

NetAtlas Workgroup

Ethernet Switch Manager

User's Guide

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Edition 1



About This User's Guide

Intended Audience

This manual is intended for people who want to configure the EMS using the web configurator. You should have at least a basic knowledge of TCP/IP networking concepts and topology.

Related Documentation

- Quick Start Guide

The Quick Start Guide is designed to help you get up and running right away. It contains information on setting up your software.



It is recommended you use the web configurator to configure the EMS.

- Supporting Disk

Refer to the included CD for support documents.

- ZyXEL Web Site

Please refer to www.zyxel.com for additional support documentation and product certifications.

User Guide Feedback

Help us help you. Send all User Guide-related comments, questions or suggestions for improvement to the following address, or use e-mail instead. Thank you!

The Technical Writing Team,
ZyXEL Communications Corp.,
6 Innovation Road II,
Science-Based Industrial Park,
Hsinchu, 300, Taiwan.

E-mail: techwriters@zyxel.com.tw

Document Conventions

Warnings and Notes

These are how warnings and notes are shown in this User's Guide.



Warnings tell you about things that could harm you or your device.








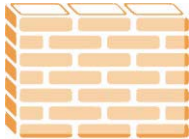


Notes tell you other important information (for example, other things you may need to configure or helpful tips) or recommendations.

Syntax Conventions

- The NetAtlas Workgroup may be referred to as the “EMS” or the “system” in this User's Guide.
- Product labels, screen names, field labels and field choices are all in **bold** font.
- A key stroke is denoted by square brackets and uppercase text, for example, [ENTER] means the “enter” or “return” key on your keyboard.
- “Enter” means for you to type one or more characters and then press the [ENTER] key. “Select” or “choose” means for you to use one of the predefined choices.
- A right angle bracket (>) within a screen name denotes a mouse click. For example, **Maintenance > Log > Log Setting** means you first click **Maintenance** in the navigation panel, then the **Log** sub menu and finally the **Log Setting** tab to get to that screen.
- Units of measurement may denote the “metric” value or the “scientific” value. For example, “k” for kilo may denote “1000” or “1024”, “M” for mega may denote “1000000” or “1048576” and so on.
- “e.g.,” is a shorthand for “for instance”, and “i.e.,” means “that is” or “in other words”.

Icons Used in Figures

Figures in this User's Guide may use the following generic icons.

Computer 	Notebook computer 	Telephone 
Server 	DSLAM 	Firewall 
Switch 	Router 	

Contents Overview

Introduction	27
Introduction	29
Main EMS Screen	33
Switch Manager	41
Switch Manager	43
Map	53
View	57
Template	77
Provisioning	85
Performance	89
Fault	101
Maintenance	107
Tools	119
Switch Configuration and Troubleshooting	123
Device Menu Overview	125
System Configuration	131
Switch Configuration	143
VLAN	157
Ethernet Port Configuration	163
Multicast Configuration	179
Configuration	191
IP Configuration	199
Troubleshooting	221
Appendices and Index	225

Table of Contents

About This User's Guide	3
Document Conventions.....	4
Contents Overview	7
Table of Contents.....	9
List of Figures	17
List of Tables.....	23
Part I: Introduction.....	27
Chapter 1	
Introduction.....	29
1.1 Overview	29
1.1.1 EMS Components	29
1.1.2 SNMPc Network Manager	30
1.1.3 Device Firmware Versions Supported	30
1.2 System Requirements and EMS Installation	30
1.3 Accessing EMS	31
Chapter 2	
Main EMS Screen	33
2.1 Main Screen Overview	33
2.2 Access Log	34
2.3 Database Management	35
2.3.1 Database Synchronization	35
2.3.2 Filename Convention	35
2.3.3 Database Backup and Restore	36
2.3.4 Database Log Storage Configuration	36
2.3.5 Database Scheduled Backup Configuration	37
2.4 SNMP Operation Mode	38
2.5 Accessing the Switch Manager Screen	39
Part II: Switch Manager	41

Chapter 3	
Switch Manager	43
3.1 Switch Manager Overview	43
3.2 Device List and Icon Colors	44
3.3 System Message Panel Alarm Status	45
3.4 System Message Panel Port Status	45
3.5 Menu Shortcut Buttons	45
3.6 EMS Main Menu Summary	46
3.7 Common EMS Command Buttons	48
3.8 View the Switch	48
3.9 Switch Information	48
3.10 Configuration Save	50
Chapter 4	
Map	53
4.1 Root Subnet and Device Mapping	53
4.1.1 Adding a Submap or Device	54
4.1.2 Editing a Node	55
4.1.3 Finding an Object	55
4.1.4 Deleting a Submap	55
4.1.5 Deleting a Device	56
4.1.6 Updating Device Map	56
4.1.7 Synchronizing Device Map Database	56
4.2 Exit	56
Chapter 5	
View	57
5.1 Hardware Status	57
5.2 STP/RSTP	59
5.2.1 STP Terminology	59
5.2.2 STP Port States	59
5.2.3 STP Status	60
5.3 VLAN Status	61
5.4 Port Status	62
5.5 802.1D	64
5.5.1 MAC Table	64
5.5.2 ARP Table	65
5.6 Multicast Status	67
5.7 Ethernet Port Status	67
5.8 IP Application Status	69
5.8.1 Routing Table Status	69
5.8.2 IP Table Status	70
5.8.3 DHCP Server Status	71

5.8.4 VRRP Status	72
5.8.5 OSPF Status	73
5.9 Interface Status	75
5.10 Firmware Version	76
Chapter 6	
Template	77
6.1 Template Overview	77
6.2 VLAN Template	77
6.2.1 Creating a New VLAN Template	79
6.3 IGMP Filtering Profile Template	79
6.3.1 Configuring an IGMP Filter Template	80
6.4 Static Multicast Group Template	82
6.4.1 Configuring a Multicast Template	83
Chapter 7	
Provisioning	85
7.1 Overview	85
7.2 Applying an IGMP Filter Profile	85
7.3 Removing an IGMP Filter Profile	87
Chapter 8	
Performance	89
8.1 Interface Performance	89
8.2 RMON Ethernet Statistics	90
8.3 RMON History Data	92
8.4 Table Menu Bar	94
8.4.1 Editing a Table Entry	95
8.4.2 Expand Dialog Box	96
8.5 Graph Menu Bar Icons	97
8.5.1 Graph Styles	98
8.5.2 Chart Format Display Variable	98
8.5.3 Graph Labels	99
Chapter 9	
Fault	101
9.1 Event Log	101
9.2 Loopback Test	102
9.3 Ping Test	103
9.4 Traceroute Test	105
Chapter 10	
Maintenance	107

10.1 Firmware Upgrade	107
10.1.1 Procedure to Update Firmware	107
10.2 Device Reset	108
10.3 NE Configuration Backup and Restore	109
10.4 Load Factory Default	110
10.5 Scheduled Network Element Configuration Backup	111
10.5.1 Configuring Scheduled NE Configuration Backup	112
10.5.2 Removing a Scheduled NE Configuration Backup	113
10.6 Scheduled Device Configuration Restore	113
10.6.1 Schedule Content Screen	114
10.6.2 Schedule Content Screen	115
10.7 Scheduled FW Upgrade	116
Chapter 11	
Tools.....	119
11.1 Accessing the Switch	119
11.1.1 Telnet	119
11.1.2 Web Access	120
11.2 Ping	120
Part III: Switch Configuration and Troubleshooting.....	123
Chapter 12	
Device Menu Overview.....	125
12.1 Device Menu Summary	125
12.2 Property Configuration	125
12.3 Introducing the Device Configuration Window	126
12.3.1 Port List Multiple Port Configuration	127
12.3.2 The Copy to.. Button	128
Chapter 13	
System Configuration.....	131
13.1 System Info	131
13.2 SNMP	131
13.2.1 Configuring SNMP	132
13.3 Remote Management	133
13.4 Time Setup	135
13.5 Syslog Setup	136
13.5.1 Configuring a Syslog Server	137
13.6 RADIUS	138
13.7 Boot Config	138

13.8 IP Setup	139
13.8.1 Configuring an IP Interface	141
Chapter 14	
Switch Configuration.....	143
14.1 Switch Setup	143
14.2 Priority Queue	145
14.3 Multiple/ Rapid STP Configuration	147
14.4 Link Aggregation	148
14.4.1 Dynamic Link Aggregation	149
14.4.2 Link Aggregation ID	149
14.4.3 Configuring Link Aggregation	149
14.5 GARP Timer	151
14.6 Filtering	152
14.6.1 Creating a New Filter	152
14.7 MAC Forwarding	153
14.7.1 Configuring a Static MAC Address Entry	154
14.8 Mirroring	155
Chapter 15	
VLAN	157
15.1 Introduction to VLANs	157
15.2 Configuring 802.1Q VLAN	157
15.2.1 Configuring an 802.11Q VLAN	159
15.2.2 Removing a VLAN	160
15.3 Introduction to Port-based VLANs	160
15.3.1 Configuring Port Based VLAN	161
Chapter 16	
Ethernet Port Configuration.....	163
16.1 Overview	163
16.2 Port Setup	163
16.3 Port VLAN	165
16.4 Port Link Aggregation	166
16.5 Port STP	167
16.6 Port 802.1x	168
16.7 Port Mirroring	169
16.8 VLAN Stacking	170
16.9 Queue Method	171
16.10 Protocol VLAN	172
16.10.1 Configuring a Protocol VLAN	173
16.11 Port Security	174
16.12 Bandwidth Control	175

16.13 Broadcast Storm Control	176
16.14 DiffServ	177
Chapter 17	
Multicast Configuration.....	179
17.1 Overview	179
17.1.1 IP Multicast Addresses	179
17.1.2 IGMP Snooping	179
17.2 Multicast Settings	180
17.2.1 Configuring Port Multicast Settings	181
17.2.2 Applying a Multicast Template	182
17.2.3 Displaying IGMP Filter Profile	183
17.3 MVR	184
17.3.1 Types of MVR Ports	185
17.3.2 MVR Modes	185
17.3.3 Viewing MVR Settings	185
17.3.4 Creating a New Multicast VLAN	186
17.3.5 Creating a New MVR Group	188
Chapter 18	
Configuration	191
18.1 RMON Overview	191
18.2 History Config	191
18.2.1 Configuring an RMON History	192
18.3 Event Config	193
18.3.1 Configuring an RMON Event	194
18.4 Alarm Config	195
18.4.1 Configuring an RMON Alarm	197
18.4.2 RMON Alarm Event Log	198
Chapter 19	
IP Configuration	199
19.1 Static Route	199
19.1.1 Configuring a Static Route	200
19.2 DiffServ	201
19.3 DSCP Setting	202
19.4 IGMP	203
19.5 DHCP	204
19.5.1 DHCP modes	204
19.5.2 Configuring DHCP Server	204
19.5.3 Configuring DHCP Relay	206
19.6 DVMRP	208
19.7 RIP	209

19.8 OSPF	210
19.8.1 OSPF Autonomous Systems and Areas	211
19.8.2 Interfaces and Virtual Links	211
19.8.3 Configuring Basic OSPF Settings	211
19.8.4 Configuring a New OSPF Area	213
19.8.5 Configuring a New OSPF Virtual Link	214
19.8.6 Configuring a New OSPF Interface	215
19.9 VRRP	217
19.9.1 Configuring Interface VRRP Settings	217
19.9.2 Configuring a VRRP Interface	218
19.10 IP Multicast	220
Chapter 20	
Troubleshooting.....	221
20.1 Installation Problems	221
20.2 Problems Accessing the EMS	221
20.3 Problems Finding a Device	222
20.4 Uninstalling the EMS	222
Part IV: Appendices and Index	225
Appendix A SNMPc Network Manager	227
Appendix B Alarm Types and Causes	231
Appendix C Legal Information	233
Appendix D Customer Support.....	235
Index.....	239

List of Figures

Figure 1 EMS Network Example	29
Figure 2 EMS Server and Remote Clients	30
Figure 3 SNMPc: Switch Device List Icon	31
Figure 4 NetAtlas Main Screen	31
Figure 5 EMS: Main Screen	32
Figure 6 Main Screen	33
Figure 7 Admin: Access Log	34
Figure 8 Admin: Database Management: Backup/Restore	36
Figure 9 Admin: Database Management: Log Storage	37
Figure 10 Admin: Database Management: Scheduled Backup	38
Figure 11 Admin: SNMP Operation Mode	39
Figure 12 Switch Manager: Main Screen	40
Figure 13 EMS Main Screen Overview	43
Figure 14 Device List and Icon Colors: Example	44
Figure 15 EMS Main Screen Shortcut Bar	45
Figure 16 Switch View	48
Figure 17 Configuration: System Configuration: System Info.	49
Figure 18 Configuration Save	50
Figure 19 Configuration Save: Result	51
Figure 20 Submaps and Device Mapping	53
Figure 21 Map: Add Submap/Device	54
Figure 22 Map: Edit Node	55
Figure 23 Map: Find Object	55
Figure 24 Map: Delete Warning	56
Figure 25 View: Hardware Status	57
Figure 26 View: STP Status	60
Figure 27 View: VLAN Status	61
Figure 28 View: Port Status	63
Figure 29 View: 802.1d: MAC Table	64
Figure 30 View: 802.1d: ARP Table	66
Figure 31 View: Multicast Status	67
Figure 32 View: Ethernet Status	68
Figure 33 View: IP Application Status: Routing Table Status	69
Figure 34 View: IP Application Status: IP Table Status	70
Figure 35 View: IP Application Status: DHCP Server Status	72
Figure 36 View: IP Application Status: VRRP Status	73
Figure 37 View: IP Application Status: OSPF Status	74
Figure 38 View: Interface Status	75

Figure 39 View: Firmware Version	76
Figure 40 Template: VLAN Template	78
Figure 41 Template: IGMP Filtering Profile Template	80
Figure 42 Template: New IGMP Filter	81
Figure 43 Template: Multicast Template	82
Figure 44 Template: New Multicast	83
Figure 45 Provisioning: IGMP Filter	86
Figure 46 Provisioning: IGMP Filter: Apply to Devices	86
Figure 47 Provisioning: IGMP Filter: Apply to Devices: Successful	86
Figure 48 Provisioning: IGMP Filter: Remove From Devices	87
Figure 49 Provisioning: IGMP Filter: Remove From Devices: Select Device	88
Figure 50 Provisioning: IGMP Filter: Remove From Devices: Successful	88
Figure 51 Performance: Interface	89
Figure 52 Performance: RMON: Ethernet Statistics	91
Figure 53 Performance: RMON: History Data	93
Figure 54 Table Menu Bar Icons	94
Figure 55 Edit Table Entry	95
Figure 56 Expand Field	97
Figure 57 Graph Menu Bar	97
Figure 58 Cell Properties Select	98
Figure 59 Chart Color Codes and Line Styles	98
Figure 60 Graph Variables	99
Figure 61 Fault: Event Log	101
Figure 62 Fault: Loopback Test	103
Figure 63 fault: Loopback: Result	103
Figure 64 Fault: Ping and TraceRoute Test: Ping	104
Figure 65 Fault: Ping and TraceRoute Test: Trace Route	105
Figure 66 Maintenance: Firmware Upgrade	108
Figure 67 Maintenance: Firmware Upgrade: Result	108
Figure 68 Maintenance: Device Reset	109
Figure 69 Maintenance: Device Reset: Result	109
Figure 70 Maintenance: Configuration Backup/Restore	110
Figure 71 Maintenance: Load Factory Defaults	111
Figure 72 Maintenance: Scheduled NE Config Backup	111
Figure 73 Maintenance: Scheduled NE Config Backup: Add Devices	113
Figure 74 Maintenance: Scheduled Device Configuration Restore	114
Figure 75 Maintenance: Scheduled Device Configuration Restore: Add/Modify	115
Figure 76 Maintenance: Scheduled Device Configuration Restore: Add/Modify	116
Figure 77 Maintenance: Scheduled FW Upgrade	116
Figure 78 Tool: Telnet	120
Figure 79 Tool: Web Access	120
Figure 80 Tool: Ping	121
Figure 81 Device Panel List Menus	125

Figure 82 Configuration Window	126
Figure 83 Configuration Window: Port List: Multiple Port Select	127
Figure 84 Applied Results	127
Figure 85 Copy Switch Setting: Example	128
Figure 86 Switch Configuration Copy: Success	129
Figure 87 Copy Port Setting: Example	129
Figure 88 Copy Successful	130
Figure 89 SNMP Management Model	131
Figure 90 System Configuration: SNMP Conf.	133
Figure 91 System Configuration: Remote Management	134
Figure 92 System Configuration: Time Setup	135
Figure 93 System Configuration: Syslog Setup	136
Figure 94 System Configuration: Syslog Setup: Add	137
Figure 95 System Configuration: RADIUS	138
Figure 96 System Configuration: Boot Config	139
Figure 97 System Configuration: Boot Config	139
Figure 98 System Configuration: IP Setup	140
Figure 99 System Configuration: IP Setup: Add	141
Figure 100 Switch Configuration: Switch Setup	143
Figure 101 Switch Configuration: Priority Queue	146
Figure 102 Switch Configuration: STP Conf.	147
Figure 103 Switch Configuration: Link Aggregation	150
Figure 104 Switch Configuration: GARP Timer	151
Figure 105 Switch Configuration: Filtering	152
Figure 106 Switch Configuration: Filtering: Add	153
Figure 107 Switch Configuration: MAC Forwarding	154
Figure 108 Switch Configuration: MAC Forwarding: Add	155
Figure 109 Switch Configuration: Mirroring	156
Figure 110 Selecting a VLAN Type	157
Figure 111 VLAN Configuration: 802.1Q	158
Figure 112 VLAN Configuration: 802.1Q: New or Modify	159
Figure 113 VLAN Configuration: Port Based	161
Figure 114 Ethernet Port Configuration: Port Setup	163
Figure 115 Ethernet Port Configuration: Port VLAN	165
Figure 116 Ethernet Port Configuration: Port Link Aggregation	166
Figure 117 Ethernet Port Configuration: Port STP	167
Figure 118 Ethernet Port Configuration: Port 802.1x	168
Figure 119 Ethernet Port Configuration: Port Mirroring	169
Figure 120 Ethernet Port Configuration: VLAN Stacking	170
Figure 121 Ethernet Port Configuration: Queue Method	171
Figure 122 Ethernet Port Configuration: Protocol VLAN	173
Figure 123 Ethernet Port Configuration: Protocol VLAN Add	174
Figure 124 Ethernet Port Configuration: Port Security	175

Figure 125 Ethernet Port Configuration: Bandwidth Ctrl.	176
Figure 126 Ethernet Port Configuration: Broadcast Storm Ctrl.	177
Figure 127 Ethernet Port Configuration: DiffServ	178
Figure 128 Multicast Configuration: Multicast Settings	180
Figure 129 Multicast Configuration: Multicast Settings: Modify	181
Figure 130 Multicast Configuration: Multicast Settings: Load Template	183
Figure 131 Multicast Configuration: Multicast Settings: View Profile	184
Figure 132 Multicast Configuration: MVR	185
Figure 133 Multicast Configuration: MVR: Add MVLAN	187
Figure 134 Multicast Configuration: MVR: Add MVLAN: Result	187
Figure 135 Multicast Configuration: MVR: Select MVLAN	188
Figure 136 Multicast Configuration: MVR: Add	188
Figure 137 Multicast Configuration: MVR: Add MVR Group: Result	189
Figure 138 RMON Configuration: History Config.	192
Figure 139 RMON Configuration: History Config.: New	193
Figure 140 RMON Configuration: Event Config.	194
Figure 141 RMON Configuration: Event Config.: New	195
Figure 142 RMON Configuration: Alarm Config.	196
Figure 143 RMON Configuration: Alarm Config.: New	197
Figure 144 RMON Configuration: Alarm Config.: New: Browse	197
Figure 145 RMON Configuration: Alarm Config.: Show Log	198
Figure 146 IP Configuration: Static Route	199
Figure 147 Routing Configuration: Static Route: Add	200
Figure 148 IP Configuration: DiffServ	201
Figure 149 IP Configuration: DiffServ	202
Figure 150 IP Configuration: IGMP	203
Figure 151 IP Configuration: DHCP: Server	205
Figure 152 IP Configuration: DHCP: Server: New	206
Figure 153 IP Configuration: DHCP: Relay	207
Figure 154 IP Configuration: DVMRP	209
Figure 155 IP Configuration: RIP	210
Figure 156 IP Configuration: OSPF	212
Figure 157 IP Configuration: OSPF: New OSPF Setting	214
Figure 158 IP Configuration: OSPF: New Virtual Link	215
Figure 159 IP Configuration: OSPF: New Interface	216
Figure 160 IP Configuration: VRRP	217
Figure 161 IP Configuration: VRRP: New	219
Figure 162 IP Configuration: IP Multicast	220
Figure 163 EMS: Remove	222
Figure 164 EMS: Remove: Select Application	223
Figure 165 Automatic Startup	227
Figure 166 SNMPc Main Windows	228
Figure 167 SNMPc Main Button Bar Icons	230

Figure 168 SNMPc Edit Button Bar Icons 230

List of Tables

Table 1 Device Firmware Versions Supported	30
Table 2 Main Screen Menu Overview	33
Table 3 Admin: Access Log	34
Table 4 Admin: Database Management: Backup/Restore	36
Table 5 Admin: Database Management: Log Storage	37
Table 6 Admin: Database Management: Scheduled Backup	38
Table 7 Admin: SNMP Operation	39
Table 8 EMS Main Screen Overview	44
Table 9 System Message Panel Alarm Status	45
Table 10 EMS Navigation Panel Sub-link Descriptions	46
Table 11 Common EMS Command Buttons	48
Table 12 Configuration: Switch Configuration: System Info.	49
Table 13 Map: Add Submap/Device	54
Table 14 Status: Hardware Status	58
Table 15 STP Path Costs	59
Table 16 STP Port States	59
Table 17 View: STP Status	60
Table 18 View: VLAN Status	62
Table 19 View: Port Status	63
Table 20 View: 802.1d: MAC Table	64
Table 21 View: 802.1d: ARP Table	66
Table 22 View: Multicast Status	67
Table 23 View: Ethernet Status	68
Table 24 View: IP Application Status: Routing Table Status	70
Table 25 View: IP Application Status: IP Table Status	71
Table 26 View: IP Application Status: DHCP Server Status	72
Table 27 View: IP Application Status: VRRP Status	73
Table 28 View: IP Application Status: OSPF Status	74
Table 29 View: Interface Status	75
Table 30 View: Firmware Version	76
Table 31 Template: VLAN	78
Table 32 Template: IGMP Filter Template	80
Table 33 Template: New IGMP Filter	81
Table 34 Template: Multicast	82
Table 35 Template: New Multicast	83
Table 36 Performance: Interface	89
Table 37 Performance: RMON: Ethernet Statistics	91
Table 38 Performance: RMON: History Data	93

Table 39 Edit Table Entry	95
Table 40 Variable Types	97
Table 41 Edit Table Entry	98
Table 42 Edit Style Dialog Box	99
Table 43 Graph Variables	99
Table 44 Fault: Event Log	101
Table 45 Fault: Ping and TraceRoute Test: Ping	104
Table 46 Fault: Ping and TraceRoute Test: Ping	105
Table 47 Maintenance: Configuration Backup/Restore	110
Table 48 Maintenance: Scheduled NE Config Backup	112
Table 49 Maintenance: Scheduled Device Configuration Restore	114
Table 50 Maintenance: Scheduled Device Configuration Restore: Add/Modify	115
Table 51 Maintenance: Scheduled Device Configuration Restore: Add/Modify	116
Table 52 Maintenance: Scheduled FW Upgrade	117
Table 53 Configuration Window	126
Table 54 Copy Port Setup	130
Table 55 SNMP Commands	132
Table 56 System Configuration: SNMP Conf.	133
Table 57 System Configuration: Remote Management	134
Table 58 System Configuration: Time Setup	135
Table 59 System Configuration: Syslog Setup	136
Table 60 System Configuration: Syslog Setup: Add	137
Table 61 System Configuration: RADIUS	138
Table 62 System Configuration: IP Setup	140
Table 63 System Configuration: IP Setup: Add	141
Table 64 Switch Configuration: Switch Setup	144
Table 65 Switch Configuration: Priority Queue	146
Table 66 Switch Configuration: Multiple STP Conf.	147
Table 67 Aggregation ID Local Switch	149
Table 68 Aggregation ID Peer Switch	149
Table 69 Switch Configuration: Link Aggregation	150
Table 70 Switch Configuration: GARP Timer	151
Table 71 Switch Configuration: Filtering	152
Table 72 Switch Configuration: Filtering: Add	153
Table 73 Switch Configuration: MAC Forwarding	154
Table 74 Switch Configuration: MAC Forwarding: Add	155
Table 75 Switch Configuration: Mirroring	156
Table 76 VLAN Configuration: 802.1Q	158
Table 77 VLAN Configuration: 802.1Q: Modify	159
Table 78 VLAN Port Type Descriptions	160
Table 79 VLAN Configuration: Port Based	162
Table 80 Ethernet Port Configuration: Port Setup	164
Table 81 Ethernet Port Configuration: Port VLAN	166

Table 82 Ethernet Port Configuring: Port Link Aggregation	167
Table 83 Ethernet Port Configuration: Port STP	167
Table 84 Ethernet Port Configuration: Port 802.1x	169
Table 85 Ethernet Port Configuration: Port Mirroring	170
Table 86 Ethernet Port Configuration: VLAN Stacking	171
Table 87 Ethernet Port Configuration: Queue Method	172
Table 88 Ethernet Port Configuration: Protocol VLAN	173
Table 89 Ethernet Port Configuration: Protocol VLAN	174
Table 90 Ethernet Port Configuration: Port Security	175
Table 91 Ethernet Port Configuration: Bandwidth Ctrl.	176
Table 92 Ethernet Port Configuration: Broadcast Storm Ctrl.	177
Table 93 Multicast Configuration: Multicast Settings	180
Table 94 Multicast Configuration: Multicast Settings: Modify	182
Table 95 Multicast Configuration: Multicast Settings: Load Template	183
Table 96 Multicast Configuration: Multicast Settings: View Profile	184
Table 97 Multicast Configuration: MVR	186
Table 98 Supported RMON Groups	191
Table 99 RMON Configuration: History Config.	192
Table 100 RMON Configuration: History Config.: New	193
Table 101 RMON Configuration: Event Config.	194
Table 102 RMON Configuration: Event Config.: New	195
Table 103 RMON Configuration: Alarm Config.	196
Table 104 RMON Configuration, Alarm Config., New	197
Table 105 RMON Configuration: Alarm Config.: Show Log	198
Table 106 Routing Configuration: Static Route	200
Table 107 Routing Configuration: Static Route: Add or Modify	200
Table 108 DiffServ: DSCP Setting	202
Table 109 Default DSCP-IEEE802.1p Mapping	202
Table 110 DiffServ: DSCP Setting	203
Table 111 IP Configuration: IGMP	204
Table 112 IP Configuration: DHCP: Server	205
Table 113 IP Configuration: DHCP: Server: New	206
Table 114 IP Configuration: DHCP: Relay	208
Table 115 IP Configuration: DVMRP	209
Table 116 IP Configuration: RIP	210
Table 117 OSPF vs. RIP	211
Table 118 IP Configuration: OSPF	212
Table 119 IP Configuration: OSPF: New OSPF Setting	214
Table 120 IP Configuration: OSPF: New Virtual Link	215
Table 121 IP Configuration: OSPF: New Interface	216
Table 122 IP Configuration: VRRP	218
Table 123 IP Configuration: VRRP: New	219
Table 124 IP Configuration: IP Multicast	220

Table 125 General Installation Problems	221
Table 126 Problems Accessing the EMS	221
Table 127 Problems Accessing the EMS	222
Table 128 SNMPc Main Window	228
Table 129 Selection Tool	229
Table 130 Alarm Types and Causes	231

PART I

Introduction

- [Introduction \(29\)](#)
- [Main EMS Screen \(33\)](#)

Introduction

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

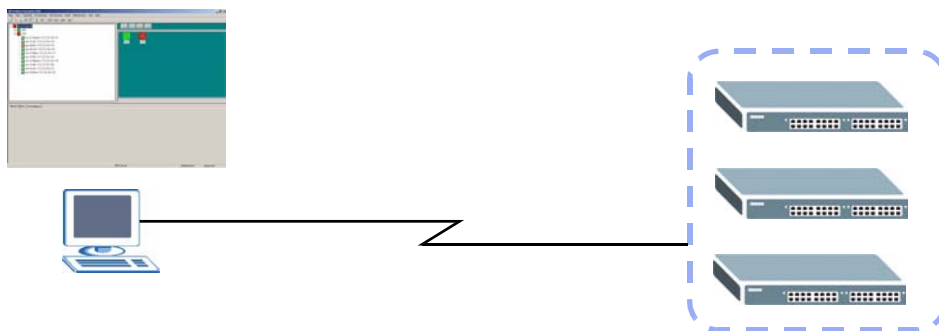
1.1 Overview

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.

The following figure shows a network example.

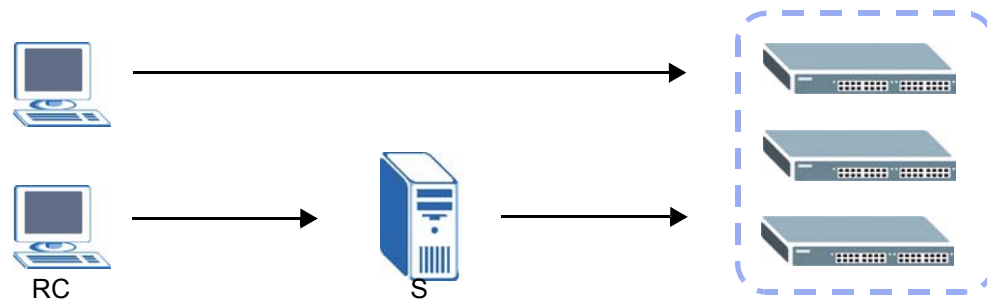
Figure 1 EMS Network Example



1.1.1 EMS Components

The EMS consists of two components: the EMS server and the EMS remote client. You must install the EMS server, which provides all the functions to use the EMS. You can install the EMS remote client on other computers if you want to use EMS on them as well.

You can send SNMP messages to managed devices from an EMS remote client (RC) or through the EMS server (S). The following figure shows a network example.

Figure 2 EMS Server and Remote Clients

1.1.2 SNMPc Network Manager

SNMPc is network management software produced by Castle Rock.

You must have SNMPc properly installed before you can use the EMS. Refer to the appendix in this User's Guide; go to the Castle Rock web site at www.castlerock.com or see your SNMPc user's guide.

1.1.3 Device Firmware Versions Supported

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

Table 1 Device Firmware Versions Supported

MODEL	FIRMWARE VERSION
ES-2108	360ABK2C0/370ABK0C0 or later versions
ES-2108G	360ABL2C0/370ABL0C0 or later versions
ES-2108PWR	360ABS2C0/370ABS1C0 or later versions
ES-2024A	360TX1C0/370TX0C0 or later versions
GS-2024	360LT1C0 or later versions
ES-3124	360TP3C0/370TP1C0 or later versions
ES-3124PWR	360TY4C0/370TY0C0 or later versions
ES-3148	360TZ1C0/370TZ0C0 or later versions
GS-4012	360TS3C0/370TS0C0 or later versions
GS-4024	360LL3C0/370LL0C0 or later versions
ES-4124	360AIC0C0/370AIC0C0 or later versions

1.2 System Requirements and EMS Installation

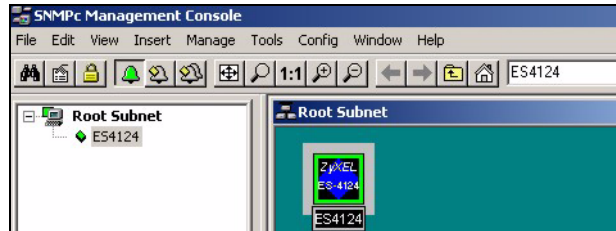
Refer to the quick start guide for a list of system requirements and the installation procedure for EMS.

1.3 Accessing EMS

Follow the steps below to access EMS.

