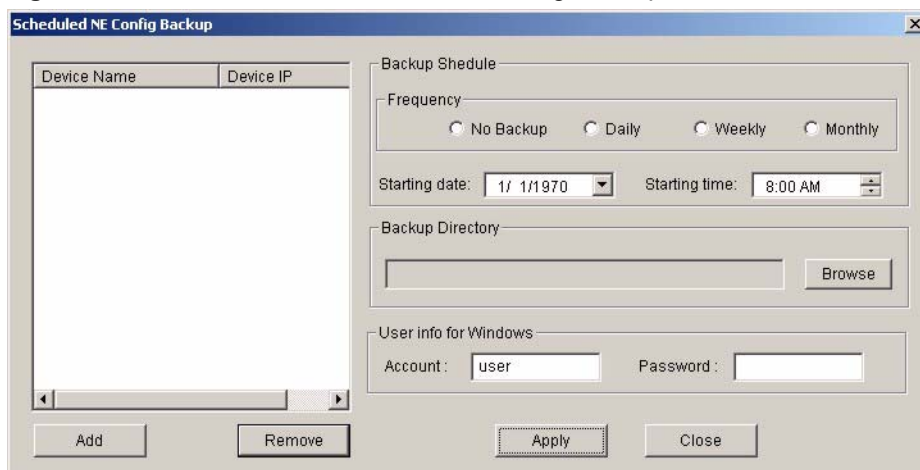


## 10.5 Scheduled Network Element Configuration Backup

Perform configuration backups according to a schedule. Set the frequency, time and date of the backup and the location where you want to backup the configuration file.

Click **Maintenance > Scheduled NE Config Backup** to display the configuration screen as shown.

**Figure 61** Maintenance: Scheduled NE Config Backup



The following table describes the labels in this screen.

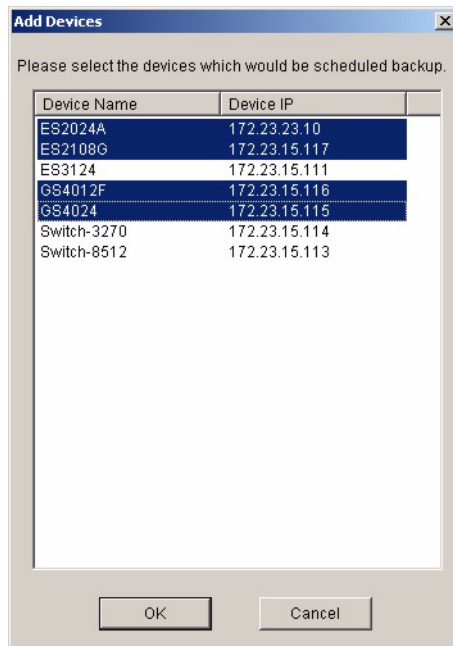
**Table 43** Maintenance: Scheduled NE Config Backup

LABEL	DESCRIPTION
Backup Schedule	
Frequency	Scheduled backups can be performed on a <b>Daily</b> , <b>Weekly</b> or <b>Monthly</b> basis. Select a radio button to schedule configuration backups starting at the date and time specified below.
Starting date	Specify the starting date to begin a configuration file backup for the selected device(s). Select a date from the drop-down list box.
Starting time	Specify the starting time to begin a configuration file backup for the selected device(s). Select a time from the selection box or enter a time (hh:mm:ss AM/PM format).
Backup Directory	Type the path and file name of the configuration file you wish to backup to your computer in the <b>Backup Directory</b> text box or click <b>Browse</b> to locate it.
User info for Windows	To perform scheduled backups, you need to specify your Windows administrator account information. This allows the EMS to add a scheduled task in Windows.
Account	Enter the Windows administrator account login username.
Password	Enter a password in this field for the administrator <b>Account</b> above.
Add	Click the <b>Add</b> button to add a switch to the list of devices in the backup schedule.
Remove	Click the <b>Remove</b> button to remove a switch from the list of devices in the backup schedule.
Apply	Click <b>Apply</b> to save changes to the EMS.
Close	Click <b>Close</b> to close this screen.

### 10.5.1 Configuring Scheduled NE Configuration Backup

Follow the steps below to add a device to the list of devices in the **Scheduled NE Configuration Backup** screen.

- 1 Click the **Add** button in the **Scheduled NE Config Backup** screen.
- 2 Select one or more switches whose configuration you want to back up. Click **OK**.

**Figure 62** Maintenance: Scheduled NE Config Backup: Add Devices

## 10.5.2 Removing a Scheduled NE Configuration Backup

Follow the steps below to remove the selected device(s) from the configuration backup schedule.

- 1 Click **Maintenance > Scheduled NE Configuration Backup**.
- 2 Select a device or devices you want to exclude from the backup schedule.
- 3 Click **Remove**.



# CHAPTER 11

## Tools

This chapter shows you how to access a switch via Telnet or web configurator directly through the EMS. You may need to do this to test the switch network connection for example.

### 11.1 Accessing the Switch

Access the switch remotely via Telnet or web browser.

**Note:** When you access a switch via Telnet or the web configurator, you CANNOT make any changes to that switch using the EMS.

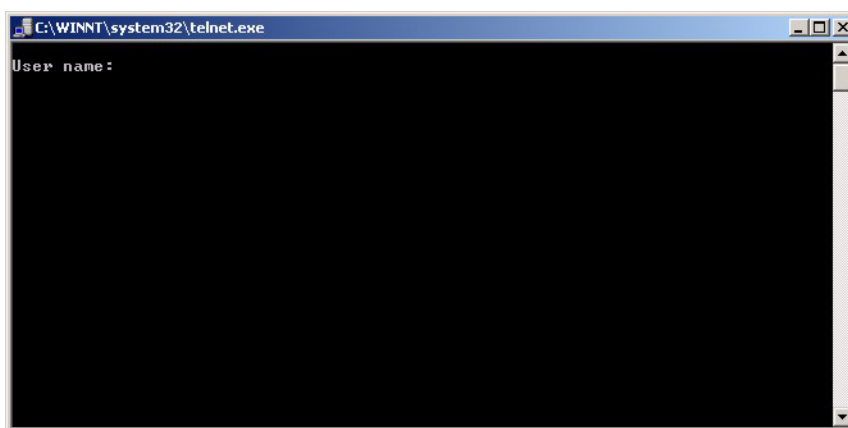
#### 11.1.1 Telnet

Telnet is the login and terminal emulation protocol common on the Internet and in UNIX environments. It operates over TCP/IP networks. Its primary function is to allow users to log into remote host systems.

The administrator uses Telnet from a computer on a remote network to access the switch. You can use remote Telnet access as shown next.

- 1 Select a switch from the list of devices shown in the Device List Panel.
- 2 Click **Tool > Telnet** to open a console session for Telnet access to the switch.
- 3 Type the switch user name and password to access the CLI.

**Figure 63** Tool: Telnet



- 4 Refer to the switch User's Guide for information on the commands used in this screen.



## 11.1.2 Web Access

Configure the switch using the web configurator as shown.

- 1 Select a switch from the list of devices shown in the Device List Panel.
- 2 Click **Tool > Web Access** to open the switch web configurator password screen. From here you can log in directly to the switch.
- 3 Type the switch **User name** and **Password** to access the web configurator.

**Figure 64** Tool: Web Access



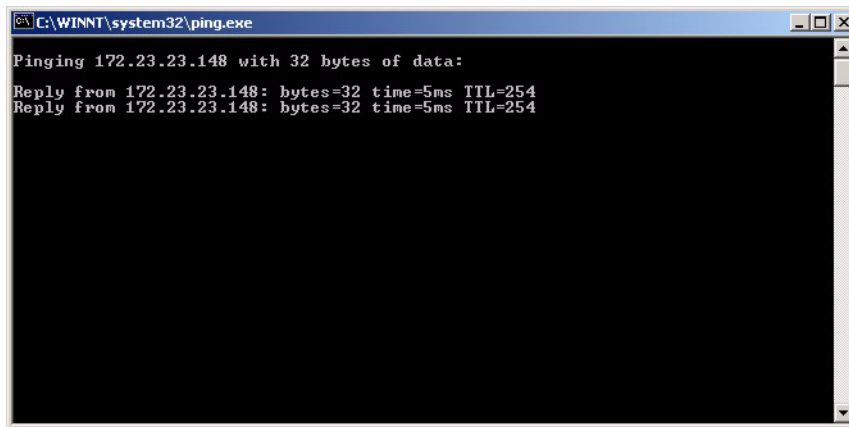
- 4 Refer to the switch User's Guide for information on the web configurator main screen.

## 11.2 Ping

Ping the host to see if the links and TCP/IP protocol on both your computer and the switch is working. Follow the steps below:

- 1 Select a switch from the list of devices shown in the Device List Panel.
- 2 Click **Tool > Ping** to have the computer ping the IP address of the selected device.
- 3 The Command Prompt window automatically closes after the computer pings the selected switch three times.

**Note:** The device IP address varies according to whether the switch is connected to the EMS computer using an in-band or an out-of-band IP address.

**Figure 65** Tool: Ping

```
C:\WINNT\system32\ping.exe
Pinging 172.23.23.148 with 32 bytes of data:
Reply from 172.23.23.148: bytes=32 time=5ms TTL=254
Reply from 172.23.23.148: bytes=32 time=5ms TTL=254
```



# CHAPTER 12

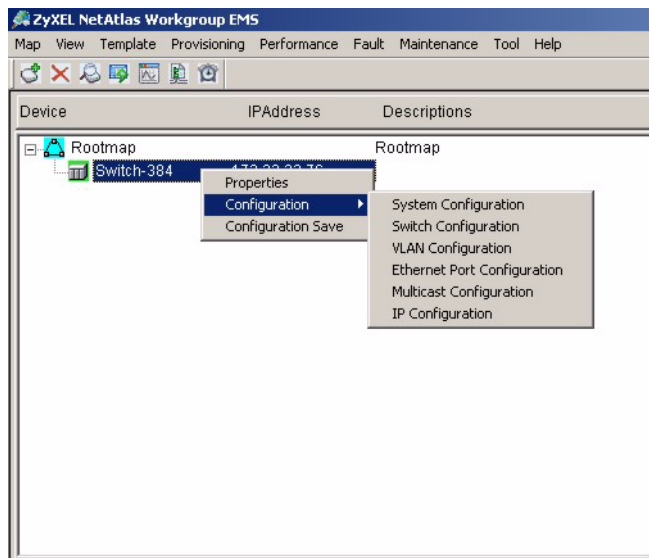
## Device Menu Overview

This chapter introduces the device configuration menus.

### 12.1 Device Menu Summary

To select a device configuration menu, right-click on a device in the Device List Panel.

**Figure 66** Device Panel List Menus



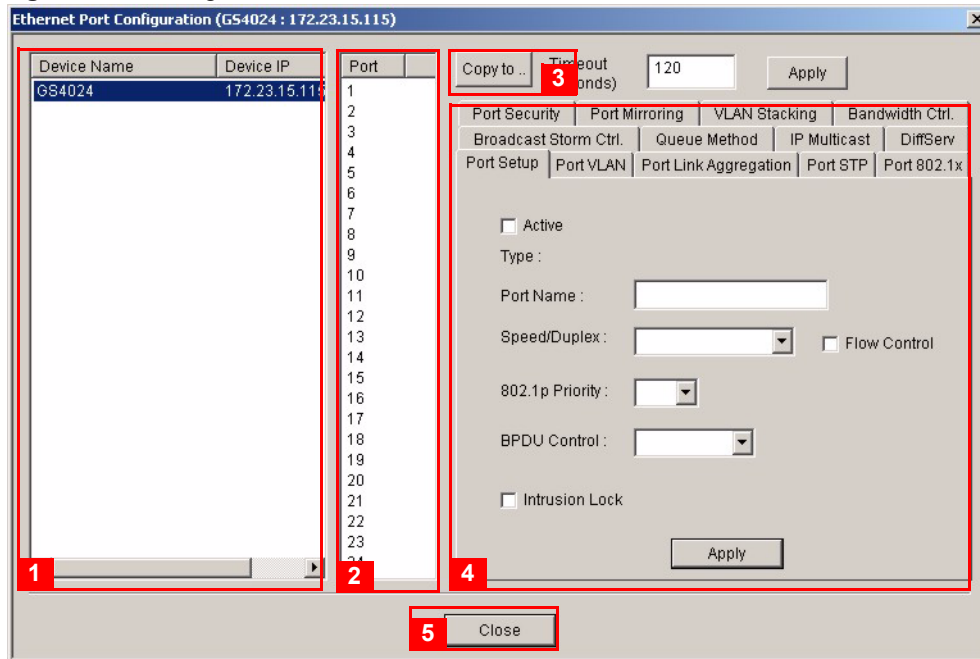
### 12.2 Property Configuration

See [Section 4.1.2 on page 47](#) for information on the **Edit Device** screen.

### 12.3 Introducing the Device Configuration Window

The following example screen displays the main features used to configure EMS-managed devices. See the individual screen selections for details on switch feature configuration.

**Figure 67** Configuration Window



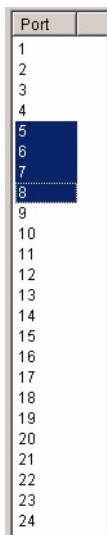
The following table describes the elements in this screen.

**Table 44** Configuration Window

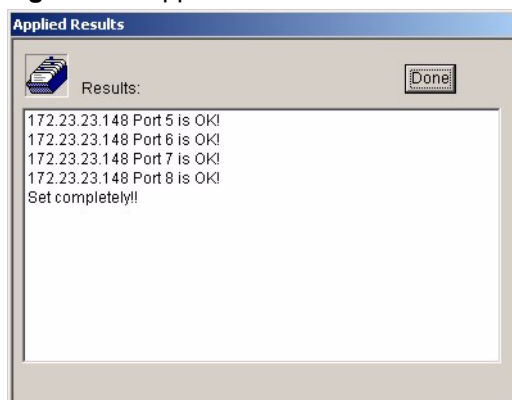
	LABEL	DESCRIPTION
1	Device Panel	This panel displays all active devices (of the same type) currently managed by the EMS.
2	Port List Panel	This field displays a list of switch ports. This list displays in the Ethernet Port Configuration screens only. To make configuration changes to each port or ports, select a port number or multiple port numbers (by pressing the [CTRL] key and clicking at the same time) in the Port List Panel.
3	Copy to..	Click the <b>Copy to..</b> button to copy the configuration from the switch that you are currently configuring to the port(s) on the same switch or other switch(es). Port configurations can also be copied to other device ports in the Ethernet Port Configuration screens.
4	Configuration Panel	Use this panel to make configuration changes to a device based on a port or multiple ports selected in the Port List Panel. If the screen does not have a Port List Panel, then use this panel to make configuration changes to a device selected in the Device Panel. Click <b>Apply</b> to save configuration changes.
5	Close	Click <b>Close</b> to close a configuration screen. If you close a screen without first clicking <b>Apply</b> , configuration changes will not be saved.

### 12.3.1 Port List Multiple Port Configuration

Configure more than one port at the same time by pressing the [CTRL] key and clicking at the same time in the Port List panel.

**Figure 68** Configuration Window: Port List: Multiple Port Select

Click **Apply** when you are satisfied with the configuration changes. A screen displays showing the configuration result.

**Figure 69** Applied Results

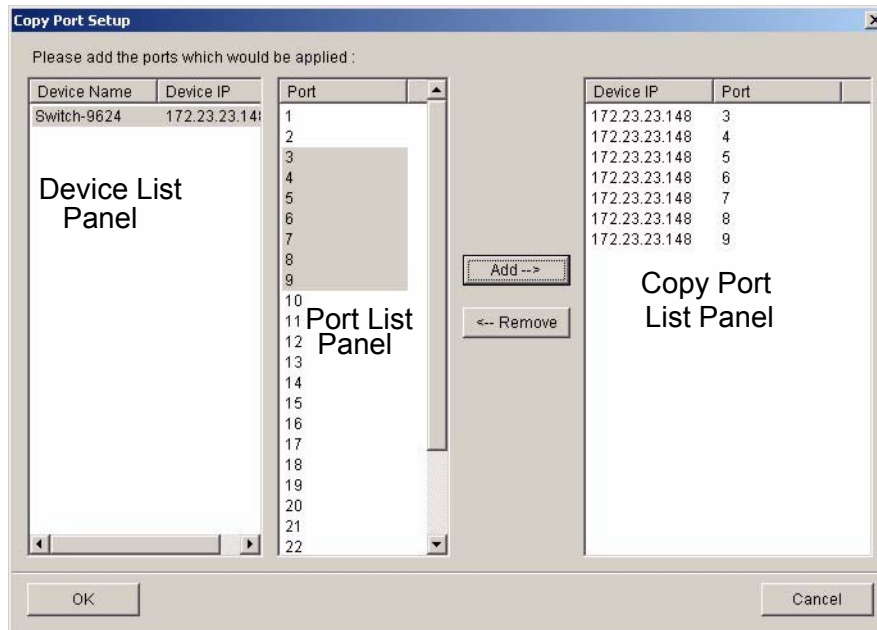
**4** Click **Done** to close the screen.

### 12.3.2 The Copy to.. Button

The **Copy to..** button allows you to copy the configuration from the switch you are currently configuring to one or more switches.

- 1** In the Device Panel list, select a device that you want configure.
- 2** Select a tab in the Configuration Panel.
- 3** Select a port or multiple ports (by pressing the [CTRL] key and clicking at the same time) from the Port List Panel.
- 4** Make your configuration changes in the Configuration Panel and click the **Apply** button.
- 5** Click the **Copy to..** button. The following screen displays.

**Figure 70** Copy Port Setup: Example

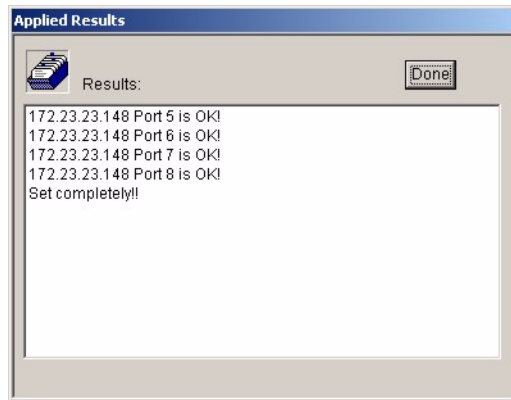


The following table describes this screen.

**Table 45** Copy Port Setup

LABEL	DESCRIPTION
Device List	Select a device to which you want to copy from the switch you are currently configuring.
Port List Panel	Select one port or multiple ports (by pressing the [CTRL] key and clicking at the same time) from the Port List Panel.
Add	Click <b>Add</b> to display the port(s) to which you want to copy from the switch you are currently configuring.
Remove	Click <b>Remove</b> to move a selected port(s) from the Copy Port List Panel list to the Port List Panel.
Copy Port List Panel	This panel displays the device port(s) to which you want to copy from the switch you are currently configuring.
OK	Click <b>OK</b> to copy the configuration from the current switch to the device port(s) displayed in the Copy Port List Panel.
Cancel	Click <b>Cancel</b> to return to the previous screen.

**6** Click **OK** to display the following screen.

**Figure 71** Copy Successful

**7** Click **Done** to close the screen.





# CHAPTER 13

## System Configuration

This chapter shows you how to view general system information, configure SNMP, remote management and time setup.

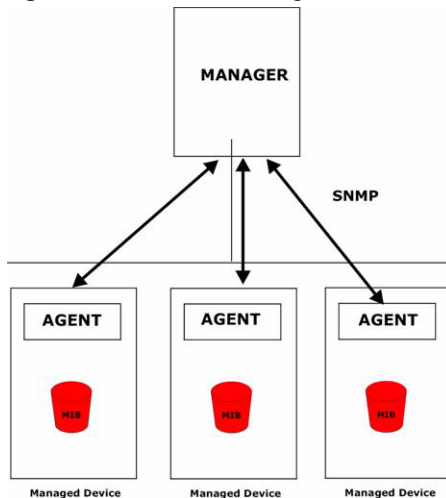
### 13.1 System Info

See [Section 3.9 on page 41](#) for information about the switch.

### 13.2 SNMP

Simple Network Management Protocol is a protocol used for exchanging management information between network switches. SNMP is a member of TCP/IP protocol suite. A manager station can manage and monitor the switch through the network via SNMP version 2c. The next figure illustrates an SNMP management operation. SNMP is only available if TCP/IP is configured.

**Figure 72** SNMP Management Model



An SNMP managed network consists of two main components: agents and a manager.

An agent is a management software module that resides in a managed switch (your Ethernet switch). An agent translates the local management information from the managed switch into a form compatible with SNMP. The manager is the console through which network administrators perform network management functions. It executes applications that control and monitor managed devices.

The managed devices contain object variables/managed objects that define each piece of information to be collected about a switch. Examples of variables include such as number of packets received, node port status etc. A Management Information Base (MIB) is a collection of managed objects. SNMP allows a manager and agents to communicate for the purpose of accessing these objects.

SNMP itself is a simple request/response protocol based on the manager/agent model. The manager issues a request and the agent returns responses using the following protocol operations:

**Table 46** SNMP Commands

COMMAND	DESCRIPTION
Get	Allows the manager to retrieve an object variable from the agent.
GetNext	Allows the manager to retrieve the next object variable from a table or list within an agent. In SNMP, when a manager wants to retrieve all elements of a table from an agent, it initiates a Get operation, followed by a series of GetNext operations.
Set	Allows the manager to set values for object variables within an agent.
Trap	Used by the agent to inform the manager of some events.

See the switch User's Guide for a list of supported traps.

### 13.2.1 Configuring SNMP

Follow the steps below to configure SNMP.

- 1** In the Device Panel list, select a device and then right-click.
- 2** Click **Configuration > System Configuration > SNMP Conf..**

**Figure 73** System Configuration: SNMP Conf.

The following table describes the labels in this screen.

**Table 47** System Configuration: SNMP Conf.

LABEL	DESCRIPTION
Read Community	Enter the get community, which is the password for the incoming Get- and GetNext- requests from the management station.
Read/Write Community	Enter the set community, which is the password for incoming Set- requests from the management station.
Trap Community	Enter the trap community, which is the password sent with each trap to the SNMP manager.
Apply	Click <b>Apply</b> to save your changes back to the switch.
Trap Destination	Enter the IP addresses of up to four stations to send your SNMP traps to.
Apply	Click <b>Apply</b> to save the trap destination changes back to the switch.

