

IES-1248-51/51A/53

ADSL2+ IP DSLAM

User's Guide

Version 3.53
08/2009
Edition 2

DEFAULT LOGIN

IP Address	http://192.168.1.1
User Name	admin
Password	1234



www.zyxel.com

About This User's Guide

Intended Audience

This manual is intended for people who want to configure the IES-1248 using the web configurator. You should have at least a basic knowledge of TCP/IP networking concepts and topology.

Related Documentation

- Quick Start Guide
The Quick Start Guide is designed to help you get up and running right away. It contains information on setting up your network and configuring for Internet access.
- Web Configurator Online Help
Embedded web help for descriptions of individual screens and supplementary information.
- Command Reference Guide
The Command Reference Guide explains how to use the Command-Line Interface (CLI) and CLI commands to configure the IES-1248.



It is recommended you use the web configurator to configure the IES-1248.

- Supporting Disk
Refer to the included CD for support documents.
- ZyXEL Web Site
Please refer to www.zyxel.com for additional support documentation and product certifications.

User's Guide Feedback

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

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

E-mail: techwriters@zyxel.com.tw

Document Conventions

Warnings and Notes

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



Warnings tell you about things that could harm you or your IES-1248.



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

Syntax Conventions

- The IES-1248-51/51A/53 may be referred to as the “IES-1248”, the “device”, the “system” or the “product” in this User's Guide.
- Product labels, screen names, field labels and field choices are all in **bold** font.
- A key stroke is denoted by square brackets and uppercase text, for example, [ENTER] means the “enter” or “return” key on your keyboard.
- “Enter” means for you to type one or more characters and then press the [ENTER] key. “Select” or “choose” means for you to use one of the predefined choices.
- A right angle bracket (>) within a screen name denotes a mouse click. For example, **Maintenance > Log > Log Setting** means you first click **Maintenance** in the navigation panel, then the **Log** sub menu and finally the **Log Setting** tab to get to that screen.
- Units of measurement may denote the “metric” value or the “scientific” value. For example, “k” for kilo may denote “1000” or “1024”, “M” for mega may denote “1000000” or “1048576” and so on.
- “e.g.” is a shorthand for “for instance”, and “i.e.” means “that is” or “in other words”.

Icons Used in Figures

Figures in this User's Guide may use the following generic icons. The IES-1248 icon is not an exact representation of your IES-1248.

IES-1248 	Computer 	Server 
Computer 	DSLAM 	Gateway 
Central Office/ ISP 	Internet 	Hub/Switch 

Firmware Naming Conventions

A firmware version includes the model code and release number as shown in the following example.

Firmware Version: V3.53 (ABQ.0)

"ABQ" is the model code.

- "ABQ" denotes the IES-1248-51 for ADSL over POTS (Annex A).
- "ABR" denotes the IES-1248-53 for ADSL over ISDN (Annex B).

"0" is this firmware's release number. This varies as new firmware is released. Your firmware's release number may not match what is displayed in this User's Guide.

Safety Warnings



For your safety, be sure to read and follow all warning notices and instructions.

- Do NOT use this product near water, for example, in a wet basement or near a swimming pool.
- Do NOT expose your device to dampness, dust or corrosive liquids.
- Do NOT store things on the device.
- Do NOT install, use, or service this device during a thunderstorm. There is a remote risk of electric shock from lightning.
- Connect ONLY suitable accessories to the device.
- ONLY qualified service personnel should service or disassemble this device.
- Make sure to connect the cables to the correct ports.
- Place connecting cables carefully so that no one will step on them or stumble over them.
- Always disconnect all cables from this device before servicing or disassembling.
- Use ONLY an appropriate power adaptor or cord for your device. Connect it to the right supply voltage (for example, 110V AC in North America or 230V AC in Europe).
- Use ONLY power wires of the appropriate wire gauge (see [Appendix on page 513](#) for details) for your device. Connect it to a power supply of the correct voltage (see [Appendix on page 513](#) for details).
- Do NOT allow anything to rest on the power adaptor or cord and do NOT place the product where anyone can walk on the power adaptor or cord.
- Do NOT use the device if the power adaptor or cord is damaged as it might cause electrocution.
- If the power adaptor or cord is damaged, remove it from the device and the power source.
- Do NOT attempt to repair the power adaptor or cord. Contact your local vendor to order a new one.
- Do not use the device outside, and make sure all the connections are indoors. There is a remote risk of electric shock from lightning.
- Caution: Risk of explosion if battery (on the motherboard) is replaced by an incorrect type. Dispose of used batteries according to the instructions. Dispose them at the applicable collection point for the recycling of electrical and electronic equipment. For detailed information about recycling of this product, please contact your local city office, your household waste disposal service or the store where you purchased the product.
- Do NOT obstruct the device ventilation slots, as insufficient airflow may harm your device.
- Use only No. 26 AWG (American Wire Gauge) or larger telecommunication line cord.
- Fuse Warning! Replace a fuse only with a fuse of the same type and rating.
- Warning! To avoid risk of electric shock, remove only one card at a time and do not place fingers or objects inside the chassis. Cover empty slots with slot covers.

- The length of exposed (bare) power wire should not exceed 7mm.
- Fan Module Warning! Use the fan module handle when pulling out or pushing in the fan module. Be careful not to put fingers or objects inside the fan module.

Your product is marked with this symbol, which is known as the WEEE mark. WEEE stands for Waste Electronics and Electrical Equipment. It means that used electrical and electronic products should not be mixed with general waste. Used electrical and electronic equipment should be treated separately.



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PART I

Introduction and Hardware

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Getting to Know the IES-1248

This chapter describes the system features, specifications and applications of your IES-1248.

The IES-1248 is an IP-based DSLAM (Internet Protocol Digital Subscriber Line Access Multiplexer) that connects ADSL subscribers to the Internet. As a high-performance but yet compact platform, it can conveniently deliver broadband Internet access to telephone company central offices, multi-tenant units (MTUs), hospitals, hotels, schools, university campuses and ISPs. The IES-1248's low cost and easy management make it a perfect DSL-provider solution.

The IES-1248 platform allows for convenient management and support of ADSL technology. Up to 48 ADSL subscribers can simultaneously utilize a wide range of powerful broadband services.

1.1 System Description

Four Telco-50 Connectors

There are four Telco-50 connectors for ADSL and POTS connections.

1000/100 Mbps Ethernet Ports

The IES-1248 has two 1000/100Mbps auto-sensing Ethernet ports.

They allow you to:

- Connect the IES-1248 to a second-level switch
- Daisy-chain other IES-1248

Two Slots for Mini GBIC Modules

The mini GBIC (Gigabit Interface Converter) module transceivers allow flexibility in connection options. You can use mini GBIC transceivers for fiber connections to backbone Ethernet switches.

Stacking

Daisy-chain up to three IES-1248 (or other Ethernet devices).

Integrated Splitters

The integrated DSL splitter eliminates the need to use external splitters that separate the voice-band and ADSL signals.

Console Port

Use the console port for local management of the IES-1248.

Fans

The fans cool the IES-1248 sufficiently to allow reliable operation of the IES-1248 in even poorly ventilated rooms or basements. To conserve energy and reduce noise, the fan speed depends on the temperature.

IP Protocols

- IP Host (No routing)
- Telnet for configuration and monitoring
- SNMP for management
 - SNMP MIB II (RFC 1213)
 - SNMP v1 RFC 1157
 - SNMPv2, SNMPv2c or later version
 - Bridge MIBs (RFC 1493, 2674)
 - SMI RFC 1155
 - ADSL Line MIB (RFC 2662)
 - ADSL Extension Line MIB (RFC2449)
 - Private MIBs

ADSL Encapsulation

Multiple Protocols over AAL5 (RFC 1483)

ADSL Compliance

- Multi-Mode ADSL standard (some IES-1248 models do not support all of these)
 - G.dmt (ITU-T G.992.1)
 - G.lite (ITU-T G.992.2)
 - G.hs (ITU-T G.994.1)
 - ETSI
 - ANSI T1.413 issue 2
 - ADSL2: G.992.3, G.992.4
 - ADSL2+: G.992.5
- Rate adaptation support

IEEE 802.1p Priority

Your IES-1248 uses IEEE 802.1p Priority to assign priority levels to individual PVCs.

Multiple PVC and ATM QoS

The IES-1248 allows you to use different channels (also called Permanent Virtual Circuits or PVCs) for different services or subscribers. Define channels¹ on each DSL port for different services or levels of service and assign each channel a priority. ATM Quality of Service (QoS) allows you to regulate the average rate and fluctuations of data transmission. This helps eliminate congestion to allow the transmission of real time data (such as audio and video).

IEEE 802.1x Port-based Authentication

The IES-1248 supports the IEEE 802.1x standard for centralized user authentication and accounting management through an optional network authentication (RADIUS) server.

2684 Routed Mode

The IES-1248 can handle 2684 routed mode traffic.

Downstream Broadcast

The IES-1248 can block downstream broadcast packets from being sent to specified VLANs on specified ports.

Management

- Remote configuration backup/restore and firmware upgrade
- SNMP manageable
- Text-based management locally via console port and remotely via telnet
- Editable plain text based configuration file

Security

- Password protection for system management
- VLAN

MAC (Media Access Control) Filter

Use the MAC filter to accept or deny incoming frames based on MAC (Media Access Control) address(es) that you specify. You may enable/disable the MAC filter on specific ports. You may specify up to ten MAC addresses per port.

MAC (Media Access Control) Count Filter

You can limit the number of MAC addresses that may be dynamically learned on a port. You may enable/disable the MAC count filter on individual ports.

Static Multicast

Use static multicast to allow incoming frames based on multicast MAC address(es) that you specify. This feature can be used in conjunction with IGMP snooping and IGMP proxy to allow multicast MAC address(es) that are not learned by IGMP snooping or IGMP proxy.

IGMP Proxy

In a simple tree network, the system can proxy multicast traffic in order to improve network performance.

IGMP Snooping

With IGMP snooping, group multicast traffic is only forwarded to ports that are members of that group. IGMP Snooping generates no additional network traffic, allowing you to significantly reduce multicast traffic passing through your IES-1248.

1. Up to eight channels on each DSL port at the time of writing.

System Monitoring

- System status (link status, rates, statistics counters)
- Temperatures, voltage reports and alarms.

System Error Logging

The IES-1248's system error log will record error logs locally. These logs may be viewed again after a warm restart.

Alarm LED

An **ALM** (alarm) LED lights when the IES-1248 is overheated, the fans are not working properly, the voltage readings are outside the tolerance levels or an alarm has been detected on the ALARM input pins.

Bandwidth Control

The IES-1248 supports rate limiting in 32 Kbps increments allowing you to create different service plans

Quality of Service

- Four priority queues for ENET and eight priority queues for downstream PVC so you can ensure mission-critical data gets delivered on time.
- Follows the IEEE 802.1p priority setting standard.

STP (Spanning Tree Protocol) / RSTP (Rapid STP)

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

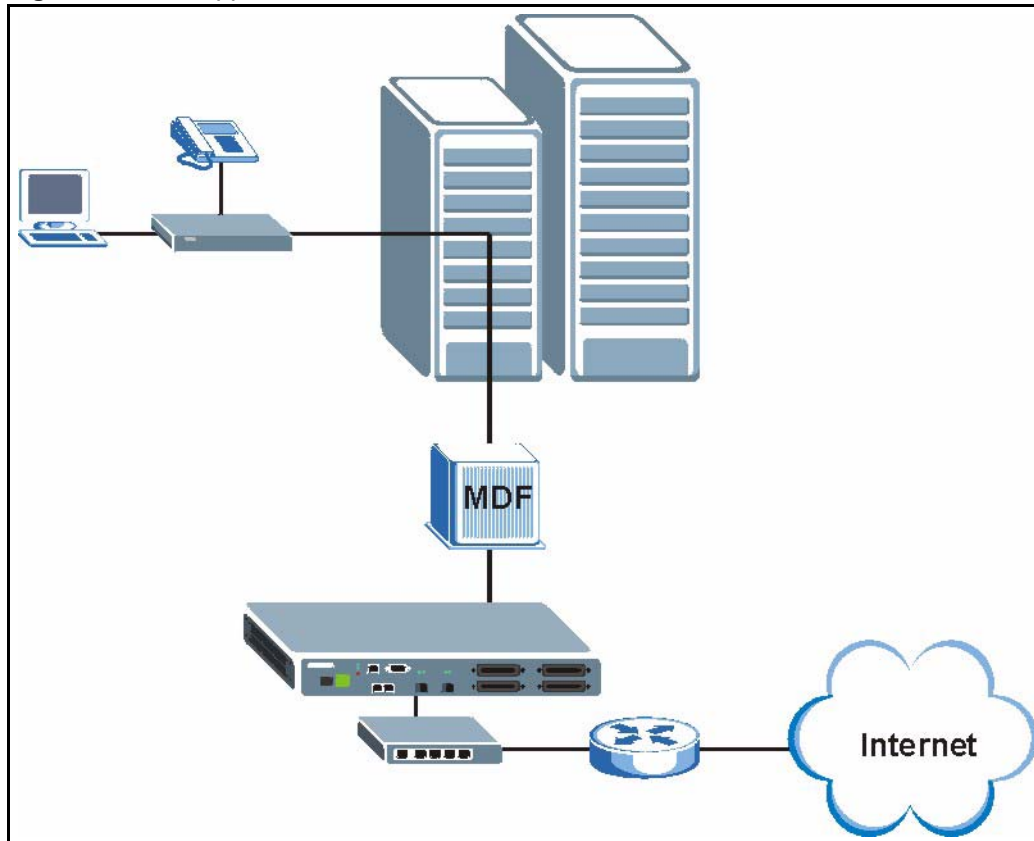
1.2 Applications

These are the main applications for the IES-1248:

- Internet access and multimedia services for Multiple Tenant Units (MTU).
- Other applications include telemedicine, surveillance systems, remote servers systems, cellular base stations and high-quality teleconferencing.

1.2.1 MTU Application

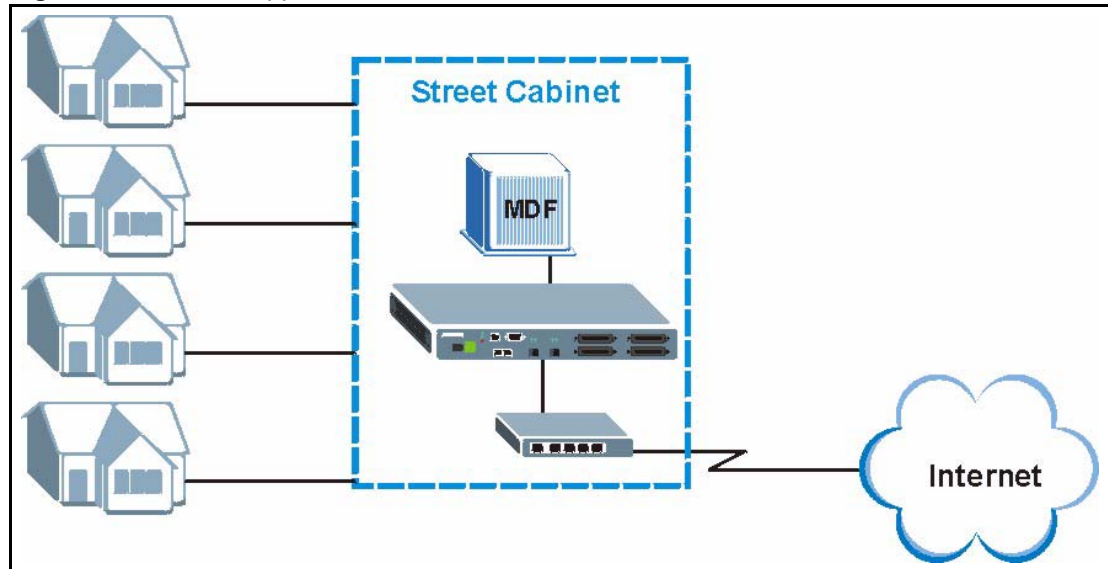
The following diagram depicts a typical application of the IES-1248 with ADSL modems, in a large residential building, or multiple tenant unit (MTU), that leverages existing phone line wiring to provide Internet access to all tenants. Note that ADSL service can coexist with voice service on the same line.

Figure 1 MTU Application

1.2.2 Curbside Application

The IES-1248 can also be used by an Internet Service Provider (ISP) in a street cabinet to form a “mini POP (Point-of-Presence)” to provide broadband services to residential areas that are too far away from the ISP to avail of DSL services. Residents need an ADSL modem, connected as shown in the previous figure.

Figure 2 Curbside Application



Hardware Installation

This chapter explains how to install the IES-1248.

2.1 General Installation Instructions

Before you begin, read all the safety warnings in [Running H/F 1](#) [Running H/F 2](#), and make sure you follow them.

Perform the installation as follows:

- 1 Make sure the IES-1248 power switch is in the **OFF** position.
- 2 Install the hardware. See [Section 2.2 on page 53](#).
- 3 Connect the frame ground. See [Section 2.3 on page 56](#).
- 4 See [Chapter 3 on page 59](#) for instructions on making front panel connections.
- 5 See [Chapter 4 on page 67](#) for instructions on connecting the Telco-50 connectors.
- 6 See [Chapter 5 on page 75](#) for instructions on making power connections and turning on the IES-1248.

2.2 Installation Scenarios

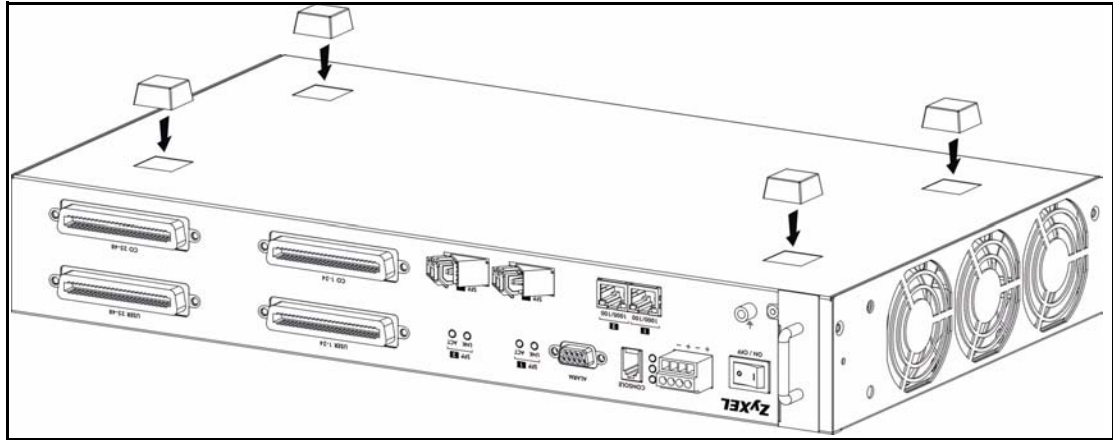
The IES-1248 can be placed on a desktop or rack-mounted on a standard EIA rack. Use the rubber feet in a desktop installation and the brackets in a rack-mounted installation.

For proper ventilation, allow at least 4 inches (10 cm) of clearance at the front and 3.4 inches (8 cm) at the back of the IES-1248. This is especially important for enclosed rack installations.

2.2.1 Desktop Installation Procedure

- 1 Make sure the IES-1248 is clean and dry.
- 2 Set the IES-1248 on a smooth, level surface strong enough to support the weight of the IES-1248 and the connected cables. Make sure there is a power outlet nearby.
- 3 Make sure there is enough clearance around the IES-1248 to allow air circulation and the attachment of cables and the power cord.
- 4 Remove the adhesive backing from the rubber feet.
- 5 Attach the rubber feet to each corner on the bottom of the IES-1248. These rubber feet help protect the IES-1248 from shock or vibration and ensure space between IES-1248 when stacking.

Figure 3 Attaching Rubber Feet



Do not block the ventilation holes. Leave space between IES-1248 when stacking.

2.2.2 Rack-Mounted Installation

2.2.2.1 Rack-mounted Installation Requirements

The IES-1248 can be mounted on an EIA standard size, 19-inch rack or in a wiring closet with other equipment. Follow the steps below to mount your IES-1248 on a standard EIA rack using a rack-mounting kit.



Make sure the rack will safely support the combined weight of all the equipment it contains.



Make sure the position of the IES-1248 does not make the rack unstable or top-heavy. Take all necessary precautions to anchor the rack securely before installing the unit.

- Use a #2 Philips screwdriver to install the screws.
- See [Appendix on page 513](#) for the gauge of wire to use for the frame ground connections.
- See [Appendix on page 513](#) for the hardware that is required to mount the IES-1248.



Failure to use the proper screws may damage the unit.

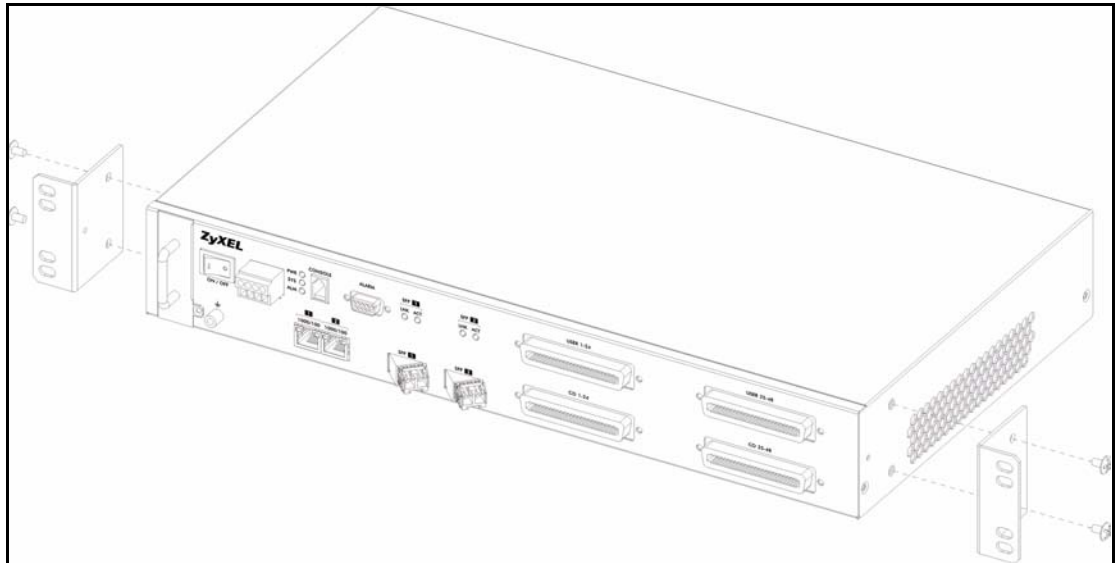


Do not block the ventilation holes. Leave space between IES-1248 when stacking.

2.2.2.2 Rack-Mounted Installation Procedure

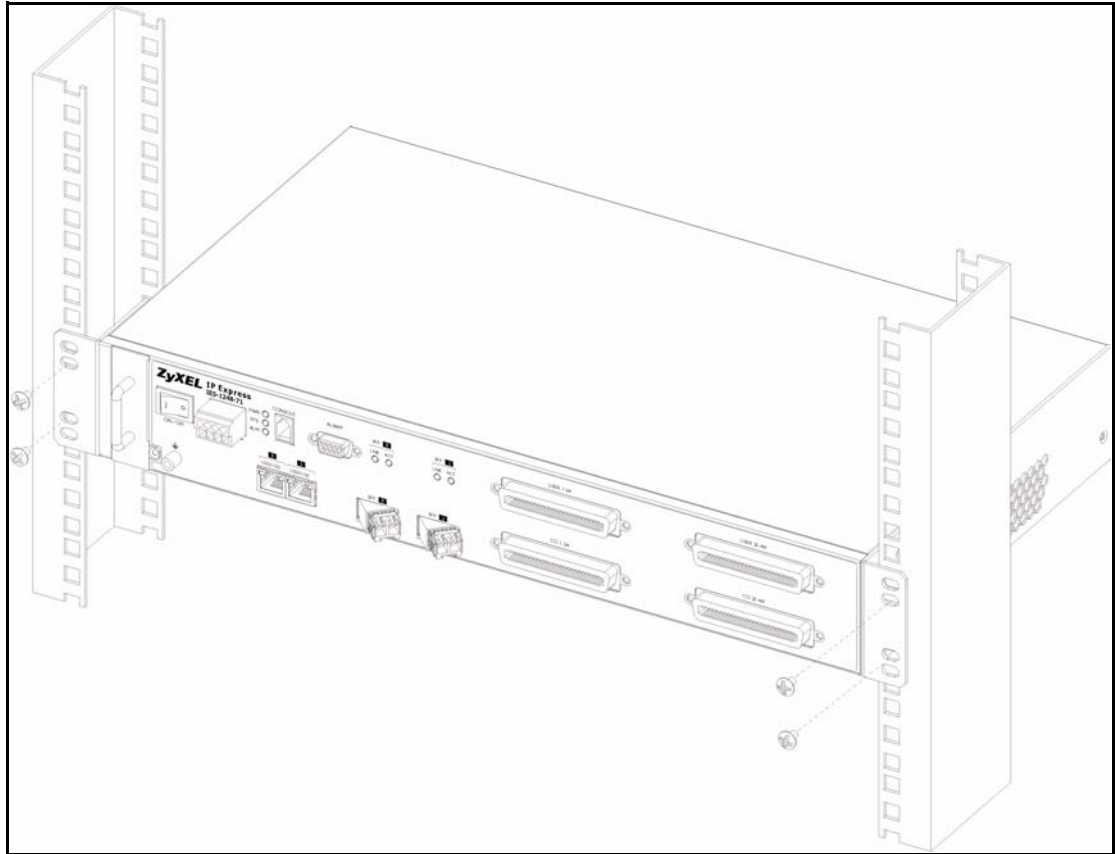
- 1 Align one bracket with the holes on one side of the IES-1248 and secure it with the bracket screws smaller than the rack-mounting screws.
- 2 Attach the other bracket in a similar fashion.

Figure 4 Attaching Mounting Brackets and Screws



- 3 After attaching both mounting brackets, position the IES-1248 in the rack by lining up the holes in the brackets with the appropriate holes on the rack. Secure the IES-1248 to the rack with the rack-mounting screws.

Figure 5 Rack Mounting



2.3 Connecting the Frame Ground

Follow the directions in this section for the IES-1248-51 and IES-1248-53. This section is not applicable for the IES-1248-51A.

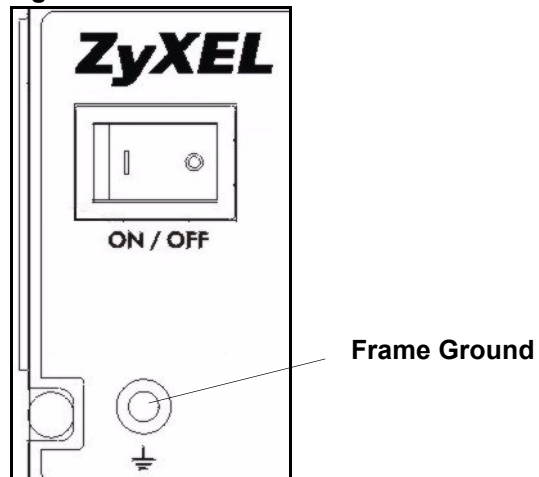


See [Appendix](#) on page 513 for the ground wire gauge.

- The IES-1248 frame ground is on the lower left corner of the front panel.
- Connect the frame grounds to a building's protective earthing terminals using a green-and-yellow frame ground wire.



Connect the frame ground before you connect any other cables or wiring.

Figure 6 IES-1248 Frame Ground

Front Panel Connections

The following table briefly describes the ports on the front panel. Then, the rest of this chapter explains how to make connections to the IES-1248's front panel.

3.1 Front Panel

The following figure shows the front panel of the IES-1248.

Figure 7 IES-1248 Front Panel

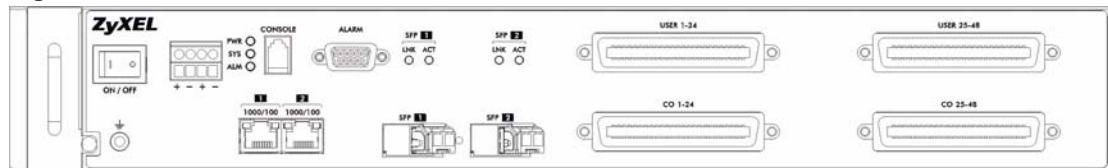
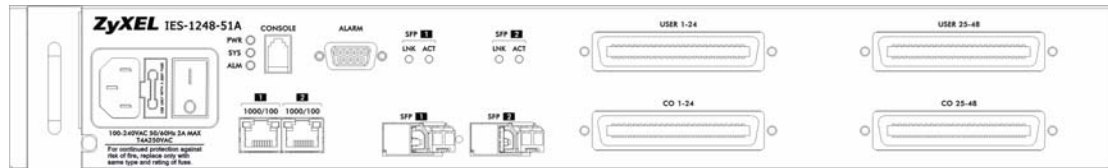


Figure 8 IES-1248-51A Front Panel



3.1.1 Front Panel Ports

The following table describes the ports on the front panel of the IES-1248.

Table 1 IES-1248 Front Panel Ports

CONNECTOR	DESCRIPTION
CONSOLE	Connect this mini-RJ-11 port to a computer for local management.
1000/100 1/2	Use these RJ-45 ports for subtending. You can daisy chain more IES-1248's or other Ethernet switches. This is an electrical Ethernet interface for use with the following copper Ethernet cables: • 100Base-Tx 2 pair UTP Cat. 5, up to 100m • 1000Base-T 4-pair UTP Cat. 5, up to 100m For better performance and lower radiation noise, use shielded Ethernet cables.
ALARM	This DB9 connector has alarm input pins and alarm output pins. Connect the alarm input pins to alarm output terminals on other pieces of equipment. Connect the alarm output pins to an alarm input terminal on another piece of equipment.

Table 1 IES-1248 Front Panel Ports (continued)

CONNECTOR	DESCRIPTION
SFP 1, 2	Each of these Small Form-factor Pluggable (SFP) slots can house a mini GBIC (Gigabit Interface Converter) transceiver.
USER 1-24, 25-48	Connect these Telco-50 connectors to subscribers 1-24 and 25-48 respectively.
CO 1-24, 25-48	Connect these Telco-50 connectors to the telephone company for subscribers 1-24 and 25-48 respectively.

3.1.2 LEDs

The following table describes the LED indicators on the IES-1248.

Table 2 LED Descriptions

LED	COLOR	STATUS	DESCRIPTION
PWR	Green	On	The power is turned on.
		Off	The power is off.
SYS	Green	Blinking	The system is rebooting and performing self-diagnostic tests.
		On	The system is on and functioning properly.
		Off	The system is not ready/malfunctioning.
ALM	Red	On	There is a hardware failure, or there is ALM input.
		Off	The system is functioning normally.
1000/100 1,2	Yellow	On	The link to a 100 Mbps Ethernet network is up.
		Blinking	The link is transmitting/receiving 100 Mbps Ethernet traffics.
		Off	The link to a 100 Mbps Ethernet network is down.
	Green	On	The link to a 1000 Mbps (1Gbps) Ethernet network is up.
		Blinking	The link is transmitting/receiving 1000 Mbps (1Gbps) Ethernet traffics.
		Off	The link to a 1000 Mbps (1Gbps) Ethernet network is down.
SFP 1,2 LNK	Green	On	The link to a 1000 Mbps (1 Gbps) Ethernet network is up.
		Off	There is not a link to a 1000 Mbps (1 Gbps) Ethernet network or the 1000 Mbps network link is down.
SFP 1,2 ACT	Green	Blinking	The system is transmitting/receiving Ethernet traffic.
		Off	The system is not transmitting/receiving Ethernet traffic.

3.2 1000/100M Auto-Sensing Ethernet

The IES-1248 has two 1000/100Mbps auto-sensing Ethernet ports. There are two factors related to Ethernet: speed and duplex mode. In 1000/100Mbps Fast Ethernet, the speed can be 100Mbps or 1000Mbps and the duplex mode can be half duplex or full duplex. The auto-negotiation capability makes one Ethernet port able to negotiate with a peer automatically to obtain the connection speed and duplex mode that both ends support.

When auto-negotiation is turned on, an Ethernet port on the IES-1248 negotiates with the peer automatically to determine the connection speed and duplex mode. If the peer Ethernet port does not support auto-negotiation or turns off this feature, the IES-1248 determines the connection speed by detecting the signal on the cable and using half duplex mode. When the IES-1248's auto-negotiation is turned off, an Ethernet port uses the pre-configured speed and duplex mode when making a connection, thus requiring you to make sure that the settings of the peer Ethernet port are the same in order to connect.

Use the Ethernet ports for subtending. You can daisy chain more IES-1248 or other Ethernet switches.

Use with the following copper Ethernet cables: 1000Base-T 4-pair UTP Cat. 5, up to 100m.



For better performance and lower radiation noise, use shielded Ethernet cables.

Each 1000/100M port is paired with a mini GBIC slot. The IES-1248 uses up to one connection for each pair for a total of two possible gigabit connections (one from each of the two pairs). The IES-1248 uses the mini GBIC transceiver whenever it has a connection.

3.2.1 Ethernet Default Settings

- Speed: Auto
- Duplex: Auto

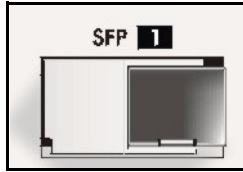
3.3 SFP Mini GBIC Slots

The **SFP** slots can each house a mini GBIC (Gigabit Interface Converter) transceiver. A transceiver is a single unit that houses a transmitter and a receiver. The IES-1248 does not come with a transceiver. You must use a transceiver that complies with the Small Form-factor Pluggable (SFP) Transceiver MultiSource Agreement (MSA). See the SFF committee's INF-8074i specification Rev 1.0 for details.

You can change transceivers while the IES-1248 is operating. You can use different transceivers to connect to Ethernet switches with different types of fiber-optic connectors.



To avoid possible eye injury, do not look directly into an operating fiber-optic module's connectors.

Figure 9 SFP Mini GBIC Slot

- Type: SFP connection interface
- Connection speed: 1 Gigabit per second (Gbps)

3.3.1 Transceiver Installation

Use the following steps to install a mini GBIC transceiver (SFP module) in the **SFP** slot.



The SFP slot is at an angle. Do not attempt to straighten it.

- 1 Remove the dust cover from the transceiver.
- 2 For transceivers with a flip-up or flip-down latch, close the latch.
- 3 Insert the fiber-optic cables into the transceiver (you may need to remove cable dust covers).
- 4 Insert the transceiver into the IES-1248's **SFP** slot with the exposed section of PCB board facing down.
- 5 Press the transceiver firmly until it clicks into place.

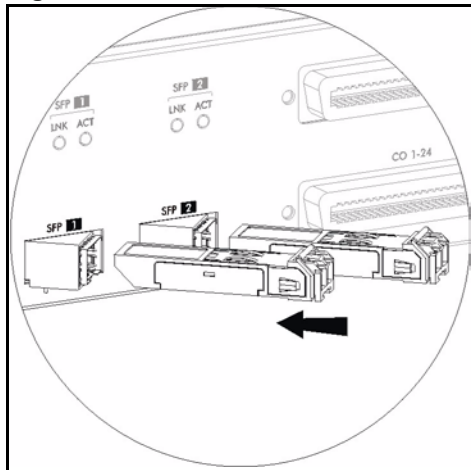
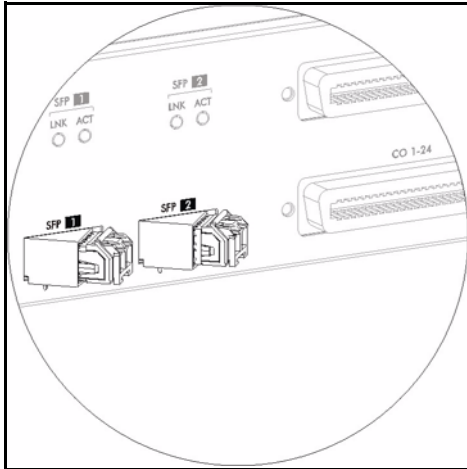
Figure 10 Transceiver Installation

Figure 11 Installed Transceivers

3.3.2 Transceiver Removal

Use the following steps to remove a mini GBIC transceiver (SFP module) from the IES-1248.

- 1 Remove the fiber-optic cables from the transceiver.
- 2 Unlock the transceiver's latch (latch styles vary).
- 3 Pull the transceiver out of the slot.
- 4 Put the transceiver's dust cover on the transceiver.

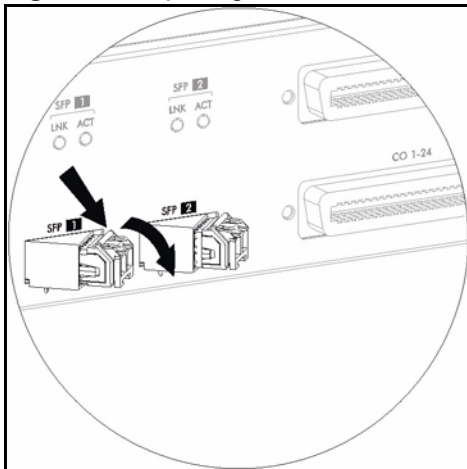
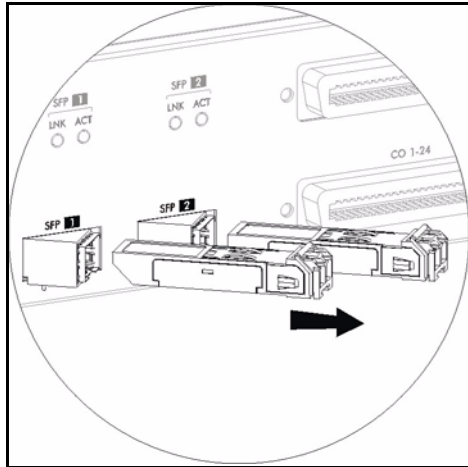
Figure 12 Opening the Transceiver Latch

Figure 13 Removing the Transceiver

3.4 Console Port Connection

For local management, you can use a computer with terminal emulation software configured to the following parameters:

- VT100 terminal emulation
- 9600 bps
- No parity, 8 data bits, 1 stop bit
- No flow control

Connect the mini-RJ-11 male end of the console cable to the console port of the IES-1248. Connect the female end to a serial port (COM1, COM2 or other COM port) of your computer.

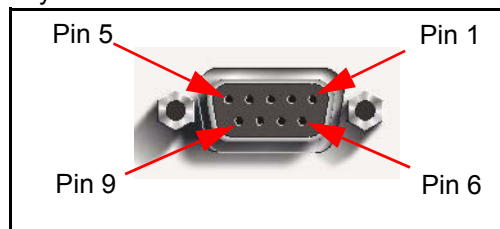
3.5 ALARM Connections

A closed circuit on the **ALARM** input pins indicates an alarm. Pins 7 and 3 are alarm input one. Pins 8 and 4 are alarm input two. Pins 9 and 5 are alarm input three.

The IES-1248 signals an alarm when it detects an alarm on the **ALARM** input pins or the IES-1248.

To signal an alarm, the IES-1248 opens the circuit for pins 1 and 6 (the common pin) and closes the circuit for pins 2 and 6.

Examples of an alarm on the IES-1248 are when the IES-1248's voltage or temperature is outside of the normal range.

Figure 14 ALARM Pins Layout

3.6 ADSL Connections

Connect the lines from the user equipment (ADSL modems) to the **USER** Telco-50 connector and the lines from the central office switch or PBX (Private Branch Exchange) to the **CO** Telco-50 connector. Make sure that the **USER** line and the **CO** lines are not shorted on the MDF (Main Distribution Frame).

The line from the user carries both the ADSL and the voice signals. For each line, the IES-1248 has a built-in splitter that separates the high frequency ADSL signal from the voice band signal and feeds the ADSL signal to the IES-1248, while the voice band signal is diverted to the CO port. See [Chapter 4 on page 67](#) for more information on the Telco-50 connections.

MDF Connections

This chapter shows you how to connect the Telco-50 connectors to an MDF.

4.1 MDF Connections Overview

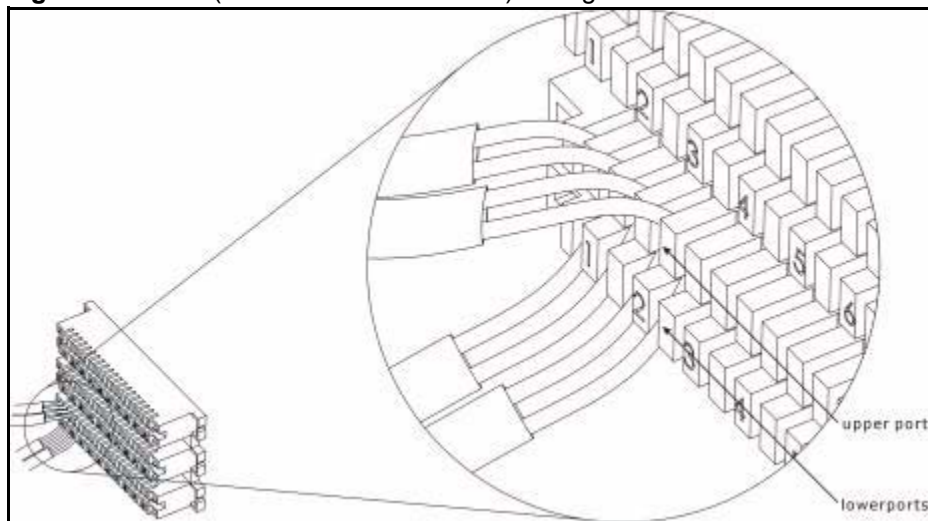
Observe the following before you start:

- See [Appendix on page 513](#) for the gauge of telephone wire to use.
- Follow the pin assignments shown in [Appendix B on page 521](#) to wire Telco-50 cables to Telco-50 connectors.
- See [Chapter 1 on page 47](#) and [Appendix B on page 521](#) for details on how to make the management connections.

4.2 MDF (Main Distribution Frame)

An MDF is usually installed between subscribers' equipment and the telephone company (CO) in a basement or telephone room. The MDF is the point of termination for the outside telephone company lines coming into a building and the telephone wiring in the building.

Figure 15 MDF (Main Distribution Frame) Wiring



- Connect wiring to end-user equipment to the lower ports of an MDF and connect wiring from the telephone company to the upper ports of an MDF (see the previous figure).

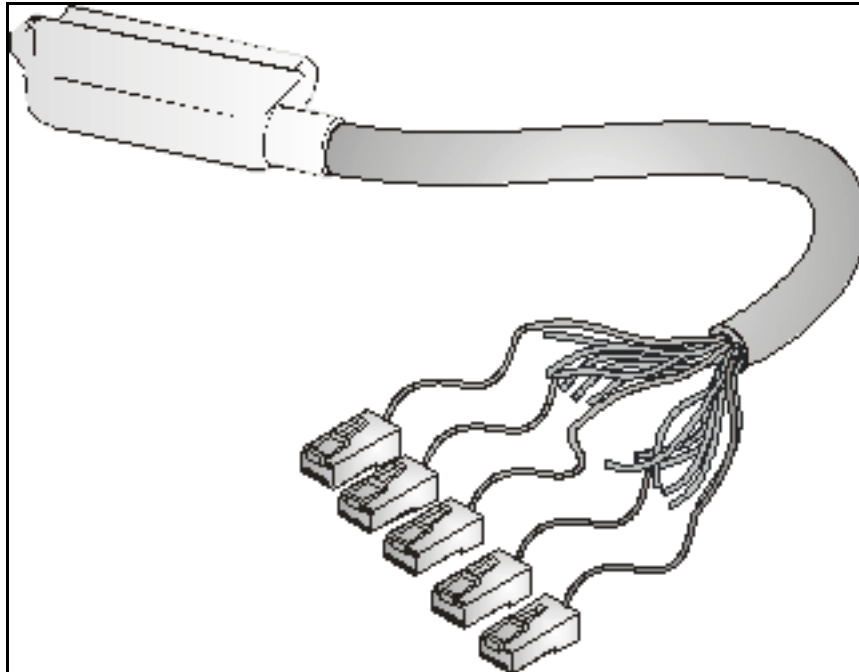
- Some MDFs have surge protection circuitry built in between the two banks; thus, do not connect telephone wires from the telephone company directly to your IES-1248.
- Use a punch-down tool to seat telephone lines into MDF blocks.
- Multiple upper and lower MDF port connections are shown as one line in the following figures.

4.3 Telco-50 Cables

Telco-50 cables are used for data and voice applications with MDFs (Main Distribution Frame), patch panels and distribution boxes. They can also be used as extension cables. Telco-50 cables are made up of 25 twisted-pair copper wires.

Connect a Telco-50 connector to one end of the cable (see [Appendix B on page 521](#) for pin assignments) and connect the other end directly to an MDF; alternatively attach RJ-11 connectors and connect directly to DSL modem(s).

Figure 16 Telco-50 Cable with RJ-11 Connectors



4.4 Telco-50 Connections

The internal DSL splitters separate the voice signals from the DSL signals. They feed the DSL signals to the IES-1248 and divert the voice signals to the **CO** Telco-50 connectors.

Connect the **CO** Telco-50 connectors to the PBX or PSTN/ISDN switch.

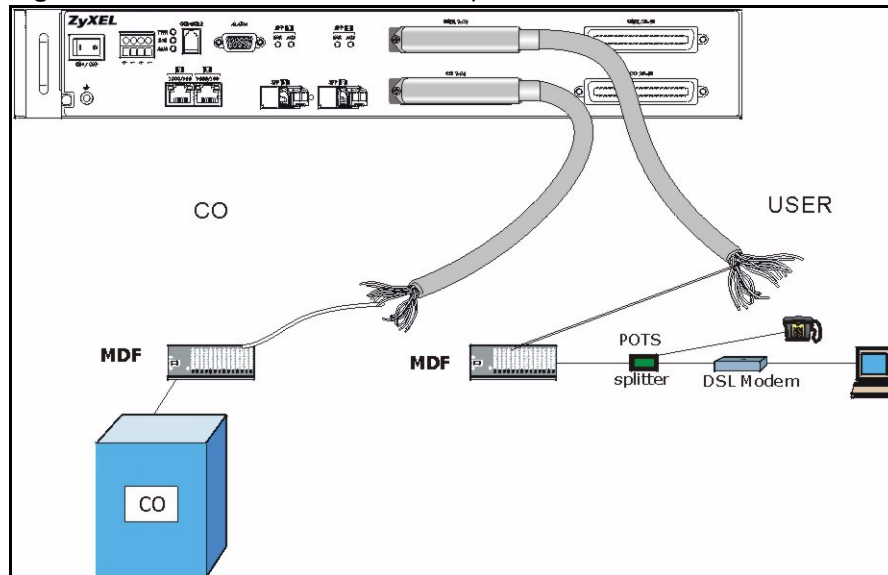
Connect the **USER** Telco-50 connectors to the subscribers' telephone wiring. In most multi-tenant unit applications, the **USER** pins connect to the subscribers' telephone wiring via Main Distribution Frame (MDF).

See the pin assignments in [Appendix B on page 521](#) and [Section 4.5 on page 69](#) for details on Telco-50 connections.

4.5 MDF Scenarios

The following figure gives an overview on a possible installation scenario for the IES-1248. Data and voice signals can coexist on the same telephone wiring.

Figure 17 Installation Overview Example



You can also attach RJ-11 connectors to the Telco-50 cable and connect directly to a DSL modem(s) or patch panel. This chapter discusses connections using MDFs.

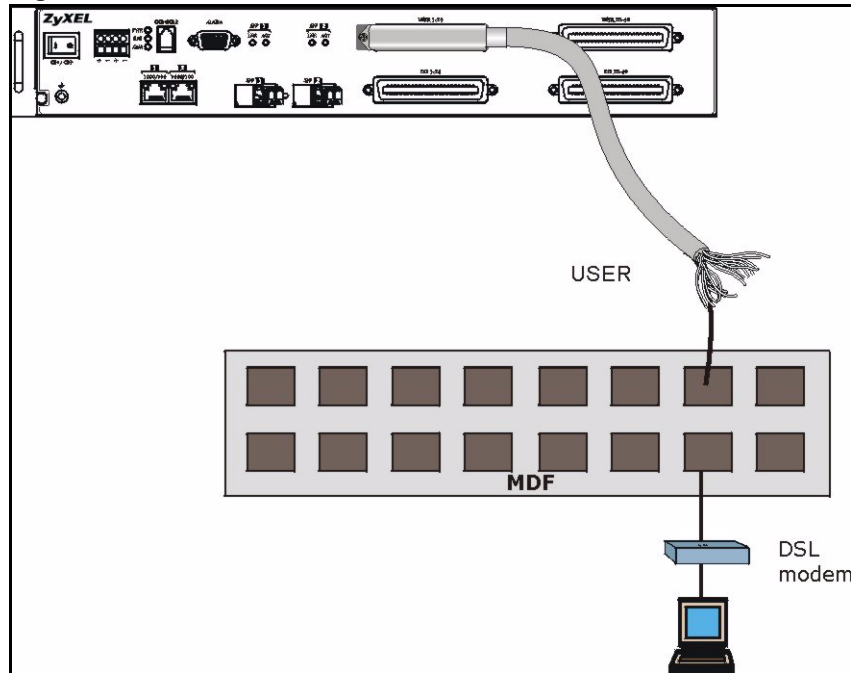
4.6 Typical MDF Scenarios

This section describes typical installation scenarios.

4.6.1 Installation Scenario A

You want to install the IES-1248 in an environment where there are no previously installed MDFs. There is no phone service and you want to install the IES-1248 for data-access only.

You may connect using an MDF or attach RJ-11 connectors to the non-IES-1248 end of the Telco-50 cable and then connect to DSL modems directly.

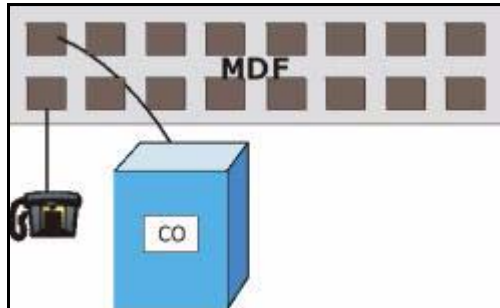
Figure 18 Installation Scenario A

4.6.1.1 Procedure to Connect to an MDF

- 1 Connect the Telco-50 connector end of the cable to the Telco-50 connector labeled **USER**.
- 2 Connect the wiring on the other end of the Telco-50 cable to the upper ports of the MDF using a punch-down tool.
- 3 Connect the telephone wiring from each end-user's DSL modem to the lower ports of the MDF.

4.6.2 Installation Scenario B

Phone service is available. There is one MDF from which end-users CO connections are made (see the next figure).

Figure 19 One MDF for End-user and CO Connections

This installation scenario requires three MDFs. Please see the following figure for the connection schema.

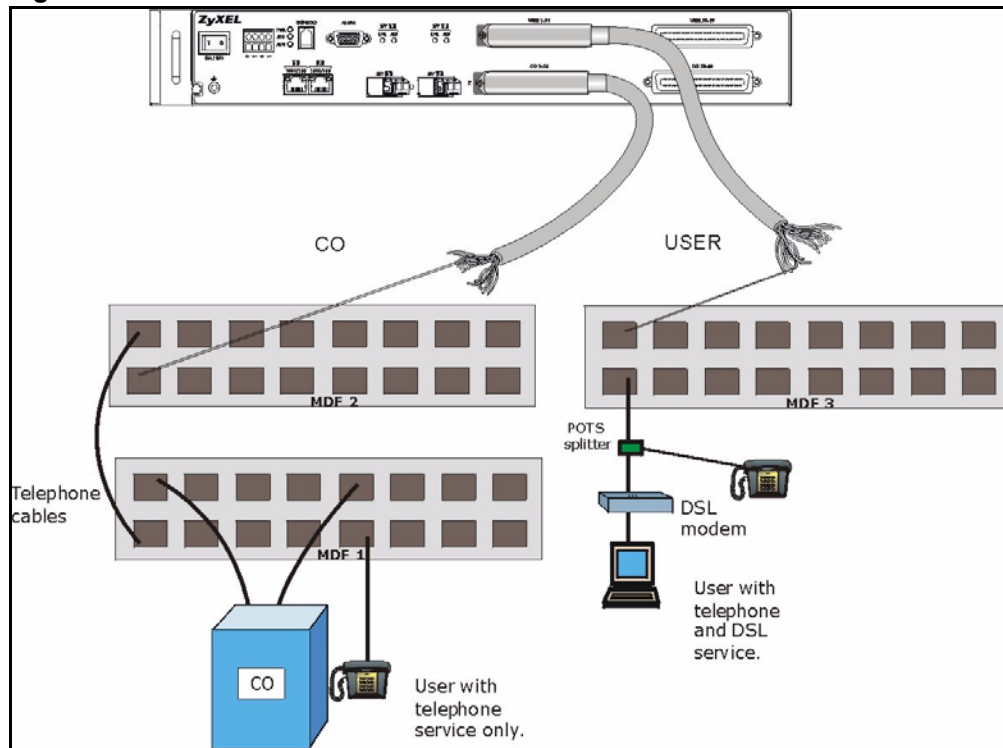
- MDF 1 is the original MDF used for telephone connections only.
- MDF 2 is used for telephone connections only.

- MDF 3 is for DSL service connections.



Change the wiring from MDF 1 to MDF 3 for telephone subscribers who want DSL service.

Figure 20 Installation Scenario B



4.6.2.1 Procedure to Connect to MDFs

- 1 Connect the Telco-50 connector end of the cable you want for DSL service to the Telco-50 connector labeled **USER**.
- 2 Connect the wiring on the other side of the Telco-50 cable to the upper ports of MDF 3 using a punch-down tool.
- 3 Connect the telephone wiring from the end-user's DSL modem(s) to the lower ports of MDF 3.
- 4 Connect the Telco-50 connector end of the cable you want for phone service to the Telco-50 connector labeled **CO**.
- 5 Connect the wiring on the other side of the Telco-50 cable to the lower ports of MDF 2 using a punch-down tool.
- 6 Connect the upper ports of MDF 2 to the lower ports of MDF 1 using telephone wires.
- 7 Connect the upper ports of MDF 1 to the telephone company.
- 8 Telephone subscribers only (non-DSL subscribers) retain connections to the lower ports of MDF 1.
- 9 Change the wiring from MDF 1 to MDF 3 for telephone subscribers who want DSL service.

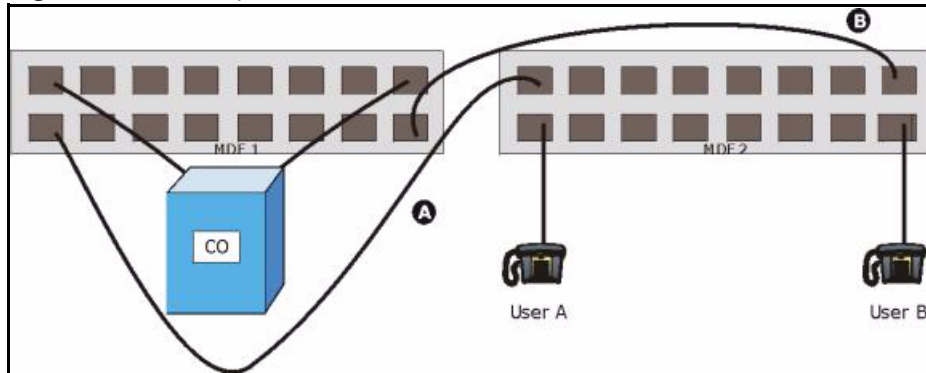
4.6.3 Installation Scenario C

Phone service is also available but there are two MDFs; one for end-user telephone line connections and the other one for CO telephone wiring connections (see the following figure).



Users A and B have telephone (only) service.

Figure 21 Two Separate MDFs for End-user and CO Connections

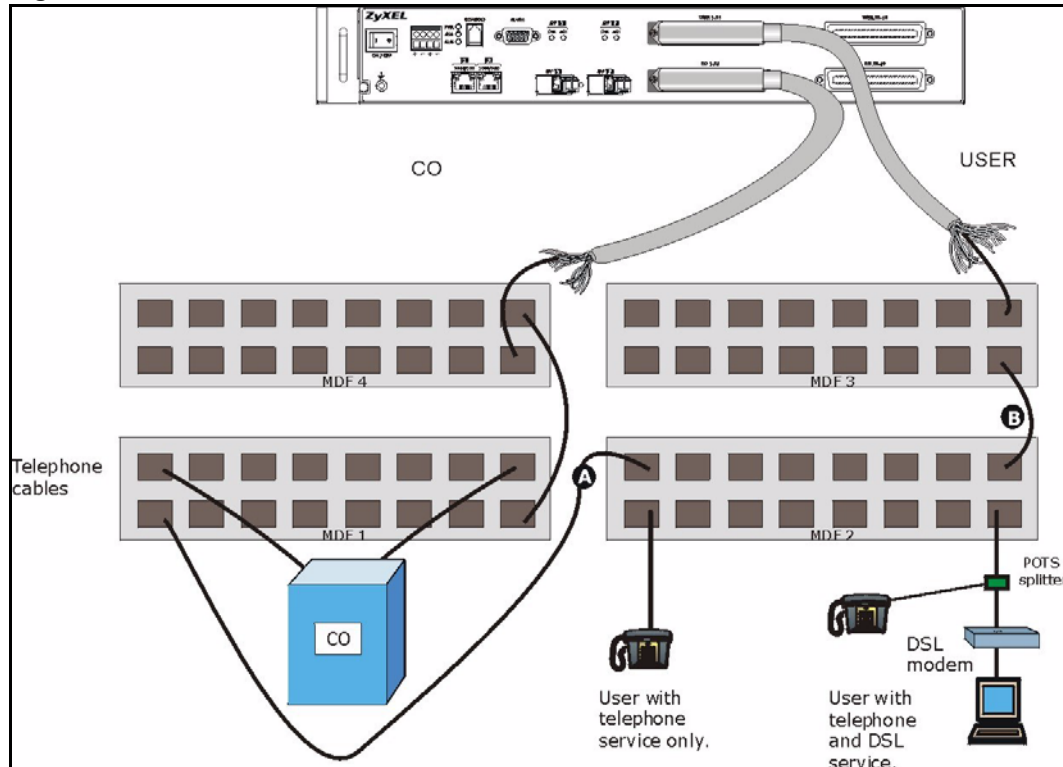


This installation scenario requires four MDFs. Please see the following figure for the DSL connection schema.

- MDFs 1 and 2 are the two original MDFs.
- MDFs 3 and 4 are two additional MDFs you need.



User A still has telephone service only. User B now has telephone and DSL service (see the following figure)

Figure 22 Installation Scenario C

4.6.3.1 Procedure to Connect to MDFs

- 1 Connect the Telco-50 connector end of the cable you want for DSL service to the Telco-50 connector labeled **USER**.
- 2 Connect the wiring on the other side of the Telco-50 cable to the upper ports of MDF 3 using a punch-down tool.
- 3 Connect the lower ports of MDF 3 to the upper ports of MDF 2 for those users that want DSL service. (Users who want telephone service only, retain the original connection from the top port of MDF 2 to the bottom port of MDF 1.)
- 4 Connect the telephone wiring from the end-user's DSL equipment to the lower ports of MDF 2.
- 5 Connect the Telco-50 connector end of the cable you want for phone service to the Telco-50 connector labeled **CO**.
- 6 Connect the wiring on the other side of the Telco-50 cable to the lower ports of MDF 4 using a punch-down tool.
- 7 Connect the top ports of MDF 4 to the bottom ports of MDF 1 using telephone wires.
- 8 Connect the top ports of MDF 1 to the telephone company.

Power Connections

This chapter shows you how to connect the IES-1248 to a power source.

5.1 Power Connections Overview

Use the following procedures to connect the IES-1248 to a power source after you have installed it in a rack.



Check the power supply requirements in [Appendix on page 513](#), and make sure you are using an appropriate power source.

Observe the following before you start:

- See [Appendix on page 513](#) for the gauge of wire to use for the IES-1248 power connections.
- (IES-1248-51A only) Use the included power cord for the IES-1248's power connections.
- Keep the IES-1248 power switch in the **OFF** position until you come to the procedure for turning on the power.
- Keep the power supply switch in the **OFF** position until you come to the procedure for turning on the power.



Use only power wires of the required diameter for connecting the IES-1248 to a power supply (see [Appendix on page 513](#) for the required wire diameter).

5.2 Power Connections

The IES-1248 power connections are at the lower-left corner of the front panel.

5.2.1 AC Power Connections (IES-1248-51A only)

Connect the female end of the power cord to the power socket of your IES-1248. Connect the other end of the cord to a power outlet. Make sure that no objects obstruct the airflow of the fans.

5.2.2 DC Power Connections (IES-1248-51, IES-1248-53)



When installing the IES-1248 power wire, push the wire firmly into the terminal as deep as possible and make sure that no exposed (bare) wire can be seen or touched.

- 1 Connect one end of a power wire to the – power terminal on the front panel of your IES-1248 and tighten the terminal screw.
- 2 Connect the other end of the power wire to the -36 to -72 VDC terminal on the power supply.
- 3 Repeat the previous step for the terminal labeled +.

5.3 Procedure to Turn on the IES-1248 Power

- 1 Turn on the power supply.
- 2 Move the IES-1248 power switch to the **ON** position.

Fan Maintenance

This chapter describes how to change a fan module.

6.1 Fan Maintenance Introduction

The IES-1248 has a hot-swappable fan module. Use the following procedures to remove the fan module. Replace the entire fan module. Return any malfunctioning fan modules to the manufacturer.

6.2 Removing and Installing the Fan Module

The IES-1248 fan module is at the left on the front panel. Perform the following procedure to remove the fan module.

- 1 Loosen the thumbscrew on the front of the fan module.
- 2 Slide out the fan module.
- 3 Use a different fan module from the manufacturer.
- 4 Slide the fan module into the fan module slot.
- 5 Tighten the thumbscrew.

Figure 23 Fan Module Thumbscrews

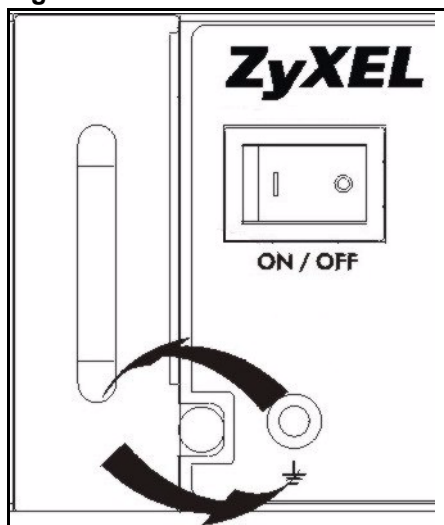


Figure 24 Removing the Fan Module

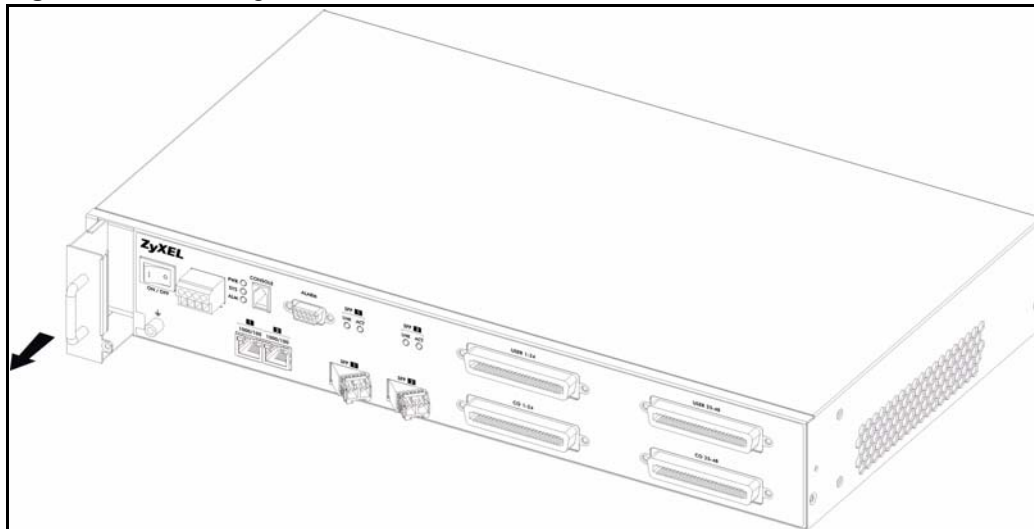
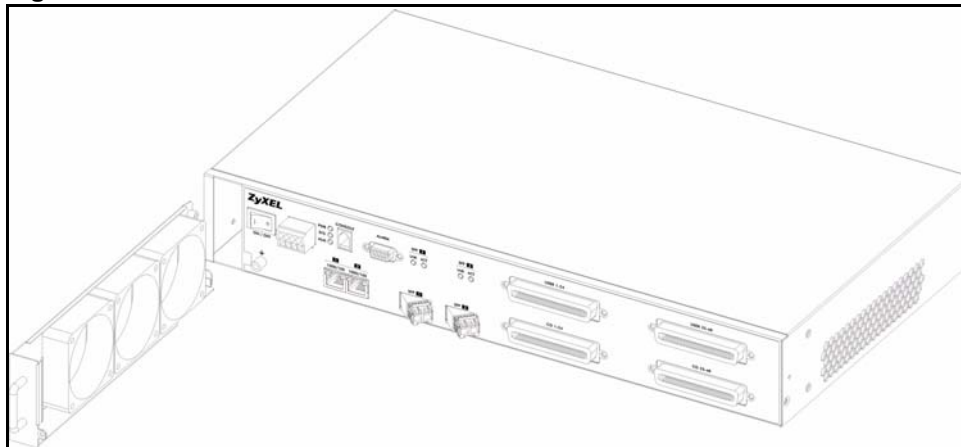


Figure 25 Fan Module Removed



PART II

Basic Settings

[Introducing the Web Configurator \(81\)](#)

[Initial Configuration \(89\)](#)

[Home and Port Statistics Screens \(97\)](#)

[System Information \(109\)](#)

[General Setup \(113\)](#)

[User Account \(115\)](#)

[Switch Setup \(119\)](#)

[IP Setup \(125\)](#)

[ENET Port Setup \(127\)](#)

[xDSL Port Setup \(129\)](#)

[xDSL Profiles Setup \(147\)](#)

[xDSL Line Data \(157\)](#)

[Gbond \(163\)](#)

Introducing the Web Configurator

This chapter tells how to access and navigate the web configurator.

7.1 Web Configurator Overview

The web configurator allows you to use a web browser to manage the IES-1248.

7.2 Screen Privilege Levels

There is a high or low privilege level for each screen.

High privilege screens are only available to administrators with high privilege access. High privilege screens include things like creating administrator accounts, restarting the system, saving changes to the nonvolatile memory and resetting to factory defaults. Nonvolatile memory refers to the IES-1248's storage that remains even if the IES-1248's power is turned off. Administrators with high privilege access can use all screens including the lower privilege screens.

Administrators with the low privilege level are restricted to using only low privilege screens. Low privilege screens are read only.

7.3 Accessing the Web Configurator

Use Internet Explorer 6 and later versions with JavaScript enabled.

Use the following instructions to log on to the web configurator.

- 1 Launch your web browser, and enter the IP address of the IES-1248 (default: **192.168.1.1** is the factory default) in the **Location** or **Address** field. Press **Enter**. The **Login** screen appears.

Figure 26 Login


Enter Network Password

Please type your user name and password.

Site: 192.168.1.1

Realm: IES1248-51 at Thu Jan 01 00:08:00 1970

User Name:

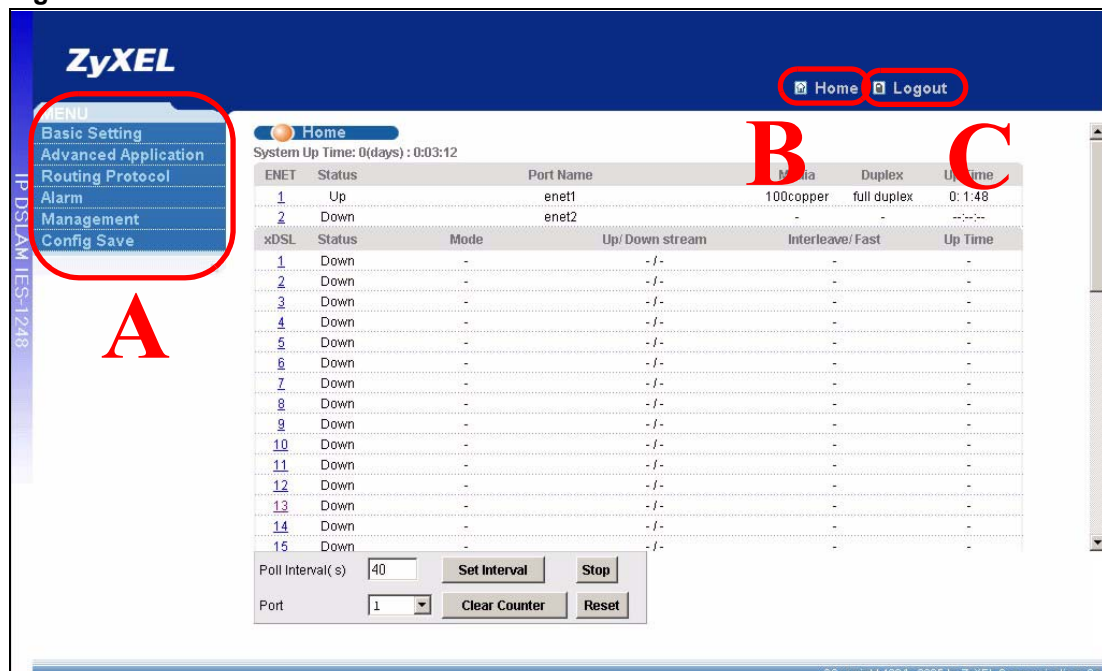
Password:

☐ Save this password in your password list

OK Cancel

- 2 Type **admin** in the **User Name** field and your password (default: **1234**) in the **Password** field. Click **OK**. The main screen appears.

This is the web configurator's main screen.

Figure 27 Home


ZyXEL

Home Logout

System Up Time: 0(days) : 0:03:12

ENET	Status	Port Name	Media	Duplex	Up Time
1	Up	enet1	100copper	full duplex	0: 1:48
2	Down	enet2	-	-	-

xDSL	Status	Mode	Up/Down stream	Interleave/ Fast	Up Time
1	Down	-	- f -	-	-
2	Down	-	- f -	-	-
3	Down	-	- f -	-	-
4	Down	-	- f -	-	-
5	Down	-	- f -	-	-
6	Down	-	- f -	-	-
7	Down	-	- f -	-	-
8	Down	-	- f -	-	-
9	Down	-	- f -	-	-
10	Down	-	- f -	-	-
11	Down	-	- f -	-	-
12	Down	-	- f -	-	-
13	Down	-	- f -	-	-
14	Down	-	- f -	-	-
15	Down	-	- f -	-	-

Poll Interval(s): 40 Set Interval Stop

Port: 1 Clear Counter Reset

IP DSLAM IES-1248

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A - Click the menu items to open submenu links, and then click on a submenu link to open the screen in the main window. See [Section 7.4 on page 83](#) for more information.