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

Figure 3 SNMPc: Switch Device List Icon



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

Figure 4 NetAtlas Main Screen

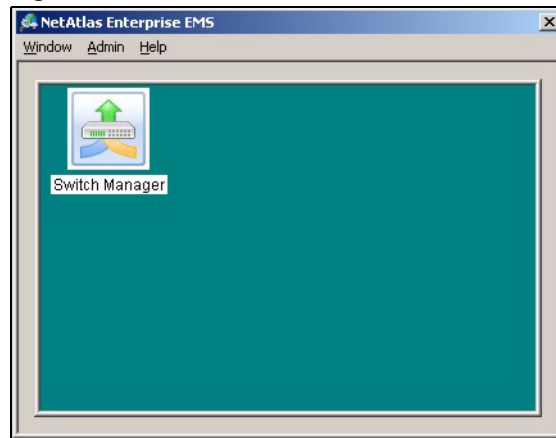
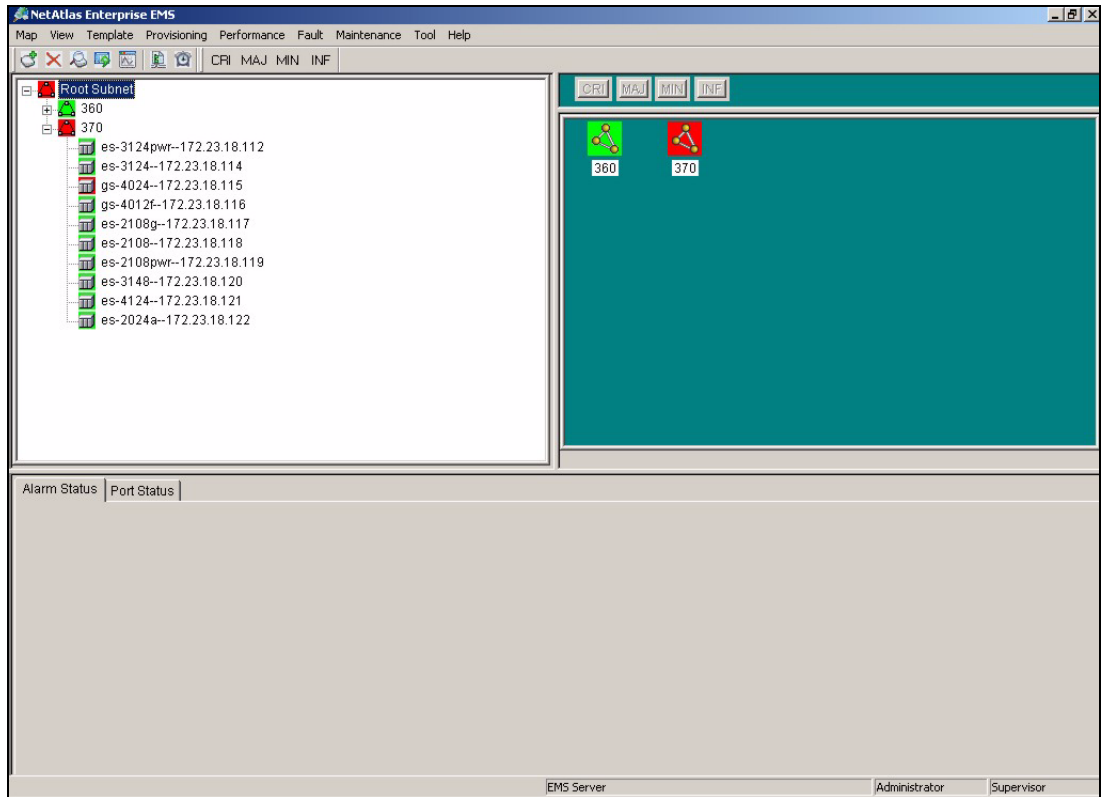


Figure 5 EMS: Main Screen



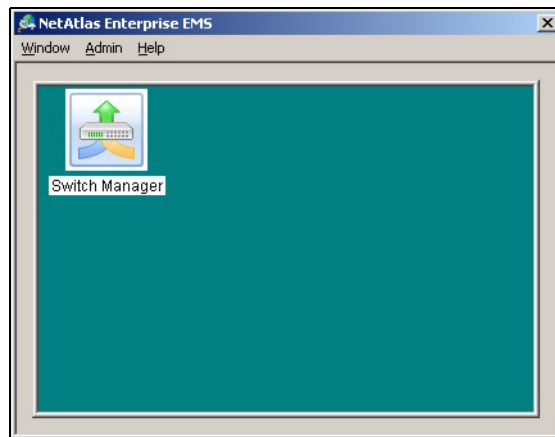
Main EMS Screen

This chapter describes the main screens you use to view access logs and maintain databases.

2.1 Main Screen Overview

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

Figure 6 Main Screen



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

Table 2 Main Screen Menu Overview

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

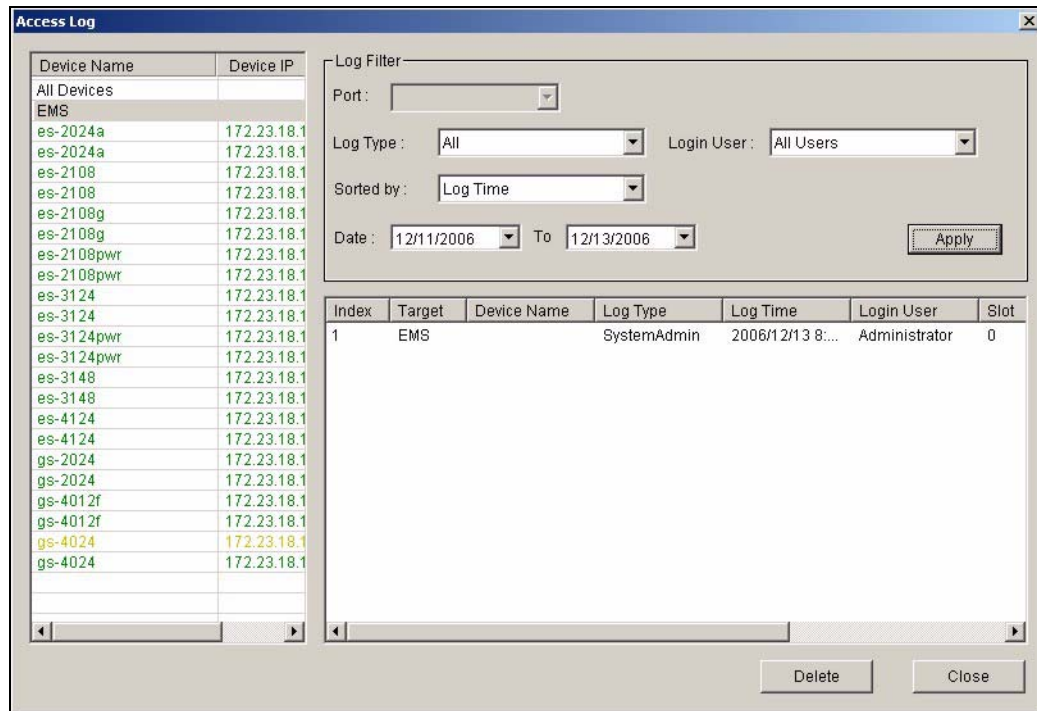
Table 2 Main Screen Menu Overview (continued)

LABEL	SUB-MENU	DESCRIPTION
	SNMP Operation Mode	Use this screen to specify whether SNMP messages can be sent directly from an EMS remote client computer or through the EMS server.
Help	On-line Help	Click On-line Help to display an EMS help file.

2.2 Access Log

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

Figure 7 Admin: Access Log



The following table describes the fields in this screen.

Table 3 Admin: Access Log

LABEL	DESCRIPTION
Log Filter	
Port	Select a port or All Ports 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 All Users to view logs for all access attempts to a switch via the EMS. Select Administrator to view only the EMS administrator access attempts.
Sorted by	Select By Device Name to sort the logs displayed in alphabetical order according to the names of the switch(es). Select Log Time to sort the logs displayed according to the times received on the switch(es).

Table 3 Admin: Access Log (continued)

LABEL	DESCRIPTION
Date	Select a start date and end date from the list boxes to display logs for that period.
Apply	Click Apply 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 Delete to delete a selected log from the list of log entries.
Close	Click Close to close this screen.

2.3 Database Management

The following information is stored in the EMS database.

- Event and access logs
- EMS configuration
- Device configuration and status information

Use the **Database Management** screens to back up logs and EMS and SNMPc configurations and restore selected backed up files.

2.3.1 Database Synchronization

The EMS is able to synchronize the device tree and device status information with SNMPc. This means that when you add a device in EMS, the same change also applies in SNMPc and the new device icon is created in both the EMS and SNMPc screens. In addition, device status changes are reflected in both the EMS and the SNMPc screens.

EMS database is synchronized:

- when you launch the Switch Manager screen.
- when you click **Map > Sync Map DB** in EMS.
- automatically everyday at mid-night (this schedule is not configurable).

2.3.2 Filename Convention

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

2.3.3 Database Backup and Restore

Use the **Database Backup/Restore** screen to back up current EMS and SNMPc databases or restore the database information. Backup data is stored as a series of files in the specified directory on your computer.

Click **Admin > Database Management > Backup/Restore (EMS & SNMPc DB)** to display the configuration screen.

Figure 8 Admin: Database Management: Backup/Restore

The following table describes the fields in this screen.

Table 4 Admin: Database Management: Backup/Restore

LABEL	DESCRIPTION
Backup	Select Backup to transfer the database file from the EMS to the computer.
Restore	Select Restore to transfer the backed up files from your computer to the EMS.
SNMPc Backup Name	Specify a backup file name for the SNMPc database to store on your computer. Enter a descriptive name for identification purposes.
Directory	This field displays the default directory to back up or restore database files. Specify the location you wish the EMS to restore from or back up to on your computer or click Browse to locate it.
Existing Backups	This field is applicable when you select the Restore option. This field displays the list of backup files available for restore.
Delete	Click Delete to remove the selected backup file.
Apply	Click Apply to backup or restore the database files.
Close	Click Close to close the screen.

2.3.4 Database Log Storage Configuration

Use the **Database Log Storage Configuration** screen to maintain logs on the EMS.

Click **Admin > Database Management > Log Storage Configuration (EMS DB)** to display the following screen.

Figure 9 Admin: Database Management: Log Storage

The screenshot shows a dialog box titled "Database Log Storage Configuration". It is divided into three main sections:

- Storage Configuration:** Contains two radio buttons. The first is selected and is next to a dropdown menu showing "1000" and the text "* 1000 latest records reserved". The second radio button is next to a text field containing "0" and the text "days of records reserved (7~365)".
- Cleared Records Backup:** Contains a checkbox labeled "Backup the cleared records" which is unchecked. Below it is a text field labeled "Backup Directory:" followed by a "Browse" button.
- User info for Windows:** Contains two text fields: "Account:" with the value "user" and "Password:" which is empty.

At the bottom of the dialog are two buttons: "Apply" and "Close".

The following table describes the fields in this screen.

Table 5 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 Browse 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 Backup Directory text box or click Browse 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 Account above.
Apply	Click Apply to save changes to the EMS.
Close	Click Close to close the screen.

2.3.5 Database Scheduled Backup Configuration

Use this screen to schedule regular backups for database files. The EMS creates a scheduled task on your Windows computer for this action. To look at scheduled tasks in Windows 2000, click **Start > Settings > Control Panel > Scheduled Tasks**. The steps are similar for other versions of Windows.

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

Figure 10 Admin: Database Management: Scheduled Backup

The following table describes the fields in this screen.

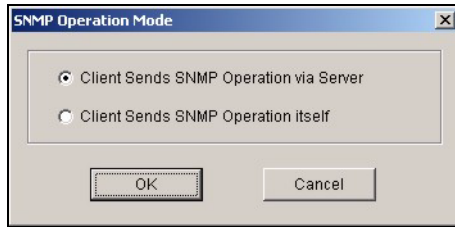
Table 6 Admin: Database Management: Scheduled Backup

LABEL	DESCRIPTION
Backup Schedule	
Frequency	Scheduled backups can be performed Daily , Weekly or Monthly . Select a radio button to schedule database backups starting from the date and time specified below. The default setting is No Backup .
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 Backup Directory text box or click Browse 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 Account above.
Apply	Click Apply to save changes to the EMS.
Close	Click Close to close the screen.

2.4 SNMP Operation Mode

When you install EMS remote client on a computer, you can use the **SNMP Operation Mode** screen to specify whether you want to allow the EMS remote client computer to send SNMP messages directly to managed ZyXEL devices or through the EMS server.

Click **Admin > SNMP Operation Mode** to display the screen as shown.

Figure 11 Admin: SNMP Operation Mode

The following table describes the fields in this screen.

Table 7 Admin: SNMP Operation

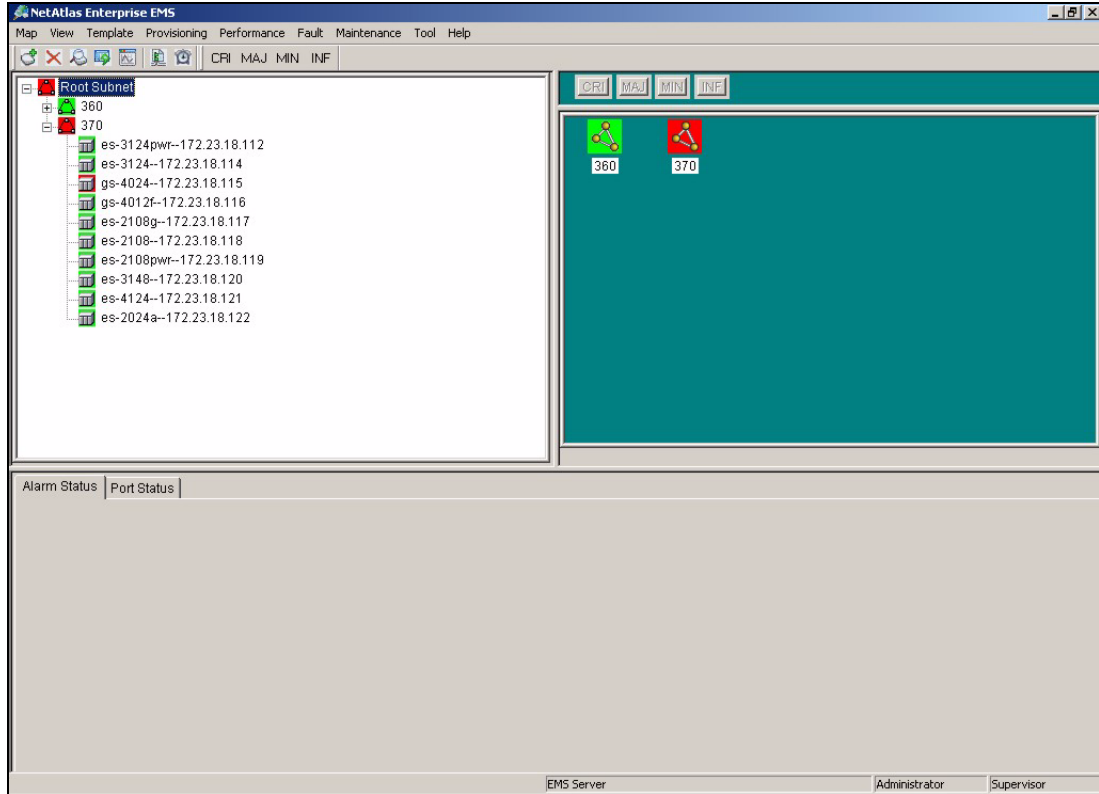
LABEL	DESCRIPTION
Client Sends SNMP Operation via Server	Select this option to set the EMS remote client computer(s) to send SNMP messages to managed ZyXEL devices through the EMS server. Select this option if the remote client computer(s) is not in the same subnet as the managed devices.
Client Sends SNMP Operation itself	Select this option to allow the EMS remote client computer(s) to send SNMP messages directly to managed ZyXEL devices. Select this option if the remote client computer(s) is in the same subnet as the managed devices.
OK	Click OK to save changes to the EMS.
Cancel	Click Cancel to discard the change and close the screen.

2.5 Accessing the Switch Manager Screen

To display the EMS main screen, click on the device icon in the main 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 12 Switch Manager: Main Screen



PART II

Switch Manager

- [Switch Manager \(43\)](#)
- [Map \(53\)](#)
- [View \(57\)](#)
- [Template \(77\)](#)
- [Provisioning \(85\)](#)
- [Performance \(89\)](#)
- [Fault \(101\)](#)
- [Maintenance \(107\)](#)
- [Tools \(119\)](#)

Switch Manager

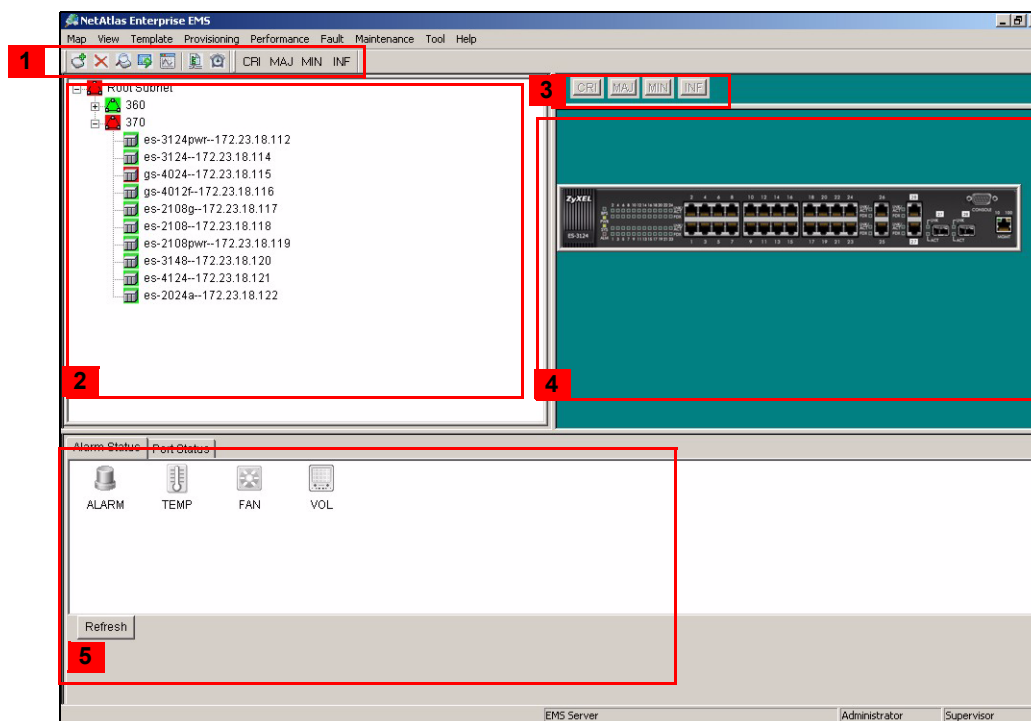
This chapter describes the Switch Manager screens and shows you some basic features.

3.1 Switch Manager Overview

To display the **Switch Manager** screen, double-click the **Switch Manager** icon in the main **NetAtlas Enterprise EMS** screen.

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

Figure 13 EMS Main Screen Overview



The following table describes the elements in the EMS screen.

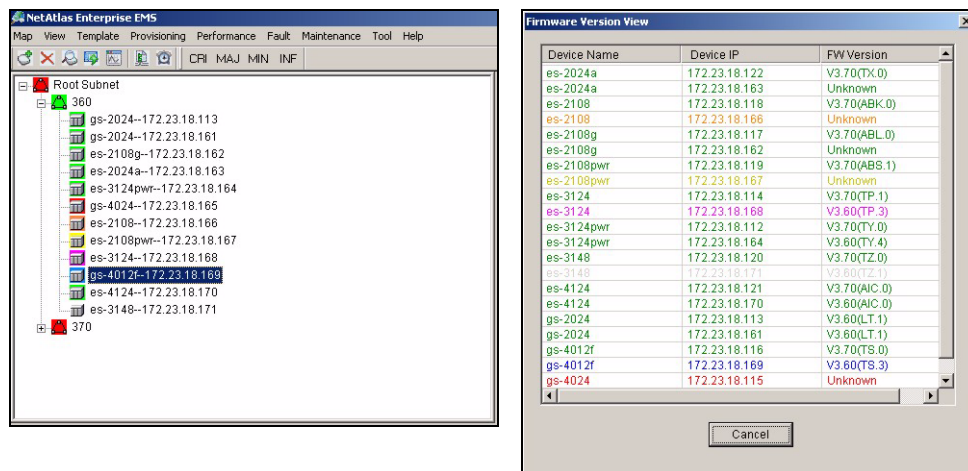
Table 8 EMS Main Screen Overview

	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. The CRI , MAJ , MIN and INF buttons are colored if a related event log has not been acknowledged yet. The event status is updated every 30 seconds.
2	Device List Panel	View devices in a tree structure. The colors of the device icons indicate the status of the devices. Refer to the document that comes with SNMPc for more information. Click on a device to retrieve updated information from the device. Double-click on a device to update device information to the EMS database.
3	Alarm Severity Icons	These icons indicate the presence of any alarm/event logs. Click on an active icon to view the Event Log 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 ^A and port status of the selected switch.

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

3.2 Device List and Icon Colors









In the Device List and Device panels, the colors of the device indicate the status of the represented devices stored in the database. The colors and the event status correspond to the settings in SNMPc. To update the device status, double-click on a device icon.

Figure 14 Device List and Icon Colors: Example

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 9 System Message Panel Alarm Status

PANEL ALARMS	ALARM OFF		ALARM ON	
ALARM	When this icon is grayed 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 grayed out, the device fans are functioning properly.		One or more of the device fans has a problem.	
TEMP	When this icon is grayed 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 grayed 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 57](#) for hardware troubleshooting.

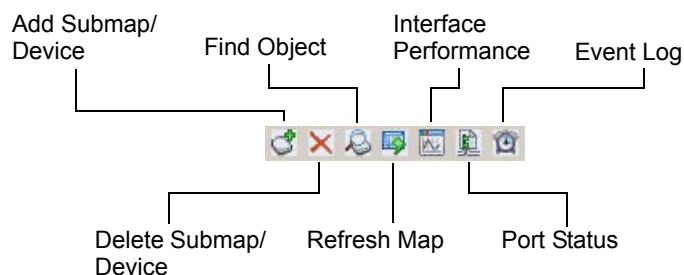
3.4 System Message Panel Port Status

Proceed to [Section 5.4 on page 62](#) for information on the details displayed in this screen.

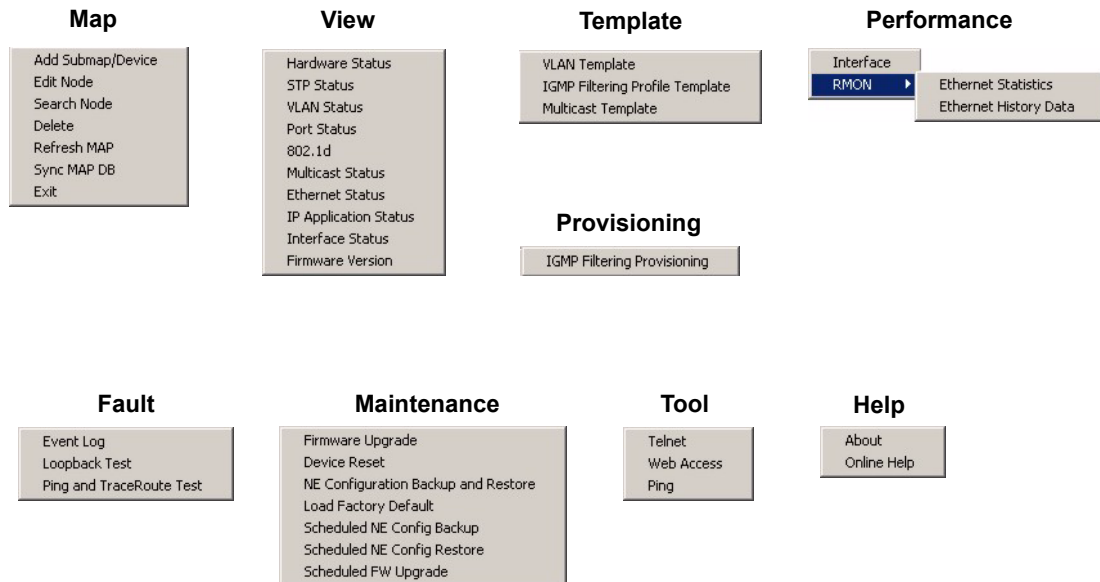
3.5 Menu Shortcut Buttons

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

Figure 15 EMS Main Screen Shortcut Bar



3.6 EMS Main Menu Summary



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



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

Table 10 EMS Navigation Panel Sub-link Descriptions

LABEL	DESCRIPTION
MAP	
Add Submap/Device	Select this to add a device or a submap folder to the EMS Device List Panel.
Edit Node	Select this to edit device or sub-map folder properties.
Search Node	Select this to search for a device or a submap folder.
Delete	Select this to delete a submap folder or devices within a folder.
Refresh Map	Select this to update the device status in the EMS device map.
Sync MAP DB	Select this to synchronize the submaps and switches in the EMS with the folders and switches in SNMPc Network Manager.
Exit	Select this to close the Switch Manager screen.
View	
Hardware Status	Select this to view the hardware status of a device.
STP Status	Select this to view the Spanning Tree Protocol (STP) status of a device.
VLAN Status	Select this to view the VLAN status of a device.
Port Status	Select this to view the port status of a device.

Table 10 EMS Navigation Panel Sub-link Descriptions (continued)

LABEL	DESCRIPTION
802.1d	Select this to 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	Select this to view the multicast traffic status of a device.
Ethernet Status	Select this view Ethernet port statistics.
IP Application Status	Select this to view IP routing domain status.
Interface Status	Select this to view IP routing interface status.
Firmware Version	Select this to view the firmware versions of the managed devices.
Template	
VLAN Template	Select this to configure a VLAN template for upload to multiple devices.
IGMP Filtering Profile Template	Select this to configure an IGMP filter template for upload to multiple devices.
Multicast Template	Select this to configure a multicast template for upload to multiple devices.
Provisioning	
IGMP Filtering Provisioning	Select this to apply IGMP filtering templates.
Performance	
Interface	Select this to configure interface performance graphs and tables.
RMON	Select this to view RMON Ethernet and history statistics.
Fault	
Event Log	Select this to configure an alarm filter.
Loopback Test	Select this to perform a loopback test.
Ping and Traceroute	Select this to test connections using a ping or traceroute test.
Maintenance	
Firmware Upgrade	Select this to perform a device firmware upgrade.
Device Reset	Select this to reboot a device.
NE Configuration Backup and Restore	Select this to back up or restore device configuration.
Load Factory Default	Select this to reset a device back to the factory default settings.
Scheduled NE Config Backup	Select this when you want to configure a schedule to back up a switch configuration file.
Scheduled NE Config Restore	Select this when you want to configure a schedule to restore a switch configuration file.
Scheduled FW Upgrade	Select this when you want to configure a schedule to perform firmware upgrade on a switch.
Tool	
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.

Table 10 EMS Navigation Panel Sub-link Descriptions (continued)

LABEL	DESCRIPTION
Ping	This link takes you to a screen where you can ping a device directly through the EMS.
Help	
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 11 Common EMS Command Buttons

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

3.8 View the Switch

To display the selected switch, double-click the appropriate switch graphic 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.

The following figure shows an example.

Figure 16 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 17 Configuration: System Configuration: System Info.

The screenshot shows a window titled "System Configuration (es-3124pwr : 172.23.18.112)". On the left is a table with two columns: "Device Name" and "Device IP". The first two rows are highlighted in blue. The first row contains "es-3124pwr" and "172.23.18.112". The second row contains "es-3124pwr" and "172.23.18.164". To the right of the table is a "Copy to .." button. Below the table is a "Close" button. On the right side of the window, there are several tabs: "System Info.", "SNMP Conf.", "Remote Mgmt.", "Time Setup", "Syslog Setup", "RADIUS", "Boot Conf.", and "IP Setup". The "System Info." tab is active. It contains the following fields and values:

- Name : ES-3124PWR
- Contact : [Empty field]
- Location : [Empty field]
- Ethernet Address : 00:13:49:00:01:02
- OS FW Version : V3.70(TY.0) | 8/2/2006
- HW Version : V1.0
- Serial No : 1234

At the bottom of the form area is an "Apply" button.

The following table describes the labels in this screen.

Table 12 Configuration: Switch Configuration: System Info.

LABEL	DESCRIPTION
Device Name	This field displays the descriptive name of a device.
Device IP	This field displays the IP address of a device
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.
Ethernet Address	This field displays the switch Ethernet MAC address in six hexadecimal character pair format.
OS FW Version	This field displays the firmware version of the selected switch.
HW Version	This field displays the hardware version of the selected switch.
Serial No.	This field displays the unique device serial number.
Apply	Click Apply to save the changes back to the switch.
Close	Click Close to close the screen.

3.10 Configuration Save

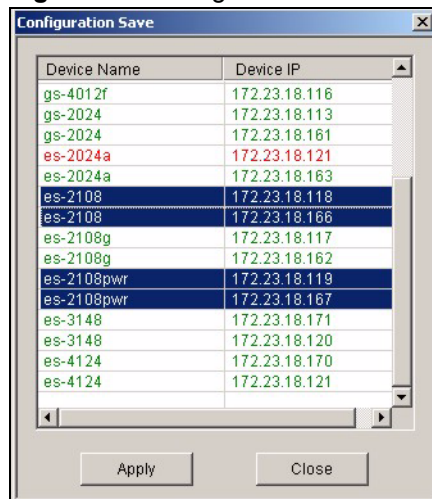
You must save the current configuration in the EMS to the selected switch(es) to make the changes take effect.



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.

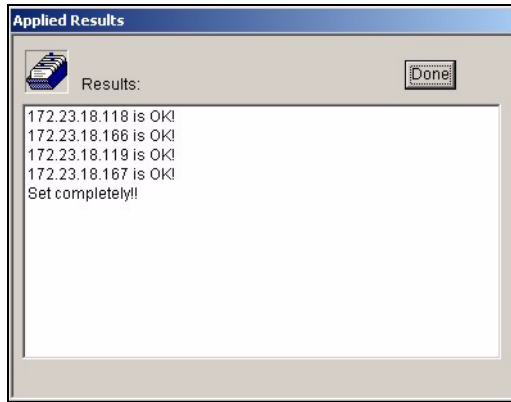
- 1 To save the current switch configuration, select and right-click on the switch icon in the Device List Panel.
- 2 Click **Configuration Save**.
- 3 Choose a switch from the list in the screen. You can select more than one switch by pressing [CTRL] and click at the same time. Note that switches that are online are displayed in green. Off line switches are displayed in red.

Figure 18 Configuration Save



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

Figure 19 Configuration Save: Result



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

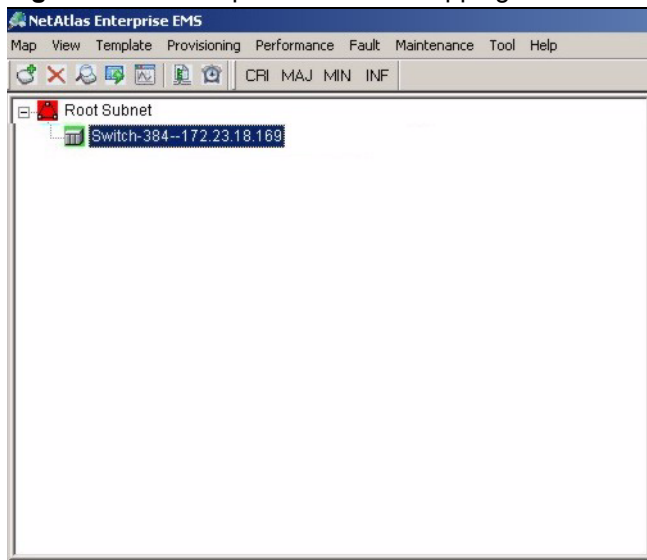
4.1 Root Subnet and Device Mapping

The EMS mapping displays logical hierarchy for the ZyXEL switch(es) in the EMS. When started, the EMS automatically synchronizes device map information with SNMPc and creates the Root Subnet and the icons for your ZyXEL switch(es) in the Device List Panel.

You can add device or submaps in EMS or SNMPc.

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

Figure 20 Submaps and Device Mapping



You cannot create, edit or delete the Root Subnet.

4.1.1 Adding a Submap or Device

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

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

Figure 21 Map: Add Submap/Device

The following table describes the labels in this screen.

Table 13 Map: Add Submap/Device

LABEL	DESCRIPTION
Properties	These options are not applicable when you edit the properties of an existing submap or device. Select the Submap or Device radio button to add a new submap or device icon to the Device List Panel. If you select Submap , only the Name and Description fields display are applicable; all other fields appear as read-only.
Name	Enter a descriptive name (up to 30 characters) for identification purposes.
IP Address	This field is not applicable when you select Submap . Enter the IP address of the device.
Login Name	Enter the administrator account user name to log into the switch.
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.

Table 13 Map: Add Submap/Device (continued)

LABEL	DESCRIPTION
OK	Click OK to save the changes and close the screen.
Cancel	Click Cancel to discard the changes and close the screen.

4.1.2 Editing a Node

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

Figure 22 Map: Edit Node

Refer to [Table 13 on page 54](#) for the field descriptions.

4.1.3 Finding an Object

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

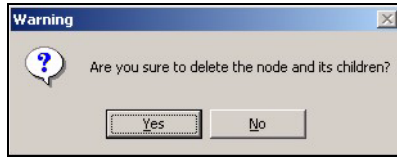
Figure 23 Map: Find Object

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 24 Map: Delete Warning



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**.

4.1.6 Updating Device Map

Click **Map > Refresh Map** to update information in the device panel from the EMS database.

4.1.7 Synchronizing Device Map Database

Click **Map > Synch MAP DB** to synchronize the device map information in EMS with the device map information in SNMPc database.

4.2 Exit

Click **Map > Exit** to close the Switch Manager screen.

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.



It may take a few seconds to update the screen.

Figure 25 View: Hardware Status

The screenshot shows the 'Hardware Status' window for device 'es-3124pwr:172.23.18.112'. It features a table of device names and IP addresses on the left, and three monitoring sections on the right: Fan RPM, Voltage, and Temperature. The Temperature section has radio buttons for Celsius (selected) and Fahrenheit. A 'Polling' field is set to 60 seconds, and there are 'Apply' and 'Close' buttons.

Device Name	Device IP
es-3124	172.23.18.114
es-3124	172.23.18.168
es-3124pwr	172.23.18.112
es-3124pwr	172.23.18.164
es-3148	172.23.18.120
es-3148	172.23.18.171
es-4124	172.23.18.121
es-4124	172.23.18.170
gs-2024	172.23.18.113
gs-2024	172.23.18.161
gs-4012f	172.23.18.116
gs-4012f	172.23.18.169
gs-4024	172.23.18.115
gs-4024	172.23.18.165

Fan RPM (RPM)						
Index	Current	Max	Min	Threshold	Status	
FAN1	5810	5859	4625	2750	NORMAL	
FAN2	5763	5787	5693	2750	NORMAL	
FAN3	5859	5958	5810	2750	NORMAL	
FAN4	6009	6009	5859	3250	NORMAL	
FAN5	6510	6571	6392	3250	NORMAL	
FAN6	6114	6167	6061	3250	NORMAL	

Voltage (V)						
Index	Current	Max	Min	Threshold	Status	
VCOR...	2.5	2.5	2.5	2.2	Normal	
VINRO	1.2	1.2	1.2	1.0	Normal	
3.3	3.3	3.3	3.3	3.0	Normal	
12	12.0	12.0	12.0	10.6	Normal	
1.3	1.3	1.3	1.3	1.1	Normal	
1.25	1.2	1.2	1.2	1.1	Normal	

Temperature						
Index	Current	Max	Min	Threshold	Status	
MAC	35	35	32	85	NORMAL	
CPU	37	38	34	85	NORMAL	
PHY1	33	33	29	85	NORMAL	
PHY2	33	33	30	85	NORMAL	
PHY3	32	32	28	85	NORMAL	

The following table describes the labels in this screen.

Table 14 Status: Hardware Status

LABEL	DESCRIPTION
Device Name	This field displays the descriptive name of a device.
Device IP	This field displays the IP address of a device
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	NORMAL indicates that this fan is functioning above the minimum speed. ERROR 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	NORMAL indicates that the voltage is within an acceptable operating range at this point; otherwise ERROR is displayed. ABSENT 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	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 NORMAL for temperatures below the threshold and ERROR 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 Apply button.
Close	Click Close 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.



