Advanced Management System

DAS4-Series IP-DSLAM Operation Guide

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Table of Contents

Chapter 1 Preface....1-1

1.1 Purpose....1-1
1.2 Organization....1-1
1.3 Conventions....1-1

Chapter 2 Advanced Management System Overview....2-1

2.1 AMS Overview....2-1
2.2 AMS Design Algorithm....2-1
2.3 AMS Feature....2-2
2.4 The Architecture of AMS....2-3
2.4.1 AMS Server Software Block Diagram....2-3
2.4.2 AMS Interface Standards Architecture....2-4
2.4.3 AMS Hardware Development Architecture....2-4
2.5 AMS Technical Indices....2-5
2.6 System Hardware and Software Requirement....2-5
2.7 Database for AMS Server....2-6
2.8 Backup and Recovery Mechanism....2-6
2.9 AMS O&M Tools....2-6

Chapter 3 Getting Started AMS....3-1

3.1 Get the AMS server and client files....3-1
3.2 Start the AMS Server....3-1
3.3 Stop the AMS Server....3-2
3.4 Start AMS Client....3-3
3.5 Navigating the AMS Client....3-4
3.5.1 Keyboard Commands....3-4
3.5.2 Right Mouse Button....3-4
3.5.3 AMS Management Window Overview....3-5

Chapter 4 Configuration Management Functions....4-1

4.1 Configuration Management General Function....4-1
4.2 Configuration Management General Features....4-4
4.3 Constructing the Managed NE Network....4-5
4.3.1 Add a Location to the Managed NE Network....4-5
4.3.2 Add a NE to the Location....4-6
4.3.3 Add a Nested Location to the Location....4-7
4.3.4 Managed NE Network Database....4-8
4.4 Constructing a NE on AMS....4-10
4.5 NE CLI User Account Management....4-13
4.6 NE Secured Host Management....4-15
4.7 Profile Management....4-17
4.7.1 ADSL Profile Management....4-19
4.7.2 ADSL Profile Template Management....4-29
4.7.3 SHDSL Profile Management....4-30
4.7.4 SHDSL Profile Template Management....4-36
4.7.5 VLAN Profile Management....4-37
4.7.6 VLAN Profile Template Management....4-42
4.7.7 Alarm Definition Profile Management....4-43
4.7.8 Alarm Definition Profile Template Management....4-46
4.8 Interface Port Management....4-47
4.8.1 ADSL Line Interface Management....4-48
4.8.2 SHDSL Line Interface Management....4-50
4.8.3 GE Network Interface Management....4-52
4.9 Data Connection Management....4-61
4.9.1 VC-to-VLAN Connection Management....4-61
4.9.2 ISP Information for IP over ATM....4-67

4.10 Access Control List 4-69
4.10.1 Source MAC Access Control List 4-69
4.11 Multicast Service Management 4-72
4.11.1 Multicast Channel Configuration 4-73
4.11.2 IGMP snooping/IGMP proxy Configuration 4-74
4.12 System Services Configuration 4-76
4.12.1 MAC Aging for Bridged Services 4-76
4.12.2 VLAN MAC Limit 4-77
4.12.3 DHCP Service Configuration 4-79
4.12.4 PPPoE Sub-option Configuration 4-82
4.12.5 xDSL Port Agent ID Management 4-83
4.13 NE Fast Provision Management 4-85
4.13.1 xDSL Interface and VC-VLAN Fast Provisioning 4-85
4.13.2 Multicast Service Fast Provisioning 4-94
4.14 NE SNMP Management 4-96
4.14.1 Configuring the SNMP Trap Manager 4-96
4.14.2 Configuring the SNMP Community 4-98
4.15 NE Date and Time Management 4-100
4.15.1 DNS Server Setting 4-102
4.15.2 Time Server Setting 4-102
4.16 System Backup and Restore 4-103
4.16.1 Export NE Configuration To AMS Client 4-104
4.16.2 Local Storage of NE configuration 4-104
4.16.3 NE Configuration Backup and Restore 4-105
4.17 NE Maintenance 4-108
4.17.1 NE Inventory Information 4-109
4.17.2 NE Firmware Upgrade 4-110
4.17.3 SHDSL LC Firmware Upgrade 4-112
4.17.4 NE Boot Partition 4-112
4.17.5 Reset the Unit 4-113

Chapter 5 Performance Management Functions 5-1

5.1 Performance Management General Functions 5-1
5.2 Performance Management Features 5-2
5.3 xDSL Line Status Diagnosis 5-2
5.3.1 xDSL Port Rate Status 5-2
5.3.2 ADSL Loop Bits Allocation Monitoring 5-5
5.3.3 Loop Monitoring 5-7
5.3.4 Loop Diagnosis (DELT <Dual-Ended Line Test>) 5-9
5.3.5 Loop SELT Test (Single End Loop Test) 5-12
5.4 xDSL Line Current Performance Monitor 5-13
5.5 xDSL Line Current Performance Information 5-15
5.6 xDSL Line Historical Performance Information 5-19
5.7 GE Interface Performance Statistics 5-22

Chapter 6 Fault Management Functions 6-1

6.1 Fault Management General Function 6-1
6.2 Overview of Environment Fault 6-2
6.2.1 Location and NE Status 6-2
6.2.2 Shelf and Card Module Status 6-3
6.2.3 Subscriber Port and Trunk GE Port Status 6-3
6.3 Alarm Data Handling 6-3
6.3.1 AMS Server SNMP Polling Time 6-4
6.3.2 Alarm Synchronization 6-4
6.3.3 Alarm Severity Definition 6-4
6.3.4 Alarm Notification 6-5
6.4 Alarm Digital Input Function 6-6
6.5 View and Analysis of Alarms 6-8
6.5.1 Active Alarm Status 6-8
6.5.2 History Alarm Status 6-13

6.5.3 History Alarm Statistics 6-17
6.6 NE Hardware Status Diagnosis....6-18
6.7 xDSL Service Status Diagnosis....6-19
6.7.1 Bridge Filtering Database 6-19
6.7.2 VLAN Membership....6-20
6.7.3 xDSL MAC Spoofing Status 6-21
6.7.4 Multicast Channel Status 6-22
6.7.5 Multicast Group Membership....6-23
6.8 LACP/RSTP Current Status Diagnosis 6-25
6.8.1 LACP Diagnosis....6-25
6.8.2 RSTP Diagnosis....6-26
6.9 Network Diagnosis 6-29
6.9.1 Subscriber Port OAM Loopback Diagnosis 6-29
6.9.2 Ping 6-31
6.9.3 Telnet....6-33
6.9.4 Check SNMP Connection 6-33

Chapter 7 Security Management Functions 7-1

7.1 Security Management General Functions 7-1
7.2 Security Management General Features....7-2
7.3 Login and Logout 7-2
7.4 Viewing System User Online List....7-3
7.5 Operation Privilege....7-3
7.6 Security Level Application 7-4

Chapter 8 Subscriber and Service Management Functions....8-1

8.1 Service Management General Function 8-1
8.2 Subscriber Management General Functions 8-1
8.3 Creating of Subscriber Service Information 8-2
8.4 Service Management General Function 8-2

Chapter 9 General System Management Functions 9-1

9.1 AMS Client Options....9-1
9.2 System Server Management 9-1

Appendix A Database Dimension and Handle Time A-1

Appendix B Abbreviations and Acronyms B-1

Appendix C Alarm Definition C-1

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List of Figures

Figure 2-1 AMS Server Processes Block Diagram....2-3
Figure 2-2 AMS Interface Standards Diagram....2-4
Figure 2-3 AMS Hardware Development Diagram....2-4
Figure 2-4 CPU Utilization....2-7
Figure 2-5 Network Utilization....2-7
Figure 3-1 Reinitialize IP DSLAM Manager Dialog....3-2
Figure 3-2 Started AMS Server Dialog....3-2
Figure 3-3 Shutdown AMS Server Dialog....3-3
Figure 3-4 IP DSLAM Manager Dialog....3-3
Figure 3-5 IP DSLAM Manager – Advanced Dialog....3-4
Figure 3-6 AMS Network Management Window....3-5
Figure 3-7 Network Management Sub-window....3-6
Figure 3-8 AMS Device Management Window....3-6
Figure 3-9 Illustration of the NE Frame Region and Card Module Region on NE....3-7
Figure 3-10 AMS NE Configuration/Status/Information Page Window....3-8
Figure 4-1 Add Location Dialog....4-5
Figure 4-2 Locations added in the Network Element Overview Sub-window....4-6
Figure 4-3 Network Management Sub-window – Location Management Pop-up....4-7
Figure 4-4 Add NE Dialog....4-7
Figure 4-5 Nested Locations added in the Network Element Overview Sub-window....4-8
Figure 4-6 Detailed Network Database List....4-9
Figure 4-7 Network Database – IP Sub-networks Perspective List....4-9
Figure 4-8 Network Database – NE Node Perspective List....4-10
Figure 4-9 Network Database – NE Interface Perspective List....4-10
Figure 4-10 Constructing a NE on a location in the managed NE Network....4-11
Figure 4-11 DAS4672 Shelf View in the AMS Device Management Window....4-11
Figure 4-12 DAS4192 Shelf View in the AMS Device Management Window....4-12
Figure 4-13 Board Setting List Dialog....4-12
Figure 4-14 Board Setting Dialog....4-12
Figure 4-15 NE User Account List Dialog....4-14
Figure 4-16 NE User Account Setting Dialog....4-14
Figure 4-17 SNMP Secured Host List Dialog....4-15
Figure 4-18 Modify Secured Host Dialog....4-16
Figure 4-19 Interrelationship of Data Transport Related Profiles....4-18
Figure 4-20 ADSL Profile List – Line Dialog....4-19
Figure 4-21 Add ADSL Line Profile– Transmission Rate Dialog....4-21
Figure 4-22 Add ADSL Line Profile– SNR Margin Dialog....4-23
Figure 4-23 Add ADSL Line Profile– PSD Dialog....4-24
Figure 4-24 Add ADSL Line Profile– Power Management Dialog....4-25
Figure 4-25 Add ADSL Line Profile– INP Dialog....4-26
Figure 4-26 xDSL Profile List– PM Threshold Dialog....4-27
Figure 4-27 Add ADSL PM Threshold Profile Dialog....4-27
Figure 4-28 ADSL Profile List– Traffic Policing Dialog....4-28
Figure 4-29 Add Traffic Policing Profile Dialog....4-29
Figure 4-30 ADSL Profile Template Dialog....4-30
Figure 4-31 SHDSL Profile List– Line Dialog....4-31
Figure 4-32 Add SHDSL Line Profile– Transmission Rate Dialog....4-32
Figure 4-33 Add SHDSL Line Profile– SNR Margin Dialog....4-33
Figure 4-34 Add SHDSL Line Profile– Miscellaneous Dialog....4-34
Figure 4-35 SHDSL Profile List– PM Threshold Dialog....4-35
Figure 4-36 Add SHDSL PM Threshold Profile Dialog....4-35
Figure 4-37 SHDSL Profile Template Dialog Function Button....4-37
Figure 4-38 VLAN Profile List– IP Traffic Dialog....4-38
Figure 4-39 Add xDSL IP Traffic Profile Dialog....4-39
Figure 4-40 VLAN Profile List– TV Channel Dialog....4-40
Figure 4-41 Add xDSL TV Channel Profile Dialog....4-40
Figure 4-42 VLAN Profile List– Multicast Service Dialog....4-41
Figure 4-43 Add xDSL Multicast Service Profile Dialog....4-42
Figure 4-44 VLAN Profile Template Dialog Function Button....4-43

Figure 4-45 Alarm Definition List Dialog 4-44
Figure 4-46 Selection of a module model on the Model combo-box 4-45
Figure 4-47 Selection of a port model on the Model combo-box....4-45
Figure 4-48 Modify Alarm Definition Dialog 4-46
Figure 4-49 Alarm Definition Template Dialog 4-47
Figure 4-50 ADSL Port List Dialog....4-48
Figure 4-51 Modify ADSL Port Dialog. 4-49
Figure 4-52 SHDSL Port List Dialog 4-51
Figure 4-53 Modify SHDSL Port Dialog 4-51
Figure 4-54 Trunk Port List Dialog 4-52
Figure 4-55 Trunk Port Configuration Dialog 4-53
Figure 4-56 GE Network Interface Packet Forward Illustrate 4-54
Figure 4-57 LACP for Trunk Port Dialog 4-54
Figure 4-58 RSTP Setting Dialog 4-56
Figure 4-59 DiffServ Field....4-58
Figure 4-60 Trunk CoS Mapping and DSCP Re-mapping Dialog....4-60
Figure 4-61 VC-to-VLAN Mapping Illustrate 4-61
Figure 4-62 xDSL VC-to-VLAN List Dialog 4-62
Figure 4-63 xDSL VC-to-VLAN Setting – IP Traffic Dialog 4-62
Figure 4-64 xDSL VC-to-VLAN Setting – 802.1Q/1P Dialog (only for the RFC2684 bridged mode) 4-63
Figure 4-65 xDSL VC-to-VLAN Setting – 802.1P Dialog (only for the RFC2684 routed mode)....4-63
Figure 4-66 xDSL VC-to-VLAN Setting – MAC Limit Dialog (only for the RFC2684 bridged mode)....4-64
Figure 4-67 xDSL VC-to-VLAN Setting – ISP Server Dialog (only for the RFC2684 routed mode)....4-64
Figure 4-68 xDSL VC-to-VLAN Setting – Service Type Dialog....4-65
Figure 4-69 RFC 2684 Route Mode Connection Method....4-67
Figure 4-70 xDSL ISP List for IPoA Dialog 4-68
Figure 4-71 Add xDSL ISP for IPoA Dialog....4-69
Figure 4-72 VC-to-VLAN Access Control List dialog 4-70
Figure 4-73 Add xDSL Access Control Dialog 4-71
Figure 4-74 xDSL Access Control List 4-72
Figure 4-75 xDSL Multicast Channel List Dialog 4-73
Figure 4-76 xDSL Multicast Channel Setting Dialog....4-74
Figure 4-77 IGMP Snooping / IGMP Proxy Setting Dialog 4-75
Figure 4-78 MAC Aging Setting Dialog 4-76
Figure 4-79 VLAN MAC Limit List Dialog....4-77
Figure 4-80 VLAN MAC Limit Configure Dialog....4-78
Figure 4-81 DHCP Setting Dialog....4-79
Figure 4-82 DHCP Server List for DHCP Relay Dialog 4-80
Figure 4-83 DHCP Broadcast Control Dialog 4-81
Figure 4-84 PPoE Sub-option Setting Dialog 4-83
Figure 4-85 xDSL Port Agent ID List Dialog 4-84
Figure 4-86 ADSL Port & VC-to-VLAN Fast Provision – bridged mode 4-86
Figure 4-87 SHDSL Port & VC-to-VLAN Fast Provision– bridged mode....4-87
Figure 4-88 ADSL Port & VC-to-VLAN Fast Provision – routed mode 4-87
Figure 4-89 SHDSL Port & VC-to-VLAN Fast Provision – routed mode 4-88
Figure 4-90 xDSL Port & VC-to-VLAN Fast Provision – IP Traffic Profile Dialog 4-90
Figure 4-91 xDSL Fast Provision List Dialog 4-91
Figure 4-92 xDSL Multicast Channel Fast Provision – Multicast Service Profile Dialog 4-94
Figure 4-93 xDSL Multicast Channel Fast Provision – MAC Limit Dialog 4-94
Figure 4-94 xDSL Multicast Channel Fast Provision List Dialog 4-95
Figure 4-95 NE SNMP Trap Host IP Address List Dialog 4-97
Figure 4-96 Add NE SNMP Trap Host IP Address Dialog 4-98
Figure 4-97 NE SNMP Community List Dialog....4-99
Figure 4-98 Add NE SNMP Community Dialog 4-100
Figure 4-99 NE System Time Dialog 4-101
Figure 4-100 NE System Time Setting Dialog 4-101
Figure 4-101 DNS Server Setting Dialog....4-102
Figure 4-102 NE Time Server Setting Dialog....4-103
Figure 4-103 Export Data To File Dialog....4-104
Figure 4-104 NE Write Flash Confirm Dialog 4-105
Figure 4-105 NE Configuration Backup & Restore File List Dialog 4-106

Figure 4-106 NE Backup File Dialog 4-107
Figure 4-107 NE Restore File Dialog 4-107
Figure 4-108 NE Configuration Auto Backup Dialog 4-108
Figure 4-109 Inventory Information List 4-109
Figure 4-110 Inventory Information Details 4-109
Figure 4-111 NE Firmware Upgrade Dialog 4-111
Figure 4-112 NE Firmware Boot Partition Dialog 4-112
Figure 4-113 Illustration of resetting the NE 4-113
Figure 4-114 Reset NE Dialog 4-114
Figure 4-115 Illustration of resetting the NC 4-114
Figure 4-116 Reset Card Dialog 4-115
Figure 4-117 Illustration of resetting an ADSL LC 4-115
Figure 4-118 Illustration of resetting a SHDSL LC 4-116
Figure 4-119 Reset Card Dialog 4-116
Figure 4-120 Illustration of resetting a xDSL Subscriber Port 4-117
Figure 4-121 Reset xDSL Subscriber Line Dialog 4-117
Figure 5-1 ADSL Port Rate Status Dialog 5-3
Figure 5-2 SHDSL Port Rate Status Dialog 5-4
Figure 5-3 ADSL Loop Bit Allocation Status Dialog 5-6
Figure 5-4 Graph of Bit Allocation 5-7
Figure 5-5 ADSL Loop Monitoring Dialog 5-8
Figure 5-6 Graph of Loop Monitoring – Magnitude Dialog 5-9
Figure 5-7 Graph of Loop Monitoring – Quiet Line Noise PSD Dialog 5-9
Figure 5-8 ADSL Loop Diagnosis Dialog 5-10
Figure 5-9 Graph of DELT result – Magnitude 5-11
Figure 5-10 Graph of DELT result – Quiet Line PSD 5-12
Figure 5-11 Graph of DELT result – SNR 5-12
Figure 5-12 ADSL Loop SELT Test 5-13
Figure 5-13 ADSL Current Performance Monitor Dialog 5-14
Figure 5-14 SHDSL Current Performance Monitor Dialog 5-14
Figure 5-15 ADSL Current Performance Dialog 5-16
Figure 5-16 SHDSL Current Performance Dialog 5-18
Figure 5-17 ADSL History Performance Dialog 5-19
Figure 5-18 SHDSL History Performance Dialog 5-21
Figure 5-19 ADSL History Performance Diagram 5-22
Figure 5-20 Trunk PM Statistics Dialog 5-23
Figure 6-1 NE Poll Setting Dialog 6-4
Figure 6-2 Pop-Up Menu 6-5
Figure 6-3 Add Policy Details Dialog 6-5
Figure 6-4 NE Relay Input List Dialog 6-7
Figure 6-5 Modify NE Relay Input Dialog 6-8
Figure 6-6 Node-Active Alarm List Dialog 6-9
Figure 6-7 Card-Active Alarm List Dialog 6-9
Figure 6-8 Port-Active Alarm List Dialog 6-9
Figure 6-9 Illustration of Sorted Node-Active Alarm List Dialog 6-11
Figure 6-10 Active Alarm List Dialog - Pop-Up Menu 6-11
Figure 6-11 Detailed Alarm Dialog 6-12
Figure 6-12 History Alarm List 6-14
Figure 6-13 Illustration of Sorted Node-History Alarm List Dialog 6-15
Figure 6-14 History Alarm List Dialog - Pop-Up Menu 6-15
Figure 6-15 Event Details 6-16
Figure 6-16 History Alarm Statistics List Dialog 6-17
Figure 6-17 Hardware Monitoring List Dialog 6-18
Figure 6-18 Bridge Filtering Database Entry List Dialog 6-19
Figure 6-19 VLAN Membership List Dialog 6-20
Figure 6-20 MAC Spoofing Status List Dialog 6-21
Figure 6-21 Multicast Channel Status List Dialog 6-23
Figure 6-22 Multicast Group Membership List Dialog 6-24
Figure 6-23 LACP Status Dialog 6-25
Figure 6-24 RSTP – Bridge Status Dialog 6-27
Figure 6-25 RSTP –Port GE1/Port GE2 Status Dialog 6-28

Figure 6-26 OAM Cell Test Dialog 6-30
Figure 6-27 Message Dialog....6-31
Figure 6-28 Ping NE from Client Dialog....6-31
Figure 6-29 Ping NE from Server Dialog 6-32
Figure 6-30 Telnet Pop-up Window 6-33
Figure 6-31 Check NE SNMP Connection Dialog 6-34
Figure 7-1 Login Window....7-2
Figure 7-2 Operator Access Control List Window....7-3
Figure 7-3 Operator Operation Log List Window....7-4
Figure 8-1 Subscriber Management List Table....8-1
Figure 8-2 Subscriber Data Window....8-2
Figure 8-3 Service Management Control Panel 8-2

List of Tables

Table 4-1 Board Setting Dialog Description 4-13
Table 4-2 NE User Account List Dialog Description 4-14
Table 4-3 NE User Account Setting Dialog Description 4-15
Table 4-4 NE Secured Host List Dialog Description....4-16
Table 4-5 Secured Host Setting Dialog Description 4-17
Table 4-6 Data Transport Related Profiles 4-18
Table 4-7 ADSL Profile List Dialog Function Button....4-20
Table 4-8 Add Line Profile– Transmission Rate Dialog Description....4-21
Table 4-9 Add Line Profile– SNR Margin Dialog Description....4-23
Table 4-10 Add Line Profile – PSD Dialog Description 4-24
Table 4-11 Add Line Profile – Power Management Dialog Description 4-25
Table 4-12 Add Line Profile – INP Dialog Description....4-26
Table 4-13 Add PM Threshold Profile Field Description 4-28
Table 4-14 Add Traffic Policing Profile Field Description 4-29
Table 4-15 ADSL Profile Template Dialog Function Button....4-30
Table 4-16 SHDSL Profile List Dialog Function Button 4-31
Table 4-17 Add SHDSL Line Profile– Transmission Rate Dialog Description....4-32
Table 4-18 Add SHDSL Line Profile - SNR Margin Dialog Description....4-33
Table 4-19 Add SHDSL Line Profile– Miscellaneous Dialog Description....4-34
Table 4-20 Add SHDSL PM Threshold Profile Dialog Description....4-36
Table 4-21 SHDSL Profile Template Dialog Function Button 4-37
Table 4-22 VLAN Profile List Dialog Function Button....4-38
Table 4-23 Add xDSL IP Traffic Profile Dialog Description....4-39
Table 4-24 Add xDSL TV Channel Profile Dialog Description....4-41
Table 4-25 Add Multicast Service Profile Dialog Description 4-42
Table 4-26 VLAN Profile Template Dialog Function Button....4-43
Table 4-27 Alarm Definition List Dialog Description 4-44
Table 4-28 Modify Alarm Definition Dialog Description 4-46
Table 4-29 Alarm Definition Template Dialog Function Button....4-47
Table 4-30 ADSL Port List Dialog Description....4-48
Table 4-31 Modify ADSL Port Dialog Description....4-50
Table 4-32 Modify SHDSL Port Dialog Description....4-52
Table 4-33 Trunk Port List Dialog Description....4-53
Table 4-34 Trunk Port Configuration Dialog Description....4-53
Table 4-35 LACP for Trunk Ports Dialog Description 4-55
Table 4-36 RSTP Setting Dialog Description 4-56
Table 4-37 DSCP: DS3~DS5 Bit Representation....4-59
Table 4-38 DSCP Class Relationship....4-59
Table 4-39 Trunk CoS Mapping and DSCP Re-mapping Dialog Description 4-60
Table 4-40 xDSL VC-to-VLAN Setting Description....4-66
Table 4-41 xDSL ISP List for IPoA Dialog Description 4-68
Table 4-42 Add xDSL ISP for IPoA Dialog Description 4-69
Table 4-43 VC-to-VLAN Access Control List Dialog Description....4-70
Table 4-44 Add xDSL Access Control Dialog Description....4-71
Table 4-45 xDSL Access Control List Description....4-72
Table 4-46 xDSL Multicast Channel Setting Description....4-74
Table 4-47 IGMP Proxy Setting Dialog Description 4-75
Table 4-48 MAC Aging Setting Dialog Description....4-77
Table 4-49 VLAN MAC Limit List Dialog Description 4-78
Table 4-50 VLAN MAC Limit Setting Dialog Description....4-78
Table 4-51 DHCP Setting Dialog Description....4-80
Table 4-52 DHCP Server List for DHCP Relay Dialog Description....4-81
Table 4-53 DHCP Broadcast Control Dialog - Description....4-82
Table 4-54 PPPoE Sub-option Setting Dialog Description....4-83
Table 4-55 xDSL Port Agent IDs Dialog Description 4-85
Table 4-56 xDSL Port & VC-to-VLAN Fast Provision Description....4-88
Table 4-57 xDSL Fast Provision List Dialog Description....4-93
Table 4-58 xDSL Multicast Channel Fast Provision Description....4-95
Table 4-59 xDSL Multicast Channel Fast Provision List Dialog Description....4-96

Table 4-60 NE SNMP Trap Host IP Address List Dialog Description 4-97
Table 4-61 NE SNMP Community List Dialog Description 4-99
Table 4-62 Add NE SNMP Community Dialog Description 4-100
Table 4-63 NE System Time Dialog Description 4-101
Table 4-64 DNS Server Setting Dialog Description 4-102
Table 4-65 NE Time Server Setting Dialog Description 4-103
Table 4-66 Export Data To File Dialog Description 4-104
Table 4-67 NE Configuration Backup & Restore File List Dialog Description 4-106
Table 4-68 NE Backup File Dialog Description 4-107
Table 4-69 NE Configuration Auto Backup Dialog Description 4-108
Table 4-70 Inventory Information Description 4-110
Table 4-71 NE Firmware Upgrade Dialog Description 4-111
Table 4-72 NE Firmware Boot Partition Dialog Description 4-112
Table 5-1 ADSL Port Rate Status Dialog Description 5-3
Table 5-2 SHDSL Port Rate Status Dialog Description 5-5
Table 5-3 ADSL Bit Allocation Status Dialog Description 5-6
Table 5-4 ADSL Loop Monitoring Dialog Description 5-8
Table 5-5 ADSL Loop Diagnosis Dialog Description 5-10
Table 5-6 ADSL Loop SELT Test Dialog Description 5-13
Table 5-7 ADSL/SHDSL Current Performance Monitor Dialog Description 5-15
Table 5-8 ADSL Current Performance Dialog Description 5-17
Table 5-9 SHDSL Current Performance Dialog Description 5-18
Table 5-10 ADSL History Performance Dialog Description 5-20
Table 5-11 SHDSL History Performance Dialog Description 5-21
Table 5-12 Trunk PM Dialog Description 5-23
Table 6-1 Location Alarm Status Symbol 6-3
Table 6-2 NE Alarm Status Symbol 6-3
Table 6-3 Shelf and Card Module Status Symbol 6-3
Table 6-4 Subscriber Port and Trunk GE Port Status Symbol 6-3
Table 6-5 NE Poll Setting Dialog Description 6-4
Table 6-6 Add Policy Details Dialog Description 6-6
Table 6-7 NE Relay Input List Dialog Description 6-7
Table 6-8 Modify NE Relay Input Dialog Description 6-8
Table 6-9 Active Alarm List Dialog Description 6-10
Table 6-10 Active Alarm List Dialog - Pop-Up Menu Description 6-12
Table 6-11 Detailed Alarm Dialog Description 6-13
Table 6-12 History Alarm List Description 6-14
Table 6-13 Event Details Description 6-16
Table 6-14 History Alarm Statistics List Description 6-17
Table 6-15 Hardware Monitoring List Dialog Description 6-18
Table 6-16 Bridge Filtering Database Entry List Dialog Description 6-19
Table 6-17 VLAN Membership List Dialog Description 6-21
Table 6-18 MAC Spoofing Status List Dialog Description 6-22
Table 6-19 Multicast Channel Status List Dialog Description 6-23
Table 6-20 Multicast Group Membership List Dialog Description 6-24
Table 6-21 LACP Status Dialog Description 6-25
Table 6-22 RSTP – Bridge Status Dialog Description 6-27
Table 6-23 RSTP –Port GE1/Port GE2 Status Dialog Description 6-28
Table 6-24 OAM Cell Test Dialog Description 6-30
Table 6-25 Ping NE from Server Dialog Description 6-31
Table 6-26 Ping NE from Client Dialog Description 6-32
Table 6-27 Check NE SNMP Connection Dialog Description 6-34

Table B-1 Abbreviations and Acronyms Table B-1
Table C-1 Alarm Definition Table C-1

Chapter 1 Preface

This preface describes the "*DAS4-Series IP-DSLAM Operation Guide*" about how it is organized, and its document conventions. It contains the following topics.

- Purpose
- Organization
- Conventions
- Related Documentation

1.1 Purpose

The purpose of this guide is to provide detailed information and description of Advanced Management System (AMS), which includes both software and hardware architecture and other specific features. This document is intended to help the operator to operate the software to manage the D-Link DAS4 Series IP-DSLAM.

1.2 Organization

This guide contains the following information:

- Preface
- Advanced Management System Overview
- Getting Started AMS
- Configuration Management Functions
- Performance Management Functions
- Fault Management Functions
- Security Management Functions
- Subscriber and Service Management Functions
- General System Management Functions

1.3 Conventions

This section describes the conventions used in this guide.

NE/NEs hereinafter referred as DAS4672, and DAS4192 IP CO-DSLAM, unless specifically indicated.

ADSL mentioned in this document covers ADSL, ADSL2, and ADSL2+, unless specifically indicated. The **ADSL** specified in this document complies with ITU-T Rec. G.992.1, G.992.2, G.992.3 and G.992.5.

SHDSL mentioned in this document complies with ITU-T Rec. G.991.2,

xDSL hereinafter is referred as both the ADSL and SHDSL, unless specifically indicated.

CLI Ex – Command line management with a local console or Telnet through in-band or out-of-band IP interface for CIT (Craft Interface Terminal) connection.

AMS – A complete centralized SNMP base NMS (Network Management System) provides GUI operation under Client-Server architecture through in-band or out-of-band IP interface to carrying out day of day operation, administration, maintenance, and configuration functions of the NE.

- **AMS Client** – Software system for Network Management System (NMS), it's in

Client-Server architecture and has ability to provide controlling and management for the whole network through GUI interface to collocate with AMS Server.

- **AMS Server** – The server station provides multiple NEs management and Database in order to perform reliability, stability, and flexibility to entire network management.

This sign indicates the **NOTICE**. A note contains helpful suggestions or reference relay on the topical subjects.

This sign indicates the **TIP**. Performing the information described in the paragraph will help you solve a problem. The tip information might not be troubleshooting or even an action, but could be useful information.

This sign indicates the **CAUTION**. In this situation, you might do something that could result in equipment damage or loss of data.

Chapter 2 Advanced Management System Overview

This chapter provides a general overview of AMS. It contains concepts used in the network and service management for the NEs (IP-DSLAM).

- AMS Overview
- Configuration Management Functions
- Fault Management Functions
- Performance Management Functions
- Security Management Functions

2.1 AMS Overview

The Advanced Management System (AMS) enables high-speed data transfer using xDSL technology with the IP-DSLAM. AMS provide the carrier classes' level management of networks. AMS supports various functions and operations for effective management and troubleshooting of faults and the maintenance of the IP-DSLAM. It also supports GUI operations including various testing functions for the IP-DSLAM network elements.

Based on the unified Network Management System (NMS) platform of AMS, it employs the mature and widely-used Client-Server architecture. Therefore, it supports multiple clients and can be used to manage large and complex networks and flexibly extended to satisfy different requirements.

AMS provides a concise and consistent management mode. It provides unified topology management, fault management, performance management, configuration management, and security management. It also provides uniform device panels and operation maintenance interfaces.

2.2 AMS Design Algorithm

AMS is an integrated Service/Network/Element Management System (SMS/NMS/EMS) for the DAS4 Series equipments. It is designed to provide the operation, administration, maintenance and provisioning (OAM&P) functions of the DSLAM broadband access networks for the Telco operators.

With powerful activities of AMS, the Telco operators can monitor and controlling NEs (IP-DSLAM) equipments from a central Network Operating Center (NOC) and/or multiple geographically separated management site of domains to streamline of their operation needs.

The system supports Fault Management, Configuration Management, Performance Management, and Security Management functions follow by ITU-T TMN recommendations principles as defined in M.3010.

AMS is a centralized system that provides Graphic User Interface (GUI) capabilities for operators to perform OAM functional to the IP-DSLAM network elements (NE) operation of the Network and display the Network topology map. AMS is a total solution for end-to-end management systems.

AMS is developed based on the Client-Server model and follows the concept of Telecommunication Management Network (TMN) defined by ITU-T Rec. M.3000 series and DSL Forum TR-005/TR-066 and TR-030/TR-035 for ADSL Network Element Management and ADSL EMS to NMS, respectively.

AMS is designed based on the following principles:

- Follow the ITU-T TMN standards X.700 series recommendations
- Control, monitor and configure the network in real-time such as diagnostics and status of the NE
- Provide synchronization function to maintain the data consistence between the AMS Server and the NEs
- Centralized management with distributed system
- Client-Server architecture
- High reliability and scalable for future enhancement and upgrade
- Easy to maintain with AMS hardware platform
- Provide southbound and northbound communication interface for NMS
- Provide user-friendly configuration interface
- Provide mass capability to manage xDSL link
- Support workstations working simultaneously
- Support restoration of configuration data in case of system failure
- Keep historic data for each subscriber line
- To enable/disable various alarm severity levels are provided for all possible events/conditions
- Easy to be integrated with the carrier's existing OSSs
- Failure on AMS or loss of communication between AMS and network element will not affect the operation of equipment and network

2.3 AMS Feature

The AMS system supports various functions for the effective operation and maintenance of the xDSL communications network. The system supports topology management, fault management, performance management, configuration management, and security management of the IP-DSLAM.

User Friendly GUI Design for OAM

The AMS provides standard Graphic User Interface (GUI) of AMS Client, it support OAM function operation of the network and display topology map, the command processing functions through graphical menu capabilities to provide convenient operation and maintenance.

Real-time System Status Monitoring

The AMS collects the SNMP traps for the discrete alarm, faceplate LEDs, and system failures in real-time for monitoring and display of the xDSL and network interfaces, and Fan, Power, and Alarm relay status.

The NE indicated with colors for different status by GUI interface. Any addition and deletion of element or plug-in unit of NE will automatically detect and reflected in AMS Client GUI interface.

Administrative

The AMS has ability to displaying the network objects (NEs) graphically to define the topology of the network and configure the network, this feature allow operator be able to built, view and modify the network by placing nodes and subscriber into the network.

The AMS also provides function to equip the node with unit and interface module to adding it on the network.

Administrative function allows operator to planning or supervision their NE on the network.

Error Handling

When execution is not successful, error message will be displayed, and the operator has to configure problem entries and the process before proceeding further.

AMS Client support function to depict the failure status of the Location and NE in registered manage network.

Historical Footprint

The AMS is able to maintain an on-line historical log for all received management parameters. The retrieving function with filtering capabilities for management data is provided.

The AMS is able to export and report the log and management information to the specific file format.

2.4 The Architecture of AMS

This section describes the AMS Server architecture and network protocols within used.

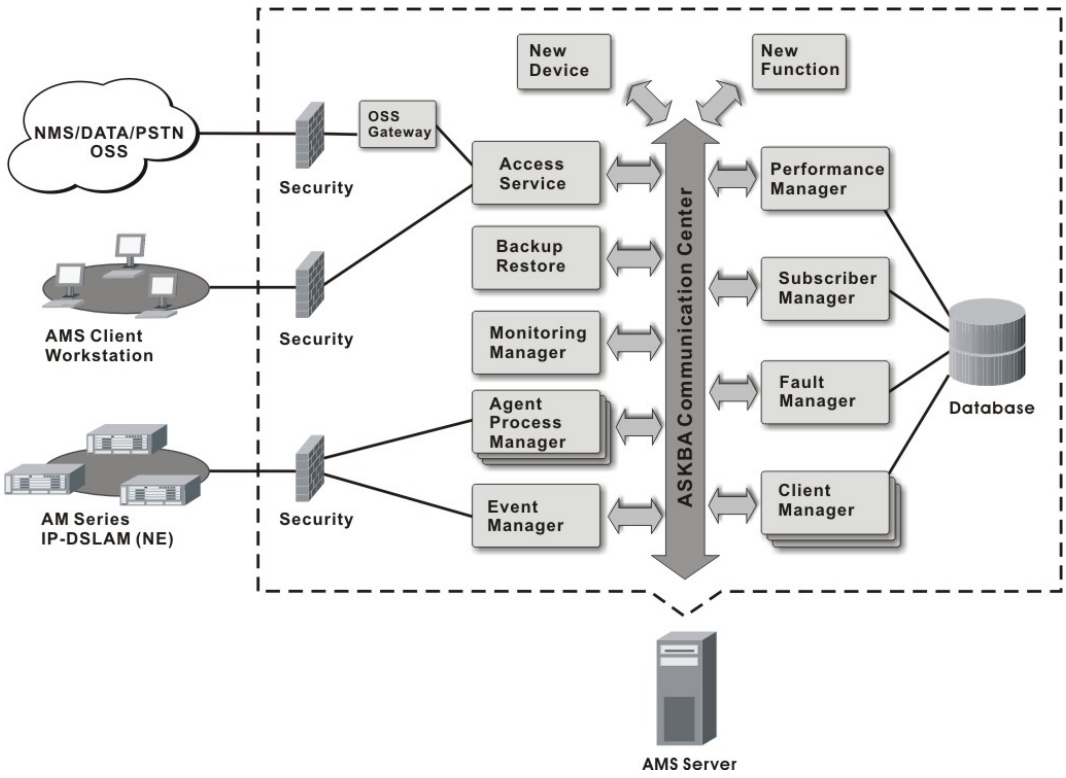
AMS is base on Client-Server architecture with database to store the enormous of NEs (Network Elements) information, includes the fault manager, performance manager, and other facility.

2.4.1 AMS Server Software Block Diagram

By employing the multi-process, modular architecture, and object-oriented design, with distributed system management supported, AMS provides high scalability, flexibility, and reliability.

The Process Manager (PM) control schedules to the NE daemon in a real-time of unified manner and monitors, all PM use the same ASKBA Communication Center (ACC) to transfer messages in between, thus making the NE daemons highly independent, each PM application can initiate multiple real-time tasks, which can be quickly switched in between.

Figure 2-1 AMS Server Processes Block Diagram



AMS Server provides device-specific component management applications. As one major feature of the NMS, the high scalability shows itself in the modular management to added new functions and easy integrated with other NMS devices.

2.4.2 AMS Interface Standards Architecture

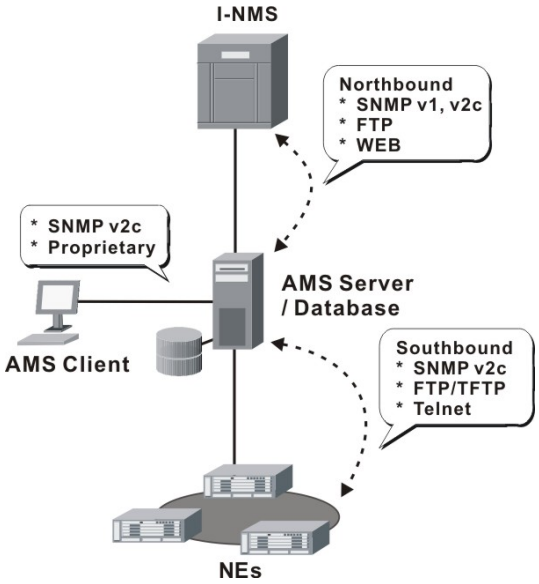
The interface standards use with in AMS Server northbound are support of SNMP v1, SNMP v2c, FTP, and WEB as an open data interface for communication between other OSS (Operation Support Systems), for southbound interface standards use are SNMP v2c and FTP/TFTP. The communication between AMS Client and AMS Server use SNMP and it proprietary protocol.

The interface protocol between AMS Server and NE is SNMP v2c.

The AMS is acts as the manager of management activities to perform monitoring and controlling NEs within its management domain.

The AMS will synchronize the NEs information and its database automatically in real-time for both direction.

Figure 2-2 AMS Interface Standards Diagram



Northbound Interface

- Northbound SNMP (v1, v2c) Interfaces – The integration interfaces of the AMS to other NMS devices.
- Northbound FTP Interface – The management interfaces for report retrieve.
- Northbound WEB Interface – The WEB base monitoring of Configuration, Fault, and Performance management.

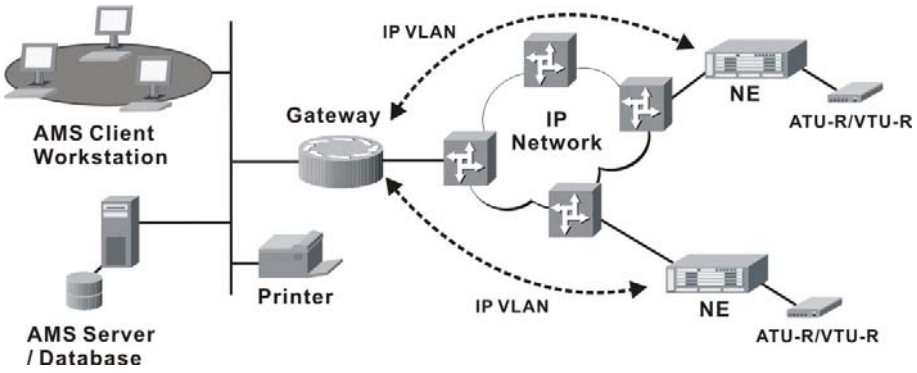
Southbound Interface

- Southbound SNMP v2c Interfaces – The management interfaces of AMS Server to the NE devices.
- Southbound FTP/TFTP Interfaces – The standard FTP/TFTP interfaces used to load, backup, and synchronize the NE devices.
- Southbound Telnet interface – The command line interface (CLI) of the AMS to the NE devices.

2.4.3 AMS Hardware Development Architecture

AMS system has ability to provide the end-to-end connecting via out-of-band IP management Ethernet interface or in-band with VLAN through gateway to reach GE interface of NE, to perform management function either independently or simultaneously.

Figure 2-3 AMS Hardware Development Diagram



AMS consists of a system server (AMS Server), workstations (AMS Client), gateways, switch hubs, and laser printers to manage the NEs, the AMS hardware architecture is shown as Figure 2-3.

The AMS is designed using Client-Server architecture and able to be managed from single software and hardware platform to have centralized network view of NEs.

2.5 AMS Technical Indices

- The AMS supports more then 1,000 NEs and 700,000 xDSL Subscribers in single AMS Server with minimum hardware specification, see this document “Chapter 2.6”.
- AMS Server can support 20 of AMS Client logging simultaneously.
- The current alarm table can store 1,000,000 alarm records at most. The alarm records to be stored in the alarm history table and the event table can be set by the user (the data will be dumped when the alarm history table or the event table is full). A maximum of 1,000,000 history alarms can be stored.
- The log database can save the log information generated during 3 months or more.
- The AMS supports function to maintain the data consistence between the AMS Server and the registered NEs in real-time.
- AMS Server has ability to keep the records of registered NEs parameter status update due to power or equipment failures.

2.6 System Hardware and Software Requirement

AMS has design in high stability and reliability platform, for perform fluent in management, the minimum hardware specification require for handle around 1,000 NEs and 20 concurrent user access from AMS Client are recommend in list below to optimal the performance. System itself have not limitation on the number of elements under it management, the limit has only be restricted by the size of the AMS hardware capabilities.

The recommend hardware & OS for AMS Server:

- Intel® Xeon™ 2.8 GHz or higher
- 1 GB RAM
- 100 GB Hard disk
- RAID 1 support
- SCSI hard disk or SATA-I/II support
- 10/100/1000 Base-T Ethernet network card
- Operating System – MS Windows 2000 Server / Windows 2003 Server

The recommend hardware & OS for AMS Client:

- Pentium 4 2.0 GHz or higher
- 512 MB RAM
- 40 GB Hard disk
- 10/100/1000 Base-T Ethernet network card
- Operating System – MS Windows 2000 Professional

The Software require for AMS System:

- AMS Installation Package
- JDK Runtime (Java)

2.7 Database for AMS Server

The Database use for AMS server is very comprehensive, the current implementing database using with AMS Server is MySQL and operating under same AMS Server OS.

The features of AMS database are lists as follow:

- Accommodate on future enhancement and modification design base
- Stability and flexibility to be able to grow with upgrade hardware
- Easy to migrate and backup
- Portable from one server to another without massive conversion involved
- Support data automated polling to the specify common repository server

2.8 Backup and Recovery Mechanism

With database backup and restore mechanism, AMS provide this mechanism for operator to save and reload the entire network configuration, include, configuration management, fault management, performance management, subscriber management, and security management data, the system data can be stored at the external non-volatile media and can be reloaded on demand to the network. In case if AMS fails due to power or equipment defective, this mechanism can keep the records of network management parameters up-to-date to prevent unnecessary damage.

The NE configuration data are backup in the server in plain text format, server will keep most recent of 30 days NE data, while the restore required; the operator has ability to choose the data from the backup list to retrieve the passed configuration.

Once the backup is in process, none of any user operation and network service will be interrupted, the files will be store in the hard disk of specific backup directory. A display message will inform operator on back and recovery to maintain the data integrity, operator can easy to store backup data to the DAT tape or burning to the recordable CD.

The duration of database backup storage is around 60 seconds with 1500 subscribers in 7 days of performance and fault management relation data files.

The features of AMS database backup and recovery are lists as follow:

- Support both backup and recovery
- Support automation and schedule of backup activity
- Support database backup and recovery on demand
- Support database backup file include the NE’s IP address and date-time
- Support NE bye NE or entire network backup and recovery

2.9 AMS O&M Tools

The AMS has ability and capabilities to perform the AMS platform of its own self-health check, such as viewing the CPU utilization, Memory, and Network utilization.

Figure 2-4 CPU Utilization

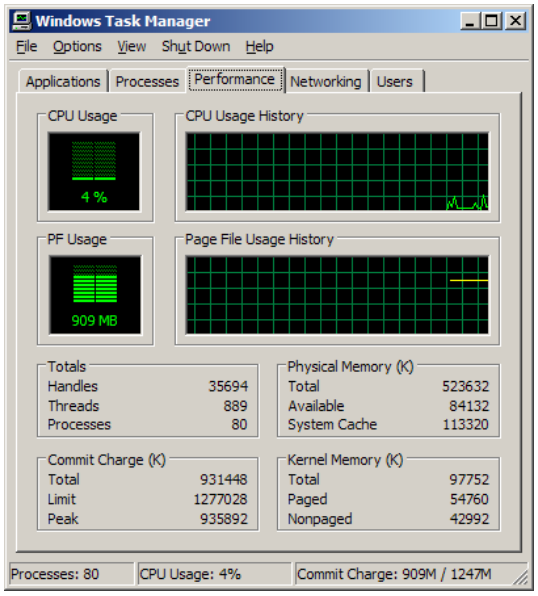
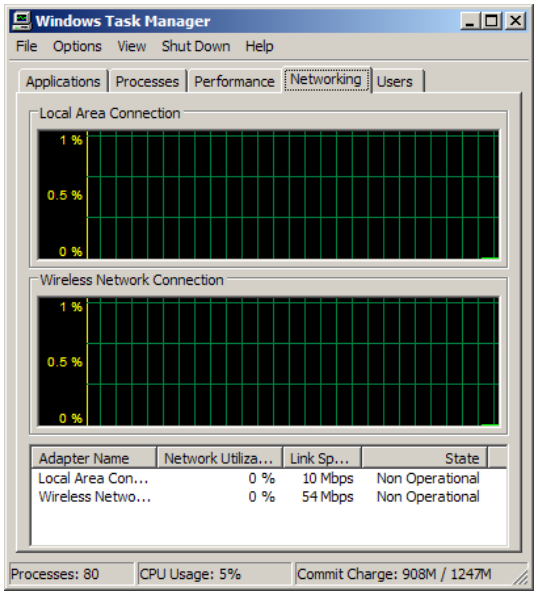


Figure 2-5 Network Utilization



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Chapter 3 Getting Started AMS

This chapter describes on how to install the AMS server and client software, and provides the general navigating concept of AMS client software to help you to quickly handle it.

This chapter contains the following sections:

- Get the AMS server and client files
- Start the AMS Server
- Stop the AMS Server
- Start the AMS Client
- Navigating of AMS Client

The AMS Server and Client can be executed on either the same PC or on different PCs.

3.1 Get the AMS server and client files

AMS software consists of two zip files: AMS_Server_Windows.rar and AMS_Client_Windows.rar. Please contact with the local agent to get them.

3.2 Start the AMS Server

Follow the subsequent procedures to start the AMS server.

Step 1 Unzip the AMS_Server_Windows file to a designated path on AMS server PC, for example,
C:\AMS_Server_Windows\

Step 2 Change to the sub-directory under “bin”, for example,
C:\AMS_Server_Windows\bin\

Step 3 Reinitialize the AMS Server by executing “reinitialize_nms.bat”. And click “YES” button in the **Reinitialize IP DSLAM Manager Dialog** as shown in Figure 3-1.

Step 4 Start the AMS Server by executing “startnms.bat”.

Step 5 Two pop-up windows will appear. Wait for the message “Please connect your client to the web server on port: 9090” which indicates that AMS server is running, as shown in Figure 3-2.

It is forbidden to stop the AMS server by closing these two pop-up windows that are created in **Step 4**. It is strongly recommended to stop the AMS server by the procedure shown in Section 3.3

Figure 3-1 Reinitialize IP DSLAM Manager Dialog

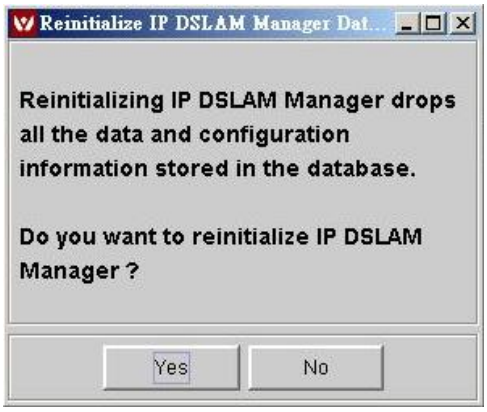
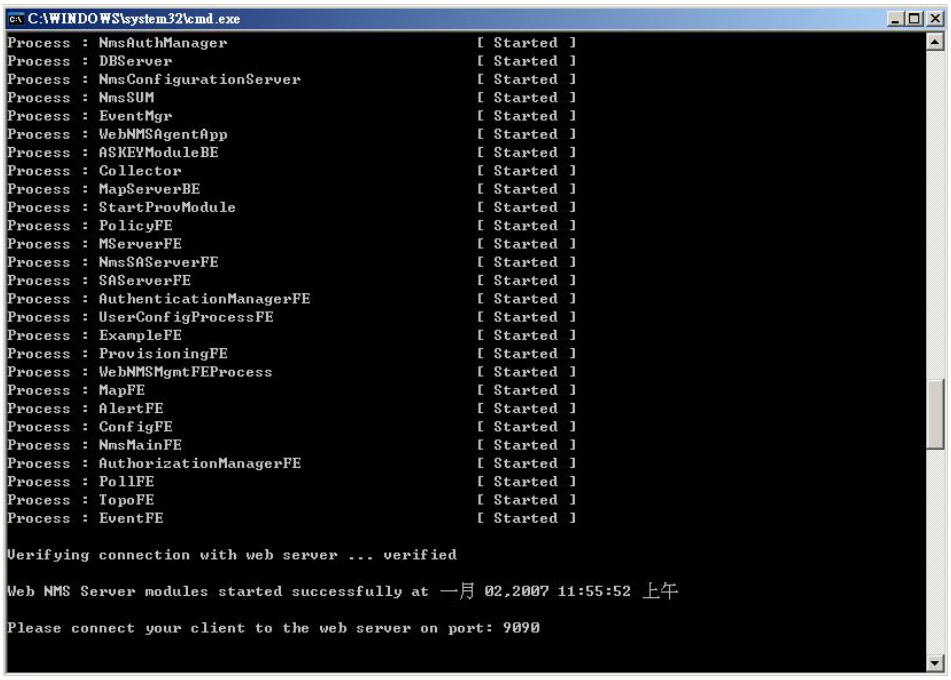


Figure 3-2 Started AMS Server Dialog



3.3 Stop the AMS Server

Follow the subsequent procedures to stop the AMS server.

Step 1 Change to the sub-directory under “bin”, for example,
C:\AMS_Server_Windows\bin\

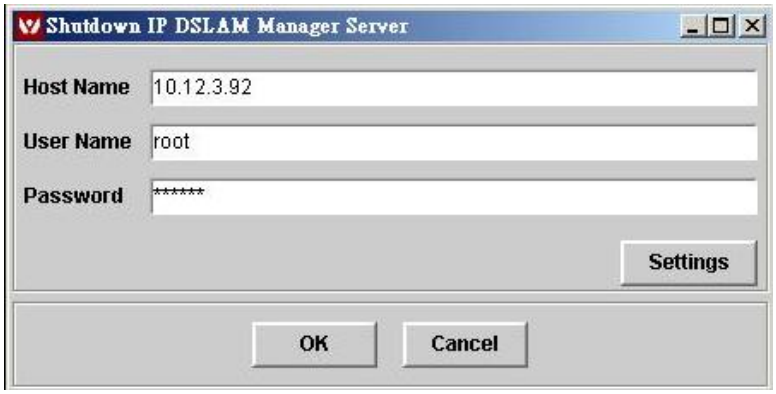
Step 2 Stop the AMS Server by executing “shotdownms.bat”

Step 3 In Figure 3-3, **Shutdown AMS Server Dialog**, fill the “Host Name” field with the AMS server IP address. And key in the user name and password accordingly.

Step 4 Click “OK” button to complete the shutdown procedure.

It is forbidden to stop the AMS server by closing these two pop-up windows which are created in **Step 4** depicted in Section 3.2.

Figure 3-3 Shutdown AMS Server Dialog



3.4 Start AMS Client

Follow the subsequent procedures to start the AMS client.

Step 1 Unzip the AMS_Client_Windows file to a designated path on AMS client PC, for example,
C:\AMS_Client_Windows\.

Step 2 Change to the sub-directory under "bin", for example,
C:\AMS_Client_Windows\bin\..

Step 3 Start the AMS Client by executing "startApplicationClient.bat" to launch the **IP DSLAM Manager Dialog** as shown in Figure 3-4

Step 4 In **IP DSLAM Manager –Dialog**, fill the "User ID" field and "Password" field with "root" and "public", respectively.

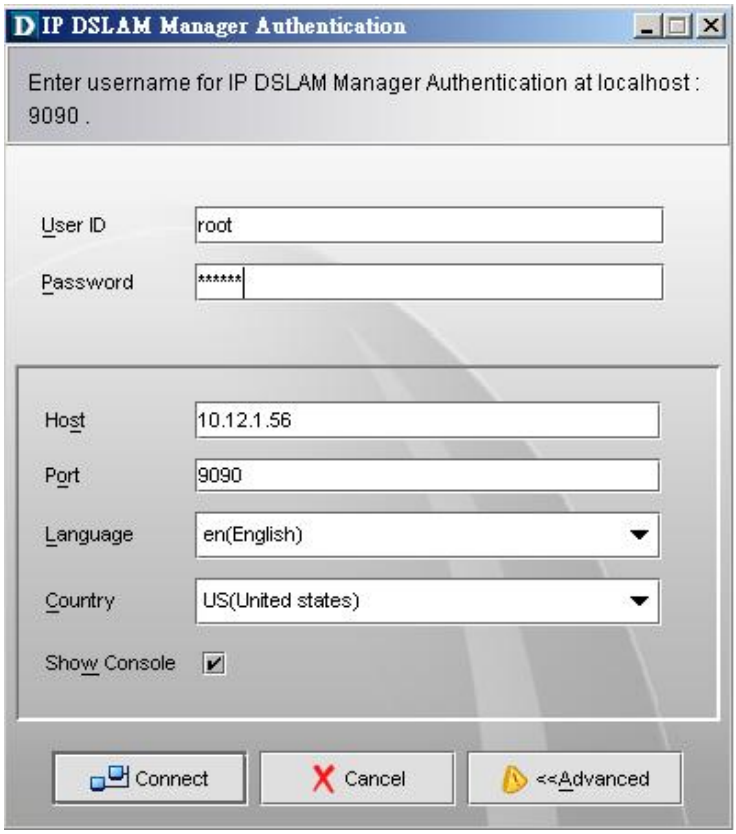
Step 5 Click the "Advanced" button to extend the **IP DSLAM Manager Dialog** as shown in Figure 3-5.

Step 6 In **IP DSLAM Manager – Advanced Dialog**, fill the "Host" field and "Port" field with the AMS server IP address and "9090", respectively.

Step 7 press "Connect" button to login the AMS server.

Figure 3-4 IP DSLAM Manager Dialog

Figure 3-5 IP DSLAM Manager – Advanced Dialog



3.5 Navigating the AMS Client

AMS software uses familiar functionality and menus found in most MS-Windows based graphical user interface. This section describes the functions available in AMS Client.

3.5.1 Keyboard Commands

Certain Keyboard commands are available in AMS Client. These commands serve as an alternative to mouse functionality.

Keyboard Command	Description
Operation	
Tab	Move among the fields in a window/dialog.
Arrow Keys	Scroll through the text in a data entry field or through the values of a list box.

3.5.2 Right Mouse Button

AMS Client software provides right-click mouse functionality. By positioning the mouse cursor over an “NE object”, you can click the right mouse button to view the launched **Function Menu**. The **Function Menu** options available depend on selected “NE object”. You can then use the left or right mouse button to open the associated function dialog window.

The “NE object” denotes the NE entity, Shelf, Slot/Box, and Port displaying on the Rack tab of Multimedia View area or Network Tree View area.

3.5.3 AMS Management Window Overview

The AMS management window contains several parts in an organized design. It provides convenience for operator to task the job easier and faster.

The AMS management window consists of three kinds of windows.

- **AMS Network Management Window:** As shown in Figure 3-6, it is the main window to manage the NEs from a network-wide perspective. Figure 3-7 shows the enlarged view of **Network Management Sub-window.**
- **AMS Device Management Window**: As shown in Figure 3-8, it is the NE management Window to manage a specific NE.
- **NE Frame Region and Card Module Region:** As shown in Figure 3-9, there are two implicit regions, **NE Frame Region and Card Module Region** on the NE. Click on either region will launch the either NE-specific pop-up menu or card-specific pop-up menu.
- **AMS NE Configuration/Status/Information Page Window**: As shown in Figure 3-10, it is the NE management Window to either configure a specific NE or view its status and information.

Figure 3-6 AMS Network Management Window

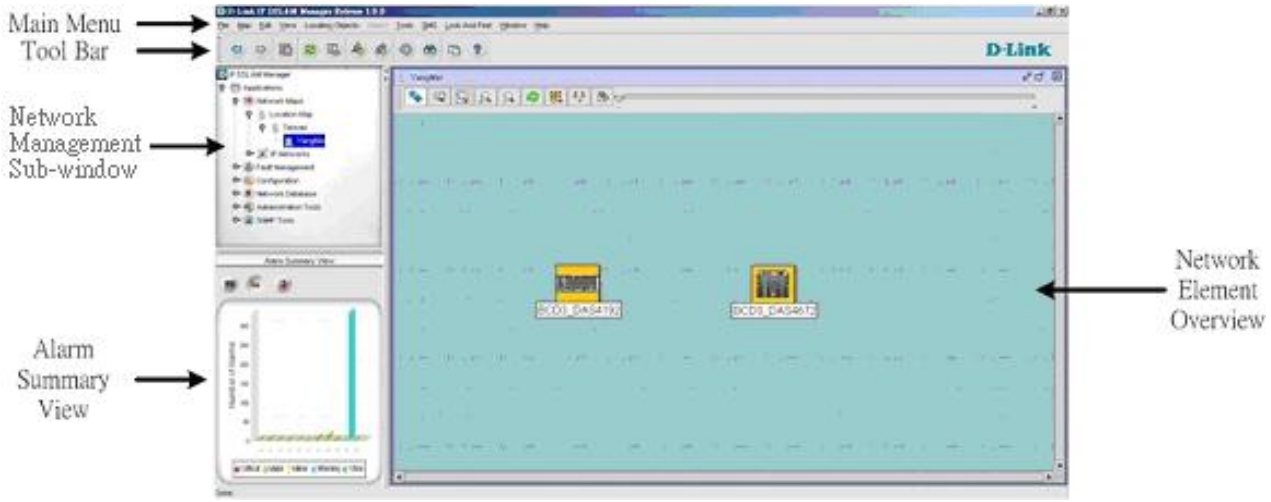


Figure 3-7 Network Management Sub-window

Figure 3-8 AMS Device Management Window

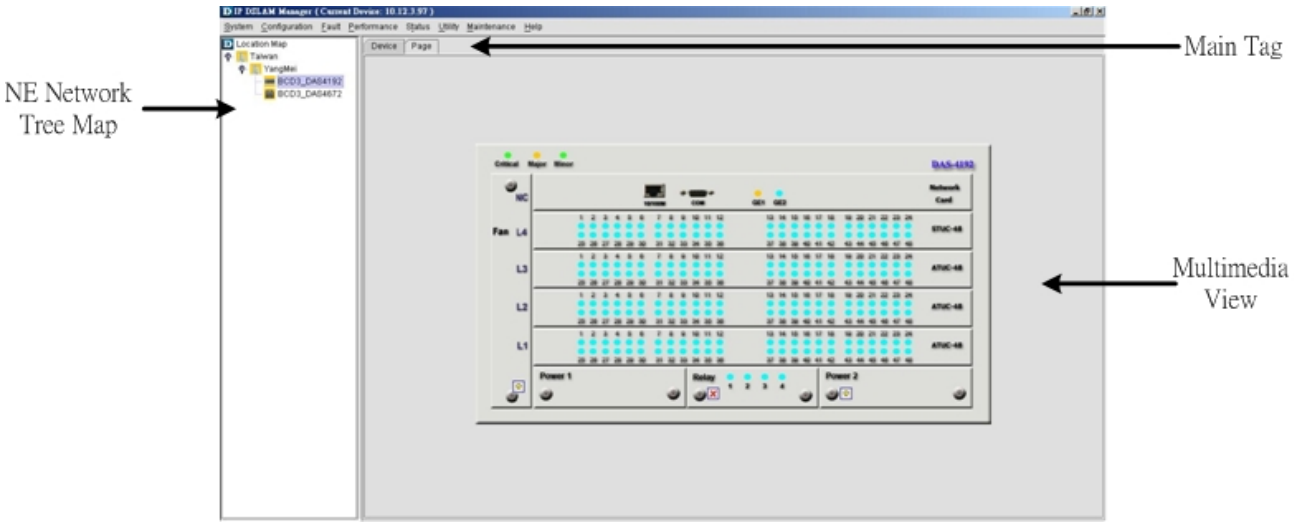
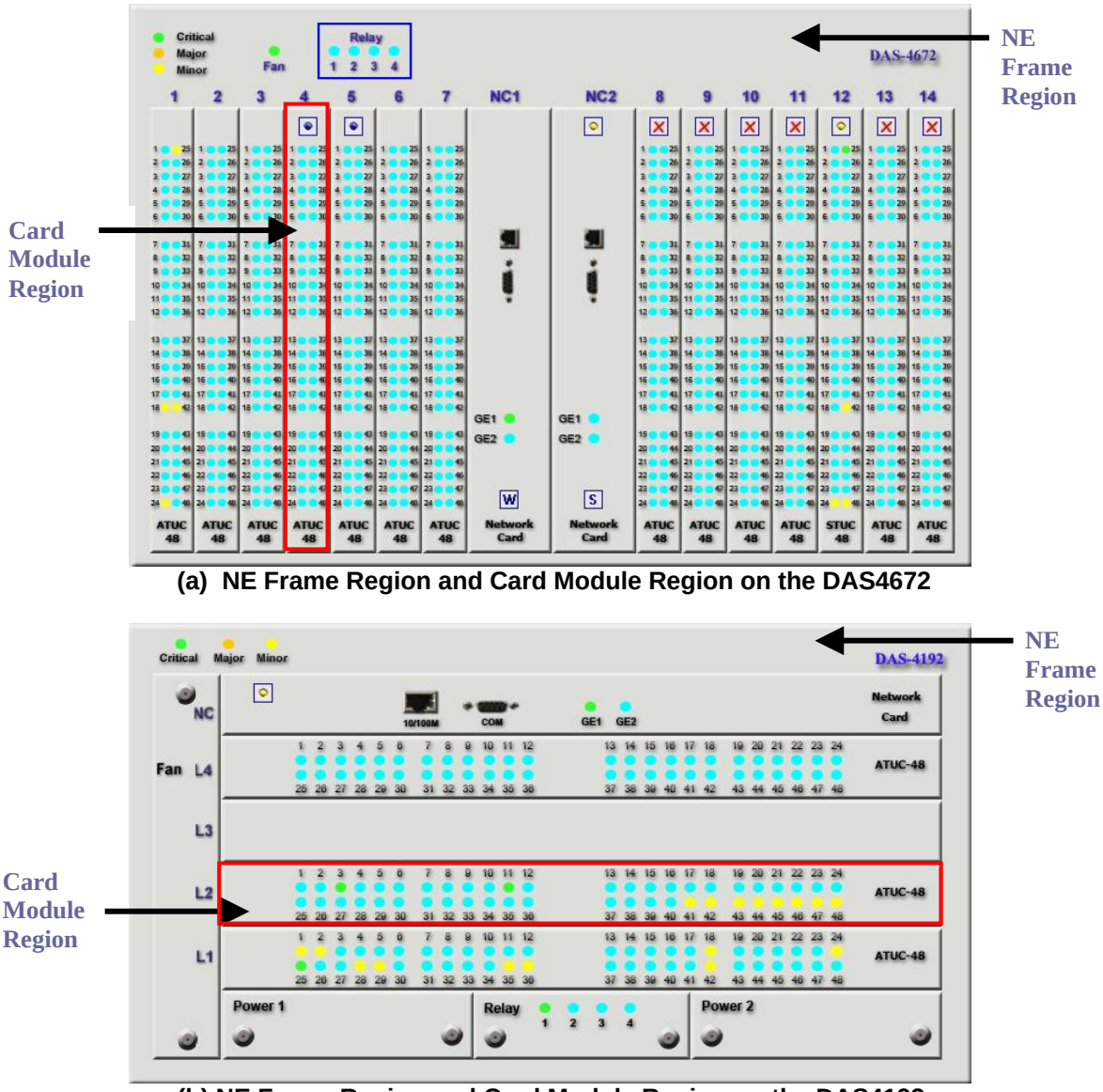


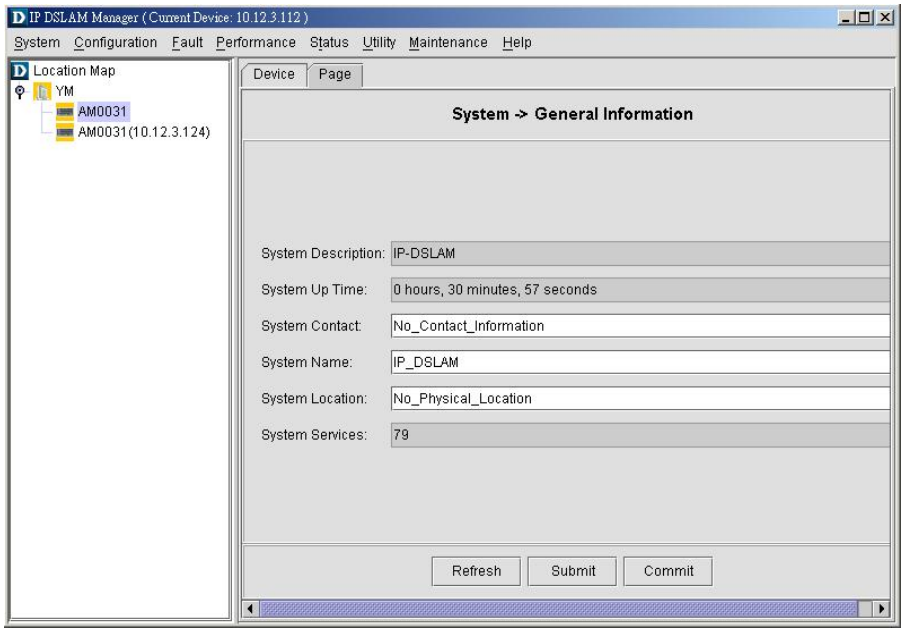
Figure 3-9 Illustration of the NE Frame Region and Card Module Region on NE.



(a) NE Frame Region and Card Module Region on the DAS4672

(b) NE Frame Region and Card Module Region on the DAS4192

Figure 3-10 AMS NE Configuration/Status/Information Page Window



Chapter 4 Configuration Management Functions

This chapter provides a general configuration management overview and features of AMS. It contains concepts used in the network and service management for the IP-DSLAM.

4.1 Configuration Management General Function

Configuration management implies all necessary tasks to identify, initialize, control and to get status information of all units and function of all NEs in a telecommunication network. With the help of configuration management it has to be possible to initialize and administrator the status of manage object.

The status information of all network elements are configured and displayed by the AMS, and the AMS provides various information management and provision functions for the network configuration elements, it has capability to setup, query, update, backup, and restore NE's configured database of it managed.

PVC to VLAN conversion table information and line rate information that is required for operation. The configuration management function of AMS consists of various views for configuration management of NE and various menus for changing the status information of NE's or for searching information on the NE.

Registration and Initialization

The AMS provides functions for registering and displaying the NE in the network search screen and able to be add, remove or edit NE from the database.

Location Management Facility

AMS provides group management function in hierarchical that present configuration of network as well as one of each specific NEs, graphic present routing of different connections and sections are visible by request of operator.

System Software/Firmware Remote Download

Remote functions for downloading, maintenance and recovery, it provided the S/W and F/W update of registered NEs.

Ethernet over ATM Management

The configuration information is able to manage such as ATM PVC to VLAN ID conversion link table, encapsulation method, bandwidth information, IP CoS information, and other Layer 2 control.

PVC to VLAN Mapping Setup and Release

The AMS has ability to configure the mapping function of ATM PVC to VLAN ID (one-to-one or multiple-to-one) as well as ATM PVC and 802.1p priority queue in the same connection. Modification and status management on the set connections is possible.

NE Connectivity

The AMS has ability to checking for any loss of connectivity between the NE and the AMS Server. If the connection is lost, and once it is reestablished, the AMS will automatic synchronize its database with the current state of NE.

ATM PVC Management

The AMS is able to create, modify, and delete the assign ATM VPI/VCI values in xDSL interface; each xDSL interface has ability to assign 8 of different ATM PVC in maximum.

Profile Template Management

AMS supports xDSL profile template and alarm definition template in centralize manage with the

registered NEs, a profile is a name list of configuration parameters with a value assigned to each parameter, the profile template function provides manual synchronization in order to download profile configuration to the specific NEs. The profile is able to create, modify, and delete.

Profile parameter changed and download to NE will affect the value of relevance ports using that profile.

ADSL Connection Management

Configuration of ADSL line rate can be managed by creating a profile for ADSL interface; the configuration and read parameters for ADSL contains SNR target margin, SNR maximum margin, SNR minimum margin, maximum interleaving delay, minimum data rate, maximum data rate, Up-shelf SNR margin, and Down-shelf SNR margin for both downstream and upstream. Rate mode support fix rate, adaptive rate, and dynamic rate, channel mode support interleave and fast mode.

The parameter supports additional maximum nominal transmit PSD for downstream and configurable spectrum bound for the ADSL2+ connection, this function is available on **AMS** as well as **CLI Ex**.

The controllable spectrum bound defined in ITU-T Rec. G.992.5 is supported, the subcarriers that will be included and not be included in the downstream and upstream will be able to be configured, and this function is available on **AMS** as well as **CLI Ex**.

The ADSL power management line states (including L0, L2, and L3) specified in ITU-T Rec. G.992.5 is supported and allowed ADSL power management link stats for L2 and L3 states to be configurable, the transitions between L0 and L2 states in downstream will be on conditions according to the control parameters specified in ITU-T Rec. G.992.5 and ITU-T Rec. G.997.1, this function is available on **AMS** as well as **CLI Ex**.

Deleted and modified will make effect of all ADSL port status apply to this profile. Operator has ability to create, delete, or modify the profile to change the connection status.

SHDSL Connection Management

Configuration of SHDSL line rate can be managed by creating a profile for SHDSL interface. The configurable and read parameter contains SNR target margin, SNR maximum margin, SNR minimum margin, minimum data rate, and maximum data rate in symmetric data transmission. Deleted and modified will make effect of all SHDSL port status apply to this profile. Operator has ability to create, delete, or modify the profile to change the connection status.

Loop Diagnostic Function

The ADSL Subscriber interface support configuration of loop diagnostic on demand (DELT / SELT), this function for any ADSL line will not affect and interrupt other working xDSL line traffic during and after the loop diagnostic procedure. This function is available for **AMS** as well as **CLI Ex**.

IP Traffic Profile Management

Configuration of IP Traffic profile can be create and delete and apply to the specific xDSL interface, the parameter contains rate limiting and queue priority control.

Traffic Policing Profile Management

Configuration of Traffic Policing profile can be create and delete and apply to the specific xDSL interface, the Traffic Policing profile is design to police on the unicast connection for user’s upstream traffic; once it is created you can apply it to distinct xDSL line interfaces.

Multicast Service Management

Configuration of multicast service can be managed by creating a profile; the parameter contains channel group information, transmission rate, and class queue. Operator can create, delete, and modify the profile.

Administration for Multicast Service

The AMS has ability to enable/disable the IGMP snooping and IGMP Proxy functions of the Multicast Service.

Administration and Configure of DHCP relay and agent Option 82

The AMS has ability to enable/disable the DHCP relay and agent option 82 functions and configure the value of Circuit ID and Remote ID sub-option.

System Deletion Function

This function enables the deletion of the corresponding NE, when deleting a NE that has been registered and was in used, database will no longer to store relevance information. This function is for managing the registered NE by Location, and enables setup, change, and delete of Location as well.

System Registration Search Function

Provides function for searching Network information, various information including NE type, IP Address.

xDSL Configuration Information Inquiry

The operating status of the subscriber modem in service, e.g. Speed, SNR margin, line conditions, etc. are managed to provide the operator in real-time.

Card Installation Information Inquiry

Various unit installation information that installed and operating onto system is read from the NE to operator. Unit installation information is automatically reported.

NE and AMS Server Synchronization

Function for maintaining synchronization of the configuration on NE and AMS can be performs on demand, the partial configuration synchronization is supported. Synchronization maintenance provides bidirectional on both NE and AMS Server.

AMS supports the instant view of every NE object (equipment) and network section.

NE Configuration Backup and Restore

If the AMS or NE information is damaged, this function enables upload or download of all configuration information. Periodical auto backup is support.

AMS provides the function request to identification of NEs and replaceable units by configuration backup and restores to procure the change of NE type and information, Configuration, and software version.

Subscriber Access Information Inquiry

Manages subscriber's ATM PVC to VLAN ID mapping table and MAC address of PVC and xDSL interface are upon to request searches and provide the corresponding information to the operator.

Subscriber Access Limiting

By verify of MAC address, AMS has ability to limiting the subscriber in port base, Source MAC filter is support.

NE Object Installation Status Display

Classifies NE and it card module installation/un-installation/dismount status, and provides the status change in real-time, AMS supply of current status and information of the present NE objects.

Administration for Ethernet over ATM Link and Status Display

Operation status controls allow operator to enable/disable the ATM PVC to VLAN ID mapping on Ethernet over ATM of xDSL interface, administration and operation status can be display from AMS, this function is available for **AMS** as well as **CLI Ex**.

Administration for xDSL port and Status Display

Operation status controls allow operator to enable/disable the ADSL/SHDSL/VDSL subscriber interface unit on per port basis, this function is available for **AMS** as well as **CLI Ex**.

Interface Port Connection Status Display

The port status on NE is reflects to AMS in real-time during status change, AMS is able to configure the administration status and read operational status for ADSL/SHDSL/VDSL subscriber interface and network interface of NE.

Remote Reset Functions

The AMS Client provides the remote reset function to reset entire NE system, Line card, and ADSL/SHDSL/VDSL subscriber on per port base.

SNMP Management

The AMS provides the configuration function for SNMP read, write, and trap community names of the NE.

AMS Database Backup and Restore

AMS Server database is conserve the current configuration of all the equipment within the sub-network that is manages in a non-volatile database, in case of breakdown all NEs (equipment) can be easily rest to the previous configuration.

4.2 Configuration Management General Features

The AMS provides the capability to setup, retrieve, update, and backup/restore all the configuration data of network elements in the managed domain.

The AMS provides request to identification of NEs and replaceable NE object (DSLAM, Card module), configuration, and software version.

The configuration management features are lists as follow:

- Support NE manually add, remove, and modify
- Identify software version of NE object (DSLAM, Card module)
- Automatic update NE status and information
- Network topology configuration
- Network element configuration
- ADSL Line profile configuration
- SHDSL Line profile configuration
- IP Traffic profile configuration
- Traffic Policing profile configuration
- Multicast service profile configuration
- ATM PVC to VLAN ID mapping
- Support DHCP relay agent option 82
- VLAN Membership listing function
- Multicast Membership listing function
- Source MAC filtering function in subscriber xDSL connection
- Subscriber Line configuration
- Subscriber Management
- DSLAM software upgrade and check software version
- Subscriber Line reset

- Subscriber interface unit enable/disable
- Support remote port reset, card reset, and NE reset

4.3 Constructing the Managed NE Network

AMS supports to construct managed NE (Network Element) network topology by adding locations to or deleting locations from a managed NE network. Each location and NE can be assign with the contact person information and topology map. And every location and NE can be assign with name for identity issue. Any modification of particular location will process updating of database regarding to particular location automatically whenever the modification has been initialized.

The AMS is able to segment the NE geographically in level with no limit, multiple map and sub-map is support to ease the configuration process.

4.3.1 Add a Location to the Managed NE Network

The first step to construct the managed NE network is to add the locations where the NE is deployed.

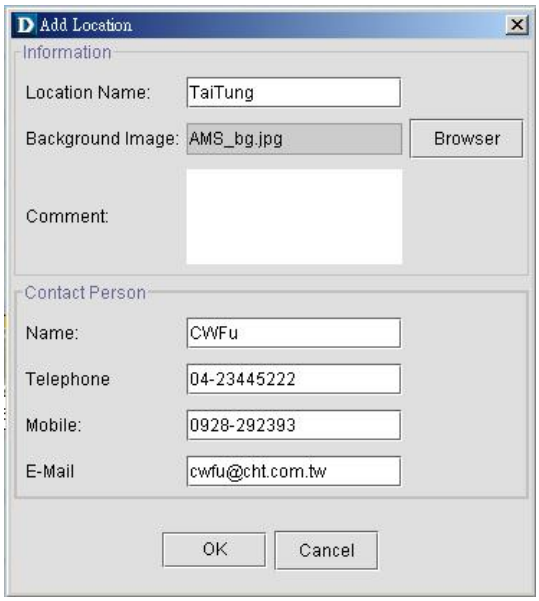
Follow the subsequent procedure to add a location to the managed NE network.

Step 1 Position the mouse cursor over the “Location Map” tab in **Network Management Sub-window** as shown in Figure 3-7, and then click the right mouse button to launch the **Add Location Dialog** as shown in Figure 4-1.

Step 2 Fill the **Add Location Dialog** with the contact person information and name and click **OK**. A new location will appear in the **Network Element Overview Sub-window** as indicated in Figure 4-2

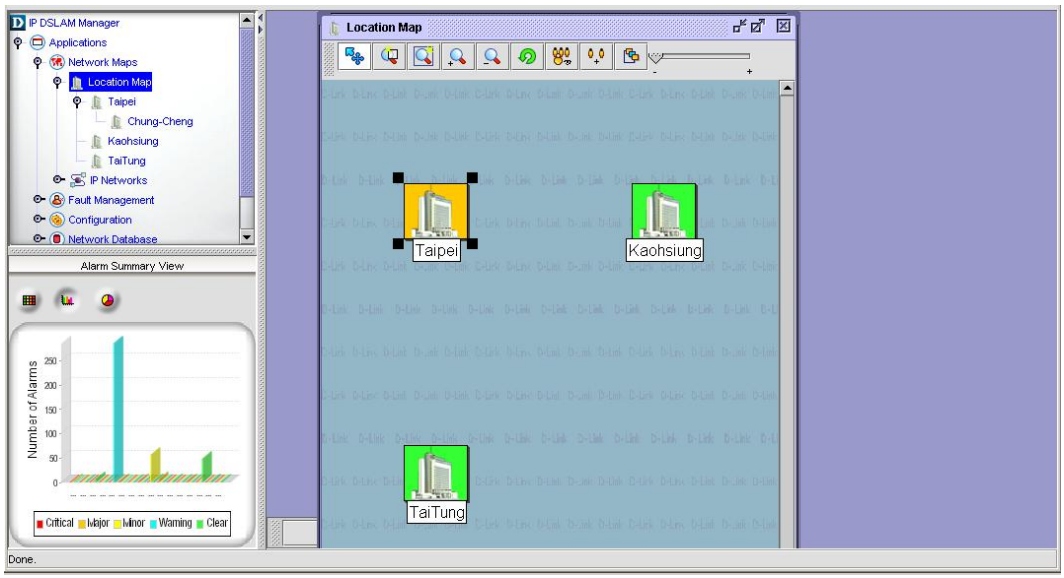
Step 3 Position the mouse cursor over this new location in **Network Element Overview Sub-window,** and then press the left mouse button and move the mouse to change its position as you want.

Figure 4-1 Add Location Dialog



It is noted that each location is to be associated with a **Backgroud Image** as indicated in Figure 4-1. The operator should configure the **Backgroud Image** by an appropriate location map to reflect the real environment.

Figure 4-2 Locations added in the Network Element Overview Sub-window



4.3.2 Add a NE to the Location

Follow the subsequent procedure to add a NE to the location in NE network.

Step 1 Position the mouse cursor over a location tab under the “Location Map” tab in **Network Management Sub-window** and then click the right mouse button to launch the **Network Management Sub-window – Location Management Pop-up** as shown in Figure 4-3.

Step 2 Select the **Add Device** option to launch the **Add NE Dialog** as shown in Figure 4-4**.**

Step 3 Fill the **Add NE Dialog** with the contact person information and name and click **OK**. A new NE will appear in the **Network Element Overview Sub-window** as indicated in Figure 3-6.

Step 4 Position the mouse cursor over this new NE in **Network Element Overview Sub-window,** and then press the left mouse button and move the mouse to change its position as you want.

Refer to Section 4.4 for the details of constructing a NE on the AMS.