## 13.3 Remote Management

Remote management allows you to determine which services/protocols can access which device interface (if any) from which computers. You can customize the service port and the secured client IP address to enhance security and flexibility.

Follow the steps below to configure remote management.

- 1** In the Device Panel list, select a device and then right-click.
- 2** Click **Configuration > System Configuration > Remote Mgmt.**

**Figure 74** System Configuration: Remote Management

The following table describes the labels in this screen.

**Table 48** System Configuration: Remote Management

LABEL	DESCRIPTION
Services	This panel displays the services that you may use to remotely manage the switch. Select the check box(es) to allow remote management using the service(s).
Port	Enter the server port number to use with the corresponding service.
Apply	Click <b>Apply</b> to save the changes back to the switch.
Secured Clients	Select the check box(es) to enable the client set.
Start	To allow a range of computers to use Telnet, FTP, HTTP, ICMP, SSH or HTTPS services, enter the first IP address in the range here. The default value for a start and end address is 0.0.0.0, which means you don't care which host is trying to use a service (Telnet, FTP, HTTP, SNMP, ICMP, SSH or HTTPS). If you enter an IP address in this field, the switch will check if the client IP address matches the value here when a (Telnet, FTP, HTTP, SNMP, ICMP, SSH or HTTPS) session is up. If it does not match, the session is disconnected immediately.
End	To allow a range of computers to use Telnet, FTP, Web, SNMP or ICMP services, enter the <b>End</b> IP address in the range here. To allow a single computer to use Telnet, FTP, HTTP, SNMP, ICMP, SSH or HTTPS services, enter the same IP address here as in the <b>Start</b> field.
Telnet, FTP, HTTP, ICMP, SNMP, ICMP, SSH, HTTPS	Select the check box to allow the trusted computer(s) in the IP address range specified above to use this service to manage the switch.
Apply	Click <b>Apply</b> to save the changes back to the switch.
Close	Click <b>Close</b> to close the screen.

## 13.4 Time Setup

The switch keeps track of the time and date. There is also a software mechanism to set the time manually or get the current time and date from an external server when you log in to the switch. Use the **Time Setup** screen to update the time and date settings in the EMS and then save the settings to the switch. The real time is then displayed in the system messages.

Follow the steps below to configure your system time.

- 1 In the Device Panel list, select a device and then right-click.
- 2 Click **Configuration > System Configuration > Time Setup**.

**Figure 75** System Configuration: Time Setup

The following table describes the labels in this screen.

**Table 49** System Configuration: Time Setup

LABEL	DESCRIPTION
Use Time Server When BootUp	Select the time service protocol that your time server sends when you start the switch. Not all time servers support all protocols, so you may have to check with your ISP/network administrator or use trial and error to find a protocol that works. The main differences between them are the format. When you select the <b>Daytime (RFC 867)</b> format, the switch displays the day, month, year and time with no time zone adjustment. When you use this format it is recommended that you use a Daytime timeserver within your geographical time zone. <b>Time (RFC-868)</b> format displays a 4-byte integer giving the total number of seconds since 1970/1/1 at 0:0:0. <b>NTP (RFC-1305)</b> is similar to <b>Time (RFC-868)</b> . <b>None</b> is the default; enter the time manually.
Time Server IP Address	Enter the IP address of your time server. Check with your ISP/network administrator if you are unsure of this information.
Current Time	This field displays an updated time only when you reenter this menu.

**Table 49** System Configuration: Time Setup (continued)

LABEL	DESCRIPTION
New Time (hh:mm:ss)	Enter the new time in hour, minute and second format.
Current Date	This field displays an updated date only when you re-enter this menu.
New Date (yyyy:mm:dd)	Enter the new date in year, month and day format.
Time Zone	Select the time difference between your time zone and Universal Time Coordinate (UTC) formerly known as Greenwich Mean Time (GMT).
Apply	Click <b>Apply</b> to save the changes.

## 13.5 RADIUS

RADIUS (Remote Authentication Dial-In User Service) authentication is a popular protocol used to authenticate users by means of an external server instead of (or in addition to) an internal device user database that is limited to the memory capacity of the device. In essence, RADIUS authentication allows you to validate an unlimited number of users from a central location.

- 1 In the Device Panel list, select a device and then right-click.
- 2 Click **Configuration > System Configuration > RADIUS**.

**Figure 76** System Configuration: RADIUS

The screenshot displays the RADIUS configuration interface. At the top, there are several tabs: 'System Info.', 'SNMP Conf.', 'Remote Mgmt.', 'Time Setup', 'RADIUS', and 'IP Setup'. The 'RADIUS' tab is active. Below the tabs, there is a section titled 'Authentication Server'. This section contains three input fields: 'IP Address' with the value '0 . 0 . 0 . 0', 'UDP Port' with the value '1812', and 'Shared Secret' which is currently empty. Below these fields is an 'Apply' button.

The following table describes the labels in this screen.

**Table 50** System Configuration: RADIUS

LABEL	DESCRIPTION
Authentication Server	
IP Address	Enter the IP address of the external RADIUS server in dotted decimal notation.
UDP Port	The default port of the RADIUS server for authentication is 1812. You need not change this value unless your network administrator instructs you to do so.
Shared Secret	Specify a password (up to 32 alphanumeric characters) as the key to be shared between the external RADIUS server and the switch. This key is not sent over the network. This key must be the same on the external RADIUS server and the switch.
Apply	Click <b>Apply</b> to save your changes.

## 13.6 IP Setup

Use the **IP Setup** screen to configure the default gateway device, the default domain name server and add IP domains.

- 1 In the Device Panel list, select a device and then right-click.
- 2 Click **Configuration > System Configuration > IP Setup**.

**Figure 77** System Configuration: IP Setup

The screenshot shows the IP Setup configuration interface. At the top, there are tabs for System Info, SNMP Conf., Remote Mgmt., Time Setup, RADIUS, and IP Setup. The IP Setup section contains the following fields:

- Default Gateway: 172.23.15.254
- Domain Name Server: 0.0.0.0
- Default Management:  In-band  Out-of-band

Below this is the Management IP Address section with the following fields:

- IP Address: 192.168.0.1
- IP Subnet Mask: 255.255.255.0
- Default Gateway: 0.0.0.0

An Apply button is located below the Management IP Address section. At the bottom of the screen is the IP Interface section, which contains a table with the following data:

Index	IP Address	IP Subnet Mask	VID
1	168.234.1.1	255.255.255.0	1
2	168.234.2.1	255.255.255.0	3802
3	168.234.3.1	255.255.255.0	3803
4	168.234.4.1	255.255.255.0	3804
5	168.234.5.1	255.255.255.0	3805
6	168.234.6.1	255.255.255.0	3806

To the right of the table are buttons for Add, Modify, and Delete.



The following table describes the labels in this screen.

**Table 51** System Configuration: IP Setup

LABEL	DESCRIPTION
IP Setup	
Default Gateway	Enter the IP address of the default outgoing gateway in dotted decimal notation, for example 192.168.1.254.
Domain Name Server	DNS (Domain Name System) is for mapping a domain name to its corresponding IP address and vice versa. Enter a domain name server IP address in order to be able to use a domain name instead of an IP address.
Default Management	Specify which traffic flow ( <b>In-Band</b> or <b>Out-of-band</b> ) the switch is to send packets originating from itself (such as SNMP traps) or packets with unknown source. Select <b>Out-of-band</b> to have the switch send the packets to the management port labelled <b>MGMT</b> . This means that device(s) connected to the other port(s) do not receive these packets. Select <b>In-Band</b> to have the switch send the packets to all ports except the management port (labelled <b>MGMT</b> ) to which connected device(s) do not receive these packets.
Management IP Address Use these fields to set the settings for the out-of-band management port.	
IP Address	Enter the out-of-band management IP address of your switch in dotted decimal notation. For example, 192.168.0.1.
IP Subnet Mask	Enter the IP subnet mask of your switch in dotted decimal notation for example 255.255.255.0.
Default Gateway	Enter the IP address of the default outgoing gateway in dotted decimal notation, for example 192.168.0.254
Apply	Click <b>Apply</b> to save the settings.
IP Interface	
Index	This field displays the index number of an entry.
IP Address	This field displays IP address of the switch in the IP domain.
Subnet Mask	This field displays the subnet mask of the switch in the IP domain.
VID	This field displays the VLAN identification number of the IP domain on the switch.
Add	Click <b>Add</b> to configure a new IP interface.
Modify	Click <b>Modify</b> to change the settings of a selected IP interface.
Delete	Click <b>Delete</b> to remove a selected IP interface.

### 13.6.1 Configuring an IP Interface

Follow the steps below to create a new IP interface.

- 1 In the Device Panel list, select a device and then right-click.
- 2 Click **Configuration > System Configuration > IP Setup**.
- 3 Click **Add**.

**Figure 78** System Configuration: IP Setup: Add

The screenshot shows a dialog box titled "IP Interface" with a close button in the top right corner. Inside the dialog, there are three input fields: "IP Address" (with a dotted decimal notation template), "IP Subnet Mask" (with a dotted decimal notation template), and "VID". At the bottom of the dialog, there are two buttons: "Add" and "Cancel".

The following table describes the labels in this screen.

**Table 52** System Configuration: IP Setup: Add

LABEL	DESCRIPTION
IP Address	Enter the IP address of your switch in dotted decimal notation for example 192.168.1.1. This is the IP address of the switch in an IP routing domain.
IP Subnet Mask	Enter the IP subnet mask of an IP routing domain in dotted decimal notation. For example, 255.255.255.0.
VID	Enter the VLAN identification number to which an IP routing domain belongs.
Add	Click <b>Add</b> to save the settings and close this screen.
Cancel	Click <b>Cancel</b> to discard all changes and close this screen.



# CHAPTER 14

## Switch Configuration

This chapter shows how to configure switch settings such as priority queuing, STP, link aggregation and GARP timer.

### 14.1 Switch Setup

Use the switch setup screen to set a VLAN type, a queuing method and enable or disable features in the **Active Control** panel.

- 1 In the Device Panel list, select a device and then right-click.
- 2 Click **Configuration > Switch Configuration > Switch Setup**.

**Figure 79** Switch Configuration: Switch Setup

The screenshot displays the 'Switch Setup' configuration window. At the top, there are three main tabs: 'Filtering', 'Mac Forwarding', and 'Mirroring'. Under the 'Filtering' tab, there are five sub-tabs: 'Switch Setup', 'Priority Queue', 'STP Conf.', 'Link Aggregation', and 'GARP Timer'. The 'Switch Setup' sub-tab is currently selected. The main configuration area contains the following elements:

- VLAN Type:** A dropdown menu set to '802.1Q'.
- MAC Address Aging Time:** A text input field set to '300' followed by the label 'seconds'.
- Active Control:** A panel containing several checkboxes:
  - STP Configuration
  - Link Aggregation
  - Bridge control protocol transparency
  - Bandwidth control
  - Broadcast storm control
  - Mirroring
  - 802.1x
  - Port Security
  - VLAN Stacking: SP TPID is set to '0x8100' (via a dropdown), with radio buttons for 'Others' and '(Hex)'.
  - GVRP
  - 802.1q Port Isolation
- Apply:** A button located at the bottom center of the configuration area.

The following table describes the related labels in the screen.

**Table 53** Switch Configuration: Switch Setup

LABEL	DESCRIPTION
VLAN Type	Choose <b>802.1Q</b> or <b>Port Based</b> from the drop-down list box. The VLAN Setup screen changes depending on whether you choose <b>802.1Q</b> or <b>Port Based</b> VLAN type in this screen. See <a href="#">Section 16.3 on page 142</a> and the VLAN chapter for more information on VLANs.
MAC Address Aging Time	MAC address learning reduces outgoing traffic broadcasts. For MAC address learning to occur on a port, the port must be active. Enter a time from 10 to 3000 seconds. This is how long all dynamically learned MAC addresses remain in the MAC address table before they age out (and must be relearned).
Queuing Method	Select a queuing method. Choices vary depending on your switch models. <b>Strict Priority Queuing (SPQ)</b> services queues based on priority only. When the highest priority queue empties, traffic on the next highest-priority queue begins. The default queuing method is <b>Strictly Priority</b> . <b>Weighted Round Robin Scheduling (WRR)</b> services queues on a rotating basis based on their queue weight (the number you select from the drop-down list box for the corresponding queue). Queues with larger weights get more service than queues with smaller weights. <b>Weighted Fair Scheduling</b> is used to guarantee each queue's minimum bandwidth based on their bandwidth portion (weight) (the number you configure in the <b>Weight</b> field). Queues with larger weights get more guaranteed bandwidth than queues with smaller weights.
Broadcast Storm Control	These fields are not available on all switch models. Set the fields below to configure traffic storm control.
Active	Select <b>Active</b> to enable traffic storm control on the switch.
Storm Control	Specify the traffic type in this field. Select <b>Broadcast Only</b> , <b>Broadcast and multicast</b> , <b>Broadcast and unknown unicast</b> or <b>Broadcast, multicast and unknown unicast</b> from the drop-down list box.
Packet Limit	From the drop-down list box, select the number of packets (of the type chosen above) a port can receive per second.
Active Control	
STP Configuration	Select the check box to activate STP.
Link Aggregation	Select the check box to activate link aggregation.
IGMP Snooping	Select the check box to enable IGMP snooping.
Bridge control protocol transparency	Select the check box to enable bridge control protocol transparency.
Bandwidth control	Select the check box to activate bandwidth control.
Broadcast storm control	Select the check box to activate broadcast storm control.
Mirroring	Select the check box to activate port mirroring.
802.1x	Select the check box to activate IEEE 802.1x authentication.
Port Security	Select the check box to activate port security.

**Table 53** Switch Configuration: Switch Setup (continued)

LABEL	DESCRIPTION
VLAN Stacking	Select the check box to enable VLAN stacking. In the <b>SP TPID</b> drop-down list box, select a standard Ethernet type code to identify the frame and indicate whether the frame carries IEEE 802.1Q tag information. Or select <b>Others</b> and then enter a four-digit hexadecimal number from 0x0000 to 0xFFFF. 0x denotes a hexadecimal number. It does not have to be typed in the <b>Others</b> field.
GVRP	Select the check box to permit VLANs groups beyond the local switch on this port. GVRP (GARP VLAN Registration Protocol) is a registration protocol that defines a way for switches to register necessary VLAN members on ports across the network.
802.1q Ingress Check	Select this check box to set the switch to discard incoming frames for VLANs that do not have this port as a member
802.1q Port Isolation	Port Isolation allows each port to communicate with the CPU port, uplink ports and stacking ports (if available) but not communicate with each other. This option is the most limiting but also the most secure.
DHCP Relay	Select the check box to enable DHCP relay.
DSCP	Select the check box to enable DSCP-IEEE 802.1q mapping.
Apply	Click <b>Apply</b> to save your changes back to the switch.

## 14.2 Priority Queue

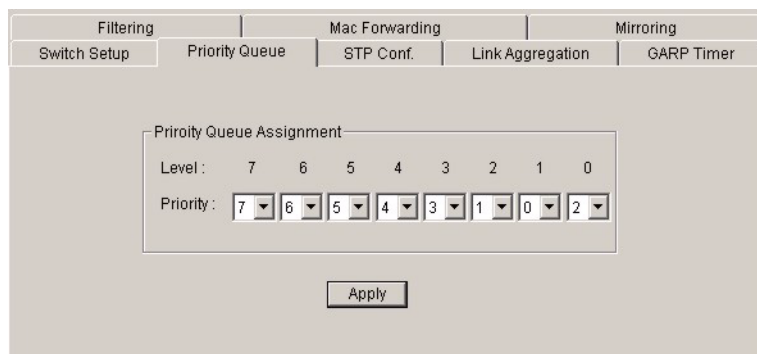
Queuing is used to help solve performance degradation when there is network congestion.

Configure queuing algorithms for outgoing traffic in the **Switch Setup** screen. Queuing algorithms allow switches to maintain separate queues for packets from each individual source or flow and prevent a source from monopolizing the bandwidth.

Follow the steps below to configure priority queuing.

- 1 In the Device Panel list, select a device and then right-click.
- 2 Click **Configuration > Switch Configuration > Priority Queue** to display the following screen.

**Figure 80** Switch Configuration: Priority Queue



The following table describes the labels in this screen.

**Table 54** Switch Configuration: Priority Queue

LABELS	DESCRIPTION
Priority Queue Assignment	IEEE 802.1p defines up to 8 separate traffic types by inserting a tag into a MAC-layer frame that contains bits to define class of service. Frames without an explicit priority tag are given the default priority of the ingress port. Use these fields to configure the priority level-to-physical queue mapping. On the switch, traffic assigned to higher index queues gets through faster while traffic in lower index queues is dropped if the network is congested.
Priority Level	The following descriptions are based on the traffic types defined in the IEEE 802.1D standard (which incorporates 802.1p). Select a level from the drop-down list box(es).
Level 7	Typically used for network control traffic such as router configuration messages.
Level 6	Typically used for voice traffic that is especially sensitive to jitter (jitter is the variations in delay).
Level 5	Typically used for video that consumes high bandwidth and is sensitive to jitter.
Level 4	Typically used for controlled load, latency-sensitive traffic such as SNA (Systems Network Architecture) transactions.
Level 3	Typically used for "excellent effort" or better than best effort and would include important business traffic that can tolerate some delay.
Level 2	This is for "spare bandwidth".
Level 1	This is typically used for non-critical "background" traffic such as bulk transfers that are allowed but that should not affect other applications and users.
Level 0	Typically used for best-effort traffic.
Apply	Click <b>Apply</b> to save your changes back to the switch.

## 14.3 STP Configuration

This section describes STP and how to configure STP.

The switch supports STP. STP detects and breaks network loops and provides backup links between switches, bridges or routers. It allows a device to interact with other STP-aware devices in your network to ensure that only one path exists between any two stations on the network. Activate the STP feature in the **Switch Setup** screen.

Refer to the user's guide that comes with your switch for more information.

- 1 In the Device Panel list, select a device and then right-click.
- 2 Click **Configuration > Switch Configuration > STP Conf..**

**Figure 81** Switch Configuration: STP Conf.

The screenshot shows a web-based configuration interface for a switch. At the top, there are tabs for 'Filtering', 'Mac Forwarding', and 'Mirroring'. Under 'Mac Forwarding', there are sub-tabs for 'Switch Setup', 'Priority Queue', 'STP Conf.', 'Link Aggregation', and 'GARP Timer'. The 'STP Conf.' tab is active, displaying a 'STP Configuration' dialog box. This dialog box contains four input fields: 'Priority' (a dropdown menu showing '32768'), 'Max Age' (a text box with '20' and 'sec' next to it, with 'Min / Max = 6 / 40' below), 'Hello Time' (a text box with '2' and 'sec' next to it, with 'Min / Max = 1 / 10' below), and 'Forward Delay' (a text box with '15' and 'sec' next to it, with 'Min / Max = 4 / 30' below). An 'Apply' button is located at the bottom center of the dialog box.

The following table describes the labels in this screen.

**Table 55** Switch Configuration: STP Conf.

LABEL	DESCRIPTION
Priority	Priority is used in determining the root device, root port and designated port. The device with the highest priority (lowest numeric value) becomes the RSTP root device. If all devices have the same priority, the device with the lowest MAC address will then become the root device. The allowed range is 0 to 65535 (32768 is the default). The lower the numeric value you assign, the higher the priority for this bridge. <b>Priority</b> determines the root bridge, which in turn determines <b>Hello Time</b> , <b>Max Age</b> and <b>Forward Delay</b> .
Max Age	This is the maximum time (in seconds) a device can wait without receiving a BPDU before attempting to reconfigure. All device ports (except for designated ports) should receive BPDUs at regular intervals. Any port that ages out STP information (provided in the last BPDU) becomes the designated port for the attached LAN. If it is a root port, a new root port is selected from among the device ports attached to the network. The allowed range is 6 to 40 seconds (20 is the default).
Hello Time	This is the time interval in seconds between BPDU (Bridge Protocol Data Units) configuration message generations (by all devices in RSTP or the root device in STP). The allowed range is 1 to 10 seconds (2 is the default).
Forward Delay	This is the maximum time (in seconds) a device will wait before changing states. This delay is required because every device must receive information about topology changes before it starts to forward frames. In addition, each port needs time to listen for conflicting information that would make it return to a blocking state; otherwise, temporary data loops might result. The allowed range is 4 to 30 seconds (15 is the default).
Apply	Click <b>Apply</b> to save your changes back to the switch.

## 14.4 Link Aggregation

Link aggregation (trunking) is the grouping of physical ports into one logical higher-capacity link. You may want to trunk ports if for example, it is cheaper to use multiple lower-speed links than to under-utilize a high-speed, but more costly, single-port link.

However, the more ports you aggregate then the fewer available ports you have. A link aggregation group is one logical link containing multiple ports.



The first port must be physically connected when forming a trunk group.

### 14.4.1 Dynamic Link Aggregation

This feature is not available on all models.

The switch adheres to the IEEE 802.3ad standard for static and dynamic (LACP) port trunking.

The switch supports the link aggregation IEEE 802.3ad standard. This standard describes the Link Aggregate Control Protocol (LACP), which is a protocol that dynamically creates and manages trunk groups.

When you enable LACP link aggregation on a port, the port can automatically negotiate with the ports at the remote end of a link to establish trunk groups. LACP also allows port redundancy, that is, if an operational port fails, then one of the “standby” ports become operational without user intervention

Please note that:

- You must connect all ports point-to-point to the same Ethernet switch and configure the ports for LACP trunking.
- LACP only works on full-duplex links.
- All ports in the same trunk group must have the same media type, speed, duplex mode and flow control settings.

Configure trunk groups or LACP before you connect the Ethernet switch to avoid causing network topology loops.