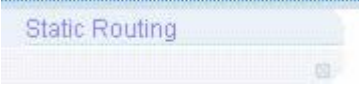
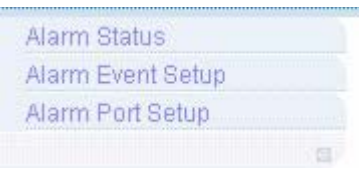
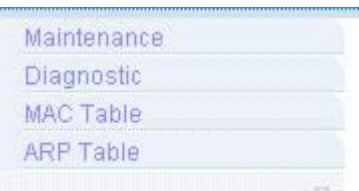
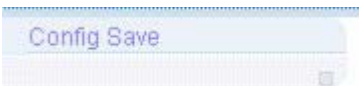
B - Click this to open the **Home** screen. (This is the same screen that is displayed above.) See [Chapter 9 on page 97](#) for more information.

C - Click this to log out of the web configurator.

7.4 Navigation Panel

In the navigation panel, click a menu item to reveal a list of submenu links. Click a submenu link to go to the corresponding screen.

Table 3 Navigation Panel Submenu Links

BASIC SETTING	ADVANCED APPLICATION	ROUTING PROTOCOL
		
ALARM	MANAGEMENT	CONFIG SAVE
		

The following table briefly describes the functions of the screens that you open by clicking the navigation panel's sub-links.

Table 4 Web Configurator Screens

LABEL	DESCRIPTION
Basic Setting	
System Information	Use this screen to display general system and hardware monitoring information.
General Setup	Use this screen to configure general identification information about the device and the time and date settings.

Table 4 Web Configurator Screens (continued)

LABEL	DESCRIPTION
User Account	Use this screen to configure system administrator accounts.
Switch Setup	Use this screen to set up system-wide parameters such as MAC address learning and priority queues.
IP Setup	Use this screen to configure the system and management IP addresses and subnet masks.
ENET Port Setup	Use this screen to configure settings for the Ethernet ports.
xDSL Port Setup	Use these screens for configuring settings for individual DSL ports.
xDSL Profiles Setup	Use these screens for configuring profiles for the DSL ports.
xDSL Line Data	Use these screens for viewing DSL line operating values, bit allocation and performance counters.
G.bond	Use this screen to configure port bonding.
Advanced Application	
VLAN	Use these screens for viewing and configuring the VLAN settings.
IGMP	Use these screens to view IGMP status information and configure IGMP settings and IGMP filters. You can also use these screens to set up bandwidth requirements by multicast group or port and to set up limits on the number of multicast groups to which a port can subscribe.
Static Multicast	Use this screen to configure static multicast entries.
Multicast VLAN	Use these screens to set up multicast VLANs that can be shared among different subscriber VLANs on the network.
Filtering	Use this screen to configure packet filtering.
MAC Filter	Use this screen to configure MAC filtering for each port.
Spanning Tree Protocol	Use these screens to display Rapid Spanning Tree Protocol (RSTP) information and configure RSTP settings.
Port Authentication	Use these screens to configure RADIUS and IEEE 802.1x security settings.
Port Security	Use this screen to limit the number of MAC address that can be learned on a port.
DHCP Relay	Use this screen to configure the DHCP relay settings.
DHCP Snoop	Use these screens to drop traffic from IP addresses not assigned by the DHCP server and to look at a summary of the DHCP packets on each port.
2684 Routed Mode	Use this screen to configure the IES-1248 to handle 2684 routed mode traffic.
PPPoA to PPPoE	Use this screen to enable PPPoA-to-PPPoE conversions on each port.
DSCP	Use this screen to set up DSCP on each port and to convert DSCP values to IEEE 802.1p values.
TLS PVC	Use this screen to set up Transparent LAN Service (VLAN stacking, Q-in-Q) on each port.
ACL	Use this screen to set up Access Control Logic profiles and to assign them to each PVC.
Downstream Broadcast	Use this screen to block downstream broadcast packets from being sent to specified VLANs on specified ports.
SysLog	Use this screen to configure the syslog settings.
Access Control	Use this screen to configure service access control and configure SNMP and remote management.

Table 4 Web Configurator Screens (continued)

LABEL	DESCRIPTION
IP Bridge	Use these screens to configure IP-aware bridging, where the IES-1248 forwards packets based on destination IP address instead of destination MAC address.
PPPoE Intermediate Agent	Use this screen to insert line information into client PPPoE PADI (PPPoE Active Discovery Initialization) and PADR (PPPoE Active Discovery Request) packets.
Maximum MTU Size	Use this screen to configure the Maximum Transmission Unit (MTU) for the Ethernet interfaces. The Ethernet interfaces discard any packets larger than this.
PVC Upstream Limit	Use this screen to limit the transmission rate for upstream traffic by PVC.
OUI Filter	Use this screen to block or forward packets from devices with the specified OUI (Organizationally Unique Identifier) in the MAC address.
Routing Protocol	
Static Routing	Use this screen to configure static routes. A static route defines how the IES-1248 should forward traffic by configuring the TCP/IP parameters manually.
Alarm	
Alarm Status	Use these screens to view the alarms that are currently in the system.
Alarm Event Setup	Use these screens to view and set the severity levels of the alarms and where the system is to send them.
Alarm Port Setup	Use this screen to set the alarm severity threshold for recording alarms on an individual port(s).
Management	
Maintenance	Use this screen to perform firmware and configuration file maintenance as well as restart the system.
Diagnostic	Use this screen to view system logs and test port(s).
MAC Table	Use this screen to view the MAC addresses of devices attached to what ports.
ARP Table	Use this screen to view the MAC address to IP address resolution table.
Config Save	
Config Save	Use this screen to save the device's configuration into the nonvolatile memory (the IES-1248's storage that remains even if the IES-1248's power is turned off).

7.5 Changing Your Password

After you log in for the first time, it is recommended you change the default administrator password. Click **Basic Setting > User Account** to display the **User Account** screen.

Figure 28 User Account

The screenshot shows the 'User Account' configuration page. At the top, there are two tabs: 'User Account' and 'Authentication'. Below the tabs, there is a form with the following fields:

- Enable:** A checkbox that is checked.
- Name:** A text input field.
- Password:** A text input field.
- Retype Password to confirm:** A text input field.
- Privilege:** A dropdown menu with 'high' selected.

Below the form are two buttons: 'Add' and 'Cancel'. Below the buttons is a table with the following columns: Index, Enable, Name, Privilege, and Select.

Index	Enable	Name	Privilege	Select
1	V	admin	high	☐

Below the table are two buttons: 'Delete' and 'Cancel'.

Click the index number **1** to edit the default administrator account settings.

Figure 29 User Account

The screenshot shows the 'User Account' configuration page. At the top, there are two tabs: 'User Account' and 'Authentication'. Below the tabs, there is a form with the following fields:

- Enable:** A checkbox that is checked.
- Name:** A text input field containing 'admin'.
- Password:** A text input field containing '123456'.
- Retype Password to confirm:** A text input field containing '123456'.
- Privilege:** A dropdown menu with 'high' selected.

Below the form are two buttons: 'Modify' and 'Cancel'. Below the buttons is a table with the following columns: Index, Enable, Name, Privilege, and Select.

Index	Enable	Name	Privilege	Select
1	V	admin	high	☐

Below the table are two buttons: 'Delete' and 'Cancel'.

Enter the new password in the **Password** and **Retype Password** to confirm fields, and click **Modify**. Do not forget to click **Config Save** before you exit the web configurator. See [Section 7.6 on page 86](#).

7.6 Saving Your Configuration

Click **Apply** in a configuration screen when you are done modifying the settings in that screen to save your changes back to the run-time memory. Settings in the run-time memory are lost when the IES-1248's power is turned off.

Click **Config Save** in the navigation panel to save your configuration to nonvolatile memory. Nonvolatile memory refers to the IES-1248's storage that remains even if the IES-1248's power is turned off.

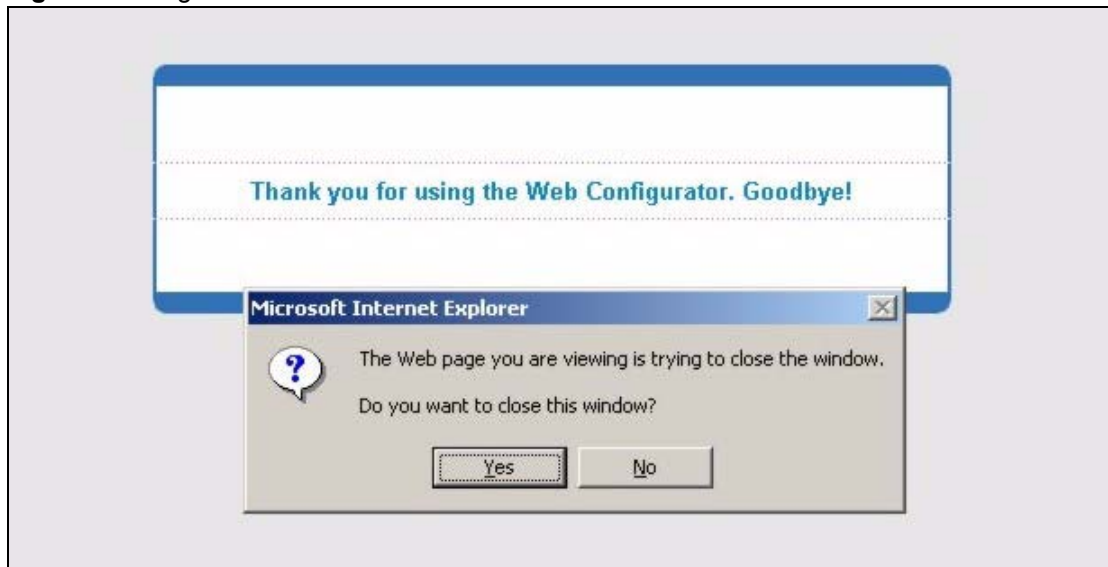


Use **Config Save** when you are done with a configuration session.

7.7 Logging Out of the Web Configurator

Click **Logout** in any screen to exit the web configurator. You have to log in with your password again after you log out. This is recommended after you finish a management session both for security reasons and so you do not lock out other device administrators.

Figure 30 Logout



Initial Configuration

This chapter describes initial configuration for the IES-1248. See [Appendix A on page 519](#) for various default settings of the IES-1248.

8.1 Initial Configuration Overview

This chapter shows what you first need to do to provide service to ADSL subscribers.

8.2 Initial Configuration

This chapter uses the web configurator for initial configuration. See the CLI chapters for information on the commands. Use Internet Explorer 6 and later versions with JavaScript enabled.

- 1 Log in to the web configurator. See [Section 7.3 on page 81](#) for instructions.
- 2 In the navigation panel, click **Basic Setting** > **IP Setup**. The **IP Setup** screen appears.

Figure 31 IP Setup

IP Setup

IP 192.168.1.1

IP mask 255.255.255.0

Apply IP setting Cancel

Default Gateway 192.168.1.254

Apply Gateway setting Cancel

- 3 Use this screen to change the IP address, subnet mask, and default gateway IP address for your network. Apply the settings.



If you change the IP address of the IES-1248, after you click **Apply IP setting**, you have to use the new IP address to log into the web configurator again.

- 4 If your subscribers use VPI 0 and VCI 33 (the default for all of the ADSL ports), go to step 13. Otherwise, use the following steps to change the VPI and VCI settings for all of the ADSL ports.

First, you will delete the default virtual channel from all of the ADSL ports. (You cannot edit it). Then, you will configure a new virtual channel for a port and copy it to the other ADSL ports.

Adding another virtual channel without deleting the default virtual channel is not recommended since you cannot set the new channel to be the port's super channel. The super channel can forward frames belonging to multiple VLAN groups (that are not assigned to other channels). A channel that is not the super channel can only forward frames with a single VLAN ID (that is configured on that channel). In this case, the IES-1248 drops any frames received from the subscriber that are tagged with another VLAN ID.

- 5 In the navigation panel, click **Basic Setting > xDSL Port Setup**. The **xDSL Port Setup** screen appears.

Figure 32 xDSL Port Setup

Port	Active	Customer Info	Customer Tel	Profile	Mode	Channels
1	enabled			DEFVAL_MAX	auto	1
2	enabled			DEFVAL_MAX	auto	1
3	enabled			DEFVAL_MAX	auto	1
4	enabled			DEFVAL_MAX	auto	1
5	enabled			DEFVAL_MAX	auto	1
6	enabled			DEFVAL_MAX	auto	1
45	enabled			DEFVAL_MAX	auto	1
46	enabled			DEFVAL_MAX	auto	1
47	enabled			DEFVAL_MAX	auto	1
48	enabled			DEFVAL_MAX	auto	1

- 6 Click **VC Setup**. The following screen appears.

Figure 33 VC Setup

VC Setup

xDSL Port Setup

VC Setup

PPVC Setup

Port

1

Super Channel

☐

VPI

0

VCI

0

DS VC Profile

DEFVAL

US VC Profile

-

PVID

1

(1-4094)

Priority

0

Add

Cancel

Show Port

ALL

Index	Port	VPI/VCI	DS / US VC Profile	PVID	Priority	Select
1	1	0/33	DEFVAL/	*	*	☐
2	2	0/33	DEFVAL/	*	*	☐
3	3	0/33	DEFVAL/	*	*	☐
4	4	0/33	DEFVAL/	*	*	☐
5	5	0/33	DEFVAL/	*	*	☐
6	6	0/33	DEFVAL/	*	*	☐
7	7	0/33	DEFVAL/	*	*	☐
45	45	0/33	DEFVAL/	*	*	☐
46	46	0/33	DEFVAL/	*	*	☐
47	47	0/33	DEFVAL/	*	*	☐
48	48	0/33	DEFVAL/	*	*	☐

Index -1 selected

Delete

No Channel copied

Copy

Paste

7 Select any virtual channel's **Select** radio button, and click **Delete**. The following screen appears.

Figure 34 VC Setup, Delete

Microsoft Internet Explorer

?

Do you want to delete this channel in other ports too?

OK

Cancel

8 Click **OK**. The following screen appears.

Figure 35 Select Ports

	0	1	2	3	4	5	6	7	8	9
1-9	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
10-19	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
20-29	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
30-39	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
40-48	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

select **All** **None**

Apply **Cancel**

9 Click **All**, and then click **Apply**. The **VC Setup** screen is updated.

Figure 36 VC Setup

VC Setup

xDSL Port Setup **VC Setup** PPVC Setup

Port: 1 Super Channel: ☐

VPI: 0 VCI: 0

DS VC Profile: DEFVAL

US VC Profile: -

PVID: 1 (1-4094) Priority: 0

Add **Cancel**

Show Port: ALL

Index	Port	VPI/VCI	DS / US VC Profile	PVID	Priority	Select
Index -1	selected					

Delete No Channel copied **Copy** **Paste**

10 Select **Super Channel** to allow the channel to forward frames belonging to multiple VLAN groups (that are not assigned to other channels). Then, enter the VPI and VCI that you use. Leave the other default settings, and click **Add**. The **VC Setup** screen is updated.

Figure 37 VC Setup

VC Setup

xDSL Port Setup

VC Setup

PPVC Setup

Port

1

Super Channel

☐

VPI

0

VCI

0

DS VC Profile

DEFVAL

US VC Profile

-

PVID

1

(1-4094)

Priority

0

Add

Cancel

Show Port

ALL

Index	Port	VPI/VCI	DS / US VC Profile	PVID	Priority	Select
1	1	10/ 43	DEFVAL/	*	*	☐

Index - 1 selected

Delete

No Channel copied

Copy

Paste

11 Select the new channel’s **Select** radio button. Click **Copy**, and then click **Paste**. The following screen appears. The following screen appears.

Figure 38 Select Ports

0 1 2 3 4 5 6 7 8 9

1-9 ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

10-19 ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

20-29 ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

30-39 ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

40-48 ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

select

All

None

Apply

Cancel

12 Click **All**, and then click **Apply**. The **VC Setup** screen is updated.

Figure 39 VC Setup

VC Setup

xDSL Port Setup | **VC Setup** | PPVC Setup

Port: 1
 VPI: 0
 DS VC Profile: DEFVAL
 US VC Profile: -
 PVID: 1 (1-4094)
 Super Channel: ☐
 VCI: 0
 Priority: 0

Add Cancel

Show Port: ALL

Index	Port	VPI/VCI	DS / US VC Profile	PVID	Priority	Select
1	1	10/43	DEFVAL/-	*	*	☐
2	2	10/43	DEFVAL/-	*	*	☐
3	3	10/43	DEFVAL/-	*	*	☐
4	4	10/43	DEFVAL/-	*	*	☐
5	5	10/43	DEFVAL/-	*	*	☐
6	6	10/43	DEFVAL/-	*	*	☐
7	7	10/43	DEFVAL/-	*	*	☐
45	45	10/43	DEFVAL/-	*	*	☐
46	46	10/43	DEFVAL/-	*	*	☐
47	47	10/43	DEFVAL/-	*	*	☐
48	48	10/43	DEFVAL/-	*	*	☐

Index - 1 selected Delete No Channel copied Copy Paste

13 Click **Config Save > Config Save**. The **Config Save** screen appears.

Figure 40 Config Save

Config Save

According to data entries, Saving process may take 10 seconds to several minutes.

Save

14 Click **Save**. The following screen should appear.

Figure 41 Config Save, Save Successful

You can now use the device (with the other settings set to the defaults) to provide service to ADSL subscribers. See [Appendix A on page 519](#) for information on other default settings.

Home and Port Statistics Screens

This chapter describes the **Home** (status), **Port Statistics**, and **RMON** screens.

9.1 Home Screen

The **Home** screen of the web configurator displays a port statistical summary with links to each port showing statistical details.

To open this screen, click **Home** in any web configurator screen.

Figure 42 Home

Home					
System Up Time: 0(days) : 1:05:39					
ENET	Status	Port Name	Media	Duplex	Up Time
1	Up	enet1	100copper	full duplex	0: 5:16
2	Up	enet2	100copper	full duplex	0: 0:39
xDSL	Status	Mode	Up/Down stream	Interleave/ Fast	Up Time
1	Down	-	- / -	-	-
2	Down	-	- / -	-	-
3	Down	-	- / -	-	-
4	Down	-	- / -	-	-
5	Down	-	- / -	-	-
6	Down	-	- / -	-	-
7	Down	-	- / -	-	-
13	Up	adsl2+	508 / 9082	Interleave	0: 1:32
41	Down	-	- / -	-	-
42	Down	-	- / -	-	-
43	Down	-	- / -	-	-
44	Down	-	- / -	-	-
45	Down	-	- / -	-	-
46	Down	-	- / -	-	-
47	Down	-	- / -	-	-
48	Down	-	- / -	-	-
Poll Interval(s) 40 Set Interval Stop Port 1 Clear Counter Reset					

The following table describes the labels in this screen.

Table 5 Home

LABEL	DESCRIPTION
System up Time	This field shows how long the system has been running since the last time it was started.
The following fields are related to the Ethernet ports.	
ENET	This field displays the number of the Ethernet port. Click a port number to display that port's statistics screen. The Ethernet Port Statistics Screen appears. See Section 9.1.1 on page 98 .
Status	This field displays whether the Ethernet port is connected (Up) or not (Down).
Port Name	This field displays the name of the Ethernet port.
Media	This field displays the type of media that this Ethernet port is using for a connection (Copper or Fiber). "-" displays when the port is disabled or not connected.
Duplex	This field displays whether the port is using half or full-duplex communication. "-" displays when the port is disabled or not connected.
Up Time	This field shows the total amount of time in hours, minutes and seconds the port's connection has been up. "--:--:--" displays when the port is disabled or not connected.
The following fields are related to the ADSL ports.	
xDSL	This identifies the ADSL port. Click a port number to display that port's statistics screen. The ADSL Port Statistics Screen appears. See Section 9.1.2 on page 101 .
Status	This field shows whether the port is connected (Up) or not (Down).
Mode	This field shows which ADSL operational mode the port is set to use. "-" displays when the port is not connected.
Up/Down stream	This field shows the number of kilobits per second that a port is set to transmit and receive.
Interleave/Fast	This field shows the port's ADSL latency mode (fast or interleave).
Up Time	This field shows the total amount of time in hours, minutes and seconds the port's connection has been up. "-" displays when the port is not connected.
The following fields and buttons apply to the whole screen.	
Poll Interval(s) Set Interval	The text box displays how often (in seconds) this screen refreshes. You may change the refresh interval by typing a new number in the text box and then clicking Set Interval .
Stop	Click Stop to halt system statistic polling.
Port Clear Counter	Select a port from the Port drop-down list box and then click Clear Counter to erase the recorded statistical information for that port.
Reset	Click this to set the Poll Interval(s) and Port fields to their default values and to refresh the screen.

9.1.1 Ethernet Port Statistics Screen

Use this screen to display statistics about an Ethernet port. To open this screen, click an Ethernet port's number in the **Home** screen.

Figure 43 Port Statistics (Ethernet)

Port Name	enet1
Rx bytes	5914126
Rx error fcs	0
Rx broadcast	11989
Rx fragments	0
Rx error mru	1
Rx jabber	0
Rx oversize	0
Rx discard	997
Tx bytes	4460004
Tx multicast	0
Tx mac_pause	0
Tx frames	7499
Tx undersize	0
Tx oversize	0
packet(<=64)	12663
packet(128-255)	4992
packet(512-1023)	846
packet(1522)	0
packet(total)	26471
multicast(total)	1201
Rx packets	18972
Rx multicast	1201
Rx mac pause	0
Rx error overrun	0
Rx dropped	0
Rx error alignment	1
Rx undersize	0
Tx packets	7499
Tx broadcast	1
Tx fragments	0
Tx error underrun	0
Tx jabber	0
packet(65-127)	2026
packet(256-511)	933
packet(1024-1518)	5011
broadcast(total)	11990
octet(total)	10374130

Poll Interval(s)

Port

The following table describes the labels in this screen.

Table 6 Port Statistics (Ethernet)

LABEL	DESCRIPTION
RMON	Click this to open the RMON Statistics screen.
Up	Click this to go back to the Home screen.
Port	Use this drop-down list box to select a port for which you wish to view statistics. This field identifies the port described in this screen.
Port Name	This field displays the name that you have configured for the port.
Rx bytes	This field shows the number of octets of Ethernet frames received that are from 0 to 1518 octets in size, counting the ones in bad packets, not counting framing bits but counting FCS (Frame Check Sequence) octets. An octet is an 8-bit binary digit (byte).
Rx packets	This field shows the number of packets received on this port (including multicast, unicast, broadcast and bad packets).
Rx error fcs	This field shows the number of frames received with an integral length of 64 to 1518 octets and containing a Frame Check Sequence error.

Table 6 Port Statistics (Ethernet) (continued)

LABEL	DESCRIPTION
Rx multicast	This field shows the number of good multicast frames received of 64 to 1518 octets in length (for non VLAN) or 1522 octets (for VLAN), not including Broadcast frames. Frames with range or length errors are also not taken into account.
Rx broadcast	This field shows the number of good broadcast frames received of 64 to 1518 octets in length (for non VLAN) or 1522 octets (for VLAN), not including multicast frames. Frames with range or length errors are also not taken into account.
Rx mac pause	This field shows the number of valid IEEE 802.3x Pause frames received on this port.
Rx fragments	This field shows the number of frames received that were less than 64 octets long, and contained an invalid FCS, including non-integral and integral lengths.
Rx error overrun	This field shows how many times an Ethernet transmitter overrun occurred.
Rx error mru	This field shows the number of received frames that were dropped due to exceeding the Maximum Receive Unit frame size.
Rx dropped	This field shows the number of received frames that were received into the IES-1248, but later dropped because of a lack of system resources.
Rx jabber	This field shows the number of frames received that were longer than 1518 octets (non VLAN) or 1522 octets (VLAN) and contained an invalid FCS, including alignment errors.
Rx error alignment	This field shows the number of frames received that were 64 to 1518 (non VLAN) or 1522 (VLAN) octets long but contained an invalid FCS and a non-integral number of octets.
Rx oversize	This field shows the number of frames received that were bigger than 1518 (non VLAN) or 1522 (VLAN) octets and contained a valid FCS.
Rx undersize	This field shows the number of frames received that were less than 64 octets long and contained a valid FCS.
Tx bytes	This field shows the number of bytes that have been transmitted on this port. This includes collisions but not jam signal or preamble/SFD (Start of Frame Delimiter) bytes.
Tx packets	This field shows the number of packets transmitted on this port.
Tx multicast	This field shows the number of good multicast frames transmitted on this port (not including broadcast frames).
Tx broadcast	This field shows the number of broadcast frames transmitted on this port (not including multicast frames).
Tx mac_pause	This field shows the number of valid IEEE 802.3x Pause frames transmitted on this port.
Tx fragments	This field shows the number of transmitted frames that were less than 64 octets long, and with an incorrect FCS value.
Tx frames	This field shows the number of complete good frames transmitted on this port.
Tx error underrun	This field shows the number of outgoing frames that were less than 64 octets long.
Tx undersize	This field shows the number of frames transmitted that were less than 64 octets long and contained a valid FCS.
Tx jabber	This field shows the number of frames transmitted that were longer than 1518 octets (non VLAN) or 1522 octets (VLAN) and contained an incorrect FCS value.

Table 6 Port Statistics (Ethernet) (continued)

LABEL	DESCRIPTION
Tx oversize	This field shows the number of frames transmitted that were bigger than 1518 octets (non VLAN) or 1522 (VLAN) and contained a valid FCS.
packet(<=64)	This field shows the number of frames received and transmitted (including bad frames) that were 64 octets or less in length (this includes FCS octets but excludes framing bits).
packet(65-127)	This field shows the number of frames received and transmitted (including bad frames) that were 65 to 127 octets in length (this includes FCS octets but excludes framing bits).
packet(128-255)	This field shows the number of frames received and transmitted (including bad frames) that were 128 to 255 octets in length (this includes FCS octets but excludes framing bits).
packet(256-511)	This field shows the number of frames received and transmitted (including bad frames) that were 256 to 511 octets in length (this includes FCS octets but excludes framing bits).
packet(512-1023)	This field shows the number of frames received and transmitted (including bad frames) that were 512 to 1023 octets in length (this includes FCS octets but excludes framing bits).
packet(1024-1518)	This field shows the number of frames received and transmitted (including bad frames) that were 1024 to 1518 octets in length (this includes FCS octets but excludes framing bits).
packet(1522)	This field shows the number of frames received and transmitted (including bad frames) that were 1519 to 1522 octets in length (this includes FCS octets but excludes framing bits).
packet(total)	This field shows the total number of received and transmitted packets.
broadcast(total)	This field shows the total number of received and transmitted broadcast frames.
multicast(total)	This field shows the total number of received and transmitted multicast frames.
octet(total)	This field shows the total number of received and transmitted octets (unicast, multicast and broadcast).
Poll Interval(s) Set Interval	The text box displays how often (in seconds) this screen refreshes. You may change the refresh interval by typing a new number in the text box and then clicking Set Interval .
Stop	Click Stop to halt system statistic polling.
Port Clear Counter	Select a port from the Port drop-down list box and then click Clear Counter to erase the recorded statistical information for that port.
Reset	Click this to set the Poll Interval(s) and Port fields to their default values and to refresh the screen.

9.1.2 ADSL Port Statistics Screen

Use this screen to display statistics about an ADSL port. To open this screen, click an ADSL port's number in the **Home** screen.

Figure 44 Port Statistics (ADSL)

Port Statistics Up

Port Statistics **RMON**

xDSL Port 1

Port Name	
Tx packets	0
Rx packets	0
Tx broadcast packets	0
Rx broadcast packets	0
Tx discard packets	0
Rx discard packets	0
Errors	0
Tx rate	0
Rx rate	0
Tx bytes	0
Rx bytes	0

VPI/VCI	10/43	-	-	-	-	-	-	-
Tx Packets	0							
Rx Packets	0	-	-	-	-	-	-	-
Tx rate	0	-	-	-	-	-	-	-
Rx rate	0	-	-	-	-	-	-	-
Tx cells	0	-	-	-	-	-	-	-
Rx cells	0	-	-	-	-	-	-	-
Errors	0							

Poll Interval(s) 40 Set Interval Stop

Port 1 Clear Counter Reset

The following table describes the labels in this screen.

Table 7 Port Statistics (ADSL)

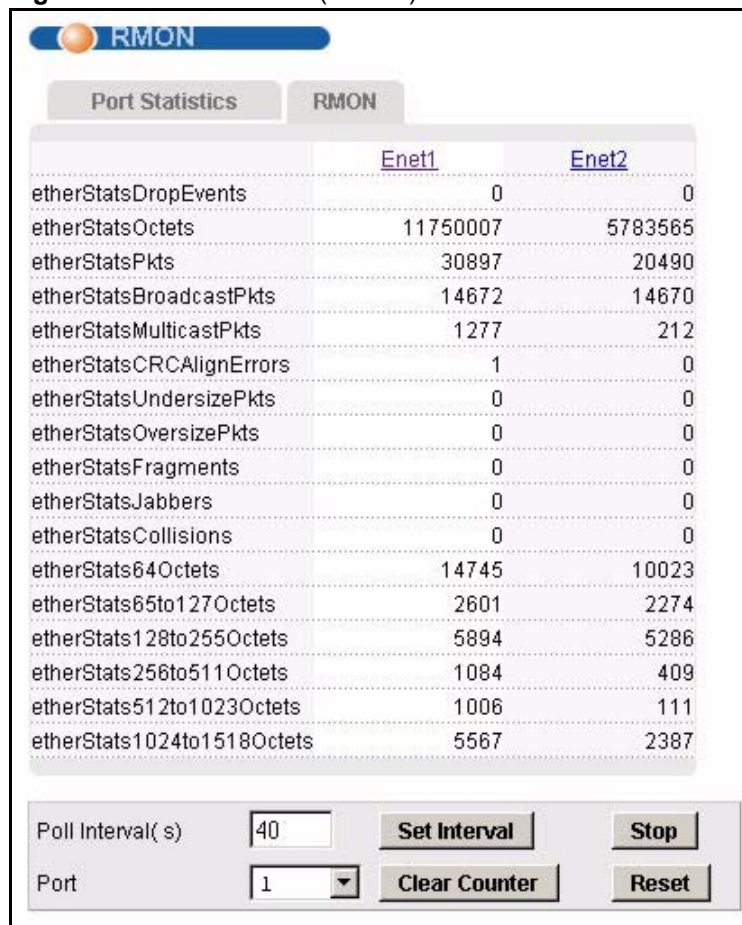
LABEL	DESCRIPTION
RMON	Click this to open the RMON Statistics screen.
Up	Click this to go back to the Home screen.
xDSL Port	Use this drop-down list box to select a port for which you wish to view statistics. This field identifies the port described in this screen.
Port Name	This field displays the name that you have configured for the port. If you have not configured a name, it is blank.
Tx packets	This field shows the number of packets transmitted on this port.
Rx packets	This field shows the number of packets received on this port.
Tx broadcast packets	This field shows the number of broadcast packets transmitted on this port.
Rx broadcast packets	This field shows the number of broadcast packets received on this port.

Table 7 Port Statistics (ADSL) (continued)

LABEL	DESCRIPTION
Tx discard packets	This field shows the number of outgoing packets that were dropped on this port. The "Tx discard packets" counter always displays "0" because the IES-1248 does not discard packets that it sends.
Rx discard packets	This field shows the number of received packets that were dropped on this port. Some of the possible reasons for the discarding of received (rx) packets are: • The packet filter is enabled and the packets matched a packet filter. • The MAC filter is enabled and the IES-1248 dropped the packets according to the MAC filter's configuration. • The packets contained frames with an invalid VLAN ID.
Errors	This field shows the number of AAL5 frames received with CRC errors.
Tx rate	This field shows the number of kilobytes per second transmitted on this port.
Rx rate	This field shows the number of kilobytes per second received on this port.
Tx bytes	This field shows the number of bytes that have been transmitted on this port.
Rx bytes	This field shows the number of bytes that have been received on this port.
VPI/VCI	This field displays the Virtual Path Identifier (VPI) and Virtual Circuit Identifier (VCI) of channels on this port.
Tx Packets	This field shows the number of packets transmitted on each channel.
Rx Packets	This field shows the number of packets received on each channel.
Tx rate	This field shows the number of bytes per second transmitted on each channel.
Rx rate	This field shows the number of bytes per second received on each channel.
Tx cells	This field shows the number of ATM cells transmitted on each channel.
Rx cells	This field shows the number of ATM cells received on each channel.
Errors	This field shows the number of error packets on each channel.
Poll Interval(s) Set Interval	The text box displays how often (in seconds) this screen refreshes. You may change the refresh interval by typing a new number in the text box and then clicking Set Interval .
Stop	Click Stop to halt system statistic polling.
Port Clear Counter	Select a port from the Port drop-down list box and then click Clear Counter to erase the recorded statistical information for that port.
Reset	Click this to set the Poll Interval(s) and Port fields to their default values and to refresh the screen.

9.1.3 RMON Statistics Screen

Use this screen to display RMON statistics about a port. To open this screen, click **RMON** in the **ADSL Port Statistics** screen or **Ethernet Port Statistics** screen.

Figure 45 Port Statistics (RMON)

The following table describes the labels in this screen.

Table 8 Port Statistics (RMON)

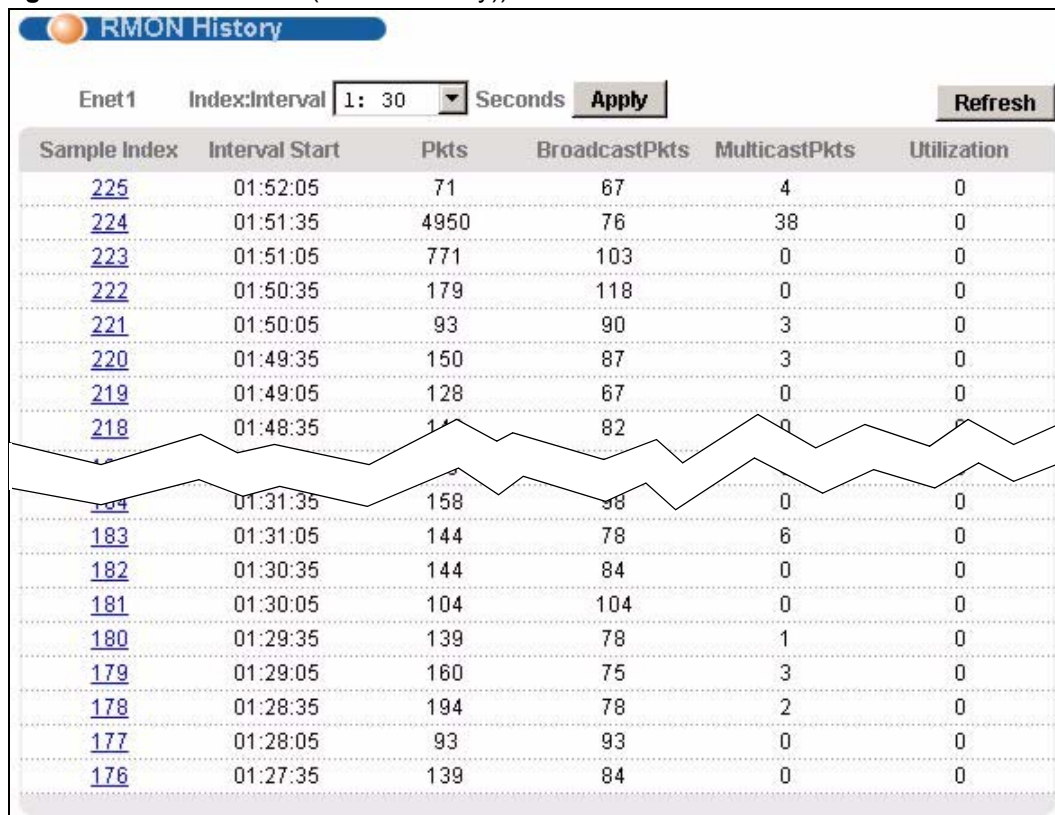
LABEL	DESCRIPTION
Port Statistics	Click this to go back to the previous screen.
Enet1	Click this to look at the RMON history for this port.
Enet2	Click this to look at the RMON history for this port.
EtherStatsDropEvents	This field displays the total number of packets that were dropped on this port.
EtherStatsOctets	This field displays the total number of octets received/transmitted on this port.
EtherStatsPkts	This field displays the total number of good packets received/transmitted on this port.
EtherStatsBroadcastPkts	This field displays the total number of broadcast packets received/transmitted on this port.
EtherStatsMulticastPkts	This field displays the total number of multicast packets received/transmitted on this port.
EtherStatsCRCAlignErrors	This field displays the total number of CRC (Cyclical Redundancy Check) alignment errors on this port.
EtherStatsUndersizePkts	This field displays the total number of packets that were too small received/transmitted on this port.

Table 8 Port Statistics (RMON) (continued)

LABEL	DESCRIPTION
EtherStatsOversizePkts	This field displays the total number of packets that were too big received/transmitted on this port.
EtherStatsFragments	This is the number of frames received/transmitted that were less than 64 octets long, and contained an invalid FCS, including non-integral and integral lengths.
EtherStatsJabbers	This is the number of frames received/transmitted that were longer than 1518 octets (non VLAN) or 1522 octets (VLAN) and contained an invalid FCS, including alignment errors.
EtherStatsCollisions	This is the number of frames for which transmission failed due to excessive collisions. Excessive collision is defined as the number of maximum collisions before the retransmission count is reset.
EtherStats64Octets	This is the number of frames received/transmitted (including bad frames) that were 64 octets or less in length (this includes FCS octets but excludes framing bits).
EtherStats65to127Octets	This is the number of frames received/transmitted (including bad frames) that were 65 to 127 octets in length (this includes FCS octets but excludes framing bits).
EtherStats128to255Octets	This is the number of frames received and transmitted (including bad frames) that were 128 to 255 octets in length (this includes FCS octets but excludes framing bits).
EtherStats256to511Octets	This is the number of frames received/transmitted (including bad frames) that were 256 to 511 octets in length (this includes FCS octets but excludes framing bits).
EtherStats512to1023Octets	This is the number of frames received/transmitted (including bad frames) that were 512 to 1023 octets in length (this includes FCS octets but excludes framing bits).
EtherStats1024to1518Octets	This is the number of frames received/transmitted (including bad frames) that were 1024 to 1518 octets in length (this includes FCS octets but excludes framing bits).
Poll Interval(s) Set Interval	The text box displays how often (in seconds) this screen refreshes. You may change the refresh interval by typing a new number in the text box and then clicking Set Interval .
Stop	Click Stop to halt system statistic polling.
Port Clear Counter	Select a port from the Port drop-down list box and then click Clear Counter to erase the recorded statistical information for that port.
Reset	Click this to set the Poll Interval(s) and Port fields to their default values and to refresh the screen.

9.1.4 RMON History Screen

Use this screen to display general information (such as sample time) on history samples. To open this screen, click any port number in the **RMON Statistics** screen.

Figure 46 Port Statistics (RMON History)

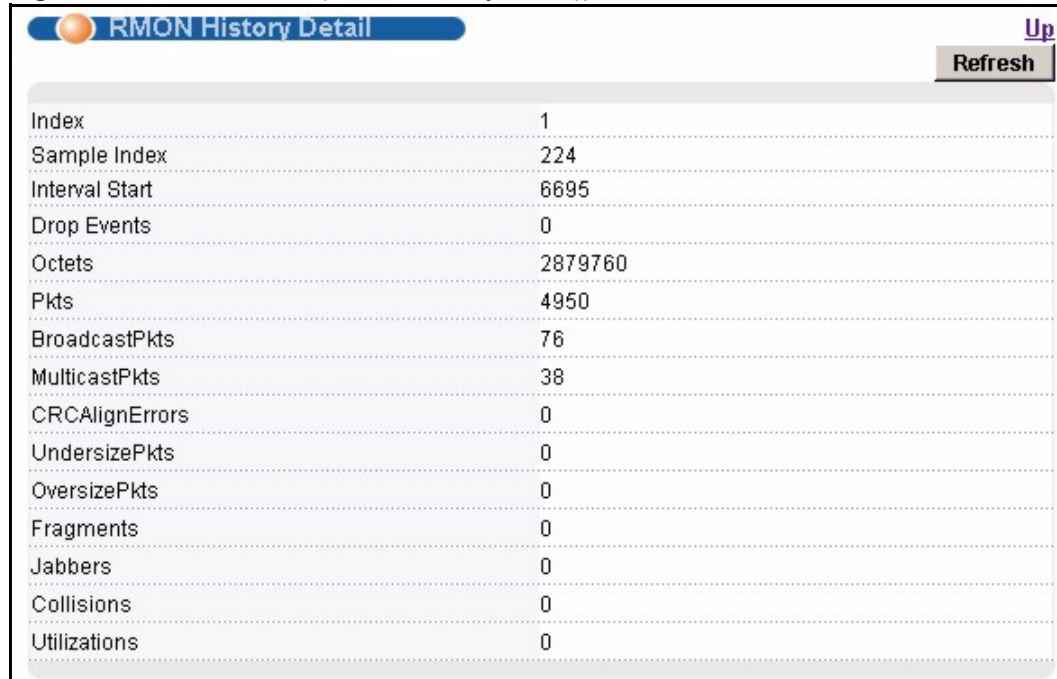
The following table describes the labels in this screen.

Table 9 Port Statistics (RMON History)

LABEL	DESCRIPTION
Index:Interval	Select the index of the sample interval and the desired data sampling time (in seconds).
Apply	Click this to use the selected data sampling time.
Refresh	Click this to update this screen.
Sample Index	This field display the sample number.
Interval Start	This field displays the data sampling time.
Pkts	This field displays the number of packets received or transmitted since the last sample time.
BroadcastPkts	This field displays the number of broadcast packets received or transmitted since the last sample time.
MulticastPkts	This field displays the number of multicast packets received/transmitted since the last sample time.
Utilization	This field displays the port utilization status.

9.1.5 RMON History Detail Screen

Use this screen to display detailed RMON history. To open this screen, click any index number in the **RMON History** screen.

Figure 47 Port Statistics (RMON History Detail)


The screenshot shows a web interface titled "RMON History Detail". In the top right corner, there is a "Up" link and a "Refresh" button. The main content area is a table with two columns: a label on the left and a numerical value on the right. The labels are: Index, Sample Index, Interval Start, Drop Events, Octets, Pkts, BroadcastPkts, MulticastPkts, CRCAlignErrors, UndersizePkts, OversizePkts, Fragments, Jabbers, Collisions, and Utilizations. The corresponding values are: 1, 224, 6695, 0, 2879760, 4950, 76, 38, 0, 0, 0, 0, 0, 0, and 0.

Label	Value
Index	1
Sample Index	224
Interval Start	6695
Drop Events	0
Octets	2879760
Pkts	4950
BroadcastPkts	76
MulticastPkts	38
CRCAlignErrors	0
UndersizePkts	0
OversizePkts	0
Fragments	0
Jabbers	0
Collisions	0
Utilizations	0

The following table describes the labels in this screen.

Table 10 Port Statistics (RMON History Detail)

LABEL	DESCRIPTION
UP	Click this to return to the previous screen.
Refresh	Click this to update this screen.
Index	This field displays the index of the sample interval.
Sample Index	This field displays the sample number.
Interval Start	This field displays the data sampling time.
Drop Events	This field displays the total number of packets that were dropped in the sampling period.
Octets	This field displays the total number of octets received/transmitted in the sampling period.
Pkts	This field displays the total number of good packets received/transmitted in the sampling period.
BroadcastPkts	This field displays the total number of broadcast packets received/transmitted in the sampling period.
MulticastPkts	This field displays the total number of multicast packets received/transmitted in the sampling period.
CRCAlignErrors	This field displays the total number of CRC (Cyclical Redundancy Check) alignment errors in the sampling period.
UndersizePkts	This field displays the total number of packets that were too small received/transmitted in the sampling period.
OversizePkts	This field displays the total number of packets that were too big received/transmitted in the sampling period.
Fragments	This is the number of frames received/transmitted that were less than 64 octets long, and contained an invalid FCS, including non-integral and integral lengths.

Table 10 Port Statistics (RMON History Detail) (continued)

LABEL	DESCRIPTION
Jabbers	This is the number of frames received/transmitted that were longer than 1518 octets (non VLAN) or 1522 octets (VLAN) and contained an invalid FCS, including alignment errors.
Collisions	This is the number of frames for which transmission failed due to excessive collisions. Excessive collision is defined as the number of maximum collisions before the retransmission count is reset.
Utilizations	This field displays the port utilization status in the sampling period.

System Information

The **System Information** screen displays general device information (such as firmware version number) and hardware polling information (such as fan status). You can check the firmware version number and monitor the hardware status in this screen.

To open this screen, click **Basic Setting > System Information**.

Figure 48 System Info


System Info

System Name	IES1248-53
ZyNOS F/W Version	V3.53(ABR.0)b4 07/28/2009
DSP Code Version	6.05.17
Hardware Version	
Serial Number	
Ethernet Address	00:13:49:23:ad:89

Hardware Monitor
☒ Enable
 Temperature Unit C

Temperature- C	Current	MAX	MIN	Average	Threshold(Low)	Threshold(Hi)	Status
1	63	63	27	60	-55	97	Normal
2	80	80	52	77	-55	97	Normal
3	62	62	28	59	-55	97	Normal

Voltage	Current	MAX	MIN	Average	Threshold(Low)	Threshold(Hi)	Status
1	1.191	1.191	1.191	1.191	1.116	1.284	Normal
2	1.792	1.792	1.792	1.792	1.656	1.944	Normal
3	3.196	3.196	3.196	3.196	3.036	3.564	Normal
4	23.726	23.726	23.726	23.726	22.080	25.920	Normal

Fan Speed(RPM)	Current	MAX	MIN	Average	Threshold(Low)	Threshold(Hi)	Status
1	0	0	0	0	2000	8000	Abnormal
2	0	0	0	0	2000	8000	Abnormal
3	0	0	0	0	2000	8000	Abnormal

External Alarm	Status	Name
1	Normal	extalm1
2	Normal	extalm2
3	Normal	extalm3

New Name

External Relay	Status
1	Alarm

Fan Trap Mode normal
 New threshold

Index	Temperature- C (Hi)	Temperature- C (Lo)	Volt. (Hi)	Volt. (Lo)	Fan(Hi)	Fan(Lo)
1	97	-55	1.284	1.116	8000	2000
2	97	-55	1.944	1.656	8000	2000
3	97	-55	3.564	3.036	8000	2000
4			25.920	22.080		

Poll Interval(s)

The following table describes the labels in this screen.

Table 11 System Info

LABEL	DESCRIPTION
System Name	This field displays the device 's model name.
ZyNOS F/W Version	This field displays the version number of the device's current firmware including the date created.
DSP Code Version	This field displays the Digital Signal Processor firmware version number. This is the modem code firmware.

Table 11 System Info (continued)

LABEL	DESCRIPTION
Hardware Version	This is the version of the physical device hardware. This field may be blank.
Serial Number	This is the individual identification number assigned to the device at the factory. This field may be blank.
Ethernet Address	This field refers to the Ethernet MAC (Media Access Control) address of the device.
Hardware Monitor	
Enable	Select this check box to turn the hardware monitor on or clear it to turn the hardware monitor off.
Temperature Unit	Select C to display all temperature measurements in degrees Celsius. Select F to display all temperature measurements in degrees Fahrenheit.
Temperature	Each temperature sensor can detect and report the temperature. Temperature sensor 1 is near the ADSL chipset. Temperature sensor 2 is near the central processing unit. Temperature sensor 3 is at the hardware monitor chip.
Current	This shows the current temperature at this sensor.
MAX	This field displays the maximum temperature measured at this sensor.
MIN	This field displays the minimum temperature measured at this sensor.
Average	This field displays the average temperature measured at this sensor.
Threshold (Low)	This field displays the lowest temperature limit at this sensor.
Threshold (Hi)	This field displays the highest temperature limit at this sensor.
Status	This field displays Normal for temperatures below the threshold and Over for those above.
Voltage(V)	The power supply for each voltage has a sensor that can detect and report the voltage.
Current	This is the current voltage reading.
MAX	This field displays the maximum voltage measured at this point.
MIN	This field displays the minimum voltage measured at this point.
Average	This field displays the average voltage measured at this sensor.
Threshold (Low)	This field displays the lowest voltage limit at this sensor.
Threshold (Hi)	This field displays the highest voltage limit at this sensor.
Status	Normal indicates that the voltage is within an acceptable operating range at this point; otherwise Abnormal is displayed.
Fan Speed (RPM)	A properly functioning fan is an essential component (along with a sufficiently ventilated, cool operating environment) in order for the device to stay within the temperature threshold. Each fan has a sensor that can detect and report the fan's RPM (Rotations Per Minute).
Current	This is the current RPM reading.
MAX	This field displays the maximum RPM measured at this point.
MIN	This field displays the minimum RPM measured at this point.
Average	This field displays the average RPM measured at this sensor.
Threshold (Low)	This field displays the lowest RPM limit at this sensor.
Threshold (Hi)	This field displays the highest RPM limit at this sensor.
Status	Normal indicates that the RPM is within an acceptable operating range at this point; otherwise Abnormal is displayed.

Table 11 System Info (continued)

LABEL	DESCRIPTION
External Alarm Status Name Apply	The IES-1248 is able to detect alarm input from other equipment connected to the ALARM connector. The Status column displays Normal when no alarm input has been detected from other equipment. It displays Abnormal when alarm input has been detected from other equipment. Use the Name column to configure a title for each external alarm for identification purposes. Use up to 31 characters. Click Apply to save the name changes to the IES-1248's volatile memory. The IES-1248 loses these changes if it is turned off or loses power, so use the Config Save link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
External Relay Status	The IES-1248 is able to send alarm output to another piece of equipment connected to the ALARM connector. The Status column displays Normal when the IES-1248 is not sending alarm output to another piece of equipment. It displays Abnormal when the IES-1248 is sending alarm output to another piece of equipment.
Use this section of the screen to configure the hardware monitor threshold settings.	
Fan Trap Mode	
New threshold Apply	Configure new threshold settings in the fields below and click Apply to use them.
Index	This field is a sequential value.
Temperature (Hi)	Use these fields to configure the highest temperature limit at each sensor.
Temperature (Lo)	Use these fields to configure the lowest temperature limit at each sensor.
Volt. (Hi)	Use these fields to configure the highest voltage limit at each sensor.
Volt. (Lo)	Use these fields to configure the lowest voltage limit at each sensor.
Fan (Hi)	Use these fields to configure the highest RPM limit at each sensor.
Fan (Low)	Use these fields to configure the lowest RPM limit at each sensor.
Poll Interval(s) Set Interval	The text box displays how often (in seconds) this screen refreshes. You may change the refresh interval by typing a new number in the text box and then clicking Set Interval .
Stop	Click Stop to halt statistic polling.

General Setup

The **General Setup** screen allows you to configure general device identification information. It also allows you to set the system time manually or get the current time and date from an external server when you turn on your device. The real time is then displayed in the logs.

To open this screen, click **Basic Setting > General Setup**.

Figure 49 General Setup

The following table describes the labels in this screen.

Table 12 General Setup

LABEL	DESCRIPTION
Host Name	Choose a descriptive name for identification purposes. This name consists of up to 31 ASCII characters; spaces are not allowed.
Location	Enter the geographic location of your device. You can use up to 31 ASCII characters; spaces are not allowed.
Contact Person's Name	Enter the name of the person in charge of this device. You can use up to 31 ASCII characters; spaces are not allowed.

Table 12 General Setup (continued)

LABEL	DESCRIPTION
Model	This field displays your device type.
Stdio Timeout	Type how many minutes a session can be left idle before the session times out. The default is 5 minutes. After it times out you have to log in with your password again. Very long idle timeouts may have security risks. A value of "0" means a management session never times out, no matter how long it has been left idle (not recommended).
Use Time Server When Bootup	Select the time service protocol that the timeserver uses. Not all time servers support all protocols, so you may have to use trial and error to find a protocol that works. The main differences between them are the time format. When you select the Daytime (RFC 867) format, the switch displays the day, month, year and time with no time zone adjustment. When you use this format it is recommended that you use a Daytime timeserver within your geographical time zone. Time (RFC-868) format displays a 4-byte integer giving the total number of seconds since 1970/1/1 at 0:0:0. NTP (RFC-1305) is similar to Time (RFC-868). None is the default value. Enter the time manually. Each time you turn on the device, the time and date will be reset to 2000-1-1 0:0.
Time Server IP Address	Enter the IP address of your timeserver. The device searches for the timeserver for up to 60 seconds.
Current Time	This field displays the time you open this menu (or refresh the menu).
New Time (hh:min:ss)	Enter the new time in hour, minute and second format. The new time then appears in the Current Time field after you click Apply .
Current Date	This field displays the date you open this menu.
New Date (yyyy-mm-dd)	Enter the new date in year, month and day format. The new date then appears in the Current Date field after you click Apply .
Time Zone	Select the time difference between UTC (Universal Time Coordinated, formerly known as GMT, Greenwich Mean Time) and your time zone from the drop-down list box. This field displays only when the selected time server protocol is NTP (RFC-1305) or TIME (RFC-868) .
Apply	Click Apply to save your changes to the IES-1248's volatile memory. The IES-1248 loses these changes if it is turned off or loses power, so use the Config Save link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Cancel	Click Cancel to start configuring the screen again.

User Account

The **User Account** screens allows you to set up and configure system administrator accounts for the IES-1248. You can also configure the authentication policy for IES-1248 administrators. This is different than port authentication in [Chapter 27 on page 205](#).

See [Chapter 27 on page 205](#) for background information on authentication.

12.1 User Account Screen

To open this screen, click **Basic Setting > User Account**.

Figure 50 User Account

Index	Enable	Name	Privilege	Select
1	V	admin	high	☐

The following table describes the labels in this screen.

Table 13 User Account

LABEL	DESCRIPTION
Authentication	Click this to open the Authentication screen. See Section 12.2 on page 116 .
Enable	Select this check box to turn on the administrator account.
Name	Enter a user name for the administrator account.
Password	Enter a password for the administrator account.
Retype Password to Confirm	Re-enter the administrator account's password to verify that you have entered it correctly.

Table 13 User Account (continued)

LABEL	DESCRIPTION
Privilege	Select a privilege level to determine which screens the administrator can use. There is a high, medium or low privilege level for each command. Select high to allow the administrator to use all commands including the lower privilege commands. High privilege commands include things like creating administrator accounts, restarting the system and resetting the factory defaults. Select middle to allow the administrator to use middle or low privilege commands. Select low to allow the administrator to use only low privilege commands. Low privilege commands are read only.
Add	Click Add to save your changes to the IES-1248's volatile memory. The IES-1248 loses these changes if it is turned off or loses power, so use the Config Save link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Cancel	Click Cancel to begin configuring the fields again.
Index	This field displays the number of the user account. Click an account's index number to use the top of the screen to edit it.
Enable	This field displays a "V" if you have the administrator account turned on. It displays a "-" if the administrator account is turned off.
Name	This field displays the administrator account's user name.
Privilege	This field displays the administrator account's access level (high, middle or low).
Select	Select this check box and click the Delete button to remove an administrator account.
Delete	Select an administrator account's check box and click this button to remove the administrator account.
Cancel	Click Cancel to start configuring the screen afresh.

12.2 Authentication Screen

Use this screen to set up the authentication policies and settings by which administrators can access the IES-1248.

To open this screen, click **Basic Setting > User Account > Authentication**.

Figure 51 Authentication

The following table describes the labels in this screen.

Table 14 User Account

LABEL	DESCRIPTION
User account	Click this to open the User Account screen. See Section 12.1 on page 115 .
Authentication Mode	Select the process by which the IES-1248 authenticates administrators. local - Search the local database. You maintain this database in the User Account screen. radius - Check an external RADIUS database using the settings below. local then radius - Search the local database; if the user name is not found, check an external RADIUS database using the settings below.
IP	Enter the IP address of the external RADIUS server in dotted decimal notation.
Port	The default UDP port of the RADIUS server for authentication is 1812 . You need not change this value unless your network administrator instructs you to do so.
Secret	Specify a password (up to 31 alphanumeric characters) as the key to be shared between the external RADIUS server and the switch. This key is not sent over the network. This key must be the same on the external RADIUS server and the switch.
Default Privilege Level	Select the privilege level assigned to administrators in case the external RADIUS database does not provide one. The privilege level determines which screens the administrator can use. There is a high, medium or low privilege level for each command. You can also choose to deny access to the IES-1248. Select high to allow the administrator to use all commands including the lower privilege commands. High privilege commands include things like creating administrator accounts, restarting the system and resetting the factory defaults. Select middle to allow the administrator to use middle or low privilege commands. Select low to allow the administrator to use only low privilege commands. Low privilege commands are read only. Select deny to prevent the administrator from accessing the IES-1248.

Switch Setup

The **Switch Setup** screen allows you to set up and configure global device features.

13.1 GARP Timer Setup

GARP (Generic Attribute Registration Protocol) allows network devices to register and de-register attribute values with other GARP participants within a bridged LAN. GARP is a protocol that provides a generic mechanism for protocols that serve a more specific application, for example, GVRP (GARP VLAN Registration Protocol). GARP and GVRP are the protocols used to automatically register VLAN membership across switches.

Switches join VLANs by making a declaration. A declaration is made by issuing a **Join** message using GARP. Declarations are withdrawn by issuing a **Leave** message. A **Leave All** message terminates all registrations. GARP timers set declaration timeout values.

13.2 Switch Modes

The IES-1248 supports standalone and daisychain switch modes.

13.2.1 Standalone Switch Mode

“Standalone switch mode” relates to the IES-1248’s operational behavior, not a standalone network topology. The standalone switch mode allows either or both of the IES-1248’s Ethernet ports to connect to the backbone Ethernet network. You can also connect one of the IES-1248’s Ethernet ports to the Ethernet network and the other to another IES-1248 (see [Figure 52 on page 120](#) for an example). When the IES-1248 is in standalone mode, you can use it in a network topology that uses loops (you should also enable RSTP). You can have multiple IES-1248 connected on the same network and set both of them to use standalone mode in order to use them with a network topology that uses loops.

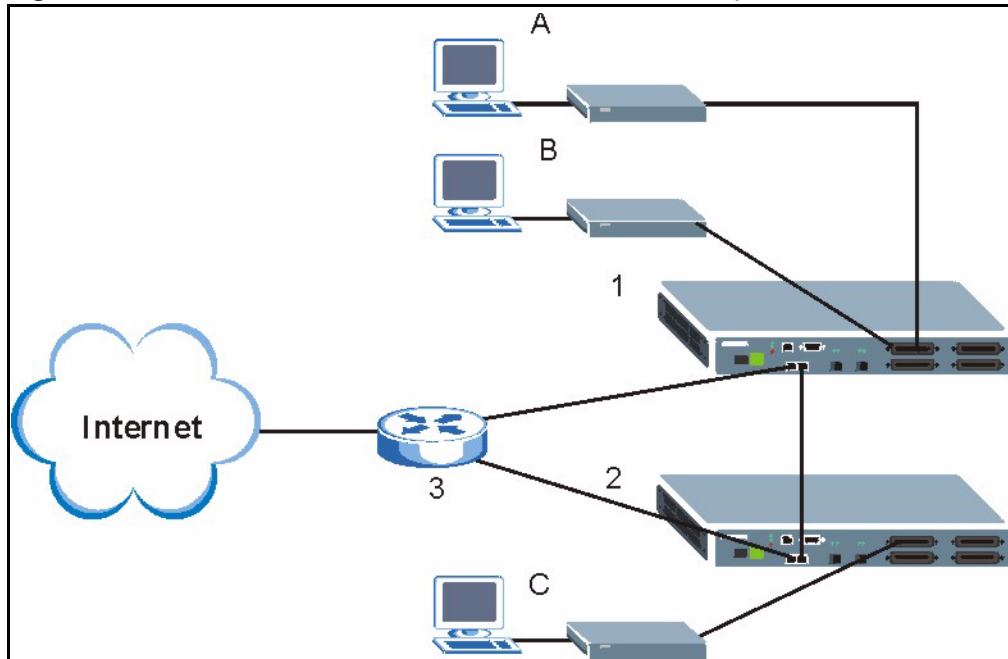
Standalone switch mode with port isolation enabled blocks communications between subscriber ports on an individual IES-1248. However, one IES-1248’s subscribers can communicate with another IES-1248’s subscribers if the two IES-1248’s Ethernet ports are connected to each other (see [Figure 52 on page 120](#) for an example). If you have multiple IES-1248 connected on the same network and set to standalone mode, they do not all need to have the same port isolation setting.

13.2.2 Port Isolation with Standalone Switch Mode Example

The following graphic shows IES-1248 **1** and **2** connected to each other and the Ethernet backbone switch (**3**) in a network topology that creates a loop. The IES-1248 are using the standalone switch mode and have RSTP enabled.

In this example, both IES-1248 have port isolation turned on. Communications between **A** and **B** must first go through another switch (**3** in the figure). However, **A** and **B** can communicate with **C** without their communications going through another switch or router.

Figure 52 Port Isolation with Standalone Switch Mode Example



13.2.3 Daisychain Switch Mode

Daisychain switch mode sets the IES-1248 to use Ethernet port one (ENET 1) as an uplink port to connect to the Ethernet backbone and Ethernet port two (ENET 2) to connect to another (daisychained or subtending) IES-1248. The daisychain switch mode is recommended for use in a network topology that does not have loops. When you daisychain multiple IES-1248 they must all be set to daisychain mode.

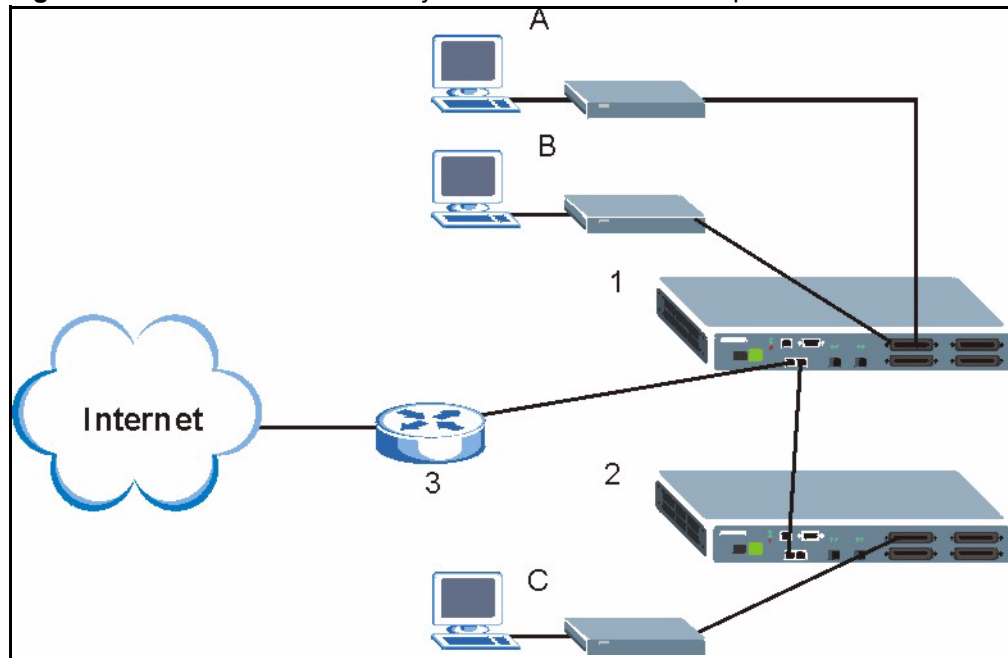
Daisychain switch mode with port isolation enabled blocks communications between subscriber ports on an individual IES-1248 and between the subscribers of any daisychained IES-1248 (see [Figure 53 on page 121](#) for an example). Use the same port isolation setting on all IES-1248 that you set up in a daisychain.

13.2.4 Port Isolation with Daisychain Switch Mode Example

In the example below, the IES-1248 **1** has its Ethernet port one (ENET 1) connected to the Ethernet backbone switch (**3**) and its Ethernet port two (ENET2) connected to Ethernet port one (ENET 1) of the daisychained IES-1248 (**2**).

With port isolation turned on, communications between **A** and **B** must first go through another switch or router (**3** in the figure). **A** and **B** also cannot communicate with **C** without their communications going through another switch or router.

Figure 53 Port Isolation with Daisychain Switch Mode Example



13.3 Switch Setup Screen

To open this screen, click **Basic Setting** > **Switch Setup**.

Figure 54 Switch Setup

Switch Setup	
MAC Address Learning	Aging Time: 300 (10-10000) seconds 0:Disabled
GARP Timer	Join Timer: 200 (100-65535) milliseconds
	Leave Timer: 600 (Leave Timer must > 2*Join Timer)
	Leave All Timer: 10000 (Leave All Timer must > Leave Timer)
Port Isolation	Active: ☒
MAC Anti-Spoofing	Active: ☐
Switch Mode	Standalone
Enet Priority Queue Assignment	Priority 7: Queue 3
	Priority 6: Queue 3
	Priority 5: Queue 2
	Priority 4: Queue 2
	Priority 3: Queue 1
	Priority 2: Queue 0
	Priority 1: Queue 0
	Priority 0: Queue 1
ADSL Priority Queue Assignment	Priority 7: Queue 7
	Priority 6: Queue 6
	Priority 5: Queue 5
	Priority 4: Queue 4
	Priority 3: Queue 3
	Priority 2: Queue 2
	Priority 1: Queue 1
	Priority 0: Queue 0

Apply Cancel

The following table describes the labels in this screen.

Table 15 Switch Setup

LABEL	DESCRIPTION
MAC Address Learning Aging Time	Enter a time from 10 to 10,000 seconds. This is how long all dynamically learned MAC addresses remain in the MAC address table before they age out (and must be relearned). Enter 0 to disable the aging out of MAC addresses.
	GARP Timer: Switches join VLANs by making a declaration. A declaration is made by issuing a Join message using GARP. Declarations are withdrawn by issuing a Leave message. A Leave All message terminates all registrations. GARP timers set declaration timeout values. Click here for more information on VLANs.
Join Timer	Join Timer sets the duration of the Join Period timer for GVRP in milliseconds. Each port has a Join Period timer. The allowed Join Time range is between 100 and 65535 milliseconds; the default is 200 milliseconds.
Leave Timer	Leave Timer sets the duration of the Leave Period timer for GVRP in milliseconds. Each port has a single Leave Period timer. Leave Time must be two times larger than Join Timer; the default is 600 milliseconds.

Table 15 Switch Setup (continued)

LABEL	DESCRIPTION
Leave All Timer	Leave All Timer sets the duration of the Leave All Period timer for GVRP in milliseconds. Each port has a single Leave All Period timer. Leave All Timer must be larger than Leave Timer.
Port Isolation Active	Turn on port isolation to block communications between subscriber ports. When you enable port isolation you do not need to configure the VLAN to isolate subscribers.
MAC Anti-Spoofing	Select this if you want the IES-1248 to generate an alarm, issue a SNMP trap, and disable the port when an existing MAC address appears on another port.
Switch Mode	Select Standalone to use both of the IES-1248's Ethernet ports (ENET 1 and ENET 2) as uplink ports. Note: Standalone mode is recommended for network topologies that use loops. Use Daisychain mode to cascade (daisychain) multiple IES-1248. The IES-1248 uses Ethernet port one (ENET 1) as an uplink port to connect to the Ethernet backbone and uses Ethernet port two (ENET 2) to connect to another (daisychained or subtending) IES-1248. Note: Daisychain mode is recommended for network topologies that do not use loops.
Priority Queue Assignment	IEEE 802.1p defines up to 8 separate traffic types by inserting a tag into a MAC-layer frame that contains bits to define class of service. Frames without an explicit priority tag are given the default priority of the ingress port. Use the next two fields to configure the priority level-to-physical queue mapping. The device has 4 physical queues that you can map to the 8 priority levels for outgoing Ethernet traffic. The device has 8 physical queues that you can map to the 8 priority levels for outgoing ADSL traffic. Traffic assigned to higher index queues gets through the device faster while traffic in lower index queues is dropped if the network is congested.
Priority Level	The following descriptions are based on the traffic types defined in the IEEE 802.1d standard (which incorporates IEEE 802.1p).
Priority 7	Typically used for network control traffic such as router configuration messages.
Priority 6	Typically used for voice traffic that is especially sensitive to jitter (jitter is the variations in delay).
Priority 5	Typically used for video that consumes high bandwidth and is sensitive to jitter.
Priority 4	Typically used for controlled load, latency-sensitive traffic such as SNA (Systems Network Architecture) transactions.
Priority 3	Typically used for "excellent effort" or better than best effort and would include important business traffic that can tolerate some delay.
Priority 2	This is for "spare bandwidth".
Priority 1	This is typically used for non-critical "background" traffic such as bulk transfers that are allowed but that should not affect other applications and users.
Priority 0	Typically used for best-effort traffic.
Apply	Click Apply to save your changes to the IES-1248's volatile memory. The IES-1248 loses these changes if it is turned off or loses power, so use the Config Save link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Cancel	Click Cancel to begin configuring this screen afresh.

IP Setup

The **IP Setup** screen allows you to configure a device IP address, subnet mask and DNS (domain name server) for management purposes.

To open this screen, click **Basic Setting > IP Setup**.

Figure 55 IP Setup

The following table describes the labels in this screen.

Table 16 IP Setup

LABEL	DESCRIPTION
IP	Enter the IP address of your IES-1248 in dotted decimal notation for example 1.2.3.4.
IP Mask	Enter the IP subnet mask of your IES-1248 in dotted decimal notation for example 255.255.255.0.
Apply IP setting	Click Apply IP setting to save your changes to the device's IP address and/or subnet mask to the IES-1248's volatile memory. The IES-1248 loses these changes if it is turned off or loses power, so use the Config Save link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Cancel	Click Cancel to begin configuring the fields again.
Default Gateway	Enter the IP address of the default outgoing gateway in dotted decimal notation.
Apply Gateway setting	Click Apply Gateway setting to save your changes to the device's IP address and/or subnet mask to the IES-1248's volatile memory. The IES-1248 loses these changes if it is turned off or loses power, so use the Config Save link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Cancel	Click Cancel to begin configuring the fields again.

ENET Port Setup

The **ENET Port Setup** screen allows you to configure settings for the Ethernet ports.

To open this screen, click **Basic Setting > ENET Port Setup**.

Figure 56 ENET Port Setup

Port	Active	Name	Speed Mode	Duplex
ENET1	☒	enet1	Auto	Full Duplex
ENET2	☒	enet2	Auto	Full Duplex

Apply Cancel

The following table describes the labels in this screen.

Table 17 ENET Port Setup

LABEL	DESCRIPTION
Port	This is the port index number.
Active	Select the check box to turn on the port. Clear it to disable the port.
Name	Enter a descriptive name that identifies this port. You can use up to 31 ASCII characters; spaces are not allowed.
Speed Mode	Select the type of Ethernet connection for this port. When you don't use auto-negotiation, you must make sure that the settings of the peer Ethernet port are the same in order to connect. Select Auto (auto-negotiation) to have the IES-1248 automatically determine the type of connection that the Ethernet port has. When the peer Ethernet device has auto-negotiation turned on, the IES-1248 negotiates with the peer to determine the connection speed. If the peer Ethernet port does not have auto-negotiation turned on, the IES-1248 determines the connection speed by detecting the signal on the cable and using full duplex. When an Ethernet port is set to Auto, the IES-1248 tries to make a fiber connection first and does not attempt to use the RJ-45 port if the fiber connection is successful. Select 100 Copper if the Ethernet port has a 100 MB electrical connection. Select 1000 Copper if the Ethernet port has a 1000 MB (1 gigabit) electrical connection. Select 1000 Fiber if the Ethernet port has a 1000 MB (1 gigabit) fiber optic connection.
Duplex	The IES-1248 uses full duplex Ethernet connections.