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 15 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 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 16 STP Port States

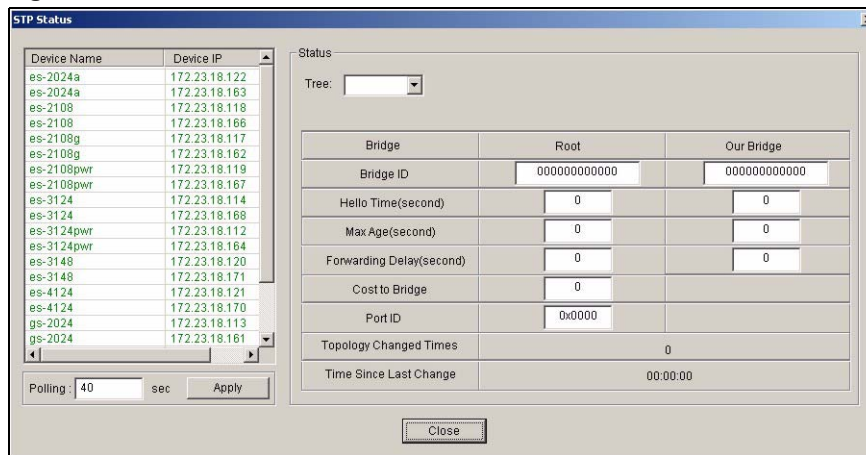
PORT STATE	DESCRIPTION
Disabled	STP is disabled (default).
Blocking	Only configuration and management BPDUs are received and processed.
Listening	All BPDUs are received and processed.

Table 16 STP Port States

PORT STATE	DESCRIPTION
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.

5.2.3 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 26 View: STP Status

The following table describes the labels in this screen.

Table 17 View: STP Status

LABEL	DESCRIPTION
Device Name	This field displays the descriptive name of a device.
Device IP	This field displays the IP address of a device
Tree	Select the index number of the spanning tree whose status you want to display.
Bridge	Root 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.

Table 17 View: STP Status (continued)

LABEL	DESCRIPTION
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 Apply button.
Close	Click Close to close the screen.

5.3 VLAN Status

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



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 27 View: VLAN Status

The screenshot shows the 'VLAN Status (es-3124pwr:172.23.18.112 : VLAN ID=1)' window. It features a list of devices on the left, a table of VLANs in the center, and a port list at the bottom.

Device Name	Device IP	VLAN ID	Name	Elapsed Time	Status
es-2024a	172.23.18.122	1		6 days, 17h 28m 00s.00th	Active
es-2024a	172.23.18.163	100	100	6 days, 17h 28m 01s.00th	Active
es-2108	172.23.18.118	111	None	6 days, 17h 28m 01s.00th	Other
es-2108	172.23.18.166				
es-2108g	172.23.18.117				
es-2108g	172.23.18.162				
es-2108pwr	172.23.18.119				
es-2108pwr	172.23.18.167				
es-3124	172.23.18.114				
es-3124	172.23.18.168				
es-3124pwr	172.23.18.112				
es-3124pwr	172.23.18.164				

Below the table, there are controls for 'Polling' (set to 60 sec), 'Apply', 'Previous Page', 'Next Page', 'Current Pages' (1), 'VLANs / Page' (10), and 'ShowPages'. At the bottom, there is a 'Port List' table with 25 columns, each containing a 'U'.

The following table describes the labels in this screen.

Table 18 View: VLAN Status

LABEL	DESCRIPTION
Device Name	This field displays the descriptive name of a device.
Device IP	This field displays the IP address of a device
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 Static if the VLAN is active and will remain so after the next reset of the device. This field displays GVRP if the VLAN is active and will remain so until removed by GVRP. This field is Other if the VLAN is active, but is not permanent or created by GVRP.
Previous Page	Click Previous Page to display the previous VLAN ID screen.
Next Page	Click Next Page to display the next VLAN ID screen.
Current Page	This field displays the current page number. Enter a number and click Show Page to display that page.
VLANs/Page	This field displays the number of VLAN entries to display in one page. Enter a number (1-99) and click Show Page to display that number of VLAN entries in a page.
Port List	This table displays port VLAN settings. A tagged port is marked T , an untagged port is marked U and a port not participating in a VLAN is marked - .
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 Apply button.
Close	Click Close 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 28 View: Port Status

Device Name	Device IP	Port	LinkSpeed	State	LACP	PD	TxPkts	RxPkts
es-2024a	172.23.18.12	1	0 Mbps	STOP	Disabled	Off	0	0
es-2024a	172.23.18.16	2	0 Mbps	STOP	Disabled	Off	0	0
es-2108	172.23.18.11	3	0 Mbps	STOP	Disabled	Off	0	0
es-2108	172.23.18.16	4	0 Mbps	STOP	Disabled	Off	0	0
es-2108g	172.23.18.11	5	0 Mbps	STOP	Disabled	Off	0	0
es-2108g	172.23.18.16	6	0 Mbps	STOP	Disabled	Off	0	0
es-2108pwr	172.23.18.11	7	0 Mbps	STOP	Disabled	Off	0	0
es-2108pwr	172.23.18.16	8	0 Mbps	STOP	Disabled	Off	0	0
es-3124	172.23.18.11	9	0 Mbps	STOP	Disabled	Off	0	0
es-3124	172.23.18.16	10	0 Mbps	STOP	Disabled	Off	0	0
es-3124pwr	172.23.18.11	11	0 Mbps	STOP	Disabled	Off	0	0
es-3124pwr	172.23.18.16	12	0 Mbps	STOP	Disabled	Off	0	0
es-3148	172.23.18.12	13	0 Mbps	STOP	Disabled	Off	0	0
es-3148	172.23.18.17	14	0 Mbps	STOP	Disabled	Off	0	0
es-4124	172.23.18.12	15	0 Mbps	STOP	Disabled	Off	0	0
es-4124	172.23.18.17	16	0 Mbps	STOP	Disabled	Off	0	0
gs-2024	172.23.18.11	17	0 Mbps	STOP	Disabled	Off	0	0
gs-2024	172.23.18.16	18	0 Mbps	STOP	Disabled	Off	0	0
gs-4012f	172.23.18.11	19	0 Mbps	STOP	Disabled	Off	0	0
gs-4012f	172.23.18.16	20	0 Mbps	STOP	Disabled	Off	0	0
gs-4024	172.23.18.11	21	0 Mbps	STOP	Disabled	Off	0	0
		22	0 Mbps	STOP	Disabled	Off	0	0
		23	0 Mbps	STOP	Disabled	Off	0	0

The following table describes the labels in this screen.

Table 19 View: Port Status

LABEL	DESCRIPTION
Device Name	This field displays the descriptive name of a device.
Device IP	This field displays the IP address of a device
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 N/A is displayed, the switch does not include a PD module. This field displays On if the switch has a PD and it is in use. This field displays Off 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 Apply button.
Close	Click Close to close the screen.

5.5 802.1D

Use the **802.1D** 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 29 View: 802.1d: MAC Table

The screenshot shows a web interface window titled "802.1d Status (es-3124pwr:172.23.18.112)". On the left, there is a list of devices with columns for "Device Name" and "Device IP". The device "es-3124pwr" with IP "172.23.18.112" is selected. The main area has two tabs: "MAC Table" (active) and "ARP Table". Below the tabs is a "Sort by" section with radio buttons for "MAC", "VID", and "Port". The "MAC" radio button is selected. Below this is a table with 10 rows and 6 columns: Index, MAC Address, VID, Port, and Type. The table contains 10 entries, all with "Dynamic" type. At the bottom, there are controls for "Polling" (set to 40 sec), "MAC Amount" (set to 55), "Current Pages" (set to 1), and "MACs / Page" (set to 10). There are also "Previous Page", "Next Page", and "Close" buttons.

Index	MAC Address	VID	Port	Type
1	00:00:ab:10:12:53	1	28	Dynamic
2	00:00:e2:6e:4b:ea	1	28	Dynamic
3	00:00:e2:82:c3:2c	1	28	Dynamic
4	00:03:baf2:f3:40	1	28	Dynamic
5	00:04:80:9b:78:00	1	28	Dynamic
6	00:05:1c:15:0a:8b	1	28	Dynamic
7	00:05:1c:a0:35:b1	1	28	Dynamic
8	00:05:1c:a0:84:bb	1	28	Dynamic
9	00:05:5d:04:29:59	1	28	Dynamic
10	00:08:a1:0d:f5:0e	1	28	Dynamic

The following table describes the labels in this screen.

Table 20 View: 802.1d: MAC Table

LABEL	DESCRIPTION
Device Name	This field displays the descriptive name of a device.
Device IP	This field displays the IP address of a device
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.
VID	This is the VLAN group to which this MAC address belongs.

Table 20 View: 802.1d: MAC Table (continued)

LABEL	DESCRIPTION
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 Static MAC Forwarding screen).
MAC Amount	This field displays the number of MAC address entries in the MAC table.
Previous Page	Click Previous Page to display the previous screen.
Next Page	Click Next Page to display the next screen.
Current Page	This field displays the current page number. Enter a number and click Show Page to display that page.
MACs/Page	This field displays the number of MAC address entries to display in one page. Enter a number (1-99) and click Show Page to display that number of MAC address entries in a page.
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 Apply button.
Close	Click Close to close the screen.

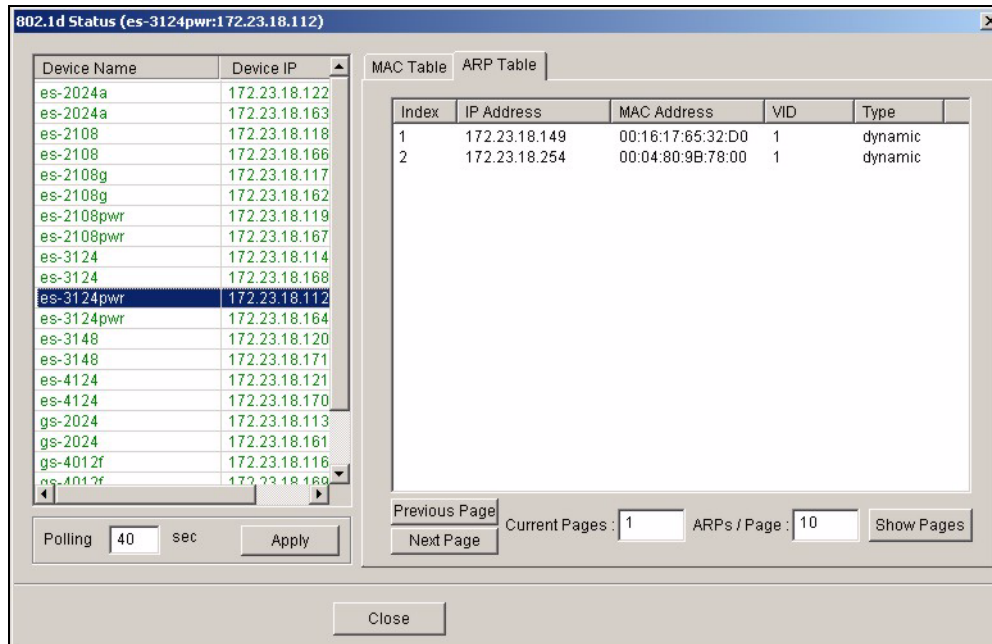
5.5.2 ARP Table

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 30 View: 802.1d: ARP Table



The following table describes the labels in this screen.

Table 21 View: 802.1d: ARP Table

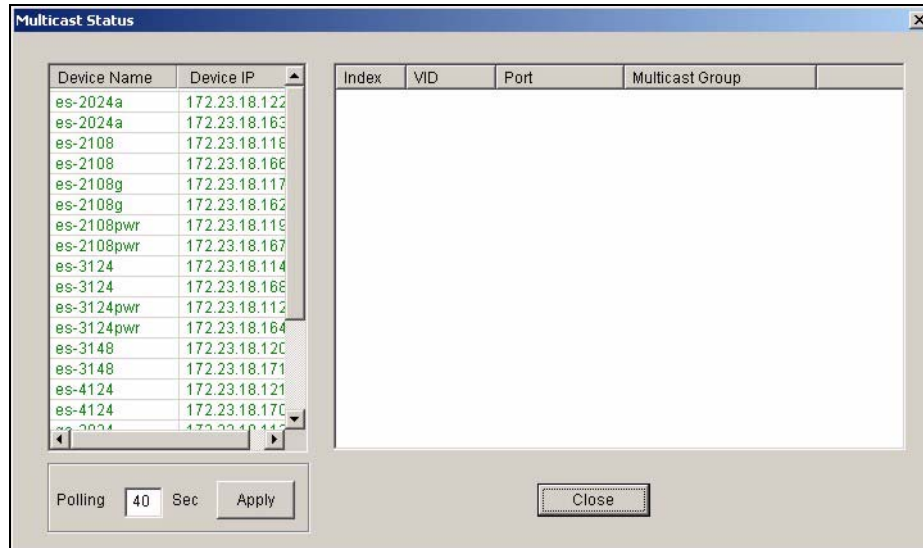
LABEL	DESCRIPTION
Device Name	This field displays the descriptive name of a device.
Device IP	This field displays the IP address of a device
Index	This is the ARP table entry number.
IP Address	This is the learned IP address of a device connected to a switch port with corresponding MAC address below.
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 Static MAC Forwarding screen).
Previous Page	Click Previous Page to display the previous screen.
Next Page	Click Next Page to display the next screen.
Current Page	This field displays the current page number. Enter a number and click Show Page to display that page.
ARPs/Page	This field displays the number of ARP entries to display in one page. Enter a number (1-99) and click Show Page to display that number of ARP entries in a page.
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 Apply button.
Close	Click Close 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 31 View: Multicast Status



The following table describes the labels in this screen.

Table 22 View: Multicast Status

LABEL	DESCRIPTION
Device Name	This field displays the descriptive name of a device.
Device IP	This field displays the IP address of a device
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 Apply button.
Close	Click Close to close the screen.

5.7 Ethernet Port Status

You can view Ethernet port statistics in the **Ethernet Status** screen.

Click **View > Ethernet Status** and select a device to display the information.

Figure 32 View: Ethernet Status

The screenshot shows a window titled "Ethernet Status (es-3124pwr:172.23.18.112)". It contains a table with the following columns: Device Name, Device IP, Index, Alignment Errors, FCS Errors, and Single Collision Fram... (truncated). The table lists 21 devices with their respective IP addresses and error counts. At the bottom, there is a "Polling" field set to "60" seconds, an "Apply" button, and a "Close" button.

Device Name	Device IP	Index	Alignment Errors	FCS Errors	Single Collision Fram...
es-2024a	172.23.18.122	1	0	0	0
es-2024a	172.23.18.163	2	0	0	0
es-2108	172.23.18.118	3	0	0	0
es-2108	172.23.18.166	4	0	0	0
es-2108g	172.23.18.117	5	0	0	0
es-2108g	172.23.18.162	6	0	0	0
es-2108pwr	172.23.18.119	7	0	0	0
es-2108pwr	172.23.18.167	8	0	0	0
es-3124	172.23.18.114	9	0	0	0
es-3124	172.23.18.168	10	0	0	0
es-3124pwr	172.23.18.112	11	0	0	0
es-3124pwr	172.23.18.164	12	0	0	0
es-3148	172.23.18.120	13	0	0	0
es-3148	172.23.18.171	14	0	0	0
es-4124	172.23.18.121	15	0	0	0
es-4124	172.23.18.170	16	0	0	0
gs-2024	172.23.18.113	17	0	0	0
gs-2024	172.23.18.161	18	0	0	0
gs-4012f	172.23.18.116	19	0	0	0
gs-4012f	172.23.18.169	20	0	0	0

The following table describes the labels in this screen.

Table 23 View: Ethernet Status

LABEL	DESCRIPTION
Device Name	This field displays the descriptive name of a device.
Device IP	This field displays the IP address of a device
Index	This field displays the index number.
Alignment Errors	This field displays the number of frames received with alignment errors.
FCS Errors	This field displays the number of frames received with Frame Check Sequence (FCS) errors.
Single Collision Frames	This field displays the number of frames with 1 collision detected.
Multiple Collision Frames	This field displays the number of frames with 2 to 15 collisions detected.
SQE Test Errors	This field displays the number of frames with Signal Quality Error (SQC) errors.
Deferred Transmissions	This field displays the number of frames that were delayed due to deferred transmission.
Late Collisions	A late collision is counted when a device detects a collision after it has sent the 512th bit of its frame. This field displays the number of times such a collision is detected.
Excessive Collisions	This field displays the number of packets with in excess of 15 collisions detected.
Mac Transmission Errors	This field displays the number of packets with internet MAC sublayer transmission error.
Carrier Sense Errors	This field displays the number of times a carrier sense error occurred.
Frame Too Longs	This field displays the number of frames dropped because they were bigger than the maximum frame size.
Mac Receive Errors	This field displays the number of frames received with MAC address errors.

Table 23 View: Ethernet Status (continued)

LABEL	DESCRIPTION
Ether Chip Set	This field identifies the Ethernet chipset used for the interface.
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 Apply button.
Close	Click Close to close the screen.

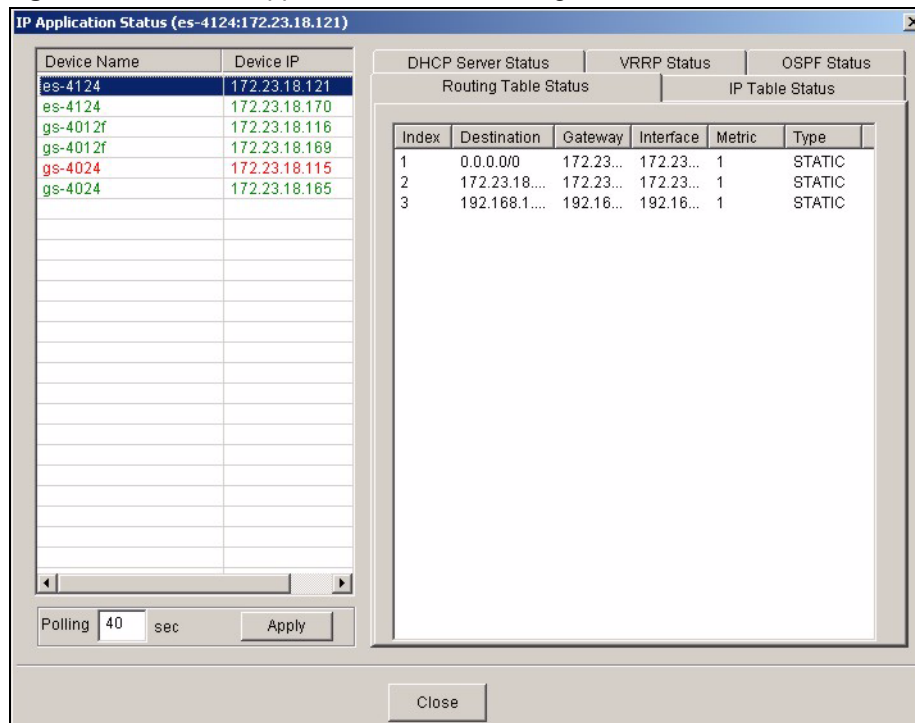
5.8 IP Application Status

Use the **IP Application Status** screens to view the routing table, IP table, DHCP server, VRRP and OSPF status on layer3 switches (the GS or ES 4000 series).

5.8.1 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 33 View: IP Application Status: Routing Table Status

The following table describes the labels in this screen.

Table 24 View: IP Application Status: Routing Table Status

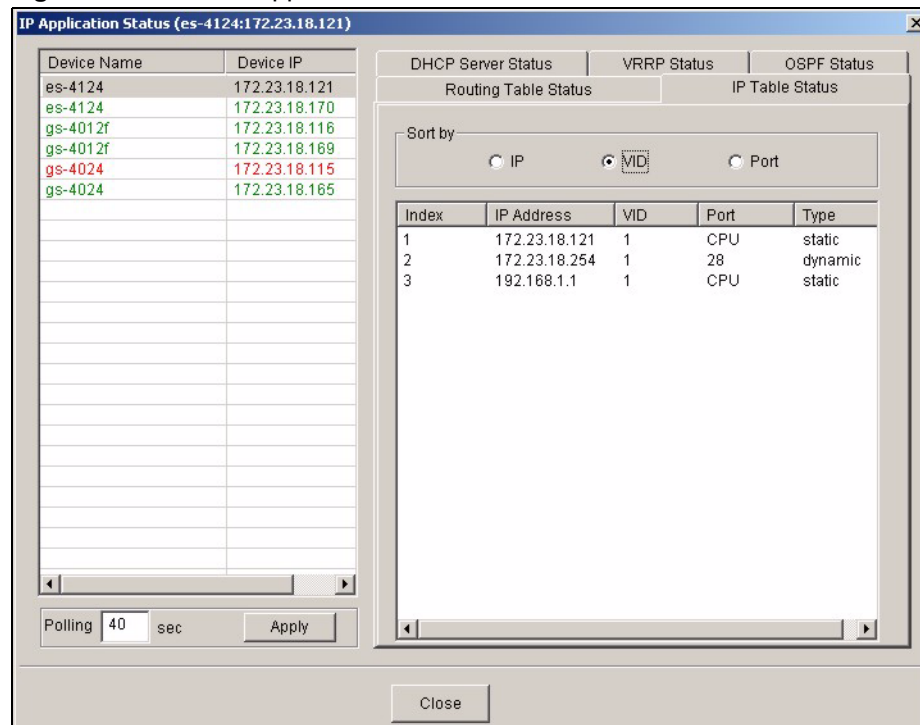
LABEL	DESCRIPTION
Device Name	This field displays the descriptive name of a device.
Device IP	This field displays the IP address of a device
Index	This field displays the index number.
Destination	This field displays the destination IP routing domain.
Gateway	This field displays the IP address of the 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 Apply button.
Close	Click Close to close the screen.

5.8.2 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 34 View: IP Application Status: IP Table Status



The following table describes the labels in this screen.

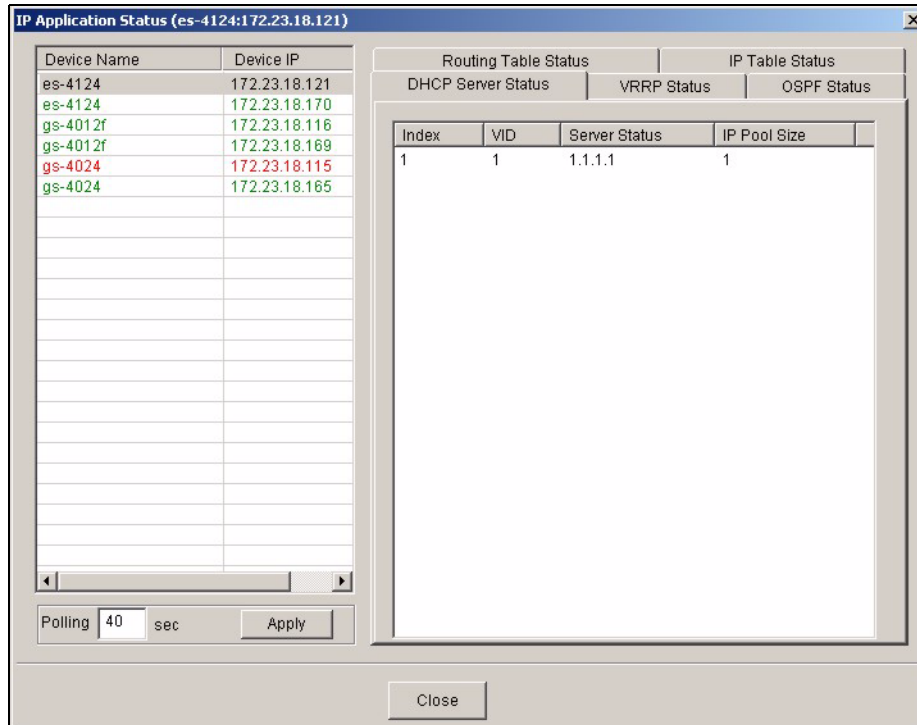
Table 25 View: IP Application Status: IP Table Status

LABEL	DESCRIPTION
Device Name	This field displays the descriptive name of a device.
Device IP	This field displays the IP address of a device
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 CPU to indicate the IP address belongs to the switch.
Type	This shows whether the IP address is dynamic (learned by the switch) or static (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 Apply button.
Close	Click Close to close the screen.

5.8.3 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 35 View: IP Application Status: DHCP Server Status

The following table describes the labels in this screen.

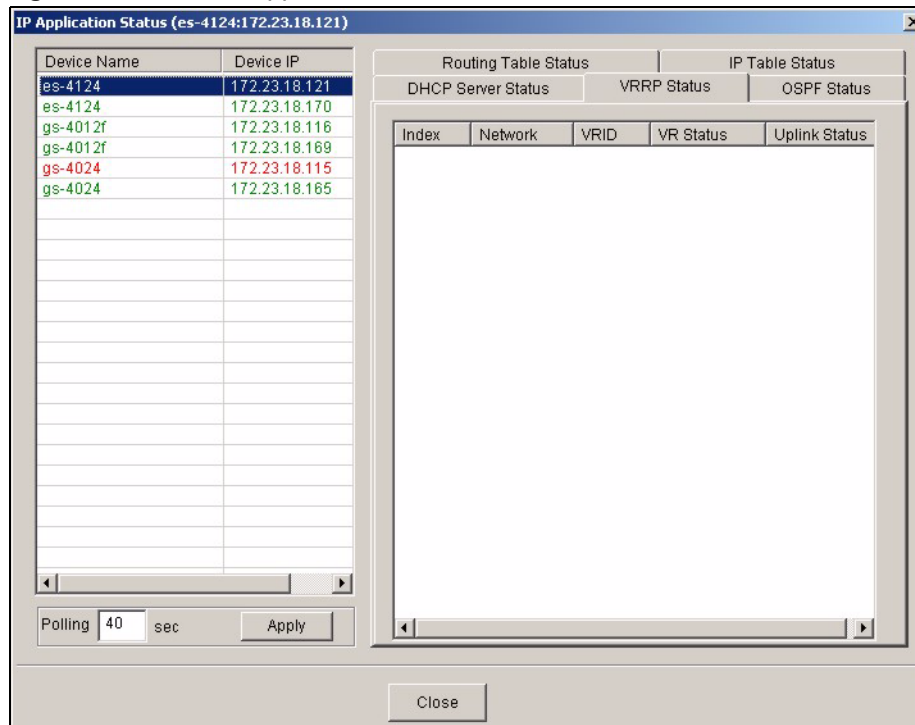
Table 26 View: IP Application Status: DHCP Server Status

LABEL	DESCRIPTION
Device Name	This field displays the descriptive name of a device.
Device IP	This field displays the IP address of a device
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 Apply .
Close	Click Close to close this screen.

5.8.4 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 36 View: IP Application Status: VRRP Status

The following table describes the labels in this screen.

Table 27 View: IP Application Status: VRRP Status

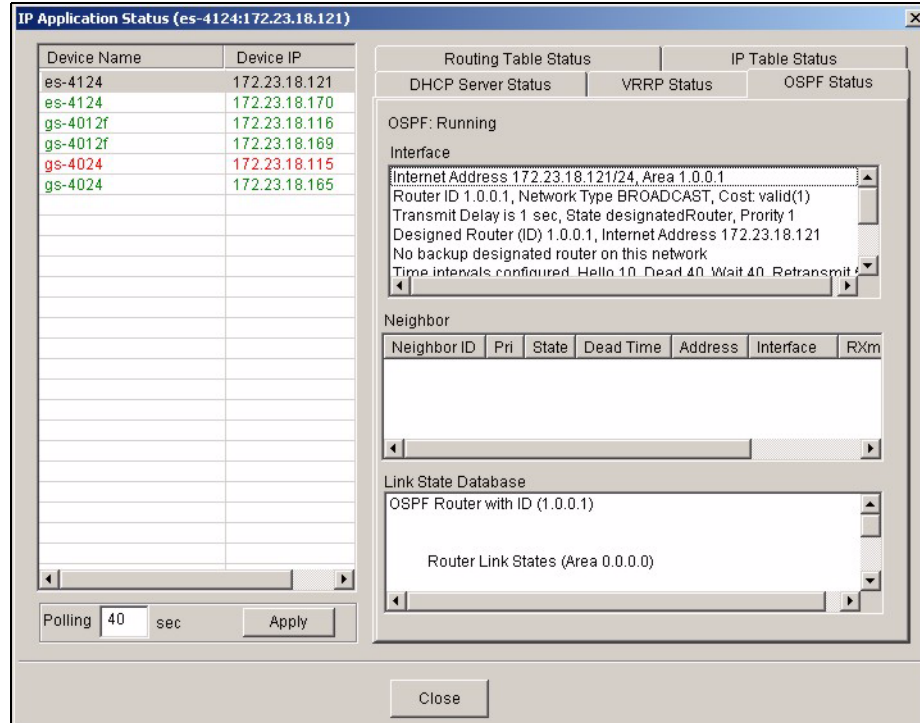
LABEL	DESCRIPTION
Device Name	This field displays the descriptive name of a device.
Device IP	This field displays the IP address of a device
Index	This field displays the index number of a rule.
Network	This field displays the IP address and the subnet mask bits of an IP routing domain that is associated 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 Master indicating that this switch functions as the master router. This field is Backup indicating that this switch functions as a backup router. This field displays Init when this switch is initiating the VRRP protocol or when the Uplink Status field displays Dead .
Uplink Status	This field displays the status of the link between this switch and the uplink gateway. This field is Alive indicating that the link between this switch and the uplink gateway is up. Otherwise, this field is Dead . This field displays Probe 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 Apply .
Close	Click Close to close this screen.

5.8.5 OSPF Status

Follow the steps below to view the OSPF 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 **OSPF Status** tab.

Figure 37 View: IP Application Status: OSPF Status



The following table describes the labels in this screen.

Table 28 View: IP Application Status: OSPF Status

LABEL	DESCRIPTION
Device Name	This field displays the descriptive name of a device.
Device IP	This field displays the IP address of a device
OSPF	This field displays whether the OSPF feature is active or not.
Interface	This field displays the OSPF interface status on the switch.
Neighbor	
Neighbor ID	This field displays the router ID of the neighbor.
Pri	This field displays the priority of the neighbor. This number is used in the designated router election.
State	This field displays the state of the neighbor (backup or DR (designated router)).
Dead Time	This field displays the dead time in seconds.
Address	This field displays the IP address of a neighbor.
Interface	This field displays the MAC address of a device.
RXmtL	This field displays the count of LS (Link State) retransmits.
RqstL	This field displays the count of LS (Link State) requests.
DBsmL	This field displays the count of DB (Database) summary.

Table 28 View: IP Application Status: OSPF Status (continued)

LABEL	DESCRIPTION
Link State Database	This field displays the link state database information such as the number of links.
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 Apply .
Close	Click Close to close this screen.

5.9 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 38 View: Interface Status

Device Name	Device IP	Index	IP Address	IP Subnet Mask	VID
es-4124	172.23.18.121	1	172.23.18.170	255.255.255.0	1
es-4124	172.23.18.170	2	192.168.1.1	255.255.255.0	1
gs-4012f	172.23.18.116				
gs-4012f	172.23.18.189				
gs-4024	172.23.18.115				
gs-4024	172.23.18.165				

The following table describes the labels in this screen.

Table 29 View: Interface Status

LABEL	DESCRIPTION
Device Name	This field displays the descriptive name of a device.
Device IP	This field displays the IP address of a device
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.

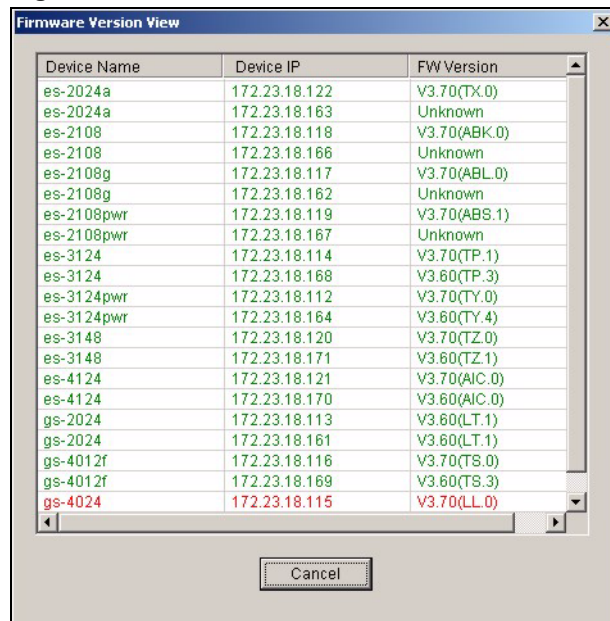
Table 29 View: Interface Status (continued)

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 Apply .
Close	Click Close to close this screen.

5.10 Firmware Version

You can view the firmware version of all managed devices in the Firmware Version screen. You can also view firmware version for a single device in the System Info screen (see [Figure 17 on page 49](#)).

Click **View > Firmware Version** to display the screen.

Figure 39 View: Firmware Version


Device Name	Device IP	FW Version
es-2024a	172.23.18.122	V3.70(TX.0)
es-2024a	172.23.18.163	Unknown
es-2108	172.23.18.118	V3.70(ABK.0)
es-2108	172.23.18.166	Unknown
es-2108g	172.23.18.117	V3.70(ABL.0)
es-2108g	172.23.18.162	Unknown
es-2108pwr	172.23.18.119	V3.70(ABS.1)
es-2108pwr	172.23.18.167	Unknown
es-3124	172.23.18.114	V3.70(TP.1)
es-3124	172.23.18.168	V3.60(TP.3)
es-3124pwr	172.23.18.112	V3.70(TY.0)
es-3124pwr	172.23.18.164	V3.60(TY.4)
es-3148	172.23.18.120	V3.70(TZ.0)
es-3148	172.23.18.171	V3.60(TZ.1)
es-4124	172.23.18.121	V3.70(AIC.0)
es-4124	172.23.18.170	V3.60(AIC.0)
gs-2024	172.23.18.113	V3.60(LT.1)
gs-2024	172.23.18.161	V3.60(LT.1)
gs-4012f	172.23.18.116	V3.70(TS.0)
gs-4012f	172.23.18.169	V3.60(TS.3)
gs-4024	172.23.18.115	V3.70(LL.0)

The following table describes the labels in this screen.