### 14.4.2 Link Aggregation ID

LACP aggregation ID consists of the following information:

**Table 56** Aggregation ID Local Switch

Local switch [(0000,00-00-00-00-00-00,0000,00,0000)]				
0000	00-00-00-00-00	0000	00	0000
System priority	MAC address	Key	Port Priority	Port Number

**Table 57** Aggregation ID Peer Switch

Peer switch [(0000,00-00-00-00-00-00,0000,00,0000)]				
0000	00-00-00-00-00	0000	00	0000
System priority	MAC address	Key	Port Priority	Port Number

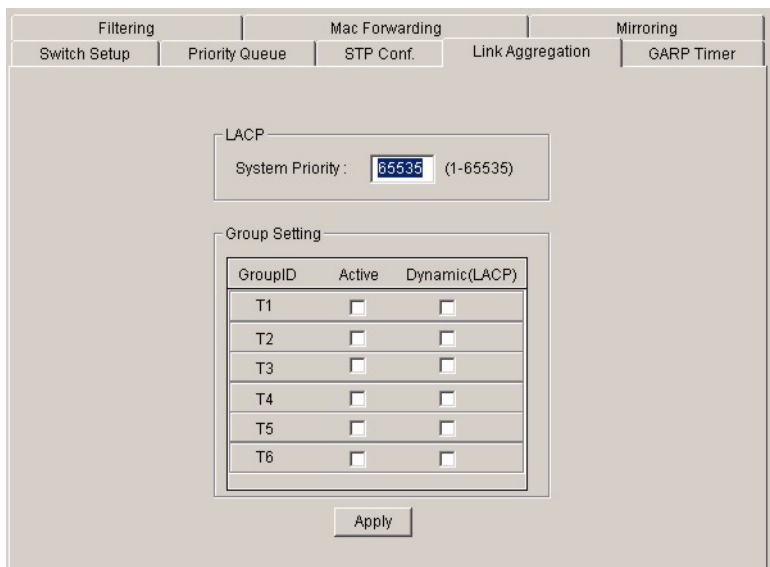
### 14.4.3 Configuring Link Aggregation

Activate link aggregation in the **Switch Setup** screen.

- 1 In the Device Panel list, select a device and then right-click.
- 2 Click **Configuration > Switch Configuration > Link Aggregation** to display the following screen.

**Note:** The number of link aggregation groups varies depending on your switch models.

**Figure 82** Switch Configuration: Link Aggregation



The following table describes the labels in this screen.

**Table 58** Switch Configuration: Link Aggregation

TABLE	DESCRIPTION
LACP	
System Priority	LACP system priority is a number between 1 and 65,535. The switch with the lowest system priority (and lowest port number if system priority is the same) becomes the LACP “server”. The LACP “server” controls the operation of LACP setup. Enter a number to set the priority of an active port using Link Aggregate Control Protocol (LACP). The smaller the number, the higher the priority level.
Group Setting	
Group ID	The field identifies the link aggregation group, that is, one logical link containing multiple ports
Active	Select this option to activate a trunk group.
Dynamic (LACP)	Select this check box to enable LACP for a trunk.
Apply	Click <b>Apply</b> to save your changes.

## 14.5 GARP Timer

Switches join VLANs by making a declaration. A declaration is made by issuing a Join message using GARP. Declarations are withdrawn by issuing a Leave message. A Leave All message terminates all registrations. GARP timers set declaration timeout values. See the chapter on VLAN setup for more background information.

- 1 In the Device Panel list, select a device and then right-click.
- 2 Click **Configuration > Switch Configuration > Switch Setup**.
- 3 Select the **GARP Timer** check box and then click **Apply**.
- 4 Click **Configuration > Switch Configuration > GARP Timer** to display the following screen.

**Figure 83** Switch Configuration: GARP Timer

The following table describes the labels in this screen.

**Table 59** Switch Configuration: GARP Timer

LABEL	DESCRIPTION
Join Timer	<b>Join Timer</b> sets the duration of the join period timer for GVRP in milliseconds. Each port has a join period timer. The allowed join time range is between 10 and 6553 centiseconds; the default is 20 centiseconds. See the chapter on VLAN setup for more background information.
Leave Timer	<b>Leave Timer</b> sets the duration of the leave period timer for GVRP in milliseconds. Each port has a single leave period timer. Leave time must be at least two times larger than <b>Join Timer</b> ; the default is 60 centiseconds.
Leave All Timer	<b>Leave All Timer</b> sets the duration of the Leave All Period timer for GVRP in milliseconds. Each port has a single Leave All Period timer. Leave All Timer must be larger than <b>Leave Timer</b> ; the default is 1000 centiseconds.
Apply	Click <b>Apply</b> to save your changes.

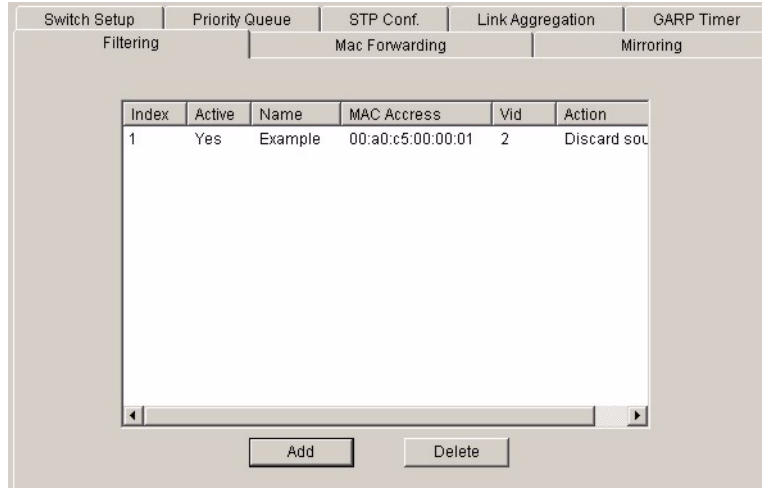
## 14.6 Filtering

This feature is not available on all switch models.

Port filtering means forwarding (not supported on all models) or discarding packets based on the MAC addresses and VLAN group.

- 1 In the Device Panel list, select a device and then right-click.
- 2 Click **Configuration > Switch Configuration > Filtering** to display the following screen.

**Figure 84** Switch Configuration: Filtering



The following table describes the labels in this screen.

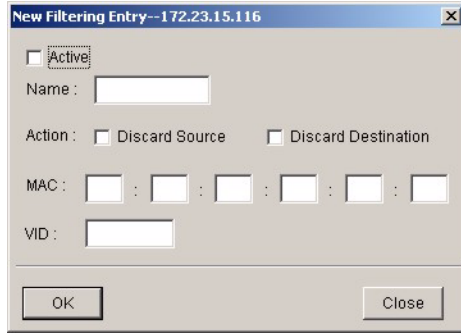
**Table 60** Switch Configuration: Filtering

LABEL	DESCRIPTION
Index	This field displays the index number.
Active	This field displays whether the filter is enabled (Yes) or not (No).
Name	This field displays the descriptive name for this filter.
MAC Address	This field displays the MAC address of a device whose traffic is forwarded or blocked.
VID	This field displays the ID of the VLAN group to which the MAC address belongs.
Action	This field displays the action on the matching packets.
Add	Click <b>Add</b> to create a new filter.
Delete	Click <b>Delete</b> to remove the selected filter.

### 14.6.1 Creating a New Filter

To create a new filter, click **Add** in the **Filtering** screen. A configuration screen displays as shown.

**Figure 85** Switch Configuration: Filtering: Add



The following table describes the related labels in this screen.

**Table 61** Switch Configuration: Filtering: Add

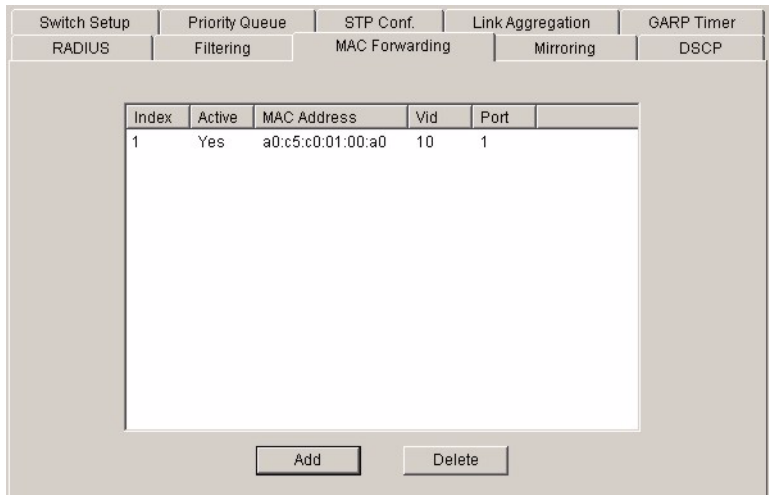
LABEL	DESCRIPTION
Active	Make sure to select this check box to activate your rule. You may temporarily deactivate a rule without deleting it by deselecting this check box.
Name	Type a descriptive name (up to 32 printable ASCII characters) for this rule. This is for identification purpose only.
Action	If the options are not applicable, packets that match the MAC address and VLAN ID specified will be discarded. Select <b>Discard source</b> to drop frame from the source MAC address (specified in the <b>MAC</b> field). The switch can still send frames to the MAC address. Select <b>Discard destination</b> to drop frames intended for the destination MAC address (specified in the <b>MAC</b> field). The switch can still receive frames originating from the MAC address. Select <b>Discard source</b> and <b>Discard destination</b> to block traffic to/from the MAC address specified in the <b>MAC</b> field.
MAC	Type a MAC address in valid MAC address format, that is, six hexadecimal character pairs.
VID	Type the VLAN group identification number.
OK	Click <b>OK</b> to save the changes and close this screen.
Close	Click <b>Close</b> to close this screen. All unsaved settings will be lost.

## 14.7 MAC Forwarding

A static MAC address entry is an address that has been manually entered in the MAC address learning table. Static MAC addresses do not age out. When you set up static MAC address rules, you are setting static MAC addresses for a port. Devices that match static MAC address rules on a port can only receive traffic on that port and cannot receive traffic on other ports. This may reduce unicast flooding.

- 1 In the Device Panel list, select a device and then right-click.
- 2 Click **Configuration > Switch Configuration > MAC Forwarding** to display the following screen.

**Figure 86** Switch Configuration: MAC Forwarding



The following table describes the labels in this screen.

**Table 62** Switch Configuration: MAC Forwarding

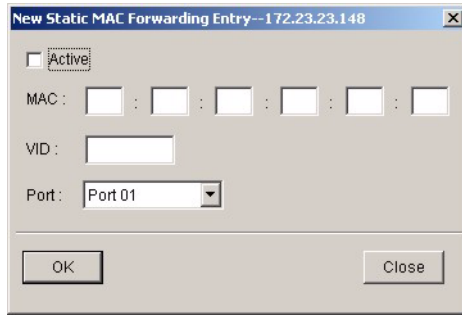
LABEL	DESCRIPTION
Index	Click an index number to modify a static MAC address rule for a port.
Active	This field displays whether this static MAC address forwarding rule is active ( <b>Yes</b> ) or not ( <b>No</b> ). You may temporarily deactivate a rule without deleting it.
MAC Address	This field displays the MAC address that will be forwarded and the VLAN identification number to which the MAC address belongs.
VID	This field displays the VLAN identification number.
Port	This field displays the port where the MAC address shown in the next field will be forwarded.
Add	Click the <b>Add</b> button to create a MAC forwarding rule.
Delete	Select the rule(s) that you want to remove in the MAC Forwarding table and then click the <b>Delete</b> button.

### 14.7.1 Configuring a Static MAC Address Entry

To add a new rule, click **Add** in the **MAC Forwarding** screen.

To change the settings of a rule, select a rule and click **Add** in the **MAC Forwarding** screen.

**Figure 87** Switch Configuration: MAC Forwarding: Add



The following table describes the labels in this screen.

**Table 63** Switch Configuration: MAC Forwarding: Add

LABEL	DESCRIPTION
Active	Select this check box to activate your rule. You may temporarily deactivate a rule without deleting it by clearing this check box.
MAC	Enter the MAC address in valid MAC address format, that is, six hexadecimal character pairs. Static MAC addresses do not age out.
VID	Enter the VLAN group identification number.
Port	Select a port where the MAC address entered in the previous field will be automatically forwarded.
OK	Click <b>OK</b> to save the settings.
Close	Click <b>Close</b> to close the screen. All unsaved settings will be lost.

## 14.8 Mirroring

Port mirroring allows you to copy a traffic flow to a mirror port (the port you copy the traffic to) in order that you can examine the traffic from the mirror port without interference.

Click **Configuration > Switch Configuration > Mirroring** to display the configuration screen.

**Figure 88** Switch Configuration: Mirroring

The following table describes the labels in this screen.

**Table 64** Switch Configuration: Mirroring

LABEL	DESCRIPTION
Monitor Port	The monitor port is the port you copy the traffic to in order to examine it in more detail without interfering with the traffic flow on the original port(s). Select a port from the drop-down list box.
Mirrored Port	Select a port from the drop-down list box to mirror the traffic on a port.
Direction	This field is not available on all switch models. Select the traffic direction from the drop-down list box. Choices are <b>Ingress</b> (incoming) or <b>Egress</b> (outgoing).
Ingress	You can specify to copy all incoming traffic or traffic to/from a specified MAC address. Select <b>All</b> to copy all incoming traffic from the mirrored port(s). Select <b>Destination MAC</b> to copy incoming traffic to a specified MAC address on the mirrored port(s). Enter the destination MAC address in the fields provided. Select <b>Source MAC</b> to copy incoming traffic from a specified MAC address on the mirrored port(s). Enter the source MAC address in the fields provided.
Egress	You can specify to copy all outgoing traffic or traffic to/from a specified MAC address. Select <b>All</b> to copy all outgoing traffic from the mirrored port(s). Select <b>Destination MAC</b> to copy outgoing traffic to a specified MAC address on the mirrored port(s). Enter the destination MAC address in the fields provided. Select <b>Source MAC</b> to copy outgoing traffic from a specified MAC address on the mirrored port(s). Enter the source MAC address in the fields provided.
Apply	Click <b>Apply</b> to save the changes.





# CHAPTER 15

## VLAN

This chapter describes how to view VLAN status, add and edit VLANs and how to use the VLAN template. The type of screen you see here depends on the **VLAN Type** you selected in the **Switch Setup** screen.

### 15.1 Introduction to VLANs

A VLAN (Virtual Local Area Network) allows a physical network to be partitioned into multiple logical networks. Devices on a logical network belong to one group. A device can belong to more than one group. With VLAN, a device cannot directly talk to or hear from devices that are not in the same group(s); the traffic must first go through a router.

In MTU (Multi-Tenant Unit) applications, VLAN is vital in providing isolation and security among the subscribers. When properly configured, VLAN prevents one subscriber from accessing the network resources of another on the same LAN, thus a user will not see the printers and hard disks of another user in the same building.

VLAN also increases network performance by limiting broadcasts to a smaller and more manageable logical broadcast domain. In traditional switched environments, all broadcast packets go to each and every individual port. With VLAN, all broadcasts are confined to a specific broadcast domain.

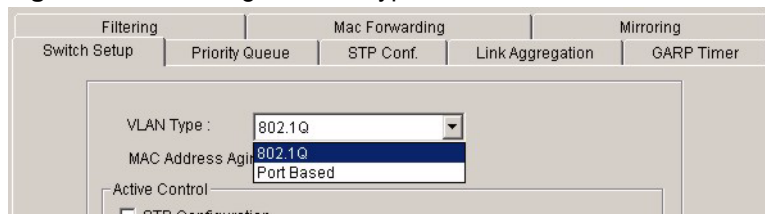
Note that VLAN is unidirectional; it only governs outgoing traffic.

### 15.2 Configuring 802.1Q VLAN

Follow the steps below to set the **802.1Q VLAN Type** on the switch.

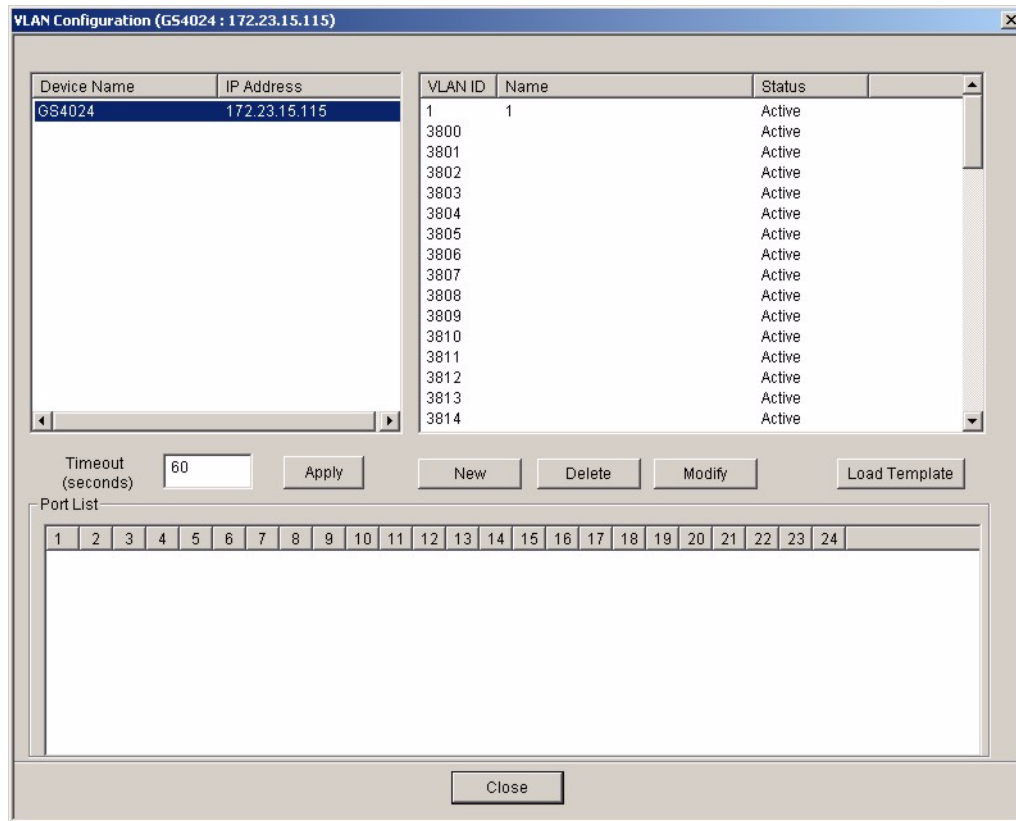
- 1 In the Device Panel list, select a device and then right-click.
- 2 Click **Configuration > Switch Configuration > Switch Setup**.
- 3 Select **802.1Q** as the **VLAN Type** and then click **Apply**.

**Figure 89** Selecting a VLAN Type



4 Click **Configuration > VLAN Configuration** to display the configuration screen.

**Figure 90** VLAN Configuration: 802.1Q



The following table describes the labels in this screen.

**Table 65** VLAN Configuration: 802.1Q

LABEL	DESCRIPTION
Device Name	This field displays the descriptive name for the device.
IP Address	This field displays the IP address of the device.
VLAN ID	This field displays the ID of the VLAN.
Name	This field displays the name of the VLAN.
Status	This field displays <b>Active</b> if the VLAN is active and will remain so after the next reset of the device. This field is <b>DynamicGVRP</b> if the VLAN is active and will remain so until removed by GVRP. This field is <b>Other</b> if the VLAN is active, but is not permanent or created by GVRP.
Timeout (seconds)	The text box displays how long (in seconds) an SNMP request times out. You may change the timeout by typing a new number in the text box and then clicking the <b>Apply</b> button.
New	Click <b>New</b> to create a new VLAN. You must enter a <b>VLAN ID</b> and a <b>VLAN Name</b> to create a new <b>VLAN</b> . The new VLAN and name is displayed in the left-hand column in this screen.
Delete	Click on a VLAN in the left-hand column of this screen and then click the <b>Delete</b> button to remove it from the VLAN template.

**Table 65** VLAN Configuration: 802.1Q (continued)

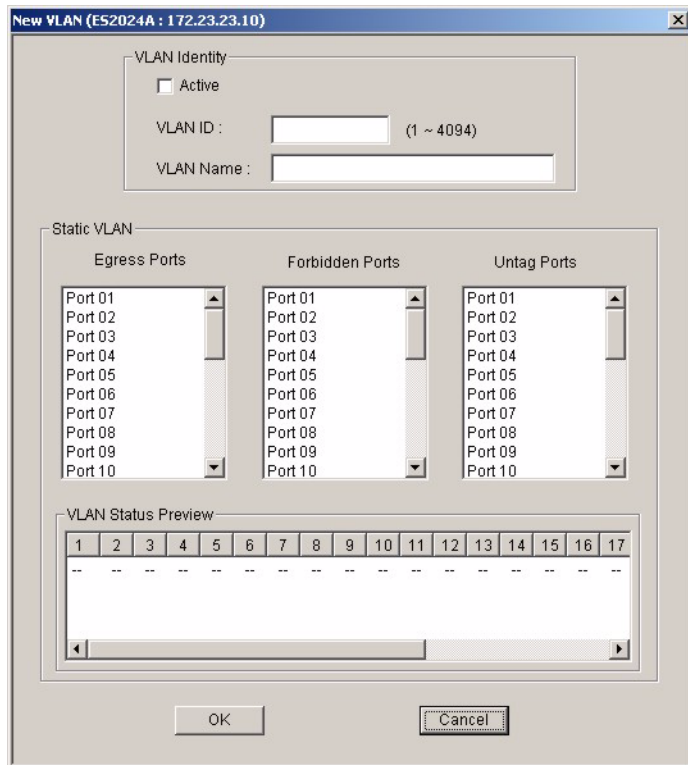
LABEL	DESCRIPTION
Modify	Click on a VLAN in the left-hand column of this screen. Change the <b>VLAN ID</b> , <b>VLAN Name</b> or change the configuration of the egress, forbidden and untagged ports. Click the <b>Modify</b> button to save the changes.
Load Template	Use a VLAN template to overwrite existing selected VLANs. Select one or more VLANs and click the <b>Load Template</b> button. See <a href="#">Section 6.2 on page 68</a> for more information.
Port List	Click on a port in the <b>Egress Ports</b> list to add the selected port to the port list. If a port is not selected from any of the three port lists, then it is a normal tagged port. Refer to <a href="#">Table 66 on page 137</a> for the VLAN port type descriptions.
Close	Click <b>Close</b> to close the screen.

### 15.2.1 Configuring an 802.11Q VLAN

Ports are assigned membership in a VLAN by associating a VLAN ID with the ports.