Table 17 ENET Port Setup (continued)

LABEL	DESCRIPTION
Apply	Click Apply to save your changes to the IES-1248's volatile memory. The IES-1248 loses these changes if it is turned off or loses power, so use the Config Save link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Cancel	Click Cancel to begin configuring this screen afresh.

xDSL Port Setup

This chapter explains how to configure settings for profiles and individual ADSL ports. It also covers how to configure virtual channels and virtual channel profiles.

16.1 ADSL Standards Overview

These are the ADSL standards and rates that the IES-1248 supports at the time of writing. The actual transfer rates will vary depending on what the subscriber's device supports, the line conditions and the connection distance.

Table 18 ADSL Standards Maximum Transfer Rates

STANDARD	MAXIMUM DOWNSTREAM	MAXIMUM UPSTREAM
G.dmt (IES-1248-51/51A)	8160 Kbps	1024 Kbps
G.dmt Annex B (IES-1248-53)	8160 Kbps	1024 Kbps
ETSI (IES-1248-53)	8160 Kbps	1024 Kbps
ANSI T1.413 issue 2 (IES-1248-51/51A)	8160 Kbps	1024 Kbps
ADSL2	12000 Kbps	1200 Kbps
ADSL2 Annex M (IES-1248-51/51A)	12000 Kbps	2400 Kbps
ADSL2+	25000 Kbps	1200 Kbps
ADSL2+ Annex M (IES-1248-51/51A)	25000 Kbps	2400 Kbps

16.2 Downstream and Upstream

Downstream refers to traffic going out from the IES-1248 to the subscriber's ADSL modem or router. Upstream refers to traffic coming into the IES-1248 from the subscriber's ADSL modem or router.

16.3 Profiles

A profile is a table that contains a list of pre-configured ADSL settings. Each ADSL port has one (and only one) profile assigned to it at any given time. You can configure multiple profiles, including profiles for troubleshooting. Profiles allow you to configure ADSL ports efficiently. You can configure all of the ADSL ports with the same profile, thus removing the need to configure the ADSL ports one-by-one. You can also change an individual ADSL port by assigning it a different profile.

For example, you could set up different profiles for different kinds of accounts (for example, economy, standard and premium). Assign the appropriate profile to an ADSL port and it takes care of a large part of the port's configuration maximum and minimum transfer rates. You still get to individually enable or disable each port, as well as configure its channels and operational mode.

16.4 Interleave Delay

Interleave delay is the wait (in milliseconds) that determines the size of a single block of data to be interleaved (assembled) and then transmitted. Interleave delay is used when transmission error correction (Reed- Solomon) is necessary due to a less than ideal telephone line. The bigger the delay, the bigger the data block size, allowing better error correction to be performed.

Reed-Solomon codes are block-based error correcting codes with a wide range of applications. The Reed-Solomon encoder takes a block of digital data and adds extra "redundant" bits. The Reed-Solomon decoder processes each block and attempts to correct errors and recover the original data.

16.4.1 Fast Mode

Fast mode means no interleaving takes place and transmission is faster (a "fast channel"). This would be suitable if you have a good line where little error correction is necessary.

16.5 Configured Versus Actual Rate

You configure the maximum rate of an individual ADSL port by modifying its profile (see [Chapter 17 on page 147](#)) or assigning the port to a different profile (see [Section 16.7.1 on page 133](#)). However, due to noise and other factors on the line, the actual rate may not reach the maximum that you specify.

Even though you can specify arbitrary numbers using the Edit Profile screen, the actual rate is always a multiple of 32 Kbps. If you enter a rate that is not a multiple of 32 Kbps, the actual rate will be the next lower multiple of 32Kbps. For instance, if you specify 60 Kbps for a port, the actual rate for that port will not exceed 32 Kbps, and if you specify 66 Kbps, the actual rate will not be over 64Kbps.

Regardless of a profile's configured upstream and downstream rates, the IES-1248 automatically limits the actual rates for each individual port to the maximum speeds supported by the port's ADSL operational mode. For example, if you configure a profile with a maximum downstream rate of 25000 Kbps, and apply it to a port set to use G.dmt, the IES-1248 automatically uses a maximum downstream rate of 8160 Kbps. This means that if you configure a profile with very high rates, you can still use it with any port. See [Table 18 on page 129](#) for a list of the maximum rates supported by the different ADSL standards.

16.6 Default Settings

The default profile always exists and all of the ADSL ports use the default profile settings when the IES-1248 is shipped. The default profile's name is set to DEFVAL_MAX.

See [Appendix A on page 519](#) for the settings of the default profile and ADSL port default settings.

16.7 xDSL Port Setup Screen

To open this screen, click **Basic Setting > xDSL Port Setup**.

Figure 57 xDSL Port Setup

The screenshot shows the 'xDSL Port Setup' interface. At the top, there are tabs for 'xDSL Port Setup', 'VC Setup', and 'PPVC Setup'. Below the tabs, there are several checkboxes for configuration options: 'Active' (checked), 'Customer Info', 'Customer Tel', '2+ Features', 'Profile & Mode', 'IGMP filter', 'Security', 'Frame Type', 'Virtual Channels', 'Alarm Profile', 'PVID & Priority', and 'Packet Filter'. There are also 'Copy', 'Port' (with a dropdown menu showing '1'), and 'Paste' buttons. Below these options is a table with columns: Port, Active, Customer Info, Customer Tel, Profile, Mode, and Channels. The table lists ports 1 through 48, all of which are 'enabled' and use the 'DEFVAL_MAX' profile in 'auto' mode with 1 channel.

Port	Active	Customer Info	Customer Tel	Profile	Mode	Channels
1	enabled			DEFVAL_MAX	auto	1
2	enabled			DEFVAL_MAX	auto	1
3	enabled			DEFVAL_MAX	auto	1
4	enabled			DEFVAL_MAX	auto	1
5	enabled			DEFVAL_MAX	auto	1
6	enabled			DEFVAL_MAX	auto	1
7	enabled			DEFVAL_MAX	auto	1
8	enabled			DEFVAL_MAX	auto	1
9	enabled			DEFVAL_MAX	auto	1
10	enabled			DEFVAL_MAX	auto	1
11	enabled			DEFVAL_MAX	auto	1
12	enabled			DEFVAL_MAX	auto	1
13	enabled			DEFVAL_MAX	auto	1
14	enabled			DEFVAL_MAX	auto	1
15	enabled			DEFVAL_MAX	auto	1
16	enabled			DEFVAL_MAX	auto	1
17	enabled			DEFVAL_MAX	auto	1
18	enabled			DEFVAL_MAX	auto	1
19	enabled			DEFVAL_MAX	auto	1
20	enabled			DEFVAL_MAX	auto	1
21	enabled			DEFVAL_MAX	auto	1
22	enabled			DEFVAL_MAX	auto	1
23	enabled			DEFVAL_MAX	auto	1
24	enabled			DEFVAL_MAX	auto	1
25	enabled			DEFVAL_MAX	auto	1
26	enabled			DEFVAL_MAX	auto	1
27	enabled			DEFVAL_MAX	auto	1
28	enabled			DEFVAL_MAX	auto	1
29	enabled			DEFVAL_MAX	auto	1
30	enabled			DEFVAL_MAX	auto	1
31	enabled			DEFVAL_MAX	auto	1
32	enabled			DEFVAL_MAX	auto	1
33	enabled			DEFVAL_MAX	auto	1
34	enabled			DEFVAL_MAX	auto	1
35	enabled			DEFVAL_MAX	auto	1
36	enabled			DEFVAL_MAX	auto	1
37	enabled			DEFVAL_MAX	auto	1
38	enabled			DEFVAL_MAX	auto	1
39	enabled			DEFVAL_MAX	auto	1
40	enabled			DEFVAL_MAX	auto	1
41	enabled			DEFVAL_MAX	auto	1
42	enabled			DEFVAL_MAX	auto	1
43	enabled			DEFVAL_MAX	auto	1
44	enabled			DEFVAL_MAX	auto	1
45	enabled			DEFVAL_MAX	auto	1
46	enabled			DEFVAL_MAX	auto	1
47	enabled			DEFVAL_MAX	auto	1
48	enabled			DEFVAL_MAX	auto	1

The following table describes the labels in this screen.

Table 19 xDSL Port Setup

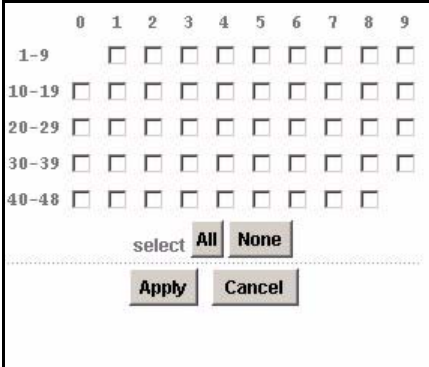
LABEL	DESCRIPTION
VC Setup	Click VC Setup to open the VC Setup screen where you can configure VC settings for the DSL ports (see Section 16.9 on page 138).
PPVC Setup	Click PPVC Setup to open the PPVC Setup screen where you can configure priority PVC settings for the DSL ports (see Section 16.11 on page 142).
Copy Port Paste	Do the following to copy settings from one DSL port to another DSL port or ports. 1. Select the number of the DSL port from which you want to copy settings. 2. Select the settings that you want to copy. 3. Click Paste and the following screen appears. 4. Select to which ports you want to copy the settings. Use All to select every port. Use None to clear all of the check boxes. 5. Click Apply to paste the settings. Figure 58 Select Ports 
Active	Select this check box to copy this port's active setting. This is configured in the xDSL Port Setting screen (see Section 16.7.1 on page 133).
Customer Info	Select this check box to copy this port's subscriber information. This is configured in the xDSL Port Setting screen (see Section 16.7.1 on page 133).
Customer Tel	Select this check box to copy this port's subscriber's telephone number. This is configured in the xDSL Port Setting screen (see Section 16.7.1 on page 133).
2+ Features	Select this check box to copy this port's ADSL2+ feature settings. These are configured in the xDSL Port Setting screen (see Section 16.7.1 on page 133).
Profile & Mode	Select this check box to copy this port's port profile settings and ADSL operational mode. The port profile settings are configured in the xDSL Port Profile Setup screens (see Chapter 17 on page 147). The ADSL operational mode is configured in the xDSL Port Setting screen (see Section 16.7.1 on page 133).
Security	Select this check box to copy this port's security settings. This is configured in the Port Security screen (see Chapter 28 on page 209).
Frame Type	Select this check box to copy this port's allowed frame type. This is configured in the Static VLAN Setting screen (see Chapter 26 on page 199).
Virtual Channels	Select this check box to copy this port's virtual channel settings. These are configured in the VC Setup screen (see Section 16.9 on page 138).
Alarm Profile	Select this check box to copy this port's alarm profile. This is configured in the Alarm Profile Setup screen (see Section 17.6 on page 155).
PVID & Priority	Select this check box to copy this port's PVID and priority settings. These are configured in the VLAN Port Setting screen (see Chapter 20 on page 167).

Table 19 xDSL Port Setup (continued)

LABEL	DESCRIPTION
Packet Filter	Select this check box to copy this port's packet filter settings. These are configured in the Packet Filtering screen (see Chapter 24 on page 195).
Paste	See Copy Port .
Port	This field shows each ADSL port number.
Active	This field shows the active status of this port. The port may be enabled or disabled . This is configured in the xDSL Port Setting screen (see Section 16.7.1 on page 133).
Customer Info	This field shows the customer information provided for this port. This is configured in the xDSL Port Setting screen (see Section 16.7.1 on page 133).
Customer Tel	This field shows the customer telephone number provided for this port. This is configured in the xDSL Port Setting screen (see Section 16.7.1 on page 133).
Profile	This field shows which profile is assigned to this port. This is configured in the xDSL Port Setting screen (see Section 16.7.1 on page 133).
Mode	This field shows which ADSL operational mode the port is set to use. This is configured in the xDSL Port Setting screen (see Section 16.7.1 on page 133).
Channels	This field displays the number of PVCs (Permanent Virtual Circuits) that are configured for this port. This is configured in the VC Setup screen (see Section 16.9 on page 138).

16.7.1 xDSL Port Setting Screen

To open this screen, click **Basic Setting** > **xDSL Port Setup**, and then click a port's index number.

Figure 59 xDSL Port Setting

The following table describes the labels in this screen.

Table 20 xDSL Port Setting

LABEL	DESCRIPTION
Up	Click this to return to the previous screen.
General Setup	
Active	Select this check box to turn on this ADSL port.
Customer Info	Enter information to identify the subscriber connected to this ADSL port. You can use up to 31 printable ASCII characters (including spaces and hyphens).
Customer Tel	Enter information to identify the telephone number of the subscriber connected to this ADSL port. You can use up to 15 ASCII characters (including spaces and hyphens).
Profile	Select a profile of ADSL settings (such as the transfer rate, interleave delay and signal to noise ratio settings) to assign to this port. Use the Port Profile screen to configure port profiles (see Chapter 17 on page 147).
Mode	Select the port's ADSL operational mode. Select the mode that the subscriber's device uses or auto to have the IES-1248 automatically determine the mode to use. See Table 18 on page 129 for information on the individual ADSL modes.
Alarm Profile	Select the port's alarm profile. The alarm profile defines alarm thresholds for the ADSL port. The IES-1248 sends an alarm trap and generates a syslog entry when the thresholds of the alarm profile are exceeded (see Section 17.6 on page 155).

Table 20 xDSL Port Setting (continued)

LABEL	DESCRIPTION
ADSL2/2+ feature	These are features available with ADSL2/2+. The subscriber's ADSL device must also support the individual features in order to use them. At the time of writing these features have not been fully tested and their performance and interoperability cannot be guaranteed.
Annex L	This field is not available for the IES-1248-53. Enable Annex L to use reach extended ADSL2. This allows increased connection distances.
Annex M	This field is not available for the IES-1248-53. Enable Annex M to use double upstream mode. This has the upstream connection use tones 6 to 63.
PMM	Enable the Power Management (PMM) feature to reduce the amount of power used overall and reduce the instances of the connection going down. PMM increases or decreases the transmission power based on line conditions. PMM also decreases the number of service interruptions. Select L2 to have the ADSL connection use power saving mode and reduce the rate when there is no traffic. The rate comes back up when there is traffic. Select L3 to use both power management modes L2 and L3. L3 puts the ADSL connection to sleep mode. L0 power mode uses no power reduction. See the ITU-T G.992.3 standard for more on PMM and the power modes (states).
SRA	Enable Seamless Rate Adaptation (SRA) to have the IES-1248 automatically adjust the connection's data rate according to line conditions without interrupting service.
	Sudden spikes in the line's noise level (impulse noise) can cause errors and result in lost packets. Set the impulse noise protection minimum to have a buffer to protect the ADSL physical layer connection against impulse noise. This buffering causes a delay that reduces transfer speeds. It is recommended that you use a non-zero setting for real time traffic that has no error correction (like videoconferencing).
US INP	Set the minimum upstream (US) impulse noise protection setting.
DS INP	Set the minimum downstream (DS) impulse noise protection setting.
Max US TX PSD	Specify the maximum upstream transmit power. The unit of measure is 0.1 dBm/Hz; for example, to set the maximum upstream transmit power to -10 dBm/Hz, set this value to -100.
Max DS TX PSD	Specify the maximum downstream transmit power. The unit of measure is 0.1 dBm/Hz; for example, to set the maximum downstream transmit power to -10 dBm/Hz, set this value to -100.
L0 Time	Set the minimum time (in seconds) that the ADSL line must stay in L0 power mode before changing to the L2 power mode.
L2 Time	Set minimum time (in seconds) that the ADSL line must stay in the L2 power mode before reducing the power again in the L2 power mode.
L2 ATPR	Set the maximum Aggregate Transmit Power Reduction (ATPR) in decibels (dB) that is permitted in a L2 power reduction. The system can gradually decrease the ADSL line transmission power while it is in the L2 power mode. This is the largest individual power reduction allowed in the L2 power mode.
L2 ATPRT	Set the maximum Aggregate Transmit Power Reduction Total (ATPRT) in decibels (dB) that is permitted in the L2 power mode. This is the total transmit power decrease that is allowed to occur in the L2 power mode.
Max L2 Rate	Set the maximum transfer rate (in Kilobits per second) that is permitted while the port is in the L2 power mode. The supported range is 32~4096 Kbps in 4 Kbps increments. If you enter a number that is not a multiple of 4, the system uses the next lower multiple of 4. If you enter 39, for example, the system will use 36.

Table 20 xDSL Port Setting (continued)

LABEL	DESCRIPTION
Min L2 Rate	Set the minimum transfer rate (in Kilobits per second) that is permitted while the port is in the L2 power mode. The supported range is 32~4096 Kbps in 4 Kbps increments. If you enter a number that is not a multiple of 4, the system uses the next lower multiple of 4. If you enter 39, for example, the system will use 36.
L0 to L2 Rate	Set the down stream transfer rate (in Kilobits per second) that serves as the threshold for whether the port is to use the L0 or the L2 power mode. The system changes from L0 mode to L2 mode when the downstream transfer rate stays below this threshold for L0 Time . The system changes back from L2 mode to L0 mode when the downstream transfer rate goes above this threshold. This rate must be less than or equal to one half of the Min L2 Rate and at least 16 Kbps.
Use this part of the screen to mask carrier tones. Masking a carrier tone disables the use of that tone on the ADSL port. Do this to have the system not use an ADSL line's tones that are known to have a high noise level. Each mask can use up to 8 hexadecimal digits (00000000~ffffff). Each hexadecimal digit represents 4 tones. The hexadecimal digit is converted to binary and a '1' masks (disables) the corresponding tone. The most significant bit defines the lowest tone number in a mask.	
US Carrier	Mask0 represents tones 0~31. Mask1 represents tones 32~63. The most significant bit defines Tone 0. In other words, 0x00000001 means tone 31. For example, you could use 0xffff000 to disable upstream carrier tones 0~19 and leave tones 20 ~ 31 enabled.
DS Carrier(32~255)	Mask1 represents tones 32~63 Mask2 represents tones 64~95 Mask3 represents tones 96~127 Mask4 represents tones 128~159 Mask5 represents tones 160~191 Mask6 represents tones 192~223 Mask7 represents tones 224~255 For example, use 0x01000000 in Mask2 to disable downstream carrier tone 71. Use 0x03000000 in Mask2 to disable downstream carrier tones 70 and 71.
DS Carrier(256~511)	Mask0 represents tones 256~287 Mask1 represents tones 288~319 Mask2 represents tones 320~351 Mask3 represents tones 352~383 Mask4 represents tones 384~415 Mask5 represents tones 416~447 Mask6 represents tones 448~479 Mask7 represents tones 480~511 For example, use 0x00001000 in Mask1 to disable downstream carrier tone 307. Use 0x0000f000 in Mask1 to disable downstream carrier tones 304 to 307.
Apply	Click Apply to save your changes to the IES-1248's volatile memory. The IES-1248 loses these changes if it is turned off or loses power, so use the Config Save link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Cancel	Click Cancel to begin configuring the fields again.

16.8 Virtual Channels

Defining virtual channels (also called Permanent Virtual Circuits or PVCs) allows you to set priorities for different services or subscribers. You can define up to eight channels on each DSL port and use them for different services or levels of service. You set the PVID that is assigned to untagged frames received on each channel. You also set an IEEE 802.1p priority for each of the PVIDs. In this way you can assign different priorities to different channels (and consequently the services that get carried on them or the subscribers that use them).

For example, you want to give high priority to voice service on one of the ADSL ports.

Use the **Edit Static VLAN** screen to configure a static VLAN on the IES-1248 for voice on the port.

Use the **ADSL Edit Port Channel Setup** screen to:

- Configure a channel on the port for voice service.
- Set the channel to use the PVID of the static VLAN you configured.
- Assign the channel a high priority.

16.8.1 Super Channel

The IES-1248 forwards frames belonging to VLAN groups that are not assigned to specific channels to the super channel. Enable the super channel option to allow a channel forward frames belonging to multiple VLAN groups (that are not assigned to other channels). The super channel functions in the same way as the channel in a single channel environment. One port can have only one super channel.

16.8.2 LLC

LLC is a type of encapsulation where one VC (Virtual Circuit) carries multiple protocols with each packet header containing protocol identifying information. Despite the extra bandwidth and processing overhead, this method may be advantageous if it is not practical to have a separate VC for each carried protocol, for example, if charging heavily depends on the number of simultaneous VCs.

16.8.3 VC Mux

VC Mux is a type of encapsulation where, by prior mutual agreement, each protocol is assigned to a specific virtual circuit, for example, VC1 carries IP, VC2 carries IPX, and so on. VC-based multiplexing may be dominant in environments where dynamic creation of large numbers of ATM VCs is fast and economical.

16.8.4 Virtual Channel Profile

Virtual channel profiles allow you to configure the virtual channels efficiently. You can configure all of the virtual channels with the same profile, thus removing the need to configure the virtual channels one-by-one. You can also change an individual virtual channel by assigning it a different profile.

The IES-1248 provides two default virtual channel profiles: **DEFVAL** (for LLC encapsulation) and **DEFVAL_VC** (for VC encapsulation). By default, all virtual channels are associated to **DEFVAL**.

16.9 VC Setup Screen

Use this screen to view and configure a port's channel (PVC) settings.

To open this screen, click **Basic Setting** > **xDSL Port Setup** > **VC Setup**.

Figure 60 VC Setup

The screenshot shows the 'VC Setup' screen with three tabs: 'xDSL Port Setup', 'VC Setup' (selected), and 'PPVC Setup'. The configuration fields include:

- Port: 1 (dropdown)
- VPI: 0 (text box)
- DS VC Profile: DEFVAL (dropdown)
- US VC Profile: - (dropdown)
- PVID: 1 (1-4094) (text box)
- Super Channel: ☐ (checkbox)
- VCI: 0 (text box)
- Priority: 0 (dropdown)

 Below these fields are 'Add' and 'Cancel' buttons. A 'Show Port' dropdown is set to 'ALL'. The main table lists virtual channels with columns: Index Port, VPI/VCI, DS/US VC Profile, PVID, Priority, and Select. The table contains 48 rows, all with 'DEFVAL/' in the DS/US VC Profile column. At the bottom, there are buttons for 'Delete', 'Copy', and 'Paste', along with status text 'Index -1 selected' and 'No Channel copied'.

Index Port	VPI/VCI	DS / US VC Profile	PVID	Priority	Select	
1	1	0/33	DEFVAL/	*	*	☐
2	2	0/33	DEFVAL/	*	*	☐
3	3	0/33	DEFVAL/	*	*	☐
4	4	0/33	DEFVAL/	*	*	☐
5	5	0/33	DEFVAL/	*	*	☐
6	6	0/33	DEFVAL/	*	*	☐
7	7	0/33	DEFVAL/	*	*	☐
8	8	0/33	DEFVAL/	*	*	☐
9	9	0/33	DEFVAL/	*	*	☐
10	10	0/33	DEFVAL/	*	*	☐
11	11	0/33	DEFVAL/	*	*	☐
12	12	0/33	DEFVAL/	*	*	☐
13	13	0/33	DEFVAL/	*	*	☐
14	14	0/33	DEFVAL/	*	*	☐
15	15	0/33	DEFVAL/	*	*	☐
16	16	0/33	DEFVAL/	*	*	☐
17	17	0/33	DEFVAL/	*	*	☐
18	18	0/33	DEFVAL/	*	*	☐
19	19	0/33	DEFVAL/	*	*	☐
20	20	0/33	DEFVAL/	*	*	☐
21	21	0/33	DEFVAL/	*	*	☐
22	22	0/33	DEFVAL/	*	*	☐
23	23	0/33	DEFVAL/	*	*	☐
24	24	0/33	DEFVAL/	*	*	☐
25	25	0/33	DEFVAL/	*	*	☐
26	26	0/33	DEFVAL/	*	*	☐
27	27	0/33	DEFVAL/	*	*	☐
28	28	0/33	DEFVAL/	*	*	☐
29	29	0/33	DEFVAL/	*	*	☐
30	30	0/33	DEFVAL/	*	*	☐
31	31	0/33	DEFVAL/	*	*	☐
32	32	0/33	DEFVAL/	*	*	☐
33	33	0/33	DEFVAL/	*	*	☐
34	34	0/33	DEFVAL/	*	*	☐
35	35	0/33	DEFVAL/	*	*	☐
36	36	0/33	DEFVAL/	*	*	☐
37	37	0/33	DEFVAL/	*	*	☐
38	38	0/33	DEFVAL/	*	*	☐
39	39	0/33	DEFVAL/	*	*	☐
40	40	0/33	DEFVAL/	*	*	☐
41	41	0/33	DEFVAL/	*	*	☐
42	42	0/33	DEFVAL/	*	*	☐
43	43	0/33	DEFVAL/	*	*	☐
44	44	0/33	DEFVAL/	*	*	☐
45	45	0/33	DEFVAL/	*	*	☐
46	46	0/33	DEFVAL/	*	*	☐
47	47	0/33	DEFVAL/	*	*	☐
48	48	0/33	DEFVAL/	*	*	☐

The following table describes the labels in this screen.

Table 21 VC Setup

LABEL	DESCRIPTION
xDSL Port Setup	Click xDSL Port Setup to go to the screen where you can configure DSL port settings (see Section 16.7 on page 131).
PPVC Setup	Click PPVC Setup to open the PPVC Setup screen where you can configure priority PVC settings for the DSL ports (see Section 16.11 on page 142).
Port	Use this drop-down list box to select a port for which you wish to view or configure settings. This field is read-only once you click on a port number below.

Table 21 VC Setup (continued)

LABEL	DESCRIPTION
Super Channel	The IES-1248 forwards frames belonging to VLAN groups that are not assigned to specific channels to the super channel. Enable the super channel option to have this channel forward frames belonging to multiple VLAN groups (that are not assigned to other channels). The super channel functions in the same way as the channel in a single channel environment.
VPI	Type the Virtual Path Identifier for a channel on this port.
VCI	Type the Virtual Circuit Identifier for a channel on this port.
DS VC Profile	Use the drop-down list box to select a VC profile to use for this channel's downstream traffic shaping.
US VC Profile	Use the drop-down list box to select a VC profile to use for this channel's upstream traffic. The IES-1248 does not perform upstream traffic policing if you do not specify an upstream VC profile. Note: Upstream traffic policing should be used in conjunction with the ATM shaping feature on the subscriber's device. If the subscriber's device does not apply the appropriate ATM shaping, all upstream traffic will be discarded due to upstream traffic policing.
PVID	Type a PVID (Port VLAN ID) to assign to untagged frames received on this channel.
Priority	Use the drop-down list box to select the priority value (0 to 7) to add to incoming frames without a (IEEE 802.1p) priority tag. An asterisk (*) denotes a super channel.
Add Apply	Click this to add or save channel settings on the selected port. (The name of the button depends on whether or not you have clicked on a PVC number in the Index column.) This saves your changes to the IES-1248's volatile memory. The IES-1248 loses these changes if it is turned off or loses power, so use the Config Save link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Cancel	Click Cancel to start configuring the screen again.
Show Port	Select the number of an ADSL port for which to display VC settings (or display all of them).
Index	This field displays the number of the PVC. Click a PVC's index number to use the top of the screen to edit the PVC. Note: At the time of writing, you cannot edit the VPI and VCI. If you want to change them, add a new PVC with the desired settings. Then you can delete any unwanted PVCs.
Port	This field displays the number of the ADSL port on which the PVC is configured.
VPI/VCI	This field displays the Virtual Path Identifier (VPI) and Virtual Circuit Identifier (VCI). The VPI and VCI identify a channel on this port.
US / DS VC Profile	This shows which VC profile this channel uses for downstream traffic shaping. The VC profile for upstream policing also displays if the channel is configured to use one.
PVID	This is the PVID (Port VLAN ID) assigned to untagged frames or priority frames (0 VID) received on this channel. An asterisk (*) denotes a super channel.

Table 21 VC Setup (continued)

LABEL	DESCRIPTION
Priority	This is the priority value (0 to 7) added to incoming frames without a (IEEE 802.1p) priority tag. An asterisk (*) denotes a super channel.

Table 21 VC Setup (continued)

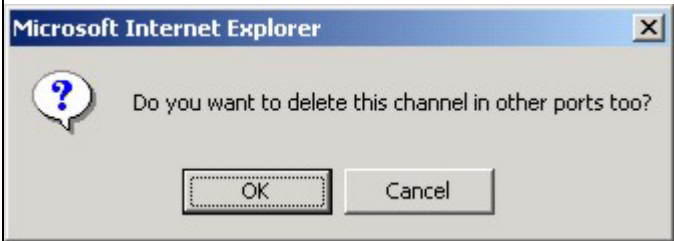
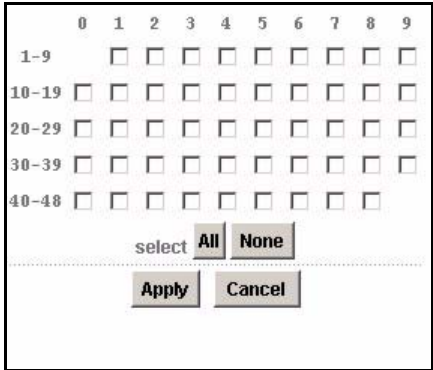
LABEL	DESCRIPTION
Select Delete	Do the following to remove one or more PVCs. 1. Select a PVC's Select radio button. 2. Click Delete. 3. Click OK if you want to remove the PVC from other ports. Click Cancel to only remove the one you selected. Figure 61 Basic Setting, xDSL Port Setup, VC Setup, Delete  4. If you clicked OK, the following screen appears. 5. Select to which ports you want to copy the settings. Use All to select every port. Use None to clear all of the check boxes. 6. Click Apply to delete the channels. Figure 62 Select Ports 

Table 21 VC Setup (continued)

LABEL	DESCRIPTION
Select Copy Paste	Do the following to copy settings from one PVC to another port or ports. 1. Click the Select radio button of the PVC from which you want to copy settings. 2. Click Paste. 3. The following screen appears. 4. Select to which ports you want to copy the settings. Use All to select every port. Use None to clear all of the check boxes. 5. Click Apply to copy the settings.

Figure 63 Select Ports

The screenshot shows a 'Select Ports' dialog box. It features a grid of checkboxes for selecting ports. The columns are labeled 0 through 9. The rows are labeled 1-9, 10-19, 20-29, 30-39, and 40-48. Below the grid are buttons for 'select', 'All', 'None', 'Apply', and 'Cancel'.

16.10 Priority-based PVCs

A PPVC (Priority-based PVC) allows you to give different priorities to PVCs that are members of the same VLAN.

The IES-1248 uses eight priority queues (also called levels) for the member PVCs. The system maps frames with certain IEEE 802.1p priorities to a PVC with a particular priority queue. The following table gives the factory default mapping.

Table 22 IEEE 802.1p Priority to PPVC Mapping

IEEE 802.1 PRIORITY	MAPS TO:	PPVC 0/33, PRIORITY QUEUE
7	->	level 7
6	->	level 6
5	->	level 5
4	->	level 4
3	->	level 3
2	->	level 2
1	->	level 1
0	>	level 0

16.11 PPVC Setup Screen

Use this screen to view and configure PPVCs.

To open this screen, click **Basic Setting > xDSL Port Setup > PPVC Setup**.

Figure 64 PPVC Setup

The following table describes the labels in this screen.

Table 23 PPVC Setup

LABEL	DESCRIPTION
xDSL Port Setup	Click xDSL Port Setup to go to the screen where you can configure DSL port settings (see Section 16.7 on page 131).
VC Setup	Click VC Setup to open the VC Setup screen where you can configure VC settings for the DSL ports (see Section 16.9 on page 138).
Port	Use this drop-down list box to select a port for which you wish to configure settings.
Encap.	Select the encapsulation type (llc or vc) for this PPVC.
VPI	Type the Virtual Path Identifier for this PPVC.
VCI	Type the Virtual Circuit Identifier for this PPVC. The IES-1248 uses this PVC channel internally. This PVC is not needed on the subscriber's device. This PVC cannot overlap with any existing PVCs on this port.
PVID	Type a PVID (Port VLAN ID) to assign to untagged frames received on this PPVC.
Priority	Use the drop-down list box to select the priority value (0 to 7) to add to incoming frames without a (IEEE 802.1p) priority tag.
Add / Modify	Click Add / Modify to save PPVC settings for a port. In order to change a port's PPVC settings, just select the port from the Port drop-down list box and then configure the settings you want. These settings replace the port's old settings when you click Add / Modify . Clicking Add / Modify saves your changes to the IES-1248's volatile memory. The IES-1248 loses these changes if it is turned off or loses power, so use the Config Save link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Cancel	Click Cancel to start configuring the screen again.
Show Port	Select the number of an ADSL port for which to display PPVC settings (or display all of them).
Index	This field displays the number of the PPVC.
Port	This field displays the number of the ADSL port on which the PPVC is configured.

Table 23 PPVC Setup (continued)

LABEL	DESCRIPTION
VPI/VCI	This field displays the Virtual Path Identifier (VPI) and Virtual Circuit Identifier (VCI). The VPI and VCI identify a channel on this port. The IES-1248 uses this PVC channel internally. This PVC is not needed on the subscriber's device.
Encap	This field displays the PPVC's type of encapsulation (llc or vc).
PVID	This is the PVID (Port VLAN ID) assigned to untagged frames or priority frames (0 VID) received on this channel.
Priority	This is the priority value (0 to 7) added to incoming frames without a (IEEE 802.1p) priority tag.
Members	This field displays how many PVCs belong to this PPVC has. Click the number to open a screen where you can configure the PPVC's member PVCs.
Delete	Click Delete to remove a PPVC. Clicking Delete saves your changes to the IES-1248's volatile memory. The IES-1248 loses these changes if it is turned off or loses power, so use the Config Save link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.

16.11.1 PPVC Setup Members Screen

Use this screen to add and remove member PVCs.



The member PVCs must be created on the subscriber's device.

To open this screen, click **Basic Setting > xDSL Port Setup > PPVC Setup**. Then, click a PPVC's member number to open the **PPVC Setup Members** screen.

Figure 65 PPVC Setup, Edit

PPVC Setup

Port 2: 2/2

Index	VPI/VCI	VC Profile	Level	Delete
1	1 / 32	DEFVAL	0	delete

Add VPI VCI DS VC Profile

US VC Profile Level

The following table describes the labels in this screen.

Table 24 PPVC Setup, Edit

LABEL	DESCRIPTION
Port	This is the port for which you are viewing or configuring settings.
Index	This field displays the number of the member PVC.
VPI/VCI	This field displays the Virtual Path Identifier (VPI) and Virtual Circuit Identifier (VCI). The VPI and VCI identify a channel on this port. The subscriber's device must create this PVC.

Table 24 PPVC Setup, Edit (continued)

LABEL	DESCRIPTION
VC Profile	This shows which VC profile this channel uses for downstream traffic shaping. The VC profile for upstream policing also displays if the channel is configured to use one.
Level	This field displays the number of the member PVC's priority queue.
Delete	Click Delete to remove a member PVC from the PPVC. Clicking Delete saves your changes to the IES-1248's volatile memory. The IES-1248 loses these changes if it is turned off or loses power, so use the Config Save link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Add	Use this section of the screen to add or modify a member PVC.
VPI	Type the Virtual Path Identifier for this member PVC.
VCI	Type the Virtual Circuit Identifier for this member PPVC. This PVC cannot overlap with any existing PVC's on this port.
DS VC Profile	Use the drop-down list box to select a VC profile to use for this channel's downstream traffic shaping.
US VC Profile	Use the drop-down list box to select a VC profile to use for this channel's upstream traffic. The IES-1248 does not perform upstream traffic policing if you do not specify an upstream VC profile.
Level	Use the drop-down list box to select the priority queue (0 to 7) to add to use for the PVC. 7 is the highest level.
Add / Modify	Click Add / Modify to save member PVC settings for a PPVC. In order to change a member PVC 's settings, just enter the PVC's VPI and VCI, and configure the settings you want. These settings replace the PVC's old settings when you click Add / Modify . Clicking Add / Modify saves your changes to the IES-1248's volatile memory. The IES-1248 loses these changes if it is turned off or loses power, so use the Config Save link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Close	Click Close to exit the screen without saving your changes.

xDSL Profiles Setup

A profile is a list of settings that you define. Then you can assign them to one or more individual ports. For background information about many of these settings, see [Chapter 16 on page 129](#).

17.1 xDSL Profile Screen

To open this screen, click **Basic Setting > xDSL Profiles Setup**.

Figure 66 Port Profile

Port Profile

xDSL Profile **VC Profile** **Alarm Profile**

Index	Name	Latency Mode	Down/ Up Stream Rate(kbps)	Select
1	DEFVAL	Interleave	2048/ 512	
2	DEFVAL_MAX	Interleave	9088/ 512	

Modify **Delete**

Name

Latency Mode **Interleave**

	Up Stream	Down Stream
Max Rate	1000 (64-4096)kbps	24000 (64-32000)kbps
Min Rate	32 (32-4096)kbps	64 (32-32000)kbps
Interleave Delay	20 (1-255) ms	20 (1-255) ms
Max SNR	31 (0-31) dB	31 (0-31) dB
Min SNR	0 (0-31) dB	0 (0-31) dB
Target SNR	6 (0-31) dB	6 (0-31) dB
Up Shift SNR	9 (0-31) dB	9 (0-31) dB
Down Shift SNR	3 (0-31) dB	3 (0-31) dB

Add **Cancel**

The following table describes the labels in this screen.

Table 25 Port Profile

LABEL	DESCRIPTION
VC Profile	Click VC Profile to open the VC Profile screen where you can configure virtual channel profiles (see Section 17.5 on page 153).
Alarm Profile	Click Alarm Profile to open the Alarm Profile screen where you can configure limits that trigger an alarm when exceeded (see Section 17.6 on page 155).

Table 25 Port Profile (continued)

LABEL	DESCRIPTION
Index	This is the port profile index number.
Name	These are the names of individual profiles. The DEFVAL profile always exists and all of the DSL ports have it assigned to them by default. You can use up to 31 ASCII characters; spaces are not allowed.
Latency Mode	This is the ADSL latency mode (Fast or Interleave) for the ports that belong to this profile.
Down/Up Stream Rate (kbps)	These are the maximum downstream and upstream transfer rates for the ports that belong to this profile.
Select Modify	Select a profile's Select radio button and click Modify to edit the profile.
Select Delete	Select a profile's Select radio button and click Delete to remove the profile.
The rest of the screen is for profile configuration.	
Name	When editing a profile, this is the name of this profile. When adding a profile, type a name (up to 31 characters) for the profile.
Latency Mode	This field sets the ADSL latency mode for the ports that belong to this profile. Select Fast mode to use no interleaving and have faster transmission (a "fast channel"). This would be suitable if you have a good line where little error correction is necessary. Select Interleave mode to use interleave delay when transmission error correction (Reed- Solomon) is necessary due to a less than ideal telephone line. See Section 16.4 on page 130 for more on interleave delay.
Up Stream	The following parameters relate to upstream transmissions.
Max Rate	Type a maximum upstream transfer rate (64 to 4096 Kbps) for this profile. Configure the maximum upstream transfer rate to be less than the maximum downstream transfer rate.
Min Rate	Type the minimum upstream transfer rate (32 to 4096 Kbps) for this port. Configure the minimum upstream transfer rate to be less than the maximum upstream transfer rate.
Interleave Delay	Configure this field when you set the Latency Mode field to Interleave . Type the number of milliseconds (1-255) of interleave delay to use for upstream transfers. It is recommended that you configure the same latency delay for both upstream and downstream.
Max SNR	Type the maximum upstream signal to noise margin (0-31 dB).
Min SNR	Type the minimum upstream signal to noise margin (0-31 dB). Configure the minimum upstream signal to noise margin to be less than or equal to the maximum upstream signal to noise margin.
Target SNR	Type the target upstream signal to noise margin (0-31 dB). Configure the target upstream signal to noise margin to be greater than or equal to the minimum upstream signal to noise margin and less than or equal to the maximum upstream signal to noise margin.
Up Shift SNR	The upstream up shift signal to noise margin (0-31 dB). When the channel's signal to noise margin goes above this number, the device can attempt to use a higher transfer rate. Configure the upstream up shift signal to noise margin to be greater than or equal to the target upstream signal to noise margin and less than or equal to the maximum upstream signal to noise margin.

Table 25 Port Profile (continued)

LABEL	DESCRIPTION
Down Shift SNR	The upstream down shift signal to noise margin (0-31 dB). When the channel's signal to noise margin goes below this number, the device shifts to a lower transfer rate. Configure the upstream down shift signal to noise margin to be less than or equal to the target upstream signal to noise margin and greater than or equal to the minimum upstream signal to noise margin.
Down Stream	The following parameters relate to downstream transmissions.
Max Rate	Type a maximum downstream transfer rate (64 to 32000 Kbps) bps for this port. Configure the maximum downstream transfer rate to be greater than the maximum upstream transfer rate.
Min Rate	Type the minimum downstream transfer rate (32 to 32000 Kbps) for this port. Configure the minimum downstream transfer rate to be less than the maximum downstream transfer rate.
Interleave Delay	Configure this field when you set the Latency Mode field to interleave . Type the number of milliseconds (1-255) of interleave delay to use for upstream transfers. It is recommended that you configure the same latency delay for both upstream and downstream.
Max SNR	Type the maximum downstream signal to noise margin (0-31 dB).
Min SNR	Type the minimum downstream signal to noise margin (0-31 dB). Configure the minimum downstream signal to noise margin to be less than or equal to the maximum downstream signal to noise margin.
Target SNR	Type the target downstream signal to noise margin (0-31 dB). Configure the target downstream signal to noise margin to be greater than or equal to the minimum downstream signal to noise margin and less than or equal to the maximum downstream signal to noise margin.
Up Shift SNR	The downstream up shift signal to noise margin (0-31 dB). When the channel's signal to noise margin goes above this number, the device can attempt to use a higher transfer rate. Configure the downstream up shift signal to noise margin to be greater than or equal to the target downstream signal to noise margin and less than or equal to the maximum downstream signal to noise margin.
Down Shift SNR	The downstream down shift signal to noise margin (0-31 dB). When the channel's signal to noise margin goes below this number, the device shifts to a lower transfer rate. Configure the downstream down shift signal to noise margin to be less than or equal to the target downstream signal to noise margin and greater than or equal to the minimum downstream signal to noise margin.
Add	Click Add to save your changes to the IES-1248's volatile memory. The IES-1248 loses these changes if it is turned off or loses power, so use the Config Save link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Cancel	Click Cancel to start configuring the screen again.

17.2 ATM QoS

ATM Quality of Service (QoS) mechanisms provide the best service on a per-flow guarantee. ATM network infrastructure was designed to provide QoS. It uses fixed cell sizes and built-in traffic management (see [Section 17.3 on page 150](#)). This allows you to fine-tune the levels of services on the priority of the traffic flow.

17.3 Traffic Shaping

Traffic shaping is an agreement between the carrier and the subscriber to regulate the average rate and fluctuations of data transmission over an ATM network. This agreement helps eliminate congestion, which is important for transmission of real time data such as audio and video connections.



Traffic shaping controls outgoing (downstream) traffic, not incoming (upstream).

17.3.1 ATM Traffic Classes

These are the basic ATM traffic classes defined by the ATM Forum Traffic Management 4.0 Specification.

17.3.1.1 Constant Bit Rate (CBR)

Constant Bit Rate (CBR) is an ATM traffic class that provides fixed bandwidth. CBR traffic is generally time-sensitive (doesn't tolerate delay). CBR is used for connections that continuously require a specific amount of bandwidth. Examples of connections that need CBR would be high-resolution video and voice.

17.3.1.2 Variable Bit Rate (VBR)

The Variable Bit Rate (VBR) ATM traffic class is used with bursty connections. Connections that use the Variable Bit Rate (VBR) traffic class can be grouped into real time (rt-VBR) or non-real time (nrt-VBR) connections.

The rt-VBR (real-time Variable Bit Rate) type is used with bursty connections that require closely controlled delay and delay variation. An example of an rt-VBR connection would be video conferencing. Video conferencing requires real-time data transfers and the bandwidth requirement varies in proportion to the video image's changing dynamics.

The nrt-VBR (non real-time Variable Bit Rate) type is used with bursty connections that do not require closely controlled delay and delay variation. An example of an nrt-VBR connection would be non-time sensitive data file transfers.

17.3.1.3 Unspecified Bit Rate (UBR)

The Unspecified Bit Rate (UBR) ATM traffic class is similar to the ABR traffic class for bursty data transfers. However, while ABR gives subscribers a set amount of bandwidth, UBR doesn't guarantee any bandwidth and only delivers traffic when the network has spare bandwidth.

17.3.2 Traffic Parameters

These are the parameters that control the flow of ATM traffic.

17.3.2.1 Peak Cell Rate (PCR)

Peak Cell Rate (PCR) is the maximum rate at which the sender can send cells. This parameter may be lower (but not higher) than the maximum line speed. 1 ATM cell is 53 bytes (424 bits), so a maximum speed of 832Kbps gives a maximum PCR of 1962 cells/sec. This rate is not guaranteed because it is dependent on the line speed.

17.3.2.2 Sustained Cell Rate (SCR)

Sustained Cell Rate (SCR) is the mean cell rate of each bursty traffic source. It specifies the maximum average rate at which cells can be sent over the virtual connection. SCR may not be greater than the PCR.

17.3.2.3 Maximum Burst Size (MBS)

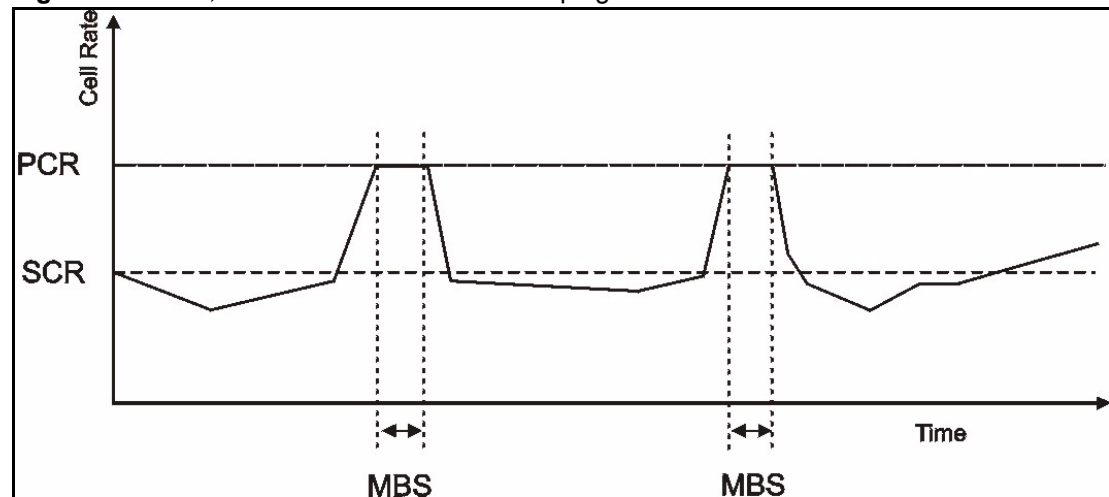
Maximum Burst Size (MBS) is the maximum number of cells that can be sent at the PCR. After MBS is reached, cell rates fall below SCR until cell rate averages to the SCR again. At this time, more cells (up to the MBS) can be sent at the PCR again.



If the PCR, SCR or MBS is set to the default of "0", the system will assign a maximum value that correlates to your upstream line rate.

The following figure illustrates the relationship between PCR, SCR and MBS.

Figure 67 PCR, SCR and MBS in Traffic Shaping



17.3.2.4 Cell Delay Variation Tolerance (CDVT)

Cell Delay Variation Tolerance (CDVT) is the accepted tolerance of the difference between a cell's transfer delay and the expected transfer delay. CDVT controls the time scale over which the PCR is enforced. CDVT is used to determine if a cell arrived too early in relation to PCR.

17.3.2.5 Burst Tolerance (BT)

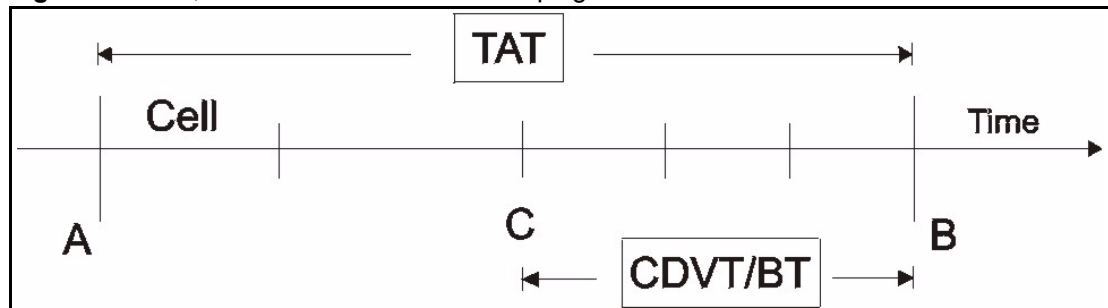
Burst Tolerance (BT) is the maximum number of cells that the port is guaranteed to handle without any discards. BT controls the time scale over which the SCR is enforced. BT is used to determine if a cell arrived too early in relation to SCR. Use this formula to calculate BT: $(MBS - 1) \times (1 / SCR - 1 / PCR) = BT$.

17.3.2.6 Theoretical Arrival Time (TAT)

The Theoretical Arrival Time (TAT) is when the next cell (in an ATM connection's stream of cells) is expected to arrive. TAT is calculated based on the PCR or SCR.

The following figure illustrates the relationship between TAT, CDVT and BT. If a cell arrives at time A, then according to PCR or SCR, the next cell is expected to arrive at time B. If the next cell arrives earlier than time C, it is discarded or tagged for not complying with the TAT. Time C is calculated based on the CDVT or BT.

Figure 68 TAT, CDVT and BT in Traffic Shaping



17.4 Upstream Policing

Upstream policing is an agreement between the carrier and the subscriber to regulate the average rate and fluctuations of data transmission coming from the subscriber's device to the IES-1248.



Upstream policing controls incoming (upstream) traffic, not outgoing (downstream).

The ATM traffic classes and parameters are identical with downstream shaping.

Upstream policing can control the upstream incoming traffic rate on specific PVCs. Upstream ATM cell traffic that violates the policing profile will be discarded. Traffic shaping must also be enabled on the subscriber's device in order to use upstream policing. If a subscriber attempts to enlarge his device's PVC shaping parameters in order to get more upstream traffic bandwidth, it will violate the IES-1248's upstream policing profile and the traffic will be discarded. Operators can use this feature to prevent subscribers from changing their device settings.



Traffic shaping must also be enabled on the subscriber's device in order to use upstream policing.

Note that since the IES-1248 uses ATM QoS, if the subscriber device's upstream shaping rate is larger than the IES-1248's upstream policing rate, some ATM cells will be discarded. In the worst case, none of the Ethernet packets from the CPE will be able to be reassembled from AAL5, so no packets from the subscriber's device can be received by the IES-1248.

The upstream policing feature can be enabled/disabled per PVC. No matter which ATM traffic class is used for the PVC's upstream traffic (CBR, VBR, or UBR), the IES-1248 will drop any upstream traffic that violates the specified ATM VC profile.

17.5 VC Profile Screen

To open this screen, click **Basic Setting** > **xDSL Profiles Setup** > **VC Profile**.

Figure 69 VC Profile

The following table describes the labels in this screen.

Table 26 VC Profile

LABEL	DESCRIPTION
xDSL Profile	Click Port Profile to configure port profiles and assign them to individual ports (see Section 17.1 on page 147).
Alarm Profile	Click Alarm Profile to open the Alarm Profile screen where you can configure limits that trigger an alarm when exceeded (see Section 17.6 on page 155).
Index	This is the number of the VC profile.
Name	This name identifies the VC profile.
Encap	This field displays the profile's type of encapsulation (llc or vc).
AAL	This field displays the ATM adaptation layer used by the VC profile. aal5 - The VC profile uses ATM adaptation layer 5.

Table 26 VC Profile (continued)

LABEL	DESCRIPTION
Class	This field displays the type of ATM traffic class: cbr (constant bit rate), vbr (real-time variable bit rate), nrt-vbr (non-real time variable bit rate) or ubr (unspecified bit rate).
PCR	This is the Peak Cell Rate (PCR), the maximum number of cells that the sender can send per second.
CDVT	This field displays the accepted tolerance of the difference between a cell's transfer delay and the expected transfer delay.
SCR	The Sustained Cell Rate (SCR) sets the average cell rate (long-term) in cells per second that can be transmitted. SCR applies with the vbr traffic class.
BT	Burst Tolerance (BT) is the maximum number of cells that the port is guaranteed to handle without any discards. BT applies with the vbr traffic class.
Select Modify	Select a VC profile's Select radio button and click Modify to edit the VC profile
Delete	Select a VC profile's Select radio button and click Delete to remove the VC profile
	The rest of the screen is for PVC configuration.
Name	When editing a profile, this is the name of this profile. When adding a profile, type a name for the profile. You can use up to 31 ASCII characters; spaces are not allowed.
Encap	Select the encapsulation type (LLC or VC) for this port.
Class	Select CBR (constant bit rate) to specify fixed (always-on) bandwidth for voice or data traffic. Select UBR (unspecified bit rate) for applications that are non-time sensitive, such as e-mail. Select VBR (real time variable bit rate) or NRT-VBR (non real time variable bit rate) for bursty traffic and bandwidth sharing with other applications.
PCR	The Peak Cell Rate (PCR) is the maximum rate at which the sender can send cells. PCR applies with all of the ATM traffic classes. You can type a number of (ATM) cells per second in the first field or type a number of kilobytes per second in the second field to have the system automatically compute the number of ATM cells per second.
CDVT	Cell Delay Variation Tolerance (CDVT) is the accepted tolerance of the difference between a cell's transfer delay and the expected transfer delay. CDVT applies with all of the ATM traffic classes. Type the CDVT here.
SCR	The Sustained Cell Rate (SCR) sets the average cell rate (long-term) that can be transmitted. Type the SCR, which must be less than the PCR. SCR applies with the VBR traffic classes. You can type a number of (ATM) cells per second in the first field or type a number of kilobytes per second in the second field to have the system automatically compute the number of ATM cells per second.
BT	Burst Tolerance (BT) sets a maximum number of cells that the port is guaranteed to handle without any discards. Type the BT here. BT applies with the VBR traffic classes.
Add	Click Add to save your changes to the IES-1248's volatile memory. The IES-1248 loses these changes if it is turned off or loses power, so use the Config Save link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Cancel	Click Cancel to start configuring the screen again.

17.6 Alarm Profile Screen

Alarm profiles define ADSL port alarm thresholds. The IES-1248 sends an alarm trap and generates a syslog entry when the thresholds of the alarm profile are exceeded.

To open this screen, click **Basic Setting > xDSL Profiles Setup > Alarm Profile**.

Use the top part of the screen (with the **Add** and **Cancel** buttons) to add or edit alarm profiles. The rest of the screen displays the configured alarm profiles.

Figure 70 Alarm Profile

Alarm Profile

xDSL Profile VC Profile Alarm Profile

Name : **Add** **Cancel**

Threshold	ATU - C	ATU - R	Threshold	ATU - C	ATU - R
15 Min LOF			Init Failure Trap	Active ☐	
15 Min LOS			Fast Rate Up (bps)		
15 Min LOL			Fast Rate Down (bps)		
15 Min LPR			Interleave Rate Up (bps)		
15 Min ES (seconds)			Interleave Rate Down (bps)		
15 Min SES (seconds)					
15 Min UAS (seconds)					
15 Min Failed Fast Retrain					

Alarm profiles with xDSL port mapping

Please click the "-" to mapping a xDSL port to a new alarm profile.

Index	Name																Modify				Delete			
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	

1	DEFVAL																Modify				Delete			
V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	
V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	

The following table describes the labels in this screen.

Table 27 Alarm Profile

LABEL	DESCRIPTION
xDSL Profile	Click Port Profile to open the Port Profile screen (see Section 17.1 on page 147). Use the Port Profile screen to configure profiles of ADSL port settings (such as the transfer rate, interleave delay and signal to noise ratio settings).
VC Profile	Click VC Profile to open the VC Profile screen where you can configure virtual channel profiles (see Section 17.5 on page 153).
Name	This field is read-only if you click Modify to edit a port profile. Type a name to identify the alarm profile (you cannot change the name of the DEFVAL profile). You can use up to 31 ASCII characters; spaces are not allowed.

Table 27 Alarm Profile (continued)

LABEL	DESCRIPTION
Add	Click Add to save your changes to the IES-1248's volatile memory. The IES-1248 loses these changes if it is turned off or loses power, so use the Config Save link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Cancel	Click Cancel to start configuring the screen again.
Threshold	Specify limits for the individual performance counters. The IES-1248 sends an alarm trap and generates a syslog entry when one of these thresholds is exceeded. A value of 0 disables the alarm threshold.
ATU-C	These fields are for traffic coming from the subscriber's device to the IES-1248.
ATU-R	These fields are for traffic going from the IES-1248 to the subscriber's device.
15 Min LOF	This field sets the limit for the number of Loss Of Frame seconds that are permitted to occur within 15 minutes.
15 Min LOS	This field sets the limit for the number of Loss Of Signal seconds that are permitted to occur within 15 minutes.
15 Min LOL	This field sets the limit for the number of Loss Of Link seconds that are permitted to occur within 15 minutes.
15 Min LPR	This field sets the limit for the number of Loss of Power seconds (on the ATUR) that are permitted to occur within 15 minutes.
15 Min ES (seconds)	This field sets the limit for the number of Errored Seconds that are permitted to occur within 15 minutes.
15 Min SES (seconds)	This field sets the limit for the number of Severely Errored seconds that are permitted to occur within 15 minutes.
15 Min UAS (seconds)	This field sets the limit for the number of UnAvailable seconds that are permitted to occur within 15 minutes.
15 Min Failed Fast Retrain	This field sets the limit for the number of failed fast retrains that are permitted within 15 minutes.
Init Failure Trap	Select Active to trigger an alarm for an initialization failure trap.
Fast Rate Up (bps)	Specify a rate in kilobits per second (kbps). If a fast mode connection's upstream transmission rate increases by more than this number, then a trap is sent.
Fast Rate Down (bps)	Specify a rate in kilobits per second (kbps). If a fast mode connection's downstream transmission rate decreases by more than this number, then a trap is sent.
Interleave Rate Up (bps)	Specify a rate in kilobits per second (kbps). If an interleave mode connection's upstream transmission rate increases by more than this number, then a trap is sent.
Interleave Rate Down (bps)	Specify a rate in kilobits per second (kbps). If an interleave mode connection's upstream transmission rate decreases by more than this number, then a trap is sent.
Alarm profiles with xDSL port mapping	After you add an alarm profile, you can click a port number's "-" symbol to map the xDSL port to that alarm profile. The port's "V" symbol in the alarm profile where it was previously mapped changes to "-".
Modify	Click Modify to edit a profile.
Delete	Click Delete to remove a profile.

xDSL Line Data

18.1 xDSL Line Rate Info Screen

This screen displays an ADSL port's line operating values. Information obtained prior to training to steady state transition will not be valid or will be old information.

To open this screen, click **Basic Setting > xDSL Line Data**.

Figure 71 xDSL Line Rate Info

The following table describes the labels in this screen.

Table 28 xDSL Line Rate Info

LABEL	DESCRIPTION
Line Performance	Click Line Performance to display an ADSL port's line performance counters (see Section 18.3 on page 160).
Line Data	Click Line Data to display an ADSL port's line bit allocation (see Section 18.2 on page 158).
Port	Use this drop-down list box to select a port for which you wish to view information.
Refresh	Click Refresh to display updated information.
Port Name	This section displays the name of the port.

Table 28 xDSL Line Rate Info (continued)

LABEL	DESCRIPTION
Rate	The rate fields display the transmission rates. "Line Down" indicates that the ADSL port is not connected to a subscriber.
Down/up Stream Rate	These are the rates (in Kbps) at which the port has been sending and receiving data.
Down/up Stream Noise Margin	These are the DSL line's downstream and upstream noise margins. Measured in decibels (dB).
Down/up Stream Attenuation	These are the reductions in amplitude of the downstream and upstream DSL signals. Measured in decibels (dB).
Down/up Stream Attainable Rate	These are the highest theoretically possible transfer rates (in Kbps) at which the port could send and receive data.
Info	
Service Mode	This field displays the ADSL standard that the port is using: G.dmt (IES-1248-51/51A), G.dmt Annex B (IES-1248-53), ETSI (IES-1248-53), G.lite, ANSI T1.413 issue 2 (IES-1248-51/51A), ADSL2, or ADSL2+.
Trellis Encoding	This field displays whether Trellis encoding is turned on or off. Trellis encoding helps to reduce the noise in ADSL transmissions. Trellis may reduce throughput but it makes the connection more stable. ^A
Down Stream Interleave Delay	This field displays the number of milliseconds of interleave delay for downstream transmissions.
Up Stream Interleave Delay	This field displays the number of milliseconds of interleave delay for upstream transmissions.
Down Stream Output Power	This field displays the amount of power that this port is using to transmit to the subscriber's ADSL modem or router. The total output power of the transceiver varies with the length and line quality. The farther away the subscriber's ADSL modem or router is or the more interference there is on the line, the more power is needed.
Up Stream Output Power	This field displays the amount of power that the subscriber's ADSL modem or router is using to transmit to this port. The total output power of the transceiver varies with the length and line quality. The farther away the subscriber's ADSL modem or router is or the more interference there is on the line, the more power is needed.
Info Atur Info Atuc	The Info Atur fields show data acquired from the ATUR (ADSL Termination Unit – Remote), in this case the subscriber's ADSL modem or router, during negotiation/provisioning message interchanges. This information can help in identifying the subscriber's ADSL modem or router. The Info Atuc fields show data acquired from the ATUC (ADSL Termination Unit – Central), in this case IES-1248, during negotiation/provisioning message interchanges. The vendor ID, vendor version number and product serial number are obtained from vendor ID fields (see ITU-T G.994.1) or R-MSGs1 (see T1.413).

A. At the time of writing, the IES-1248 always uses Trellis coding.

18.2 xDSL Line Data Screen

This screen displays an ADSL port's line bit allocation.

Discrete Multi-Tone (DMT) modulation divides up a line's bandwidth into tones. This screen displays the number of bits transmitted for each tone. This can be used to determine the quality of the connection, whether a given sub-carrier loop has sufficient margins to support ADSL transmission rates, and possibly to determine whether certain specific types of interference or line attenuation exist. See the ITU-T G.992.1 recommendation for more information on DMT.

The better (or shorter) the line, the higher the number of bits transmitted for a DMT tone. The maximum number of bits that can be transmitted per DMT tone is 15.

The bit allocation contents are only valid when the link is up.

To open this screen, click **Basic Setting**, **xDSL Line Data**, **Line Data**.

In the screen shown, the downstream channel is carried on tones 48 to 255 and the upstream channel is carried on tones 16 to 31 (space is left between the channels to avoid interference).

Figure 72 xDSL Line Data

The screenshot shows the 'xDSL Line Data' interface. At the top, there's a title bar with an orange icon and the text 'xDSL Line Data'. Below it, a 'Port' dropdown menu is set to '4', and a 'Refresh' button is on the right. Three tabs are visible: 'Line Rate Info', 'Line Data' (which is active), and 'Line Performance'. The main content area is divided into two sections. The top section, labeled 'Port Name', shows 'DS carrier load: number of bits per symbol(tone):' followed by a list of tones and their corresponding bit values. The bottom section, labeled 'Bit Allocation', shows 'US carrier load: number of bits per symbol(tone):' followed by a list of tones and their corresponding bit values.

Port Name	DS carrier load: number of bits per symbol(tone):
tone 000~015:	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
tone 016~031:	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
tone 032~047:	00 08 08 09 0a 0a 0b 0b 0c 0c 0c 0d 0d 0d 0e 0e
tone 048~063:	0e 0e 0e 0f 0f 0f 0f 0f 0f 0f 0f 0f 0f 0f 0f 0f
tone 064~079:	00 0f 0f 0f 0f 0f 0f 0f 0f 0f 0f 0f 0f 0f 0f 0f
tone 080~095:	0f 0f 0f 0f 0f 0f 0f 0f 0f 0f 0f 0f 0f 0f 0f 0f
tone 096~111:	0f 0f 0f 0f 0f 0f 0f 0f 0f 0f 0f 0f 0f 0f 0f 0f
tone 112~127:	0f 0f 0f 0f 0f 0f 0f 0f 0f 0f 0f 0f 0f 0f 0f 0f

Port Name	US carrier load: number of bits per symbol(tone):
tone 000~015:	00 00 00 00 00 00 00 06 07 09 0a 0b 0b 0b 0b 0c
tone 016~031:	0c 0c 0c 0c 0c 0c 0c 0d 0d 0d 0c 0b 0b 0b 00 00

The following table describes the labels in this screen.

Table 29 xDSL Line Data

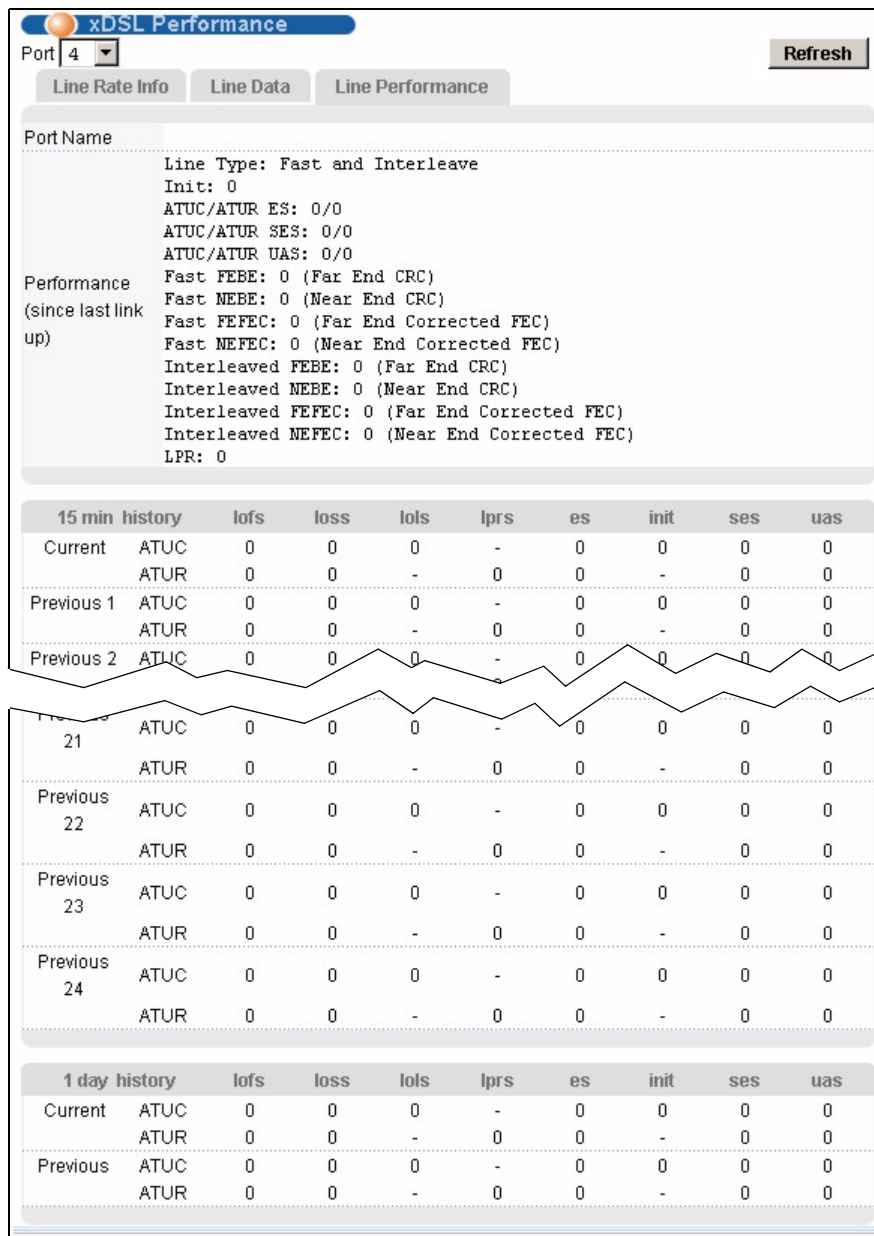
LABEL	DESCRIPTION
Line Rate Info	Click Line Rate to display an ADSL port's line operating values (see Section 18.1 on page 157).
Line Performance	Click Line Performance to display an ADSL port's line performance counters (see Section 18.3 on page 160).
Port	Use this drop-down list box to select a port for which you wish to view information.
Refresh	Click Refresh to display updated information.
Port Name	This section displays the name of the port.
Bit Allocation	"DS carrier load" displays the number of bits transmitted per DMT tone for the downstream channel (from the IES-1248 to the subscriber's DSL modem or router). "US carrier load" displays the number of bits received per DMT tone for the upstream channel (from the subscriber's DSL modem or router to the IES-1248).

18.3 xDSL Performance Screen

These counters display line performance data that has been accumulated since the system started. The definitions of near end/far end are always relative to the ATU-C (ADSL Termination Unit-Central Office). ATU-C refers to downstream traffic from the IES-1248. ATU-R (ADSL Termination Unit-Remote) refers to upstream traffic from the subscriber.

To open this screen, click **Basic Setting > xDSL Line Data > Line Performance**.

Figure 73 xDSL Performance



The following table describes the labels in this screen.

Table 30 xDSL Performance

LABEL	DESCRIPTION
Line Rate Info	Click Line Rate to display an ADSL port's line operating values (see Section 18.1 on page 157).
Line Data	Click Line Data to display an ADSL port's line bit allocation (see Section 18.2 on page 158).
Port	Use this drop-down list box to select a port for which you wish to view information.
Refresh	Click Refresh to display updated information.
Port Name	This section displays the name of the port.
Performance	
Line Type	"Fast" stands for non-interleaved (fast mode) and "Interleaved" stands for interleaved mode.
Init	This field displays the number of link-ups and link-downs.
ATUC/ATUR ES	The Number of Errored Seconds transmitted (downstream) or received (upstream) on this ADSL port.
ATUC/ATUR SES	The Number of Severely Errored Seconds transmitted (downstream) or received (upstream) on this ADSL port. Severely errored seconds contained 30% or more errored blocks or at least one defect. This is a subset of the Down/Up Stream ES .
ATUC/ATUR UAS	The downstream or upstream number of UnAvailable Seconds.
Fast FEBE	In fast mode, the number of Far End Block Errors (Far End Cyclic Redundancy Checks).
Fast NEBE	In fast mode, the number of Near End Block Errors (Near End Cyclic Redundancy Checks).
Fast FE FEC	In fast mode, the Far End number of ADSL frames repaired by Forward Error Correction.
Fast NE FEC	In fast mode, the Near End number of ADSL frames repaired by Forward Error Correction.
Interleaved FE BE	In interleaved mode, the number of Far End Block Errors (Far End Cyclic Redundancy Checks).
Interleaved NE BE	In interleaved mode, the number of Near End Block Errors (Near End Cyclic Redundancy Checks).
Interleaved FE FEC	In interleaved mode, the Far End number of ADSL frames repaired by Forward Error Correction.
Interleaved NE FEC	In interleaved mode, the Near End number of ADSL frames repaired by Forward Error Correction.
LPR	This is the number of times that the subscriber's ADSL device has experienced a Loss of Power (been off).
15 min, 1day history	This section of the screen displays line performance statistics for the current and previous 15-minute periods, as well as for the current and previous 24 hours.
lofs	The number of Loss Of Frame Seconds that have occurred within the period.
loss	The number of Loss Of Signal Seconds that have occurred within the period.
lols	The number of Loss Of Link Seconds that have occurred within the period.
lprs	The number of Loss of Power Seconds that have occurred within the period.