Table 30 View: Firmware Version

LABEL	DESCRIPTION
Device Name	This field displays the descriptive name of a device.
Device IP	This field displays the IP address of a device
Firmware Version	This field displays the version number of the firmware the device is currently using.
Cancel	Click Cancel to close this screen.

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 157](#) 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 40 Template: VLAN Template

The following table describes the labels in this screen.

Table 31 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 New to create a new VLAN. You must enter a VLAN ID and a VLAN Name to create a new VLAN . 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 Delete button to remove it from the VLAN template.

Table 31 Template: VLAN (continued)

LABEL	DESCRIPTION
Modify	Click on a VLAN in the left-hand column of this screen. Change the VLAN Name or change the configuration of the egress, forbidden and untagged ports. Click the Modify button to save the changes to the switch. If you want to change the VLAN ID of a VLAN configuration, you can only delete the VLAN configuration or create a new VLAN configuration using a different VLAN ID .
Port List	Click on a port in the Egress Ports 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 T , an untagged port is marked U and a port not participating in a VLAN is marked - .
Close	Click Close 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.

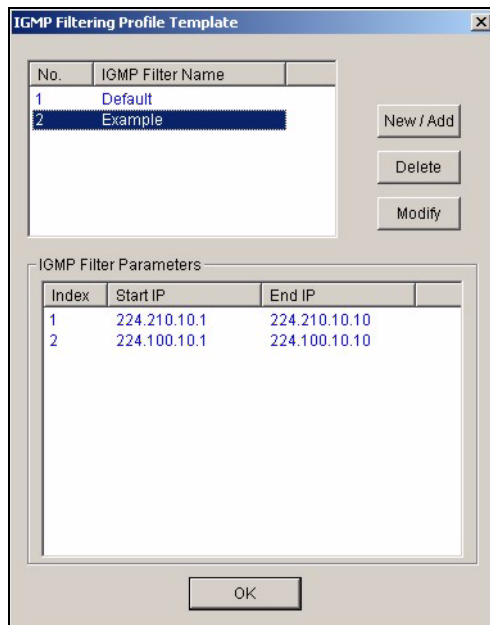
- 1 Click **Template > VLAN Template**.
- 2 A screen displays. Select a switch model in the **Device List** field.
- 3 Enter a unique number (between 1 and 4094) in the **VLAN ID** field.
- 4 Enter a descriptive name (up to 12 characters) in the **VLAN Name** field for identification purposes.
- 5 Configure 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 41 Template: IGMP Filtering Profile Template

The following table describes the labels in this screen.

Table 32 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 New/Add to create an IGMP filter profile.
Delete	Click Delete to remove one or more selected IGMP filter profiles.
Modify	Click Modify to edit a selected IGMP filter profile.
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 OK 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 42 Template: New IGMP Filter

The screenshot shows a 'New IGMP Filter' dialog box. At the top, there is a title bar. Below it, there is a text input field for 'IGMP Filter Name'. Underneath are two IP address input fields labeled 'Start Address' and 'End Address', both containing the value '224 . 0 . 0 . 0'. To the right of these fields are 'Add' and 'Clear' buttons. Below this section is a table titled 'IGMP Filter Parameters' with three columns: 'Index', 'Start Address', and 'End Address'. The table is currently empty. At the bottom center of the dialog is a 'Close' button.

The following table describes the labels in this screen.

Table 33 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.
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 Start IP and End IP fields.
Add	Click Add to create a new IGMP filter.
Clear	Click Clear 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 Close 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 43 Template: Multicast Template

The following table describes the labels in this screen.

Table 34 Template: Multicast

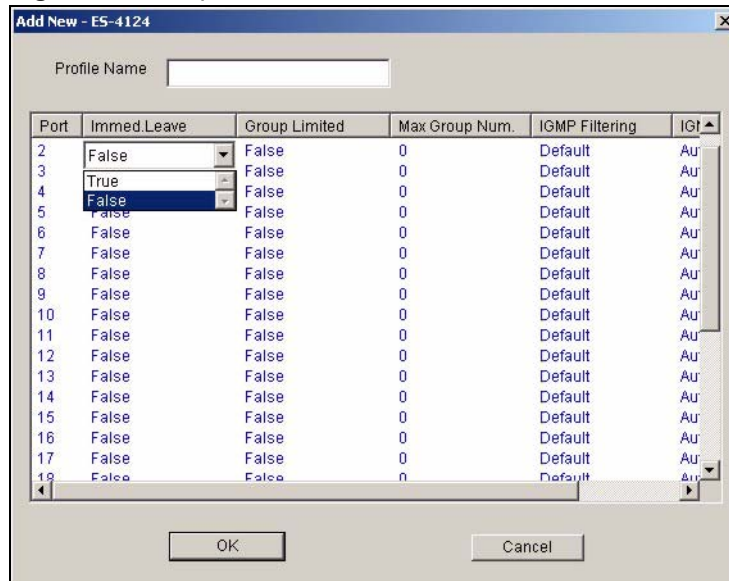
LABEL	DESCRIPTION
Device Type	Select a device from the drop-down list box to view the device's VLAN configuration.
Template	
No.	This field displays the index number.
Multicast Name	This field displays the descriptive name for the multicast template.
New	Click New to create a new multicast template.
Modify	Click Modify to change the settings of the selected multicast template.
Delete	Click Delete to remove the selected multicast template.
Port List	
Port	This field displays the port number.
Immed. Leave	This field displays True 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 False when the feature is disabled.

Table 34 Template: Multicast (continued)

LABEL	DESCRIPTION
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.
IGMP Filtering	This field displays the name of the IGMP filtering profile to use for this port.
IGMP Querier Mode	This field displays the IGMP querier mode for this port.
Close	Click Close 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 44 Template: New Multicast

The following table describes the labels in this screen.

Table 35 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 True from the drop-down list box to activate the immediate leave feature. Select False to disable this feature.

Table 35 Template: New Multicast (continued)

LABEL	DESCRIPTION
Group Limit	<p>Double-click to configure this field.</p> <p>Select True 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.</p> <p>Select False to disable this feature.</p>
Max. Group Number	<p>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.</p>
IGMP Filter	<p>Double-click this field to select the name of the IGMP filtering profile to use for this port.</p>
IGMP Querier Mode	<p>The switch treats an IGMP query port as being connected to an IGMP multicast router (or server). The switch forwards IGMP join or leave packets to an IGMP query port.</p> <p>Select Auto to have the switch use the port as an IGMP query port if the port receives IGMP query packets.</p> <p>Select Fixed to have the switch always use the port as an IGMP query port. Select this when you connect an IGMP multicast server to the port.</p> <p>Select Edge to stop the switch from using the port as an IGMP query port. The switch will not keep any record of an IGMP router being connected to this port. The switch does not forward IGMP join or leave packets to this port.</p>
OK	<p>Click OK to save the settings and close this screen.</p>
Cancel	<p>Click Cancel to discard all changes and close this screen.</p>

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.

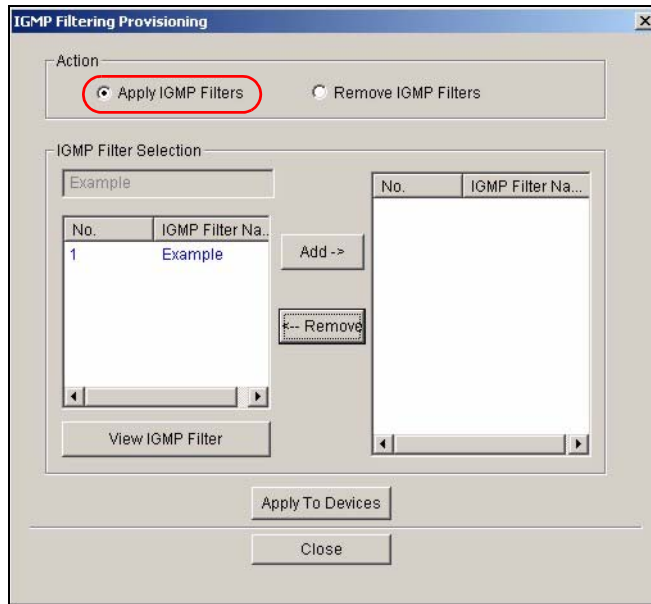


You must first create IGMP filtering templates before you can apply them using the Provisioning screen. Refer to the chapter on creating templates for more information.

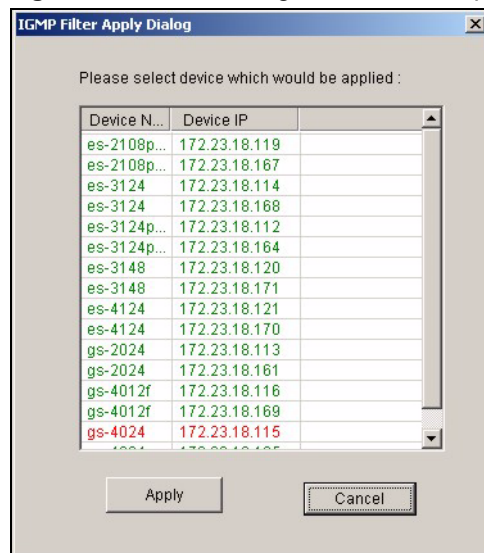
7.2 Applying an IGMP Filter Profile

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 45 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 46 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.

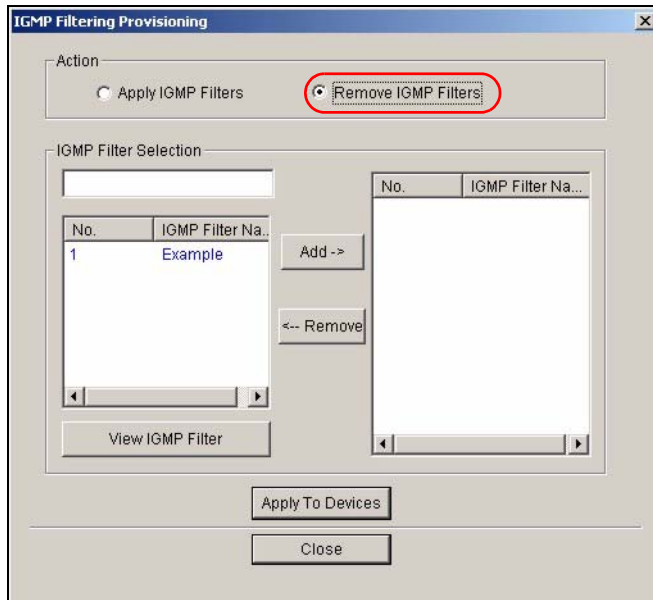
Figure 47 Provisioning: IGMP Filter: Apply to Devices: Successful

7.3 Removing an IGMP Filter Profile

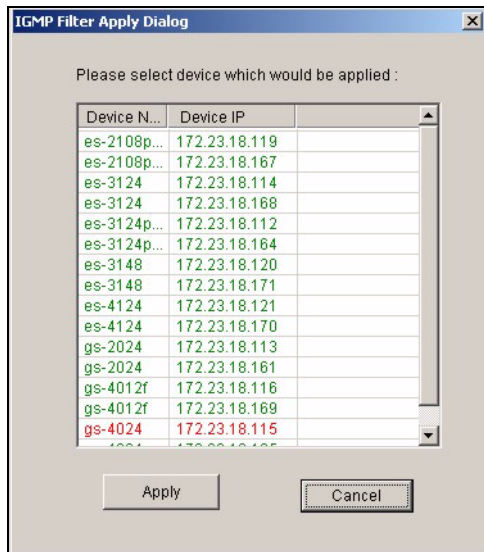
Follow the steps below to remove an IGMP filter from a device.

- 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 48 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 49 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 50 Provisioning: IGMP Filter: Remove From Devices: Successful

Performance

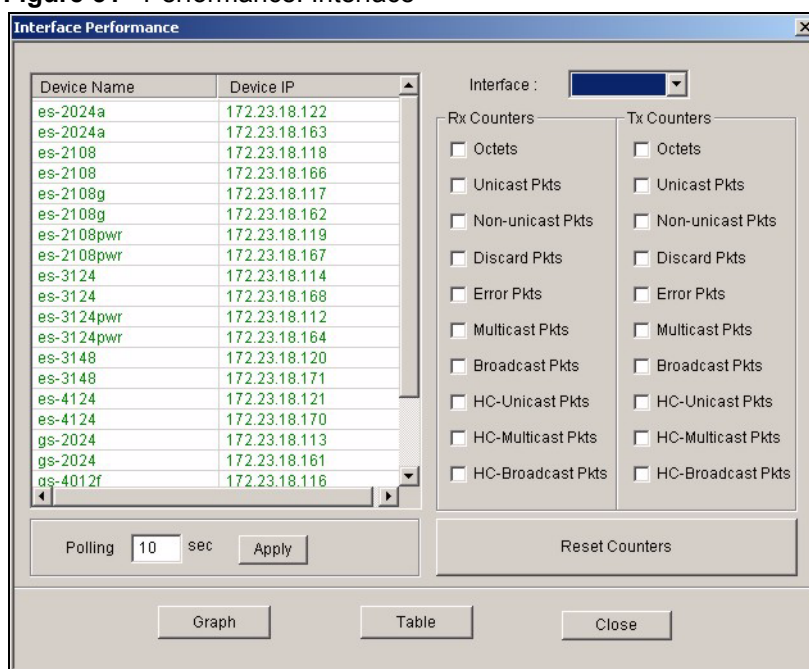
This chapter describes the interface performance screen, graph setup and table setup. View Ethernet history statistics for your switch network.

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 51 Performance: Interface



The following table describes the labels in this screen.

Table 36 Performance: Interface

LABEL	DESCRIPTION
Device Name	This field displays the descriptive name of a device.
Device IP	This field displays the IP address of a device
Interface	Select an interface (or port) from the drop-down list box.

Table 36 Performance: Interface (continued)

LABEL	DESCRIPTION
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.
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).
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 Apply .
Close	Click Close to close this screen.
Reset Counters	Click Reset Counters to clear the counters.
Graph	Click the Graph button to create a graph based on the above selections.
Table	Click the Table button to create a table based on the above selections.
Close	Click Close to close the screen.

8.2 RMON Ethernet Statistics

Use this screen to look at network traffic on an Ethernet port since the last time the switch was reset. To open this screen, click **Performance > RMON > Ethernet Statistics**.

Figure 52 Performance: RMON: Ethernet Statistics

The following table describes the labels in this screen.

Table 37 Performance: RMON: Ethernet Statistics

LABEL	DESCRIPTION
Device Name	This field displays the name of each switch. Select a switch to look at statistics for one of its ports.
Device IP	This field displays the corresponding IP address of the switch.
Port	Select the port at whose statistics you want to look.
Polling	Select how often you want the EMS to update the statistics it displays.
Basic Counters	
Drop Events	Select this to display the total number of packets that were dropped.
Octets	Select this to display the total number of octets received.
Collisions	Select this to display the total number of collisions occurred.
Total Packets	Select this to display the total number of all good packets received.
Broadcast Packets	Select this to display the total number of good broadcast packets received.
Multicast Packets	Select this to display the total number of good multicast packets received.
Packets of Variable Size	
0 ~ 64 Octets (Undersize)	Select this to display the number of packets (including bad packets) received that were between 0 and 64 octets in length.
64 Octets	Select this to display the number of packets (including bad packets) received that were 64 octets in length.
65 ~ 127 Octets	Select this to display the number of packets (including bad packets) received that were between 65 and 127 octets in length.
128 ~ 255 Octets	Select this to display the number of packets (including bad packets) received that were between 128 and 255 octets in length.

Table 37 Performance: RMON: Ethernet Statistics (continued)

LABEL	DESCRIPTION
256 ~ 511 Octets	Select this to display the number of packets (including bad packets) received that were between 256 and 511 octets in length.
512 ~ 1023 Octets	Select this to display the number of packets (including bad packets) received that were between 512 and 1023 octets in length.
1024 ~ 1518 Octets	Select this to display the number of untagged packets (including bad packets) received that were between 1024 and 1518 octets in length. This number also includes tagged packets received that were 1522 octets in size.
1518 ~Octets (Oversize)	Select this to display the number of untagged packets (including bad packets) received that were greater than 1518 octets in length.
Packets with FCS/Alignment Errors	
CRCAAlignErrors (Normal Packets, 64~1518)	Select this to display the number of packets (between 64 ~ 1518 octets long) dropped because they either had bad Frame Check Sequence (FCS) or non-integral number of octets (alignment error).
Fragments (Undersize Packets)	Select this to display the number of frames dropped because they were less than 64 octets long, and contained an invalid FCS, including non-integral and integral lengths.
Jabbers (Oversize Packets)	Select this to display the number of frames dropped because they were longer than 1518 octets and contained an invalid FCS, including alignment errors.
Graph	Select this to create a graph based on the above selection(s).
Table	Select this to create a table based on the above selection(s).
Close	Click this to close the screen.

8.3 RMON History Data

Use this screen to look at historical network traffic on an Ethernet port. To open this screen, click **Performance > RMON > History Data**.

Figure 53 Performance: RMON: History Data

Device Name	Device IP
es-2024a	172.23.18.122
es-2024a	172.23.18.163
es-2108	172.23.18.118
es-2108	172.23.18.166
es-2108g	172.23.18.117
es-2108g	172.23.18.162

Index	Data Source	Bucket Granted	Interval (sec)
1	ifIndex.1	50	30
2	ifIndex.1	50	1800
3	ifIndex.2	50	30
4	ifIndex.2	50	1800
5	ifIndex.3	50	30
6	ifIndex.3	50	1800
7	ifIndex.4	50	30
8	ifIndex.4	50	1800
9	ifIndex.5	50	30
10	ifIndex.5	50	1800
11	ifIndex.6	50	30
12	ifIndex.6	50	1800
13	ifIndex.7	50	30

Polling : 40 sec

Table Close

The following table describes the labels in this screen.

Table 38 Performance: RMON: History Data

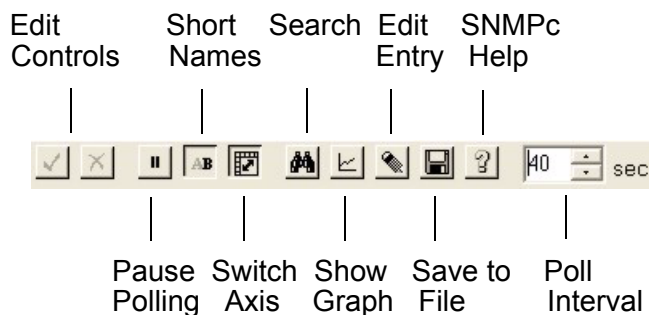
LABEL	DESCRIPTION
Device Name	This field displays the name of each IP DSLAM. Select an IP DSLAM to look at statistics for one of its ports.
Device IP	This field displays the corresponding IP address of the IP DSLAM.
History Control Table	
Index	This field displays the configuration index number.
Data Source	This field displays the port of the IP DSLAM that the EMS will poll for data.
Bucket Granted	This field displays the number of data samplings the probe allows to stores.
Interval (sec)	This field displays the time between data samplings.
Polling	Select how often you want the EMS to update the statistics it displays.
Basic Counters	
Dropped Events	Select this to display the total number of packets that were dropped.
Octets	Select this to display the total number of octets received.
Collisions	Select this to display the total number of collisions occurred.
Utilization	Select this to display the utilization of the LAN ports.
Packet Counters	
Total Packets	Select this to display the total number of all good packets received.
Broadcast Packets	Select this to display the total number of good broadcast packets received.

Table 38 Performance: RMON: History Data (continued)

LABEL	DESCRIPTION
Multicast Packets	Select this to display the total number of good multicast packets received.
Undersize Packets (less than 64 octets)	Select this to display the number of packets dropped because they were too short (shorter than 64 octets).
Oversize Packets (longer than 1518 octets)	Select this to display the number of packets dropped because they were too big (bigger than the maximum frame size).
Packets with FCS/Alignment Errors	
CRCAAlignErrors (Normal Packets, 64 ~1518 octets)	Select this to show the number of packets (between 64 ~ 1518 octets long) dropped because they either had bad Frame Check Sequence (FCS) or non-integral number of octets (alignment error).
Fragments (Undersize Packets)	Select this to display the number of frames dropped because they were less than 64 octets long, and contained an invalid FCS, including non-integral and integral lengths.
Jabbers (Oversize Packets)	Select this to display the number of frames dropped because they were longer than 1518 octets (non VLAN) or 1522 octets (VLAN) and contained an invalid FCS, including alignment errors.
Table	Select this to create a table based on the above selection(s).
Close	Click this to close the screen.

8.4 Table Menu Bar

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

Figure 54 Table Menu Bar Icons

8.4.1 Editing a Table Entry



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


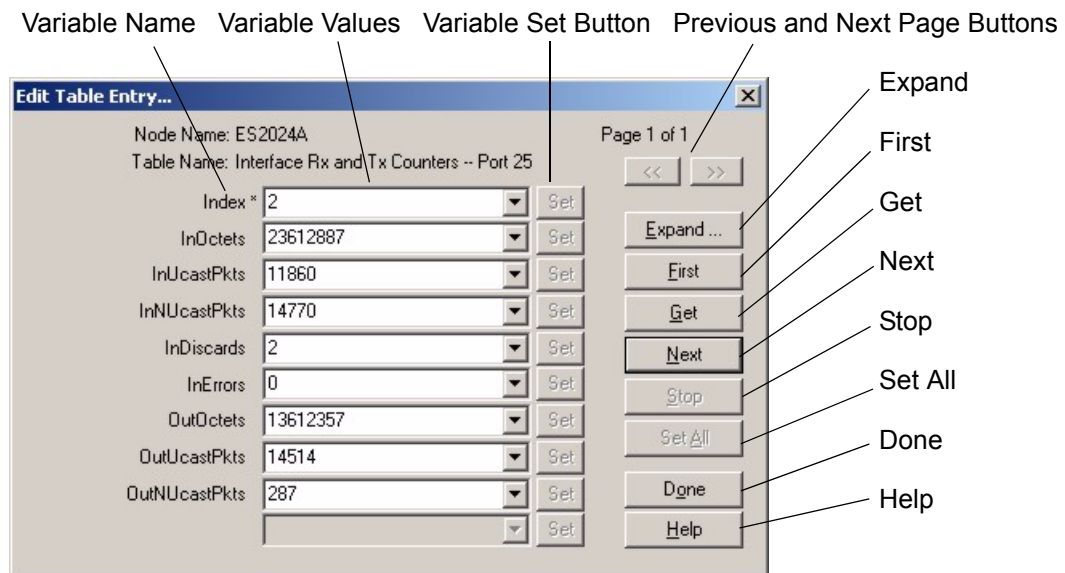
In any tabulated screen display, click the **Edit** icon  in the menu bar icon to display the **Edit Table Entry** screen and edit any field in a table. There is a set of variable names, value and set button controls that operate on the fields of the selected table. There is also a set of function control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

Figure 55 Edit Table Entry



The following table describes the labels in this screen.

Table 39 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.

Table 39 Edit Table Entry (continued)

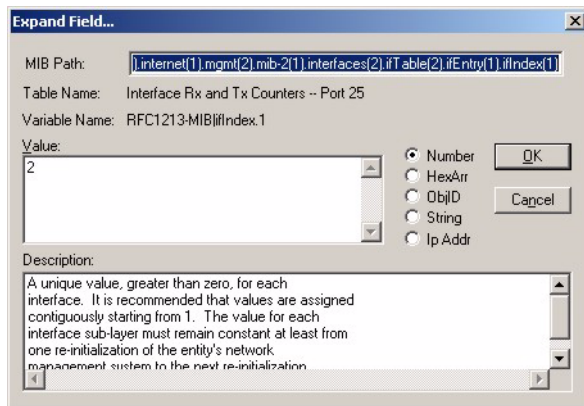
COMMAND	DESCRIPTION
Variable Set Button	Each variable value has a small Set button to the right. Click this Set button to perform an SNMP set on only one variable. Set buttons are grayed for variables that are read-only.
Previous/Next Page Buttons	Each page shows up to ten variables. The page number 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 Expand button to expand the view of the active variable value edit box. First click on the edit box, then select the Expand button.
First	Click the First 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 Get 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 Get button to refresh the variable values.
Next	Click the Next 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 Stop 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 Set All 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.



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.

8.4.2 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 56 Expand Field

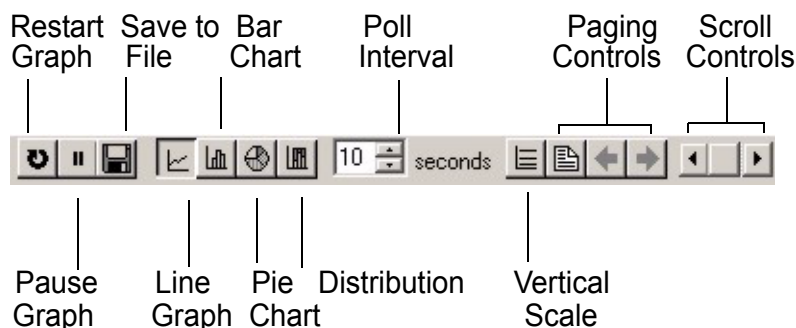
The **Expand** screen shows the variable value in a larger edit box, so you can more easily enter a long value. It also shows the variable type and a description from the MIB source file. Possible variable types are shown in the following table.

Table 40 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.

8.5 Graph Menu Bar Icons

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

Figure 57 Graph Menu Bar

8.5.1 Graph Styles

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

Table 41 Edit Table Entry

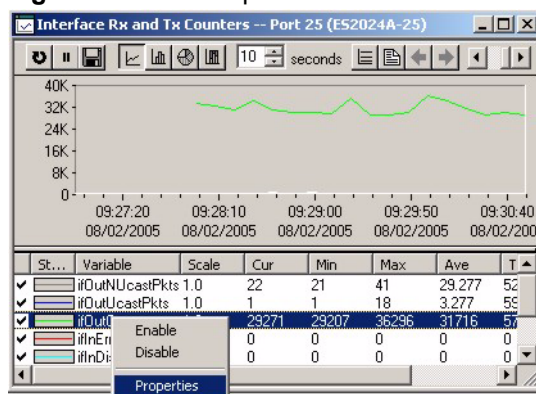
STYLE	DESCRIPTION
Line	Each variable is displayed as a line, with time as the horizontal axis. The vertical axis represents the size of each polled value for each poll interval.
Bar	The cumulative average value for each variable is displayed as a vertical bar.
Pie	All variables are displayed as relative 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.

8.5.2 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 58 Cell Properties Select



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

Figure 59 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.

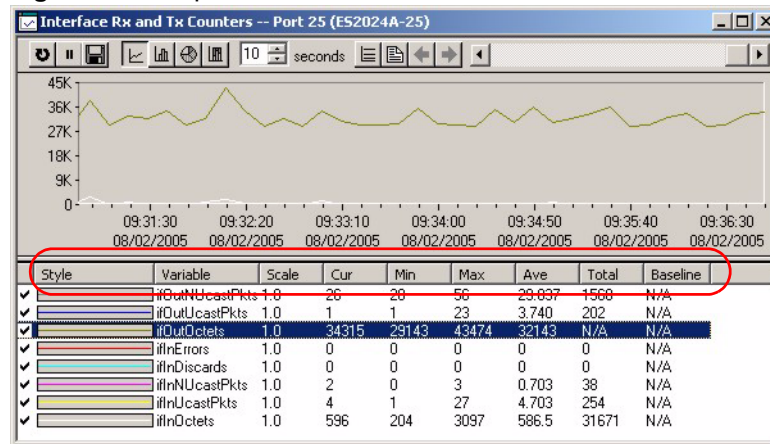
Table 42 Edit Style Dialog Box

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.

8.5.3 Graph Labels

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

Figure 60 Graph Variables



The following table describes the labels in this screen.

Table 43 Graph Variables

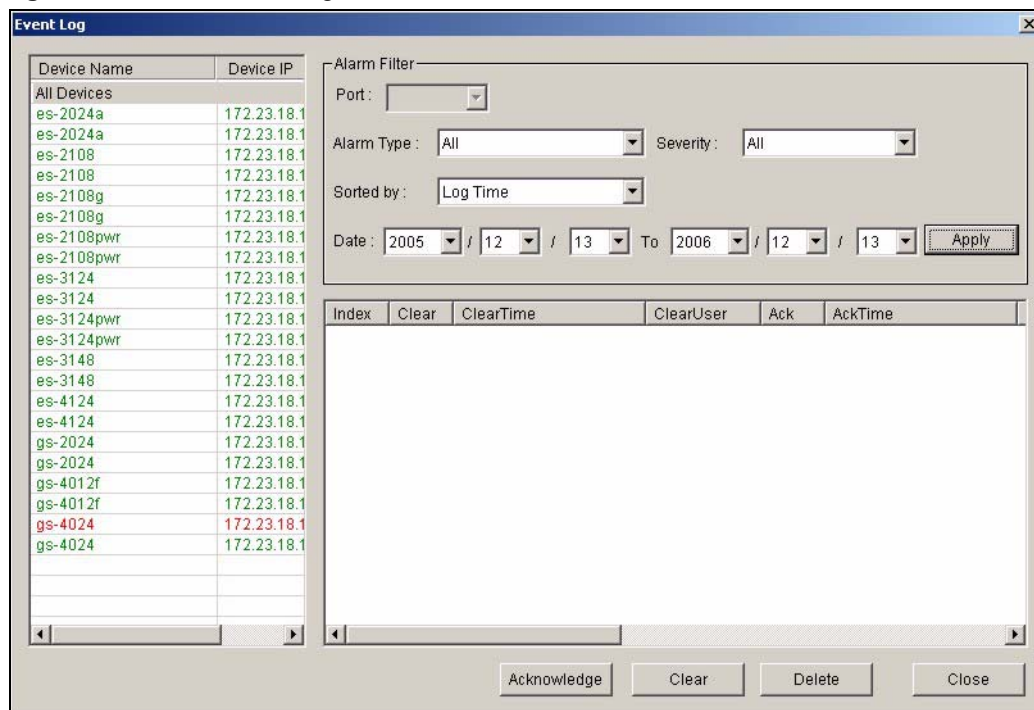
LABEL	DESCRIPTION
Style	This is the line style discussed above.
Variable	This is the variable being represented by the line style discussed above.
Scale	This is the scaling multiplier.
Cur	This is the current value of the variable.
Min	This is the minimum value of the variable.
Max	This is the maximum 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.

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 61 Fault: Event Log



The following table describes the labels in this screen.

Table 44 Fault: Event Log

LABEL	DESCRIPTION
Device Name	This field displays the name of each IP DSLAM. Select an IP DSLAM to look at statistics for one of its ports.
Device IP	This field displays the corresponding IP address of the IP DSLAM.
Alarm Filter	
Port	To display event logs of a port, select the port from the drop-down list box.

Table 44 Fault: Event Log (continued)

LABEL	DESCRIPTION
Alarm Type	Select the type of logs from the drop-down list box. Choices are All , Communication , QualityOfService , ProcessingError , Equipment and Environmental . Select All for system event logs generated by all alarm types. Select Communication for transmission and signal logs. Select QualityOfService for performance logs. Select Processing Error for software and configuration problem logs. Select Equipment for hardware-related logs. Select Environmental 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"> • Critical - Red • Major - Orange • Minor - Yellow • Information - Blue
Sorted by	Select Log Time to sort event logs by the time at which they were generated or select Device Name 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 Apply to display event logs generated within the specified time period.
Index	This field displays the index number of the event log.
Clear	This field displays whether this log was cleared.
ClearTime	This field displays when this log was cleared.
ClearUser	This field displays the name of the user who cleared this log.
Ack	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.
AckTime	This field displays the date and time this log was acknowledged.
AckUser	This field displays the name of the user who acknowledged this log.
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 Acknowledge to acknowledge any selected log messages.
Delete	Click Delete to remove the selected log.
Close	Click Close to close this screen.

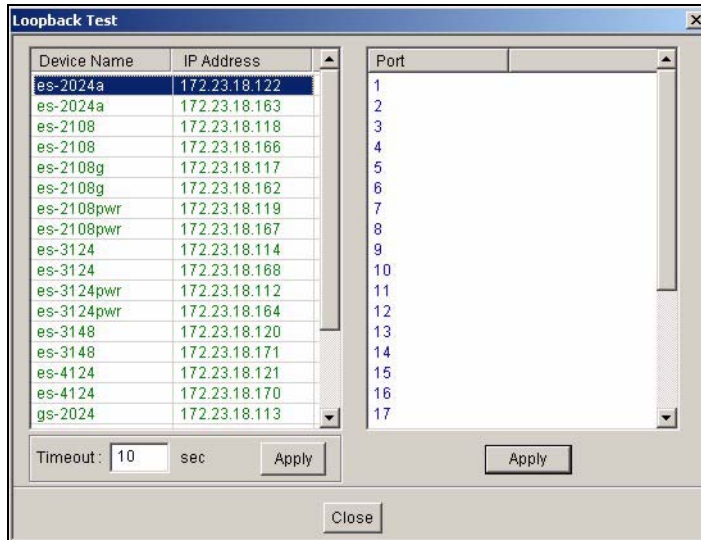
9.2 Loopback Test

Follow the steps below to perform an internal loopback test.

- 1 Click **Fault > Loopback Test**.