Figure 4-3 Network Management Sub-window – Location Management Pop-up

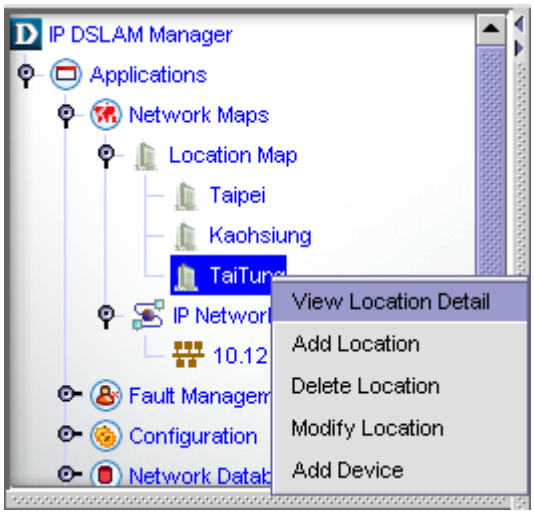
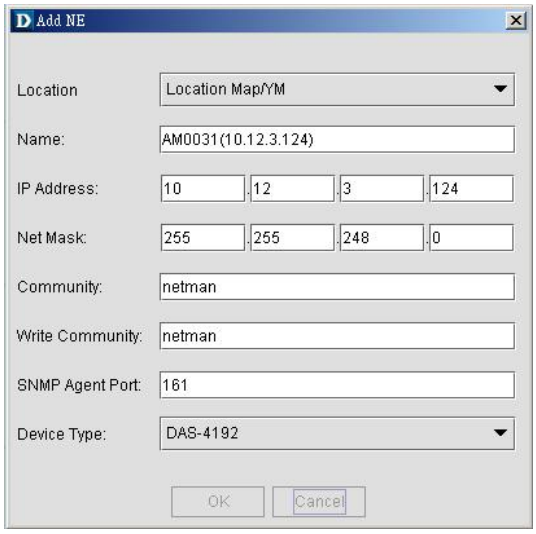


Figure 4-4 Add NE Dialog



4.3.3 Add a Nested Location to the Location

AMS supports nested location management. The network operator is allowed to add a location to a location to reflect the deployment of NE in real environment.

Follow the subsequent procedure to add a nested location to the location in NE network.

Step 1 Position the mouse cursor over a location tab under the "Location Map" tab in **Network Management Sub-window** and then click the right mouse button to launch the **Network Management Sub-window – Location Management Pop-up** as shown in Figure 4-3.

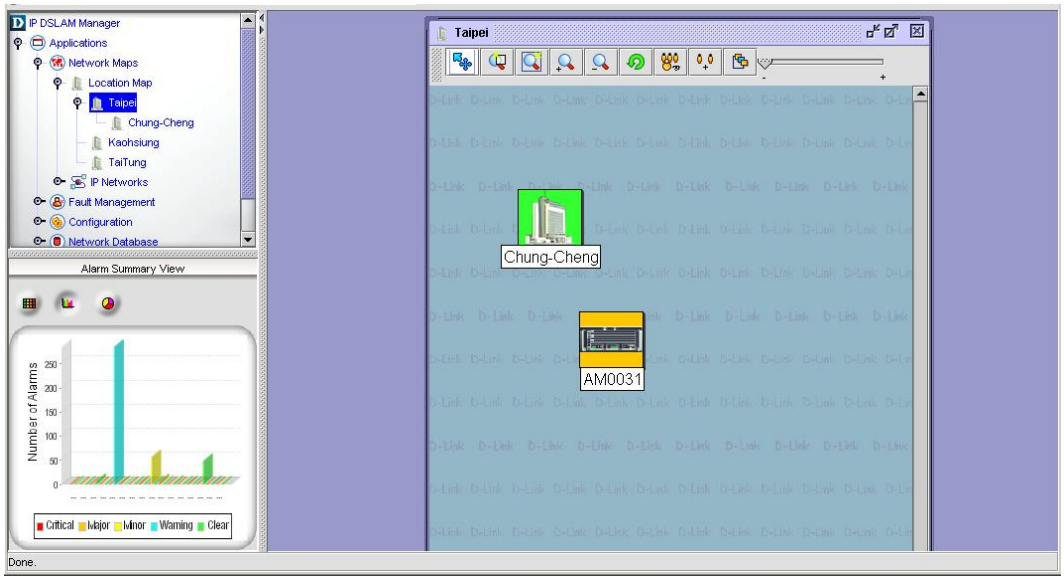
Step 2 Select the **Add Location** option to launch the **Add Location Dialog** as shown in Figure 4-1.

Step 3 Fill the **Add Location Dialog** with the contact person information and name and click **OK**. A new location will appear in the **Network Element Overview Sub-window** as indicated in Figure 4-5.

Step 4 Position the mouse cursor over this new NE in **Network Element Overview Sub-window,** and then press the left mouse button and move the mouse to change its

location as you want.

Figure 4-5 Nested Locations added in the Network Element Overview Sub-window



NOTE It is noted that there is something different between Figure 4-2 and Figure 4-5. They are different at the up-left corner which displays the location.

4.3.4 Managed NE Network Database

AMS supports to view the managed NEs status in various points of view. Operator can easy to identify the connection between the NEs and the AMS Server. Operators can also use the SNMP connection tools to check the up level protocol on the link between NE and AMS Server.

The operator can view the details of managed NEs by a network perspective as follows

Click to the “Network Database” tab in **Network Management Sub-window** as shown in Figure 3-7. Click the “Network Database” tab to launch the **Detailed Network Database List** in the Network Element Overview Sub-window as depicted in Figure 4-6.

Or the operator can follow the subsequent procedure to view managed NEs records from the perspective of node/network/uplink interface.

Step 1 Double Click to extend the “Network Database” tab in **Network Management Sub-window** as shown in Figure 3-7.

Step 2 Click the “Networks” tab under the “Network Database” tab to view the managed NE network from a perspective of IP-sub-networks as shown in Figure 4-7.

Or

Step 2 Click the “Nodes” tab under the “Network Database” tab to view the managed NE network from a perspective of NE nodes as shown in Figure 4-8.

Or

Step 2 Click the “Nodes” tab under the “Network Database” tab to view the managed NE network from a perspective of NE interfaces as shown in Figure 4-9.

Figure 4-6 Detailed Network Database List

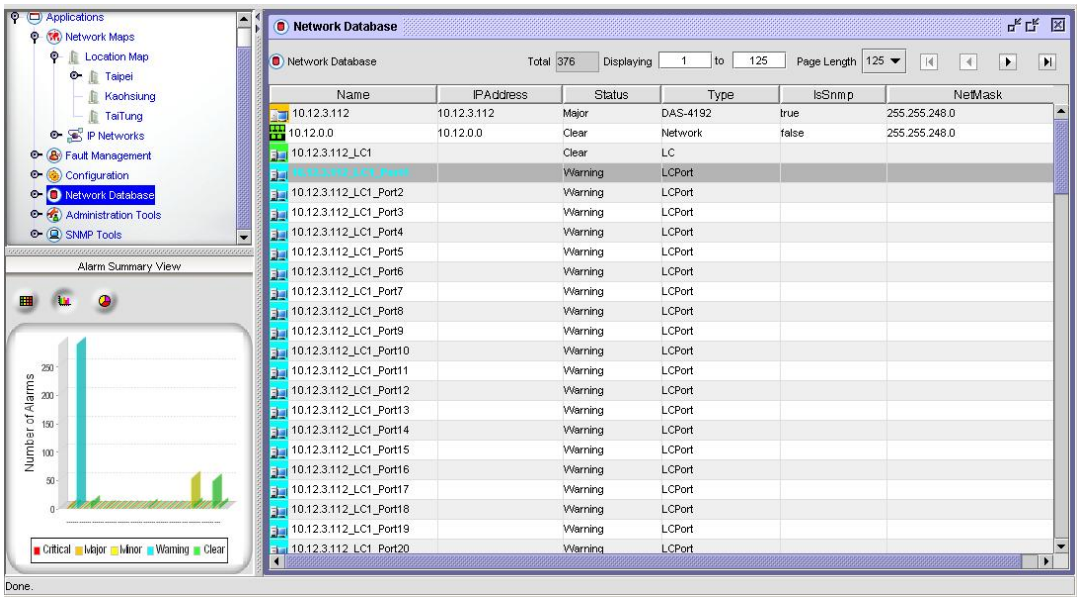


Figure 4-7 Network Database – IP Sub-networks Perspective List

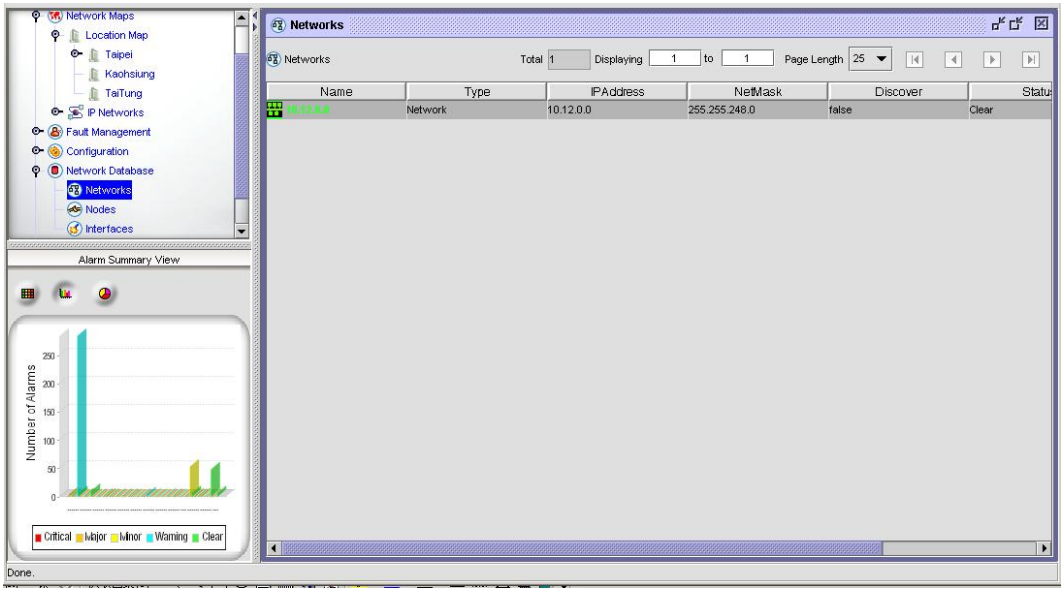


Figure 4-8 Network Database – NE Node Perspective List

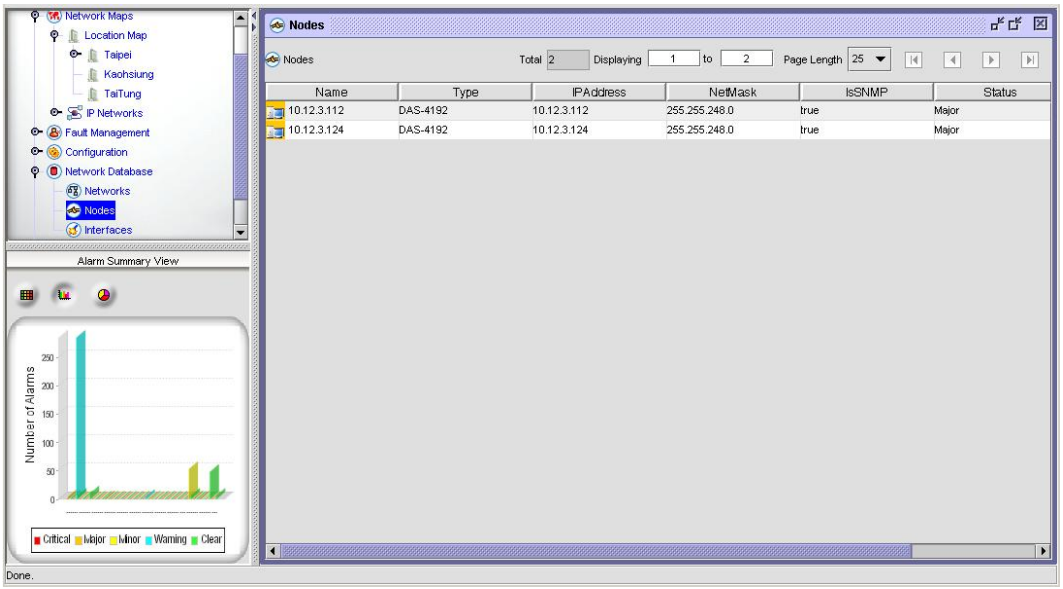
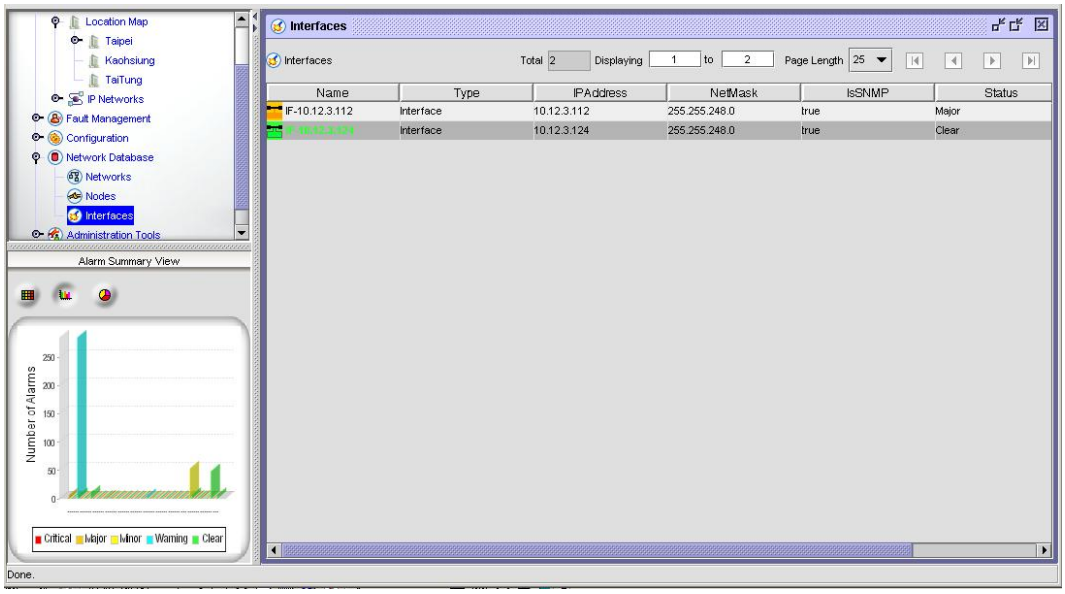


Figure 4-9 Network Database – NE Interface Perspective List



4.4 Constructing a NE on AMS

In Section 4.3.2, a procedure is described to add NE to a location in the managed HE network. This section and hereafter describes the procedure construct a NE on AMS.

As the DAS4 Series IP-DSLAM provides the flexibility to be equipped with various card modules such as ADSL-LC (Line Card) and SHDSL-LC, constructing the NE board type of card module is the first task you need to perform.

The AMS supports operator to predefine NE object from AMS Client application. Once the card modules to be equipped to the DAS4 Series IP-DSLAM are determined, you need to set the planned type according to their correspondent slot to secure the system operation. For any reason (removed or type error), if the planned type is not the same as the online type detected from the NE, the board mismatch alarm message will be reported to the AMS server and the error sign will be shown on the NE.

Step 1 Click the location tab under the “Location Map” tab in **Network Management Sub-window.** AMS will present the NEs on this location in the **Network Element Overview Sub-window** as shown in Figure 4-10.

Step 2 Select and click the NE in the **Network Element Overview Sub-window** to launch the **AMS Device Management Window**. Depending on the type of NE, either DAS4192 or DAS4672 shelf view appears in the window as shown in Figure 4-11 and Figure 4-12, respectively.

Step 3 Click Configuration → Board Setting on **Main Menu** to open the **Board Setting List Dialog** as shown in Figure 4-13. Table 4-1 depicts the related parameters.

Step 4 To modify the slot setting, double click and highlight a slot from **Board Setting List** to launch the **Board Setting** Dialog as shown in Figure 4-14.

Figure 4-10 Constructing a NE on a location in the managed NE Network

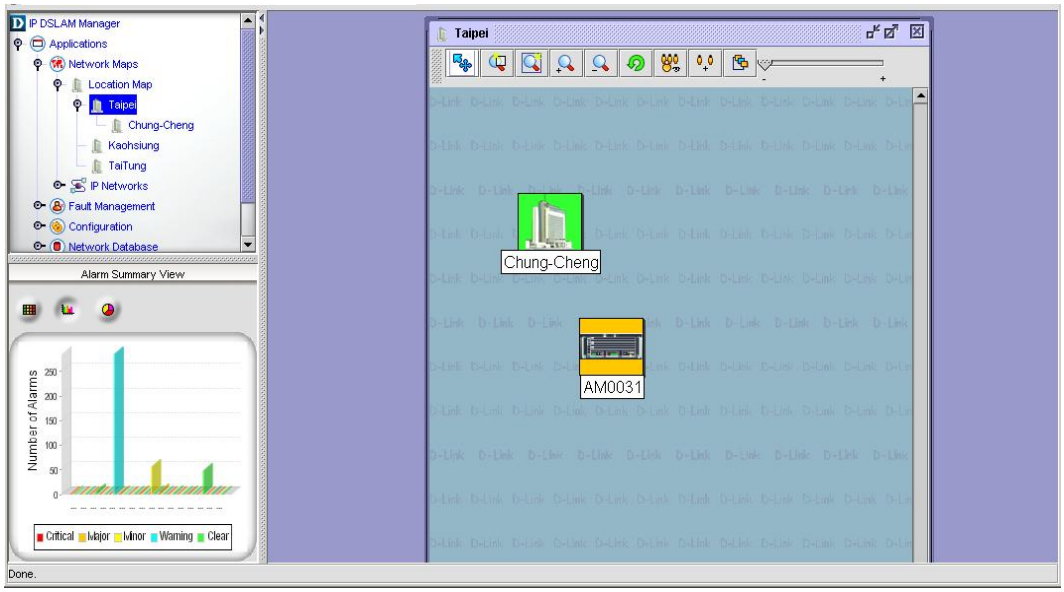


Figure 4-11 DAS4672 Shelf View in the AMS Device Management Window

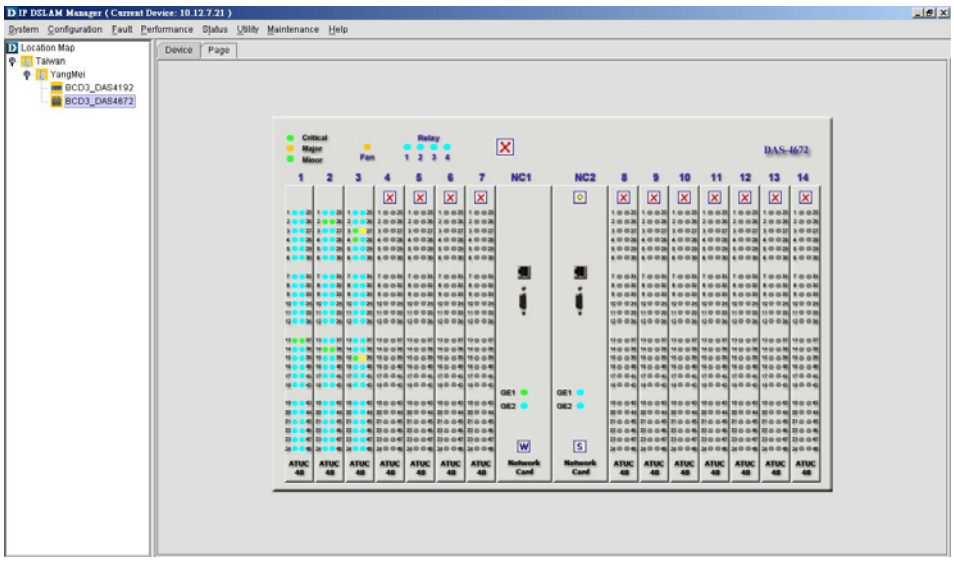


Figure 4-12 DAS4192 Shelf View in the AMS Device Management Window

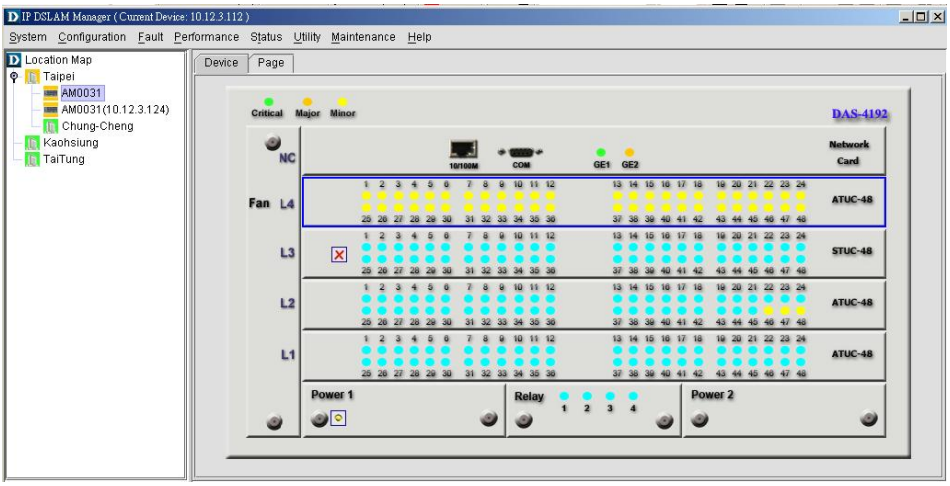


Figure 4-13 Board Setting List Dialog

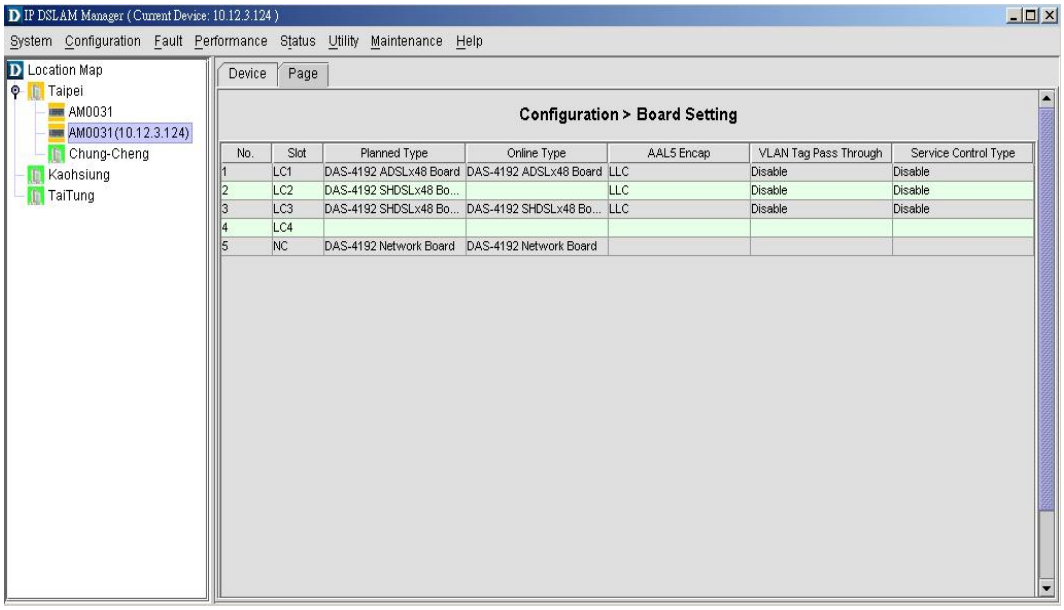


Figure 4-14 Board Setting Dialog

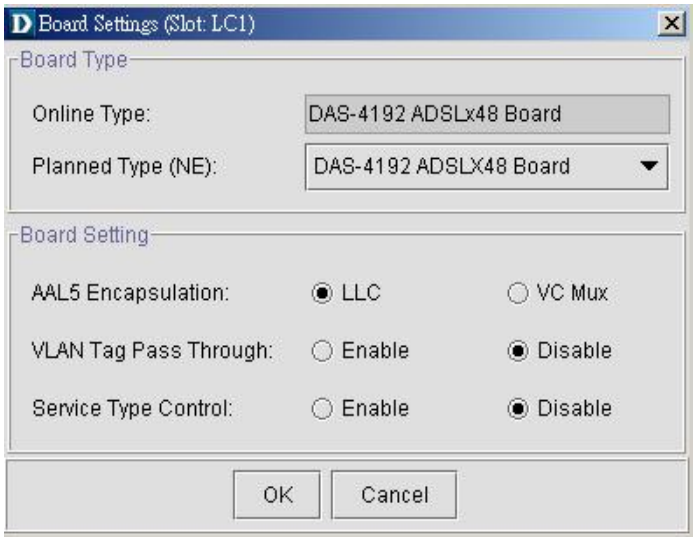


Table 4-1 Board Setting Dialog Description

Field	Description
List Table	
No.	This indicates the serial number of entry of the List Table.
Slot	This indicates the location of board.
Planned Type	This specifies the board type planned to be equipped to the slot of DAS4 Series IP-DSLAM. If the planned type is mismatched (removed or type error) with online type detected from the system, the board mismatch alarm message will be reported.
Online Type	This indicates the observed board type of the card module in the slot (current type)
AAL5 Encap	This specifies the AAL5 encapsulation mode, either "LLC" or "VC-MUX"(VC Based Multiplexing) per RFC-2684. RFC 2684 defines the encapsulation methods for transporting the routed and bridged Protocol Data Units (PDUs) across an native ATM network.
VLAN Tag Pass Through	This specifies the VLAN tab pass-through as enables or not. (per LC setting) Whenever the VLAN tag pass-through function is enabled, it provides transparent transportation of the VLAN traffic from subscriber interface to network interface without VLAN tag attached.
Service Type Control	This specifies the "Service Type Control" function as enabled or not. The service type control can be enabled to provide control of PPPoE, DHCP or static IP on a per line card basis.

Board Setting Dialog allows you to define the line card (LC) AAL5 encapsulation mode, "VLAN Tag pass-through" mode and "Service Type Control" mode. Those functions indicate as per board, configuration affects the setting of all ports of selected LC.

Whenever changing the setting of "AAL5 Encap", "VLAN Tag Pass Through" or "Service Type Control" of a specific ADSL LC, the operator MUST reset this ADSL LC to let the changes take effect.

4.5 NE CLI User Account Management

Follow the subsequent procedures to configure the CLI user account of the NE.

Step 1 Click Configuration → NE Management → NE User Account on **Main Menu** to open the **NE User Account List** Dialog as shown in Figure 4-15 and Table 4-2 depicts the related parameters.

Step 2 Click '**Add**' button to create a new user account or click '**Modify**' button to modify a user account, while to remove the user account, click and highlight a user name in the list and click '**Delete**' button, as shown in Figure 4-16. Table 4-3 depicts the related parameters.

Figure 4-15 NE User Account List Dialog

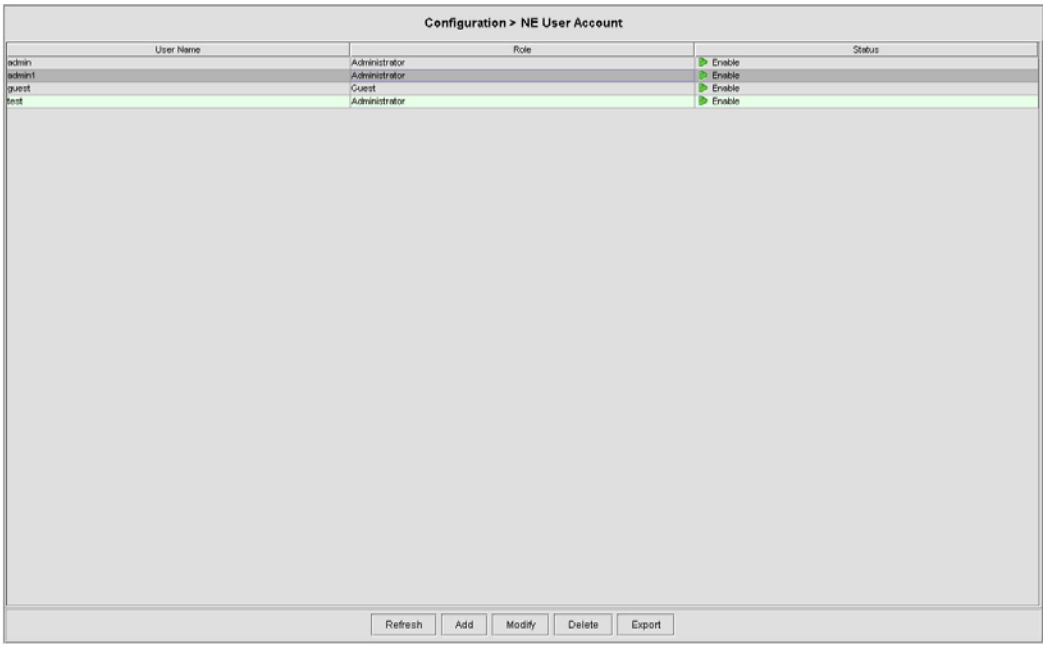


Table 4-2 NE User Account List Dialog Description

Field	Description
List Table	
User Name	This indicates the user account name.
Role	This indicates the permission right of user group.
Status	This indicates the operational state of the role.(julia)
Function Button	
Refresh	Click this button to refresh the **NE User Account List Dialog**
Modify	Select a user name from the list table to modify.
Add	Click this button to create a new user of NE.
Delete	Select a user from the list table to remove.
Export	Click this button to save the contents of **NE User Account List** to the AMS client.

Figure 4-16 NE User Account Setting Dialog

Table 4-3 NE User Account Setting Dialog Description

Field	Description
User Name	This indicates the user account name. **Valid values:** String of up to 20 characters and any combination of printable characters (‘A’ – ‘Z’, ‘a’ – ‘z’, ‘0’ – ‘9’, ‘-’, ‘_’, ‘@’).
Password	This specifies the password.
Verification	This verifies the password again.
Role	This indicates the permission right of user group. Administrator – Owns privilege of Read/Write Guest – Owns only Read privilege

4.6 NE Secured Host Management

Follow the subsequent procedures to configure the secured (trusted) hosts allowed to access the NE.

Step 1 Click System → SNMP Configuration→ Secured Hosts on **Main Menu** to open the **SNMP Secured Host List** Dialog as shown in Figure 4-17. Table 4-4 depicts the related parameters.

Figure 4-17 SNMP Secured Host List Dialog

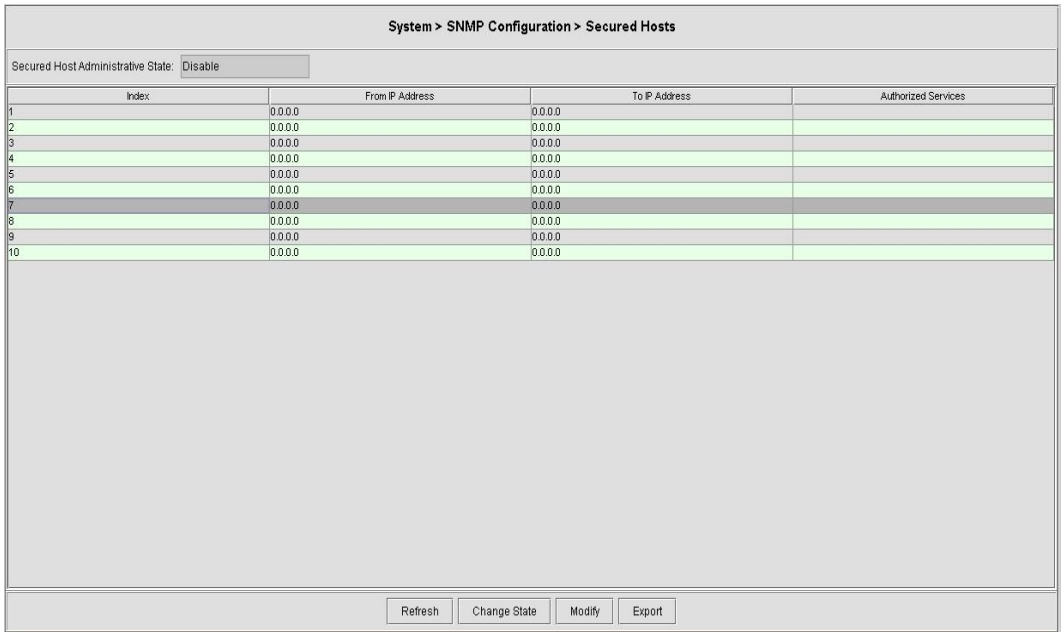


Table 4-4 NE Secured Host List Dialog Description

Field	Description
Secured Host Administrative State	
Administrative State	This indicates the state of NE secured host function. In case of enabled state, only the hosts of configured IP addresses are allowed to access the NE via the configured 'Authorized Services'.
List Table	
Index	This indicates the number of List Table.
From IP Address	This indicates the beginning of the IP address range of the secured hosts.
To IP Address	This indicates the end of the IP address range of the secured hosts.
Authorized Services	This indicates the services (any combination of SNMP, TELNET, FTP and TFTP) the specified secured hosts are allowed.
Function Button	
Refresh	Click this button to refresh the **SNMP Secured Host List**
Change State	Click this button to enable or disable the secured host function.
Modify	Click this button to modify the specified secured host list.
Export	Click this button to save the contents of **SNMP Secured Host List** to the AMS client.

Step 2 Click and highlight a row and click '**Modify**' button to modify the secured hosts, as shown in Figure 4-18. Table 4-5 depicts the related parameters.

Step 3 Assign the IP range and check the authorized services (any combination of SNMP, TELNET, FTP and TFTP) of trusted hosts to be allowed.

Figure 4-18 Modify Secured Host Dialog

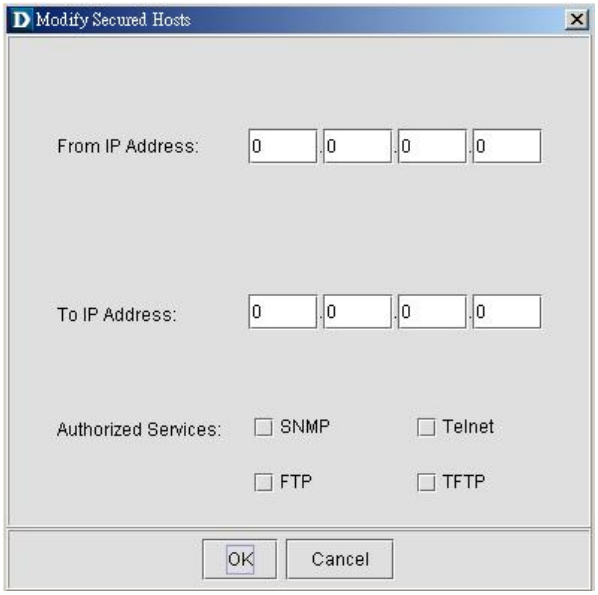


Table 4-5 Secured Host Setting Dialog Description

Field	Description
IP Address Section	
From IP Address	This specifies the beginning of the IP address section of the secured hosts.
To IP Address	This specifies the end of the IP address section of the secured hosts.
Authorized Service	Check the checkbox to select the authorized services.

4.7 Profile Management

A profile is a named list of configuration parameters with a value assigned to each parameter. By using a profile, the operator can configure the NE without to key in a lot of configuration parameters.

The AMS supports the configuration of profile and profile template. Both the profile and profile template possess the same parameter fields. However, the profile indicates the profile saved in the NE. As to the profile template, it indicates the profile saved in the AMS. Whenever the operator modifies a profile on a NE, the modification will affect all the ports using that profile. For this sake, the AMS provides the profile template to make management of port/NE settings easier to operator. It is recommended to set-up a number of templates prior to creating any xDSL profile and alarm definition profile.

As the profile and profile template possess the same parameter fields, the descriptions of profile are applicable to profile template in this section and here after.

This section describes the management of two kinds of profiles, data transport related profiles and alarm definition profile. The alarm definition profile defines the attributes of the report (alarm) of abnormality launched by the NE.

As to the data transport related profiles, they are

- xDSL Profile
- VLAN Profile

The xDSL Profile indicates the ADSL Profile and SHDSL Profile. It defines the attributes of the connection established via the xDSL subscriber loop. As to the VLAN Profile, it defines the attributes of services/applications applied to the xDSL subscriber.

Figure 4-19 and Table 4-6 help you to understand each profile and their interrelationship.

Figure 4-19 Interrelationship of Data Transport Related Profiles

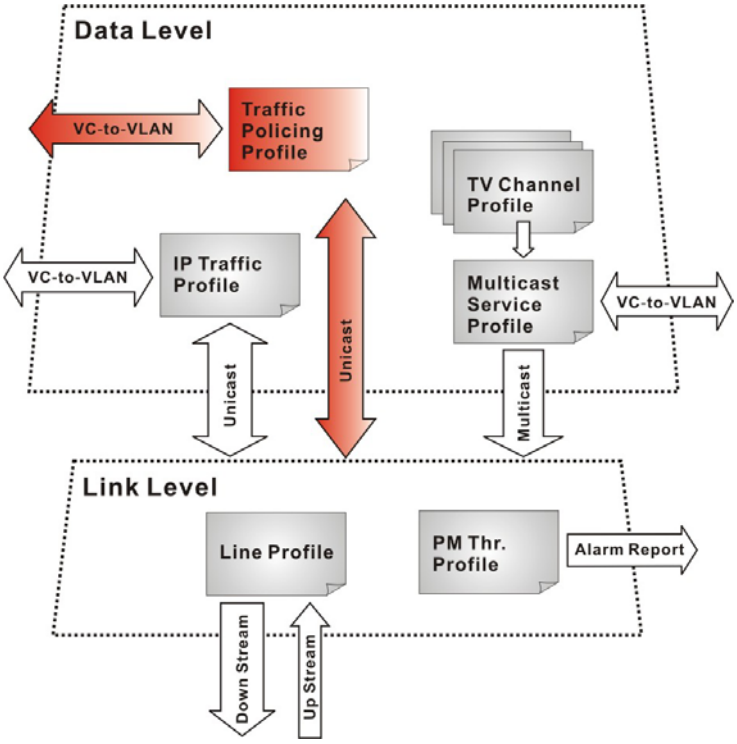


Table 4-6 Data Transport Related Profiles

Profile		Capacity	Level	Category	Description
XDSL Profile	Line Profile	60 sets	Link	Loop	Define the attributes of xDSL loop connection.
	PM Threshold Profile	60 sets	Link	Loop	Report the message if loop connection error across the threshold.
	Traffic Policing Profile (ADSL LC only)	60 sets	Data	User Data	Define the rule of traffic policing for user data.
VLAN Profile	IP Traffic Profile	60 sets	Data	Unicast	Define the traffic bandwidth of Unicast connection.
	Multicast Service Profile	60 sets	Data	Multicast	A set of service selected from menu list.
	TV Channel Profile	800 sets	Data	Multicast	A menu list of multicast channel, it also defines the traffic bandwidth of Multicast connection.

NOTE To make Traffic Policing Profile take effect, it needs to set IP Traffic Profile properly. Please refer to the NOTE under Table 4-14.

NOTE To make an xDSL line works normally, the IP Traffic Profile is essential. As to the Traffic Policing Profile, it is optional and is only applicable to ADSL LC.

A profile is a named list of configuration parameters with a value assigned to each parameter. When you delete a profile you will affect the change on all port or connection using that profile. If you want to change a single port or a subset of ports, you can create another profile with desired parameters, and then assign the new profile to the desired port.

This section contains the following sections:

- ADSL profile management
- ADSL profile template management
- SHDSL profile management
- SHDSL profile template management
- VLAN profile management
- VLAN profile template management
- Alarm definition profile management
- Alarm definition profile template management

4.7.1 ADSL Profile Management

The ADSL profiles enable you to simplify the process to configure the different ADSL loops with the same loop/data connection attributes. For example, you may classify the subscribers to several categories like category of residential customers, category of small office customers, category of enterprise customers and so on. Each category of subscribers is with the same loop/data connection attributes. Different categories are with their specific attributes like the line speed and performance monitoring to secure their particular service quality. Once the profiles are created, you can easily assign the ADSL subscriber with the request ADSL loop attributes.

Three types of profiles are relative to the ADSL loop, which are Line Profile, PM Threshold Profile and Traffic Policing Profile.

To configure the ADSL loop relative profiles, click Configuration → Line Profile → ADSL Profile List on **Main Menu** to open the **ADSL Profile List Dialog** as shown in Figure 4-20. Table 4-7 depicts the utilities of function button in the function menu as indicated in Figure 4-20.

Figure 4-20 ADSL Profile List – Line Dialog

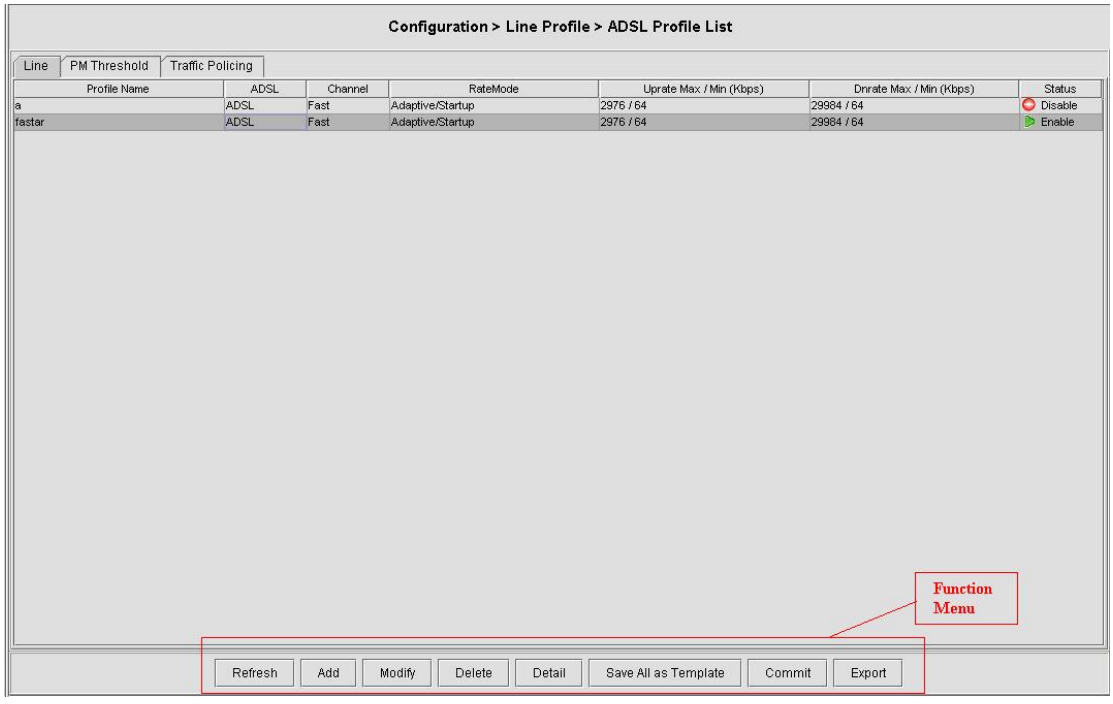


Table 4-7 ADSL Profile List Dialog Function Button

Field	Description
Refresh	Click this button to refresh the **ADSL Profile List**
Add	Click to add a new profile.
Modify	Click this button to modify the parameters of selected profile
Delete	Click this button to delete the selected profile.
Detail	Click this button to view the details of selected profile.
Save All as Template	Click to save all the profile on the NE as the profile template on the AMS server
Commit	Click this button to apply the setting to NE.
Export	Click this button to save the contents of **ADSL Profile List** to the AMS client.

Line Profile

The line profile contains parameter relate to the ADSL.loop connection.

Follow the subsequent procedures to configure an ADSL line profile.

Step 1 Click the **Line** tab in **ADSL Profile List Dialog** to launch the **ADSL Profile List – Line Dialog** to configure the ADSL Line profile as shown in Figure 4-20.

Step 2 Click 'Add' button to generate a line profile. Or select an existent profile and click 'Modify' to modify it. It is noted that each profile must have its unique profile name.

The line profile consists of the following groups of ADSL loop related parameters.

- Transmission Rate
- SNR margin
- PSD
- Power management
- INP

Transmission Rate

Click the **Transmission Rate tab** in **ADSL Line Profile Dialog** to launch the **ADSL Line Profile– Transmission Rate Dialog** as shown in Figure 4-21. Table 4-8 depicts the related parameters.

Figure 4-21 Add ADSL Line Profile– Transmission Rate Dialog

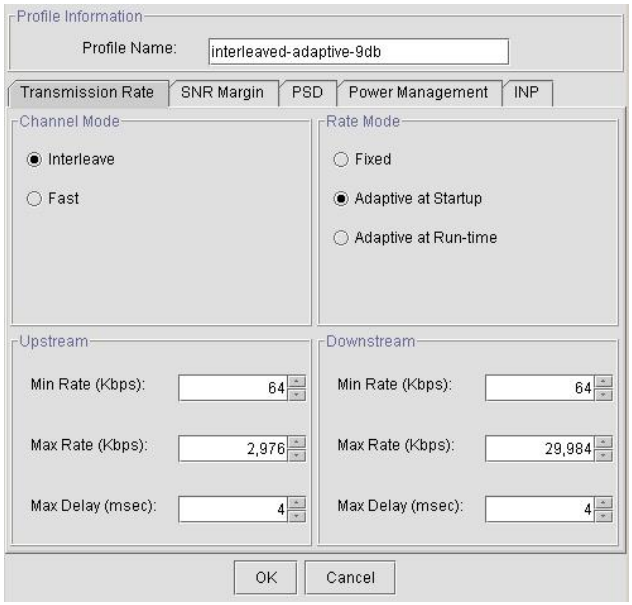


Table 4-8 Add Line Profile– Transmission Rate Dialog Description

Field	Description
Profile Information	
Profile Name	Enter to give a profile name
Channel Mode	
Interleave	Click to let the ADSL loop to be in the interleave mode. Interleave mode enhances the immunity to the impulse noise like lighting. However, its side effect is to introduce the transmission latency. Hence it is suitable for the time-insensitive data transmission, like file transfer. Its associated parameters are the 'Upstream/Downstream Max Delay'
Fast	Click to let the ADSL loop to be in the fast mode. Fast mode is suitable for the transmission of time-sensitive information such as audio.
Rate Mode	
Fixed	Click to let the ADSL loop to be of a fixed rate as specified by the 'Upstream/Downstream Min Rate'. In this mode, the NE will fail to establish the connection with ATU-R whenever it is not allowed in the physical loop environment. The failure may be due to the loop length, line quality, and so on.
Adaptive at Startup	Click to let the ADSL loop to be of the rate adapted in the range specified by the 'Upstream/Downstream Min/Max Rate'. In comparison with 'Adaptive at Run-time', the NE will re-try to establish a new lower-rate connection with the ATU-R whenever the NE or ATU-R detects 10 consecutive SESs (Severely Error Seconds) in this mode.
Adaptive at Run-time	Click to let the ADSL loop to be of the rate adapted in the range specified by the 'Upstream/Downstream Min/Max Rate'. In comparison with 'Adaptive at Startup', the NE will trigger the SRA (Seamless Rate Adaptation) process to change the line rates without losing the connection with ATU-R whenever the physical loop environment varies in this mode.

Table 4-8 Add Line Profile– Transmission Rate Dialog Description (Continued)

Field	Description
Rate Mode	
Fixed	Click to let the ADSL loop to be of a fixed rate as specified by the 'Upstream/Downstream Min Rate'. In this mode, the NE will fail to establish the connection with ATU-R whenever it is not allowed in the physical loop environment. The failure may be due to the loop length, line quality, and so on.
Adaptive at Startup	Click to let the ADSL loop to be of the rate adapted in the range specified by the 'Upstream/Downstream Min/Max Rate'. In comparison with 'Adaptive at Run-time', the NE will re-try to establish a new lower-rate connection with the ATU-R whenever the NE or ATU-R detects 10 consecutive SESs (Severely Error Seconds) in this mode.
Adaptive at Run-time	Click to let the ADSL loop to be of the rate adapted in the range specified by the 'Upstream/Downstream Min/Max Rate'. In comparison with 'Adaptive at Startup', the NE will trigger the SRA (Seamless Rate Adaptation) process to change the line rates without losing the connection with ATU-R whenever the physical loop environment varies in this mode.
Upstream	
Min Rate	Choose the minimum rate for the ATU-R to transmits traffic
Max Rate	Choose the maximum rate for the ATU-R to transmits traffic
Max Delay	Choose the maximum interleaved delay in milliseconds. (interleave mode only) Interleaved delay applies only to the interleave channel and defines the mapping between subsequent input bytes at the inter-leaver input and their placement in the bit stream at the interleave output. Larger numbers provide greater separation between consecutive input bytes in the output bit stream, allowing for improved impulse noise immunity at the expense of payload latency.
Downstream	
Min Rate	Choose the minimum rate for the ATU-C to transmits traffic
Max Rate	Choose the maximum rate for the ATU-C to transmits traffic
Max Delay	Choose the maximum interleaved delay in milliseconds. (applied to the interleave mode only)

The associated parameters of the Rate Mode 'Adaptive at Run-Time' are as follows.

'Upshift Noise Margin', 'Downshift Noise Margin', 'Upshift Time' and 'Downshift Time'

In the Rate Mode 'Adaptive at Run-Time', the NE will lose the connection with ATU-R if it fails to complete the SRA process to change the line rates

SNR Margin

Click the **SNR Margin tab** in **ADSL Line Profile Dialog** to launch the **ADSL Line Profile– SNR Margin Dialog** as shown in Figure 4-22. Table 4-9 depicts the related parameters.

Figure 4-22 Add ADSL Line Profile– SNR Margin Dialog

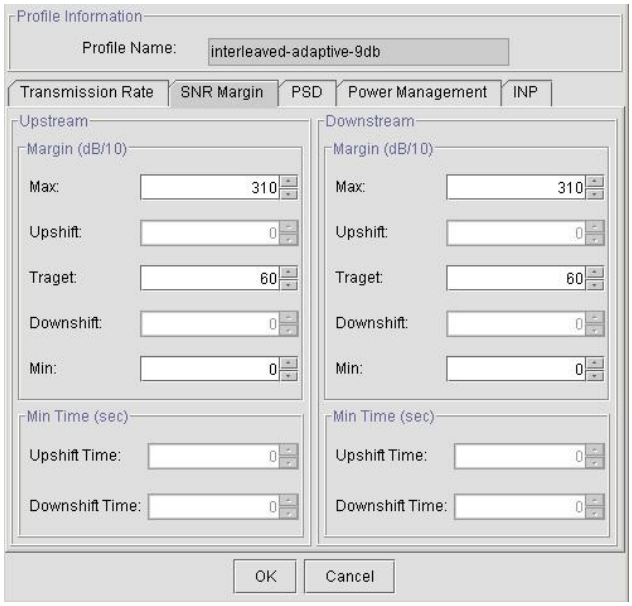


Table 4-9 Add Line Profile– SNR Margin Dialog Description

Field	Description
Upstream	
Downstream	
Max Margin	It specifies the maximum margin in 0.1 dB steps. Default value is 310.
Upshift	It specifies the up-shift margin in 0.1dB steps. Default value is 200
Target	It specifies the target margin in 0.1dB steps. Default value is 60.
Downshift	It specifies the downshift margin in 0.1 dB steps. Default value is 30
Min	It specifies the minimum margin in 0.1 dB steps. Default value is 0.
Upshift Time	It specifies the upshift time in sec. It defines the minimum time interval during which the upstream noise margin should stay above the Upshift SNR before the ATU-C triggers the SRA process to increase the line rate. Default value is 1000.Default value is 1000.
Downshift Time	It specifies the downshift time in sec. It defines the minimum time interval during which the upstream noise margin should stay above the Downshift SNR before the ATU-C triggers the SRA process to decrease the line rate. Default value is 1000.

‘Upshift Noise Margin’, ‘Downshift Noise Margin’, ‘Upshift Time’ and ‘Downshift Time’ are only applied to the Rate Mode ‘Adaptive at Run-Time’.

Minimum Noise Margin ≤ Downshift Noise Margin ≤ Target Noise Margin ≤ Upshift Noise Margin ≤ Maximum Noise Margin.

PSD

Click the **PSD tab** in **ADSL Line Profile Dialog** to launch the **ADSL Line Profile– PSD Dialog** as shown in Figure 4-23. Table 4-10 depicts the related parameters.

Figure 4-23 Add ADSL Line Profile– PSD Dialog

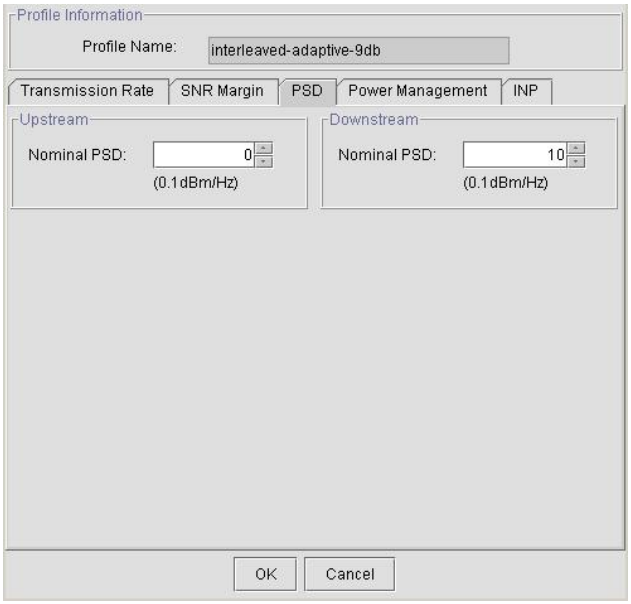


Table 4-10 Add Line Profile – PSD Dialog Description

Field	Description
Upstream	
Downstream	
Nominal PSD	It specifies the discrepancy with respect to the ITU-T G.992.3-defined MAXNOMPSD value. Its unit is 0.1 dBm/Hz. And its allowed range is from 40 to -400.

It is noted that the MAXNOMPSD settings are different for the following three protocol groups.

- G.992.1 Annex A and B; G.992.2 Annex A and G; G.992.3 Annex A, B and J;
- G.992.5 Annex A, B and M
- G.992.3 Annex L

To ease the configuration, the Nominal PSD is defined to be the discrepancy with respect to the MAXNOMPSD..

Power Management

In order to save power, G.992.3 and G.992.5 define the power management function. The operator can either configure the ADSL line Transmission (Tx) power be either manually or automatically managed.

The automatic power management function enables the ADSL line to automatically transfer from the L0 (full-on) state to the L2 (low power) state whenever the downstream net data rate is lower than expected. And it also enables the ADSL line to automatically transfer from the L2 state to the L0 state once the NE begins to drop the downstream data.

Click the **Power Management tab** in **ADSL Line Profile Dialog** to launch the **ADSL Line Profile– Power Management Dialog** as shown in Figure 4-24. Table 4-11 depicts the related parameters.

Figure 4-24 Add ADSL Line Profile– Power Management Dialog

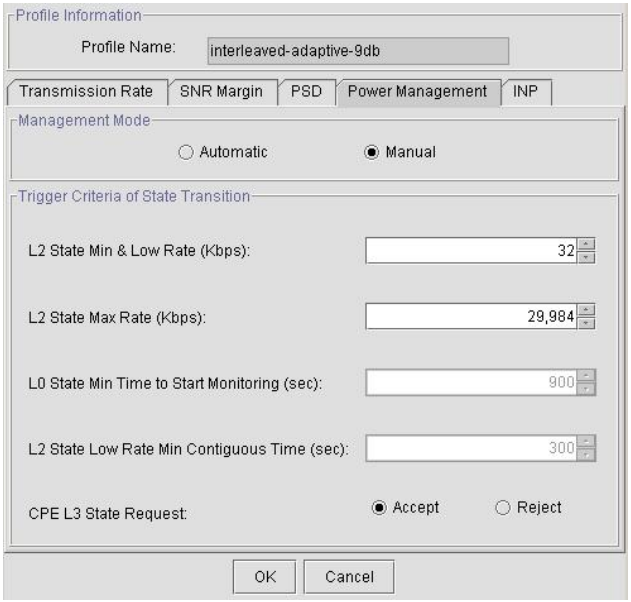


Table 4-11 Add Line Profile – Power Management Dialog Description

Field	Description
Management Mode	
Automatic – This mode enables the ADSL line to automatically transfer from the L0 (full-on) state to the L2 (low power) state whenever the downstream net data rate is lower than expected. And it also enables the ADSL line to automatically transfer from the L2 state to the L0 state once the NE begins to drop the downstream data.	
Manual –This mode allows the operator to manually force the specific ADSL line to transfer from the L2 state to the L0 state, and vice versa.	
Trigger Criteria Of State Transition	
L2 State Min & Low Rate	It specifies the minimum rate (manual mode) or Lowest criteria (auto mode) of L2 state. (See the Note below) Default value is 32.
L2 State Max Rate	It specifies the maximum rate of L2 state. (See the Note below) Default value is 29984.
L0 State Min Time to Start Monitoring	It specifies the minimum time (seconds) the ADSL line must stay at the L0 state. During this time interval, the ADSL line is not allowed to transfer to the L2 state. It is the so-called L0-TIME as defined in ITU-T G.997.1. (See the Note below) Default value is 900.
L2 State Low Rate Min Contiguous Time	It specifies the contiguous time interval for which the downstream mean net data rate is below the 'L2 State Min & Low Rate' on a ADSL line. (See the Note below) Default value is 300.
CPE L3 State Request	It specifies whether the ADSL port accepts L3 command from CPE or not. Default value is "Accept".

In order to let the ADSL line avoid going into and out of L2 too often, the following L0↔L2 state transition criteria are adopted.

L0→L2:

- The ADSL line must stay at the L0 state for a period specified by 'L0 State Min Time to Start Monitoring' (i.e., the L0-TIME as defined in ITU-T G.997.1)
- After the L0-TIME, the NE begins to compute the mean net-data rate for a period of 'L2 State Low Rate Min Contiguous Time' on a ADSL line.
- The ADSL line transfers to the L2 state once the computed mean net-data rate is below the 'L2 State Min & Low Rate'.
- Once an ADSL line is at the L2 state, its downstream ADSL line rate is in the range from 'L2 State Min & Low Rate' to 'L2 State Max Rate'.

L2→L0:

- The ADSL line immediately transfers to the L0 state once the NE detects packet loss on the ADSL line in the down stream direction.

INP

The INP (Impulse Noise Protection) defines the minimum protection symbol time both for upstream and downstream on this ADSL subscriber.

Click the **INP tab** in **ADSL Line Profile Dialog** to launch the **ADSL Line Profile– INP Dialog** as shown in Figure 4-25. Table 4-12depicts the related parameters.

Figure 4-25 Add ADSL Line Profile– INP Dialog

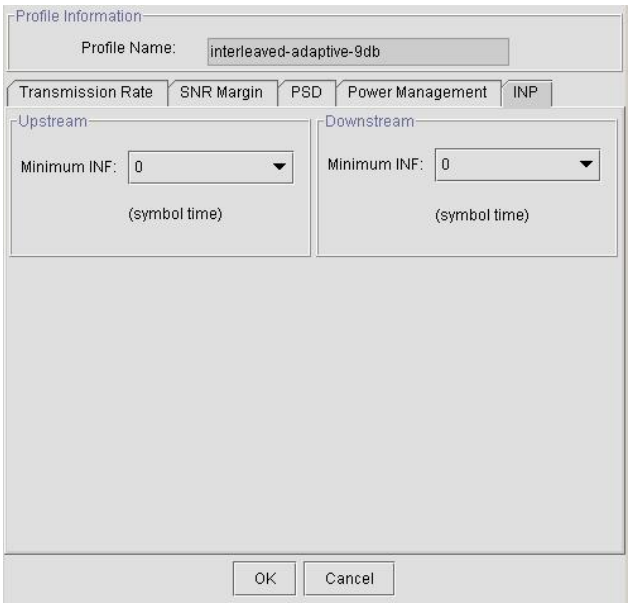


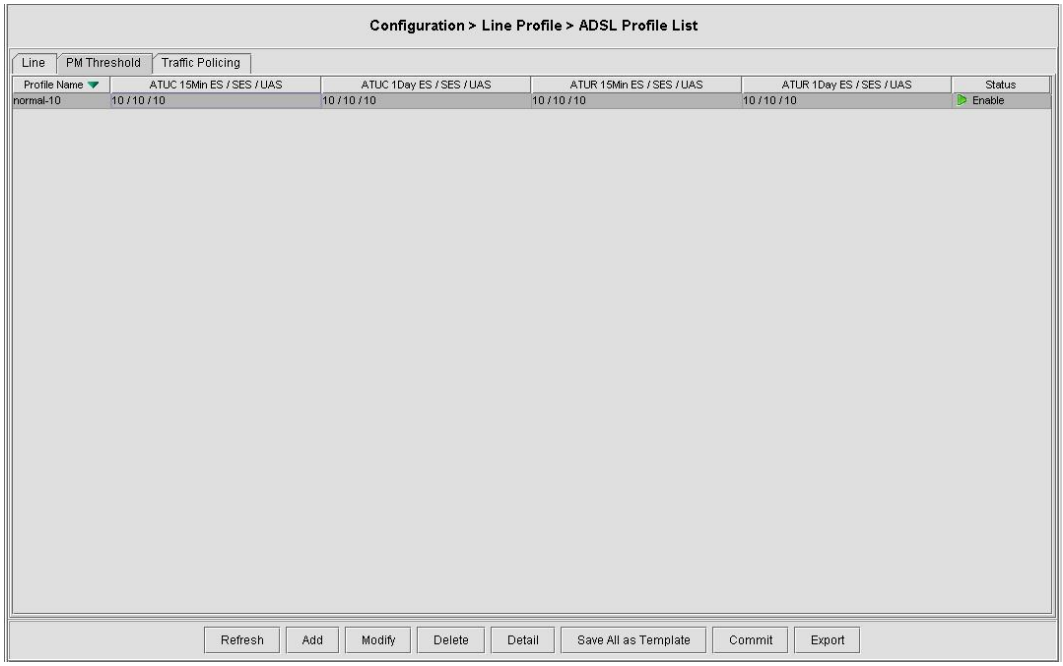
Table 4-12 Add Line Profile – INP Dialog Description

Field	Description
Upstream	
Downstream	
Minimum INP	It specifies the impulse noise protection symbol time in {0, 1/2, 1, 2, 4, 8, 16}.

PM Threshold Profile

The PM threshold profile sets the threshold values for the performance parameters associated with the ADSL line. The NE will report the threshold-over trap (i.e. TCA, Threshold-Crossing Alarm) to the AMS Server when the specified performance threshold is over. Figure 4-26 shows ADSL PM threshold profiles accommodated in the system and allows adding a new profile or deleting the existing profile, by system (NE) unit. Table 4-7 depicts the utilities of function button in the function menu in Figure 4-26.

Figure 4-26 xDSL Profile List– PM Threshold Dialog



Click ‘Add’ button to generate a PM threshold profile, each profile must have its unique profile name. Or select an existent profile and click ‘Modify’ to modify it. Figure 4-27shows **Add ADSL PM Threshold Profile Dialog**. Table 4-13 depicts the related parameters.

Figure 4-27 Add ADSL PM Threshold Profile Dialog

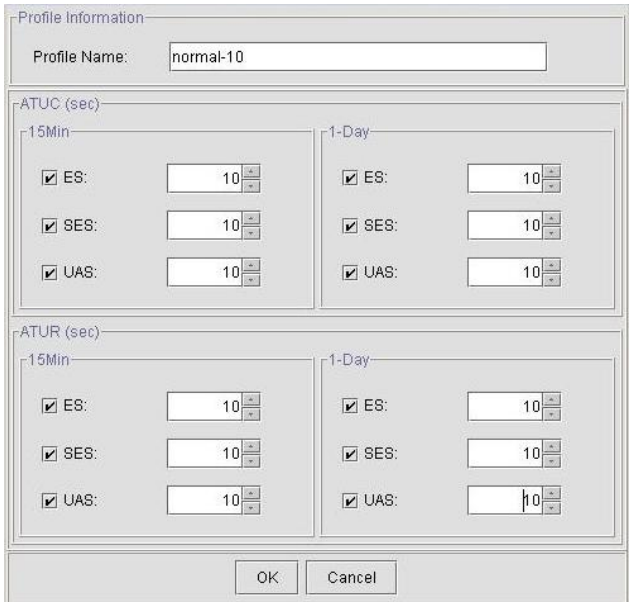


Table 4-13 Add PM Threshold Profile Field Description

Field	Description
15-Min / CO	This field indicates the CO side errors. When the threshold is set to 10, the NE launches a trap (alarm) if the count of specific errors exceeds 10 during the last 15 minutes.
1-Day / CO	This field indicates the CO side errors. When the threshold is set to 10, the NE launches a trap (alarm) if the count of specific errors exceeds 10 during the last 1 day.
15-Min / RT	This field indicates the RT side (CPE) errors. When the threshold is set to 10, the NE launches a trap (alarm) if the count of specific errors exceeds 10 during the last 15 minutes.
1-Day / RT	This field indicates the RT side (CPE) errors. When the threshold is set to 10, the NE launches a trap (alarm) if the count of specific errors exceeds 10 during the last 1 day.
ES	It specifies the Error second (0 ~ 900 sec)
SES	It specifies the Several Error Second (0 ~ 900 sec)
UAS	It specifies the unavailable Second (0 ~ 900 sec)

Traffic Policing Profile

According to SLA (Service Level Agreements) between subscribers and ISP, the edge network equipment marks subscriber's traffic with different service level. The traffic policing profile serves to keep the rule to re-mark the subscriber's upstream traffic with designated DSCP values. The traffic policing profile is design to police on the unicast connection for user's upstream traffic; once it is created you can apply it to distinct ADSL line interfaces (see 4.8.1 ADSL Line Interface Management.)

To set the traffic policing profile, click **Configuration → Profile → ADSL Profile → Traffic Policing** tab to launch the **ADSL Profile List – Traffic Policing Dialog** as shown in Figure 4-28. Table 4-7 depicts the utilities of function button in the function menu in Figure 4-28

Figure 4-28 ADSL Profile List– Traffic Policing Dialog

Click ‘Add’ button to generate a Traffic Policing profile, each profile must have its unique profile name. Or select an existent profile and click ‘Modify’ to modify it. Figure 4-29 shows the **Add Traffic Policing Profile Dialog**. Table 4-14 depicts the related parameters.

Figure 4-29 Add Traffic Policing Profile Dialog

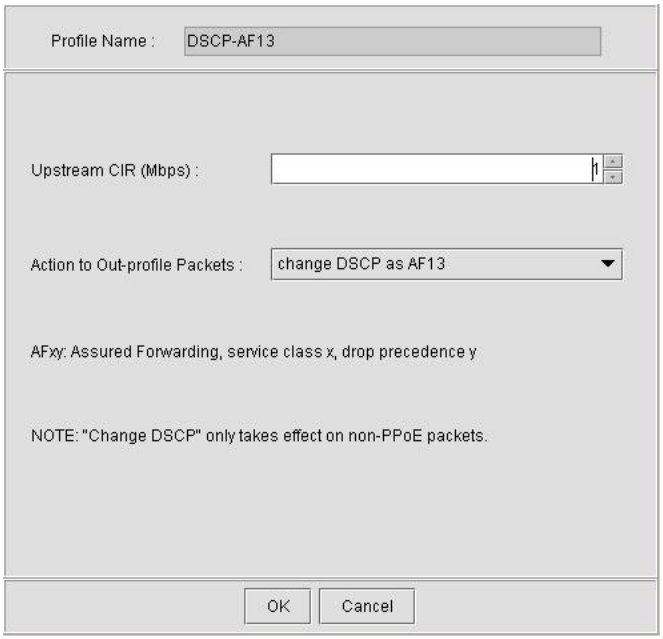


Table 4-14 Add Traffic Policing Profile Field Description

Field	Description
Profile Information	
Name	It specifies the name of traffic policing profile.
Rate Limiting	
Upstream CIR (Mbps)	It specifies the CIR (Commit Information Rate). Valid value is 0~2 Mbps.
Action to Out-profile Packets	It specifies the DSCP value to be set, drop packets or do nothing whenever the user’s upstream traffic exceeds CIR.

The Service Type Control shall be enabled when Traffic Policing Profile is assign to xDSL subscribers (refer to Figure 4-51).

Please refer to Figure 4-59 for more details of Differentiated Service Code Point.

4.7.2 ADSL Profile Template Management

The profile template indicates the profile saved in the AMS. The AMS provides the profile template to make management of port/NE settings easier to operator. It is recommended to set-up a number of templates prior to creating any ADSL profile.

To configure the ADSL loop relative profile templates, click Configuration → Line Profile → ADSL Profile Template on **Main Menu** to open the **ADSL Profile Template Dialog** as shown in

Figure 4-30. Table 4-15 depicts the utilities of function button in the function menu as indicated in Figure 4-30.

As the profile template possesses the same parameter fields as the profile does, the descriptions of profile in Section 4.7.1 are applicable to the profile template. Please refer to Section 4.7.1 for the configuration details.

Figure 4-30 ADSL Profile Template Dialog

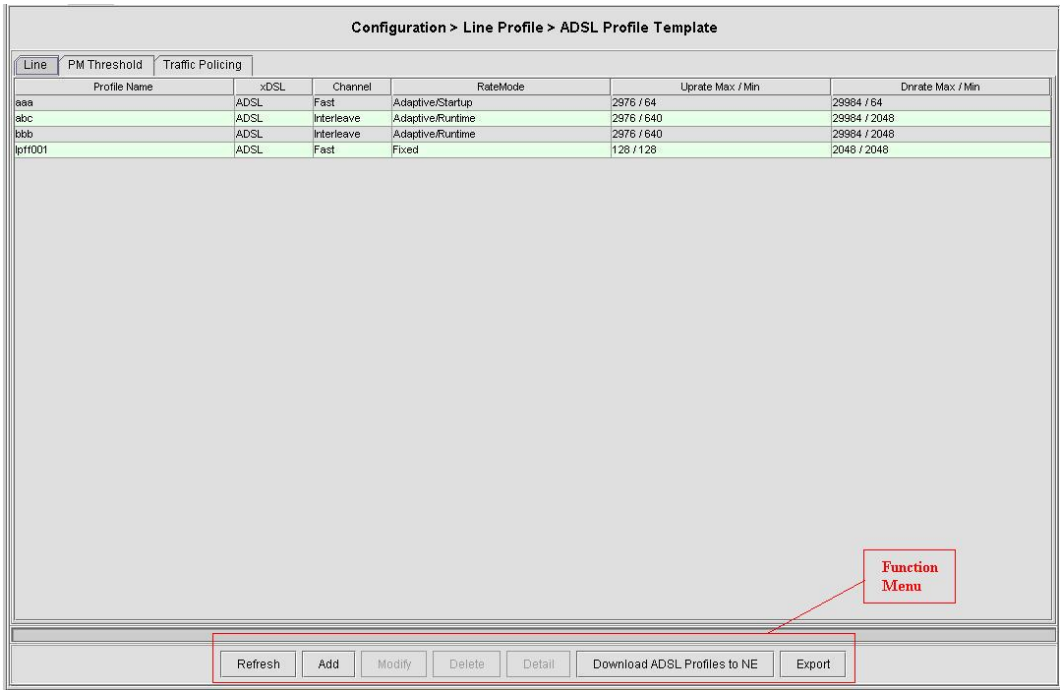


Table 4-15 ADSL Profile Template Dialog Function Button

Field	Description
Refresh	Click to refresh the **ADSL Profile Template List**
Add	Click to add a new profile template.
Modify	Click this button to modify the parameters of selected profile template.
Delete	Click this button to delete the selected profile template.
Detail	Click this button to view the details of selected profile template.
Download ADSL profile to NE	Click to download all the ADSL profile templates on the AMS server to the NE.
Export	Click this button to save the contents of **ADSL Profile Template List** to the AMS client.

4.7.3 SHDSL Profile Management

The SHDSL profiles enable you to simplify the process to configure the different SHDSL loops with the same loop/data connection attributes. For example, you may classify the subscribers to several categories like category of residential customers, category of small office customers, category of enterprise customers and so on. Each category of subscribers is with the same loop/data connection attributes. Different categories are with their specific attributes like the line speed and performance monitoring to secure their particular service quality. Once the profiles are created, you can easily assign the SHDSL subscriber with the request SHDSL loop attributes.

Two types of profiles are related with the SHDSL loop, which are Line Profile and PM Threshold Profile.

To configure the SHDSL loop relative profiles, click Configuration → Line Profile → SHDSL Profile List on **Main Menu** to open the **SHDSL Profile List Dialog** as shown in Figure 4-31. Table 4-16 depicts the utilities of function button in the function menu as indicated in Figure 4-31.

Figure 4-31 SHDSL Profile List– Line Dialog

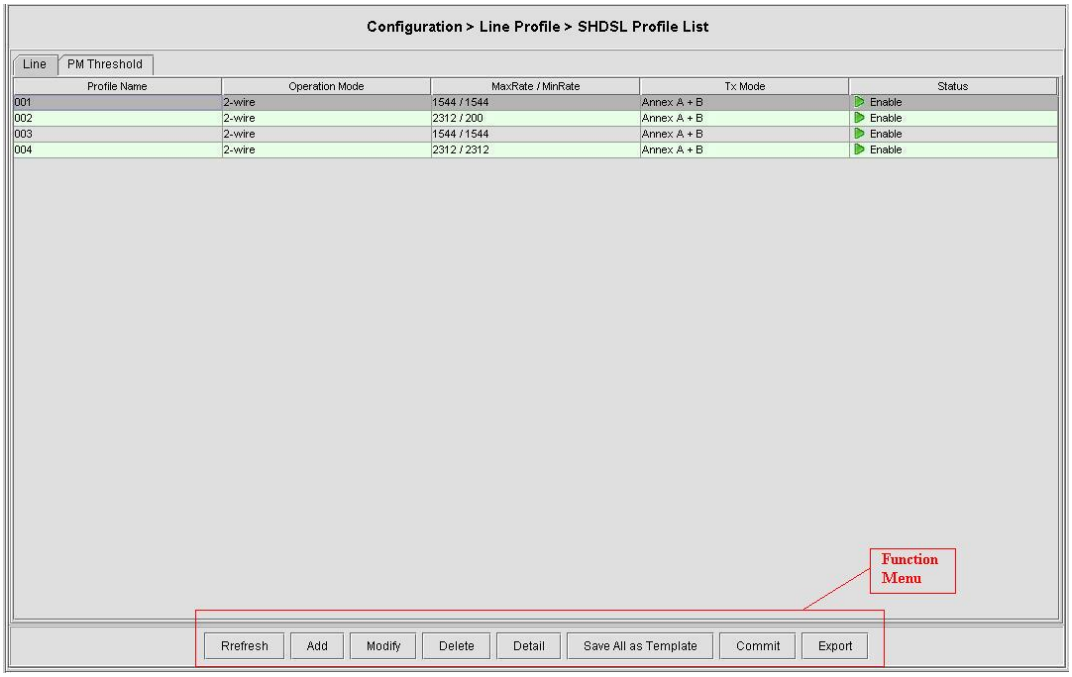


Table 4-16 SHDSL Profile List Dialog Function Button

Field	Description
Refresh	Click this button to refresh the **SHDSL Profile List**
Add	Click to add a new profile.
Modify	Click this button to modify the parameters of selected profile
Delete	Click this button to delete the selected profile.
Detail	Click this button to view the details of selected profile.
Save All as Template	Click to save all the profile on the NE as the profile template on the AMS server
Commit	Click this button to apply the setting to NE.
Export	Click this button to save the contents of **SHDSL Profile List** to the AMS client.

Line Profile

The line profile contains parameter relate to the SHDSL loop connection.

Follow the subsequent procedures to configure an SHDSL line profile.

Click the **Line** tab in **SHDSL Profile List Dialog** to launch the **SHDSL Profile List – Line Dialog** to configure the ADSL Line profile as shown in Figure 4-31.

Click ‘Add’ button to generate a line profile. Or select an existent profile and click ‘Modify’ to modify it. It is noted that each profile must have its unique profile name.

The line profile consists of the following groups of SHDSL loop related parameters.

- Transmission Rate
- SNR margin
- Miscellaneous

Transmission Rate

Click the **Transmission Rate tab** in **SHDSL Line Profile Dialog** to launch the **SHDSL Line Profile– Transmission Rate Dialog** as shown in Figure 4-32. Table 4-17depicts the related parameters.

Figure 4-32 Add SHDSL Line Profile– Transmission Rate Dialog

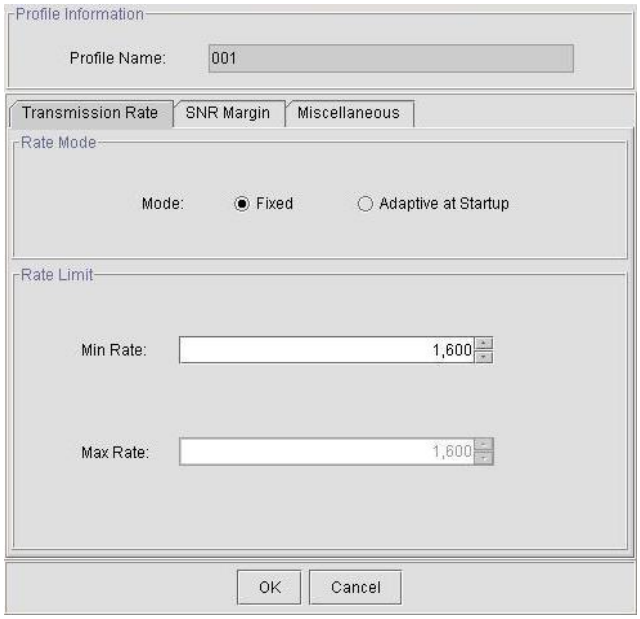


Table 4-17 Add SHDSL Line Profile– Transmission Rate Dialog Description

Field	Description
Profile Information	
Profile Name	Enter to give a profile name
Rate Mode	
Fixed	Click to let the SHDSL loop to be of a fixed rate as specified by the 'Min Rate'. In this mode, the NE will fail to establish the connection with STU-R whenever it is not allowed in the physical loop environment. The failure may be due to the loop length, line quality, and so on.
Adaptive at Startup	Click to let the SHDSL loop to be of the rate adapted in the range specified by the 'Min/Max Rate'.
Rate Limit	
Min Rate	Choose your minimum rate
Max Rate	Choose your maximum rate

SNR Margin

Click the **SNR Margin tab** in **SHDSL Line Profile Dialog** to launch the **SHDSL Line Profile–SNR Margin Dialog** as shown in Figure 4-33. Table 4-18 depicts the related parameters.

Figure 4-33 Add SHDSL Line Profile– SNR Margin Dialog

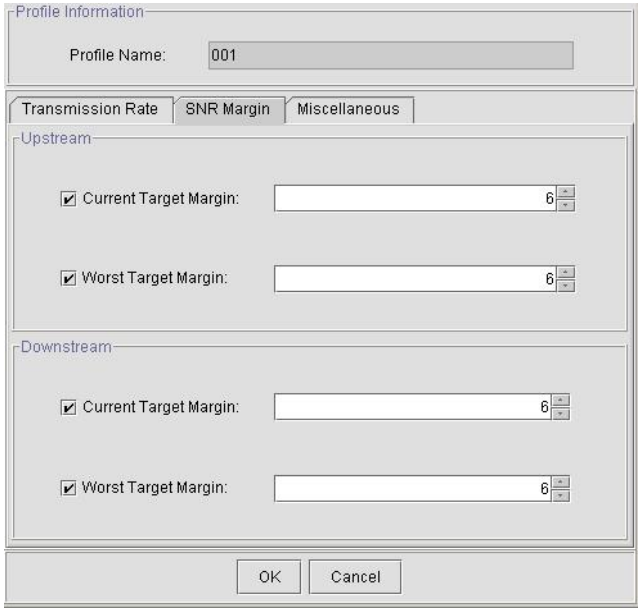


Table 4-18 Add SHDSL Line Profile - SNR Margin Dialog Description

Field	Description
Upstream / Downstream	
Current Target Margin	It specifies the current target margin. Default value is 6.
Worst Target Margin	It specifies the worst target margin. Default value is 6.

Miscellaneous

Click the **Miscellaneous tab** in **SHDSL Line Profile Dialog** to launch the **SHDSL Line Profile–Miscellaneous Dialog** as shown in Figure 4-34. Table 4-19 depicts the related parameters.

Figure 4-34 Add SHDSL Line Profile– Miscellaneous Dialog

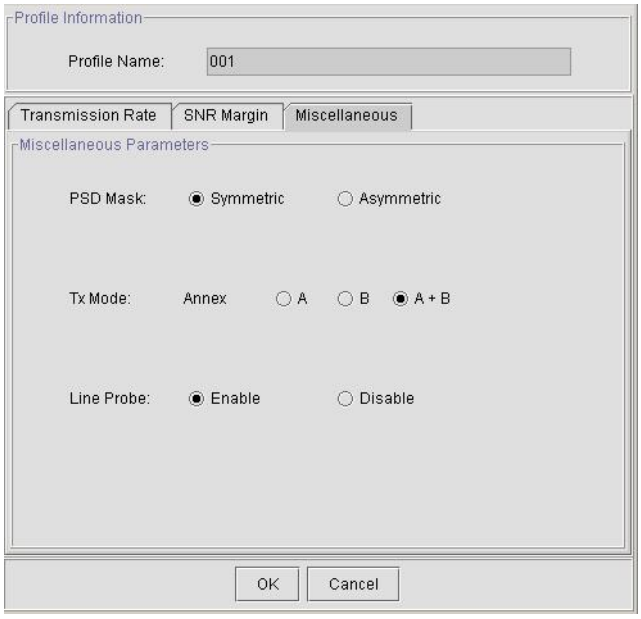


Table 4-19 Add SHDSL Line Profile– Miscellaneous Dialog Description

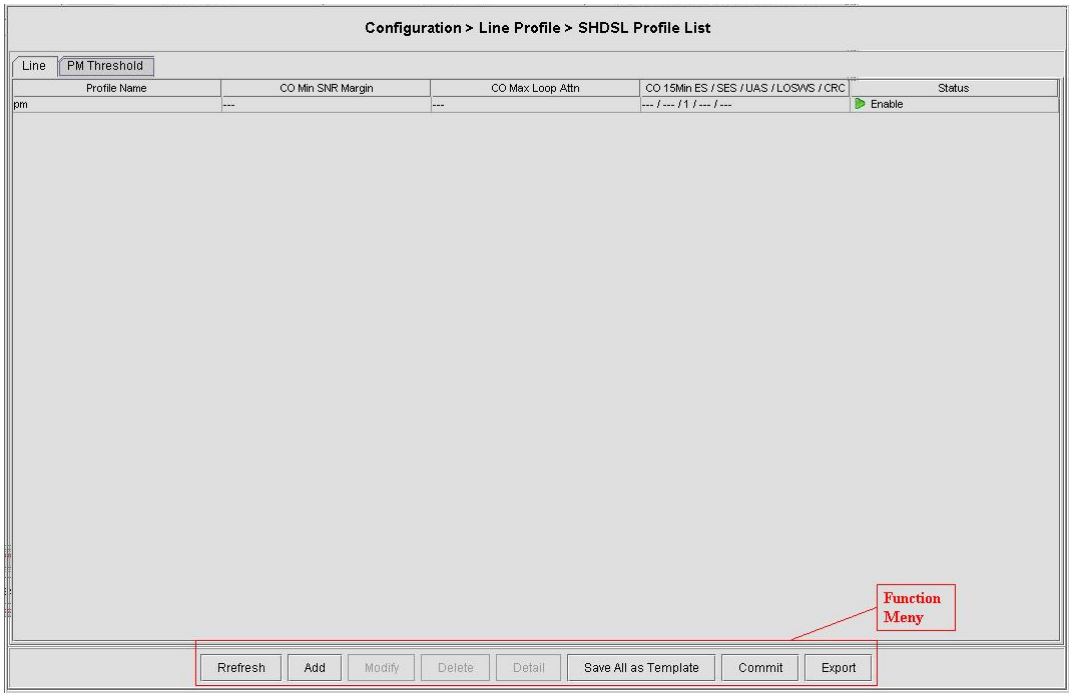
Field	Description
Miscellaneous Parameters	
PSD Mask	It specifies the setting of PSD Mask to be symmetric or asymmetric
Tx Mode	It specifies the setting of Tx mode. A: Indicates the ITU-T G.991.2 Annex A B: Indicates the ITU-T G.991.2 Annex B A+B: Compatible with ITU-T G.991.2 Annex A and Annex B.
Line Probe	Enable or disable the line probe state before training with STU-R. Enable: To make the 'line rate limit' up to 2312Kbps. Disable: To make the 'line rate limit' up to 1.5Mbps.