In the **VLAN Configuration** screen, click **New** or **Modify** to display the setup screen.

**Figure 91** VLAN Configuration: 802.1Q: New or Modify



The following table describes the labels in this screen.

**Table 66** VLAN Configuration: 802.1Q: Modify

LABEL	DESCRIPTION
VLAN Identity	
Active	Select <b>Active</b> to enable this VLAN.
VLAN ID	This field displays a unique number to identify the VLAN.
VLAN Name	Enter a descriptive name for identification purposes.
Static VLAN	Click on a port in a list to add the selected port to the port list. If a port is not on any of the three port lists, then it is a normal tagged port. Refer to the following table for the VLAN port type descriptions.
Egress Ports	Select the port(s) to belong to this VLAN.
Forbidden Ports	This is a port that is blocked from joining a VLAN group. No frames are transmitted through this port.
Untag Port	This is a port that does not tag all outgoing frames transmitted.
VLAN Status Preview	Click on a port in the <b>Egress Ports</b> list to add the selected port to the VLAN Status Preview list. If a port is not selected from any of the three port lists, then it is a normal tagged port. Refer to <a href="#">Table 67 on page 137</a> for the VLAN port type descriptions.
OK	Click <b>OK</b> to save the changes and close this screen.
Cancel	Click <b>Cancel</b> to close this screen. All unsaved changes will be lost.

**Note:** A forbidden port cannot be an egress port.

The following table describes the labels in this screen for each VLAN port type.

**Table 67** VLAN Port Type Descriptions

LABEL	DESCRIPTION
Egress Ports	A port that is in the egress list in a VLAN. Only select this if the connected device supports IEEE 802.1Q VLAN.
Forbidden Ports	A port that is blocked from joining a VLAN group. No frames are transmitted through this port.
Untag Ports	A port that does not tag all outgoing frames transmitted.
Normal Tagged Port	A port that joins a VLAN group using GVRP. Outgoing frames are tagged on this port.

## 15.2.2 Removing a VLAN

In the **VLAN Configuration** screen, select a VLAN and click **Delete**.

## 15.3 Introduction to Port-based VLANs

Port-based VLANs are VLANs where the packet forwarding decision is based on the destination MAC address and its associated port.

Port-based VLANs require allowed outgoing ports to be defined for each port. Therefore, if you wish to allow two subscriber ports to talk to each other, for example, between conference rooms in a hotel, you must define the egress (an egress port is an outgoing port, that is, a port through which a data packet leaves) for both ports.

Port-based VLANs are specific only to the switch on which they were created.

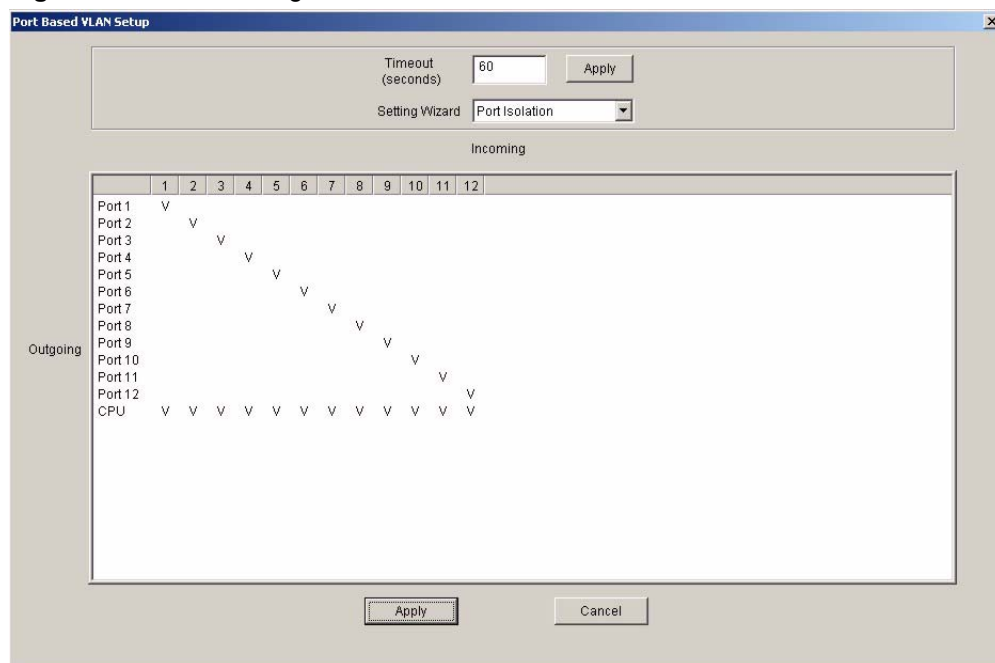
The port-based VLAN setup screen is shown next. The CPU management port forms a VLAN with all Ethernet ports.

### 15.3.1 Configuring Port Based VLAN

Follow the steps below to set the **Port Based VLAN Type** on the switch.

- 1 In the Device Panel list, select a device and then right-click.
- 2 Click **Configuration > Switch Configuration > Switch Setup**.
- 3 Select **Port Based** as the **VLAN Type** and then click **Apply**.
- 4 Select a device, right-click and click **Configuration > VLAN Configuration** to display the screen as shown next.

**Figure 92** VLAN Configuration: Port Based



The following table describes the labels in this screen.

**Table 68** VLAN Configuration: Port Based

LABEL	DESCRIPTION
Timeout (seconds)	The text box displays how long (in seconds) an SNMP request times out. You may change the timeout by typing a new number in the text box and then clicking the <b>Apply</b> button.
Setting Wizard	<p>Choose from <b>All connected</b> or <b>Port isolation</b>.</p> <p><b>All connected</b> means all ports can communicate with each other, that is, there are no virtual LANs. All incoming and outgoing ports are selected. This option is the most flexible but also the least secure.</p> <p><b>Port isolation</b> means that each port can only communicate with the <b>CPU</b> management port and cannot communicate with each other. All incoming ports are selected while only the <b>CPU</b> outgoing port is selected. This option is the most limiting but also the most secure.</p> <p>After you make your selection, click <b>Apply</b> to display the screens as mentioned above. You can still customize these settings by adding/deleting incoming or outgoing ports, but you must also click <b>Apply</b> at the bottom of the screen.</p>
Incoming	These are the ingress ports; an ingress port is an incoming port, that is, a port through which a data packet enters. If you wish to allow two subscriber ports to talk to each other, you must define the ingress port for both ports. The numbers in the top row denote the incoming port for the corresponding port listed on the left (its outgoing port). <b>CPU</b> refers to the switch management port. By default it forms a VLAN with all Ethernet ports. If it does not form a VLAN with a particular port then the switch cannot be managed from that port.
Outgoing	These are the egress ports; an egress port is an outgoing port, that is, a port through which a data packet leaves. If you wish to allow two subscriber ports to talk to each other, you must define the egress port for both ports. <b>CPU</b> refers to the switch management port. By default it forms a VLAN with all Ethernet ports. If it does not form a VLAN with a particular port then the switch cannot be managed from that port.
Apply	Click <b>Apply</b> to save the changes, including the "wizard settings".
Cancel	Click <b>Cancel</b> to start configuring the screen again.

# CHAPTER 16

## Ethernet Port Configuration

This chapter shows how to configure the Ethernet port settings.

### 16.1 Overview

Use the **Ethernet Port Configuration** screens to set port-related settings (such as port VLAN, STP and security, etc.).

Once you configure a feature on a port, you must enable that feature on the switch in the **Switch Setup** screen.

### 16.2 Port Setup

Use the **Port Setup** screen to activate and configure switch port parameters.

- 1 In the Device Panel list, select a device and then right-click.
- 2 Click **Configuration > Ethernet Port > Port Setup**.
- 3 Select a device and the ports to which you want to apply this configuration.

**Figure 93** Ethernet Port Configuration: Port Setup

The screenshot displays the 'Port Setup' configuration window. At the top, there are several tabs: Port Security, Port Mirroring, VLAN Stacking, Bandwidth Ctrl., Broadcast Storm Ctrl., Queue Method, IP Multicast, DiffServ, Port Setup (selected), Port VLAN, Port Link Aggregation, Port STP, and Port 802.1x. The main area contains the following settings:

- Active
- Type: 1000M
- Port Name: port01
- Speed/Duplex: Auto (dropdown menu)  Flow Control
- 802.1p Priority: 0 (dropdown menu)
- BPDU Control: Peer (dropdown menu)
- Intrusion Lock

An 'Apply' button is located at the bottom center of the window.



The following table describes the fields in this screen.

**Table 69** Ethernet Port Configuration: Port Setup

LABEL	DESCRIPTION
Timeout (seconds)	The text box displays how long (in seconds) an SNMP request times out. You may change the timeout by typing a new number in the text box and then clicking the <b>Apply</b> button.
Active	Select this check box to enable a port. The factory default for all ports is enabled. A port must be enabled for data transmission to occur.
Type	This field displays the port type and port speed.
Port Name	This field displays the name of a selected port.
Speed/Duplex	<p>Select the speed and the duplex mode of the Ethernet connection on this port. Choices are <b>Auto</b>, <b>10M/Half Duplex</b>, <b>10M/Full Duplex</b>, <b>100M/Half Duplex</b>, <b>100M/Full Duplex</b> and <b>1000M/Full Duplex</b> (for Gigabit/mini-GBIC ports only).</p> <p>Selecting <b>Auto</b> (auto-negotiation) makes one Ethernet port able to negotiate with a peer automatically to obtain the connection speed and duplex mode that both ends support. When auto-negotiation is turned on, an Ethernet port on the switch negotiates with the peer automatically to determine the connection speed and duplex mode. If the peer Ethernet port does not support auto-negotiation or turns off this feature, the switch determines the connection speed by detecting the signal on the cable and using half duplex mode. When the switch's auto-negotiation is turned off, an Ethernet port uses the pre-configured speed and duplex mode when making a connection, thus requiring you to make sure that the settings of the peer Ethernet port are the same in order to connect.</p>
Flow Control	<p>A concentration of traffic on a port decreases port bandwidth and overflows buffer memory causing packet discards and frame losses. Flow Control is used to regulate transmission of signals to match the bandwidth of the receiving port. The switch uses IEEE 802.3x flow control in full duplex mode and backpressure flow control in half duplex mode.</p> <p>IEEE 802.3x flow control is used in full duplex mode to send a pause signal to the sending port, causing it to temporarily stop sending signals when the receiving port memory buffers fill. Back Pressure flow control is typically used in half duplex mode to send a "collision" signal to the sending port (mimicking a state of packet collision) causing the sending port to temporarily stop sending signals and resend later. Select <b>Flow Control</b> to enable it.</p>
802.1p Priority	The switch uses this priority value for incoming frames without an IEEE 802.1p priority queue tag. The switch uses this priority value internally and does not add an IEEE 802.1p priority tag.
Intrusion Lock	<p>Select the <b>Intrusion Lock</b> check box to enable this security feature on a selected port on the switch. If an Ethernet cable is disconnected from the port, intrusion locking prevents access once a cable is reconnected. This limits risk from unauthorized access such as hacking.</p> <p><b>Note:</b> You cannot access a port with intrusion locking enabled after a cable is disconnected and then reconnected. You must clear and re-select the <b>Intrusion Lock</b> check box to allow access to the port again.</p>
Jumbo Frame	<p>Jumbo frames are used to forward non-standard packet sizes on your network. These frames can deliver frames of up to 9216 bytes instead of standard Ethernet frames of 1522 bytes. Fewer packets are required for large data transfer, improving traffic throughput on the port.</p> <p>Select this option to allow a port to send and receive jumbo frames.</p> <p><b>Note:</b> The peer device must also support non-standard packet traffic.</p>

**Table 69** Ethernet Port Configuration: Port Setup (continued)

LABEL	DESCRIPTION
BPDU Control	Configure the way to treat BPDUs received on this port. You must activate bridging control protocol transparency in the <b>Switch Setup</b> screen first. Select <b>Peer</b> to process any BPDU (Bridge Protocol Data Units) received on this port. Select <b>Tunnel</b> to forward BPDUs received on this port. Select <b>Discard</b> to drop any BPDU received on this port. Select <b>Network</b> to process a BPDU with no VLAN tag and forward a tagged BPDU.
Apply	Click <b>Apply</b> to save your changes.

## 16.3 Port VLAN

Follow the steps below to configure the **Port VLAN** screen.

- 1 In the Device Panel list, select a device and then right-click.
- 2 Click **Configuration > Ethernet Port Configuration > Port VLAN**.
- 3 Select a device and the port(s) to which you want to apply this configuration.

**Figure 94** Ethernet Port Configuration: Port VLAN

The following table describes the labels in this screen.

**Table 70** Ethernet Port Configuration: Port VLAN

LABEL	DESCRIPTION
Ingress	This feature is not supported on all models. If this check box is selected for a port, the device discards incoming frames for VLANs that do not include this port in its member set.
PVID	Each port on the switch is capable of passing tagged or untagged frames. To forward a frame from an IEEE 802.1Q VLAN-unaware switch to an IEEE 802.1Q VLAN-aware switch, the switch first decides where to forward the frame, and then inserts a VLAN tag reflecting the default ingress port's VLAN ID, the PVID. The default PVID is VLAN 1 for all ports, but this can be changed to any number between 1 and 4094.
GVRP	Select the check box to permit VLAN groups beyond the local switch on this port. GVRP (GARP VLAN Registration Protocol) is a registration protocol that defines a way for switches to register necessary VLAN members on ports across the network.
Acceptable Frame Type	Specify the type of frames allowed on a port. Choices are <b>All</b> and <b>Tag Only</b> . Select <b>All</b> to accept all frames with untagged or tagged frames on this port. This is the default setting. Select <b>Tag Only</b> to accept only tagged frames on this port. All untagged frames are dropped.
VLAN Trunking	Enable VLAN trunking on ports connected to other switches or routers (but not ports directly connected to end users) to allow frames belonging to unknown VLAN groups to pass through the switch.
Apply	Click <b>Apply</b> to save the changes.

## 16.4 Port Link Aggregation

Use the **Port Link Aggregation** screen to configure a port trunk group and set LACP timeout.

- 1 In the Device Panel list, select a device and then right-click.
- 2 Click **Configuration > Ethernet Port Configuration > Port Link Aggregation**.
- 3 Select a device and the port(s) to which you want to apply this configuration.

**Figure 95** Ethernet Port Configuration: Port Link Aggregation

The following table describes the fields in this screen.

**Table 71** Ethernet Port Configuring: Port Link Aggregation

LABEL	DESCRIPTION
Timeout (seconds)	The text box displays how long (in seconds) an SNMP request times out. You may change the timeout by typing a new number in the text box and then clicking the <b>Apply</b> button.
Group	Select the trunk group to which a port belongs.
LACP Timeout	Timeout is the time interval between the individual port exchanges of LACP packets in order to check that the peer port in the trunk group is still up. If a port does not respond after three tries, then it is deemed to be "down" and is removed from the trunk. Set a short timeout (one second) for busy trunked links to ensure that disabled ports are removed from the trunk group as soon as possible. Select from 1 second to 30 seconds.
Apply	Click <b>Apply</b> to save the changes.

## 16.5 Port STP

Use the **Port STP** screen to configure STP for the selected ports.

- 1 In the Device Panel list, right-click on a device.
- 2 Click **Configuration > Ethernet Port Configuration > Port STP**.
- 3 Select a device and the port(s) to which you want to apply this configuration.

**Figure 96** Ethernet Port Configuration: Port STP

The following table describes the fields in this screen.

**Table 72** Ethernet Port Configuration: Port STP

LABEL	DESCRIPTION
STP Active	Select this check box to activate STP on this port.
Priority	Priority is used in determining the root device, root port and designated port. The device with the highest priority (lowest numeric value) becomes the STP root device. If all devices have the same priority, the device with the lowest MAC address will then become the root device. The allowed range is 0 to 255. The lower the numeric value you assign, the higher the priority for this device.

**Table 72** Ethernet Port Configuration: Port STP (continued)

LABEL	DESCRIPTION
Path Cost	Path cost is the cost of transmitting a frame on to a LAN through that port. It is assigned according to the speed of the link. The slower the media, the higher the cost (refer to the table on path cost in the section on STP).
Apply	Click <b>Apply</b> to save the changes.

## 16.6 Port 802.1x

Use the **Port 802.1x** screen to configure reauthentication for selected ports.

- 1 In the Device Panel list, select a device and then right-click.
- 2 Click **Configuration > Ethernet Port Configuration > Port 802.1x**.
- 3 Select a device and the port(s) to which you want to apply this configuration.

**Figure 97** Ethernet Port Configuration: Port 802.1x

The following table describes the fields in this screen.

**Table 73** Ethernet Port Configuration: Port 802.1x

LABEL	DESCRIPTION
802.1x Active	Select this check box to permit IEEE 802.1x authentication on this port. You must first allow IEEE 802.1x authentication on the switch before configuring it on each port.
Reauthentication	Select <b>On</b> from the drop-down list box to periodically prompt a subscriber to re-enter his or her username and password to stay connected to the port.
Reauthentication Timer	Specify how often a client has to re-enter his or her username and password to stay connected to the port.
Apply	Click <b>Apply</b> to save the changes.

## 16.7 Broadcast Storm Control

Broadcast storm control limits the number of broadcast, multicast and destination lookup failure (DLF) packets the switch receives per second on the ports. When the maximum number of allowable broadcast, multicast and/or DLF packets is reached per second, the subsequent packets are discarded. Enable this feature to reduce broadcast, multicast and/or DLF packets in your network.

- 1 In the Device Panel list, select a device and then right-click.
- 2 Click **Configuration > Ethernet Port Configuration > Broadcast Storm Ctrl.**
- 3 Select a device and the port(s) to which you want to apply this configuration.

**Figure 98** Ethernet Port Configuration: Broadcast Storm Ctrl.

The screenshot shows a configuration window with a tabbed interface. The active tab is 'Broadcast Storm Ctrl.'. Below the tabs are three rows of controls:

- Broadcast: [0] (pkt / s)
- Multicast: [0] (pkt / s)
- DLF: [0] (pkt / s)

An 'Apply' button is located at the bottom center of the window.

The following table describes the labels in this screen.

**Table 74** Ethernet Port Configuration: Broadcast Storm Ctrl.

LABEL	DESCRIPTION
Active	Select <b>Active</b> to enable broadcast storm control.  <b>Note:</b> For GS-2024, configure rate limiting settings in the <b>Switch Configuration: Switch Setup</b> screen. Refer to <a href="#">Section 14.1 on page 120</a> .
Rate	Specify the traffic a port receives in kilobits per second (Kbps). <ul style="list-style-type: none"> <li>• If you enter a number between 64 and 1728, the switch automatically rounds the number down to the nearest multiple of 64.</li> <li>• If you enter a number between 1729 and 1999, the rate is fixed at 1792.</li> <li>• If you enter a number between 2000 and 103999, the switch rounds the number down to the nearest multiple of 1000.</li> <li>• On a Gigabit Ethernet/ Mini-GBIC port, the switch rounds a number down to the nearest multiple of 8000 for a number between 104000 and 1000000.</li> </ul>
Broadcast	Select this option and specify how many broadcast packets the port receives per second.
Multicast	Select this option and specify how many multicast packets the port receives per second.

**Table 74** Ethernet Port Configuration: Broadcast Storm Ctrl. (continued)

LABEL	DESCRIPTION
DLF	Select this option and specify how many destination lookup failure (DLF) packets the port receives per second.
Apply	Click <b>Apply</b> to save the changes.

## 16.8 Queue Method

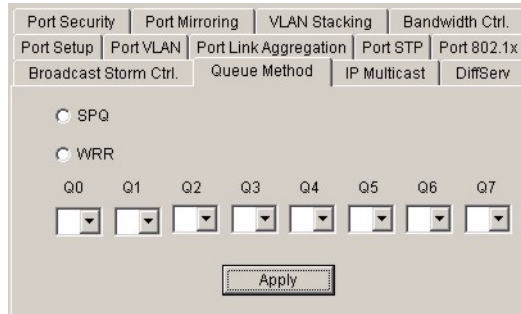
Queuing is used to help solve performance degradation when there is network congestion.

Depending on your device model, use the **Switch Setup** screen to configure queuing algorithms for outgoing traffic (refer to [Section 14.1 on page 120](#)).

Follow the steps below to configure queuing for each port.

- 1 In the Device Panel list, select a device and then right-click.
- 2 Click **Configuration > Ethernet Port Configuration > Queue Method**.
- 3 Select a device and the port(s) to which you want to apply this configuration.

**Figure 99** Ethernet Port Configuration: Queue Method



The following table describes the fields in this screen.

**Table 75** Ethernet Port Configuration: Queue Method

LABEL	DESCRIPTION
SPQ	Select <b>SPQ</b> (Strict Priority Queuing) to service queues based on priority only. When the highest priority queue empties, traffic on the next highest-priority queue begins. The default queuing method is <b>Strictly Priority</b> . <b>Weighted Fair Scheduling</b> is used to guarantee each queue's minimum bandwidth based on their bandwidth portion (weight) (the number you configure in the <b>Weight</b> field). Queues with larger weights get more guaranteed bandwidth than queues with smaller weights.
WRR	Select <b>WRR</b> (Weighted Round Robin Scheduling) to service queues on a rotating basis based on their queue weight (the number you select from the drop-down list box for the corresponding queue). Queues with larger weights get more service than queues with smaller weights.

**Table 75** Ethernet Port Configuration: Queue Method (continued)

LABEL	DESCRIPTION
Q0 - Q7	For <b>Weighted Fair Scheduling</b> , select the queue weight here. Bandwidth is divided across the different traffic queues according to their weights. Queues with larger weights get more guaranteed bandwidth than queues with smaller weights. For Gigabit/ Mini-GBIC ports, if you select <b>0</b> for the queue weight, the switch uses <b>Strictly Priority</b> to service the queue.
Apply	Click <b>Apply</b> to save the changes.

## 16.9 IP Multicast

Use the **IP Multicast** screen to specify which multicast VLAN ID you want the device to remove from the packets before transmitting.

- 1 In the Device Panel list, select a device and then right-click.
- 2 Click **Configuration > Ethernet Port Configuration > IP Multicast**.
- 3 Select a device and the port(s) to which you want to apply this configuration.
- 4 In the **IP Multicast Egress Untag VLAN ID** field, enter the multicast VLAN ID you want to remove from the outgoing traffic.