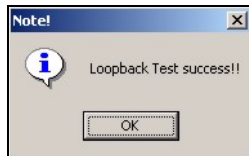
- 2 Choose a switch from the list located on the left-hand side of the screen.
- 3 Choose a port from the list located on the right-hand side of the screen.
- 4 In the **Timeout** field, accept the default or specify a connection timeout period (in seconds).
- 5 Click **Apply** to start the loopback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

Figure 62 Fault: Loopback Test



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

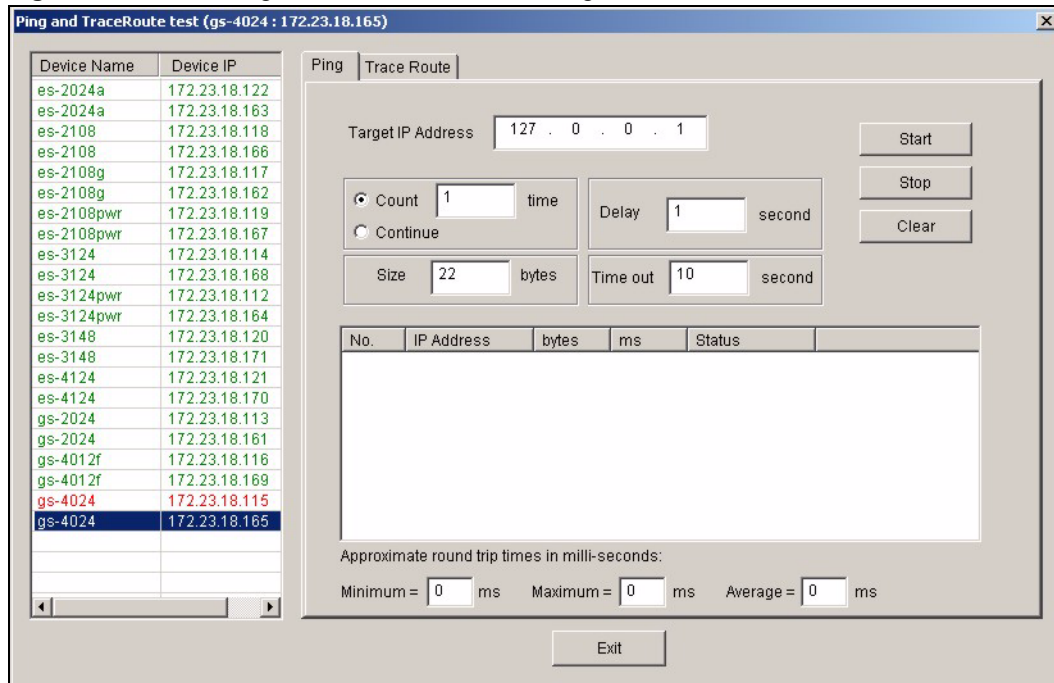
Figure 63 fault: Loopback: Result



9.3 Ping Test

You can use the **Ping** screen to test connection from the selected switch to a specified IP address.

Click **Fault > Ping and TraceRoute Test** and click the **Ping** tab to display the screen.

Figure 64 Fault: Ping and TraceRoute Test: Ping

The following table describes the labels in this screen.

Table 45 Fault: Ping and TraceRoute Test: Ping

LABEL	DESCRIPTION
Device Name	This field displays the name of each switch. Select a switch to look at statistics for one of its ports.
Device IP	This field displays the corresponding IP address of the switch.
Target IP Address	Enter the IP address of the device to which you want to test the connection from the selected switch.
Count	Select this option and enter the number of ping test (1-15) to perform.
Delay	Enter the number of seconds (1-30) the switch is to wait between ping tests.
Continue	Select this option to perform ping tests continuously until you click Stop .
Size	Specify the size of the ping packet (0-1472 bytes) to send.
Timeout	Specify the time (1-30 seconds) the switch is to wait for a reply from the remote device before declaring this a failed ping test.
Start	Click Start to begin the ping connection test.
Stop	Click Stop to end the ping connection test if you select the Continue option.
Clear	Click Clear to reset the fields in this part of the screen.
No.	This field displays the index number.
IP Address	This field displays the destination IP address for this ping test.
bytes	This field displays the number of bytes sent for this ping test.
ms	This field displays the round trip time in milli-seconds (ms).
Status	This field indicates whether this ping test is successful or not.
Approximate round trip times in milli-seconds:	

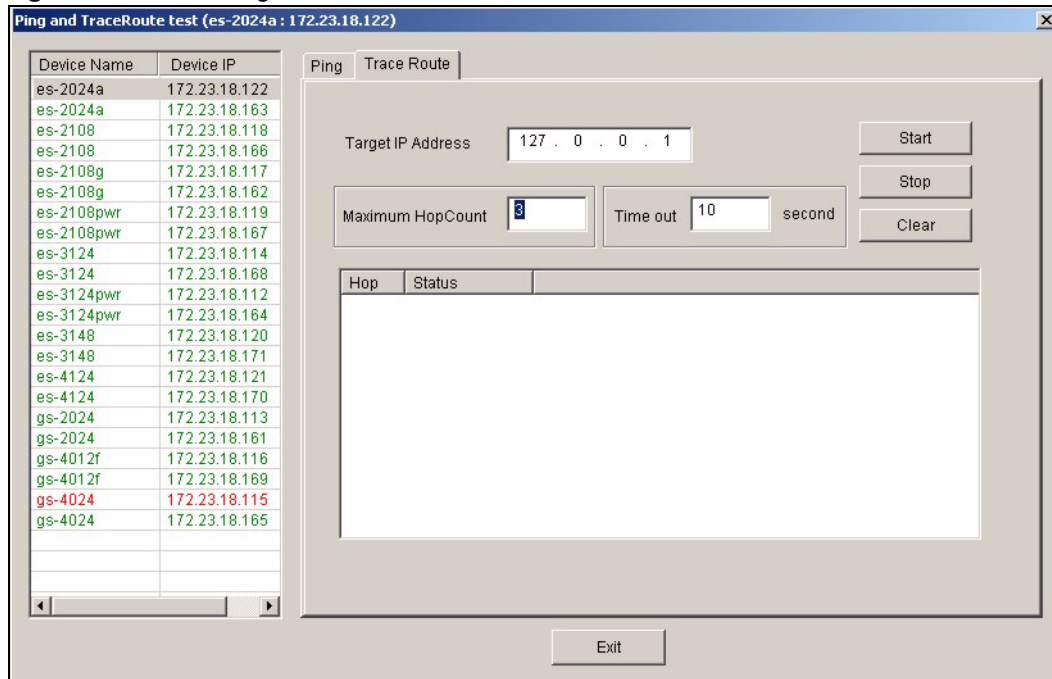
Table 45 Fault: Ping and TraceRoute Test: Ping (continued)

LABEL	DESCRIPTION
Minimum	This field displays the shortest round-trip time (the time it takes to send a packet from a switch to the destination and back).
Maximum	This field displays the longest round-trip time.
Average	This field displays the average round-trip time.
Exit	Click Exit to close this screen.

9.4 Traceroute Test

You can use the **Trace Route** screen to test connection from the selected switch to a specified IP address.

Click **Fault > Ping and TraceRoute Test** and click the **Trace Route** tab to display the screen.

Figure 65 Fault: Ping and TraceRoute Test: Trace Route

The following table describes the labels in this screen.

Table 46 Fault: Ping and TraceRoute Test: Ping

LABEL	DESCRIPTION
Device Name	This field displays the name of each switch. Select a switch to look at statistics for one of its ports.
Device IP	This field displays the corresponding IP address of the switch.
Target IP Address	Enter the IP address of the device to which you want to test the connection from the selected switch.
Maximum Hop Count	Specify the maximum number of hops (intermediary devices) you want to trace. Enter a number between 1 and 10.

Table 46 Fault: Ping and TraceRoute Test: Ping (continued)

LABEL	DESCRIPTION
Timeout	Specify the time (1-60 seconds) the switch is to wait for a reply from the remote device before declaring this a failed traceroute test.
Start	Click Start to begin the ping connection test.
Stop	Click Stop to end the ping connection test if you select the Continue option.
Clear	Click Clear to reset the fields in this part of the screen.
Hop	This field displays the index number.
Status	This field indicates whether this ping test is successful or not.
Exit	Click Exit to close this screen.

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.



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

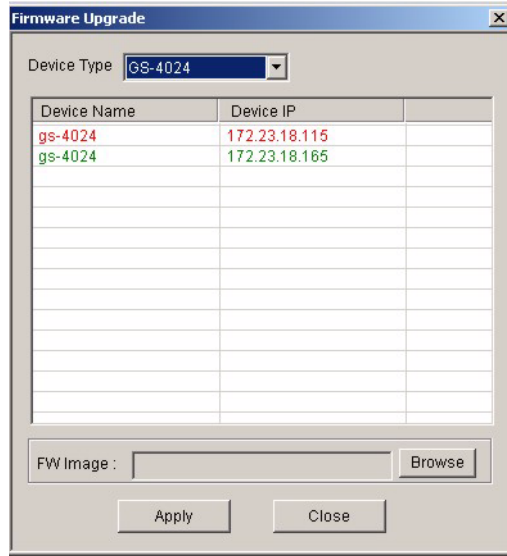
10.1.1 Procedure to Update Firmware

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.

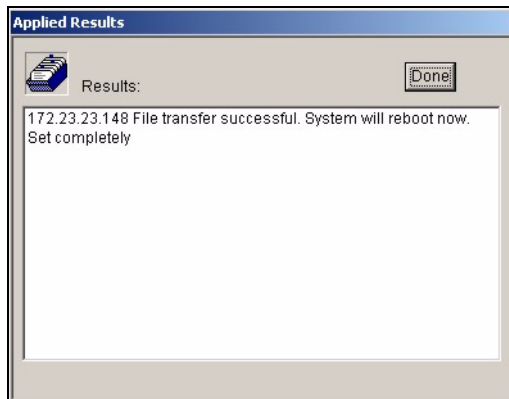


Do NOT turn off the switch during the updating process, as it may corrupt the firmware and make your switch unusable.

- 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 66 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).

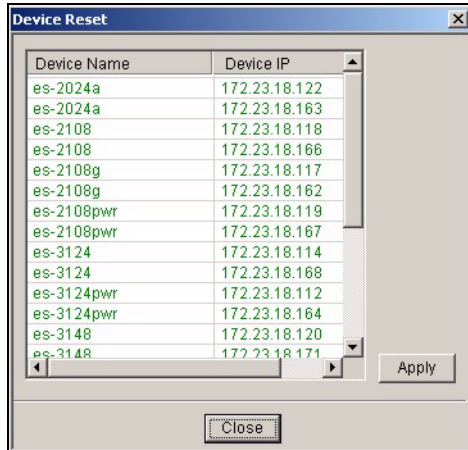
Figure 67 Maintenance: Firmware Upgrade: Result

- 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.

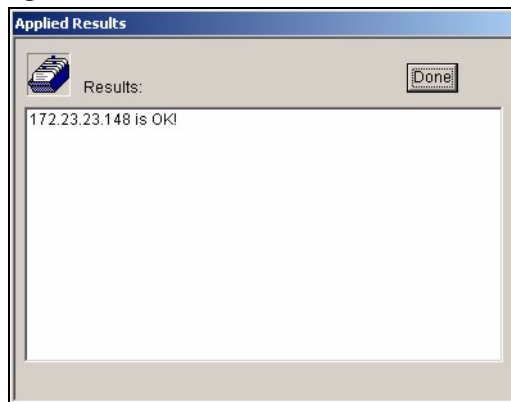
10.2 Device Reset

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 68 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 69 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 70 Maintenance: Configuration Backup/Restore

The following table describes the labels in this screen.

Table 47 Maintenance: Configuration Backup/Restore

LABEL	DESCRIPTION
Device Name	This field displays the name of each IP DSLAM. Select an IP DSLAM to look at statistics for one of its ports.
Device IP	This field displays the corresponding IP address of the IP DSLAM.
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 Directory / File Name text box or click Browse to locate it.
Save running-config to configuration	This field is applicable when you select Backup . Select the Save running-config to configuration text box to save the most recently updated configuration to a file specified in the Directory/File Name field.
Backup	Click the Backup radio button to transfer the configuration file from your switch to a computer.
Restore	Click the Restore radio button to transfer the configuration file from your computer to a switch.
Apply	Click Apply to backup or restore the switch(es) configuration file.
Close	Click Close to close this screen.

10.4 Load Factory Default

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

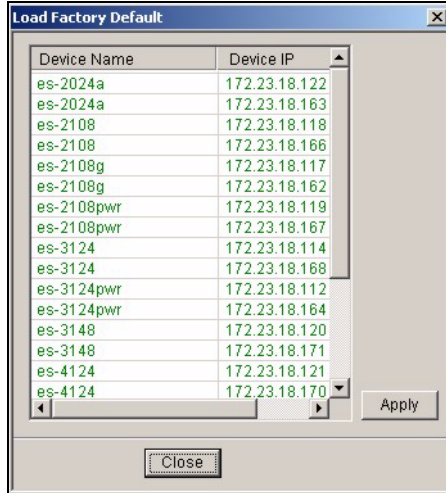
- 1 Click **Maintenance > Load Factory Default**.
- 2 Select a switch from the list of devices shown.

- 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 71 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 72 Maintenance: Scheduled NE Config Backup



The following table describes the labels in this screen.

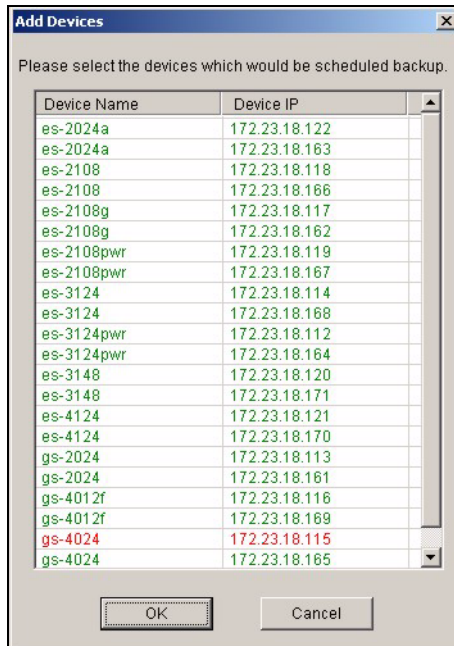
Table 48 Maintenance: Scheduled NE Config Backup

LABEL	DESCRIPTION
Device Name	This field displays the name of each IP DSLAM. Select an IP DSLAM to look at statistics for one of its ports.
Device IP	This field displays the corresponding IP address of the IP DSLAM.
Add	Click the Add button to add a switch to the list of devices in the backup schedule.
Remove	Click the Remove button to remove a switch from the list of devices in the backup schedule.
Backup Schedule	
Frequency	Scheduled backups can be performed on a Daily , Weekly or Monthly basis. Select a radio button to schedule configuration backups starting at the date and time specified below. Select No Backup to disable this feature.
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 Backup Directory text box or click Browse 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 Account above.
Apply	Click Apply to save changes to the EMS.
Close	Click Close 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 73 Maintenance: Scheduled NE Config Backup: Add Devices

10.5.2 Removing a Scheduled NE Configuration Backup

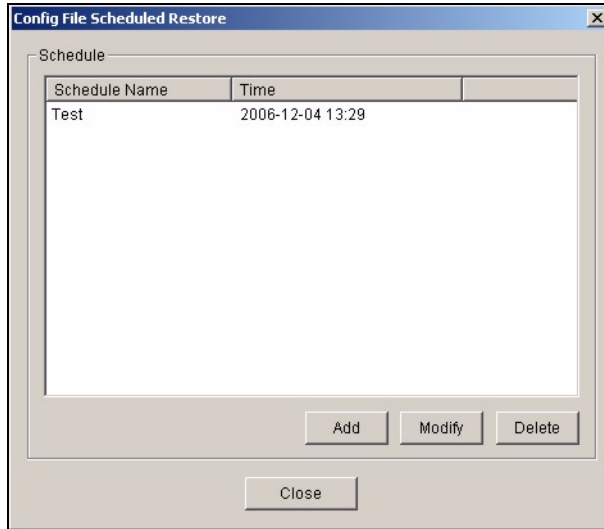
Follow the steps below to remove the selected device(s) from the configuration backup schedule.

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

10.6 Scheduled Device Configuration Restore

Use this screen to restore the configuration of one or more switches at a scheduled time. Set the time and date of the restore and the location of the configuration file you want to restore. Each schedule can restore configuration files for multiple switches, and you can set up multiple schedules to restore configuration files at more than one scheduled time.

To open this screen, click **Maintenance > Scheduled Device Configuration Restore**.

Figure 74 Maintenance: Scheduled Device Configuration Restore

The following table describes the labels in this screen.

Table 49 Maintenance: Scheduled Device Configuration Restore

LABEL	DESCRIPTION
Schedule Name	This field displays the name of each schedule for restoring configuration files.
Time	This field displays when the configuration files will be restored.
Add	Click this to create a new schedule for restoring configuration files.
Modify	Select an existing schedule, and click this to edit it.
Delete	Select one or more schedules, and click this to remove them.
Close	Click this to close this screen.

10.6.1 Schedule Content Screen

Use the **Schedule Content** screen to configure a schedule for restoring configuration files. Click **Maintenance > Scheduled Device Configuration Restore**. Click **Add** to create a new schedule or click **Modify** to edit the selected schedule.

Figure 75 Maintenance: Scheduled Device Configuration Restore: Add/Modify

The following table describes the labels in this screen.

Table 50 Maintenance: Scheduled Device Configuration Restore: Add/Modify

LABEL	DESCRIPTION
Device List	
Device Name	This field displays the name of each switch in the schedule.
Device IP	This field displays the corresponding IP address of the switch.
File	This field displays the full path and name of the configuration file that will be restored to the switch.
Add	Click this to add one or more switches to the schedule.
Remove	Select one or more switches, and click this to remove them from the schedule.
Schedule Time	Specify when the configuration files should be restored. This is based on the current date and time of the computer on which the EMS is running, not the current date and time of the switch(es).
Schedule Name	This field is grayed out unless you are creating a new schedule. Type a name to create a new profile. You can use 1-31 alphanumeric characters, underscores (_), or dashes(-). Spaces are not allowed.
User info for Windows	
Account	Enter the user name for the Windows account.
Password	Enter the password for the Windows account.
Apply	Click this to save your changes.
Close	Click this to discard any unsaved changes and close this screen.

10.6.2 Schedule Content Screen

Use this screen to add one or more switches to a schedule for restoring configuration files. To open this screen, click **Add** when you are creating a new schedule or editing an existing one.

Figure 76 Maintenance: Scheduled Device Configuration Restore: Add/Modify

The following table describes the labels in this screen.

Table 51 Maintenance: Scheduled Device Configuration Restore: Add/Modify

LABEL	DESCRIPTION
Device Type	Select the model of the switch you want to add to the schedule.
Restore Directory	Enter the full path and name of the configuration file that will be restored to the switch, or click Browse to locate it.
Device Name	Select one or more switches to which you want to restore the specified configuration file. Use the Shift key or Ctrl key to select more than one switch.
Device IP	This field displays the IP address of the switch.
OK	Click this to save your changes and return to the previous screen.
Cancel	Click this to discard any changes and return to the previous screen.

10.7 Scheduled FW Upgrade

Use this screen to upload firmware to one or more switches at a scheduled time. Set the time and date of the upload and the location of the firmware you want to upload to each of them. Each schedule can upload firmware for multiple switches.

To open this screen, click **Maintenance > Scheduled FW Upgrade**.

Figure 77 Maintenance: Scheduled FW Upgrade

The following table describes the labels in this screen.

Table 52 Maintenance: Scheduled FW Upgrade

LABEL	DESCRIPTION
Device Name	This field displays the name of each switch in the schedule.
Device IP	This field displays the corresponding IP address of the switch.
Add	Click Add to specify the switch(es) to include in this schedule.
Remove	Click Remove to delete the selected switch from this schedule.
Firmware Upgrade Schedule	
Starting Date	Specify the date the firmware should be uploaded. This is based on the current date of the computer on which the EMS is running, not the current date of the switch(es).
Starting Time	Specify the time the firmware should be uploaded. This is based on the current time of the computer on which the EMS is running, not the current time of the switch(es).
FW Image	Click Browse to specify the full path and file name of the firmware that will be uploaded to the switch(es).
User info for Windows	
Account	Enter the user name for the Windows account.
Password	Enter the password for the Windows account.
Apply	Click this to save the settings. When a Success screen displays, click OK .
Close	Click this to close this screen.

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.



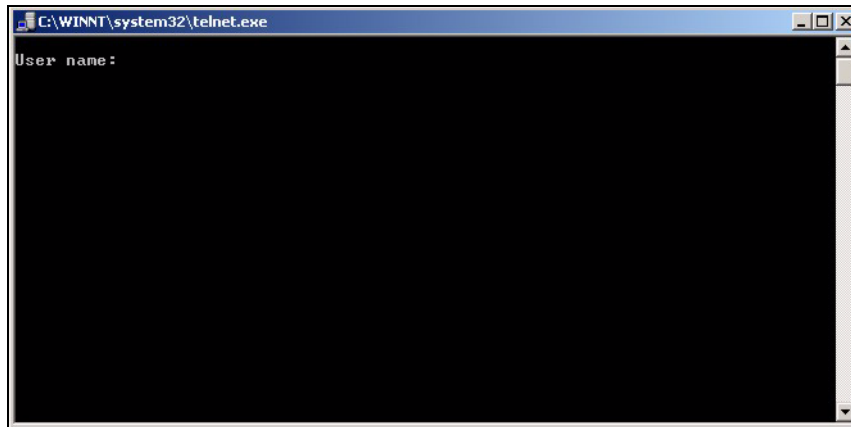
When you access a switch via Telnet or the web configurator, you **CANNOT** make any changes to that switch using the EMS.

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 78 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 79 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.