PM Threshold Profile

The PM threshold profile sets the threshold values for the error status generated in the ADSL line, and sets the system to report the threshold-over trap (alarm) to the AMS Server when the set error threshold is over. Figure 4-35 lists SHDSL PM threshold profiles accommodated in the system and allows adding a new profile or deleting the existing profile, by system (NE) unit. Table 4-7 depicts the utilities of function button in the function menu in Figure 4-35.

Click the **PM Threshold tab** to launch the **PM Threshold Dialog** as shown in Figure 4-35.

Figure 4-35 SHDSL Profile List– PM Threshold Dialog



Click 'Add' button to generate a PM threshold profile, each profile must have its unique profile name. Or select an existent profile and click 'Modify' to modify it. Figure 4-36 shows **Add SHDSL PM Threshold Profile Dialog**. Table 4-20 depicts the related parameters.

Figure 4-36 Add SHDSL PM Threshold Profile Dialog

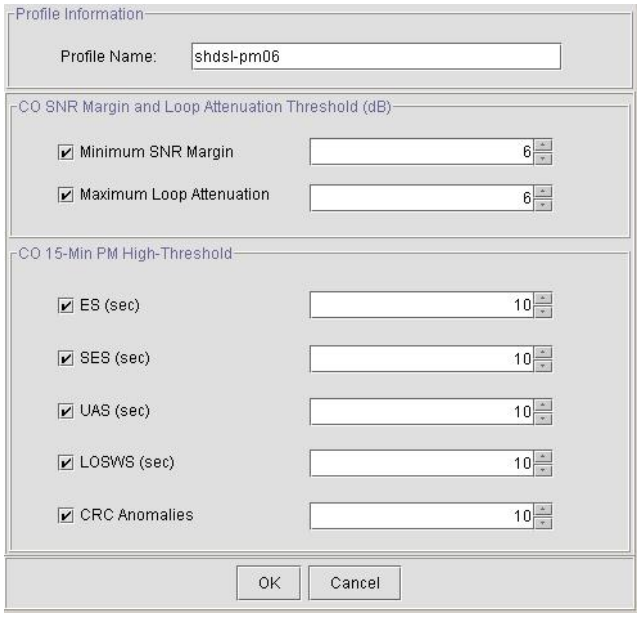


Table 4-20 Add SHDSL PM Threshold Profile Dialog Description

Field	Description
CO SNR Margin and Loop Attenuation Threshold This field indicates the minimum SNR margin and maximum loop attenuation. When the minimum SNR margin is set to 10, if the current SNR margin is below 10 dB, a trap (alarm) occurs. When the maximum loop attenuation is set to 100, if the current loop attenuation exceeds 100 dB, a trap (alarm) occurs.	
CO 15-Min PM High-Threshold This field indicates the CO side errors. When the threshold is set to 10, if the count of specific errors exceeds 10 seconds for the last error accumulated, a trap (alarm) occurs.	
ES	It specifies the Error second (0 ~ 900 sec)
SES	It specifies the Several Error Second (0 ~ 900 sec)
UAS	It specifies the unavailable Second (0 ~ 900 sec)
LOSWS	It specifies the Loss of Synchronization Word Second (0 ~ 900 sec)
CRC Anomalies	It specifies the count of anomaly of Cyclic Redundancy Check (1 ~ 44100)

4.7.4 SHDSL Profile Template Management

The profile template indicates the profile saved in the AMS. The AMS provides the profile template to make management of port/NE settings easier to operator. It is recommended to set-up a number of templates prior to creating any SHDSL profile.

To configure the SHDSL loop relative profile templates, click Configuration → Line Profile → SHDSL Profile Template on **Main Menu** to open the **SHDSL Profile Template Dialog** as shown in Figure 4-37. Table 4-21 depicts the utilities of function button in the function menu as indicated in Figure 4-37.

As the profile template possesses the same parameter fields as the profile does, the descriptions of profile in Section 4.7.3 are applicable to the profile template. Please refer to Section 4.7.3 for the configuration details.

Figure 4-37 SHDSL Profile Template Dialog Function Button

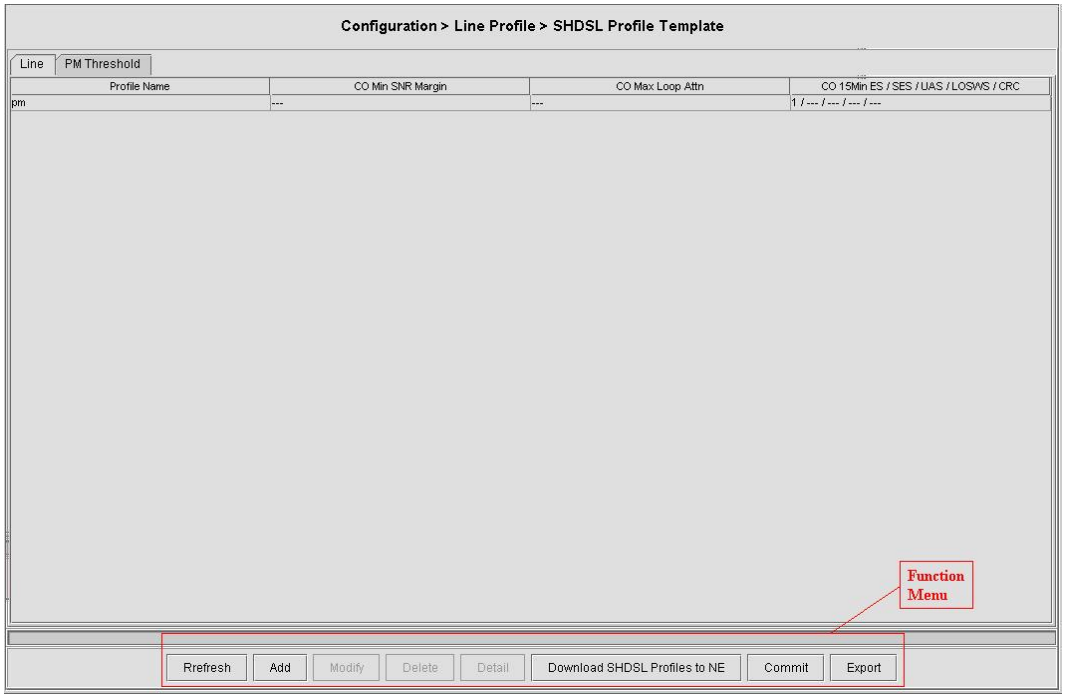


Table 4-21 SHDSL Profile Template Dialog Function Button

Field	Description
Refresh	Click this button to refresh the **SHDSL Profile Template List**
Add	Click to add a new profile template.
Modify	Click this button to modify the parameters of selected profile template.
Delete	Click this button to delete the selected profile template.
Detail	Click this button to view the details of selected profile template.
Download SHDSL profile to NE	Click to download all the SHDSL profile templates on the AMS server to the NE.
Commit	Click this button to apply the setting to NE.
Export	Click this button to save the contents of **SHDSL Profile Template List** to the AMS client.

4.7.5 VLAN Profile Management

VLAN Profile contains three categories of profiles; IP Traffic Profile, TV Channel Profile, and Multicast Service Profile.

As shown in Figure 4-19, NE forwards traffic on 2 kinds of connections, unicast connection and multicast connection, on the Data Level. For the unicast connection, it carries all traffic (unicast and broadcast) except multicast traffic. The attributes of unicast connection are specified by the IP Traffic Profile. As for the multicast connection, its attributes are specified by the TV Channel Profile. Moreover, the NE also supports to restrict the subscriber to receive a set of specific TV channels. Multicast Service Profile records the set of specific TV channels.

Click Configuration → Line Profile → VLAN Profile List on **Main Menu** to open the **VLAN Profile List Dialog** as shown in Figure 4-38. Table 4-22 depicts the utilities of function button in the function menu as indicated in Figure 4-38.

Table 4-22 VLAN Profile List Dialog Function Button

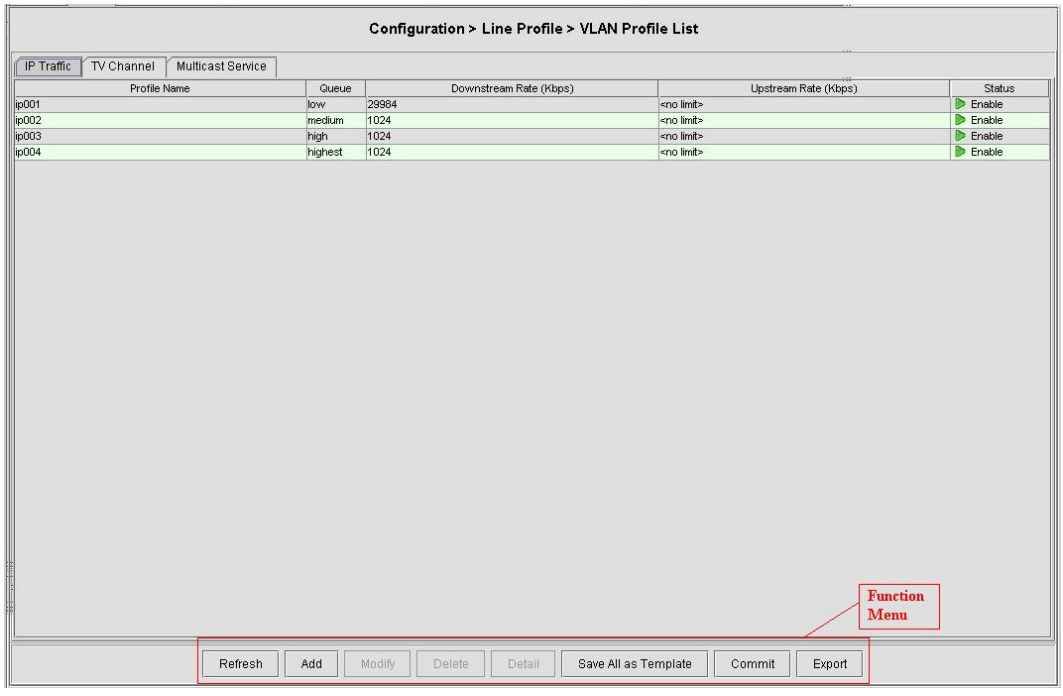
Field	Description
Refresh	Click to refresh the **VLAN Profile List**
Add	Click to add a new profile.
Modify	Click this button to modify the parameters of selected profile
Delete	Click this button to delete the selected profile.
Detail	Click this button to view the details of selected profile.
Save All as Template	Click to save all the profile on the NE as the profile template on the AMS server
Commit	Click this button to apply the setting to NE.
Export	Click this button to save the contents of **VLAN Profile List** to the AMS client.

IP Traffic Profile

The IP traffic profile is design to specify the traffic attributes of the PVC on the ADSL line. The operator can create the IP Traffic Profile according to the Service Level Agreement (SLA) and apply it to the corresponding VC-to-VLAN on demand. (see Section 4.9.1 'VC-to-VLAN Connection Management').

Click the **IP Traffic** tab in **VLAN Profile List Dialog** to launch the **VLAN Profile List–IP Traffic Dialog** as shown in Figure 4-38.

Figure 4-38 VLAN Profile List– IP Traffic Dialog



Click 'Add' button to generate an IP traffic profile, each profile must have its unique profile name. Or select an existent profile and click 'Modify' to modify it. Figure 4-39 shows **Add xDSL IP Traffic Profile Dialog**. Table 4-23 depicts the related parameters.

Figure 4-39 Add xDSL IP Traffic Profile Dialog

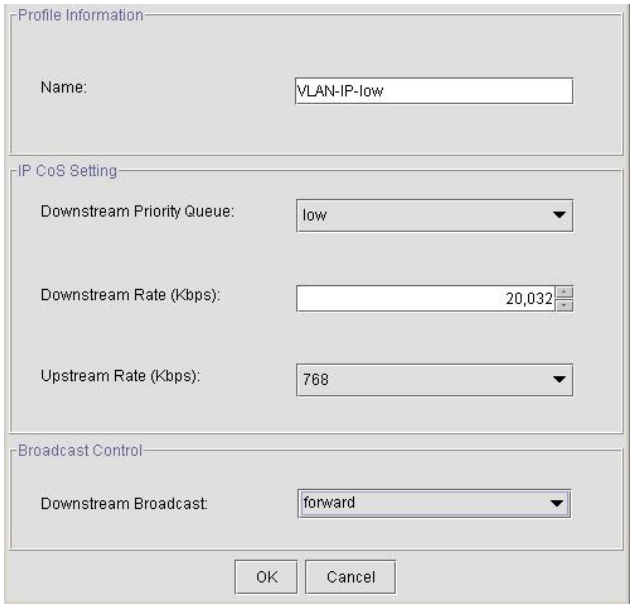


Table 4-23 Add xDSL IP Traffic Profile Dialog Description

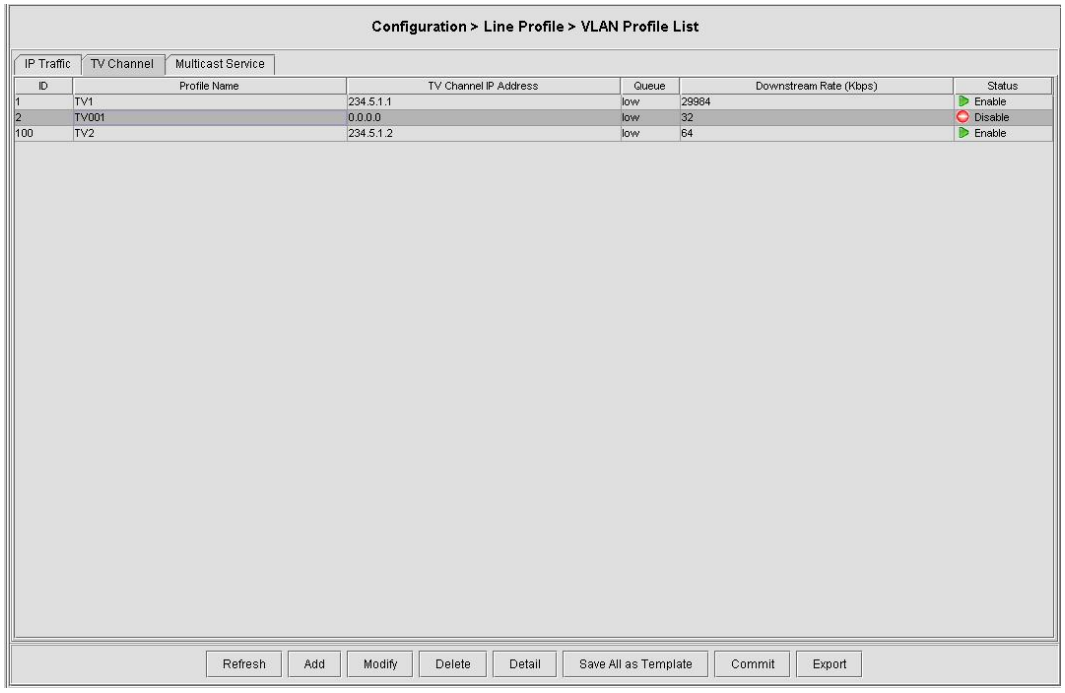
Field	Description
Profile Information	
Name	Enter the name of traffic profile.
Line Board IP CoS Setting	
Downstream Priority Queue (Kbps)	It specifies the downstream priority queue. Valid values are “Low”, “Medium”, “High” and “Highest”.
Downstream Rate (Kbps)	It specifies the maximum allowed downstream net-data rate. The drops drop packets whenever the downstream traffic exceeds the specified rate.
Upstream Rate (Kbps)	It specifies the maximum allowed upstream net-data rate. The drops drop packets whenever the user’s upstream traffic exceeds the specified rate. Valid values are “no limit”, “32”, “64”, “128”, “256”, “384”, “512”, “768”
Broadcast Control	
Downstream Broadcast	This indicates the rule (forward or drop) for downstream broadcast traffic.

TV Channel Profile

The TV channel profile sets value of multicast group IP and the associated downstream bandwidth resource, it is a menu list of the TV channel (multicast group) provided by the Content Service Provider (CSP) or Application Service Provider (ASP).

Click the **TV Channel tab** in **VLAN Profile List Dialog** to launch the **VLAN Profile List–TV Channel Dialog** as shown in Figure 4-40.

Figure 4-40 VLAN Profile List– TV Channel Dialog



Click ‘Add’ button to generate a TV channel profile, each profile must have its unique profile name. Or select an existent profile and click ‘Modify’ to modify it. Figure 4-41 shows **Add xDSL TV Channel Profile Dialog.** Table 4-24 depicts the related parameters.

Figure 4-41 Add xDSL TV Channel Profile Dialog

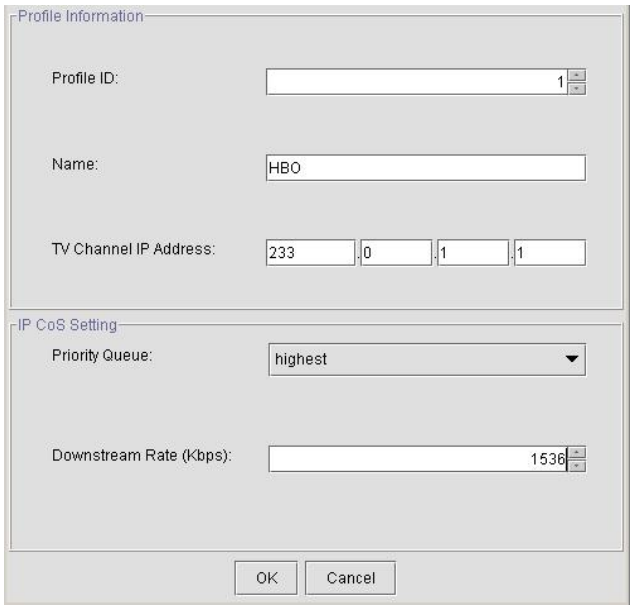


Table 4-24 Add xDSL TV Channel Profile Dialog Description

Field	Description
Profile Information	
Profile ID	It specifies the TV channel ID
Name	Enter the TV channel name
TV Channel IP Address	It specifies the IP address of TV channel (multicast group IP)
IP CoS Settings	
Priority Queue	This specifies the priority queue of TV Channel address. Valid values are “Low”, “Medium”, “High” and “Highest”.
Downstream Rate (Kbps)	It specifies the maximum allowed downstream net-data rate. The drops drop packets whenever the downstream traffic exceeds the specified rate.

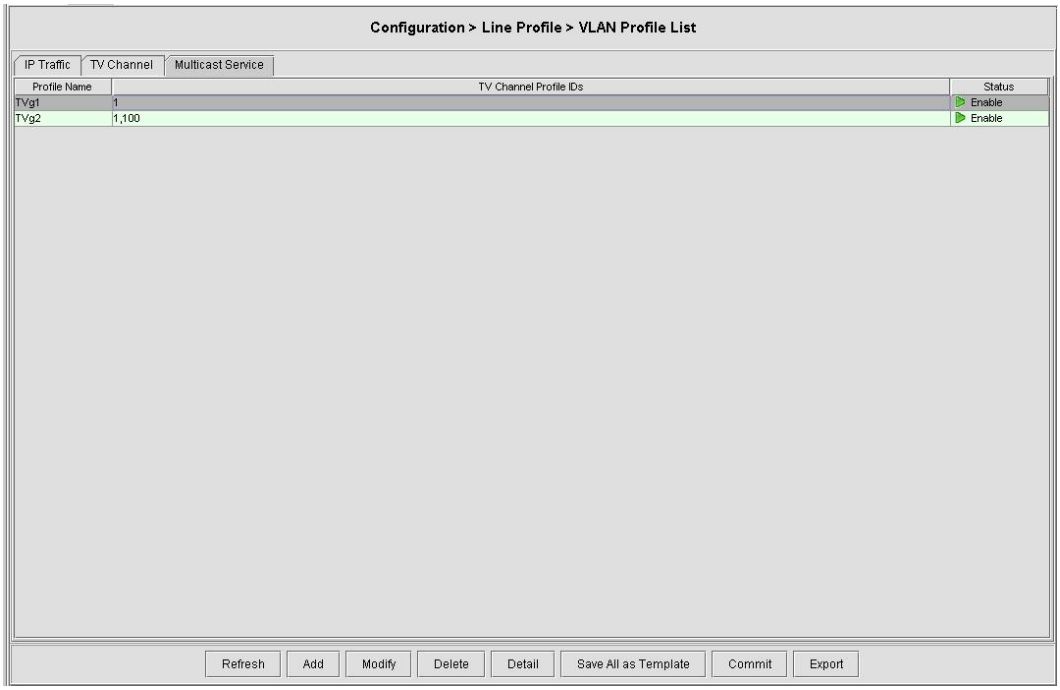
Multicast Service Profile

The multicast service profile is a set of TV channel profiles. Once the TV channel profiles are created, you can generate the multicast service profile to bind suitable TV channel profiles. Each multicast service profile is viewed as a service package for the subscriber to book. The operator then applies the booked multicast service profile to the distinct VC-to-VLAN associated with the subscriber. (see Section 4.9.1 ‘VC-to-VLAN Connection Management’).

Whenever the subscriber clicks his remote controller to watch a TV channel transmitted via the ADSL line, the set-top-box sends the corresponding IGMP report packet. The NE will forward IGMP packet if its multicast IP hits the associated multicast service profile. Otherwise, the NE drops the IGMP packet. As a result, the subscriber is restricted to watch the TV programs that he booked.

Click the **Multicast Service tab** in **VLAN Profile List Dialog** to launch the **VLAN Profile List–Multicast Service Dialog** as shown in Figure 4-42.

Figure 4-42 VLAN Profile List– Multicast Service Dialog



Click ‘Add’ button to generate a multicast service profile, each profile must have its unique profile name. Or select an existent profile and click ‘Modify’ to modify it. Figure 4-43 shows **Add xDSL Multicast Service Profile Dialog**. Table 4-25 depicts the related parameters.

Figure 4-43 Add xDSL Multicast Service Profile Dialog

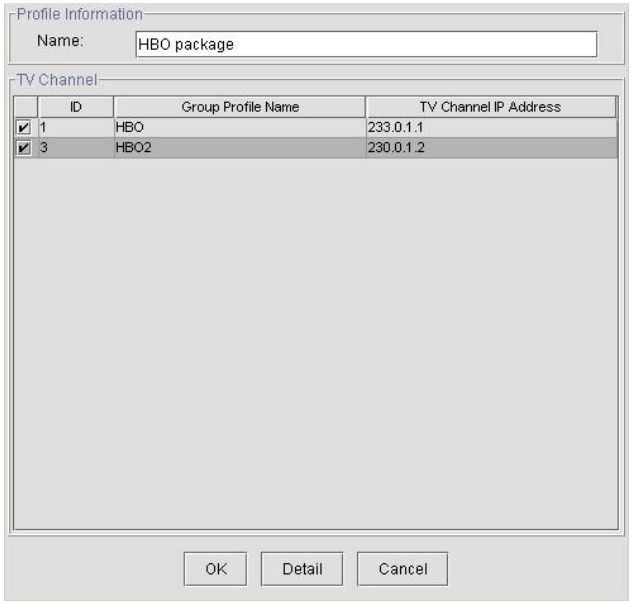


Table 4-25 Add Multicast Service Profile Dialog Description

Field	Description
Profile Information	
Name	Enter the multicast service profile name.
TV Channel	
ID	The serial number for group profile.
Group Profile Name	It indicates the TV Channel profile name specified in Figure 4-41.
TV Channel IP Address	It indicates the corresponding multicast IP address of TV Channel.
Function Button	
OK	Click this button to confirm the setting
Detail	Click this button to view the details of TV Channel profile.
Cancel	Click this button to cancel the modification.

4.7.6 VLAN Profile Template Management

The profile template indicates the profile saved in the AMS. The AMS provides the profile template to make management of port/NE settings easier to operator. It is recommended to set-up a number of templates prior to creating any VLAN profile.

To configure the VLAN profile templates, click Configuration → Line Profile → VLAN Profile Template on **Main Menu** to open the **VLAN Profile Template Dialog** as shown in Figure 4-44. Table 4-26 depicts the utilities of function button in the function menu as indicated in Figure 4-44.

As the profile template possesses the same parameter fields as the profile does, the descriptions of profile in Section 4.7.5 are applicable to the profile template. Please refer to Section 4.7.5 for the configuration details.

Figure 4-44 VLAN Profile Template Dialog Function Button

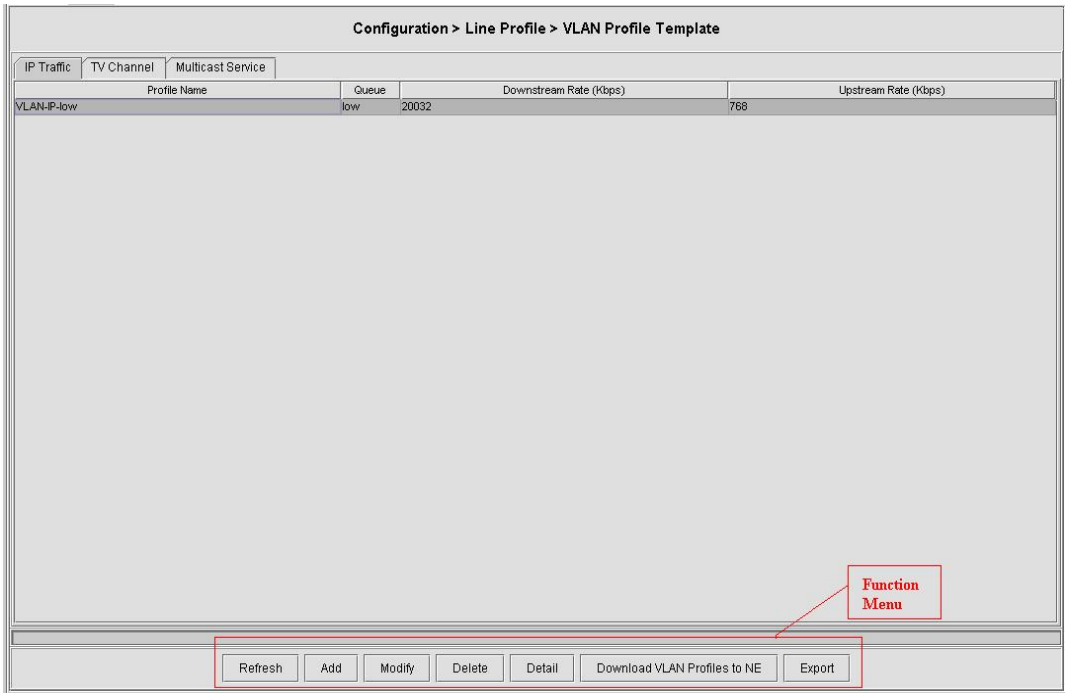


Table 4-26 VLAN Profile Template Dialog Function Button

Field	Description
Refresh	Click to refresh the **VLAN Profile Template List**
Add	Click to add a new profile template.
Modify	Click this button to modify the parameters of selected profile template.
Delete	Click this button to delete the selected profile template.
Detail	Click this button to view the details of selected profile template.
Download VLAN profile to NE	Click to download all the VLAN profile templates to the NE.
Export	Click this button to save the contents of **VLAN Profile Template List** to the AMS client.

4.7.7 Alarm Definition Profile Management

The alarm definition profile allows you to define the rule of alarm element in system. Through this profile, you are able to change the severity of individual alarm element and decide to report it or not.

Alarm Severity. Change the particular alarm type's severity level

.

Alarm Reporting. Alarm reporting provides enable/disable capability for the specific alarm types. E.g. to disable the LPR alarm will mask this alarm inherent in the NE.

Alarm Suppression. To suppression with specify alarm type due to occurrence. E.g. LOF is suppress by LOS, NE will reporting LOS when both are occurrence.

Alarm element is specified in the class of module or port. Different types of module may present different alarm element. Different types of port may also present different alarm element.

Step 1 Click Configuration → Alarm Definition → Alarm Definition List on **Main Menu** to open the **Alarm Definition List** Dialog as shown in Figure 4-45. Table 4-27 depicts the related parameters.

Step 2 Select either a module or a port on the **Class** combo-box.

Step 3 Select a module model on the **Model** combo-box as shown in Figure 4-46.
Or
Select a port model on the **Model** combo-box as shown in Figure 4-47.

Step 4 Click 'Modify' button to modify the Alarm Definition. Figure 4-48 shows an example of **Modify Alarm Definition Dialog**. Table 4-28 depicts the related parameters.

Figure 4-45 Alarm Definition List Dialog

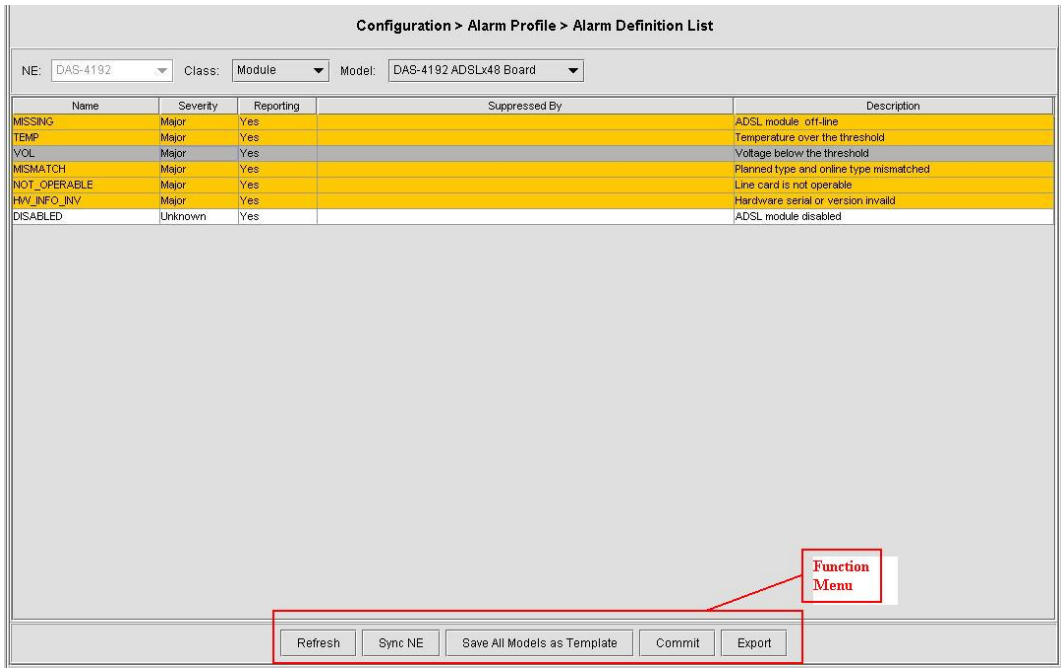


Table 4-27 Alarm Definition List Dialog Description

Field	Description
List Table	
Name	It specifies the alarm name.
Severity	It specifies the alarm severity.
Reporting	It specifies the reporting status.
Suppressed By	It specifies the rule of alarm suppression.
Description	It specifies the alarm description.
Top Combo-box	
NE	This indicates the current NE model.
Class	Use this combo-box to select the alarm class, either module or port.
Model	Use this combo-box to select the card module or port module.

Table 4-27 Alarm Definition List Dialog Description (Continued)

Field	Description
Function Button	
Refresh	Click to refresh the **Alarm Definition List**
Sync NE	Click to get all the profile from the NE to the AMS server.
Save All Models as Template	Click to save all the profile on the AMS server as the profile template.
Commit	Click this button to apply the setting to NE.
Export	Click this button to save the contents of **Alarm Definition List** to the AMS client.

Figure 4-46 Selection of a module model on the Model combo-box

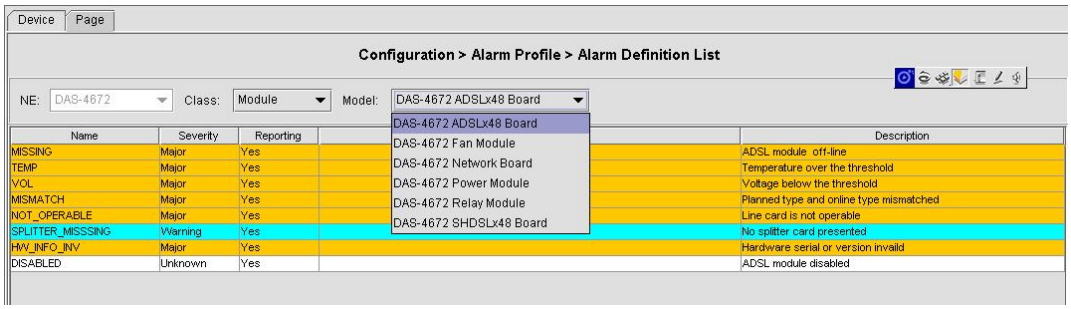


Figure 4-47 Selection of a port model on the Model combo-box

Figure 4-48 Modify Alarm Definition Dialog

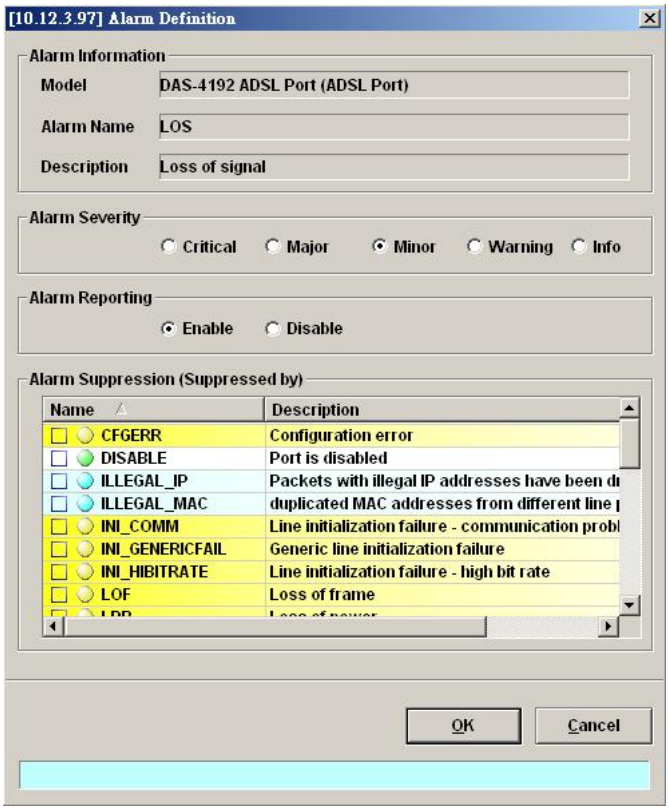


Table 4-28 Modify Alarm Definition Dialog Description

Field	Description
Alarm Information	
Model	It specifies current module name under modifying.
Alarm Name	It specifies the alarm name.
Description	This describes the current selected alarm.
Alarm Severity	Check the radio button to set the alarm severity of the specified alarm.
Alarm Reporting	Enable or disable reporting of the specified alarm.
Alarm Suppression (Suppressed by)	
Name	Check the check-box to choose which the specified alarm to be suppressed by.
Description	This describes the alarm's meaning.

NOTE The alarm suppression (suppressed by) allows you to mask specific alarms when there are sequences occurred at the same time. For example, let the LOF (Loss of Frame) be configured to be suppressed by the LOS (Loss of Signal), the LOF will not be display on the screen but only LOS whenever the corresponding ADSL loop is cut.

4.7.8 Alarm Definition Profile Template Management

The profile template indicates the profile saved in the AMS. It is recommended to set-up a number of templates prior to creating any alarm definition profile.

To configure the alarm definition profile templates, click Configuration → Alarm Definition →

Alarm Definition Template on **Main Menu** to open the **Alarm Definition Template Dialog** as shown in Figure 4-49. Table 4-29 depicts the utilities of function button in the function menu as indicated in Figure 4-49.

As the profile template possesses the same parameter fields as the profile does, the descriptions of profile in Section 4.7.7 are applicable to the profile template. Please refer to Section 4.7.7 for the configuration details.

Figure 4-49 Alarm Definition Template Dialog

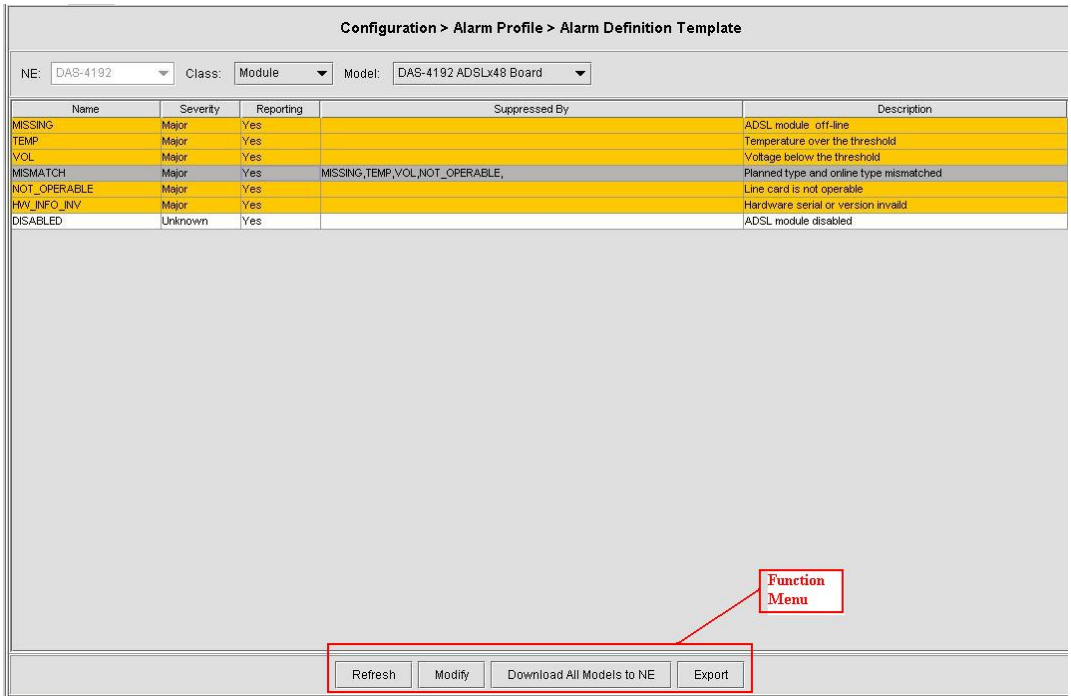


Table 4-29 Alarm Definition Template Dialog Function Button

Field	Description
Refresh	Click to refresh the **Alarm Definition Template List**
Modify	Click this button to modify the parameters of selected profile
Download All Models to NE	Click to download all the Alarm Definition profile templates on the AMS server to the NE.
Export	Click this button to save the contents of **Alarm Definition Template List** to the AMS client.

4.8 Interface Port Management

This section depicts the management of subscriber interfaces and GE network interfaces. This section contains the following sections:

- ADSL Line Interface Management
- SHDSL Line Interface Management
- GE Network Interface Management

4.8.1 ADSL Line Interface Management

This section helps you to attach the profile to the ADSL line interfaces. The function buttons of ADSL Port List dialog provides shortcut of relative port setting.

Step 1 Click Configuration → ADSL Port Setting on **Main Menu** to open the **ADSL Port List** Dialog as shown in Figure 4-50. Table 4-30 depicts the related parameters.

Figure 4-50 ADSL Port List Dialog

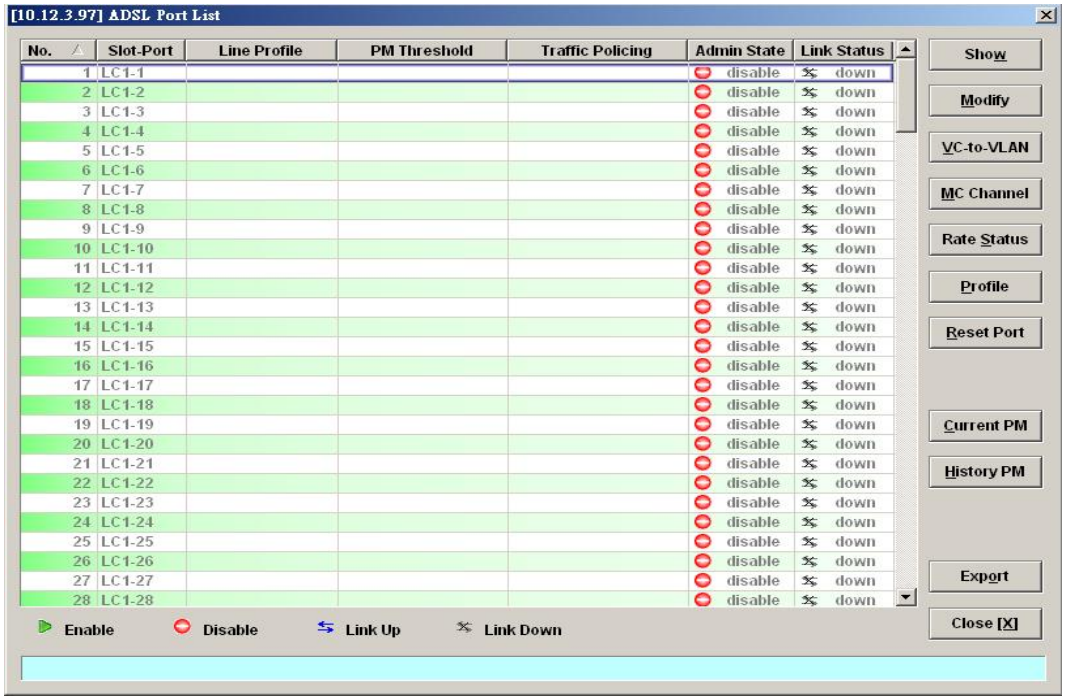


Table 4-30 ADSL Port List Dialog Description

Field	Description
List Table	
No.	This specifies the serial number of entry of List Table.
Slot-Port	This specifies the location of ADSL port
Line Profile	This specifies the line profile.
PM Threshold	This specifies the PM threshold profile.
Traffic Policing	This specifies the Traffic Policing profile. [Only for the **ADSL Port List** Dialog]
Admin State	This specifies the administrative status (enable or disable)
Link Status	It specifies the link connection status.

Table 4-30 ADSL Port List Dialog Description (Continued)

Field	Description
Function Button	
Show	Click this button to show.
Modify	Click this button to modify.
VC-to-VLAN	Click this button to configure the VC-to-VLAN parameters
MC Channel	Click this button to configure the multicast channel related parameters. [Only for the **ADSL Port List** Dialog]
Rate Status	Click this button to monitor the connection rate status.
Profile	Click this button to arrange the profile setting.
Reset Port	Click this button to reset port
Current PM	Click this button to view the current performance
History PM	Click this button to view the historical performance
Export	Click this button to save the contents of **ADSL Port List** to the AMS client.
Close	Exit the **ADSL Port List** Dialog.

Step 2 Select an ADSL port and click 'Modify' button to modify the ADSL port. Figure 4-51 shows **Modify ADSL Port Dialog**. Table 4-31 depicts the related parameters.

Figure 4-51 Modify ADSL Port Dialog**.**

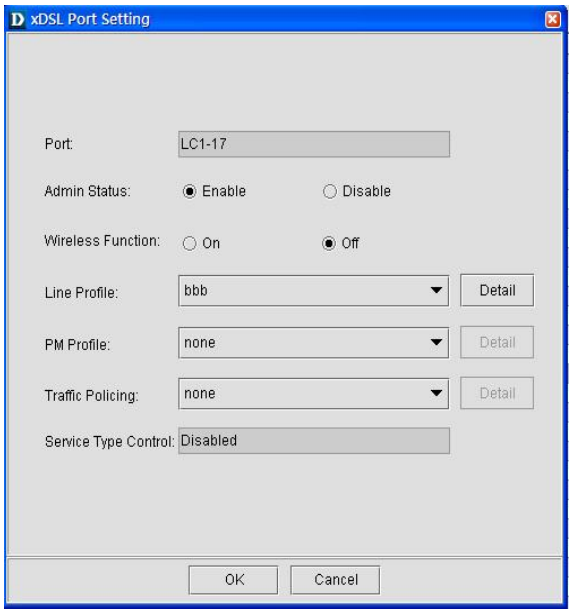


Table 4-31 Modify ADSL Port Dialog Description

Field	Description
ADSL Port	This indicates the current ADSL Port under modification.
Administrative State	Enable or disable the specified ADSL port.
ADSL Profiles	
Line Profile	Use this combo-box to select an existent ADSL line profile.
PM Threshold	Use this combo-box to select an existent PM Threshold profile.
Traffic Policing	Use this combo-box to select an existent Traffic Policing profile.
Service Type Control	This indicates the state of Service Type Control (STC) of the selected ADSL line card.
Function Button	
OK	Press this button to commit setting.
Cancel	Press this button to cancel setting.

Service Type Control (STC) only takes effect after the applied line card is reset.

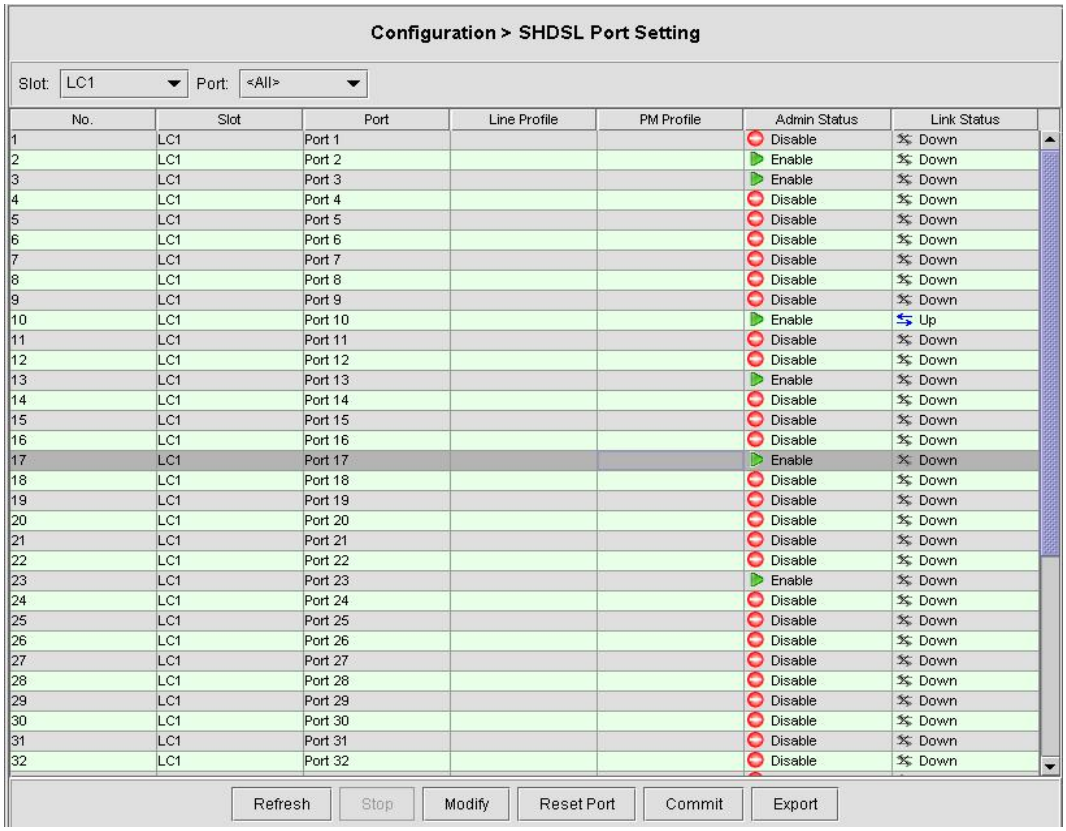
To make the applied Traffic Policing Profile take effect, Service Type Control (STC) must be enabled.

4.8.2 SHDSL Line Interface Management

This section helps you to attach the profile to the SHDSL line interfaces. The function buttons of SHDSL Port List dialog provides shortcut of relative port setting.

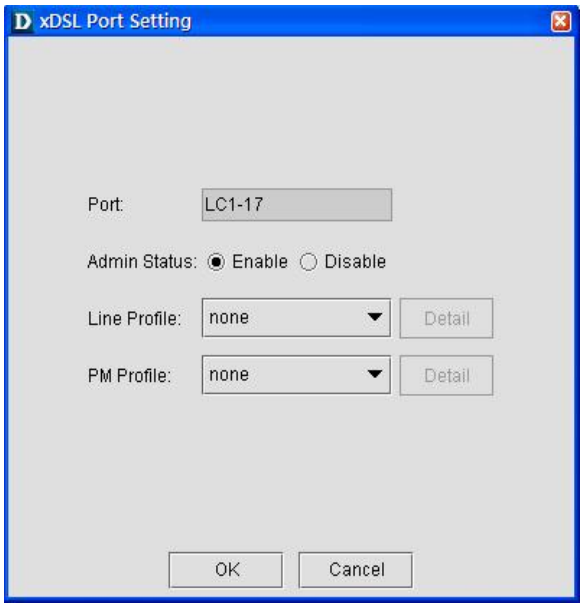
Step 1 Click Configuration → SHDSL Port Setting on **Main Menu** to open the **SHDSL Port List** Dialog as shown in. Figure 4-52 depicts the related parameters.

Figure 4-52 SHDSL Port List Dialog



Step 2 Select a SHDSL port and click ‘Modify’ button to modify the SHDSL port. Figure 4-53 shows **Modify SHDSL Port Dialog**. Table 4-32 depicts the related parameters.

Figure 4-53 Modify SHDSL Port Dialog



In comparison with the **ADSL Port List** Dialog, the **SHDSL Port List** Dialog does not support the following functions

- Traffic Policing
- Service Type Control

Table 4-32 Modify SHDSL Port Dialog Description

Field	Description
SHDSL Port	This indicates the current SHDSL Port which is under modifying.
Administrative State	Enable or disable the specified SHDSL port.
SHDSL Profiles	
Line Profile	Use this combo-box to select an existent SHDSL line profile.
PM Threshold	Use this combo-box to select an existent PM Threshold profile.
Function Button	
OK	Press this button to commit setting.
Cancel	Press this button to cancel setting.

4.8.3 GE Network Interface Management

There are two GE network interfaces, GE1 and GE2, for DAS4 series IP-DSLAM. GE1 is stated as the uplink GE port. All traffic from the xDSL line interface is forwarded to this interface by default. (i.e., the so-called port isolation) GE2 is stated as the subtended GE port, and it connects to other equipment and forward traffics to GE1 if none of LACP or RSTP is enabled.

Step 1 Click Configuration → Trunk → Trunk Port Setting to open the **Trunk Port List** Dialog as shown in Figure 4-54 and Table 4-33 depicts the related parameters.

Figure 4-54 Trunk Port List Dialog

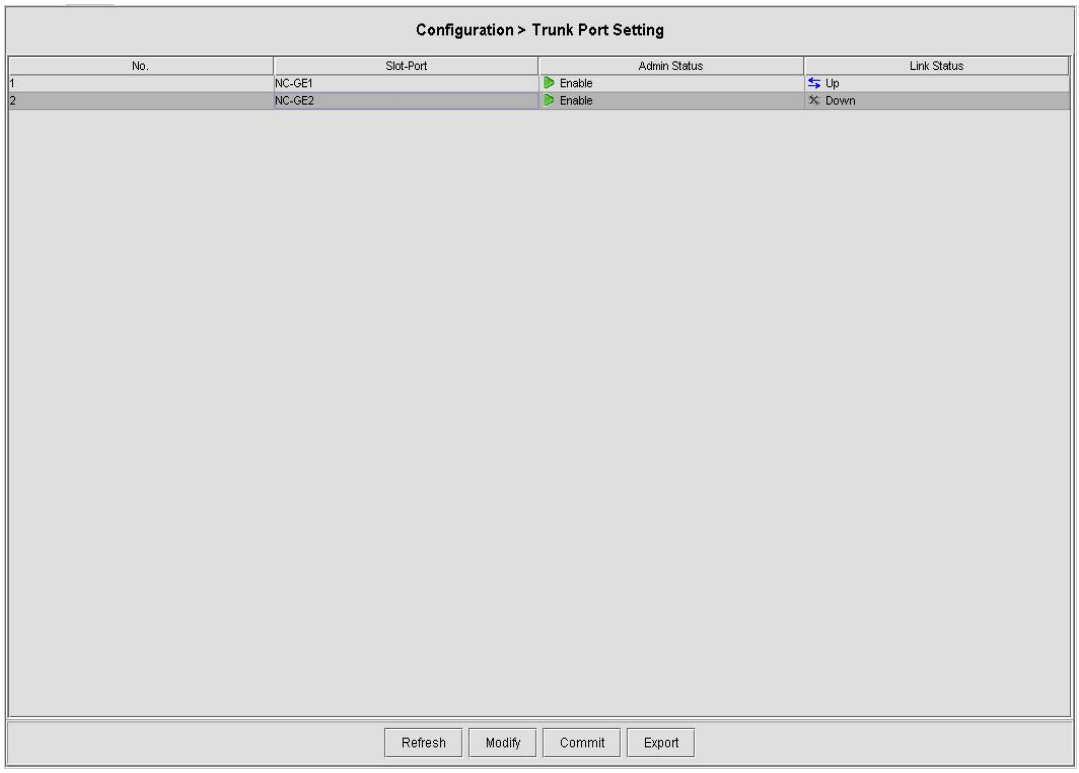


Table 4-33 Trunk Port List Dialog Description

Field	Description
Trunk Port List Table	
No.	This indicates the serial number of entry of the List Table.
Slot-Port	This indicates the location of trunk GE port.
Admin State	This indicates the administrative state of GE port.
Link Status	This indicates the operational state of GE port.
Function Button	
Refresh	Click this button to refresh the **Trunk Port List**
Modify	Click this button to modify.
Commit	Click this button to apply the setting to NE
Export	Click this button to save the contents of **Trunk Port List** to the AMS client.

Step 2 Click 'Modify' button to modify the trunk port. Figure 4-55 shows the **Trunk Port Configuration Dialog**, and Table 4-34 depicts the related parameters.

Figure 4-55 Trunk Port Configuration Dialog

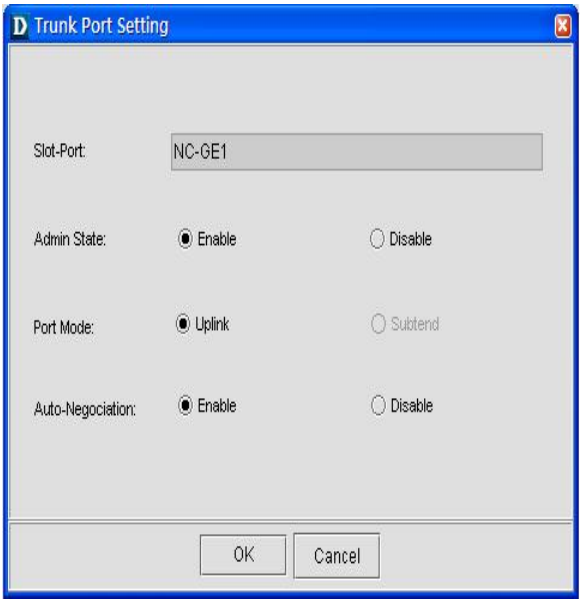
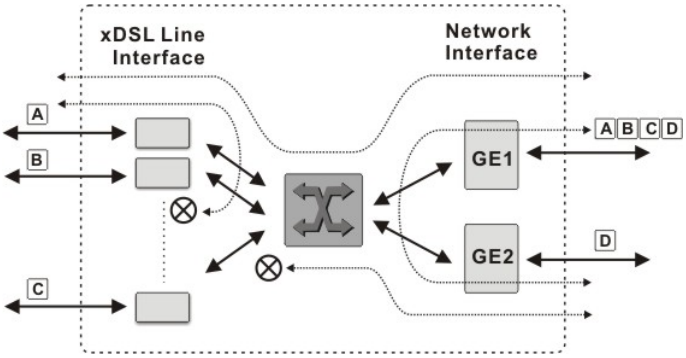


Table 4-34 Trunk Port Configuration Dialog Description

Field	Description
Slot-port	This indicates the location of GE port under configuring.
Admin. State	Enable or disable the specified GE port.
Port Mode	Setting the GE port to uplink mode or subtended mode. Subtended mode is only available on GE2, GE1 is always the uplink port.
Auto-Negotiation	Enable or disable the auto-negotiation mode of the specified GE port.

Figure 4-56 GE Network Interface Packet Forward Illustrate



The DAS4 series IP-DSLAM support the so-called “Port Isolation”, all xDSL users can not communicate with each other.

Once the GE2 is configured as a subtended port, all the ingress traffic of GE2 is restricted to be forwarded to GE1.

Link Aggregation (Static / Dynamic)

Link aggregation is to aggregate the 2 GE ports to provide higher uplink bandwidth. This dialog allows you to configure both static link aggregation and LACP (IEEE802.3ad, Link Aggregation Control Protocol).

Follow the subsequent procedures to configure the related parameters.

Click Configuration → Trunk → Link Aggregation on **Main Menu** to open the **LACP for Trunk Port Dialog**. Figure 4-57 shows **LACP for Trunk Port Dialog**. Table 4-35 depicts the related parameters.

Figure 4-57 LACP for Trunk Port Dialog

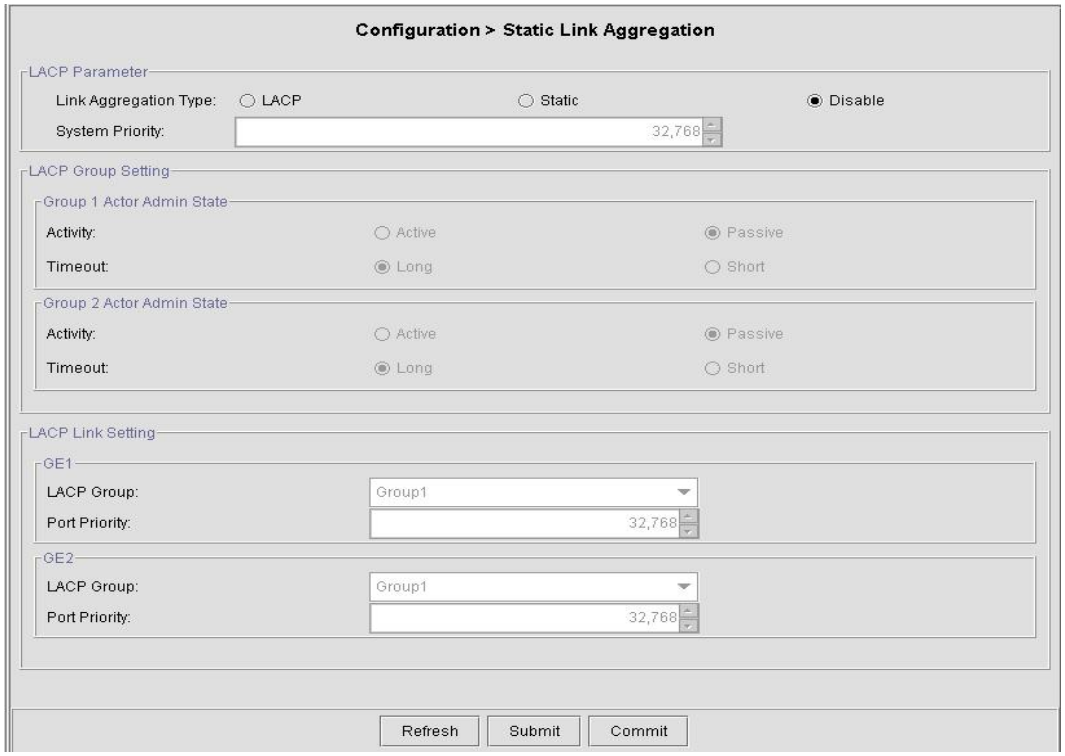


Table 4-35 LACP for Trunk Ports Dialog Description

	Description
Link Aggregation Type	
LACP	Set link aggregation type to "LACP" for GE ports.
Static	Set link aggregation type to "Static" for GE ports.
Disable	Check this radial button to forbid the GE ports to run any link aggregation function.
LACP Setting	
System Priority	It specifies the system priority required for the LACP.
LACP Group1/Group2 Setting	
Activity	It specifies the activity of the GE ports of the specified group, active or passive, for the LACP. • **Passive**: The NE does not initiate LACP negotiation procedure on the specified group voluntarily, but waits for its LACP peer (in active state) initiates negotiation. The NE will form the aggregation link with its peer at the end of the negotiation procedure. • **Active**: The NE is willing to initiate the LACP negotiation procedure on the specified group and sends out an LACP packet voluntarily. The aggregation link will be formed if the other end is running in LACP active or passive mode.
Timeout	It specifies the interval of periodical transmitting LACP BPDU by the peer NE. If the NE does not receive the LACP BPDU after 3 consecutive specified intervals, the NE will remove the port from the aggregation link. For a busy aggregation link, it is recommended to set a short timeout to ensure that a disabled port is removed as soon as possible. Its value is either long (30 seconds) or short (1 second).
LACP GE1/GE2 Link Setting	
LACP Group	It specifies which the LACP group of GE1/GE2 is.
Port Priority	It specifies the port priority of GE1/GE2.
Function Button	
Refresh	Click this button to refresh the **LACP for Trunk Port Dialog**
Submit	Click this button to apply the setting to NE.
Commit	Click this button to apply the setting to NE.

RSTP Configuration

The RSTP protocol smartly prevents the loop connection in your uplink networks. It improves the Spanning Tree Protocol (STP) by reducing the fail-over time whenever there is network topology change. The configuration of RSTP is divided to 2 parts. One is the system-wise configuration, which is described in the subsection "Bridge". The other one is the port-specific configuration, which is described in the subsection "Port GE1/Port GE2".

Follow the subsequent procedures to configure the related parameters.

Click Configuration → Trunk → RSTP Setting on **Main Menu** to open the **Rapid Spanning Tree Protocol for Trunk Ports** Dialog as shown in Figure 4-58. Table 4-36 depicts the related parameters.

Figure 4-58 RSTP Setting Dialog

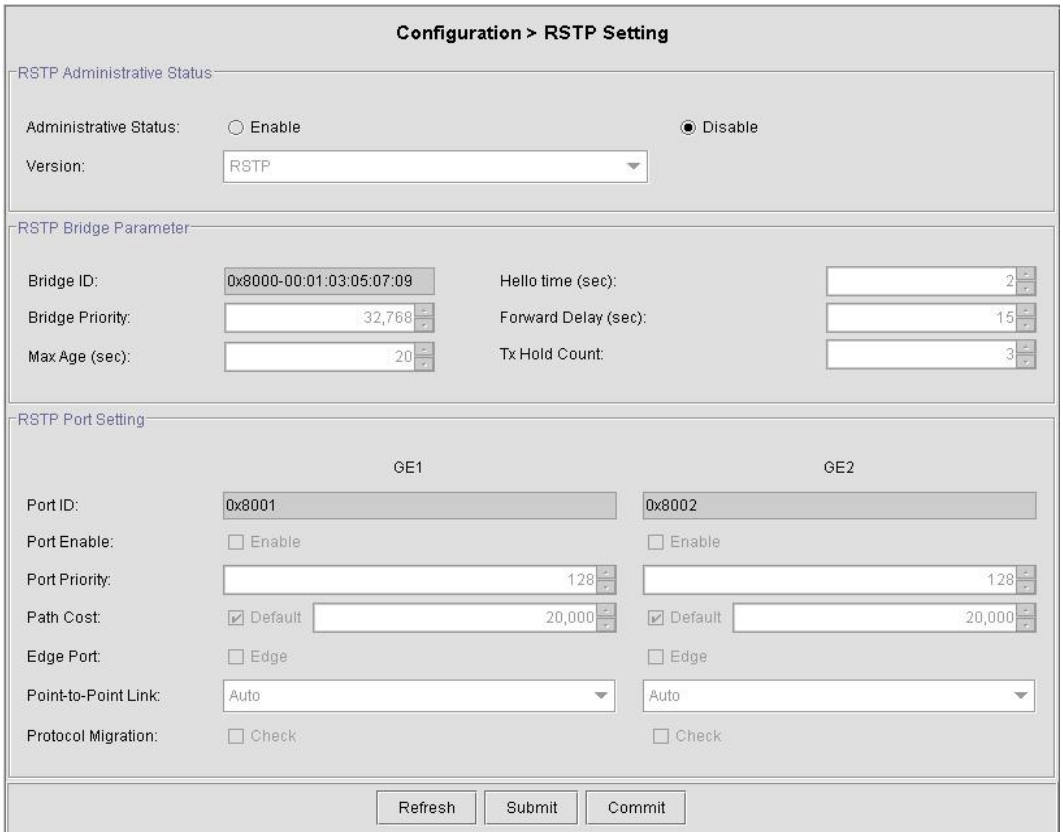


Table 4-36 RSTP Setting Dialog Description

Field	Description
RSTP Administrative State	
Administrative State	Enable or disable the RSTP function for GE ports.
Version	This specifies the RSTP version the NE runs.
RSTP Bridge Parameter	
Bridge ID	It indicates an unique 8-octet bridge ID which consists of a 2-octet Bridge Priority and a 6-octet MAC address.
Bridge Priority	It specifies the 2-octet bridge priority. If the given value is lower than all the other L2 devices', the NE is selected as the root bridge as defined in IEEE 802.1d/ 802.1w. Its valid range is through 0 to 61440 in steps of 4096
Max Age (Sec)	It specifies the maximum age of STP/RSTP information learned from the network on any port before it is discarded.
Hello Time	It specifies the amount of time between the transmission of configuration bridge PDUs by this node on any port when it is the root of the spanning tree or trying to become so.
Forward Delay	This specifies the time value that controls how fast a port changes its spanning state when moving towards the Forwarding state. The value determines how long the port stays in the Learning states, which precede the Forwarding state. This value is also used, when topology change has been detected and is underway, to age all dynamic entries in the Forwarding Database.
Tx Hold Count	This specifies the value used by the port Transmit state machine to limit the maximum transmission rate.

Table 4-36 RSTP Setting Dialog Description (Continued)

Field	Description
RSTP GE1/GE2 Port Setting	
Port ID	It specifies the GE1/GE2 port's port ID so far.
Port Enable	The current RSTP enabled/disabled status of the port
Port Priority	It specifies the port priority of a port. In the case that more than one ports form a loop in the NE, the RSTP/STP will block the ports of lower Port Priority (higher numerical value). Only the port of higher Port Priority (lower numerical value) is to be at the Forwarding state. Its valid range is through 0 to 240 in steps of 16
Path Cost	It specifies the contribution of this port to the path cost of paths towards the spanning tree root bridge. A port of higher speed should be configured with lower numerical value. When set it to be "default", its value follows the definition of IEEE 802.1d Table 17-3.
Edge Port	Check to let the port become edge port in spanning tree topology. An edge port on an RSTP switch will immediately transition to the forwarding state. However, the port will be a non-edge port if the NE receives RSTP BPDU on that port. And the port state and port role of the non-edge port will be determined by the RSTP hereafter.
Point-to-Point Link	Select YES to force this port always be treated as if it is connected to a point-to-point link. Select NO to let this port be treated as having a shared media connection. AUTO indicates that this port is considered to have a point-to-point link if it is an aggregator and all of its members are aggregately, or if the MAC entity is configured for full duplex operation, either through auto-negotiation or by management means.
Protocol Migration	Check to force this port to transmit RSTP BPDUs.
Function Button	
Refresh	Click this button to refresh the **RSTP Setting Dialog**
Submit	Click this button to apply the setting to NE.
Commit	Click this button to apply the setting to NE.

It is noted that the following relationships have to be maintained.

2 x (***Forward Delay*** – 1 *second*) >= ***Max Age***
Max Age >= 2 x (***Hello Time*** + 1 *second*)

When set Path Cost to be "default", its value follows the definition of IEEE 802.1d Table 17-3 as follows.

Link Speed	Recommended value	Recommended range	Range
<=100 Kb/s	200 000 000[a]	20 000 000–200 000 000	1–200 000 000
1 Mb/s	20 000 000[a]	2 000 000–200 000 000	1–200 000 000
10 Mb/s	2 000 000[a]	200 000–20 000 000	1–200 000 000
100 Mb/s	200 000[a]	20 000–2 000 000	1–200 000 000
1 Gb/s	20 000	2 000–200 000	1–200 000 000
10 Gb/s	2 000	200–20 000	1–200 000 000
100 Gb/s	200	20–2 000	1–200 000 000
1 Tb/s	20	2–200	1–200 000 000
10 Tb/s	2	1–20	1–200 000 000

CoS Configuration

In order for the NE to play the role of edge (boundary) node of a DiffServ domain, the NE supports the the configurable mapping among the following entities.

- IEEE 802.1p User Priority as configured in the VC-to-VLAN configuration.
- Queue (Traffic Class) on each uplink trunk GE port
- DiffServ Code Point (DSCP) of the IP frame to be forwarded via the uplink trunk GE port.

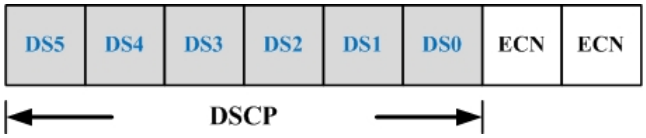
User priority: The IEEE 802.1p user priority is a label carried with the frame that communicates the requested priority to the next hop (bridge, router or end systems). Typically, the user priority is not modified in the intermediate hop. Thus, the user priority has end-to-end significance across bridged LANs.

Queue (traffic class): A bridge can be configured so that multiple queues are used to hold frames waiting to be transmitted on a given outbound port, in which case the traffic class is used to determine the relative priority of the queues. Whenever the bridge's physical port is configured as strict priority (SP), all waiting frames at a higher traffic class are transmitted before any waiting frames of a lower traffic class. As with access priority, traffic class is assigned by the bridge on the basis of incoming user priority.

NOTE Currently, the NE supports 8 traffic classes (queues) on its GE ports with the strict priority (SP) scheduling policy only.

Differentiated Service Code Point (DSCP): RFC 2474/2475 defines the DiffServ field, which replaces the Type of Service (ToS) field in the IPv4 header. It facilitates the network devices behind IP-DSLAM to fulfill the end-to-end QoS.
Figure 4-59 shows the DiffServ field.

Figure 4-59 DiffServ Field



The most significant six bits of DiffServ field are called DSCP. The network device classifies packets and marks them with appropriate DSCP value. According to these values, other network devices in the DiffServ domain can make decision for packets behavior and provide the Quality of Service properly.

A network device classify the priorities of traffic with 6 different levels, they are Express Forwarding (EF), Assured Forwarding Class 4 (AF4), Assured Forwarding Class 3 (AF3), Assured

Forwarding Class 2 (AF2), Assured Forwarding Class 1 (AF1) and Best Effort (BE). These forwarding classes are represented by the first 3 bits of DSCP as shown in Table 4-37.Moreover, the network device differentiates three drop precedence in AF4~AF1 respectively into last 3 bits of DSCP, they are Low Drop Precedence, Medium Drop Precedence and High Drop Precedence.

Table 4-37 DSCP: DS3~DS5 Bit Representation

Decimal representation of bits DS5, DS4 and DS3	Description
7	For link layer and routing protocol keep alive.
6	For using for IP routing protocols.
5	Express Forwarding (EF)
4	Assured Forwarding Class 4 (AF4)
3	Assured Forwarding Class 3 (AF3)
2	Assured Forwarding Class 2 (AF2)
1	Assured Forwarding Class 1 (AF1)
0	Best Effort (BF)

Expedited Forwarding: The code point of EF is 101110, the packets marked with EF is to be transmitted with highest priority, lowest drop probability.

Assured Forwarding: Assured Forwarding PHB is suggested for applications that require a better reliability than the best-effort service. There are 4 classes of AF. Within Each AF class, there are 3 drop precedences. In case of congestion, the drop precedence of a packet determines the relative importance of the packet within the AF class. Table 4-38 indicates the relationship of the 4 AF class.

Table 4-38 DSCP Class Relationship

	Class			
Drop	**AF1**	**AF2**	**AF3**	**AF4**
Low Drop Probability	001010 (AF11)	010010 (AF21)	011010 (AF31)	100010 (AF41)
Medium Drop Probability	001100 (AF12)	010100 (AF22)	011100 (AF32)	100100 (AF42)
High Drop Probability	001110 (AF13)	010110 (AF23)	011110 (AF33)	100110 (AF43)

Follow the subsequent procedure to configure the Trunk CoS mapping.

Click Configuration → Trunk → CoS Mapping on **Main Menu** to open the **CoS Priority – Queue Mapping Dialog** as shown in Figure 4-60. Table 4-39 depicts the related parameters.

Figure 4-60 Trunk CoS Mapping and DSCP Re-mapping Dialog

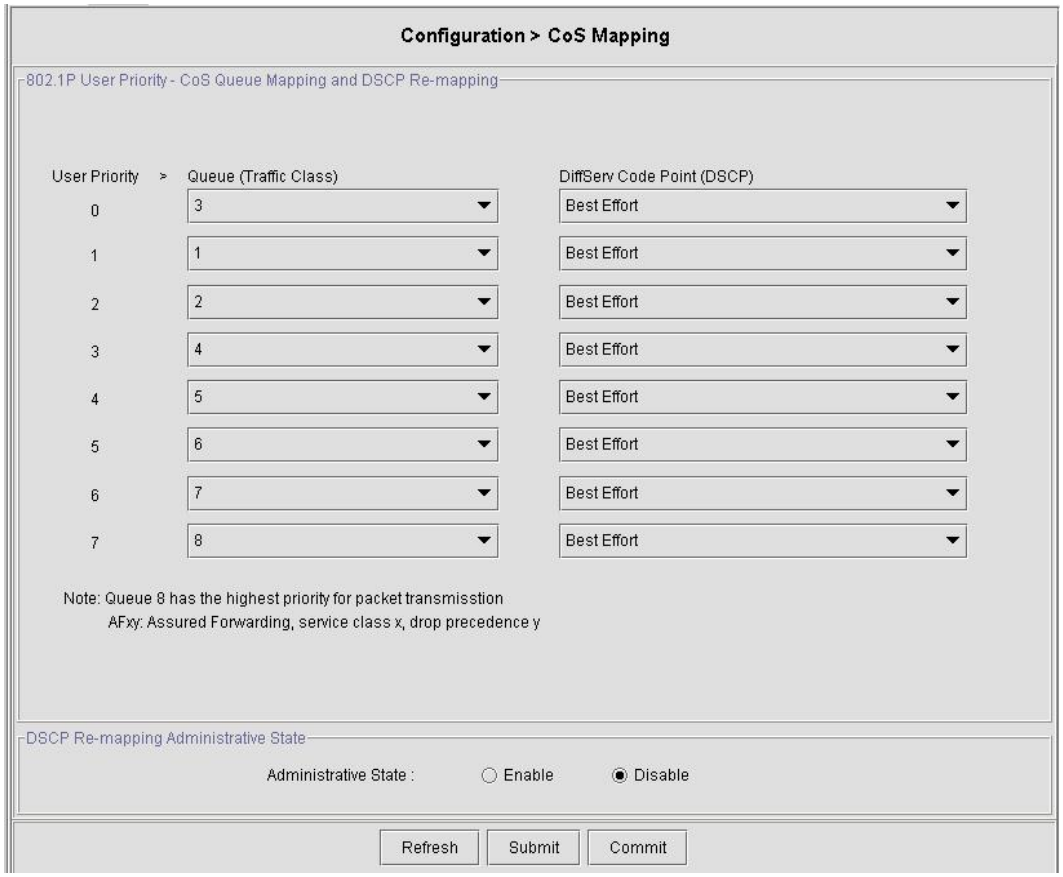


Table 4-39 Trunk CoS Mapping and DSCP Re-mapping Dialog Description

Field	Description
802.1p User Priority-CoS Queue Mapping and DSCP Re-mapping	
User Priority	This indicates the 802.1p user priority as configured in the VC-to-VLAN configuration
Queue (Traffic Class)	Use this combo-box to set the mapping relation between each 802.1p and CoS queues on the uplink trunk GE port
DiffServ Code Point (DSCP)	Use this combo-box to set the new DSCP value on the IP frame to be forwarded via the uplink trunk GE port.
DSCP Re-mapping Administrative State	
Administrative State	Enable or disable the DSCP Re-mapping function.
Function Button	
Refresh	Click this button to refresh the **Trunk CoS Mapping and DSCP Re-mapping Dialog.**
Submit	Click this button to apply the setting to NE.
Commit	Click this button to apply the setting to NE.

4.9 Data Connection Management

This section contains the following sections:

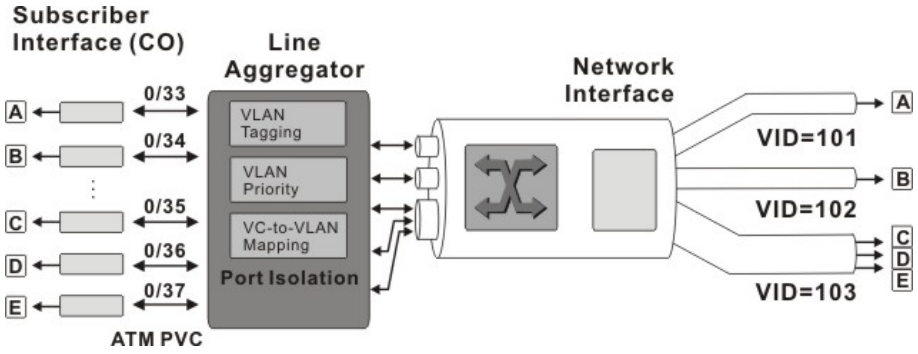
- VC-to-VLAN Configuration
- ISP Information for IP over ATM

4.9.1 VC-to-VLAN Connection Management

The VC-to-VLAN setting can easily define the multiple to one or one to one mapping; you can group different PVCs to a single VLAN ID as well as single PVC to one VLAN mapping. Figure 4-61 illustrates the basic principle for VLAN assignment in the DAS4 Series IP-DSLAM. As shown in Figure 4-61, the NE forwards five data flows, A~E, which may be either owned by the same subscriber or by different subscribers. It is noted that these data flows are conveyed in five individual ATM PVCs, and they are grouped into 3 individual VLANs.

NOTE
The NE supports up to 8 PVCs per xDSL port .
The NE supports up to 4094 VLANs per system .

Figure 4-61 VC-to-VLAN Mapping Illustrate



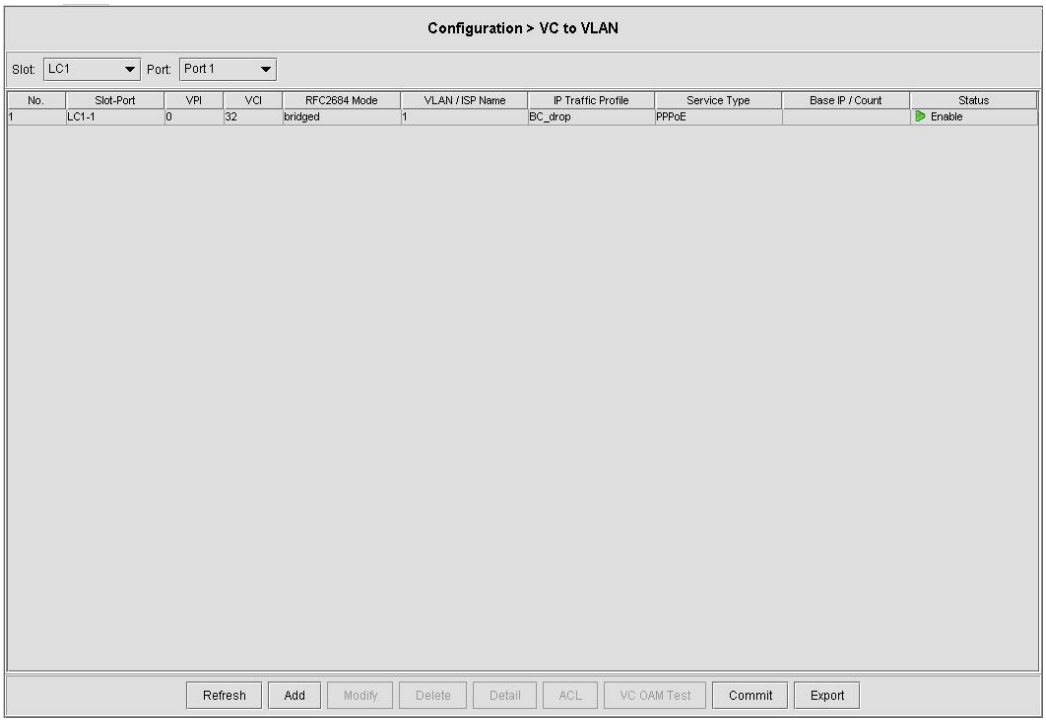
According to IETF RFC2684, an IP packet is encapsulated in either bridged mode or routed mode. The VC-to-VLAN settings are similar but not the same in these two encapsulation modes. This section depicts their configuration procedures together.

NOTE
The VC-to-VLAN configuration procedures are the same to both the ADSL port and SHDSL port.

Follow the subsequent procedure to manage your VC-to-VLAN connectivity on a specific xDSL port.

Step 1 Click Configuration → VC-to-VLAN on **Main Menu** to open the **xDSL VC-to-VLAN List** Dialog as shown in Figure 4-62.