**Figure 100** Ethernet Port Configuration: IP Multicast

## 16.10 DiffServ

DiffServ is a class of service (CoS) model that marks packets so that they receive specific per-hop treatment at DiffServ-compliant network devices along the route based on the application types and traffic flow. Packets are marked with DiffServ Code Points (DSCPs) indicating the level of service desired. This allows the intermediary DiffServ-compliant network devices to handle the packets differently depending on the code points without the need to negotiate paths or remember state information for every flow. In addition, applications do not have to request a particular service or give advanced notice of where the traffic is going.

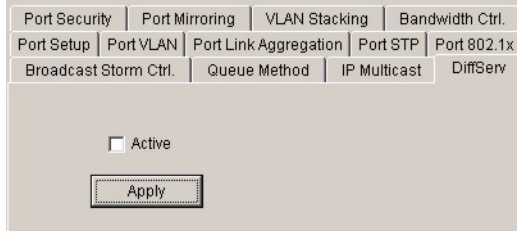
Enable DiffServ in the **DiffServ** screen.

- 1 In the Device Panel list, select a device and then right-click.
- 2 Click **Configuration > Ethernet Port Configuration > DiffServ**.



- 3 Select **Active** to enable the DSCP-to-IEEE 802.1q mapping. Set the mapping in the **IP Configuration: DSCP** screen (refer to [Section 18.7 on page 180](#)).
- 4 Click **Apply** to save the changes.

**Figure 101** Ethernet Port Configuration: DiffServ



## 16.11 Port Security

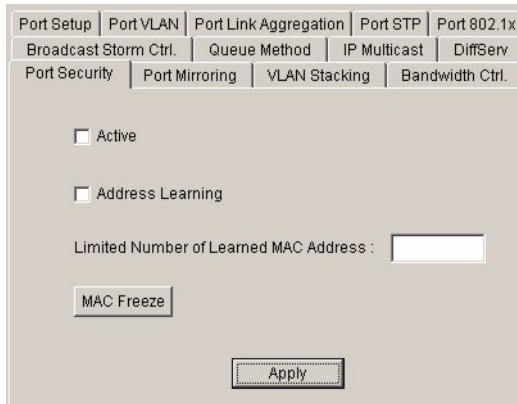
Port security allows only packets with dynamically learned MAC addresses and/or configured static MAC addresses to pass through a port on the switch.

For maximum port security, enable this feature, disable MAC address learning and configure static MAC address(es) for a port. It is not recommended you disable Port Security together with MAC address learning as this will result in many broadcasts. By default, MAC address learning is still enabled even though the port security is not activated.

Follow the steps below to configure the **Port Security** screen.

- 1 In the Device Panel list, select a device and then right-click.
- 2 Click **Configuration > Ethernet Port Configuration > Port Security**.
- 3 Select a device and the port(s) to which you want to apply this configuration.

**Figure 102** Ethernet Port Configuration: Port Security



The following table describes the fields in this screen.

**Table 76** Ethernet Port Configuration: Port Security

TABLE	DESCRIPTION
Active	Select this check box to enable the port security feature on selected ports.
Address Learning	MAC address learning reduces outgoing broadcast traffic. For MAC address learning to occur on a port, the port itself must be active with address learning enabled. Select the <b>Address Learning</b> check box.
Limited Number of Learned MAC Address	Use this field to limit the number of (dynamic) MAC addresses that may be learned on a port. For example, if you set this field to "5" on port 2, then only the devices with these five learned MAC addresses may access port 2 at any one time. A sixth device would have to wait until one of the five learned MAC addresses aged out. MAC-address aging out time can be set in the <b>Switch Setup</b> screen. The valid range is from 0 to 16K. 0 means this feature is disabled, so the switch will learn MAC addresses up to the global limit of 16K.
MAC Freeze	Click <b>MAC Freeze</b> to convert all current dynamic MAC addresses to static MAC addresses. When you click the <b>MAC Freeze</b> button, the <b>MAC Address Learning</b> check box is cleared but port security becomes <b>Active</b> .
Apply	Click <b>Apply</b> to save the changes.

## 16.12 Port Mirroring

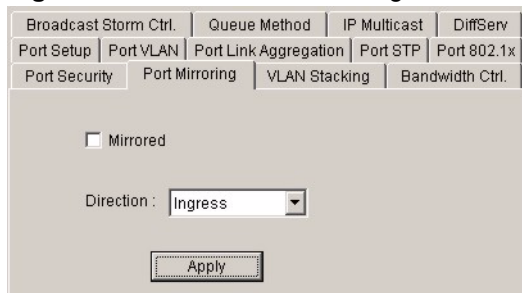
Port mirroring allows you to copy traffic going from one or all ports to another or all ports in order that you can examine the traffic from the mirror port (the port you copy the traffic to) without interference.

You must first select a monitor port. A monitor port is a port that copies the traffic of another port. After you select a monitor port, configure a mirroring rule in the related fields.

Follow the steps below to configure the **Port Mirroring** screen.

- 1 In the Device Panel list, select a device and then right-click.
- 2 Click **Configuration > Ethernet Port Configuration > Port Mirroring**.
- 3 Select a device and the port(s) to which you want to apply this configuration.

**Figure 103** Ethernet Port Configuration: Port Mirroring



The following table describes the fields in this screen.

**Table 77** Ethernet Port Configuration: Port Mirroring

LABEL	DESCRIPTION
Mirrored	Select this option to mirror the traffic on a port.
Direction	Specify the direction of the traffic to mirror. Select <b>Egress</b> (outgoing), <b>Ingress</b> (incoming) or <b>Both</b> from the drop-down list box.
Apply	Click <b>Apply</b> to save the changes.

## 16.13 VLAN Stacking

A service provider can use VLAN stacking to allow it to distinguish multiple customers VLANs, even those with the same (customer-assigned) VLAN ID, within its network.

Use VLAN stacking to add an outer VLAN tag to the inner IEEE 802.1Q tagged frames that enter the network. By tagging the tagged frames ("double-tagged" frames), the service provider can manage up to 4,094 VLAN groups with each group containing up to 4,094 customer VLANs. This allows a service provider to provide different service, based on specific VLANs, for many different customers.

A service provider's customers may require a range of VLANs to handle multiple applications. A service provider's customers can assign their own inner VLAN tags on ports for these applications. The service provider can assign an outer VLAN tag for each customer. Therefore, there is no VLAN tag overlap among customers, so traffic from different customers is kept separate.

Follow the steps below to configure the **VLAN Stacking** screen.

- 1 In the Device Panel list, select a device and then right-click.
- 2 Click **Configuration > Ethernet Port Configuration > VLAN Stacking**.
- 3 Select a device and the port(s) to which you want to apply this configuration.

**Figure 104** Ethernet Port Configuration: VLAN Stacking

The following table describes the fields in this screen.

**Table 78** Ethernet Port Configuration: VLAN Stacking

LABEL	DESCRIPTION
Role	Select <b>Normal</b> to have the switch ignore frames received (or transmitted) on this port with VLAN stacking tags. Anything you configure in <b>SPVID</b> and <b>Priority</b> is ignored. Select <b>Access Port</b> to have the switch add the <b>SP TPID</b> tag to all incoming frames received on this port. Select <b>Access Port</b> for ingress ports at the edge of the service provider's network. Select <b>Tunnel Port</b> (available for Gigabit ports only) for egress ports at the edge of the service provider's network. In order to support VLAN stacking on a port, the port must be able to allow frames of 1526 Bytes (1522 Bytes + 4 Bytes for the second tag) to pass through it.
SPVID	<b>SPVID</b> is the service provider's VLAN ID (the outer VLAN tag). Enter the service provider ID (from 1 to 4094) for frames received on this port. See the chapter on VLANs for more background information on VLAN ID.
Priority	Select the priority level of the inner IEEE 802.1Q tag. "0" is the lowest priority level and "7" is the highest.
Apply	Click <b>Apply</b> to save the changes.

## 16.14 Bandwidth Control

Bandwidth control means defining a maximum allowable bandwidth for incoming and/or outgoing traffic flows on a port.

- 1 In the Device Panel list, select a device and then right-click.
- 2 Click **Configuration > Ethernet Port Configuration > Bandwidth Ctrl.**
- 3 Select a device and the port(s) to which you want to apply this configuration.

**Figure 105** Ethernet Port Configuration: Bandwidth Ctrl.

The following table describes the labels in this screen.

**Table 79** Ethernet Port Configuration: Bandwidth Ctrl.

LABEL	DESCRIPTION
Active	Select this check box to enable bandwidth control on the selected port(s). You may temporarily deactivate a rule without deleting it by clearing this check box.
Ingress Rate	Type the maximum bandwidth allowed in kilobits per second (Kbps) for traffic coming into this port.
Committed Rate	Specify the guaranteed bandwidth allowed in kilobits per second (Kbps) for the incoming traffic flow on a port. The commit rate should be less than the peak rate. The sum of commit rates cannot be greater than or equal to the uplink bandwidth.
Peak Rate	Specify the maximum bandwidth allowed in kilobits per second (Kbps) for the incoming traffic flow on a port.
Egress Rate	Type the maximum bandwidth allowed in kilobits per second (Kbps) for traffic going out of this port.
Scheme	<p>Select <b>Drop</b> (default) from the drop-down list box to discard all incoming packets that are over the maximum allowable bandwidth on a port.</p> <p>A concentration of traffic on a port decreases port bandwidth and overflows buffer memory causing packet discards and frame losses. <b>Flow Control</b> is used to regulate transmission of signals to match the bandwidth of the receiving port.</p> <p>The switch uses IEEE 802.3x flow control in full duplex mode and backpressure flow control in half duplex mode.</p> <p>IEEE 802.3x flow control is used in full duplex mode to send a pause signal to the sending port, causing it to temporarily stop sending signals when the receiving port memory buffers fill. Back Pressure flow control is typically used in half duplex mode to send a "collision" signal to the sending port (mimicking a state of packet collision) causing the sending port to temporarily stop sending signals and resend later. Select this option to enable flow control.</p>
Apply	Click <b>Apply</b> to save the changes.

# CHAPTER 17

## Multicast Configuration

This chapter shows you how to configure multicast settings and MVR (Multicast VLAN Registration) groups.

### 17.1 Overview

Traditionally, IP packets are transmitted in one of either two ways - Unicast (1 sender to 1 recipient) or Broadcast (1 sender to everybody on the network). Multicast delivers IP packets to just a group of hosts on the network.

IGMP (Internet Group Multicast Protocol) is a session-layer protocol used to establish membership in a multicast group - it is not used to carry user data. Refer to RFC 1112 and RFC 2236 for information on IGMP versions 1 and 2 respectively.

#### 17.1.1 IP Multicast Addresses

In IPv4, a multicast address allows a device to send packets to a specific group of hosts (multicast group) in a different subnet. A multicast IP address represents a traffic receiving group, not individual receiving devices. IP addresses in the Class D range (224.0.0.0 to 239.255.255.255) are used for IP multicasting. Certain IP multicast numbers are reserved by IANA for special purposes (see the IANA web site for more information).

#### 17.1.2 IGMP Snooping

A switch can passively snoop on IGMP Query, Report and Leave (IGMP version 2) packets transferred between IP multicast routers/switches and IP multicast hosts to learn the IP multicast group membership. It checks IGMP packets passing through it, picks out the group registration information, and configures multicasting accordingly. IGMP snooping allows the switch to learn multicast groups without you having to manually configure them.

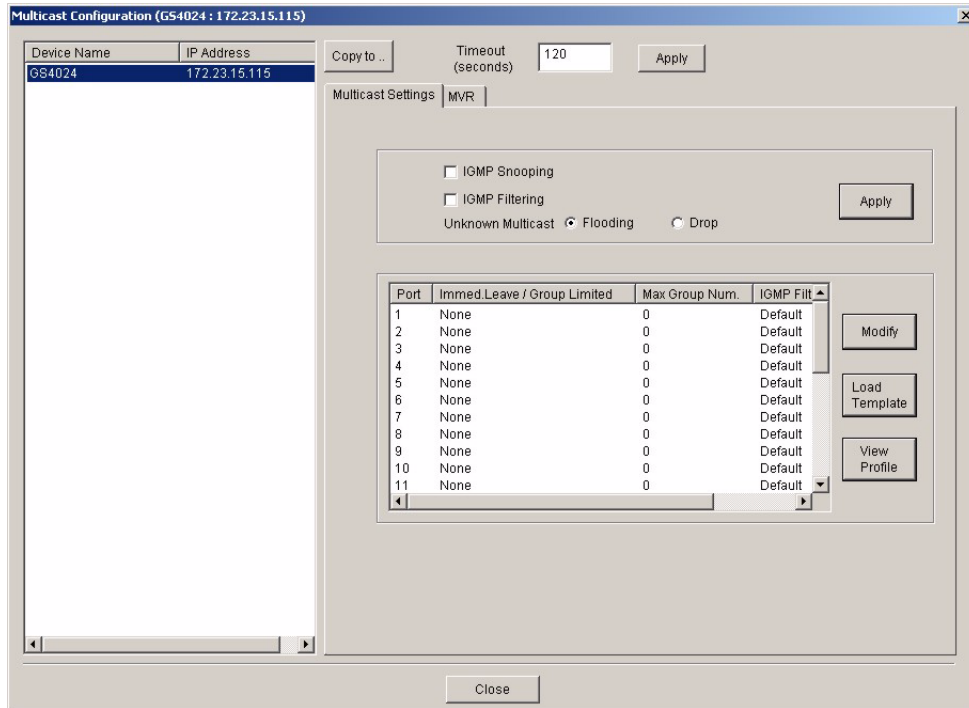
The switch forwards multicast traffic destined for multicast groups (that it has learned from IGMP snooping or that you have manually configured) to ports that are members of that group. IGMP snooping generates no additional network traffic, allowing you to significantly reduce multicast traffic passing through your switch.

For background information on IGMP filtering, refer to [Section 6.3 on page 70](#).

## 17.2 Multicast Settings

To configure multicast settings, click **Configuration > Multicast Configuration** to display the configuration screen.

**Figure 106** Multicast Configuration: Multicast Settings



The following table describes the labels in this screen.

**Table 80** Multicast Configuration: Multicast Settings

LABEL	DESCRIPTION
IGMP Snooping	Select <b>Active</b> to enable IGMP snooping to forward group multicast traffic only to ports that are members of that group
IGMP Filtering	Select <b>Active</b> to enable IGMP filtering to control which IGMP groups a subscriber on a port can join.
Unknown Multicast Frame	Specify the action to perform when the switch receives an unknown multicast frame. Select <b>Drop</b> to discard the frame(s). Select <b>Flooding</b> to send the frame(s) to all ports.
Port	This field displays the port number.
Immed. Leave/ Group Limited	This field displays whether the switch is set to remove this port from the multicast tree when an IGMP version 2 leave message is received on this port. This field also displays whether the port is set to join a limited number of groups.
Max Group Num.	This field displays number of multicast groups this port is allowed to join. Once a port is registered in the specified number of multicast groups, any new IGMP join report frame(s) is dropped on this port.
IGMP Filtering Profile	This field displays the name of the IGMP filtering profile this port uses. The default profile ( <b>Default</b> ) prohibits the port from joining any multicast group.

**Table 80** Multicast Configuration: Multicast Settings (continued)

LABEL	DESCRIPTION
Modify	Click <b>Modify</b> to change the multicast settings of the selected port.
Load Template	Click <b>Load Template</b> to display a screen you use to select a multicast template.
View Profile	Click <b>View Profile</b> to display the settings of a selected multicast template.
Apply	Click <b>Apply</b> to save your changes back to the switch.
Cancel	Click <b>Cancel</b> to begin configuring this screen afresh.

## 17.2.1 Changing the Port Multicast Settings

To change the multicast settings of a port, select a port in the **Multicast Setting** screen and click **Modify**. A configuration screen displays.

**Figure 107** Multicast Configuration: Multicast Settings: Modify

The following table describes the labels in this screen.

**Table 81** Multicast Configuration: Multicast Settings: Modify

LABEL	DESCRIPTION
Port	This field displays the port number.
Immed. Leave	Select this option to set the switch to remove this port from the multicast tree when an IGMP version 2 leave message is received on this port. Select this option if there is only one host connected to this port.
Group Limited	Select this option to limit the number of multicast groups this port is allowed to join.
Max Group Num.	Enter the number of multicast groups this port is allowed to join. Once a port is registered in the specified number of multicast groups, any new IGMP join report frame(s) is dropped on this port. Enter <b>0</b> to allow a port to join any number of multicast groups.
IGMP Filtering Profile	Select the name of the IGMP filtering profile to use for this port. Otherwise select <b>Default</b> to prohibit the port from joining any multicast group.
OK	Click <b>OK</b> to save your changes and close this screen.
Cancel	Click <b>Cancel</b> to discard all changes and close this screen.

## 17.2.2 Applying a Multicast Template

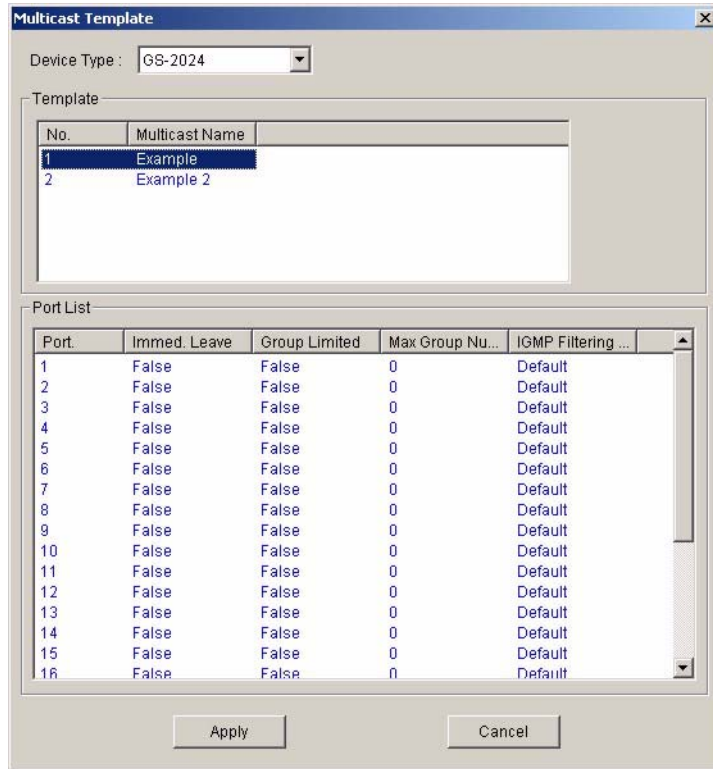
After you create a multicast template using the Template screen, you can apply the template to the switch in the **Multicast Setting** screen.



**Note:** When you apply a multicast template, all custom port multicast settings will be erased.

In the **Multicast Setting** screen, select a device in the device list panel and click **Load Template**. A screen displays as shown.

**Figure 108** Multicast Configuration: Multicast Settings: Load Template



The following table describes the labels in this screen.

**Table 82** Multicast Configuration: Multicast Settings: Load Template

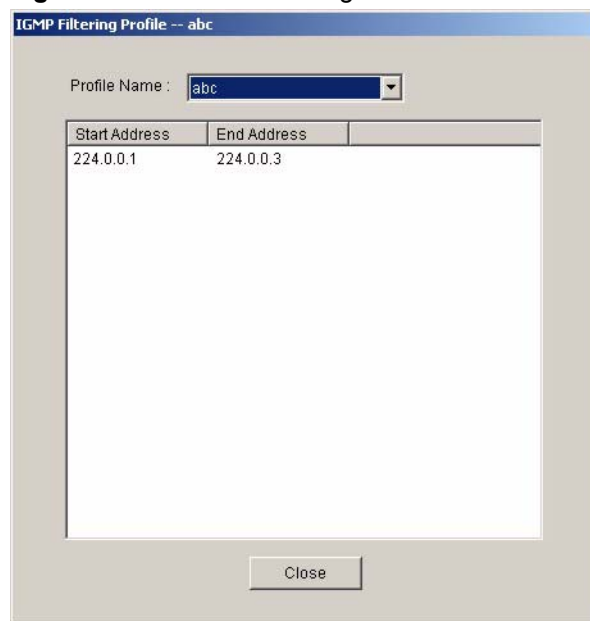
LABEL	DESCRIPTION
Device Type	Select a device type from the drop-down list box.
Template	
No.	This field displays the index number.
Multicast Name	This field displays the name of a multicast template you create using the <b>Template</b> screen.
PortList	This table displays the template settings. Refer to <a href="#">Figure 106 on page 155</a> for more information.
Apply	Click <b>Apply</b> to save the settings and close this screen.
Cancel	Click <b>Cancel</b> to discard the changes and close this screen.

## 17.2.3 Displaying IGMP Filter Profile

You can create IGMP filter templates in the **IGMP Filter Template** screen (refer to [Section 6.3 on page 70](#)) and apply IGMP filter templates in the **Multicast Template** screen.

In the **Multicast Setting** screen, select a port number and click **View Profile** to display IGMP filter profile settings.

**Figure 109** Multicast Configuration: Multicast Settings: View Profile



The following table describes the labels in this screen.

**Table 83** Multicast Configuration: Multicast Settings: View Profile

LABEL	DESCRIPTION
Profile Name	Select a profile name from the drop-down list box.
Start Address	This field displays the starting multicast IP address for a range of multicast IP addresses to which you want this IGMP filter profile to allow access.
End Address	This field displays the ending multicast IP address for a range of IP addresses to which you want this IGMP filter profile to allow access.
Close	Click <b>Close</b> to close this screen.

## 17.3 MVR

Multicast VLAN Registration (MVR) is designed for applications (such as Media-on-Demand (MoD)) that use multicast traffic across a service provider network.

MVR allows one single multicast VLAN to be shared among different subscriber VLANs on the network. While isolated in different subscriber VLANs, connected devices can subscribe to and unsubscribe from the multicast stream in the multicast VLAN. This improves bandwidth utilization with reduced multicast traffic in the subscriber VLANs and simplifies multicast group management.

You must enable IGMP snooping to use MVR. However, MVR only responds to IGMP join and leave control messages from multicast groups that are configured under MVR. Join and leave reports from other multicast groups are managed by IGMP snooping.