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 80 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
```

PART III

Switch

Configuration and Troubleshooting

Device Menu Overview (125)
System Configuration (131)
Switch Configuration (143)
VLAN (157)
Ethernet Port Configuration (163)
Multicast Configuration (179)
Configuration (191)
IP Configuration (199)
Troubleshooting (221)

Device Menu Overview

This chapter introduces the device configuration menus.

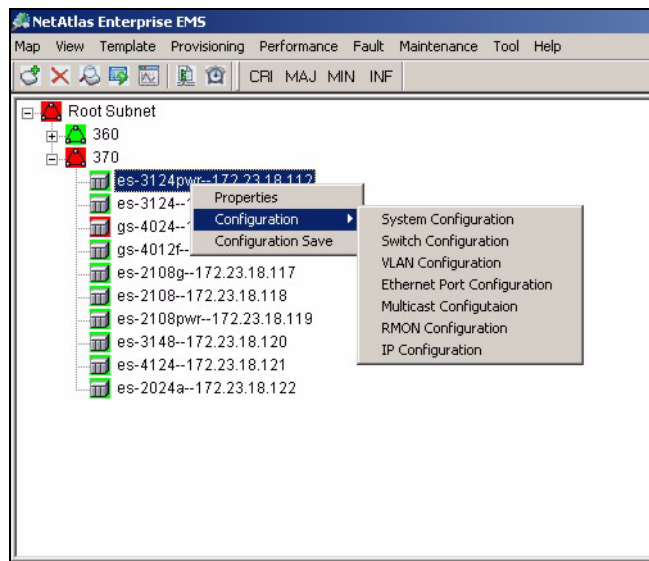
12.1 Device Menu Summary

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



Available screens and fields vary depending on your switch model and the switch firmware version. Example configuration screens are shown.

Figure 81 Device Panel List Menus



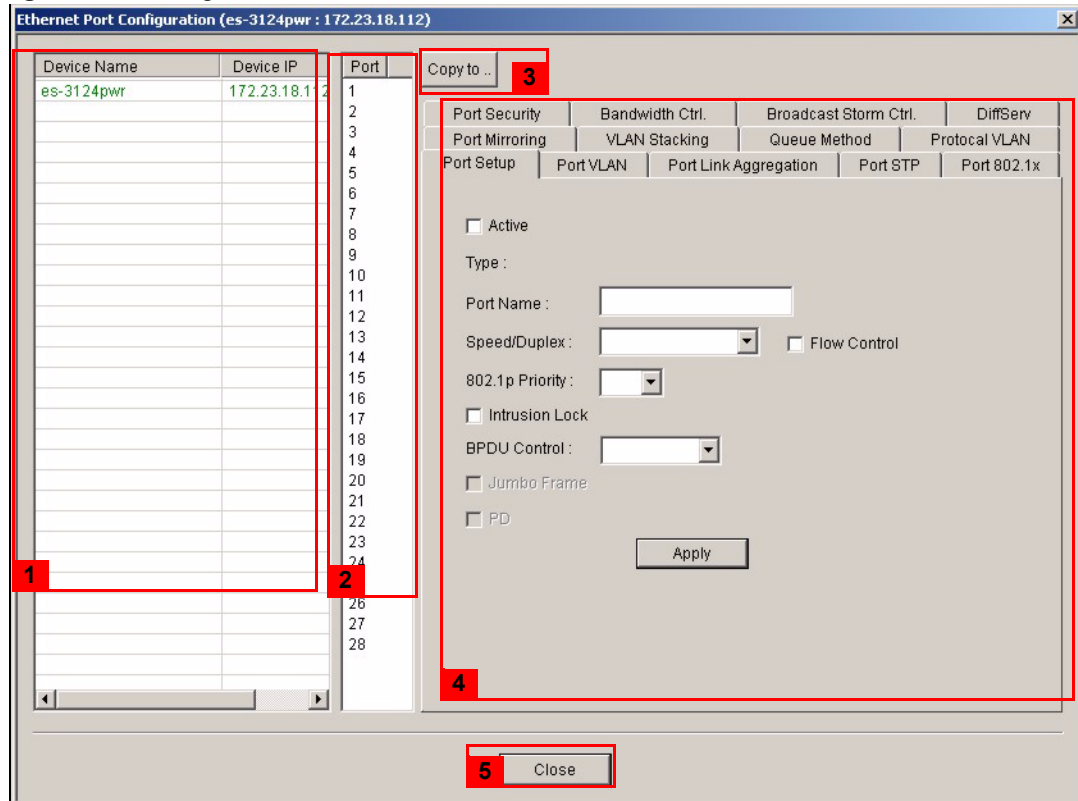
12.2 Property Configuration

See [Section 4.1.2 on page 55](#) 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 82 Configuration Window



The following table describes the elements in this screen.

Table 53 Configuration Window

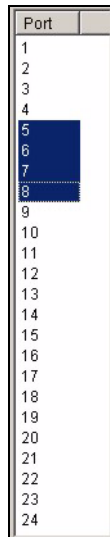
	LABEL	DESCRIPTION
1	Device Panel	This panel displays all devices (of the same type) currently managed by the EMS. The color of the text indicates the device status.
2	Port List Panel	This field displays a list of switch ports. This list displays in the Ethernet Port Configuration screens only. To make 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 Copy to.. 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) of the same model. Port configurations can also be copied to other device ports in the Ethernet Port Configuration screens.

Table 53 Configuration Window

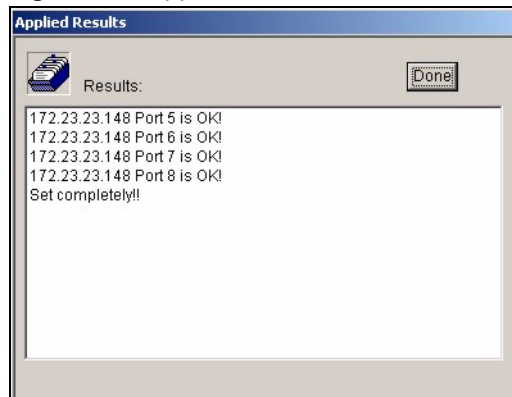
	LABEL	DESCRIPTION
4	Configuration Panel	Use this panel to make configuration changes to a device based on a port or multiple ports selected in the Port List Panel. If the screen does not have a Port List Panel, then use this panel to make configuration changes to a device selected in the Device Panel. Click Apply to save configuration changes.
5	Close	Click Close to close a configuration screen. If you close a screen without first clicking Apply , 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 83 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 84 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 of the same model.

12.3.2.1 Copy Configuration to Other Switches

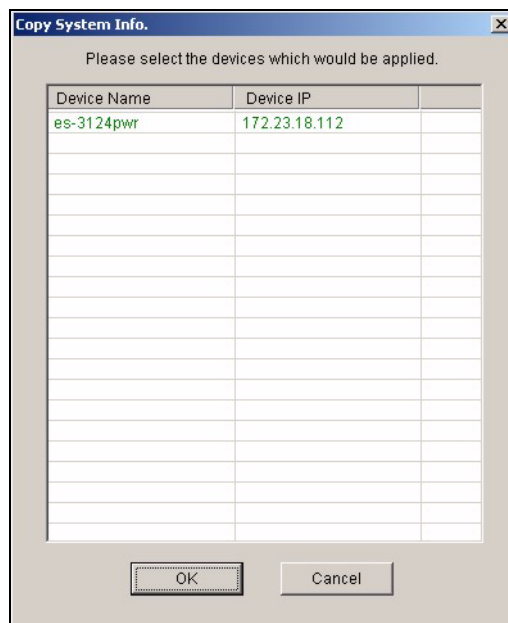
You can copy the screen settings (in the configuration group listed below) from one switch to another switch of the same model.

- System configuration
- Switch configuration
- Multicast configuration
- RMON configuration

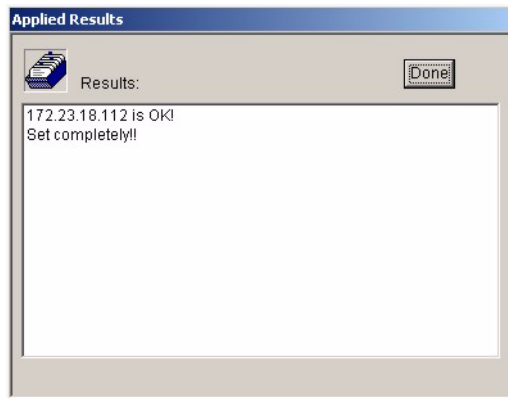
Follow the steps below to copy settings between switches.

- 1 In a configuration screen (in the configuration group listed above), click the **Copy to ..** button to display the switch select screen as shown.
- 2 Select one or more switches and click **OK** to copy the settings.

Figure 85 Copy Switch Setting: Example



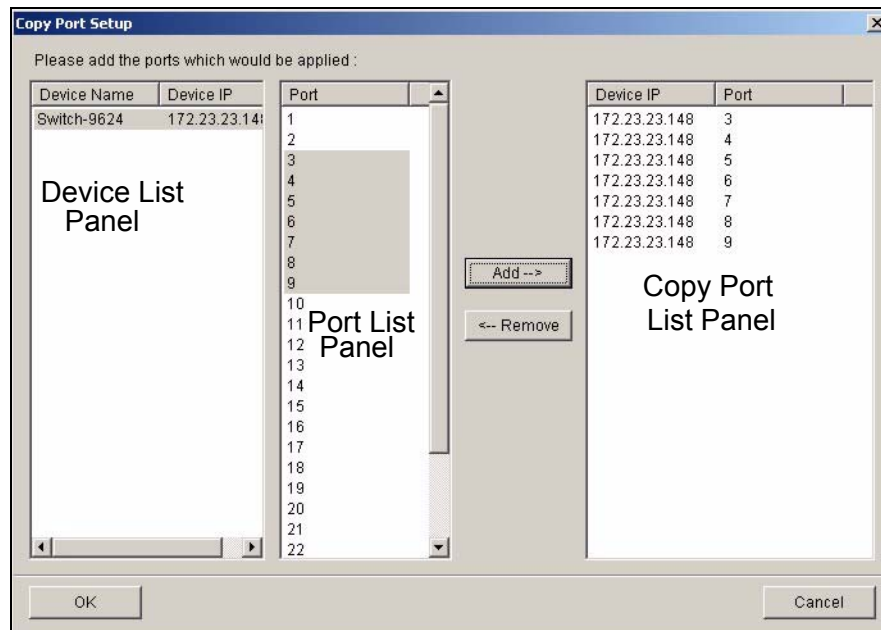
- 3 After the process is complete, a status screen displays. Click **Done**.

Figure 86 Switch Configuration Copy: Success

12.3.2.2 Copy Configuration to Other Switch Ports

In an **Ethernet Port Configuration** screen, click the **Copy to ..** button to copy a port's configuration to another port on the same or a different switch.

- 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 87 Copy Port Setting: Example

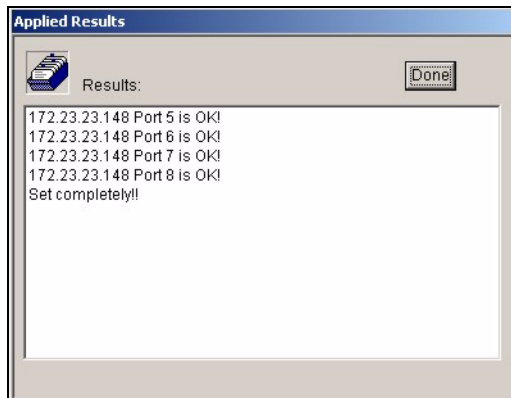
The following table describes this screen.

Table 54 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 Add to display the port(s) to which you want to copy from the switch you are currently configuring.
Remove	Click Remove 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 OK to copy the configuration from the current switch to the device port(s) displayed in the Copy Port List Panel.
Cancel	Click Cancel to return to the previous screen.

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

Figure 88 Copy Successful



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

System Configuration

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

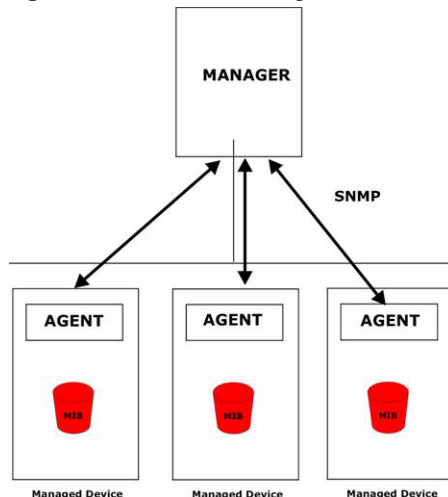
13.1 System Info

See [Section 3.9 on page 48](#) 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 89 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 55 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

To open display the **SNMP Config** screen, right-click on a switch in the Device List Panel, and click **Configuration > System Configuration > SNMP Conf.**

Figure 90 System Configuration: SNMP Conf.

The following table describes the labels in this screen.

Table 56 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 Apply 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 Apply 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.

To open this screen, right-click on the switch in the Device List Panel, and click **Configuration > System Configuration > Remote Mgmt.**

Figure 91 System Configuration: Remote Management

The following table describes the labels in this screen.

Table 57 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.
Timeout	For HTTP and HTTPS, you can also specify the administrative idle timeout (in minutes).
Apply	Click Apply 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 End 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 Start 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 Apply to save the changes back to the switch.
Close	Click Close 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.

To open this screen, right-click on the switch in the Device List Panel, and click **Configuration > System Configuration > Time Setup**.

Figure 92 System Configuration: Time Setup

The following table describes the labels in this screen.

Table 58 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 Daytime (RFC 867) 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. Time (RFC-868) format displays a 4-byte integer giving the total number of seconds since 1970/1/1 at 0:0:0. NTP (RFC-1305) is similar to Time (RFC-868) . None 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.
New Time (hh:mm:ss)	Enter the new time in hour, minute and second format.

Table 58 System Configuration: Time Setup (continued)

LABEL	DESCRIPTION
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 Apply to save the changes.

13.5 Syslog Setup

Use this screen to configure syslog settings for a switch. To open this screen, right-click on the switch in the Device List Panel, and click **Configuration > System Configuration > Syslog**.

Figure 93 System Configuration: Syslog Setup

The screenshot shows the Syslog Setup configuration interface. At the top, there are navigation tabs: System Info, SNMP Conf, Remote Mgmt, Time Setup, Syslog Setup, RADIUS, Boot Conf, and IP Setup. The Syslog Setup section contains an 'Active' checkbox, a 'Logging Type' table with columns for 'Active' and 'Facility', and an 'Apply' button. The Syslog Server Setup section contains a table with columns for 'Index', 'Active', 'IP Address', and 'Log Level', and buttons for 'Add', 'Modify', and 'Delete'.

The following table describes the labels in this screen.

Table 59 System Configuration: Syslog Setup

LABEL	DESCRIPTION
Syslog Setup	
Active	Select Active to enable the syslog feature.
Logging Type	This field displays the name of the log type.
Active	Select Active to enable to create and store logs of the selected type.
Facility	Select the log facility. The log facility allows you to log the messages to different files in the syslog server. See your syslog manual for more information
Apply	Click Apply to save your changes.

Table 59 System Configuration: Syslog Setup (continued)

LABEL	DESCRIPTION
Syslog Server Setup	
Index	This field displays the index number.
Active	This field indicates whether the syslog server setting is enabled or not.
IP Address	This field displays the IP address of the syslog server.
Log Level	This field displays the severity level of the logs which is to be stored on the syslog server.
Add	Click Add to configure a new syslog server.
Modify	Click Modify to change the settings of a selected syslog server.
Delete	Click Delete to remove the selected syslog server.

13.5.1 Configuring a Syslog Server

You must specify a syslog server for the switch to send logs. In the Syslog Setup screen, click Add to create a new syslog server entry or click Modify to edit an existing one.

Figure 94 System Configuration: Syslog Setup: Add

The following table describes the labels in this screen.

Table 60 System Configuration: Syslog Setup: Add

LABEL	DESCRIPTION
Active	Select Active to enable the settings of the syslog server.
Server Address	Enter the IP address of a syslog server in dotted decimal notation.
Log Level	Select the severity level of the logs to be stored on the syslog server.
OK	Click OK to save the changes and close this screen.
Cancel	Click Cancel to discard all changes and close this screen.
Clear	Click Clear to start configuring this screen again.

13.6 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.

To open this screen, right-click on the switch in the Device List Panel, and click **Configuration > System Configuration > RADIUS**.

Figure 95 System Configuration: RADIUS

The following table describes the labels in this screen.

Table 61 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 Apply to save your changes.

13.7 Boot Config

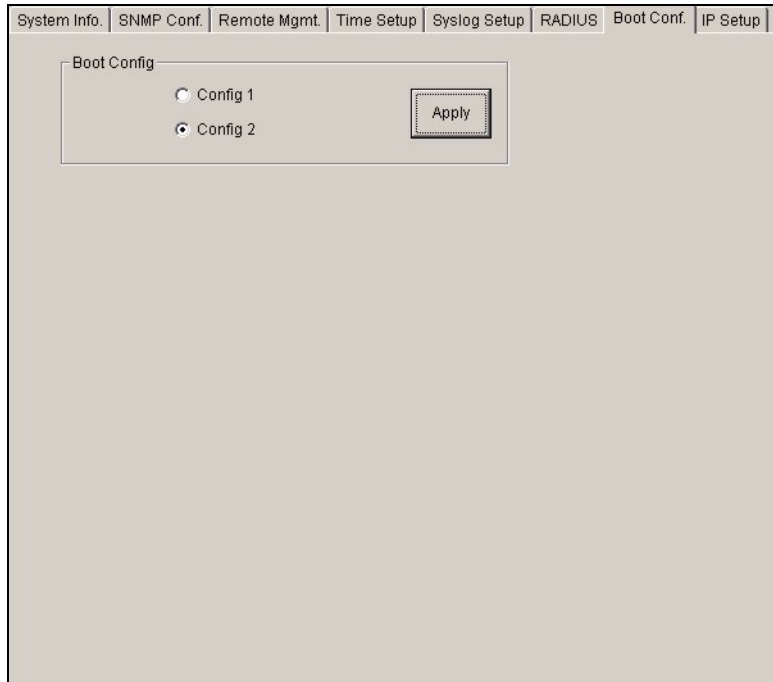
You can store up to two configuration files on the switch. Only one configuration file is used at a time. By default the switch uses the first configuration file (with an index number of 1). You can set the switch to use another configuration file.

Use the **Boot Config** screen to select which configuration file you want the switch to use after the next system reboot.

- 1 Right-click on a switch and click **Configuration > System Configuration** and the **Boot Config** tab.

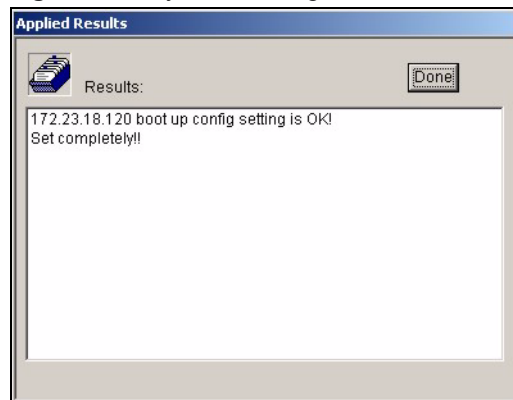
- 2 Specify which configuration the switch is to use after a reboot. Select **Config 1** or **Config 2**.
- 3 Click **Apply** to save the setting.

Figure 96 System Configuration: Boot Config



- 4 When the setting is successful, a result screen displays. Click Done.

Figure 97 System Configuration: Boot Config



- 5 Reboot the switch to have it use the selected configuration file.

13.8 IP Setup

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

To open this screen, right-click on the switch in the Device List Panel, and click **Configuration > System Configuration > IP Setup**.

Figure 98 System Configuration: IP Setup

System Info | SNMP Conf | Remote Mgmt | Time Setup | Syslog Setup | RADIUS | Boot Conf | IP Setup

Domain Name Server: 0 . 0 . 0 . 0

Default Management: In-band Out-of-band

-In-band Management IP Address

DHCP Client Static IP Address

IP Address: 172 . 23 . 18 . 120

IP Subnet Mask: 255 . 255 . 255 . 0

Default Gateway: 172 . 23 . 18 . 254

VID: 1

-Out-of-band Management IP Address

IP Address: 192 . 168 . 0 . 1

IP Subnet Mask: 255 . 255 . 255 . 0

Default Gateway: 0 . 0 . 0 . 0

Apply

-IP Interface

IP Address	IP Subnet Mask	VID	Default Gateway	
				Add
				Modify
				Delete

The following table describes the labels in this screen.

Table 62 System Configuration: IP Setup

LABEL	DESCRIPTION
IP Setup	
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 (In-Band or Out-of-band) the switch is to send packets originating from itself (such as SNMP traps) or packets with unknown source. Select Out-of-band to have the switch send the packets to the management port labelled MGMT . This means that device(s) connected to the other port(s) do not receive these packets. Select In-Band to have the switch send the packets to all ports except the management port (labelled MGMT) to which connected device(s) do not receive these packets.
In-band Management IP Address	Use these fields to set the settings for the in-band management port.
DHCP Client	Select this option to have the switch automatically obtain an IP address from a DHCP server.
Static IP Address	Select this option to specify a fixed IP address for the switch and configure the fields below.
IP Address	Enter the in-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
VID	Enter the VLAN ID to which this IP address belongs.

Table 62 System Configuration: IP Setup (continued)

LABEL	DESCRIPTION
Out-of-band 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 Apply to save the settings for this part of the screen.
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.
Default Gateway	This field displays the IP address of the gateway device.
Manageable	
Add	Click Add to configure a new IP interface.
Modify	Click Modify to change the settings of a selected IP interface.
Delete	Click Delete to remove a selected IP interface.

13.8.1 Configuring an IP Interface

To create a new IP interface, click **Add** in the **IP Setup** screen.

Figure 99 System Configuration: IP Setup: Add

The following table describes the labels in this screen.

Table 63 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 the IP address belongs.

Table 63 System Configuration: IP Setup: Add

LABEL	DESCRIPTION
Default Gateway	Enter the IP address of the gateway device.
Manageable	Select this option to allow device management using this IP address. This means that you can access the device for management through this IP address. Clear this check box to disable this feature.
Add	Click Add to save the settings and close this screen.
Cancel	Click Cancel to discard all changes and close this screen.

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.

To open this screen, right-click on the switch in the Device List Panel, and click **Configuration > Switch Configuration > Switch Setup**.

Figure 100 Switch Configuration: Switch Setup

The screenshot shows the 'Switch Setup' configuration window. It features a title bar with tabs for various switch settings: Priority Queue, LACP Conf., GARP Timer., Multiple STP Conf., MAC Forwarding, Mirroring, Switch Setup, and MAC Filtering. The 'Switch Setup' tab is selected. The main configuration area is divided into several sections:

- VLAN Type:** A dropdown menu is set to '802.1Q'.
- MAC Address Aging Time:** A text input field contains '300' followed by 'seconds'.
- Queuing Method:** A dropdown menu is set to 'Strictly Priority'.
- FE Port SPQ Enable:** A dropdown menu is set to 'Q7'.
- Queues:** Four dropdown menus labeled Q0, Q1, Q2, and Q3 are visible.
- Broadcast Storm Control:**
 - Active
 - Storm Control Type: [dropdown]
 - Packet Limit: [dropdown]
- Active Control:**
 - Link Aggregation
 - Bandwidth control
 - Mirroring
 - 802.1x
 - Port Security
 - GVRP
 - 802.1q Port Isolation
 - 802.1q Ingress Check
 - VLAN Stacking
 - SP TPID: 0x8100 Others [text input] (Hex)
 - Bridge control protocol transparency

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

The following table describes the related labels in the screen.

Table 64 Switch Configuration: Switch Setup

LABEL	DESCRIPTION
VLAN Type	Choose 802.1Q or Port Based from the drop-down list box. The VLAN Setup screen changes depending on whether you choose 802.1Q or Port Based VLAN type in this screen. See Section 16.3 on page 165 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. Strict Priority Queuing (SPQ) 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 Strictly Priority . Weighted Fair Scheduling is used to guarantee each queue's minimum bandwidth based on their bandwidth portion (weight) (the number you configure in the Weight field). Queues with larger weights get more guaranteed bandwidth than queues with smaller weights. Weighted Round Robin Scheduling (WRR) 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.
FE Port SPQ Enable	This field is applicable only when you select WFQ or WRR . Select a queue (Q0 to Q7) to have the switch use Strictly Priority to service the subsequent queue(s) after and including the specified queue for the 10/100 Mbps Ethernet ports. For example, if you select Q5 , the switch services traffic on Q5 , Q6 and Q7 using Strictly Priority . Select None to always use WFQ or WRR for the 10/100 Mbps Ethernet ports.
Q0-Q3	These fields are applicable only for switches that use WRR and for switches that assign queue weights for the entire system (not per port). Use the drop down list boxes to choose queue weights (1-15). Bandwidth is divided across the different traffic queues according to their weights.
Broadcast Storm Control	These fields are not available on all switch models. Set the fields below to configure traffic storm control.
Active	Select Active to enable traffic storm control on the switch.
Storm Control Type	Specify the traffic type in this field. Select Broadcast Only , Broadcast and multicast , Broadcast and unknown unicast or Broadcast, multicast and unknown unicast 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	
Link Aggregation	Select the check box to activate link aggregation.
Bandwidth control	Select the check box to activate bandwidth 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 64 Switch Configuration: Switch Setup (continued)

LABEL	DESCRIPTION
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 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.
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
VLAN Stacking	Select the check box to enable VLAN stacking. In the SP TPID 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 Others 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 Others field.
Bridge control protocol transparency	Select the check box to allow the switch to handle bridging control protocols (STP for example). You also need to define how to treat a BPDU in the Port Setup screen.
Apply	Click Apply 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.

To open this screen, right-click on the switch in the Device List Panel, and click **Configuration > Switch Configuration > Priority Queue** to display the following screen.

Figure 101 Switch Configuration: Priority Queue

MAC Filtering	MAC Forwarding	Mirroring	Switch Setup
Priority Queue	LACP Conf.	GARP Timer.	Multiple STP Conf.

Priority Queue Assignment

Level : 7 6 5 4 3 2 1 0

Priority :

The following table describes the labels in this screen.

Table 65 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 Apply to save your changes back to the switch.

14.3 Multiple/ Rapid STP Configuration

STP (Spanning Tree Protocol) 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. Refer to the user's guide that comes with your switch for more information.

Use the **Multiple STP Conf.** screen to configure STP and/or multiple STP settings on the switch.

To open this screen, right-click on the switch in the Device List Panel, and click **Configuration > Switch Configuration > Multiple STP Conf.**

Figure 102 Switch Configuration: STP Conf.

The following table describes the labels in this screen.

Table 66 Switch Configuration: Multiple STP Conf.

LABEL	DESCRIPTION
Multiple Rapid Spanning Tree Protocol	
Tree	This field displays the index number of a spanning tree.
Active	Select this option to enable the tree.
Bridge 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. Priority determines the root bridge, which in turn determines Hello Time , Max Age and Forward Delay .

Table 66 Switch Configuration: Multiple STP Conf. (continued)

LABEL	DESCRIPTION
Hello Time	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).
Max Age	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).
Forwarding 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).
Rapid Spanning Tree Protocol	
Active	Select this option to enable STP.
Bridge 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. Priority determines the root bridge, which in turn determines Hello Time , Max Age and Forward Delay .
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).
Forwarding 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 Apply 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 67 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 68 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

- 1 First activate link aggregation in the **Switch Setup** screen.
- 2 To open the **LACP Conf.** screen, right-click on the switch in the Device List Panel, and click **Configuration > Switch Configuration > LACP Conf.** to display the configuration screen.



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

Figure 103 Switch Configuration: Link Aggregation

MAC Filtering	MAC Forwarding	Mirroring	Switch Setup
Priority Queue	LACP Conf.	GARP Timer.	Multiple STP Conf.

LACP

System Priority : (1-65535)

Group Setting

GroupID	Active	Dynamic(LACP)
T1	<input type="checkbox"/>	<input type="checkbox"/>
T2	<input type="checkbox"/>	<input type="checkbox"/>
T3	<input type="checkbox"/>	<input type="checkbox"/>
T4	<input type="checkbox"/>	<input type="checkbox"/>
T5	<input type="checkbox"/>	<input type="checkbox"/>
T6	<input type="checkbox"/>	<input type="checkbox"/>

The following table describes the labels in this screen.

Table 69 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 Apply 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 104 Switch Configuration: GARP Timer

The following table describes the labels in this screen.

Table 70 Switch Configuration: GARP Timer

LABEL	DESCRIPTION
Join Timer	Join Timer 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	Leave Timer 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 Join Timer ; the default is 60 centiseconds.
Leave All Timer	Leave All Timer 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 Leave Timer ; the default is 1000 centiseconds.
Apply	Click Apply to save your changes.

14.6 Filtering

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

To open the **MAC Filtering** screen, right-click on the switch in the Device List Panel, and click **Configuration > Switch Configuration > Filtering** to display the following screen.

Figure 105 Switch Configuration: Filtering

Priority Queue	LACP Conf.	GARP Timer.	Multiple STP Conf.		
MAC Filtering	MAC Forwarding	Mirroring	Switch Setup		
Index	Active	Name	MAC Address	VID	Action
1	No	fsdaf	00:99:88:77:66:55	12	Disca
2	Yes	FDF	00:99:88:77:66:55	123	Disca
3	Yes	fdsfs	88:77:66:55:44:33	2211	Disca

The following table describes the labels in this screen.

Table 71 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 Add to create a new filter.
Delete	Click Delete 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 106 Switch Configuration: Filtering: Add

The following table describes the related labels in this screen.

Table 72 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 Discard source to drop frame from the source MAC address (specified in the MAC field). The switch can still send frames to the MAC address. Select Discard destination to drop frames intended for the destination MAC address (specified in the MAC field). The switch can still receive frames originating from the MAC address. Select Discard source and Discard destination to block traffic to/from the MAC address specified in the MAC 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 OK to save the changes and close this screen.
Close	Click Close 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.

To open the configuration screen, right-click on the switch in the Device List Panel, and click **Configuration > Switch Configuration > MAC Forwarding**.

Figure 107 Switch Configuration: MAC Forwarding

Priority Queue	LACP Conf.	GARP Timer.	Multiple STP Conf.
MAC Filtering	MAC Forwarding	Mirroring	Switch Setup

Index	Active	MAC Address	VID	Port
1	Yes	a0:c5:44:11:ff:00	1	1

The following table describes the labels in this screen.

Table 73 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 (Yes) or not (No). 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 Add 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 Delete 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 108 Switch Configuration: MAC Forwarding: Add

The following table describes the labels in this screen.

Table 74 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 OK to save the settings.
Close	Click Close 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 109 Switch Configuration: Mirroring

The following table describes the labels in this screen.

Table 75 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	Select the traffic direction from the drop-down list box. Choices are Ingress (incoming) or Egress (outgoing).
Ingress	You can specify to copy all incoming traffic or traffic to/from a specified MAC address. Select All to copy all incoming traffic from the mirrored port(s). Select Destination MAC to copy incoming traffic to a specified MAC address on the mirrored port(s). Enter the destination MAC address in the fields provided. Select Source MAC 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 All to copy all outgoing traffic from the mirrored port(s). Select Destination MAC to copy outgoing traffic to a specified MAC address on the mirrored port(s). Enter the destination MAC address in the fields provided. Select Source MAC 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 Apply to save the changes.

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.

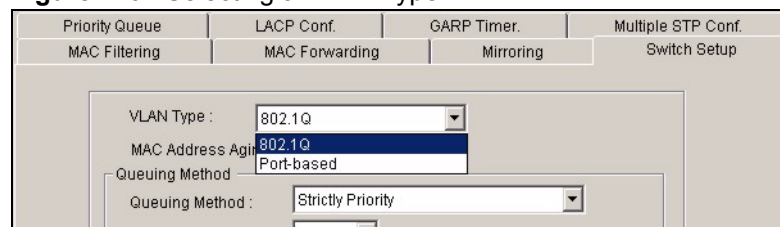
Note that VLAN is unidirectional; it only governs outgoing traffic.

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 110 Selecting a VLAN Type



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

Figure 111 VLAN Configuration: 802.1Q

Device Name	Device IP
es-3124pwr	172.23.18.112

VLAN ID	Name	Status
1	1	Active
100	100	Active

Start VID: End VID:

Number of VLAN(s) per page (Max:100):

Buttons: Refresh, New, Delete, Modify, Load Template

Port List
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
U U

Close

The following table describes the labels in this screen.

Table 76 VLAN Configuration: 802.1Q

LABEL	DESCRIPTION
Device Name	This field displays the descriptive name for the device.
Device IP	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 Active if the VLAN is active and will remain so after the next reset of the device. This field is DynamicGVRP if the VLAN is active and will remain so until removed by GVRP. This field is Other if the VLAN is active, but is not permanent or created by GVRP.
Start VID	Enter the first VID in the range of VLAN IDs you want to display.
End VID	Enter the last VID in the range of VLAN IDs you want to display.
Numbers of VLAN(s) per page (Max 100)	Enter the number of VLAN IDs (between 1 and 100) you want to display at a time.
Refresh	Click Refresh to update the VID list.
New	Click New to create a new VLAN. You must enter a VLAN ID and a VLAN Name to create a new VLAN . 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 Delete button to remove it from the VLAN template.

Table 76 VLAN Configuration: 802.1Q (continued)

LABEL	DESCRIPTION
Modify	Click on a VLAN in the left-hand column of this screen. Change the VLAN ID , VLAN Name or change the configuration of the egress, forbidden and untagged ports. Click the Modify button to save the changes.
Load Template	Use a VLAN template to overwrite existing selected VLANs. Select one or more VLANs and click the Load Template button. See Section 6.2 on page 77 for more information.
Port List	Click on a port in the Egress Ports 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 Table 77 on page 159 for the VLAN port type descriptions.
Close	Click Close 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 112 VLAN Configuration: 802.1Q: New or Modify

The following table describes the labels in this screen.

Table 77 VLAN Configuration: 802.1Q: Modify

LABEL	DESCRIPTION
VLAN Identity	
Active	Select Active to enable this VLAN.
VLAN ID	This field displays a unique number to identify the VLAN.

Table 77 VLAN Configuration: 802.1Q: Modify (continued)

LABEL	DESCRIPTION
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 Egress Ports 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 Table 78 on page 160 for the VLAN port type descriptions.
OK	Click OK to save the changes and close this screen.
Cancel	Click Cancel to close this screen. All unsaved changes will be lost.



A forbidden port cannot be an egress port.

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

Table 78 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.

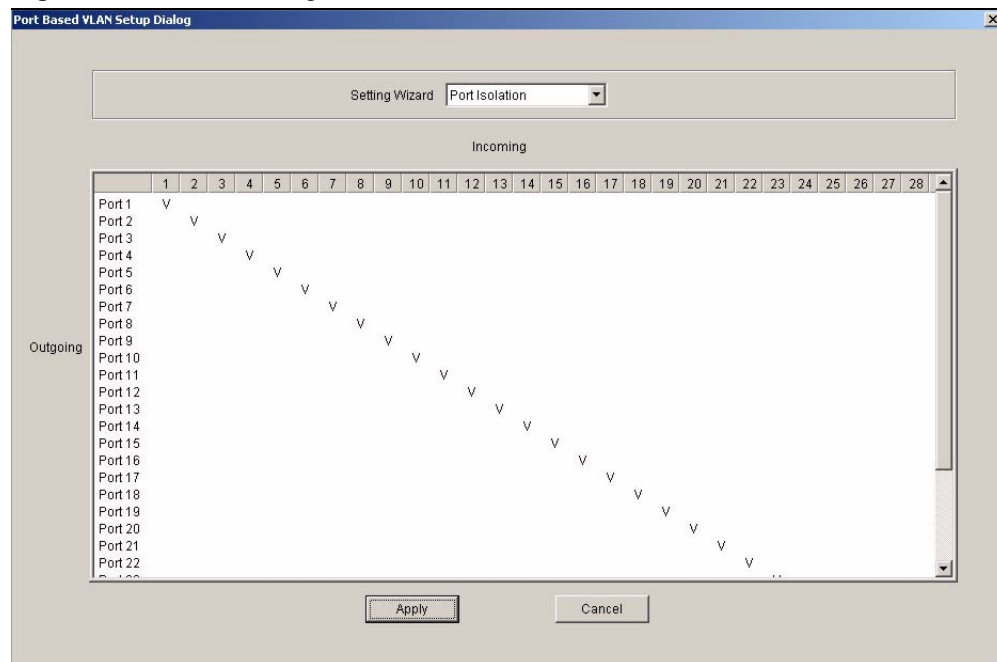
The port-based VLAN setup screen is shown next. The CPU management port forms a VLAN with all Ethernet ports.

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 113 VLAN Configuration: Port Based



The following table describes the labels in this screen.

Table 79 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 Apply button.
Setting Wizard	<p>Choose from All connected or Port isolation.</p> <p>All connected 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>Port isolation means that each port can only communicate with the CPU management port and cannot communicate with each other. All incoming ports are selected while only the CPU outgoing port is selected. This option is the most limiting but also the most secure.</p> <p>After you make your selection, click Apply 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 Apply 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). CPU 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. CPU 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 Apply to save the changes, including the “wizard settings”.
Cancel	Click Cancel to start configuring the screen again.

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 settings.

To open this screen, right-click on the switch in the Device List Panel, and click **Configuration > Ethernet Port > Port Setup**. Then select a device and the port(s) to which you want to apply this configuration.

Figure 114 Ethernet Port Configuration: Port Setup

Port Security	Bandwidth Ctrl.	Broadcast Storm Ctrl.	DiffServ
Port Mirroring	VLAN Stacking	Queue Method	Protocol VLAN
Port Setup	Port VLAN	Port Link Aggregation	Port STP
			Port 802.1x

Active

Type : FastEthernet_10/100

Port Name :

Speed/Duplex : Flow Control

802.1p Priority :

Intrusion Lock

BPDU Control :

Jumbo Frame

PD

The following table describes the fields in this screen.

Table 80 Ethernet Port Configuration: Port Setup

LABEL	DESCRIPTION
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	Enter a descriptive name for identification purposes.
Speed/ Duplex	<p>Select the speed and the duplex mode of the Ethernet connection on this port. Choices are Auto, 10M/Half Duplex, 10M/Full Duplex, 100M/Half Duplex, 100M/Full Duplex and 1000M/Full Duplex (for Gigabit/mini-GBIC ports only).</p> <p>Selecting Auto (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 Flow Control 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 Intrusion Lock 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>Note: You cannot access a port with intrusion locking enabled after a cable is disconnected and then reconnected. You must clear and re-select the Intrusion Lock check box to allow access to the port again.</p>
BPDU Control	<p>Configure the way to treat BPDUs received on this port. You must activate bridging control protocol transparency in the Switch Setup screen first.</p> <p>Select Peer to process any BPDU (Bridge Protocol Data Units) received on this port.</p> <p>Select Tunnel to forward BPDUs received on this port.</p> <p>Select Discard to drop any BPDU received on this port.</p> <p>Select Network to process a BPDU with no VLAN tag and forward a tagged BPDU.</p>

Table 80 Ethernet Port Configuration: Port Setup (continued)

LABEL	DESCRIPTION
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>Note: The peer device must also support non-standard packet traffic.</p>
PD	<p>A powered device (PD) is a device such as an access point or a switch, that supports PoE (Power over Ethernet) so that it can receive power from another device through a 10/100Mbps Ethernet port.</p> <p>Select the check box to allow a powered device (connected to the port) to receive power from the switch.</p>