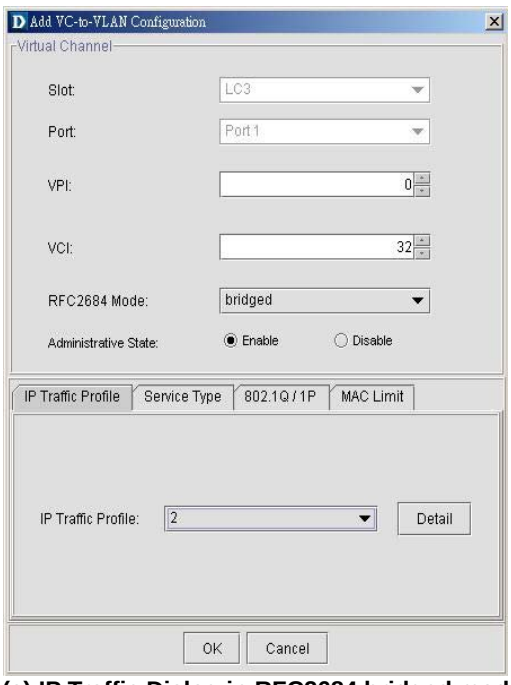
Figure 4-62 xDSL VC-to-VLAN List Dialog



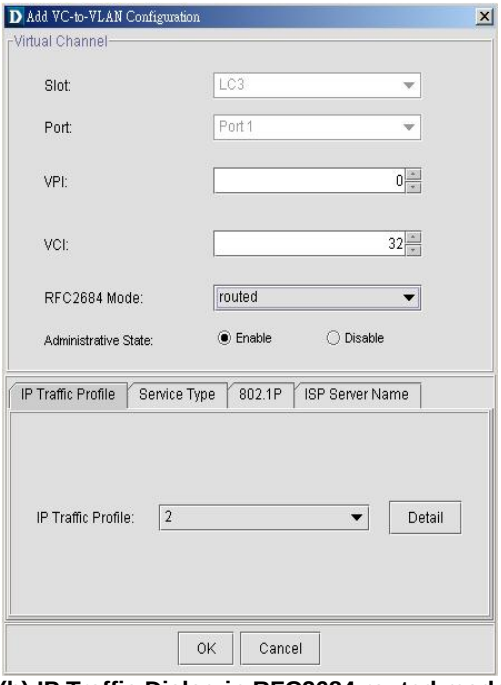
Step 2 Click on the 'Add' button on the bottom side of Figure 4-62 to display the window (Figure 4-63) for adding new PVC and configuring the associated setting. Figure 4-63 ~ Figure 4-68 show the corresponding configuration dialogs in the RFC2684 bridged mode and routed mode. Click either one tab to launch the corresponding dialog to configure the parameters. Table 4-40 depicts the related configuration parameters

According to IETF RFC2684, an IP packet is encapsulated in either bridged mode or routed mode. The VC-to-VLAN settings are similar but not the same in these two encapsulation modes.

Figure 4-63 xDSL VC-to-VLAN Setting – IP Traffic Dialog



(a) IP Traffic Dialog in RFC2684 bridged mode



(b) IP Traffic Dialog in RFC2684 routed mode

Figure 4-64 xDSL VC-to-VLAN Setting – 802.1Q/1P Dialog (only for the RFC2684 bridged mode)

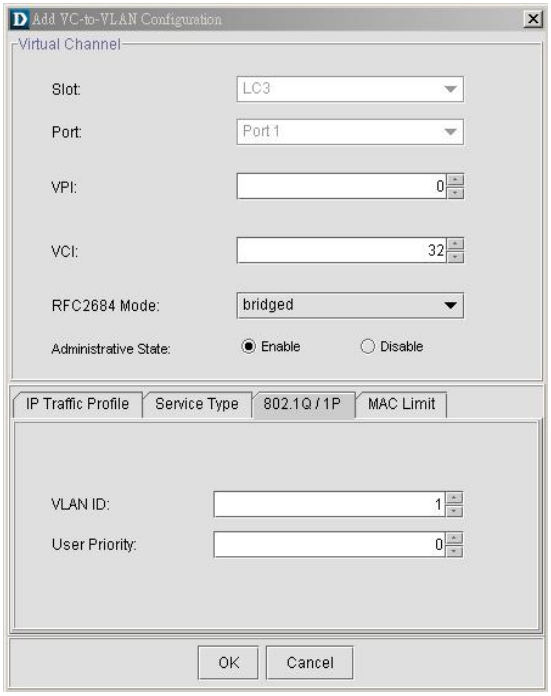


Figure 4-65 xDSL VC-to-VLAN Setting – 802.1P Dialog (only for the RFC2684 routed mode)

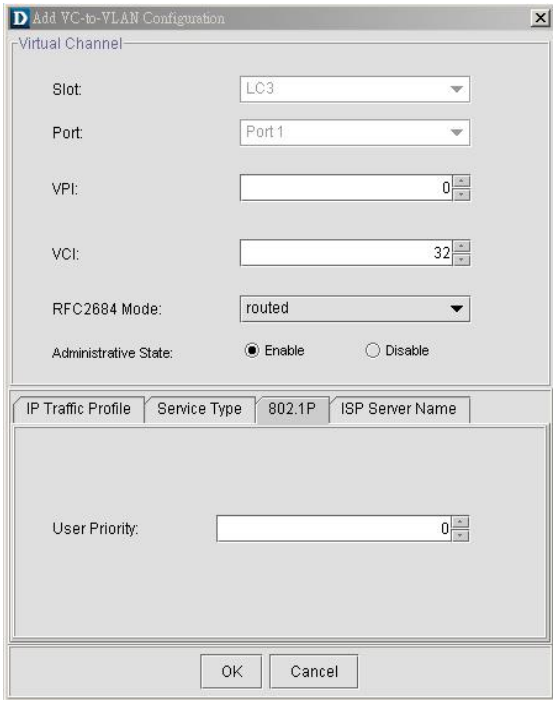


Figure 4-66 xDSL VC-to-VLAN Setting – MAC Limit Dialog (only for the RFC2684 bridged mode)

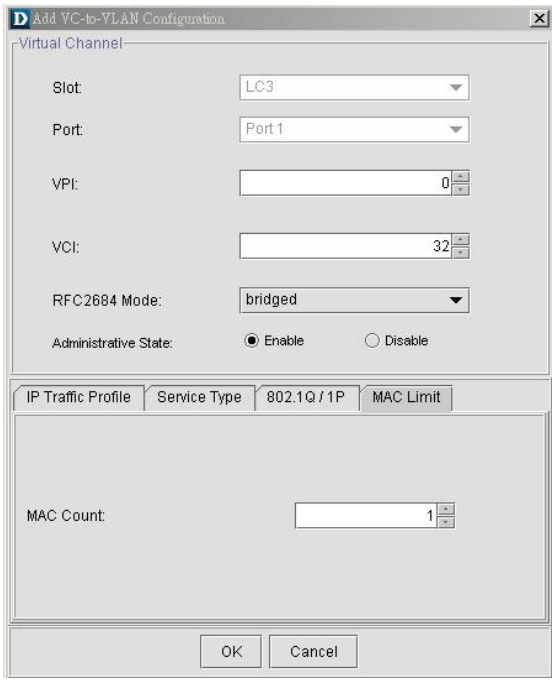


Figure 4-67 xDSL VC-to-VLAN Setting – ISP Server Dialog (only for the RFC2684 routed mode)

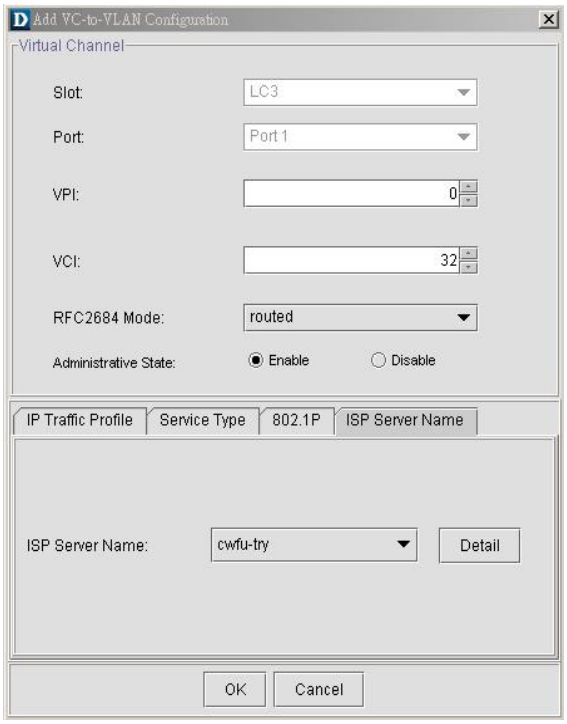
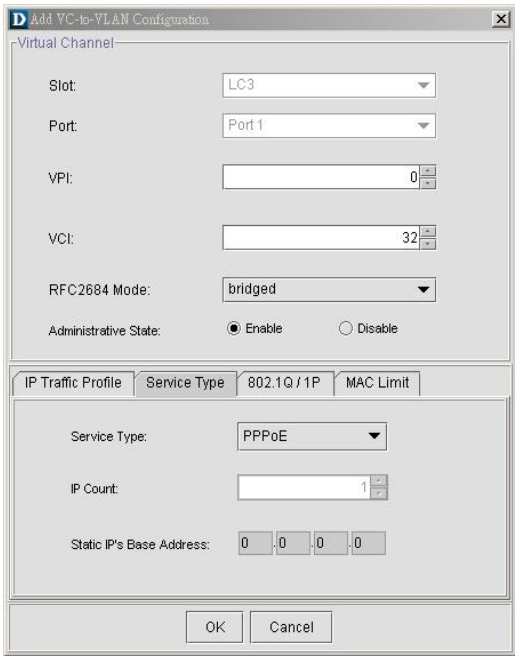
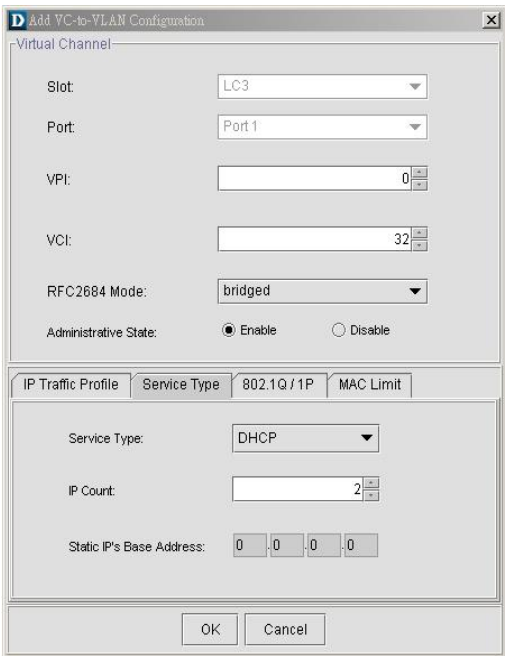


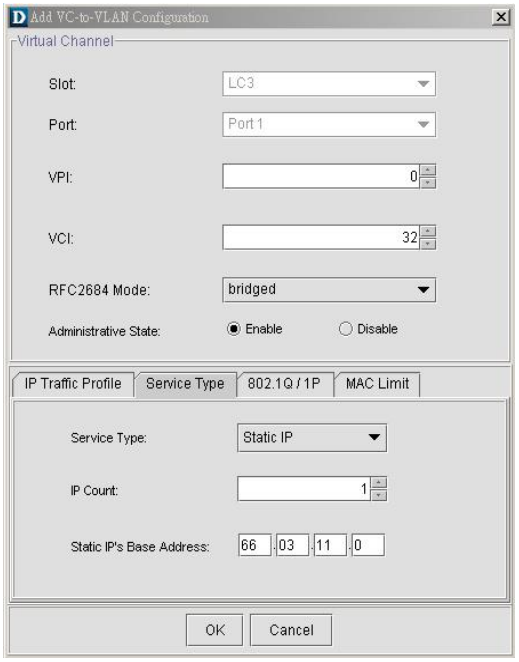
Figure 4-68 xDSL VC-to-VLAN Setting – Service Type Dialog



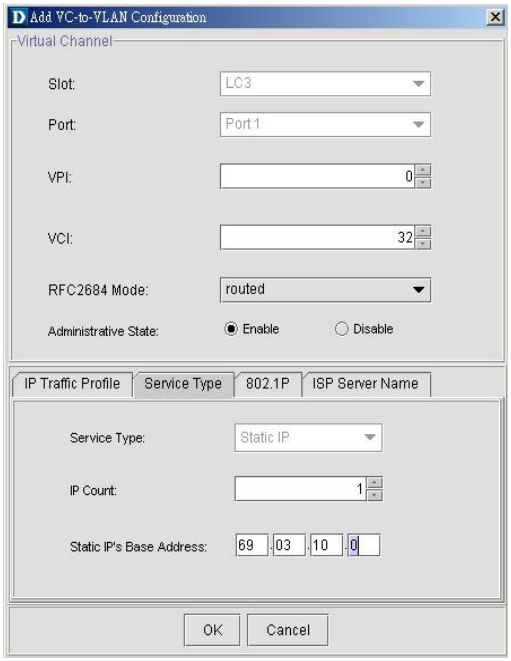
(a) PPPoE service in RFC2684 bridged mode



(b) DHCP service in RFC2684 bridged mode



(c) Static IP service in RFC2684 bridged mode



(d) Static IP service in RFC2684 routed mode

Table 4-40 xDSL VC-to-VLAN Setting Description

Field	Description
Virtual Channel	
Slot, Port	This specifies the location of xdsl port.
VPI	It specifies the VPI value
VCI	It specifies the VCI value
Administrative State	It specifies the state of this VC-VLAN to enable or disable.
RFC2684 Mode	It specifies the RFC 2684 mode, (Bridged or Routed)
IP Traffic Profile Dialog	
IP Traffic Profile	This specifies the IP traffic profile
802.1Q/1P Dialog [only for RFC2684 bridged mode]	
VLAN ID	This specifies the VLAN ID value
User Priority	This specifies the VLAN priority
802.1P Dialog [only for RFC2684 routed mode]	
User Priority	This specifies the VLAN priority of corresponding VC-to-VLAN connection.
ISP Server Dialog [only for RFC2684 routed mode]	
ISP Server Name	It specifies the ISP server name as specified in Section 4.9.2 'ISP Information for IP over ATM'
MAC Limit Dialog [only for RFC2684 bridged mode]	
MAC Count	This specifies the number of subscriber's MACs allowed for the corresponding VC-to-VLAN connection.
Service Type Dialog	
Service Type	This specifies the service type to be allowed on the PVC of individual subscriber. In RFC2684 routed mode, the following service type is supported. ● Static IP In RFC2684 bridged mode, the following three service types are supported. ● PPPoE ● DHCP ● Static IP
IP Count [only for DHCP/ Static IP Service]	This indicates the number of IP to be allowed while 'DHCP' or 'Static IP' service type is selected
Static IP's Basic Address [only for Static IP Service]	This specifies the base of the IP address if the service type is Static IP

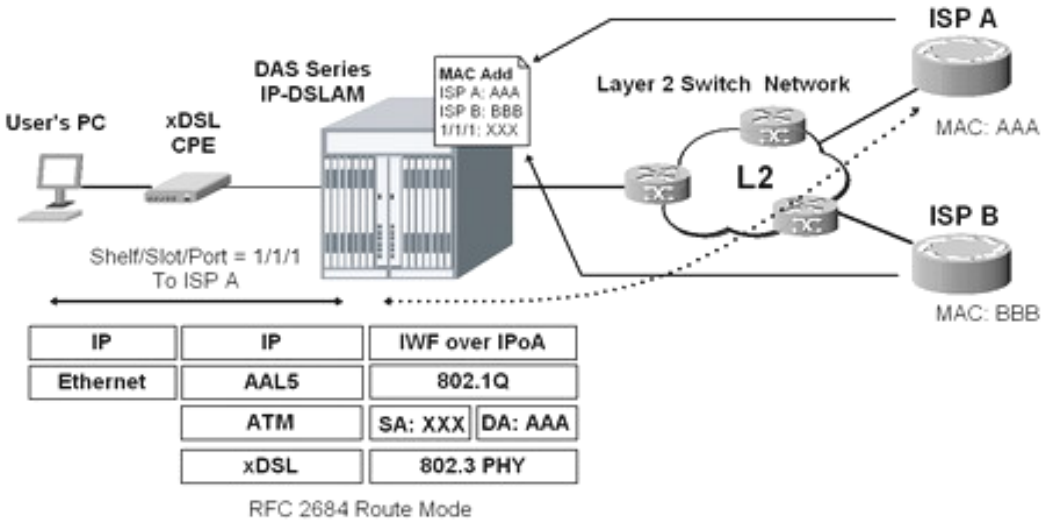
Enabling the Service Type Control makes the NE to provide the IP/MAC anti spoofing function.

In the case that the subscriber acquires his IP address dynamically via PPPoE or DHCP, the NE will block the subscriber's traffic before a valid IP address assigning. Once the subscriber possesses a valid dynamic or static IP, the NE will just forward the packet of valid source IP/MAC addresses. IN other words, the NE drops the subscriber's traffic of invalid source IP/MAC addresses.

4.9.2 ISP Information for IP over ATM

In the RFC 2684 routed mode, IP packets are directly encapsulated, i.e., no MAC layer is presented. Through the IWF (Inter-Work Function) of IPoA of IP-DSLAM, it needs to append the Ethernet MAC layer for particular subscriber interface, the source MAC address is specially generate by IP-DSLAM, and the destination MAC address is the next-hop router toward the ISP's router. The NE determines the MAC address of next-hop router by the(Address Resolution Protocol (ARP). Figure 4-69 illustrates an example of the IWF in the case of RFC 2684 routed mode.

Figure 4-69 RFC 2684 Route Mode Connection Method



Follow the subsequent procedure to launch the ISP Information dialog to resolve the MAC address by just specifying the ISP's IP address.

Step 1 Click Configuration → ISP Info for IP over ATM on **Main Menu** to open the **xDSL ISP List for IP over ATM** Dialog as shown in Figure 4-70 and Table 4-41 depicts the related parameters.

Figure 4-70 xDSL ISP List for IPoA Dialog

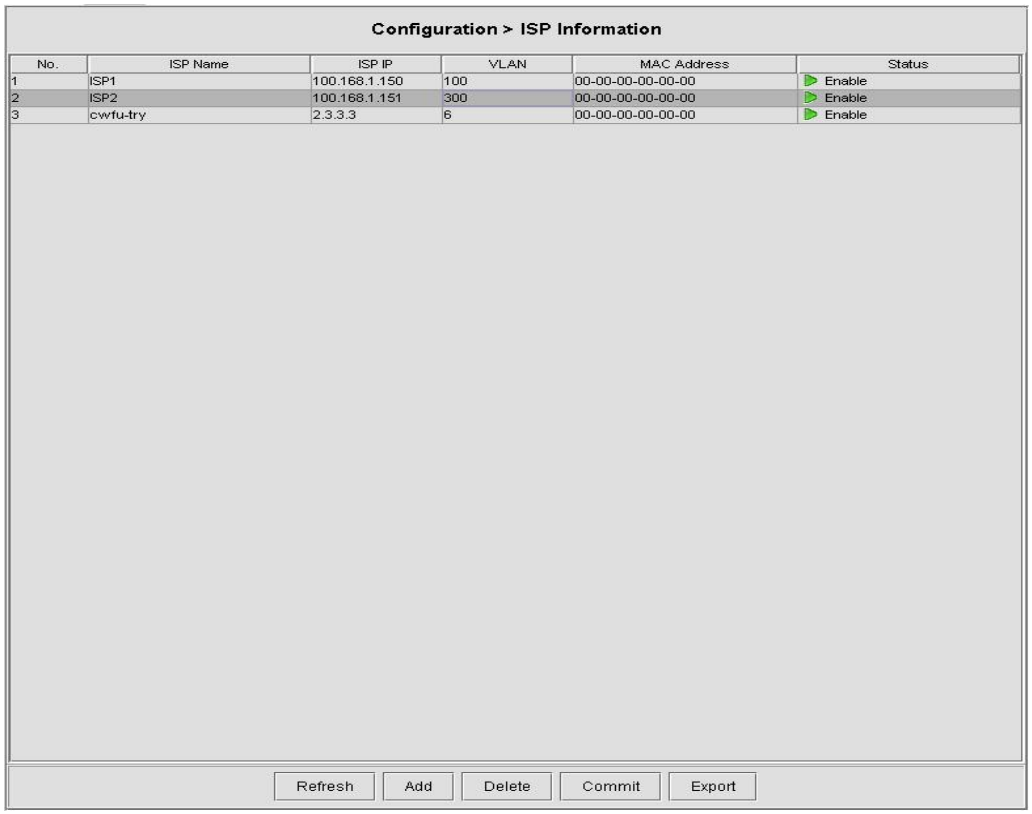


Table 4-41 xDSL ISP List for IPoA Dialog Description

Field	Description
List Table	
No.	This indicates the serial number of entry of the List Table.
ISP Name	It specifies the ISP name.
ISP IP	It specifies the ISP router IP.
VLAN	It specifies the VLAN grouping number for ISP connection.
MAC Address	It specifies the MAC address of the next-hop router toward the ISP's router.
Function Button	
Refresh	Click this button to refresh the **ISP List**
Add	Click this button to add a new ISP entry
Delete	Click this button to remove the ISP entry
Commit	Click this button to apply the setting to NE.
Export	Click this button to save the contents of **ISP List** to the AMS client.

Step 2 Click 'Add' button to launch the **xDSL ISP for IPoA Dialog** Figure 4-71 shows **xDSL ISP for IPoA Dialog,** and Table 4-42 depicts the related parameters.

Figure 4-71 Add xDSL ISP for IPoA Dialog

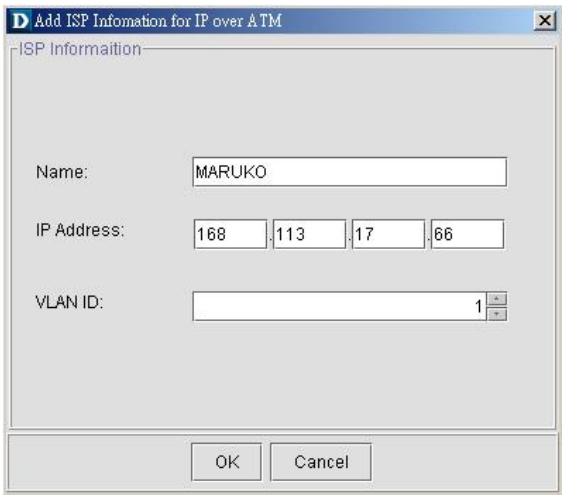


Table 4-42 Add xDSL ISP for IPoA Dialog Description

Field	Description
ISP Information	
Name	This specifies the ISP name.
IP Address	This specifies the ISP router IP.
VLAN ID	This specifies the VLAN grouping number for ISP connection.

4.10 Access Control List

The NE supports packet filtering functions to forward or drop subscriber traffics received on the subscriber interfaces.

- Source MAC Access Control List

4.10.1 Source MAC Access Control List

Follow the subsequent procedures to configure the access control list.

Step 1 Click Configuration → VC-to-VLAN on **Main Menu** to open the **xDSL VC-to-VLAN List** Dialog as shown in Figure 4-62.

Step 2 Select a port in **VC to VLAN List dialog** and click "ACL" button on the bottom side of Figure 4-72 to configure the Access Control List option of the selected port. Figure 4-72 illustrated the **VC-to-VLAN Access Control List dialog**. Table 4-43 depicts the related parameters. Figure 4-73 illustrated the window for adding new MAC into the access control list.

Figure 4-72 VC-to-VLAN Access Control List dialog

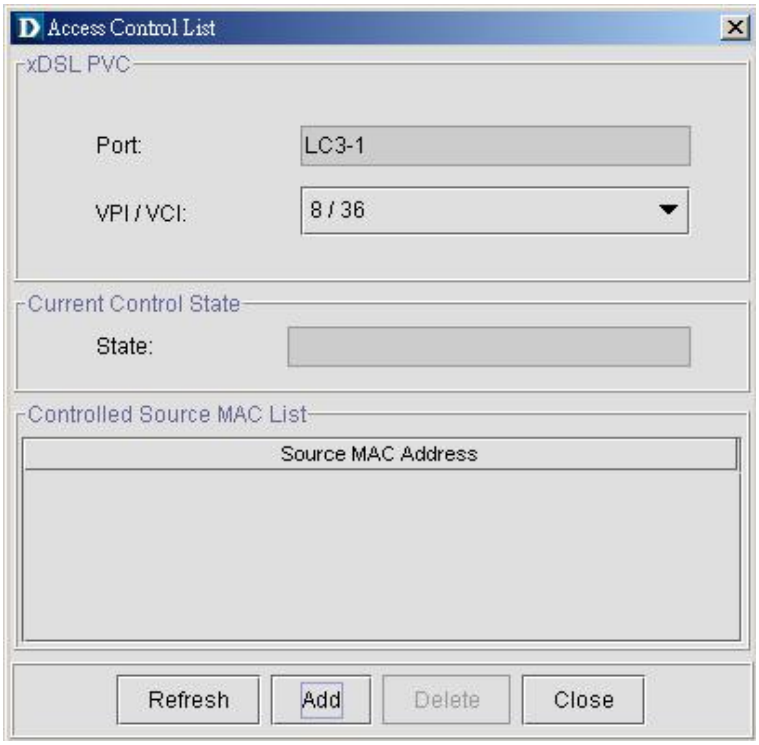


Table 4-43 VC-to-VLAN Access Control List Dialog Description

Field	Description
xDSL PVC	
Port	This indicates the location of xDSL port
VPI/VCI	This indicates the PVC.
Current Control State	
State	This indicates the current access control state of the specified PVC.
Controlled Source MAC List	
Source MAC Address	This indicates the MAC address under controlling.
Function Button	
Refresh	Click this button to refresh the **Access Control List**.
Add	Click this button to add an access control entry.
Delete	Click this button to delete the specified access control entry.
Close	Exit the **Access Control List Dialog**.

Step 3 Click 'Add' button to launch the **xDSL Access Control Dialog.** Figure 4-73 shows the **xDSL Access Control Dialog,** and Table 4-44 depicts the related parameters.

Figure 4-73 Add xDSL Access Control Dialog

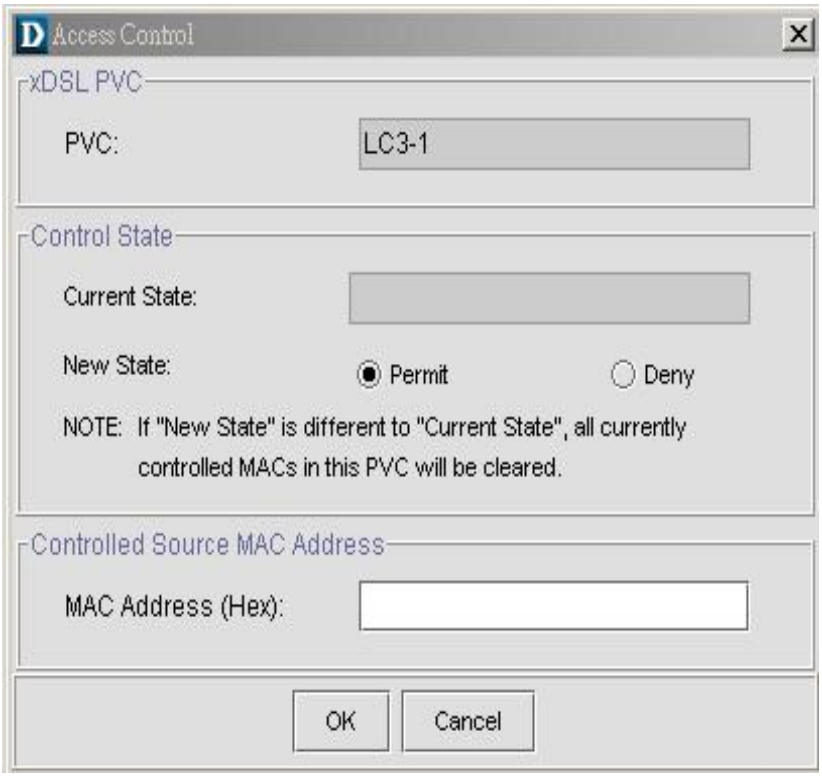


Table 4-44 Add xDSL Access Control Dialog Description

Field	Description
xDSL PVC	
PVC	This indicates the specified xDSL port and specified PVC.
Control State (Add)	
Current State	This indicates the current access control state of the specified PVC.
New State	Check the radio button to select the role of new state.
Controlled Source MAC Address (Add)	
MAC Address (Hex)	This specifies the MAC address under controlling.

NOTE The roles of access control function, Deny and Permit, are repulsive, i.e. a “deny” role will be replaced while a new role “permit” is be configured.

Review of Source MAC Access Control List

Follow the subsequent procedures to review the access control list configuration.

Click Configuration → Access Control List on **Main Menu** to open the **xDSL Access Control List** Dialog as shown in Figure 4-74 and Table 4-45 depicts the related parameters.

Figure 4-74 xDSL Access Control List

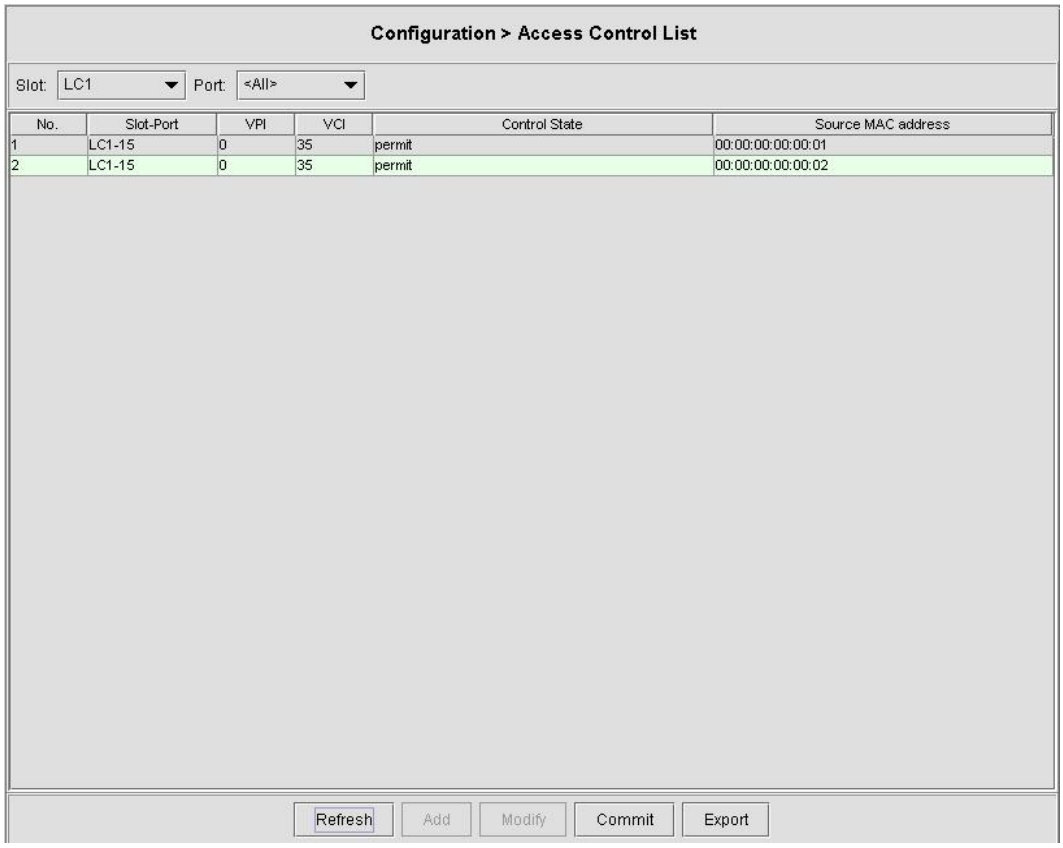


Table 4-45 xDSL Access Control List Description

Field	Description
List Table	
No.	This indicates the serial number of entry of the access control list.
Slot-Port	This indicates the location of xDSL port.
VPI	This indicates the VPI of the specified xDSL subscriber.
VCI	This indicates the VCI of the specified xDSL subscriber.
Control State	This indicates the control state of access control of the specified xDSL subscriber.
Source MAC Address	This indicates the source MAC address which is under controlling of the specified xDSL subscriber.
Function Button	
Refresh	Click this button to refresh the **Access Control List**.
Commit	Click this button to apply the setting NE
Export	Click this button to save the contents of **xDSL Access Control List** to the AMS client.

4.11 Multicast Service Management

To provide multicast service, the operator needs to properly configure the multicast channel and IGMP snooping /IGMP proxy. This section contains the following two subsections.

- Multicast Channel Configuration
- IGMP snooping/IGMP proxy Configuration

4.11.1 Multicast Channel Configuration

To forward the multicast stream, you are required to establish a VC-to-VLAN tunnel and specify the associated multicast service profile.

Follow the subsequent procedures to configure the related parameters.

Step 1 Click Configuration → Multicast Channel on **Main Menu** to open the **xDSL Multicast Channel** Dialog.

Step 2 Click on the 'Modify' or 'Add' button on the bottom side of Figure 4-75 to open the window (Figure 4-76) for adding new multicast channel and configure the associated setting.

In Figure 4-76, it is noted that two individual tabs (Multicast Channel Profile and MAC Limit) are provided to set the Multicast Channel related parameters. Click either one **tab** to launch the corresponding dialog to configure the parameters. Table 4-46 depicts the related parameters

Figure 4-75 xDSL Multicast Channel List Dialog

Figure 4-76 xDSL Multicast Channel Setting Dialog

Table 4-46 xDSL Multicast Channel Setting Description

Field	Description
Ethernet over ATM	
Slot, Port	This specifies the physical connection information
VPI	This specifies the VPI values
VCI	This specifies the VCI values
VLAN ID	This specifies the multicast VLAN ID
Administrative State	Enable or disable the specified multicast channel.
Multicast Service Profile Dialog	
Profile	This specifies the multicast service profile. Please refer to the section “Multicast Service Profile” in Section 4.7.5.
Access Control Dialog	
Stream Count	This specifies the allowed number of multicast streams to be forwarded via the VC-to-VLAN connection.

4.11.2 IGMP snooping/IGMP proxy Configuration

Follow the subsequent procedures to configure the IGMP snooping and IGMP proxy related parameters.

Click Configuration → IGMP Snooping / Proxy on **Main Menu** to open the **IGMP Snooping / IGMP Proxy Setting** Dialog as shown in Figure 4-77 and Table 4-47 depicts the related parameters.

Figure 4-77 IGMP Snooping / IGMP Proxy Setting Dialog

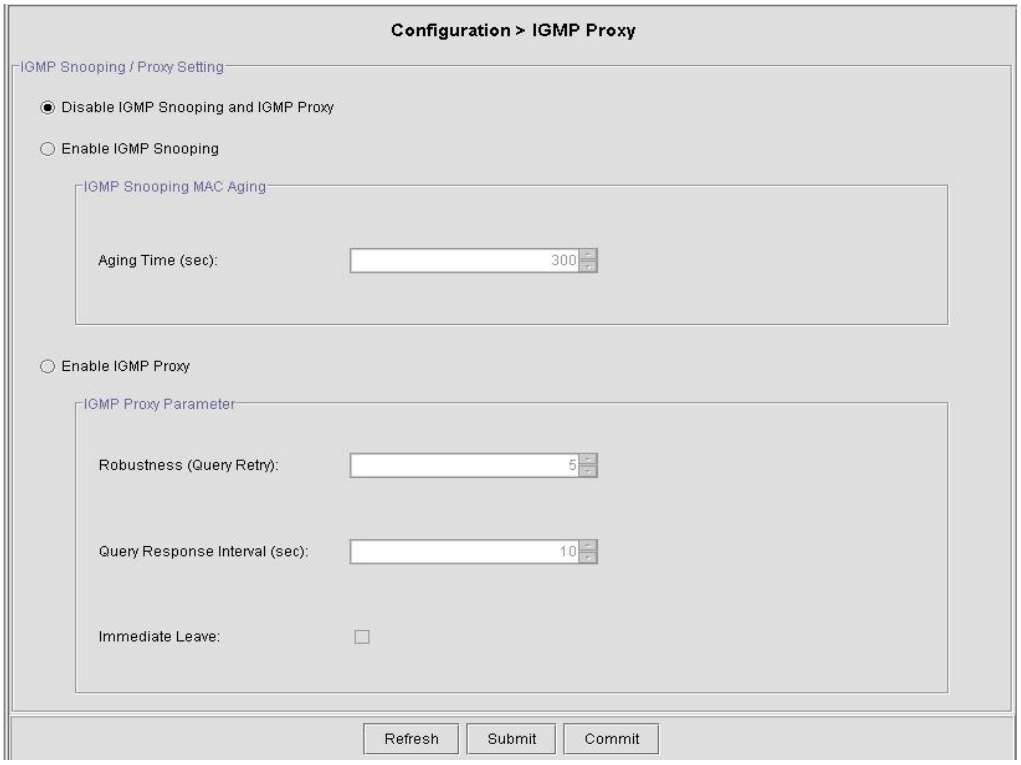


Table 4-47 IGMP Proxy Setting Dialog Description

Field	Description
IGMP Snooping / IGMP Proxy Setting	
Disable IGMP snooping and IGMP proxy	This disables the IGMP Snooping and Proxy functionality. (Default)
Enable IGMP Snooping	This enables the IGMP Snooping functionality.
Enable IGMP Proxy	This enables the IGMP Proxy functionality.
IGMP Snooping MAC Aging	
Aging Time	This specifies the aging time of snooped legal multicast group MAC address.
IGMP Proxy Setting	
Robustness (Query Retry)	This specifies the IGMP Robustness retry times. Available value is 1 ~ 5 (times).
Query Response Interval (Sec)	This specifies the period between the NE send 2 consecutive IGM queries to the xDSL subscriber. Available value is 1 ~ 30 (seconds).
Immediate Leave	This specifies the immediate leave.
Function Button	
Refresh	Click this button to refresh the **IGMP Snooping / IGMP Proxy Setting Dialog.**
Submit	Click this button to apply the setting to NE
Commit	Click this button to apply the setting to NE

4.12 System Services Configuration

The system services configuration covers the following settings.

- MAC Aging for Bridged Services
- VLAN MAC Limit
- DHCP Service Configuration
- PPPoE Sub-option Configuration
- xDSL Port Agent ID

4.12.1 MAC Aging for Bridged Services

The MAC aging time sets the lifetime for the learned MAC address. A specific MAC address will be dropped when aging out until it get learning again. Disable this function will keep the learned MAC addresses permanent in the learning table.

Click Configuration → MAC Aging on **Main Menu** to open the **MAC Aging** Dialog as shown in Figure 4-78 and Table 4-48 depicts the related parameters.

Figure 4-78 MAC Aging Setting Dialog

Table 4-48 MAC Aging Setting Dialog Description

Field	Description
Unicast MAC Aging	
Admin Status	This specifies the administration status
Aging Time (seconds)	This specifies the MAC aging time. Default value is 300 seconds.
Function Button	
Refresh	Click this button to refresh the **MAC Aging Setting Dialog.**
Submit	Click this button to apply the setting to NE.
Commit	Click this button to apply the setting to NE

4.12.2 VLAN MAC Limit

To limit the number of source MAC address learned in a specific VLAN, the users can enable the MAC limiting function and configure the upper limit of allowed MAC for a specific VLAN.

Step 1 Click Configuration → VLAN MAC Limit on **Main Menu** to open the **VLAN MAC Limit** Dialog as shown in Figure 4-79. Table 4-49 depicts the related parameters.

Figure 4-79 VLAN MAC Limit List Dialog

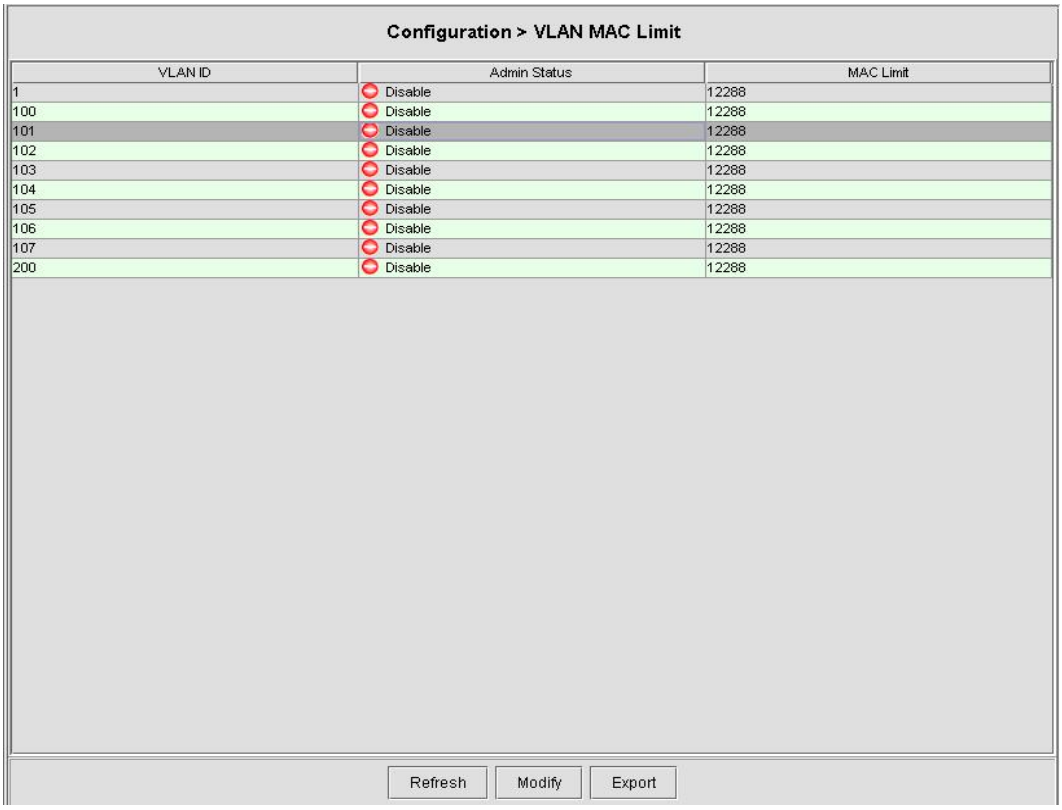


Table 4-49 VLAN MAC Limit List Dialog Description

Field	Description
List Table	
VLAN ID	It specifies the VLAN.
Admin State	It specifies the administrative state.
MAC Limit	It specifies the number of MACs allowed for the corresponding VC-to-VLAN connection.
Function Button	
Refresh	Click this button to refresh the **VLAN MAC Limit List Dialog**
Modify	Click this button to open the MAC limit configure dialog.
Export	Click this button to save the contents of **VLAN MAC Limit List** to the AMS client.

Step 2 Click 'Modify' button to launch the **VLAN MAC Limit Configure Dialog.** Figure 4-80 shows **VLAN MAC Limit Configure Dialog,** and Table 4-50 depicts the related parameters.

Figure 4-80 VLAN MAC Limit Configure Dialog

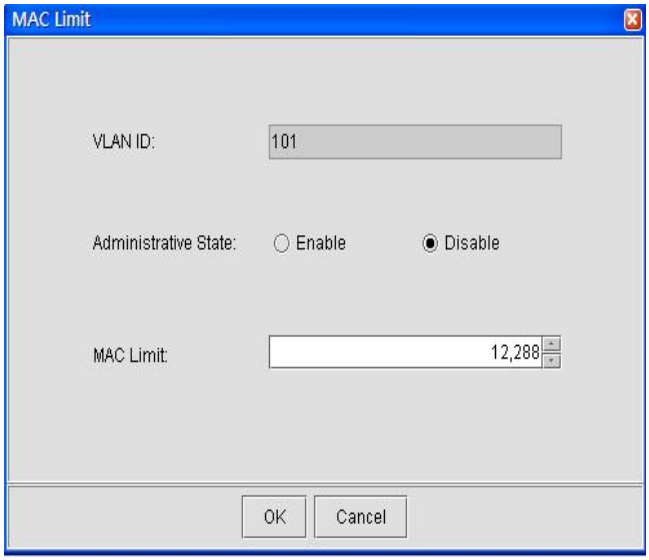


Table 4-50 VLAN MAC Limit Setting Dialog Description

Field	Description
MAC Limit (Modify)	
VLAN ID	It specifies the VLAN.
Administrative State	Enable or disable the MAC limit function. Default state is "disable".
MAC Limit	This specifies the number of MAC allowed for the VLAN, from 5 ~ 50000. Default value is 12288.

4.12.3 DHCP Service Configuration

Four dialogs are related to the DHCP Service Configuration.

- DHCP Setting
- DHCP Server List for DHCP Relay
- DHCP Broadcast Control

DHCP Setting

The DHCP relay intercepts the DHCP request packets from subscriber interface and forwards them to the specified DHCP server. In the opposite direction, the DHCP relay transfers the DHCP reply packets from DHCP server to the specified xDSL subscriber.

The setting of DHCP option 82 contents is performed by configuring the xDSL Port Agent ID

Follow the subsequent procedures to configure the related parameters.

Click Configuration → DHCP → DHCP Setting on **Main Menu** to open the **DHCP Setting** Dialog as shown in Figure 4-81 and Table 4-51 depicts the related parameters.

Figure 4-81 DHCP Setting Dialog

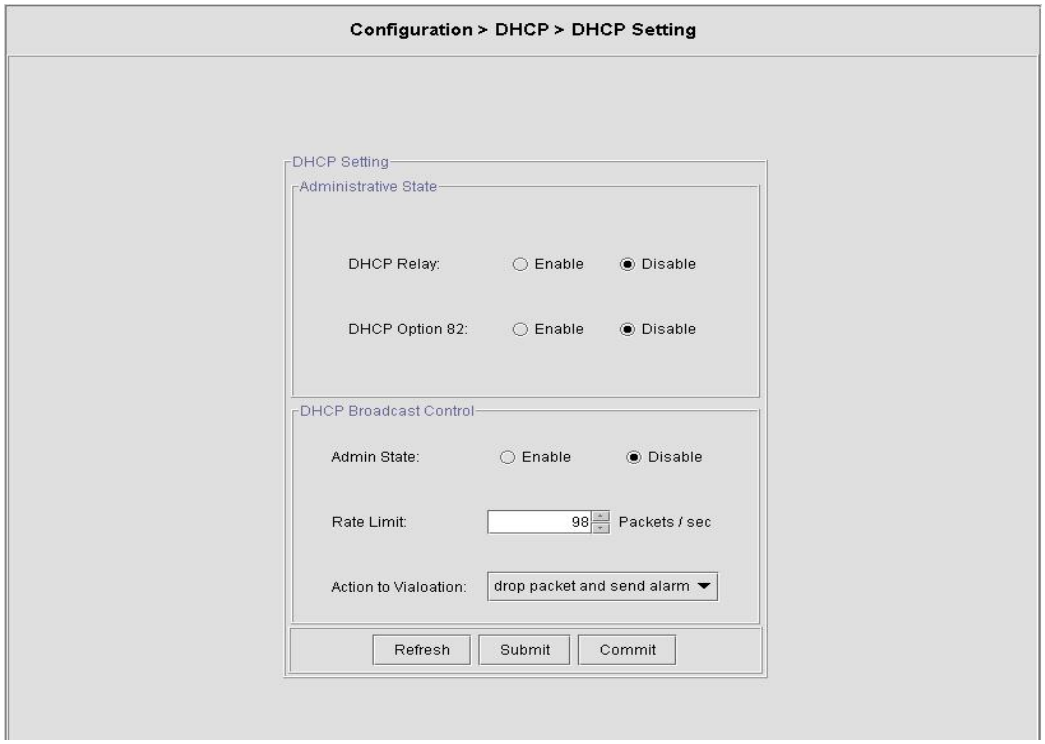


Table 4-51 DHCP Setting Dialog Description

Field	Description
DHCP Relay	Enable or disable the DHCP Relay function.
DHCP Option82	Enable or disable the DHCP option 82 function. Enable: The relayed DHCP packet is to be appended with the configured DHCP option 82 information as specified in the xDSL Port Agent ID List
Function Button	
Refresh	Click this button to refresh the **DHCP Setting Dialog.**
Submit	Click this button to apply the setting to NE.
Commit	Click this button to apply the setting to NE.

DHCP Server List for DHCP Relay

Follow the subsequent procedures to configure the related parameters.

Click Configuration → DHCP → DHCP Server for DHCP Relay on **Main Menu** to open the **DHCP Server List for DHCP Relay** Dialog as shown in Figure 4-82and Table 4-52 depicts the related parameters.

Figure 4-82 DHCP Server List for DHCP Relay Dialog

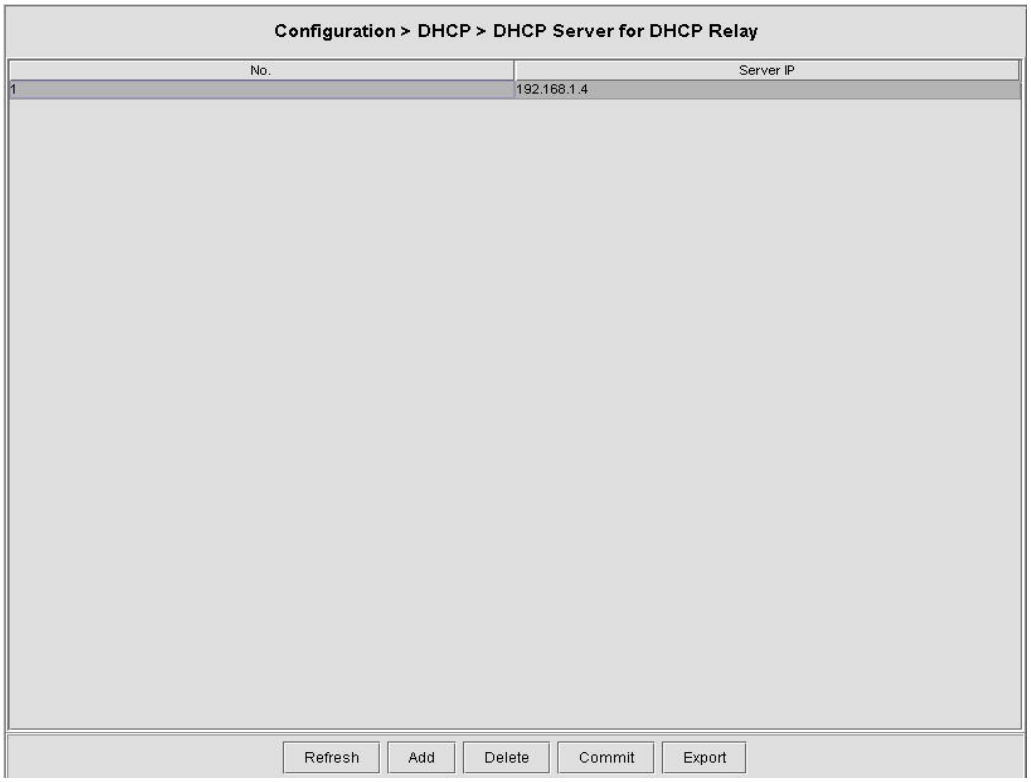


Table 4-52 DHCP Server List for DHCP Relay Dialog Description

Field	Description
Table List	
No.	This indicates the serial number of entry of the List.
Server IP	This specifies the DHCP server IP address.
Function Button	
Refresh	Click this button to refresh the **DHCP Server List for DHCP Relay Dialog**
Add	Click this button to add a new DHCP server IP address.
Delete	Click this button to delete the specified DHCP server.
Commit	Click this button to apply the setting to NE.
Export	Click this button to save the contents of **DHCP Server List** to the AMS client.

DHCP Broadcast Control

Users can set the DHCP broadcast packet rate limit and set the action applied to the out-of-profile traffic.

Follow the subsequent procedures to configure the related parameters.

Click Configuration → DHCP → DHCP Broadcast Control on **Main Menu** to open the **DHCP Broadcast Control s** Dialog as shown in Figure 4-83 and Table 4-53 the related parameters.

Figure 4-83 DHCP Broadcast Control Dialog

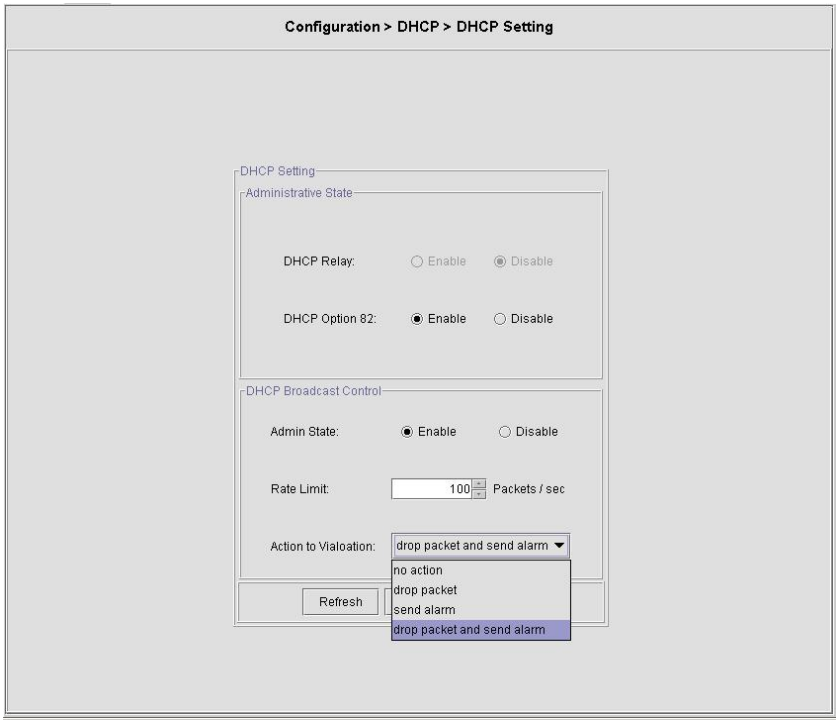


Table 4-53 DHCP Broadcast Control Dialog - Description

Field	Description
Rate Limit	
Admin State	Enable or disable the DHCP broadcast control. The default setting is “disable”.
Rate Limit	This specifies the rate limit based on packets per second. Available value is 1 ~ 100000 (packet per second). Default value is 100 packets per second.
Action to Violation	This specifies the action to be taken for the packets over the limit. “No action”, “Drop packet”, “Send alarm” and “Drop packet and send alarm”.
Function Button	
Refresh	Click this button to refresh the **DHCP Broadcast Control Dialog.**
Submit	Click this button to apply the setting to NE.
Commit	Click this button to apply the setting to NE.

When the action is set to be either “Send alarm” and “Drop packet and send alarm”, the NE will launch SNMP traps to the SNMP trap managers as specified in Section 4.14.1 “Configuring the SNMP Trap Manager”.

4.12.4 PPPoE Sub-option Configuration

PPPoE sub-option has similar mechanism as DHCP option 82. The NE can insert Circuit ID and Remote ID in all upstream PPPoE discovery stage packets, i.e. the PADI, PADR and upstream PADT packets. Figure 4-84 illustrates the enable/disable window for this functionality.

The setting of PPPoE sub-option contents is performed by configuring the xDSL Port Agent ID

Follow the subsequent procedures to configure the related parameters.

Click Configuration →PPPoE on **Main Menu** to open the **PPPoE setting** Dialog as shown in Figure 4-84 and Table 4-54 depicts the related parameters.

Figure 4-84 PPoE Sub-option Setting Dialog

Table 4-54 PPPoE Sub-option Setting Dialog Description

Field	Description
PPPoE Sub-option 1 & 2	
Administrative State	Enable or disable the PPPoE sub-option function. Enable: The relayed PPPoE packet is to be appended with the configured PPPoE Sub-option 1 &2 information as specified in the xDSL Port Agent ID List Default value is “Disable”.
Function Button	
Refresh	Click this button to refresh the **PPPoE Sub-option Setting Dialog**
Submit	Click this button to apply the setting to NE.
Commit	Click this button to apply the setting to NE.

4.12.5 xDSL Port Agent ID Management

The xDSL Port Agent ID List keeps the Agent Circuit ID (intended for circuits terminated by the system hosting the Relay agent) and Agent Remote ID (intended to identify the remote host end of a circuit). The NE allows the operator to specify Agent Remote ID with an ASCII string of up to 63 characters. As to the Agent Circuit ID, NE assigns its value with the format as follows.

“NE-InbandIP-userSrcMAC atm slot-port:VPI.VCI”

Here is one example Agent Circuit ID

“IP_DSLAM-100.168.3.97-00:11:d8:80:93:23 atm 3-1:100.33”,

which represents

NE’s inband IP=100.168.3.97,

MAC address of subscriber’s personal computer (or the CPE)= 00:11:d8:80:93:23,

slot = 3, port = 1, vpi = 100, vci = 33.

xDSL Port Agent ID is to be inserted into either all upstream DHCP messages sent by the client and all upstream PPPoE discovery stage packets

Follow the subsequent procedures to configure the xDSL Port Agent ID.

Step 1 Click Configuration → Port Agent ID on **Main Menu** to open the **xDSL Port Agent ID List** Dialog as shown in Figure 4-85. Table 4-55 depicts the related parameters. To modify the

Step 2 Click and highlight a row and click '**Modify**' button to modify the Agent Remote ID.

Figure 4-85 xDSL Port Agent ID List Dialog

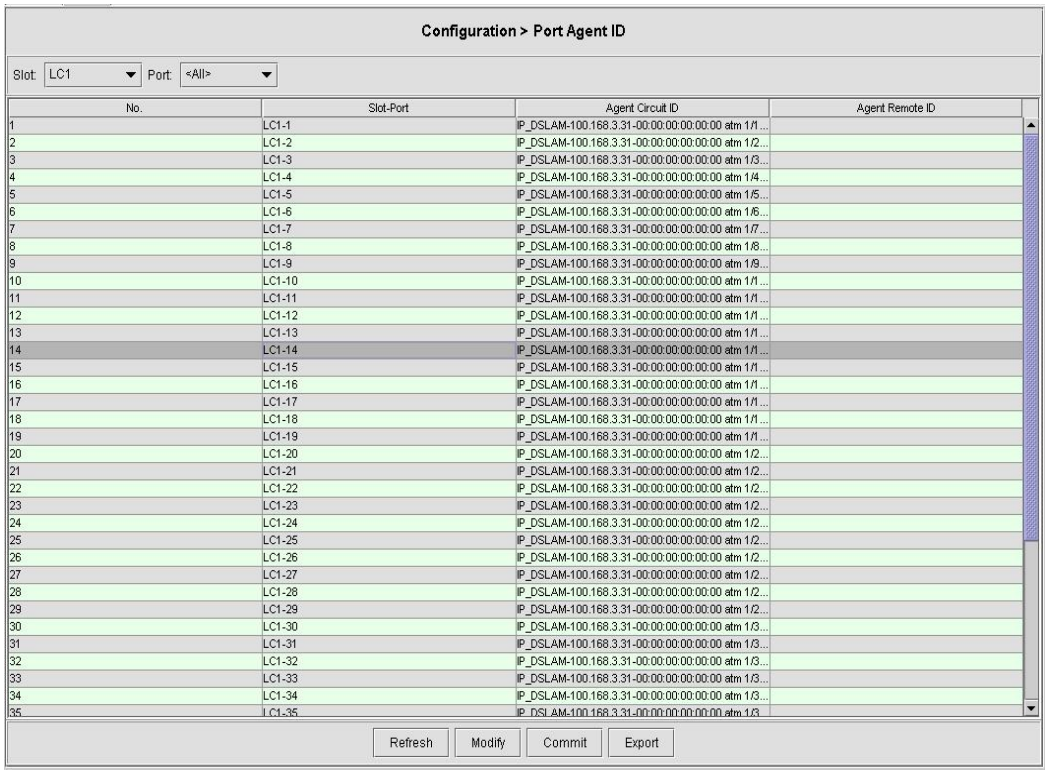


Table 4-55 xDSL Port Agent IDs Dialog Description

Field	Description
Table List	
No,	This indicates the number of Table List.
Slot-Port	This indicates the slot-port address.
Agent Circuit ID	This indicates the agent circuit ID of the specified xDSL subscriber. Its format is as follows. "NE-InbandIP-userSrcMAC atm slot-port:VPI.VCI"
Agent Remote ID	This indicates the agent remote ID of the specified xDSL subscriber. It is an ASCII string of up to 63 characters.
Function Button	
Refresh	Click this button to refresh the **Port Agent ID List.**
Modify	Click this button to modify the selected xDSL port's agent ID.
Commit	Click this button to apply the setting to NE**.**
Export	Click this button to save the contents of **xDSL Port Agent ID List** to the AMS client.

4.13 NE Fast Provision Management

This section describes the NE Fast Provision functions as follows. Through this function, you are able to efficiently apply the profiles to a mass of xDSL subscriber ports.

- xDSL Interface and VC-VLAN Fast Provisioning
- Multicast Service Fast Provisioning

4.13.1 xDSL Interface and VC-VLAN Fast Provisioning

The AMS provides a fast provision function that helps you to build-up the principal connection setting of interface ports in fast and efficient way. Through this function, you can apply the xDSL profile and VC-to-VLAN setting to a mass of xDSL subscriber interfaces simultaneously, instead of configuring the individual subscriber interfaces one by one.

Follow the subsequent procedure to configure the xDSL interface and VC-VLAN fast provision. As the configurations are not exact the same for the RFC2684 bridged mode and routed mode on the ADSL and SHDSL interface ports, please note the various alternatives in **Step 2**.

Step 1 Click Configuration → Fast Provision → Port & VC-to-VLAN on **Main Menu** to open the **xDSL Port & VC-to-VLAN Fast Provision** Dialog.

Step 2 **ADSL port and VC-VLAN fast provision in RFC2684 bridged mode:**
Use the **Type** combo-box to select the board type of line card as 'ADSLx48 Board' and use the **RFC2684 Mode** combo-box to select the mode as 'Bridged'. The **ADSL Port & VC-to-VLAN Fast Provision – bridged mode Dialog** appears as shown in Figure 4-86. Table 4-56 depicts related parameters.

Or

Step 2 **SHDSL port and VC-VLAN fast provision in RFC2684 bridged mode:**
Use the **Type** combo-box to select the board type of line card as 'SHDSLx48 Board' and use the **RFC2684 Mode** combo-box to select the mode as 'Bridged'. The **SHDSL**

Port & VC-to-VLAN Fast Provision – bridged mode Dialog appears as shown in Figure 4-87. Table 4-56 depicts related parameters.

Or

Step 2 **ADSL port and VC-VLAN fast provision in RFC2684 routed mode:**
Use the **Type** combo-box to select the board type of line card as 'ADSLx48 Board' and use the **RFC2684 Mode** combo-box to select the mode as 'Routed'. The **ADSL Port & VC-to-VLAN Fast Provision – routed mode Dialog** appears as shown in Figure 4-88. Table 4-56 depicts related parameters.

Or

Step 2 **SHDSL port and VC-VLAN fast provision in RFC2684 routed mode:**
Use the **Type** combo-box to select the board type of line card as 'SHDSLx48 Board' and use the **RFC2684 Mode** combo-box to select the mode as 'Routed'. The **SHDSL Port & VC-to-VLAN Fast Provision – routed mode Dialog** appears as shown in Figure 4-89. Table 4-56 depicts related parameters.

As the configuration parameters are different for the ADSL and SHDSL interface port, the operator MUST be careful not to apply the ADSL-related profile to the SHDSL interface port and vice versa.

The Service Type Control (STC) must be enabled to make the setting of **VPI (Start, Increment)** and **VCI (Start, Increment)** take effect.

Figure 4-86 ADSL Port & VC-to-VLAN Fast Provision – bridged mode

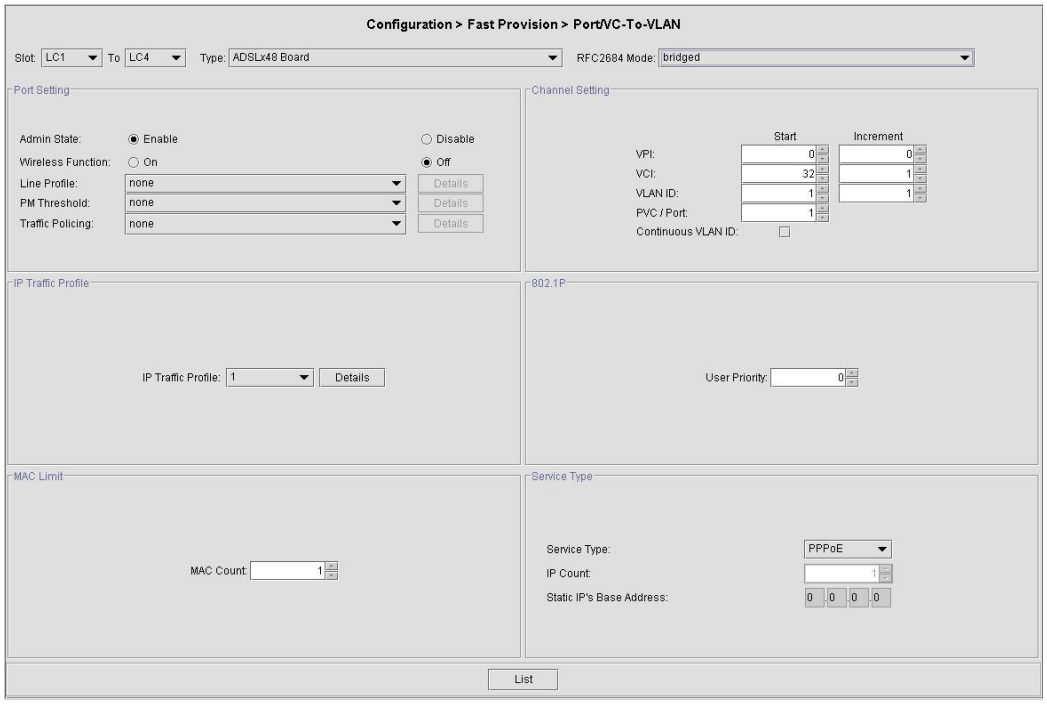


Figure 4-87 SHDSL Port & VC-to-VLAN Fast Provision– bridged mode

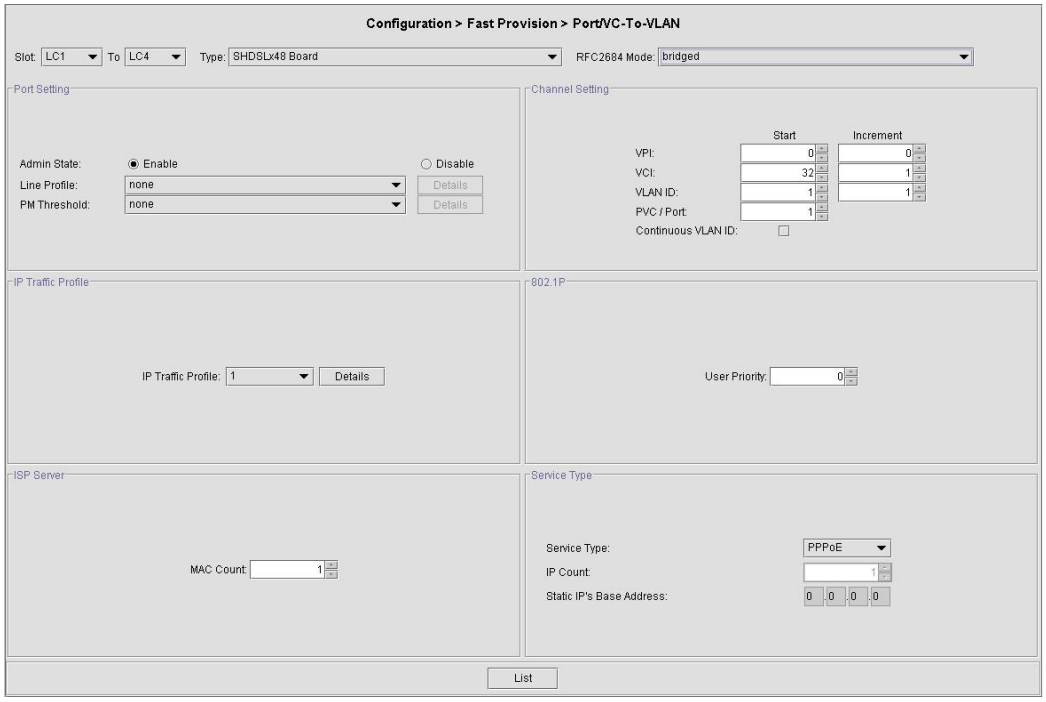


Figure 4-88 ADSL Port & VC-to-VLAN Fast Provision – routed mode

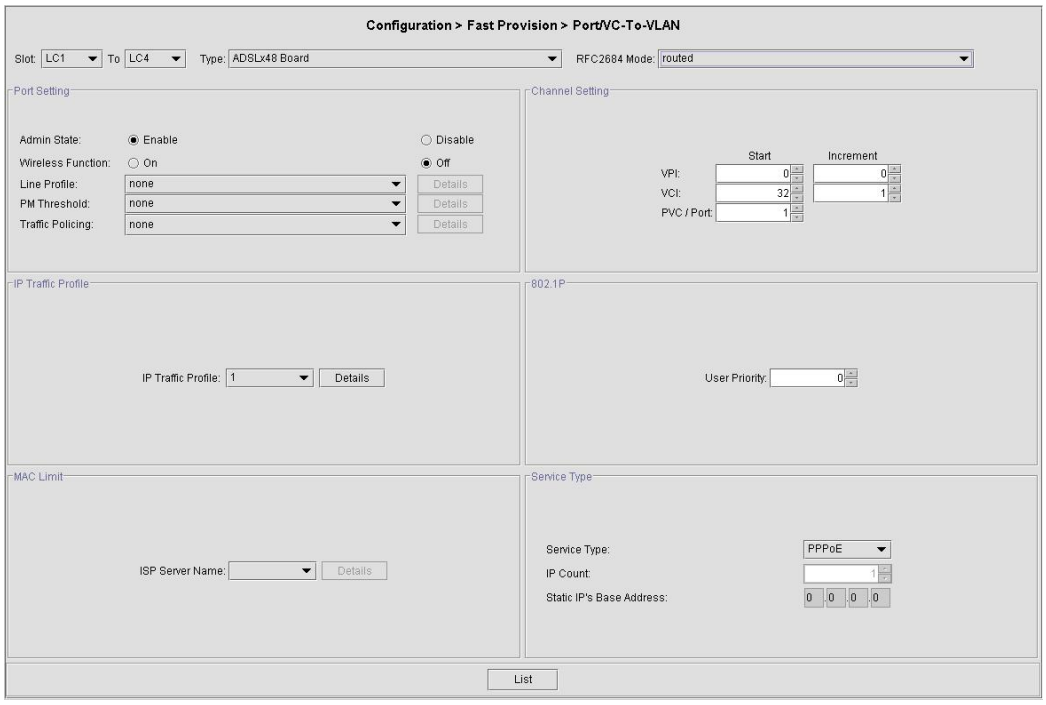


Figure 4-89 SHDSL Port & VC-to-VLAN Fast Provision – routed mode

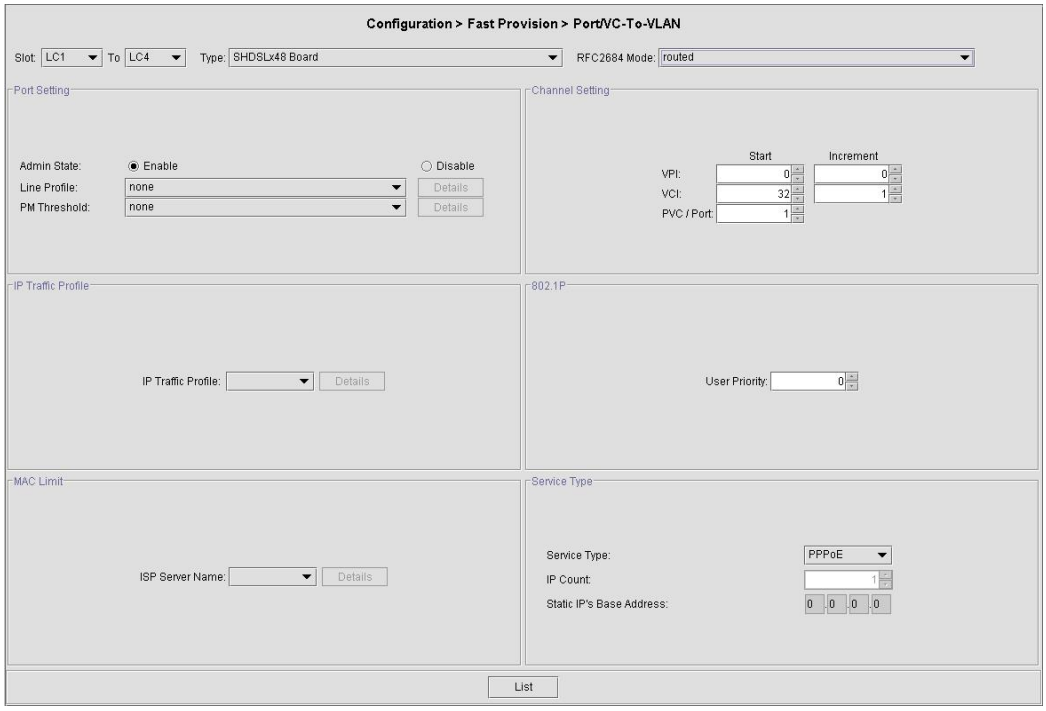


Table 4-56 xDSL Port & VC-to-VLAN Fast Provision Description

Field	Description
Module Criteria (Function Button)	
Slot	This indicates the beginning location of line card to perform fast provision
To	This indicates the end location of line card to perform fast provision
Type	Use this combo-box to select the board type of line card. (‘ADSLx48 Board’ or ‘SHDSLx48 Board’)
RFC2684 Mode	Use this combo-box to select the RFC 2684 encapsulation mode (‘Bridged’ or ‘Routed’)
Function Button	
List	Click to launch the **xDSL Fast Provision List** dialog as shown in Figure 4-91.
Port Setting	
Admin State	It specifies the administrative state. (‘Enable’ or ‘Disable’)
Wireless Function	It specifies to enable or disable the wireless AP on the remote CPE (This function only works for the certified CPE)
Line Profile	Use this combo-box to select the line profile. (xDSL Profile)
PM Threshold	Use this combo-box to select the PM threshold profile.
Traffic Policing [Only for the ADSL port]	Use this combo-box to select the Traffic Policing profile.

Table 4-56 xDSL Port & VC-to-VLAN Fast Provision Description (Continued)

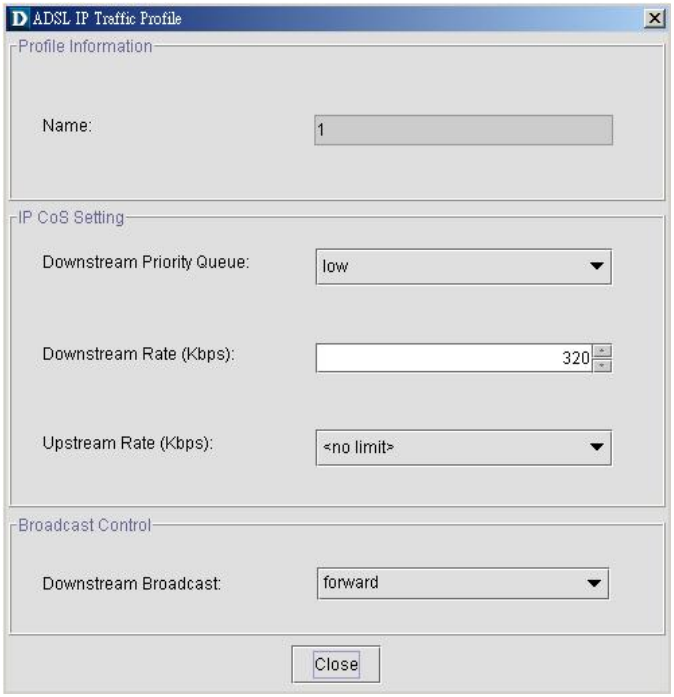
Field	Description
Channel Setting Start – Identify the number of starting value. Increment – Identify the number to be increment if more then one **PVCs / Port** is defined.	
VPI (Start, Increment)	It specifies the VPI value of PVCs. Use the **Start** combo-box to select the beginning VPI value and use the **Increment** combo-box to select the increments between two consecutive PVCs on the same xDSL port.
VCI (Start, Increment)	It specifies the VCI value of PVCs. Use the **Start** combo-box to select the beginning VCI value and use the **Increment** combo-box to select the increments between two consecutive PVCs on the same xDSL port.
VLAN ID (Start, Increment)	It specifies the VLAN ID value of corresponding VC-to-VLAN connections. Use the **Start** combo-box to select the beginning VLAN-ID value and use the **Increment** combo-box to select the increments between two consecutive xDSL port. Note that the setting takes effect only when **Continuous VLAN ID** is checked.
PVCs / Port	It specifies the number of PVCs to be applied to each xDSL port.
Continuous VLAN ID	Check to enable the setting of **VLAN ID** combo-box to take effect.
IP Traffic Profile	
IP Traffic Profile	This specifies the IP Traffic Profile of corresponding VC-to-VLAN connection.
Details	Click to view the details of selected IP Traffic Profile.
802.1P	
User Priority	This specifies the VLAN priority of corresponding VC-to-VLAN connection.
ISP Server [only for RFC2684 routed mode]	
ISP Server Name	It specifies the ISP server name as specified in Section 4.9.2 ‘ISP Information for IP over ATM’
MAC Limit [only for RFC2684 bridged mode]	
MAC Count	It specifies the number of subscriber’s MACs allowed for the corresponding VC-to-VLAN connection.
Service Type	
Service Type	This specifies the service type to be allowed on the PVC of individual subscriber. The following three service types are supported now. ● PPPoE ● DHCP ● Static IP
IP Count [only for DHCP/ Static IP Service]	This indicates the number of IP to be allowed while ‘DHCP’ or ‘Static IP’ service type is selected
Static IP’s Basic Address [only for Static IP Service]	This specifies the base of the IP address if the service type is Static IP

Enabling the Service Type Control makes the NE to provide the IP/MAC anti spoofing function.

In the case that the subscriber acquires his IP address dynamically via PPPoE or DHCP, the NE will block the subscriber's traffic before a valid IP address assignment. Once the subscriber possesses a valid dynamic or static IP, the NE will just forward the packet of valid source IP/MAC addresses. In other words, the NE drops the subscriber's traffic of invalid source IP/MAC addresses.

Step 3 To inspect the details of miscilleus profiles to be applied, click the **Detail** button on the dialog as shown in Figure 4-86 ~ Figure 4-89. Figure 4-90 shows an example of IP Traffic Profile.

Figure 4-90 xDSL Port & VC-to-VLAN Fast Provision – IP Traffic Profile Dialog

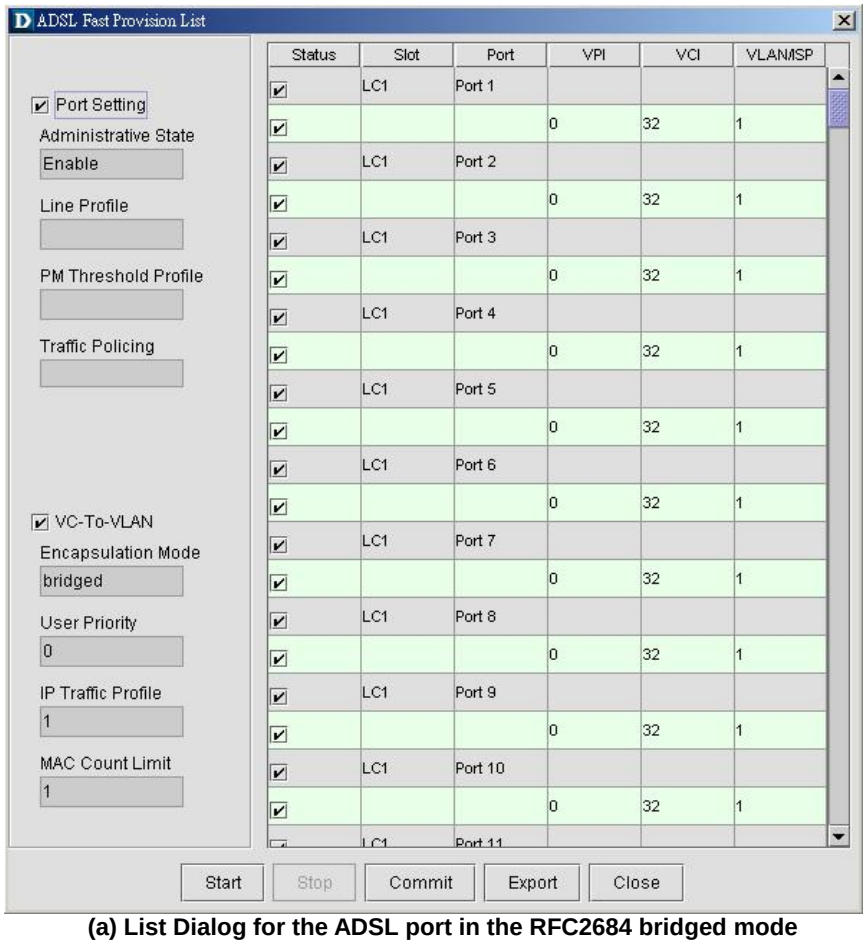


Step 4 Click '**List**' button to launch the **xDSL Fast Provision List** dialog as shown in Figure 4-91 which summarizes what you set via the **xDSL Port & VC-to-VLAN Fast Provision** dialog. Figure 4-91 depicts the list of subscriber ports you wish to apply to. If you do no want to apply the setting to any port or PVC, just remove it from the List Table by clearing the corresponding check-box.

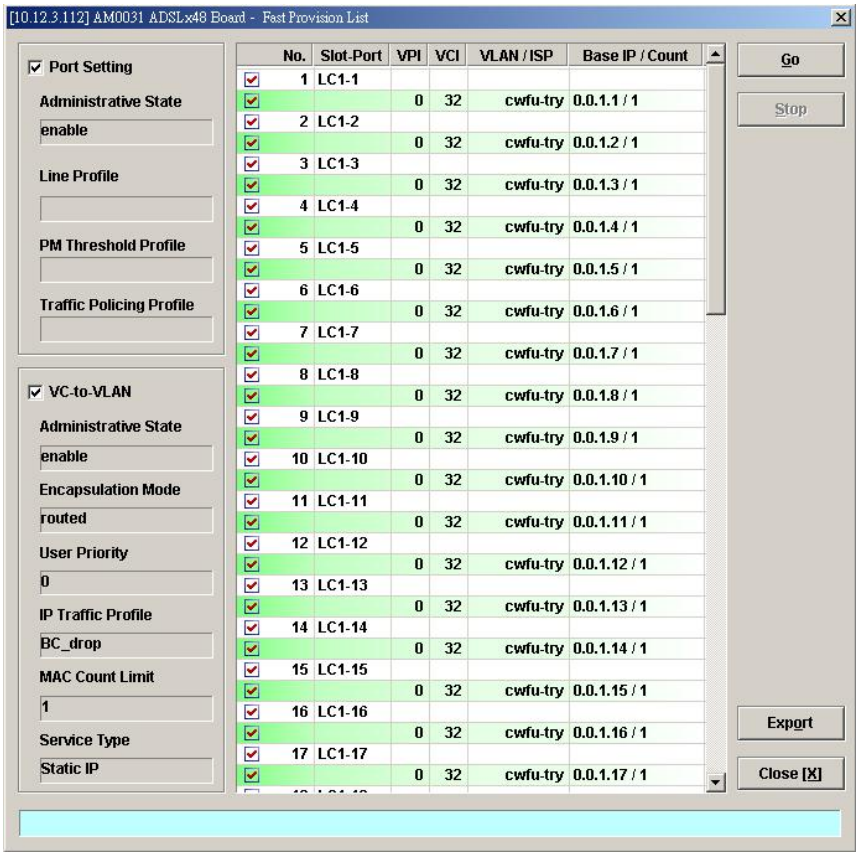
Table 4-57 depicts the related parameters.

Step 5 Click '**Start**' button to apply the given setting to all ports in the List Table. The checks are removed when the setting is successfully applied. Click '**Stop**' to stop the fast provisioning immediately if you want.