Table 30 xDSL Performance (continued)

LABEL	DESCRIPTION
es	The number of Errored Seconds that have occurred within the period.
init	The number of successful initializations that have occurred within the period.
ses	The number of Severely Errored Seconds that have occurred within the period.
uas	The number of UnAvailable Seconds that have occurred within the period.

G.bond

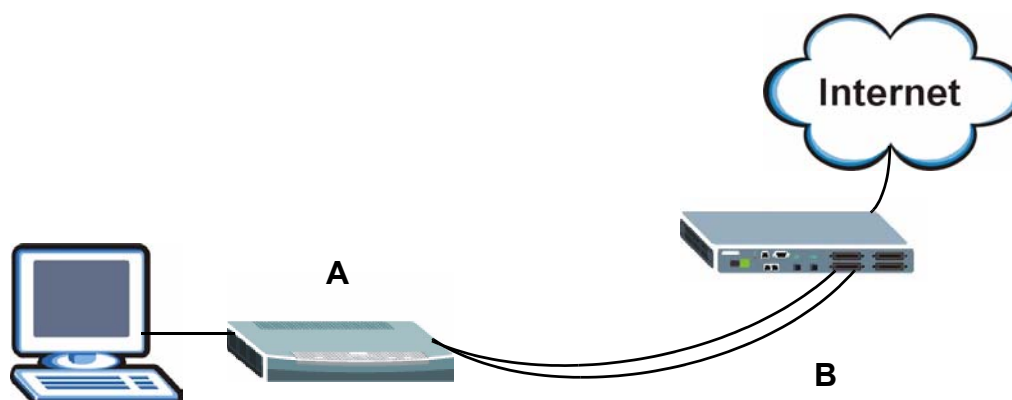
This chapter describes the **G.Bond** screen.

19.1 The G.bond Screen

G.bond (also known as port bonding) allows subscribers to connect to an ISP using data streams spread over multiple DSL lines. The total available bandwidth for the subscriber then becomes the sum of the bandwidth available for each of the subscriber's line connections. As well as extra bandwidth, additional DSL lines also provide backup support.

The next figure shows a subscriber using port bonding on two DSL lines between a P-663H-51 (A) (using a Y-connector) and the IES-1248 to connect to the Internet.

Figure 74 ADSL Pair Bonding Example



To configure the IES-1248's port bonding settings, click **Basic Setting > G.Bond**. The following screen displays.

Figure 75 The Basic Setting > G.bond Screen

The following table describes the labels in this screen

Table 31 The Basic Setting > G.bond Screen

LABEL	DESCRIPTION
Name	Type a descriptive name for a group in this field or edit an existing name to set up a new group.
Member Port	Select the ports you want to add to the group from the drop-down list box.
Add	Click this to create a new port bonding group, or modify an existing group.
Cancel	Click this to return the Name and Member Port fields to their default states.
Refresh	Click Refresh to display updated information.
Index	This displays the bonding group's index number. Click the number to edit the group's port details. Note: You cannot edit a group's name, only its port details.
Name	This displays the port bonding group's name.
Member Port	This displays the bonded ports for this group.
Us rate (kbps)	This displays the upstream data rate in kilobits per second.
Ds rate (kbps)	This displays the downstream data rate in kilobits per second.
Select	Click this to select or deselect an individual port bonding group.
All	Click this to select all the port bonding groups.
None	Click this to deselect all port bonding groups.
Delete	Click this to delete all selected port bonding groups from the list.

PART III

Advanced

Application

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This chapter shows you how to configure IEEE 802.1Q tagged VLANs.

20.1 Introduction to VLANs

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

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

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

Note that a VLAN is unidirectional, it only governs outgoing traffic.

20.2 Introduction to IEEE 802.1Q Tagged VLAN

Tagged VLAN uses an explicit tag (VLAN ID) in the MAC header to identify the VLAN membership of a frame across bridges - they are not confined to the device on which they were created. The VLANs can be created statically by hand or configured dynamically using GVRP.² The VLAN ID associates a frame with a specific VLAN and provides the information that devices need to process the frame across the network. A tagged frame is four bytes longer than an untagged frame and contains two bytes of TPID (Tag Protocol Identifier, residing within the type/length field of the Ethernet frame) and two bytes of TCI (Tag Control Information, starts after the source address field of the Ethernet frame).

The CFI (Canonical Format Indicator) is a single-bit flag, always set to zero for Ethernet switches. If a frame received at an Ethernet port has a CFI set to 1, then that frame should not be forwarded as it is to an untagged port. The remaining twelve bits define the VLAN ID, giving a possible maximum number of 4,096 (2¹²) VLANs. Note that user priority and VLAN ID are independent of each other. A frame with VID (VLAN Identifier) of null (0) is called a

2. GVRP (GARP VLAN Registration Protocol) defines a way for switches to automatically configure switches in a VLAN network.

priority frame, meaning that only the priority level is significant and the default VID of the ingress port is given as the VID of the frame. Of the 4096 possible VIDs, a VID of 0 is used to identify priority frames and value 4095 (FFF) is reserved, so the maximum possible VLAN configurations are 4,094.

TPID 2 Bytes	User Priority 3 Bits	CFI 1 Bit	VLAN ID 12 bits

The IES-1248 handles up to 4094 VLANs (VIDs 1-4094). The device accepts incoming frames with VIDs 1-4094.

20.2.1 Forwarding Tagged and Untagged Frames

Each port on the device is capable of passing tagged or untagged frames. To forward a frame from an 802.1Q VLAN-aware switch to an 802.1Q VLAN-unaware switch, the IES-1248 first decides where to forward the frame and then strips off the VLAN tag. To forward a frame from an 802.1Q VLAN-unaware switch to an 802.1Q VLAN-aware switch, the IES-1248 first decides where to forward the frame, and then inserts a VLAN tag reflecting the ingress port's default VID. The default PVID is VLAN 1 for all ports, but this can be changed.

The egress (outgoing) port(s) of a frame is determined on the combination of the destination MAC address and the VID of the frame. For a unicast frame, the egress port (based on the destination MAC address) must be a member of the VID, also; otherwise, the frame is blocked. For a broadcast frame, it is duplicated only on ports (except the ingress port itself) that are members of the VID, thus confining the broadcast to a specific domain.

Whether to tag an outgoing frame depends on the setting of the egress port on a per-VLAN, per-port basis (recall that a port can belong to multiple VLANs). If the tagging on the egress port is enabled for the VID of a frame, then the frame is transmitted as a tagged frame; otherwise, it is transmitted as an untagged frame.

20.3 VLAN Status Screen

To open this screen, click **Advanced Application > VLAN**.

Figure 76 VLAN Status

VLAN Status

VLAN Status Static VLAN Settings VLAN Port Setting

The Number Of VLAN = 1
Page 1 of 1

Index	Name / VID												
	1	2	3	4	5	6	7	8	9	10	11	12	enet1
	13	14	15	16	17	18	19	20	21	22	23	24	enet2
Elapsed Time	25	26	27	28	29	30	31	32	33	34	35	36	
Status	37	38	39	40	41	42	43	44	45	46	47	48	

1	DEFAULT / 1												
	U	U	U	U	U	U	U	U	U	U	U	U	U
U	U	U	U	U	U	U	U	U	U	U	U	U	
0(days) : 6:38:07	U	U	U	U	U	U	U	U	U	U	U	U	
Static	U	U	U	U	U	U	U	U	U	U	U	U	

Poll Interval(s) **Set Interval** **Stop**

Change Pages **Previous Page** **Next Page**

The following table describes the labels in this screen.

Table 32 VLAN Status

LABEL	DESCRIPTION
Static VLAN Settings	Click Static VLAN Setting to configure ports to dynamically join a VLAN group or permanently assign ports to a VLAN group or prohibit ports from joining a VLAN group (see Section 20.4 on page 170).
VLAN Port Setting	Click VLAN Port Setting to specify Port VLAN IDs (PVIDs). See Section 20.5 on page 171 .
The Number of VLAN	This is the number of VLANs configured on the IES-1248.
Page X of X	This identifies which page of VLAN status information is displayed and how many total pages of VLAN status information there are.
	The first table displays the names of the fields. The subsequent tables show the settings of the VLANs.
Index	This is the VLAN index number.
Name / VID	The name identifies an individual VLAN. The vid is the PVID, the Port VLAN ID assigned to untagged frames or priority-tagged frames received on this port.
1~48, enet1, enet2	These columns display the VLAN's settings for each port. A tagged port is marked as T , an untagged port is marked as U and ports not participating in a VLAN are marked as — .
Elapsed Time	This field shows how long it has been since a normal VLAN was registered or a static VLAN was set up.
Status	This field shows that this VLAN was added to the IES-1248 statically, that is, added as a permanent entry.
Poll Interval(s) Set Interval	The text box displays how often (in seconds) this screen refreshes. You may change the refresh interval by typing a new number in the text box and then clicking Set Interval .
Stop	Click Stop to halt polling statistics.
Previous Page Next Page	Click one of these buttons to show the preceding/following screen if the information cannot be displayed in one screen.

20.4 Static VLAN Settings Screen

You can assign a port to be a member of a VLAN group or prohibit a port from joining a VLAN group in this screen. This is an IEEE 802.1Q VLAN.

To open this screen, click **Advanced Application > VLAN > Static VLAN Settings**.

Figure 77 Static VLAN Settings

The following table describes the labels in this screen.

Table 33 Static VLAN Settings

LABEL	DESCRIPTION
VLAN Status	Click VLAN Status to see which of the IES-1248's ports are members of which VLANs (see Section 20.3 on page 168).
VLAN Port Setting	Click VLAN Port Setting to specify Port VLAN IDs (PVIDs). See Section 20.5 on page 171 .
VID	This field displays the ID number of the VLAN group. Click the number to edit the VLAN settings.
Active	This field indicates whether the VLAN settings are enabled (Yes) or disabled (No).
Name	This field displays the descriptive name for this VLAN group.

Table 33 Static VLAN Settings (continued)

LABEL	DESCRIPTION
Delete	Select the check boxes of the rule(s) that you want to remove in the Delete column and then click the Delete button. You cannot delete a VLAN if any PVIDs are set to use the VLAN or the VLAN is the CPU (management) VLAN.
Cancel	Click Cancel to clear the Delete check boxes.
Active	Select this check box to enable the VLAN. You cannot disable a VLAN if any PVIDs are set to use the VLAN or the VLAN is the CPU (management) VLAN.
Name	Enter a descriptive name for this VLAN group for identification purposes. Spaces are not allowed.
VLAN ID	Enter the VLAN ID for this static VLAN entry; the valid range is between 1 and 4094.
Port	The port numbers identify the IES-1248's ports.
Control	Select Fixed for the port to be a permanent member of this VLAN group. Use the Select All button to include every port. Select Forbidden if you want to prohibit the port from joining this VLAN group. Use the Select All button to include every port.
Tagging	Select TX Tagging if you want the port to tag all outgoing frames transmitted with this VLAN ID. Use the All button to include every port. Use the None button to clear all of the ports check boxes.
Add	Click Add to save your settings. The VLAN then displays in the summary table at the top of the screen. Clicking Add saves your changes to the IES-1248's volatile memory. The IES-1248 loses these changes if it is turned off or loses power, so use the Config Save link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Cancel	Click Cancel to begin configuring the fields afresh.

20.5 VLAN Port Setting Screen

Use this screen to specify port VLAN IDs and to set whether or not Ethernet ports propagate VLAN information to other devices.

To open this screen, click **Advanced Application > VLAN > VLAN Port Setting**.

Figure 78 VLAN Port Setting

Port	PVID	Priority	GVRP	Acceptable Frame Type
ENET1	1 (1-4094)	0	☐	ALL
ENET2	1 (1-4094)	0	☐	ALL
1	1 (1-4094)	0	☐	All
2	1 (1-4094)	0	☐	All
3	1 (1-4094)	0	☐	All
4	1 (1-4094)	0	☐	All
5	1 (1-4094)	0	☐	All
6	1 (1-4094)	0	☐	All
41	1 (1-4094)	0	☐	All
42	1 (1-4094)	0	☐	All
43	1 (1-4094)	0	☐	All
44	1 (1-4094)	0	☐	All
45	1 (1-4094)	0	☐	All
46	1 (1-4094)	0	☐	All
47	1 (1-4094)	0	☐	All
48	1 (1-4094)	0	☐	All

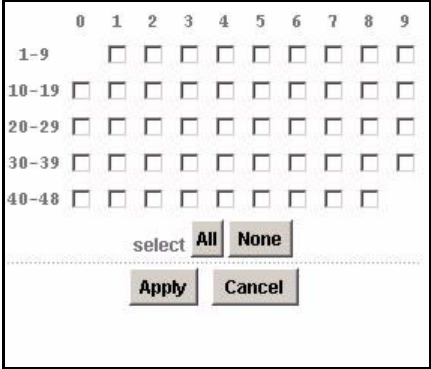
Apply Cancel Copy port 1 Paste

The following table describes the labels in this screen.

Table 34 VLAN Port Setting

LABEL	DESCRIPTION
VLAN Status	Click VLAN Status to see which of the IES-1248's ports are members of which VLANs (see Section 20.3 on page 168).
Static VLAN Settings	Click Static VLAN to configure ports to dynamically join a VLAN group or permanently assign ports to a VLAN group or prohibit ports from joining a VLAN group (see Section 20.4 on page 170).
Port	The port numbers identify the IES-1248's ports.
PVID	Type the Port VLAN ID (PVID) from 1 to 4094. The IES-1248 assigns the PVID to untagged frames or priority frames (0 VID) received on this port.
Priority	Select an IEEE 802.1p priority to assign to untagged frames or priority frames (0 VID) received on this port.
GVRP	Select this check box if the IES-1248 should use GVRP to automatically register and configure VLAN membership.
Acceptable Frame Type	Select All to have the port accept both tagged and untagged incoming frames. ^A Select Tag Only to have the port only accept incoming frames that have a VLAN tag.
Apply	Click Apply to save your changes to the IES-1248's volatile memory. The IES-1248 loses these changes if it is turned off or loses power, so use the Config Save link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.

Table 34 VLAN Port Setting (continued)

LABEL	DESCRIPTION
Cancel	Click Cancel to begin configuring this screen afresh.
Copy port Paste	Do the following to copy settings from one port to another port or ports. 1. Select the number of the port from which you want to copy settings. 2. Click Paste and the following screen appears. 3. Select to which ports you want to copy the settings. Use All to select every port. Use None to clear all of the check boxes. 4. Click Apply to paste the settings. Figure 79 Select Ports 

A. At the time of writing, the **VLAN Acceptable Frame Type** field is read-only for the Ethernet ports. The IES-1248 accepts both tagged and untagged incoming frames on the Ethernet ports.

This chapter describes the **IGMP** screens.

21.1 IGMP

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

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

21.2 IP Multicast Addresses

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

21.2.1 IGMP Snooping

A layer-2 switch can passively snoop on IGMP Query, Report and Leave (IGMP version 2) packets transferred between IP multicast routers/switches and IP multicast hosts to learn the IP multicast group membership. It checks IGMP packets passing through it, picks out the group registration information, and configures multicasting accordingly. IGMP snooping allows the IES-1248 to learn multicast groups without you having to manually configure them.

The IES-1248 forwards multicast traffic destined for multicast groups (that it has learned from IGMP snooping or that you have manually configured) to ports that are members of that group. The IES-1248 discards multicast traffic destined for multicast groups that it does not know. IGMP snooping generates no additional network traffic, allowing you to significantly reduce multicast traffic passing through your device.

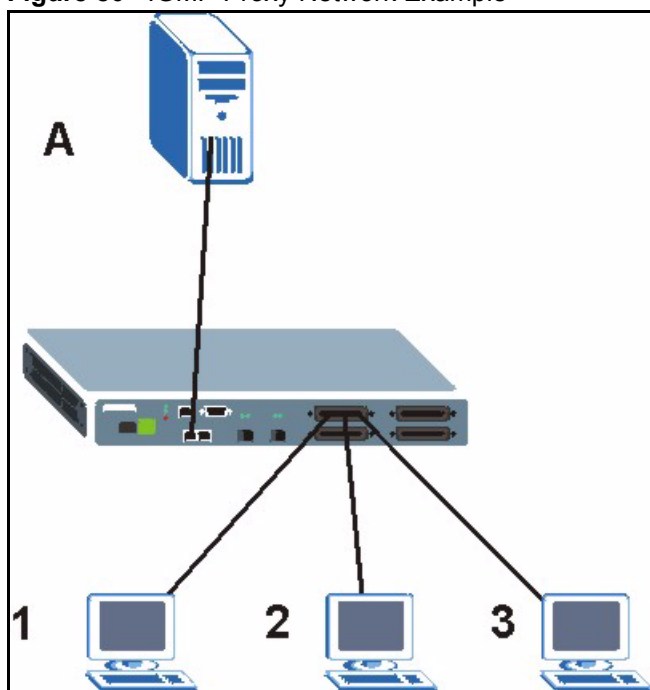
21.2.2 IGMP Proxy

To allow better network performance, you can use IGMP proxy instead of a multicast routing protocol in a simple tree network topology.

In IGMP proxy, an upstream interface is the port that is closer to the source (or the root of the multicast tree) and is able to receive multicast traffic. There should only be one upstream interface (also known as the query port) for one query VLAN on the IES-1248. A downstream interface is a port that connects to a host (such as a computer).

The following figure shows a network example where A is the multicast source while computers 1, 2 and 3 are the receivers. In the figure A is connected to the upstream interface and 1, 2 and 3 are connected to the downstream interface.

Figure 80 IGMP Proxy Network Example



The IES-1248 will not respond to IGMP join and leave messages on the upstream interface. The IES-1248 only responds to IGMP query messages on the upstream interface. The IES-1248 sends IGMP query messages to the hosts that are members of the query VLAN.

The IES-1248 only sends an IGMP leave messages via the upstream interface when the last host leaves a multicast group.

In daisychain mode, Ethernet interface 1 is set as the upstream interface and Ethernet interface 2 and the DSL ports are set as downstream interfaces.

21.3 IGMP Status Screen

Use this screen to view current IGMP information.

To open this screen, click **Advanced Application > IGMP**.

Figure 81 IGMP (Status)

IGMP

Clear

Status Bandwidth Bandwidth Port Config Filter Port Group Port Info Count Setup

Query 0

Report 0

Leave 0

Number of IGMP Groups 0

Previous Reload Next

Page 0 of 0

Index									VID									IP Address																													
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	ENET1																							
25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	ENET2																							

The following table describes the labels in this screen.

Table 35 IGMP (Status)

LABEL	DESCRIPTION
Bandwidth	Click Bandwidth Setup to open the IGMP Bandwidth screen where you can set up bandwidth requirements for multicast channels (see Section 21.4 on page 178). You can also open the Bandwidth Port Setup screen to set up multicast bandwidth requirements for selected ports (see Section 21.4.1 on page 179).
Bandwidth Port	Click Bandwidth Port to open the Bandwidth Port Setup screen where you can set up multicast bandwidth requirements on specified ports (see Section 21.4.1 on page 179).
Config	Click Config to open the IGMP screen where you can configure IGMP settings (see Section 21.5 on page 180).
Filter	Click Filter to open the IGMP Filter Profile screen where you can configure IGMP multicast filter profiles (see Section 21.5 on page 180).
Port Group	Click Port Group to open the IGMP Port Group screen where you can look at the current list of multicast groups each port has joined (see Section 21.7 on page 183).
Port Info	Click Port Info to open the IGMP Port Info screen where you can look at the current number of IGMP-related packets received on each port (see Section 21.8 on page 184).
Count Setup	Click Count Setup to open the IGMP Count screen where you can limit the number of IGMP groups a subscriber on a port can join (see Section 21.9 on page 184).
Clear	Click Clear to delete the information the IES-1248 has learned about multicast groups. This resets every counter in this screen.
Query	This is the total number of Query packets received.
Report	This is the total number of Report packets received.
Leave	This is the total number of Leave packets received.
Number of IGMP Groups	This is how many IGMP groups the IES-1248 has identified on the local network.
Previous Next	Click one of these buttons to show the previous/next screen if all of the information cannot be seen in one screen.
Reload	Click this button to refresh the screen.

Table 35 IGMP (Status) (continued)

LABEL	DESCRIPTION
Page X of X	This identifies which page of information is displayed and the total number of pages of information.
The first table displays the names of the fields. The subsequent tables show the settings of the IGMP groups.	
Index	This is the IGMP group index number.
VID	The VID is the VLAN ID on which the IGMP group is created.
IP Address	This is the IP address of an IP multicast group member.
1~48, enet1, enet2	These columns display the ports that are members of the IGMP snooping group.

21.4 IGMP Bandwidth Screen

Use this screen to set up bandwidth requirements for multicast channels. To open this screen, click **Advanced Application > IGMP > Bandwidth**.

Figure 82 IGMP Bandwidth

The following table describes the labels in this screen.

Table 36 IGMP Bandwidth

LABEL	DESCRIPTION
Default Bandwidth	Enter the default bandwidth for multicast channels for which you have not configured bandwidth requirements.
Apply	Click Apply to save your changes to the IES-1248's volatile memory. The IES-1248 loses these changes if it is turned off or loses power, so use the Config Save link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Index	Select a unique number for this setting. If you select a number that is already used, the new setting overwrites the old one when you click Apply .
Start Multicast IP	Enter the beginning of the multicast range.

Table 36 IGMP Bandwidth (continued)

LABEL	DESCRIPTION
End Multicast IP	Enter the end of the multicast range. For one multicast address, enter the start of the multicast range again.
Bandwidth	Enter the bandwidth requirement for the specified multicast range.
Apply	Click Apply to save the filter settings. The settings then display in the summary table at the bottom of the screen. Clicking Apply saves your changes to the IES-1248's volatile memory. The IES-1248 loses these changes if it is turned off or loses power, so use the Config Save link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Cancel	Click Cancel to begin configuring the fields afresh.
	This table shows the multicast range settings.
Index	This field displays the number that identifies this setting.
Start Multicast IP	This field displays the beginning of the multicast range.
End Multicast IP	This field displays the end of the multicast range.
Bandwidth	This field displays the allowed bandwidth for the specified multicast range.
Select	Select this, and click Delete to remove the setting.
Delete	Click this to remove the selected settings.
Select All	Click this to select all entries in the table.
Select None	Click this to un-select all entries in the table.

21.4.1 Bandwidth Port Setup Screen

Use this screen to set up multicast bandwidth requirements for specific ports. To open this screen, click **Advanced Application > IGMP > Bandwidth Port**.

Figure 83 Bandwidth Port Setup

Port	Active	Bandwidth	Select
1	-	4096 (1~100,000)Kbps	☐
2	-	4096 (1~100,000)Kbps	☐
3	-	4096 (1~100,000)Kbps	☐
4	-	4096 (1~100,000)Kbps	☐
5	-	4096 (1~100,000)Kbps	☐
6	-	4096 (1~100,000)Kbps	☐
7	-	4096 (1~100,000)Kbps	☐
41	-	4096 (1~100,000)Kbps	☐
42	-	4096 (1~100,000)Kbps	☐
43	-	4096 (1~100,000)Kbps	☐
44	-	4096 (1~100,000)Kbps	☐
45	-	4096 (1~100,000)Kbps	☐
46	-	4096 (1~100,000)Kbps	☐
47	-	4096 (1~100,000)Kbps	☐
48	-	4096 (1~100,000)Kbps	☐

The following table describes the labels in this screen.

Table 37 Bandwidth Port Setup

LABEL	DESCRIPTION
Port	This field shows each ADSL port number.
Active	This field shows whether or not multicast bandwidth requirements are enabled on this port. "V" displays if it is enabled and "-" displays if it is disabled.
Bandwidth	Enter the maximum acceptable multicast bandwidth for this port. This has no effect if bandwidth requirements are disabled.
Select	Select this, and click Active or Inactive to enable or disable the specified multicast bandwidth requirements on this port.
Active	Click this to enable the specified multicast bandwidth requirements on the selected port.
Inactive	Click this to disable the specified multicast bandwidth requirements on the selected port.
Select All	Click this to select all entries in the table.
Select None	Click this to un-select all entries in the table.

21.5 IGMP Config Screen

Use this screen to configure your IGMP settings.

To open this screen, click **Advanced Application > IGMP > Config**.

Figure 84 IGMP Config

IGMP

Status Bandwidth Bandwidth Port **Config** Filter Port Group Port Info Count Setup

IGMP Mode Disable

IGMP Version V2

Apply

Add Static Query VLAN 0 Apply

Static Query VID Table

Index	Query VID	Select

Delete

Dynamic Query VID Table

Index	Query VID

The following table describes the labels in this screen.

Table 38 IGMP Config

LABEL	DESCRIPTION
IGMP Mode	Select Proxy to have the device use IGMP proxy. Select Snooping to have the device passively learn multicast groups. Select Disable to have the device not use either IGMP proxy or snooping.
IGMP Version	Select which version of IGMP you want the device to support. Select IGMPv2 (V2) or IGMPv3 (V3). If you select IGMPv2, the device discards IGMPv3 packets. This provides better security if none of the devices in the network use IGMPv3. If you select IGMPv3, the device recognizes both IGMPv2 and IGMPv3.
Apply	Click Apply to save your IGMP mode settings. Clicking Apply saves your changes to the IES-1248's volatile memory. The IES-1248 loses these changes if it is turned off or loses power, so use the Config Save link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Add Static Query VLAN Apply	Enter a VLAN ID in this field and click Apply to create a static query VLAN.
Static Query VID Table	This displays the static IGMP query VLANs already configured on the IES-1248.
Index	This is the index number of an existing static IGMP query VLAN on the IES-1248.
Query VID	This is the static IGMP query VLAN's VLAN ID.
Select	Click this to select an entry in the static query VLAN table.
Delete	Select a static query VLAN and click this to remove it from the table.
Dynamic Query VID Table	This section displays the list of dynamic query VLANs.
Index	This is the dynamic IGMP query VLAN.
Query VID	This is the dynamic IGMP query VLAN's VLAN ID.

21.6 IGMP Filtering

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

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

21.6.1 IGMP Filter Profile Screen

You can use the IGMP filter profiles to control access to a service that uses a specific multicast group (like a SIP server for example). Configure an IGMP filter profile that allows access to that multicast group. Then assign the IGMP filter profile to ADSL ports that are allowed to use the service.

The **DEFVAL** IGMP filter profile is assigned to all of the ADSL ports by default. It allows a port to join all multicast IP addresses (224.0.0.0~239.255.255.255). If you want to allow an ADSL subscriber access to only specific IGMP multicast groups, use the **IGMP Filter Profile** screen to configure a different profile and then assign it to the subscriber's ADSL port in the **XDSL Port Setting** screen (see [Section 16.7 on page 131](#)).

To open this screen, click **Basic Setting > xDSL Profiles Setup > IGMP Filter**.

The top of the screen displays the configured IGMP filter profiles. Use the bottom part of the screen (with the **Add** and **Cancel** buttons) to add or edit alarm profiles.

Figure 85 IGMP Filter Profile

Index	Name	Delete
1	DEFVAL	☐

Delete

Name	Start IP	End IP
1	0.0.0.0	0.0.0.0
2	0.0.0.0	0.0.0.0
3	0.0.0.0	0.0.0.0
4	0.0.0.0	0.0.0.0
5	0.0.0.0	0.0.0.0
6	0.0.0.0	0.0.0.0
7	0.0.0.0	0.0.0.0
8	0.0.0.0	0.0.0.0
9	0.0.0.0	0.0.0.0
10	0.0.0.0	0.0.0.0
11	0.0.0.0	0.0.0.0
12	0.0.0.0	0.0.0.0
13	0.0.0.0	0.0.0.0
14	0.0.0.0	0.0.0.0
15	0.0.0.0	0.0.0.0
16	0.0.0.0	0.0.0.0

Add **Cancel**

The following table describes the labels in this screen.

Table 39 IGMP Filter Profile

LABEL	DESCRIPTION
Index	This is the number of the IGMP filter profile. Click a profile's index number to edit the profile. You cannot edit the DEFVAL profile.
Name	This name identifies the IGMP filter profile.
Delete	Select the Delete check box and click Delete to remove an IGMP filter profile. You cannot delete the DEFVAL profile.
Name	Type a name to identify the IGMP filter profile (you cannot change the name of the DEFVAL profile). You can use up to 31 ASCII characters; spaces are not allowed.
Start IP	Enter the starting multicast IP address for a range of multicast IP addresses to which you want this IGMP filter profile to allow access.
End IP	Enter the ending multicast IP address for a range of IP addresses to which you want this IGMP filter profile to allow access. If you want to add a single multicast IP address, enter it in both the Start IP and End IP fields.
Add	Click Add to save your changes to the IES-1248's volatile memory. The IES-1248 loses these changes if it is turned off or loses power, so use the Config Save link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Cancel	Click Cancel to start configuring the screen again.

21.7 IGMP Port Group Screen

Use this screen to display the current list of multicast groups each port joins. To open this screen, click **Advanced Application > IGMP > Port Group**.

Figure 86 IGMP Port Group

The following table describes the labels in this screen.

Table 40 IGMP Port Group

LABEL	DESCRIPTION
Show Port	Select a port for which you wish to view information.
Port	This field shows each port number.
VID	This field shows the associated VLAN ID.
Multicast IP	This field shows the IP address of the multicast group joined by this port.
Source IP	This field shows the IP address of the client that joined the multicast group on this port.
Refresh	Click Refresh to display updated information.

21.8 IGMP Port Info Screen

Use this screen to display the current number of IGMP-related packets received on each port. To open this screen, click **Advanced Application > IGMP > Port Info**.

Figure 87 IGMP Port Info

Port	Group Count	Query Count	Join Count	Leave Count
1	0	0	0	0
2	0	0	0	0
3	0	0	0	0
4	0	0	0	0
5	0	0	0	0
6	0	0	0	0
7	0	0	0	0
...	...	...	...	...
41	0	0	0	0
42	0	0	0	0
43	0	0	0	0
44	0	0	0	0
45	0	0	0	0
46	0	0	0	0
47	0	0	0	0
48	0	0	0	0
enet1	0	0	0	0
enet2	0	0	0	0

The following table describes the labels in this screen.

Table 41 IGMP Port Info

LABEL	DESCRIPTION
Show Port	Select a port for which you wish to view information.
Port	This field shows each port number.
Group Count	This is the total number of Group packets received on this port.
Query Count	This is the total number of Query packets received on this port.
Join Count	This is the total number of Join packets received on this port.
Leave Count	This is the total number of Leave packets received on this port.
Clear	Click Clear to delete the information the IES-1248 has learned about multicast groups. This resets every counter in this screen.

21.9 IGMP Count Screen

Use this screen to limit the number of IGMP groups a subscriber on a port can join. This allows you to control the distribution of multicast services (such as content information distribution) based on service plans and types of subscription.

IGMP count is useful for ensuring the service quality of high bandwidth services like video or Internet Protocol television (IPTV). IGMP count can limit how many channels (IGMP groups) the subscriber connected to a DSL port can use at a time. If each channel requires 4~5 Mbps of download bandwidth, and the subscriber's connection supports 11 Mbps, you can use IGMP count to limit the subscriber to using just 2 channels at a time. This also effectively limits the subscriber to using only two IPTVs with the DSL connection.

To open this screen, click **Advanced Application > IGMP > Count Setup**.

Figure 88 IGMP Count

Port	Active	Count	Select
1	-	5 (0~16)	☐
2	-	5 (0~16)	☐
3	-	5 (0~16)	☐
4	-	5 (0~16)	☐
5	-	5 (0~16)	☐
6	-	5 (0~16)	☐
7	-	5 (0~16)	☐
8	-	5 (0~16)	☐
9	-	5 (0~16)	☐
10	-	5 (0~16)	☐
11	-	5 (0~16)	☐
12	-	5 (0~16)	☐
13	-	5 (0~16)	☐
14	-	5 (0~16)	☐
15	-	5 (0~16)	☐
16	-	5 (0~16)	☐
17	-	5 (0~16)	☐
18	-	5 (0~16)	☐
19	-	5 (0~16)	☐
20	-	5 (0~16)	☐
21	-	5 (0~16)	☐
22	-	5 (0~16)	☐
23	-	5 (0~16)	☐
24	-	5 (0~16)	☐
25	-	5 (0~16)	☐
26	-	5 (0~16)	☐
27	-	5 (0~16)	☐
28	-	5 (0~16)	☐
29	-	5 (0~16)	☐
30	-	5 (0~16)	☐
31	-	5 (0~16)	☐
32	-	5 (0~16)	☐
33	-	5 (0~16)	☐
34	-	5 (0~16)	☐
35	-	5 (0~16)	☐
36	-	5 (0~16)	☐
37	-	5 (0~16)	☐
38	-	5 (0~16)	☐
39	-	5 (0~16)	☐
40	-	5 (0~16)	☐
41	-	5 (0~16)	☐
42	-	5 (0~16)	☐
43	-	5 (0~16)	☐
44	-	5 (0~16)	☐
45	-	5 (0~16)	☐
46	-	5 (0~16)	☐
47	-	5 (0~16)	☐
48	-	5 (0~16)	☐

Active Inactive Select All None

The following table describes the labels in this screen.

Table 42 IGMP Count

LABEL	DESCRIPTION
Port	This field shows each ADSL port number.
Active	This field shows whether or not the IGMP count limit is enabled on this port. "V" displays if it is enabled and "-" displays if it is disabled.
Count	Enter the maximum number of IGMP groups a subscriber on this port can join. This has no effect if the IGMP count limit is disabled.
Select	Select this, and click Active or Inactive to enable or disable the specified IGMP count limit on this port.
Active	Click this to enable the specified IGMP count limits on the selected ports.
Inactive	Click this to disable the specified IGMP count limits on the selected ports.
Select All	Click this to select all entries in the table.
Select None	Click this to un-select all entries in the table.

22.1 Static Multicast

22.2 Static Multicast Screen

Figure 89 Static Multicast


Static Multicast

The Number Of Static Multicast = 2
 Page 1 of 1

[Previous](#)
[Reload](#)
[Next](#)

Index			MAC Address																							
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48			
1			01:00:5e:10:10:10												Join All			Leave All			Delete					
V	V	V	V	V	V	V	V	-	V	V	V	V	V	V	-	V	V	V	V	V	V	V	V			
V	V	V	V	V	V	V	V	V	V	-	V	V	V	V	V	V	V	V	V	V	V	V	V			
2			01:00:5e:20:20:20												Join All			Leave All			Delete					
-	-	-	V	-	-	-	-	-	-	-	-	V	-	-	-	-	-	-	-	-	-	-	-			
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			

Adding new entry

To join/leave a multicast group, click the port status.

Table 43 Static Multicast

LABEL	DESCRIPTION
The Number of Static Multicast	This is the number of static multicast entries configured on the IES-1248.
Page X of X	This identifies which page of information is displayed and the total number of pages of information.

Table 43 Static Multicast (continued)

LABEL	DESCRIPTION
Previous Next	Click one of these buttons to show the previous/next screen if all status information cannot be seen in one screen.
Reload	Click this button to refresh the screen.
	The first table displays the names of the fields. The subsequent tables show the settings of the IGMP groups.
Index	This is the static multicast group index number.
MAC Address	This is the multicast MAC address.
1~48	These fields display the static multicast group membership status of the ADSL ports. “V” displays for members and “-” displays for non-members. Click an ADSL port’s status to change it (clicking a “V” changes it to “-” and vice versa).
Join All	Click Join All to make all of the ADSL ports members of the static multicast group.
Leave All	Click Leave All to remove all of the ADSL ports from the static multicast group.
Delete	Click Delete to remove a static multicast group.
Adding new entry Add	Type a multicast MAC address in the field, and click the Add button to create a new static multicast entry. Multicast MAC addresses must be 01:00:5E:xx:xx:xx, where x is a “don’t care” value. For example, 01:00:5E:10:10:10 is a valid multicast MAC address. Clicking Add saves your changes to the IES-1248’s volatile memory. The IES-1248 loses these changes if it is turned off or loses power, so use the Config Save link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.

Multicast VLAN

This chapter describes the **Multicast VLAN** screens.

23.1 Multicast VLAN Overview

Multicast VLAN allows one single multicast VLAN to be shared among different subscriber VLANs on the network. This improves bandwidth utilization by reducing multicast traffic in the subscriber VLANs and simplifies multicast group management.

When the IES-1248 forwards traffic to a subscriber port, it tries to forward traffic to a normal PVC with the same VLAN ID. If this PVC does not exist, the IES-1248 uses the super channel instead. This applies to all downstream traffic, not just multicast traffic.

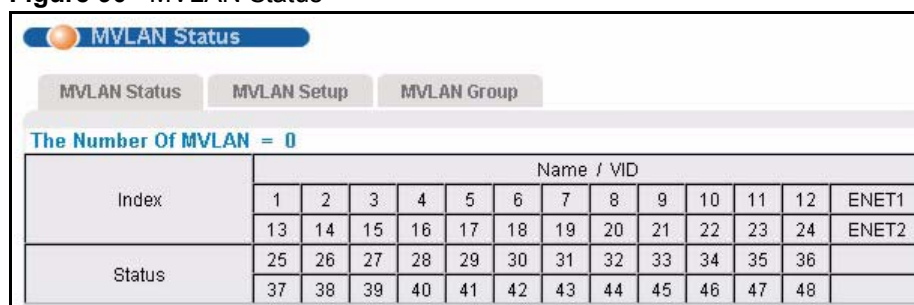
It is suggested to use a super channel for multicast VLAN. If a normal PVC is used and the multicast VLAN ID is not the same as the PVC's VID, the IES-1248 does not forward traffic to this PVC even if the subscriber's port has joined the multicast VLAN.

Since the IES-1248 might change the subscriber's VLAN ID to the multicast VLAN ID, both the subscriber's port and the Ethernet port should join the multicast VLAN.

23.2 MVLAN Status Screen

Use this screen to look at a summary of all multicast VLAN on the IES-1248. To open this screen, click **Advanced Application > Multicast VLAN**.

Figure 90 MVLAN Status



MVLAN Status													
MVLAN Status MVLAN Setup MVLAN Group													
The Number Of MVLAN = 0													
Index	Name / VID												
	1	2	3	4	5	6	7	8	9	10	11	12	ENET1
Status	13	14	15	16	17	18	19	20	21	22	23	24	ENET2
	25	26	27	28	29	30	31	32	33	34	35	36	
	37	38	39	40	41	42	43	44	45	46	47	48	

The following table describes the labels in this screen.

Table 44 MVLAN Status

LABEL	DESCRIPTION
MVLAN Setup	Click MVLAN Setup to open the MVLAN Setup screen where you can configure basic settings and port members for each multicast VLAN (see Section 23.3 on page 190).
MVLAN Group	Click MVLAN Group to open the MVLAN Group screen where you can configure ranges of multicast IP addresses for each multicast VLAN (see Section 23.4 on page 192).
The Number of MVLAN	This is the number of multicast VLAN configured on the IES-1248.
	The first table displays the names of the fields. The subsequent tables show the settings for each multicast VLAN.
Index	This is a sequential value and is not associated with this multicast VLAN.
Name / VID	This field shows the name and VLAN ID of this multicast VLAN.
1~48 ENET1-2	These fields display whether or not each port is a member of this multicast VLAN. "V" displays for members and "-" displays for non-members. You can change these settings in the MVLAN Setup screen.
Status	This field shows whether this multicast VLAN is active (Enable) or inactive (Disable).

23.3 MVLAN Setup Screen

Use this screen to configure basic settings and port members for each multicast VLAN. To open this screen, click **Advanced Application** > **Multicast VLAN** > **MVLAN Setup**.

Figure 91 MVLAN Setup

MVLAN Setup

MVLAN Status MVLAN Setup MVLAN Group

VID	Active	Name	Delete
Delete Cancel			

Active ☐

Name

VLAN ID (1~4094)

Port	Control		Tagging		
	Select All	Select All	Select	All	None
ENET1	☒ Fixed	☐ Forbidden	☐	☐ Tx Tagging	
ENET2	☒ Fixed	☐ Forbidden	☐	☐ Tx Tagging	
1	☒ Fixed	☐ Forbidden	☐	☐ Tx Tagging	
2	☒ Fixed	☐ Forbidden	☐	☐ Tx Tagging	
3	☒ Fixed	☐ Forbidden	☐	☐ Tx Tagging	
4	☒ Fixed	☐ Forbidden	☐	☐ Tx Tagging	
5	☒ Fixed	☐ Forbidden	☐	☐ Tx Tagging	
6	☒ Fixed	☐ Forbidden	☐	☐ Tx Tagging	
7	☒ Fixed	☐ Forbidden	☐	☐ Tx Tagging	
45	☒ Fixed	☐ Forbidden	☐	☐ Tx Tagging	
46	☒ Fixed	☐ Forbidden	☐	☐ Tx Tagging	
47	☒ Fixed	☐ Forbidden	☐	☐ Tx Tagging	
48	☒ Fixed	☐ Forbidden	☐	☐ Tx Tagging	

The following table describes the labels in this screen.

Table 45 MVLAN Setup

LABEL	DESCRIPTION
MVLAN Status	Click MVLAN Status to open the MVLAN Status screen where you can view a summary of all multicast VLAN on the IES-1248 (see Section 23.2 on page 189).
MVLAN Group	Click MVLAN Group to open the MVLAN Group screen where you can configure ranges of multicast IP addresses for each multicast VLAN (see Section 23.4 on page 192).
VID	This field shows the VLAN ID of each multicast VLAN. Click it to edit its basic settings and port members in the fields below.
Active	This field shows whether this multicast VLAN is active (Yes) or inactive (No).
Name	This field shows the name of this multicast VLAN.
Delete	Select the check boxes of the rule(s) that you want to remove in the Delete column and then click the Delete button. You cannot delete a VLAN if any PVIDs are set to use the VLAN or the VLAN is the CPU (management) VLAN.
Cancel	Click Cancel to begin configuring the fields afresh.
Active	Select this if you want the multicast VLAN to be active. Clear this if you want the multicast VLAN to be inactive.
Name	Enter a descriptive name for the multicast VLAN. The name can be 1-31 printable ASCII characters long. Spaces are not allowed.

Table 45 MVLAN Setup (continued)

LABEL	DESCRIPTION
VLAN ID	Enter the VLAN ID of the multicast VLAN; the valid range is between 1 and 4094.
Port	This field displays each port number.
Control	Select Fixed for the port to be a permanent member of this multicast VLAN. Use the Select All button to include every port. Select Forbidden if you want to prohibit the port from joining this multicast VLAN. Use the Select All button to include every port.
Tagging	Select TX Tagging if you want the port to tag all outgoing frames transmitted with this VLAN ID. Use the All button to include every port. Use the None button to clear all of the ports check boxes.
Add	Click Add to save your changes to the IES-1248's volatile memory. The IES-1248 loses these changes if it is turned off or loses power, so use the Config Save link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Cancel	Click Cancel to begin configuring the fields afresh.

23.4 MVLAN Group Screen

Use this screen to configure ranges of multicast IP addresses for each multicast VLAN. To open this screen, click **Advanced Application > Multicast VLAN > MVLAN Group**.

Figure 92 MVLAN Group

The following table describes the labels in this screen.

Table 46 MVLAN Group

LABEL	DESCRIPTION
MVLAN Status	Click MVLAN Status to open the MVLAN Status screen where you can view a summary of all multicast VLAN on the IES-1248 (see Section 23.2 on page 189).
MVLAN Setup	Click MVLAN Setup to open the MVLAN Setup screen where you can configure basic settings and port members for each multicast VLAN (see Section 23.3 on page 190).

Table 46 MVLAN Group (continued)

LABEL	DESCRIPTION
MVLAN ID	Select the VLAN ID of the multicast VLAN for which you want to configure a range of multicast IP addresses.
Index	Select the index number of the multicast VLAN group (the range of multicast IP addresses) you want to configure for this multicast VLAN. If you want to change the current settings, select an index number that already exists. If you want to add a new multicast VLAN group, select an index number that does not exist.
Start Multicast IP	Enter the beginning of the range of multicast IP addresses. The IP address must be a valid multicast IP address, between 224.0.0.0 and 239.255.255.255.
End Multicast IP	Enter the end of the range of multicast IP addresses. The IP address must be a valid multicast IP address, between 224.0.0.0 and 239.255.255.255.
Apply	Click Apply to save your changes to the IES-1248's volatile memory. The IES-1248 loses these changes if it is turned off or loses power, so use the Config Save link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Cancel	Click Cancel to begin configuring the fields afresh.
MVLAN ID	Select the VLAN ID of the multicast VLAN for which you want to look at or remove the multicast IP addresses currently added to it.
Name	This field displays the name of this multicast VLAN.
State	This field shows whether this multicast VLAN is active (Enable) or inactive (Disable).
Entry Index	This field displays the index number of each multicast VLAN group (the range of multicast IP addresses) configured for this multicast VLAN.
Start Multicast IP	This field displays the beginning of this range of multicast IP addresses.
End Multicast IP	This field displays the end of this range of multicast IP addresses.
Select	Select this, and click Delete to remove the multicast VLAN group.
Delete	Click this to remove the selected multicast VLAN groups.
Cancel	Click Cancel to begin configuring the fields afresh.

Filtering

This chapter describes how to configure the **Packet Filter** screen.

24.1 Packet Filter Screen

Use this screen to set which types of packets the IES-1248 accepts on individual ADSL ports. To open this screen, click **Advanced Application > Filtering**.

Figure 93 Packet Filter

Port	PPPoE	IP	ARP	NetBios	DHCP	EAPOL	IGMP	PPPoE Only
1	V	V	V	V	V	V	V	-
2	V	V	V	V	V	V	V	-
3	V	V	V	V	V	V	V	-
4	V	V	V	V	V	V	V	-
5	V	V	V	V	V	V	V	-
6	V	V	V	V	V	V	V	-
7	V	V	V	V	V	V	V	-
43	V	V	V	V	V	V	V	-
44	V	V	V	V	V	V	V	-
45	V	V	V	V	V	V	V	-
46	V	V	V	V	V	V	V	-
47	V	V	V	V	V	V	V	-
48	V	V	V	V	V	V	V	-

The following table describes the labels in this screen.

Table 47 Packet Filter

LABEL	DESCRIPTION
Port	Use this drop-down list box to select an ADSL port for which you wish to configure packet type filtering. This box is read-only after you click on one of the port numbers in the table below.
PPPoE Only	Select this to allow only PPPoE traffic. This will gray out the check boxes for other packet types and the system will drop any non-PPPoE packets.

Table 47 Packet Filter (continued)

LABEL	DESCRIPTION
	Select the check boxes of the types of packets to accept on the ADSL port. When you clear one of these check boxes, the field label changes to Filter Out and the system drops the corresponding type of packets
PPPoE Pass through	Point-to-Point Protocol over Ethernet relies on PPP and Ethernet. It is a specification for connecting the users on an Ethernet to the Internet through a common broadband medium, such as a single DSL line, wireless device or cable modem.
IP Pass through	Internet Protocol. The underlying protocol for routing packets on the Internet and other TCP/IP-based networks.
ARP Pass through	Address Resolution Protocol is a protocol for mapping an Internet Protocol address (IP address) to a physical computer address that is recognized in the local network.
NetBios Pass through	NetBIOS (Network Basic Input/Output System) are TCP or UDP packets that enable a computer to find other computers.
DHCP Pass through	Dynamic Host Configuration Protocol automatically assigns IP addresses to clients when they log on. DHCP centralizes IP address management on central computers that run the DHCP server program. DHCP leases addresses, for a period of time, which means that past addresses are “recycled” and made available for future reassignment to other systems.
EAPOL Pass through	EAP (Extensible Authentication Protocol, RFC 2486) over LAN. EAP is used with IEEE 802.1x to allow additional authentication methods (besides RADIUS) to be deployed with no changes to the access point or the wireless clients.
IGMP Pass through	Internet Group Multicast Protocol is used when sending packets to a specific group of hosts.
Apply	Click Apply to save the filter settings. The settings then display in the summary table at the bottom of the screen. Clicking Apply saves your changes to the IES-1248's volatile memory. The IES-1248 loses these changes if it is turned off or loses power, so use the Config Save link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Cancel	Click Cancel to begin configuring the fields afresh.
	This table shows the ADSL port packet filter settings.
Port	These are the numbers of the ADSL ports. Click this number to edit the port's filter settings in the section at the top.
PPPoE, IP, ARP, NetBios, DHCP, EAPOL, IGMP, PPPoE Only	These are the packet filter settings for each port. “V” displays for the packet types that the IES-1248 is to accept on the port. “-” displays for packet types that the IES-1248 is to reject on the port (packet types that are not listed are accepted). When you select PPPoE Only , “#” appears for all of the packet types. With PPPoE Only , the IES-1248 rejects all packet types except for PPPoE (packet types that are not listed are also rejected).

MAC Filter

This chapter introduces the MAC filter.

25.1 MAC Filter Introduction

Use the MAC filter to control from which MAC (Media Access Control) addresses frames can (or cannot) come in through a port.

25.2 MAC Filter Screen

To open this screen, click **Advanced Application > MAC Filter**.

Figure 94 MAC Filter

MAC Filter

Accept Mode: accept specified MACs but deny others.
Deny Mode: deny specified MACs but accept others.

Port: 1 MAC:

Add Cancel

Port	Mode	Active	MAC	Delete
1	Accept	☐		
2	Accept	☐		
3	Accept	☐		
4	Accept	☐		
5	Accept	☐		
6	Accept	☐		
7	Accept	☐		
8	Accept	☐		
9	Accept	☐		
10	Accept	☐		
11	Accept	☐		
12	Accept	☐		
13	Accept	☐		
14	Accept	☐		
15	Accept	☐		
16	Accept	☐		
17	Accept	☐		
18	Accept	☐		
19	Accept	☐		
20	Accept	☐		
21	Accept	☐		
22	Accept	☐		
23	Accept	☐		
24	Accept	☐		
25	Accept	☐		
26	Accept	☐		
27	Accept	☐		
28	Accept	☐		
29	Accept	☐		
30	Accept	☐		
31	Accept	☐		
32	Accept	☐		
33	Accept	☐		
34	Accept	☐		
35	Accept	☐		
36	Accept	☐		
37	Accept	☐		
38	Accept	☐		
39	Accept	☐		
40	Accept	☐		
41	Accept	☐		
42	Accept	☐		
43	Accept	☐		
44	Accept	☐		
45	Accept	☐		
46	Accept	☐		
47	Accept	☐		
48	Accept	☐		

Apply

The following table describes the labels in this screen.

Table 48 MAC Filter

LABEL	DESCRIPTION
Port	Use this drop-down list box to select an ADSL port for which you wish to configure MAC filtering.
MAC	Type a device's MAC address in hexadecimal notation (xx:xx:xx:xx:xx:xx, where x is a number from 0 to 9 or a letter from a to f) in this field. The MAC address must be a valid MAC address.
Add	Click Add to save your changes to the IES-1248's volatile memory. The IES-1248 loses these changes if it is turned off or loses power, so use the Config Save link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Cancel	Click Cancel to begin configuring this screen afresh.
Port	These are the numbers of the ADSL ports.
Mode	Select Accept to only allow frames from MAC addresses that you specify and block frames from other MAC addresses. Select Deny to block frames from MAC addresses that you specify and allow frames from other MAC addresses.
Active	Select this check box to turn on MAC filtering for a port.
MAC	This field lists the MAC addresses that are set for this port.
Delete	Click Delete to remove a MAC address from the list.
Apply	Click Apply to save your changes to the IES-1248's volatile memory. The IES-1248 loses these changes if it is turned off or loses power, so use the Config Save link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.

Spanning Tree Protocol

This chapter introduces the Spanning Tree Protocol (STP) and Rapid Spanning Tree Protocol (RSTP).

26.1 RSTP and STP

RSTP adds rapid reconfiguration capability to STP. The IES-1248 supports RSTP and the earlier STP. RSTP and STP detect and break network loops and provide backup links between switches, bridges or routers. They allow a device to interact with other RSTP or STP-aware devices in your network to ensure that only one path exists between any two stations on the network. The Integrated Ethernet Switch uses RSTP by default but can still operate with STP switches (although without RSTP's benefits).

The root bridge is the base of the spanning tree; it is the bridge with the lowest identifier value (MAC address). Path cost is the cost of transmitting a frame onto a LAN through that port. It is assigned according to the speed of the link to which a port is attached. The slower the media, the higher the cost, as illustrated in the following table.

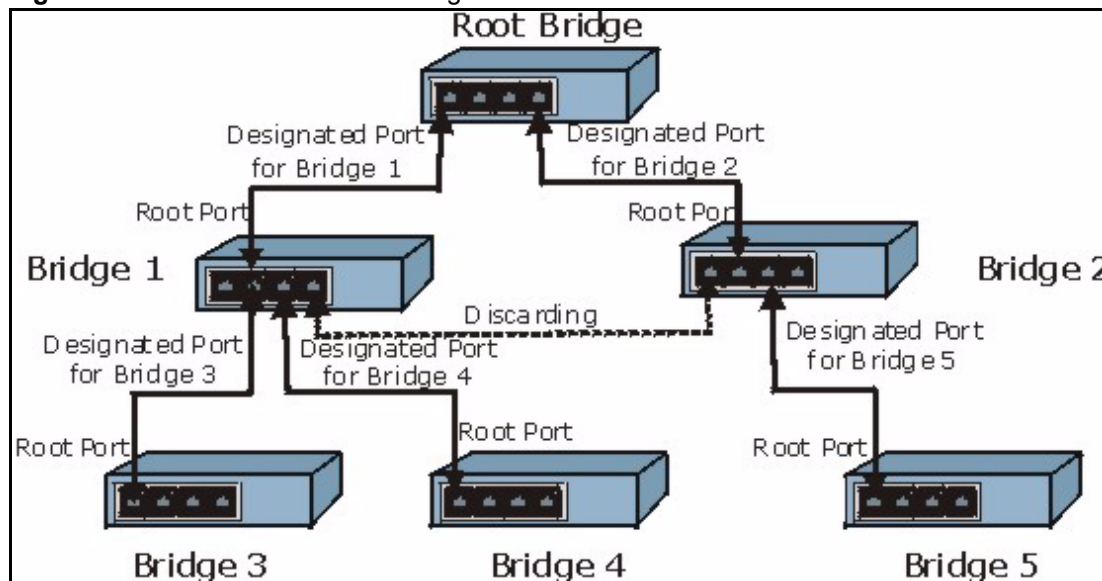
Table 49 Path Cost

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

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

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

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

Figure 95 STP Root Ports and Designated Ports

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

In RSTP, the devices send BPDUs every Hello Time. If an RSTP-aware device does not get a Hello BPDU after three Hello Times pass (or the Max Age), the device assumes that the link to the neighboring bridge is down. This device then initiates negotiations with other devices to reconfigure the network to re-establish a valid network topology.

In STP, once a stable network topology has been established, all devices listen for Hello BPDUs transmitted from the root bridge. If an STP-aware device does not get a Hello BPDU after a predefined interval (Max Age), the device assumes that the link to the root bridge is down. This device then initiates negotiations with other devices to reconfigure the network to re-establish a valid network topology.

RSTP assigns three port states to eliminate packet looping while STP assigns five (see [Table 50 on page 200](#)). A device port is not allowed to go directly from blocking state to forwarding state so as to eliminate transient loops.

Table 50 RSTP Port States

RSTP PORT STATE	STP PORT STATE	DESCRIPTION
Discarding	Disabled	RSTP or STP is disabled (default).
Discarding	Blocking	In RSTP, BPDUs are discarded. In STP, only configuration and management BPDUs are received and processed.
Discarding	Listening	In RSTP, BPDUs are discarded. In STP, all BPDUs are received and processed.
Learning	Learning	All BPDUs are received and processed. Information frames are submitted to the learning process but not forwarded.
Forwarding	Forwarding	All BPDUs are received and processed. All information frames are received and forwarded.

See the IEEE 802.1w standard for more information on RSTP. See the IEEE 802.1D standard for more information on STP.

26.2 Spanning Tree Protocol Status Screen

To open this screen, click **Advanced Application > Spanning Tree Protocol**.

Figure 96 Spanning Tree Protocol Status

Spanning Tree Protocol Status

STP Status STP Config

Spanning Tree Protocol : On

Bridge Status	
Our bridge ID	8000-00134923ad89
Designated root ID	8000-00134923ad89
Topology change times	0
Time since change	0:00:03
Cost to root	0
Root port ID	0x0000
Root max age (second)	20
Root hello time (second)	2
Root forward delay (second)	15
Max age (second)	20
Hello time (second)	2
Forward delay (second)	15

Port Status	ENET1	ENET2
State	Disabled	Disabled
Port ID	-	-
Path cost	-	-
Cost to root	-	-
Designated bridge	-	-
Designated port	-	-

Poll Interval(s)

The following table describes the labels in this screen.

Table 51 Spanning Tree Protocol Status

LABEL	DESCRIPTION
STP Config	Click STP Config to modify the IES-1248's STP settings (see Section 26.3 on page 202).
Spanning Tree Protocol	This field displays On if STP is activated. Otherwise, it displays Off .
Bridge Status	If STP is activated, the following fields appear. If STP is not activated, Disabled appears.
Our bridge ID	This is the unique identifier for this bridge, consisting of bridge priority plus MAC address. This ID is the same in Designated root ID if the IES-1248 is the root switch.
Designated root ID	This is the unique identifier for the root bridge, consisting of bridge priority plus MAC address. This ID is the same in Our bridge ID if the IES-1248 is the root switch.
Topology change times	This is the number of times the spanning tree has been reconfigured.
Time since change	This is the time since the spanning tree was last reconfigured.
Cost to root	This is the path cost from the root port on this switch to the root switch.

Table 51 Spanning Tree Protocol Status (continued)

LABEL	DESCRIPTION
Root port ID	This is the priority and number of the port on the switch through which this switch must communicate with the root of the Spanning Tree. "0x0000" displays when this device is the root switch.
Root max age (second)	This is the maximum time (in seconds) the root switch can wait without receiving a configuration message before attempting to reconfigure.
Root hello time (second)	This is the time interval (in seconds) at which the root switch transmits a configuration message. The root bridge determines Hello Time , Max Age and Forwarding Delay .
Root forward delay (second)	This is the time (in seconds) the root switch will wait before changing states (that is, listening to learning to forwarding).
Max age (second)	This is the maximum time (in seconds) the IES-1248 can wait without receiving a configuration message before attempting to reconfigure.
Hello time (second)	This is the time interval (in seconds) at which the IES-1248 transmits a configuration message. The root bridge determines Hello Time , Max Age and Forwarding Delay .
Forward delay (second)	This is the time (in seconds) the IES-1248 will wait before changing states (that is, listening to learning to forwarding).
Port Status	This identifies the IES-1248's ports that support the use of STP. If STP is activated, the following fields appear. If STP is not activated, Disabled appears.
State	This field displays the port's RSTP (or STP) state. With RSTP, the state can be discarding , learning or forwarding . With STP, the state can be disabled , blocking , listening , learning , or forwarding . Disabled appears when RSTP has not been turned on for the individual port or the whole device.
Port ID	This is the priority and number of the port on the switch through which this switch must communicate with the root of the Spanning Tree. "0x0000" displays when this device is the root switch.
Path cost	This is the path cost from this port to the root switch.
Cost to root	This is the path cost from the root port on this switch to the root switch.
Designated bridge	This is the unique identifier for the bridge that has the lowest path cost to reach the root bridge, consisting of bridge priority plus MAC address.
Designated port	This is the port on the designated bridge that has the lowest path cost to reach the root bridge, consisting of bridge priority.
Poll Interval(s) Set Interval	The text box displays how often (in seconds) this screen refreshes. You may change the refresh interval by typing a new number in the text box and then clicking Set Interval .
Stop	Click Stop to halt STP statistic polling.

26.3 Spanning Tree Protocol Screen

To open this screen, click **Advanced Application > Spanning Tree Protocol > STP Config**.

Figure 97 Spanning Tree Protocol

Spanning Tree Protocol

STP Status STP Config

Active ☒

Bridge Priority 32768 (0-65535)

Hello Time 2 (1-10) seconds

MAX Age 20 (6-40) seconds

Forwarding Delay 15 (4-30) seconds

Port	Active	Priority(0-255)	Path Cost(1-65535)
ENET1	☐	128	4
ENET2	☐	128	4

Apply Cancel

The following table describes the labels in this screen.

Table 52 Spanning Tree Protocol

LABEL	DESCRIPTION
STP Status	Click STP Status to display the IES-1248's STP status (see Section 26.2 on page 201).
Active	Select this check box to turn on RSTP. Note: It is recommended that you only use STP when you use the IES-1248 in standalone mode with a network topology that has loops.
Bridge Priority	Bridge priority is used in determining the root switch, root port and designated port. The switch with the highest priority (lowest numeric value) becomes the STP root switch. If all switches have the same priority, the switch with the lowest MAC address will then become the root switch. The allowed range is 0 to 61440. The lower the numeric value you assign, the higher the priority for this bridge. Bridge Priority determines the root bridge, which in turn determines Hello Time, Max Age and Forwarding Delay.
Hello Time	This is the time interval in seconds between BPDU (Bridge Protocol Data Units) configuration message generations by the root switch. The allowed range is 1 to 10 seconds.
MAX Age	This is the maximum time (in seconds) a switch can wait without receiving a BPDU before attempting to reconfigure. All switch ports (except for designated ports) should receive BPDUs at regular intervals. Any port that ages out STP information (provided in the last BPDU) becomes the designated port for the attached LAN. If it is a root port, a new root port is selected from among the switch ports attached to the network. The allowed range is 6 to 40 seconds.
Forwarding Delay	This is the maximum time (in seconds) a switch will wait before changing states. This delay is required because every switch must receive information about topology changes before it starts to forward frames. In addition, each port needs time to listen for conflicting information that would make it return to a blocking state; otherwise, temporary data loops might result. The allowed range is 4 to 30 seconds. As a general rule: Note: $2 * (\text{Forward Delay} - 1) \geq \text{Max Age} \geq 2 * (\text{Hello Time} + 1)$
Port	This field identifies the Ethernet port.

Table 52 Spanning Tree Protocol (continued)

LABEL	DESCRIPTION
Active	Select this check box to activate STP on this port.
Priority	Configure the priority for each port here. Priority decides which port should be disabled when more than one port forms a loop in a switch. Ports with a higher priority numeric value are disabled first. The allowed range is between 0 and 255 and default value is 128.
Path Cost	Path cost is the cost of transmitting a frame on to a LAN through that port. It is assigned according to the speed of the bridge. The slower the media, the higher the cost.
Apply	Click Apply to save your changes to the IES-1248's volatile memory. The IES-1248 loses these changes if it is turned off or loses power, so use the Config Save link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Cancel	Click Cancel to begin configuring this screen afresh.

Port Authentication

This chapter describes the 802.1x authentication method and RADIUS server connection setup.

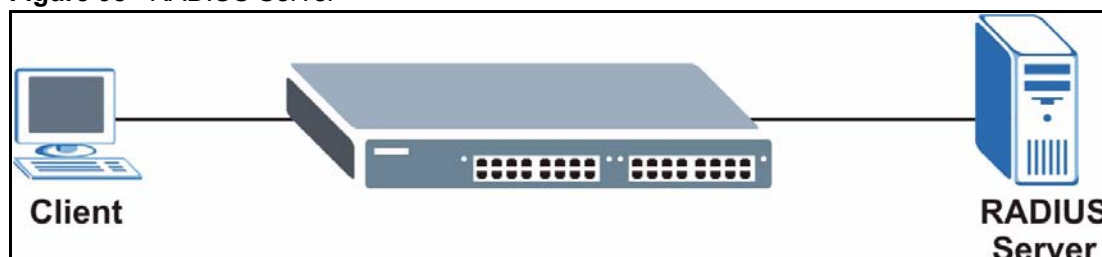
27.1 Introduction to Authentication

IEEE 802.1x is an extended authentication protocol³ that allows support of RADIUS (Remote Authentication Dial In User Service, RFC 2138, 2139) for centralized user profile management on a network RADIUS server.

27.1.1 RADIUS

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

Figure 98 RADIUS Server



27.1.2 Introduction to Local User Database

By storing user profiles locally on the IES-1248, your IES-1248 is able to authenticate users without interacting

3. At the time of writing, Windows XP of the Microsoft operating systems supports 802.1x. See the Microsoft web site for information on other Windows operating system support. For other operating systems, see its documentation. If your operating system does not support 802.1x, then you may need to install 802.1x client software.

27.2 RADIUS Screen

To open this screen, click **Advanced Application > Port Authentication**.

Figure 99 RADIUS

The following table describes the labels in this screen.

Table 53 RADIUS

LABEL	DESCRIPTION
802.1x	Click 802.1x to configure individual port authentication settings (see Section 27.3 on page 207).
Enable Authentication Server	Select this check box to have the IES-1248 use an external RADIUS server to authenticate users.
IP Address	Enter the IP address of the external RADIUS server in dotted decimal notation.
UDP Port	The default port of the RADIUS server for authentication is 1812 . You need not change this value unless your network administrator instructs you to do so.
Shared Secret	Specify a password (up to 31 alphanumeric characters) as the key to be shared between the external RADIUS server and the switch. This key is not sent over the network. This key must be the same on the external RADIUS server and the switch.
Apply	Click Apply to save your changes to the IES-1248's volatile memory. The IES-1248 loses these changes if it is turned off or loses power, so use the Config Save link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Enable Local Profile Setting	Select this check box to have the IES-1248 use its internal database of user names and passwords to authenticate users.
Name	Type the user name of the user profile.
Password	Type a password up to 31 characters long for this user profile.
Retype Password to confirm	Type the password again to make sure you have entered it properly.

Table 53 RADIUS (continued)

LABEL	DESCRIPTION
Add	Click Add to save your changes to the IES-1248's volatile memory. The IES-1248 loses these changes if it is turned off or loses power, so use the Config Save link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Cancel	Click Cancel to begin configuring this screen afresh.
This table displays the configured user profiles.	
Index	These are the numbers of the user profiles. Click this number to edit the user profile.
Name	This is the user name of the user profile.
Delete	Select a user profile's Delete check box and click Delete to remove the user profile.
Cancel	Click Cancel to begin configuring this screen afresh and clear any selected Delete check boxes.

27.3 802.1x Screen

To open this screen, click **Advanced Application > Port Authentication > 802.1x**.

Figure 100 802.1x

802.1x

RADIUS 802.1x

Enable ☒

Apply Cancel

Port	Enable	Control	Reauthentication	Reauthentication Period(s)
1	☐	AUTO	On	3600 (60~65535)
2	☐	AUTO	On	3600 (60~65535)
3	☐	AUTO	On	3600 (60~65535)
4	☐	AUTO	On	3600 (60~65535)
5	☐	AUTO	On	3600 (60~65535)
6	☐	AUTO	On	3600 (60~65535)
7	☐	AUTO	On	3600 (60~65535)
42	☐	AUTO	On	3600 (60~65535)
43	☐	AUTO	On	3600 (60~65535)
44	☐	AUTO	On	3600 (60~65535)
45	☐	AUTO	On	3600 (60~65535)
46	☐	AUTO	On	3600 (60~65535)
47	☐	AUTO	On	3600 (60~65535)
48	☐	AUTO	On	3600 (60~65535)

Apply Cancel

The following table describes the labels in this screen.

Table 54 802.1x

LABEL	DESCRIPTION
Enable	Select this check box to turn on IEEE 802.1x authentication on the switch.
Apply	Click Apply to save your changes to the IES-1248's volatile memory. The IES-1248 loses these changes if it is turned off or loses power, so use the Config Save link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Cancel	Click Cancel to begin configuring this screen afresh.
Port	This field displays a port number.
Enable	Select this check box to turn on IEEE 802.1x authentication on this port.
Control	Select AUTO to authenticate all subscribers before they can access the network through this port. Select FORCE AUTHORIZED to allow all connected users to access the network through this port without authentication. Select FORCE UNAUTHORIZED to deny all subscribers access to the network through this port.
Reauthentication	Specify if a subscriber has to periodically re-enter his or her username and password to stay connected to the port.
Reauthentication Period(s)	Specify how often a client has to re-enter his or her username and password to stay connected to the port.
Apply	Click Apply to save your changes to the IES-1248's volatile memory. The IES-1248 loses these changes if it is turned off or loses power, so use the Config Save link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Cancel	Click Cancel to begin configuring this screen afresh.

Port Security

This chapter shows you how to set up port security.

28.1 Port Security Overview

Port security allows you to restrict the number of MAC addresses that can be learned on a port.

28.2 Port Security Screen

To open this screen, click **Advanced Application > Port Security**.

Figure 101 Port Security

Port	Enable	Limited Number of Learned MAC Address
1	☐	5 (1-128)
2	☐	5 (1-128)
3	☐	5 (1-128)
4	☐	5 (1-128)
5	☐	5 (1-128)
6	☐	5 (1-128)
7	☐	5 (1-128)
...		
42	☐	5 (1-128)
43	☐	5 (1-128)
44	☐	5 (1-128)
45	☐	5 (1-128)
46	☐	5 (1-128)
47	☐	5 (1-128)
48	☐	5 (1-128)

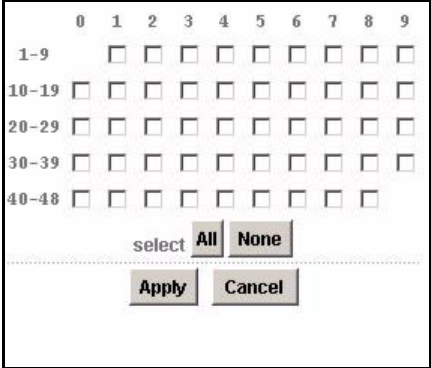
Apply Cancel Copy port 1 Paste

The following table describes the labels in this screen.

Table 55 Port Security

LABEL	DESCRIPTION
Port	This field displays a port number.
Enable	Select this check box to restrict the number of MAC addresses that can be learned on the port. Clear this check box to not limit the number of MAC addresses that can be learned on the port.