Apply	Click Apply to save your changes.

16.3 Port VLAN

To open the **Port VLAN** screen, right-click on the switch in the Device List Panel, and click **Configuration > Ethernet Port > Port VLAN**. Then select a device and the port(s) to which you want to apply this configuration.

Figure 115 Ethernet Port Configuration: Port VLAN

Port Security	Bandwidth Ctrl.	Broadcast Storm Ctrl.	DiffServ
Port Mirroring	VLAN Stacking	Queue Method	Protocol VLAN
Port Setup	Port VLAN	Port Link Aggregation	Port STP
		Port 802.1x	

Ingress

PVID: (1 ~ 4094)

GVRP

Acceptable Frame Type:

VLAN Trunking

The following table describes the labels in this screen.

Table 81 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 All and Tag Only . Select All to accept all frames with untagged or tagged frames on this port. This is the default setting. Select Tag Only 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 Apply 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.

To open the configuration screen, right-click on the switch in the Device List Panel, and click **Configuration > Ethernet Port > Port Link Aggregation**. Then select a device and the port(s) to which you want to apply this configuration.

Figure 116 Ethernet Port Configuration: Port Link Aggregation

The screenshot displays the configuration interface for Port Link Aggregation. At the top, there is a horizontal menu with the following items: Port Security, Bandwidth Ctrl., Broadcast Storm Ctrl., DiffServ, Port Mirroring, VLAN Stacking, Queue Method, Protocol VLAN, Port Setup, Port VLAN, Port Link Aggregation (highlighted), Port STP, and Port 802.1x. Below the menu, the configuration area contains a 'Group' dropdown menu currently set to 'None', a 'LACP Timeout' field with a value of '30' and the unit 'seconds', and an 'Apply' button centered at the bottom.

The following table describes the fields in this screen.

Table 82 Ethernet Port Configuring: Port Link Aggregation

LABEL	DESCRIPTION
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 Apply to save the changes.

16.5 Port STP

Use the **Port STP** screen to set multiple/Rapid STP for the selected port(s).

To open the configuration screen, right-click on the switch in the Device List Panel, and click **Configuration > Ethernet Port > Port STP**. Then select a device and the port(s) to which you want to apply this configuration.

Figure 117 Ethernet Port Configuration: Port STP

The following table describes the fields in this screen.

Table 83 Ethernet Port Configuration: Port STP

LABEL	DESCRIPTION
RSTP	Select this check box to activate Rapid STP (RSTP) on this port.
MRSTP	Select this check box to activate Multiple Rapid STP (MRSTP) on this port.
RSTP	

Table 83 Ethernet Port Configuration: Port STP (continued)

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 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.
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).
MRSTP	
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.
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).
Tree	Select the index number of the spanning tree to which this port belongs.
Apply	Click Apply to save the changes.

16.6 Port 802.1x

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

To open the configuration screen, right-click on the switch in the Device List Panel, and click **Configuration > Ethernet Port > Port 802.1x**. Then select a device and the port(s) to which you want to apply this configuration.

Figure 118 Ethernet Port Configuration: Port 802.1x

Port Security	Bandwidth Ctrl.	Broadcast Storm Ctrl.	DiffServ
Port Mirroring	VLAN Stacking	Queue Method	Protocol VLAN
Port Setup	Port VLAN	Port Link Aggregation	Port STP
			Port 802.1x
<input type="checkbox"/> 802.1x Active			
Reauthentication : <input type="text" value="On"/>			
Reauthentication Timer : <input type="text" value="3600"/> seconds			
<input type="button" value="Apply"/>			

The following table describes the fields in this screen.

Table 84 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 On 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 Apply to save the changes.

16.7 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.

To open the **Port Mirroring** screen, right-click on the switch in the Device List Panel, and click **Configuration > Ethernet Port > Port Mirroring**. Then select a device and the port(s) to which you want to apply this configuration.

Figure 119 Ethernet Port Configuration: Port Mirroring

Port Setup	Port VLAN	Port Link Aggregation	Port STP	Port 802.1x
Port Security	Bandwidth Ctrl.	Broadcast Storm Ctrl.	DiffServ	
Port Mirroring	VLAN Stacking	Queue Method	Protocol VLAN	

Mirrored

Direction: Ingress

The following table describes the fields in this screen.

Table 85 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 Egress (outgoing), Ingress (incoming) or Both from the drop-down list box.
Apply	Click Apply to save the changes.

16.8 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.

To open the **VLAN Stacking** screen, right-click on the switch in the Device List Panel, and click **Configuration > Ethernet Port > VLAN Stacking**. Then select a device and the port(s) to which you want to apply this configuration.

Figure 120 Ethernet Port Configuration: VLAN Stacking

Port Setup	Port VLAN	Port Link Aggregation	Port STP	Port 802.1x
Port Security	Bandwidth Ctrl.	Broadcast Storm Ctrl.	DiffServ	
Port Mirroring	VLAN Stacking	Queue Method	Protocol VLAN	

Role :

SPVID : (1 ~ 4094)

Priority :

If the Role is Access Port, and the port is forbidden of the SPVID, then it will fail to apply.

The following table describes the fields in this screen.

Table 86 Ethernet Port Configuration: VLAN Stacking

LABEL	DESCRIPTION
Role	Select Normal to have the switch ignore frames received (or transmitted) on this port with VLAN stacking tags. Anything you configure in SPVID and Priority is ignored. Select Access Port to have the switch add the SP TPID tag to all incoming frames received on this port. Select Access Port for ingress ports at the edge of the service provider's network. Select Tunnel Port (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	SPVID 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 Apply to save the changes.

16.9 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 143](#)).

To open the configuration screen, right-click on the switch in the Device List Panel, and click **Configuration > Ethernet Port > Queue Method**. Then select a device and the port(s) to which you want to apply this configuration.

Figure 121 Ethernet Port Configuration: Queue Method

The following table describes the fields in this screen.

Table 87 Ethernet Port Configuration: Queue Method

LABEL	DESCRIPTION
Q0 - Q7	For Weighted Fair Scheduling , 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 0 for the queue weight, the switch uses Strictly Priority to service the queue.
GE Port SPQ Enable	
SPQ	Select SPQ (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 Strictly Priority . Weighted Fair Scheduling is used to guarantee each queue's minimum bandwidth based on their bandwidth portion (weight) (the number you configure in the Weight field). Queues with larger weights get more guaranteed bandwidth than queues with smaller weights.
WRR	Select WRR (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.
Apply	Click Apply to save the changes.

16.10 Protocol VLAN

Protocol based VLANs allow you to group traffic into logical VLANs based on the protocol you specify. When an upstream frame is received on a port (configured for a protocol based VLAN), the switch checks if a tag is added already and its protocol. The untagged packets of the same protocol are then placed in the same protocol based VLAN. One advantage of using protocol based VLANs is that priority can be assigned to traffic of the same protocol.

Note: Protocol based VLAN applies to un-tagged packets and is applicable only when you use IEEE 802.1Q tagged VLAN.

To open the **Protocol VLAN** screen, right-click on the switch in the Device List Panel, and click **Configuration > Ethernet Port > Protocol VLAN**. Then select a device and the port(s) to which you want to apply this configuration.

Figure 122 Ethernet Port Configuration: Protocol VLAN

Port Security	Bandwidth Ctrl.	Broadcast Storm Ctrl.	DiffServ
Port Setup	Port VLAN	Port Link Aggregation	Port STP
Port 802.1x	Port Mirroring	VLAN Stacking	Queue Method
Protocol VLAN			

Index	Active	Port	Name	Ethernet-type	VID
1	V	1	ARPTTest	arp	1

The following table describes the fields in this screen.

Table 88 Ethernet Port Configuration: Protocol VLAN

TABLE	DESCRIPTION
Index	This is the index number identifying this protocol based VLAN.
Active	This field shows whether the protocol based VLAN is active or not.
Port	This field shows which port belongs to this protocol based VLAN.
Name	This field shows the name the protocol based VLAN.
Ethernet Type	This field shows which Ethernet protocol is part of this protocol based VLAN.
VID	This field shows the VLAN ID of the port.
Priority	This field shows the priority which is assigned to frames belonging to this protocol based VLAN.
Add	Click Add to create a new protocol VLAN entry.
Modify	Click Modify to change the settings of a selected protocol VLAN.
Delete	Click Delete to remove the selected protocol based VLANs.

16.10.1 Configuring a Protocol VLAN

To create a new protocol VLAN, click **Add** in the **Protocol VLAN** screen. Click **Modify** to change the settings of the selected entry. The **Protocol VLAN Add** or **Protocol VLAN Modify** screen displays.

Figure 123 Ethernet Port Configuration: Protocol VLAN Add

The following table describes the fields in this screen.

Table 89 Ethernet Port Configuration: Protocol VLAN

TABLE	DESCRIPTION
Active	Check this box to activate this protocol based VLAN.
Port	This read-only field displays the port number to which this protocol VLAN setting is applied.
Name	Enter up to 32 alphanumeric characters to identify this protocol based VLAN.
Ethernet-type	Use the drop down list box to select a predefined protocol to be included in this protocol based VLAN or select Others and type the protocol number in hexadecimal notation. For example the IP protocol in hexadecimal notation is 0800, and Novell IPX protocol is 8137. Note: Protocols in the hexadecimal number range of 0x0000 to 0x05ff are not allowed to be used for protocol based VLANs.
VID	Enter the ID of a VLAN to which the port belongs. This must be an existing VLAN which you defined in the Advanced Applications, VLAN screens.
Priority	Select the priority level that the switch will assign to frames belonging to this VLAN.
OK	Click OK to save the settings and close this screen.
Close	Click Close to discard all changes and close this screen.

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.

To open the **Port Security** screen, right-click on the switch in the Device List Panel, and click **Configuration > Ethernet Port > Port Security**. Then select a device and the port(s) to which you want to apply this configuration.

Figure 124 Ethernet Port Configuration: Port Security

Port Mirroring	VLAN Stacking	Queue Method	Protocol VLAN
Port Setup	Port VLAN	Port Link Aggregation	Port STP
Port Security	Bandwidth Ctrl.	Broadcast Storm Ctrl.	DiffServ
<input type="checkbox"/> Active <input type="checkbox"/> Address Learning Limited Number of Learned MAC Address : <input type="text"/> <input type="button" value="MAC Freeze"/> <input type="button" value="Apply"/>			

The following table describes the fields in this screen.

Table 90 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 Address Learning 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 Switch Setup 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 MAC Freeze to convert all current dynamic MAC addresses to static MAC addresses. When you click the MAC Freeze button, the MAC Address Learning check box is cleared but port security becomes Active .
Apply	Click Apply to save the changes.

16.12 Bandwidth Control

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

To open the configuration screen, right-click on the switch in the Device List Panel, and click **Configuration > Ethernet Port > Bandwidth Ctrl.** Then select a device and the port(s) to which you want to apply this configuration.

Figure 125 Ethernet Port Configuration: Bandwidth Ctrl.

Port Setup	Port VLAN	Port Link Aggregation	Port STP	Port 802.1x
Port Mirroring	VLAN Stacking	Queue Method	Protocol VLAN	
Port Security	Bandwidth Ctrl.	Broadcast Storm Ctrl.	DiffServ	

Ingress Rate :

enable Commit Rate : Kbps

enable Peak Rate : Kbps

Egress Rate :

enable Egress Rate : Kbps

The following table describes the labels in this screen.

Table 91 Ethernet Port Configuration: Bandwidth Ctrl.

LABEL	DESCRIPTION
Enable	Select this check box to enable ingress and/or egress bandwidth control. 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.
Commit 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.
Apply	Click Apply to save the changes.

16.13 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.

To open the configuration screen, right-click on the switch in the Device List Panel, and click **Configuration > Ethernet Port > Broadcast Storm Ctrl.** Then select a device and the port(s) to which you want to apply this configuration.

Figure 126 Ethernet Port Configuration: Broadcast Storm Ctrl.

Port Mirroring	VLAN Stacking	Queue Method	Protocol VLAN
Port Setup	Port VLAN	Port Link Aggregation	Port STP
Port Security	Bandwidth Ctrl.	Broadcast Storm Ctrl.	DiffServ

Broadcast (pkt / s)

Multicast (pkt / s)

DLF (pkt / s)

The following table describes the labels in this screen.

Table 92 Ethernet Port Configuration: Broadcast Storm Ctrl.

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

16.14 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 19.2 on page 201](#)).
- 4 Click **Apply** to save the changes.

Figure 127 Ethernet Port Configuration: DiffServ

Port Mirroring	VLAN Stacking	Queue Method	Protocol VLAN	
Port Setup	Port VLAN	Port Link Aggregation	Port STP	Port 802.1x
Port Security	Bandwidth Ctrl.	Broadcast Storm Ctrl.	DiffServ	

Active

Apply

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 subnetwork. 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 79](#).

17.2 Multicast Settings

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



For devices that do not support the multicast feature, this screen only allows you to configure the **IGMP Snooping** option.

Figure 128 Multicast Configuration: Multicast Settings

The following table describes the labels in this screen.

Table 93 Multicast Configuration: Multicast Settings

LABEL	DESCRIPTION
IGMP Snooping	Select Active to enable IGMP snooping to forward group multicast traffic only to ports that are members of that group.
Host Timeout	Specify the time (from 1 to 16,711,450) in seconds that elapses before the switch removes an IGMP group membership entry if it does not receive report messages from the port.
Leave Timeout	Enter an IGMP leave timeout value (from 1 to 16,711,450) in seconds. This defines how many seconds the switch waits for an IGMP report before removing an IGMP snooping membership entry when an IGMP leave message is received from a host.
802.1p Priority	Select a priority level (0-7) to which the switch changes the priority in outgoing IGMP control packets. Otherwise, select No-Change to not replace the priority.
IGMP Filtering	Select Active to enable IGMP filtering to control which IGMP groups a subscriber on a port can join.

Table 93 Multicast Configuration: Multicast Settings (continued)

LABEL	DESCRIPTION
Unknown Multicast Frame	Specify the action to perform when the switch receives an unknown multicast frame. Select Drop to discard the frame(s). Select Flooding to send the frame(s) to all ports.
Reserved Multicast Group	Multicast addresses (224.0.0.0 to 224.0.0.255) are reserved for the local scope. For examples, 224.0.0.1 is for all hosts in this subnet, 224.0.0.2 is for all multicast routers in this subnet, etc. A router will not forward a packet with the destination IP address within this range. See the IANA web site for more information. Specify the action to perform when the switch receives a frame with a reserved multicast address. Select Drop to discard the frame(s). Select Flooding to send the frame(s) to all ports.
Apply	Click Apply to save the settings in this part of the screen.
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 (Default) prohibits the port from joining any multicast group.
IGMP Querier Mode	This field displays the IGMP querier mode on the port.
Modify	Click Modify to change the multicast settings of the selected port.
Load Template	Click Load Template to display a screen you use to select a multicast template.
View Profile	Click View Profile to display the settings of a selected multicast template.

17.2.1 Configuring 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 129 Multicast Configuration: Multicast Settings: Modify

Port	Immed. Leave	Group Limited	Max Group Num	IGMP Filtering Profile	IGMP Querier Mode
1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3	Default	Edge

OK Cancel

The following table describes the labels in this screen.

Table 94 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 0 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 Default to prohibit the port from joining any multicast group.
IGMP Querier Mode	The switch treats an IGMP query port as being connected to an IGMP multicast router (or server). The switch forwards IGMP join or leave packets to an IGMP query port. Select Auto to have the switch use the port as an IGMP query port if the port receives IGMP query packets. Select Fixed to have the switch always use the port as an IGMP query port. Select this when you connect an IGMP multicast server to the port. Select Edge to stop the switch from using the port as an IGMP query port. The switch will not keep any record of an IGMP router being connected to this port. The switch does not forward IGMP join or leave packets to this port.
OK	Click OK to save your changes and close this screen.
Cancel	Click Cancel 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.



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 130 Multicast Configuration: Multicast Settings: Load Template

The following table describes the labels in this screen.

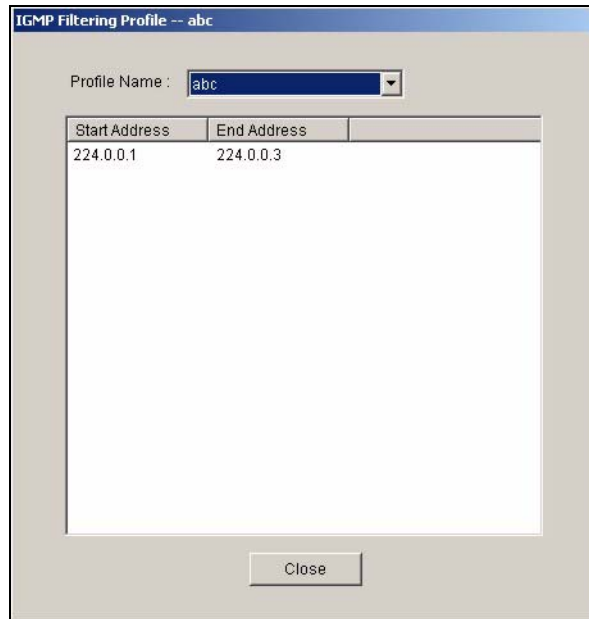
Table 95 Multicast Configuration: Multicast Settings: Load Template

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 Template screen.
PortList	This table displays the template settings. Refer to Figure 128 on page 180 for more information.
Apply	Click Apply to save the settings and close this screen.
Cancel	Click Cancel 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 79](#)) 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 131 Multicast Configuration: Multicast Settings: View Profile

The following table describes the labels in this screen.

Table 96 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 Close 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.

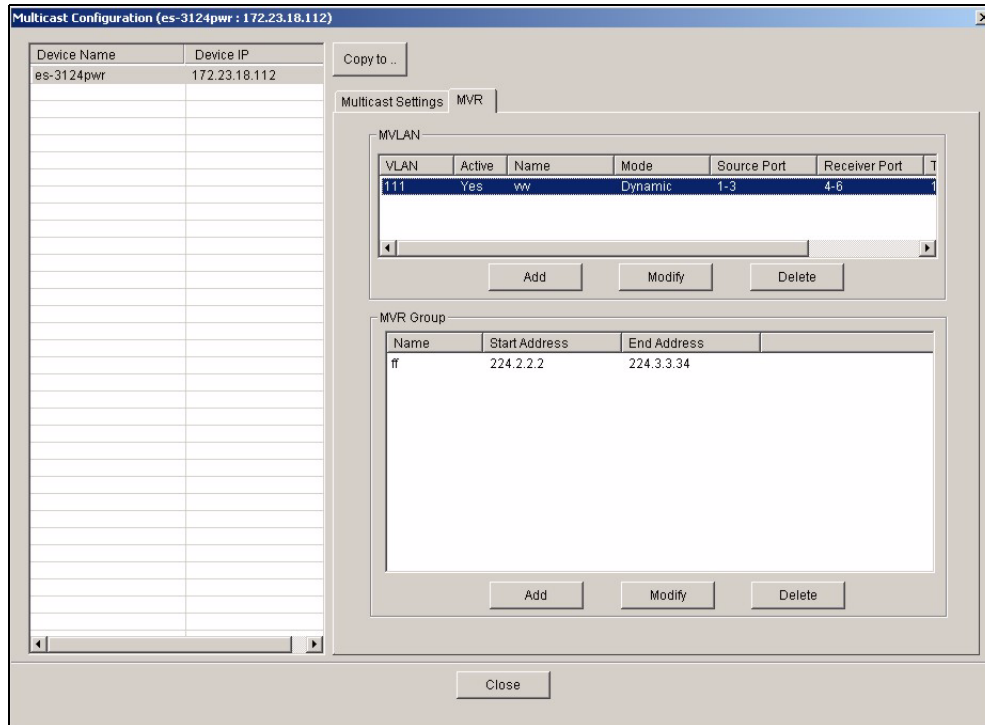
In compatible mode, the switch does not send any IGMP reports through the source port(s). In this case, you must manually configure the forwarding settings on the multicast devices in the multicast VLAN.

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 132 Multicast Configuration: MVR



The following table describes the labels in this screen.

Table 97 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.
802.1p	This field displays the priority level.
Add	Click Add to add a new entry.
Modify	Click Modify to change the settings of the selected MVLAN.
Delete	Click Delete 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.
Add	Click Add to add a new entry.
Modify	Click Modify to change the settings of the selected MVR.
Delete	Click Delete 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 133 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 **802.1p Priority** field, select a priority level (0-7) with which the switch replaces the priority in outgoing IGMP control packets (belonging to this multicast VLAN).
- 6 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.
- 7 In the **Source Port** list box, select the MVR source port that sends and receives multicast traffic.
- 8 In the **Receiver Port** list box, select the port(s) that only receives multicast traffic.
- 9 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).
- 10 In the **Tagging** list box, select the port(s) to add the VLAN ID tag to all outgoing frames.
- 11 Click **OK** to save the settings and close this screen. Otherwise, click **Cancel** to discard the settings and close this screen.
- 12 A screen displays showing the configuration result. Click **Done** to close the screen.

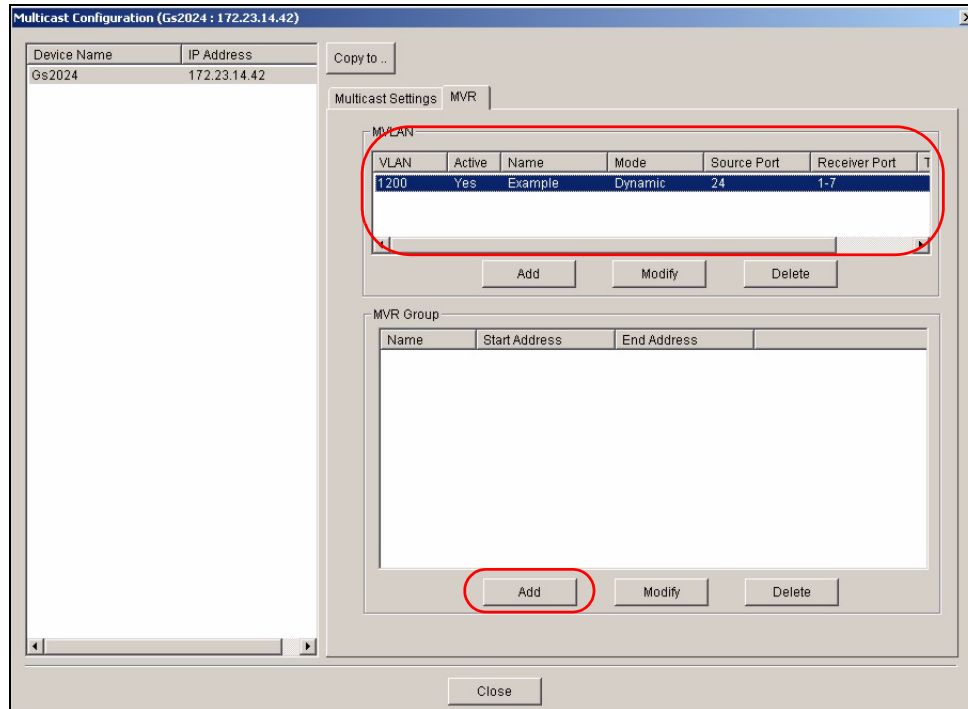
Figure 134 Multicast Configuration: MVR: Add MVLAN: Result

17.3.5 Creating a New MVR Group

Follow the steps below to create a new MVR group.

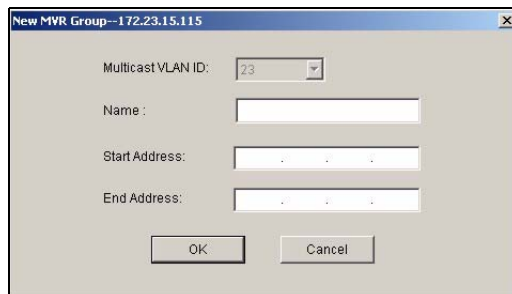
- 1 In the **MVR** screen, select one entry in the **MVLAN** list table.
- 2 Click **Add** under **MVR Group**.

Figure 135 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.

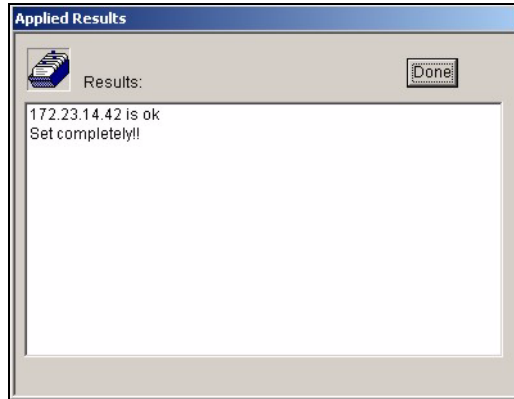
Figure 136 Multicast Configuration: MVR: Add



- 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 137 Multicast Configuration: MVR: Add MVR Group: Result



Configuration

Use this menu item to look at and configure RMON (Remote Network Monitor) on a switch.

18.1 RMON Overview

Similar to SNMP, RMON (Remote Network Monitor) allows you to gather and monitor network traffic.

Both SNMP and RMON use an agent, known as a probe, which are software processes running on network devices to collect information about network traffic and store it in a local MIB (Management Information Base). With SNMP, a network manager has to constantly poll the agent to obtain MIB information. With RMON, the probe is located on a remote device (the MSC), so a network manager (the EMS) does not need to constantly poll the probe for information. The probe communicates with the network manager via SNMP.

RMON groups contain detailed information about specific activities. The following table describes the four RMON groups that your IES supports.

Table 98 Supported RMON Groups

GROUP	DESCRIPTION
History	Records network traffic information on a specified Ethernet port.
Alarm	Provides alerts when configured alarm conditions are met.
Event	Defines event generation and resulting actions to be taken based on an alarm.

18.2 History Config

Use this screen to view and configure RMON history configuration settings. To open this screen, right-click on the switch in the Device List Panel, and click **Configuration > RMON Configuration > History Config**. Then, select the switch that you want to configure.

Figure 138 RMON Configuration: History Config.

Index	Active	Data Source	Bucket Requested	Bucket Granted	Interval
1	Yes	ifIndex.2	50	50	30
2	Yes	ifIndex.2	50	50	180
3	Yes	ifIndex.3	50	50	30
4	Yes	ifIndex.3	50	50	180
5	Yes	ifIndex.4	50	50	30
6	Yes	ifIndex.4	50	50	180
7	Yes	ifIndex.5	50	50	30
8	Yes	ifIndex.5	50	50	180
9	Yes	ifIndex.6	50	50	30
10	Yes	ifIndex.6	50	50	180
11	Yes	ifIndex.7	50	50	30
12	Yes	ifIndex.7	50	50	180

The following table describes the labels in this screen.

Table 99 RMON Configuration: History Config.

LABEL	DESCRIPTION
Index	This field displays the configuration index number.
Active	This field displays Yes if the history setting is enabled. Otherwise, it displays No .
Data Source	This is the port of the IP DSLAM that the EMS will poll for data.
Bucket Requested	This field displays the number of data samplings the network manager requests the probe to store.
Bucket Granted	This field displays the number of data samplings the probe allows to stores.
Interval (sec)	This field displays the time between data samplings.
Owner	This field displays the application that creates this entry.
New	Click this to add a new history configuration.
Delete	Click this to remove the selected history configuration.
Modify	Click this to change the setting of the selected history configuration.

18.2.1 Configuring an RMON History

To configure a new RMON history, click **New** in the **History Config.** screen.

To change the settings of a selected RMON history, click **Modify** in the **History Config.** screen.

Figure 139 RMON Configuration: History Config.: New

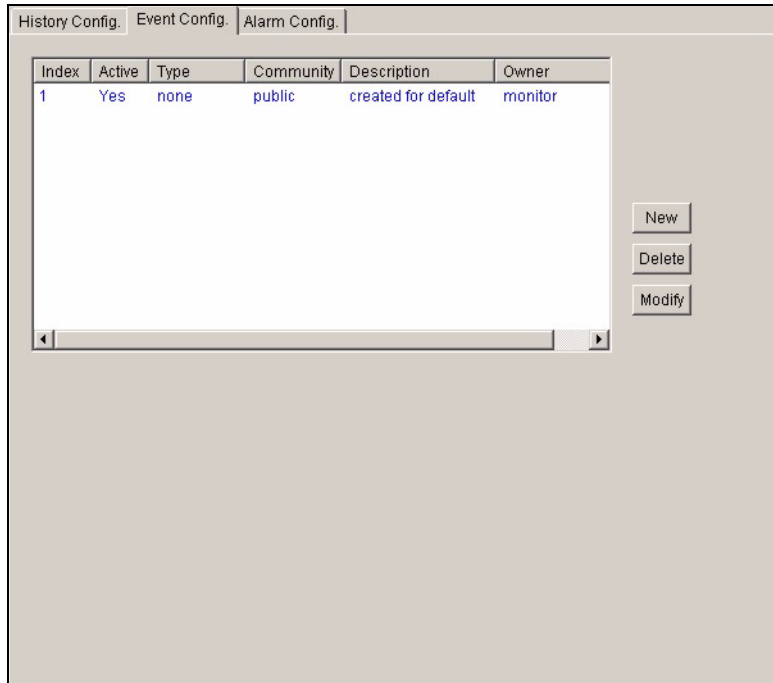
The following table describes the labels in this screen.

Table 100 RMON Configuration: History Config.: New

LABEL	DESCRIPTION
Active	Select Yes to enable this rule. Select No to disable this rule.
Data Source	Select the port of the switch that the EMS polls for data. The probe sends data from this port.
Interval	Enter the time (in seconds) between data samplings.
Bucket Requested	Specify the number of data samplings (between 1 and 100) the network manager requests the probe to store.
Owner	Enter a descriptive name of the application that creates this entry. You can use 1-31 printable characters. Spaces are allowed.
OK	Click this to save the settings and close this screen.
Cancel	Click this to discard all changes and close the screen.

18.3 Event Config

Use the **Event Config** screen to configure the actions that a switch takes when an alarm is triggered. To open this screen, right-click on the switch in the Device List Panel, and click **Configuration > RMON Configuration > Event Config**. Then, select the switch that you want to configure.

Figure 140 RMON Configuration: Event Config.

The following table describes the labels in this screen.

Table 101 RMON Configuration: Event Config.

LABEL	DESCRIPTION
Index	This field displays an event index number.
Active	This field display whether an event is enabled (Yes) or not (No).
Type	This field displays the event type (log , snmp-trap or log&trap).
Community	This field displays the community (or password).
Description	This field displays a description of the event.
Owner	Enter a descriptive name of the application that creates this entry.
New	Click this to add a new event configuration.
Delete	Click this to remove the selected event configuration.
Modify	Click this to change the settings of the selected event configuration.

18.3.1 Configuring an RMON Event

To create a new RMON event, click **New** in the **Event Config.** screen.

To change the settings of a selected RMON event, click **Modify** in the **Event Config.** screen.

Figure 141 RMON Configuration: Event Config.: New

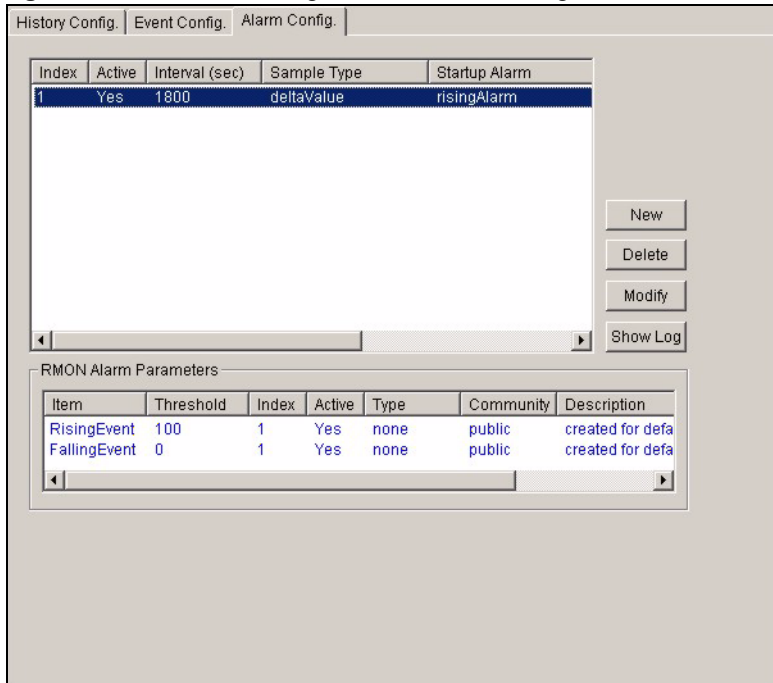
The following table describes the labels in this screen.

Table 102 RMON Configuration: Event Config.: New

LABEL	DESCRIPTION
Active	Select Yes to enable this event. Otherwise, select No .
Type	Select an event type. Choices are Log and Trap . Select Log to generate a log when an associated alarm is generated. Select Trap to generate a trap when an associated alarm is generated. Select both Log and Trap to generate a log entry and trap when an associated alarm is generated.
Community	This field displays the community (or password). You can use 1-31 printable ASCII characters. Spaces are allowed.
Description	Enter a description of the event. You can use 1-127 printable ASCII characters. Spaces are allowed. You can also leave this field blank.
Owner	Enter a descriptive name of the application that creates this entry. You can use 1-31 printable ASCII characters. Spaces are allowed.
OK	Click this to save the settings and close this screen.
Cancel	Click this to discard all changes and close the screen.

18.4 Alarm Config

Use this screen to configure alarms that occur when the sampled data exceeds the specified threshold. To open this screen, right-click on the switch in the Device List Panel, and click **Configuration > RMON Configuration > Alarm Config**. Then, select the switch that you want to configure.

Figure 142 RMON Configuration: Alarm Config.

The following table describes the labels in this screen.

Table 103 RMON Configuration: Alarm Config.

LABEL	DESCRIPTION
Index	This field displays the alarm configuration index number.
Active	This field displays Yes if an alarm configuration is enabled. Otherwise, it displays No .
Interval (sec)	This field displays the time interval (in seconds) between data samplings.
Sample Type	This field displays the method of obtaining the sample value (Absolute or Delta).
Startup Alarm	This field displays the alarm type (Rising , Falling , R/F) that can be sent when this alarm is first activated.
Port	This field displays the port number.
Variable	This field displays the name of the MIB field whose data is to be sampled.
Owner	This field displays the name of the application that creates this entry.
New	Click this to add a new history configuration.
Delete	Click this to remove the selected history configuration.
Modify	Click this to change the setting of the selected history configuration.
Show Log	Click this to view logs.
RMON Alarm Parameters	
Item	This field indicates the type of alarm.
Threshold	This field displays the threshold setting for the type of alarm. The meaning depends on the type of alarm.
Index	This field displays the event index number.
Active	This field display whether an alarm is enabled (Yes) or not (No).

Table 103 RMON Configuration: Alarm Config. (continued)

LABEL	DESCRIPTION
Type	This field displays the alarm type (log , snmp-trap or log&trap).
Community	This field displays the community (or password).
Description	This field displays a description of the alarm.
Owner	This field displays the name of the application that creates this entry.

18.4.1 Configuring an RMON Alarm

To create a new RMON alarm, click **New** in the **Alarm Config.** screen.

To change the settings of a selected RMON alarm, click **Modify** in the **Alarm Config.** screen.

Figure 143 RMON Configuration: Alarm Config.: New

The following table describes the labels in this screen.

Table 104 RMON Configuration, Alarm Config., New

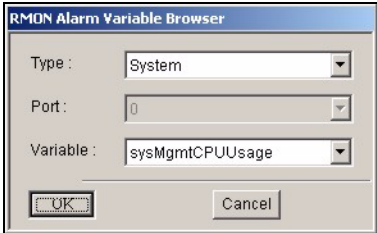
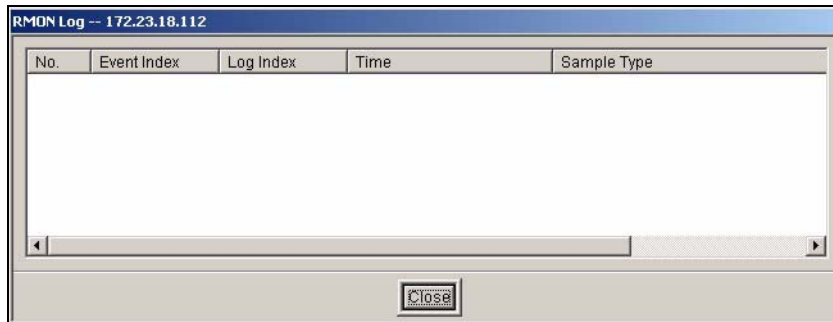
LABEL	DESCRIPTION
Active	Select Yes to enable this alarm. Otherwise, select No .
Variable	Click Browse to select the variable whose data is sampled. The following screen appears. Figure 144 RMON Configuration: Alarm Config.: New: Browse  Select the type, port, and variable whose data should be sampled, and click OK .
Interval	Specify the time between data samplings.

Table 104 RMON Configuration, Alarm Config., New (continued)

LABEL	DESCRIPTION
Sample Type	Select the method of obtaining the sample value. Choices are Absolute Value and Delta Value .
Startup Alarm	Select the startup alarm type (Rising Alarm , Falling Alarm , Rising Or Falling Alarm).
Rising Condition	
Rising Threshold	Specify a rising threshold (between 0 and 2147483647). When a value that is greater or equal to this threshold, the probe triggers an alarm.
Rising Event	Click Browse to select an index number of a rising event.
Falling Condition	
Falling Threshold	Specify the falling threshold (between 0 and 2147483647). When a value that is smaller or equal to this threshold, the probe triggers an alarm.
Falling Event	Click Browse to select an index number of a falling event.
Owner	Enter a descriptive name of the application that creates this entry. You can use 1-31 printable ASCII characters. Spaces are allowed.
OK	Click this to save the settings and close this screen.
Cancel	Click this to discard all changes and close the screen.

18.4.2 RMON Alarm Event Log

Use this screen to display alarm logs. To open this screen, click **Configuration**, **RMON Configuration**, **Alarm Config**, **Show Log**.

Figure 145 RMON Configuration: Alarm Config.: Show Log

The following table describes the labels in this screen.

Table 105 RMON Configuration: Alarm Config.: Show Log

LABEL	DESCRIPTION
No.	This field displays an index number.
Event Index	This field displays an event index number.
Log Index	This field displays a log index number.
Time	This field displays the time a log was generated.
Sample Type	This field displays the method of obtaining the sample value.