Figure 4-91 xDSL Fast Provision List Dialog

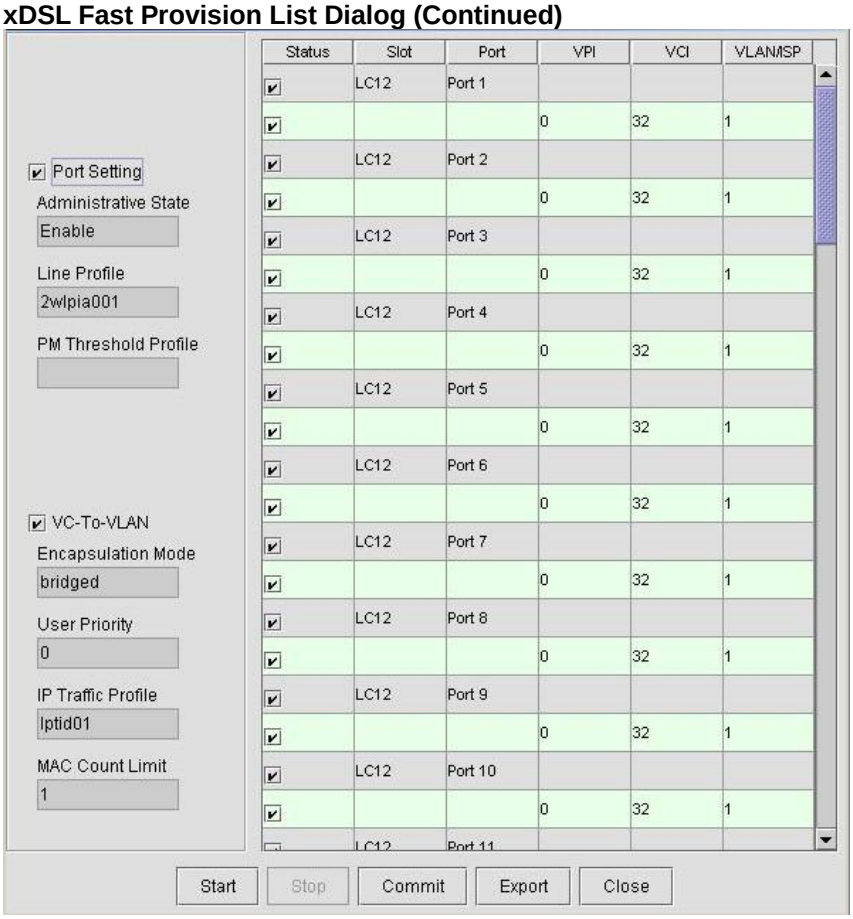


(a) List Dialog for the ADSL port in the RFC2684 bridged mode

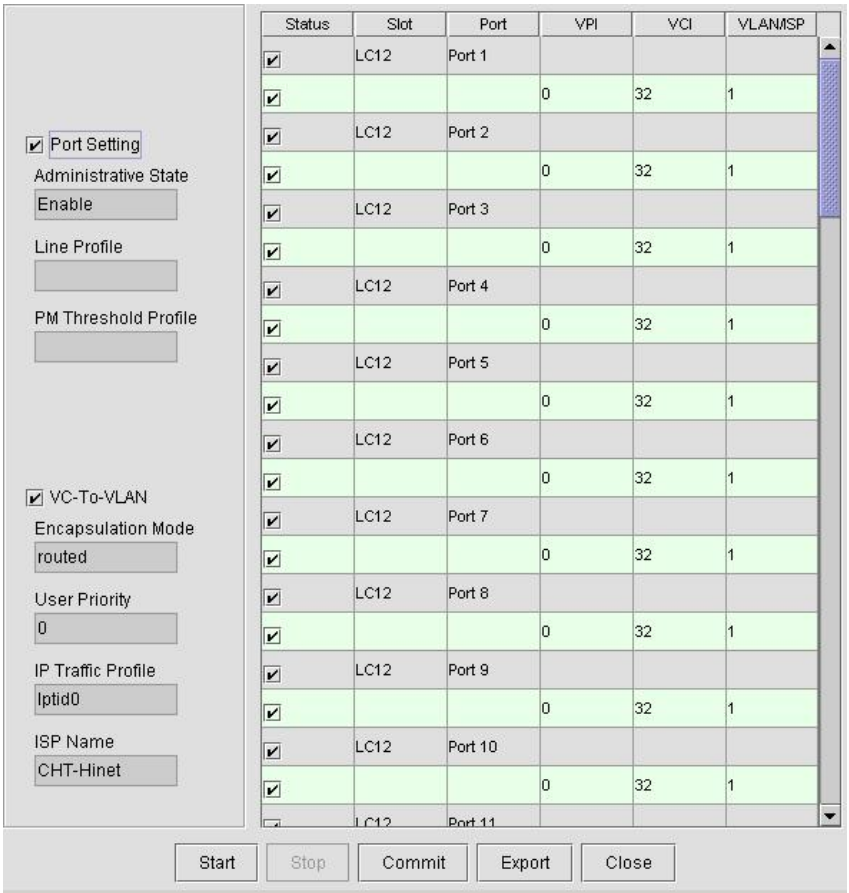


(b) List Dialog for the ADSL port in the RFC2684 routed mode

Figure 4-91 xDSL Fast Provision List Dialog (Continued)



(c) List Dialog for the SHDSL port in the RFC2684 bridged mode



(d) List Dialog for the SHDSL port in the RFC2684 routed mode

Table 4-57 xDSL Fast Provision List Dialog Description

Field	Description
Condition	
Port Setting – Check to allow the correspondent setting to be applied to the ports in List Table. VC-to-VLAN – Check to allow the correspondent setting to be applied to the ports in List Table.	
Administrative State	This specifies the administrative state. (enable or disable)
Line Profile	This specifies the line profile. (xDSL Profile)
PM Threshold Profile	This specifies the PM threshold profile.
Traffic Policing Profile [Only for the ADSL port]	This specifies the Traffic Policing profile. [Only for the ADSL port]
Encapsulation Mode	This specifies the RFC2684 encapsulation mode of corresponding PVC.
User Priority	This specifies the VLAN priority of corresponding VC-to-VLAN connection.
IP Traffic Profile	This specifies the IP traffic profile of corresponding VC-to-VLAN connection.
MAC Count Limit	It specifies the number of subscriber's MACs allowed for the corresponding VC-to-VLAN connection. [only for RFC2684 bridged mode]
Service Type	This specifies the service type of corresponding VC-to-VLAN connection. The following three service types are supported now. ● PPPoE ● DHCP ● Static IP
ISP Name	It indicates the ISP server name as specified in Section 4.9.2 'ISP Information for IP over ATM'.
List Table	
No.	This indicates the serial number of entry of the List Table.
Status	This specifies whether to apply this PVC/Port setting to NE. Un-check this check-box makes the AMS not apply this PVC/Port setting to NE.
Slot-Port	This specifies the location of subscriber port.
VPI	This specifies the VPI value of PVC.
VCI	This specifies the VCI value of PVC.
VLAN / ISP	This specifies the VLAN ID (in RFC2684 bridged mode) or ISP name (in RFC2684 routed mode) of corresponding VC-to-VLAN connection.
Base IP / Count	This specifies the IP Base address and count of IP address of corresponding VC-to-VLAN connection. It applies whenever the Service Type Control is enabled and Static IP or DHCP is selected
Function Button	
Start	Click this button to start fast provisioning.
Stop	Click this button to force the fast provision terminating.
Commit	Click this button to apply the setting to NE.
Export	Click this button to save the contents of **xDSL Fast Provision List** to the Personal Computer.
Close	Exit this **xDSL Fast Provision List** Dialog.

4.13.2 Multicast Service Fast Provisioning

The multicast service fast provision function helps you to build-up the multicast connection and the associated service profile efficiently.

Follow the subsequent procedures to configure the multicast service fast provision.

Step 1 Click Configuration → Fast Provision → Multicast Channel on **Main Menu** to open the **xDSL Multicast Channel Fast Provision** Dialog, as shown in Figure 4-92 and Table 4-58 depicts the related parameters.

In Figure 4-92, it is noted that two individual tabs (Multicast Service Profile and MAC Limit) are provides to set the Multicast Service Fast Provision related parameters. Click either one tab to launch the corresponding dialog to configure the parameters. Figure 4-92 and Figure 4-93 show the corresponding configuration Dialog. As to the description of the configuration parameters, please refer to Table 4-58.

Figure 4-92 xDSL Multicast Channel Fast Provision – Multicast Service Profile Dialog

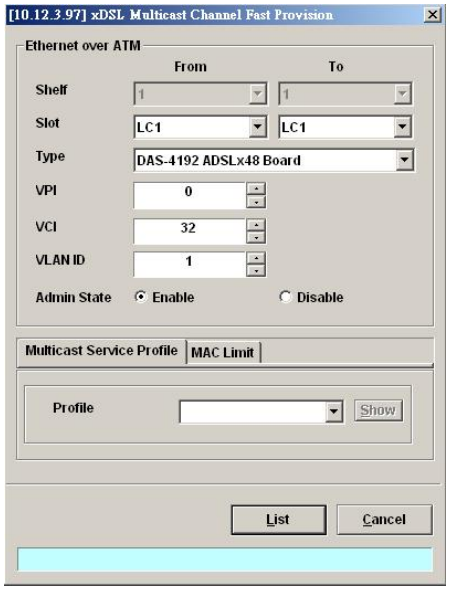


Figure 4-93 xDSL Multicast Channel Fast Provision – MAC Limit Dialog

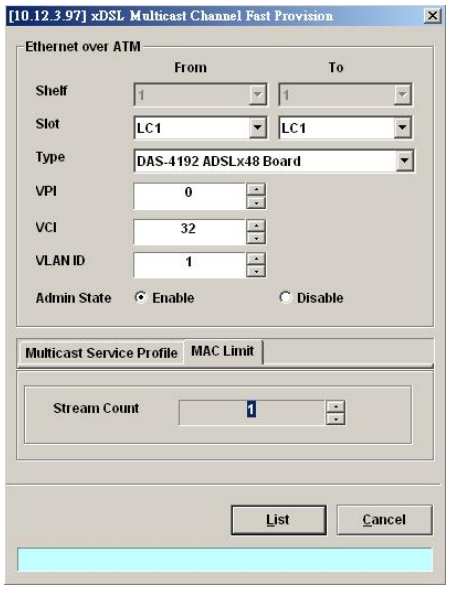


Table 4-58 xDSL Multicast Channel Fast Provision Description

Field	Description
Ethernet over ATM	
Shelf	This specifies the shelf ID.
Slot	It specifies the slot range.
Type	It specifies the LC board type.
VPI	It specifies the VPI value.
VCI	It specifies the VCI value.
VLAN ID	It specifies the VLAN ID value.
Admin State	It specifies the administrative state of these multicast channels.
Multicast Service Profile Dialog Show – Click this button to display the details of multicast service profile collocated.	
Profile	It specifies the Multicast Service Profile
MAC Limit Dialog	
Stream Count	This specifies the allowed number of concurrent multicast streams to be forwarded via each VC-to-VLAN connection.

Step 2 Click '**List**' button to launch the **xDSL Multicast Channel Fast Provision List** dialog. Figure 4-94 summarizes what you set via the **xDSL Multicast Channel Fast Provision** dialog. As shown in Figure 4-94, it depicts the list of subscriber ports you wish to apply to. If you do not want to apply the setting to any port in the list table, just clear the corresponding check-box

Table 4-59 depicts the related parameters.

Step 3 Click '**Go**' button to apply the given setting to all ports listing in the List Table. The checks are removed when the setting is successfully applied. Click '**Stop**' to stop the fast provision immediately if you want.

Figure 4-94 xDSL Multicast Channel Fast Provision List Dialog

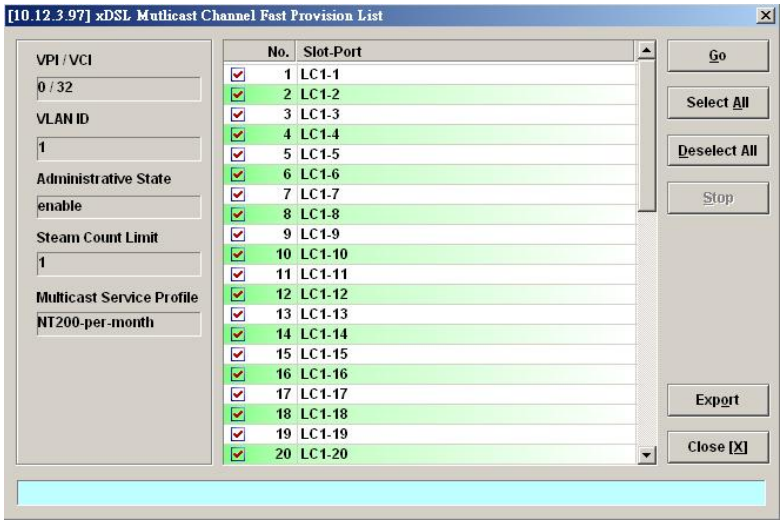


Table 4-59 xDSL Multicast Channel Fast Provision List Dialog Description

Field	Description
Condition	
VPI / VCI	This specifies the VPI / VCI value of corresponding PVC.
VLAN ID	This specifies the VLAN ID value of corresponding VC-to-VLAN connection.
Administrative State	This specifies the admin state of corresponding VC-to-VLAN connection..
Stream Count Limit	This specifies the allowed number of multicast streams to be forwarded via each VC-to-VLAN connection.
Multicast Service Profile	This specifies the multicast service profile.
List Table	
No.	This indicates the serial number of entry of the List Table.
Slot-Port	This specifies the location of subscriber port.
Function Button	
Go	Click this button to start fast provisioning.
Select All	Click this button to select all rows from List Table.
Deselect All	Click this button to deselect all rows from List Table
Stop	Click this button to force the fast provision terminating.
Export	Click this button to save the contents of **xDSL Multicast Channel Fast Provision List** to the Personal Computer.
Close	Exit the **xDSL Multicast Channel Fast Provision List** Dialog.

4.14 NE SNMP Management

SNMP (Simple Network Management Protocol) is an application-layer protocol that facilitates the exchange of management information between a NE and AMS server. SNMP enables the administrators to manage the NE by the AMS server. In the term of SNMP, the NE plays the role of SNMP agent and the AMS server serves as the SNMP server. This section describes how to configure the SNMP on the NE.

Beware of the SNMP community setting, this will affects the communication between the AMS AMS server and NE, re-login the NE if the SNMP community has been modified.

4.14.1 Configuring the SNMP Trap Manager

SNMP Trap Manager records the hosts (any SNMP server, like LCT, AMS Server, and so on) to be notified whenever the NE encounters abnormalities. When a trap condition happens to the NE, the NE sends the corresponding SNMP trap message to the hosts (SNMP server) specified in the SNMP Manager IP Address List.

Follow the subsequent procedures to configure the NE's SNMP Manager.

Step 1 Click System→SNMP Configuration → SNMP Trap Host on **Main Menu** to open the **SNMP Trap Host List** Dialog as shown in Figure 4-95. Table 4-60 depicts the related parameters.

Figure 4-95 NE SNMP Trap Host IP Address List Dialog

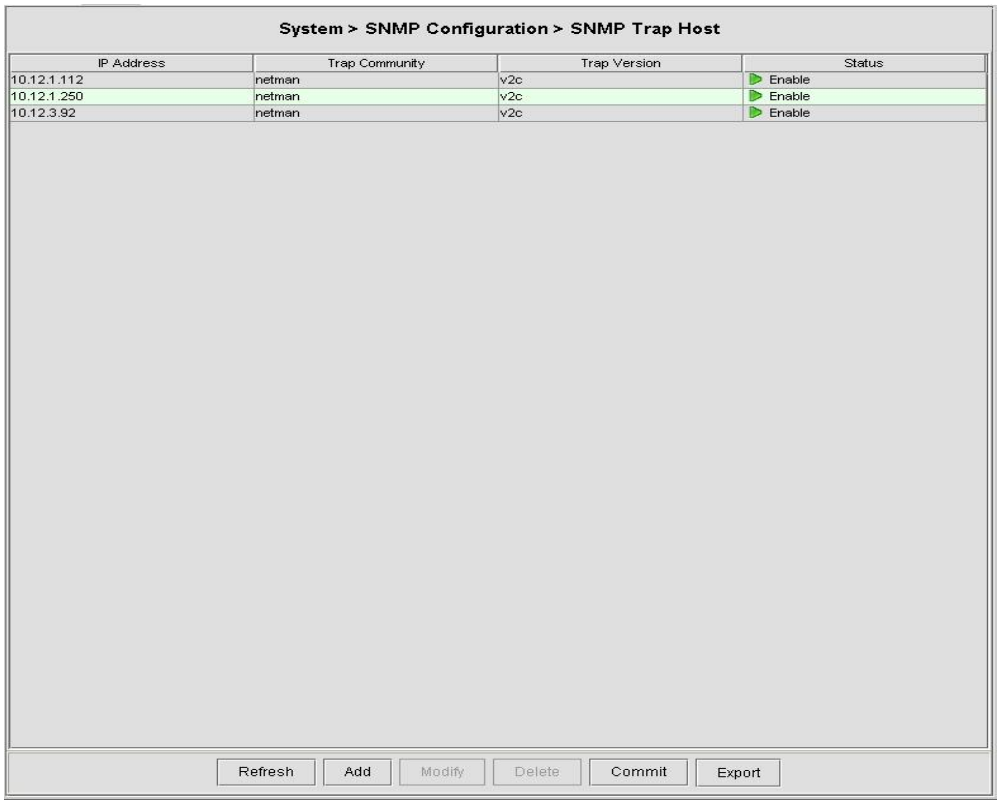
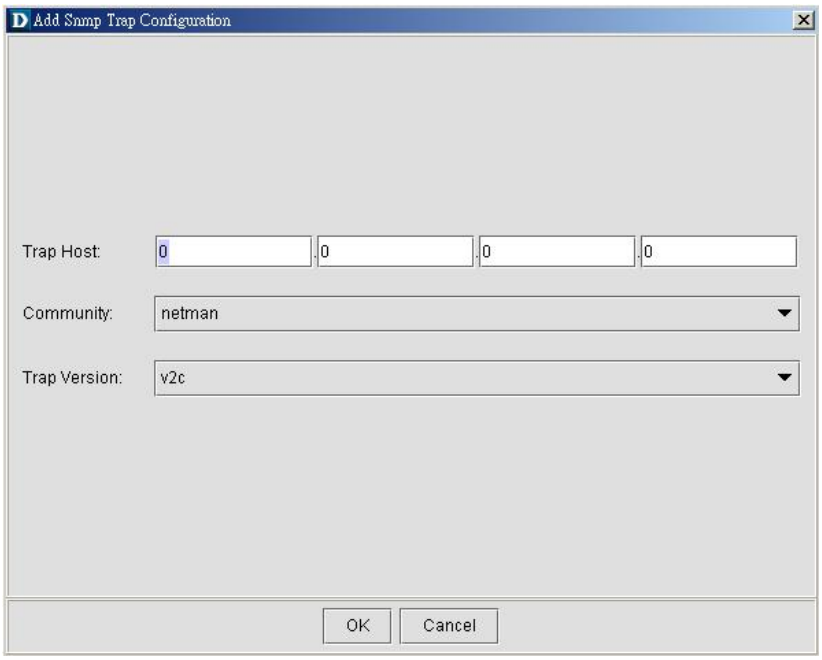


Table 4-60 NE SNMP Trap Host IP Address List Dialog Description

Field	Description
List Table	
IP address	This specifies the IP address (Server / Host IP) of SNMP Manager. **Valid values:** Any valid class A/B/C address
Trap Community	This specifies the SNMP trap community of NE (Send Trap). **Valid values:** String of up to 20 characters and any combination of printable characters (‘A’ – ‘Z’, ‘a’ – ‘z’, ‘0’ – ‘9’, ‘-’, ‘_’, ‘@’).
Trap Version	This specifies the SNMP Trap version. **Valid values:** SNMP v2c
Status	This specifies the status of entry, either “Enabled” or “Disabled”.
Function Button	
Refresh	Click this button to refresh the SNMP Trap Host List.
Add	Click this button to create a new SNMP Manager (Trap) IP Address.
Delete	Select a trap community from the list table to remove.
Commit	Click this button to apply the setting to NE.
Export	Click this button to save the contents of **NE SNMP Manager IP Address List** to the AMS client.

Step 2 Click ‘**Add**’ button to create a new trap receiver host with community, while to remove the trap receiver, click and highlight a host in the list and click ‘**Delete**’ button, as shown in Figure 4-96. Table 4-60 depicts the related parameters.

Figure 4-96 Add NE SNMP Trap Host IP Address Dialog



4.14.2 Configuring the SNMP Community

The SNMP community is a string representing the password to access the MIB of NE with the associated privilege. The NE supports two levels of privilege (Permission) as follows.

- Read / Write / Create – Allow the SNMP server to read and write all objects in the MIB, as well as the community strings.
- Read-only – Only allow the SNMP server to read all objects in the MIB except the community strings.

The community string definitions on your AMS server must match at least one of those community string definitions on the NE. Otherwise, the AMS server is not allowed to access the NE.

Follow the subsequent procedures to configure the NE's SNMP Community.

Step 1 Click System→ SNMP Configuration→ SNMP Community on **Main Menu** to open the **NE SNMP Community List** Dialog as shown in Figure 4-97 and Table 4-61 depicts the related parameters.

Figure 4-97 NE SNMP Community List Dialog

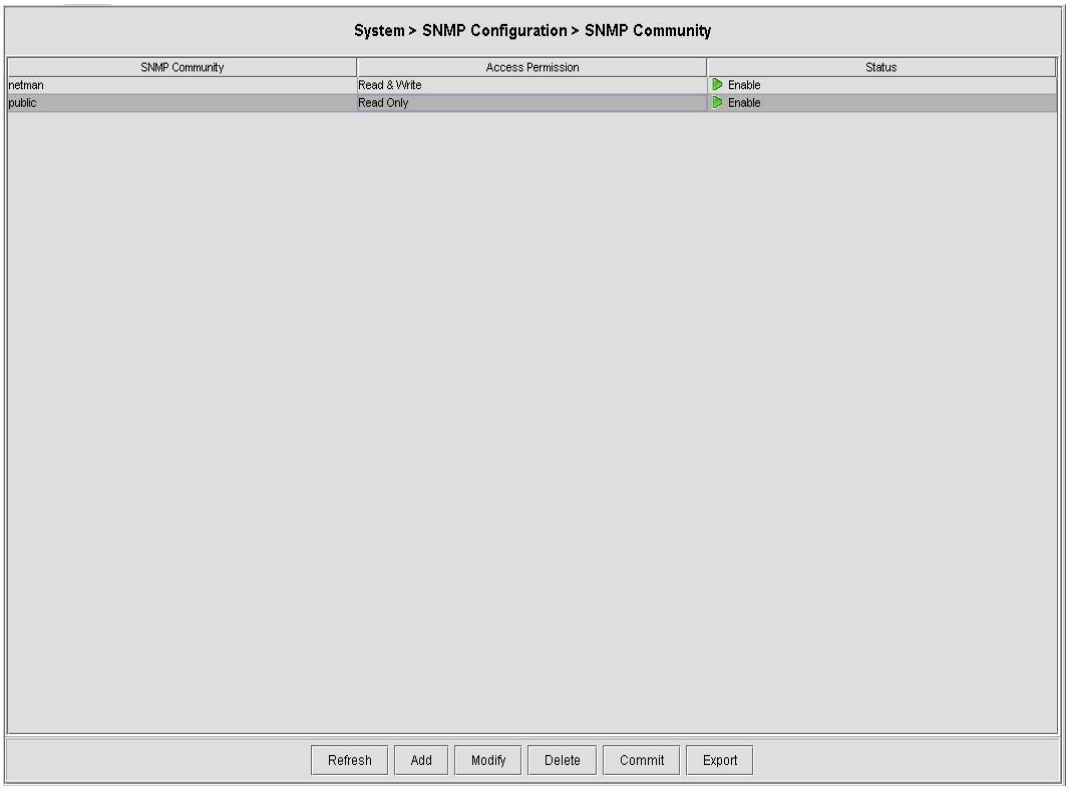


Table 4-61 NE SNMP Community List Dialog Description

Field	Description
List Table	
SNMP Community	This indicates the case-sensitive SNMP community name.
Read & Write	This indicates the permission level, either “read only” or “read & write”,
Status	This specifies the status of entry, either “Enabled” or “Disabled”.
Function Button	
Refresh	Click this button to refresh the **NE SNMP Community List Dialog**
Add	Click this button to create a new SNMP community of NE.
Modify	Select a SNMP community to modify.
Delete	Select a SNMP community to remove.
Commit	Click this button to apply the setting to NE.
Export	Click this button to save the contents of **NE SNMP Community List** to the AMS client.

Step 2 Click ‘**Add**’ button to create a new SNMP community strings, while to remove the SNMP community strings, click and highlight a community in the list and click ‘**Delete**’ button, as shown in Figure 4-98 and Table 4-62 depicts the related parameters.

Figure 4-98 Add NE SNMP Community Dialog

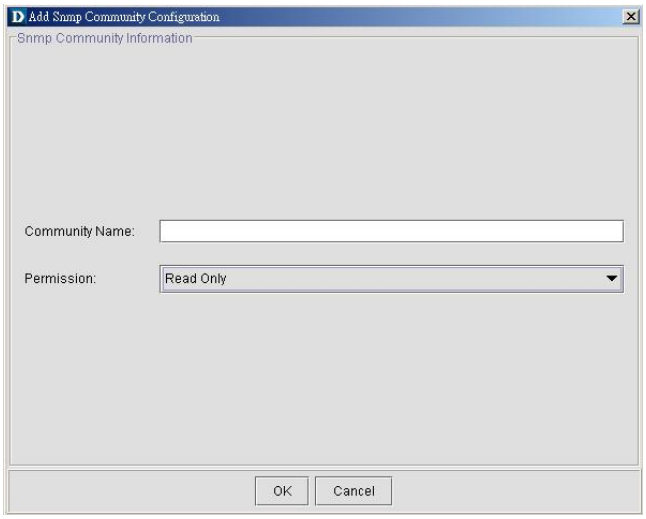


Table 4-62 Add NE SNMP Community Dialog Description

Field	Description
Community Name	This indicates the case-sensitive SNMP community name. **Valid values:** String of up to 20 characters and any combination of printable characters (‘A’ – ‘Z’, ‘a’ – ‘z’, ‘0’ – ‘9’, ‘-’, ‘_’, ‘@’).
Permission	This indicates the permission level. **Valid values:** “read only” or “read & write”

4.15 NE Date and Time Management

AMS Client can synchronization and adjust the date and time from AMS Server to NE, the date and time of NE gives right information for alarm occurred time.

Follow the subsequent procedures to configure the NE system time.

Step 1 Click Configuration → NE Management → System Time on **Main Menu** to open the **NE System Time** Dialog as shown in Figure 4-99. Table 4-63 depicts the related parameters.

Step 2 Click ‘**Modify**’ button to change the NE system time as shown in Figure 4-100. Table 4-63 depicts the related parameters.

Figure 4-99 NE System Time Dialog

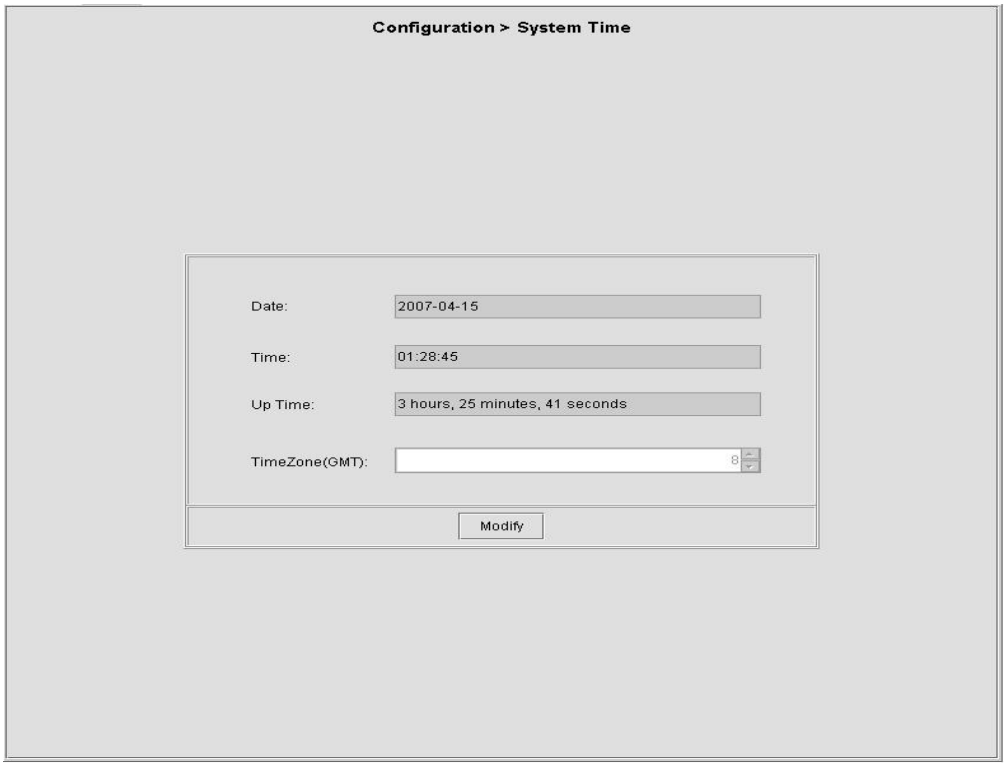


Figure 4-100 NE System Time Setting Dialog

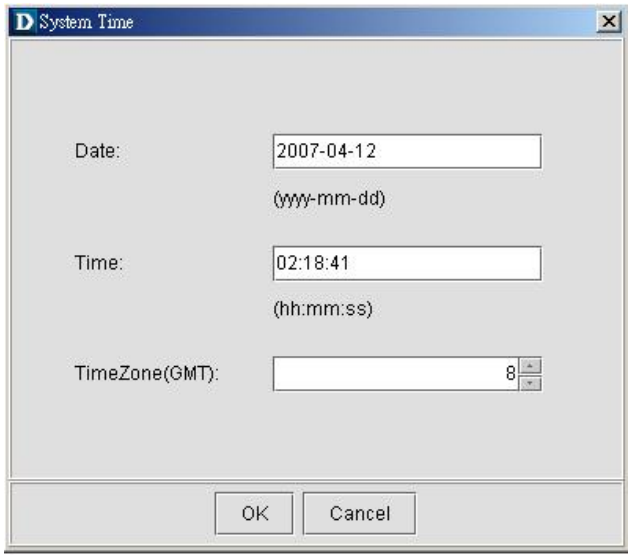


Table 4-63 NE System Time Dialog Description

Field	Description
Date / Time / Up Time / Time Zone	
Date / Time	This indicates the current NE date and time.
Up Time	This indicates the period since the NE is rebooted last.
Time Zone (GMT)	This indicates the time differences between the Greenwich Mean Time and the local time.
Function Button	
OK	Click this button to apply the modification to NE.

4.15.1 DNS Server Setting

The DNS Server is used for the resolution of domain name. In other words, the DNS replies the corresponding IP address to the URL.

Follow the subsequent procedures to configure the DNS Server.

Click Configuration → NE Management → DNS Servers on **Main Menu** to open the **NE DNS Server Setting** Dialog as shown in Figure 4-101 and Table 4-64 depicts the related parameters.

Figure 4-101 DNS Server Setting Dialog

Table 4-64 DNS Server Setting Dialog Description

Field	Description
DNS Server Information	
The First Server	This specifies the first DNS server IP address.
The Second Server	This specifies the second DNS server IP address.
The Third Server	This specifies the third DNS server IP address.
Function Button	
Refresh	Click this button to refresh the **DNS Server Setting Dialog**
Submit	Click this button to apply the setting to NE.
Commit	Click this button to apply the setting to NE.

4.15.2 Time Server Setting

Follow the subsequent procedures to configure the time servers.

Step 1 Click Configuration → NE Management → Time Servers on **Main Menu** to open the **Time Setting Status** Dialog as shown in Figure 4-102 and Table 4-65 depicts the related parameters.

Figure 4-102 NE Time Server Setting Dialog

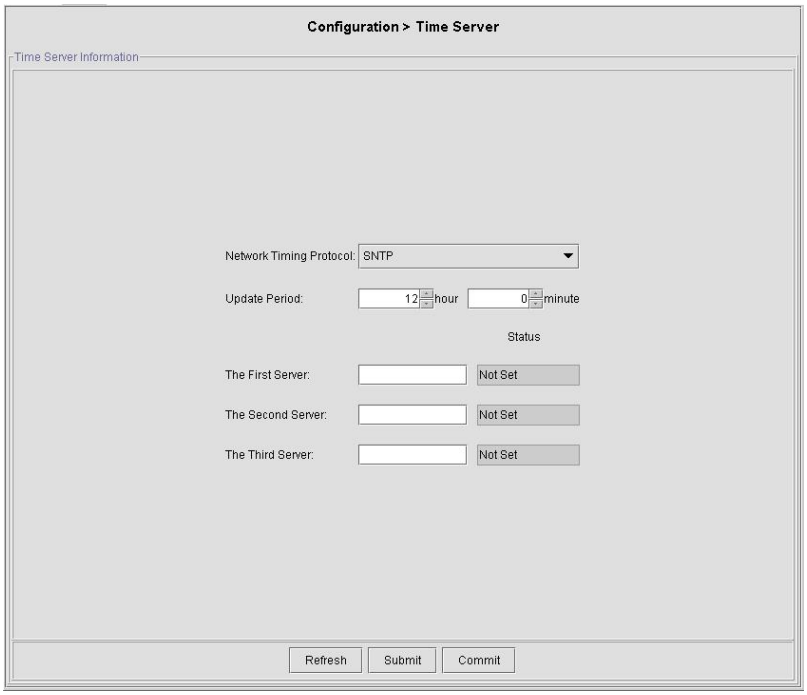


Table 4-65 NE Time Server Setting Dialog Description

Field	Description
DNS Server Information	
Network Timing Protocol	This indicates the current network time protocol, SNTP or None.
Update Period	This indicates the time period between two consecutive synchronizations of the NE's local time with the time server's.
The First Server	This indicates the first time server the NE tries to synchronize with.
The Second Server	This indicates the second time server the NE tries to synchronize with.
The Third Server	This indicates the third time server the NE tries to synchronize with.
Function Button	
Refresh	Click this button to refresh the **NE Time Server Setting Dialog.**
Submit	Click this button to apply the setting to NE.
Commit	Click this button to apply the setting to NE.

NOTE The NE will synchronize its local time with the first time server's time as a top priority. If the first time server fails to respond, the NE tries to synchronize it's local time with the second and third time server's time in sequence.

4.16 System Backup and Restore

System backup/restore function contains three parts,

- Export NE Configuration To AMS Client
- Local storage of NE configuration

- NE configuration backup/restore to/from the AMS Server

4.16.1 Export NE Configuration To AMS Client

Follow the subsequent procedures to save the NE configuration to the local AMS client.

Step 1 Click the '**Export**' button whenever it appears in the function menu to open the **Export Data To File** Dialog as shown in Figure 4-103. Table 4-66 depicts the related parameters.

Step 2 Press the '**Browse**' button to choose the target directory to save the exported file.

Figure 4-103 Export Data To File Dialog

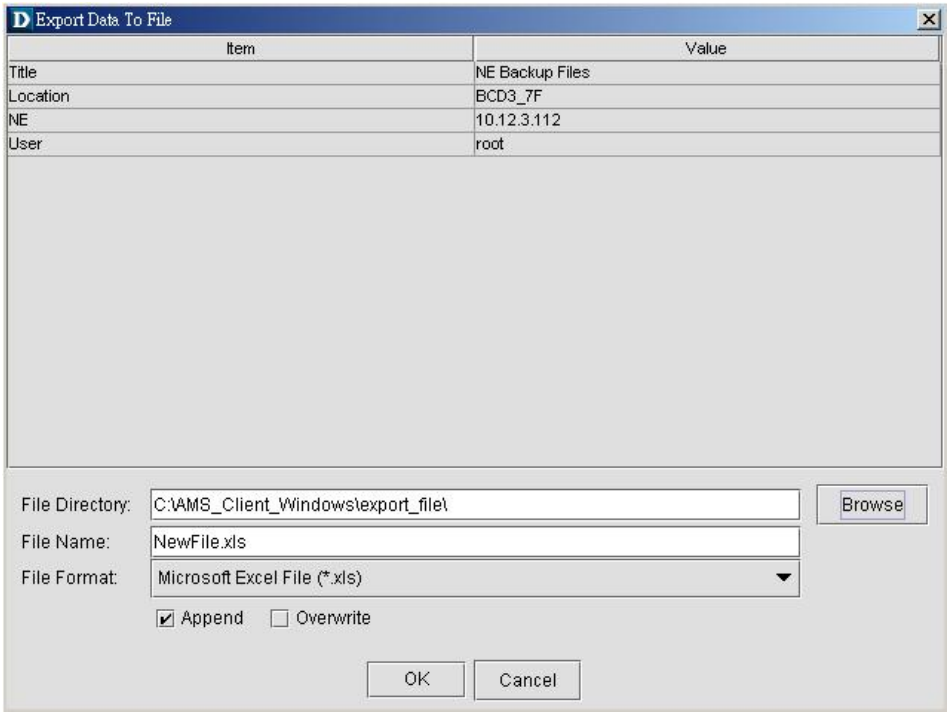


Table 4-66 Export Data To File Dialog Description

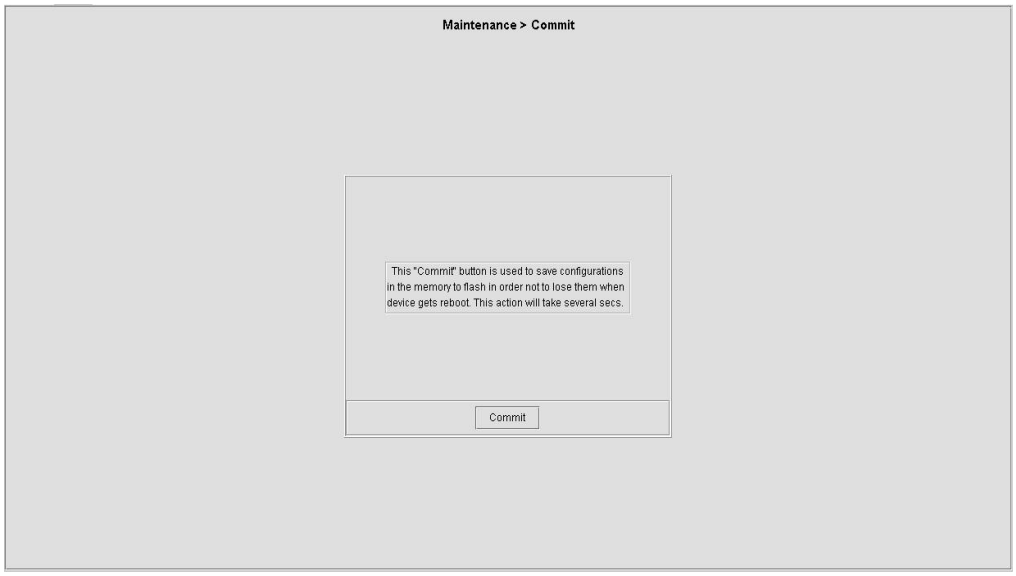
Field	Description
Export To File	
File Directory	This specifies the target directory to save the exported file.
File Name	This specifies the file name of the exported file to be saved.
File Format	This specifies the file format of the exported file to be saved.

4.16.2 Local Storage of NE configuration

Follow the subsequent procedures to save the NE configuration to the flash of NE.

Click Maintenance → Commit on **Main Menu** to open the **Commit Confirm** Dialog to save the NE configuration to the flash of NE as shown in Figure 4-104

Figure 4-104 NE Write Flash Confirm Dialog



4.16.3 NE Configuration Backup and Restore

The AMS supports for backing up the NE configuration information to the AMS Server hard disk or tape as a file format, and support restoration of backuped file to NE on demand.

With NE configuration backup and restoration function, it enables an operator to backup NE configuration at any time and provide operator to assign periodically automatic backup purpose.

NE Configuration Backup/Restoration on Demand

Follow the subsequent procedure to backup and restore the configuration data file of NE to AMS server through FTP.

Step 1 Click Maintenance → NE Backup & Restore on **Main Menu** to open the **NE Configuration Backup & Restore** Dialog as shown in Figure 4-105. Table 4-67 depicts the related parameters.

Step 2 To backup the configuration file, click '**Backup**' button to launch the **NE Backup File Dialog** as shown in Figure 4-106 and Table 4-68 depicts the related parameters. Please input a valid administrative level username/password and give your backup file a file name.

Step 3 To restore the configuration file, choose the target file from the backup file directory, then click '**Restore**' button to launch the **NE Restore File Dialog** as shown in Figure 4-107**.** Table 4-68 depicts the related parameters

Step 4 After restoring the configuration data, it is noted that the NE needs to be rebooted to make the configuration data take effect.

You can also select and highlight the NE from the **NE Network Tree Map** (Figure 3-8) to progress the NE configuration Backup & Restore by right click of pop-up menu, NE Management → NE Backup & Restore.

Figure 4-105 NE Configuration Backup & Restore File List Dialog

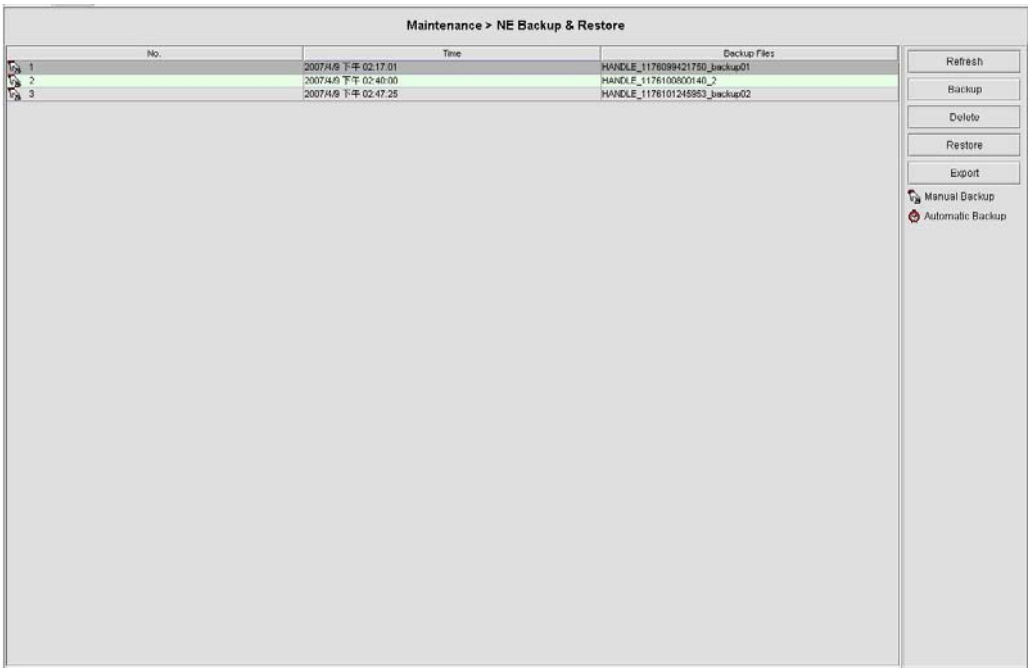


Table 4-67 NE Configuration Backup & Restore File List Dialog Description

Field	Description
List Table	
No.	This indicates the serial number of entry of the list table.
Time	This indicates the date when the NE configuration data is saved to the AMS server.
Backup Files	This indicates the filename of the backuped NE configuration data.
Function Button	
Refresh	Click this button to refresh the **NE Configuration Backup & Restore List.**
Backup	Start to backup the configuration data file of NE by saving it as the specified file on the local AMS server
Delete	Click this button to remove the selected backup files.
Restore	Start to restore the configuration of NE by sending the specified NE configuration file to NE from the local AMS server via FTP.
Export	Click this button to save the contents of **NE Configuration Backup & Restore Dialog** to the AMS client.

Figure 4-106 NE Backup File Dialog

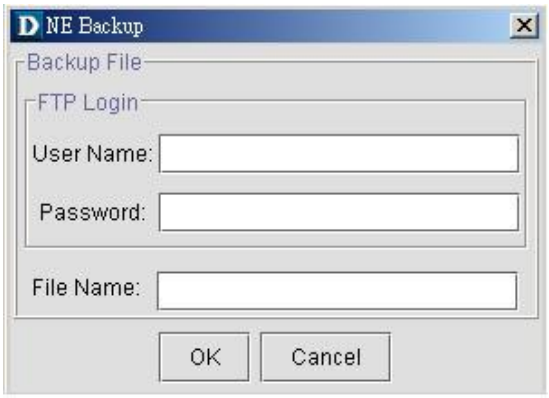
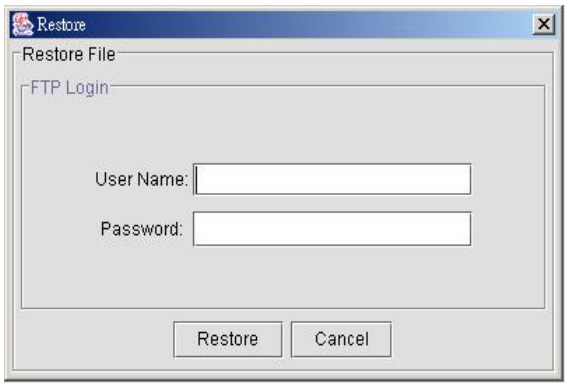


Table 4-68 NE Backup File Dialog Description

Field	Description
FTP Login	
User Name	Fill the administrative level username of FTP.
Password	Fill the comparative password of the administrative level username.
Backup File	
File Name	This indicates the filename of the backuped NE configuration data.

Figure 4-107 NE Restore File Dialog



NE Configuration Periodical Backup/Restoration

Follow the subsequent procedure to perform periodical backup/restoration of the configuration data file of NE to/from the AMS server through FTP.

Step 1 Click Maintenance → NE Auto Backup on **Main Menu** to open the **NE Auto Backup** Dialog as shown in Figure 4-108. Table 4-69 depicts the related parameters.

Step 2 After restoring the configuration data, it is noted that the NE needs to be rebooted to make the configuration data take effect.

Figure 4-108 NE Configuration Auto Backup Dialog

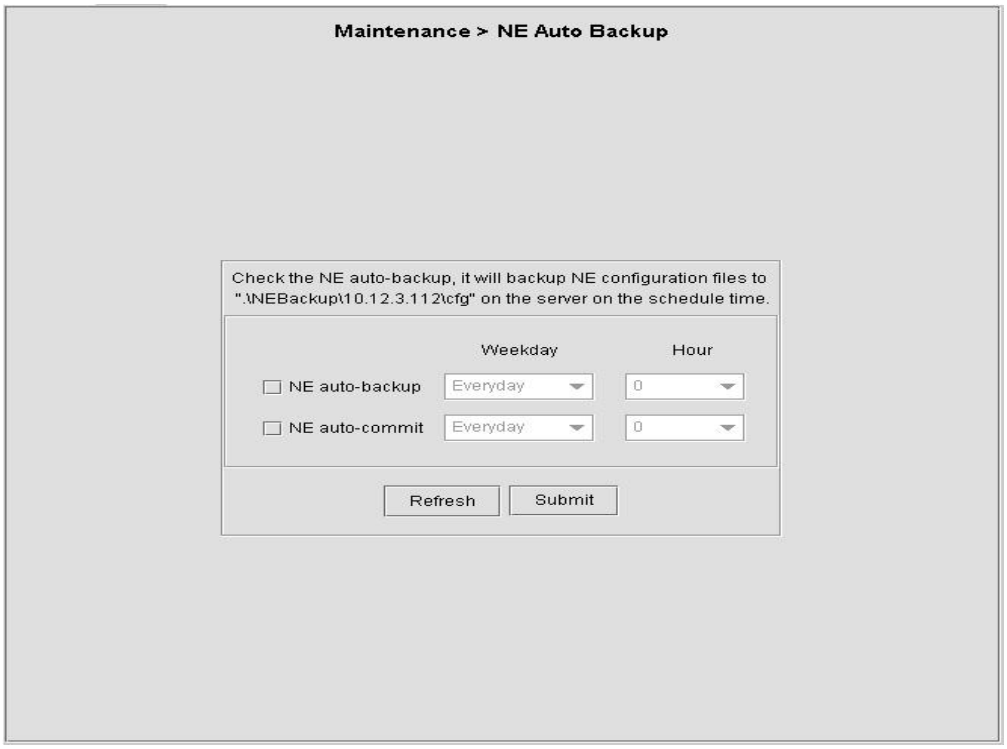


Table 4-69 NE Configuration Auto Backup Dialog Description

Field	Description
List Table	
Weekday-/Hour	This specifies the time when to perform automatically backup/restoration
NE auto-backup	Check the checkbox to enable the AMS server to automatically backup the NE configuration to AMS server everyday or every week.
NE auto-commit	Check the checkbox to enable the AMS server to automatically restore the NE configuration everyday or every week.
Function Button	
Refresh	Click this button to refresh the **NE Configuration Auto Backup Dialog**
Submit	Click this button to apply the setting to AMS server.

4.17 NE Maintenance

AMS supports the NE firmware and NE inventory management as follows.

- NE Inventory Information
- NE Firmware Upgrade
- SHDSL LC Firmware Upgrade
- NE Boot Partition
- Reset the Unit

4.17.1 NE Inventory Information

Follow the subsequent procedure to display the inventory information of NE software/ hardware version, card serial number, card type and so on

Step 1 Click Status → Inventory on **Main Menu** to open the **Inventory** information table as shown in Figure 4-109 and. Table 4-70 depicts the related parameters.

Step 2 Select a slot and click '**Details**' button to view the detailed inventory information of the card Figure 4-110 and Table 4-70 depicts the related parameters.

Figure 4-109 Inventory Information List

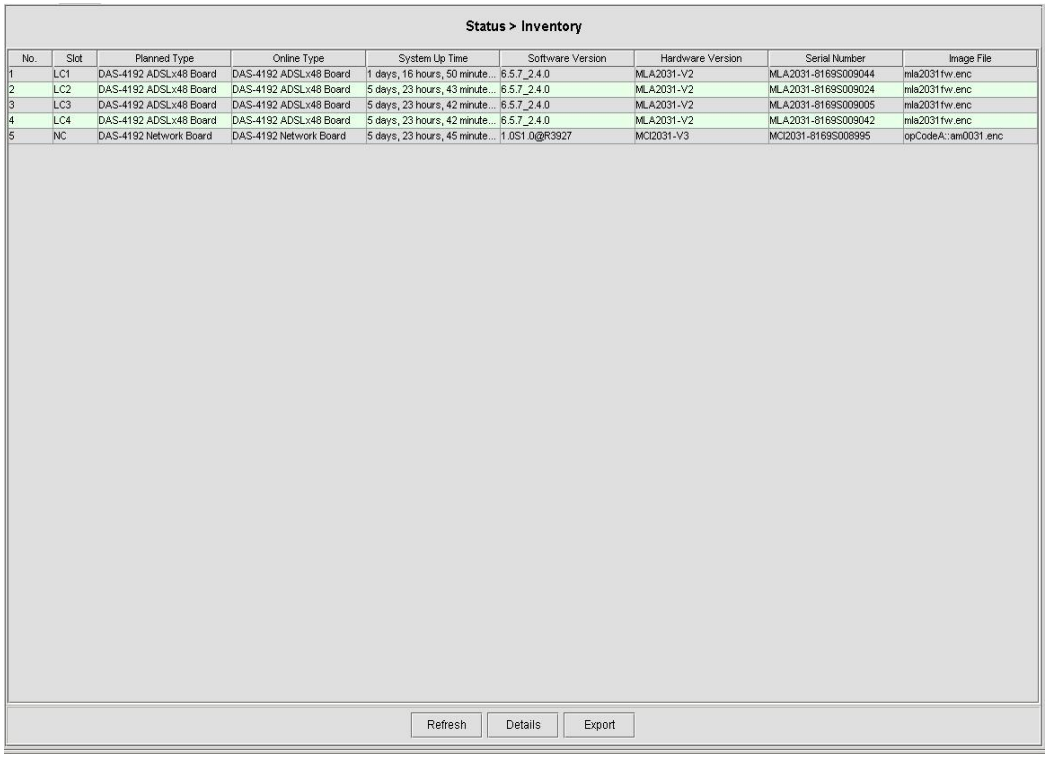


Figure 4-110 Inventory Information Details

Table 4-70 Inventory Information Description

Field	Description
List Table	
No.	This indicates the serial number of entry of the list table.
Slot	This indicates the location of board.
Planned Type	This indicates the board type planned to be equipped to the slot of DAS4 Series IP-DSLAM. If the planned type is mismatched (removed or type error) with online type detected from the system, the board mismatch alarm message will be reported.
Online Type	This indicates the observed board type of the card module in the slot (current type)
System Up Time	This indicates the period since the card is rebooted last.
Software Version	This indicates the software version running on the card.
Hardware Version	This indicates the hardware version of the card.
Serial Number	This indicates the hardware serial number of the card.
Image File	This indicates the file name of software running on the card.
Function Button	
Refresh	Click this button to refresh the **Inventory Information List**
Details	Click this button to view the details of selected profile.
Export	Click this button to save the contents of **Inventory Information** to the AMS Client
Close	Exit the **Inventory Information Details** Dialog.

4.17.2 NE Firmware Upgrade

AMS server provides the "NE Firmware Upgrade" dialog to upgrade the NC firmware image to NE through FTP.

The features of NE firmware upgrade are lists as follow:

- GUI base upgrade from remote AMS Client
- Support successful message and upgrade checksum to prevent mismatch data
- Service will not be interrupt during NE software upgrade until next reset

Follow the subsequent procedure to upgrade the NC firmware image. It is noted that the NC needs to be rebooted to execute the new image.

Step 1 Click Maintenance → Firmware Upgrade on **Main Menu** to open the **Firmware Upgrade** Dialog as shown in Figure 4-111. Table 4-71 depicts the related parameters.

Step 2 Click '**Browse**' button to choose the suitable firmware image file from host directory.

Step 3 Click '**Upgrade**' button to process.

Step 4 Reset the NC to execute the upgraded firmware.

Make sure the source image file that you select is accordant to the NE model, else the NE may not run well with the upgraded firmware image after rebooting.

Figure 4-111 NE Firmware Upgrade Dialog

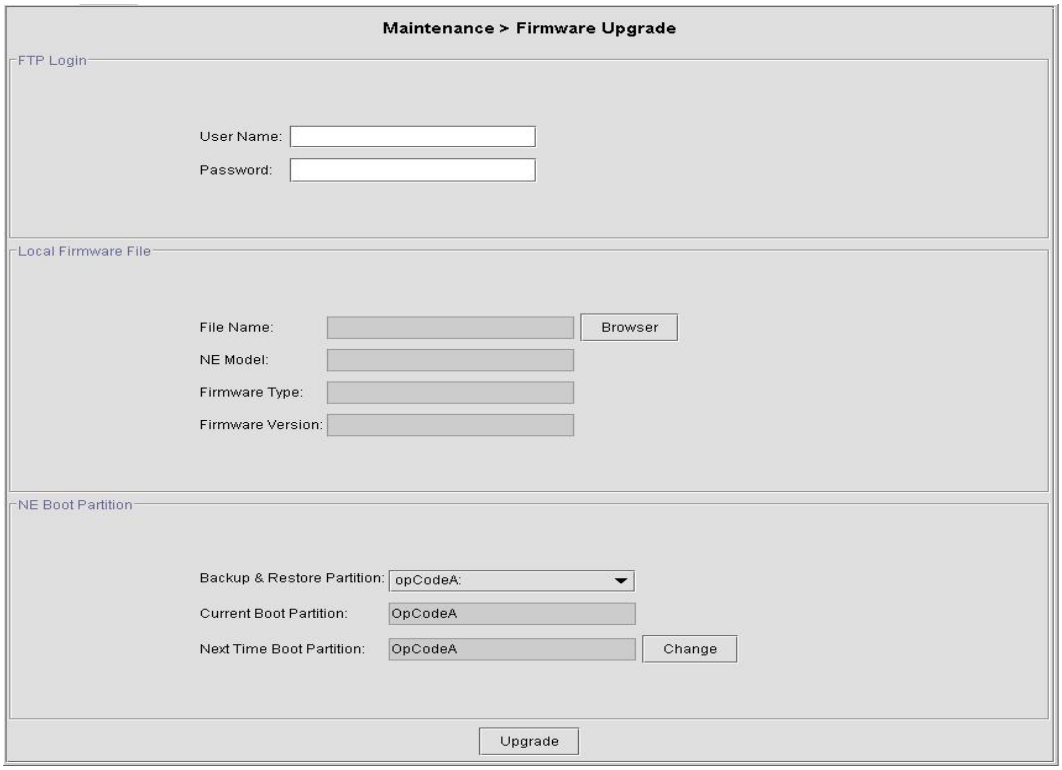


Table 4-71 NE Firmware Upgrade Dialog Description

Field	Description
FTP Login	
User Name	This indicates the user name of FTP to access the NE with administrator right.
Password	This indicates the password of FTP to access the NE with administrator right.
Local Firmware File	
File Name	Click the ‘Browse’ button to select a file of NC firmware or an ADSL LC firmware from your local host.
NE Model	This indicates the model name of the NE
Firmware Type	This indicates the firmware type for upgrade.
Firmware Version	This indicates the firmware version for upgrade.
NE Boot Partition (also refer to NE Boot Partition)	
Backup / Restore Partition	This specifies the boot partition where the upgraded file to be placed to or backup from.
Current Boot Partition	This specifies the current boot partition.
Next Time Boot Partition	This indicates the partition of NE for next booting. Click ‘Change’ button to change boot partition.
Function Button	
Upgrade	Start to upgrade the NC/ADSL LC firmware image of NE by sending the specified file on the local AMS server through FTP.

4.17.3 SHDSL LC Firmware Upgrade

AMS will provides the “NE SHDSL Firmware Upgrade” dialog to upgrade the SHDSL LC firmware image to NE through FTP in the future release.

4.17.4 NE Boot Partition

As the NE needs to be rebooted to execute the new image running on NC, follow the subsequent procedure to select boot partition when the NC reboots.

Step 1 Click Maintenance → NE Boot Partition on **Main Menu** to open the **NE Boot Partition** Dialog as shown in Figure 4-112.and Table 4-72 depicts the related parameters.

Step 2 Select the boot partition form ‘Next Time Boot Partition’ field to decide the booting image the NE will run whenever it is rebooted.

Figure 4-112 NE Firmware Boot Partition Dialog

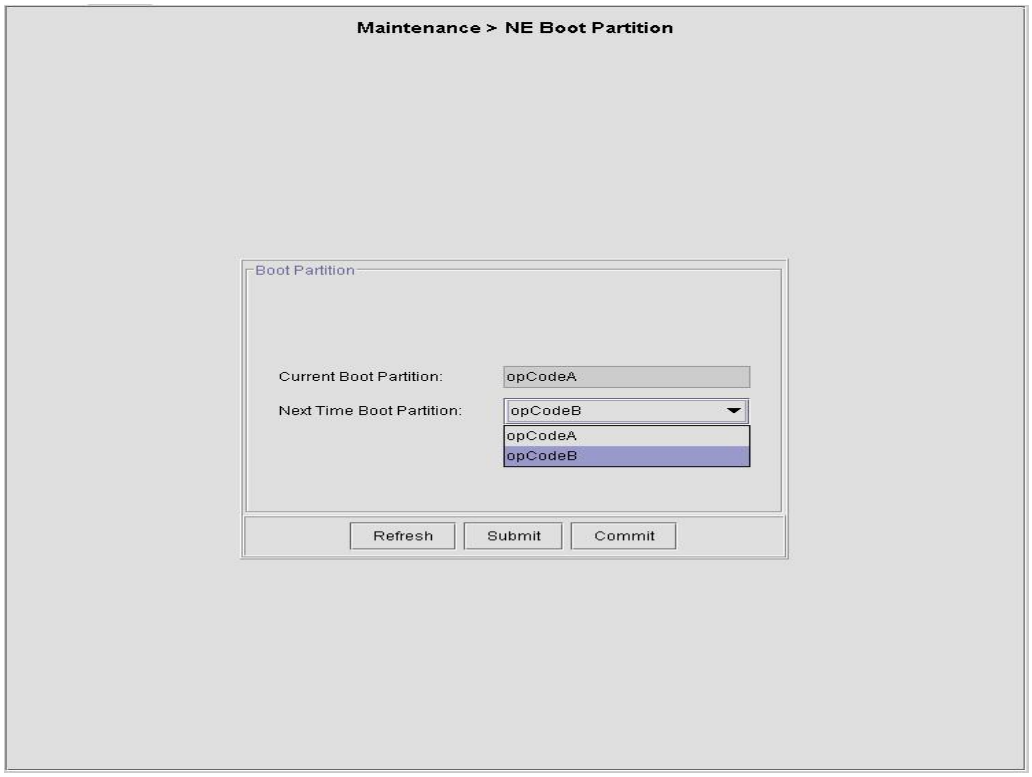


Table 4-72 NE Firmware Boot Partition Dialog Description

Field	Description
Current Boot Partition	This indicates the current boot partition.
Next Time Boot Partition	Use this combo-box to select the next boot partition.
Function Button	
Refresh	Click this button to refresh the **NE Firmware Boot Partition Dialog**
Submit	Click this button to apply the setting to NE
Commit	Click this button to apply the setting to NE

4.17.5 Reset the Unit

AMS supports to reset the NC, LC, xDSL subscriber port and NE.

Reset the NE

Follow either one of the subsequent procedures to reset the NE.

Procedure 1
Click Maintenance → Reset NE on **Main Menu** to open the **Reset NE Dialog** as shown in Figure 4-114

Or

Procedure 2

Step 1 Position the mouse cursor over the "NE frame" and then press the right mouse button to bring out the menu as shown in Figure 4-113.

Step 2 Select the 'Reset NE' option to launch the **Reset NE Dialog** as shown in Figure 4-114.

Figure 4-113 Illustration of resetting the NE

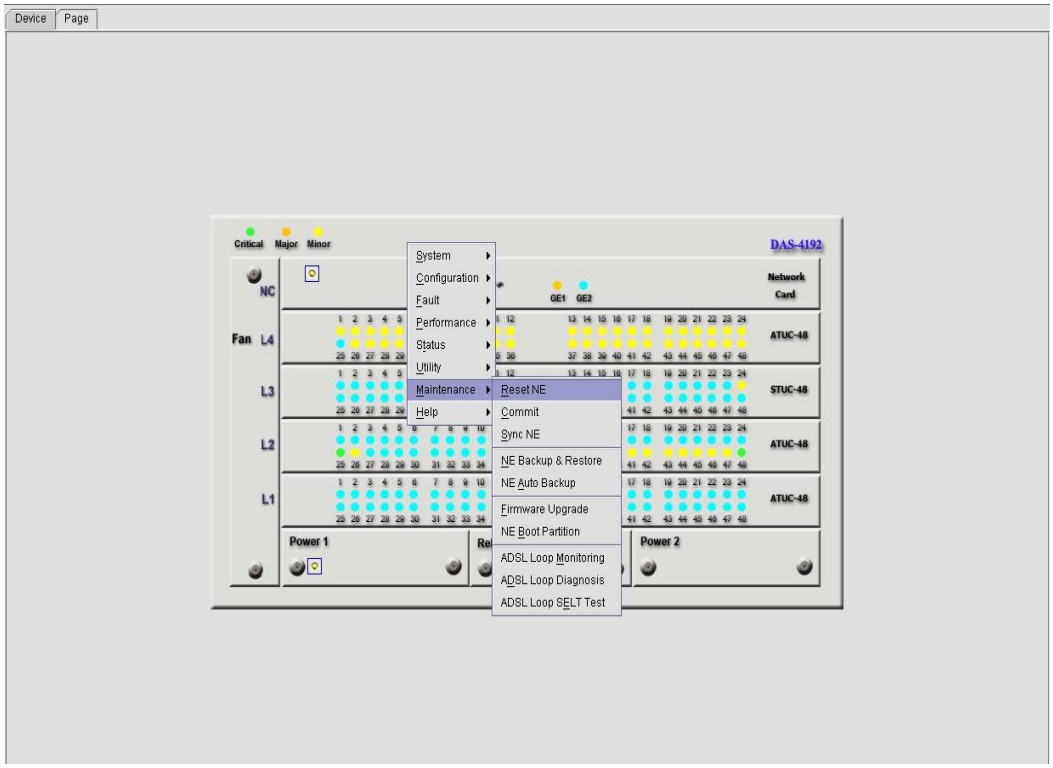
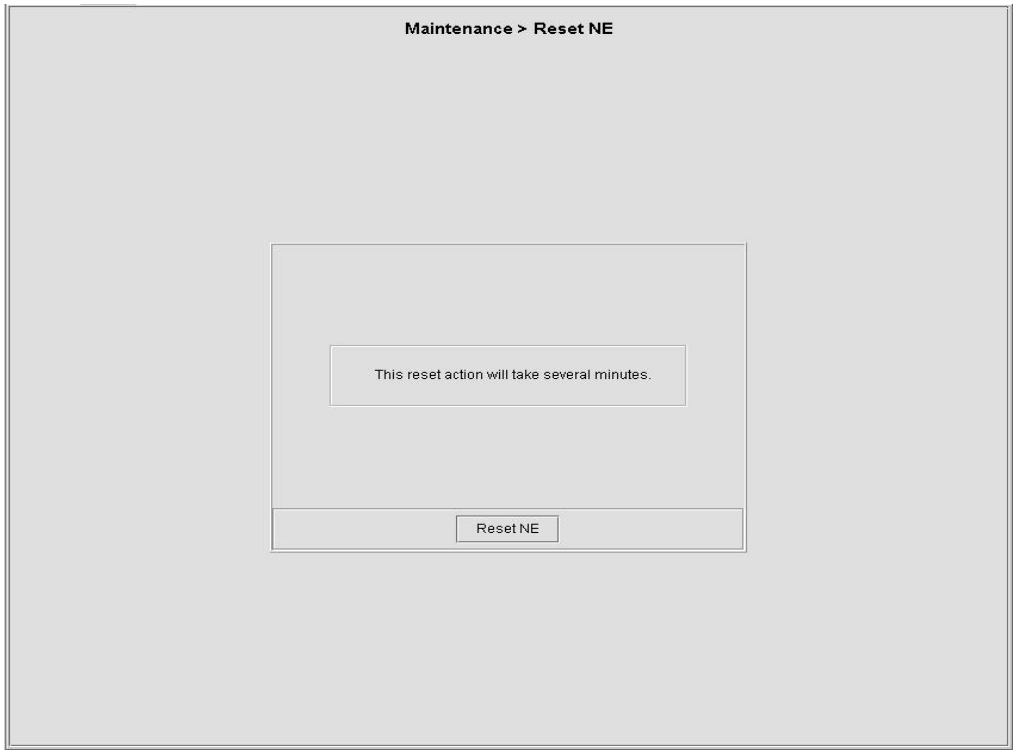


Figure 4-114 Reset NE Dialog



Reset the NC

Follow the subsequent procedure to reset the NC.

Step 1 Position the mouse cursor over an “NC object” and then press the right mouse button to bring out the menu as shown in Figure 4-115.

Step 2 Select the ‘Reset’ option to launch the **Reset Card Dialog** as shown in Figure 4-116.

Figure 4-115 Illustration of resetting the NC

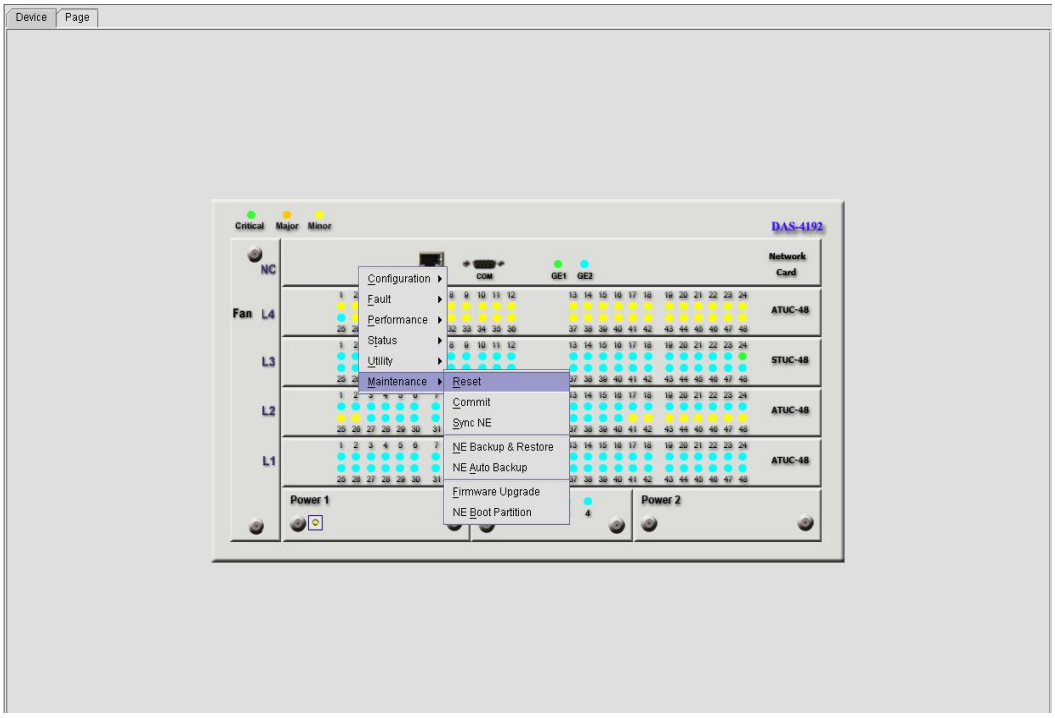


Figure 4-116 Reset Card Dialog

Reset the LC

Follow the subsequent procedure to reset LC.

Step 1 Position the mouse cursor over a “LC object” and then press the right mouse button to bring out the menu as shown in Figure 4-117or in Figure 4-118.

Step 2 Select the ‘Reset Card’ or ‘Reset SHDSL Card’ option to launch the **Reset Card Dialog** as shown in Figure 4-119.

Figure 4-117 Illustration of resetting an ADSL LC

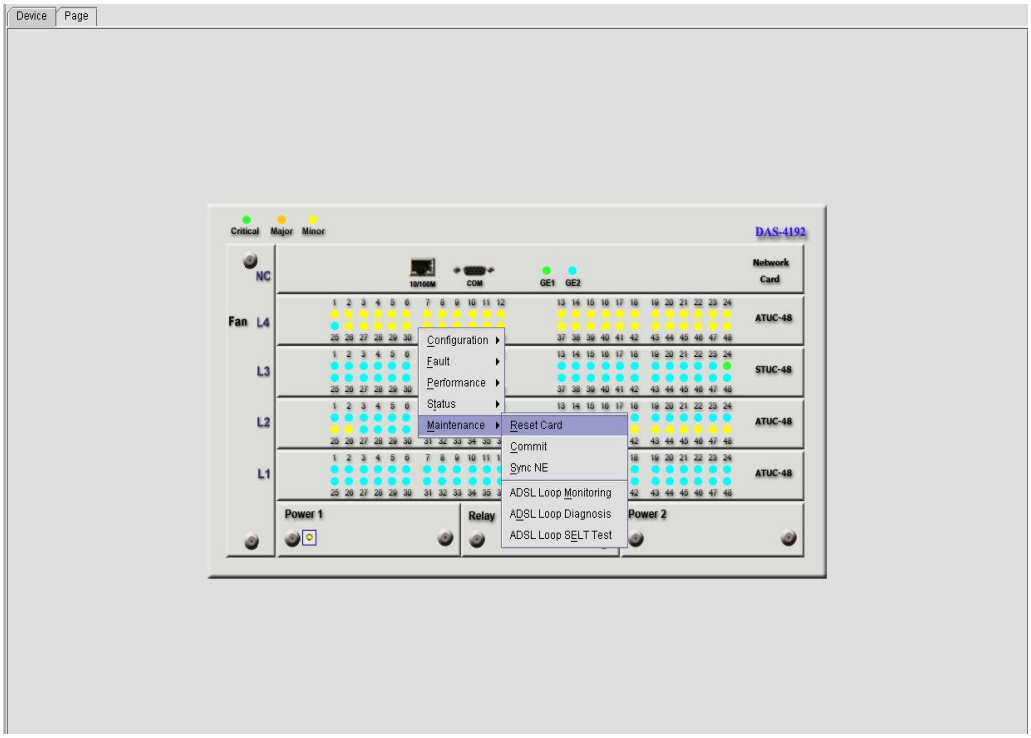


Figure 4-118 Illustration of resetting a SHDSL LC

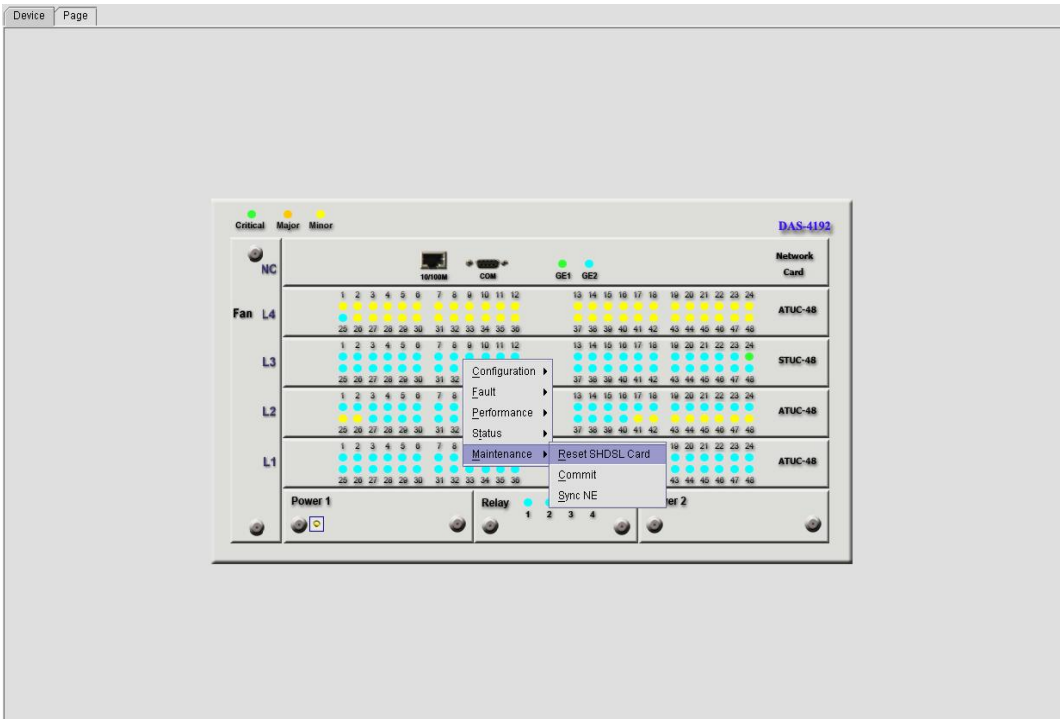


Figure 4-119 Reset Card Dialog

Reset the xDSL Subscriber Port

Follow the subsequent procedure to reset a port.

Step 1 Position the mouse cursor over a “port object” and then press the right mouse button to bring out the menu as shown in Figure 4-121.

Step 2 Select the ‘Reset Port’ option to launch the **Reset Line Dialog** as shown in Figure 4-121

Figure 4-120 Illustration of resetting a xDSL Subscriber Port

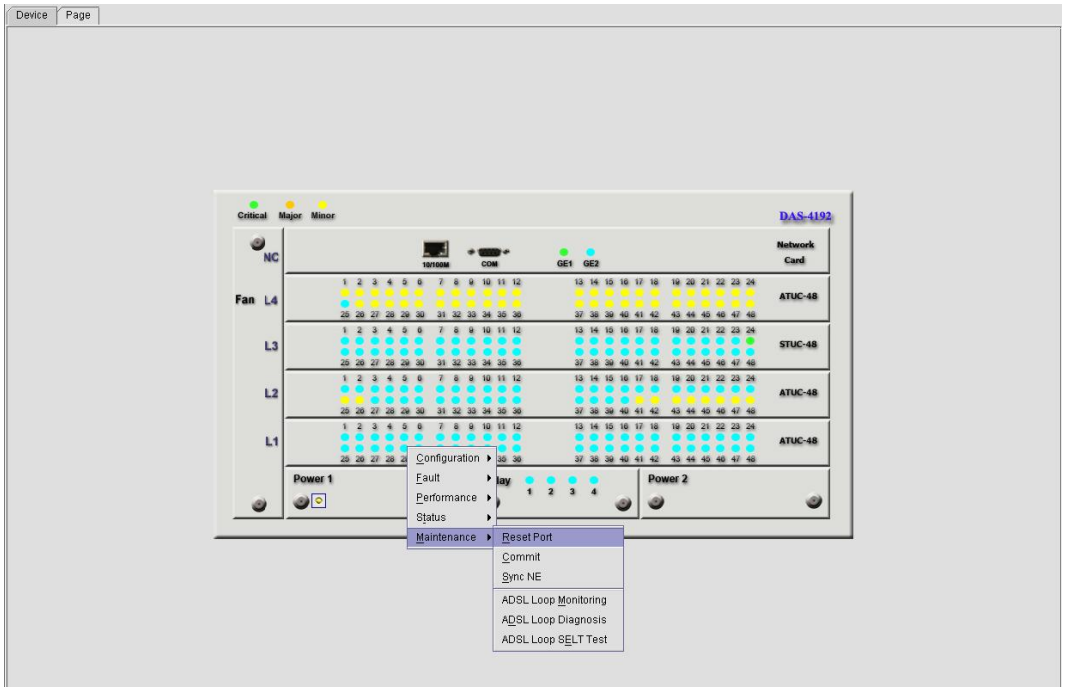


Figure 4-121 Reset xDSL Subscriber Line Dialog

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Chapter 5 Performance Management Functions

This chapter provides a general performance management overview and features of AMS. It contains concepts used in the network and service management for the NE.

This chapter contains the following sections:

- Performance Management General Functions
- Performance Management Features
- xDSL Line Status Diagnosis
- xDSL Line Current Performance Monitor
- xDSL Line Current Performance Information
- xDSL Line Historical Performance Information
- GE Interface Performance Statistics

5.1 Performance Management General Functions

Performance management provides functions to evaluate and report on the behavior of telecommunication equipment and the effectiveness of the network or NEs. Its role is to gather statistical data for the purpose of monitoring and correcting the behavior and effectiveness of the network to aid in planning and analysis.

An operator can search and monitoring performance data or performance log files of a selected NE. The performance record is classified into 15-min performance data and 24- hour performance data from which operator may perform analysis or evaluation accordingly.

Setup of Threshold Profile

AMS supports to configure the xDSL subscriber line performance threshold profile for both CO and CPE side as depicted in Section 4.7.

Scope of Performance Management on xDSL Subscriber Interface

AMS supports to gather the xDSL subscriber line performance information as follows.

- **PM Periodic for xDSL / GE:** Near End (CO) current 15 minutes/ 1 day/ previous 1 day, Far End (RT) current 15 minutes/ 1 day/ previous 1 day.
- **PM Parameter for ADSL:** LOS (Loss of Second), ES (Errored Second), SES (Severely Errored Second), UAS (Unavailable Second), Tx Cell, Rx Blocks, Tx Blocks, correct Blocks, uncorrected Blocks, full initialization count, Code Violation on both CO and RT side, and more.
- **PM Parameter for SHDSL:** LOSW (Loss of Second Word), ES (Errored Second), SES (Severely Errored Second), UAS (Unavailable Second), Tx Cell on both CO and RT side, and more.

Scope of Performance Management on GE Network Interface

AMS supports to gather the GE Network interface performance information such as unicast packets, non-unicast packets, error packets, and discarded packets for both incoming and outgoing direction on demand.

Traffic Statistics Function

The performance information is able to retrieve the Tx/Rx traffic data, which include raw data on GE Network interface in packets and ADSL/SHDSL subscriber interface in cells.

Monitor xDSL Operation Status

The AMS supports to retrieve the following status parameter of xDSL interface.

- **ADSL Operation Status Parameter:** For both downstream and upstream supports SNR margin, line attenuation, output power, current rate, interleaving delay, attainable rate, previous rate, channel characteristics per sub-carrier, quiet line noise PSD per sub-carrier, Corrected block, Uncorrected block, and CRC.

- **SHDSL Operation Status Parameter:** For both downstream and upstream supports SNR margin, current rate, line attenuation, output power, and CRC.

5.2 Performance Management Features

AMS provides the function of Performance Management (PM) that periodically receives and indicates the PM to the NEs. The performance parameters included Loss of Signal seconds (LOS), far-end and near-end Errored Second (ES), Severely Errored Second (SES), Unavailable Second (UAS) and etc. Those parameters help the operator to analysis the network performance in ADSL/SHDSL, and Network uplink interfaces.

The features of performance management functions include the following:

- Viewing performance management on Network interface and xDSL subscriber interfaces
- Support monitoring on subscriber operation status
- The analysis result can be displayed and printed in graphical or tabular formats, the performance value in able to export in ASCII format.

5.3 xDSL Line Status Diagnosis

The AMS supports the following five xDSL line status related diagnosis functions.

- xDSL Port Rate Status
- ADSL Loop Bits Allocation Monitoring
- Loop Monitoring
- Loop Diagnosis (DELT <Dual-Ended Line Test>)
- Loop SELT Test (Single End Loop Test)

5.3.1 xDSL Port Rate Status

Follow the subsequent procedure to monitor the ADSL current rate status.

Step 1 Click Status → xDSL Port Rate Status → on **Main Menu** to open the **xDSL Port Rate Dialog** as shown in Figure 5-1.

Step 2 Select the port to show its current xDSL port rate status. It is noted that the loop parameters of ADSL port and SHDSL port are different. Depending on the port you select, either the **ADSL Port Rate Status Dialog** or **SHDSL Port Rate Status Dialog** appears. Figure 5-1shows the **ADSL Port Rate Status Dialog** and Table 5-1 depicts the corresponding parameter descriptions. As to the **SHDSL Port Rate Status Dialog**, it is shown in Figure 5-2. The corresponding descriptions are depicted in Table 5-2.