Table 55 Port Security (continued)

LABEL	DESCRIPTION
Limited Number of Learned MAC Address	Specify how many MAC addresses the IES-1248 can learn on this port. The range is 1~128. Note: If you also use MAC filtering on a port, it is recommended that you set this limit to be equal to or greater than the number of MAC filter entries you configure.
Apply	Click Apply to save your changes to the IES-1248's volatile memory. The IES-1248 loses these changes if it is turned off or loses power, so use the Config Save link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Cancel	Click Cancel to begin configuring this screen afresh.
Copy port Paste	Do the following to copy settings from one port to another port or ports. 1. Select the number of the port from which you want to copy settings. 2. Click Paste and the following screen appears. 3. Select to which ports you want to copy the settings. Use All to select every port. Use None to clear all of the check boxes. 4. Click Apply to paste the settings. Figure 102 Select Ports 

DHCP Relay

This chapter shows you how to set up DHCP relays for each VLAN.

29.1 DHCP Relay

DHCP (Dynamic Host Configuration Protocol, RFC 2131 and RFC 2132) allows individual clients to obtain TCP/IP configuration at start-up from a DHCP server. You can configure the IES-1248 to relay DHCP requests to one or more DHCP servers and the server's responses back to the clients. You can specify default DHCP servers for all VLAN, and you can specify DHCP servers for each VLAN.

29.2 DHCP Relay Agent Information Option (Option 82)

The IES-1248 can add information to DHCP requests that it relays to a DHCP server. This helps provide authentication about the source of the requests. You can also specify additional information for the IES-1248 to add to the DHCP requests that it relays to the DHCP server. Please see RFC 3046 for more details.

29.2.1 DHCP Relay Agent Circuit ID and Remote ID Sub-option Formats

The DHCP relay agent information feature adds an Agent Information field to the option 82 field of the DHCP headers of DHCP request frames that the IES-1248 relays to a DHCP server. The Agent Information field that the IES-1248 adds contains an "Agent Circuit-ID sub-option" that includes the port number, VLAN ID and optional information about the port where the DHCP request was received.

The following figure shows the format of the Agent Circuit ID sub-option. The 1 in the first field identifies this as an Agent Circuit ID sub-option. The length N gives the total number of octets in the Agent Information Field. If the configuration request was received on a DSL port, a 2-byte Port No field specifies the ingress port number (the first byte is always 0, the second byte is in hexadecimal format). The next field is 2 bytes and displays the DHCP request packet's VLAN ID. The last field (A) can range from 0 to 24 bytes and is optional information (that you specify) about this relay agent.

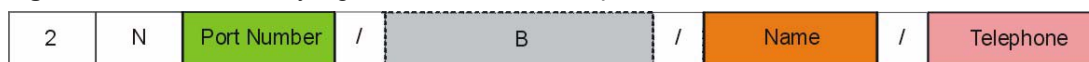
Figure 103 DHCP Relay Agent Circuit ID Sub-option Format



The Agent Information field that the IES-1248 adds also contains an “Agent Remote-ID sub-option” of information that you specify.

The following figure shows the format of the Agent Remote ID sub-option. The 2 in the first field identifies this as an Agent Remote ID sub-option. The length N gives the total number of octets in the Agent Information Field. Then there is the number of the port (in plain text format) upon which the DHCP client request was received. The next field (B in the figure) is 0 to 23 bytes of optional information that you specify. This is followed by the name and telephone number configured for the ADSL port. The port number, optional information (B in the figure), ADSL name and ADSL telephone number fields are separated by forward slashes.

Figure 104 DHCP Relay Agent Remote ID Sub-option Format



29.3 DHCP Relay Screen

To open this screen, click **Advanced Application > DHCP Relay**.

Figure 105 DHCP Relay

The following table describes the labels in this screen.

Table 56 DHCP Relay

LABEL	DESCRIPTION
VLAN ID	Enter the ID of the VLAN served by the specified DHCP relay(s). Enter 0 to set up the default DHCP relay(s).
Enable DHCP Relay	Select this to have the IES-1248 relay DHCP requests in the selected VLAN to a DHCP server and the server's responses back to the clients. The IES-1248 uses the management VLAN to communicate with the DHCP server.
Enable Option82 Sub-option1 (Circuit ID)	Select this to have the IES-1248 add the originating port numbers to DHCP requests in the selected VLAN regardless of whether the DHCP relay is on or off. In the field next to the check box, you can also specify up to 23 English keyboard characters of additional information for the IES-1248 to add to the DHCP requests to a DHCP server. Examples of information you could add would be the system name of the IES-1248 or the ISP's name.

Table 56 DHCP Relay (continued)

LABEL	DESCRIPTION
Enable Option82 Sub-option2 (Remote ID)	Select this to have the IES-1248 add the sub-option 2 (Remote ID) to DHCP requests in the selected VLAN regardless of whether the DHCP relay is on or off. In the field next to the check box, you can also specify up to 23 English keyboard characters of additional information for the IES-1248 to add to the DHCP requests to a DHCP server.
Primary Server IP	Enter the IP address of one DHCP server to which the switch should relay DHCP requests for the selected VLAN.
Secondary Server IP	Enter the IP address of a second DHCP server to which the switch should relay DHCP requests for the selected VLAN. Enter 0.0.0.0 if there is only one DHCP relay for the selected VLAN.
Relay Mode	Specify how the IES-1248 relays DHCP requests for the selected VLAN. Auto - The IES-1248 routes DHCP requests to the active server for the VLAN. Both - The IES-1248 routes DHCP requests to the primary and secondary server for the VLAN, regardless of which one is active.
Option Mode	Select either the Private or TR-101 Option 82 Sub-option 1 and Sub-option 2 format.
Active Server	This field has no effect if the Relay Mode is Both . If the Relay Mode is Auto , select which DHCP server (the primary one or the secondary one) to which the IES-1248 should relay DHCP requests for the selected VLAN.
Apply	Click Apply to save your changes to the IES-1248's volatile memory. The IES-1248 loses these changes if it is turned off or loses power, so use the Config Save link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Cancel	Click Cancel to begin configuring this screen afresh.
Server List	This section lists the current DHCP relay settings for each VLAN. An asterisk in parentheses (*) indicates which DHCP server is active for each VLAN.
VID	This field displays the ID of the VLAN served by the specified DHCP relay(s).
Active	This field displays whether or not the IES-1248 relays DHCP requests in the selected VLAN to a DHCP server and the server's responses back to the clients.
Primary Server IP	This field displays the IP address of one DHCP server to which the switch should relay DHCP requests. If this is the active server for the selected VLAN, it is marked with an asterisk (*).
Secondary Server IP	This field displays the IP address of a second DHCP server to which the switch should relay DHCP requests. This field is 0.0.0.0 if the primary server is the only DHCP relay. If this is the active server for the selected VLAN, it is marked with an asterisk (*).
Relay Mode	This field displays how the IES-1248 relays DHCP requests for the selected VLAN. Auto - The IES-1248 routes DHCP requests to the active server for the VLAN. Both - The IES-1248 routes DHCP requests to the primary and secondary server for the VLAN, regardless of which one is active.
Option82 Sub-option1	This field displays whether or not the IES-1248 adds the originating port numbers (and any additional information) to DHCP requests in the selected VLAN.
Option82 Sub-option2	This field displays whether or not the IES-1248 adds the sub-option 2 (and any additional information) to DHCP requests in the selected VLAN.
Delete	Select the check box next to the VLAN ID, and click Delete to remove the entry.

Table 56 DHCP Relay (continued)

LABEL	DESCRIPTION
Select All	Click this to select all entries in the Server List .
Select None	Click this to un-select all entries in the Server List .

DHCP Snoop

This chapter shows you how to set up DHCP snooping settings on the subscriber ports.

30.1 DHCP Snoop Overview

DHCP snooping prevents clients from assigning their own IP addresses. The IES-1248 can store every (ADSL port, MAC address, IP address) tuple offered by the DHCP server. Then, it only forwards packets from clients whose MAC address and IP address are recorded. Packets from unknown IP addresses are dropped.

In some cases, you might want to allow packets from an IP address not offered by the DHCP server. This might apply, for example, when a device uses a static IP address. In this case, you can specify the IP address whose packets are allowed, and the IES-1248 forwards these packets as well.

30.2 DHCP Snoop Screen

Use this screen to activate or deactivate DHCP snooping on each port. To open this screen, click **Advanced Application > DHCP Snoop**.

Figure 106 DHCP Snoop

Port	Active	Static IP Pool
1	-	-
2	-	-
3	-	-
4	-	-
5	-	-
6	-	-
7	-	-
...	...	...
46	-	-
47	-	-
48	-	-

The following table describes the labels in this screen.

Table 57 DHCP Snoop

LABEL	DESCRIPTION
DHCP Snoop Status	Click DHCP Snoop Status to open the screen where you can look at or clear the current DHCP snooping table on each port (see Section 30.3 on page 217).
DHCP Counter	Click DHCP Counter to open the screen where you can look at a summary of the DHCP packets on each port (see Section 30.4 on page 217).
Port	This field displays each ADSL port number.
Active	Specify whether DHCP snooping is active ("V") or inactive ("-") on this port.
Static IP 1~3	These fields are only effective when DHCP snooping is active. Enter up to three IP addresses for which the IES-1248 should forward packets, even if the IP address is not assigned by the DHCP server. The IES-1248 drops packets from other unknown IP addresses on this port. To delete an existing IP address, enter 0.0.0.0 .
Apply	Click Apply to save your changes to the IES-1248's volatile memory. The IES-1248 loses these changes if it is turned off or loses power, so use the Config Save link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Cancel	Click Cancel to begin configuring this screen afresh.
Port	This field displays each ADSL port number. Click a port number to edit it in the section above.
Active	This field displays whether DHCP snooping is active ("V") or inactive ("-") on this port.
Static IP Pool	These fields display IP addresses for which the IES-1248 should forward packets, even if the IP address is not assigned by the DHCP server. 0.0.0.0 is a blank value.

30.3 DHCP Snoop Status Screen

Use this screen to look at or to clear the DHCP snooping table on each port. To open this screen, click **Advanced Application > DHCP Snoop > DHCP Snoop Status**.

Figure 107 DHCP Snoop Status

Port	Overflow	IP	MAC	VID
1	0	-	-	-
2	0	-	-	-
3	0	-	-	-
4	0	-	-	-
5	0	-	-	-
6	0	-	-	-
42	0	-	-	-
43	0	-	-	-
44	0	-	-	-
45	0	-	-	-
46	0	-	-	-
47	0	-	-	-
48	0	-	-	-

The following table describes the labels in this screen.

Table 58 DHCP Snoop Status

LABEL	DESCRIPTION
DHCP Snoop	Click DHCP Snoop to open the screen where you can activate or deactivate DHCP snooping on each port (see Section 30.2 on page 215).
DHCP Counter	Click DHCP Counter to open the screen where you can look at a summary of the DHCP packets on each port (see Section 30.4 on page 217).
Show Port	Select a port for which you wish to view information.
Port	This field displays the selected ADSL port number(s).
Overflow	The DHCP server can assign up to 32 IP addresses at one time to each port. This field displays the number of requests from DHCP clients above this limit.
IP	This field displays the IP address assigned to a client on this port.
MAC	This field displays the MAC address of a client on this port to which the DHCP server assigned an IP address.
VID	This field displays the VLAN ID, if any, on the DHCP Request packet.
Flush	Click Flush to remove all of the entries from the DHCP snooping table for the selected port(s).

30.4 DHCP Counter Screen

Use this screen to look at a summary of the DHCP packets on each port. To open this screen, click **Advanced Application > DHCP Snoop > DHCP Counter**.

Figure 108 DHCP Counter

Port	Discover	Offer	Request	Ack	Overflow
1	0	0	0	0	0
2	0	0	0	0	0
3	0	0	0	0	0
4	0	0	0	0	0
5	0	0	0	0	0
6	0	0	0	0	0
7	0	0	0	0	0
...	...	...	...	...	...
42	0	0	0	0	0
43	0	0	0	0	0
44	0	0	0	0	0
45	0	0	0	0	0
46	0	0	0	0	0
47	0	0	0	0	0
48	0	0	0	0	0

The following table describes the labels in this screen.

Table 59 DHCP Counter

LABEL	DESCRIPTION
DHCP Snoop	Click DHCP Snoop to open the screen where you can activate or deactivate DHCP snooping on each port (see Section 30.2 on page 215).
DHCP Snoop Status	Click DHCP Snoop Status to open the screen where you can look at or clear the current DHCP snooping table on each port (see Section 30.3 on page 217).
Show Port	Select a port for which you wish to view information.
Port	This field displays the selected ADSL port number(s).
Discover	This field displays the number of DHCP Discover packets on this port.
Offer	This field displays the number of DHCP Offer packets on this port.
Request	This field displays the number of DHCP Request packets on this port.
Ack	This field displays the number of DHCP Acknowledge packets on this port.
Overflow	The DHCP server can assign up to 32 IP addresses at one time to each port. This field displays the number of requests from DHCP clients above this limit.
Clear	Click Clear to delete the information the IES-1248 has learned about DHCP packets. This resets every counter in this screen.

2684 Routed Mode

This chapter shows you how to set up 2684 routed mode service.

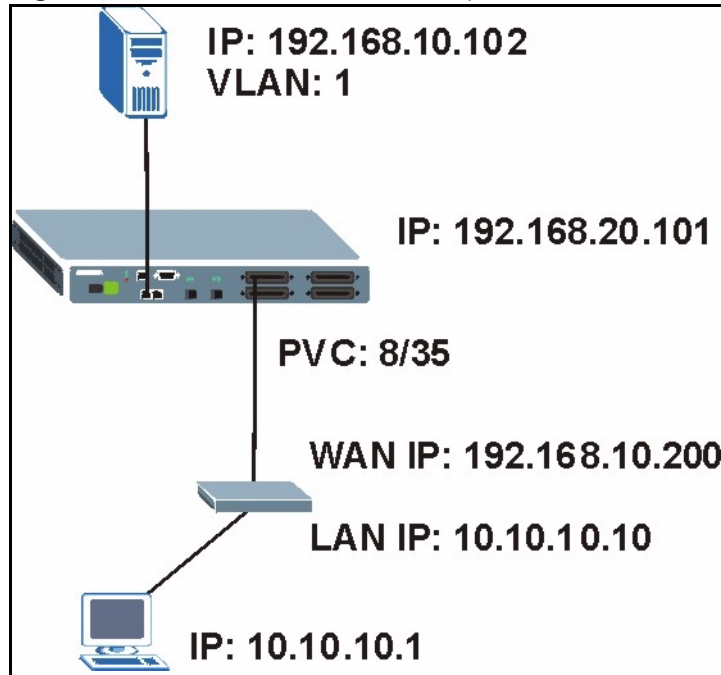
31.1 2684 Routed Mode

Use the 2684 (formerly 1483) routed mode to have the IES-1248 add MAC address headers to 2684 routed mode traffic from a PVC that connects to a subscriber device that uses 2684 routed mode. You also specify the gateway to which the IES-1248 sends the traffic and the VLAN ID tag to add. See RFC-2684 for details on routed mode traffic carried over AAL type 5 over ATM.

- Use the [2684 Routed PVC Screen](#) to configure PVCs for 2684 routed mode traffic.
- Use the [2684 Routed Domain Screen](#) to configure domains for 2684 routed mode traffic. The domain is the range of IP addresses behind the subscriber's device (the CPE or Customer Premises Equipment). This includes the CPE device's LAN IP addresses and the IP addresses of the LAN computers.
- Use the [RPVC Arp Proxy Screen](#) to view the Address Resolution Protocol table of IP addresses of CPE devices using 2684 routed mode and configure how long the device is to store them.
- Use the [2684 Routed Gateway Screen](#) to configure gateway settings.
- For upstream traffic: Since the subscriber's device will not send out a MAC address, after the IES-1248 reassembles the Ethernet packets from the AAL5 ATM cells, the IES-1248 will append the routed mode gateway's MAC address and the IES-1248's MAC address as the destination/source MAC address.
- For downstream traffic: When the IES-1248 sees the destination IP address is specified in the RPVC (or RPVC domain), the IES-1248 will strip out the MAC header and send them to the corresponding RPVC.

31.1.1 2684 Routed Mode Example

The following figure shows an example 2684 routed mode set up. The gateway server uses IP address 192.168.10.102 and is in VLAN 1. The IES-1248 uses IP address 192.168.20.101. The subscriber's device (the CPE) is connected to DSL port 1 on the IES-1248 and the 2684 routed mode traffic is to use the PVC identified by VPI 8 and VCI 35. The CPE device's WAN IP address is 192.168.10.200. The routed domain is the LAN IP addresses behind the CPE device. The CPE device's LAN IP address is 10.10.10.10 and the LAN computer's IP address is 10.10.10.1. This includes the CPE device's LAN IP addresses and the IP addresses of the LAN computers.

Figure 109 2684 Routed Mode Example

Note the following.

- The CPE device's WAN IP (192.168.10.200 in this example) must be in the same subnet as the gateway's IP address (192.168.10.102 in this example).
- The IES-1248's management IP address can be any IP address, it doesn't have any relationship to the WAN IP address or routed gateway IP address.
- The IES-1248's management IP address should not be in the same subnet as the one defined by the WAN IP address and netmask of the subscriber's device. It is suggested that you set the netmask of the subscriber's WAN IP address to 32 to avoid this problem.
- The IES-1248's management IP address should not be in the same subnet range of any RPVC and RPVC domain. It will make the IES-1248 confused if the IES-1248 receives a packet with this IP as destination IP.
- The IES-1248's management IP address also should not be in the same subnet as the one defined by the LAN IP address and netmask of the subscriber's device. Make sure you assign the IP addresses properly.
- In general deployment, the computer must set the CPE device's LAN IP address (10.10.10.10 in this example) as its default gateway.
- The subnet range of any RPVC and RPVC domain must be unique.

31.2 2684 Routed PVC Screen

Use this screen to configure PVCs for 2684 routed mode traffic.

To open this screen, click **Advanced Application > 2684 Routed Mode**.

Figure 110 2684 Routed PVC

2684 Routed PVC

Routed PVC Routed Domain RPVC ARP Proxy Routed Gateway

Port 1 Gateway IP 0.0.0.0

VPI 0 VCI 0

IP 0.0.0.0 NetMask 0 (1-32)

DS VC Profile DEFVAL

US VC Profile -

Add Cancel

Index	Port	VPI	VCI	IP	DS / US VC Profile	NetMask	Gateway IP	Delete

Delete Cancel

The following table describes the labels in this screen.

Table 60 2684 Routed PVC

LABEL	DESCRIPTION
Routed Domain	Click Routed Domain to open this screen where you can configure domains for 2684 routed mode traffic (see Section 31.3 on page 222).
RPVC ARP Proxy	Click RPVC ARP Proxy to go to the screen where you can view the Address Resolution Protocol table of IP addresses of CPE devices using 2684 routed mode and configure how long the device is to store them (see Section 31.4 on page 223).
Routed Gateway	Click Routed Gateway to go to the screen where you can configure gateway settings (see Section 31.5 on page 224).
Port	Use this drop-down list box to select a port for which you wish to configure settings.
Gateway IP	Enter the IP address of the gateway to which you want to send the traffic that the system receives from this PVC. Enter the IP address in dotted decimal notation.
VPI	Type the Virtual Path Identifier for this routed PVC.
VCI	Type the Virtual Circuit Identifier for this routed PVC.
IP	Enter the subscriber's CPE WAN IP address in dotted decimal notation.
NetMask	The bit number of the subnet mask of the subscriber's WAN IP address. To find the bit number, convert the subnet mask to binary and add all of the 1's together. Take "255.255.255.0" for example. 255 converts to eight 1's in binary. There are three 255's, so add three eights together and you get the bit number (24). Make sure that the routed PVC's subnet does not include the IES-1248's IP address.
DS VC Profile	Use the drop-down list box to select a VC profile to use for this channel's downstream traffic shaping.
US VC Profile	Use the drop-down list box to select a VC profile to use for this channel's upstream traffic. The IES-1248 does not perform upstream traffic policing if you do not specify an upstream VC profile.
Add	Click Add to save your changes to the IES-1248's volatile memory. The IES-1248 loses these changes if it is turned off or loses power, so use the Config Save link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Cancel	Click Cancel to start configuring the screen again.
Index	This field displays the number of the routed PVC.

Table 60 2684 Routed PVC (continued)

LABEL	DESCRIPTION
Port	This field displays the number of the ADSL port on which the routed PVC is configured.
VPI	This field displays the Virtual Path Identifier (VPI). The VPI and VCI identify a channel on this port.
VCI	This field displays the Virtual Circuit Identifier (VCI). The VPI and VCI identify a channel on this port.
IP	This field displays the subscriber's IP address.
DS / US VC Profile	This shows which VC profile this channel uses for downstream traffic shaping. The VC profile for upstream policing also displays if the channel is configured to use one.
NetMask	This field displays the bit number of the subnet mask of the subscriber's IP address.
Gateway IP	This field displays the IP address of the gateway to which you want to send the traffic that the system receives from this PVC.
Delete	Select an entry's Delete check box and click Delete to remove the entry. Clicking Delete saves your changes to the IES-1248's volatile memory. The IES-1248 loses these changes if it is turned off or loses power, so use the Config Save link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Cancel	Click Cancel to start configuring the screen again.

31.3 2684 Routed Domain Screen

Use this screen to configure domains for 2684 routed mode traffic. The domain is the range of IP addresses behind the subscriber's device (the CPE). This includes the CPE device's LAN IP addresses and the IP addresses of the LAN computers.

To open this screen, click **Advanced Application > 2684 Routed Mode > Routed Domain**.

Figure 111 2684 Routed Domain

2684 Routed Domain

Routed PVC Routed Domain RPVC ARP Proxy Routed Gateway

Port: 1
VPI: 0
VCI: 0
IP: 0.0.0.0
NetMask: 0 (1-32)

Add Cancel

Index	Port	VPI	VCI	IP	NetMask	Delete

Delete Cancel

The following table describes the labels in this screen.

Table 61 2684 Routed Domain

LABEL	DESCRIPTION
Routed PVC	Click Routed PVC to go to the screen where you can configure routed PVC settings (see Section 31.2 on page 220).
RPVC ARP Proxy	Click RPVC ARP Proxy to go to the screen where you can view the Address Resolution Protocol table of IP addresses of CPE devices using 2684 routed mode and configure how long the device is to store them (see Section 31.4 on page 223).
Routed Gateway	Click Routed Gateway to go to the screen where you can configure gateway settings (see Section 31.5 on page 224).
Port	Use this drop-down list box to select a port for which you wish to configure settings.
VPI	Type the Virtual Path Identifier for this routed PVC.
VCI	Type the Virtual Circuit Identifier for this routed PVC.
IP	Enter the subscriber's CPE LAN IP address in dotted decimal notation.
NetMask	The bit number of the subnet mask of the subscriber's IP address. To find the bit number, convert the subnet mask to binary and add all of the 1's together. Take "255.255.255.0" for example. 255 converts to eight 1's in binary. There are three 255's, so add three eights together and you get the bit number (24).
Add	Click Add to save your changes to the IES-1248's volatile memory. The IES-1248 loses these changes if it is turned off or loses power, so use the Config Save link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Cancel	Click Cancel to start configuring the screen again.
Index	This field displays the number of the routed PVC.
Port	This field displays the number of the ADSL port on which the routed PVC is configured.
VPI	This field displays the Virtual Path Identifier (VPI). The VPI and VCI identify a channel on this port.
VCI	This field displays the Virtual Circuit Identifier (VCI). The VPI and VCI identify a channel on this port.
IP	This field displays the subscriber's IP address.
NetMask	This field displays the bit number of the subnet mask of the subscriber's LAN IP address.
Delete	Select an entry's Delete check box and click Delete to remove the entry. Clicking Delete saves your changes to the IES-1248's volatile memory. The IES-1248 loses these changes if it is turned off or loses power, so use the Config Save link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Cancel	Click Cancel to start configuring the screen again.

31.4 RPVC Arp Proxy Screen

Use this screen to view the Address Resolution Protocol table of IP addresses of CPE devices using 2684 routed mode and configure how long the device is to store them.

To open this screen, click **Advanced Application > 2684 Routed Mode > RPVC ARP Proxy**.

Figure 112 RPVC Arp Proxy

The following table describes the labels in this screen.

Table 62 RPVC Arp Proxy

LABEL	DESCRIPTION
Routed PVC	Click Routed PVC to go to the screen where you can configure routed PVC settings (see Section 31.2 on page 220).
Routed Domain	Click Routed Domain to open this screen where you can configure domains for 2684 routed mode traffic (see Section 31.3 on page 222).
Routed Gateway	Click Routed Gateway to go to the screen where you can configure gateway settings (see Section 31.5 on page 224).
Aging Time	Enter a number of seconds (10~10000) to set how long the device keeps the Address Resolution Protocol table's entries of IP addresses of CPE devices using 2684 routed mode. Enter 0 to disable the aging time.
Apply Setting	Click Apply Setting to save your changes to the IES-1248's volatile memory. The IES-1248 loses these changes if it is turned off or loses power, so use the Config Save link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Index	This field displays the number of the IP address entry.
Gateway IP	This field displays the IP address of the gateway to which the device sends the traffic that it receives from this entry's IP address.
VID	This field displays the VLAN Identifier that the device adds to Ethernet frames that it sends to this gateway.
MAC	This field displays the subscriber's MAC (Media Access Control) address.
Flush	Click Flush to remove all of the entries from the ARP table.

31.5 2684 Routed Gateway Screen

Use this screen to configure gateway settings.

To open this screen, click **Advanced Application > 2684 Routed Mode > Routed Gateway**.

Figure 113 2684 Routed Gateway

2684 Routed Gateway

Routed PVC Routed Domain **RPVC ARP Proxy** Routed Gateway

Gateway IP 0.0.0.0

VID 0 (1~4094)

Priority 0 (0~7, default: 0)

Add

Index	Gateway IP	VID	Priority	Delete
Delete Cancel				

The following table describes the labels in this screen.

Table 63 2684 Routed Gateway

LABEL	DESCRIPTION
Routed PVC	Click Routed PVC to go to the screen where you can configure routed PVC settings (see Section 31.2 on page 220).
Routed Domain	Click Routed Domain to open this screen where you can configure domains for 2684 routed mode traffic (see Section 31.3 on page 222).
RPVC ARP Proxy	Click RPVC ARP Proxy to go to the screen where you can view the Address Resolution Protocol table of IP addresses of CPE devices using 2684 routed mode and configure how long the device is to store them (see Section 31.4 on page 223).
Gateway IP	Enter the IP address of the gateway to which you want to send the traffic that the system receives from this PVC. Enter the IP address in dotted decimal notation.
VID	Specify a VLAN Identifier to add to Ethernet frames that the system routes to this gateway.
Priority	Select the IEEE 802.1p priority (0~7) to add to the traffic that you send to this gateway.
Add	Click Add to save your changes to the IES-1248's volatile memory. The IES-1248 loses these changes if it is turned off or loses power, so use the Config Save link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Index	This field displays the number of the gateway entry.
Gateway IP	This field displays the IP address of the gateway.
VID	This field displays the VLAN Identifier that the system adds to Ethernet frames that it sends to this gateway.
Priority	This field displays the IEEE 802.1p priority (0~7) that is added to traffic sent to this gateway.
Delete	Select an entry's Delete check box and click Delete to remove the entry. Clicking Delete saves your changes to the IES-1248's volatile memory. The IES-1248 loses these changes if it is turned off or loses power, so use the Config Save link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Cancel	Click Cancel to start configuring the screen again.

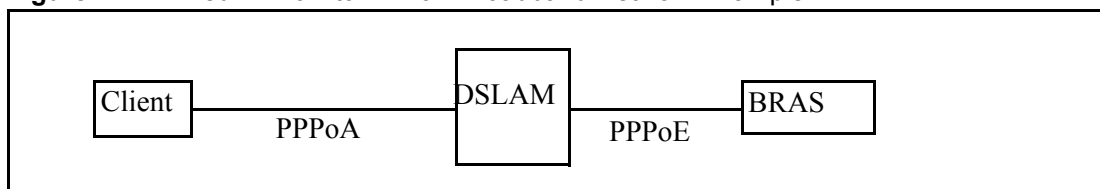
PPPoA to PPPoE

This chapter shows you how to set up the IES-1248 to convert PPPoA frames to PPPoE traffic and vice versa.

32.1 PPPoA to PPPoE Overview

Before migrating to an Ethernet infrastructure, a broadband network might consist of PPPoA connections between the CPE devices and the DSLAM and PPPoE connections from the DSLAM to the Broadband Remote Access Server (BRAS). The following figure shows a network example.

Figure 114 Mixed PPPoA-to-PPPoE Broadband Network Example



In order to allow communication between the end points (the CPE devices and the BRAS), you need to configure the DSLAM (the IES-1248) to translate PPPoA frames to PPPoE packets and vice versa.

When PPPoA packets are received from the CPE, the ATM headers are removed and the IES-1248 adds PPPoE and Ethernet headers before sending the packets to the BRAS. When the IES-1248 receives PPPoE packets from the BRAS, PPPoE and Ethernet headers are stripped and necessary PVC information (such as encapsulation type) is added before forwarding to the designated CPE.

32.2 PPPoA to PPPoE Screen

Use this screen to set up PPPoA to PPPoE conversions on each port. This conversion is set up by creating a PAE PVC. See [Chapter 16 on page 129](#) for background information about creating PVCs. To open this screen, click **Advanced Application > PPPoA to PPPoE**.

Figure 115 PPPoA to PPPoE

PPPoA to PPPoE

Port: 1

VPI: 0 VCI: 0

DS VC Profile: DEFVAL

US VC Profile: -

PVID: 1 (1~4094) Priority: 0

AC Name:

Service Name:

Hellotime: 600 sec(0~600)

Apply Cancel

Show Port: All

Index	Port	VPI/VCI	PVID	Priority	Hellotime	DS / US VC Profile	Access Concentrator Name	Select
Delete Select All None								

The following table describes the labels in this screen.

Table 64 PPPoA to PPPoE

LABEL	DESCRIPTION
Port	Use this drop-down list box to select a port for which you wish to set up PPPoA to PPPoE conversions. This field is read-only once you click on a port number below.
VPI	Type the Virtual Path Identifier for a channel on this port.
VCI	Type the Virtual Circuit Identifier for a channel on this port.
DS VC Profile	Use the drop-down list box to select a VC profile to use for this channel's downstream traffic shaping.
US VC Profile	Use the drop-down list box to select a VC profile to use for this channel's upstream traffic. The IES-1248 does not perform upstream traffic policing if you do not specify an upstream VC profile. Note: Upstream traffic policing should be used in conjunction with the ATM shaping feature on the subscriber's device. If the subscriber's device does not apply the appropriate ATM shaping, all upstream traffic will be discarded due to upstream traffic policing.
PVID	Type a PVID (Port VLAN ID) to assign to untagged frames received on this channel. Note: Make sure the VID is not already used for multicast VLAN or TLS PVC.
Priority	Use the drop-down list box to select the priority value (0 to 7) to add to incoming frames without a (IEEE 802.1p) priority tag.

Table 64 PPPoA to PPPoE (continued)

LABEL	DESCRIPTION
AC Name	This field is optional. Specify the hostname of a remote access concentrator if there are two access concentrators (or BRAS) on the network or if you want to allow PAE translation to the specified access concentrator. In this case, the IES-1248 checks the AC name field in the BRAS's reply PDU. If there is a mismatch, the IES-1248 drops this PDU. (This is not recorded as an PPPoE AC System Error in the PPPoA to PPPoE Status screen, however.)
Service Name	This field is optional. Specify the name of the service that uses this PVC. This must be a service name that you configure on the remote access concentrator.
Hellotime	Specify the timeout, in seconds, for the PPPoE session. Enter 0 if there is no timeout.
Apply	Click this to add or save channel settings on the selected port. This saves your changes to the IES-1248's volatile memory. The IES-1248 loses these changes if it is turned off or loses power, so use the Config Save link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Cancel	Click Cancel to start configuring the screen again.
Show Port	Select which ADSL port(s) for which to display PPPoA to PPPoE conversion settings.
Index	This field displays the number of the PVC. Click a PVC's index number to open the screen where you can look at the current status of this PPPoA-to-PPPoE conversion. (See Section 32.3 on page 230 .) Note: At the time of writing, you cannot edit the VPI and VCI. If you want to change them, add a new PVC with the desired settings. Then, delete any unwanted PVCs.
Port	This field displays the number of the ADSL port on which the PVC is configured.
VPI/VCI	This field displays the Virtual Path Identifier (VPI) and Virtual Circuit Identifier (VCI). The VPI and VCI identify a channel on this port.
PVID	This is the PVID (Port VLAN ID) assigned to untagged frames or priority frames (0 VID) received on this channel.
Priority	This is the priority value (0 to 7) added to incoming frames without a (IEEE 802.1p) priority tag.
Hellotime	This field displays the timeout for the PPPoE session, in seconds.
DS / US VC Profile	This shows which VC profile this channel uses for downstream traffic shaping. The VC profile for upstream policing also displays if the channel is configured to use one.
Access Concentrator Name	This field displays the name of the specified remote access concentrator, if any.
Service Name	This field displays the name of the service that uses this PVC on the remote access concentrator.
Select Delete	Select the check box in the Select column for an entry, and click Delete to remove the entry.
Select All	Click this to select all entries in the table.
Select None	Click this to un-select all entries in the table.

32.3 PPPoA to PPPoE Status Screen

Use this screen to look at the current status of each PPPoA to PPPoE conversion. To open this screen, click **Advanced Application > PPPoA to PPPoE**, and then click an index number.

Figure 116 PPPoA to PPPoE Status

PPPoA to PPPoE Status		
PVC 7-31/32		
Session Status		
Session State	Down	
Session ID	0	
Session Uptime	0secs	
AC Name		
Service Name		
Counter Status		
	Tx	Rx
PPP LCP Config-Request	-	0
PPP LCP Echo-Request	-	0
PPP LCP Echo-Reply	-	0
PPPoE PADI	0	-
PPPoE PADO	-	0
PPPoE PADR	0	-
PPPoE PADS	-	0
PPPoE PADT	0	0
PPPoE Service Name Error	-	0
PPPoE AC System Error	-	0
PPPoE Generic Error	0	0

The following table describes the labels in this screen.

Table 65 PPPoA to PPPoE Status

LABEL	DESCRIPTION
Up	Click Up to open the screen where you can set up PPPoA-to-PPPoE conversions on each port (see Section 32.2 on page 227).
PVC	This field displays the port number, VPI, and VCI of the PVC.
Session Status	
Session State	This field displays whether or not the current session is Up or Down .
Session ID	This field displays the ID of the current session. It displays 0 if there is no current session.
Session Uptime	This field displays how long the current session has been up.
AC Name	This field displays the hostname of the remote access concentrator if there are two access concentrators (or BRAS) on the network or if you want to allow PAE translation to the specified access concentrator.
Service Name	This field specifies the name of the service that uses this PVC.
Counter Status	
Tx/Rx	The values in these columns are for packets transmitted (tx) or received (rx) by the IES-1248.

Table 65 PPPoA to PPPoE Status (continued)

LABEL	DESCRIPTION
PPP LCP Config-Request	This field displays the number of config-request PDUs received by the IES-1248 from the CPE (client) device.
PPP LCP Echo-Request	This field displays the number of echo-request PDUs received by the IES-1248 from the CPE (client) device.
PPP LCP Echo-Reply	This field displays the number of echo-reply PDUs received by the IES-1248 from the CPE (client) device.
PPPoE PADI	This field displays the number of padi PDUs sent by the IES-1248 to the BRAS.
PPPoE PADO	This field displays the number of pado PDUs sent by the BRAS to the IES-1248.
PPPoE PADR	This field displays the number of padr PDUs sent by the IES-1248 to the BRAS.
PPPoE PADS	This field displays the number of pads PDUs sent by the BRAS to the IES-1248.
PPPoE PADT	This field displays the number of padt PDUs sent and received by the IES-1248.
PPPoE Service Name Error	This field displays the number of service name errors; for example, the IES-1248's specified service is different than the BRAS's setting.
PPPoE AC System Error	This field displays the number of times the access concentrator experienced an error while performing the Host request; for example, when resources are exhausted in the access concentrator. This value does not include the number of times the IES-1248 checks the AC name field in the BRAS's reply PDU and finds a mismatch, however.
PPPoE Generic Error	This field displays the number of other types of errors that occur in the PPPoE session between the IES-1248 and the BRAS.

This chapter shows you how to set up DSCP on each port and how to convert DSCP values to IEEE 802.1p values.

33.1 DSCP Overview

DiffServ Code Point (DSCP) is a field used for packet classification on DiffServ networks. The higher the value, the higher the priority. Lower-priority packets may be dropped if the total traffic exceeds the capacity of the network.

33.2 DSCP Setup Screen

Use this screen to activate or deactivate DSCP on each port. To open this screen, click **Advanced Application > DSCP**.

Figure 117 DSCP Setup

The screenshot shows the 'DSCP Setup' screen with two tabs: 'DSCP Setup' and 'DSCP Map'. The 'DSCP Setup' tab is active, displaying a table with columns 'Port', 'Active', and 'Select'. The table lists ports 1 through 7, followed by a break, then ports 43 through 48, and finally ENET1 and ENET2. Each port has a checkbox in the 'Select' column. At the bottom, there are buttons for 'Active', 'Inactive', 'Select', 'All', and 'None'.

Port	Active	Select
1	-	☐
2	-	☐
3	-	☐
4	-	☐
5	-	☐
6	-	☐
7	-	☐
...		
43	-	☐
44	-	☐
45	-	☐
46	-	☐
47	-	☐
48	-	☐
ENET1	-	☐
ENET2	-	☐

Active Inactive Select All None

The following table describes the labels in this screen.

Table 66 DSCP Setup

LABEL	DESCRIPTION
DSCP Map	Click DSCP Map to open the screen where you can set up the mapping between source DSCP priority and IEEE 802.1p priority (see Section 33.3 on page 234).
Port	This field displays each port number.
Active	This field displays whether DSCP is active ("V") or inactive ("-") on this port.
Select	Select this, and click Active or Inactive to enable or disable the DSCP on this port.
Active	Click this to enable DSCP on the selected ports.
Inactive	Click this to disable DSCP on the selected ports.
All	Click this to select all entries in the table.
None	Click this to un-select all entries in the table.

33.3 DSCP Map Screen

Use this screen to convert DSCP priority to IEEE 802.1p priority. To open this screen, click **Advanced Application > DSCP > DSCP Map**.

Figure 118 DSCP Map

Source DSCP	802.1P Priority
0	0 (0-7)
1	0 (0-7)
2	0 (0-7)
3	0 (0-7)
4	0 (0-7)
5	0 (0-7)
6	0 (0-7)
56	7 (0-7)
57	7 (0-7)
58	7 (0-7)
59	7 (0-7)
60	7 (0-7)
61	7 (0-7)
62	7 (0-7)
63	7 (0-7)

Apply

The following table describes the labels in this screen.

Table 67 DSCP Map

LABEL	DESCRIPTION
DSCP Map	Click DSCP Setup to open the screen where you can activate or deactivate DSCP on each port (see Section 33.2 on page 233).
Source DSCP	This field displays each DSCP value.
802.1P Priority	Enter the IEEE 802.1p priority to which you would like to map this DSCP value.
Apply	Click Apply to save your changes to the IES-1248's volatile memory. The IES-1248 loses these changes if it is turned off or loses power, so use the Config Save link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.

TLS PVC

This chapter shows you how to set up Transparent LAN Service (VLAN stacking, Q-in-Q) on each port.

34.1 Transparent LAN Service (TLS) Overview

Transparent LAN Service (also known as VLAN stacking or Q-in-Q) allows a service provider to distinguish multiple customers VLANs, even those with the same (customer-assigned) VLAN ID, within its network.

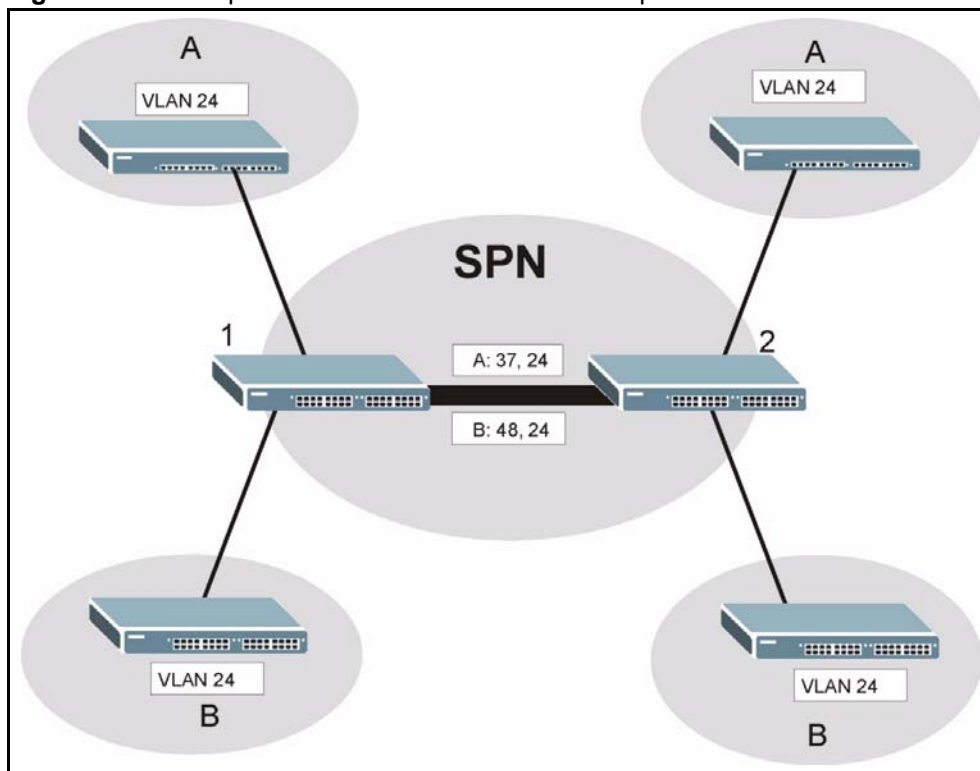
Use TLS to add an outer VLAN tag to the inner IEEE 802.1Q tagged frames that enter the network. By tagging the tagged frames (“double-tagged” frames), the service provider can manage up to 4,094 VLAN groups with each group containing up to 4,094 customer VLANs. This allows a service provider to provide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

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

Before the IES-1248 sends the frames from the customers, the VLAN ID is added to the frames. When packets intended for specific customers are received on the IES-1248, the outer VLAN tag is removed before the traffic is sent.

34.1.1 TLS Network Example

In the following example figure, both A and B are Service Provider’s Network (SPN) customers with VPN tunnels between their head offices and branch offices, respectively. Both have an identical VLAN tag for their VLAN group. The service provider can separate these two VLANs within its network by adding tag 37 to distinguish customer A and tag 48 to distinguish customer B at edge device 1 and then stripping those tags at edge device 2 as the data frames leave the network.

Figure 119 Transparent LAN Service Network Example

34.2 TLS PVC Screen

Use this screen to set up Transparent LAN Services on each port. This is set up by creating a TLS PVC. See [Chapter 16 on page 129](#) for background information about creating PVCs. To open this screen, click **Advanced Application > TLS PVC**.



You can NOT configure PPPoA-to-PPPoE and TLS settings on the same PVC.

Figure 120 TLS PVC

Port: 1

VPI: 0

VCI: 0

DS VC Profile: DEFVAL

US VC Profile: -

VID: 1 (1~4094)

Priority: 0

Apply Cancel

Show Port: All

Index	Port	VPI/VCI	VID	Priority	DS/US VC Profile	Select
Delete						
						Select All None

The following table describes the labels in this screen.

Table 68 TLS PVC

LABEL	DESCRIPTION
Port	Use this drop-down list box to select a port for which you wish to set up a TLS PVC. This field is read-only once you click on a port number below.
VPI	Type the Virtual Path Identifier for a channel on this port.
VCI	Type the Virtual Circuit Identifier for a channel on this port.
DS VC Profile	Use the drop-down list box to select a VC profile to use for this channel's downstream traffic shaping.
US VC Profile	Use the drop-down list box to select a VC profile to use for this channel's upstream traffic. The IES-1248 does not perform upstream traffic policing if you do not specify an upstream VC profile. Note: Upstream traffic policing should be used in conjunction with the ATM shaping feature on the subscriber's device. If the subscriber's device does not apply the appropriate ATM shaping, all upstream traffic will be discarded due to upstream traffic policing.
VID	Type a VLAN ID to assign to frames received on this channel. Note: Make sure the VID is not already used for PPPoA-to-PPPoE conversions.
Priority	Use the drop-down list box to select the priority value (0 to 7) to add to incoming frames without a (IEEE 802.1p) priority tag.
Apply	Click this to add or save channel settings on the selected port. This saves your changes to the IES-1248's volatile memory. The IES-1248 loses these changes if it is turned off or loses power, so use the Config Save link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Cancel	Click Cancel to start configuring the screen again.

Table 68 TLS PVC (continued)

LABEL	DESCRIPTION
Show Port	Select which ADSL port(s) for which to display TLS PVC settings.
Index	This field displays the number of the PVC. Click a PVC's index number to use the top of the screen to edit the PVC. Note: At the time of writing, you cannot edit the VPI and VCI. If you want to change them, add a new PVC with the desired settings. Then you can delete any unwanted PVCs.
Port	This field displays the number of the ADSL port on which the PVC is configured.
VPI/VCI	This field displays the Virtual Path Identifier (VPI) and Virtual Circuit Identifier (VCI). The VPI and VCI identify a channel on this port.
VID	This is the VLAN ID assigned to frames received on this channel.
Priority	This is the priority value (0 to 7) added to incoming frames without a (IEEE 802.1p) priority tag.
DS/US VC Profile	This shows which VC profile this channel uses for downstream traffic shaping. The VC profile for upstream policing also displays if the channel is configured to use one.
Select Delete	Select the check box in the Select column for an entry, and click Delete to remove the entry.
Select All	Click this to select all entries in the table.
Select None	Click this to un-select all entries in the table.

This chapter shows you how to set up ACL profiles on each port.

35.1 Access Control Logic (ACL) Overview

An ACL (Access Control Logic) profile allows the IES-1248 to classify and perform actions on the upstream traffic. Each ACL profile consists of a rule and an action, and you assign ACL profiles to PVCs.

35.1.1 ACL Profile Rules

Each ACL profile uses one of 14 rules to classify upstream traffic. These rules are listed below by rule number.

- 1** etype <etype> vlan <vid>
- 2** etype <etype> smac <mac>
- 3** etype <etype> dmac <mac>
- 4** vlan <vid> smac <mac>
- 5** vlan <vid> dmac <mac>
- 6** smac <mac> dmac <mac>
- 7** vlan <vid> priority <priority>
- 8** etype <etype>
- 9** vlan <vid>
- 10** smac <mac>
- 11** dmac <mac>
- 12** priority <priority>
- 13** protocol <protocol>
- 14** {srcip <ip>/<mask> {dstip <ip>/<mask> {tos <stos> <etos> {srcport <sport> <eport> {dstport <sport> <eport>}}}}}

The input values for these values have the following ranges.

- <vid>: 1~4094
- <priority>: 1~7
- <etype>: 0~65535
- <protocol>: tcp|udp|ospf|igmp|ip|gre|icmp|<ptype>
- <ptype>: 0~255
- <mask>: 0~32

- <tos>: 0~255
- <port>: 0~65535

If you apply multiple profiles to a PVC, the IES-1248 checks the profiles by rule number. The lower the rule number, the higher the priority the rule (and profile) has. For example, there are two ACL profiles assigned to a PVC. Profile1 is for VLAN ID 100 (rule number 9) traffic, and Profile2 is for IEEE 802.1p priority 0 traffic (rule number 12). The IES-1248 checks Profile1 first. If the traffic is VLAN ID 100, the IES-1248 follows the action in Profile1 and does not check Profile2. You cannot assign profiles that have the same rule numbers to the same PVC.

35.1.2 ACL Profile Actions

The IES-1248 can perform the following actions after it classifies upstream traffic.

- rate <rate>: change the rate to the specified value (1~65535 kbps)
- rvlan <rvlan>: change the VLAN ID to the specified value (1~4094)
- rpri <rpri>: change the IEEE 802.1p priority to the specified value (0~7)
- deny: do not forward the packet

The IES-1248 can apply more than one action to a packet, unless you select deny.

If you select the rvlan action, the IES-1248 replaces the VLAN ID before it compares the VLAN ID of the packet to the VID of the PVC. As a result, it is suggested that you replace VLAN ID on super channels, not normal PVC, since super channels accept any tagged traffic. If you replace the VLAN ID for a normal PVC, the IES-1248 drops the traffic because the new VLAN ID does not match the VID of the PVC. This is illustrated in the following scenario.

There is a normal PVC, and its PVID is 900. You create an ACL rule to replace the VLAN ID with 901. Initially, the traffic for the PVC belongs to VLAN 900. Then, the IES-1248 checks the ACL rule and changes the traffic to VLAN 901. When the IES-1248 finally compares the VLAN ID of the traffic (901) to the VID of the PVC (900), the IES-1248 drops the packets because they do not match.

35.2 ACL Setup Screen

Use this screen to assign ACL profiles to each PVC. To open this screen, click **Advanced Application > ACL**.

Figure 121 ACL Setup

The following table describes the labels in this screen.

Table 69 ACL Setup

LABEL	DESCRIPTION
ACL Profile Setup	Click ACL Profile Setup to open the screen where you can set up ACL profiles (see Section 35.3 on page 244).
ACL Port Map	Click ACL Profile Map to open the screen where you can look at which ACL profiles are assigned to which PVCs (see Section 35.4 on page 245).
Port	Use this drop-down list box to select a port to which you wish to assign an ACL profile. This field is read-only once you click on a port number below.
VPI	Type the Virtual Path Identifier for a channel on this port.
VCI	Type the Virtual Circuit Identifier for a channel on this port.
ACL Profile	Use the drop-down list box to select the ACL profile you want to assign to this PVC.
Apply	Click this to save your changes to the IES-1248's volatile memory. The IES-1248 loses these changes if it is turned off or loses power, so use the Config Save link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Cancel	Click Cancel to start configuring the screen again.
Show Port	Select which ADSL port(s) for which to display ACL profile settings.
Index	This field displays the number of the PVC. Click a PVC's index number to use the top of the screen to edit the PVC. Note: At the time of writing, you cannot edit the VPI and VCI. If you want to change them, add a new PVC with the desired settings. Then you can delete any unwanted PVCs.
Port	This field displays the number of the ADSL port on which the PVC is configured.
VPI/VCI	This field displays the Virtual Path Identifier (VPI) and Virtual Circuit Identifier (VCI). The VPI and VCI identify a channel on this port.
ACL Profile	This field shows the ACL profile assigned to this PVC.
Select Delete	Select the check box in the Select column for an entry, and click Delete to remove the entry.
Select All	Click this to select all entries in the table.
Select None	Click this to un-select all entries in the table.

35.3 ACL Profile Setup Screen

Use this screen to set up ACL profiles. To open this screen, click **Advanced Application > ACL > ACL Profile Setup**.

Figure 122 ACL Profile Setup

ACL Profile Setup

ACL Setup | **ACL Profile** | ACL Port Map

Profile Name:

Rule:

- ☐ 1. ethernet type (0~65535) vlan (1~4094)
- ☐ 2. ethernet type (0~65535) source mac
- ☐ 3. ethernet type (0~65535) dest mac
- ☐ 4. vlan (1~4094) source mac
- ☐ 5. vlan (1~4094) dest mac
- ☐ 6. source mac dest mac
- ☐ 7. vlan (1~4094) priority
- ☐ 8. ethernet type (0~65535)
- ☐ 9. vlan (1~4094)
- ☐ 10. source mac
- ☐ 11. dest mac
- ☐ 12. priority
- ☐ 13. protocol or protocol type (0~255)
- ☐ 14.
 - ☐ source ip mask
 - ☐ dest ip mask
 - ☐ tos: start tos (0~255) end tos (0~255)
 - ☐ source port: start port (0~65535) end port (0~65535)
 - ☐ dest port: start port (0~65535) end port (0~65535)

Action:

- ☐ rate (1~65535)Kbps
- ☐ replaced vlan (1~4094)
- ☐ replaced priority
- ☐ deny

Apply **Cancel**

ACL Profile List

Index	ACL Profile	Select
Delete Select All None		

The following table describes the labels in this screen.

Table 70 ACL Profile Setup

LABEL	DESCRIPTION
ACL Setup	Click ACL Setup to open the screen where you can assign ACL profiles to PVCs (see Section 35.2 on page 242).
ACL Port Map	Click ACL Profile Map to open the screen where you can look at which ACL profiles are assigned to which PVCs (see Section 35.4 on page 245).
Profile Name	Enter a descriptive name for the ACL profile. The name can be 1-31 printable ASCII characters long. Spaces are not allowed.

Table 70 ACL Profile Setup (continued)

LABEL	DESCRIPTION
Rule	Select which type of rule to use. Note: The lower the number (1-14), the higher the priority the rule has. Provide additional information required for the selected rule. Additional rules consist of one or more of the following criteria.
ethernet type	Enter the 16-bit EtherType value between 0 and 65535.
vlan	Enter a VLAN ID between 1 and 4094.
source mac	Enter the source MAC address.
dest mac	Enter the destination MAC address.
priority	Select the IEEE 802.1p priority.
protocol	Select the IP protocol used.
protocol type	Enter the IP protocol number (between 0 and 255) used.
source ip	Enter the source IP address and subnet mask in dotted decimal notation.
dest ip	Enter the source IP address and subnet mask in dotted decimal notation.
tos	Enter the start and end Type of Service between 0 and 255.
source port	Enter the source port or range of source ports.
dest port	Enter the destination port or range of destination ports.
Action	Select which action(s) the IES-1248 should follow when the criteria are satisfied.
rate	Enter the maximum bandwidth this traffic is allowed to have.
replaced vlan	Enter the VLAN ID that this traffic should use.
replaced priority	Select the IEEE 802.1p priority that this traffic should have.
deny	Select this if you want the IES-1248 to reject this kind of traffic.
ACL Profile List	
Index	This field displays a sequential value. The sequence in this table is not important. Click this to edit the associated ACL profile in the section above.
ACL Profile	This field displays the name of this ACL profile.
Select Delete	Select the check box in the Select column for an entry, and click Delete to remove the entry.
Select All	Click this to select all entries in the table.
Select None	Click this to un-select all entries in the table.

35.4 ACL Profile Map Screen

Use this screen to look at all the ACL profiles and the PVCs to which each one is assigned. To open this screen, click **Advanced Application > ACL > ACL Port Map**.

Figure 123 ACL Profile Map

The following table describes the labels in this screen.

Table 71 ACL Profile Map

LABEL	DESCRIPTION
ACL Setup	Click ACL Setup to open the screen where you can assign ACL profiles to PVCs (see Section 35.2 on page 242).
ACL Profile	Click ACL Profile Setup to open the screen where you can set up ACL profiles (see Section 35.3 on page 244).
ACL Profile	Select the ACL profile(s) for which you want to see which PVCs are assigned to it.
Index	This field displays the number of an entry.
Profile	This field shows the ACL profile assigned to this PVC.
Port	This field displays the ADSL port number on which the PVC is configured.
VPI/VCI	This field displays the Virtual Path Identifier (VPI) and Virtual Circuit Identifier (VCI). The VPI and VCI identify a channel on this port.

Downstream Broadcast

This chapter shows you how to allow or block downstream broadcast traffic.

36.1 Downstream Broadcast

Downstream broadcast allows you to block downstream broadcast packets from being sent to specified VLANs on specified ports.

36.2 Downstream Broadcast Screen

To open this screen, click **Advanced Application > Downstream Broadcast**.

Figure 124 Downstream Broadcast

The following table describes the labels in this screen.

Table 72 Downstream Broadcast

LABEL	DESCRIPTION
Port	Use this drop-down list box to select a port for which you wish to configure settings.
VLAN	Specify the number of a VLAN (on this entry's port) to which you do not want to send broadcast traffic. The VLAN must already be configured in the system.
Add	Click Add to save your changes to the IES-1248's volatile memory. The IES-1248 loses these changes if it is turned off or loses power, so use the Config Save link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Blocking Table	
Port	Use this drop-down list box to select a port for which you wish to display settings.

Table 72 Downstream Broadcast (continued)

LABEL	DESCRIPTION
Index	This field displays the number of the downstream broadcast blocking entry.
Port	This is the number of a DSL port through which you will block downstream broadcast traffic (on a specific VLAN).
VLAN	This field displays the number of a VLAN to which you do not want to send broadcast traffic (on the entry's port).
Select	Select an entry's Select check box and click Delete to remove the entry. Clicking Delete saves your changes to the IES-1248's volatile memory. The IES-1248 loses these changes if it is turned off or loses power, so use the Config Save link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Select All	Click All to mark all of the check boxes.
Select None	Click None to un-mark all of the check boxes.

Syslog

This chapter explains how to set the syslog parameters.

37.1 Syslog

The syslog feature sends logs to an external syslog server.

37.2 SysLog Screen

To open this screen, click **Advanced Application > SysLog**.

Figure 125 SysLog

The following table describes the labels in this screen.

Table 73 SysLog

LABEL	DESCRIPTION
Enable Unix Syslog	Select this check box to activate syslog (system logging) and then configure the syslog parameters described in the following fields.
Syslog Server IP	Enter the IP address of the syslog server. (The log facility is specified in Alarm > Alarm Event Setup . See Section 45.4 on page 296 .)
Apply	Click Apply to save your changes to the IES-1248's volatile memory. The IES-1248 loses these changes if it is turned off or loses power, so use the Config Save link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Cancel	Click Cancel to begin configuring this screen afresh.

Access Control

This chapter describes how to configure access control.

38.1 Access Control Screen

Use this screen to configure SNMP and enable/disable remote service access.

To open this screen, click **Advanced Application > Access Control**.

Figure 126 Access Control



38.2 Access Control Overview

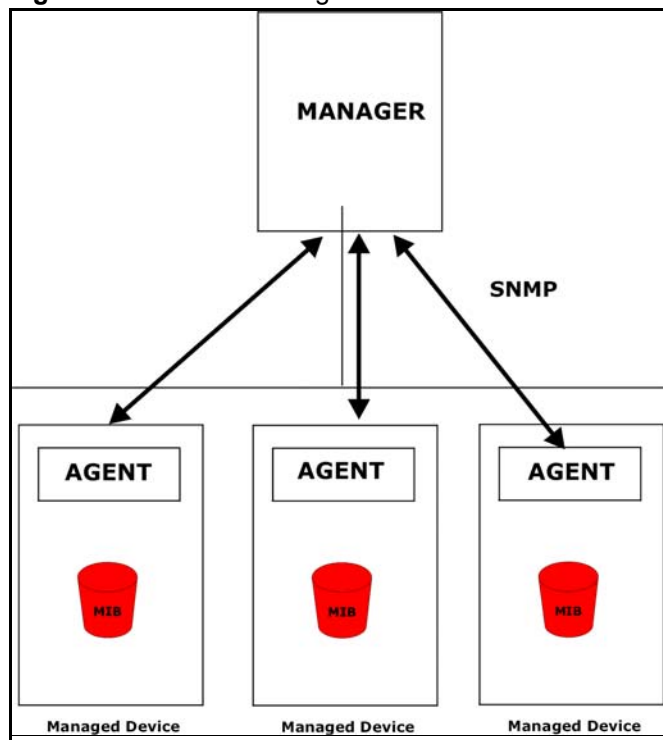
A console port or Telnet session can coexist with one FTP session, a web configurator session and/or limitless SNMP access control sessions.

Table 74 Access Control Summary

	CONSOLE PORT	TELNET	FTP	WEB	SNMP
Number of sessions allowed	1	5	1	No limit	No limit

38.3 SNMP

Simple Network Management Protocol is a protocol used for exchanging management information between network devices. SNMP is a member of TCP/IP protocol suite. A manager station can manage and monitor the IES-1248 through the network via SNMP version one (SNMPv1) and/or SNMP version 2c. The next figure illustrates an SNMP management operation. SNMP is only available if TCP/IP is configured.

Figure 127 SNMP Management Model

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

An agent is a management software module that resides in a managed device (the IES-1248). An agent translates the local management information from the managed device into a form compatible with SNMP. The manager is the console through which network administrators perform network management functions. It executes applications that control and monitor managed devices.

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

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

Table 75 SNMP Commands

COMMAND	DESCRIPTION
Get	Allows the manager to retrieve an object variable from the agent.
GetNext	Allows the manager to retrieve the next object variable from a table or list within an agent. In SNMPv1, when a manager wants to retrieve all elements of a table from an agent, it initiates a Get operation, followed by a series of GetNext operations.
Set	Allows the manager to set values for object variables within an agent.
Trap	Used by the agent to inform the manager of some events.

38.3.1 Supported MIBs

MIBs let administrators collect statistics and monitor status and performance. The IES-1248 supports the following MIBs:

- MIB II IF MIB and ADSL line MIB (RFC-2662)
- SNMP MIB II (RFC-1215)
- BRIDGE MIB: FDB status

The IES-1248 can also respond with specific data from the DSLAM private MIBs:

- dslam.mib
- dslam-AS-ATM.mib
- dslam-AS.mib
- dslam-AESCommon.mib
- dslam-iesCommon.mib
- ies1248.mib

38.3.2 SNMP Traps

The IES-1248 can send the following SNMP traps to an SNMP manager when an event occurs. ATUC refers to the downstream channel (for traffic going from the IES-1248 to the subscriber). ATUR refers to the upstream channel (for traffic coming from the subscriber to the IES-1248).

Table 76 SNMPv2 Traps

TRAP NAME	DESCRIPTION
coldStart	This trap is sent when the IES-1248 is turned on.
warmStart	This trap is sent when the IES-1248 restarts.
linkDown	This trap is sent when the Ethernet link is down. Enterprise specific (adsl_atuc_los) traps are sent when an ADSL link is down.
linkUp	This trap is sent when the Ethernet or ADSL link comes up.
authenticationFailure	This trap is sent when the SNMP community check fails.
reboot	This trap is sent when the system is going to reboot. The variable is the reason for the system reboot.
overheat	This trap is sent when the system is overheated. The variable is the current system temperature in Celsius.
overheatOver	This trap is sent when the system is no longer overheated. The variable is the current system temperature in Celsius.
fanRpmLow	This trap is sent when the RPM of the fan is too low. The variable is the current RPM of the fan.
fanRpmNormal	This trap is sent when the RPM of the fan is back within the normal range. The variable is the current RPM of the fan.
voltageOutOfRange	This trap is sent when the voltage of the system is out of the normal range. The variable is the current voltage of the system in volts.
voltageNormal	This trap is sent when the voltage of the system is back within the normal range. The variable is the current voltage of the system in volts.
extAlarmInputTrigger	This trap is sent when there is an external alarm input.
extAlarmInputRelease	This trap is sent when the external alarm input stops.

Table 76 SNMPv2 Traps (continued)

TRAP NAME	DESCRIPTION
thermalSensorFailure	This trap is sent when the thermal sensor fails.
adslAtucLof	This trap is sent when a Loss Of Frame is detected on the ATUC.
adslAturLof	This trap is sent when a Loss Of Frame is detected on the ATUR.
adslAtucLos	This trap is sent when a Loss Of Signal is detected on the ATUC.
adslAturLos	This trap is sent when a Loss Of Signal is detected on the ATUR.
adslAturLpr	This trap is sent when a Loss Of Power is detected on the ATUR.
adslAtucLofClear	This trap is sent when the Loss Of Frame detected on the ATUC is over.
adslAturLofClear	This trap is sent when the Loss Of Frame detected on the ATUR is over.
adslAtucLosClear	This trap is sent when the Loss Of Signal detected on the ATUC is over.
adslAturLosClear	This trap is sent when the Loss Of Signal detected on the ATUR is over.
adslAturLprClear	This trap is sent when the Loss Of Power detected on the ATUR is over.
adslAtucPerfLofsThreshTrap	The number of times a Loss Of Frame has occurred within 15 minutes for the ATUC has reached the threshold. currValue is the number of times a Loss Of Frame has occurred within the 15-minute interval.
adslAtucPerfLossThreshTrap	The number of times a Loss Of Signal has occurred within 15 minutes for the ATUC has reached the threshold. currValue is the number of times a Loss Of Signal has occurred within the 15 minute interval.
adslAtucPerfLprsThreshTrap	The number of times a Loss Of Power has occurred within 15 minutes for the ATUC has reached the threshold. currValue is the number of times a Loss Of Power has occurred within the 15-minute interval.
adslAtucPerfESsThreshTrap	The number of error seconds within 15 minutes for the ATUC has reached the threshold. currValue is the number of error seconds that have occurred within the 15-minute interval.
adslAtucPerfLolsThreshTrap	The number of times a Loss Of Link has occurred within 15 minutes for the ATUC has reached the threshold. currValue is the number of times a Loss Of Link has occurred within the 15-minute interval.
adslAturPerfLofsThreshTrap	The number of times a Loss Of Frame has occurred within 15 minutes for the ATUR has reached the threshold. currValue is the number of times a Loss Of Frame has occurred within the 15-minute interval.
adslAturPerfLossThreshTrap	The number of times a Loss Of Signal has occurred within 15 minutes for the ATUR has reached the threshold. currValue is the number of times a Loss Of Signal has occurred within the 15-minute interval.
adslAturPerfLprsThreshTrap	The number of times a Loss Of Power has occurred within 15 minutes for the ATUR has reached the threshold. currValue is the number of times a Loss Of Power has occurred within the 15-minute interval.
adslAturPerfESsThreshTrap	The number of error seconds within 15 minutes for the ATUR has reached the threshold. currValue is the number of error seconds that have occurred within the 15-minute interval.
adslAtucSesLThreshTrap	The number of severely errored seconds within 15 minutes for the ATUC has reached the threshold. currValue is the number of severely errored seconds that have occurred within the 15-minute interval.

Table 76 SNMPv2 Traps (continued)

TRAP NAME	DESCRIPTION
adslAtucUasLThreshTrap	The number of Unavailable seconds within 15 minutes for the ATUC has reached the threshold. currValue is the number of Unavailable seconds that have occurred within the 15-minute interval.
adslAturSesLThreshTrap	The number of severely errored seconds within 15 minutes for the ATUR has reached the threshold. currValue is the number of severely errored seconds that have occurred within the 15-minute interval.
adslAturUasLThreshTrap	The number of Unavailable seconds within 15 minutes for the ATUR has reached the threshold. currValue is the number of Unavailable seconds that have occurred within the 15-minute interval.

38.4 SNMP Screen

To open this screen, click **Advanced Application > Access Control > SNMP**.

Figure 128 SNMP

The following table describes the labels in this screen.

Table 77 SNMP

LABEL	DESCRIPTION
Up	Click Up to go back to the previous screen.
Get Community	Enter the get community, which is the password for the incoming Get- and GetNext- requests from the management station.
Set Community	Enter the set community, which is the password for incoming Set- requests from the management station.
Trap Community	Enter the trap community, which is the password sent with each trap to the SNMP manager.
Trap Destination 1~4	Enter the IP address of a station to send your SNMP traps to.
Port	Enter the port number upon which the station listens for SNMP traps.
Trusted Host	A "trusted host" is a computer that is allowed to use SNMP with the IES-1248. 0.0.0.0 allows any computer to use SNMP to access the IES-1248. Specify an IP address to allow only the computer with that IP address to use SNMP to access the IES-1248.

Table 77 SNMP (continued)

LABEL	DESCRIPTION
Apply	Click Apply to save your changes to the IES-1248's volatile memory. The IES-1248 loses these changes if it is turned off or loses power, so use the Config Save link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Cancel	Click Cancel to begin configuring this screen afresh.

38.5 Service Access Control Screen

To open this screen, click **Advanced Application > Access Control > Service Access Control**.

Figure 129 Service Access Control

Services	Active	Server Port
Telnet	☒	23 (1-65535)
FTP	☒	21 (1-65535)
WEB	☒	80 (1-65535)
ICMP	☒	

Apply Cancel

The following table describes the labels in this screen.

Table 78 Service Access Control

LABEL	DESCRIPTION
Up	Click Up to go back to the previous screen.
Services	Services you may use to access the IES-1248 are listed here.
Active	Select the Active check boxes for the corresponding services that you want to allow to access the IES-1248.
Server Port	For Telnet, FTP or web services, you may change the default service port by typing the new port number in the Server Port field. If you change the default port number then you will have to let people (who wish to use the service) know the new port number for that service.
Apply	Click Apply to save your changes to the IES-1248's volatile memory. The IES-1248 loses these changes if it is turned off or loses power, so use the Config Save link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Cancel	Click Cancel to begin configuring this screen afresh.

38.6 Remote Management Screen

Use this screen to configure the IP address ranges of trusted computers that may manage the IES-1248.

To open this screen, click **Advanced Application > Access Control > Secured Client**.

Figure 130 Remote Management (Secured Client Setup)

Index	Enable	Start IP Address	End IP Address	Telnet	FTP	Web	ICMP	SNMP
1	☒	0.0.0.0	223.255.255.255	☒	☒	☒	☒	☐
2	☐	0.0.0.0	0.0.0.0	☐	☐	☐	☐	☐
3	☐	0.0.0.0	0.0.0.0	☐	☐	☐	☐	☐
4	☐	0.0.0.0	0.0.0.0	☐	☐	☐	☐	☐
5	☐	0.0.0.0	0.0.0.0	☐	☐	☐	☐	☐
6	☐	0.0.0.0	0.0.0.0	☐	☐	☐	☐	☐
7	☐	0.0.0.0	0.0.0.0	☐	☐	☐	☐	☐
8	☐	0.0.0.0	0.0.0.0	☐	☐	☐	☐	☐
9	☐	0.0.0.0	0.0.0.0	☐	☐	☐	☐	☐
10	☐	0.0.0.0	0.0.0.0	☐	☐	☐	☐	☐
11	☐	0.0.0.0	0.0.0.0	☐	☐	☐	☐	☐
12	☐	0.0.0.0	0.0.0.0	☐	☐	☐	☐	☐
13	☐	0.0.0.0	0.0.0.0	☐	☐	☐	☐	☐
14	☐	0.0.0.0	0.0.0.0	☐	☐	☐	☐	☐
15	☐	0.0.0.0	0.0.0.0	☐	☐	☐	☐	☐
16	☐	0.0.0.0	0.0.0.0	☐	☐	☐	☐	☐

The following table describes the labels in this screen.

Table 79 Remote Management (Secured Client Setup)

LABEL	DESCRIPTION
Up	Click this to go back to the previous screen.
Index	This is the client set index number. A “client set” is a group of one or more “trusted computers” from which an administrator may use a service to manage the IES-1248.
Enable	Select this check box to activate this secured client set. Clear the check box if you wish to temporarily disable the set without deleting it.
Start IP Address End IP Address	Configure the IP address range of trusted computers from which you can manage the IES-1248. The IES-1248 checks if the client IP address of a computer requesting a service or protocol matches the range set here. The IES-1248 immediately disconnects the session if it does not match.
Telnet/FTP/Web/ ICMP/SNMP	Select services that may be used for managing the IES-1248 from the specified trusted computers.
Apply	Click Apply to save your changes to the IES-1248’s volatile memory. The IES-1248 loses these changes if it is turned off or loses power, so use the Config Save link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Cancel	Click Cancel to begin configuring this screen afresh.