Close	Click this to close this screen.

IP Configuration

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

19.1 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 146 IP Configuration: Static Route

Index	Name	Active	Destination Address	Subnet Mask	Gateway Address	Metric
1	Example	No	172.23.11.100	255.255.25...	172.23.11.254	15
2	Example	No	172.23.37.100	255.255.25...	172.23.37.254	15
3	Example	No	192.168.1.100	255.255.25...	192.168.1.1	15

Static Route | DiffServ | DSCP Setting | IGMP | DHCP | DVMPRP | RIP | OSPF | VRRP | IP Multicast

Add

Modify

Delete

The following table describes the labels in the summary table.

Table 106 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 Yes when the static route is activated and No 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 Add button to create a new static route.
Modify	Select the rule(s) that you want to change and click the Modify button.
Delete	Select the rule(s) that you want to remove in the Delete column, and then click the Delete button.

19.1.1 Configuring 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 147 Routing Configuration: Static Route: Add

The following table describes the labels in this screen.

Table 107 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.

Table 107 Routing Configuration: Static Route: Add or Modify (continued)

LABEL	DESCRIPTION
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 OK to save the settings and close this screen.
Cancel	Click Cancel to discard all changes and close this screen.

19.2 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 this feature in the **DiffServ** screen. Click **IP Configuration > DiffServ** to display the screen as shown.

Figure 148 IP Configuration: DiffServ

The following table describes the labels in this screen.

Table 108 DiffServ: DSCP Setting

LABEL	DESCRIPTION
Active	Select Active to enable DiffServ on the port.
Apply	Click Apply to save the changes.

19.3 DSCP Setting

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 109 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 **DSCP Setting** screen.

Figure 149 IP Configuration: DiffServ

The screenshot shows the 'DSCP Setting' configuration page. At the top, there are tabs for 'Static Route', 'DiffServ', 'DSCP Setting', 'IGMP', 'DHCP', 'DVMRP', 'RIP', 'OSPF', 'VRRP', and 'IP Multicast'. The main area is titled 'DSCP to 802.1p Mapping' and contains a grid of 64 entries. Each entry consists of a DSCP value on the left and a corresponding IEEE802.1p value in a dropdown menu on the right. The default mapping is as follows:

DSCP	IEEE802.1p
0	0
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	1
9	1
10	1
11	1
12	1
13	1
14	1
15	1
16	2
17	2
18	2
19	2
20	2
21	2
22	2
23	2
24	3
25	3
26	3
27	3
28	3
29	3
30	3
31	3
32	4
33	4
34	4
35	4
36	4
37	4
38	4
39	4
40	5
41	5
42	5
43	5
44	5
45	5
46	5
47	5
48	6
49	6
50	6
51	6
52	6
53	6
54	6
55	6
56	7
57	7
58	7
59	7
60	7
61	7
62	7
63	7

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

The following table describes the labels in this screen.

Table 110 DiffServ: DSCP Setting

LABEL	DESCRIPTION
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 Apply to save the changes.

19.4 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.

Right-click on a device in the Device Panel and click **Configuration > IP Configuration > IGMP** to display the configuration screen.

Figure 150 IP Configuration: IGMP

The screenshot shows the IGMP configuration interface. At the top, there is a horizontal menu with tabs for 'Static Route', 'DiffServ', 'DSCP Setting', 'IGMP', 'DHCP', 'DVMRP', 'RIP', 'OSPF', 'VRRP', and 'IP Multicast'. The 'IGMP' tab is active. Below the menu, there is a checkbox labeled 'Active' which is currently unchecked. Underneath the checkbox is a table with three columns: 'Index', 'Network', and 'Version'. The table is currently empty. At the bottom center of the configuration area is an 'Apply' button.

The following table describes the labels in this screen.

Table 111 IP Configuration: IGMP

LABEL	DESCRIPTION
Active	Select this check box to enable IGMP on the switch. Note: 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 Section 13.8 on page 139 for more information on configuring IP domains.
Version	Select an IGMP version from the drop-down list box. Choices are IGMP-v1 , IGMP-v2 and None .
Apply	Click Apply to save your changes.

19.5 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.

19.5.1 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.

19.5.2 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 151 IP Configuration: DHCP: Server

The following table describes the related labels in this screen.

Table 112 IP Configuration: DHCP: Server

LABEL	DESCRIPTION
Server	
VID	This field displays the ID number of the VLAN group to which this DHCP settings apply.
Type	This field displays Server for the DHCP mode.
DHCP Status	This field displays the starting and the size of DHCP client IP address.
Add	Click Add to configure DHCP client pool settings.
Modify	Click Modify to change the settings of the selected DHCP client pool.
Delete	Click Delete to remove the selected DHCP client pool setting.

- 4 Click **Add** to configure DHCP client pool information.

Figure 152 IP Configuration: DHCP: Server: New

The following table describes the labels in this screen.

Table 113 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.
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.
Apply	Click Apply to save the changes and close this screen.
Cancel	Click Cancel to discard all changes and close this screen.

19.5.3 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.

19.5.3.1 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 153 IP Configuration: DHCP: Relay

The screenshot shows the DHCP configuration interface with the following details:

- Static Route | DiffServ | DSCP Setting | IGMP | DHCP | DVMP | RIP | OSPF | VRRP | IP Multicast** (Navigation tabs)
- Relay** (Selected tab)
 - Relay
 - Server
 - Relay: Active
 - Remote DHCP Server 1: 0 . 0 . 0 . 0
 - Remote DHCP Server 2: 0 . 0 . 0 . 0
 - Remote DHCP Server 3: 0 . 0 . 0 . 0
 - Relay Agent Information: Option82
 - Information: ES-3124PWR
 - Apply button
- Server** (Tab)

VID	Type	DHCP Status

 - Add button
 - Modify button
 - Delete button

The following table describes the related labels in this screen.

Table 114 IP Configuration: DHCP: Relay

LABEL	DESCRIPTION
Relay	
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 Option 82 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 System Information screen (refer to Section 14.1 on page 143). 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 Apply to save the changes.

19.6 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.

To open the **DVMRP** screen, right-click on a switch in the Device Panel list and click **Configuration > IP Configuration > DVMRP**.

Figure 154 IP Configuration: DVMRP

The following table describes the labels in this screen.

Table 115 IP Configuration: DVMRP

LABEL	DESCRIPTION
Active	Select Active 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 Network . The maximum number of DVMRP configurations allowed is the maximum number of IP routing domains allowed on the switch. See Section 13.8 on page 139 for more information on IP routing domains.
Network	This is the IP routing domain IP address and subnet mask you set up in IP Setup .
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 Yes to enable DVMRP on this IP routing domain. Select No to disable this feature.
Apply	Click Apply to save these changes.

19.7 RIP

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

To open the **RIP** screen, right-click on a switch in the Device Panel list and click **Configuration > IP Configuration > RIP**.

Figure 155 IP Configuration: RIP

Index	Network	Direction	Version
1	172.23.18.121/24	None	RIP-1
2	192.168.1.1/24	None	RIP-1

The following table describes the labels in this screen.

Table 116 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.
Direction	The Direction field controls the sending and receiving of RIP packets. When set to: <ul style="list-style-type: none"> • Both - the switch will broadcast its routing table periodically and incorporate the RIP information that it receives. • Incoming - the switch will not send any RIP packets but will accept all RIP packets received. • Outgoing - the switch will send out RIP packets but will not accept any RIP packets received. • None - the switch will not send any RIP packets and will ignore any RIP packets received.
Version	Select the RIP version from the drop-down list box. Choices are RIP-1 , RIP-2B and RIP-2M .
Apply	Click Apply to save the changes.

19.8 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 117 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

19.8.1 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.

19.8.2 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.

19.8.3 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 156 IP Configuration: OSPF

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

- Active:** A checked checkbox.
- Router ID:** A text field containing "1 . 0 . 0 . 1".
- Redistribute Route:** A table with columns: Redistribute Route, Active, Type, Metric value.

Redistribute Route	Active	Type	Metric value
RIP	<input checked="" type="checkbox"/>	1	15
Static	<input checked="" 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	1	1.0.0.1	MD5	
- Virtual-Link:** A table with columns: Index, Name, Peer Router ID, Authentication, Key ID.

Index	Name	Peer Router ID	Authentication	Key ID
1	1	1.0.0.1	MD5	1
- Interface:** A table with columns: Index, Network, Area ID, Authentication, Key ID, Cost.

Index	Network	Area ID	Authentication	Key ID	Cost
1	172.23.18.121/24	1.0.0.1	MD5	1	15

The following table describes the related labels in this screen.

Table 118 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 (RIP and Static) into the OSPF network transparently.
Active	Select this option to activate route redistribution for routes learnt through the selected protocol.
Type	Select 1 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 2 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 Apply 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 0.0.0.0 indicates the backbone.

Table 118 IP Configuration: OSPF (continued)

LABEL	DESCRIPTION
Authentication	This field displays the authentication method used (None , Simple or MD5).
Stub Network	This field displays whether an area is a stub network (Yes) or not (No).
Add	Click Add to create a new OSPF area.
Modify	Click Modify to change the settings of the selected OSPF area.
Delete	Click Delete 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 (Same-as-Area , None , Simple or MD5).
Key ID	When the Authentication field displays MD5 , this field displays the identification number of the key used.
Add	Click Add to create a new OSPF virtual link.
Modify	Click Modify to change the settings of the selected OSPF virtual link.
Delete	Click Delete 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 (Same-as-Area , None , Simple or MD5).
Key ID	When the Authentication field displays MD5 , this field displays the identification number of the key used.
Cost	This field displays the interface cost used for calculating the routing table.
Priority	This field displays the priority of the interface.
Add	Click Add to create a new OSPF interface.
Modify	Click Modify to change the settings of the selected OSPF interface.
Delete	Click Delete to remove the selected OSPF interface.

19.8.4 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 157 IP Configuration: OSPF: New OSPF Setting

The following table describes the related labels in this screen.

Table 119 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 0.0.0.0 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 (Simple or MD5) to activate authentication. Select None to disable authentication. Interface(s) and virtual interface(s) must use the same authentication method as the associated area.
Stub Network	Select this option to set the area as a stub area. If you enter 0.0.0.0 in the Area ID field, the settings in the Stub Network fields are ignored.
No Summary	Select this option to set the switch to not send/receive LSAs.
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 Add to apply the changes and close this screen.
Cancel	Click Cancel to discard all changes and close this screen.

19.8.5 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 158 IP Configuration: OSPF: New Virtual Link

The following table describes the labels in this screen.

Table 120 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.
Authentication	<p>Note: Virtual interface(s) must use the same authentication method within the same area.</p> <p>Select an authentication method. Choices are Same-as-Area, None (default), Simple and MD5.</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. Select Same-as-Area to use the same authentication method within the area and set the related fields when necessary.</p> <p>Select None to disable authentication. This is the default setting.</p> <p>Select Simple to authenticate OSPF packets transmitted through this interface using a simple password.</p> <p>Select MD5 to authenticate OSPF packets transmitted through this interface using MD5 authentication.</p>
Key ID	When you select MD5 in the Authentication field, specify the identification number of the authentication you want to use.
Key	When you select Simple in the Authentication field, enter a password eight-character long. When you select MD5 in the Authentication field, enter a password 16-character long.
Add	Click Add to apply the changes and close this screen.
Cancel	Click Cancel to discard all changes and close this screen.

19.8.6 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 159 IP Configuration: OSPF: New Interface

The following table describes the labels in this screen.

Table 121 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>Note: OSPF Interface(s) must use the same authentication method within the same area.</p> <p>Select an authentication method. Choices are Same-as-Area, None (default), Simple and MD5.</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 Same-as-Area to use the same authentication method within the area and set the related fields when necessary.</p> <p>Select None to disable authentication. This is the default setting.</p> <p>Select Simple and set the Key field to authenticate OSPF packets transmitted through this interface using simple password authentication.</p> <p>Select MD5 and set the Key ID and Key fields to authenticate OSPF packets transmitted through this interface using MD5 authentication.</p>
Key ID	When you select MD5 in the Authentication field, specify the identification number of the authentication you want to use.
Key	When you select Simple in the Authentication field, enter a password eight-character long. Characters after the eighth character will be ignored. When you select MD5 in the Authentication field, enter a password 16-character long.
Cost	The interface cost is used for calculating the routing table. Enter a number between 0 and 65535.
Priority	The priority you assign to the interface is used in router elections to decide which router is going to be the Designated Router (DR) or the Backup Designated Router (BDR). You can assign a number between 0 and 255. A priority of 0 means that the router will not participate in router elections.

Table 121 IP Configuration: OSPF: New Interface (continued)

LABEL	DESCRIPTION
Add	Click Add to apply the changes and close this screen.
Cancel	Click Cancel to discard all changes and close this screen.

19.9 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.

19.9.1 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 160 IP Configuration: VRRP

The screenshot displays the VRRP configuration window. At the top, there are tabs for various IP services: Static Route, DiffServ, DSCP Setting, IGMP, DHCP, DVMP, RIP, OSPF, VRRP, and IP Multicast. The VRRP tab is active, showing a table with the following data:

Index	Network	Authentication	Key
1	168.234.3.1/24	None	
2	168.234.4.1/24	None	
3	168.234.5.1/24	None	
4	168.234.6.1/24	None	
5	168.234.7.1/24	None	
6	168.234.8.1/24	None	
7	168.234.9.1/24	None	

Below this table is an 'Apply' button. At the bottom of the window, there is another table with the following columns: Index, Active, Name, Network, VRID, Primary VIP, Uplink Gateway, and P. To the right of this table are three buttons: 'Add', 'Modify', and 'Delete'.

The following table describes the labels in this screen.

Table 122 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 None to disable authentication. This is the default setting. Select Simple to use a simple password to authenticate VRRP packet exchanges on this interface.
Key	When you select Simple in the Authentication field, enter a password key (up to eight printable ASCII character long) in this field.
Apply	Click Apply to save the changes.
Index	This field displays the index number of an entry.
Active	This field shows whether a VRRP entry is enabled (Yes) or disabled (No).
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 Add to create a new VRRP interface.
Modify	Click Modify to change the settings of the selected VRRP interface.
Delete	Click Delete to remove the selected VRRP interface.

19.9.2 Configuring a VRRP Interface

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

Figure 161 IP Configuration: VRRP: New

The following table describes the labels in this screen.

Table 123 IP Configuration: VRRP: New

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 100 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 0.0.0.0 .
OK	Click OK to apply the changes and close this screen.
Cancel	Click Cancel to discard all changes and close this screen.

19.10 IP Multicast

You can configure the switch to untag (remove the VLAN tags from) IP multicast packets that the switch forwards. This allows the switch to send packets to Ethernet devices that are not VLAN-aware.

To display the IP Multicast screen, right-click on a switch in the Device Panel list and click **Configuration > IP Configuration > IP Multicast**.

Figure 162 IP Configuration: IP Multicast

Port	IP Multicast Egress Untag Vlan ID
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	0
12	0

Apply

The following table describes the labels in this screen.

Table 124 IP Configuration: IP Multicast

LABEL	DESCRIPTION
Port	This read-only field displays the port number.
IP Multicast Egress Untag Vlan ID	The switch removes the VLAN tag from IP multicast packets belonging to the specified VLAN before transmission on this port. Enter a VLAN group ID in this field. Enter 0 to set the switch not to remove any VLAN tags from the packets.
Apply	Click Apply to save the settings.

Troubleshooting

This chapter covers potential problems and the corresponding remedies.

20.1 Installation Problems

Table 125 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 the quick start guide 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 Section 20.4 on page 222 for information on how to do this.</p> <p>Re-install the EMS.</p>

20.2 Problems Accessing the EMS

Table 126 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>

20.3 Problems Finding a Device

Table 127 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>

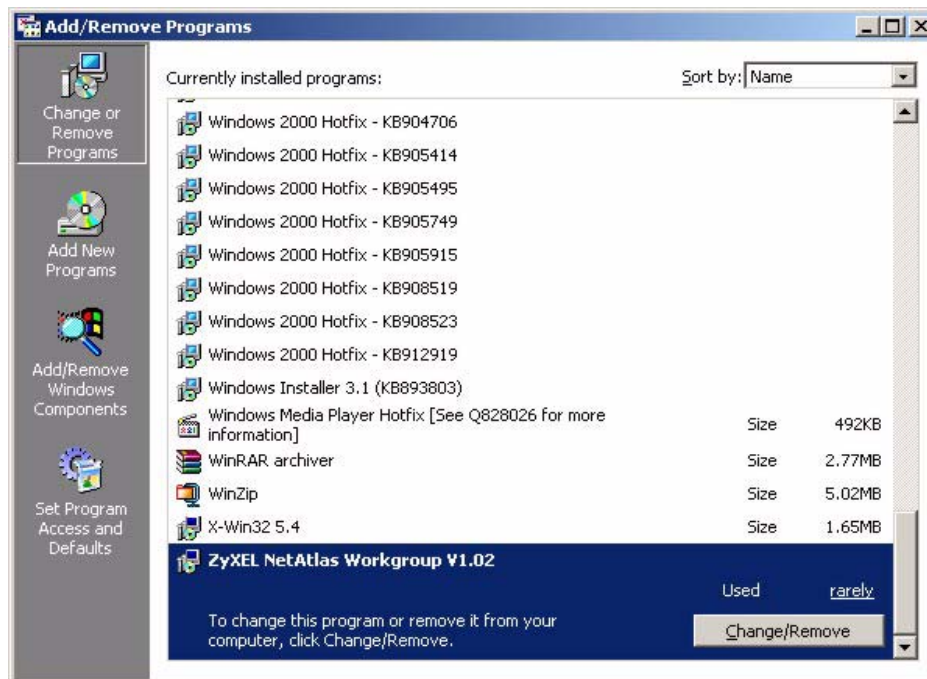
20.4 Uninstalling the EMS

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.

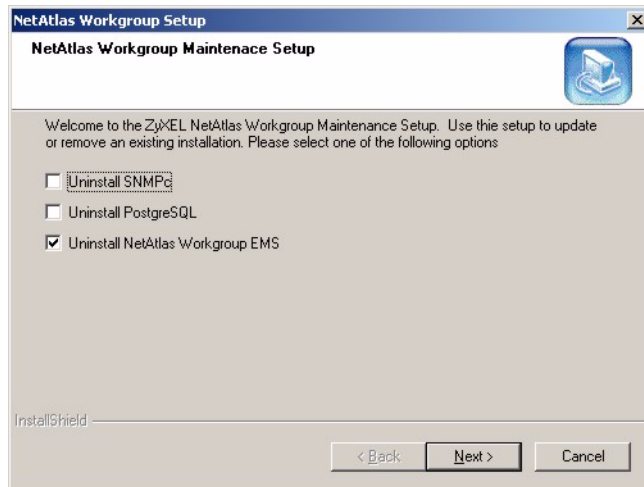
Figure 163 EMS: Remove



- 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 164 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.

PART IV

Appendices and Index

SNMPc Network Manager (227)

Alarm Types and Causes (231)

Legal Information (233)

Customer Support (235)

Index (239)

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 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

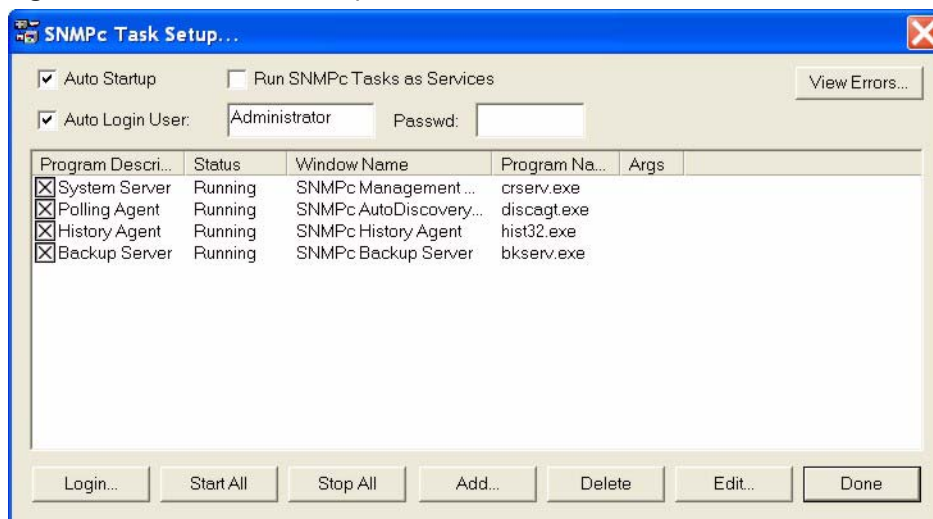
Click **Start, Programs, SNMPc, Startup System** to manually start the SNMPc network manager. This is the default location of the SNMPc network manager.

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 165 Automatic Startup



SNMPc Main Window

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

Figure 166 SNMPc Main Windows

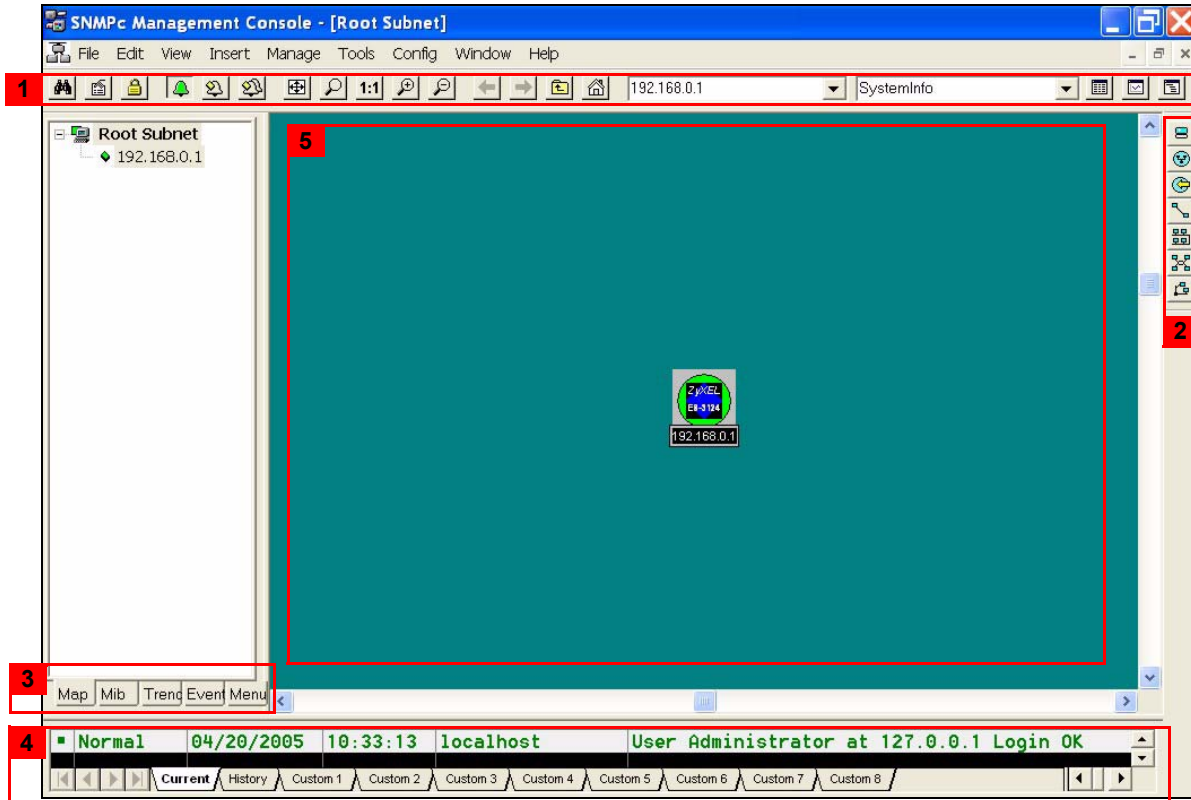


Table 128 SNMPc Main Window

	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 129 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 167 SNMPc Main Button Bar Icons

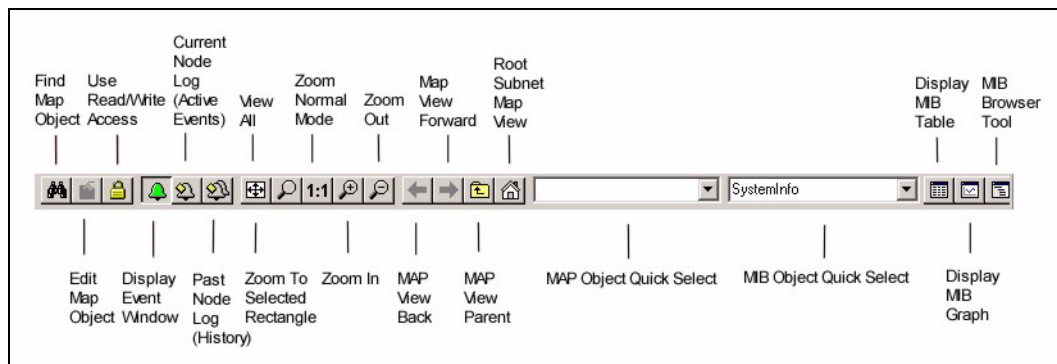
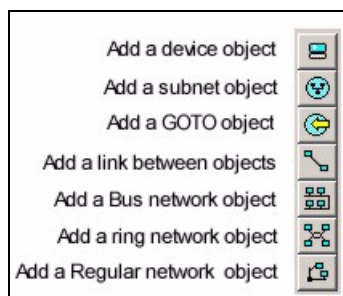


Figure 168 SNMPc Edit Button Bar Icons



For more detailed information, please see www.castlerock.com.

Alarm Types and Causes

This appendix shows examples of probable alarm types and causes.

Table 130 Alarm Types and Causes

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

Legal Information

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Registration

Register your product online to receive e-mail notices of firmware upgrades and information at www.zyxel.com for global products, or at www.us.zyxel.com for North American products.

Customer Support

Please have the following information ready when you contact customer support.

Required Information

- 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.

Corporate Headquarters (Worldwide)

- Support E-mail: support@zyxel.com.tw
- Sales E-mail: sales@zyxel.com.tw
- Telephone: +886-3-578-3942
- Fax: +886-3-578-2439
- Web Site: www.zyxel.com, www.europe.zyxel.com
- FTP Site: [ftp.zyxel.com](ftp://ftp.zyxel.com), [ftp.europe.zyxel.com](ftp://ftp.europe.zyxel.com)
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- Sales E-mail: sales@zyxel.co.cr
- Telephone: +506-2017878
- Fax: +506-2015098
- Web Site: www.zyxel.co.cr
- FTP Site: [ftp.zyxel.co.cr](ftp://ftp.zyxel.co.cr)
- Regular Mail: ZyXEL Costa Rica, Plaza Roble Escazú, Etapa El Patio, Tercer Piso, San José, Costa Rica

Czech Republic

- E-mail: info@cz.zyxel.com
- Telephone: +420-241-091-350
- Fax: +420-241-091-359
- Web Site: www.zyxel.cz
- Regular Mail: ZyXEL Communications, Czech s.r.o., Modranská 621, 143 01 Praha 4 - Modrany, Česká Republika

Denmark

- Support E-mail: support@zyxel.dk
- Sales E-mail: sales@zyxel.dk
- Telephone: +45-39-55-07-00
- Fax: +45-39-55-07-07
- Web Site: www.zyxel.dk
- Regular Mail: ZyXEL Communications A/S, Columbusvej, 2860 Soeborg, Denmark

Finland

- Support E-mail: support@zyxel.fi
- Sales E-mail: sales@zyxel.fi
- Telephone: +358-9-4780-8411
- Fax: +358-9-4780 8448
- Web Site: www.zyxel.fi
- Regular Mail: ZyXEL Communications Oy, Malminkaari 10, 00700 Helsinki, Finland

France

- E-mail: info@zyxel.fr
- Telephone: +33-4-72-52-97-97
- Fax: +33-4-72-52-19-20
- Web Site: www.zyxel.fr
- Regular Mail: ZyXEL France, 1 rue des Vergers, Bat. 1 / C, 69760 Limonest, France

Germany

- Support E-mail: support@zyxel.de
- Sales E-mail: sales@zyxel.de
- Telephone: +49-2405-6909-0
- Fax: +49-2405-6909-99
- Web Site: www.zyxel.de
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Hungary

- Support E-mail: support@zyxel.hu
- Sales E-mail: info@zyxel.hu
- Telephone: +36-1-3361649
- Fax: +36-1-3259100
- Web Site: www.zyxel.hu
- Regular Mail: ZyXEL Hungary, 48, Zoldlomb Str., H-1025, Budapest, Hungary

Kazakhstan

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- Web Site: www.zyxel.kz
- Regular Mail: ZyXEL Kazakhstan, 43, Dostyk ave., Office 414, Dostyk Business Centre, 050010, Almaty, Republic of Kazakhstan

North America

- Support E-mail: support@zyxel.com
- Sales E-mail: sales@zyxel.com
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- FTP Site: <ftp.us.zyxel.com>
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Norway

- Support E-mail: support@zyxel.no
- Sales E-mail: sales@zyxel.no
- Telephone: +47-22-80-61-80
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- Regular Mail: ZyXEL Communications A/S, Nils Hansens vei 13, 0667 Oslo, Norway

Poland

- E-mail: info@pl.zyxel.com
- Telephone: +48 (22) 333 8250
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- Web Site: www.pl.zyxel.com
- Regular Mail: ZyXEL Communications, ul. Okrzei 1A, 03-715 Warszawa, Poland

Russia

- Support: <http://zyxel.ru/support>
- Sales E-mail: sales@zyxel.ru
- Telephone: +7-095-542-89-29
- Fax: +7-095-542-89-25
- Web Site: www.zyxel.ru
- Regular Mail: ZyXEL Russia, Ostrovityanova 37a Str., Moscow, 117279, Russia

Spain

- Support E-mail: support@zyxel.es
- Sales E-mail: sales@zyxel.es
- Telephone: +34-902-195-420
- Fax: +34-913-005-345

- Web Site: www.zyxel.es
- Regular Mail: ZyXEL Communications, Arte, 21 5ª planta, 28033 Madrid, Spain

Sweden

- Support E-mail: support@zyxel.se
- Sales E-mail: sales@zyxel.se
- Telephone: +46-31-744-7700
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- Web Site: www.zyxel.se
- Regular Mail: ZyXEL Communications A/S, Sjöporten 4, 41764 Göteborg, Sweden

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- Sales E-mail: sales@ua.zyxel.com
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United Kingdom

- Support E-mail: support@zyxel.co.uk
- Sales E-mail: sales@zyxel.co.uk
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- FTP Site: [ftp.zyxel.co.uk](ftp://ftp.zyxel.co.uk)
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“+” is the (prefix) number you dial to make an international telephone call.

Index

Numerics

802.1D [64](#)

A

Access EMS Troubleshooting [222](#)
 access logs [34](#)
 accessing EMS [31](#)
 accessing Switch Manager [39](#)
 accessing switches [119](#)
 adding a device [53](#)
 Address Resolution Protocol (see also ARP) [65](#)
 alarm status [45](#)
 application status [69](#)
 applying templates (provisioning) [85](#)
 Area 0 [211](#)
 Area ID [213](#), [214](#)
 ARP table [65](#)
 authentication [214](#), [215](#), [216](#)
 authentication, OSPF [213](#)
 Autonomous system (AS) [208](#), [211](#)

B

Backbone [211](#)
 backup files [35](#)
 backup schedules, database [37](#)
 bandwidth control [175](#)
 broadcast storm control [176](#)

C

chart formats [98](#)
 Class of Service (CoS) [177](#), [201](#)
 command buttons explained [48](#)
 compatible MVR mode [185](#)
 configuration files [138](#)

configuration settings, and template [77](#)
 Configure [127](#)
 contact information [235](#)
 Copy to button [128](#)
 copying switch settings [128](#)
 copyright [233](#)
 customer support [235](#)

D

database backup [36](#)
 database synchronization [35](#)
 default gateway [206](#)
 deleting devices [56](#)
 deleting submaps [56](#)
 device configuration [125](#)
 window overview [126](#)
 device list [44](#)
 device mapping [53](#)
 device reset [108](#)
 devices
 scheduled firmware upgrade [116](#)
 scheduled restore for configuration [113](#)
 DHCP [204](#)
 client IP pool [206](#)
 modes [204](#)
 relay agent [204](#)
 server [204](#)
 setup [204](#)
 DHCP (Dynamic Host Configuration Protocol) [204](#)
 DHCP server status [71](#)
 DiffServ
 DSCP [177](#), [201](#)
 discarding packets [152](#)
 disclaimer [233](#)
 DSCP (DiffServ Code Point) [177](#), [201](#)
 DVMRP
 Autonomous system [208](#)
 implementation [208](#)
 threshold [209](#)
 DVMRP (Distance Vector Multicast Routing Protocol) [208](#)
 dynamic link aggregation [149](#)
 dynamic MVR mode [185](#)

E

editing device mapping [55](#)
Element Management System (EMS) [29](#)
EMS
 main menu summary [46](#)
EMS components [29](#)
EMS database [35](#)
Ethernet port status [67](#)

F

factory defaults [110](#)
filtering [152](#)
finding objects [55](#)
firmware
 scheduled uploads to devices [116](#)
firmware upgrade [107](#)
firmware versions, viewing [76](#)

G

GARP timer [151](#)
graph menu icons [97](#)
graph styles [98](#)

H

hardware status [57](#)

I

icons, colors explained [44](#)
IGMP [203](#)
IGMP profile template [79](#)
IGMP snooping [179](#), [184](#)
Interface [211](#)
interface performance [89](#)
interface status [75](#)
IP address mappings [64](#)
IP interface [141](#)
IP setup [139](#)

IP table status [70](#)

K

key, and OSPF [216](#)

L

link aggregation [148](#)
loading factory defaults [110](#)
logs [136](#)
 access [34](#)
 configuration [36](#)
 event [101](#)
loopback test [102](#)

M

MAC address learning [174](#)
MAC address mappings [64](#)
MAC forwarding [153](#)
MAC forwarding, creating rules [154](#)
maintenance [107](#)
managed devices [29](#)
Media-on-Demand (MoD) [184](#)
menu shortcuts [45](#)
metric [212](#)
Mirror port [155](#)
mirroring [155](#)
multicast
 and VLAN [220](#)
multicast group templates [82](#)
multicast status [67](#)
Multicast VLAN Registration (MVR) [184](#)
multicasting overview [179](#)
MVR (Multicast VLAN Registration) [184](#)
MVR modes [185](#)
MVR ports [185](#)

N

NE [109](#)
 configuration backup [109](#)

scheduling backups [111](#)
 Network Element (see also NE) [109](#)
 Network Management System (see also NMS) [29](#)
 NMS [29](#)

O

OSPF [210](#)
 advantage [211](#)
 Area [211](#)
 Area 0 [211](#)
 Area ID [213](#), [214](#)
 authentication [213](#), [214](#), [215](#), [216](#)
 Autonomous system [211](#)
 Backbone [211](#)
 Interface [211](#)
 redistribute route [212](#)
 router ID [212](#)
 Stub area [211](#)
 Virtual link [211](#)
 OSPF (Open Shortest Path First) [210](#)
 OSPF status [73](#)
 OSPF vs RIP [211](#)
 overview, main screen [33](#)

P

performance [89](#), [91](#)
 ping [121](#)
 ping test [103](#)
 Port mirroring
 Mirror port [155](#)
 port mirroring [155](#)
 port security [174](#)
 port status [62](#)
 prioritizing traffic [145](#)
 product registration [234](#)
 protocol based VLAN [172](#)
 and IEEE 802.1Q tagging [172](#)
 isolate traffic [172](#)
 provisioning (applying templates) [85](#)

Q

queuing [145](#)

R

RADIUS server [138](#)
 Rapid Spanning Tree Protocol (See also STP) [59](#)
 redistribute route [212](#)
 registration
 product [234](#)
 related documentation [3](#)
 remote client [29](#)
 remote management [133](#)
 resetting devices [108](#)
 RMON
 alarm [191](#)
 event [191](#)
 history [191](#)
 RMON (Remote Network Monitor) [191](#)
 RMON groups [191](#)
 RMON history [92](#)
 RMON probe [191](#)
 RMON statistics [90](#)
 router ID [212](#)
 routing interfaces [75](#)
 routing protocol [212](#)
 routing table [69](#)

S

saving configuration [50](#)
 setup [136](#)
 shortcuts, menu [45](#)
 Simple Network Management Protocol (See also SNMP) [131](#)
 SNMP
 agents [132](#)
 commands [132](#)
 managed devices [132](#)
 operation mode [38](#)
 SNMP configuration [131](#)
 SNMPc Network Manager [30](#)
 Spanning Tree Protocol (See also STP) [59](#)
 STP [59](#)
 STP configuration [147](#)
 STP port states [59](#)
 STP status [60](#)
 Stub area [211](#), [214](#)
 submap [53](#)
 switch information [49](#)
 Switch Manager [31](#)
 overview [43](#)

- switch setup [143](#)
- synchronizing device map [56](#)
- syntax conventions [4](#)
- syslog server [137](#)
- syslog setup [136](#)
- system info [131](#)
- system logs [101](#)
- system messages [45](#)

T

- table menu icons [94](#)
- telnet [119](#)
- template explained [77](#)
- template, for IGMP profile [79](#)
- template, for multicast groups [82](#)
- template, for VLANs [78](#)
- test
 - loopback [103](#)
 - ping [103](#)
 - traceroute [104, 105](#)
- time setup [135](#)
- Time To Live (TTL) [209](#)
- tools to access the switch [119](#)
- traceroute test [105](#)
- traffic shaping [175](#)
- trunking [148](#)
- trunking, dynamic [149](#)

V

- VID [141](#)
- viewing the switch [48](#)
- Virtual link [211](#)
- Virtual router
 - Status [73](#)
- Virtual router (VR) [217](#)
- VLAN [151](#)
- VLAN number [141](#)
- VLAN status [61](#)
- VLAN template [78](#)
- VLAN, protocol based, See protocol based VLAN
- VRID (Virtual Router ID) [73](#)
- VRRP
 - authentication [218](#)
 - Backup router [217](#)
 - how it works [217](#)

- Master router [217](#)
- Preempt mode [219](#)
- Priority [219](#)
- Uplink gateway [219](#)
- Uplink status [73](#)
- Virtual IP [219](#)
- Virtual router [217](#)
- Virtual Router ID [219](#)
- VRID [73](#)
- VRRP status [72](#)

W

- warranty [233](#)
 - note [233](#)
- web configurator [119](#)