Figure 5-1 ADSL Port Rate Status Dialog

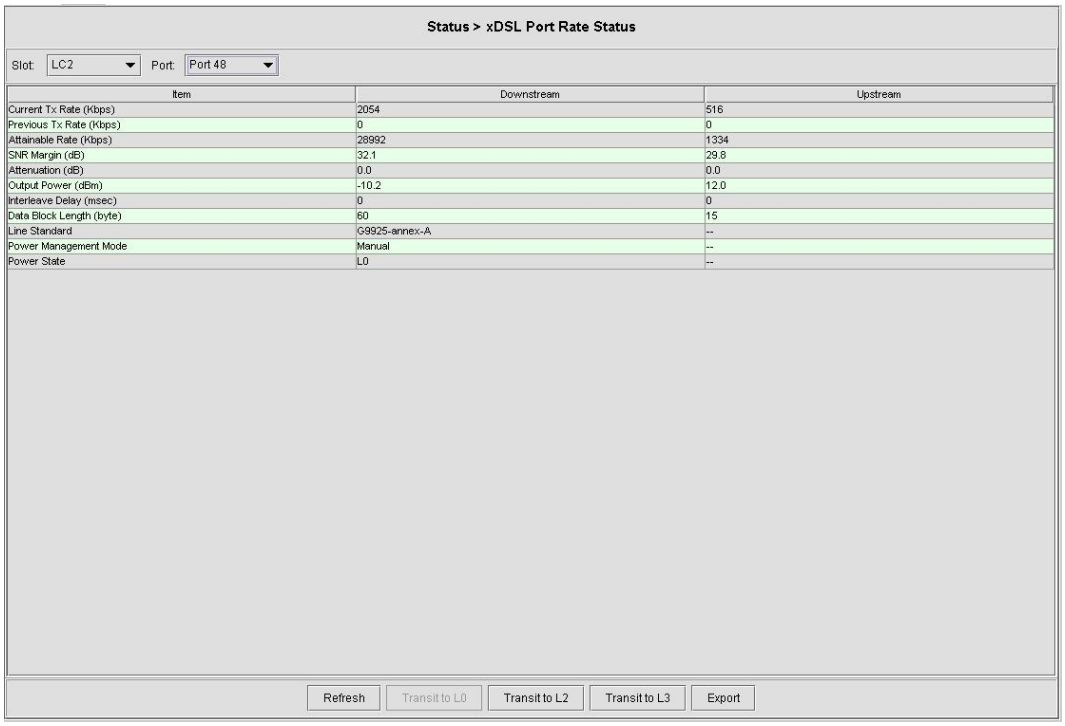


Table 5-1 ADSL Port Rate Status Dialog Description

Field	Description
List Table	
Slot-Port	This specifies the location of ADSL port
Current Tx Rate (Kbps)	This indicates the current DS/US transmit rate in unit of Kbps. (in the current show-time)
Previous Tx Rate (Kbps)	This indicates the previous DS/US transmit rate in unit of Kbps. (in the last show-time)
Attainable Rate (Kbps)	This indicates the DS/US attainable rate in unit of Kbps.
SNR Margin (dB)	This indicates the DS/US SNR margin in unit of dB.
Attenuation (dB)	This indicates the DS/US attenuation in unit of dB.
Output Power (dBm)	This indicates the DS/US output power in unit of dBm.
Interleave Delay (msec)	This indicates the DS/US interleave delay whenever the line is in the interleaved mode.
Data Block Length (byte)	This indicates the DS/US ADSL data block length in unit of octet.
Line Standard	This indicates the adopted for the current ADSL connection.
Power Management Mode	This indicates the power management mode, either manual or. Automatic.
Power State	This indicates the power management state of this subscriber port per ITU-T 992.3.

Table 5-1 ADSL Port Rate Status Dialog Description (Continued)

Field	Description
Function Button	
Refresh	Click this button to refresh the specified threshold value.
Transit to L0	Click this button to force the power management state to L0 per ITU-T 992.3.
Transit to L2	Click this button to set the power management state to L2 per ITU-T 992.3.
Transit to L3	Click this button to set the power management state to L3 per ITU-T 992.3.
Export	Click this button to save the contents of **ADSL Port Rate Status List** to the AMS client

Please refer to ITU-T 992.3 for the details of state transition among the power management state L0, L2 and L3.

Figure 5-2 SHDSL Port Rate Status Dialog

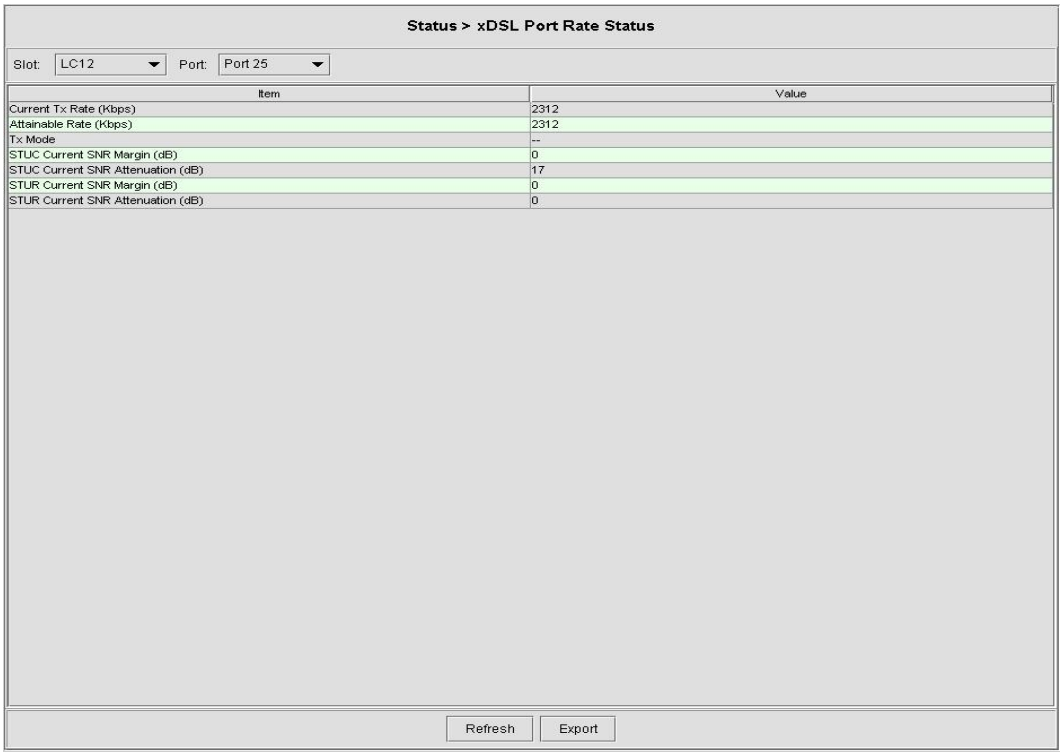


Table 5-2 SHDSL Port Rate Status Dialog Description

Field	Description
List Table	
Slot-Port	This specifies the location of SHDSL port
Current Tx Rate (Kbps)	This indicates the current DS/US transmit rate in unit of Kbps. (in the current show-time)
Attainable Rate (Kbps)	This indicates the DS/US attainable rate in unit of Kbps.
Tx Mode	This indicates the transmission mode, either 'Annex A' or 'Annex B'.
STUC Current SNR Margin (dB)	This indicates the DS SNR margin in unit of dB.
STUC Current SNR Attenuation (dB)	This indicates the DS SNR attenuation in unit of dB.
STUR Current SNR Margin (dB)	This indicates the US SNR margin in unit of dB.
STUR Current SNR Attenuation (dB)	This indicates the US SNR attenuation in unit of dB.
Function Button	
Refresh	Click this button to refresh the specified threshold value.
Export	Click this button to save the contents of **ADSL Current Rate Status List** to the AMS client.

5.3.2 ADSL Loop Bits Allocation Monitoring

The bit allocation monitoring function allows the operator to observe the number of bits carried on each tone of ADSL line in show-time.

Follow the subsequent procedure to monitor the bit allocation status on the specified ADSL connection.

Step 1 Click Status → xDSL Bits Allocation on **Main Menu** to open the **ADSL Loop Bit Allocation Status** Dialog as shown in Figure 5-3.

Step 2 Select the port to show its **bit allocation status** as shown in Figure 5-3. Table 5-3 depicts the related parameters.

Step 3 Click the **Graph** button to show the corresponding 2D graph as shown in Figure 5-4.

Figure 5-3 ADSL Loop Bit Allocation Status Dialog

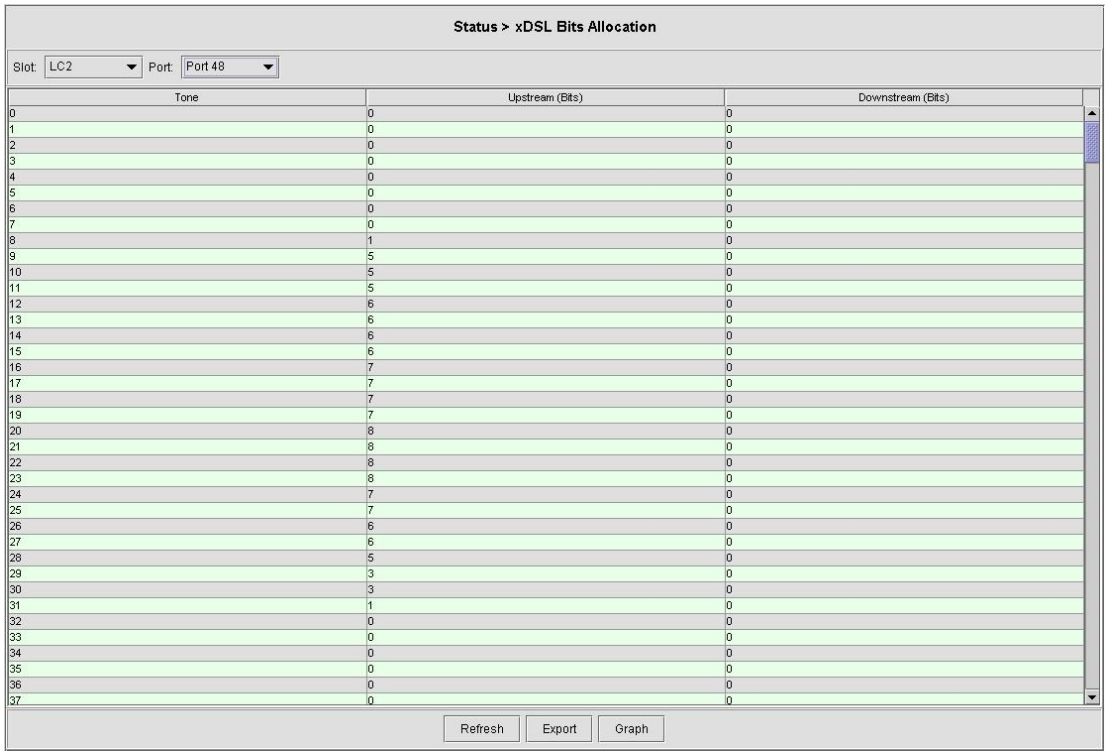
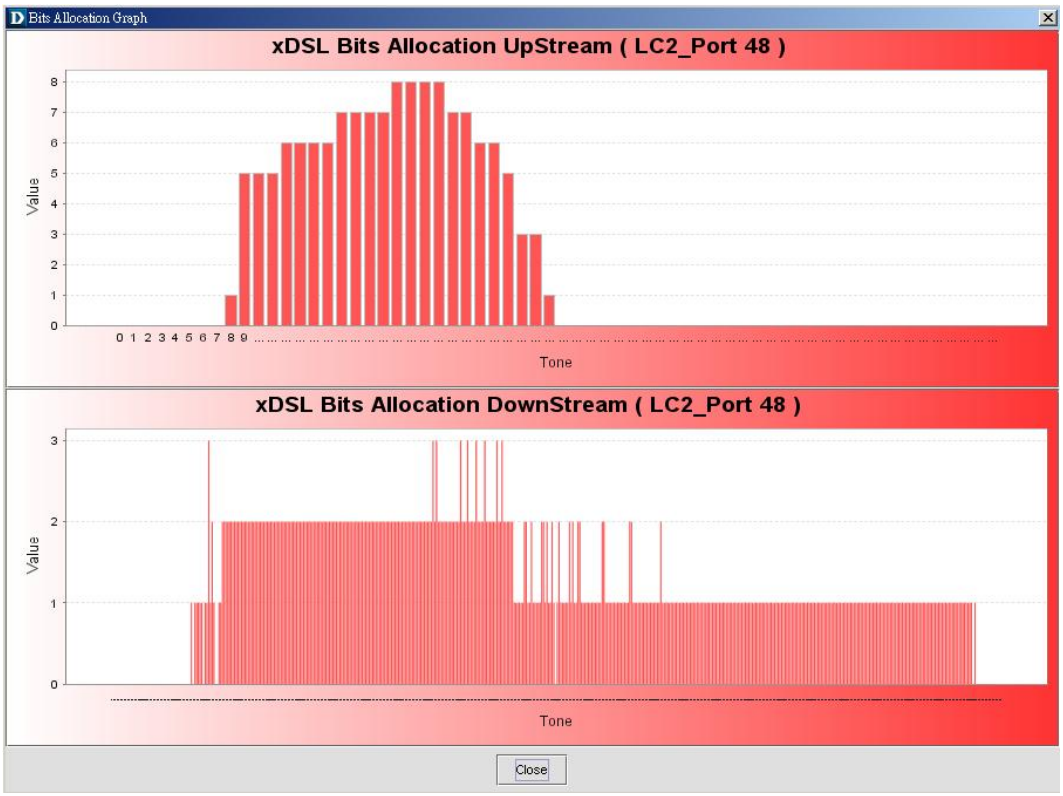


Table 5-3 ADSL Bit Allocation Status Dialog Description

Field	Description
List Table	
Slot-Port	This specifies the location of ADSL port
Tone	This indicates number of tone index.
Upstream (Bits)	This indicates the upstream bit allocation of the specified tone.
Downstream (Bits)	This indicates the downstream bit allocation of the specified tone.
Function Button	
Refresh	Click this button to refresh the bit allocation list table.
Export	Click this button to save the contents of **ADSL Bit Allocation Status List** to the AMS client.
Graph	Click this button to display the graph for the bit allocation.

Figure 5-4 Graph of Bit Allocation



5.3.3 Loop Monitoring

The loop monitoring function provides the records of ADSL loop characteristics measured during the last training. It is noted that the measured results are only available in the show-time.

Step 1 Click Maintenance → ADSL Loop Monitoring on **Main Menu** to open the **ADSL Loop Monitoring Dialog.**.

Step 2 Select the port to show its loop characteristic as shown in Figure 5-5. Table 5-4 depicts the related parameters.

Step 3 Press Start button to get starting.

Step 4 Click **Graph** button to open the **Graph of Loop Monitoring – Magnitude** Dialog as shown in Figure 5-6.

Step 5 In the **Graph of Loop Monitoring – Magnitude** Dialog, click **Magnitude** tab to view the magnitude of transfer function per tone as shown in Figure 5-6
Or
In the **Graph of Loop Monitoring – Magnitude** Dialog , click **Quiet Line PSD** tab to view the Quiet Line PSD per tone as shown in Figure 5-7

.

NOTE Please refer to ITU-T 992.3 for the details of loop monitoring parameters.

NOTE In comparison with the DELT, the ADSL loop is not corrupted whenever the operator performs the loop monitoring function.

Figure 5-5 ADSL Loop Monitoring Dialog

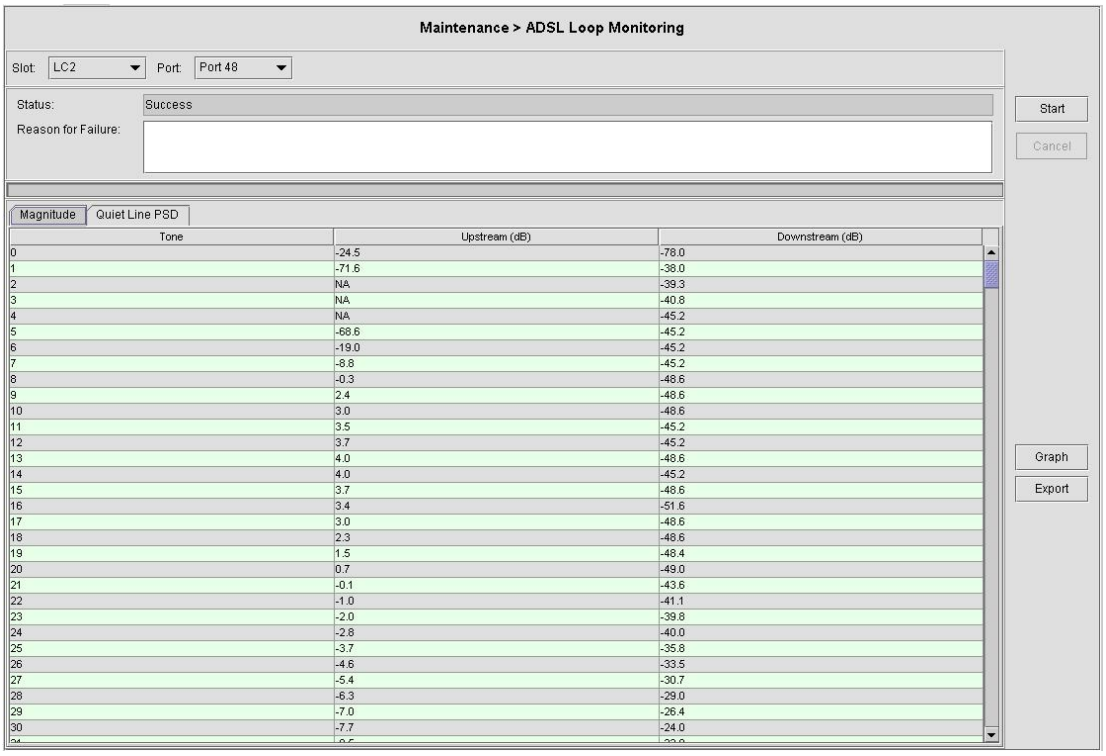


Table 5-4 ADSL Loop Monitoring Dialog Description

Field	Description
List Table	
Slot-Port	This specifies the location of ADSL port
Status	This indicates the status of the loop monitoring.
Reason for Failure	This indicates the result of failure case.
Magnitude Dialog (The magnitude of ADSL line transfer function)	
Tone	This indicates the serial number of tone.
Upstream (dB)	This indicates the magnitude of transfer function per tone of the upstream channel.
Downstream (dB)	This indicates the magnitude of transfer function per tone of the downstream channel.
Quiet Line PSD Dialog (PSD of Quiet Line Noise)	
Tone	This indicates the serial number of tone.
Upstream (dB)	This indicates the quiet line noise PSD per tone of the upstream channel.
Downstream (dB)	This indicates the quiet line noise PSD per tone of the downstream channel.
Function Button	
Start	Click this button to start the loop monitoring function.
Graph	Click this button to display the resultant graph of loop monitoring.
Export	Click this button to save the contents of **xDSL Loop Monitoring List** to the AMS client.
Cancel	Stop the ADSL Loop Monitoring process.

Figure 5-6 Graph of Loop Monitoring – Magnitude Dialog

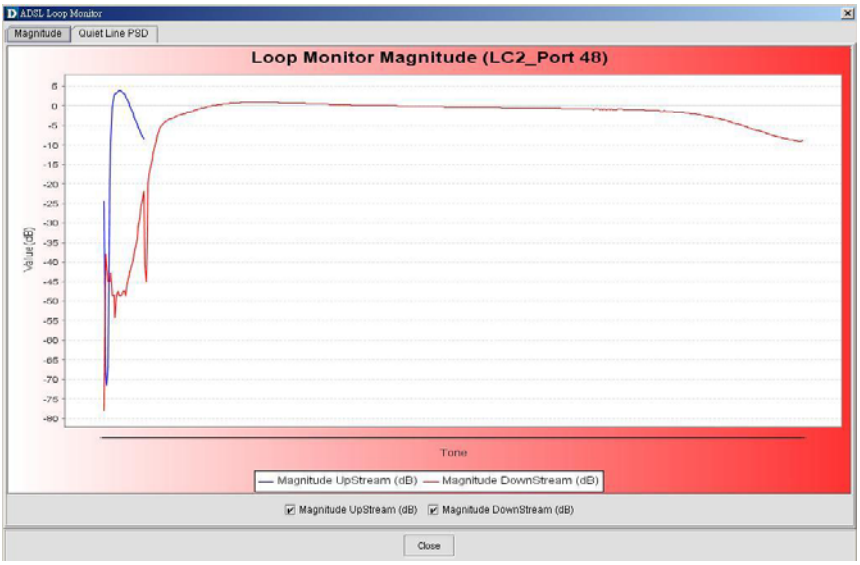
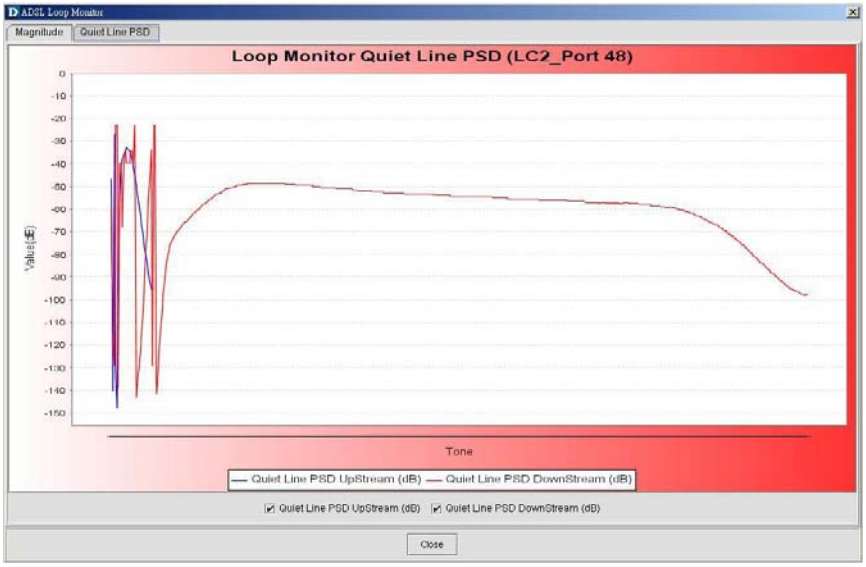


Figure 5-7 Graph of Loop Monitoring – Quiet Line Noise PSD Dialog



5.3.4 Loop Diagnosis (DELT <Dual-Ended Line Test>)

The DELT loop diagnosis function provides mechanism to measure the ADSL loop quality. This action will interrupt the ADSL connection. However, more detailed inform are gathered in comparison with the aforementioned loop monitoring function.

Step 1 Click Maintenance → ADSL Loop Diagnosis on **Main Menu** to open the **ADSL Loop Diagnosis Dialog** as shown in Figure 5-8.

Step 2 Select the port to show its **Loop Diagnosis** as shown in Figure 5-8. Table 5-5 depicts the related parameters.

Step 3 Press Start button to get starting.

Step 4 Click **Magnitude** button to view the magnitude of transfer function per tone. And click **Graph** button to show the graph of the Magnitude of transfer function as shown in Figure 5-9

Or
Click **Quiet Line PSD** button to view the Quiet Line Noise PSD per tone. And click **Graph** button to show the graph of the Quiet Line Noise PSD per tone as shown in Figure 5-10
Or
Click **SNR** button to view the SNR per tone. And click **Graph** button to show the graph of the SNR per tone as shown in Figure 5-11

In comparison with the loop monitoring function, the ADSL loop is corrupted whenever the operator performs the DELT.

Figure 5-8 ADSL Loop Diagnosis Dialog

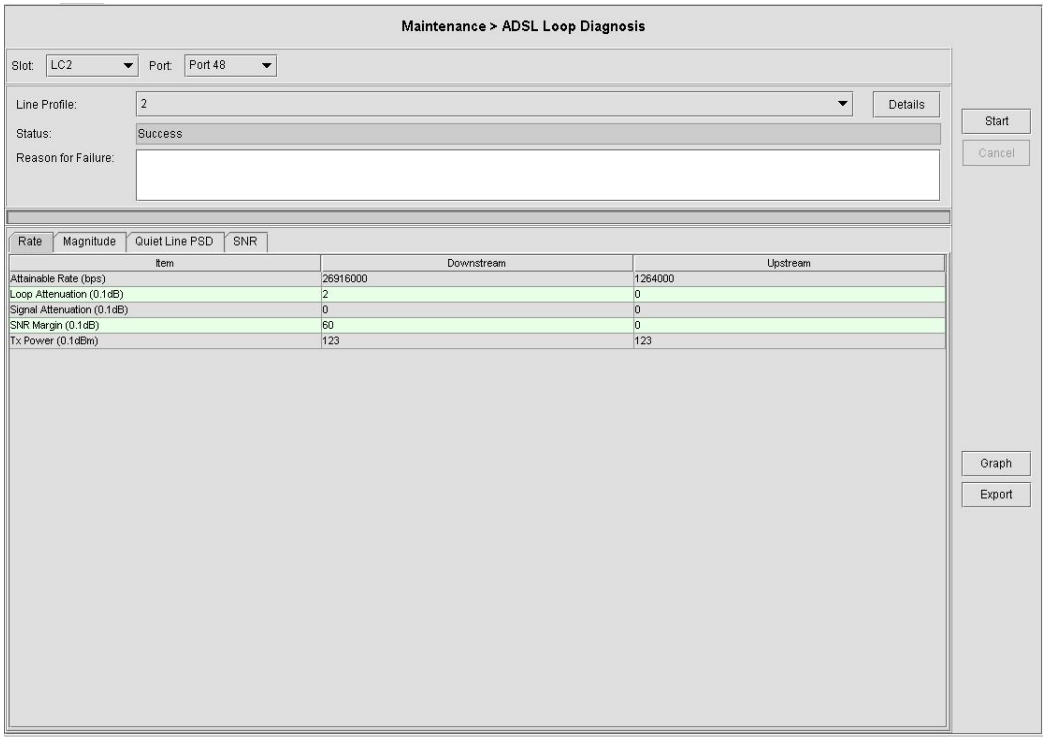


Table 5-5 ADSL Loop Diagnosis Dialog Description

Field	Description
List Table	
Slot-Port	This specifies the location of ADSL port
Line Profile	Use this combo-box to select the line profile to test.
Status	This indicates the status of the DELT.
Reason for Failure	This indicates the result of failure case.
Rate Dialog	
Attainable Rate (bps)	This displays the attainable rate of DELT.
Loop Attenuation (0.1dB)	This displays the loop attenuation of DELT.
Signal Attenuation (0.1dB)	This displays the signal attenuation of DELT.
SNR Margin (0.1dB)	This displays the SNR margin value of DELT.
Tx Power (0.1dB)	This displays the transmit power value of DELT.

Table 5-5 ADSL Loop Diagnosis Dialog Description (Continued)

Field	Description
Magnitude Dialog (The magnitude of ADSL line transfer function)	
Tone	This indicates the number of the tone.
Upstream (dB)	This indicates the magnitude of transfer function per tone of the upstream channel.
Downstream (dB)	This indicates the magnitude of transfer function per tone of the downstream channel.
Quiet Line PSD Dialog (PSD of Quiet Line Noise)	
Tone	This indicates the serial number of the tone.
Upstream (dB)	This indicates the quiet line noise PSD per tone of the upstream channel.
Downstream (dB)	This indicates the quiet line noise PSD per tone of the downstream channel.
SNR Dialog	
Tone	This indicates the number of the tone.
Upstream (dB)	This indicates the upstream SNR of the specified tone.
Downstream (dB)	This indicates the downstream SNR of the specified tone.
Function Button	
Start	Click this button to start the DELT function.
Graph	Click this button to display the result graph of DELT.
Export	Click this button to save the results of **ADSL Loop Diagnosis (DELT)** to the AMS client
Cancel	Stop the ADSL Loop Diagnosis (DELT) process.

NOTE Please refer to ITU-T 992.3 for the details of loop diagnostics (DELT) parameters.

NOTE ‘Upshift Noise Margin’, ‘Downshift Noise Margin’, ‘Upshift Time’ and ‘Downshift Time’ are only applied to the Rate Mode ‘Adaptive at Run-Time’.

Figure 5-9 Graph of DELT result – Magnitude

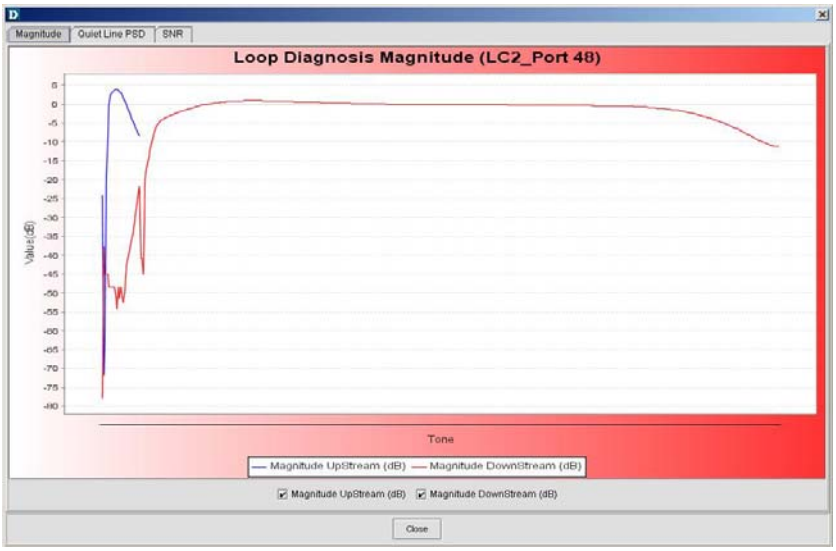


Figure 5-10 Graph of DELT result – Quiet Line PSD

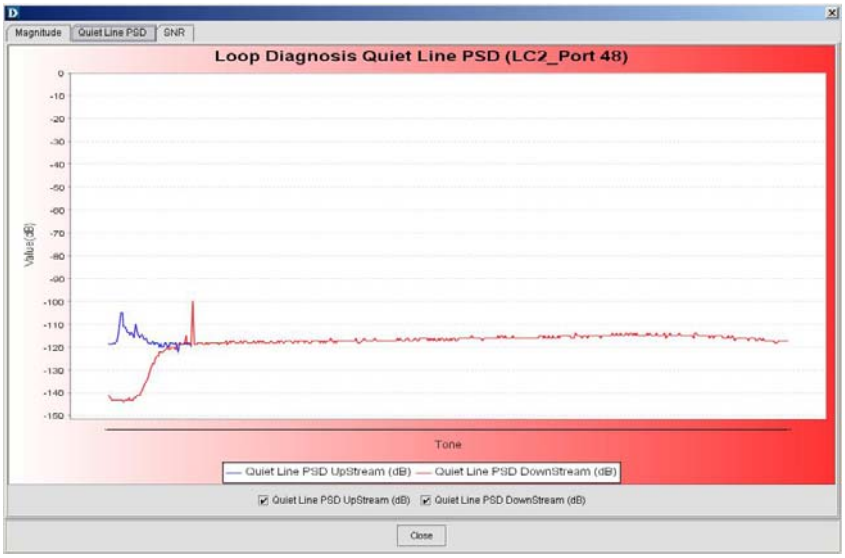
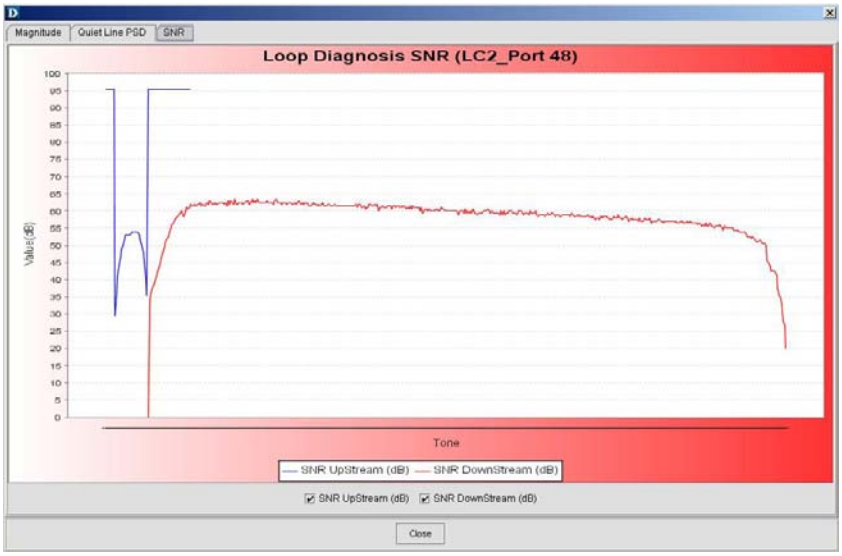


Figure 5-11 Graph of DELT result – SNR



5.3.5 Loop SELT Test (Single End Loop Test)

The SELT loop function diagnosis function is to estimate the distance of the DSL connection from the NE to the subscriber's location without connecting a subscriber device.

Step 1 Click Maintenance → ADSL Loop SELT Test on **Main Menu** to open the **ADSL Loop SELT Test** Dialog as shown in Figure 5-12.

Step 2 Select the port to show its **ADSL Loop SELT Test** as shown in Figure 5-12 and Table 5-6 depicts the related parameters.

Step 3 Press Start button to get starting.

Figure 5-12 ADSL Loop SELT Test

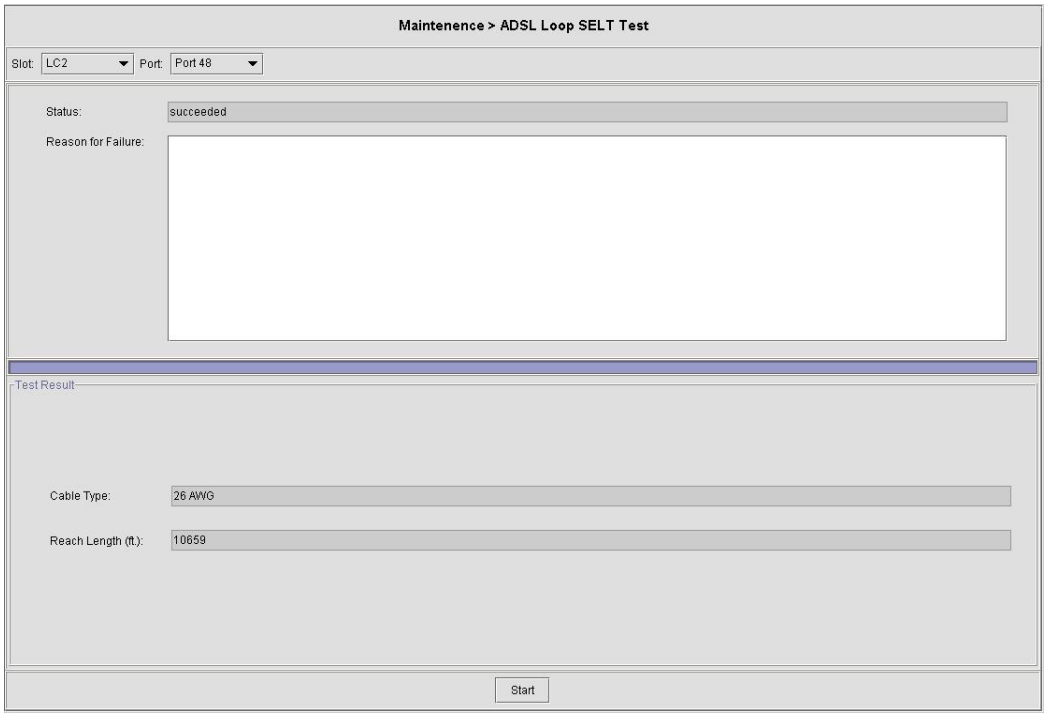


Table 5-6 ADSL Loop SELT Test Dialog Description

Field	Description
List Table	
Slot-Port	This specifies the location of ADSL port
Status	This indicates the status of the SELT.
Reason for Failure	This indicates the result of failure case.
Test Result	
Cable Type	This displays the estimated cable type.
Reach Length (ft.)	This displays the estimated cable length.
Function Button	
Start	Click this button to start the SELT.

Please refer to ITU-T 992.3 for the details of SELT.

5.4 xDSL Line Current Performance Monitor

Follow the subsequent procedure to monitor the current xDSL line performance via 2D graph..

Step 1 Click Performance → xDSL Current Performance Monitor on **Main Menu** to open the **xDSL Current Performance Monitor Dialog**.

Step 2 Select the port to show its current 2D xDSL performance graph. It is noted that the performance data of ADSL port and SHDSL port are different. Depending on the port you select, either the **ADSL Current Performance Monitor Dialog** or **SHDSL Current Performance Monitor Dialog** appears as shown in Figure 5-13 and Figure 5-14, respectively. Table 5-7depicts the corresponding parameter descriptions.

Figure 5-13 ADSL Current Performance Monitor Dialog

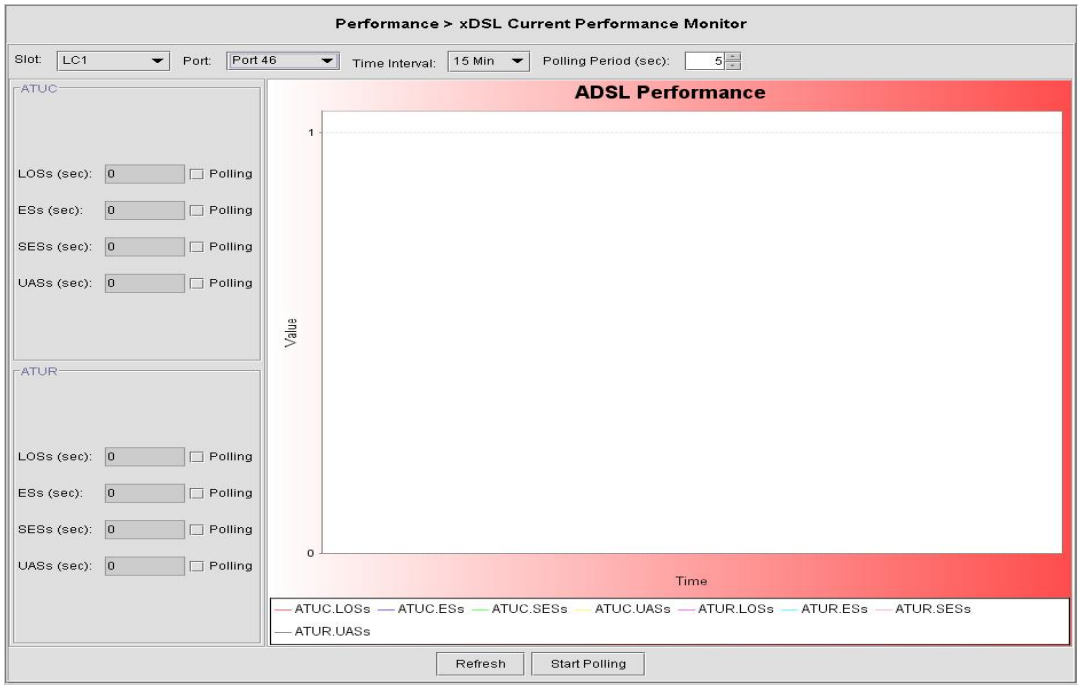


Figure 5-14 SHDSL Current Performance Monitor Dialog

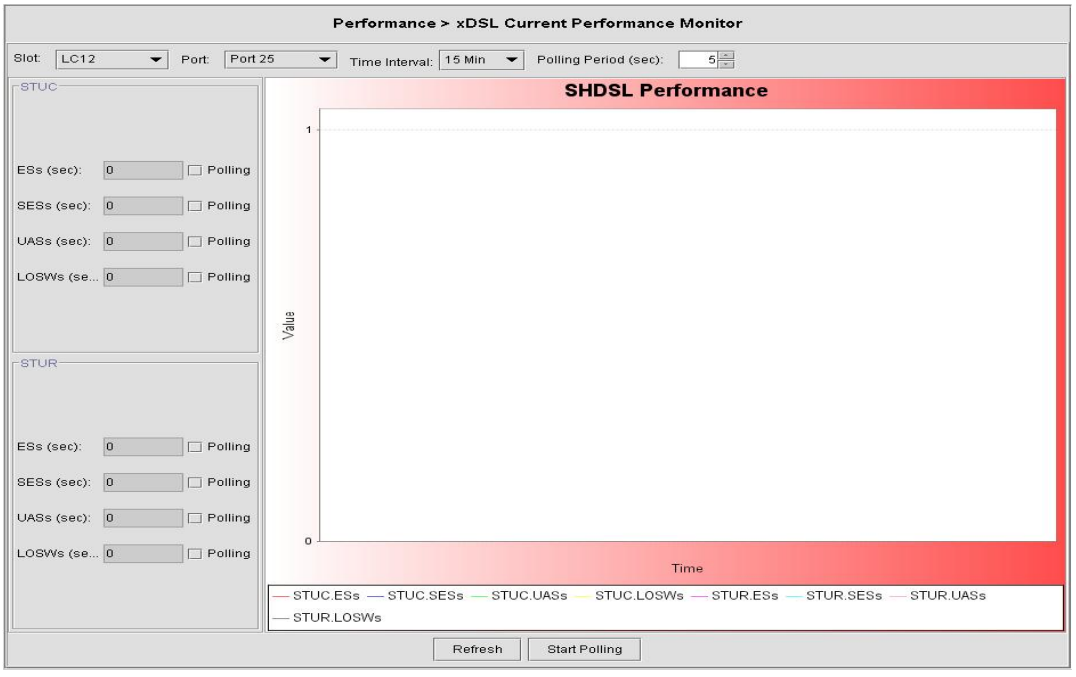


Table 5-7 ADSL/SHDSL Current Performance Monitor Dialog Description

Field	Description
List Table	
Slot-Port	This indicates the location of the ADSL port.
Time Interval	This indicates the unit of time interval on the x-axis of the displayed 2D graph. Either 15-miniute or 1-Day.
Polling Period (sec)	This specifies the period between the AMS server to consecutively poll the current PM data.
LOSs (sec)	This indicates the count of Loss of Signal Second during the current accumulated period.
ESs (sec)	This indicates the count of Error Second during the current accumulated period.
SESs (sec)	This indicates the count of Severely Error Second during the current accumulated period.
UASs (sec)	This indicates the count of Unavailable Error Second during the current accumulated period.
Function Button	
Refresh	Click this button to refresh the List Table.
Start Polling	Click this button to start to poll the NE.

5.5 xDSL Line Current Performance Information

Follow the subsequent procedure to obtain data for evaluating the current xDSL line performance.

Step 1 Click Performance → xDSL Current Performance on **Main Menu** to open the **xDSL Current Performance** Dialog.

Step 2 Select the port to show its current performance information. It is noted that the performance data of ADSL port and SHDSL port are different. Depending on the port you select, either the **ADSL Current Performance Dialog** or **SHDSL Current Performance Dialog** appears. Figure 5-15shows the **ADSL Current Performance Dialog** and Table 5-8 depicts the corresponding parameter descriptions. As to the **SHDSL Current Performance Dialog**, it is shown in Figure 5-16. The corresponding descriptions are depicted in Table 5-9.

Figure 5-15 ADSL Current Performance Dialog

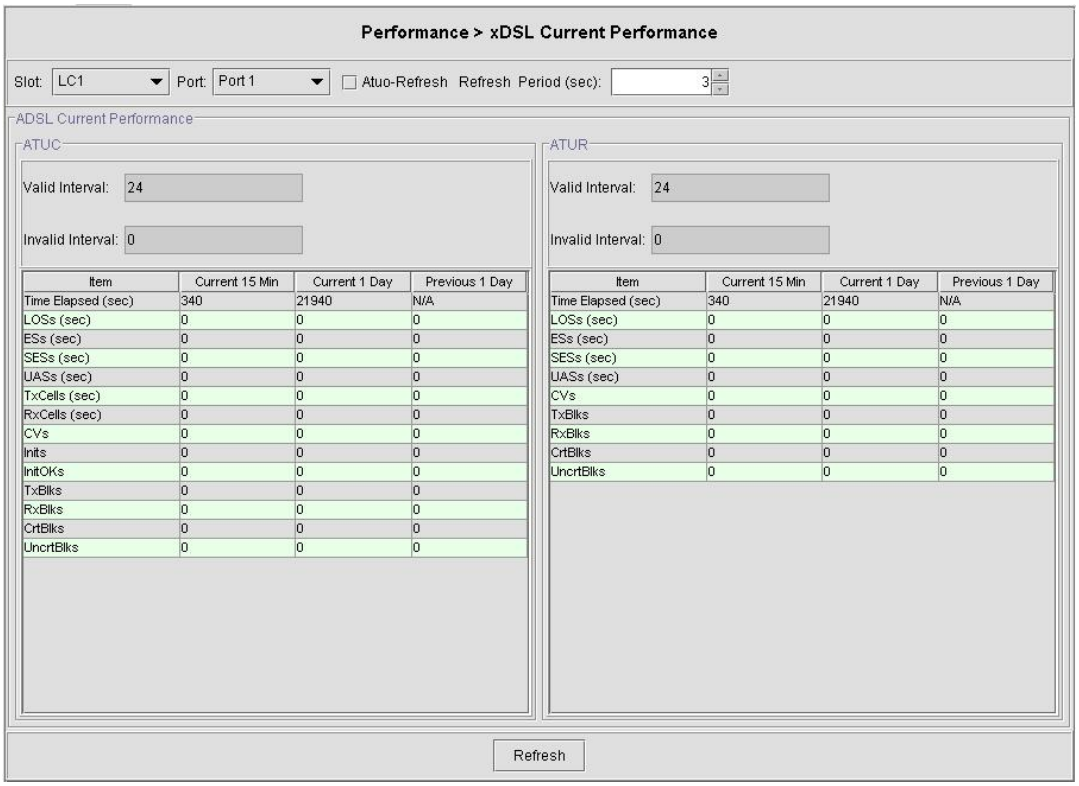


Table 5-8 ADSL Current Performance Dialog Description

Field	Description
List Table	
Slot-Port	This indicates the location of the ADSL port.
Auto-Refresh	Check the check-box to auto-refresh this dialog.
Refresh period (sec)	This specifies the period between the AMS server to consecutively refresh the current performance data.
Valid Intervals	The number of previous 15-minute intervals in the list table for which data was collected.
Invalid Intervals	The number of intervals in the range from 0 to the value of "Valid Intervals" for which no data is available. This object will typically be zero except in cases where the data for some intervals are not available.
Time Elapsed (sec)	This indicates the time elapsed in the current 15-miniute interval.
LOSs (sec)	This indicates the count of Loss of Signal Second during the current accumulated period.
ESs (sec)	This indicates the count of Error Second during the current accumulated period.
SESs (sec)	This indicates the count of Severely Error Second during the current accumulated period.
UASs (sec)	This indicates the count of Unavailable Error Second during the current accumulated period.
Tx Cells (sec)	This indicates the transmitted number of ATM cells and net data rate during the current accumulated period.
Rx Cell (sec)	This indicates the received number of ATM cells and net data rate during the current accumulated period.
CVs	This indicates the count of Code Violation during the current accumulated period.
Inits	This indicates the total number of full initializations (successful and failed) attempted on the lineduring the current accumulated period.
InitOKs	This indicates the total number of successful full initializations during the current accumulated period. A failed full initialization is when show time is not reached at the end of the full initialization procedure, e.g., when: • A CRC error is detected. • A time-out occurs. • Unexpected message content is received.
TxBlks	This indicates the transmitted number of FEC block during the current accumulated period.
RxBlks	This indicates the received number of FEC block during the current accumulated period.
CrtBlks	This indicates the count of all blocks received with errors that were corrected during the current accumulated period.
UncrtBlks	This indicates the count of all blocks received with uncorrectable errors during the current accumulated period.
Function Button	
Refresh	Click this button to refresh the List Table.

Figure 5-16 SHDSL Current Performance Dialog

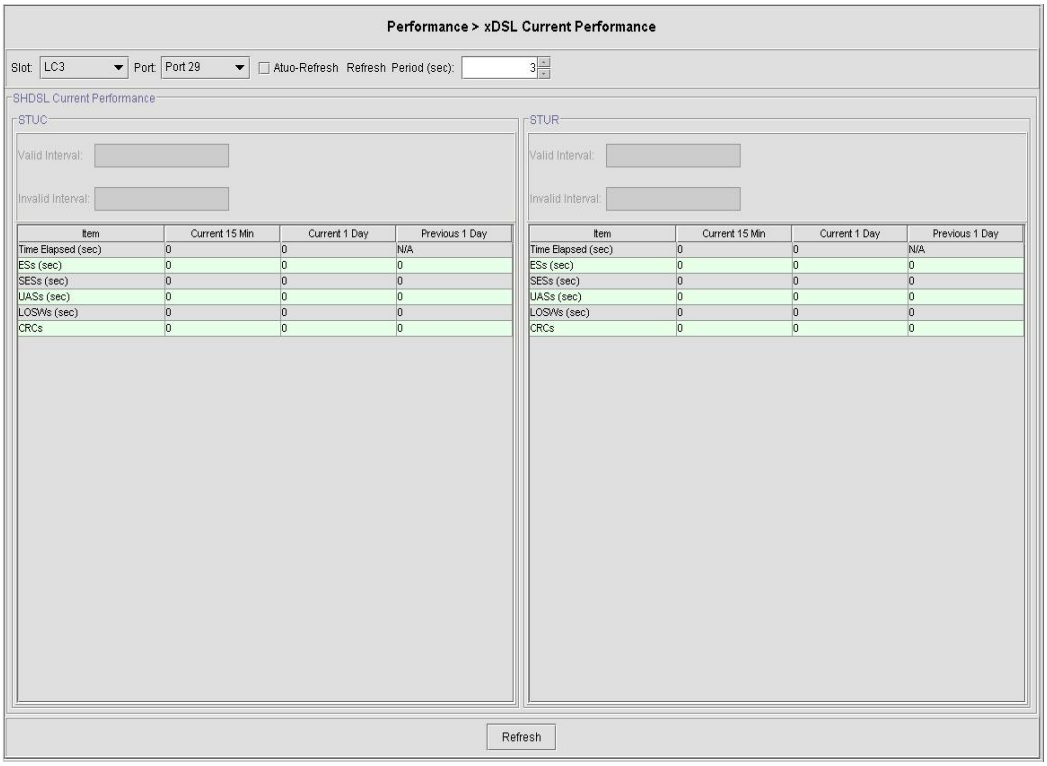


Table 5-9 SHDSL Current Performance Dialog Description

Field	Description
List Table	
Slot-Port	This indicates the location of the ADSL port.
Auto-Refresh	Check the check-box to auto-refresh this dialog.
Refresh period (sec)	This specifies the period between the AMS server to consecutively refresh the current performance data.
Valid Intervals	The number of previous 15-minute intervals in the list table for which data was collected.
Invalid Intervals	The number of intervals in the range from 0 to the value of "Valid Intervals" for which no data is available. This object will typically be zero except in cases where the data for some intervals are not available.
Time Elapsed (sec)	This indicates the time elapsed in the current 15-miniute interval.
ESs (sec)	This indicates the count of Error Second during the current accumulated period.
SESs (sec)	This indicates the count of Severely Error Second during the current accumulated period.
UASs (sec)	This indicates the count of Unavailable Error Second during the current accumulated period.
LOSWs (sec)	This indicates the count of LOSW second during the current accumulated period.
CRCs (sec)	This indicates the count of the SHDSL CRC anomalies occurring during the current accumulation period.
Function Button	
Refresh	Click this button to refresh the List Table

5.6 xDSL Line Historical Performance Information

Follow the subsequent procedure to obtain data for evaluating the history xDSL line performance.

Step 1 Click Performance → xDSL History performance on **Main Menu** to open the **xDSL History Performance** Dialog.

Step 2 Select the port to show its current performance information. It is noted that the performance data of ADSL port and SHDSL port are different. Depending on the port you select, either the **ADSL History Performance Dialog** or **SHDSL History Performance Dialog** appears. Figure 5-17 shows the **ADSL History Performance Dialog** and Table 5-10 depicts the corresponding parameter descriptions. As to the **SHDSL History Performance Dialog**, it is shown in Figure 5-18. The corresponding descriptions are depicted in Table 5-11.

Step 3 Depending on the port you select, click the 'Graph' button to show the corresponding **ADSL/SHDSL History Performance Diagram**. Figure 5-19 shows the **ADSL History Performance Diagram** as an example.

Figure 5-17 ADSL History Performance Dialog

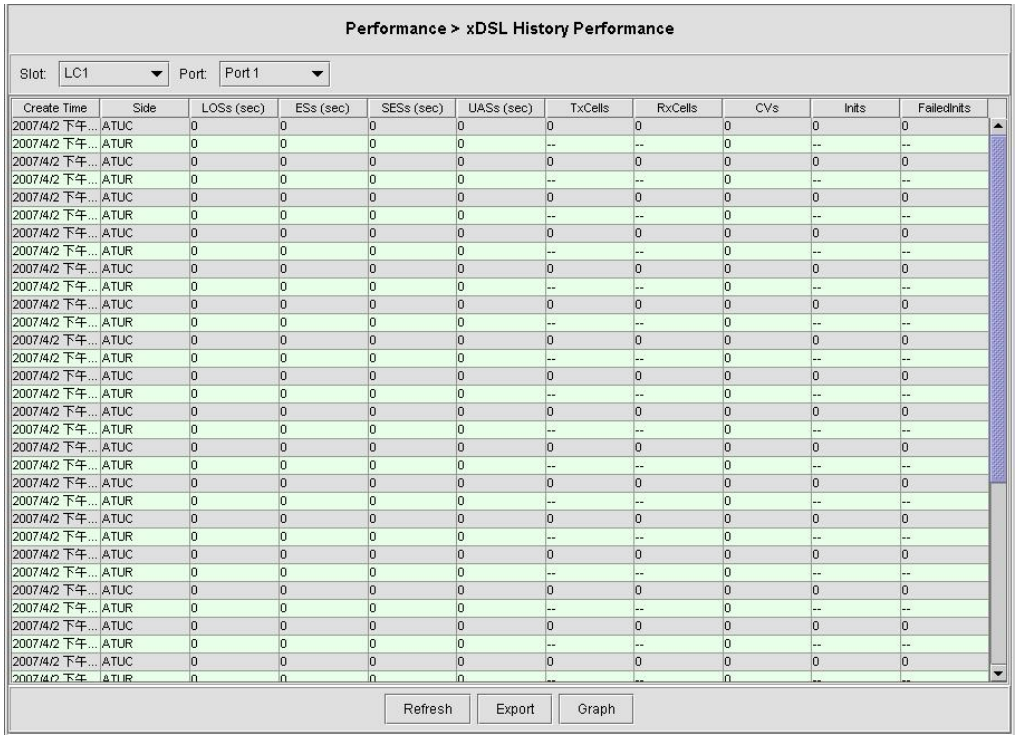


Table 5-10 ADSL History Performance Dialog Description

Field	Description
List Table	
Create Time	This indicates the time when the xDSL historical PM is recoreded.
Side	This indicates the location where the PM parameters are observed. (Either central side(CO) or remote side(RT))
LOSs (sec)	This indicates the count of Loss of Signal Second during the indicated period.
ESs (sec)	This indicates the count of Error Second during the indicated period.
SESs (sec)	This indicates the count of Severely Error Second during the indicated period.
UASs (sec)	This indicates the count of Unavailable Error Second during the indicated period.
Tx Cells / Rate	This indicates the transmitted number of ATM cells and net data rate during the indicated period.
Rx Cell / Rate	This indicates the received number of ATM cells and net data rate during the indicated period.
CVs	This indicates the count of Code Violation during the indicated period.
Inits	This indicates the total number of full initializations (successful and failed) attempted on the lineduring the current accumulated period.
FailedInits	This indicates the total number of failed full initializations during the indicated period. A failed full initialization is when showtime is not reached at the end of the full initialization procedure, e.g., when: • A CRC error is detected. • A time-out occurs. • Unexpected message content is received.
Function Button	
Refresh	Click this button to refresh the **xDSL History Port Selection Dialog.**
Export	Click this button to save the contents of **ADSL History PM** to the AMS client.
Graph	Click this button to draw the 2D diagram.

Figure 5-18 SHDSL History Performance Dialog

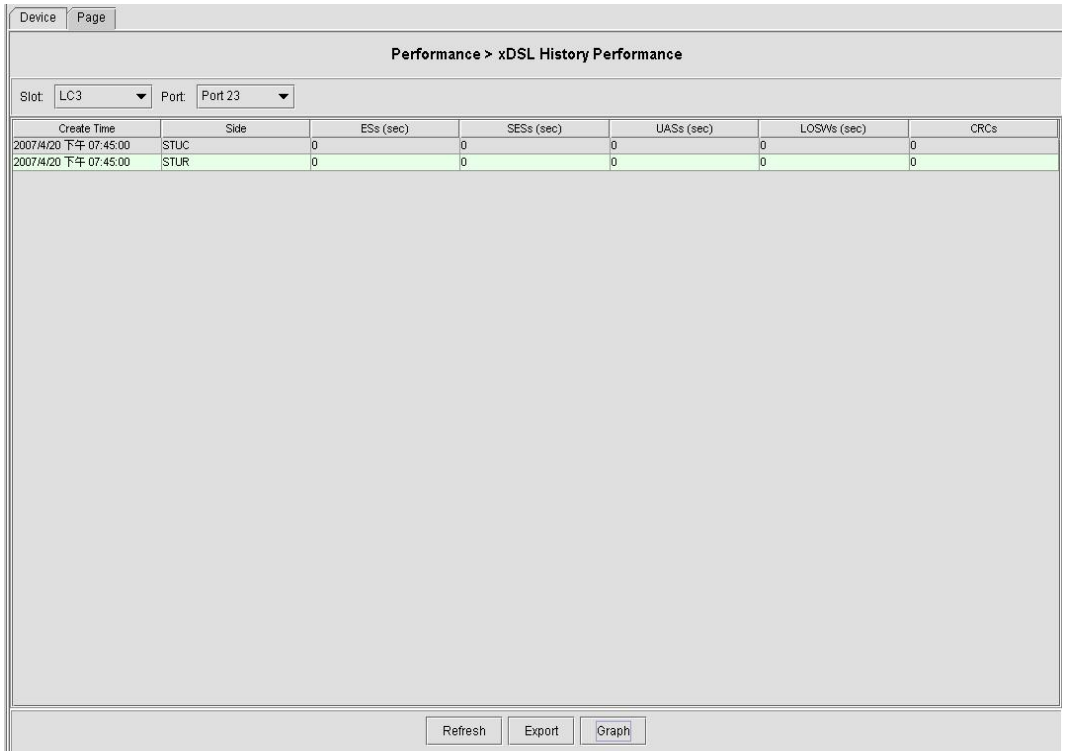
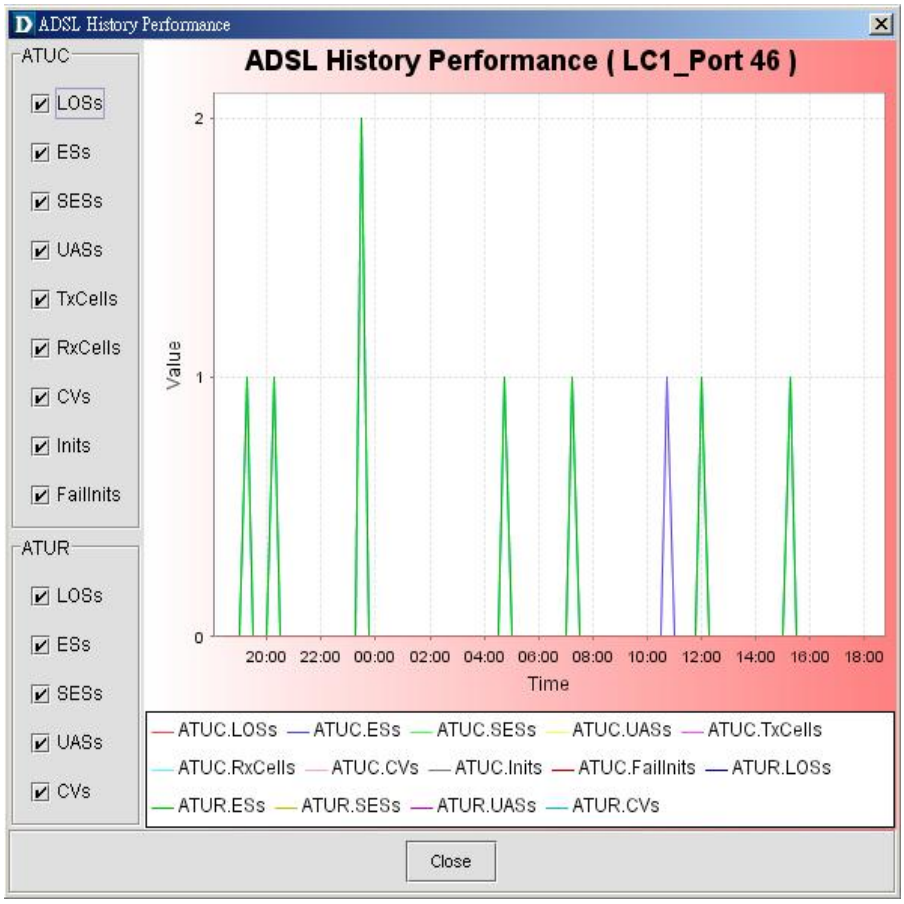


Table 5-11 SHDSL History Performance Dialog Description

Field	Description
List Table	
ESs	This indicates the count of Error Second during the indicated period.
SESs	This indicates the count of Severely Error Second during the indicated period.
UASs	This indicates the count of Unavailable Error Second during the indicated period.
LOSWs	This indicates the count of LOSW second during the indicated period.
CRCs	This indicates the count of the SHDSL CRC anomalies occurring during the current accumulation period.
Function Button	
Refresh	Click this button to refresh the **xDSL History Port Selection Dialog.**
Export	Click this button to save the contents of **SHDSL History PM** to the AMS client.
Graph	Click this button to draw the 2D diagram.

Figure 5-19 ADSL History Performance Diagram



5.7 GE Interface Performance Statistics

Follow the subsequent procedure to obtain data for evaluating the GE interface performance.

Click Performance → Trunk Performance Statistics on **Main Menu** to open the **Trunk Port PM** Dialog as shown in Figure 5-20. Table 5-12 depicts the related parameters.

Figure 5-20 Trunk PM Statistics Dialog

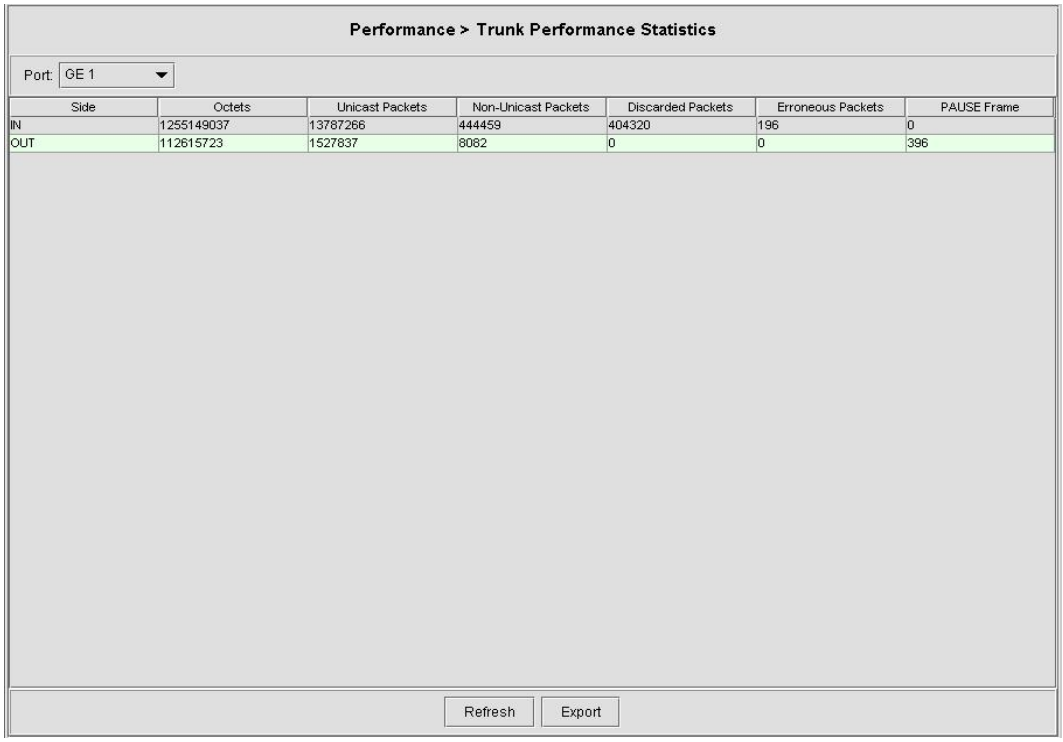


Table 5-12 Trunk PM Dialog Description

Field	Description
List Table	
Side	This indicates the IN(ingress direction)/OUT(egress direction) where the performance parameters are observed
Octets	This indicates the numbers of incoming/outgoing octets via the specified GE port.
Unicast Packets	This indicates the numbers of incoming/outgoing unicast packets via the specified GE port.
Non-Unicast Packets	This indicates the numbers of incoming/outgoing non-unicast packets via the specified GE port.
Discarded Packets	This indicates the numbers of incoming/outgoing discarded packets on the specified GE port per RFC1213.
Erroneous Packets	This indicates the numbers of incoming/outgoing erroneous packets on the specified GE port per RFC1213.
PAUSE Frame	This indicates the numbers of incoming/outgoing IEEE 802.3x pause frames on the specified GE port.
Function Button	
Refresh	Click this button to refresh the List Table
Export	Click this button to save the contents of **Trunk Port PM** to the AMS client.

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Chapter 6 Fault Management Functions

This chapter provides a general fault management overview and the corresponding AMS operational procedure.

6.1 Fault Management General Function

AMS supports the following fault management functions.

Alarm Definition Management

Through alarm definition management, operator can define (modify) the alarm severely level or even mask the particular alarm item, alarm definition is in profile form applied to every registered NEs.

Alarm Categories (Severity)

AMS collect and display the several categories of alarm and event message from the managed NEs in real-time, alarm categories defined as below:

- Critical alarm
- Major alarm
- Minor alarm
- Warning alert

Alarm Display

- **Visible alarm** – When any fault is encountered, it wills change icons in the network map and shelf view. AMS provided alarms/warnings information in the text form and indicated alerted by the alarm indications table with on-line logging capability to have total alarm visible of all NEs under it management, and prompt the EMS operator if there is an incoming alarm.

Alarm Trigger and Retrieving

- Alarm generated against the network is classified (such as Critical, Major, Minor, and Warning)
- Alarm filtering function is provided for the history alarms/warnings with categories, managed resources, location, severity type, and date-time of occurrences.
- Trouble shooting and trouble clearing functions are provided.
- The fault administrator functions are provided for the fault report, analysis, and storage rule, fault log and historical database and correction command in sequentially.
- Recognize all incoming alarm reports and correlate them according to the network layer (location) perspectives. The trail identifier of the effected trail has to be combined with the correlated alarms.

Alarm Information Storage in the Database

Every current and history alarms/warnings are stored in AMS Server database including categories, managed resources, location , originator type (slot-port), severity type, time of occurrences (received date and time, cleared date and time) and alarm description.

Alarm Processing

- All fault alarms due to the NE or environment are processed.
- Physical class include alarms occurred on GE interface, ADSL and SHDSL Line interface (Near end and Far end).
- Performance alarm includes threshold, performance degradation, excess of available resources, and congestion.

Fault Active and History Management

Every active and history alarms are stored in the database. The AMS supports to report them to operators in the form of statistic table. The operator can also retrieve the following fault

information via AMS client when required.

- Active alarms with it's severity
- Historical alarms with it's severity
- Summary of alarms with it's severity

Alarm List Sorting and Filtering Function

AMS supports the sorting of all alarm generated by selected object in alarm list form. It cover both active and historical alarms/events received from NE. The alarm list provides sufficient information such as location, NE name, NE object, alarm types, alarm severity, day and time of occurrence and so on.

Alarm Synchronization

AMS Client support alarm synchronizes to make the alarm information consistent between NE and AMS Server.

Fault Acknowledge

AMS Client support fault acknowledge function for operator annotate on active alarm list.

Fault Notification (To be released in the future)

Notification function offer the escalation of alarm to operator via sending E-mail, the trigger threshold can be configurable.

OAM Cell Test Function

F5 OAM End-to-End or Segment-to-Segment are support to verify the connection of PVC on subscribe side.

Ping and SNMP Test

AMS Client provides ping and SNMP diagnosis test to check the corresponding NE and path health, and notifies the result to the operator.

Subscriber MAC Collection

The AMS Client supports collection and displaying source MAC addresses information on a per subscriber port and ATM PVC basis.

xDSL Interface Fault Collection

The AMS Client supports collection and displaying of maintenance signal alarms/events such as LPR, LOS, LOF, and Link up/down for ADSL, LOS, LOF, and LOSW and Link up/down for SHDSL during data connections.

6.2 Overview of Environment Fault

AMS Client provides fault determination on environment and network; AMS Client is capable to display real-time status (Shelf view, Network view) and highlight the faults instantly in visible or audible notification.

6.2.1 Location and NE Status

Operator can view NE from Node List Box or Container Box, the icon colors present the alarm status of manage Location and NE, table below describes the meaning of possibility status.

Table 6-1 Location Alarm Status Symbol

Symbol	(White)	(Green)	(Yellow)	(Orange)	(Red)
Description	Location in normal state	Location contains warning alert	Location contains minor alarm	Location contains major alarm	Location contains critical alarm

Table 6-2 NE Alarm Status Symbol

Symbol	DAS4672 / DAS4192 (Green)	/ (Blue)	/ (Yellow)
Description	NE in normal state	NE contains warning alert	NE contains minor alarm
Symbol	/ (Orange)	/ (Red)	/ (? Sign)
Description	NE contains major alarm	NE contains critical alarm	NE model mismatch
Symbol	/ (X Sign)		
Description	NE disconnected		

6.2.2 Shelf and Card Module Status

The shelf view represents the shelf and card module working status. The table below describes the meaning of each sign display on the shelf and card module object.

Table 6-3 Shelf and Card Module Status Symbol

Shelf Card Module Symbol	(Grey)		
Description	**Normal Sign** Shelf or Card module in normal status	**? Sign** The define shelf/card module did not consist with actual module plugged in the NE	**X Sign** The shelf/card module is fail or define shelf/card module is not exist in the NE

6.2.3 Subscriber Port and Trunk GE Port Status

The shelf view also represents the subscriber port and trunk GE port working status. The table below describes the meaning of each sign display on the shelf and card module object.

Table 6-4 Subscriber Port and Trunk GE Port Status Symbol

Symbol	(Green)	(Blue)	(Yellow)
Description	Port in normal state	Port contains warning alert	Port contains minor alarm
Symbol	(Orange)	(Red)	
Description	Port contains major alarm	Port contains critical alarm	

6.3 Alarm Data Handling

AMS allowed operator to define the alarm severity, polling time, and setup alarm notification criteria.

6.3.1 AMS Server SNMP Polling Time

Follow the subsequent procedure to configure the SNMP auto polling time between AMS Server and NE.
Click Tool → NE Poll Settings on **Main Menu** to open the **NE Poll Settings** Dialog as shown in Figure 6-1**.** Table 6-5 depicts the related parameters.

Figure 6-1 NE Poll Setting Dialog

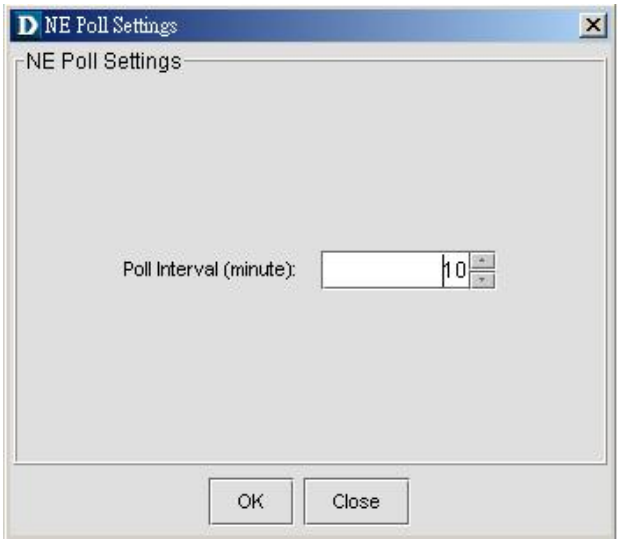


Table 6-5 NE Poll Setting Dialog Description

Field	Description
NE Poll Settings	
Poll Interval (minute)	This indicates the interval between the AMS server polls the NE.
Function Button	
OK	Click this button to apply the modification to NE.

6.3.2 Alarm Synchronization

The communication link between the AMS server and NE may be break due to miscellaneous reason. Whenever the communication between the AMS and NE recovers, the operator should synchronize the alarm information of NE to make the alarm information consistent between the AMS server and NE.

Follow the subsequent procedure to perform the aforementioned task.

Click Maintenance → Sync NE on **Main Menu** to Sync NE.

6.3.3 Alarm Severity Definition

AMS supports the alarm definition profile to define the alarm properties, such as alarm severity and suppressed of dependency. The operator is able to customize their alarm definition and apply it to all registered NEs.

Please refer to Section 4.7.7 for the modification of alarm severity.

6.3.4 Alarm Notification

Alarm notification supports operator to define notification report (escalation) by sending an E-mail to responder. Operator can choose the alarm types and threshold of continuous period of NE to trigger the report sending.

Follow the subsequent procedure to perform the aforementioned task.

Step 1 Click IP DSLAM Manager → Applications → Administration Tools → Policies on **Network Management Sub-window** and click right mouse button to bring out the pop-up menu as shown in Figure 6-2.

Step 2 Select the Add Policy to open the **Add Policy Details** dialog as shown in Figure 6-3. Table 6-6 depicts the related parameters.

Figure 6-2 Pop-Up Menu

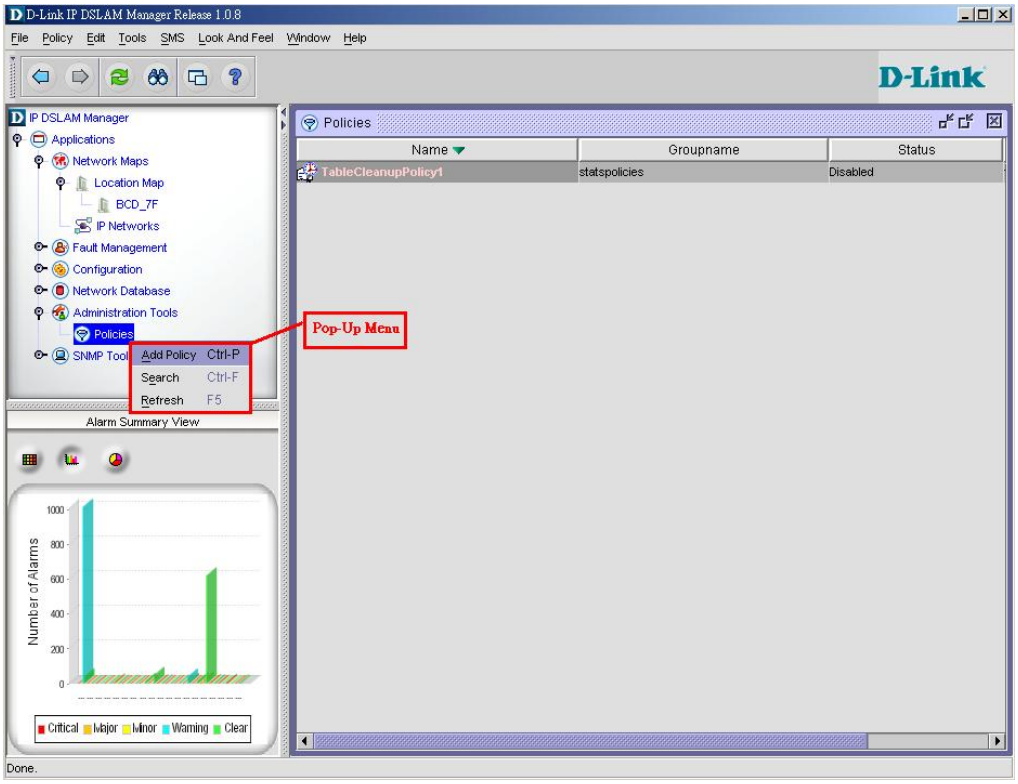


Figure 6-3 Add Policy Details Dialog

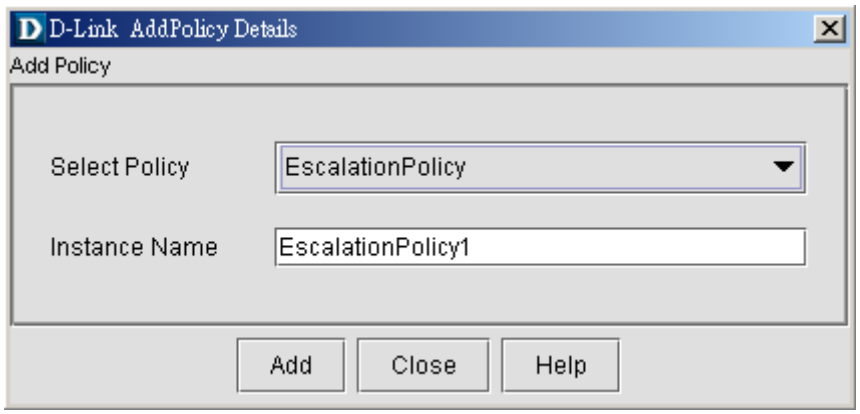


Table 6-6 Add Policy Details Dialog Description

Field	Description
Add Policy	
Select Policy	This indicates the category of policy.
Instance Name	This indicates the name of policy to be applied.
Function Button	
Add	Click this button to add a new profile.
Close	Click this button to close **Add Policy Details Dialog**
Help	Click this button to open the help documents.

6.4 Alarm Digital Input Function

The NE support up to four digital input alarm relay facility, it has ability to connect to the third party equipment such as DC circuit breaker, rack temperature, fan status, UPS system or other equipment support alarm relay indicate output.

The relay input management allows the operator to define the alarm relay input and inspect the status of digital input that has used to connect to NE. Please see "*System Installation Guide*" for the definition. Once the normal status of input signal is different from the current status, the NE will launch an "abnormal status" alarm of the specified relay input to AMS server.

Follow the subsequent procedure to manage the relay input.

Step 1 Click Configuration → Relay Input on **Main Menu** to open the **NE Relay Input** Dialog as shown in Figure 6-4. Table 6-7 depicts the related parameters.

Step 2 Select a row and click '**Modify**' button to modify the setting of the relay input port as shown in Figure 6-5. Table 6-8 depicts the related parameters.

Please refer to Section 4.7.7 for the modification of alarm severity.

Figure 6-4 NE Relay Input List Dialog

Table 6-7 NE Relay Input List Dialog Description

Field	Description
List Table	
No.	This indicates the index of alarm relay input port.
Name	This indicates the name of replay input port.
Current Status	This indicates the current status of the specified relay input port.
Normal Status	This indicates the normal status of the specified relay input port that configured by operator.
Severity	This indicates the alarm severity while the status is abnormal.
Function Button	
Refresh	Click this button to refresh the List Table
Modify	Click this button to modify the parameters of selected replay input port.
Commit	Click this button to apply the setting to NE.
Export	Click this button to save the contents of **NE Relay Input List** to the AMS client.

Figure 6-5 Modify NE Relay Input Dialog

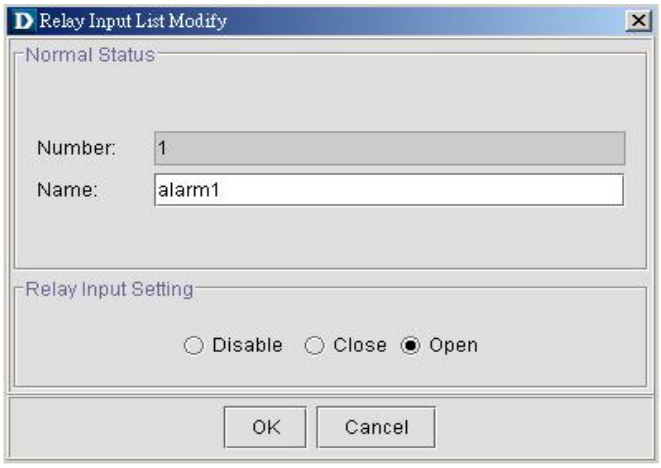


Table 6-8 Modify NE Relay Input Dialog Description

Field	Description
Normal Status	
Number	This indicates the index of alarm relay input port.
Name	This gives a meaningful name to the specified relay input port.
Relay Input Setting	
Disable	Check this radio button to disable the specified relay input port.
Close	Check this radio button to define normal status of the specified relay input port to be “Close”. I.e. the NE launches the corresponding SNMP trap whenever the external circuit is an opened circuit.
Open	Check this radio button to define normal status of the specified relay input port to be “Open”. I.e. the NE launches the corresponding SNMP trap whenever the external circuit is a closed circuit.

6.5 View and Analysis of Alarms

The AMS enable operator to identify faults or alarms generated by a NE. Whenever a fault occurs on a managed object in the network, the presence of an alarm will depict on the network objects.

The AMS processes supports the incoming alarm reports and supports to sort them by severity priority. Hence the operator can rapidly identify the alarm report he concerns.

Active alarm, history alarm, and summary alarm event display processing with location, NE name, NE object, alarm types, alarm severity, and timestamp of occurrence, received, and cleared.

6.5.1 Active Alarm Status

The real-time alarm monitoring can alert the operator the network faults. Levels of severity will prompt for proper handlings. With precise fault analysis, the operator can better pinpoint the trouble spots and work for speedy recovery.

Follow the subsequent procedure to observe the current node specific, card specific or port specific alarm information.

Step 1 Click → Fault → Active Alarm List on **Main Menu** to open the **Node-Active Alarm List** dialog, or alternatively put the mouse on the NE frame region (Figure 3-9) and click right mouse button to bring out the pop-up menu, select the **Alarm → Active Alarm List** to open the **Node-Active Alarm List** dialog as shown in Figure 6-6. Table 6-9 depicts the definition of fields.

Or

Step 1 Put the mouse on the card module region (Figure 3-9) and click right mouse button to bring out the pop-up menu, select the **Alarm → Active Alarm List** to open the **Card-Active Alarm List** dialog as shown in Figure 6-7. Table 6-9 depicts the definition of fields.

Or

Step 1 Put the mouse on a specific xDSL/GE port and click right mouse button to bring out the pop-up menu, select the **Alarm → Active Alarm List** to open the **Port-Active Alarm List** dialog as shown in Figure 6-8. Table 6-9 depicts the definition of fields.