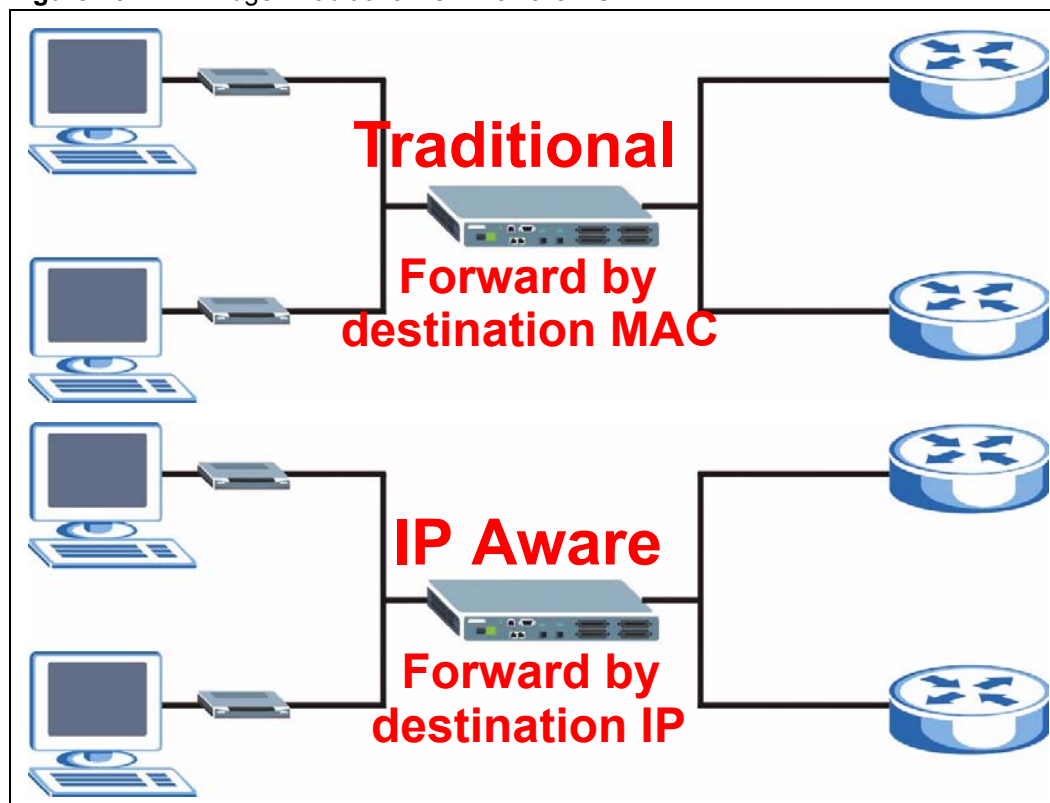
IP Bridge

This chapter explains how to set up the IP bridge function in the IES-1248.

39.1 IP Bridge Overview

The IP bridge function is designed for large-scale, flat, access networks, and it is ideal when the network is based on Ethernet. When the IP bridge is enabled, the IES-1248 forwards frames based on the destination IP address, instead of the destination MAC address, and it replaces the source MAC address with its own MAC address.

Figure 131 IP Bridge: Traditional vs. IP-aware DSLAM



The IP-aware IES-1248 does not modify the IP packet header, but it uses the destination IP address to modify the layer-2 header, in particular the source MAC address, destination MAC address, and VLAN tag. As a result, the IES-1248 prevents the MAC addresses and VLAN ID downstream of the IES-1248 (in other words, the subscribers' MAC addresses and VLAN ID) from propagating into the network upstream of the IES-1248, and vice versa.

In the end, the IP-aware IES-1248 makes the network more secure and more scalable, as explained below.

- User-to-user security. The IES-1248 does not forward subscribers' MAC addresses upstream of the IES-1248, so there is no way for subscribers to know each other's MAC addresses. This prevents the spoofing of MAC addresses and IP addresses upstream of the IES-1248.
- Scalability. The scale of access networks is typically limited by the number of MAC addresses in the network. Since the IES-1248 does not forward subscribers' MAC addresses or VLAN ID upstream, the upstream network is more scalable, and it is simpler to use the same VLAN ID upstream of several IES-1248. In addition, the IES-1248 drastically reduces the scale of ARP traffic storms.

The IES-1248 itself is transparent in the network.

39.1.1 Upstream and Downstream Traffic

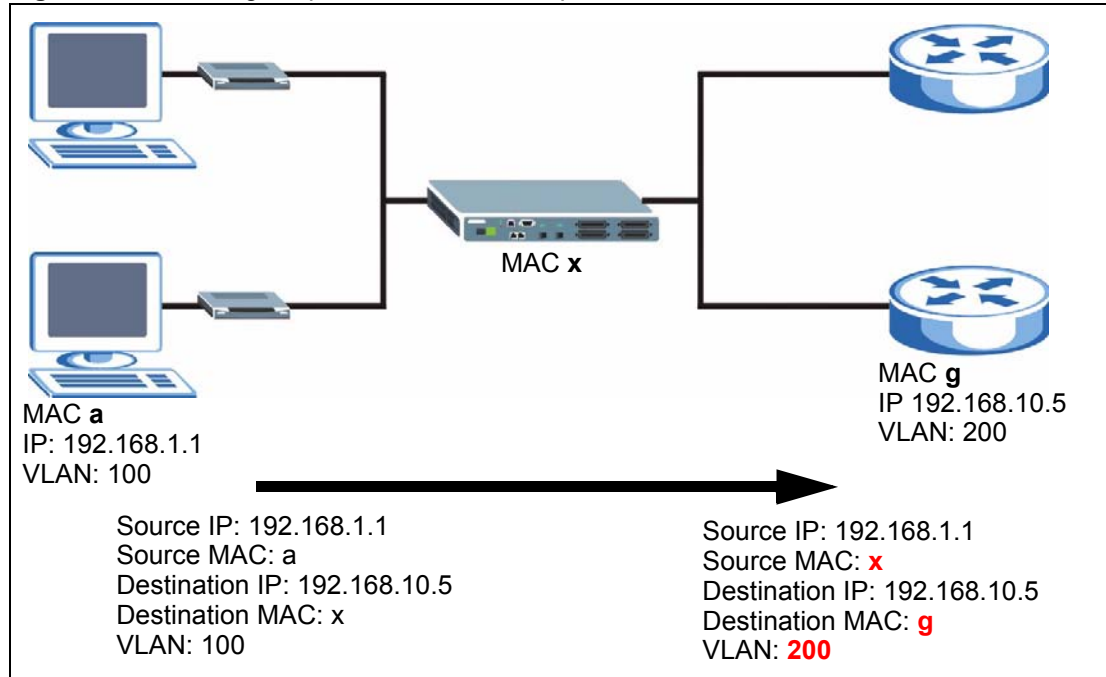
When the IES-1248 forwards upstream traffic, it makes the following changes in the layer-2 header.

Table 80 IP Bridge: Layer-2 Header for Upstream Traffic

	ORIGINAL	UPDATED
Source MAC address	Subscriber's MAC address	IES-1248's MAC address
Destination MAC address	IES-1248's MAC address	Destination IP's MAC address
VLAN ID	Subscriber's VLAN ID	Destination IP's VLAN ID

The original frame has the IES-1248's MAC address as the destination MAC address because the IES-1248, not the device that really has the destination IP, responded to the ARP request for the destination IP. (This is part of the ARP proxy feature for IP bridges.) Once the IES-1248 receives the frame, it updates the MAC addresses and VLAN ID and forwards it to the device that really has the destination IP.

This is illustrated in the following example.

Figure 132 IP Bridge: Upstream Traffic Example

Notice that the IES-1248 does not change the IP packet header.

The process is reversed but otherwise similar for downstream traffic. The IES-1248 learns how to forward frames to the appropriate subscriber from one of the following sources.

- DHCP snooping. The IP-aware IES-1248 snoops DHCP packets, so it knows what IP addresses have been assigned to subscribers.
- ARP. The IES-1248 uses ARP to find out which subscriber has a particular IP address.
- Static information. You should provide forwarding information manually for subscribers that have static IP addresses and do not respond to ARP queries.

39.1.2 IP Bridge Settings

The IP bridge function consists of the following settings.

- Domains and VLANs
- Edge routers
- Downlink interfaces
- Routing tables
- PVCs
- ARP proxy settings

Each set of settings is discussed in more detail in the following sections.

39.1.2.1 Domains and VLAN

A domain represents an ISP. Each domain is defined by (and dominates) the VLAN that are in it and has its own routing table and ARP table. As a result, two or more VLANs in different domains can use the same IP subnet, and one network can support multiple ISPs.

VLANs in IP bridges are exclusive. They can be in at most one domain. In addition, VLANs in IP bridges share the same VLAN space as regular VLANs, so VLANs in IP bridges must have different VLAN IDs than regular VLANs.

39.1.2.1.1 Configuring VLANs for Domains

To add a VLAN to a domain,

- 1 Add (Join) a new (undefined) VLAN ID to the domain.
- 2 Create the VLAN in the system using the regular screens or commands for VLANs.

To remove a VLAN from a domain,

- 1 Delete the VLAN from the system using the regular screens or commands for VLANs.
- 2 Remove (Leave) the VLAN ID from the domain.

39.1.2.2 Edge Routers

Edge routers are usually the gateways that are provided to the subscribers. They can also be gateways that are specified in static routing table entries. Each edge router, in addition to its IP address, has an associated VLAN ID. When the IES-1248 forwards a frame to an edge router, it uses this VLAN ID to replace whatever VLAN ID the subscriber specified. The IES-1248 also uses the VLAN ID to identify the domain the edge router is in.

If two edge routers are in different domains, it is possible for them to have the same IP address.

39.1.2.3 Downlink Interfaces

Downlink interfaces provide forwarding information for downstream traffic. The IES-1248 learns some of this information by snooping DHCP packets. For static IP addresses, you should provide this information manually. In this case, specify the VLAN ID and, optionally, the PVC for a range of IP addresses. The IES-1248 uses the VLAN ID to identify the domain the downlink interface is in. Downlink interfaces in the same domain cannot have overlapping IP addresses.

Since the IES-1248 creates downlink interfaces by snooping DHCP packet, if subscribers are on a different VLAN in a domain, make sure the DHCP server assigns a different range of IP addresses to these subscribers, whether or not the DHCP VLAN feature is enabled in the domain. The DHCP server can use the DHCP option 82 feature to distinguish between users and assign different IP addresses appropriately.

The DHCP server cannot assign the same or an overlapping range of IP addresses to subscribers on a different VLAN in the same domain because downlink interfaces in the same domain cannot have overlapping IP addresses.

39.1.2.4 Routing Tables

Each domain has its own routing table. Each routing table contains entries that, based on the destination IP address, control where the IES-1248 forwards packets (for upstream and downstream traffic). The IES-1248 automatically creates routing table entries for each downlink interface and for each edge router in the domain. You can create additional entries by specifying the edge router to which the IES-1248 should forward traffic for a particular destination IP address or IP subnet.

39.1.2.5 PVCs

IP bridge PVCs are similar to regular PVCs and are endpoints of the IP bridge. In addition, IP bridge PVCs are one of two types, IP over Ethernet or IP over ATM, depending on the underlying network.

The PVID is used to identify the domain the PVC is in, so the PVID must be in a domain.

39.1.2.6 ARP Proxy Settings

The IES-1248 is an ARP proxy for edge routers and subscribers in an IP bridge. You can configure basic settings for this, and you can look at (and flush, in some cases) the (PVC, MAC, IP, VID) information the IES-1248 has learned using DHCP snooping and ARP.

39.1.3 IP Bridge Configuration

Follow these steps to set up a simple IP bridge.

- 1 Create a domain. (Each domain is an ISP.)
- 2 Create one or more VLANs in the domain. (For example, one VLAN is for high-speed Internet, and another VLAN is for VoIP.)
- 3 Create the VLAN in the system using the regular screens or commands for VLANs.
- 4 Specify one or more edge routers for the domain.
- 5 Create routing table entries, so the IES-1248 forwards frames to the appropriate edge router.
- 6 Create downlink interfaces, so the IES-1248 forwards frames to the appropriate subscribers.
- 7 Create PVCs for the subscribers.

39.2 IPB PVC Screen

Use this screen to set up and maintain PVCs for subscribers in an IP bridge.

To open this screen, click **Advanced Application > IP Bridge > IPB PVC**.

Figure 133 IPB PVC

The screenshot shows the 'IPB PVC' configuration screen. At the top, there are tabs for 'IPB PVC', 'Domain', 'Edge Router', 'Downlink Interface', 'Routing Table', and 'IPB ARP Proxy'. The 'IPB PVC' tab is selected. Below the tabs, there are several input fields and checkboxes:

- Port: 1 (dropdown)
- VPI: 0 (text box)
- DS VC Profile: DEFVAL (dropdown)
- US VC Profile: - (dropdown)
- PVID: 0 (text box) with a range of (1-4094)
- Type: IPoE (dropdown)
- Super Channel: ☐
- VCI: 0 (text box)
- Priority: 0 (dropdown)

Below these fields are 'Add' and 'Cancel' buttons. Underneath is a table with the following columns: Index, Port, VPI, VCI, DS / US VC Profile, PVID, Priority, Type, and Select. The table is currently empty. Below the table are 'Delete' and 'Cancel' buttons. At the bottom right, there are 'Select All' and 'None' buttons.

The following table describes the labels in this screen.

Table 81 IPB PVC

LABEL	DESCRIPTION
Domain	Click Domain to open the screen where you can set up and maintain domains in an IP bridge (see Section 39.3 on page 265).
Edge Router	Click Edge Router to open the screen where you can set up and maintain edge routers in an IP bridge (see Section 39.4 on page 268).
Downlink Interface	Click Downlink Interface to open the screen where you can set up and maintain forwarding information for downstream traffic (see Section 39.5 on page 269).
Routing Table	Click Routing Table to open the screen where you can set up and maintain the routing table for each domain (see Section 39.6 on page 271).
IPB ARP Proxy	Click IPB ARP Proxy to open the screen where you can look at and flush the ARP table for each domain (see Section 39.7 on page 275).
Port	Use this drop-down list box to select a port for which you wish to set up an IP bridge PVC.
Super Channel	The IES-1248 forwards frames belonging to VLAN groups that are not assigned to specific channels to the super channel. Enable the super channel option to have this channel forward frames belonging to multiple VLAN groups (that are not assigned to other channels). The super channel functions in the same way as the channel in a single channel environment.
VPI	Type the Virtual Path Identifier for a channel on this port.
VCI	Type the Virtual Circuit Identifier for a channel on this port.
DS VC Profile	Use the drop-down list box to select a VC profile to use for this channel's downstream traffic shaping.
US VC Profile	Use the drop-down list box to select a VC profile to use for this channel's upstream traffic. The IES-1248 does not perform upstream traffic policing if you do not specify an upstream VC profile. Note: Upstream traffic policing should be used in conjunction with the ATM shaping feature on the subscriber's device. If the subscriber's device does not apply the appropriate ATM shaping, all upstream traffic will be discarded due to upstream traffic policing.
PVID	Type the VLAN ID to assign to frames received on this channel. This VLAN ID must be in an IP bridge domain.
Priority	Use the drop-down list box to select the priority value (0 to 7) to add to incoming frames without a (IEEE 802.1p) priority tag.
Type	Use the drop-down list box to specify whether the PVC is running on Ethernet (IPoE) or on ATM (IPoA).
Add Apply	Click this to add or save channel settings on the selected port. Clicking Add saves your changes to the IES-1248's volatile memory. The IES-1248 loses these changes if it is turned off or loses power, so use the Config Save link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Cancel	Click Cancel to start configuring the screen again.

Table 81 IPB PVC (continued)

LABEL	DESCRIPTION
Index	This field displays the number of the PVC. Click a PVC's index number to use the top of the screen to edit the PVC. Note: At the time of writing, you cannot edit the VPI and VCI. If you want to change them, add a new PVC with the desired settings. Then you can delete any unwanted PVCs.
Port	This field displays the number of the ADSL port on which the PVC is configured.
VPI/VCI	This field displays the Virtual Path Identifier (VPI) and Virtual Circuit Identifier (VCI). The VPI and VCI identify a channel on this port.
DS/US VC Profile	This shows which VC profile this channel uses for downstream traffic shaping. The VC profile for upstream policing also displays if the channel is configured to use one.
PVID	This is the VLAN ID assigned to frames received on this channel.
Priority	This is the priority value (0 to 7) added to incoming frames without a (IEEE 802.1p) priority tag.
Type	This specifies whether the PVC is running on Ethernet (ipoe) or on ATM (ipoa).
Select Delete	Select the check box in the Select column for an entry, and click Delete to remove the entry.
Cancel	Click Cancel to start configuring the screen again.
Select All	Click this to select all entries in the table.
Select None	Click this to un-select all entries in the table.

39.3 IPB Domain Screen

Use this screen to set up and maintain domains in an IP bridge. A domain represents an ISP. Each domain is defined by (and dominates) the VLAN that are in it and has its own routing table and ARP table.

To open this screen, click **Advanced Application > IP Bridge > Domain**.

Figure 134 IPB Domain

The screenshot shows the 'IPB Domain' configuration interface. At the top, there's a title bar with an orange icon and the text 'IPB Domain'. Below this, a row of tabs includes 'IPB PVC', 'Domain' (which is highlighted), 'Edge Router', 'Downlink Interface', 'Routing Table', and 'IPB ARP Proxy'. The main content area features a 'Domain Name' text input field. Directly beneath this field is an 'Add' button. At the bottom of the screen, there's a table with three columns: 'Index', 'Domain Name', and 'Select'. Below the table, there are two buttons: 'Delete' and 'Cancel'.

The following table describes the labels in this screen.

Table 82 IPB Domain

LABEL	DESCRIPTION
IPB PVC	Click IPB PVC to open the screen where you can set up and maintain PVCs for subscribers in an IP bridge (see Section 39.2 on page 263).
Edge Router	Click Edge Router to open the screen where you can set up and maintain edge routers in an IP bridge (see Section 39.4 on page 268).
Downlink Interface	Click Downlink Interface to open the screen where you can set up and maintain forwarding information for downstream traffic (see Section 39.5 on page 269).
Routing Table	Click Routing Table to open the screen where you can set up and maintain the routing table for each domain (see Section 39.6 on page 271).
IPB ARP Proxy	Click IPB ARP Proxy to open the screen where you can look at and flush the ARP table for each domain (see Section 39.7 on page 275).
Domain Name	Enter the name of the domain you want to create. You can use 1-31 printable English keyboard characters, except for right angle brackets (>). Spaces are allowed.
Add	Click Add to create the domain. It is then displayed in the summary table at the bottom of the screen. Clicking Add saves your changes to the IES-1248's volatile memory. The IES-1248 loses these changes if it is turned off or loses power, so use the Config Save link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Index	This field displays the number of the domain. Click a domain's index number to edit the VLAN that are in it. (See Section 39.3.1 on page 266 .)
Domain Name	This field displays the name of each domain.
Select Delete	Select the check box in the Select column for an entry, and click Delete to remove the entry.
Cancel	Click Cancel to start configuring the screen again.

39.3.1 Configure IPB Domain Screen

Use this screen to edit the VLANs that are in a domain.

To open this screen, click **Advanced Application > IP Bridge > Domain**, and click on the domain's **Index** number.

Figure 135 IPB Domain (Edit)

The screenshot shows the 'IPB Domain' configuration screen. At the top, there's a title bar with 'IPB Domain' and an 'Up' link. Below it, there are two input fields: 'Domain Name' (containing 'EXAMPLE.COM') and 'VLAN ID' (containing '0' with a range '(1~4094)'). To the right of these fields are 'Add' and 'Cancel' buttons. Below this is a 'DHCP VLAN' dropdown menu currently set to 'Disabled', with 'Apply' and 'Cancel' buttons to its right. At the bottom, there is a table with three columns: 'Index', 'VLAN ID', and 'Leave'. Below the table, there are four buttons: 'Delete', 'Select', 'All', and 'None'.

The following table describes the labels in this screen.

Table 83 IPB Domain (Edit)

LABEL	DESCRIPTION
Up	Click this to return to the previous screen without saving changes.
Domain Name	This field displays the name of the domain.
VLAN ID	Enter the ID of the VLAN you want to add to the domain. Use the regular VLAN screens to configure this VLAN (see Chapter 20 on page 167).
Add	Click Add to add the VLAN to the domain. It is then displayed in the summary table at the bottom of the screen. Clicking Add saves your changes to the IES-1248's volatile memory. The IES-1248 loses these changes if it is turned off or loses power, so use the Config Save link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Cancel	Click Cancel to start configuring the screen again.
DHCP VLAN	This setting has no effect on DHCP packets where the IES-1248's DHCP relay settings are active. (See Chapter 29 on page 211 . The DHCP relay settings take precedence over the IP bridge DHCP VLAN setting.) Select the VLAN where the domain's DHCP server is located. If you select a specific VLAN, the IES-1248 forwards subscribers' DHCP packets to the selected VLAN and changes the source MAC address to the IES-1248's MAC address. Select Disabled if you want the IES-1248 to not change the VLAN but still change the source MAC address to the IES-1248's MAC address in DHCP packets. Regardless of this setting, the IES-1248 still adds whatever Option 82 information is specified and enabled for the original subscriber VLAN in the DHCP relay settings. (See Chapter 29 on page 211 .) Option 82 settings for the DHCP VLAN are not considered. The IES-1248 adds Option 82 information according to the subscriber's VLAN setting, not the DHCP VLAN.
Apply	Click Apply to save the domain settings. Clicking Apply saves your changes to the IES-1248's volatile memory. The IES-1248 loses these changes if it is turned off or loses power, so use the Config Save link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Cancel	Click Cancel to start configuring the screen again.
Index	This field displays the index number of the VLAN in the domain.
VLAN ID	This field displays the ID of each VLAN in the domain.
Leave Delete	Select the check box in the Leave column for an entry, and click Delete to remove the entry. Note: You have to delete every IP bridge setting (including DHCP VLAN) that uses the selected VLAN before you can remove it from the domain.
Select All	Click this to select all entries in the table.
Select None	Click this to un-select all entries in the table.

39.4 IPB Edge Router Screen

Use this screen to set up and maintain edge routers in an IP bridge. Edge routers are usually the gateways that are provided to the subscribers. They can also be the gateways that are specified in static routing table entries. If two edge routers are in different domains, it is possible for them to have the same IP address.

To open this screen, click **Advanced Application > IP Bridge > Edge Router**.

Figure 136 IPB Edge Router

The following table describes the labels in this screen.

Table 84 IPB Edge Router

LABEL	DESCRIPTION
IPB PVC	Click IPB PVC to open the screen where you can set up and maintain PVCs for subscribers in an IP bridge (see Section 39.2 on page 263).
Domain	Click Domain to open the screen where you can set up and maintain domains in an IP bridge (see Section 39.3 on page 265).
Downlink Interface	Click Downlink Interface to open the screen where you can set up and maintain forwarding information for downstream traffic (see Section 39.5 on page 269).
Routing Table	Click Routing Table to open the screen where you can set up and maintain the routing table for each domain (see Section 39.6 on page 271).
IPB ARP Proxy	Click IPB ARP Proxy to open the screen where you can look at and flush the ARP table for each domain (see Section 39.7 on page 275).
Edge Router IP	Enter the IP address of the edge router.
NetMask	Enter the number of bits in the subnet mask of the edge router.
VID	Enter the ID of the VLAN of which the edge router is a member. The IES-1248 uses this VLAN ID when it forwards frames to the edge router. It also uses the VLAN ID to identify the domain the edge router is in. You have to add the VLAN ID to an IP bridge domain before you can enter it here.
Add	Click Add to create the edge router. It is then displayed in the summary table at the bottom of the screen. Clicking Add saves your changes to the IES-1248's volatile memory. The IES-1248 loses these changes if it is turned off or loses power, so use the Config Save link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Index	This field displays the number of the edge router.
Edge Router IP	This field displays the IP address of the edge router.
NetMask	This field displays the number of bits in the subnet mask of the edge router.

Table 84 IPB Edge Router (continued)

LABEL	DESCRIPTION
VID	This field displays the VLAN ID of the edge router.
Select Delete	Select the check box in the Select column for an entry, and click Delete to remove the entry.
Cancel	Click Cancel to start configuring the screen again.
Select All	Click this to select all entries in the table.
Select None	Click this to un-select all entries in the table.

39.5 IPB Downlink Interface Screen

Use this screen to set up and maintain forwarding information for downstream traffic. The IES-1248 learns some of this information by snooping DHCP packets. For static IP addresses, you should provide this information manually. Downlink interfaces in the same domain cannot have overlapping IP addresses.

To open this screen, click **Advanced Application > IP Bridge > Downlink Interface**.

Figure 137 IPB Downlink Interface

The following table describes the labels in this screen.

Table 85 IPB Downlink Interface

LABEL	DESCRIPTION
IPB PVC	Click IPB PVC to open the screen where you can set up and maintain PVCs for subscribers in an IP bridge (see Section 39.2 on page 263).
Domain	Click Domain to open the screen where you can set up and maintain domains in an IP bridge (see Section 39.3 on page 265).
Edge Router	Click Edge Router to open the screen where you can set up and maintain edge routers in an IP bridge (see Section 39.4 on page 268).
Routing Table	Click Routing Table to open the screen where you can set up and maintain the routing table for each domain (see Section 39.6 on page 271).
IPB ARP Proxy	Click IPB ARP Proxy to open the screen where you can look at and flush the ARP table for each domain (see Section 39.7 on page 275).
Use the top section to create downlink interfaces manually.	

Table 85 IPB Downlink Interface (continued)

LABEL	DESCRIPTION
Interface IP NetMask	Enter the IP address and the number of bits in the subnet mask that define the range of IP addresses to which this downlink interface applies. If the destination IP address of a packet is in this range, the IES-1248 tries to forward the frame to a subscriber in the specified VLAN or PVC. Downlink interfaces in the same domain cannot have overlapping IP addresses.
VID	Enter the VLAN ID the subscriber is in. The IES-1248 uses this VLAN ID when it forwards frames to the subscriber. It also uses the VLAN ID to identify the domain the downlink interface is in. You have to add the VLAN ID to an IP bridge domain before you can enter it here.
Port	Select the check box next to this field if you want the IES-1248 to forward frames to a specific channel in the specified VLAN. Use this drop-down list box to select the port for the channel. Note: Make sure you specify a valid IP bridge PVC. Do not specify PVCs that are not defined in the IPB PVC screen in Section 39.2 on page 263 .
VPI	This field is enabled if the check box next to Port is selected. Type the Virtual Path Identifier for a channel on this port.
VCI	This field is enabled if the check box next to Port is selected. Type the Virtual Circuit Identifier for a channel on this port.
Add	Click Add to create the downlink interface. It is then displayed in the summary table at the bottom of the screen. Clicking Add saves your changes to the IES-1248's volatile memory. The IES-1248 loses these changes if it is turned off or loses power, so use the Config Save link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Show Current Interfaces	Click this to look at all the forwarding information for downstream traffic, whether learned by snooping DHCP packets or provided manually. (See Section 39.5.1 on page 271 .)
The bottom section displays downlink interfaces created manually. It does not show forwarding information learned by snooping DHCP packets.	
Index	This field displays the index number of the downlink interface.
Interface IP NetMask	This field displays the IP address and the number of bits in the subnet mask that define the range of IP addresses to which this downlink interface applies. If the destination IP address of a packet is in this range, the IES-1248 tries to forward the frame to a subscriber in the specified VLAN and PVC, if any.
VID	This field displays the VLAN ID the subscriber is in.
Port	This field displays the number of the ADSL port to which the IES-1248 forwards frames. It displays "-" if the IES-1248 looks for the subscriber in the whole VLAN and not a specific PVC.
VPI/VCI	This field displays the Virtual Path Identifier (VPI) and Virtual Circuit Identifier (VCI), if any. The VPI and VCI identify a channel on this port.
Select Delete	Select the check box in the Select column for an entry, and click Delete to remove the entry.
Cancel	Click Cancel to start configuring the screen again.
Select All	Click this to select all entries in the table.
Select None	Click this to un-select all entries in the table.

39.5.1 Current Interfaces Screen

Use this screen to look at all the forwarding information for downstream traffic, whether learned by snooping DHCP packets or provided manually.

To open this screen, click **Advanced Application > IP Bridge > Downlink Interface > Show Current Interfaces**.

Figure 138 Current Interfaces

							Refresh	Close
Current Interfaces								
Index	Interface IP	NetMask	VID	Port	VPI	VCI	Type	
1	192.168.1.33	32	200	-	-	-	ipoe	
2	192.168.1.34	32	210	1	31	64	ipoa	

The following table describes the labels in this screen.

Table 86 Current Interfaces

LABEL	DESCRIPTION
Refresh	Click this to update the information in this screen.
Close	Click this to close this window.
Index	This field displays the index number of the downlink interface.
Interface IP NetMask	This field displays the IP address and the number of bits in the subnet mask that define the range of IP addresses to which this downlink interface applies. If the destination IP address of a packet is in this range, the IES-1248 tries to forward the frame to a subscriber in the specified VLAN and PVC, if any.
VID	This field displays the VLAN ID the subscriber is in.
Port	This field displays the number of the ADSL port to which the IES-1248 forwards frames. It displays "-" if the IES-1248 looks for the subscriber in the whole VLAN and not a specific PVC.
VPI/VCI	This field displays the Virtual Path Identifier (VPI) and Virtual Circuit Identifier (VCI), if any. The VPI and VCI identify a channel on this port.
Type	This field specifies whether the downlink interface is running on Ethernet (ipoe) or on ATM (ipoa).

39.6 IPB Routing Table Screen

Use this screen to set up and maintain the routing table for each domain. Each routing table contains entries that, based on the destination IP address, control where the IES-1248 forwards packets. The IES-1248 automatically creates routing table entries for each downlink interface and for each edge router in the domain that the associated VLAN is in. You can create additional entries by specifying the edge router to which the IES-1248 should forward traffic for a particular destination IP address or IP subnet.

To open this screen, click **Advanced Application > IP Bridge > Routing Table**.

Figure 139 IPB Routing Table

The following table describes the labels in this screen.

Table 87 IPB Routing Table

LABEL	DESCRIPTION
IPB PVC	Click IPB PVC to open the screen where you can set up and maintain PVCs for subscribers in an IP bridge (see Section 39.2 on page 263).
Domain	Click Domain to open the screen where you can set up and maintain domains in an IP bridge (see Section 39.3 on page 265).
Edge Router	Click Edge Router to open the screen where you can set up and maintain edge routers in an IP bridge (see Section 39.4 on page 268).
Downlink Interface	Click Downlink Interface to open the screen where you can set up and maintain forwarding information for downstream traffic (see Section 39.5 on page 269).
IPB ARP Proxy	Click IPB ARP Proxy to open the screen where you can look at and flush the ARP table for each domain (see Section 39.7 on page 275).
Use the top section to create routing table entries manually.	
Domain Name	Select the domain whose routing table you want to add this entry.
IP NetMask	Enter the IP address and the number of bits in the subnet mask that define the range of IP addresses to which this entry applies. If the destination IP address of a packet is in this range, the IES-1248 forwards the frame to the specified edge router.
Edge Router IP	Enter the IP address to which the IES-1248 forwards frames if the destination IP address of a packet is in the specified range. If this IP address corresponds to an edge router in the edge router screen (see Section 39.4 on page 268), the IES-1248 uses the associated VLAN ID. In addition, - If the edge router is in the same domain as the entry, the entry is used for upstream traffic. - If the edge router is in a different domain than the entry, the entry is used for downstream traffic. If the specified edge router is not set up in the edge router screen, the IES-1248 uses the entry for downstream traffic and does not change the VLAN ID.
Priority	Use the drop-down list box to select the priority value (0 to 7) to add to incoming frames without a (IEEE 802.1p) priority tag.

Table 87 IPB Routing Table (continued)

LABEL	DESCRIPTION
Metric	The metric represents the “cost” of transmission for routing purposes. IP routing uses hop count as the measurement of cost, with a minimum of 1 for directly-connected networks. Select the number that approximates the cost for this link. The number need not be precise, but it must be between 1 and 15. In practice, 2 or 3 is usually a good number. If two entries have the same metric, the IES-1248 uses the one with the lower IP address.
Add	Click Add to create the routing table entry. It is then displayed in the summary table at the bottom of the screen. Clicking Add saves your changes to the IES-1248’s volatile memory. The IES-1248 loses these changes if it is turned off or loses power, so use the Config Save link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Cancel	Click Cancel to start configuring the screen again.
Show Domain	Select a domain for which you wish to view information.
Show Current Routes	Click this to look at the routing table(s) for the selected domain(s). This table includes all the entries, whether added automatically by the IES-1248 or provided manually. (See Section 39.6.1 on page 273 .)
The bottom section displays routing table entries created manually. It does not show entries added automatically by the IES-1248.	
Index	This field displays the number of the entry.
Domain Name	This field displays the name of the domain to which this entry applies.
IP NetMask	This field displays the IP address and the number of bits in the subnet mask that define the range of IP addresses to which this entry applies. If the destination IP address of a packet is in this range, the IES-1248 forwards the frame to the specified edge router.
Edge Router IP	This field displays the IP address to which the IES-1248 forwards frames if the destination IP address of a packet is in the specified range.
Metric	This field displays the “cost” of transmission for routing purposes.
Priority	This field displays the priority value (0 to 7) to add to incoming frames without a (IEEE 802.1p) priority tag.
Select Delete	Select the check box in the Select column for an entry, and click Delete to remove the entry.
Cancel	Click Cancel to start configuring the screen again.
Select All	Click this to select all entries in the table.
Select None	Click this to un-select all entries in the table.

39.6.1 Current Routes Screen

Use this screen to look at the routing table for a domain. This table includes all the entries, whether added automatically by the IES-1248 or provided manually.

To open this screen, click **Advanced Application > IP Bridge > Routing Table > Show Current Routes**.

Figure 140 Current Routes

Show Domain

RefreshClose

Current Routes

Type: U is Uplink, D is Downlink

Index	Domain Name	IP	NetMask	Edge Router IP	Metric	Priority	Type
1	example1	192.168.1.250	32	-	-	-	U
2	example1	192.168.1.251	32	-	-	-	U
3	example1	192.168.1.252	32	-	-	-	U
4	example1	172.23.37.0	24	192.168.1.251	1	0	U
5	example1	0.0.0.0	0	192.168.1.250	1	0	U
6	example1	192.168.1.33	32	-	-	-	D
7	example1	192.168.1.34	32	-	-	-	D
8	example1	192.168.1.36	32	-	-	-	D
9	example1	192.168.1.37	32	-	-	-	D
10	example1	192.168.1.38	32	-	-	-	D
11	example1	192.168.1.64	28	-	-	-	D

The following table describes the labels in this screen.

Table 88 Current Routes

LABEL	DESCRIPTION
Show Domain	Select a domain for which you wish to view information.
Refresh	Click this to update the information in the screen.
Close	Click this to close this window.
Current Routes	
Index	This field displays the number of the entry.
Domain Name	This field displays the name of the domain to which this entry applies.
IP NetMask	This field displays the IP address and the number of bits in the subnet mask that define the range of IP addresses to which this entry applies. If the destination IP address of a packet is in this range, the IES-1248 forwards the frame to the specified edge router.
Edge Router IP	This field displays the IP address to which the IES-1248 forwards frames if the destination IP address of a packet is in the specified range. It displays "-" if the field does not apply to the entry (for example, in entries created automatically by the IES-1248).
Metric	This field displays the "cost" of transmission for routing purposes. It displays "-" if the field does not apply to the entry (for example, in entries created automatically by the IES-1248).
Priority	This field displays the priority value (0 to 7) to add to incoming frames without a (IEEE 802.1p) priority tag. It displays "-" if the field does not apply to the entry (for example, in entries created automatically by the IES-1248).
Type	This field indicates whether this entry is used for upstream traffic (U , or uplink interface) or downstream traffic (D , or downlink interface). By default, all entries are for downstream traffic, unless the edge router is configured in the edge router screen (see Section 39.4 on page 268).

39.7 IPB ARP Proxy Screen

Use this screen to look at and flush the Address Resolution Protocol (ARP) table for each domain. You can also configure how long the IES-1248 keeps entries in the ARP table.

To open this screen, click **Advanced Application > IP Bridge > IPB ARP Proxy**.

Figure 141 IPB ARP Proxy

IPB ARP Proxy

IPB PVC Domain Edge Router Downlink Interface Routing Table IPB ARP Proxy

Aging Time (60-10000) seconds

Apply Setting

Show Show

Page 1

Type: U is Uplink, D is Downlink

Index	IP	MAC	Port	VPI	VCI	Interface	VID	Type	Select
1	192.168.2.2	00:05:5d:03:99:3a	22	0	33	192.168.2.0/24	3	D	☐
2	192.168.2.254	00:13:49:95:03:07	50	-	-	192.168.2.254	2	U	☐

Flush

Select

The following table describes the labels in this screen.

Table 89 IPB ARP Proxy

LABEL	DESCRIPTION
IPB PVC	Click IPB PVC to open the screen where you can set up and maintain PVCs for subscribers in an IP bridge (see Section 39.2 on page 263).
Domain	Click Domain to open the screen where you can set up and maintain domains in an IP bridge (see Section 39.3 on page 265).
Edge Router	Click Edge Router to open the screen where you can set up and maintain edge routers in an IP bridge (see Section 39.4 on page 268).
Downlink Interface	Click Downlink Interface to open the screen where you can set up and maintain forwarding information for downstream traffic (see Section 39.5 on page 269).
Routing Table	Click Routing Table to open the screen where you can set up and maintain the routing table for each domain (see Section 39.6 on page 271).
Aging Time	Enter a number of seconds (10~10000) to set how long the IES-1248 keeps ARP table entries for IP bridge domains. Enter 0 to disable the aging time.
Apply Setting	Click Apply Setting to save your changes to the IES-1248's volatile memory. The IES-1248 loses these changes if it is turned off or loses power, so use the Config Save link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Show	Select the domain at whose ARP table you want to look. You can also look at the ARP table entries for a specific type of interface or a specific interface in the domain. Click Show to display the requested entries below.
Page	Click the page number you want to view.
Index	This field displays the number of the IP address entry.
IP	This field displays the IP address assigned to the specific device.
MAC	This field displays the MAC (Media Access Control) address of the device.

Table 89 IPB ARP Proxy (continued)

LABEL	DESCRIPTION
Port	This field displays the port number to which the device is connected.
VPI/VCI	This field displays the Virtual Path Identifier (VPI) and Virtual Circuit Identifier (VCI) the device is using. The VPI and VCI identify a channel on this port.
Interface	This field displays the name of the interface the device is using.
VID	This field displays the ID of the VLAN to which the device belongs.
Type	This field indicates whether this entry is used for upstream traffic (U , or uplink interface) or downstream traffic (D , or downlink interface). By default, all entries are for downstream traffic, unless the Edge Router IP is configured in the edge router screen (see Section 39.4 on page 268).
Select Flush	Select the check box in the Select column for an entry, and click Flush to remove the entry from the ARP table.
Select Uplink	Click Uplink to mark all of the check boxes for entries using uplink interfaces.
Select Downlink	Click Downlink to mark all of the check boxes for entries using downlink interfaces.
Select None	Click None to un-mark all of the check boxes.

PPPoE Intermediate Agent

This chapter describes how the IES-1248 gives a PPPoE termination server additional information that the server can use to identify and authenticate a PPPoE client.

40.1 PPPoE Intermediate Agent Tag Format

If the PPPoE Intermediate Agent is enabled, the IES-1248 adds a vendor-specific tag to PADI (PPPoE Active Discovery Initialization) and PADR (PPPoE Active Discovery Request) packets from PPPoE clients. This tag is defined in RFC 2516 and has the following format for this feature.

Table 90 PPPoE Intermediate Agent Vendor-specific Tag Format

Tag_Type (0x0105)	Tag_Len	Value	i1	i2

The Tag_Type is 0x0105 for vendor-specific tags, as defined in RFC 2516. The Tag_Len indicates the length of Value, i1 and i2. The Value is the 32-bit number 0x00000DE9, which stands for the “ADSL Forum” IANA entry. i1 and i2 are PPPoE intermediate agent sub-options, which contain additional information about the PPPoE client. The IES-1248 supports two formats for the PPPoE intermediate agent sub-options: private and TR-101.

40.1.1 Private Format

There are two types of sub-option: “Agent Circuit ID Sub-option” and “Agent Remote ID Sub-option”. They have the following formats.

Table 91 PPPoE Intermediate Agent Vendor-specific Tag Format

SubOpt (0x01)	Length	Slot ID (1 byte)	Port No (1 byte)	VLAN ID (2 bytes)	Extra Information (0~23 bytes)

Table 92 PPPoE Intermediate Agent Remote ID Sub-option Format

SubOpt (0x02)	Length	MAC (6 bytes)

The IES-1248 adds the slot ID of the PPPoE client, the port number of the PPPoE client, the VLAN ID on the PPPoE packet, and any extra information (for example, the device name) into the Agent Circuit ID Sub-option. In addition, the IES-1248 puts the PPPoE client’s MAC address into the Agent Remote ID Sub-option. The slot ID is zero, if this value is not applicable. If the IES-1248 adds extra information, it does not append a trailing 0x00 (00h).

40.1.2 TR-101 Format

The PPPoE Intermediate Agent sub-option includes the system name or IP address, slot ID, port number, VPI, and VCI on which the TCP/IP configuration request was received.

The following figure shows the format of the TR-101 PPPoE Intermediate Agent sub-option. The 1 in the first field identifies this as an Agent Circuit ID sub-option. The next field specifies the length of the field. The hostname field displays the system name, if it has been configured, the extra information field (A) if the hostname was not configured, or the IP address in dotted decimal notation (w.x.y.z), if neither the system name nor the extra information field was been configured. In either case, the hostname is truncated to 23 characters, and trailing spaces are discarded. The hostname field is followed by a space, the string “atm”, and another space. Then, a 1-byte Slot ID field specifies the ingress slot number, and a 1-byte Port No field specifies the ingress port number. Next, the VPI and VCI denote the virtual circuit that received the DHCP request message from the subscriber. If the VID is turned on, there is a colon and then the VLAN ID (1 ~ 4094). If the VID is turned off, there is neither colon nor VID.

The slot ID, port number, VPI, VCI and MAC are separated from each other by a forward slash (/) colon (:) or period (.). An example is “SYSNAME atm 3/10:0.33:12”.

Table 93 PPPoE Intermediate Agent Sub-option Format: TR-101 (VID on)

1	N	hostname / A / IP	“ atm “	Slot ID	/	Port No.	:	VPI	.	VCI	:	VLAN ID

Table 94 PPPoE Intermediate Agent Sub-option Format: TR-101 (VID off)

1	N	hostname / A / IP	“ atm “	Slot ID	/	Port No.	:	VPI	.	VCI

Unlike the private format for PPPoE intermediate agent, the TR-101 format for PPPoE intermediate agent does not include the Remote ID sub-option.

40.2 PPPoE Intermediate Agent Screen

Use this screen to configure the IES-1248 to give a PPPoE termination server additional information that the server can use to identify and authenticate a PPPoE client.

To open this screen, click **Advanced Application > PPPoE Intermediate Agent**.

Figure 142 PPPoE Intermediate Agent

PPPoE Intermediate Agent

Enable Agent ☐

VLAN ID (0~4094)

Option Mode Private

Info (Circuit ID)

Add **Cancel**

Note: The agent with VLAN ID 0 is the default agent.

Index	VLAN ID	Enable	Option Mode	Info (Circuit ID)	Select
1	0	-	private		☐

Enable **Disable** **Delete**

Select **All** **None**

The following table describes the labels in this screen.

Table 95 PPPoE Intermediate Agent

LABEL	DESCRIPTION
Enable Agent	Select this if you want the IES-1248 to add a vendor-specific tag to PADI (PPPoE Active Discovery Initialization) and PADR (PPPoE Active Discovery Request) packets from PPPoE clients in the specified VLAN. This tag contains information that a PPPoE termination server can use to identify and authenticate a PPPoE client. This information includes the slot ID, port number, VLAN ID, and MAC address of the PPPoE client, as well as any additional information specified in the Info field. Clear this if you do not want the IES-1248 to add a vendor-specific tag to PADI and PADR packets from PPPoE clients in the specified VLAN.
VLAN ID	Enter the source VLAN ID for which the PPPoE intermediate agent settings apply. Enter 0 if you want to configure the default settings for all VLAN.
Option Mode	Select either the Private or TR-101 PPPoE Intermediate Agent sub-option.
Info (Circuit ID)	Enter any extra information the IES-1248 adds to PADI and PADR packets in the specified VLAN. You can enter up to 23 printable English keyboard characters or spaces.
Add	Click Add to save the settings. The settings then display in the summary table at the bottom of the screen. Clicking Add saves your changes to the IES-1248's volatile memory. The IES-1248 loses these changes if it is turned off or loses power, so use the Config Save link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Cancel	Click Cancel to begin configuring the fields afresh.
Index	This field displays the index number of the entry.
VLAN ID	This field displays the source VLAN ID for which the PPPoE intermediate agent settings apply.
Enable	This field displays whether or not the IES-1248 adds a vendor-specific tag to PADI (PPPoE Active Discovery Initialization) and PADR (PPPoE Active Discovery Request) packets from PPPoE clients in the specified VLAN.
Option Mode	This field displays which method (Private or TR-101) is used to encode PPPoE line information in PPPoE discover packets.
Info (Circuit ID)	This field displays any extra information the IES-1248 adds to PADI and PADR packets in the specified VLAN, if the PPPoE intermediate agent is turned on.

Table 95 PPPoE Intermediate Agent (continued)

LABEL	DESCRIPTION
Select Enable	Select the check box in the Select column for an entry, and click Enable to add a vendor-specific tag to PADI and PADR packets for PPPoE clients in the selected VLAN(s).
Select Disable	Select the check box in the Select column for an entry, and click Disable to not add a vendor-specific tag to PADI and PADR packets for PPPoE clients in the selected VLAN(s).
Select Delete	Select the check box in the Select column for an entry, and click Delete to delete the PPPoE intermediate agent settings for subscribers in the selected VLAN(s). This also disables this feature for PPPoE clients in the selected VLAN(s).
Select All	Click All to mark all of the check boxes.
Select None	Click None to un-mark all of the check boxes.

Maximum MTU Size

This chapter describes how to configure the Maximum Transmission Unit (MTU) for the Ethernet interfaces. The Ethernet interfaces discard any packets larger than this.

41.1 Maximum MTU Size Screen

Use this screen to configure the Maximum Transmission Unit (MTU) for the Ethernet interfaces. The Ethernet interfaces discard any packets larger than this.

To open this screen, click **Advanced Application > Maximum MTU Size**.

Figure 143 Maximum MTU

The following table describes the labels in this screen.

Table 96 Maximum MTU

LABEL	DESCRIPTION
Maximum MTU Size	Enter the size, in bytes, of the Maximum Transmission Unit (MTU) for the Ethernet interfaces. The Ethernet interfaces discard any packets larger than this.
Apply Setting	Click Apply Setting to save your MTU settings. Clicking Apply Setting saves your changes to the IES-1248's volatile memory. The IES-1248 loses these changes if it is turned off or loses power, so use the Config Save link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.

PVC Upstream Limit

This chapter describes how to limit the transmission rate for upstream traffic by PVC.



You can set this limit for regular PVCs, priority PVCs, TLS PVCs, and IP bridge PVCs.

These limits are packet-based, not cell-based. If the limit is exceeded, the packet is discarded the moment it exceeds the limit, regardless of 802.1p priority. The IES-1248 does not check the p-bit of incoming packets from subscribers when it discards the packet.

These limits are completely managed by the IES-1248, regardless of the CPE device's settings, which makes this approach more flexible and easier for operators to deploy.

42.1 PVC Upstream Limit and Upstream VC Profiles

You can also set limits on the transmission rate for upstream traffic in upstream VC profiles, but this approach has some limitations.

- It is cell-based. If one ATM cell is lost, you lose one complete Ethernet frame from the IES-1248. In contrast, PVC upstream rate limits are packet-based. If the limit is 500 Kbps and users inject data at 600 Kbps, you can still get around 500 Kbps traffic. If you use upstream VC profiles, you might get a much lower data rate.
- The IES-1248 has to work together with the CPE device's ATM output shaping. If the CPE device does not support this or does not do it accurately, it is very easy to violate the upstream VC profile and get poor throughput through the IES-1248.

If there are limits on the transmission rate for upstream traffic both in upstream VC profiles and in this feature, the IES-1248 enforces the limit in the upstream VC profile first.

42.2 PVC Upstream Limit Screen

Use this screen to limit the transmission rate for upstream traffic by PVC.

To open this screen, click **Advanced Application > PVC Upstream Limit**.

Figure 144 PVC Upstream Limit

PVC Upstream Limit

Enable Rate Limit ☐

Rate (1-65535) kbps

Port

VPI VCI

Show Port

Index	Type	Port	VPI	VCI	Rate	Enable Rate Limit	Select
1	pvc	1	10	43	65535	-	☐
2	pvc	2	10	43	65535	-	☐
3	ppvc	2	2	2	65535	-	☐
4	pvc	3	10	43	65535	-	☐
5	pvc	4	10	43	65535	-	☐
6	pvc	5	10	43	65535	-	☐
7	pvc	6	10	43	65535	-	☐
44	pvc	44	10	43	65535	-	☐
45	pvc	45	10	43	65535	-	☐
46	pvc	46	10	43	65535	-	☐
47	pvc	47	10	43	65535	-	☐
48	pvc	48	10	43	65535	-	☐
49	pvc	49	10	43	65535	-	☐

The following table describes the labels in this screen.

Table 97 PVC Upstream Limit

LABEL	DESCRIPTION
Enable Rate Limit	Select this to set a limit on the upstream transmission rate for the specified PVC. Clear this if there is no limit.
Rate	This field has no effect unless Enable Rate Limit is selected. Enter the maximum upstream transmission rate, in kbps, for the specified PVC.
Port	Use this drop-down list box to select the port for the PVC for which you wish to configure the maximum upstream transmission rate.
VPI	Type the Virtual Path Identifier for the PVC for which you wish to configure the maximum upstream transmission rate.
VCI	Type the Virtual Circuit Identifier for the PVC for which you wish to configure the maximum upstream transmission rate.
Apply	Click Apply to save the settings. The settings then display in the summary table at the bottom of the screen. Clicking Apply saves your changes to the IES-1248's volatile memory. The IES-1248 loses these changes if it is turned off or loses power, so use the Config Save link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Cancel	Click Cancel to begin configuring the fields afresh.
Show Port	Select a port for which you wish to view information.
Index	This field displays the index number for each PVC. Click it to edit the settings for the maximum upstream transmission rate.
Type	This field displays what type of PVC the specified PVC is.
Port	This field displays the port number for the specified PVC.
VPI	This field displays the Virtual Path Identifier for the specified PVC.

Table 97 PVC Upstream Limit (continued)

LABEL	DESCRIPTION
VCI	This field displays the Virtual Circuit Identifier for the specified PVC.
Rate	This field displays the maximum upstream transmission rate for the specified PVC. This has no effect, however, unless Enable Rate Limit is enabled.
Select Enable	Select the check box in the Select column for an entry, and click Enable to activate the limit on the upstream transmission rate for the select PVC(s).
Select Disable	Select the check box in the Select column for an entry, and click Disable to deactivate the limit on the upstream transmission rate for the select PVC(s).
Select All	Click All to mark all of the check boxes.
Select None	Click None to un-mark all of the check boxes.

OUI Filter

This chapter describes the **OUI Filter** screen.

43.1 The OUI Screen

Configure an OUI (Organizationally Unique Identifier) filter to block or forward packets from devices with the specified OUI in the MAC address.

The OUI field is the first three octets in a MAC address. An OUI uniquely identifies the manufacturer of a network device and allows you to identify from which device brands the switch will accept traffic or send traffic to. The OUI value is assigned by the IANA.

Click **Advanced Application > OUI Filter** to display the following screen.

Figure 145 OUI Filter

OUI Filter

Accept Mode: accept specified OUIs but deny others.
Deny Mode: deny specified OUIs but accept others.

Port: 1 OUI: . .

Add Cancel

Port	Mode	Active	OUI	Delete
1	Accept	☐		
2	Accept	☐		
3	Accept	☐		
4	Accept	☐		
5	Accept	☐		
6	Accept	☐		
...	...	...	...	...
46	Accept	☐		
47	Accept	☐		
48	Accept	☐		

Apply

The following table describes the labels in this screen.

Table 98 OUI Filter

LABEL	DESCRIPTION
Port	Select a port for which you wish to configure packet type filtering.
OUI	Enter the first three octets of a MAC address in the format xx:xx:xx. For example, 00:AF:FF.
Add	Click this to save the OUI to the specified port.
Cancel	Click this to reset the OUI field.
Port	This displays the IES-1248's port number.
Mode	Specify the action on matched frames. Select accept to allow frames with a matched OUI field in the MAC addresses. The switch blocks frames with other OUIs not specified. Select deny to block frames with a matched OUI field in the MAC addresses. The switch allows frames with other OUIs not specified.
Active	Select this to activate this filter. Clear this check box to disable the filter without deleting it.
OUI	This displays the first three octets of a MAC address in the format xx:xx:xx.
Delete	Click this to remove the OUI filter from the port.
Apply	Click Apply to save the changes in this screen to the system's volatile memory. The system loses these changes if it is turned off or loses power, so use the Config Save on the navigation panel and then the Save button to save your changes to the non-volatile memory when you are done configuring.

PART IV

Routing Protocol, Alarm and Management

Static Routing (291)

Alarm (293)

Maintenance (301)

Diagnostic (305)

MAC Table (311)

ARP Table (313)

Static Routing

This chapter shows you how to configure the static routing function.

44.1 The Static Routing Screen

Static routes tell the IES-1248 how to forward the IES-1248's own IP traffic when you configure the TCP/IP parameters manually. This is generally useful for allowing management of the device from a device with an IP address on a different subnet from that of the device's IP address (remote management).

To open this screen, click **Routing Protocol > Static Routing**.

Figure 146 Static Routing

Static Routing

Name

Destination IP Address

IP Subnet Mask

Gateway IP Address

Metric (1-15)

Page 1 of 1

Index	Name	Destination Address	Subnet Mask	Gateway Address	Metric	Delete
-		Default	-	192.168.1.254	1	-
1		192.168.1.0	255.255.255.0	192.168.1.1	1	☐

The following table describes the labels in this screen.

Table 99 Static Routing

LABEL	DESCRIPTION
Use this section to create a new static route.	
Name	Type a name to identify this static route. Use up to 31 ASCII characters. Spaces and tabs are not allowed.
Destination IP Address	This parameter specifies the IP network address of the final destination. Routing is always based on network number. If you need to specify a route to a single host, use a subnet mask of 255.255.255.255 in the subnet mask field to force the network number to be identical to the host ID.

Table 99 Static Routing (continued)

LABEL	DESCRIPTION
IP Subnet Mask	Enter the subnet mask for this destination.
Gateway IP Address	Enter the IP address of the gateway. The gateway is an immediate neighbor of your device that will forward the packet to the destination. The gateway must be a router on the same segment as your device.
Metric	The metric represents the “cost” of transmission for routing purposes. IP routing uses hop count as the measurement of cost, with a minimum of 1 for directly connected networks. Enter a number that approximates the cost for this link. The number need not be precise, but it must be between 1 and 15. In practice, 2 or 3 is usually a good number.
Add	Click Add to save the new rule to the IES-1248’s volatile memory. It then displays in the summary table at the bottom of the screen. The IES-1248 loses these changes if it is turned off or loses power, so use the Config Save link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Cancel	Click Cancel to reset the fields to your previous configuration.
Use this section to look at a summary of all static routes in the IES-1248.	
Previous Page	Click this to display the preceding page of static route entries.
Next Page	Click this to display the following page of static route entries.
Index	This field displays the index number of the route.
Name	This field displays the name of this static route.
Destination Address	This field displays the IP network address of the final destination.
Subnet Mask	This field displays the subnet mask for this destination.
Gateway Address	This field displays the IP address of the gateway. The gateway is an immediate neighbor of your device that will forward the packet to the destination.
Metric	This field displays the cost of transmission for routing purposes.
Delete	Select the rule(s) that you want to remove in the Delete column, and then click the Delete button.
Cancel	Click Cancel to clear the selected check boxes in the Delete column.

Alarm

This chapter shows you how to display the alarms, sets the severity level of an alarm(s) and where the system is to send the alarm(s) and set port alarm severity level threshold settings.

45.1 Alarm

The IES-1248 monitors for equipment, DSL and system alarms and can report them via SNMP or syslog. You can specify the severity level of an alarm(s) and where the system is to send the alarm(s). You can also set the alarm severity threshold for recording alarms on an individual port(s). The system reports an alarm on a port if the alarm has a severity equal to or higher than the port's threshold.

45.2 Alarm Status Screen

This screen displays the alarms that are currently in the system.

To open this screen, click **Alarm > Alarm Status**.

Figure 147 Alarm Status



Alarm Status				
Alarm Status		Alarm History		
Alarm Type		Refresh Clear		
No	Alarm	Condition Source	Severity	Timestamp
1	eqpt	+fan_err eqpt 1	critical	08/05 06:30:17
2	eqpt	+fan_err eqpt 3	critical	08/05 06:30:17
3	eqpt	+fan_err eqpt 2	critical	08/05 06:30:17

Page 1 of 1

The following table describes the labels in this screen.

Table 100 Alarm Status

LABEL	DESCRIPTION
Alarm History	Click Alarm History to go to a screen where you can view a list of alarms raised. See Section 45.2.1 on page 294 .
Alarm Type	Select which type of alarms to display by Severity , or select All to look at all the alarms.

Table 100 Alarm Status (continued)

LABEL	DESCRIPTION
Refresh	Click this button to update this screen.
Clear	Click this button to erase the clearable alarm entries.
No	This field displays the index number of the alarm entry in the system.
Alarm	This field displays the alarm category to which the alarm belongs.
Condition	This field displays a text description for the condition under which the alarm applies.
Severity	This field displays the alarm severity level (critical, major, minor or info).
Timestamp	This field displays the month, day, hour, minute and second that the system created the log.
Source	This field displays where the alarm originated. This is either a DSL port number, one of the Ethernet ports (enet 1 or 2), or "eqpt" for the system itself.
Page X of X	This identifies which page of information is displayed and the total number of pages of information.
Previous	Click this to display the preceding page of entries.
Next	Click this to display the following page of entries.

45.2.1 Alarm History

This screen displays the alarms that have been raised by the IES-1248, including the severity level of an alarm(s) and the date/time when the alarm occurred.

To open this screen, click **Alarm > Alarm Status > Alarm History**.

Figure 148 Alarm Status

No	Alarm	Condition	Source	Severity	Timestamp
1	enet	up	enet 1	info	08/05 06:30:13
2	eqpt	+fan_err	eqpt 1	critical	08/05 06:30:17
3	eqpt	+fan_err	eqpt 3	critical	08/05 06:30:17
4	eqpt	+fan_err			08/05 06:30:17
16	enet	down	enet 2	major	08/05 06:52:17
17	enet	+down	enet 2	major	08/05 06:59:41
18	enet	up	enet 2	info	08/05 07:00:03
19	enet	-down	enet 2	major	08/05 07:00:03
20	enet	+down	enet 2	major	08/05 07:00:04

Page 1 of 4 Next

The following table describes the labels in this screen.

Table 101 Alarm Status

LABEL	DESCRIPTION
Alarm Status	Click Alarm Status to go to a screen where you can view the alarms currently on the system. See Section 45.2 on page 293 .
Alarm Type	Select which type of alarms to display by Severity , or select All to look at all the alarms.
Refresh	Click this button to update this screen.
Clear	Click this button to erase the clearable alarm entries.
No	This field displays the index number of the alarm entry in the system.
Alarm	This field displays the alarm category to which the alarm belongs.
Condition	This field displays a text description for the condition under which the alarm applies.
Source	This field displays where the alarm originated. This is either a DSL port number, one of the Ethernet ports (enet 1 or 2), or "eqpt" for the system itself.
Severity	This field displays the alarm severity level (critical, major, minor or info).
Timestamp	This field displays the month, day, hour, minute and second that the system created the log.
Page X of X	This identifies which page of information is displayed and the total number of pages of information.
Previous	Click this to display the preceding page of entries.
Next	Click this to display the following page of entries.

45.3 Alarm Descriptions

This table describes alarms that the system can send.

ATUC refers to the downstream channel (for traffic going from the IES-1248 to the subscriber). ATUR refers to the upstream channel (for traffic coming from the subscriber to the IES-1248). A "V" in the **CLEARABLE** column indicates that an administrator can remove the alarm.

Table 102 Alarm Descriptions

NO	ALARM	CONDITION	FACILITY	SNMP	SYSLOG	SEVERITY	CLEARABLE
1	dsl	(5000)line_up	local1	V	V	info	-
2	dsl	(5001)line_down	local1	V	V	minor	V
3	dsl	(5002)ad_perf_loI_thres h	local1	V	V	minor	V
4	dsl	(5003)ad_perf_lof_thres h	local1	V	V	minor	V
5	dsl	(5004)ad_perf_los_thres h	local1	V	V	minor	V
6	dsl	(5005)ad_perf_lop_thres h	local1	V	V	minor	V
7	dsl	(5006)ad_perf_es_thres h	local1	V	V	minor	V

Table 102 Alarm Descriptions (continued)

NO	ALARM	CONDITION	FACILITY	SNMP	SYSLOG	SEVERITY	CLEARABLE
8	dsl	(5007)ad_perf_ses_thresh	local1	V	V	minor	V
9	dsl	(5008)ad_perf_uas_thresh	local1	V	V	minor	V
10	dsl	(5009)ad_atuc_loftrap	local1	V	V	minor	-
11	dsl	(5010)ad_atuc_lostrap	local1	V	V	minor	-
12	dsl	(5011)ad_atur_loftrap	local1	V	V	minor	-
13	dsl	(5012)ad_atur_lostrap	local1	V	V	minor	-
14	dsl	(5013)ad_atur_lprtrap	local1	V	V	minor	-
15	eqpt	(10000)vol_err	local1	V	V	critical	-
16	eqpt	(10001)temp_err	local1	V	V	critical	-
17	eqpt	(10002)fan_err	local1	V	V	critical	-
18	eqpt	(10003)hw_rtc_fail	local1	V	V	critical	-
19	eqpt	(10004)hw_mon_fail	local1	V	V	critical	-
20	eqpt	(10005)cold_start	local1	V	V	info	-
21	eqpt	(10006)warm_start	local1	V	V	info	-
22	eqpt	(10007)alm_input	local1	V	V	critical	-
23	sys	(15000)reboot	local1	V	V	info	-
24	sys	(15001)aco	local1	V	V	info	-
25	sys	(15002)alm_clear	local1	V	V	info	-
26	sys	(15003)login_fail	local1	V	V	minor	V
27	sys	(15004)anti_spoofing	local1	V	V	minor	V
28	enet	(20000)up	local1	V	V	info	-
29	enet	(20001)down	local1	V	V	major	V

45.4 Alarm Event Setup Screen

This screen lists the alarms that the system can generate along with the severity levels of the alarms and where the system is to send them.

To open this screen, click **Alarm, Alarm Event Setup**.

Figure 149 Alarm Event Setup

Alarm Event Setup								
Index	Alarm	Condition Code	Condition	Facility	SNMP	Syslog	Severity	Clearable
1	dsl	5000	line_up	local1	V	V	info	-
2	dsl	5001	line_down	local1	V	V	minor	V
3	dsl	5002	ad_perf_lol_thresh	local1	V	V	minor	V
4	dsl	5003	ad_perf_lof_thresh	local1	V	V	minor	V
5	dsl	5004	ad_perf_los_thresh	local1	V	V	minor	V
6	dsl	5005	ad_perf_lop_thresh	local1	V	V	minor	V
7	dsl	5006	ad_perf_es_thresh	local1	V	V	minor	V
8	dsl	5007	ad_perf_ses_thresh	local1	V	V	minor	V
9	dsl	5008	ad_perf_uas_thresh	local1	V	V	minor	V
10	dsl	5009	ad_atuc_loftrap	local1	V	V	minor	-
11	dsl	5010	ad_atuc_lostrap	local1	V	V	minor	-
12	dsl	5011	ad_atur_loftrap	local1	V	V	minor	-
13	dsl	5012	ad_atur_lostrap	local1	V	V	minor	-
14	dsl	5013	ad_atur_lprtrap	local1	V	V	minor	-
15	eqpt	10000	vol_err	local1	V	V	critical	-
16	eqpt	10001	temp_err	local1	V	V	critical	-
17	eqpt	10002	fan_err	local1	V	V	critical	-
18	eqpt	10003	hw_rtc_fail	local1	V	V	critical	-
19	eqpt	10004	hw_mon_fail	local1	V	V	critical	-
20	eqpt	10005	cold_start	local1	V	V	info	-
21	eqpt	10006	warm_start	local1	V	V	info	-
22	eqpt	10007	alm_input	local1	V	V	critical	-
23	sys	15000	reboot	local1	V	V	info	-
24	sys	15001	acc	local1	V	V	info	-
25	sys	15002	alm_clear	local1	V	V	info	-
26	sys	15003	login_fail	local1	V	V	minor	V
27	sys	15004	anti_spoofing	local1	V	V	minor	V
28	enet	20000	up	local1	V	V	info	-
29	enet	20001	down	local1	V	V	major	V

The following table describes the labels in this screen.

Table 103 Alarm Event Setup

LABEL	DESCRIPTION
Alarm Status	Click Alarm Status to go to a screen that displays the alarms that are currently in the system (see Section 45.2 on page 293).
Alarm Port Setup	Click Alarm Port Setup to go to a screen where you can configure the alarm severity threshold for recording alarms on an individual port(s). See Section 45.5 on page 299 .
Index	This field displays the index number of the alarm in the list. Click this to specify the severity level of an alarm(s) and where the system is to send the alarm(s). See Section 45.4.1 on page 298 .
Alarm	This field displays the alarm category to which the alarm belongs. eqpt represents equipment alarms. dsl represents Digital Subscriber Line (DSL) alarms. enet represents Ethernet alarms. sys represents system alarms.
Condition Code	This field displays the condition code number for the specific alarm message.
Condition	This field displays a text description for the condition under which the alarm applies.
Facility	This field displays the log facility (local1~local7) on the syslog server where the system is to log this alarm. This is for alarms that send alarms to a syslog server.

Table 103 Alarm Event Setup (continued)

LABEL	DESCRIPTION
SNMP	This field displays “V” if the system is to send this alarm to an SNMP server. It displays “-” if the system does not send this alarm to an SNMP server.
Syslog	This field displays “V” if the system is to send this alarm to a syslog server. It displays “-” if the system does not send this alarm to a syslog server.
Severity	This field displays the alarm severity level (critical, major, minor or info).
Clearable	This displays “V” if the alarm clear command removes the alarm from the system. It displays “-” if the alarm clear command does not remove the alarm from the system.

45.4.1 Edit Alarm Event Setup Screen

Use this screen to specify the severity level of an alarm(s) and where the system is to send the alarm(s).

To open this screen, click **Alarm**, **Alarm Status**. Then, click an alarm’s index number.

Figure 150 Alarm Event Setup Edit

Alarm	Condition Code	Condition	Facility	SNMP	Syslog	Severity	Clearable
dsl	5000	line_up	Local 1	☒	☒	Info	☐

Apply Close

The following table describes the labels in this screen.

Table 104 Alarm Event Setup Edit

LABEL	DESCRIPTION
Alarm	This field displays the alarm category to which the alarm belongs. eqpt represents equipment alarms. dsl represents Digital Subscriber Line (DSL) alarms. enet represents Ethernet alarms. sys represents system alarms.
Condition Code	This field displays the condition code number for the specific alarm message.
Condition	This field displays a text description for the condition under which the alarm applies.
Facility	The log facility (local1~local7) has the device log the syslog messages to a particular file in the syslog server. Select a log facility (local1~local7) from the drop-down list box if this entry is for sending alarms to a syslog server. See your syslog program’s documentation for details.
SNMP	Select this check box to have the system send this alarm to an SNMP server.
Syslog	Select this check box to have the system send this alarm to a syslog server.
Severity	Select an alarm severity level (critical, major, minor or info) for this alarm. Critical alarms are the most severe, major alarms are the second most severe, minor alarms are the third most severe and info alarms are the least severe.
Clearable	Select this check box to allow administrators to use the management interface to remove an alarm report generated by this alarm event entry. Select this check box to keep an alarm report generated by this alarm event in the system until the conditions that caused the alarm report are no longer present.

Table 104 Alarm Event Setup Edit (continued)

LABEL	DESCRIPTION
Apply	Click Apply to save your changes to the IES-1248's volatile memory. The IES-1248 loses these changes if it is turned off or loses power, so use the Config Save link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Close	Click Close to exit the screen without saving your changes.

45.5 Alarm Port Setup Screen

Use this screen to set the alarm severity threshold for recording alarms on an individual port(s). The system reports an alarm on a port if the alarm has a severity equal to or higher than the port's threshold.

To open this screen, click **Alarm**, **Alarm Port Setup**.

Figure 151 Alarm Port Setup

Port	Severity
1	Minor
2	Minor
3	Minor
4	Minor
5	Minor
6	Minor
7	Minor
...	
43	Minor
44	Minor
45	Minor
46	Minor
47	Minor
48	Minor
Enet 1	Minor
Enet 2	Minor

Apply Cancel

The following table describes the labels in this screen.

Table 105 Alarm Port Setup

LABEL	DESCRIPTION
Alarm Status	Click Alarm Status to go to a screen that displays the alarms that are currently in the system (see Section 45.2 on page 293).
Alarm Event Setup	Click Alarm Event Setup to go to a screen where you can configure the severity level of an alarm(s) and where the system is to send the alarm(s). See Section 45.4 on page 296 .
Port	This column lists the device's individual DSL and Ethernet interfaces.

Table 105 Alarm Port Setup (continued)

LABEL	DESCRIPTION
Severity	Select an alarm severity level (critical, major, minor or info) as the threshold for reporting alarms on this port. Critical alarms are the most severe, major alarms are the second most severe, minor alarms are the third most severe and info alarms are the least severe.
Apply	Click Apply to save your changes to the IES-1248's volatile memory. The IES-1248 loses these changes if it is turned off or loses power, so use the Config Save link on the navigation panel to save your changes to the non-volatile memory when you are done configuring.
Cancel	Click Cancel to start configuring the screen again.

Maintenance

This chapter explains how to use the maintenance screens.

46.1 Maintenance Screen

To open this screen, click **Management > Maintenance**.

Figure 152 Maintenance



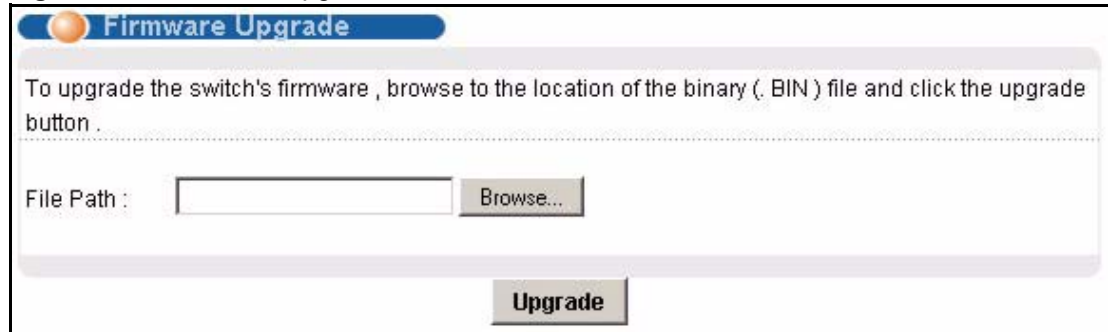
46.2 Firmware Upgrade Screen

Use this screen to upgrade your device firmware. See the **System Info** screen to verify your current firmware version number. Make sure you have downloaded (and unzipped) the correct model firmware and version to your computer before uploading to the device.