### 17.3.1 Types of MVR Ports

In MVR, a source port is a port on the switch that can send and receive multicast traffic in a multicast VLAN while a receiver port can only receive multicast traffic. Once configured, the switch maintains a forwarding table that matches the multicast stream to the associated multicast group.

### 17.3.2 MVR Modes

You can set your switch to operate in either dynamic or compatible mode.

In dynamic mode, the switch sends IGMP leave and join reports through the source port(s) to the other multicast devices (such as multicast routers or servers) in the multicast VLAN. This allows the multicast devices to update the multicast forwarding table to forward or not forward multicast traffic to the receiver ports.

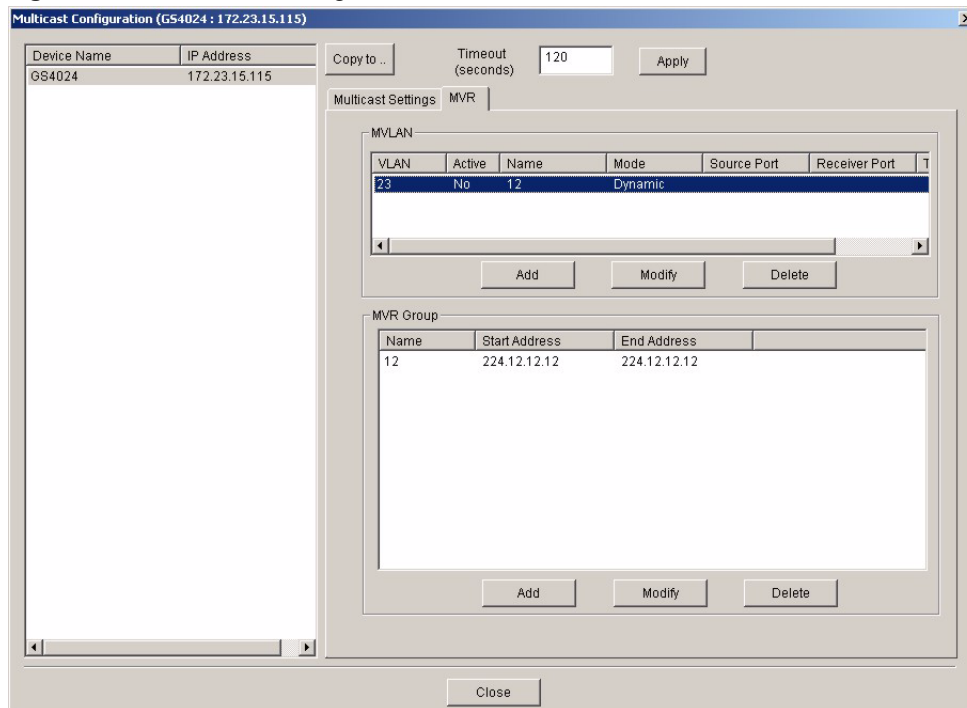
In compatible mode, the switch does not send any IGMP reports through the source port(s). In this case, you must manually configure the forwarding settings on the multicast devices in the multicast VLAN.

Refer to the user's guide that comes with your switch for more background information.

### 17.3.3 Viewing MVR Settings

Click **Configuration > Multicast Configuration > MVR** to display the screen as shown.

**Figure 110** Multicast Configuration: MVR



The following table describes the labels in this screen.

**Table 84** Multicast Configuration: MVR

LABEL	DESCRIPTION
MVLAN	This table displays the settings the multicast VLAN settings.
VLAN	This field displays the multicast VLAN ID.
Active	This field displays whether the multicast group is enabled or not.
Name	This field displays the descriptive name for this setting.
Mode	This field displays the MVR mode.
Source Port	This field displays the source port number(s).
Receiver Port	This field displays the receiver port number(s).
Tagging Port	This field displays the port number(s) that adds the VLAN ID tag to all outgoing frames transmitted.
Add	Click <b>Add</b> to add a new entry.
Modify	Click <b>Modify</b> to change the settings of the selected MVLAN.
Delete	Click <b>Delete</b> to remove the selected MVLAN.
MVR Group	This table displays the MVR group settings.
Name	This field displays the descriptive name for this MVR group.
Start Address	This field displays the starting IP address of the MVR group.
End Address	This field displays the ending IP address of the MVR group.

**Table 84** Multicast Configuration: MVR (continued)

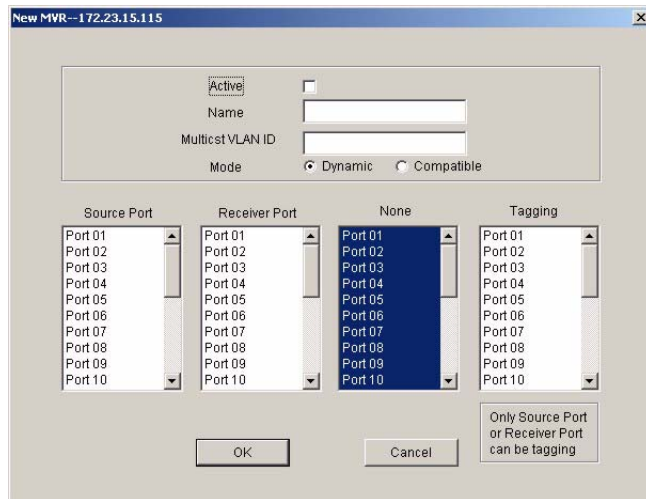
LABEL	DESCRIPTION
Add	Click <b>Add</b> to add a new entry.
Modify	Click <b>Modify</b> to change the settings of the selected MVR.
Delete	Click <b>Delete</b> to remove the selected MVR.

### 17.3.4 Creating a New Multicast VLAN

Follow the steps below to create a new multicast VLAN.

- 1 In the **MVR** screen, click **Add** under **MVLAN**. A screen displays as shown.

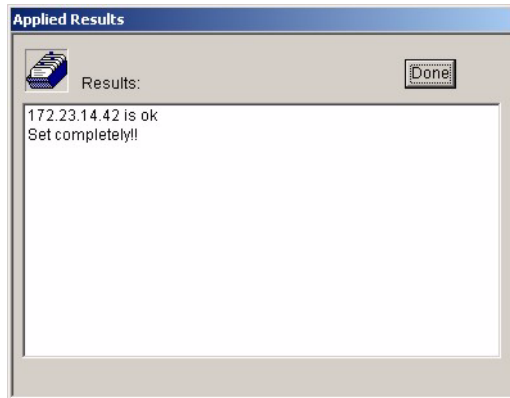
**Figure 111** Multicast Configuration: MVR: Add MVLAN



- 2 Select **Active** to enable this multicast VLAN setting.
- 3 In the **Name** field, enter a descriptive name (up to 32 ASCII characters) for identification purposes.
- 4 Specify a VLAN ID in the **Multicast VLAN ID** field. Enter a number between 1 and 4094.
- 5 In the **Mode** field, select **Dynamic** to send IGMP reports to all MVR source ports in the multicast VLAN. Select **Compatible** to set the switch not to send IGMP reports.
- 6 In the **Source Port** list box, select the MVR source port that sends and receives multicast traffic.
- 7 In the **Receiver Port** list box, select the port(s) that only receives multicast traffic.
- 8 In the **None** list box, select the port(s) not to participate in MVR. No MVR multicast traffic is sent or received on the port(s).
- 9 In the **Tagging** list box, select the port(s) to add the VLAN ID tag to all outgoing frames.
- 10 Click **OK** to save the settings and close this screen. Otherwise, click **Cancel** to discard the settings and close this screen.

11A screen displays showing the configuration result. Click **Done** to close the screen.

**Figure 112** Multicast Configuration: MVR: Add MVLAN: Result

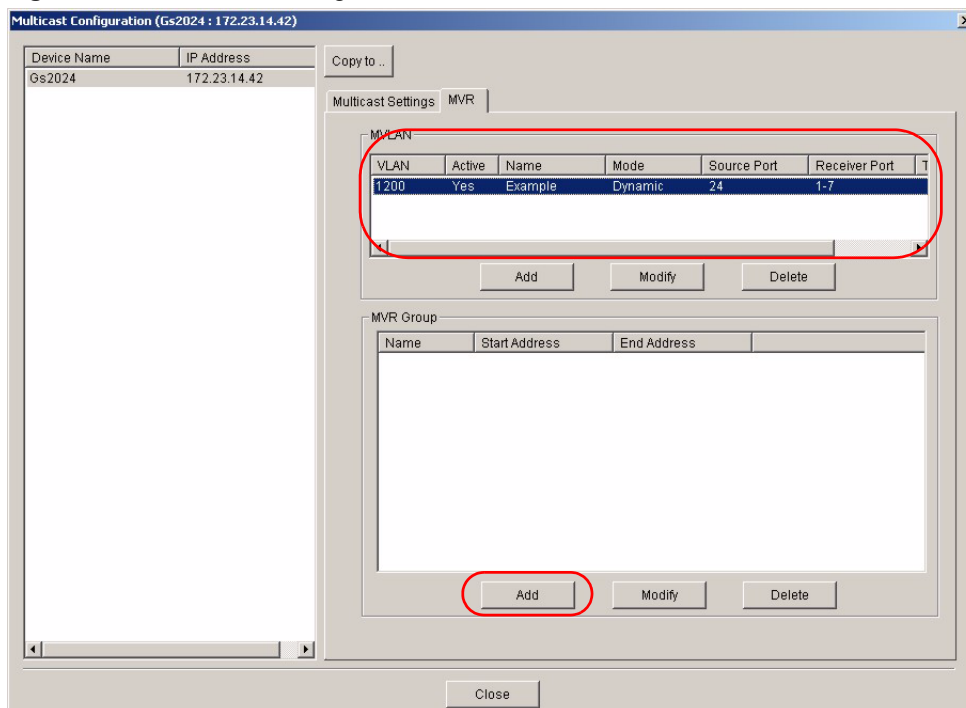


### 17.3.5 Creating a New MVR Group

Follow the steps below to create a new MVR group.

- 1 In the **MVR** screen, select one entry in the **MVLAN** list table.
- 2 Click **Add** under **MVR Group**.

**Figure 113** Multicast Configuration: MVR: Select MVLAN



- 3 A screen displays as shown. The **Multicast VLAN ID** field displays the VLAN ID to which this MVR group setting applies. In the **Name** field, enter a descriptive name for identification purposes.

**Figure 114** Multicast Configuration: MVR: Add

- 4** In the **Start Address** field, enter the starting IP multicast address of the multicast group in dotted decimal notation.
- 5** In the **End Address** field, enter the ending IP multicast address of the multicast group in dotted decimal notation.  
  
Enter the same IP address as the **Start Address** field if you want to configure only one IP address for a multicast group.
- 6** Click **OK** to save the settings and close this screen. Otherwise, click **Cancel** to discard the settings and close this screen.
- 7** A screen displays showing the configuration result. Click **Done** to close the screen.

**Figure 115** Multicast Configuration: MVR: Add MVR Group: Result

# CHAPTER 18

## IP Configuration

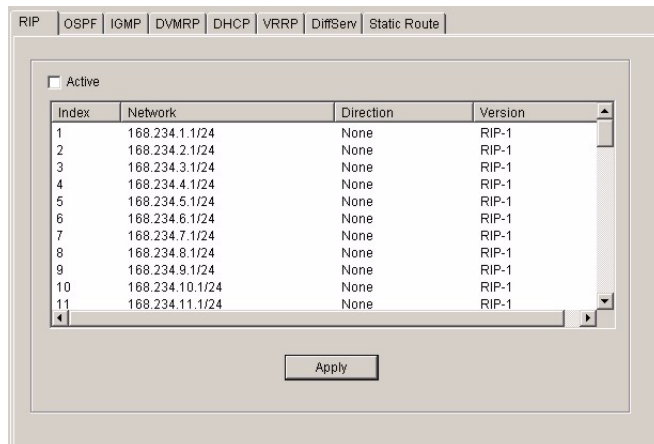
This chapter shows you how to configure the routing functions using the IP Configuration screens.

### 18.1 RIP

RIP (Routing Information Protocol) allows a routing device to exchange routing information with other routers.

- 1 In the Device Panel list, right-click on a device.
- 2 Click **Configuration > IP Configuration > RIP**.

**Figure 116** IP Configuration: RIP



The following table describes the labels in this screen.

**Table 85** IP Configuration: RIP

LABEL	DESCRIPTION
Active	Select this check box to enable RIP on the switch.
Index	This field displays the index number of an IP interface.
Network	This field displays the IP interface configured on the switch. Refer to the section on IP Setup for more information on configuring IP domains.



**Table 85** IP Configuration: RIP (continued)

LABEL	DESCRIPTION
Direction	The <b>Direction</b> field controls the sending and receiving of RIP packets. When set to: <ul style="list-style-type: none"> <li>• <b>Both</b> - the switch will broadcast its routing table periodically and incorporate the RIP information that it receives.</li> <li>• <b>Incoming</b> - the switch will not send any RIP packets but will accept all RIP packets received.</li> <li>• <b>Outgoing</b> - the switch will send out RIP packets but will not accept any RIP packets received.</li> <li>• <b>None</b> - the switch will not send any RIP packets and will ignore any RIP packets received.</li> </ul>
Version	Select the RIP version from the drop-down list box. Choices are <b>RIP-1</b> , <b>RIP-2B</b> and <b>RIP-2M</b> .
Apply	Click <b>Apply</b> to save the changes.

## 18.2 OSPF

OSPF (Open Shortest Path First) is a link-state protocol designed to distribute routing information within an autonomous system (AS). An autonomous system is a collection of networks using a common routing protocol to exchange routing information.

OSPF offers some advantages over traditional vector-space routing protocols (such as RIP). The following table summarizes some of the major differences between OSPF and RIP.

**Table 86** OSPF vs. RIP

	OSPF	RIP
Network Size	Large	Small (with up to 15 routers)
Metrics	Bandwidth, hop count, throughput, round trip time and reliability.	Hop count
Convergence	Fast	Slow

### 18.2.1 OSPF Autonomous Systems and Areas

An OSPF autonomous system can be divided into logical areas. Each area represents a group of adjacent networks. All areas are connected to a backbone (also known as area 0). The backbone is the transit area to route packets between two areas. A stub area, at the edge of an AS, is not a transit area since there is only one connection to the stub area.

### 18.2.2 Interfaces and Virtual Links

An OSPF interface is a link between a layer 3 device and an OSPF network. An interface has state information, an IP address and subnet mask associated with it. When you configure an OSPF interface, you first set an interface to transmit OSPF traffic and add the interface to an area.

You can configure a virtual link to establish/maintain connectivity between a non-backbone area and the backbone. The virtual link must be configured on both layer 3 devices in the non-backbone area and the backbone.

### 18.2.3 Configuring Basic OSPF Settings

Follow the steps below to activate OSPF and configure basic settings.

- 1 In the Device Panel list, right-click on a device.
- 2 Click **Configuration > IP Configuration > OSPF**.

**Figure 117** IP Configuration: OSPF

The screenshot shows the OSPF configuration window with the following sections:

- Active:** A checked checkbox.
- Router ID:** A text field containing "2 . 3 . 0 . 0".
- Redistribute Route:** A table with columns: Active, Type, Metric value.
 

Active	Type	Metric value
<input type="checkbox"/>	1	15
<input type="checkbox"/>	1	15
- OSPF Configuration:** A table with columns: Index, Name, Area ID, Authentication, Stub Network.
 

Index	Name	Area ID	Authentication	Stub Network
1	123	12.4.0.0	MD5	Yes
- Virtual-Link:** A table with columns: Index, Name, Peer Router ID, Authentication, Key ID. It is currently empty.
- Interface:** A table with columns: Index, Network, Area ID, Authentication, Key ID, Cost.
 

Index	Network	Area ID	Authentication	Key ID	Cost
1	168.234.25.1/24	12.4.0.0	MD5	1	15
2	168.234.30.1/24	12.4.0.0	Simple	1	15
3	168.234.31.1/24	12.4.0.0	MD5	1	15
4	168.234.38.1/24	12.4.0.0	MD5	1	15

The follow table describes the related labels in this screen.

**Table 87** IP Configuration: OSPF

LABEL	DESCRIPTION
Active	OSPF is disabled by default. Select this option to enable it.
Router ID	Router ID uniquely identifies the switch in an OSPF. Enter a unique ID (that uses the format of an IP address in dotted decimal notation) for the switch.
Redistribute Route	Route redistribution allows your switch to import and translate external routes learned through other routing protocols ( <b>RIP</b> and <b>Static</b> ) into the OSPF network transparently.
Active	Select this option to activate route redistribution for routes learnt through the selected protocol.

**Table 87** IP Configuration: OSPF (continued)

LABEL	DESCRIPTION
Type	Select <b>1</b> for routing protocols (such as RIP) whose external metrics are directly comparable to the internal OSPF cost. When selecting a path, the internal OSPF cost is added to the AB boundary router to the external metrics. Select <b>2</b> for routing protocols whose external metrics are not comparable to the OSPF cost. In this case, the external cost of the AB boundary router is used in path decision to a destination.
Metric Value	Enter a route cost (between 0 and 16777214).
Apply	Click <b>Apply</b> to save the changes.
OSPF Configuration	
Index	This field displays the index number of an area.
Name	This field displays the descriptive name of an area.
Area ID	This field displays the area ID (that uses the format of an IP address in dotted decimal notation) that uniquely identifies an area. An area ID of <b>0.0.0.0</b> indicates the backbone.
Authentication	This field displays the authentication method used ( <b>None</b> , <b>Simple</b> or <b>MD5</b> ).
Stub Network	This field displays whether an area is a stub network ( <b>Yes</b> ) or not ( <b>No</b> ).
Add	Click <b>Add</b> to create a new OSPF area.
Modify	Click <b>Modify</b> to change the settings of the selected OSPF area.
Delete	Click <b>Delete</b> to remove the selected OSPF area.
Virtual Link	
Index	This field displays an index number of an entry.
Name	This field displays a descriptive name of a virtual link.
Peer Router ID	This field displays the ID (that uses the format of an IP address in dotted decimal notation) of a peer border router.
Authentication	This field displays the authentication method used ( <b>Same-as-Area</b> , <b>None</b> , <b>Simple</b> or <b>MD5</b> ).
Key ID	When the <b>Authentication</b> field displays <b>MD5</b> , this field displays the identification number of the key used.
Add	Click <b>Add</b> to create a new OSPF virtual link.
Modify	Click <b>Modify</b> to change the settings of the selected OSPF virtual link.
Delete	Click <b>Delete</b> to remove the selected OSPF virtual link.
Interface	
Index	This field displays the index number for an interface.
Network	This field displays the IP interface information.
Area ID	This field displays the area ID (that uses the format of an IP address in dotted decimal notation) of an area to associate the interface to that area.
Authentication	This field displays the authentication method used ( <b>Same-as-Area</b> , <b>None</b> , <b>Simple</b> or <b>MD5</b> ).
Key ID	When the <b>Authentication</b> field displays <b>MD5</b> , this field displays the identification number of the key used.
Cost	This field displays the interface cost used for calculating the routing table.
Add	Click <b>Add</b> to create a new OSPF interface.

**Table 87** IP Configuration: OSPF (continued)

LABEL	DESCRIPTION
Modify	Click <b>Modify</b> to change the settings of the selected OSPF interface.
Delete	Click <b>Delete</b> to remove the selected OSPF interface.

## 18.2.4 Configuring a New OSPF Area

Follow the steps below to create a new OSPF area.

- 1 In the Device Panel list, right-click on a device.
- 2 Click **Configuration > IP Configuration > OSPF**.
- 3 Click **Add** in the **OSPF Configuration** pane.

**Figure 118** IP Configuration: OSPF: New OSPF Setting

The following table describes the related labels in this screen.

**Table 88** IP Configuration: OSPF: New OSPF Setting

LABEL	DESCRIPTION
Name	Enter a descriptive name (up to 32 printable ASCII characters) for identification purposes.
Area ID	Enter a 32-bit ID (that uses the format of an IP address in dotted decimal notation) that uniquely identifies an area. A value of <b>0.0.0.0</b> indicates that this is a backbone (also known as Area 0). You can create only one backbone area on the switch.
Authentication	Select an authentication method ( <b>Simple</b> or <b>MD5</b> ) to activate authentication. Select <b>None</b> to disable authentication. Interface(s) and virtual interface(s) must use the same authentication method as the associated area.
Stub Area	Select this option to set the area as a stub area. If you enter <b>0.0.0.0</b> in the <b>Area ID</b> field, the settings in the <b>Stub Area</b> fields are ignored.
No Summary	Select this option to set the switch to not send/receive LSAs.

**Table 88** IP Configuration: OSPF: New OSPF Setting (continued)

LABEL	DESCRIPTION
Default Route Cost	Specify a cost (between 0 and 16777214) used to add a default route into a stub area for routes which are external to an OSPF domain. If you do not set a route cost, no default route is added.
Add	Click <b>Add</b> to apply the changes and close this screen.
Cancel	Click <b>Cancel</b> to discard all changes and close this screen.

## 18.2.5 Configuring a New OSPF Virtual Link

Follow the steps below to create a new OSPF virtual link.

- 1** In the Device Panel list, right-click on a device.
- 2** Click **Configuration > IP Configuration > OSPF**.
- 3** Click **Add** in the **Virtual Link** pane.

**Figure 119** IP Configuration: OSPF: New Virtual Link

The following table describes the labels in this screen.

**Table 89** IP Configuration: OSPF: New Virtual Link

LABEL	DESCRIPTION
Name	Enter a descriptive name (up to 32 printable ASCII characters) for identification purposes.
Area ID	Select the area ID (that uses the format of an IP address in dotted decimal notation) of an area to associate the interface to that area.
Peer Router ID	Enter the ID of a peer border router.