Figure 6-6 Node-Active Alarm List Dialog

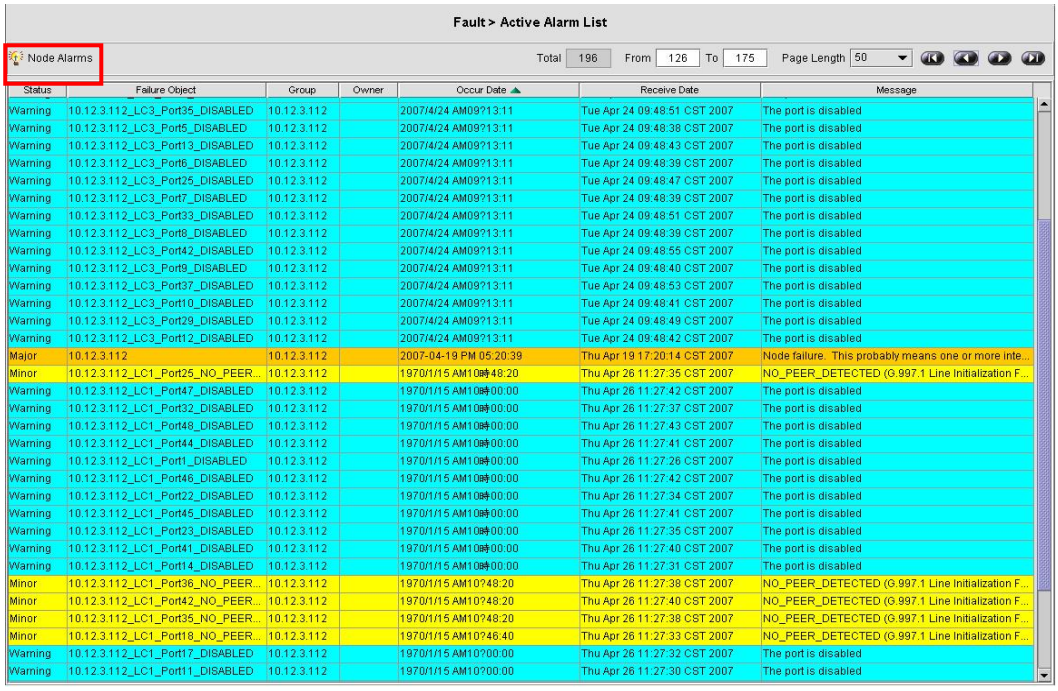


Figure 6-7 Card-Active Alarm List Dialog

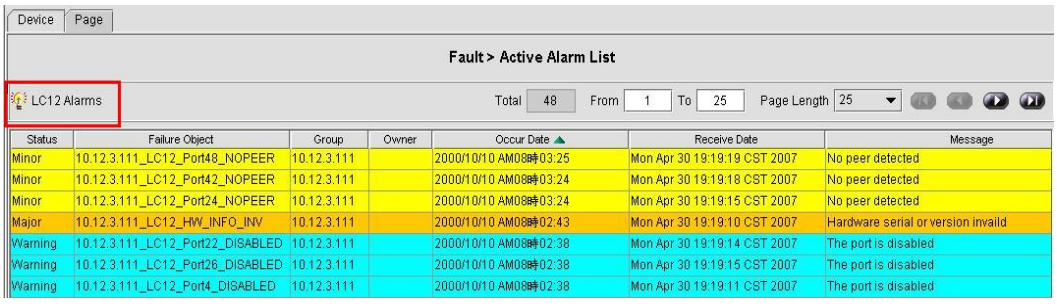


Figure 6-8 Port-Active Alarm List Dialog

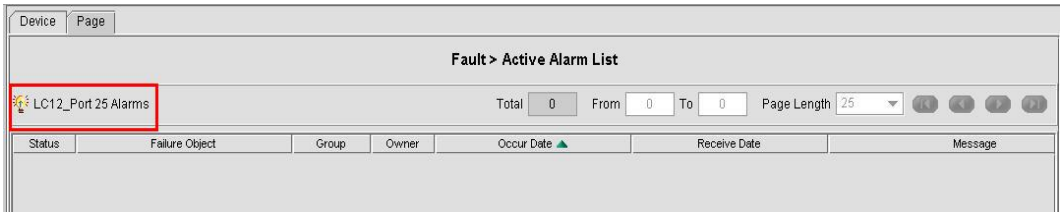


Table 6-9 Active Alarm List Dialog Description

Field	Description
Function Button	
Total.	This indicates the total number of active alarms.
From	This indicates the beginning serial number of active alarm to be shown on the list
To	This indicates the end serial number of active alarm to be shown on the list
Page Length	This indicates the total number of active alarms shown on the list.
List Table	
Status	This indicates the severity of the specified alarm/event.
Failure Object	This indicates the location of alarm/event. It also describes the alarm in brief.
Group	This indicates the IP address of NE.
Owner	This indicates the responder assigned to handle this alarm.
Occur Date	This indicates the time when the indicated alarm/event occurs at the NE.
Receive Date	This indicates the time when the indicated alarm/event received by the AMS Server.
Message	This indicates the description of alarm.

Step 2 Put the mouse on one of the following **tab**s and click left mouse button to sort the active alarms accordingly. Figure 6-9 shows an example of sorting the active alarms by the failure object.

- Status
- Failure Object
- Group
- Owner
- Occur Date
- Receive Date
- Message

Step 3 Select an alarm/event from the List Table and click the right mouse button to open the **Pop-Up Menu** as shown in Figure 6-10. Table 6-10 depicts the related parameters

Step 4 Click '**Detail**' button on the **Function Menu** to view the detail of a specific event as shown in Figure 6-11. Table 6-11 depicts the related parameters

Figure 6-9 Illustration of Sorted Node-Active Alarm List Dialog

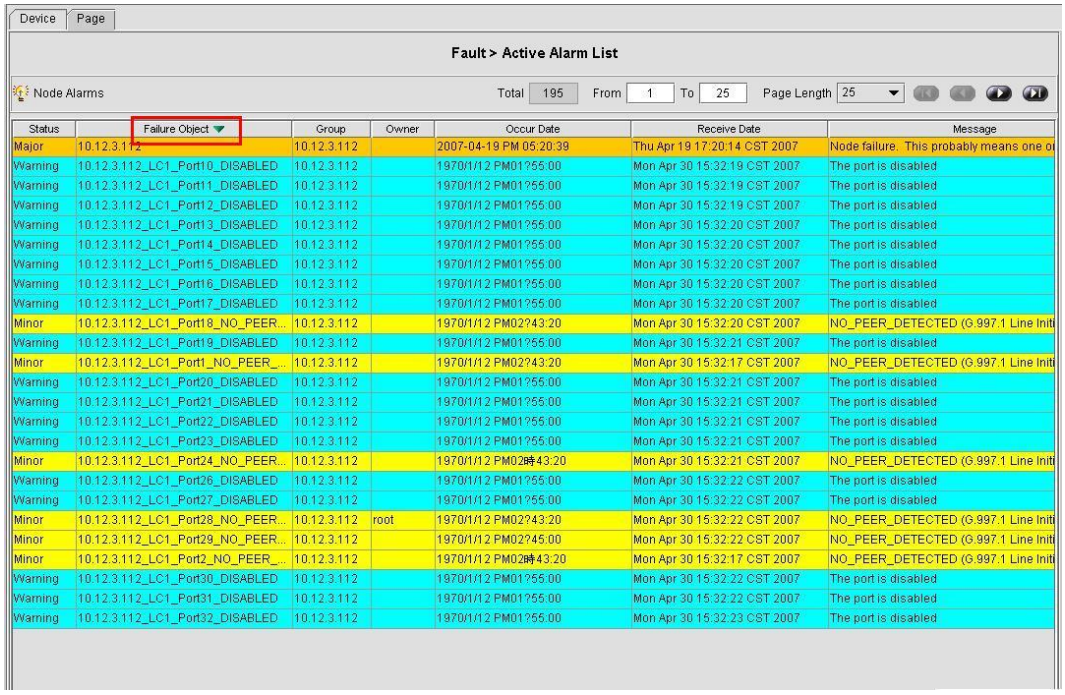


Figure 6-10 Active Alarm List Dialog - Pop-Up Menu

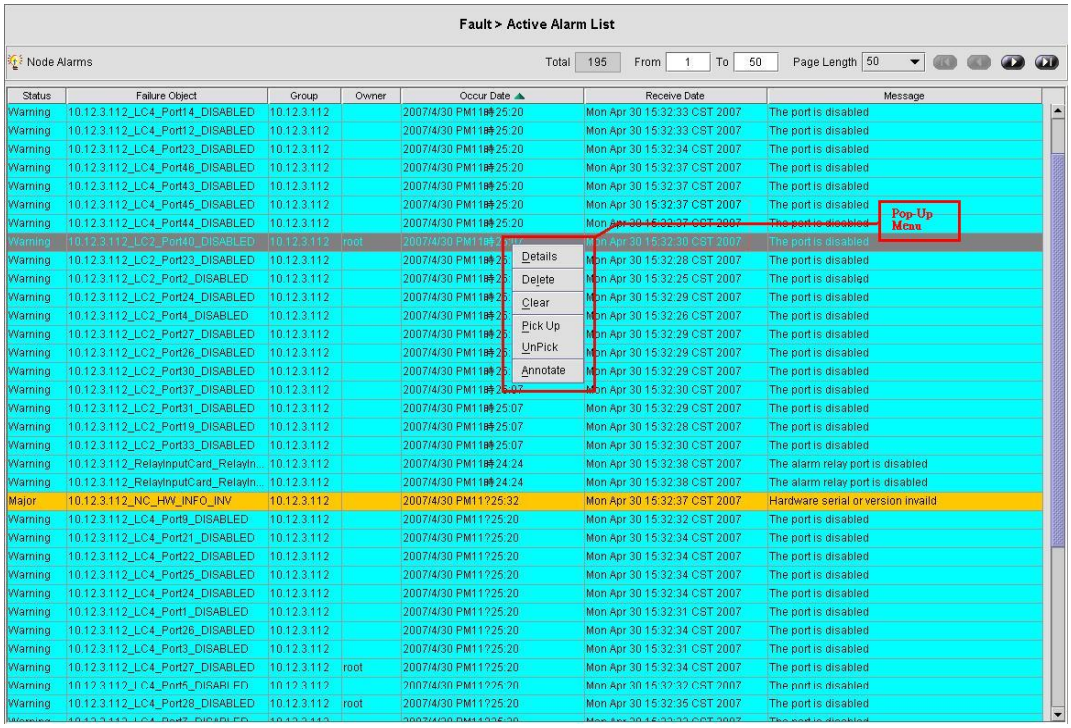


Table 6-10 Active Alarm List Dialog - Pop-Up Menu Description

Field	Description
Function Button	
Details	Click this button to display the detail information of the specified alarm.
Delete	Click this button to delete the selected object.
Clear	Click this button to delete the selected object.
Pick Up	Click this button to let the operator be in charge of this alarm. Once the operator picks up the alarm, the operator's account name will appear in the corresponding owner field of the **Active Alarm List Dialog**.
UnPick	Click this button to release the operator from handling this alarm. As a result, the corresponding owner field becomes blank.
Annotate	Click this button to make notes to the alarm/event.

Figure 6-11 Detailed Alarm Dialog

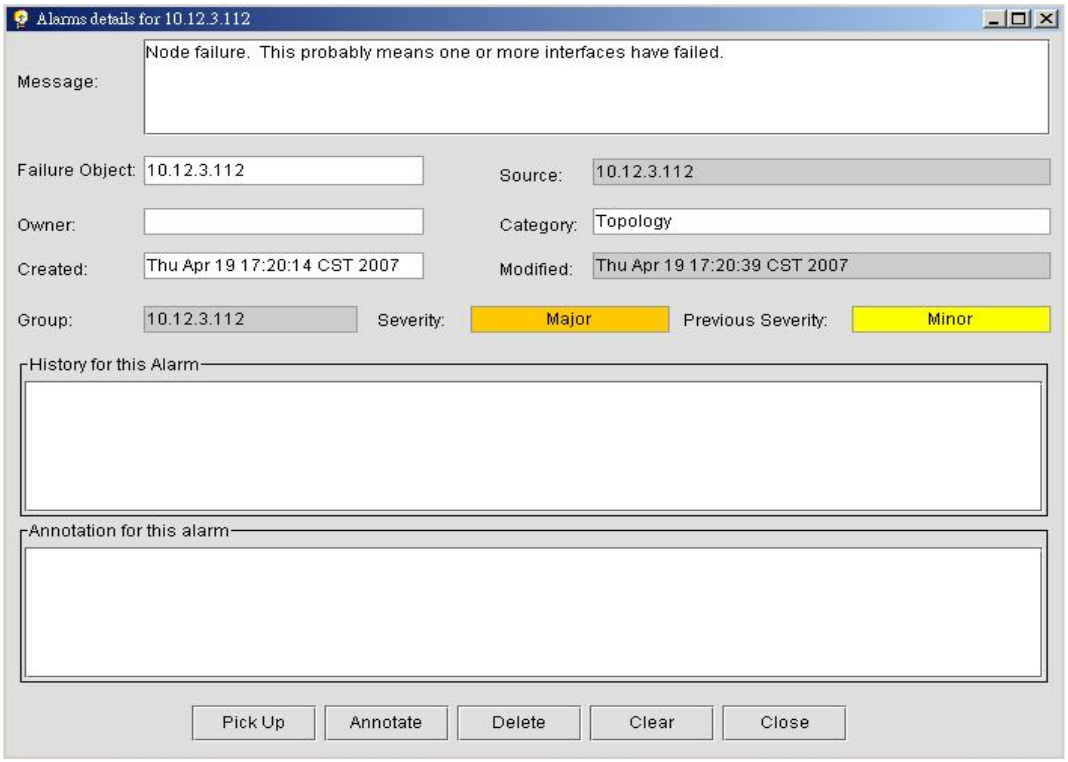


Table 6-11 Detailed Alarm Dialog Description

Field	Description
Alarm Information	
Message	This indicates the description of alarm.
Failure Object	This indicates the location of alarm/event. It also describes the alarm in brief.
Source	This indicates the IP address of NE.
Owner	This indicates the responder assigned to handle this alarm.
Category	This indicates the alarm type
Created	This indicates the time when the indicated alarm/event received by the AMS Server.
Modified	This indicates the time when the indicated alarm/event was picked up or annotated by the operator
Group	This indicates the IP address of NE.
Severity	This indicates the severity of the specified alarm/event.
Previous Severity	This indicates the previous severity of the specified alarm/event.
History for this alarm	This indicates the history of this alarm
Annotation for this alarm	This indicates the noted information.
Function Button	
Pick Up	Click this button to let the operator be in charge of this alarm. Once the operator picks up the alarm, the operator's account name will appear in the corresponding owner field of the **Active Alarm List Dialog**.
Annotate	Click this button to make notes to the alarm/event.
Delete	Click this button to delete the selected object.
Clear	Click this button to delete the selected object.
Close	Click this button to close **Detailed Alarm Dialog.**

6.5.2 History Alarm Status

AMS server stores all the received alarms and is capable to provide historical alarm data for further analysis. For every alarm, AMS will generate the historical alarm details to present network status.

Follow the subsequent procedure to observe the historical node specific, card specific or port specific alarm information.

Step 1 Click → Fault → History Alarm List on **Main Menu** to open the **Node-History Alarm List** dialog, or alternatively put the mouse on the NE frame region (Figure 3-9) and click right mouse button to bring out the pop-up menu, select the **Alarm → History Alarm List** to open the **Node-History Alarm List** dialog as shown in Figure 6-12. Table 6-12 depicts the definition of fields.

Or

Step 1 Put the mouse on the card module region (Figure 3-9) and click right mouse button to bring out the pop-up menu, select the **Alarm → History Alarm List** to open the **Card-History Alarm List** dialog.

Or

Step 1 Put the mouse on the a specific xDSL/GE port and click right mouse button to bring out the pop-up menu, select the **Alarm → History Alarm List** to open the **Port-History Alarm List** dialog.

Figure 6-12 History Alarm List

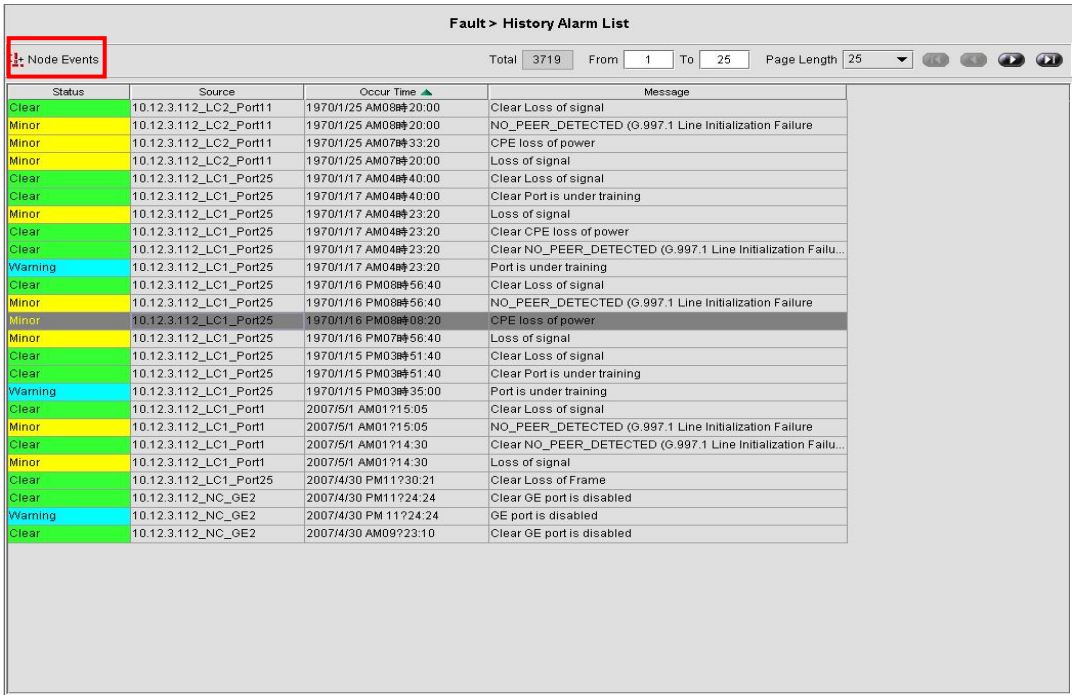


Table 6-12 History Alarm List Description

Field	Description
Function Button	
Total.	This indicates the total number of historical alarms.
From	This indicates the beginning serial number of historical alarm to be shown on the list
To	This indicates the end serial number of historical alarm to be shown on the list
Page Length	This indicates the total number of historical alarms shown on the list.
Alarm Information	
Status	This indicates the severity of the specified alarm/event.
Source	This indicates the IP address of NE.
Occur Time	This indicates the time when the indicated alarm/event occurs at the NE.
Message	This indicates the description of alarm.

Step 2 Put the mouse on one of the following **tab**s and click left mouse button to sort the historical alarms accordingly. Figure 6-13 shows an example of sorting the active alarms by the status.

- Status
- Source
- Occur Time
- Message

Step 3 Select an alarm/event from the List Table and click the right mouse button to open the **Pop-Up Menu** as shown in Figure 6-14.

Step 4 Click '**Detail**' button on the **Function Menu** to view the detail of a specific event as shown in Figure 6-15.Table 6-13 depicts the related parameters.

Figure 6-13 Illustration of Sorted Node-History Alarm List Dialog

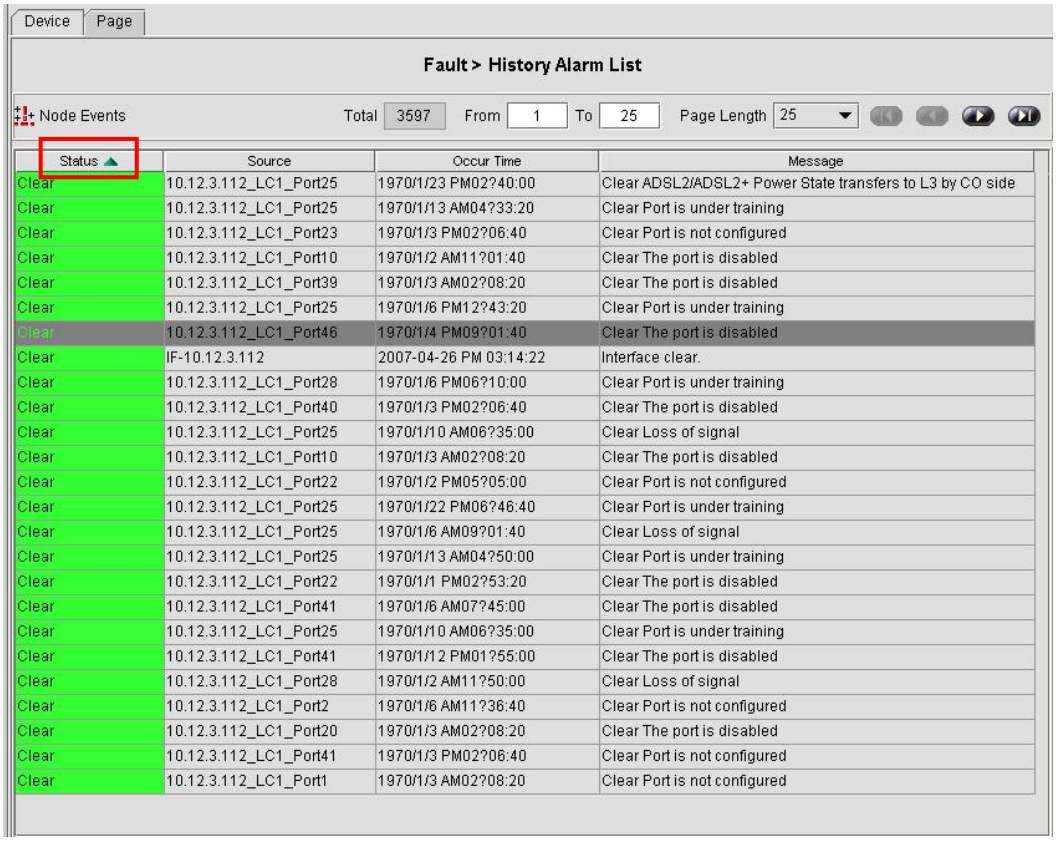


Figure 6-14 History Alarm List Dialog - Pop-Up Menu

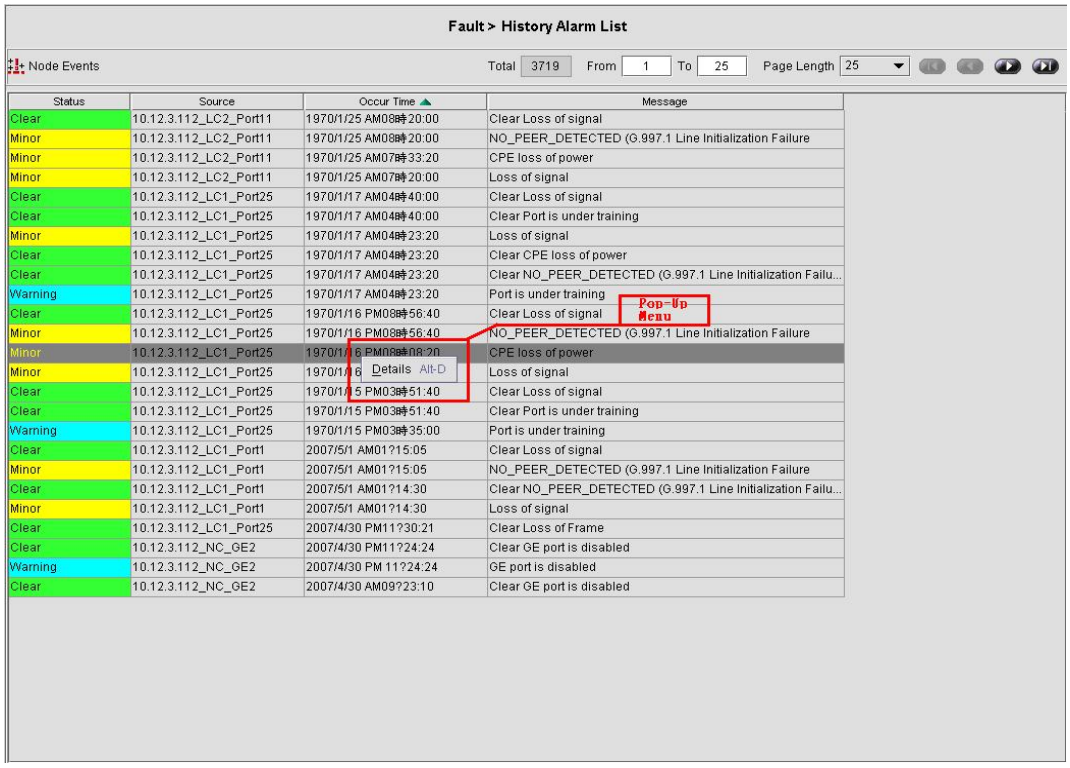


Figure 6-15 Event Details

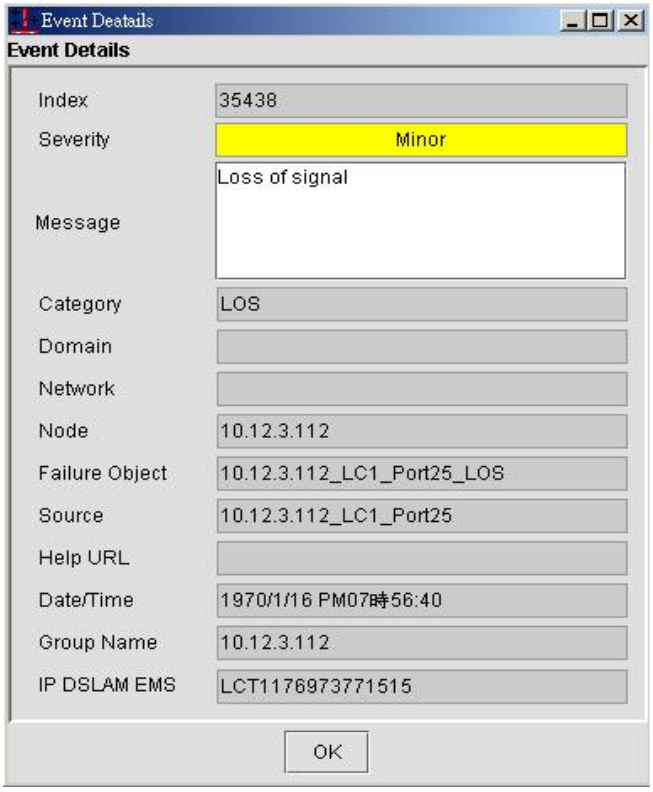


Table 6-13 Event Details Description

Field	Description
Alarm Information	
Index	This indicates a unique ID of generated event.
Severity	This indicates the severity of the specified alarm/event.
Message	This indicates the description of alarm.
Category	This indicates the alarm type
Domain	This indicates any domain-specific information based on physical location, functional categorization, or logical categorization of the source of the event.
Network	This indicates the network to which the source of the event belongs is specified here.
Node	This indicates the IP address of NE.
Failure Object	This indicates the location of alarm/event. It also describes the alarm in brief.
Source	This indicates the location of alarm/event
Help URL	This indicates the URL of the help document related to the event, which is reached through the "Help" button at the bottom of the event details sheet.
Date/Time	This indicates the time when the indicated alarm/event occurs at the NE.
Group Name	This indicates a group name, based on which events are grouped in the client. In other words, the group name of the event under which there are one or many events grouped together.
IP DSLAM EMS	This indicates a unique location ID to which the source of the event belongs.

6.5.3 History Alarm Statistics

History alarm statistics function collect the total alarms occurred on particular object in severity, it helps operator to analysis the fault easier.

Follow the subsequent procedure to observe the historical node specific, card specific or port specific alarm statistics.

Click → Fault → History Alarm Statistics on **Main Menu** to open the **Node-History Alarm List** dialog, or alternatively put the mouse on the NE frame region (Figure 3-9) and click right mouse button to bring out the pop-up menu, select the **Alarm → History Alarm** Statistics to open the **Node- History Alarm** Statistics **List** dialog as shown in Figure 6-16. Table 6-14 depicts the definition of fields.

Or

Put the mouse on the card module region (Figure 3-9) and click right mouse button to bring out the pop-up menu, select the **Alarm → History Alarm** Statistics to open the **Card-History Alarm** Statistics **List** dialog.

Or

Put the mouse on the a specific xDSL/GE port and click right mouse button to bring out the pop-up menu, select the **Alarm → History Alarm** Statistics to open the **Port-History Alarm** Statistics **List** dialog.

Figure 6-16 History Alarm Statistics List Dialog

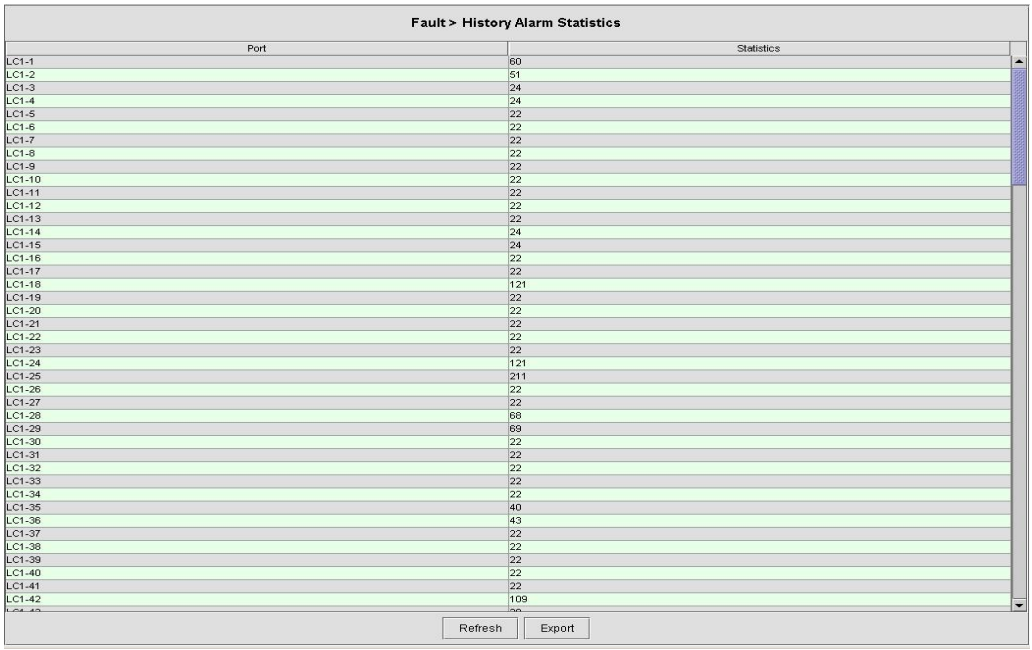


Table 6-14 History Alarm Statistics List Description

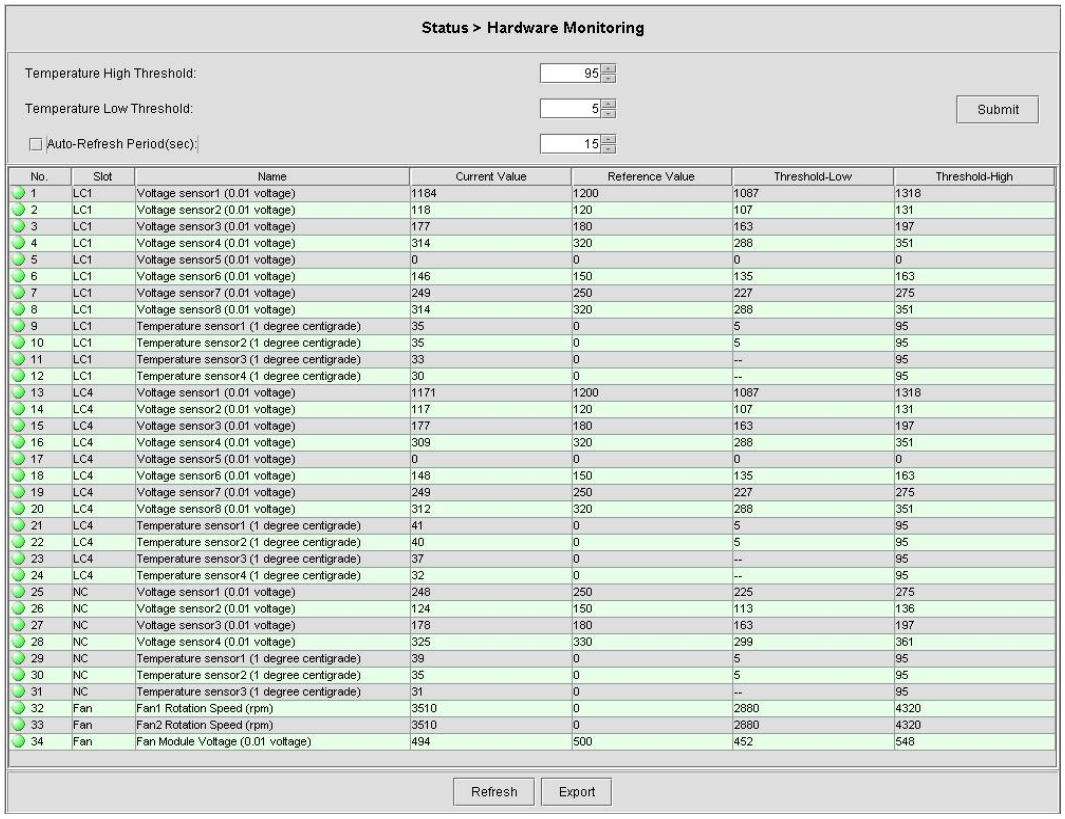
Field	Description
Alarm Information	
Port	This indicates the location where the alarm occurred.
Statistics	This indicates the number of alarms/event occurred on the indicated port.
Function Button	
Refresh	Click this button to refresh the List Table.
Export	Click this button to save the contents of **History Alarm Statistics** to the AMS client.

6.6 NE Hardware Status Diagnosis

In the hardware monitoring list dialog, you can monitor the temperature and voltage status of any specific card module.

Step 1 Click Status → Hardware Monitoring on **Main Menu** to open the **Hardware Monitoring List** Dialog as shown in Figure 6-17. Table 6-15 depicts the related parameters.

Figure 6-17 Hardware Monitoring List Dialog



No.	Slot	Name	Current Value	Reference Value	Threshold-Low	Threshold-High
1	LC1	Voltage sensor1 (0.01 voltage)	1184	1200	1087	1318
2	LC1	Voltage sensor2 (0.01 voltage)	118	120	107	131
3	LC1	Voltage sensor3 (0.01 voltage)	177	180	163	197
4	LC1	Voltage sensor4 (0.01 voltage)	314	320	288	351
5	LC1	Voltage sensor5 (0.01 voltage)	0	0	0	0
6	LC1	Voltage sensor6 (0.01 voltage)	146	150	135	163
7	LC1	Voltage sensor7 (0.01 voltage)	249	250	227	275
8	LC1	Voltage sensor8 (0.01 voltage)	314	320	288	351
9	LC1	Temperature sensor1 (1 degree centigrade)	35	0	5	95
10	LC1	Temperature sensor2 (1 degree centigrade)	35	0	5	95
11	LC1	Temperature sensor3 (1 degree centigrade)	33	0	--	95
12	LC1	Temperature sensor4 (1 degree centigrade)	30	0	--	95
13	LC4	Voltage sensor1 (0.01 voltage)	1171	1200	1087	1318
14	LC4	Voltage sensor2 (0.01 voltage)	117	120	107	131
15	LC4	Voltage sensor3 (0.01 voltage)	177	180	163	197
16	LC4	Voltage sensor4 (0.01 voltage)	309	320	288	351
17	LC4	Voltage sensor5 (0.01 voltage)	0	0	0	0
18	LC4	Voltage sensor6 (0.01 voltage)	148	150	135	163
19	LC4	Voltage sensor7 (0.01 voltage)	249	250	227	275
20	LC4	Voltage sensor8 (0.01 voltage)	312	320	288	351
21	LC4	Temperature sensor1 (1 degree centigrade)	41	0	5	95
22	LC4	Temperature sensor2 (1 degree centigrade)	40	0	5	95
23	LC4	Temperature sensor3 (1 degree centigrade)	37	0	--	95
24	LC4	Temperature sensor4 (1 degree centigrade)	32	0	--	95
25	NC	Voltage sensor1 (0.01 voltage)	248	250	225	275
26	NC	Voltage sensor2 (0.01 voltage)	124	150	113	136
27	NC	Voltage sensor3 (0.01 voltage)	178	180	163	197
28	NC	Voltage sensor4 (0.01 voltage)	325	330	299	361
29	NC	Temperature sensor1 (1 degree centigrade)	39	0	5	95
30	NC	Temperature sensor2 (1 degree centigrade)	35	0	5	95
31	NC	Temperature sensor3 (1 degree centigrade)	31	0	--	95
32	Fan	Fan1 Rotation Speed (rpm)	3510	0	2880	4320
33	Fan	Fan2 Rotation Speed (rpm)	3510	0	2880	4320
34	Fan	Fan Module Voltage (0.01 voltage)	494	500	452	548

Table 6-15 Hardware Monitoring List Dialog Description

Field	Description
List Table	
No.	This indicates the serial number of entry of the List Tale.
Slot	This indicates the location of line card or other card model.
Name	This indicates the name of sensor.
Current Value	This indicates the current value of the specified sensor.
Reference Value	This indicates the normal value of the specified sensor.
Threshold – Low/High	This indicates the low-high threshold value of the specified sensor.
Function Button	
Submit	Click this button to apply the setting to NE.
Refresh	Click this button to refresh the table list.
Export	Click this button to save the contents of **Hardware Monitoring List** to the AMS client.

6.7 xDSL Service Status Diagnosis

The AMS supports the following xDSL service status related diagnosis functions.

- Bridge Filtering Database
- VLAN Membership
- xDSL MAC Spoofing Statu
- Multicast Channel Status
- Multicast Group Membership

6.7.1 Bridge Filtering Database

The filtering database (FDB) displays the status of MAC address recorded in the line card on a per PVC basis.

Click Status → Bridge Filtering Database on **Main Menu** to open the **Filtering Database Entry List** Dialog as shown in Figure 6-18. Table 6-16 depicts the related parameters.

Figure 6-18 Bridge Filtering Database Entry List Dialog

Table 6-16 Bridge Filtering Database Entry List Dialog Description

Field	Description
List Table	
No.	This indicates the serial number of entry of the List Table.
Slot-Port	This indicates the location of xDSL port.
VPI	This indicates the VPI of the specified entry.
VCI	This indicates the VCI of the specified entry.
MAC Address	This indicates the MAC address of the specified entry.

Table 6-16 Bridge Filtering Database Entry List Dialog Description (Continued)

Field	Description
Status	This indicates the reason the MAC address appears in this entry. The definitions of status are as follows. • **Learned-unique:** It indicates the MAC address is dynamically learned by the NE and is an unique one. • **Learned-spoofed-inactive:** It indicates the MAC address is dynamically learned by the NE and but already appears on some other subscriber port of the NE. Hence, the NE does not forward this subscriber's upstream Ethernet frame of the identical source MAC address. • **Mgmt-permit:** It indicates the MAC address is manually set for the NE to forward the upstream Ethernet frame of the identical source MAC address. • **Mgmt-forbid:** It indicates the MAC address is manually set for the NE to drop the upstream Ethernet frame of the identical source MAC address.
Function Button	
Refresh	Click this button to refresh the list table.
Export	Click this button to save the contents of **Filtering Database Entry List** to the AMS client.

6.7.2 VLAN Membership

The VLAN membership displays the list of xDSL ports belonging to a VLAN of particular VLAN ID.

Click Status →VLAN Membership on **Main Menu** to open the **VLAN Membership List** Dialog as shown in Figure 6-19. Table 6-17 depicts the related parameters.

Figure 6-19 VLAN Membership List Dialog

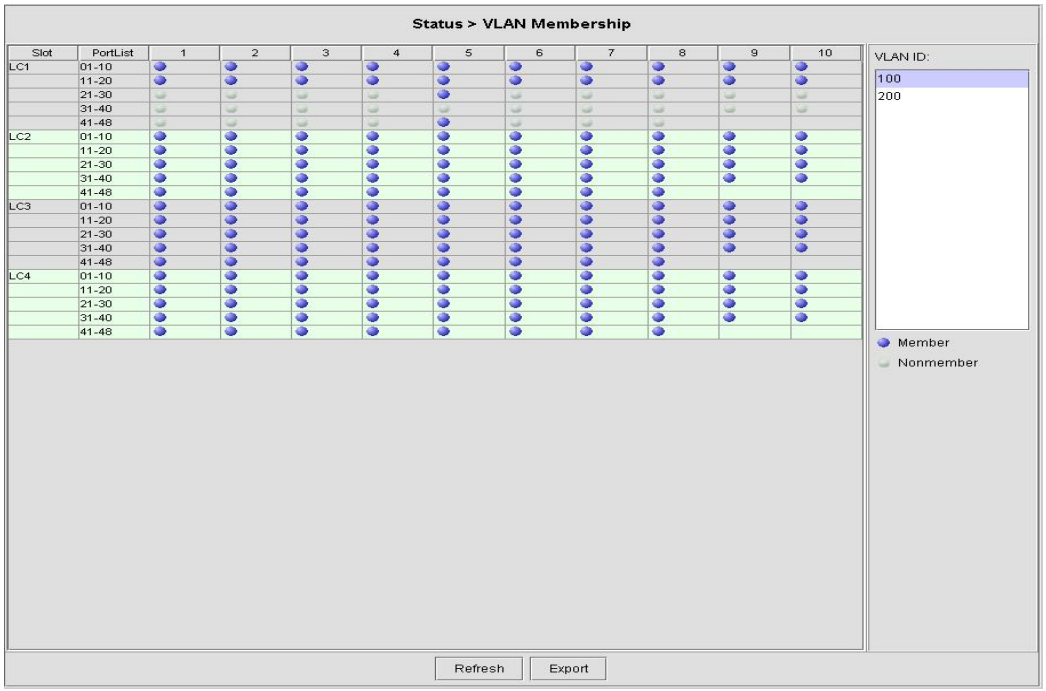


Table 6-17 VLAN Membership List Dialog Description

Field	Description
List Table	
Slot	This indicates the location of line card.
Port-List	This indicates the location of xDSL port. The blue point indicates that the corresponding port is a member port of a VLAN of the specified VLAN ID.
VLAN ID	This specifies the VLAN ID of the VLAN to show its members ports. Change the VLAN ID by clicking VLAN ID value with left button on mouse.
Function Button	
Refresh	Click this button to refresh the **VLAN Membership List Dialog**
Export	Click this button to save the contents of **VLAN Membership List** to the AMS client.

6.7.3 xDSL MAC Spoofing Status

The xDSL MAC Spoofing displays the duplicate MAC address from two or more individual xDSL subscriber ports.

Click Status → MAC Spoofing Status on **Main Menu** to open the **MAC Spoofing Status List** Dialog as shown in Figure 6-20. Table 6-18 depicts the related parameters.

Figure 6-20 MAC Spoofing Status List Dialog

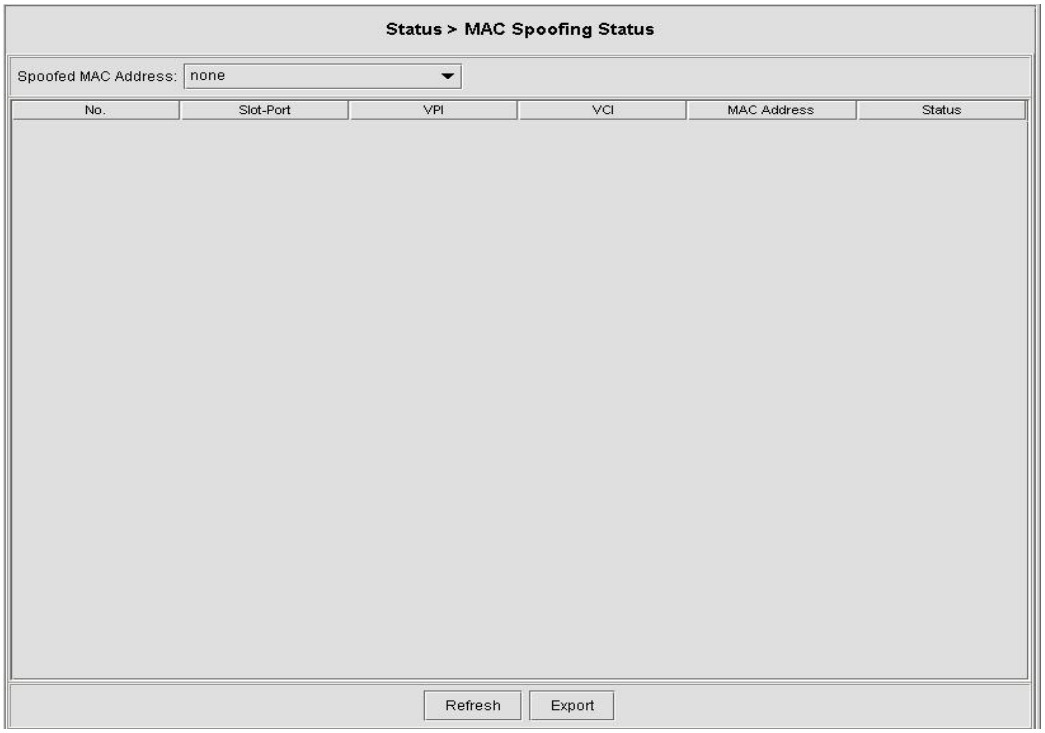


Table 6-18 MAC Spoofing Status List Dialog Description

Field	Description
Spoofed MAC Address	This displays the current spoofed MAC address.
List Table	
No.	This indicates the serial number of entry of the List Table.
Slot-Port	This indicates the location of xDSL port where the spoofed MAC address is observed.
VPI	This indicates the VPI of the PVC where the spoofed MAC address is observed.
VCI	This indicates the VCI of the PVC where the spoofed MAC address is observed.
MAC Address	This indicates the spoofed MAC address
Status	This indicates the current status of the recorded MAC address. The definition of possible statuses is as follows. • **Learned-unique:** It indicates the MAC address is dynamically learned by the NE and is an unique one. • **Learned-spoofed-inactive:** It indicates the MAC address is dynamically learned by the NE and but already appears on some other subscriber port of the NE. Hence, the NE does not forward this subscriber's upstream Ethernet frame of the identical source MAC address.
Function Button	
Refresh	Click this button to refresh the Spoofed MAC Address list.
Export	Click this button to save the contents of **Spoofed MAC Address List** to the AMS client.

Whenever the NE detects spoofed MAC address, the NE launches a SNMP traps to the SNMP trap managers as specified by the procedure in Section 4.14.1 "Configuring the SNMP Trap Manager" .

6.7.4 Multicast Channel Status

Whenever the subscriber clicks his remote controller to watch a TV channel transmitted via the ADSL line, the set-top-box sends the corresponding IGMP report packet. The NE inspects the received IGMP report packet to check whether its multicast IP hits the associated multicast service profile (MSP) or not. If the multicast IP hits the associated MSP, the NE forwards the IGMP packet. In the meantime, the NE also records the multicast IP in the **Multicast Channel Status List** s shown in Figure 6-21. Refer the related information to the section "Multicast Service Profile" in Section 4.7.5.

Click Status → Multicast Channel Status on **Main Menu** to open the **Multicast Channel Status List** Dialog as shown in Figure 6-21. Table 6-19 depicts the related parameters.

Figure 6-21 Multicast Channel Status List Dialog

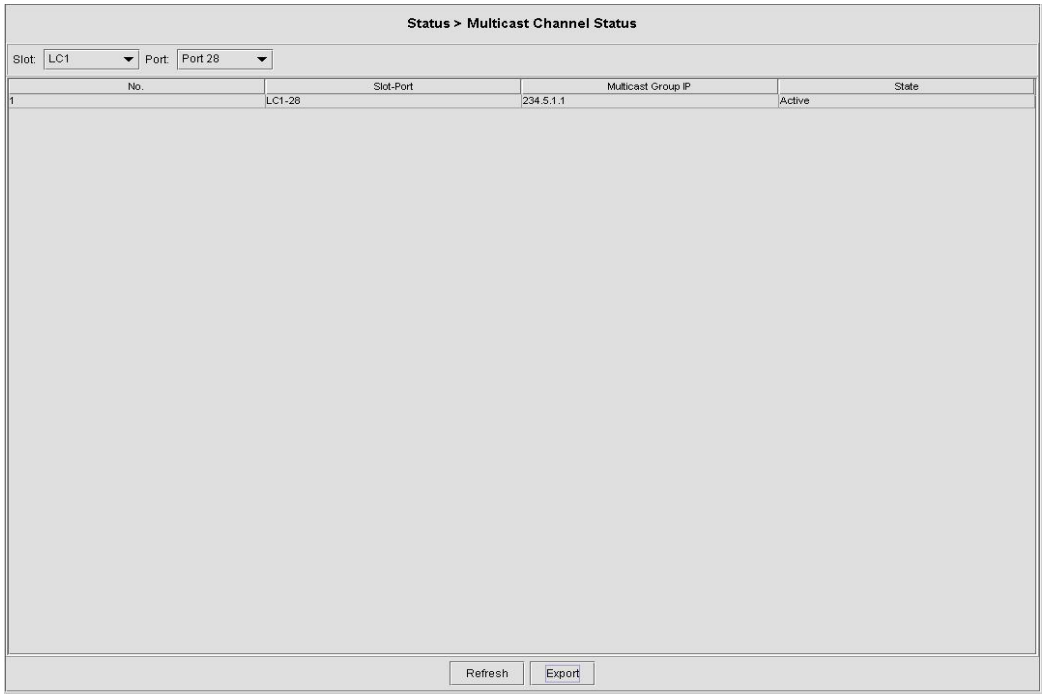


Table 6-19 Multicast Channel Status List Dialog Description

Field	Description
List Table	
No.	This indicates the serial number of entry of the List Table.
Slot-Port	This indicates the location of xDSL port.
Multicast TV Channel	This indicates that recorded multicast channel group IP address which the NE has received the corresponding IGMP report (Join) packet.
Status	This indicates the current status of the multicast channel group. The definition of possible statuses is as follows. • **Active:** The NE received the subscriber's IGMP report. • **Poll:** The NE does not receive the subscriber's IGMP report which responds to the IGMP server/proxy's IGMP query packet. • **Idle:** The NE retries to query the subscriber for "IGMP Robustness retry" times, but it does not get the response. In fact, the LCT will not show the entries of status equal to **Idle**.
Function Button	
Slot	Use this combo-box to select the line card.
Port	Use this combo-box to select the xDSL port.
Refresh	Click this button to refresh the multicast channel status.
Export	Click this button to save the contents of **Multicast Channel Status List** to the AMS client.

6.7.5 Multicast Group Membership

The multicast group membership list displays the list of xDSL subscriber ports from which the NE has received the IGMP report (Join) packets to join a particular multicast TV channel. In other

word, the multicast group membership list shows the xDSL member ports of a particular multicast TV Channel.

Click Status → Multicast Group Membership on **Main Menu** to open the **Multicast Group Membership List** Dialog as shown in Figure 6-22. Table 6-20 depicts the related parameters.

Figure 6-22 Multicast Group Membership List Dialog

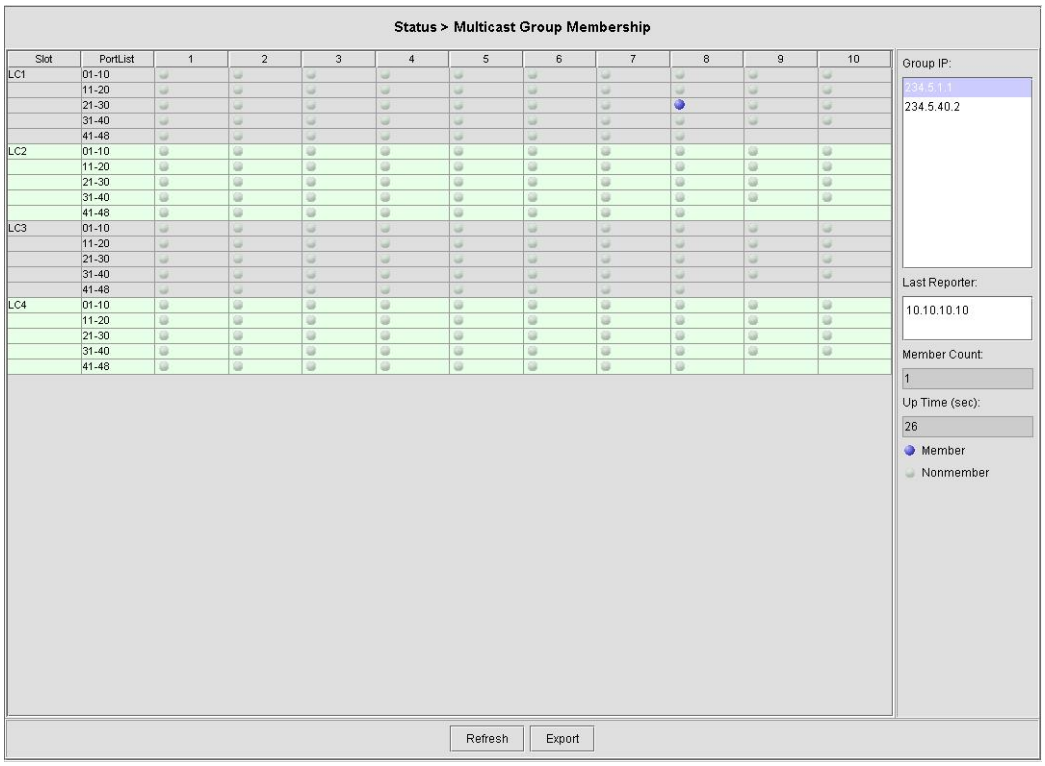


Table 6-20 Multicast Group Membership List Dialog Description

Field	Description
Group IP	Use this list to select the multicast IP (TV Channel) to display its members.
Last Reporter	This indicates the last xDSL subscriber launches an IGMP report to join the specified multicast TV channel. Its representation includes the location of the subscriber as well as its IP address.
Member Count	This indicates the number of xDSL subscribers currently join the specified multicast TV channel.
Up Time (sec)	This indicates the time period since the NE received the first IGMP report to join the specified multicast TV channel.
List Table	
Slot	This indicates the location of line card.
Port-List	This indicates the port list number. The blue point means that the specified port is a member of the specified multicast channel.
Function Button	
Refresh	Click this button to refresh the multicast group membership list.
Export	Click this button to save the contents of **Multicast Group Membership List** to the Personal AMS client.

6.8 LACP/RSTP Current Status Diagnosis

This section contains the following two subsections.

- LACP Diagnosis
- RSTP Diagnosis

6.8.1 LACP Diagnosis

Follow the subsequent procedures to view the current LACP status of trunk port.

Step 1 Click Status → LACP Status on **Main Menu** to open the **LACP Status Dialog**. Figure 6-23 shows the **LACP Status Dialog**.

Step 2 Click the **NC-GE1** or **NC-GE2** button on the **LACP Status Dialog** to view the corresponding LACP status on the specific trunk port**.** Table 6-21 depicts the related parameters.

Figure 6-23 LACP Status Dialog

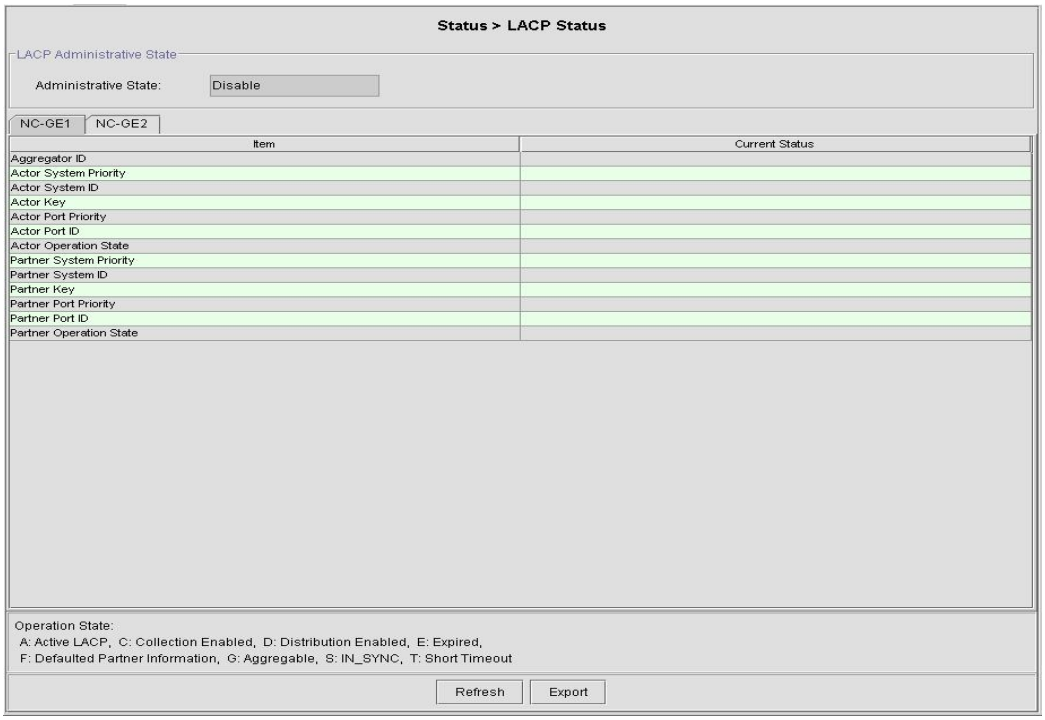


Table 6-21 LACP Status Dialog Description

Field	Description
LACP Administrative	
Administrative State	This indicates the current setting of the LACP on the trunk port.
NC - GE1/ NC - GE2 (Tab)	
Aggregator ID	It indicates the ID of aggregation group which the port belongs to.
Actor System Priority	It indicates the system priority configured for the LACP running on the NE.
Actor System ID	It indicates a 6-octet unique system ID for the LACP running on the NE. It is the MAC address of one of the GE port.
Actor Key	It indicates a 2-octet operational Key value of the GE port for the LACP running on the NE.

Table 6-21 LACP Status Dialog Description (Continued)

Field	Description
Actor Port Priority	It indicates a 2-octet port priority configured for the LACP running on the NE.
Actor Port ID	It indicates the port ID for the LACP running on the NE.
Actor Operation State	It indicates the current port status of the LACP on the NE per the IEEE 802.3 Annex 30C.6. A: lacpActivity, T: lacpTimeout(1), G: aggregation(2), S: synchronization(3), C: collecting(4), D: distributing(5), F: defaulted(6), E: expired(7)
Partner System Priority	It indicates the system priority of the peer LACP partner.
Partner System ID	It indicates a 6-octet unique system ID of the peer LACP partner.
Partner Key	It indicates a 2-octet operational Key value of GE port of the peer LACP partner.
Partner Port Priority	It indicates a 2-octet GE port priority of the peer LACP partner.
Partner Port ID	It indicates the port ID of GE port of the peer LACP partner.
Partner Operation State	It indicates the current GE port status of the peer LACP partner per the IEEE 802.3 Annex 30C.6. A: lacpActivity, T: lacpTimeout(1), G: aggregation(2), S: synchronization(3), C: collecting(4), D: distributing(5), F: defaulted(6), E: expired(7)
Function Button	
Refresh	Click this button to refresh the **LACP Status dialog**.
Export	Click this button to save the contents of the **LACP Status dialog** to the AMS client.

6.8.2 RSTP Diagnosis

The AMS supports to show the bridge status and port status of RSTP.

RSTP – Bridge Status

Follow the subsequent procedures to view the current RSTP-Bridge status.

Click Status → RSTP Status on **Main Menu** to open the **RSTP– Bridge Status Dialog** as shown in Figure 6-24. Table 6-22 depicts the related parameters.

Figure 6-24 RSTP – Bridge Status Dialog

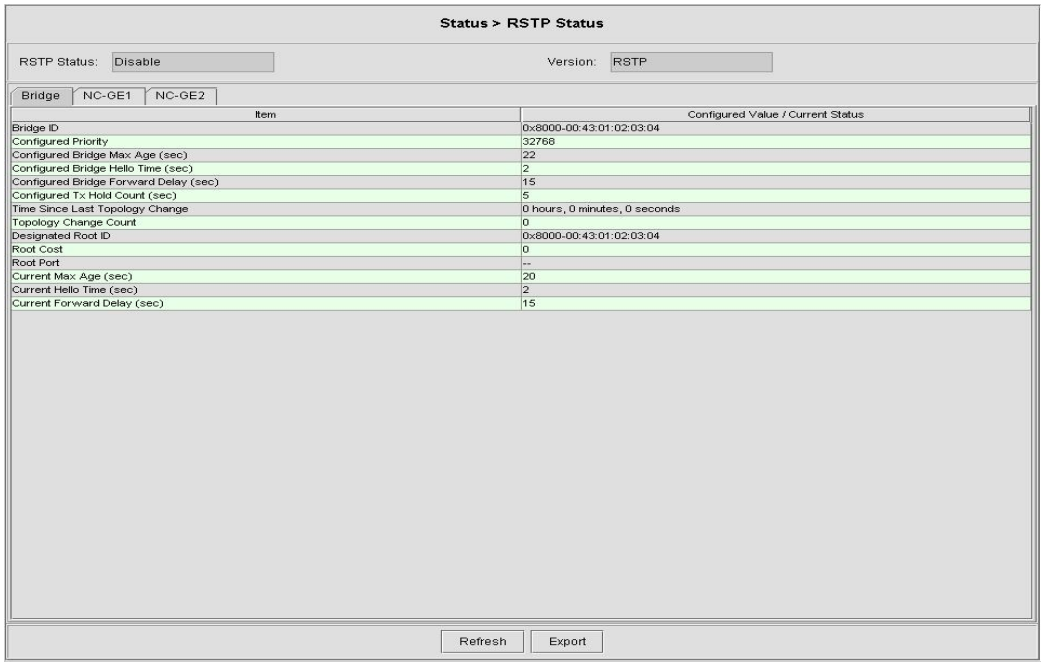


Table 6-22 RSTP – Bridge Status Dialog Description

Field	Description
RSTP Status	This indicates the enable/disable the RSTP function at GE ports.
Version	This indicates the RSTP version the NE runs.
Bridge (Tab)	
Bridge ID	It indicates a unique 8-octet bridge ID which consists of a 2-octet Bridge Priority and a 6-octet MAC address.
Configured Priority	It indicates the configured 2-octet bridge priority.
Configured Bridge Max Age (sec)	It indicates the configured maximum age of STP/RSTP.
Configured Bridge Hello Time (sec)	It indicates the configured amount of time between the transmission of configuration bridge PDUs by this node on any port when it is the root of the spanning tree or trying to become so.
Configured Bridge Forward Delay (sec)	It indicates the configured time value that controls how fast a port changes its spanning state when moving towards the Forwarding state.
Configured Bridge Tx Hold Count (sec)	It indicates the configured Bridge Tx Hold Count.
Time Since Last Topology Change	It indicates the time since last topology change.
Topology Change Count	It indicates the count of topology changes.
Designated Root ID	It indicates the Root Bridge ID once the RSTP selects a bridge as a root bridge.
Root Cost	It indicates the total cost from the NE to the root bridge.
Root Port	It indicates the port toward the root bridge
Current Max Age (sec)	It indicates the Max Age determined by RSTP.
Current Hello Time (sec)	It indicates the Hello Time determined by RSTP.
Current Forward Delay (sec)	It indicates the Forward Delay determined by RSTP.

Table 6-22 RSTP – Bridge Status Dialog Description(Continued)

Field	Description
Function Button	
Refresh	Click this button to refresh the **RSTP – Bridge Status Dialog.**
Export	Click this button to save the contents of the **RSTP - Bridge Status Dialog** to the AMS Client.

RSTP – Port GE1/Port GE2 Status

Follow the subsequent procedures to view the current RSTP- Port GE1/Port GE2 status.

Step 1 Click Status → RSTP Status on **Main Menu** to open the **RSTP Status Dialog** as shown in Figure 6-24.

Step 2 Click the **NC-GE1** or **NC-GE2** button on the **RSTP Status Dialog** to open the **RSTP –Port GE1/Port GE2 Status Dialog** as shown in Figure 6-25. Table 6-23 depicts the related parameters.

Figure 6-25 RSTP –Port GE1/Port GE2 Status Dialog

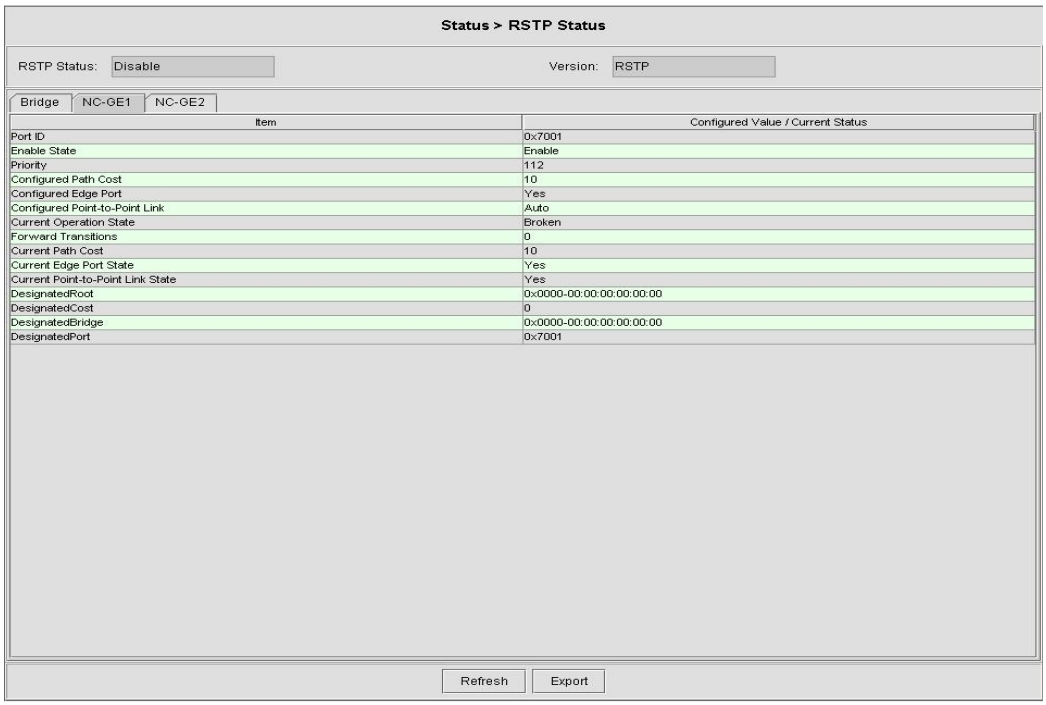


Table 6-23 RSTP –Port GE1/Port GE2 Status Dialog Description

Field	Description
RSTP Status	This indicates the enable/disable the RSTP function at GE ports.
Version	This indicates the RSTP version the NE runs.
Port GE 1 / Port GE 2 (Tab)	
Port ID	It indicates the port ID the GE port.
Enable State	It indicates the current RSTP enabled/disabled status of the GE port.
Priority	It indicates the configured port priority the GE port.
Configured Path Cost	It indicates the configured path cost of the GE port.

Table 6-23 RSTP –Port GE1/Port GE2 Status Dialog Description (Continued)

Field	Description
Configured Edge Port	It indicates whether the GE port is configured as Edge Port or not.
Configured Point-to-Point Link	It indicates the configured status of the LAN segment attached to this GE port. • Yes: It indicates that this port should always be treated as if it is connected to a point-to-point link. • No: It indicates that this port should be treated as having a shared media connection • Auto-detection: It indicates that this port is considered to have a point-to-point link if it is an Aggregator and all of its members are aggregatable, or if the MAC entity is configured for full duplex operation, either through auto-negotiation or by management means.
Current Operation State	It indicates the current operation state of GE port.
Forward Transitions	It indicates the number of times this port has transitioned from the Learning state to the Forwarding state.
Current Path Cost	It indicates the configured numerical path cost of the GE port.
Current Edge Port State	It indicates whether the GE port is edge port or not.
Current Point-to-Point Link State	It indicates whether the GE port connects with point-to-point link or not.
Designated Root	It indicates the unique Bridge Identifier of the Bridge recorded as the Root in the Configuration BPDUs transmitted by the designated Bridge for the segment to which the port is attached.
Designated Cost	It indicates the path cost of the Designated Port of the segment connected to this port. This value is compared to the Root Path cost field in received bridge BPDUs
Designated Bridge	It indicates the Bridge Identifier of the bridge which this port considers to be the Designated Bridge for this port's segment.
Designated Port	The Port Identifier of the port on the Designated Bridge for this port's segment.
Function Button	
Refresh	Click this button to refresh the **RSTP – Port GE1/Port GE2 Status Dialog.**
Export	Click this button to save the contents of the **RSTP – Port GE1/Port GE2 Status Dialog** to the AMS Client.

6.9 Network Diagnosis

The AMS supports to check the connection between the NE and xDSL subscriber.. The AMS also supports the network related diagnosis functions to check the connection between the NE and AMS server/client as follows.

- Subscriber Port OAM Loopback Diagnosis
- Ping
- Telnet
- Check SNMP Connection

6.9.1 Subscriber Port OAM Loopback Diagnosis

The information flow F5 is used for segment or End-to-End management at the virtual channel

(VC) level. AMS Client supports the F5 End-to-End and Segment Loopback OAM fault management on the ATM PVC of subscriber interface.

Follow the subsequent procedure to perform the OAM F5 End-to-End and Segment loopback diagnosis function to check the connection between the NE and xDSL subscriber.

Step 1 Click Configuration →VC to VLAN on **Main Menu** to open the **VC to VLAN** Dialog; select a xDSL subscriber port in **VC to VLAN List dialog** as shown in Figure 4-62.

.

Step 2 Click the **VC OAM Test** button to launch the **OAM Cell Test** Dialog as shown in Figure 6-26. Table 6-24 depicts the related parameters. At the completion of the OAM F5 test process, a **Message Dialog** appears to indicate the results as shown in Figure 6-27.

Figure 6-26 OAM Cell Test Dialog

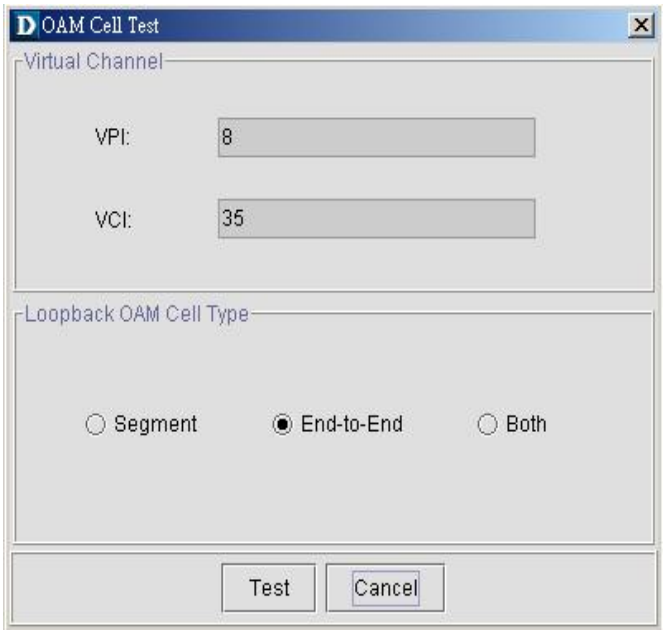


Table 6-24 OAM Cell Test Dialog Description

Field	Description
Virtual Channel	
VPI/VCI	This indicates the PVC to be tested on the selected xDSL subscriber port.
Loopback OAM Cell Type	
Segment	Check this radial button to perform the OAM F5 segment loopback test
End-to-End	Check this radial button to perform the OAM F5 end-to-end loopback test
Both	Check this radial button to perform both the OAM F5 segment and end-to-end loopback test
Function Button	
Test	Click this button to start the OAM F5 loopback test
Cancel	Exit the **OAM Cell Test Dialog**.

Figure 6-27 Message Dialog

6.9.2 Ping

AMS supports 'Ping NE' function either from the AMS Client or from the AMS Server.

Ping NE from the AMS Client

Follow the subsequent procedure to use the 'Ping NE' echo to check the NE connection from AMS client.

Click Utility → Ping NE from Client on **Main Menu** to open the **Ping NE from Client** Dialog as shown in Figure 6-28. Table 6-25 depicts the related parameters.

Figure 6-28 Ping NE from Client Dialog

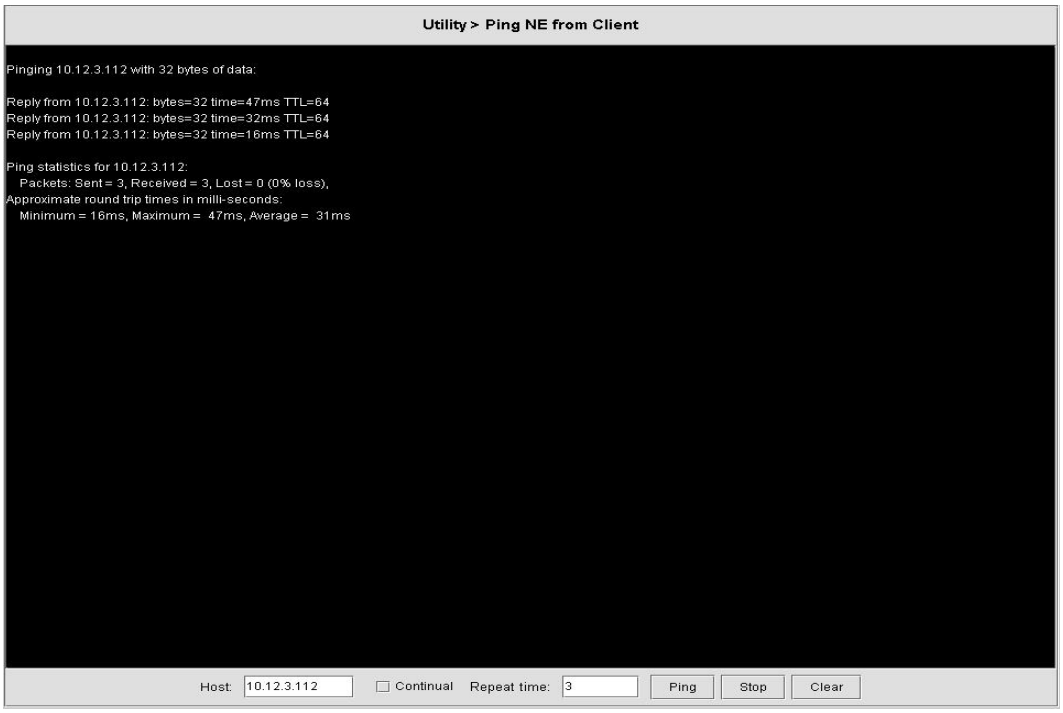


Table 6-25 Ping NE from Server Dialog Description

Field	Description
Function Button	
Host	This indicates the IP address of NE to ping
Continual	Check this check box to ping the NE until the operator clicks the **Stop** button.
Repeat Times	Use this field to specify the number of ICMP ping packets to be launched by the AMS client. Valid value is 1 ~ xxxx.

Table 6-25 Ping NE from Server Dialog Description(Continued)

Field	Description
Ping	Start sending ICMP packets.
Clear	Clear all the result above.
Stop	Click to stop pinging the NE.

Ping NE from the AMS Server

Follow the subsequent procedure to use the 'Ping NE' echo to check the NE connection from AMS server.

Click Utility → Ping NE from Server on **Main Menu** to open the **Ping NE from Server** Dialog as shown in Figure 6-29. Table 6-26 depicts the related parameters.

Figure 6-29 Ping NE from Server Dialog

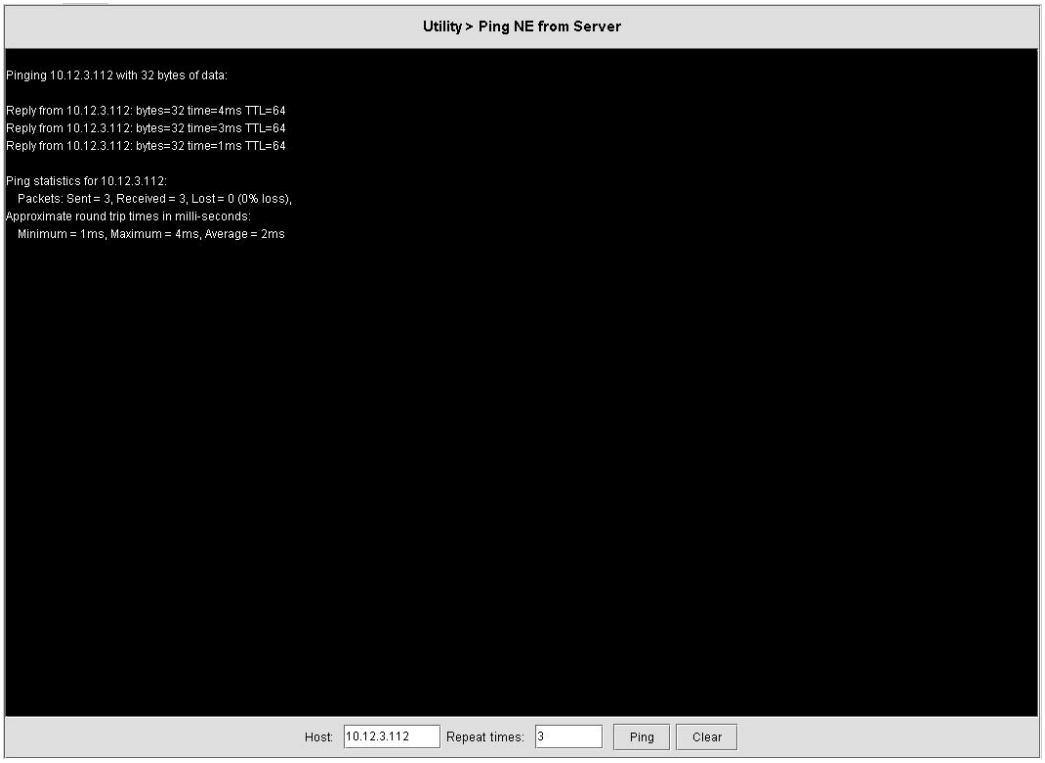


Table 6-26 Ping NE from Client Dialog Description

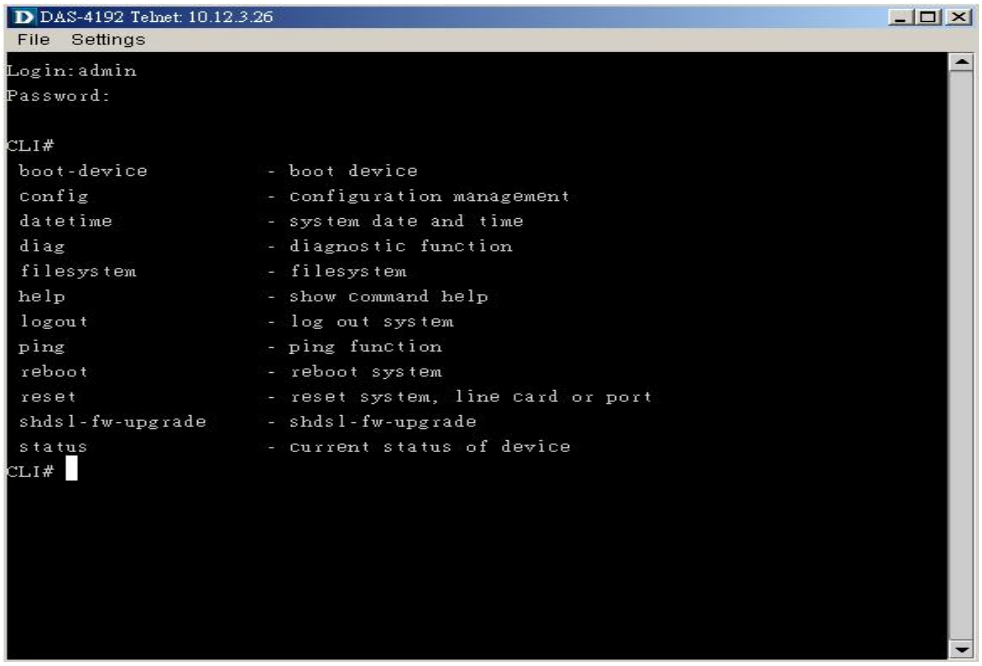
Field	Description
Function Button	
Host	This indicates the IP address of NE to ping
Continual	Check this check box to ping the NE until the operator clicks the **Stop** button.
Repeat Times	Use this field to specify the number of ICMP ping packets to be launched by the AMS client. Valid value is 1 ~ xxxx.
Ping	Start sending ICMP packets.
Clear	Clear all the result above.
Stop	Click to stop pinging the NE.

6.9.3 Telnet

The AMS client allows operator to launch a Telnet window in the AMS client environment.

Click Utility →Telnet on **Main Menu** to launch the Telnet window as shown in Figure 6-30.

Figure 6-30 Telnet Pop-up Window



6.9.4 Check SNMP Connection

Use the 'SNMP Connection' to check whether the connection between NE and AMS server is normal or not.

Click Utility →Check SNMP Connection from Sever on **Main Menu** to open the **SNMP Connection** Dialog as shown in Figure 6-31 and Table 6-27 depicts the related parameters.

Figure 6-31 Check NE SNMP Connection Dialog

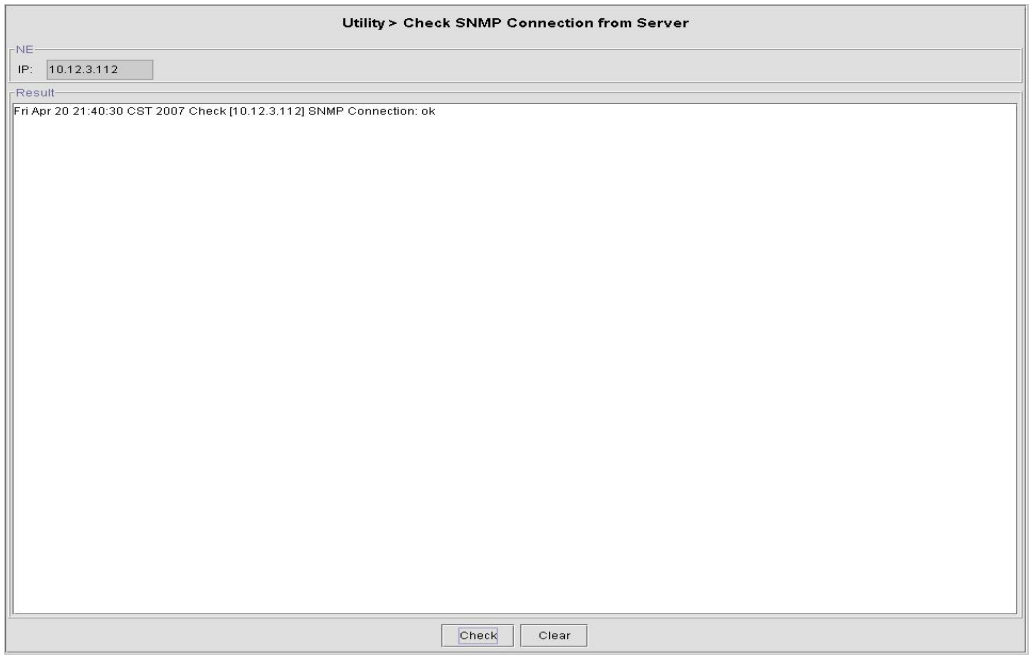


Table 6-27 Check NE SNMP Connection Dialog Description

Field	Description
NE	
IP	This indicates the IP address of the selected NE.
Function Button	
Check	Start checking the SNMP connection.
Clear	Clear all the result above.

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Chapter 7 Security Management Functions

This chapter provides a general security management overview and features of AMS. It contains concepts used in the network and service management for the AMS Client.

7.1 Security Management General Functions

Security management is use to provide security mechanisms to make sure secure access to the AMS and the Network, it protects resources and controlling the authorization within the AMS. To provide the system from:

- Unauthorized access to any internal information
- Modification of information
- Disturbance of the functionality

Security feature of AMS assured in every management facility (by the type of implementation), that the security in given on application level, it does not provide globe access in any kind to bypass on operation system.

The security management of AMS configures the operator's managing operations into Network Administrator, Network Manager, or Operator to assure the system security. According to each operating class, the menus provide administrator to re-designed and set the security class flexibly base upon operating environment. All operator password management and operating history, and access history are managed to provide function for searching at corresponding history when required.