Be sure to upload the correct model firmware as uploading the wrong model firmware may damage your device.

To open this screen, click **Management > Maintenance > Click here (Firmware Upgrade)**.

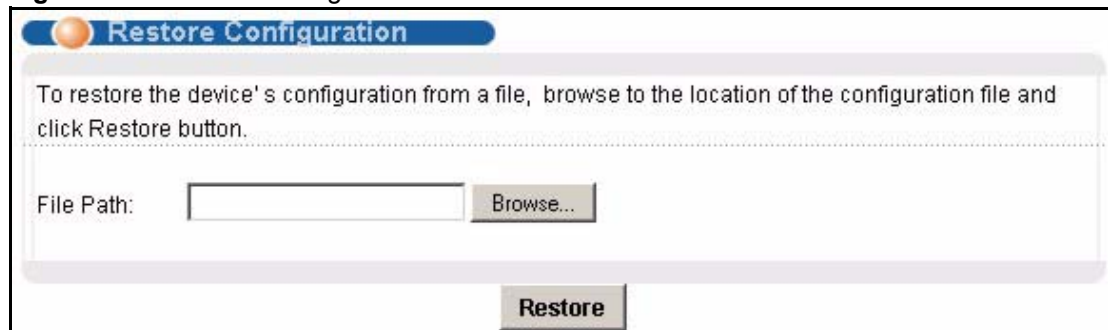
Figure 153 Firmware Upgrade


Type the path and file name of the firmware file you wish to upload to the device in the **File Path** text box or click **Browse** to locate it. After you have specified the file, click **Upgrade**.

46.3 Restore Configuration Screen

Use this screen to load a configuration file from your computer to the device.

To open this screen, click **Management > Maintenance > Click here** (Restore Text Configuration).

Figure 154 Restore Configuration


Type the path and file name of the configuration file you wish to restore in the **File Path** text box or click **Browse** to display a **Choose File** screen from which you can locate it. After you have specified the file, click **Restore**. "conf-0" is the name of the configuration file on the device, so your backup configuration file is automatically renamed when you restore using this screen.



Warning! If you load an invalid configuration file, it may corrupt the settings, and you might have to use the console to reconfigure the system.

46.4 Backing Up a Configuration File

Backing up your device configurations allows you to create various “snap shots” of your device from which you may restore at a later date.

Click **Management > Maintenance**, and do the following to save your device's configuration to your computer.

- 1 Right-click the **Click here** (Backup Text Configuration) link and click **Save Target As**.
Or:
Click the **Click here** (Backup Text Configuration) link and then click **File, Save As**.
- 2 In the **Save As** screen, choose a location to save the file on your computer from the **Save in** drop-down list box and type a descriptive name for it in the **File name** list box. Click **Save** to save the configuration file to your computer.



See the CLI chapters to edit the configuration text file.



You can change the “.dat” file to a “.txt” file and still upload it back to the IES-1248.

46.5 Load Factory Defaults

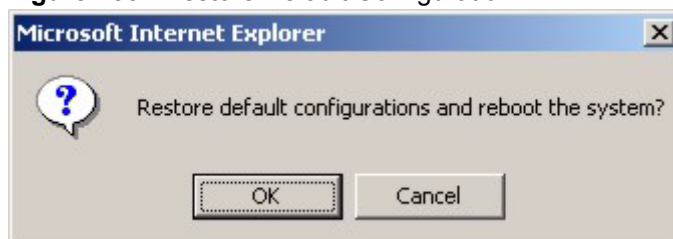
Use this function to clear all device configuration information you configured and return to the factory defaults.



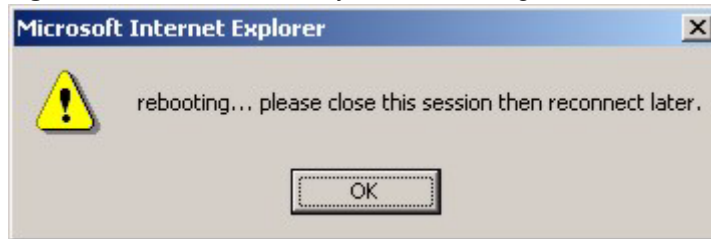
Warning! Restoring the default configuration deletes all the current settings. It is recommended to back up the configuration file before restoring the default configuration.

To do this, click **Management > Maintenance > Click here** (Restore Default Configuration).

Figure 155 Restore Default Configuration



Click **OK** to begin resetting all device configurations to the factory defaults and then wait for the device to restart. This takes up to two minutes. If you want to access the web configurator again, you may need to change the IP address of your computer to be in the same subnet as that of the default device IP address (192.168.1.1).

Figure 156 Restore Factory Default Settings, Reboot

46.6 Reboot System

Use this function to restart the device without physically turning the power off.

To open this screen, click **Management > Maintenance > Click here (Reboot System)**.

Figure 157 Reboot System

Click **OK**. You then see the screen as shown in [Figure 156 on page 304](#). Click **OK** again and wait for the device to restart. This takes up to two minutes. This does not affect the device's configuration.

46.7 Command Line FTP

See [Chapter 61 on page 431](#) for how to upload or download files to or from the device using FTP commands.

Diagnostic

This chapter explains the Diagnostic screens.

47.1 Diagnostic Screen

Use this screen to check system logs, ping IP addresses or perform loopback tests.

To open this screen, click **Management > Diagnostic**.

Figure 158 Diagnostic

The screenshot shows the 'Diagnostic' screen with a title bar containing an orange sphere icon and the word 'Diagnostic'. Below the title bar is a large, empty white area with a vertical scrollbar on the right. At the bottom of the screen is a control panel with several sections:

- Syslog/ Event Log**: Includes 'Display' and 'Clear' buttons.
- IP Ping**: Includes an 'IP Address' field with '0.0.0.0', a 'Ping' button, and a '1' in a box followed by 'Times(1-10)'.
- Loopback Test**: Includes 'Port' (1), 'VPI' (0), 'VCI' (0), and an 'OAM F5 Loopback' button.
- LDM Test**: Includes 'Port' (1), 'Set LDM Port' button, 'Get LDM Data(raw)' button, and 'Get LDM Data(992.3)' button.
- SELT**: Includes 'Port' (1), 'Set SELT Port' button, and 'Get SELT Data' button.
- PMM**: Includes 'Port' (1), 'Mode' (I0), 'Set PMM Mode' button, and 'Get PMM Mode' button.
- ToneDiag**: Includes 'Port' (1) and 'Get ToneDiag data' button.

The following table describes the labels in this screen.

Table 106 Diagnostic

LABEL	DESCRIPTION
Syslog/ Event Log	Click Display to display a log of events in the multi-line text box. Click Clear to empty the text box and reset the log.
IP Ping	Type the IP address of a device that you want to ping in order to test a connection. In the field to the right specify the number of times that you want to ping the IP address. Click Ping to have the device ping the IP address (in the field to the left).
Loopback Test	Select a port number from the Port drop-down list box and enter a VPI/VCI to specify a PVC. Click OAM F5 Loopback to perform an OAMF5 loopback test on the specified DSL port. An Operational, Administration and Maintenance Function 5 test is used to test the connection between two DSL devices. First, the DSL devices establish a virtual circuit. Then the local device sends an ATM F5 cell to be returned by the remote DSL device (both DSL devices must support ATM F5 in order to use this test). The results ("Passed" or "Failed") display in the multi-line text box.
LDM Test	Select a port number from the Port drop-down list box and click Set LDM Port to have the IES-1248 perform line diagnostics on the specified port. The ADSL port must be set to ADSL2 or ADSL2+ ADSL operational mode and have a connection. It takes about one minute for the line diagnostics to finish. The screen displays a message confirming upon which ADSL port line diagnostics will be performed. Click Get LDM Data to display the line diagnostics results after using the Set LDM Port button on an ADSL port. Use the line diagnostics results to analyze problems with the physical ADSL line. Click Get LDM Data(raw) to display the unformatted line diagnostics results. Click Get LDM Data(992.3) to display the line diagnostics results in the format defined in the ITU-T G.992.3 standard. Note: Wait at least one minute after using Set LDM Port before using Get LDM Data.
SELT	Select a port number from the Port drop-down list box and click Set SELT Port to perform a Single End Loop Test (SELT) on the specified port. This test checks the distance to the subscriber's location. Note: The port must have an open loop. There cannot be a DSL device, phone, fax machine or other device connected to the subscriber's end of the telephone line. The SELT takes at least fifteen seconds. To check the status of the SELT or to look at the results when the SELT is complete, select a port number from the Port drop-down list box and click Get SELT Data . The results tell you what gauge of telephone wire is connected to the port and the approximate length of the line.

Table 106 Diagnostic (continued)

LABEL	DESCRIPTION
PMM	Select a port number from the Port drop-down list box and a power management mode from the Mode drop-down list box and click Set PMM Mode to have the specified port use the specified power management mode. Select L0 to turn off power management on the port. Select L2 to scale back the power usage to just support the transmission rate that the subscriber is using. Select L2 to have the ADSL connection use power saving mode and reduce the rate when there is no traffic. The rate comes back up when there is traffic. The ADSL port must be set to ADSL2 or ADSL2+ ADSL operational mode. Click Get PMM Mode to display which power mode the ADSL port is currently set to use.
ToneDiag	Select a port number from the Port drop-down list box. The ADSL port must be set to ADSL2 or ADSL2+ ADSL operational mode and have a connection. Click Get ToneDiag data to display the ADSL port's tone diagnostics. The tone diagnostic information displays in the format defined in the ITU-T G.992.3 standard. Use the information to analyze problems with the physical ADSL line. Note: ToneDiag is faster than the LDM test but displays less information.

47.2 Log Format

The common format of the system logs is: <item no> <time> <process> <type> <log message>.

Table 107 Log Format

LABEL	DESCRIPTION
<item no>	This is the index number of the log entry.
<time>	This is the time and date when the log was created.
<process>	This is the process that created the log.
<type>	This identifies what kind of log it is. "INFO" identifies an information log. "WARN" identifies a warning log.
<log message>	This is the log's detailed information (see Table 108 on page 308).

47.2.1 Log Messages

The following table lists and describes the system log messages.

Table 108 Log Messages

LOG MESSAGE	TYPE	DESCRIPTION
ADSL <port> Link Up (SN=<seq no>) : <ds rate>/<us rate>! or ADSL Link Info: NM:<ds NM>/<us NM>!	INFO	An ADSL port established a connection. <port> - port number <seq no> - sequence number of the connection <ds rate> - downstream rate <us rate> - upstream rate <us NM> - upstream noise margin <ds NM> - downstream noise margin
ADSL <port> Link Down (SN=<seq no>) !	WARN	An ADSL port lost its connection. <port> - port number <seq no> - sequence number of the connection
Session Begin!	INFO	A console, telnet or FTP session has begun (see the <process> field for the type of session).
Session End!	INFO	A console telnet or FTP session has terminated (see the <process> field for the type of session).
Incorrect Password!	WARN	Someone attempted to use the wrong password to start a console, telnet or FTP session (see the <process> field for the type of session).
Received Firmware Checksum Error!	WARN	A checksum error was detected during an attempted FTP firmware upload.
Received Firmware Size too large!	WARN	The file size was too large with an attempted FTP firmware upload.
Received Firmware Invalid!	WARN	Someone attempted to upload a firmware file with a wrong identity via FTP.
Received File <file>!	INFO	A file was uploaded to the IES-1248 by FTP. <file> - received file's name
THERMO OVER TEMPERATURE: dev:<id> threshold:<threshold> (degree C) value:<temp>(degree C) !	WARN	The temperature was too high at one of the temperature sensors. <id> - 0: sensor near the ADSL chipset 1: sensor near the CPU 2: thermal sensor chip itself <threshold> - threshold temperature <temp> - temperature when the entry was logged
THERMO OVER TEMPERATURE released: dev:<id> threshold:<threshold> (degree C) value:<temp>(degree C) !	INFO	The temperature at one of the temperature sensors has come back to normal. <id> 0: sensor near the ADSL chipset 1: sensor near the CPU 2: thermal sensor chip itself <threshold> - threshold temperature <temp> - temperature when the entry was logged

Table 108 Log Messages (continued)

LOG MESSAGE	TYPE	DESCRIPTION
THERMO OVER VOLTAGE: nominal:<nominal>(mV) value:<voltage> mV)!	WARN	The voltage went outside of the accepted operating range. <nominal> - nominal voltage of the DC power <voltage> - voltage of the DC power when logged
THERMO OVER VOLTAGE released: nominal:<nominal>(mV) value:<voltage> (mV)!	INFO	The voltage is back inside the accepted operating range. <nominal> - nominal voltage of the DC power <voltage> - voltage of the DC power when logged

47.3 LDM Test Parameters

The following table lists the line diagnostics test parameters that display, see the ITU-T's G.992.3 for more information.

Table 109 LDM Test Parameters

LABEL	DESCRIPTION
number_of_subcarriers	Discrete Multi-Tone (DMT) modulation divides up a line's bandwidth into sub-carriers (sub-channels) of 4.3125 KHz each. The first number is the total number of DMT sub-carriers the ADSL connection is using. The second number indicates how many upstream DMT sub-carriers the ADSL connection is using.
hlinScale:	The channel characteristics function is represented in linear format by a scale factor and a complex number. These are the maximum upstream and downstream scale factors used in producing the channel characteristics function.
latn:	This is the upstream and downstream Line Attenuation (in dB).
satn:	This is the upstream and downstream Signal Attenuation (in dB).
snrm:	This is the upstream and downstream Signal-to-Noise Ratio Margin (in dB). A DMT sub-carrier's SNR is the ratio between the received signal power and the received noise power. The signal-to-noise ratio margin is the maximum that the received noise power could increase with the IES-1248 still being able to meet its transmission targets.
attnr:	This is the upstream and downstream Attainable Net Data Rate (in bit/s).
farEndActatp:	This is the upstream and downstream Far End Actual Aggregate Transmit Power (in dBm)
i	This is the index number of the DMT sub-carrier.
li.rl	The channel characteristics function is represented in linear format by a scale factor and a complex number. This is the real part of the complex number used in producing the channel characteristics function for this sub-carrier.
li.im	The channel characteristics function is represented in linear format by a scale factor and a complex number. This is the imaginary part of the complex number used in producing the channel characteristics function for this sub-carrier
log	This is a format for providing channel characteristics. It provides magnitude values in a logarithmic scale. This can be used in analyzing the physical condition of the ADSL line.

Table 109 LDM Test Parameters (continued)

LABEL	DESCRIPTION
QLN	The Quiet Line Noise for a DMT sub-carrier is the rms (root mean square) level of the noise present on the line, when no ADSL signals are present. It is measured in dBm/Hz. The QLN can be used in analyzing crosstalk.
SNR	This is the upstream and downstream Signal-to-Noise Ratio (in dB). A DMT sub-carrier's SNR is the ratio between the received signal power and the received noise power. The SNR can be used in analyzing time dependent changes in crosstalk levels and line attenuation (such as those caused by temperature variations and moisture).

47.4 ToneDiag Parameters

The following table lists the tone diagnostic parameters that display, see the ITU-T's G.992.3 for more information.

Table 110 ToneDiag Parameters

LABEL	DESCRIPTION
number_of_subcarriers	Discrete Multi-Tone (DMT) modulation divides up a line's bandwidth into sub-carriers (sub-channels) of 4.3125 KHz each. This number indicates how many upstream and downstream DMT sub-carriers the ADSL connection is using.
hlinScale:	The channel characteristics function is represented in linear format by a scale factor and a complex number. This is the maximum upstream and downstream scale factor used in producing the channel characteristics function.
latn:	This is the upstream and downstream Line Attenuation (in dB).
satn:	This is the upstream and downstream Signal Attenuation (in dB).
snrm:	This is the upstream and downstream Signal-to-Noise Ratio Margin (in dB). A DMT sub-carrier's SNR is the ratio between the received signal power and the received noise power. The signal-to-noise ratio margin is the maximum that the received noise power could increase with the IES-1248 still being able to meet its transmission targets.
attnDr:	This is the upstream and downstream Attainable Net Data Rate (in bit/s).
farEndActatp:	This is the upstream and downstream Far End Actual Aggregate Transmit Power (in dBm)
i	This is the index number of the DMT sub-carrier.
log (dB)	This is a format for providing channel characteristics. It provides magnitude values in a logarithmic scale. This can be used in analyzing the physical condition of the ADSL line.
QLN (dBm)	The Quiet Line Noise for a DMT sub-carrier is the rms (root mean square) level of the noise present on the line, when no ADSL signals are present. It is measured in dBm/Hz. The QLN can be used in analyzing crosstalk.
SNR (dB)	This is the upstream and downstream Signal-to-Noise Ratio (in dB). A DMT sub-carrier's SNR is the ratio between the received signal power and the received noise power. The SNR can be used in analyzing time dependent changes in crosstalk levels and line attenuation (such as those caused by temperature variations and moisture).

MAC Table

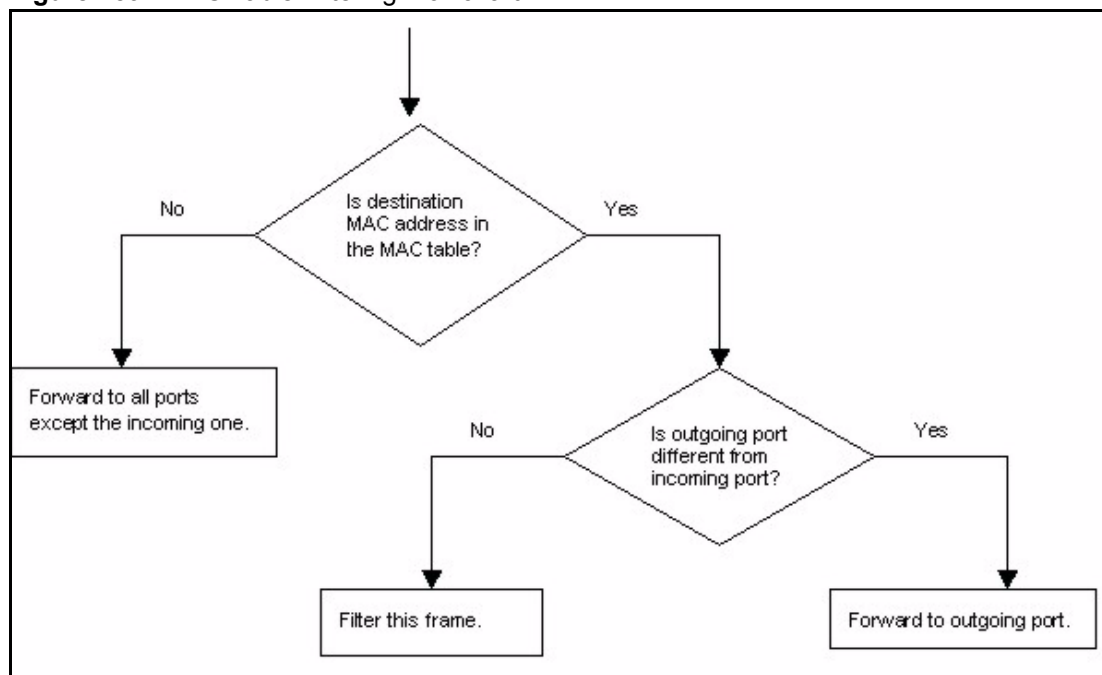
This chapter introduces the MAC Table.

48.1 Introduction to MAC Table

The MAC table lists device MAC addresses that are dynamically learned by the IES-1248. The table shows the following for each MAC address: the port upon which Ethernet frames were received from the device, to which VLAN groups the device belongs (if any) and to which channel it is connected (for devices connected to DSL ports).

The device uses the MAC table to determine how to forward frames. See the following figure.

Figure 159 MAC Table Filtering Flowchart



- 1 The device examines a received frame and learns the port on which this source MAC address came.
- 2 The device checks to see if the frame's destination MAC address matches a source MAC address already learned in the MAC table.
 - If the device has already learned the port for this MAC address, then it forwards the frame to that port.

- If the device has not already learned the port for this MAC address, then the frame is flooded to all ports. Too much port flooding leads to network congestion.
- If the device has already learned the port for this MAC address, but the destination port is the same as the port it came in on, then it filters the frame.

48.2 MAC Table Screen

To open this screen, click **Management > MAC Table**.

Figure 160 MAC Table

The screenshot shows the 'MAC Table' screen with a title bar and a search section. The search section includes a 'Show port' dropdown menu set to 'ALL', a 'Query VID' input field, and a 'Set' button. Below the search section, it displays 'Refresh time: 11:21:32 2009/08/06'. The main area contains a table with four columns: Index, Port, VID, and MAC. The table lists 12 entries, all with 'Enet 1' as the port and '1' as the VID. At the bottom of the screen, there are 'Refresh' and 'Flush' buttons.

Index	Port	VID	MAC
1	Enet 1	1	00:04:80:9b:78:00
2	Enet 1	1	00:05:5d:69:a7:4f
3	Enet 1	1	00:07:40:ca:45:e9
4	Enet 1	1	00:0b:5d:78:40:29
5	Enet 1	1	00:0b:cd:94:89:b2
6	Enet 1	1	00:0d:9d:9f:ae:e1
7	Enet 1	1	00:0d:9d:9f:ae:eb
8	Enet 1	1	00:0d:9d:d9:43:3b
9	Enet 1	1	00:0e:7f:a8:90:13
10	Enet 1	1	00:0e:7f:a9:80:70
11	Enet 1	1	00:0f:fe:09:c5:f8
12	Enet 1	1	00:0f:fe:09:c9:94

The following table describes the labels in this screen.

Table 111 MAC Table

LABEL	DESCRIPTION
Show port	Select a port for which to display learned MAC addresses (or display all of them).
Query VID	Enter the VID for which you want to see the MAC table.
Page X of X	This identifies which page of information is displayed and the total number of pages of information.
Previous/Next	Click one of these buttons to show the previous/next screen if all of the information cannot be seen in one screen.
Index	This is the number of the MAC table entry.
Port	This is the port to which the MAC address is associated.
MAC	This is the MAC address of the device from which this incoming frame came.
Refresh	Click Refresh to update the list of dynamically learned MAC addresses.
Flush	Click Flush to remove all of the dynamically learned MAC address entries from the MAC table.

ARP Table

This chapter describes the ARP Table.

49.1 Introduction to ARP Table

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

An IP (version 4) address is 32 bits long. In an Ethernet LAN, MAC addresses are 48 bits long. The ARP Table maintains an association between each MAC address and its corresponding IP address.

49.1.1 How ARP Works

When an incoming packet destined for a host device on a local area network arrives at the device, the device's ARP program looks in the ARP Table and, if it finds the address, sends it to the device.

If no entry is found for the IP address, ARP broadcasts the request to all the devices on the LAN. The device fills in its own MAC and IP address in the sender address fields, and puts the known IP address of the target in the target IP address field. In addition, the device puts all ones in the target MAC field (FF.FF.FF.FF.FF.FF is the Ethernet broadcast address). The replying device (which is either the IP address of the device being sought or the router that knows the way) replaces the broadcast address with the target's MAC address, swaps the sender and target pairs, and unicasts the answer directly back to the requesting machine. ARP updates the ARP Table for future reference and then sends the packet to the MAC address that replied.

49.2 ARP Table Screen

The ARP table can hold up to 500 entries.

To open this screen, click **Management > ARP Table**.

Figure 161 ARP Table

ARP Table		
Flush Total 1 ARP entries		
Page 1 of 1		
Index	IP Address	MAC Address
1	192.168.1.33	00:50:8d:48:59:1f
Previous Page Next Page		

The following table describes the labels in this screen.

Table 112 ARP Table

LABEL	DESCRIPTION
Flush	Click Flush to remove all of the entries from the ARP table.
Total X ARP Entries	This displays the number of entries in the ARP table.
Page X of X	This identifies which page of information is displayed and the total number of pages of information.
Index	This is the ARP table entry number.
IP Address	This is the learned IP address of a device connected to a port.
MAC Address	This is the MAC address of the device with the listed IP address.
Previous Page Next Page	Click one of these buttons to show the preceding or following screen if the information cannot be displayed in one screen.

PART V

Commands and Troubleshooting

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Commands

This chapter introduces the command line interface and lists the available commands.

50.1 Command Line Interface Overview



See the earlier chapters for background information on features configurable by the web configurator. The web configurator is the preferred configuration tool.

You can use text command lines for software configuration. The rules of the commands are listed next.

- 1 The command keywords are in `courier new` font.
- 2 Commands can be abbreviated to the smallest unique string that differentiates the command. For example, the “`system date`” command could be abbreviated to “`sy d`”.
- 3 The optional fields in a command are enclosed in square brackets []. For instance, `config [save]` means that the `save` field is optional.
- 4 “Command” refers to a command used in the command line interface (CI command).
- 5 The | symbol means “or”.



Using commands not documented in the User’s Guide can damage the unit and possibly render it unusable.

50.2 Command Privilege Levels

There is a high, middle or low privilege level for each command.

High privilege commands are only available to administrators with high privilege access. High privilege commands include things like creating administrator accounts, restarting the system and resetting the factory defaults. Administrators with high privilege access can use all commands including the lower privilege commands.

Administrators with middle privilege access can use middle or low privilege commands.

Administrators with the low privilege level are restricted to using only low privilege commands. Low privilege commands are read-only.

50.3 Saving Your Configuration

Use the following command to save your configuration when you are done with a configuration session.

```
ras> config save
```



Do not turn off your IES-1248 while saving your configuration.

This command saves all system configurations to nonvolatile memory. You must use this command to save any configuration changes that you make, otherwise the IES-1248 returns to its default settings when it is restarted. Save your changes after each configuration session.

Nonvolatile memory refers to the IES-1248's storage that remains even if the IES-1248's power is turned off. Run-time (memory) is lost when the IES-1248's power is turned off.

50.4 Commands

The following table lists commands that you can use with the IES-1248.

The **P** column on the right indicates the administrator privilege level needed to use the command (**H** for high, **M** for middle or **L** for low) and the equivalent in the web configurator (**H** for high or **L** for low).

Table 113 Commands

CLASS	COMMAND	PARAMETERS	DESCRIPTION	P
sys				
	client disable	<index>	Turns off a secure client.	H/H
	client enable	<index>	Turns on a secure client.	H/H
	client set	<index> <start ip> <end ip> [[telnet] [ftp] [web] [icmp] [snmp]]	Sets a secured client set: a range of IP addresses from which you can manage the device and the protocols that can be used.	H/H
	client show		Displays the device's secured client settings.	M/L
	date set	<yyyy mm dd>	Sets the system's date.	H/H
	date show		Displays the system's current date.	L/L
	info contact	<contact>	Sets contact person information.	L/L
	info hostname	<hostname>	Sets the system name.	M/L

Table 113 Commands (continued)

CLASS	COMMAND	PARAMETERS	DESCRIPTION	P
	info location	<location>	Sets location information.	L/L
	info show		Displays general system information.	L/L
	log clear		Clears the device's logs.	H/H
	log show		Displays the device's logs.	M/L
	monitor disable		Turns the hardware monitor off.	H/H
	monitor enable		Turns the hardware monitor on.	H/H
	monitor extalm	<idx> <name>	Set external alarm name.	H/H
	monitor flimit	<idx> <high> <low>	Sets the maximum (<high>) or minimum (<low>) fan revs per minute (RPM) at the specified fan (<idx>). Idx: 1=Fan 1, 2=Fan 2, 3=Fan 3.	H/H
	monitor show		Displays the hardware monitor's statistics.	L/L
	monitor tlimit	<idx> <high> <low>	Sets the maximum (<high>) or minimum (<low>) temperature at the specified temperature sensor. You can specify a temperature with up to three digits after a decimal point (-50.025 for example). Temperature sensor locations: Idx: 1=DSL, 2=CPU, 3=HW monitor	H/H
	monitor vlimit	<idx> <high> <low>	Sets the maximum (<high>) or minimum (<low>) voltage at the specified voltage sensor. You can specify a voltage with up to three digits after a decimal point (0.941 for example). Normal voltage at each sensor: Idx: 1=1.2v, 2=1.8v, 3=3.3v, 4=24v	H/H
	passwd		Sets the user password.	H/H
	reboot	[show sec cancel]	Sets the reboot timer or displays the timer and remaining time for reboot. If a reboot has been scheduled, use this command to prevent a reboot.	H/H
	server disable	<telnet ftp web icmp>	Turns off a service.	H/H
	server enable	<telnet ftp web icmp>	Turns on a service.	H/H
	server port	<telnet ftp web icmp>	Sets a port for a service.	H/H
	server show		Displays the device's service status and port numbers.	M/L
	snmp getcommunity	<community>	Sets the SNMP GetRequest community.	H/H

Table 113 Commands (continued)

CLASS	COMMAND	PARAMETERS	DESCRIPTION	P
	snmp setcommunity	<community>	Sets the SNMP SetRequest community.	H/H
	snmp show		Displays SNMP settings.	H/H
	snmp trapcommunity	<community>	Sets the SNMP Trap community.	H/H
	snmp trapdst del	<index>	Deletes the SNMP trap server	H/H
	snmp trapdst set	<index> <ip> [<port>]	Specifies the IP address (and port number) of a trap server to which the IES-1248 sends SNMP traps. If you leave the trap destination set to 0.0.0.0 (default), the IES-1248 will not send any SNMP traps. <index>: The number of the trap server (1~4). [<port>]: The port number upon which the trap server listens for SNMP traps. The IES-1248 uses the default of 162 if you do not specify a trap port.	H/H
	snmp trusthost	<ip>	Specifies the IP address of a trusted host. If you enter a specific IP address, the IES-1248 will only respond to SNMP messages from this address. You can use the <code>sys client set</code> command to specify additional IP addresses, if necessary. If you specify 0.0.0.0, the IES-1248 responds to all SNMP messages it receives, regardless of the settings for the <code>sys client set</code> command.	H/H
	stdio set	<minute 0:no timeout>	Sets the console timeout period in minutes. 0:no timeout	H/H
	stdio show		Displays Current Stdio Timeout.	L/L
	syslog disable		Turns off the syslog logging.	H/H
	syslog enable		Turns on the syslog logging.	H/H
	syslog server	<ip>	Sets the IP address of the syslog server.	H/H
	syslog show		Displays the syslog settings.	M/L
	time set	<hh> [<mm> [<ss>]]	Sets the system's time.	H/H
	time show		Displays the system's current time.	L/L
	timeserver set	<none>	Sets the system to not use a time server.	H/H
	timeserver set	<daytime time ntp> <ip> <utc[<+ ->0100~1200]> [nosync]	Sets the time service protocol, time server's IP address and the device's time zone.	H/H

Table 113 Commands (continued)

CLASS	COMMAND	PARAMETERS	DESCRIPTION	P
	timeserver show		Displays the system's time server.	M/L
	timeserver sync		Retrieves the date and time from the time server.	H/H
	user auth	<local radius land r>	Set authentication method.	H/H
	user delete	<name>	Removes the specified user name of multi-login.	H/H
	user disable	<name>	Turns off the specified user name of multi-login.	H/H
	user enable	<name>	Turns on the specified user name of multi-login.	H/H
	user online		Displays online user info.	M/~
	User server	<ip> <port> <secret> [high middle low d eny]	Set remote authentication server IP address and secret	H/H
	user set	<username> <password> <high middle low>	Creates or edits the password and privilege level of the specified user name.	H/H
	user show		Displays the authentication mode, RADIUS server settings and user info.	M/L
	wdog set	<msec 0:disable>	Sets the watchdog count. 0 turns the watchdog off.	H/~
	wdog show		Displays the current watchdog firmware protection feature status and timer.	H/~
adsl				
	alarmprofile delete	<profile>	This command allows you to delete an individual ADSL alarm profile by its name. You cannot delete the DEFVAL alarm profile.	H/H
	alarmprofile map	<portlist> <profile>	Sets the IES-1248 to use an (already-configured) alarm profile with the specified ADSL ports.	H/H

Table 113 Commands (continued)

CLASS	COMMAND	PARAMETERS	DESCRIPTION	P
	alarmprofile set	<profile> [<atuc lofs> <atur lofs> <atuc loss> <atur loss> <atuc olls> <atur lprs> <atur lprs> <atuc ess> <atur ess> <atuc fast rateup> <atur fast rateup> <atuc interleave rateup> <atur interleave rateup> <atuc fast ratedown> <atur fast ratedown> <atuc interleave ratedown> <atur interleave ratedown> <init fail enable> <atuc fail fast> <atuc ses> <atur ses> <atuc uas> <atur uas>]	This command configures settings and thresholds that define when the IES-1248 is to send an alarm trap and generate a syslog entry. Configure alarm profiles first and then use the alarmprofile map command to set the IES-1248 to use them with specific ADSL ports.	H/H
	alarmprofile show	[profile]	Displays alarm profiles and their settings.	L/L
	alarmprofile showmap	[port number]	Displays alarm profile to ADSL port mapping.	L/L
	alarmprofile showport	<port number>	Displays which alarm profile parameters are mapped to an ADSL port.	L/~
	annexl disable	<portlist>	(IES-1248-51, IES-1248-51A) Turns off the Annex L feature on the specified port(s).	H/H
	annexl enable	<portlist>	(IES-1248-51, IES-1248-51A) Turns on the Annex L feature on the specified port(s).	H/H
	annexl show	<portlist>	(IES-1248-51, IES-1248-51A) Displays the Annex L feature setting for the specified port(s).	M/L
	annexm disable	<portlist>	(IES-1248-51, IES-1248-51A) Turns off the Annex M feature on the specified port(s).	H/H
	annexm enable	<portlist>	(IES-1248-51, IES-1248-51A) Turns on the Annex M feature on the specified port(s).	H/H
	annexm show	<portlist>	(IES-1248-51, IES-1248-51A) Displays the Annex M feature setting for the specified port(s).	M/L
	disable	<portlist>	Turns off the specified ADSL ports.	M/L
	dsbcast disable	<port number> <vlanlist>	Disables downstream broadcast on the specified xDSL port.	H/H

Table 113 Commands (continued)

CLASS	COMMAND	PARAMETERS	DESCRIPTION	P
	dsbcast enable	<port number> <vlanlist>	Enables downstream broadcast on the specified xDSL port.	H/H
	dsbcast show	<portlist>	Show downstream broadcast on the specified xDSL port.	M/L
	dscarrier0	<port> [<m1> <m2> <m3> <m4> <m5> <m6> <m7>]	Displays or sets masks for downstream carrier tones from 33 to 255. Masking a carrier tone disables the use of that tone on the specified ADSL port. The most significant bit defines the lowest tone number in a mask. m1: tones 32~63 m2: tones 64~95 m3: tones 96~127 m4: tones 128~159 m5: tones 160~191 m6: tones 192~223 m7: tones 224~255	H/H
	dscarrier1	<port> [<m0> <m1> <m2> <m3> <m4> <m5> <m6> <m7>]	Displays or sets masks for downstream carrier tones from 256 to 511 on the specified ADSL2+ port(s). Use this command to have the system not use an ADSL line's tones that are known to have a high noise level. m0: tones 256~287 m1: tones 288~319 m2: tones 320~351 m3: tones 352~383 m4: tones 384~415 m5: tones 416~447 m6: tones 448~479 m7: tones 480~511	H/H
	dsnompsd	<portNo> [<max nominal psd>]	Displays or sets the maximum downstream nominal PSD (Power Spectral Density) values. This is for testing purposes. [<max_nominal_psd>]: Downstream PSD (-400 ~ 40 in 0.1dBm/Hz).	H/H
	enable	<portlist>	Turns on the specified ADSL ports.	M/L
	gbond delete	<bond_name>	Removes G.bond settings from the DSL lines specified in the G.bond group. <i>bond_name</i> : The name of a DSL line group with G.bond configured on them.	M/L
	gbond set	<bond_name> <portlist>	Configures a G.bond group or modifies the membership of a G.bond group. <i>portlist</i> : A list of ports, for example, (1,2), (5~7).	M/L

Table 113 Commands (continued)

CLASS	COMMAND	PARAMETERS	DESCRIPTION	P
	gbond show	[<bond_name>]	Shows G.bond settings on the specified port.	L/L
	inp	<portlist> [<usINP> [,<dsINP>]]	Sets the upstream (us) and downstream (ds) impulse noise protection minimum setting on the specified ADSL port(s). Sudden spikes in the line's noise level (impulse noise) can cause errors and result in lost packets. Set the impulse noise protection minimum to have a buffer to protect the ADSL physical layer connection against impulse noise. This buffering causes a delay that reduces transfer speeds. It is recommended that you use a non-zero setting for real time traffic that has no error correction (like videoconferencing). <usINP>: Sets the minimum upstream (us) impulse noise protection setting. Use 0~3 to define a number of DMT symbols. 0 = 0 DMT symbols, 1 = 0.5 DMT symbols, 2 = 1 DMT symbols, 3 = 2 DMT symbols. <dsINP>: Sets the minimum downstream (ds) impulse noise protection setting. Use 0~3 to define a number of DMT symbols. 0 = 0 DMT symbols, 1 = 0.5 DMT symbols, 2 = 1 DMT symbols, 3 = 2 DMT symbols.	H/H
	ipbpvc arpproxy agingtime set	<sec>	Sets the valid time interval of a learned MAC address. 10..10000 seconds	H/H
	ipbpvc arpproxy agingtime show		Display the current time interval of a learned MAC address	M/L
	ipbpvc arpproxy flush	all edgerouter [<ip> <vid>] interface [<ip>/ <mask> <vid>]	Flush the learned MAC addresses manually	H/H
	ipbpvc arpproxy show	[domain <domain> [edgerouter [<ip> <vid>]] [interface [<ip>/ <mask> <vid>]]]	Displays learnt MAC table for a domain Displays learnt MAC table for all/an edge router in a domain Displays learnt MAC table for all/an interface in a domain	M/L
	ipbpvc delete	<portlist> <vpi> <vci>	Remove IP aware Bridge PVC.	H/H
	ipbpvc domain delete	<domain name>	Delete a domain, have to delete all VLANs belonging to this domain first.	H/H
	ipbpvc domain dhcpvlan disable	<domain name>	Disable DHCP VLAN in a domain	H/H

Table 113 Commands (continued)

CLASS	COMMAND	PARAMETERS	DESCRIPTION	P
	ipbpvc domain dhcpvlan enable	<domain name> <vid>	Enable DHCP VLAN in a domain	H/H
	ipbpvc domain set	<domain name>	Create domain, maximum 8 domains in the system.	H/H
	ipbpvc domain show	[<domain name>]	Display domain setting	M/L
	ipbpvc domain vlan	<domain name> <vid> <registration>	Set vlan to join or leave specified domain, maximum 8 VLANs in one domain.	H/H
	ipbpvc edgerouter delete	<ip> <vid>	Delete specified edge router setting	H/H
	ipbpvc edgerouter set	<ip>/<mask> <vid>	Sets the edge router	H/H
	ipbpvc edgerouter show	[<vid>]	Displays the edge router setting.	M/L
	ipbpvc interface delete	<ip>/<mask> <vid>	Delete an IP interface.	H/H
	ipbpvc interface runtime	[<ip>/<mask> <vid> <ip>/ <mask> <vid>]	Display runtime interfaces by optional <ip>/<mask> and vlan id parameter	M/L
	ipbpvc interface set	<ip>/<mask> <vid> [<port> <vpi> <vci>]	Sets the interface.	H/H
	ipbpvc interface show	[<ip>/<mask> <vid> <ip>/ <mask> <vid>]	Displays the interface setting by optional <ip>/<mask> and vlan id parameter.	M/L
	ipbpvc route delete	<domain name> <ip>/<mask> <nexthop>	Deletes route entry from specified domain	H/H
	ipbpvc route runtime	[<domain name> <ip>/<mask> <domain> <ip>/ <mask>]	Displays the runtime route information	M/L
	ipbpvc route set	<domain name> <ip>/<mask> <nexthop> <metric> [<priority>]	Sets a new route to specified edgerouter for a given domain. Maximum 16 routes in a domain	H/H
	ipbpvc route show	[<domain name> <ip>/<mask> <domain> <ip>/ <mask>]	Displays the current routing table for the specified domain.	M/L
	ipbpvc set	<portlist> <vpi> <vci> <DS vcprofile[,US vcprofile]> <pvid> <priority> <ipab_type>	Sets IP aware Bridge PVC.	H/H
	ipbpvc show	[<portlist> [<vpi> <vci>]]	Displays IP aware Bridge PVC setting	M/L

Table 113 Commands (continued)

CLASS	COMMAND	PARAMETERS	DESCRIPTION	P
	linediag getld	<port number>	Displays the line diagnostics results after using the line diagnostics set command on an ADSL port. Use the line diagnostics results to analyze problems with the physical ADSL line. Note: Wait at least one minute after using the line diagnostic set command before using this command.	L/L
	linediag getld992_3	<port number>	Displays the line diagnostics results in the format defined in the ITU-T G.992.3 standard after using the line diagnostics set command on an ADSL port. Use the line diagnostics results to analyze problems with the physical ADSL line. Wait at least one minute after using the line diagnostic set command before using this command.	L/L
	linediag getselt	<port number>	Displays the status and the results of the SELT test on the specified port. The report tells you what gauge of telephone wire is connected to the port and the approximate length of the line measured both in meters and thousands of feet.	L/L
	linediag setld	<port number>	Performs line diagnostics on the specified port. The ADSL port must be set to ADSL2 or ADSL2+ ADSL operational mode and have a connection. It takes about one minute for the line diagnostics to finish.	H/H
	linediag setselt	<port number>	Performs a single end line test on the specified port. This test checks the distance to the subscriber's location. Note: The port must have an open loop. There cannot be a DSL device, phone, fax machine or other device connected to the subscriber's end of the telephone line.	H/H

Table 113 Commands (continued)

CLASS	COMMAND	PARAMETERS	DESCRIPTION	P
	linediag toneDiag	<port number>	Displays the tone diagnostics for a port in the format defined in the ITU-T G.992.3 standard. You do not need to use the line diagnostics set command first. Use the tone diagnostics to analyze problems with the physical ADSL line.	L/L
	loopback	<portlist> <f5> <vpi> <vci>	Performs an OAMF5 loopback test.	H/H
	name	<portlist> <name>	Sets the name of a port(s).	M/L
	paepvc counter	<portlist> [<vpi> <vci>]	Display PPPoAoE PVC counter	L/L
	paepvc delete	<portlist> <vpi> <vci>	Delete a PPPoAoE PVC	M/H
	paepvc session	<portlist> [<vpi> <vci>]	Display PPPoAoE PVC session status	L/L
	paepvc set	<portlist> <vpi> <vci> <DS vcprofile[,US vcprofile]> <pvid> <priority> [acname <string32>] [srvcname <string32>] [hellotime <time>]	Create/modify a PPPoAoE PVC <acname>: access concentrator name <srvcname>: service name, <time>: 0~600 in unit of second Default: acname="", srvcname="", <time>=600	M/H
	paepvc show	<portlist> [detail]	Display PPPoAoE PVC setting by	L/L
	pmm disable	<portlist>	Turns off the Power Management feature on the specified port(s).	H/H
	pmm enable	<portlist> <L2 L3>	Turns on the Power Management feature on the specified port(s).	H/H
	pmm param	<portlist> [<l0time> <l2time> <l2atpr> <l2atprt>] [<max_l2 rate> <min_l2rate> <l0tol2_rate>]	Displays or sets PMM parameters for the specified ADSL port(s).	H/H
	pmm set	<portlist> <L0 L2>	Sets the power management mode. L0: Turns off power management on a port. L2: Low Power. Sets the power management feature to scale back line usage to the minimum level sufficient to maintain an active connection when there is low level of traffic.	H/H
	pmm show	<portlist>	Displays the Power Management feature setting for the specified port(s).	M/L

Table 113 Commands (continued)

CLASS	COMMAND	PARAMETERS	DESCRIPTION	P
	ppvc delete	<portlist> <vpi> <vci>	Remove Priority PVC.	H/H
	ppvc member delete	<portlist> <vpi> <vci> <member vpi> <member vci>	Remove PPVC member.	H/H
	ppvc member set	<portlist> <vpi> <vci> <member vpi> <member vci> <DS vcprofile[,US vcprofile]> <level>	Set PPVC member.	H/H
	ppvc member show	[<portlist>] [<vpi> <vci>]	Display PPVC member settings.	M/L
	ppvc set	<portlist> <vpi> <vci> <encap> <pvid> <priority>	Set priority PVC.	H/H
	ppvc show	[<portlist>] [<vpi> <vci>]	Display priority PVC settings	M/L
	profile delete	<profile>	Removes an ADSL profile.	H/H
	profile map	<portlist> <profile> <glite gdm t1413 auto adsl2 adsl2+>	IES-1248-51/51A: Assigns a specific profile to a port(s) and sets the port's ADSL mode.	H/H
	profile map	<portlist> <profile> <gdm etsi auto ad sl2 adsl2+>	IES-1248-53: Assigns a specific profile to a port(s) and sets the port's ADSL mode.	H/H
	profile set	<profile> <fast interleave [=<up delay>,<down delay>]> <up max rate> <down max rate> [<up target margin> <up min margin> <up max margin> <up min rate> <down target margin> <down min margin> <down max margin> <down min rate> <up down- shift margin> <up up-shift margin> <down down-shift margin> <down up- shift margin>]	Creates an adsl line profile.	H/H
	profile show	[<profile>]	Displays profile contents.	L/L
	pvc delete	<portlist> <vpi> <vci>	Removes a PVC setting.	H/H

Table 113 Commands (continued)

CLASS	COMMAND	PARAMETERS	DESCRIPTION	P
	pvc set	<portlist> <vpi> <vci> <super vid = 1..4094 <priority>> <DS vcprofile[,US vcprofile]>	Creates or modifies a PVC setting.	H/H
	pvc show	[<portlist>] [<vpi> <vci>]	Displays PVC settings.	M/L
	queuemap set	<priority> <queue>	Sets a queue's priority.	H/H
	queuemap show		Displays the queues' priorities	M/L
	reset	<portlist>	Resets an xDSL port.	H/H
	rpvc arp agingtime set	<sec, 10..10000 0:disabl ed>	Configures how long the device stores the IP addresses of CPE devices using 2684 routed mode in the Address Resolution Protocol table. <i>sec</i> : The number of seconds (10~10000) the device is to keep the Address Resolution Protocol table's entries of IP addresses of 2684 routed mode gateways. Use 0 to disable the aging time.	M/L
	rpvc arp agingtime show		Displays RPVC ARP proxy aging time.	H/H
	rpvc arp flush		Flushes RPVC ARP proxy table.	H/H
	rpvc arp show		Shows the RPVC ARP proxy table.	M/L
	rpvc delete	<portlist> <vpi> <vci>	Deletes RPVC on a port.	H/H
	rpvc gateway delete	<gateway ip>	Removes the gateway IP address that the device was set to use for 2684 routed mode traffic.	H/H
	rpvc gateway set	<gateway ip> <vlan id> [<priority>]	Adds a gateway IP address to use for 2684 routed mode traffic.	H/H
	rpvc gateway show		Displays the gateway IP addresses that are configured for use with 2684 routed mode traffic.	M/L
	rpvc route delete	<port number> <vpi> <vci> <ip>/ <netmask>	Deletes RPVC routing subnet on a port.	H/H
	rpvc route set	<port number> <vpi> <vci> <ip>/ <netmask>	Sets RPVC routing subnet on a port.	H/H
	rpvc route show	<portlist>	Displays RPVC routing subnet on a port.	M/L

Table 113 Commands (continued)

CLASS	COMMAND	PARAMETERS	DESCRIPTION	P
	rpvc set	<portlist> <vpi> <vci> <DS vcprofile[,US vcprofile]> <ip>/ <netmask> <gateway ip>	This command adds a PVC to handle 2684 routed mode traffic. Make sure that the routed PVC's subnet does not include the IES-1248's IP address. Note: You must use the rpvc gateway set command to configure the gateway's settings before you use the rpvc set command.	H/H
	rpvc show	<portlist>	Displays RPVC on a port.	M/L
	show		Displays the ADSL settings.	L/L
	sra disable	<portlist>	Turns off SRA ADSL2+ on the specified port(s).	H/H
	sra enable	<portlist>	Turns on Seamless Rate Adaptation (SRA) ADSL2+ on the specified port(s).	H/H
	sra show	<portlist>	Displays the SRA ADSL2+ setting for the specified port(s).	M/L
	tel	<portlist> <tel>	Records an ADSL port(s) subscriber's telephone number.	M/L
	tlspvc delete	<portlist> <vpi> <vci>	Delete a TLS PVC	M/H
	tlspvc set	<portlist> <vpi> <vci> <DS vcprofile[,US vcprofile]> <pvid> <priority>	Create/modify a TLS PVC <profile>: <vid>: s-tag VLAN id <priority>: priority for s-tag	M/H
	tlspvc show	portlist [detail]	Display TLS PVC setting by 'port'	L/L

Table 113 Commands (continued)

CLASS	COMMAND	PARAMETERS	DESCRIPTION	P
	uscarrier	<port number> [<m0> <m1>]	Displays or sets masks for upstream carrier tones from 0 to 63. Masking a carrier tone disables the use of that tone on the specified ADSL port. Use this command to have the system not use an ADSL line's tones that are known to have a high noise level. The most significant bit defines the lowest tone number in a mask. The hexadecimal digit is converted to binary and a '1' masks (disables) the corresponding tone. Disabling a carrier tone turns it off so the system does not send data on it. The most significant bit defines the first tone sequentially. For example, in <m0>, 0x00000001 means tone 31. For example, you could use 0xffff0000 for <m0> to disable upstream carrier tones 0~15 and leave tones 16 ~ 31 enabled. m0 : tones 0~31 m1 : tones 32~63	H/H
	uslimit disable	<portlist> <vpi> <vci>	Disable a upstream rate-limit setting	H/H
	uslimit enable	<portlist> <vpi> <vci>	Enable a upstream rate-limit setting	H/H
	uslimit set	<portlist> <vpi> <vci> <rate>	Sets a upstream rate limit to a PVC (PVC could be pvc, ppvc, ipbpvc and tispvc)	H/H
	uslimit show	[<portlist> [<vpi> <vci>]]	Displays current up rate-limit settings of PVCs	M/L
	usnompsd	<portNo> [<max nominal psd>]	Displays or sets the upstream maximum nominal transmit PSD (Power Spectral Density). [<max nominal psd>]: -400 ~ 40 (unit of measure is 0.1dBm/Hz)	H/H
	vcprofile delete	<vcprofile>	Removes a virtual channel profile.	H/H
	vcprofile set	<vcprofile> <vc llc> <ubr cbr> <pcr> <cdvt>	Creates a UBR or CBR virtual channel profile (with encapsulation).	H/H
	vcprofile set	<vcprofile> <vc llc> <vbr(rt- vbr) nrt-vbr> <pcr> <cdvt> <scr mcr> <bt nrm>	Creates a VBR virtual channel profile (with encapsulation).	H/H
	vcprofile show	[vcprofile]	Shows a virtual channel profile's contents.	L/L
alarm				

Table 113 Commands (continued)

CLASS	COMMAND	PARAMETERS	DESCRIPTION	P
	clear		Erases historic alarm entries.	M/L
	cutoff		This command cancels an alarm. This stops the sending of the alarm signal current. This is useful in stopping an alarm if you have the alarm output connector pins connected to a visible or audible alarm. The alarm entry remains in the system.	M/~
	history clear	<alarm> all <condition> all	Removes historic alarm entries by alarm category and alarm condition or by severity.	M/~
	history clear	clear <severity>		M/~
	history show	[<severity> all] [<alarm> all] [<condition> all] [<sdate> all] [<edate> all] [for rev] [detail]	This command displays historic alarms by severity, alarm category, alarm condition and/or dates. <severity>: Specify an alarm severity level (critical, major, minor, info or all). Critical alarms are the most severe, major alarms are the second most severe, minor alarms are the third most severe and info alarms are the least severe. <alarm>: Specify a category of alarms. eqpt represents equipment alarms. dsl represents Digital Subscriber Line (DSL) alarms. enet represents Ethernet alarms. sys represents system alarms. all specifies every alarm category. condition: This is the text description for the condition under which the alarm applies. Use the alarm tablelist to find alarm conditions. sdate: The start date, in yyyy/mm/dd format. edate: The end date, in yyyy/mm/dd format. for rev: The displaying order. Use for to display in chronological order starting from the oldest alarm. Use rev to display in reverse chronological order starting from the most recent alarm. detail: Display in-depth alarm information.	L/~

Table 113 Commands (continued)

CLASS	COMMAND	PARAMETERS	DESCRIPTION	P
	port set	<all enet1 enet2 port> <severity>	This command sets the alarm severity threshold for recording alarms on an individual port(s). The system reports an alarm on a port if the alarm has a severity equal to or higher than the port's threshold. all enet1 enet2 port: Ports on the IES-1248.	M/L
	port show		This command displays port alarm severity level thresholds. The system reports an alarm on a port if the alarm has a severity equal to or higher than the port's threshold.	L/L
	show	[<severity> all] [<alarm> all] [<condition> all] [<sdate> all] [<edate> all] [for rev] [detail]	Displays current alarm settings.	L/L
	tablelist	[<alarm> all] [<severity> all] [<fac> all] [<target>[,<target>]] [<condition> all]	This command lists alarm settings. <fac>: The log facility (local1~local7) that has the device log the syslog messages to different files in the syslog server. See your syslog program's documentation for details. <target>: snmp syslog all The type of alarm messages that the device is to send (SNMP, syslog or all).	L/L

Table 113 Commands (continued)

CLASS	COMMAND	PARAMETERS	DESCRIPTION	P
	xedit	<alarm> all <cond> <condcode> <severity> <fac> <target>[,<target>] [clearable]	Sets the severity level of an alarm(s) and where the system is to send the alarm(s). Use the <code>alarm tablelist</code> command to display alarm setting details. <cond>: all condition This is the text description for the condition under which the alarm applies. Use the <code>alarm tablelist</code> to find alarm conditions. <condcode>: The condition code is the number of a specific alarm message. Use the <code>alarm tablelist</code> to find alarm condition codes. <severity>: Specify an alarm severity level (critical, major, minor or info) for this alarm. Critical alarms are the most severe, major alarms are the second most severe, minor alarms are the third most severe and info alarms are the least severe. <fac>: The log facility (local1~local7) has the device log the syslog messages to a particular file in the syslog server. Set this if this entry is for sending alarms to a syslog server. See your syslog program's documentation for details. <target>: snmp syslog all The type of alarm messages that the device is to send (SNMP, syslog or all). You can specify more than one, separated by commas. clearable unclearable This sets whether or not the alarm clear command removes the alarm from the system.	M/L
switch				
	acl delete	<portlist> <vpi> <vci> <profile>	Remove an acl profile from PVC <profile>: string32 up to 8 profiles if only one PVC has profiles	M/H
	acl profile delete	<name>	delete an acl profile	M/H

Table 113 Commands (continued)

CLASS	COMMAND	PARAMETERS	DESCRIPTION	P
	acl profile set	<name> <rule> <action>	Create/modify a acl profile <rule>: <l2> <l3_protocol> <mfc> <l2>: Layer-2 match fields (listed in priority sequence match) etype <etype> vlan <vid> etype <etype> smac <mac> etype <etype> dmac <mac> vlan <vid> smac <mac> vlan <vid> dmac <mac> smac <mac> dmac <mac> vlan <vid> priority <priority> etype <etype> vlan <vid> smac <mac> dmac <mac> priority <priority> protocol <protocol> <priority>: 0~7 <etype>: 0~65535 <protocol>: tcp udp ospf igmp ip gre icmp <pty pe> <ptype>: 0~65535 Note: multiple-field rules (position independent): MFC rules: {srcip <ip>/<mask>{ dstip <ip>/ <mask>{ tos <tos>{ srcport <port>{ dstport <port>}}}}} <mask>: 0~32 <tos>:0~255 <port>:0~65535 <action>: rate <rate> rvlan <rvlan> rpri <rpri> deny <rate>: 1~65535 in unit of kbps <rvlan>: replaced vlan 1~4094 <rpri>: replaced priority 0~7	M/H
	acl profile show	[<name>]	Display an acl profile	L/L
	acl profile showmap	<name>	Display acl profile reference	L/L
	acl set	<portlist> <vpi> <vci> <profile>	Apply an acl profile to a PVC Max. 8 profiles per port	M/H
	acl show	[<portlist>] [<vpi> <vci>]	Shows acl profile setting for a PVC.	L/L
	dhcprelay disable	<vid> all	Turns off DHCP relay.	H/H

Table 113 Commands (continued)

CLASS	COMMAND	PARAMETERS	DESCRIPTION	P
	dhcprelay enable	<vid> all	Turns on DHCP relay.	H/H
	dhcprelay opt82sub2 disable	<vid> all	Turns off option 82 sub-option 2	M/H
	dhcprelay opt82sub2 enable	<vid> all	Turns on option 82 sub-option 2	M/H
	dhcprelay opt82sub2 set	<vid> all <relay info>	Adds the specified information for sub-option 2	M/H
	dhcprelay option82 disable	<vid> all	Turns off the DHCP relay agent information (Option 82) feature.	M/H
	dhcprelay option82 enable	<vid> all	Turns on the DHCP relay agent information (Option 82) feature.	M/H
	dhcprelay option82 set	<vid> all <relay info>	Adds the specified information for the relay agent.	M/H
	dhcprelay optionmode	<<vid> all> <private tr101>	Sets the option 82 sub-option 1 and sub-option 2 format to TR-101 or private mode.	M/H
	dhcprelay relaymode	<vid> all <mode>	DHCP relay mode, auto/both	M/H
	dhcprelay server active	<vid> all <active-server>	Enables the specified DHCP server.	M/H
	dhcprelay server delete	<vid> all [<primary-server>]	Removes the specified DHCP server.	M/H
	dhcprelay server set	<vid> <primary-server> [<secondary-server>]	Set DHCP server IP address where the DHCP request will forward to <vid>: VLAN < primary-server >: IP address for primary server < secondary-server >: IP address for secondary server Maximum 32 entries can be configured. Default: (empty list)	M/H
	dhcprelay show		Displays DHCP relay settings.	L/L
	dhcpsnoop disable	< portlist >	Disables ip spoofing for a port.	M/H
	dhcpsnoop enable	< portlist >	Enables ip spoofing for a port.	M/H
	dhcpsnoop flush	< portlist >	Flushes DHCP snooping table for a port.	M/H
	dhcpsnoop pool delete	<port> <ip>	Deletes a static IP for dhcp snooping per port.	M/H
	dhcpsnoop pool set	<port> <ip>	Sets a static IP for dhcp snooping per port.	M/H
	dhcpsnoop show	<portlist>	Displays the DHCP snooping result on a port.	L/L
	dhcpsnoop lan2lan show		This command displays whether LAN to LAN DHCP services are enabled or disabled.	L

Table 113 Commands (continued)

CLASS	COMMAND	PARAMETERS	DESCRIPTION	P
	dhcpsnoop lan2lan disable		This command disables LAN to LAN DHCP services.	M
	dhcpsnoop lan2lan enable		This command enables LAN to LAN DHCP services.	M
	dot1x auth	<profile radius>	Set authentication method to profile or radius.	H/H
	dot1x disable		Turn off dot1x.	H/H
	dot1x enable		Turn on dot1x.	H/H
	dot1x port control	<portlist> <auto auth unauth>	Set port authentication status.	H/H
	dot1x port disable	<portlist>	Turn off dot1x on port.	H/H
	dot1x port enable	<portlist>	Turn on dot1x on port.	H/H
	dot1x port peroid	<portlist> <period>	Set port reauth period.	H/H
	dot1x port reauth	<portlist> <on off>	Turn on or turn off port to do reauthentication.	H/H
	dot1x profile delete	<name>	Remove account for profile mode.	H/H
	dot1x profile set	<name> <password>	Set account and password for profile mode.	H/H
	dot1x profile show		Display accounts for profile mode.	M/L
	dot1x radius ip	<ip>	Set Radius server IP.	H/H
	dot1x radius port	<port>	Set Radius server port.	H/H
	dot1x radius secret	<secret>	Set Radius server secret.	H/H
	dot1x radius show		Display radius server settings.	M/L
	dot1x show	[portlist]	Display dot1x settings.	M/L
	dscp disable	< portlist >	Disable ADSL/ENET ports to use DSCP mapping	M/H
	dscp enable	< portlist >	Enable ADSL/ENET ports to use DSCP mapping	M/H
	dscp map set	<srccp> <mappri> <srccp>: source code point, 0~63, example: 1,3~5,10~15 <mappri> : mapping priority, 0~7	Setting the DSCP code to 802.1p mapping table	M/H
	dscp map show		Displaying the DSCP code to 802.1p mapping table	L/L
	dscp show		Displayis per port DSCP setting	L/L
	enet disable	<portlist>	Turns off the specified Ethernet port(s).	H/H

Table 113 Commands (continued)

CLASS	COMMAND	PARAMETERS	DESCRIPTION	P
	enet enable	<portlist>	Turns on the specified Ethernet port(s).	H/H
	enet maxmtu set	<size>	Sets the maximum MTU size for layer 2 frame size, from 1526 to 1600. The default value is 1526.	H/H
	enet maxmtu show		Displays current maximum MTU size	M/L
	enet name	<portlist> <name>	Sets the Ethernet port(s) name.	H/H
	enet reset	<portlist>	Resets the specified Ethernet port(s).	H/H
	enet show		Displays the Ethernet port settings.	M/L
	enet speed	<portlist> <1000fiber 1000copper 100copper auto>	Sets the Ethernet port(s) connection speed.	H/H
	garptimer join	<join msec>	Set system's garp join time.	H/H
	garptimer leave	<leave msec>	Set system's garp leave time.	H/H
	garptimer leaveall	<leaveall msec>	Set system's garp leaveall time.	H/H
	garptimer show		Display the system's garp settings.	M/L
	igmpfilter profile delete	<name>	Removes an IGMP filter profile.	H/H
	igmpfilter profile set	<name> <index> <startip> <endip>	Configures an IGMP filter profile.	H/H
	igmpfilter profile show	[name]	Displays an IGMP filter profile's settings.	M/L
	igmpfilter set	<portlist> <name>	Sets an ADSL port(s) to use an IGMP filter profile.	H/H
	igmpfilter show	[portlist]	Displays which IGMP filter profile an ADSL port(s) is using.	M/L
	igmpsnoop bandwidth default	<bandwidth>	Sets default bandwidth for multicast IP channels.	M/H
	igmpsnoop bandwidth delete	<index>	Delete an entry of bandwidth budget setting specified in <index> field.	M/H
	igmpsnoop bandwidth port disable	<portlist>	Disable bandwidth budget control for a port	M/H
	igmpsnoop bandwidth port enable	<portlist>	Enable bandwidth budget control for a port	L/H
	igmpsnoop bandwidth port set	<portlist> <bandwidth>	Set bandwidth threshold for a port <bandwidth>: 1..100,000, in unit of kbps	M/H

Table 113 Commands (continued)

CLASS	COMMAND	PARAMETERS	DESCRIPTION	P
	igmpsnoop bandwidth port show	<portlist>	Show bandwidth control setting for a port	L/L
	igmpsnoop bandwidth set	<index> <start-mcast-ip> <end-mcast-ip> <bandwidth>	Set bandwidth budget for a range of multicast IP channels specified in <index> field. <index>: ? <start-mcast-ip>: <ip>, start multicast IP address <end-mcast-ip>: <ip>, end multicast IP address	M/H
	igmpsnoop bandwidth show		Show bandwidth budget for a range of multicast IP channels	L/L
	igmpsnoop disable		Turns off IGMP snooping.	H/H
	igmpsnoop enable	<proxy snooping> [v2 v3]	Sets IGMP snooping mode with V2 or V3 mode (default is v2).	H/H
	igmpsnoop igmpcount disable	<portlist>	Disable IGMP count limiting to subscriber port	H/H
	igmpsnoop igmpcount enable	<portlist>	Enable IGMP count limiting to subscriber port	H/H
	igmpsnoop igmpcount set	<portlist> <count>	Set IGMP count limiting number to subscriber port	H/H
	igmpsnoop igmpcount show	[portlist]	Display IGMP count limiting setting status on the specified port	M/L
	igmpsnoop mvlan delete	<vlanlist>	Removes a MVLAN entry.	H/H
	igmpsnoop mvlan disable	<vid>	Turns off a MVLAN entry.	H/H
	igmpsnoop mvlan enable	<vid>	Turns on a MVLAN entry.	H/H
	igmpsnoop mvlan group delete	<vid> <index>	Delete a multicast to VLAN translation entry.	H/H
	igmpsnoop mvlan group set	<vid> <index> <start_mcast_ip> <end_mcast_ip>	Create a multicast to VLAN translation entry. up to 16 entries <index>: 1~16, Note: IP address in each entry should be disjointed	H/H
	igmpsnoop mvlan group show	<vlanlist>	Show a multicast to VLAN translation entry.	M/L
	igmpsnoop mvlan name	<vid> <name>	Sets the name of the specified MVLAN ID.	H/H
	igmpsnoop mvlan set	<vid> <portlist>:<F<T U> X N> [<portlist>: <F<T U> X N> ...] [name]	Configures a MVLAN entry. (Same as VLAN command)	H/H

Table 113 Commands (continued)

CLASS	COMMAND	PARAMETERS	DESCRIPTION	P
	igmpsnoop mvlan show	<vlanlist>	Show multicast vlans, Include group information	M/L
	igmpsnoop qryvid delete	<vid>	Delete the specified IGMP query VLAN ID in IGMP proxy mode.	H/H
	igmpsnoop qryvid set	<vid>	Set an IGMP query VLAN ID in IGMP proxy mode.	H/H
	igmpsnoop qryvid show	<vid>	Display details of the IES-1248's IGMP query VLANs.	M/L
	igmpsnoop show		Displays the IGMP snooping setting.	M/L
	isolation daisychain		Sets the switch to daisychain mode.	H/H
	isolation disable		Turns the subscriber isolation feature off.	H/H
	isolation enable		Turns the subscriber isolation feature on.	H/H
	isolation show		Displays the subscriber isolation feature's current setting.	M/L
	isolation standalone		Sets the switch to standalone mode.	H/H
	isolation vlan delete	<vid>	Turns off per-VLAN isolation for the specified VLAN.	H/H
	isolation vlan set	<vid>	Turns on per-VLAN isolation for the specified VLAN.	H/H
	mac agingtime set	<sec, 10..10000 0:disabled>	Sets the MAC aging out time period.	H/H
	mac agingtime show		Displays the MAC aging out time period.	M/L
	mac antispoofing disable		Turns off the MAC antispoofing	H/H
	mac antispoofing enable		Turns on the MAC antispoofing	H/H
	mac antispoofing show		Show the MAC antispoofing status	M/L
	mac count disable	<portlist>	Turns off the MAC address count filter for an ADSL port(s).	H/H
	mac count enable	<portlist>	Turns on the MAC address count filter for an ADSL port(s).	H/H
	mac count set	<portlist> <count>	Sets the MAC address count filter for an ADSL port(s).	H/H
	mac count show	[portlist]	Displays the system's current MAC address count settings.	M/L
	mac filter delete	<port> <mac> [<mac> <mac> ...]	Removes a MAC filter MAC entry on an ADSL port(s).	H/H
	mac filter disable	[portlist]	Turns off the MAC filter.	H/H

Table 113 Commands (continued)

CLASS	COMMAND	PARAMETERS	DESCRIPTION	P
	mac filter enable	[portlist]	Turns on the MAC filter.	H/H
	mac filter mode	<port> <accept deny>	Sets the MAC filter to accept or deny.	H/H
	mac filter set	<port> <mac> [<mac> <mac> ...]	Adds a MAC filter MAC entry on an ADSL port(s).	H/H
	mac filter show	[portlist]	Displays MAC filter settings.	M/L
	mac flush		Clears learned MAC addresses from the forwarding table.	H/H
	ouifilter delete	<port> <mac-oui>	Removes the OUI filter on the specified port. The OUI (Organization Unit Identifier) filter allows or drops packets with MAC addresses from specific vendors. <oui>: The first three octets of the MAC address.	M/L
	ouifilter disable	<port>	Deactivates OUI filtering on the specified port(s).	M/L
	ouifilter enable	<port>	Activates MAC OUI filtering on the specified port(s).	M/L
	ouifilter mode	<port> <accept deny>	Set OUI filter operating mode. accept: Accept packets from specified OUIs, and deny packets from other OUIs. deny: Deny packets from specified OUIs, and accept packets from other OUIs.	M/L
	ouifilter set	<port> <mac-oui>	Creates a MAC OUI filter. mac-oui: The first three octets of the MAC address.	M/L
	ouifilter show	<port>	Displays MAC OUI filter settings for the specified port.	L/L
	pktfilter pppoeonly	pppoeonly <portlist>	Accepts only PPPoE packets and rejects all other packet types on this port. (Point-to-Point Protocol over Ethernet) relies on PPP and Ethernet. PPPoE is a specification for connecting the users on an Ethernet to the Internet through a common broadband medium, such as a single DSL line, wireless device or cable modem	H/H

Table 113 Commands (continued)

CLASS	COMMAND	PARAMETERS	DESCRIPTION	P
	pktfilter set	set <portlist> <filter>	Sets the packet type filter for the specified subscriber ports. Packet type filter allows or drops specified packet types on the specified subscriber ports. <filter>: Filter options include [pppoe] [ip] [arp] [netbios] [dhcp] [eapol] [igmp] [none]. Setting the filter to none will allow all types of packet to pass.	H/H
	pktfilter show	[portlist]	Display packet filter settings.	M/L
	poeagent clearinfo	<<vid> all>	Clears Sub-option 1 of an Agent. vid is 0..4094	H/H
	poeagent delete	<<vid> all>	Deletes a PPPoE Intermediate Agent. vid is 0..4094	H/H
	poeagent disable	<<vid> all>	Disables a PPPoE Intermediate Agent. vid is 0..4094	H/H
	poeagent enable	<<vid> all>	Enable a PPPoE Intermediate Agent. vid is 0..4094	H/H
	poeagent info	<<vid> all> <info>	Sets Sub-option 1 (Circuit ID) of an Agent, it will append this string to BRAS. vid is 0..4094	H/H
	poeagent optionmode	<<vid> all> <private tr101>	Set the Sub-option 1 (Circuit ID) format to TR-101 or private mode.	H/H
	poeagent set	<vid>	Sets a PPPoE Intermediate Agent. vid is 1..4094	H/H
	poeagent show	[<vlan list>]	Displays current settings of PPPoE Intermediate Agent	M/L
	queuemap set	<priority> <queue>	Maps a priority level to a physical queue.	H/H
	queuemap show		Displays the system's priority level to physical queue mapping.	M/L
	rstp disable		Turn system's rstp off.	H/H
	rstp enable		Turn system's rstp on.	H/H
	rstp fwdelay	<fwdelay sec>	Set system rstp's forward delay time.	H/H
	rstp hellotime	<hellotime sec>	Set system rstp's hello time.	H/H
	rstp maxage	<maxage sec>	Set system rstp's max age.	H/H
	rstp port disable	<portlist>	Set enet port to disable rstp.	H/H
	rstp port enable	<portlist>	Set enet port to enable rstp.	H/H
	rstp port pathcost	<portlist> <pathcost>	Set enet port's rstp pathcost.	H/H
	rstp port priority	<portlist> <priority>	Set enet port's rstp priority.	H/H

Table 113 Commands (continued)

CLASS	COMMAND	PARAMETERS	DESCRIPTION	P
	rstp port show		Display enet port rstp status.	M/L
	rstp priority	<priority>	Set system rstp's priority.	H/H
	rstp show		Display the system's rstp settings.	M/L
	smcast delete	<mac>	Removes a static multicast filter entry by deleting the associated MAC address.	H/H
	smcast set	<adsl_port> <mac> <join leave>	Use join/leave to add/ remove multicast MAC addresses on specified ADSL ports, a range of ADSL ports or all ADSL ports. MAC example: 01005E010203	H/H
	smcast show		Display all MAC addresses joined to ADSL ports.	M/L
	vlan cpu set	<vid>	Sets the VLAN ID of the Management VLAN.	H/~
	vlan cpu show		Displays the VLAN ID of the Management VLAN.	M/~
	vlan delete	<vlanlist>	Removes a VLAN entry.	H/H
	vlan disable	<vid>	Turns off a VLAN entry.	H/H
	vlan enable	<vid>	Turns on a VLAN entry.	H/H
	vlan frametype	<portlist> <all tag>	Sets the specified DSL port to accept tagged, untagged or Ethernet frames (or both). Note: enet1, enet2 are fixed at 'all'.	H/H
	vlan gvrp	<portlist> <enable disable>	Set the port(s) to enable or disable gvrp.	H/H
	vlan name	<vid> <name>	Configures the VLAN's name	H/H
	vlan portshow	[portlist]	Displays the port(s) VLAN settings.	M/L
	vlan priority	<portlist> <priority>	Sets a port's default IEEE 802.1p priority.	H/H
	vlan pvid	<portlist> <pvid>	Sets the PVID (Port VLAN ID) assigned to untagged frames or priority frames (0 VID) received on this port(s).	H/H
	vlan set	<vid> <portlist>:<F<T U> X N> [<portlist>: <F<T U> X N> ...] [name]	Configures a VLAN entry.	H/H
	vlan show	<vlanlist>	Displays VLAN settings.	M/L
ip				
	arp flush		Clears the device's IP Address Resolution Protocol(ARP) table.	H/H
	arp show		Displays the device's IP Address Resolution Protocol(ARP) table.	M/L

Table 113 Commands (continued)

CLASS	COMMAND	PARAMETERS	DESCRIPTION	P
	gateway	<gateway ip>	Sets the IP address of the device's default gateway.	H/H
	ping	<ip> [count]	Pings a remote host.	M/L
	route delete	<dst ip>[/netmask]	Removes a routing table entry.	H/H
	route flush		Clears the routing table.	H/~
	route set	<dst ip>[/netmask] <gateway ip> [metric] <name>	Adds a routing table entry.	H/H
	route set	default <gateway ip> <metric>	Sets the device's default route.	H/H
	route show		Displays the routing table.	M/L
	set	<ip>[/netmask]	Sets the Management IP address and subnet mask.	H/H
	show		Displays the Management IP address settings.	M/L
statistics				
	adsl 15mperf	<portlist> [count <0..96>]	Displays line performance statistics for the current and previous 15-minute periods.	M/L
	adsl 1dayperf	<portlist>	Displays line performance statistics for the current and previous 24 hours.	M/L
	adsl gbond	[<bond_name>]	Display G.bond settings and link US/DS rate.	
	adsl linedata	<portlist>	Displays the line data load per symbol (tone).	M/L
	adsl lineinfo	<portlist>	Displays the info of the specified ADSL ports.	M/L
	adsl lineperf	<portlist>	Displays the performance statistics of the specified ADSL port.	M/L
	adsl linerate	<portlist>	Displays the line rate.	M/L
	adsl show	[portlist]	Displays ADSL port connection status.	M/L
	dhcp counter	[<portlist> [clear]]	Display DHCP statistics for a port	L/L
	dhcp snoop	<portlist>	Display snooping	L/L
	dot1x	[portlist]	Displays detailed IEEE 802.1x authentication- related statistics.	M/L
	enet		Displays Ethernet port settings and statistics.	M/L
	igmpsnoop group	[<vid> [<mcast_ip>]]	Display IGMP learned group member information	M/L
	igmpsnoop info [clear]		Display protocol packets counters & number of learned groups	M/L

Table 113 Commands (continued)

CLASS	COMMAND	PARAMETERS	DESCRIPTION	P
	igmpsnoop port group	<portlist>	Display joined groups in this port	M/L
	igmpsnoop port info	[<portlist> [clear]]	Display received protocol packets counters, number of joined groups. multicast data volume (in bytes).? multicast bandwidth usage in this port.?	M/L
	ip		Displays a Management port's status and performance data.	M/~
	mac		Displays current MAC address forwarding table.	M/L
	monitor		Displays hardware monitor status.	M/L
	port	<portlist> [<vpi> <vci>] [clear]	This command displays and/or erases port statistics.	M/L
	rmon	Stats history <giga-port>	Display uplink/subtending link RMON information	M/L
	rstp		Enables RSTP (Rapid Tree Spanning Protocol).	M/L
	vlan		Displays current VLANs.	M/L
config				
	restore		Reloads the factory default configuration.	H/H
	save		Saves the current configuration.	H/H
	show	<sys sw adsl ip stat all> [nopause]	Displays the device's configuration.	M/L
exit			Ends the console or telnet session.	L/L

Command Examples

This chapter gives some examples of commands.