**Table 89** IP Configuration: OSPF: New Virtual Link (continued)

LABEL	DESCRIPTION
Authentication	<p><b>Note:</b> Virtual interface(s) must use the same authentication method within the same area.</p> <p>Select an authentication method. Choices are <b>Same-as-Area</b>, <b>None</b> (default), <b>Simple</b> and <b>MD5</b>.</p> <p>To exchange OSPF packets with peer border router, you must set the authentication method and/or password the same as the peer border router.</p> <p>Select <b>Same-as-Area</b> to use the same authentication method within the area and set the related fields when necessary.</p> <p>Select <b>None</b> to disable authentication. This is the default setting.</p> <p>Select <b>Simple</b> to authenticate OSPF packets transmitted through this interface using a simple password.</p> <p>Select <b>MD5</b> to authenticate OSPF packets transmitted through this interface using MD5 authentication.</p>
Key ID	When you select <b>MD5</b> in the <b>Authentication</b> field, specify the identification number of the authentication you want to use.
Key	<p>When you select <b>Simple</b> in the <b>Authentication</b> field, enter a password eight-character long.</p> <p>When you select <b>MD5</b> in the <b>Authentication</b> field, enter a password 16-character long.</p>
Add	Click <b>Add</b> to apply the changes and close this screen.
Cancel	Click <b>Cancel</b> to discard all changes and close this screen.

## 18.2.6 Configuring a New OSPF Interface

Follow the steps below to create a new OSPF interface.

- 1 In the Device Panel list, right-click on a device.
- 2 Click **Configuration > IP Configuration > OSPF**.
- 3 Click **Add** in the **Interface** pane.

**Figure 120** IP Configuration: OSPF: New Interface

The following table describes the labels in this screen.

**Table 90** IP Configuration: OSPF: New Interface

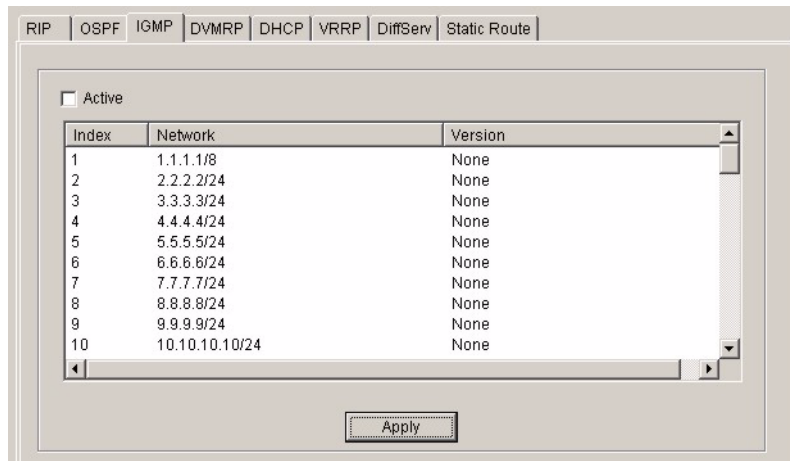
LABEL	DESCRIPTION
Network	Select an IP interface.
Area ID	Select the area ID (that uses the format of an IP address in dotted decimal notation) of an area to associate the interface to that area.
Authentication	<p><b>Note:</b> OSPF Interface(s) must use the same authentication method within the same area.</p> <p>Select an authentication method. Choices are <b>Same-as-Area</b>, <b>None</b> (default), <b>Simple</b> and <b>MD5</b>.</p> <p>To participate in an OSPF network, you must set the authentication method and/or password the same as the associated area.</p> <p>Select <b>Same-as-Area</b> to use the same authentication method within the area and set the related fields when necessary.</p> <p>Select <b>None</b> to disable authentication. This is the default setting.</p> <p>Select <b>Simple</b> and set the <b>Key</b> field to authenticate OSPF packets transmitted through this interface using simple password authentication.</p> <p>Select <b>MD5</b> and set the <b>Key ID</b> and <b>Key</b> fields to authenticate OSPF packets transmitted through this interface using MD5 authentication.</p>
Key ID	When you select <b>MD5</b> in the <b>Authentication</b> field, specify the identification number of the authentication you want to use.
Key	<p>When you select <b>Simple</b> in the <b>Authentication</b> field, enter a password eight-character long. Characters after the eighth character will be ignored.</p> <p>When you select <b>MD5</b> in the <b>Authentication</b> field, enter a password 16-character long.</p>
Cost	The interface cost is used for calculating the routing table. Enter a number between 0 and 65535.
Add	Click <b>Add</b> to apply the changes and close this screen.
Cancel	Click <b>Cancel</b> to discard all changes and close this screen.

## 18.3 IGMP

IGMP (Internet Group Multicast Protocol) is a session-layer protocol used to establish membership in a multicast group - it is not used to carry user data. Refer to *RFC 1112* and *RFC 2236* for information on IGMP versions 1 and 2 respectively.

- 1 In the Device Panel list, right-click on a device.
- 2 Click **Configuration > IP Configuration > IGMP**.

**Figure 121** IP Configuration: IGMP



The following table describes the labels in this screen.

**Table 91** IP Configuration: IGMP

LABEL	DESCRIPTION
Active	Select this check box to enable IGMP on the switch.  <b>Note:</b> You <i>cannot</i> enable both IGMP snooping and IGMP at the same time. Refer to the section on IGMP snooping.
Index	This field displays an index number of an entry.
Network	This field displays the IP domain configured on the switch. Refer to <a href="#">Section 13.6 on page 116</a> for more information on configuring IP domains.
Version	Select an IGMP version from the drop-down list box. Choices are <b>IGMP-v1</b> , <b>IGMP-v2</b> and <b>None</b> .
Apply	Click <b>Apply</b> to save your changes.

## 18.4 DVMRP

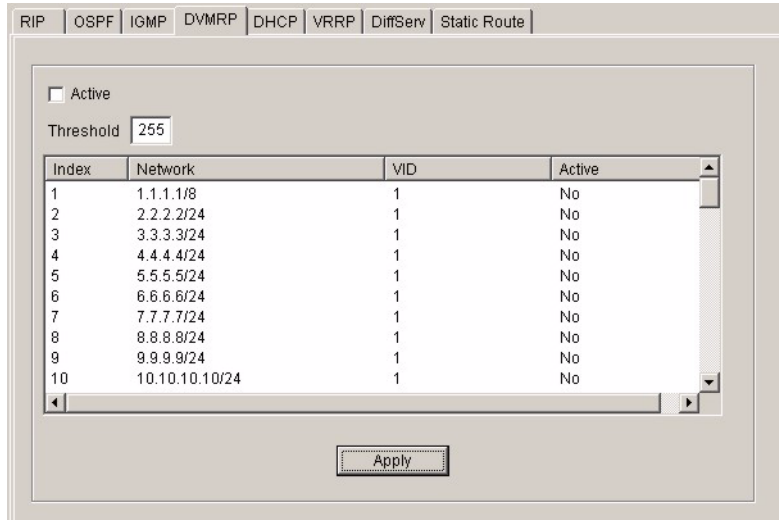
DVMRP (Distance Vector Multicast Routing Protocol) is a protocol used for routing multicast data within an autonomous system (AS). This DVMRP implementation is based on draft-ietf-idmr-dvmrp-v3-10. DVMRP provides multicast forwarding capability to a layer 3 switch that runs both the IPv4 protocol (with IP Multicast support) and the IGMP protocol. The DVMRP metric is a hop count of 32.

IGMP is a protocol used for joining or leaving a multicast group. You must have IGMP enabled when you enable DVMRP.

- 1** In the Device Panel list, right-click on a device.
- 2** Click **Configuration > IP Configuration > DVMRP**.



**Figure 122** IP Configuration: DVMRP



The following table describes the labels in this screen.

**Table 92** IP Configuration: DVMRP

LABEL	DESCRIPTION
Active	Select <b>Active</b> to enable DVMRP on the switch. You should do this if you want the switch to act as a multicast router.
Threshold	Threshold is the maximum time to live (TTL) value. TTL is used to limit the scope of multicasting. You should reduce this value if you do not wish to flood Layer 3 devices many hops away with multicast traffic. This applies only to multicast traffic this switch sends out.
Index	Index is the DVMRP configuration for the IP routing domain defined under <b>Network</b> . The maximum number of DVMRP configurations allowed is the maximum number of IP routing domains allowed on the switch. See <a href="#">Section 13.6 on page 116</a> for more information on IP routing domains.
Network	This is the IP routing domain IP address and subnet mask you set up in <b>IP Setup</b> .
VID	DVMRP cannot be enabled on the same VLAN group across different IP routing domains, that is, you cannot have duplicate VIDs for different DVMRP configurations.
Active	Select <b>Yes</b> to enable DVMRP on this IP routing domain. Select <b>No</b> to disable this feature.
Apply	Click <b>Apply</b> to save these changes.

## 18.5 DHCP

DHCP (Dynamic Host Configuration Protocol RFC 2131 and RFC 2132) allows individual computers to obtain TCP/IP configuration at start-up from a server. You can configure the switch as a DHCP server or disable it. When configured as a server, the switch provides the TCP/IP configuration for the clients. If you disable the DHCP service, you must have another DHCP server on your LAN, or else the computer must be manually configured.

## 18.5.1 DHCP modes

Depending on your switch model, your switch can be configured as a DHCP server or DHCP relay agent.

- If you configure the switch as a DHCP server, it will maintain the pool of addresses and distribute them to your LAN computers.
- If there is an Ethernet device that performs the DHCP server function for your network, then you can configure the switch as a DHCP relay agent. When the switch receives a request from a computer on your network, it contacts the Ethernet device (the DHCP server) for the necessary IP information, and then relays the assigned information back to the computer.

## 18.5.2 Configuring DHCP Server

Follow the steps below to set the switch as a DHCP server.

- 1 In the Device Panel list, right-click on a device.
- 2 Click **Configuration > IP Configuration > DHCP**.
- 3 Select **Server**.

**Figure 123** IP Configuration: DHCP: Server

The screenshot displays the DHCP configuration interface. At the top, there are tabs for various protocols: RIP, OSPF, IGMP, DVMRP, DHCP, VRRP, DiffServ, and Static Route. The DHCP tab is selected. Below the tabs, there are two radio buttons: 'Relay' and 'Server'. The 'Server' radio button is selected. Under the 'Relay' section, there is an 'Active' checkbox which is unchecked. Below it are three 'Remote DHCP Server' fields, each containing the IP address '0 . 0 . 0 . 0'. To the right of these fields is an 'Apply' button. Below the 'Relay' section is the 'Server' section, which contains a table with three columns: 'VID', 'Type', and 'DHCP Status'. The table is currently empty. To the right of the table are three buttons: 'Add', 'Modify', and 'Delete'. Below the table is a horizontal scrollbar.

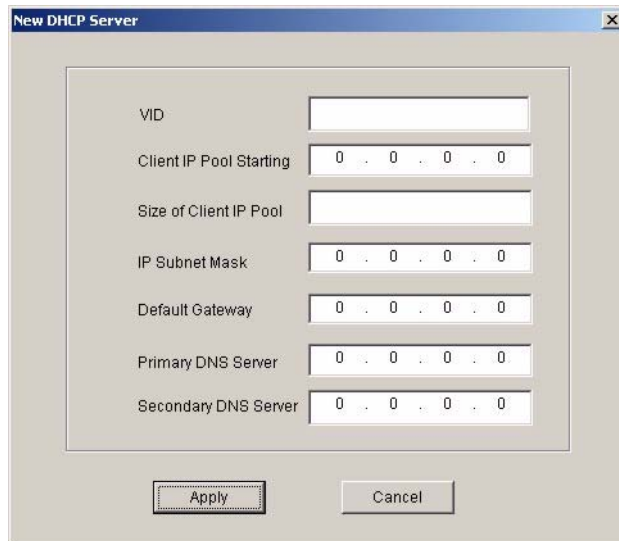
The following table describes the labels in this screen.

**Table 93** IP Configuration: DHCP: Server

LABEL	DESCRIPTION
VID	This field displays the ID number of the VLAN group to which this DHCP settings apply.
Type	This field displays <b>Server</b> for the DHCP mode.
DHCP Status	This field displays the starting and the size of DHCP client IP address.
Add	Click <b>Add</b> to create a new OSPF virtual link.
Modify	Click <b>Modify</b> to change the settings of the selected OSPF virtual link.
Delete	Click <b>Delete</b> to remove the selected OSPF virtual link.

**4** Click **Add** to configure DHCP server information.

**Figure 124** IP Configuration: DHCP: Server: New



The following table describes the labels in this screen.

**Table 94** IP Configuration: DHCP: Server: New

LABEL	DESCRIPTION
VID	Enter the ID number of the VLAN group to which this DHCP settings apply.
Client IP Pool Starting	Specify the first of the contiguous addresses in the IP address pool.
Size of Client IP Pool	Specify the size, or count of the IP address pool.
IP Subnet Mask	Enter the subnet mask of the DHCP server.
Default Gateway	Enter the IP address of the default gateway device.

**Table 94** IP Configuration: DHCP: Server: New (continued)

LABEL	DESCRIPTION
Primary/ Secondary DNS Server	Enter the IP addresses of the DNS servers. The DNS servers are passed to the DHCP clients along with the IP address and the subnet mask.
Add	Click <b>Add</b> to save the changes and close this screen.
Cancel	Click <b>Cancel</b> to discard all changes and close this screen.

### 18.5.3 Configuring DHCP Relay

Configure DHCP relay on the switch if the DHCP clients and the DHCP server are not in the same subnet. During the initial IP address leasing, the switch helps to relay network information (such as the IP address and subnet mask) between a DHCP client and a DHCP server. Once the DHCP client obtains an IP address and can connect to the network, network information renewal is done between the DHCP client and the DHCP server without the help of the switch.

#### 18.5.3.1 DHCP Relay Agent Information

The switch can add information to client DHCP requests that it relays to a DHCP server. This helps provide authentication about the source of the requests. You can also specify additional information for the switch to add to the client DHCP requests that it relays to the DHCP server. Please refer to RFC 3046 for more details.

The DHCP relay agent information feature adds an Agent Information field to the option 82 field of the DHCP headers of client DHCP request frames that the switch relays to a DHCP server. The following lists the DHCP relay agent option 82 information that the switch sends to the DHCP server:

- Slot ID (1 byte)
- Port ID (1 byte)
- VLAN ID (2 bytes)
- System name (up to 32 bytes, this is optional)

Follow the steps below to set the switch as a DHCP server.

- 1** In the Device Panel list, right-click on a device.
- 2** Click **Configuration > IP Configuration > DHCP**.
- 3** Select **Relay**.

**Figure 125** IP Configuration: DHCP: Relay

The following table describes the labels in this screen.

**Table 95** IP Configuration: DHCP: Relay

LABEL	DESCRIPTION
Active	Select this check box to enable DHCP relay.
Remote DHCP Server 1 .. 3	Enter the IP address of a DHCP server in dotted decimal notation.
Relay Agent Information	Select the <b>Option 82</b> check box to have the switch add information (slot number, port number and VLAN ID) to client DHCP requests that it relays to a DHCP server.
Information	This read-only field displays the system name you configure in the <b>System Information</b> screen (refer to <a href="#">Section 14.1 on page 120</a> ). Select the check box for the switch to add the system name to the client DHCP requests that it relays to a DHCP server.
Apply	Click <b>Apply</b> to save the changes.

## 18.6 VRRP

Virtual Router Redundancy Protocol (VRRP), defined in RFC 2338, allows you to create redundant backup gateways to ensure that the default gateway of a host is always available.

In VRRP, a virtual router (VR) represents a number of physical layer-3 devices. An IP address is associated with the virtual router. A layer-3 device having the same IP address is the preferred master router while the other Layer-3 devices are the backup routers. The master router forwards traffic for the virtual router. When the master router becomes unavailable, a backup router assumes the role of the master router until the master router comes back up and takes over.

## 18.6.1 Configuring Interface VRRP Settings

Follow the steps below to configure VRRP settings on an interface.

- 1 In the Device Panel list, right-click on a device.
- 2 Click **Configuration > IP Configuration > VRRP**.

**Figure 126** IP Configuration: VRRP

The following table describes the labels in this screen.

**Table 96** IP Configuration: VRRP

LABEL	DESCRIPTION
Index	This field displays the index number of an entry.
Network	This field displays the IP address and number of subnet mask bit of an IP domain.
Authentication	Select <b>None</b> to disable authentication. This is the default setting. Select <b>Simple</b> to use a simple password to authenticate VRRP packet exchanges on this interface.
Key	When you select <b>Simple</b> in the <b>Authentication</b> field, enter a password key (up to eight printable ASCII character long) in this field.
Apply	Click <b>Apply</b> to save the changes.

**Table 96** IP Configuration: VRRP (continued)

LABEL	DESCRIPTION
Index	This field displays the index number of an entry.
Active	This field shows whether a VRRP entry is enabled ( <b>Yes</b> ) or disabled ( <b>No</b> ).
Name	This field displays a descriptive name of an entry.
Network	This field displays the IP address and subnet mask of an interface.
VRID	This field displays the ID number of a virtual router.
Primary VIP	This field displays the IP address of the primary virtual router.
Uplink Gateway	This field displays the IP address of the uplink gateway.
Priority	This field displays the priority level (1 to 255) of the entry.
Add	Click <b>Add</b> to create a new VRRP interface.
Modify	Click <b>Modify</b> to change the settings of the selected VRRP interface.
Delete	Click <b>Delete</b> to remove the selected VRRP interface.

## 18.6.2 Configuring a VRRP Interface

- 1 In the Device Panel list, right-click on a device.
- 2 Click **Configuration > IP Configuration > VRRP**.

**Figure 127** IP Configuration: VRRP: New

The following table describes the labels in this screen.

**Table 97** VRRP Configuration: VRRP Parameters

LABEL	DESCRIPTION
Active	Select this option to enable this VRRP interface.
Name	Enter a descriptive name (up to 32 printable ASCII characters) for identification purposes.
Network	Select an IP domain to which this VRRP entry applies.
Virtual Router ID	Select a virtual router number (1 to 7) for which this VRRP entry is created. You can configure up to seven virtual routers for one network.
Advertisement Interval	Specify the number of seconds between Hello message transmissions. The default is 1.
Preempt Mode	Select this option to activate preempt mode.
Priority	Enter a number (between 1 and 254) to set the priority level. The bigger the number, the higher the priority. This field is <b>100</b> by default.
Uplink Gateway	Enter the IP address of the uplink gateway in dotted decimal notation. The switch checks the link to the uplink gateway.
Primary Virtual IP	Enter the IP address of the primary virtual router in dotted decimal notation.
Secondary Virtual IP	This field is optional. Enter the IP address of a secondary virtual router in dotted decimal notation. This field is ignored when you enter <b>0.0.0.0</b> .
OK	Click <b>OK</b> to apply the changes and close this screen.
Cancel	Click <b>Cancel</b> to discard all changes and close this screen.

## 18.7 DiffServ

DiffServ is a class of service (CoS) model that marks packets so that they receive specific per-hop treatment at DiffServ-compliant network devices along the route based on the application types and traffic flow. Packets are marked with DiffServ Code Points (DSCPs) indicating the level of service desired. This allows the intermediary DiffServ-compliant network devices to handle the packets differently depending on the code points without the need to negotiate paths or remember state information for every flow. In addition, applications do not have to request a particular service or give advanced notice of where the traffic is going.

You can configure the DSCP to IEEE802.1p mapping to allow the switch to prioritize all traffic based on the incoming DSCP value according to the DiffServ to IEEE802.1p mapping table.

The following table shows the default DSCP-to-IEEE802.1P mapping.

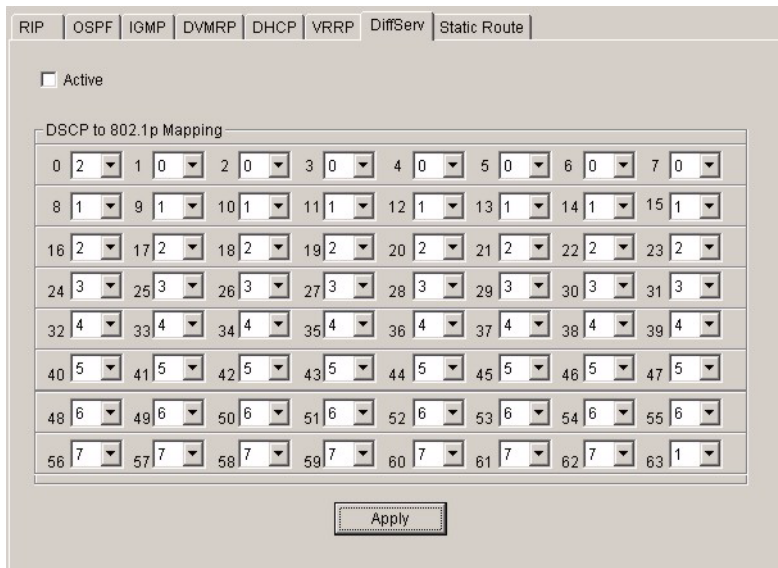
**Table 98** Default DSCP-IEEE802.1p Mapping

DSCP VALUE	0 – 7	8 – 15	16 – 23	24 – 31	32 – 39	40 – 47	48 – 55	56 – 63
IEEE802.1P	0	1	2	3	4	5	6	7



Configure DSCP mappings in the **DiffServ** screen. Click **IP Configuration > DiffServ** to display the screen as shown.

**Figure 128** IP Configuration: DiffServ



The following table describes the labels in this screen.

**Table 99** DiffServ: DSCP Setting

LABEL	DESCRIPTION
Active	Select <b>Active</b> to enable DiffServ on the port.
DSCP to 802.1p Mapping	
0 ... 63	This is the DSCP classification identification number. To set the IEEE802.1p priority mapping, select the priority level from the drop-down list box.
Apply	Click <b>Apply</b> to save the changes.

## 18.8 Static Route

Static routes tell the switch how to forward IP traffic when you configure the TCP/IP parameters manually.

- 1 In the Device Panel list, right-click on a device.
- 2 Click **Configuration > IP Configuration > Static Route**.

**Figure 129** IP Configuration: Static Route

Index	Name	Active	Destination Address	Subnet Mask	Gateway Address	Metri
1	static	Yes	192.168.169.2	255.255.25...	192.168.1.30	1
2	static	Yes	192.168.169.3	255.255.25...	192.168.1.30	1
3	static	Yes	192.168.169.4	255.255.25...	192.168.1.30	1
4	static	Yes	192.168.169.5	255.255.25...	192.168.1.30	1
5	static	Yes	192.168.169.6	255.255.25...	192.168.1.30	1
6	static	Yes	192.168.169.7	255.255.25...	192.168.1.30	1
7	static	Yes	192.168.169.8	255.255.25...	192.168.1.30	1
8	static	Yes	192.168.169.9	255.255.25...	192.168.1.30	1
9	static	Yes	192.168.169.10	255.255.25...	192.168.1.30	1
10	static	Yes	192.168.169.11	255.255.25...	192.168.1.30	1
11	static	Yes	192.168.169.12	255.255.25...	192.168.1.30	1
12	static	Yes	192.168.169.13	255.255.25...	192.168.1.30	1
13	static	Yes	192.168.169.14	255.255.25...	192.168.1.30	1
14	static	Yes	192.168.169.15	255.255.25...	192.168.1.30	1

Buttons: Add, Modify, Delete

The following table describes the labels in the summary table.