Registration and Management Function of Operator

Provides function for registering the actual AMS user with log-in and password (password change allow only for administrator group user to do so) facilities, and assigning the operating class for ensuring appropriate authority to multiple users.

It allow only System Administrator to assign new category (group) of user define as well as create, delete, and modify the users.

Menu Access Authority Setup Function

The menu access authority function allow access in each menu according to their operating class on each of the AMS account user, The AMS manages this by dividing into several operating classes, such as Administrator, Manager, and User. Menu setup can be performed according to each operating class.

User Operation Log Management Function

The operation logging and storing of all security-relevant activities refers to the administrator that allow to tracing every used functions list of corresponding user.

Connection Status Search Function

Displays the status of the account user currently connected to the AMS Server. The AMS Server enables multi Client connection.

Connection Release Function

This function provide administrator to forcefully release the connection of the currently on-line user. After the force connection release, the corresponding operator with AMS connection session will be terminating.

Multiple Level Securities

AMS provides security management function of account user in multiple security levels, operator with different identify provide it own access right, access right are configurable by Administrator class level.

Hierarchic Level Securities

AMS has ability to perform securities of account user in hierarchic level base up on there own location; this provides access right that has to be configurable about topological and function restrictions.

7.2 Security Management General Features

Security management of AMS is architecture and design proposed with incorporate feature to ensure and procure the security of the AMS.

The AMS can create user account with proper privilege, this is the most important task of the system administration, without a valid account, authorization control and hacker attacks will post a big threat of the network security.

The features of performance management functions include the following:

- Support AMS Client, AMS Server, and database security by login username and password
- Without any delay and effect other working process of AMS when it login to server
- Support multiple account user working simultaneously
- Support different categories (groups) of user accounts
- Allowed administrator to add, remove, and modify user authority.
- Support user profile
- Support access right for all user categories
- Support audit trail on all user categories

7.3 Login and Logout

AMS Client provides on-line multiple-user security login to prevent unauthorized account to access AMS network.

Figure 7-1 Login Window

The AMS follow the operator's attribute to given their right privileges while login.

7.4 Viewing System User Online List

AMS provide observing and search function of online account operators.

AMS system has ability to display all operator access to the AMS Server. Security management also allow operator to add, remove, and modify operator account.

The user description can also be memo in the comment column, which can be the, full name, telephone number, division, address, NE function menu controlled, and NE location controlled.

AMS has design in Location topological of layer structure; the upper layer location is able to perform all the functions available to the lower layer.

7.5 Operation Privilege

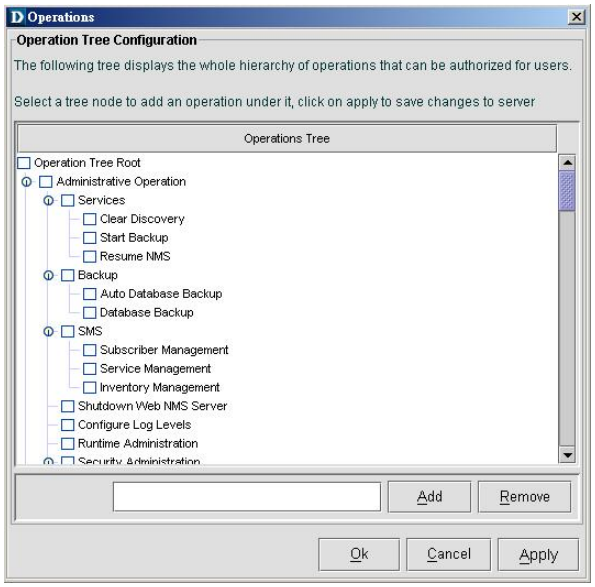
AMS provide function to ensure that only authorized operator are allowed to access all or certain part of management system, several level of access right are provide that ensure that authorized operators are given access to the facilities relevant to there job function.

AMS system has ability to assign the operator in different categories (group), the default known as “Admin” and “User”, the privilege of each group can be manually defined.

- There is no limit to the number of AMS operator account that may be registered
- There is no limit to the number of AMS operator group that may be created
- The uppermost class is the Administrator, who can access all the menus of AMS in default

AMS provides access right of an individual by an Administrator who ahs only right to given the appropriate authorization.

Figure 7-2 Operator Access Control List Window



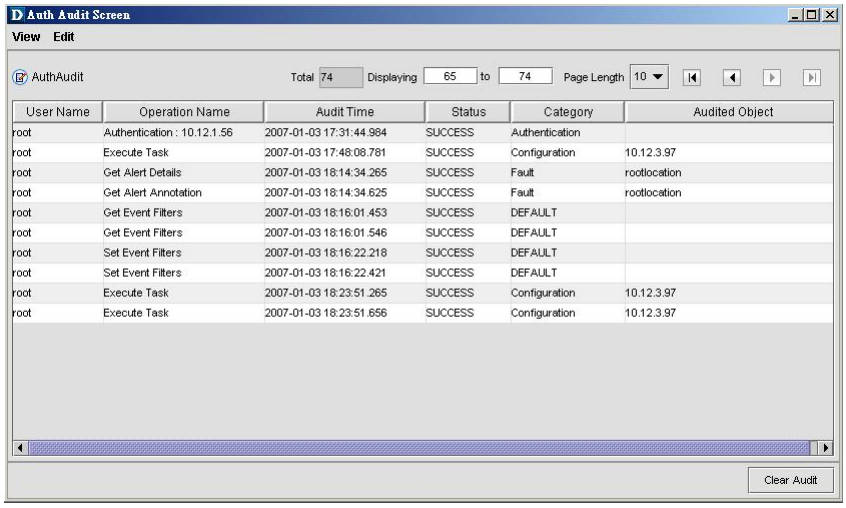
NOTE Access Control authority only be allowed by the Administrator privileges

7.6 Security Level Application

The AMS system will automatically log the operator behavior. This will allowed operator to trace the major activities of the specify user.

After the query request, the system will list in chronological order all user records that will display the user login location, operation and operation elapsed time as shown in Figure 7-3 below.

Figure 7-3 Operator Operation Log List Window



The AMS security management trail function include following item:

- Date and Time
- Operation activities
- NE related to the activity
- Operator Name
- Operation category
- Operation audited object

Chapter 8 Subscriber and Service Management Functions

The subscriber management is used to manage subscriber information that uses the xDSL service. Operators can manage it in per port base, all information were stored in AMS Server database and provided in a table form. Export in text format is support.

8.1 Service Management General Function

General functions of service management are described as following:

Subscriber Registration and Management Function

Provides function for registering the subscriber information of subscriber port interface.

Service Ordering and Provisioning

AMS provide service ordering and provisioning in service level, this will allow operator to manage their service to the subscriber under port base.

Service Administration and Assurance

Administration allow operator to activate or de-activation the afford service to subscriber under port base.

8.2 Subscriber Management General Functions

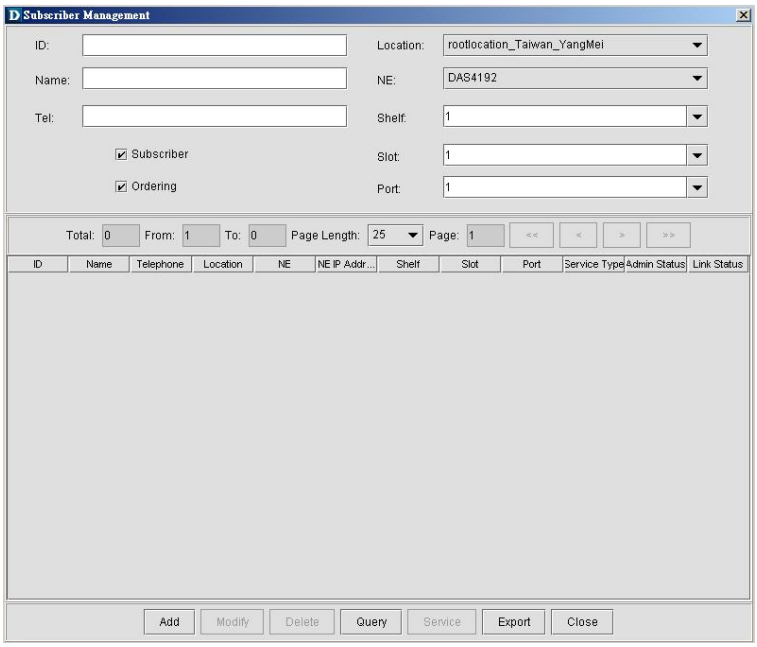
General functions of subscriber management are described as following:

Subscriber Search Function

Search function for operator to find out the subscriber locating, it provide single NE search or entire system search base on subscriber ID or subscriber name, the sub-string search is support.

The list table allow to exporting to ASCII format as well as MS Word.

Figure 8-1 Subscriber Management List Table



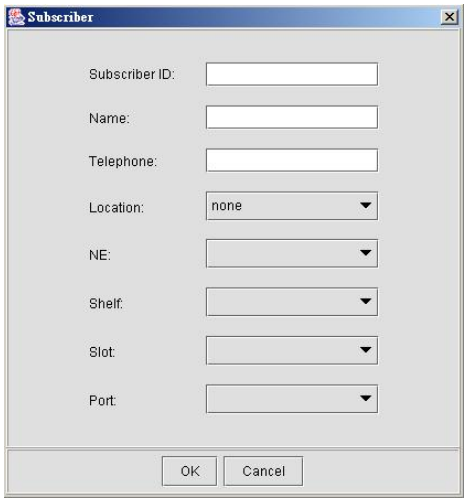
Cross Reference of xDSL Setting Inquiry

The xDSL setting information can be easy to figure out with subscriber management function, to enhance the operator configuring and troubleshooting.

8.3 Creating of Subscriber Service Information

The subscriber data can be store and retrieve from the database of AMS, it allow operator to add / modify / delete the service type and general subscriber information in order to trace in the future.

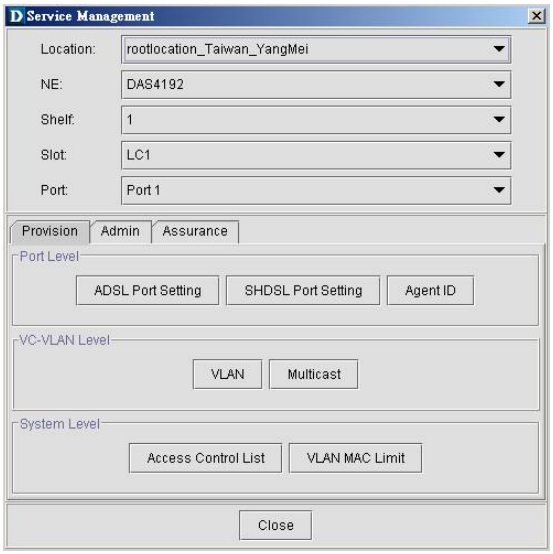
Figure 8-2 Subscriber Data Window



8.4 Service Management General Function

The service management provides a “Provision”, “Administrative”, and “Assurance” function control over xDSL port base, the service management control panel helps operator to quickly handle the subscriber port interface and it’s relative service information.

Figure 8-3 Service Management Control Panel



Chapter 9 General System Management Functions

This chapter provides a general system management overview and features of AMS. It contains concepts used in the network and system management for the AMS Client and AMS Server.

The AMS performs management function of server registration; this includes the SNMP polling period, topology appearance setting, database log management, auto backup period, and NE auto discovery.

9.1 AMS Client Options

Client options covers the communication interval between AMS Server and AMS Client, it allowed operator to manage the reacting time and topology functions.

The Alarm Warning feature assist operator in vision and hearing from AMS when alarm arise, the AMS is support to indicated with colors for different status by GUI interface, any addition and deletion of element or plug-in unit of NE will be automatically detected and reflected in GUI interface.

The Map function provides property of Topology Map boundary and pattern of different Locations.

9.2 System Server Management

AMS server periodically checks the status of all NEs that are registered. This continuously monitors the connection status with NE, and depicts any failure state of the node in the displayed managed Network immediately, and for auto backup, inquires deal from the NE to store in the database, to provide functions for information synchronization with NE and for backup when fault occurs.

This function provides the SNMP polling option, alarm and PM log file size, periodical auto backup feature, Alarm notification setting, and Northbound connection property.

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Appendix A Database Dimension and Handle Time

AMS database has handled four categories of NE's information, Configuration, fault, performance, and security, the dimension of each category is describing as follow.

The below example is taken approximate 300 K subscribers in single database, calculation within 30 days of alarm history, 7 days of performance monitor information, and 20 concurrent operator's log file for 2 months.

Configuration Management / Subscriber Service Management

Dimension of PVC to VLAN mapping is 100 bytes, 300 K subscribers is around 30 MB in total.
Dimension of xDSL profile record is 100 bytes, 300 K subscribers is around 30 MB in total.

Other data regarding to configuration management and subscriber service management is around 20 MB.

Total HD space required of CM is taken about 80 MB.

The response times taken for retrieve CM information are around 10 sec. under above condition.

Fault Management

Assume NE generates one alarm from xDSL interface per day, the dimension of single alarm is 180 bytes, and for 300 K subscribers is around 54 MB in total.

Alarm generate up to one month takes around 54 MB times 30 day, the outcome is 1.62 GB in total.

The response time for retrieve history alarm is less then 10 sec.
The response time for retrieve current alarm is less then 3 sec.

Performance Management

Assume only 10% of PM information been visited by server and keep in 7 days, each PM is in 60 bytes, for 300 K subscribers is taken around 1.3 GB (300 K x 10% x 60 x 7 x 96)

The response time for retrieve PM table is less then 15 sec.

Security Management

Dimension of one record is 120 bytes, assume 3000 records generate per days, the total add up dimension for 20 user in 2 month is approximate 140 MB.

Total database HD space required for the above circumstance is approximate 3 GB.

The response time for add NE/Operator is less then 5 sec.

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Appendix B Abbreviations and Acronyms

The abbreviations and acronyms used in this document.

Table B-1 Abbreviations and Acronyms Table

Abbreviations	Full Name
AAL	ATM Adaptation Layer
ADSL	Asymmetric Digital Subscriber Line
AIS	Alarm Indication Signal
ATM	Asynchronous Transfer Mode
ATU-C	ADSL Transceiver Unit at the central office end
ATU-R	ADSL Transceiver Unit at the remote end
CBR	Constant Bit Rate
CV	Coding Violation
DSLAM	Digital Subscriber Line Access Multiplexer
ES	Error Seconds
EOA	Ethernet over ATM
GE	Gigabit Ethernet
IP	Internet Protocol
LOF	Loss of Frame
LOS	Loss of Signal
LPR	Loss of Power
OAM	Operation, Administration, and Maintenance
PCR	Peak Cell Rate
PSD	Power Spectral Density
PVC	Permanent Virtual Channel
rtVBR	Real time Variable Bit Rate
SCR	Sustainable Cell Rate
SNR	Signal-to Noise Ratio
SNMP	Simple Network Management Protocol
UAS	Unavailable Seconds
UBR	Unspecified Bit Rate
VC	Virtual Channel
VCI	Virtual Channel Identify
VCL	Virtual Channel Link
VDSL	Very high-speed Digital Subscriber Line
VLAN	Virtual Local Area Network
VP	Virtual Path
VPI	Virtual Path Identifier
VTU-O	VDSL Transmission Unit at the Optical network interface
VTU-R	VDSL Transmission Unit at the remote end
xDSL	ADSL/VDSL

Appendix C Alarm Definition

Describe all the alarm in the AMS.

Table C-1 Alarm Definition Table

NE Model	Module Name	Alarm Name	Default Severity	Alarm Description
All	noEntity	EMPTY	No	Neither plan type nor on-line type configured
DAS4192	CPU Module	MISSING	Major	CPU Module is off-line
		TEMP	Major	Temperature is over the threshold
		VOL	Major	Voltage is below the threshold
		MISMATCH	Major	Planned type and online type are mismatched
		TCA_DHCP_BC	Warning	DHCP broadcast request rate threshold-crossing alert
	ADSL Module	MISSING	Major	ADSL module is off-line
		TEMP	Major	Temperature is over the threshold
		VOL	Major	Voltage is below the threshold
		MISMATCH	Major	Planned type and online type are mismatched
		NOT_OPERABLE	Major	ADSL line card is not operable
	Power Module	MISSING	Major	Power module is off-line
		NOT_OPERABLE	Major	Power card is not operable
	Fan Module	MISSING	Major	Fan module is off-line
		FAN1_SPEED	Major	Fan1 speed is below the threshold
		FAN2_SPEED	Major	Fan2 speed is below the threshold
		VOL	Major	Voltage is below the threshold
	ADSL Port	ES_NE_15_MIN	Minor	15 min near end ES is over threshold
		SES_NE_15_MIN	Minor	15 min near end SES is over threshold
		UAS_NE_15_MIN	Minor	15 min near end UAS is over threshold
		ES_FE_15_MIN	Minor	15 min far end ES is over threshold
		SES_FE_15_MIN	Minor	15 min far end SES is over threshold
		UAS_FE_15_MIN	Minor	15 min far end UAS is over threshold
		ES_NE_1_DAY	Minor	1 day near end ES is over threshold
		SES_NE_1_DAY	Minor	1 day near end SES is over threshold
		UAS_NE_1_DAY	Minor	1 day near end UAS is over threshold
		ES_FE_1_DAY	Minor	1 day far end ES is over threshold
		SES_FE_1_DAY	Minor	1 day far end SES is over threshold
		UAS_FE_1_DAY	Minor	1 day far end UAS is over threshold
		LOS	Minor	Loss of signal
		LOF	Minor	Loss of frame
		LPWR	Warning	CPE loss of power
		GEN_LINE_INIT_FAIL	Minor	Generic line initialization failure
		CONFIG_ERROR	Minor	Line initialization failure - configuration error
		HIGH_BIT_RATE	Minor	Line initialization failure - high bit rate
		COMM_PROBLEM	Minor	Line initialization failure - communication problem
		NO_PEER_DETECTED	Minor	No peer detected
		TRAINING	Warning	Port is under training
		NO_CONFIG	Information	Port is not configured
		PS_L2_MANUAL	Information	ADSL2/ADSL2+ Power State transfers to L2 by manual mode

NE Model	Module Name	Alarm Name	Default Severity	Alarm Description
DAS4192	ADSL Port	PS_L2_AUTO	Information	ADSL2/ADSL2+ Power State transfers to L2 by automatic mode
		PS_L3_CO	Information	ADSL2/ADSL2+ Power State transfers to L3 by CO side
		PS_L3_CPE	Information	ADSL2/ADSL2+ Power State transfers to L3 by CPE side
		ILLEGAL_IP	Warning	Packets with illegal IP addresses have been dropped
		ILLEGAL_MAC	Warning	duplicated MAC addresses from different line ports are made out
		DISABLED	Information	The port is disabled
	GE Port	MISSING	Major	GE Port is off-line
		NOT_OPERABLE	Major	GE Port is not operable
		STP_LEARN	Information	GE port is transited to STP-learnning state
		STP_BLOCK	Information	GE port is transited to STP-blocking state
		DISABLED	Information	GE port is disabled
	Alarm Relay Module	MISSING	Major	Alarm relay module is off-line
	Alarm Relay Port	MISSING	Major	Alarm relay port is off-line
		RELAY_ABNORMAL	Major	The alarm relay port is under abnormal status
		DISABLED	Information	The alarm repay port is disabled
	SHDSL Module	MISSING	Major	SHDSL module is off-line
		TEMP	Major	Temperature is over the threshold
		VOL	Major	Voltage is below the threshold
		MISMATCH	Major	Planned type and online type are mismatched
		NOT_OPERABLE	Major	Line card is not operable
	SHDSL Port	TCA_ES_NE_15_MIN	Minor	15-min near end ES is over the threshold
		TCA_SES_NE_15_MIN	Minor	15-min near end SES is over the threshold
		TCA_UAS_NE_15_MIN	Minor	15-min near end UAS is over the threshold
		TCA_CRC_NE_15MIN	Minor	15-min near end CRC is over the threshold
		TCA_LOSW_NE_15MIN	Minor	15-min near end LOSW is over the threshold
		TCA_SNR_NE	Minor	Near end SNR margin is over the threshold
		TCA_ATTN_NE	Minor	Near end loop attenuation is over the threshold
		OPI	Information	Operation state change indication
		LOS	Minor	Loss of signal (FOH losd bit)
		SEGA	Minor	Segment anomaly - CRC anomaly (FOH sega bit)
		LPR	Minor	Loss of power - power status (FOH ps bit)
		SEGD	Minor	Segment defect - LOSW defect (FOH segd bit)
		PBO_NE	Minor	Near end enhanced power back off
		DEVFAULT_NE	Minor	Near end device fault - Diagnostic or self-test fault
		DCCONT_NE	Minor	Near end DC continuity fault - interfere with span powering
		LOSW_NE	Minor	Near end LOSW failure
		INI_CFG_NE	Minor	Near end indicates Far end not able to support requested configuration
		INI_PROTOCOL_NE	Minor	Near end indicates incompatible protocol used by Far end
		NOPEER	Minor	No peer detected
		PBO_FE	Minor	Far end enhanced power back off
		DEVFAULT_FE	Minor	Far end device fault - Diagnostic or self-test fault
		DCCONT_FE	Minor	Far end DC continuity fault - interfere with span powering

NE Model	Module Name	Alarm Name	Default Severity	Alarm Description
DAS4192	SHDSL Port	LOSW_FE	Minor	Far end LOSW failure
		INI_CFG_FE	Minor	Far end indicates Near end not able to support requested configuration
		INI_PROTOCOL_FE	Minor	Far end indicates incompatible protocol used by Near end
		DISABLED	Information	The port is disabled
DAS4672	CPU Module	MISSING	Major	CPU Module is off-line
		TEMP	Major	Temperature is over the threshold
		VOL	Major	Voltage is below the threshold
		MISMATCH	Major	Planned type and online type are mismatched
		NOT_OPERABLE	Major	CPU card is not operable
		TCA_DHCP_BC	Warning	DHCP broadcast request rate threshold-crossing alert
		STANDBY	Information	Running in standby mode
		HW_VERSION	Major	Hardware version is inconsistent
		SWAP	Information	Standby CPU module has been changed as active.
	ADSL Module	MISSING	Major	ADSL module is off-line
		TEMP	Major	Temperature is over the threshold
		VOL	Major	Voltage is below the threshold
		MISMATCH	Major	Planned type and online type are mismatched
		NOT_OPERABLE	Major	Line card is not operable
	Fan Module	MISSING	Major	Fan module is off-line
		FAN1_SPEED	Major	Fan1 speed is below the threshold
		FAN2_SPEED	Major	Fan2 speed is below the threshold
		FAN3_SPEED	Major	Fan3 speed is below the threshold
		VOL	Major	Voltage is below the threshold
	ADSL Port	ES_NE_15_MIN	Minor	15 min near end ES is over the threshold
		SES_NE_15_MIN	Minor	15 min near end SES is over the threshold
		UAS_NE_15_MIN	Minor	15 min near end UAS is over the threshold
		ES_FE_15_MIN	Minor	15 min far end ES is over the threshold
		SES_FE_15_MIN	Minor	15 min far end SES is over the threshold
		UAS_FE_15_MIN	Minor	15 min far end UAS is over the threshold
		ES_NE_1_DAY	Minor	1 day near end ES is over the threshold
		SES_NE_1_DAY	Minor	1 day near end SES is over the threshold
		UAS_NE_1_DAY	Minor	1 day near end UAS is over the threshold
		ES_FE_1_DAY	Minor	1 day far end ES is over the threshold
		SES_FE_1_DAY	Minor	1 day far end SES is over the threshold
		UAS_FE_1_DAY	Minor	1 day far end UAS is over the threshold
		LOS	Minor	Loss of signal
		LOF	Minor	Loss of frame
		LPWR	Warning	CPE Loss of power
		GEN_LINE_INIT_FAIL	Minor	Generic line initialization failure
		CONFIG_ERROR	Minor	Line initialization failure - configuration error
		HIGH_BIT_RATE	Minor	Line initialization failure - high bit rate
		COMM_PROBLEM	Minor	Line initialization failure - communication problem
		NO_PEER_DETECTED	Minor	No peer detected
		TRAINING	Warning	Port is under training
		NO_CONFIG	Information	Port is not configured
	ADSL Port	PS_L2_MANUAL	Information	ADSL2/ADSL2+ Power State transfers to L2 by manual mode.
		PS_L2_AUTO	Information	ADSL2/ADSL2+ Power State transfers to L2 by automatic mode.
		PS_L3_CO	Information	ADSL2/ADSL2+ Power State transfers to L3 by CO side
		PS_L3_CPE	Information	ADSL2/ADSL2+ Power State transfers to L3 by CPE side
		ILLEGAL_IP	Warning	Packets with illegal IP addresses have been dropped
		ILLEGAL_MAC	Warning	duplicated MAC addresses from different line ports are made out
		DISABLED	Information	The port is disabled
	GE Port	MISSING	Major	GE Port is off-line

NE Model	Module Name	Alarm Name	Default Severity	Alarm Description
DAS4672	GE Port	NOT_OPERABLE	Major	GE Port is not operable
		STP_LEARN	Information	GE port is transited to STP-learnning state
		STP_BLOCK	Information	GE port is transited to STP-blocking state
		DISABLED	Information	GE port is disabled
	Alarm Relay Module	MISSING	Major	Alarm relay module is off-line
	Alarm Relay Port	MISSING	Major	Alarm relay port is off-line
		RELAY_ABNORMAL	Major	The alarm relay port is under abnormal status
		DISABLED	Information	The port is disabled
	SHDSL Module	MISSING	Major	SHDSL module is off-line
		TEMP	Major	Temperature is over the threshold
		VOL	Major	Voltage is below the threshold
		MISMATCH	Major	Planned type and online type are mismatched
		NOT_OPERABLE	Major	Line card is not operable
	SHDSL Port	ES_NE_15_MIN	Minor	15-min near end ES is over the threshold
		SES_NE_15_MIN	Minor	15-min near end SES is over the threshold
		UAS_NE_15_MIN	Minor	15-min near end UAS is over the threshold
		TCA_CRC_NE_15MIN	Minor	15-min near end CRC is over the threshold
		TCA_LOSW_NE_15MIN	Minor	15-min near end LOSW is over the threshold
		TCA_SNR_NE	Minor	Near end SNR margin is over the threshold
		TCA_ATTN_NE	Minor	Near end loop attenuation is over the threshold
		OPI	Minor	Operation state change indication
		LOS	Minor	Loss of signal (FOH losd bit)
		SEGA	Minor	Segment anomaly - CRC anomaly (FOH sega bit)
		LPR	Minor	Loss of power - power status (FOH ps bit)
		SEGD	Minor	Segment defect - LOSW defect (FOH segd bit)
		PBO_NE	Minor	Near end enhanced power bac koff
		DEVFAULT_NE	Minor	Near end device fault - Diagnostic or self-test fault
		DCCONT_NE	Minor	Near end DC continuity fault - interfere with span powering
		LOSW_NE	Minor	Near end LOSW failure
		INI_CFG_NE	Minor	Near end indicates Far end not able to support requested configuration
		INI_PROTOCOL_NE	Minor	Near end indicates incompatible protocol used by Far end
		NOPEER	Minor	No peer detected
		PBO_FE	Minor	Far end enhanced power back off
		DEVFAULT_FE	Minor	Far end device fault - Diagnostic or self-test fault
		DCCONT_FE	Minor	Far end DC continuity fault - interfere with span powering
		LOSW_FE	Minor	Far end LOSW failure
		INI_CFG_FE	Minor	Far end indicates Near end not able to support requested configuration
		INI_PROTOCOL_FE	Minor	Far end indicates incompatible protocol used by Near end
		DISABLED	Information	The port is disabled
	Chassis	PWR1_FAIL	Warning	Power1 failed
		PWR2_FAIL	Warning	Power2 failed
		PWR1_NOT_OPERABLE	Major	Power1 is not operable
		PWR2_NOT_OPERABLE	Major	Power2 is not operable

Revision History

1) Revision Date: 2007/4/26
Release version: v1.0.1
Author: William Fu
Summary of Change(s):
(1) Section 4.4 Constructing a NE on AMS
Add Figure 4-14 Board Setting Dialog
Add a **Note** to remind to reset ADSL LC after changing the board setting.
Figure 3-9 Illustration of the NE Frame Region and Card Module Region on NE.

2) Revision Date: 2007/4/30
Release version: v1.0.2
Author: William Fu
Summary of Change(s):
(1) Section 3.5.3: AMS Management Window Overview
Add
Figure 3-9 Illustration of the NE Frame Region and Card Module Region on NE.
for the reference in Section 6.5.1 “Active Alarm Status”
(2) Section 4.7.7: Alarm Definition Profile Management
Extend this section by adding 2 more pictures and corresponding configuration procedure.
(3) Section 4.9.1: VC-to-VLAN Connection Management
Modify Table 4-40 xDSL VC-to-VLAN Setting Description’
(4) Section 4.13: NE Fast Provision Management: Add this new section
Add this new section.
(5) Chapter 6: Fault Management Functions
Add this new chapter.
(6) “How to”
Add new appendix at the end of document.

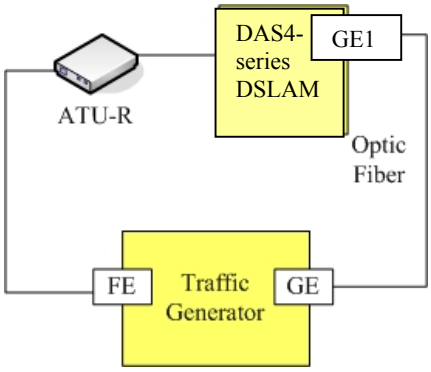
Quick Configuration Guide for AMS Client

This chapter contains the following "How to" for the operator to be familiar with the DAS4-series product.

HowTo 1. How to configure to provide a unicast/broadcast and bridged data service on the DAS4 series IP-DSALM
HowTo 2. How to configure to provide a multicast and bridged data service on the DAS4 series IP-DSALM

HowTo 1. How to configure to provide a unicast/broadcast and bridged data service on the DAS4 series IP-DSALM

Environment



Set Up via AMS client

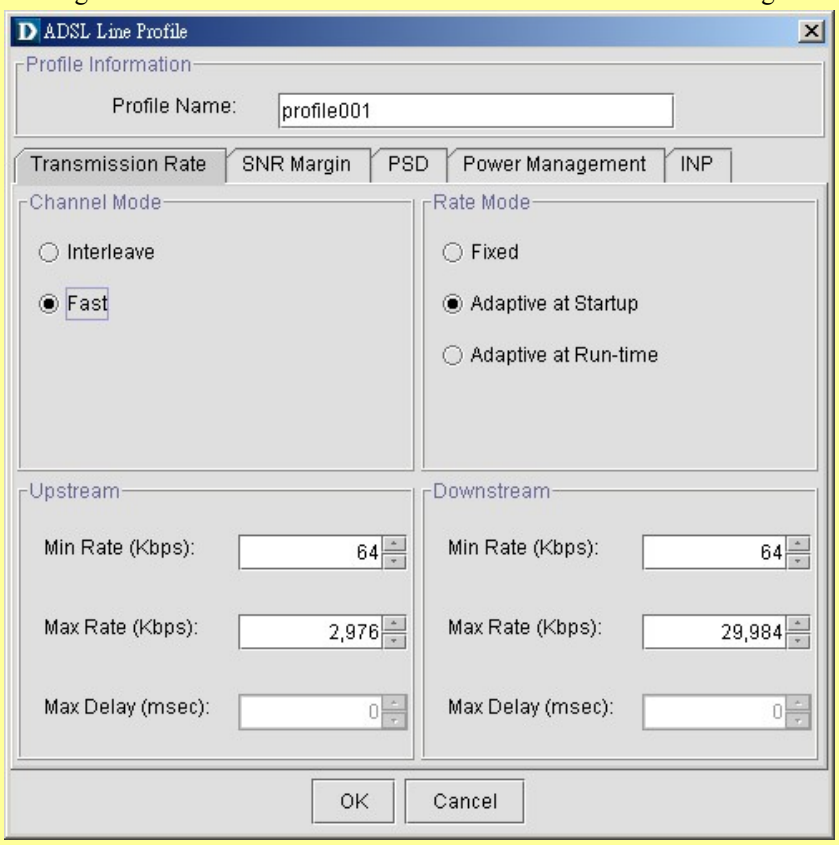
Step	Procedure and example of parameter value (Procedure with blue background, Example with yellow background)
Step 1	Add a ADSL line profile to system.
	Follow the procedures in Section 4.7.1 ADSL Profile Management to set the profiles by filling the indicated dialogs as follows **Line Profile** 1. Figure 4-21 Add ADSL Line Profile– Transmission Rate Dialog 2. Figure 4-22 Add ADSL Line Profile– SNR Margin Dialog 3. Figure 4-23 Add ADSL Line Profile– PSD Dialog 4. Figure 4-24 Add ADSL Line Profile– Power Management Dialog 5. Figure 4-25 Add ADSL Line Profile– INP Dialog **PM Threshold Profile (optional)** 1. Figure 4-27 Add ADSL PM Threshold Profile Dialog **Traffic Policing Profile** 1. Figure 4-39 Add xDSL IP Traffic Profile Dialog

Example:

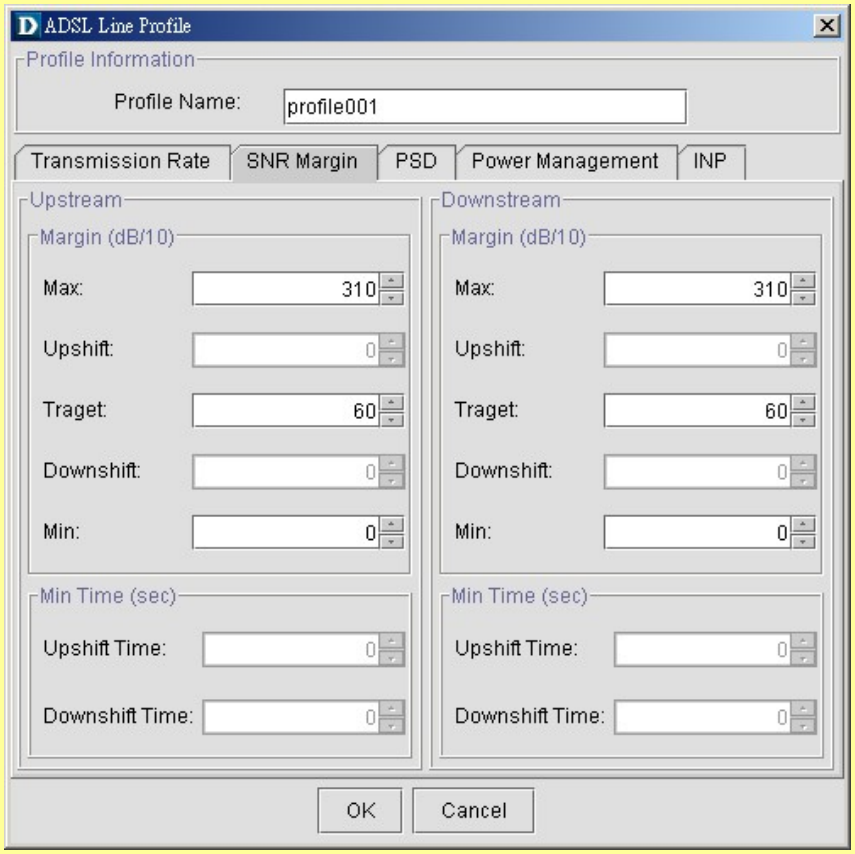
Please see the example setting as follows.

Line Profile

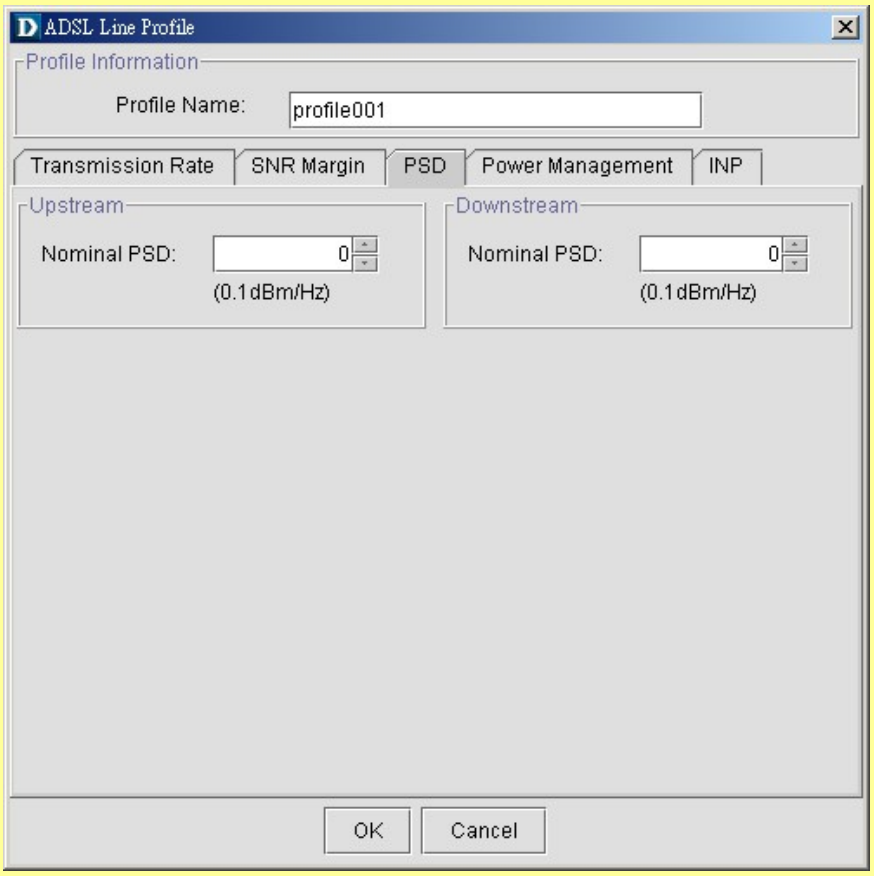
1. Figure 4-21 Add ADSL Line Profile– Transmission Rate Dialog



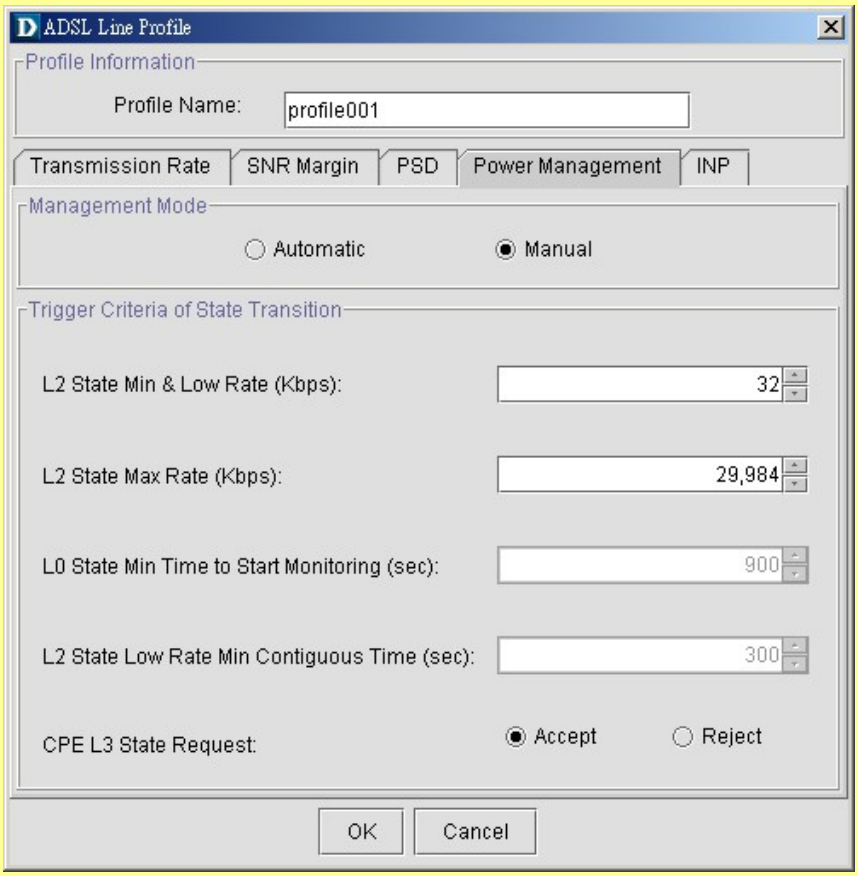
2. Figure 4-22 Add ADSL Line Profile– SNR Margin Dialog



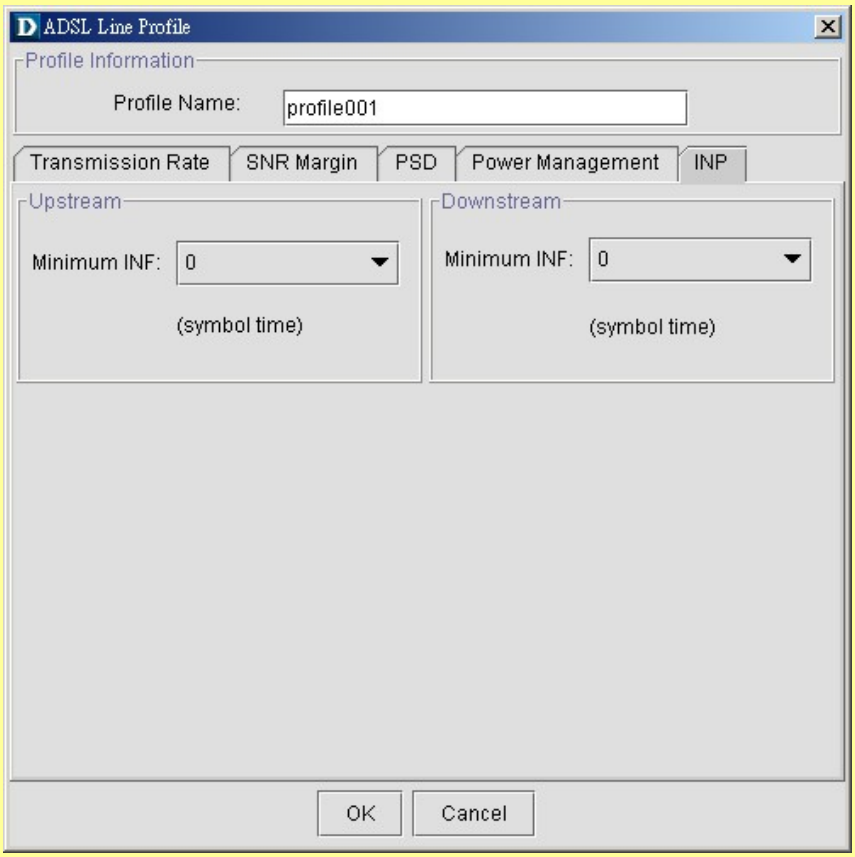
3. Figure 4-23 Add ADSL Line Profile– PSD Dialog



4. Figure 4-24 Add ADSL Line Profile– Power Management Dialog

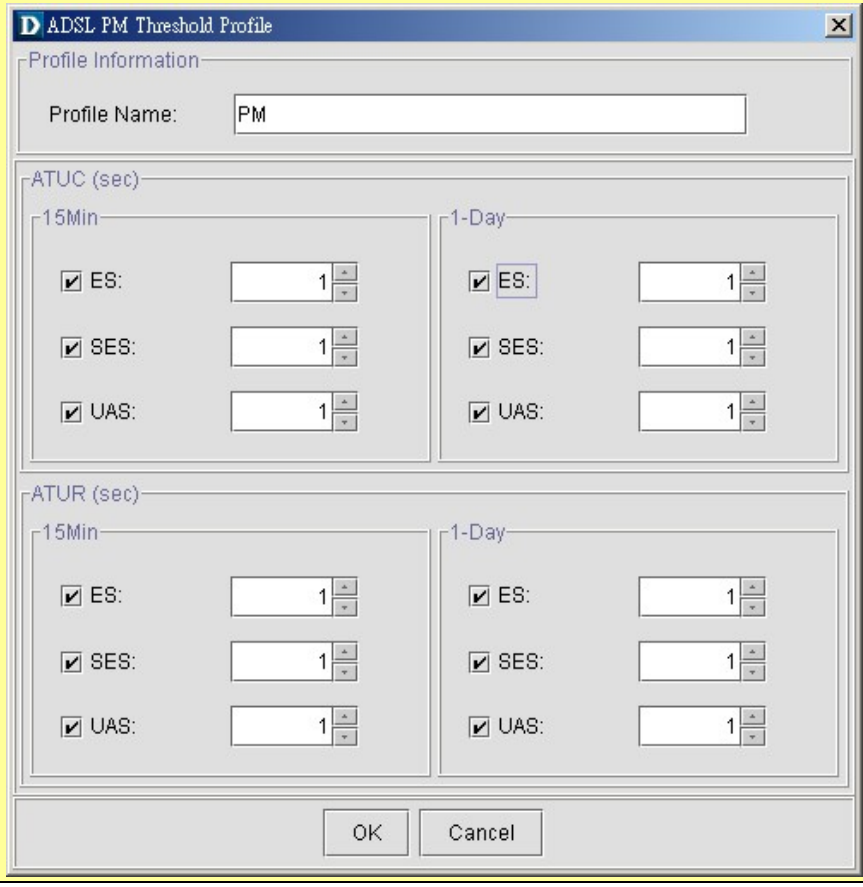


5. Figure 4-25 Add ADSL Line Profile– INP Dialog



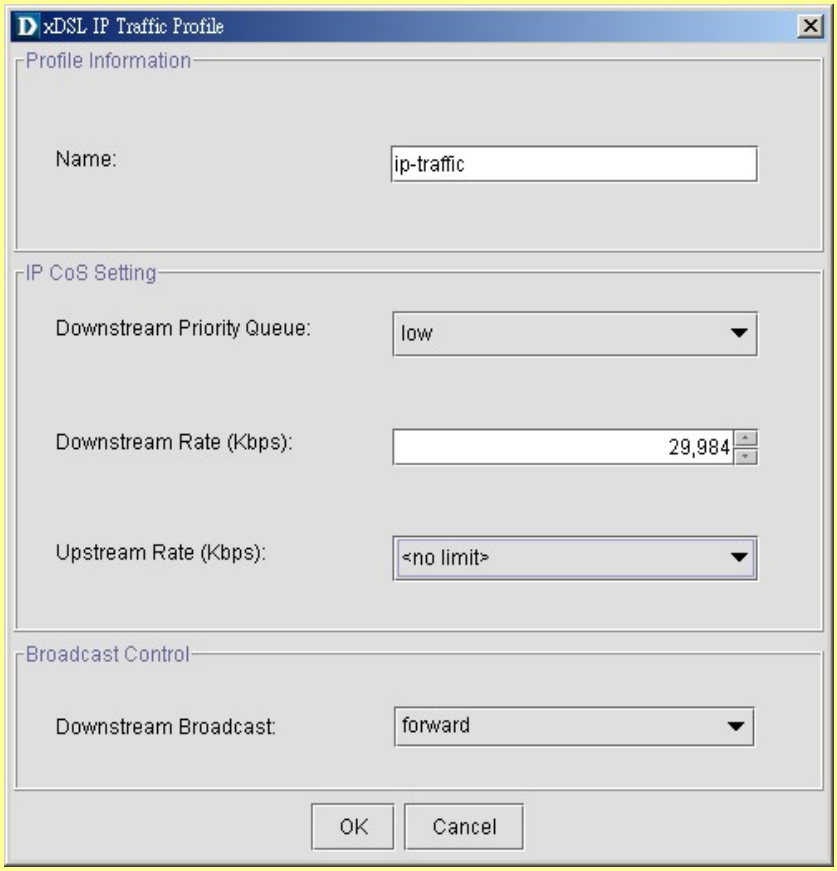
PM Threshold Profile (optional)

1. Figure 4-27 Add ADSL PM Threshold Profile Dialog

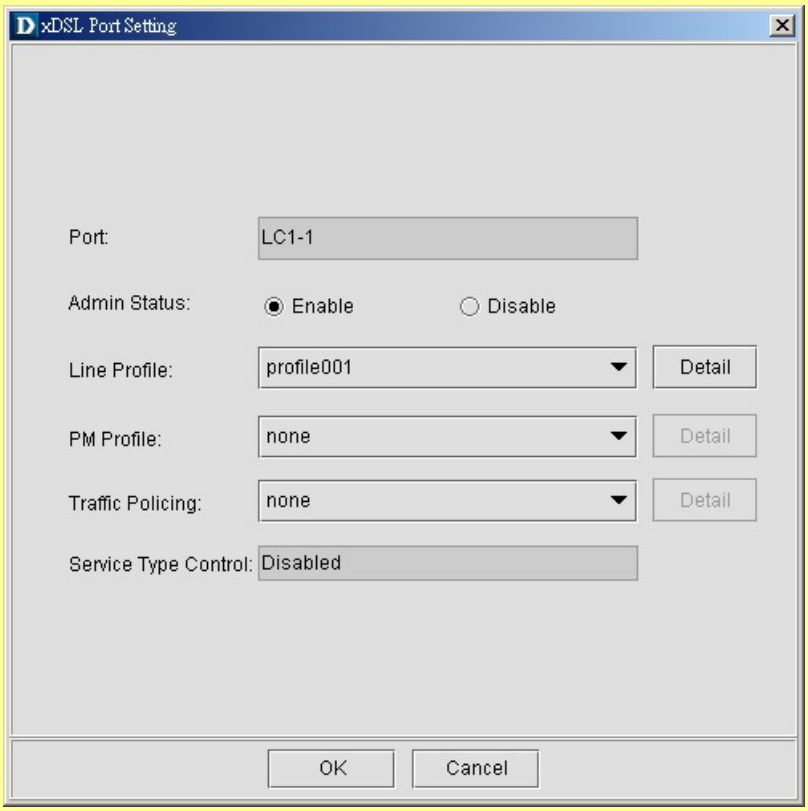


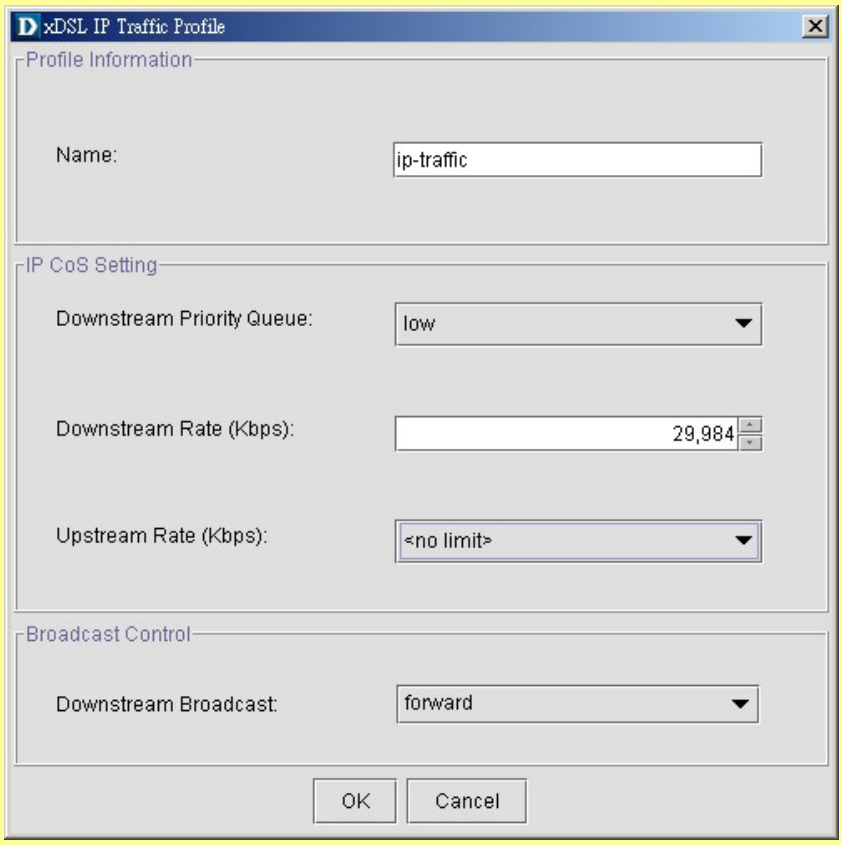
Traffic Policing Profile

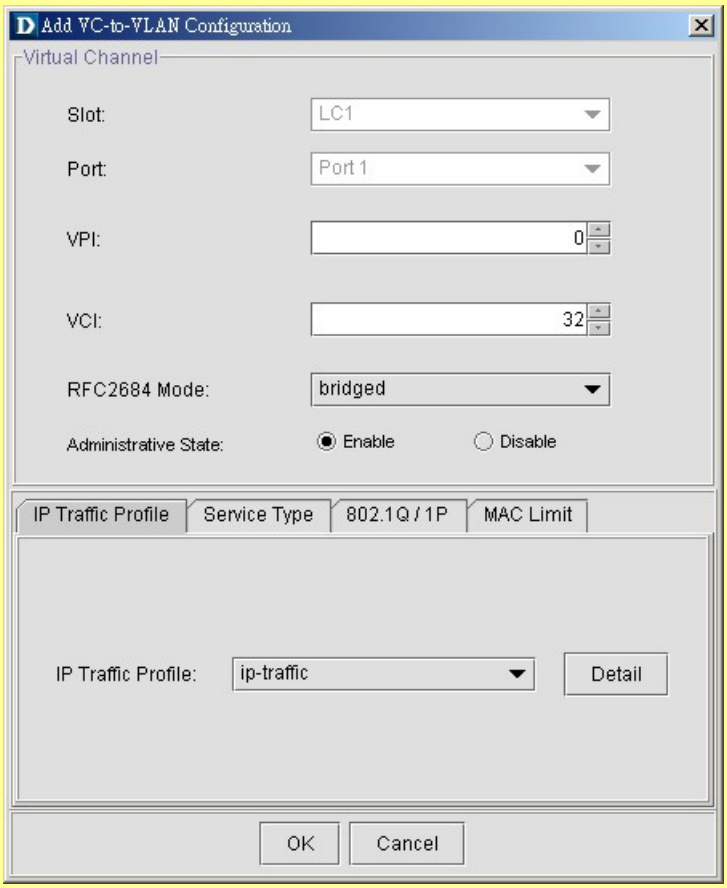
1. Figure 4-39 Add xDSL IP Traffic Profile Dialog



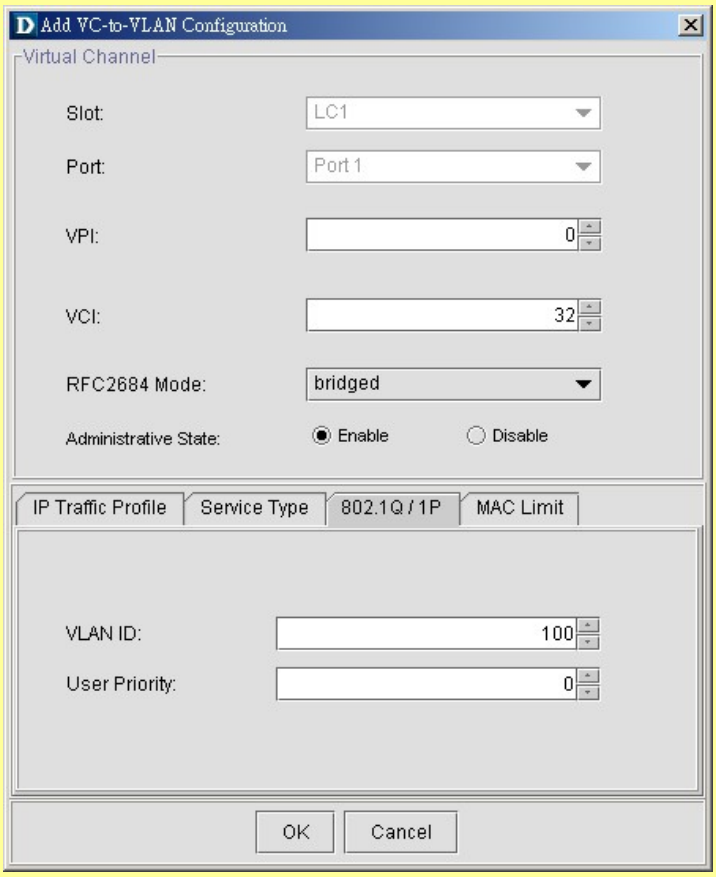
..

Step 2	Assign ADSL line profile to a ADSL subscriber and enable it.
	Follow the procedures in Section 4.8.1 ADSL Line Interface Management to modify the configuration of target ADSL port by filling the following dialog. 1. Figure 4-51 Modify ADSL Port Dialog.
	Example: Please see the example setting as follows. 1. Figure 4-51 Modify ADSL Port Dialog. 

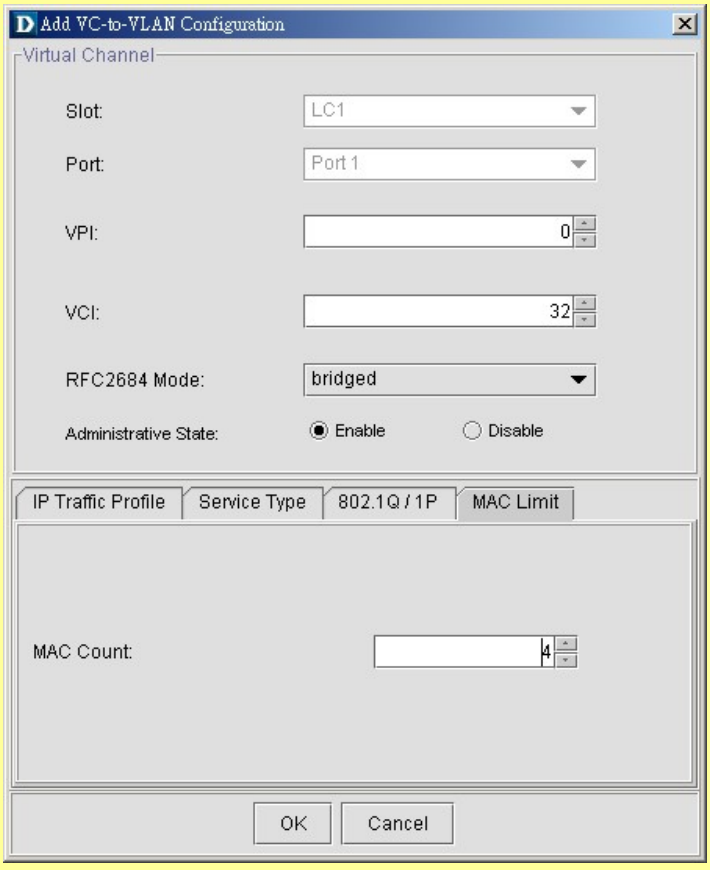
Step 3	Add an IP traffic profile to system.
	Follow the procedures in 4.7.5 VLAN Profile Management to set the following profiles **IP Traffic Profile** 1. Figure 4-39 Add xDSL IP Traffic Profile Dialog
	Example: Please see the example setting as follows. 1. Figure 4-39 Add xDSL IP Traffic Profile Dialog 

Step 4	Create a bidirectional PVC between IP-DSLAM and ATU-R
	Follow the procedures in Section 4.9.1 VC-to-VLAN Connection Management to fill the following dialogs 1. Figure 4-63 xDSL VC-to-VLAN Setting – IP Traffic Dialog 2. Figure 4-64 xDSL VC-to-VLAN Setting – 802.1Q/1P Dialog (only for the RFC2684 bridged mode) 3. Figure 4-66 xDSL VC-to-VLAN Setting – MAC Limit Dialog (only for the RFC2684 bridged mode) 4. Figure 4-68 xDSL VC-to-VLAN Setting – Service Type Dialog
	Example: Please see the example setting as follows. 1. Figure 4-63 xDSL VC-to-VLAN Setting – IP Traffic Dialog 

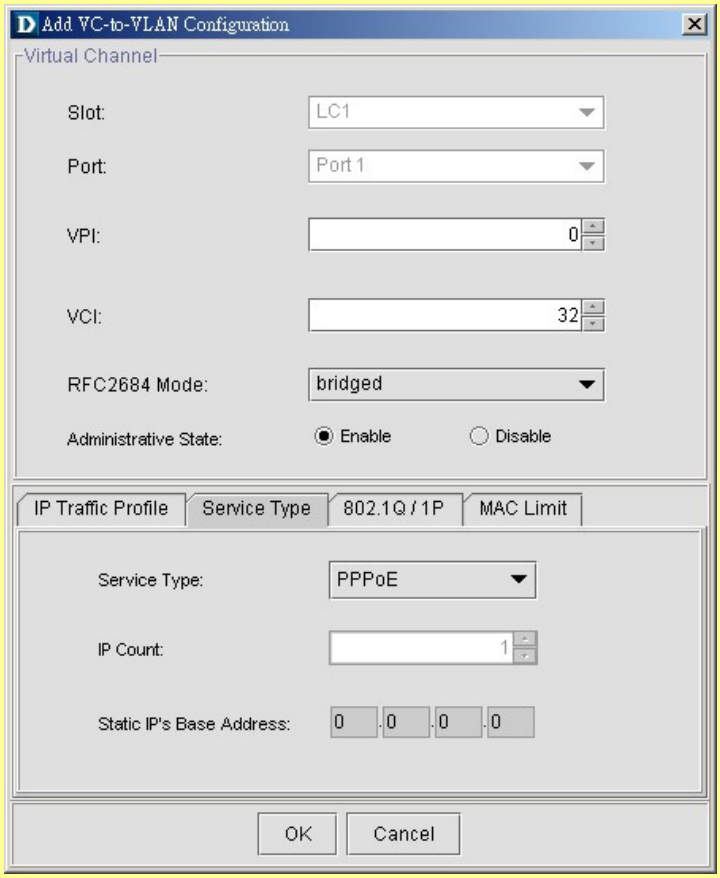
2. Figure 4-64 xDSL VC-to-VLAN Setting – 802.1Q/1P Dialog (only for the RFC2684 bridged mode)

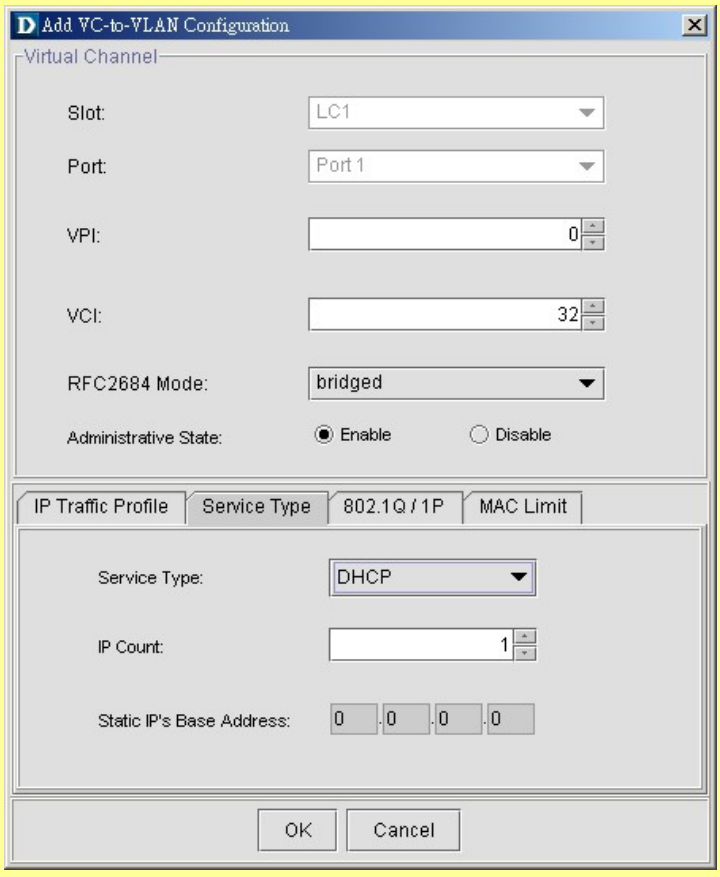


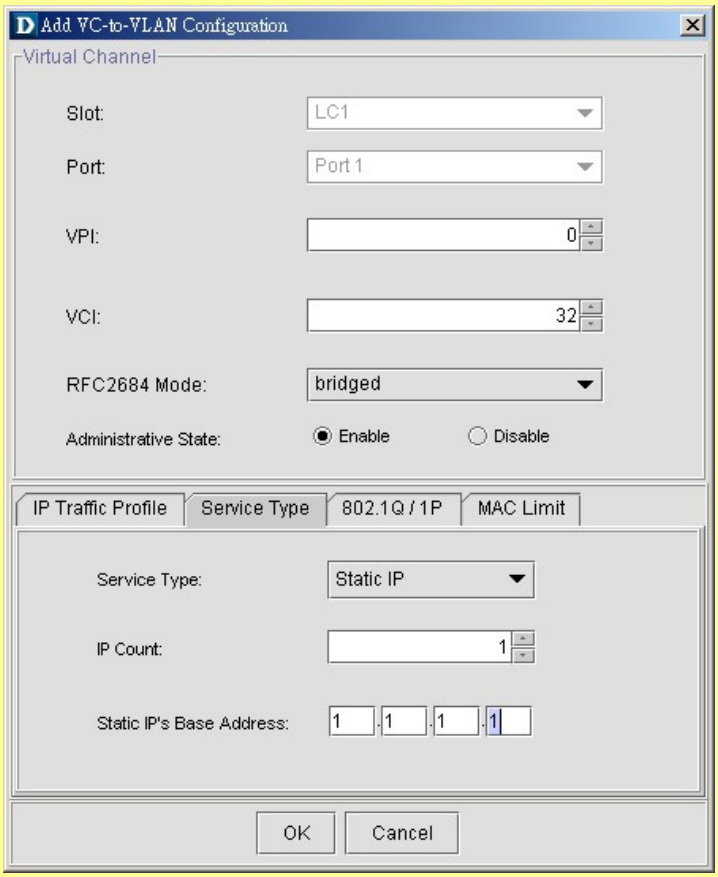
3. Figure 4-66 xDSL VC-to-VLAN Setting – MAC Limit Dialog (only for the RFC2684 bridged mode)



4. Figure 4-68 xDSL VC-to-VLAN Setting – Service Type Dialog

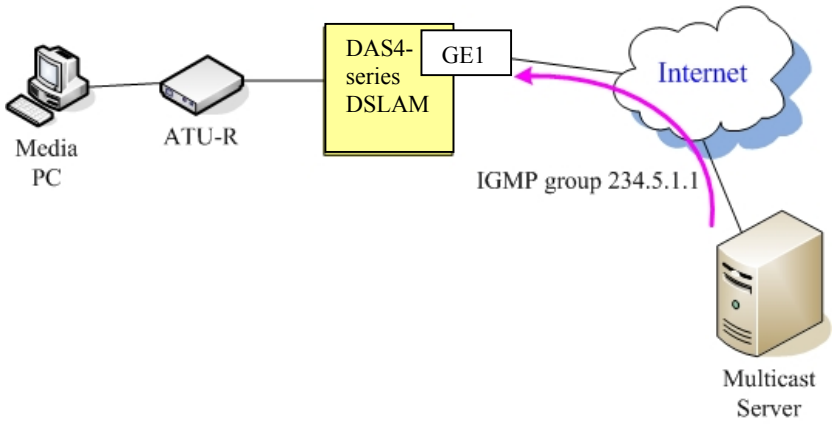




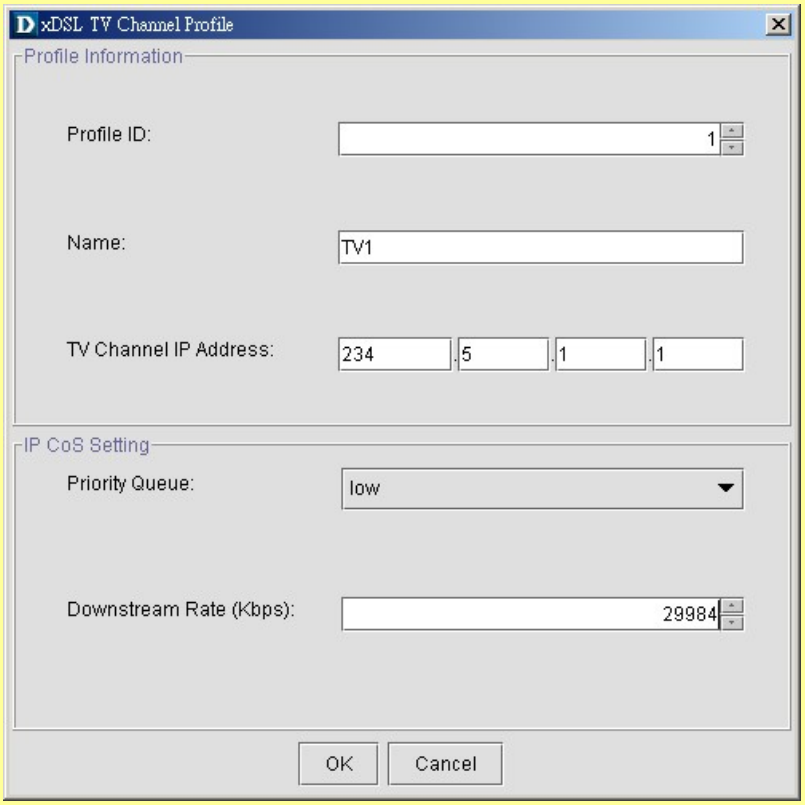

Add VC-to-VLAN Configuration
Virtual Channel
Slot:
LC1
Port:
Port 1
VPI:
0
VCI:
32
RFC2684 Mode:
bridged
Administrative State:
Enable
Disable
IP Traffic Profile
Service Type
802.1Q / 1P
MAC Limit
Service Type:
Static IP
IP Count:
1
Static IP's Base Address:
1 . 1 . 1 . 1
OK
Cancel

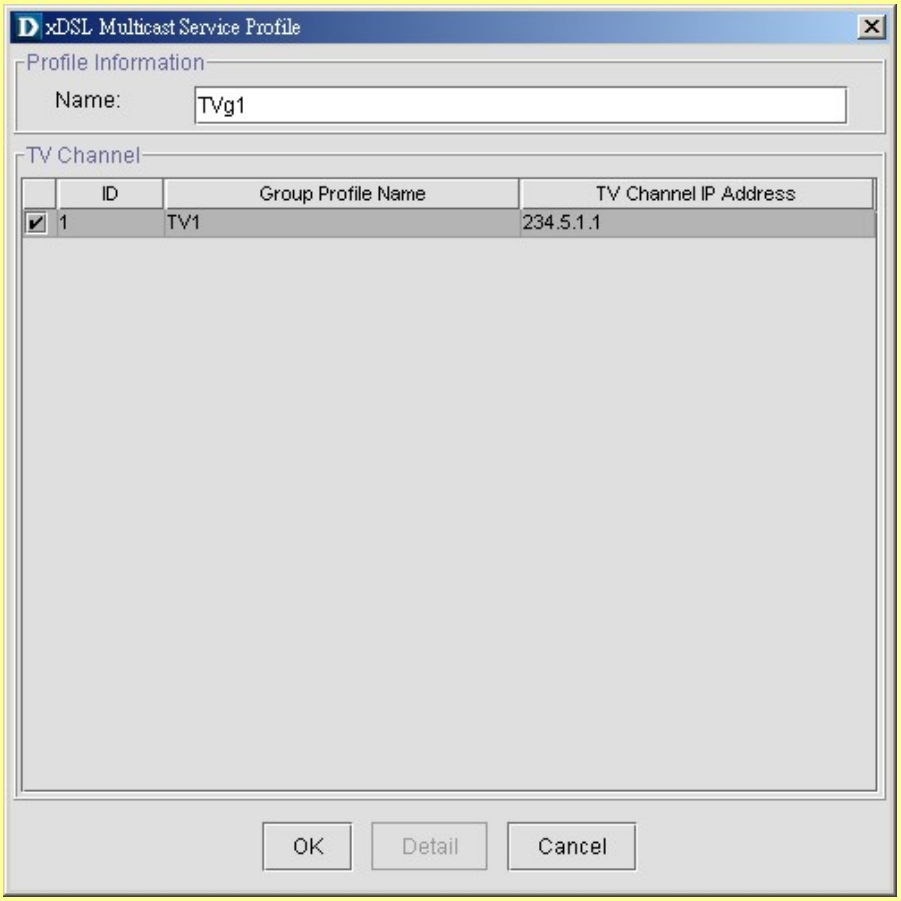
HowTo 2. How to configure to provide a multicast and bridged data service on the DAS4 series IP-DSALM

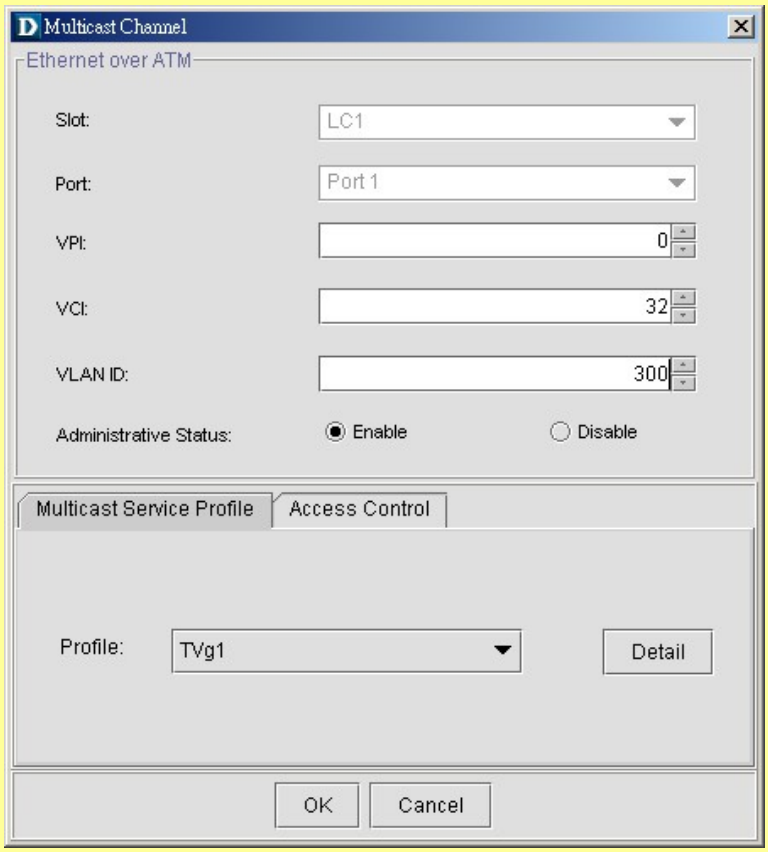
Environment

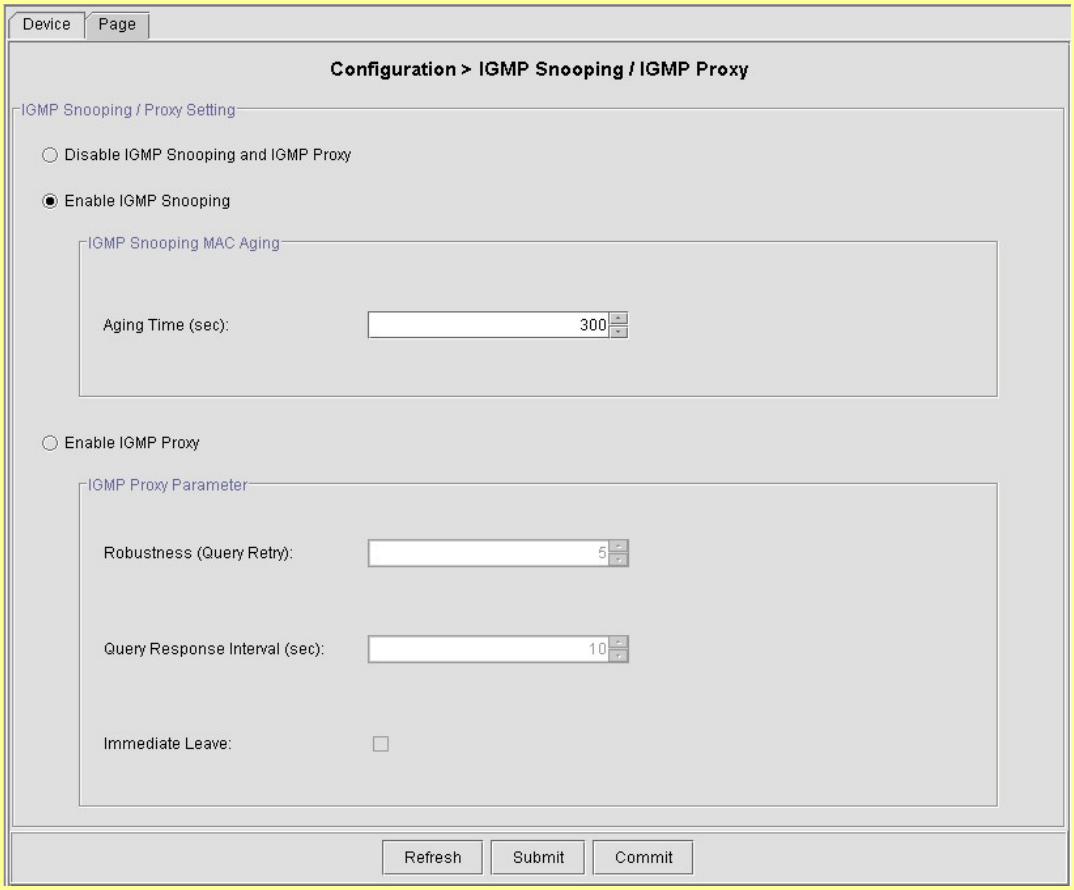


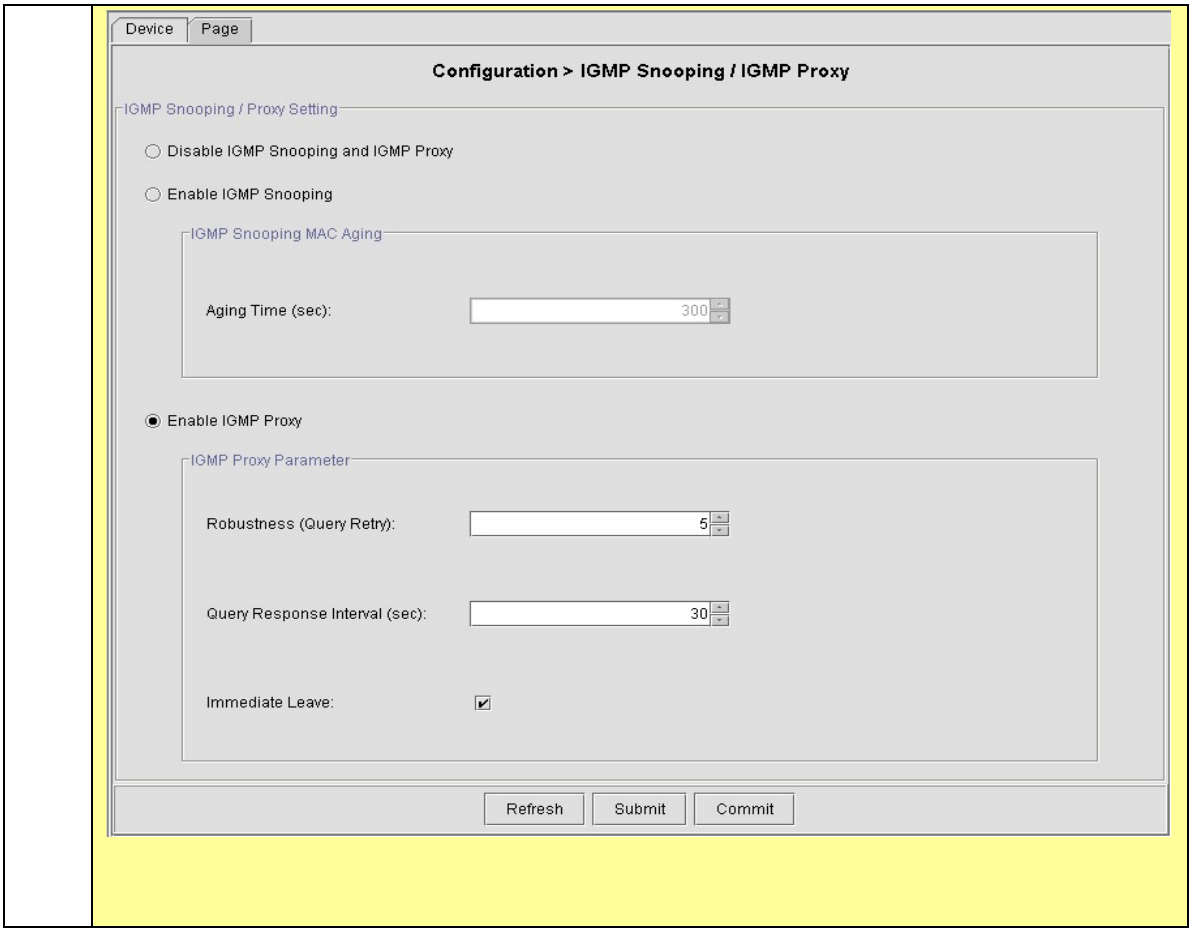
Set Up via AMS client

Step	Procedure and example of parameter value (Procedure with blue background, Example with yellow background)
Step 1	Add a TV (multicast) channel profile to system.
	Follow the procedures in 4.7.5 VLAN Profile Management to set the following profiles **TV Channel Profile** 1. Figure 4-39 Add xDSL IP Traffic Profile DialogFigure 4-41 Add xDSL TV Channel Profile Dialog
	Example: Please see the example setting as follows. 1. Figure 4-39 Add xDSL IP Traffic Profile DialogFigure 4-41 Add xDSL TV Channel Profile Dialog 

Step 2	Create a multicast service profile and assign multicast channel profile to a service profile.
	Follow the procedures in 4.7.5 VLAN Profile Management to set the following profiles **Multicast Service Profile** 1. Figure 4-43 Add xDSL Multicast Service Profile Dialog
	Example: Please see the example setting as follows. 1. Figure 4-43 Add xDSL Multicast Service Profile Dialog 

Step 3	Follow step 1~4 in **HowTo 1**
Step 4	Create a mcau (multicast conditional access unit) on xDSL subscriber.
	Follow the procedures in Section 4.11.1 Multicast Channel Configuration to fill the following dialogs 1. Figure 4-76 xDSL Multicast Channel Setting Dialog
	Example: Please see the example setting as follows. 1. Figure 4-76 xDSL Multicast Channel Setting Dialog 

Step 5	Enable IGMP snoopy function on IP-DSLAM.
	Follow the procedures in Section 4.11.2 IGMP snooping/IGMP proxy Configuration to fill the following dialogs 1. Figure 4-77 IGMP Snooping / IGMP Proxy Setting Dialog
	Example: Please see the example setting as follows. 1. Figure 4-77 IGMP Snooping / IGMP Proxy Setting Dialog 


Device
Page
Configuration > IGMP Snooping / IGMP Proxy
IGMP Snooping / Proxy Setting
Disable IGMP Snooping and IGMP Proxy
Enable IGMP Snooping
IGMP Snooping MAC Aging
Aging Time (sec):
300
Enable IGMP Proxy
IGMP Proxy Parameter
Robustness (Query Retry):
5
Query Response Interval (sec):
30
Immediate Leave:
Refresh
Submit
Commit