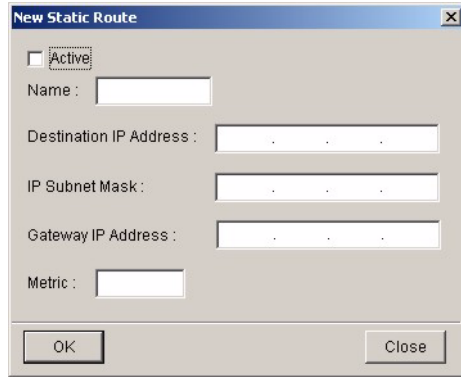
**Table 100** Routing Configuration: Static Route

LABEL	DESCRIPTION
Index	This field displays the index number of the route.
Name	This field displays the descriptive name for this route. This is for identification purposes only.
Active	This field displays <b>Yes</b> when the static route is activated and <b>No</b> when it is deactivated.
Destination Address	This field displays the IP network address of the final destination.
Subnet Mask	This field displays the subnet mask for this destination.
Gateway Address	This field displays the IP address of the gateway. The gateway is an immediate neighbor of your switch that will forward the packet to the destination.
Metric	This field displays the cost of transmission for routing purposes.
Add	Click the <b>Add</b> button to create a new static route.
Modify	Select the rule(s) that you want to change and click the <b>Modify</b> button.
Delete	Select the rule(s) that you want to remove in the <b>Delete</b> column, and then click the <b>Delete</b> button.

### 18.8.1 Add or Modify a Static Route

Click the **Add** button or select a static route and click the **Modify** button in the **Routing Configuration** screen to display the following screen.

**Figure 130** Routing Configuration: Static Route: Add



The following table describes the labels in this screen.

**Table 101** Routing Configuration: Static Route: Add or Modify

LABEL	DESCRIPTION
Active	This field allows you to activate/deactivate this static route.
Name	Enter a descriptive name for this route. This is for identification purposes only.
Destination IP Address	This parameter specifies the IP network address of the final destination. Routing is always based on network number. If you need to specify a route to a single host, use a subnet mask of 255.255.255.255 in the subnet mask field to force the network number to be identical to the host ID.
IP Subnet Mask	Enter the subnet mask for this destination.
Gateway IP Address	Enter the IP address of the gateway. The gateway is an immediate neighbor of your switch that will forward the packet to the destination. The gateway must be a router on the same segment as your switch.
Metric	The metric represents the “cost” of transmission for routing purposes. IP routing uses hop count as the measurement of cost, with a minimum of 1 for directly connected networks. Enter a number that approximates the cost for this link. The number need not be precise, but it must be between 1 and 15. In practice, 2 or 3 is usually a good number.
OK	Click <b>OK</b> to save the settings and close this screen.
Cancel	Click <b>Cancel</b> to discard all changes and close this screen.

# CHAPTER 19

## Troubleshooting

This chapter covers potential problems and the corresponding remedies.

### 19.1 Installation Problems

**Table 102** General Installation Problems

PROBLEM	CORRECTIVE ACTION
The EMS or PostgreSQL will not install properly	<p>Make sure that the computer meets the minimum hardware and software requirements. See <a href="#">Section 1.2 on page 24</a> for more information.</p> <p>Close all programs before the installation.</p> <p>Remove any previous versions of the EMS software from your computer. See <a href="#">Section 19.4 on page 185</a> for information on how to do this.</p> <p>Re-install the EMS.</p>

### 19.2 Problems Accessing the EMS

**Table 103** Problems Accessing the EMS

PROBLEM	CORRECTIVE ACTION
When I click the Switch Manager icon, I cannot access the EMS	<p>Make sure the ODBC driver is configured properly to connect to the EMS database. Refer to the Quick Start Guide for more information.</p> <p>Shut down and restart both PostgreSQL and the SNMPc manager.</p> <p>EMS may already be running. Check your Windows task bar.</p>

## 19.3 Problems Finding a Device

**Table 104** Problems Accessing the EMS

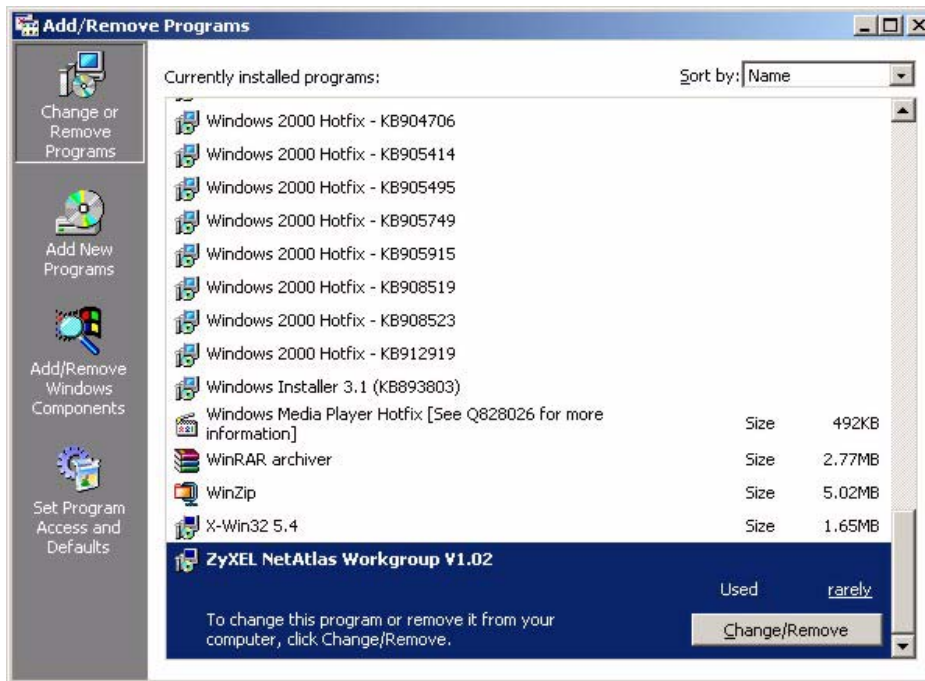
PROBLEM	CORRECTIVE ACTION
In the SNMPc Management Console I cannot find my device	<p>Check that you have compiled and added the MIBs correctly.</p> <p>Check that you have enabled auto-discovery.</p> <p>Check that the map object properties are correct for initial installation. Make sure the IP address entered is the IP address of the switch you want to manage via the EMS.</p> <p>Check that the ODBC driver is correctly configured.</p> <p>Make sure that PostgreSQL is running.</p> <p>Make sure that the computer you have installed the EMS on, is connected to the network where the switch is located.</p> <p>Make sure your computer's Ethernet card is working properly.</p> <p>If the problem still persists, uninstall and re-install the EMS software.</p>

## 19.4 Uninstalling the EMS

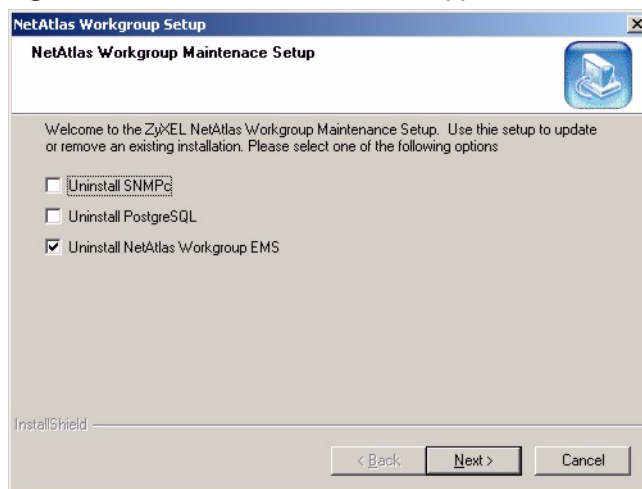
When you install a new EMS version, the setup program automatically detects and uninstalls a previous EMS version.

Or you can manually uninstall the EMS. Follow the steps below.

- 1 Click **Start > Settings > Control Panel > Add/Remove Programs**. The **Add or Remove Programs** dialog box opens.

**Figure 131** EMS: Remove

- 2 Select **ZyXEL NetAtlas Workgroup V1.02** and then click **Change/Remove** (or **Add/Remove** depending on your version of Windows).
- 3 Screen displays as shown. Specify whether you also want to remove SNMPc and/or PostgreSQL. Click **Next** to continue.

**Figure 132** EMS: Remove: Select Application

- 4 Click **Yes** when asked to confirm removal. The **Uninstall Shield** now runs.
- 5 Click **OK** when the uninstall has successfully completed. Restart the computer when prompted.



# Appendix A

## SNMPc Network Manager

This appendix gives a brief overview of the SNMPc Network Manager.

### Starting the SNMPc Network Manager

You must have SNMPc properly installed before you can use the EMS; please refer to the Castle Rock web site at [www.castlerock.com](http://www.castlerock.com) or see your SNMPc user's guide.

You may start the SNMPc Network Manager manually or automatically each time you turn on your computer.

### Manual Startup

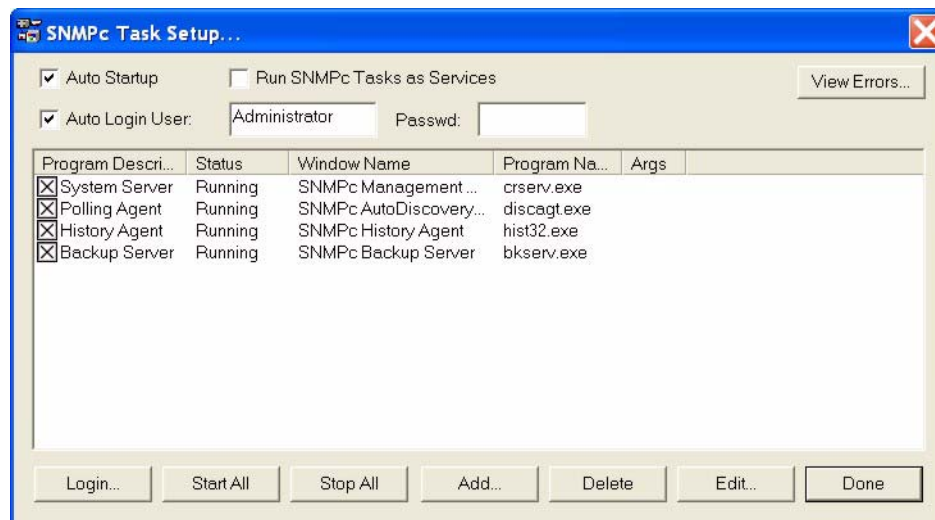
Click **Start, Programs, SNMPc, Startup System** to manually start the SNMPc network manager. This is the default location of the SNMPc network manager.

### Automatic Startup

To automatically start the SNMPc network manager each time you turn on your computer:

- 1 In SNMPc main window, click **Config, System Startup**.
- 2 Select the **Auto Startup** check box and click **Done**.

**Figure 133** Automatic Startup

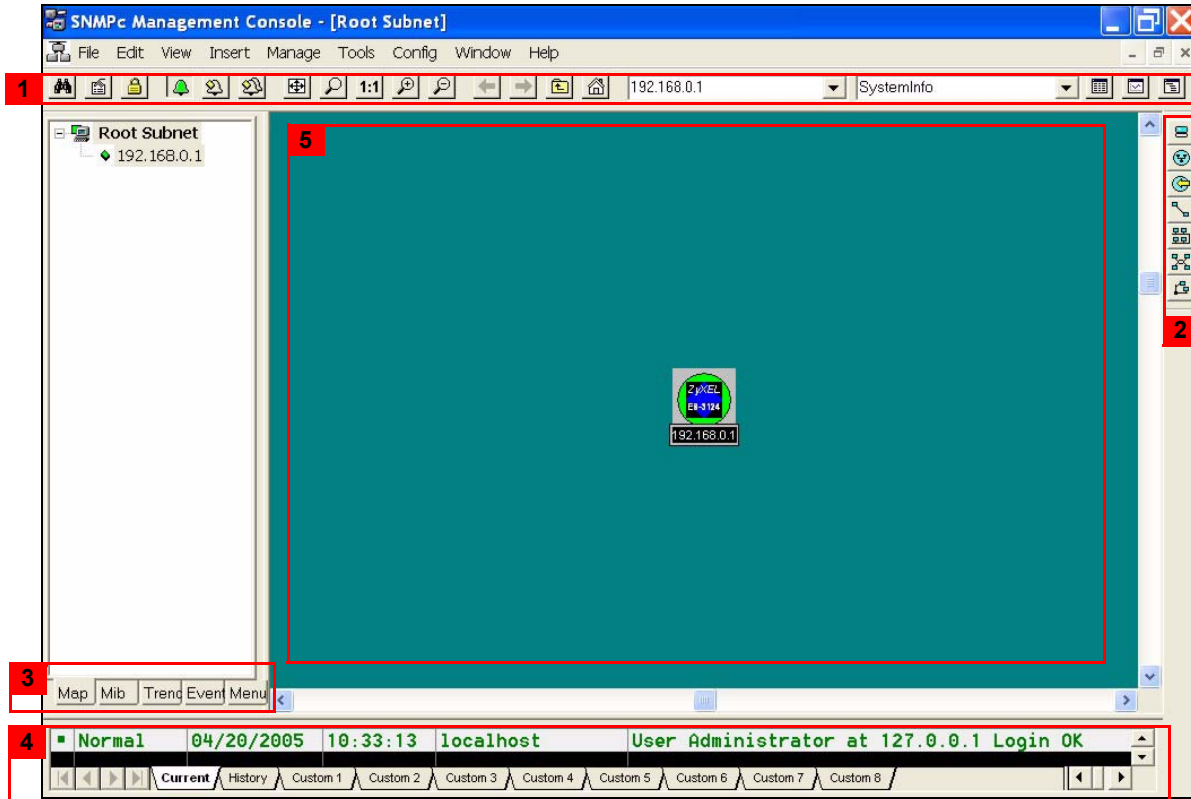




## SNMPc Main Window

The following figure and table show the elements of the SNMPc main window.

**Figure 134** SNMPc Main Windows



**Table 105** SNMPc Main Window

	ELEMENT	FUNCTION
1	Main Button Bar	Buttons and controls to execute common commands quickly. Hold the cursor over an icon to see a tool tip.
2	Edit Button Bar	Buttons to quickly insert map elements. Hold the cursor over an icon to see a tool tip.
3	Selection Tool	Tabbed control for selection of objects within different SNMPc functional modules.
4	Event Log Tool	Tabbed control for display of filtered event log entries.
5	View Window Area	Map View, Mib Tables and Mib Graph windows are shown here.

## Selection Tool

If you can't see the selection tool, click **View, Selection Tool** to display it. Use the selection tool to manipulate objects from one of several databases. Use the drag control at the right of the selection tool to change its size. Select one of the selection tool tabs to display a tree control for the database. Right-click on an icon inside a selection tree for database-specific commands.

**Table 106** Selection Tool

TAB	DESCRIPTION
Map	Map Object database, including devices and subnets.
Mib	Compiled SNMP Mibs, Custom Tables and Custom Mib Expressions.
Trend	Report profiles that define long-term polling procedures and scheduled reports.
Event	Event filters used to determine what happens when an event is received.
Menu	Custom menus that appear in the Manage, Tools and Help SNMPc menus.

## Event Log Tool

The event log tool displays different filtered views of the SNMPc event log. If you can't see the event log tool, click **View, Event Log Tool** to display it.

- Select the **Current** tab to show unacknowledged (current) events. These events have a colored box at the left side of the log entry. The color of map objects is determined by the highest priority unacknowledged event for that object.
- Select the **History** tab to show all events, including acknowledged and unacknowledged events.
- Select one of the **Custom** tabs and use the right-click **Filter View** menu to specify what events should be displayed for that tab.
- Double-click an event entry to display a **Map View** window with the corresponding device icon visible.
- To quickly view events for a particular device, first select the device and then use one of the **View Events** buttons (or the **View, Active Events** and **View, History Events** menus). This will show the device events in a separate window in the View Windows area.
- To remove one or more events, select the events and click the **Delete** key.
- To acknowledge (remove current status of) an event, right-click on an event entry and click **Acknowledge**.
- To completely clear the event log, click **File** and **Clear Events**.

## View Window Area

The View Window Area is the main interface for viewing the SNMPc map and command results. This area uses the Multi-Document-Interface (MDI) specification to display multiple windows at the same time. Click **Window** and select **Cascade**, **Tile Horizontally** or **Tile Vertically** to rearrange the windows in the View Window Area in a way that makes them all visible.

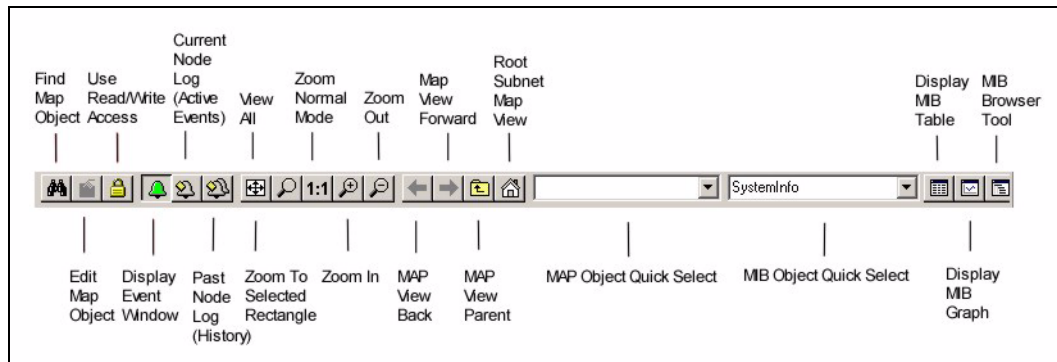
Windows in this area can be in one of several states:

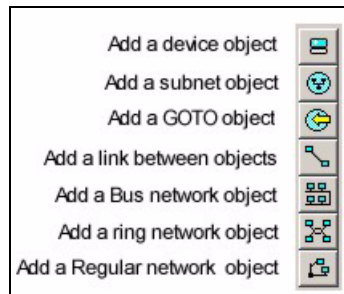
- A **Maximized** window uses the entire area and hides any other windows behind it. If you close a maximized window, the next top-most window will still be displayed in the maximized state. You need to be careful when using maximized windows because it is easy to lose track of how many windows you have open and there is an upper limit. Use the Windows menu to see a list of windows. Click **Windows** and select either **Tile Horizontally** or **Tile Vertically** to view all windows at the same time.
- An **Overlapped** window does not take up the entire area. One window will be completely visible and other windows are partially hidden behind it. This is the most common situation for the View Window area because it lets you view maps, tables and graphs at the same time and quickly move between them. Click **Windows** and select **Cascade**.
- A **Minimized** window is displayed as a small title bar with window open/close buttons. Windows are not typically minimized within the View Window Area because, as with the maximized case, they can easily be lost behind other windows.

## Main and Edit Button Bar Icons

The following figure is a brief overview of the SNMPc main button and edit button bar icons.

**Figure 135** SNMPc Main Button Bar Icons



**Figure 136** SNMPc Edit Button Bar Icons

**Note:** For more detailed information, please see [www.castlerock.com](http://www.castlerock.com).



# Appendix B

## Alarm Types and Causes

This appendix shows examples of probable alarm types and causes.

**Table 107** Alarm Types and Causes

ALARM TYPE	PROBABLE CAUSES	
Communications	<ul style="list-style-type: none"> <li>• Loss of signal</li> <li>• Loss of frame</li> <li>• Framing error</li> <li>• Local node transmission error</li> <li>• Remote node transmission error</li> <li>• Call establishment error</li> </ul>	<ul style="list-style-type: none"> <li>• Degraded signal</li> <li>• Communications subsystem failure</li> <li>• Communications protocol error</li> <li>• LAN error</li> <li>• DTE-DCE interface error</li> </ul>
Quality of service	<ul style="list-style-type: none"> <li>• Response time excessive</li> <li>• Queue size exceeded</li> <li>• Bandwidth reduced</li> <li>• Retransmission rate excessive</li> </ul>	<ul style="list-style-type: none"> <li>• Threshold crossed</li> <li>• Performance degraded</li> <li>• Congestion</li> <li>• Resource at or nearing capacity</li> </ul>
Processing error	<ul style="list-style-type: none"> <li>• Storage capacity problem</li> <li>• Version mismatch</li> <li>• Corrupt data</li> <li>• CPU cycles limit exceeded</li> <li>• Software error</li> <li>• Software program error</li> </ul>	<ul style="list-style-type: none"> <li>• Software program abnormally terminated</li> <li>• File error</li> <li>• Out of memory</li> <li>• Underlying resource unavailable</li> <li>• Application subsystem failure</li> <li>• Configuration or customization error</li> </ul>
Equipment	<ul style="list-style-type: none"> <li>• Power problem</li> <li>• Timing problem</li> <li>• Processor problem</li> <li>• Dataset or modem error</li> <li>• Multiplexer problem</li> <li>• Receiver failure</li> <li>• Transmitter failure</li> </ul>	<ul style="list-style-type: none"> <li>• Receive failure</li> <li>• Transmit failure</li> <li>• Output device error</li> <li>• Input device error</li> <li>• I/O device error</li> <li>• Equipment malfunction</li> <li>• Adapter error</li> </ul>
Environmental	<ul style="list-style-type: none"> <li>• Temperature unacceptable</li> <li>• Humidity unacceptable</li> <li>• Heating/ventilation/cooling system problem</li> <li>• Fire detected</li> <li>• Flood detected</li> <li>• Toxic leak detected</li> </ul>	<ul style="list-style-type: none"> <li>• Leak detected</li> <li>• Pressure unacceptable</li> <li>• Excessive vibration</li> <li>• Material supply exhausted</li> <li>• Pump failure</li> <li>• Enclosure door open</li> </ul>



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