51.1 Command Examples Overview

These are commands that you may use frequently in configuring and maintaining your IES-1248. See [Chapter 54 on page 377](#) for commands that deal with the IEEE 802.1Q Tagged VLAN.

51.2 Sys Commands

These are the commonly used commands that belong to the sys (system) group of commands.

51.2.1 Log Show Command

Syntax:

```
ras> sys log show
```

This command displays the system error log. An example is shown next.

Figure 162 Log Show Command Example

```
ras> sys log show
 1 Wed Aug 11 20:37:11 2004 telnetd   INFO  Session Begin!
 2 Wed Aug 11 20:37:05 2004 telnetd   INFO  Session Begin!
 3 Wed Aug 11 20:36:56 2004 telnetd   INFO  Session Begin!
```

51.3 Log Format

The common format of the system logs is: <item no> <time> <process> <type> <log message>.

Table 114 Log Format

LABEL	DESCRIPTION
<item no>	This is the index number of the log entry.
<time>	This is the time and date when the log was created.
<process>	This is the process that created the log.

Table 114 Log Format (continued)

LABEL	DESCRIPTION
<type>	This identifies what kind of log it is. "INFO" identifies an information log. "WARN" identifies a warning log.
<log message>	This is the log's detailed information (see Table 115 on page 348)

51.3.1 Log Messages

The following table lists and describes the system log messages.

Table 115 Log Messages

LOG MESSAGE	TYPE	DESCRIPTION
ADSL <port> Link Up (SN=<seq no>) : <ds rate>/<us rate>! or ADSL Link Info: NM:<ds NM>/<us NM>!	INFO	An ADSL port established a connection. <port> - port number <seq no> - sequence number of the connection <ds rate> - downstream rate <us rate> - upstream rate <us NM> - upstream noise margin <ds NM> - downstream noise margin
ADSL <port> Link Down (SN=<seq no>) !	WARN	An ADSL port lost its connection. <port> - port number <seq no> - sequence number of the connection
ADSL <port> Link Loss of Power Dying-Gasp Event!	WARN	The subscriber device connected to an ADSL port experienced a loss of power (Dying-Gasp). <port> - port number
Change time server to none.	INFO	The time server setting was changed to none.
Change time server to TIME. IP:<ip> Timezone: <time zone>.	INFO	The time server protocol setting was changed to TIME. The time server's IP address and time zone are displayed.
Change time server to DAYTIME. IP: <ip>	INFO	The time server protocol setting was changed to DAYTIME. The time server's IP address and time zone are displayed.
Change time server to NTP. IP: <ip> Timezone: <time zone>	INFO	The time server protocol setting was changed to NTP. The time server's IP address and time zone are displayed.
External alarm is triggered!	WARN	External alarm input was detected.
Ether <port> Link Down (SN=N) !	WARN	An Ethernet link is down. <port> - 1 is ENET1, 2 is ENET2 SN - an internal sequencer number
Ether N Link Up (SN=N) : <speed>!	INFO	An Ethernet link is up. <port> - 1 is ENET1, 2 is ENET2 SN - an internal sequencer number <speed> - Ethernet connection speed, for example 1000M or 100M
External alarm is released.	INFO	An external alarm is over and the input has returned to a normal state.

Table 115 Log Messages (continued)

LOG MESSAGE	TYPE	DESCRIPTION
FAN RPM DOWN: dev: <id> Limit:N value:N!	WARN	A fan's RPM went too low. <id> 1=Fan 1, 2=Fan 2, 3=Fan 3 Limit - minimum (low) fan (RPM) value - the measured fan RPM
FAN RPM OK: dev: <id> Limit:N value:N!	INFO	A fan's RPM returned to the normal range. <id> 1=Fan 1, 2=Fan 2, 3=Fan 3 Limit - maximum (high) or minimum fan (RPM) that had been breached value - the measured fan RPM
FAN RPM OVER: dev: <id> Limit:N value:N!	WARN	A fan's RPM went too high. <id> 1=Fan 1, 2=Fan 2, 3=Fan 3 Limit - maximum (high) fan (RPM) value - the measured fan RPM
Incorrect Password!	WARN	Someone attempted to use the wrong password to start a console, telnet or FTP session (see the <process> field for the type of session).
Session Begin!	INFO	A console, telnet or FTP session has begun (see the <process> field for the type of session).
Session End!	INFO	A console telnet or FTP session has terminated (see the <process> field for the type of session).
Sync with timeserver <ip> failed!	WARN	The device was not able to synchronize the time with the time server at the listed IP address.
Sync with timeserver <ip> successful!	INFO	The device synchronized the time with the time server at the listed IP address.
Received File <file>!	INFO	A file was uploaded to the IES-1248 by FTP. <file> - received file's name
Received Firmware Checksum Error!	WARN	A checksum error was detected during an attempted FTP firmware upload.
Received Firmware Invalid!	WARN	Someone attempted to upload a firmware file with a wrong identity via FTP.
Received Firmware Size too large!	WARN	The file size was too large with an attempted FTP firmware upload.
THERMO LOW VOLTAGE: dev: <id> limit: <threshold> value: <voltage>!	WARN	The device's voltage went above the accepted operating range. <id> 1=1.2v, 2=1.8v, 3=3.3v, 4=24v <threshold> - voltage limit <voltage> - voltage of the DC power when logged
THERMO LOW TEMPERATURE: dev:<id> threshold:<threshold> (degree C) value:<temp>(degree C)!	WARN	The temperature was too low at one of the temperature sensors. <id> - 0: sensor near the ADSL chipset 1: sensor near the CPU 2: thermal sensor chip <threshold> - temperature limit <temp> - temperature when the entry was logged

Table 115 Log Messages (continued)

LOG MESSAGE	TYPE	DESCRIPTION
THERMO OVER TEMPERATURE: dev:<id> threshold:<threshold> (degree C) value:<temp>(degree C)!	WARN	The temperature was too high at one of the temperature sensors. <id> - 0: sensor near the ADSL chipset 1: sensor near the CPU 2: thermal sensor chip <threshold> - temperature limit <temp> - temperature when the entry was logged
THERMO OVER TEMPERATURE released: dev:<id> threshold:<threshold> (degree C) value:<temp>(degree C)!	INFO	The temperature at one of the temperature sensors has come back to normal. <id> - 0: sensor near the ADSL chipset 1: sensor near the CPU 2: thermal sensor chip <threshold> - temperature limit <temp> - temperature when the entry was logged
THERMO OVER VOLTAGE: dev: <id> limit: <threshold> value: <voltage>!	WARN	The voltage at one of the voltage sensors went above the accepted operating range. <id> 1=1.2v, 2=1.8v, 3=3.3v, 4=24v <threshold> - voltage limit <voltage> - voltage of the DC power when logged
THERMO OVER VOLTAGE released: nominal:<nominal>(mV) value:<voltage> (mV)!	INFO	The device's voltage is back inside the accepted operating range. <nominal> - nominal voltage of the DC power <voltage> - voltage of the DC power when logged

51.3.2 Log Clear Command

Syntax:

```
ras> sys log clear
```

This command clears the system error log.



If you clear a log (using the log clear command), you cannot view it again.

51.3.3 Info Show Command

Syntax:

```
ras> sys info show
```

This command shows general system settings, the BIN (firmware) version, system uptime and bootbase version.

An example is shown next.

Figure 163 Info Show Example

```

ras> sys info show
      Hostname:
      Location:
      Contact:
      Model: IES1248-53
      ZyNOS version: V3.53 (ABR.0) | 05/11/2006
      F/W size: 2756752
      MAC address: 00:13:49:92:14:06
      System up time: 7(days) : 7:36:30
      Bootbase version: VABR1.01 | 03/07/2006
      F/W build date: May 11 2006 10:40:48
      DSP code version: 6.04.0003
      Hardware version: AB
      Serial number: 0Z0615000022

```

51.4 Isolation Commands

Turn on port isolation to block communications between subscriber ports. When you enable port isolation, you do not need to configure the VLAN to isolate subscribers.

Turn on VLAN isolation to block communications between subscribers in the same VLAN if you do not block communications between subscriber ports. For example, you might want to isolate some VLAN (for example, high-speed Internet) and not isolate other VLAN (for example, VoIP).

51.4.1 Isolation Show Command

Syntax:

```

ras> switch isolation show

```

This command displays the current setting of the subscriber isolation feature.

An example is shown next.

Figure 164 Isolation Show Example

```

ras> switch isolation show
system isolation: disabled
system switch mode : stand alone
isolated vlan list
----
33

```

51.4.2 Port Isolation Enable Command

Syntax:

```

ras> switch isolation enable

```

This command turns on the port isolation feature.

51.4.3 Port Isolation Disable Command

Syntax:

```
ras> switch isolation disable
```

This command turns off the port isolation feature.

51.4.4 VLAN Isolation Set Command

Syntax:

```
ras> switch isolation vlan set <vid>
```

where

<vid> = The VLAN ID [1 – 4094].

This command turns on VLAN isolation for the specified VLAN. This prevents subscriber ports from communicating directly with each other.

The following example turns on VLAN isolation for VLAN 100.

Figure 165 VLAN Isolation Set Example

```
ras> switch isolation vlan set 100
ras> switch isolation show
system isolation: disabled
system switch mode : stand alone
isolated vlan list
----
   33
  100
```

51.4.5 VLAN Isolation Delete Command

Syntax:

```
ras> switch isolation vlan delete <vid>
```

where

<vid> = The VLAN ID [1 – 4094].

This command turns off VLAN isolation for the specified VLAN.

The following example turns off VLAN isolation for VLAN 100.

Figure 166 VLAN Isolation Delete Example

```
ras> switch isolation vlan delete 100
ras> switch isolation show
system isolation: disabled
system switch mode : stand alone
isolated vlan list
----
   33
```

51.5 switch ouifilter Commands

Use the following OUI (Organizationally Unique Identifier) filter commands to filter out packets from devices with the specified OUI in the MAC address field.

The OUI field is the first three octets in a MAC address. An OUI uniquely identifies the manufacturer of a network device and allows you to identify from which device brands the switch will accept traffic or send traffic to. The OUI value is assigned by the IANA.

51.5.1 switch ouifilter disable Command

Syntax:

```
switch ouifilter disable <port>
```

This command deactivates MAC OUI filtering on the specified port(s).

51.5.2 switch ouifilter enable Command

Syntax:

```
switch ouifilter enable <port>
```

This command activates MAC OUI filtering on the specified port(s).

51.5.3 switch ouifilter mode Command

Syntax:

```
switch ouifilter mode <port> accept|deny
```

where

accept deny	accept: Allows frames from MAC addresses with the OUI(s) that you specify and blocks frames with MAC addresses of other OUIs. deny: Blocks frames from MAC addresses with the OUI(s) that you specify and allows frames from other MAC addresses.

This command activates MAC OUI filtering on the specified port(s). Use the `switch ouifilter set` command to set the OUI value(s).

The following example sets the system to drop packets with the specified OUI value on port 1.

```
ras> switch ouifilter mode 1 deny
```

51.5.4 switch ouifilter set Command

Syntax:

```
switch ouifilter set <port> <mac-oui>
```

where

<i>mac-oui</i>	The first three octets of a MAC address in the format xx:xx:xx. For example, 00:0F:FE.

This command specifies a MAC OUI whose packets you want to filter. Use the `switch ouifilter mode` command to set the action on the matched packets.

The following example sets the system to filter packets with an OUI value of 00-0F-FE on port 1.

```
ras> switch ouifilter set 1 00:0f:fe
```

51.5.5 switch ouifilter show Command

Syntax:

```
switch ouifilter show <port>
```

This command displays the OUI filtering status (V for enabled, - for disabled) and the OUI value(s) of the MAC address on a DSL port(s) or on all of the DSL ports if no port is specified. The following example displays the OUI filter setting of port 1.

```
ras> switch ouifilter show 1
      status:V, enable oui filter function.
      status:-, disable oui filter function.
port  mode  status oui
-----
  1  accept   -    -
```

51.6 Statistics Monitor Command

Syntax:

```
ras> statistics monitor
```

This command shows the current hardware status (voltage, temperature, fan speed and alarm status).

An example is shown next.

Figure 167 Statistics Monitor Command Example

```

ras> statistics monitor
Hardware monitor status: enabled

```

	nominal	limit(hi)	limit(lo)	current	min	max	avg	status
v1(v)	1.000	1.242	1.035	1.152	1.152	1.152	1.152	Normal
v2(v)	1.800	1.944	1.656	1.792	1.778	1.792	1.787	Normal
v3(v)	3.300	3.564	3.036	3.315	3.315	3.315	3.315	Normal
v4(v)	24.000	25.920	22.080	23.700	23.700	23.700	23.700	Normal

	limit(hi)	limit(lo)	current	min	max	avg	status
t1(c)	97.000	-55.000	32.000	25.000	33.000	30.000	Normal
t2(c)	97.000	-55.000	27.000	24.000	28.000	25.000	Normal
t3(c)	97.000	-55.000	29.000	25.000	30.000	27.000	Normal

	limit(hi)	limit(lo)	current	min	max	avg	status
fan1(rpm)	8000	2000	5416	5032	5449	5417	Normal
fan2(rpm)	8000	2000	5555	5167	5555	5547	Normal
fan3(rpm)	8000	2000	5521	5325	5532	5508	Normal

status	name
ext alm1	Normal extalm1
ext alm2	Normal extalm2
ext alm3	Normal extalm3

status	
ext relay	Normal

51.7 Statistics Port Command

Syntax:

```
ras> statistics port <portlist> [<vpi> <vci>] [clear]
```

where

- <portlist> = You can specify a single port <1>, all ports <*> or a list of ports <1,3,enet1>. You can also include a range of ports <1,5,6~10,enet1,enet2>.
- <vpi> <vci> = The VPI and VCI of an individual PVC.
- [clear] = Use clear to have the IES-1248 set the specified port(s) or PVC's counters back to zero.

This command displays and/or erases port statistics.

The following example displays port statistics for ADSL port 1.

Figure 168 Statistics Port Command Example

```
ras> statistics port 1
[adsl port 1]
tx packets           : 20
rx packets           : 0
tx uni-packets       : 1
rx uni-packets       : 0
tx nonuni-packets    : 19
rx nonuni-packets    : 0
tx discard packets   : 0
rx discard packets   : 0
errors               : 0
tx rate (bytes/s)    : 0
rx rate (bytes/s)    : 128
tx bytes             : 5904
rx bytes             : 0
```

where

tx uni-packets	=	This field shows the number of unicast packets transmitted on this port.
rx uni-packets	=	This field shows the number of unicast packets received on this port.
tx nonuni-packets	=	This field shows the number of non-unicast (broadcast and multicast) packets transmitted on this port.
rx nonuni-packets	=	This field shows the number of non-unicast (broadcast and multicast) packets received on this port.

See [Chapter 9 on page 97](#) for details on the other port statistics fields.

Alarm Commands

This chapter describes the alarm management commands.

52.1 Alarm Commands

Use these commands to view, customize and clear alarms. You can also set the device to report alarms to an SNMP or syslog server that you specify.

52.2 General Alarm Command Parameters

The following table describes commonly used alarm command parameter notation.

Table 116 General Alarm Command Parameters

NOTATION	DESCRIPTION
<alarm>	Specify a category of alarms. eqpt represents equipment alarms. dsl represents Digital Subscriber Line (DSL) alarms. enet represents Ethernet alarms. sys represents system alarms. all specifies every alarm category.
<severity>	Specify an alarm severity level (critical, major, minor, info or all). Critical alarms are the most severe, major alarms are the second most severe, minor alarms are the third most severe and info alarms are the least severe.
<condition>	This is the text description for the condition under which the alarm applies. Use the alarm tablelist to find alarm conditions.

52.3 Alarm Show Command

Syntax:

```
ras> alarm show [<severity>|all] [<alarm>|all] [<condition>|all] [detail]
```

where

[detail] = Display in-depth alarm information.

This command displays the current alarms by severity, alarm category or alarm condition.

The following example displays the current critical level alarms for all alarm categories and conditions.

The source is where the alarm originated. This is either a DSL port number, one of the Ethernet ports (enet 1 or 2), or “eqpt” for the system itself.

Figure 169 Alarm Show Command Example

```

ras> alarm tablelist
no alarm          condition          facility snmp syslog severity
clearable
-----
 1  dsl ( 5000)line_up             local1    V    V    info    -
 2  dsl ( 5001)line_down           local1    V    V    minor   V
 3  dsl ( 5002)ad_perf_lo1_thresh local1    V    V    info    V
 4  dsl ( 5003)ad_perf_lof_thresh local1    V    V    info    V
 5  dsl ( 5004)ad_perf_los_thresh local1    V    V    info    V
 6  dsl ( 5005)ad_perf_lop_thresh local1    V    V    info    V
 7  dsl ( 5006)ad_perf_es_thresh  local1    V    V    info    V
 8  dsl ( 5007)ad_perf_rate_chg   local1    V    V    info    V
 9  dsl ( 5008)ad_perf_ses_thresh local1    V    V    info    V
10  dsl ( 5009)ad_perf_uas_thresh local1    V    V    info    V
11  dsl ( 5010)ad_atuc_loftrap     local1    V    V    minor   -
12  dsl ( 5011)ad_atuc_lostrap     local1    V    V    minor   -
13  dsl ( 5012)ad_atur_loftrap     local1    V    V    minor   -
14  dsl ( 5013)ad_atur_lostrap     local1    V    V    minor   -
15  dsl ( 5014)ad_atur_lprtrap     local1    V    V    minor   -
16  eqpt ( 10000)vol_err           local1    V    V    critical -
17  eqpt ( 10001)temp_err          local1    V    V    critical -
18  eqpt ( 10002)fan_err           local1    V    V    critical -
19  eqpt ( 10003)hw_rtc_fail       local1    V    V    critical -

Press any key to continue, 'e' to exit, 'n' for nopause

```

52.4 Alarm Port Show Command

Syntax:

```
ras> alarm port show [<severity>|all]
```

This command displays port alarm severity level thresholds. The system reports an alarm on a port if the alarm has a severity equal to or higher than the port’s threshold.

The following example displays the port alarm thresholds for all ports. “ifindex” identifies the interface.

Figure 170 Alarm Port Show Command Example

```
ras> alarm port show

      Press any key to continue, 'e' to exit, 'n' for nopause

no      ifindex      severity
-----
01      01          minor
02      02          minor
03      03          minor
04      04          minor
05      05          minor
06      06          minor
07      07          minor
08      08          minor
09      09          minor
10      10          minor
11      11          minor
12      12          minor
13      13          minor
14      14          minor
15      15          minor
16      16          minor
17      17          minor
18      18          minor
19      19          minor
20      20          minor

      Press any key to continue, 'e' to exit, 'n' for nopause
```

52.5 Alarm Port Set Command

Syntax:

```
ras> alarm port set <all|enet1|enet2|port> <severity>
```

where

```
<all|enet1|enet2|port> = Ports on the IES-1248.
```

This command sets the alarm severity threshold for reporting alarms on an individual port(s). The system reports an alarm on a port if the alarm has a severity equal to or higher than the port’s threshold.

The following example has the IES-1248 only record critical alarms on DSL port 7.

Figure 171 Alarm Port Set Command Example

```
ras> alarm port set 7 critical
```

52.6 Alarm Tablelist Command

Syntax:

```
ras> alarm tablelist [<alarm>|all] [<severity>|all]
[<fac>|all][<target>[,<target>]] [<condition>|all]
```

where

<fac> = The log facility (local1~local7) that has the device log the syslog messages to different files in the syslog server. See your syslog program's documentation for details.

<target> = snmp|syslog|all The type of alarm messages that the device is to send (SNMP, syslog or all).

This command lists alarm settings.

The following example displays the supported minor level alarms for all alarm categories, facilities, types of alarm messages and conditions.

Figure 172 Alarm Tablelist Command Example

ras> alarm table							
no	alarm	condition	facility	snmp	syslog	severity	
clearable							
1	dsl (5000)	line_enable	local1	V	V	info	-
2	dsl (5001)	line_disable	local1	V	V	info	-
3	dsl (5002)	line_up	local1	V	V	info	-
4	dsl (5003)	line_down	local1	V	V	minor	V
5	dsl (5004)	line_cross_thresh	local1	V	V	minor	-
6	dsl (5005)	line_planrate	local1	V	V	minor	-
7	dsl (5006)	line_ldm	local1	V	V	info	-
8	dsl (5007)	line_ldm_done	local1	V	V	info	-
9	dsl (5008)	line_pml2	local1	V	V	info	-
10	dsl (5009)	line_pml0	local1	V	V	info	-
				-----Snip-----			

52.7 Log Format

The following table describes the columns in the list.

Table 117 Log Format

LABEL	DESCRIPTION
no	This is the index number of the alarm entry in this list display.
alarm	This is the category of alarms. eqpt represents equipment alarms. dsl represents Digital Subscriber Line (DSL) alarms. enet represents Ethernet alarms. sys represents system alarms.
condition	There is a condition code number for the specific alarm message and a text description for the condition under which the alarm applies.
facility	This is the log facility (local1~local7) on the syslog server where the system is to log this alarm. This is for alarms that send alarms to a syslog server.

Table 117 Log Format (continued)

LABEL	DESCRIPTION
snmp	This displays “V” if the system is to send this alarm to an SNMP server. It displays “-” if the system does not send this alarm to an SNMP server.
syslog	This displays “V” if the system is to send this alarm to a syslog server. It displays “-” if the system does not send this alarm to a syslog server.
severity	This is the alarm severity level (critical, major, minor or info).
clearable	This displays “V” if the alarm clear command removes the alarm from the system. It displays “-” if the alarm clear command does not remove the alarm from the system.

52.8 Alarm History Show Command

Syntax:

```
ras> alarm history show [<severity>|all] [<alarm>|all] [<condition>|all]
[<sdate>|all] [<edate>|all] [for|rev] [detail]
```

where

- <sdate> = The start date, in yyyy/mm/dd format.
- <edate> = The end date, in yyyy/mm/dd format.
- [for|rev] = The displaying order. Use *for* to display in chronological order starting from the oldest alarm. Use *rev* to display in reverse chronological order starting from the most recent alarm.
- [detail] = Display in-depth alarm information.

This command displays historic alarms by severity, alarm category, alarm condition and/or dates.

The following example displays the historic critical level alarms for all alarm categories, and all conditions.

Figure 173 Alarm History Show Command Example

ras> alarm history show critical all all all all rev detail					
no	alarm	condition	severity	timestamp	source
-----	-----	-----	-----	-----	-----
1	eqpt	+fan_err	critical	07/28 15:23:35	eqpt
		* IES-1248:Fan 2 speed 0, low 2000, high 8000			
2	eqpt	+fan_err	critical	07/28 15:23:35	eqpt
		* IES-1248:Fan 3 speed 0, low 2000, high 8000			
3	eqpt	+fan_err	critical	07/28 15:23:33	eqpt
		* IES-1248:Fan 1 speed 0, low 2000, high 8000			

52.9 Alarm History Clear Command

Syntax:

```
ras> alarm history clear [<alarm>|all <condition>|all] <severity>
```

This command removes historic alarm entries by alarm category, alarm condition or severity.

The following example removes the historic minor level alarms for all alarm categories, and all conditions.

Figure 174 Alarm History Clear Command Example

```
ras> alarm history clear minor
```

52.10 Alarm XEdit Command

Syntax:

```
ras> alarm xedit <alarm>|all <cond>|<condcode> <severity> <fac>  
<target>[,<target>] [clearable]
```

where

<cond>	=	all condition This is the text description for the condition under which the alarm applies. Use the <code>alarm tablelist</code> to find alarm conditions.
<condcode >	=	The condition code is the number of a specific alarm message. Use the <code>alarm tablelist</code> to find alarm condition codes.
<severity>	=	Specify an alarm severity level (critical, major, minor or info) for this alarm. Critical alarms are the most severe, major alarms are the second most severe, minor alarms are the third most severe and info alarms are the least severe.
<fac>	=	The log facility (local1~local7) has the device log the syslog messages to a particular file in the syslog server. Set this if this entry is for sending alarms to a syslog server. See your syslog program's documentation for details.
<target>	=	snmp syslog all The type of alarm messages that the device is to send (SNMP, syslog or all). You can specify more than one separated by commas.
[clearable]	=	clearable unclearable This sets whether or not the alarm clear command removes the alarm from the system.

This command sets the severity level of an alarm(s) and where the system is to send the alarm(s).



Use the `alarm tablelist` command to display alarm setting details.

The following example creates an alarm report entry that sets all system alarms to the major severity level and sends them to an SNMP server at the local 3 log facility.

Figure 175 Alarm Xedit Command Example

```
ras> alarm xedit sys all major local3 syslog
```

52.11 Alarm Cutoff Command

Syntax:

```
ras> alarm cutoff
```

This command cancels an alarm. This stops the sending of the alarm signal current. This is useful in stopping an alarm if you have the alarm output connector pins connected to a visible or audible alarm. The alarm entry remains in the system.

52.12 Alarm Clear Command

Syntax:

```
ras> alarm clear
```

This command erases the clearable alarm entries.

DHCP Commands

This chapter describes how to use the DHCP Relay and DHCP Snoop commands.

53.1 DHCP Relay Commands

Use these commands to configure the DHCP relay feature. See [Chapter 29 on page 211](#) for background information on DHCP relay.

53.1.1 Show Command

Syntax:

```
ras> switch dhcprelay show
```

This command displays whether or not the DHCP relay feature is activated, which relay mode the IES-1248 is using, the current list of DHCP servers by VLAN, the status of the DHCP relay agent info option 82 feature and the information configured for it.

Figure 176 Show Command Example

```
DHCP relay status: disable
DHCP relay mode:  auto
Server list:
index  vid  primary-server      secondary-server
-----
   1    1  (*) 212.212.212.212  213.213.213.213
   2    2  (*) 214.214.214.214  215.215.215.251

option82 sub-opt1 info (Circuit ID)
-----
-

option82 sub-opt2 info (Remote ID)
-----
-
```

53.1.2 Enable Command

Syntax:

```
ras> switch dhcprelay enable <vid>|all
```

This command turns on the DHCP relay feature.

53.1.3 Disable Command

Syntax:

```
ras> switch dhcprelay disable <vid>|all
```

This command turns off the DHCP relay feature.

53.1.4 Server Set Command

Syntax:

```
ras> switch dhcprelay server set <vid> <primary-server> [<secondary-server>]
```

where

<vid>	=	The ID of the VLAN served by the specified DHCP server(s).
<primary-server>	=	The IP address of one DHCP server.
<secondary-server>	=	The IP address of a second DHCP server.

This command specifies the DHCP server(s) that serve the specified VLAN. The primary server is required; the secondary server is optional. The IES-1248 routes DHCP requests to the specified DHCP server(s) according to the `relaymode`. See [Section 53.1.7 on page 367](#).

Use VLAN ID 0 to set up the default DHCP server(s) for all non-listed VLAN.

53.1.5 Server Delete Command

Syntax:

```
ras> switch dhcprelay server delete <vid>|all [<primary-server>]
```

where

<vid>	=	The ID of the VLAN served by the specified DHCP server(s).
<primary-server>	=	The IP address of one DHCP server.

This command deletes all information about DHCP servers for the specified VLAN. Afterwards, the specified VLAN can use the default DHCP server(s) set up for VLAN ID 0, if any.

53.1.6 Server Active Command

Syntax:

```
ras> switch dhcprelay server active <vid>|all <active-server>
```

where

<vid>	=	The ID of the VLAN served by the specified DHCP server(s).
<active-server>	=	1: The primary DHCP server is active. 2: The secondary DHCP server is active.

This command has no effect if the **relaymode** is **both**. If the **relaymode** is **auto**, this command specifies to which DHCP server (the primary one or the secondary one) the IES-1248 should relay DHCP requests for the selected VLAN.

53.1.7 Relaymode Command

Syntax:

```
ras> switch dhcprelay relaymode <vid>|all <mode>
```

where

<mode>	=	relay process mode; it controls to which DHCP server(s) the IES-1248 relays DHCP requests.
		auto - the IES-1248 relays DHCP requests to the active server for each VLAN
		both - the IES-1248 relays DHCP requests to the primary and secondary server for each VLAN, regardless of which one is active

This command controls how the IES-1248 routes DHCP requests. The IES-1248 can route DHCP requests to the active DHCP server for the VLAN, or it can route DHCP requests to all DHCP servers set up for the VLAN.

53.2 DHCP Relay Option 82 (Agent Information) Sub-option 1 (Circuit ID)

Use the following commands to configure the DHCP relay Option 82 (agent information) feature, sub-option 1. This feature applies regardless of whether or not the DHCP relay is on.

53.2.1 Option 82 Sub-option 1 Enable Command

Syntax:

```
ras> switch dhcprelay option82 enable <vid>|all
```

This command turns on the DHCP relay agent information (Option 82 Sub-option 1) feature.

53.2.2 Option 82 Sub-option 1 Disable Command

Syntax:

```
ras> switch dhcprelay option82 disable <vid>|all
```

This command turns off the DHCP relay agent information (Option 82, Sub-option 1) feature.

53.2.3 Option 82 Sub-option 1 Set Command

Syntax:

```
ras> switch dhcprelay option82 set <vid>|all [<relay info>]
```

where

[<relay info>] = Up to 23 ASCII characters of additional information for the IES-1248 to add to the DHCP requests that it relays to a DHCP server.

Examples of information you could add would be the name of the IES-1248 or the ISP.

This command adds the specified information for the relay agent.

53.3 DHCP Relay Option 82 (Agent Information) Sub-option 2 (Remote ID)

Use the following commands to configure the DHCP relay Option 82 (agent information) feature, sub-option 2. This feature applies regardless of whether or not the DHCP relay is on.

53.3.1 Option 82 Sub-option 2 Enable Command

Syntax:

```
ras> switch dhcprelay opt82sub2 enable <vid>|all
```

This command turns on the DHCP relay agent information (Option 82, Sub-option 2) feature.

53.3.2 Option 82 Sub-option 2 Disable Command

Syntax:

```
ras> switch dhcprelay opt82sub2 disable <vid>|all
```

This command turns off the DHCP relay agent information (Option 82, Sub-option 2) feature.

53.3.3 Option 82 Sub-option 2 Set Command

Syntax:

```
ras> switch dhcprelay opt82sub2 set <vid>|all [<relay info>]
```

where

[<relay info>] = Up to 23 ASCII characters of additional information for the IES-1248 to add to the DHCP requests that it relays to a DHCP server.

Examples of information you could add would be the name of the IES-1248 or the ISP.

This command adds the specified information for the relay agent.

53.4 PPPoE Intermediate Agent Information

Use these commands if you want the IES-1248 to add a vendor-specific tag to PADI (PPPoE Active Discovery Initialization) and PADR (PPPoE Active Discovery Request) packets from PPPoE clients. This tag gives a PPPoE termination server additional information (such as the port number, VLAN ID, and MAC address) that the server can use to identify and authenticate a PPPoE client.

53.4.1 PPPoE Intermediate Agent Clear Info Command

Syntax:

```
ras> switch poeagent clearinfo <vid>|all
```

where

<vid>|all = The ID of the VLAN to which to apply the setting. Type `all` to apply the setting to all VLAN.

This command clears any extra information the IES-1248 adds to PADI and PADR packets in the specified VLAN or for all VLAN.

53.4.2 PPPoE Intermediate Agent Enable Command

Syntax:

```
ras> switch poeagent enable <vid>|all
```

where

<vid>|all = The ID of the VLAN to which to apply the setting. Type `all` to apply the setting to all VLAN.

This command adds a vendor-specific tag to PADI and PADR packets for PPPoE clients in the selected VLAN(s) or for all VLAN. This tag contains information that a PPPoE termination server can use to identify and authenticate a PPPoE client.

The following example activates the PPPoE agent setting for VLAN 100.

Figure 177 PPPoE Intermediate Agent Enable Command Example

```
ras> switch poeagent enable 100
ras> switch poeagent show
vid enable  info
-----
  0      -
100     V
101     -
102     -
Note: vid 0 is the default agent.
```

53.4.3 PPPoE Intermediate Agent Delete Command

Syntax:

```
ras> switch poeagent delete <vid>|all
```

where

`<vid>|all` = The ID of the VLAN to which to apply the setting. Type `all` to apply the setting to all VLAN.

This command deletes the PPPoE intermediate agent settings for the specified VLAN or for all VLAN. You cannot delete the setting for VLAN 0.

53.4.4 PPPoE Intermediate Agent Disable Command

Syntax:

```
ras> switch poeagent disable <vid>|all
```

where

`<vid>|all` = The ID of the VLAN to which to apply the setting. Type `all` to apply the setting to all VLAN.

This command removes the vendor-specific tag from PADI and PADR packets for PPPoE clients in the selected VLAN(s) or for all VLAN.

53.4.5 PPPoE Intermediate Agent Info Command

Syntax:

```
ras> switch poeagent info <vid>|all <description>
```

where

`<vid>|all` = The ID of the VLAN to which to apply the setting. Type `all` to apply the setting to all VLAN.

`<description>` = The PPPoE line information the switch is to add to PPPoE discover packets from the specified VLAN or from all VLAN. Enter a description (up to 24 alphanumeric characters).

This command specifies the extra information the IES-1248 adds to PADI and PADR packets in the specified VLAN or in all VLANs, if the PPPoE intermediate agent is enabled.



Before you can configure PPPoE intermediate agent information, you must first create a entry using the `poeagent set` command.

The following example sets the switch to add “testing” to PADI and PADR packets on VLAN 100.

Figure 178 PPPoE Intermediate Agent Info Command Example

```

ras> switch poeagent info 100 testing
ras> switch poeagent show
  vid enable  info
-----
   0      -
  100    V    testing
  101    -
  102    -
Note: vid 0 is the default agent.
```

53.4.6 PPPoE Intermediate Agent Set Command

Syntax:

```
ras> switch poeagent set <vid>
```

This command creates a PPPoE agent information entry for the VLAN. After you have created an entry for a VLAN, you can configure the line information settings. The following example creates an entry for VLAN 10.

Figure 179 PPPoE Intermediate Agent Set Command Example

```

ras> switch poeagent set 10
ras> switch poeagent show
  vid enable  info
-----
   0      -
   10     -
  100    V    testing
  101    -
  102    -
Note: vid 0 is the default agent.
```

53.4.7 PPPoE Intermediate Agent Show Command

Syntax:

```
ras> switch poeagent show [<vlanlist>]
```

where

<vlanlist> = You can specify a single VID: <1>, all VIDs: <*>, a list of VIDs: <1,3>, you can also include a range of VIDs: <1,5,6~10>.

This command displays PPPoE intermediate agent settings for the specified VLAN or for all VLAN. The following example shows the PPPoE intermediate agent settings for all VLAN.

Figure 180 PPPoE Intermediate Agent Show Command Example

```

ras> switch poeagent show
vid enable  info
-----
  0      -
 10      -
100    V    testing
101      -
102      -
Note: vid 0 is the default agent.

```

53.5 DHCP Snoop Commands

Use these commands to configure or show DHCP snooping settings on the subscriber ports. The system gets the client MAC-IP address information (in the reply from a DHCP server) and stores it in the DHCP snooping table. The system only forwards packets from the clients whose MAC-IP address is in the DHCP snooping table. Packets from unknown IP address(es) are not forwarded (dropped). This feature prevents clients from assigning their own static IP addresses.

53.5.1 DHCP Snoop Enable Command

Syntax:

```
ras> switch dhcpsnoop enable <portlist>
```

where

[portlist] = You can specify a single port <1>, all ports <*> or a list of ports <1,3,enet1>. You can also include a range of ports <1,5,6~10,enet1,enet2>.

This command activates the DHCP snooping feature on the specified port(s). The following example enables DHCP snooping on port 1.

Figure 181 DHCP Snoop Enable Command Example

```

ras> switch dhcpsnoop enable 1

```

53.5.2 DHCP Snoop Disable Command

Syntax:

```
ras> switch dhcpsnoop disable <portlist>
```


where

[portlist] = You can specify a single port <1>, all ports <*> or a list of ports <1,3,enet1>. You can also include a range of ports <1,5,6~10,enet1,enet2>.

This command disables the DHCP snooping feature on the specified port(s).

53.5.3 DHCP Snoop Flush Command

Syntax:

```
ras> switch dhcpsnoop flush <portlist>
```

where

[portlist] = You can specify a single port <1>, all ports <*> or a list of ports <1,3,enet1>. You can also include a range of ports <1,5,6~10,enet1,enet2>.

This command clears the DHCP snooping binding table on the specified port(s). The system also automatically clears the binding table when you disable DHCP snooping.

53.5.4 DHCP Snoop Show Command

Syntax:

```
ras> switch dhcpsnoop show <portlist>
```

where

[portlist] = You can specify a single port <1>, all ports <*> or a list of ports <1,3,enet1>. You can also include a range of ports <1,5,6~10,enet1,enet2>.

Use this command to display the current DHCP snooping settings of the specified port(s). The following example displays the settings of ports 1-5.

Figure 182 DHCP Snoop Show Command Example

```

ras> switch dhcpsnoop show 1~5
port  enable
-----
  1    V
  2    -
  3    -
  4    -
  5    -

```

53.5.5 DHCP Counter Statistics Command

Syntax:

```
ras> statistics dhcp counter [<portlist> [clear]]
```

where

<portlist> = You can specify a single port <1>, all ports <*> or a list of ports <1,3,enet1>. You can also include a range of ports <1,5,6~10,enet1,enet2>.

Use this command to display a summary of DHCP packets on the specified port(s). The following example displays the settings of port 1.

Figure 183 DHCP Counter Statistics Command Example

ras> statistics dhcp counter 1					
port	discover	offer	request	ack	overflow
-----	-----	-----	-----	-----	-----
1	0	0	0	0	0

Each field is described in the following table.

port	=	The selected ADSL port number(s).
discover	=	The number of DHCP Discover packets on this port.
offer	=	The number of DHCP Offer packets on this port.
request	=	The number of DHCP Request packets on this port.
ack	=	The number of DHCP Ack packets on this port.
overflow	=	The DHCP server can assign up to 32 IP addresses at one time to each port. This field displays the number of requests from DHCP clients above this limit.

53.5.6 DHCP Snoop Statistics Command

Syntax:

```
ras> statistics dhcp snoop <portlist>
```

where

<portlist> = You can specify a single port <1>, all ports <*> or a list of ports <1,3,enet1>. You can also include a range of ports <1,5,6~10,enet1,enet2>.

Use this command to look at the DHCP snooping table on the specified port(s). The following example displays the settings of port 1.

Figure 184 DHCP Snoop Statistics Command Example

ras> statistics dhcp snoop 1		
port	overflow	mac ip
-----	-----	-----

Each field is described in the following table.

port	=	The selected ADSL port number(s).
overflow	=	The DHCP server can assign up to 32 IP addresses at one time to each port. This field displays the number of requests from DHCP clients above this limit.
mac	=	The MAC address of a client on this port to which the DHCP server assigned an IP address.
ip	=	The IP address assigned to a client on this port.

53.5.7 DHCP Snoop LAN to LAN Show Command

Syntax:

```
ras> switch dhcpsnoop lan2lan show
```

This command displays whether LAN to LAN DHCP services are enabled or disabled.

53.5.8 DHCP Snoop LAN to LAN Disable Command

Syntax:

```
ras> switch dhcpsnoop lan2lan disable
```

This command disables LAN to LAN DHCP services.

By default, the LAN to LAN DHCP service should be disabled except in cases wherein a customer needs to put a DHCP server on the subscriber side.

If LAN to LAN DHCP service is disabled, the DHCP Discover and DHCP Request will not be forwarded to the subscriber side, and DHCP client cannot get a correct IP address.

53.5.9 DHCP Snoop LAN to LAN Enable Command

Syntax:

```
ras> switch dhcpsnoop lan2lan enable
```

This command enables LAN to LAN DHCP services.

The LAN to LAN DHCP service can be enabled in special cases wherein a customer needs to put a DHCP server on the subscriber side. This forwards DHCP Discover and DHCP Request to the subscriber side allowing a DHCP client to get a correct IP address.

IEEE 802.1Q Tagged VLAN Commands

This chapter describes the IEEE 802.1Q Tagged VLAN commands.

54.1 Introduction to VLANs

See [Chapter 20 on page 167](#) for more background information on VLANs.

54.2 IEEE 802.1Q Tagging Types

There are two kinds of tagging:

- Explicit Tagging

A VLAN identifier is added to the frame header that identifies the source VLAN.

- Implicit Tagging

The MAC (Media Access Control) number, the port or other information is used to identify the source of a VLAN frame.

The IEEE 802.1Q Tagged VLAN uses both explicit and implicit tagging.

It is important for the IES-1248 to determine what devices are VLAN-aware and VLAN-unaware so that it can decide whether to forward a tagged frame (to a VLAN-aware device) or first strip the tag from a frame and then forward it (to a VLAN-unaware device).

54.3 Filtering Databases

A filtering database stores and organizes VLAN registration information useful for switching frames to and from the IES-1248. A filtering database consists of static entries (Static VLAN or SVLAN table).

54.3.1 Static Entries (SVLAN Table)

Static entry registration information is added, modified and removed by administrators only.

54.4 IEEE VLAN1Q Tagged VLAN Configuration Commands

These switch commands allow you to configure and monitor the IEEE 802.1Q Tagged VLAN.

54.4.1 VLAN Port Show Command

Syntax:

```
ras> switch vlan portshow [portlist]
```

where

[portlist] = You can specify a single port <1>, all ports <*> or a list of ports <1,3,enet1>. You can also include a range of ports <1,5,6~10,enet1,enet2>.

This command displays the port's IEEE 802.1Q VLAN tag settings.

The following example shows the settings for ADSL port 1.

Figure 185 VLAN Port Show Command Example

```
ras> switch vlan portshow 3
port pvid priority frametype
-----
  3    1          0         all
```

54.4.2 VLAN PVID Command

Syntax:

```
ras> switch vlan pvid <portlist> <pvid>
```

where

<portlist> = You can specify a single port <1>, all ports <*> or a list of ports <1,3,enet1>. You can also include a range of ports <1,5,6~10,enet1,enet2>.

<pvid> = The VLAN ID. Valid parameter range = [1 – 4094].

This command sets a default VLAN ID for all untagged packets that come in through the specified port.

The following example sets the default VID of port 1 to 200.

Figure 186 VLAN PVID Command Example

```
ras> switch vlan pvid 1 200
```

54.4.3 VLAN Priority Command

Syntax:

```
ras> switch vlan priority <portlist> <priority>
```

where

- `<portlist>` = You can specify a single port: `<1>`, all ports: `<*>`, a list of ports: `<1,3,enet1>`, you can also include a range of ports: `<1,5,6~10,enet1,enet2>`.
- `<priority>` = This is the priority value (0 to 7) to use for incoming frames with an IEEE 802.1Q VLAN tag.

This command sets the priority of incoming frames with an IEEE 802.1Q VLAN tag.

The following example sets a priority of three for frames (with an IEEE 802.1Q VLAN tag) that come in on ADSL port 2.

Figure 187 VLAN CPU Set Command Example

```
ras> switch vlan priority 2 3
```

54.4.4 VLAN Set Command

Syntax:

```
ras> switch vlan set <vid> <portlist>:<F<T|U>|X|N> [<portlist>:<F<T|U>|X>
...][name]
```

where

- `<vid>` = The VLAN ID [1 – 4094].
- `<portlist>` = You can specify a single port: `<1>`, all ports: `<*>`, a list of ports: `<1,3,enet1>`, you can also include a range of ports: `<1,5,6~10,enet1,enet2>`.
- `<F<T|U>|` = The `<F>` stands for a fixed registrar administration control flag and registers a `<port #>` to the static VLAN table with `<vid>`.
For a fixed port, you also have to specify `<T|U>`, the tag control flag.
`<T>` has the device add an IEEE 802.1Q tag to frames going out through this port(s).
`<U>` has the device send frames out through this port(s) without an IEEE 802.1Q tag.
- `|X|N>` = This is the registrar administration control flag.
`<X>` stands for forbidden and blocks a `<port #>` from joining the static VLAN table with `<vid>`.
`<N>` stands for normal and confirms registration of the `<port #>` to the static VLAN table with `<vid>`. This is used in GVRP applications.
- `[name]` = A name to identify the SVLAN entry.

This command adds or modifies an entry in the static VLAN table. Use the `switch vlan show` command to display your configuration. An example of a configuration is shown next.

54.4.4.1 Modify a Static VLAN Table Example

The following is an example of how to modify a static VLAN table.

Figure 188 Modifying the Static VLAN Example

```
ras> switch vlan set 2000 1:FU
ras> switch vlan set 2001 2:FU
```

54.4.4.2 Forwarding Process Example

Tagged Frames

- 1 First the IES-1248 checks the VLAN ID (VID) of tagged frames or assigns temporary VIDs to untagged frames (see [Section 54.4.2 on page 378](#)).
- 2 The IES-1248 checks the frame's source MAC address against the MAC filter.
- 3 The IES-1248 then checks the VID in a frame's tag against the SVLAN table.
- 4 The IES-1248 notes what the SVLAN table says (that is, the SVLAN tells the IES-1248 whether or not to forward a frame and if the forwarded frames should have a tag).
- 5 Frames might be dropped if they are sent to a CPE (customer premises equipment) DSL device that does not accept tagged frames.

Untagged Frames

- 1 An untagged frame comes in from the LAN.
- 2 The IES-1248 checks the frame's source MAC address against the MAC filter.
- 3 The IES-1248 checks the PVID table and assigns a VID and IEEE 802.1Q priority.
- 4 The IES-1248 ignores the port from which the frame came, because the IES-1248 does not send a frame to the port from which it came. The IES-1248 also does not forward frames to "forbidden" ports.
- 5 If after looking at the SVLAN, the IES-1248 does not have any ports to which it will send the frame, it drops the frame.

54.4.5 VLAN Frame Type Command

Syntax:

```
ras> switch vlan frametype <portlist> <all|tag>
```

where

<portlist>	=	You can specify a single DSL port <1>, all DSL ports <*> or a list of DSL ports <1,3>. You can also include a range of DSL ports <1,5,6~10>.
<all tag>	=	Use <code>tag</code> to have the specified port(s) accept only incoming Ethernet frames that have a VLAN tag. Use <code>all</code> to have the specified port(s) accept both tagged and untagged incoming Ethernet frames.

This command sets the specified DSL ports to accept VLAN tagged Ethernet frames, or both tagged and untagged Ethernet frames.



The IES-1248 accepts both tagged and untagged incoming frames on the Ethernet ports.

The following example sets the IES-1248 to accept only VLAN tagged Ethernet frames on DSL port 3.

Figure 189 VLAN Frame Type Command Example

```
ras> switch vlan frametype 3 tag
```

54.4.6 VLAN CPU Show Command

Syntax:

```
ras> switch vlan cpu show
```

This command displays the management VLAN (CPU). You can only use ports that are members of this management VLAN in order to manage the IES-1248.

The following example sets VLAN ID 2 to be the CPU (management) VLAN.

Figure 190 VLAN CPU Set Command Example

```
ras> switch vlan cpu set 2
```

54.4.7 VLAN CPU Set Command

Syntax:

```
ras> switch vlan cpu set <vid>
```

where

<vid> = The VLAN ID. Valid parameter range = [1 – 4094].

This command sets the management VLAN (CPU). You can only use ports that are members of this management VLAN in order to manage the IES-1248.

The following example sets VLAN ID 2 to be the CPU (management) VLAN.

Figure 191 VLAN CPU Set Command Example

```
ras> switch vlan cpu set 2
```

54.4.8 Configuring Management VLAN Example



After the following example configuration, you must connect to the first Ethernet port through a VLAN aware device that is using the proper VLAN ID in order to perform management.

By default, the IES-1248's ADSL ports are members of the management VLAN (VID 1). The following procedure shows you how to configure a tagged VLAN that limits management access to just one Ethernet port.



Use the console port to configure the IES-1248 if you misconfigure the management VLAN and lock yourself out.

- 1 Use the `switch vlan set` command to configure a VLAN ID (VID 3 in this example) for managing the IES-1248 (the “management” or “CPU” VLAN).

Figure 192 CPU VLAN Configuration and Activation Example

```
ras> switch vlan set 3 enet1:FT
```

- 2 Use the `switch vlan1q vlan cpu` command to set VID 3 as the management VLAN.

Figure 193 Deleting Default VLAN Example

```
ras> switch vlan cpu set 3
```

54.4.9 VLAN Delete Command

Syntax:

```
ras> switch vlan delete <vlanlist>
```

where

<vlanlist> = You can specify a single VID: <1>, all VIDs: <*>, a list of VIDs: <1,3>, you can also include a range of VIDs: <1,5,6~10>.

This command deletes the specified VLAN ID entry from the static VLAN table. The following example deletes entry 2 in the static VLAN table.

Figure 194 VLAN Delete Command Example

```
ras> switch vlan delete 2
```

54.5 VLAN Enable

Syntax:

```
ras> switch vlan enable <vid>
```

This command enables the specified VLAN ID in the SVLAN (Static VLAN) table.

54.6 VLAN Disable

Syntax:

```
ras> switch vlan disable <vid>
```

This command disables the specified VLAN ID in the SVLAN (Static VLAN) table.

54.7 VLAN Name

Syntax:

```
ras> switch vlan name <vid> <name>
```

This command configures the name of the specified VLAN.

54.7.1 VLAN Show Command

Syntax:

```
ras> switch vlan show <vlanlist>
```

where

<vlanlist> = You can specify a single VID: <1>, all VIDs: <*>, a list of VIDs: <1,3>, you can also include a range of VIDs: <1,5,6~10>.

This command shows information about the specified port's VLAN settings.

The following example shows the settings for all VIDs.

Figure 195 VLAN Show Command Example

```

ras> switch vlan show *
vid name          F:fixed X:forbidden N:normal   U:untag T:tag
-----
 1 -
   enabled        12345678901234567890123456789012345678 12
                  FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF FF
                  UUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUU UU
 2 -
   disabled       12345678901234567890123456789012345678 12
                  FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF FF
                  UUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUU UU
2000 -
   enabled        12345678901234567890123456789012345678 12
                  FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF FF
                  UUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUU UU

```


MAC Commands

This chapter describes how to configure the IES-1248's MAC commands.

55.1 MAC Commands Overview

Use the MAC commands to configure MAC filtering or limit the MAC count.

55.2 MAC Filter Commands

Use the MAC filter to control from which MAC (Media Access Control) addresses frames can (or cannot) come in through a port.

55.2.1 MAC Filter Show Command

Syntax:

```
ras> switch mac filter show [portlist]
```

where

<portlist> = You can specify a single ADSL port <1>, all ADSL ports <*> or a list of ADSL ports <1,3,5>. You can also include a range of ports <1,5,6~10>.

This command displays the MAC filtering status (V for enabled, - for disabled) and the fixed source MAC addresses on the specified ADSL port(s) or on all ADSL ports if no port is specified.

The following example displays the MAC filtering mode, status and the fixed source MAC addresses on ADSL port 5.

Figure 196 MAC Filter Show Command Example

```

ras> sw mac filter show 5
  status:V, enable mac filter function.
  status:-, disable mac filter function.
port  mode  status mac
-----
  5  accept  -    00:a0:c5:12:34:56

```

55.2.2 MAC Filter Enable Command

Syntax:

```
ras> switch mac filter enable [portlist]
```

where

<portlist> = You can specify a single ADSL port <1>, all ADSL ports <*> or a list of ADSL ports <1,3,5>. You can also include a range of ports <1,5,6~10>.

This command turns on the MAC filtering feature on the specified ADSL port(s) or on all ADSL ports if no port is specified.

The following example turns on the MAC filtering feature on ADSL port 5.

Figure 197 MAC Filter Enable Command Example

```
ras> switch mac filter enable 5
```

55.2.3 MAC Filter Disable Command

Syntax:

```
ras> switch mac filter disable [portlist]
```

where

<portlist> = You can specify a single ADSL port <1>, all ADSL ports <*> or a list of ADSL ports <1,3,5>. You can also include a range of ports <1,5,6~10>.

This command turns off the MAC filtering feature on the specified ADSL port(s) or on all ADSL ports if no port is specified.

The following example turns off the MAC filtering feature on ADSL port 5.

Figure 198 MAC Filter Disable Command Example

```
ras> switch mac filter disable 5
```

55.2.4 MAC Filter Mode Command

Syntax:

```
ras> switch mac filter mode <port> <accept|deny>
```

where

<accept|deny> = accept = Only allow frames from MAC addresses that you specify and block frames from other MAC addresses.
deny = Block frames from MAC addresses that you specify and allow frames from other MAC addresses.

This command sets whether the IES-1248 allows or blocks access for the MAC addresses you specify.

The following example sets ADSL port 5 to allow frames from the MAC addresses specified for ADSL port 5.

Figure 199 MAC Filter Mode Command Example

```
ras> switch mac filter mode 5 accept
```

55.2.5 MAC Filter Set Command

Syntax:

```
ras> switch mac filter set <port> <mac> [<mac> <mac> ...]
```

where

<port>	=	The number of an ADSL port.
<mac>	=	The source MAC address in "00:a0:c5:12:34:56" format.

This command adds an allowed source MAC address on the specified ADSL port.

The following example adds source MAC address 00:a0:c5:12:34:56 for ADSL port 5.

Figure 200 MAC Filter Set Command Example

```
ras> switch mac filter set 5 00:a0:c5:12:34:56
```

55.2.6 MAC Filter Delete Command

Syntax:

```
ras> switch mac filter delete <port> <mac> [<mac> <mac> ...]
```

where

<port>	=	The number of an ADSL port.
<mac>	=	The source MAC address in "00:a0:c5:12:34:56" format.

This command removes a configured source MAC address from the ADSL port that you specify.

The following example removes the source MAC address of 00:a0:c5:12:34:56 from the MAC filter for ADSL port 5.

Figure 201 MAC Filter Delete Command Example

```
ras> switch mac filter delete 5 00:a0:c5:12:34:56
```

55.3 MAC Count Commands

Use MAC count commands to limit how many MAC addresses may be dynamically learned. MAC count commands are listed next. When the MAC filter accept mode is enabled (see [Section 55.2 on page 385](#)), the IES-1248 ignores the MAC count setting and accepts all of the MAC addresses listed for the port in the MAC filter settings.

55.3.1 MAC Count Show Command

Syntax:

```
ras> switch mac count show [portlist]
```

where

[portlist] = You can specify a single ADSL port <1>, all ADSL ports <*> or a list of ADSL ports <1,3,5>. You can also include a range of ports <1,5,6~10>.

This command displays the MAC count settings on the specified ADSL port(s) or on all ADSL ports if no port is specified.

The following example displays the MAC count settings for ADSL port 4.

Figure 202 MAC Count Show Command Example

```
ras> switch mac count show 4
port status count
----
4      V      128
```

55.3.2 MAC Count Enable Command

Syntax:

```
ras> switch mac count enable <portlist>
```

where

<portlist> = You can specify a single ADSL port <1>, all ADSL ports <*> or a list of ADSL ports <1,3,5>. You can also include a range of ports <1,5,6~10>.

This command enables the MAC count filter on the specified ADSL port(s). When the MAC filter accept mode is enabled (see [Section 55.2 on page 385](#)), the IES-1248 ignores the MAC count setting and accepts all of the MAC addresses listed for the port in the MAC filter settings.

The following example turns on the MAC count filter on ADSL port 4.

Figure 203 MAC Count Enable Command Example

```
ras> switch mac count enable 4
```

55.3.3 MAC Count Disable Command

Syntax:

```
ras> switch mac count disable <portlist>
```

where

<portlist> = You can specify a single ADSL port <1>, all ADSL ports <*> or a list of ADSL ports <1,3,5>. You can also include a range of ports <1,5,6~10>.

This command disables the MAC filtering feature on the specified ADSL port(s).

The following example turns off the MAC count filter on ADSL port 4.

Figure 204 MAC Count Disable Command Example

```
ras> switch mac count disable 4
```

55.3.4 MAC Count Set Command

Syntax:

```
ras> switch mac count set <portlist> <count>
```

where

<portlist> = You can specify a single ADSL port <1>, all ADSL ports <*> or a list of ADSL ports <1,3,5>. You can also include a range of ports <1,5,6~10>.

<count> = Set the limit for how many MAC addresses that a port may dynamically learn. For example, if you are configuring port 2 and you set this field to "5", then only five devices with dynamically learned MAC addresses may access port 2 at any one time. A sixth device would have to wait until one of the five learned MAC addresses ages out.

The valid range is from "1" to "128".

This command sets the limit for how many MAC addresses may be dynamically learned on the specified ADSL port(s).

The following example sets the MAC count filter to allow up to 50 MAC addresses to be dynamically learned on ADSL port 7.

Figure 205 MAC Count Set Command Example

```
ras> switch mac count set 7 50
```


IGMP Commands

This chapter describes the IGMP snooping and filtering commands.

56.1 Multicast Overview

See [Chapter 21 on page 175](#) for background information on this feature.

56.2 IGMP Snoop Commands

Use the IGMP snoop commands to enable or disable IGMP proxy or IGMP snooping.

56.2.1 IGMP Snoop Show Command

Syntax:

```
ras> switch igmpsnoop show
```

This command displays the IGMP mode (proxy, snooping or disabled).

The following is an example.

Figure 206 IGMP Snoop Show Command Example

```
ras> switch igmpsnoop show
IGMP Snooping/Proxy is Disable
```

56.2.2 IGMP Snoop Enable Command

Syntax:

```
ras> switch igmpsnoop enable <proxy|snooping> [v2|v3]
```

This command turns on IGMP proxy or snooping with v2 or v3 mode (the default is v2). Use proxy to have the device use IGMP proxy. Use IGMP snooping to have the device passively learn multicast groups.

The following example sets the device to use IGMP proxy with v2 mode.

Figure 207 IGMP Snoop Enable Command Example

```
ras> switch igmpsnoop enable proxy v2
```

56.2.3 IGMP Snoop Disable Command

Syntax:

```
ras> switch igmpsnoop disable
```

This command turns off IGMP proxy or snooping.

The following example sets the device to not use IGMP proxy or snooping.

Figure 208 IGMP Snoop Disable Command Example

```
ras> switch igmpsnoop disable
```

56.2.4 IGMP Snoop mvlan name Command

Syntax:

```
ras> switch igmpsnoop mvlan name <vid> <name>
```

This command sets the name of the multicast VLAN ID. The following example sets the name of the multicast VLAN (VID=10) to “example”.

```
ras> switch igmpsnoop mvlan name 10 example
```

56.2.5 IGMP Snoop qryvid delete Command

Syntax:

```
ras> switch igmpsnoop qryvid delete <vid>
```

This command deletes an IGMP query VLAN ID in IGMP proxy mode. The following example deletes VLAN 10.

```
ras> switch igmpsnoop qryvid 10
```

56.2.6 IGMP Snoop qryvid set Command

Syntax:

```
ras> switch igmpsnoop qryvid set <vid>
```

This command configures an IGMP query VLAN ID in IGMP proxy mode. The following example configures VLAN 10 as an IGMP query VLAN.

```
ras> switch igmpsnoop qryvid 10
```

56.2.7 IGMP Snoop qryvid show Command

Syntax:

```
ras> switch igmpsnoop qryvid show
```

This command displays information about the IES-1248's IGMP query VLAN IDs, as follows.

```

ras> switch igmpsnoop qryvid show
igmp proxy query vlan table
vid  static/dynamic
----  -----
    10  static
    120  static

```

56.3 IGMP Filter Commands

Use the IGMP filter commands to define IGMP filter profiles and assign them to ADSL ports.

IGMP filter profiles allow you to control access to IGMP multicast groups. You can have a service available to a specific IGMP multicast group. You can configure an IGMP filter profile for an IGMP multicast group that has access to a service (like a SIP server for example). Then you can assign the IGMP filter profile to ADSL ports that are allowed to use the service.

56.3.1 IGMP Filter Show Command

Syntax:

```
ras> switch igmpfilter show [portlist]
```

where

[portlist] = You can specify a single ADSL port <1>, all ADSL ports <*> or a list of ADSL ports <1,3,5>. You can also include a range of ports <1,5,6~10>.

This command displays which IGMP filter profile an ADSL port(s) is using.

The following example displays which IGMP filter profile ADSL port 9 is using.

Figure 209 IGMP Filter Show Command Example

```

ras> switch igmpfilter show 9
port                                profile
-----
    9                                DEFVAL

```

56.3.2 IGMP Filter Set Command

Syntax:

```
ras> switch igmpfilter set [<port>|*] <name>
```

where

[<port>|*] = You can specify a single ADSL port <1> or all ADSL ports <*>.

<name> = The name of an IGMP filter profile.

This command sets an ADSL port(s) to use an IGMP filter profile.

The following example sets ADSL port 9 to use the voice IGMP filter profile.

Figure 210 IGMP Filter Set Command Example

```
ras> switch igmpfilter set 9 voice
```

56.3.3 IGMP Filter Profile Set Command

Syntax:

```
ras> switch igmpfilter profile set <name> <index> <startip> <endip>
```

where

<name>	=	Specify a name to identify the IGMP filter profile (you cannot change the name of the DEFVAL profile). You can use up to 31 ASCII characters; spaces are not allowed.
<index>	=	The number (1~16) to identify a multicast IP address range.
<startip>	=	Type the starting multicast IP address for a range of multicast IP addresses that you want to belong to the IGMP filter profile.
<endip>	=	Type the ending multicast IP address for a range of IP addresses that you want to belong to the IGMP filter profile.

If you want to add a single multicast IP address, enter it in both the **Start IP** and **End IP** fields.

This command configures an IGMP filter profile.

The following example configures an IGMP filter profile named voice with a range of multicast IP addresses (index 1) from 224.1.1.10 to 224.1.1.44.

Figure 211 IGMP Filter Profile Set Command Example

```
ras> switch igmpfilter profile set test1 1 224.1.1.10 224.1.1.44
```

56.3.4 IGMP Filter Profile Delete Command

Syntax:

```
ras> switch igmpfilter profile delete <name>
```

where

<name>	=	The name of an IGMP filter profile.

This command removes an IGMP filter profile.

The following example removes the voice IGMP filter profile.

Figure 212 IGMP Filter Profile Delete Command Example

```
ras> switch igmpfilter profile delete voice
```

56.3.5 IGMP Filter Profile Show Command

Syntax:

```
ras> switch igmpfilter profile show [<name>|*]
```

where

[<name>|*] = The name of an IGMP filter profile or all of the IGMP filter profiles <*>.

This command displays an IGMP filter profile's settings.

The following example displays the voice IGMP filter profile's settings.

Figure 213 IGMP Filter Show Command Example

ras> switch igmpfilter profile show voice				
	profile	index	startip	endip

	voice	1	224.1.1.10	224.1.1.44
	voice	2	0.0.0.0	0.0.0.0
	voice	3	0.0.0.0	0.0.0.0
	voice	4	0.0.0.0	0.0.0.0
	voice	5	0.0.0.0	0.0.0.0
	voice	6	0.0.0.0	0.0.0.0
	voice	7	0.0.0.0	0.0.0.0
	voice	8	0.0.0.0	0.0.0.0
	voice	9	0.0.0.0	0.0.0.0
	voice	10	0.0.0.0	0.0.0.0
	voice	11	0.0.0.0	0.0.0.0
	voice	12	0.0.0.0	0.0.0.0
	voice	13	0.0.0.0	0.0.0.0
	voice	14	0.0.0.0	0.0.0.0
	voice	15	0.0.0.0	0.0.0.0
	voice	16	0.0.0.0	0.0.0.0

56.4 IGMP Bandwidth Commands

Use the IGMP bandwidth commands to set up bandwidth budgets for specific multicast channels.

56.4.1 IGMP Bandwidth Default Command

Syntax:

```
ras> switch igmpsnoop bandwidth default <bandwidth>
```

where

<bandwidth> = Allowed bandwidth between 1 and 1000 000 kbps (kilo bits per second).

This command sets the default bandwidth for multicast channels for which you have not configured bandwidth requirements yet. Multicast bandwidth settings on channels (using the `switch igmpsnoop bandwidth set` command) have higher priority over this default setting.

56.4.2 IGMP Bandwidth Set Command

Syntax:

```
ras> switch igmpsnoop bandwidth set <index> <start-mcast-ip> <end-mcast-ip>
<bandwidth>
```

where

<index>	=	1..96; a unique number for this setting.
<start-mcast-ip>	=	224.0.0.0..239.255.255.255; the beginning of the multicast range.
<end-mcast-ip>	=	224.0.0.0..239.255.255.255; the end of the multicast range. It must be greater than <start-mcast-ip>.
<bandwidth>	=	1..100000, in units of kbps

This command configures bandwidth allocation for the multicast channel(s). For multicast channel(s) for which you have not configured bandwidth settings, the default multicast bandwidth setting applies (see the `switch igmpsnoop bandwidth default` command).

56.4.3 IGMP Bandwidth Delete Command

Syntax:

```
ras> switch igmpsnoop bandwidth delete <index>
```

where

<index>	=	1..96; a unique number for this setting.

This command removes the specified multicast bandwidth configuration profile.

56.5 IGMP Bandwidth Port Commands

Use the IGMP bandwidth port commands to set up bandwidth budgets for multicast traffic on specific ports.

56.5.1 IGMP Bandwidth Port Disable Command

Syntax:

```
ras> switch igmpsnoop bandwidth port disable <portlist>
```


where

<portlist> = You can specify a single ADSL port <1>, all ADSL ports <*> or a list of ADSL ports <1,3,5>. You can also include a range of ports <1,5,6~10>.

This command deactivates multicast bandwidth settings of the specified port.

56.5.2 IGMP Bandwidth Port Enable Command

Syntax:

```
ras> switch igmpsnoop bandwidth port enable <portlist>
```

where

<portlist> = You can specify a single ADSL port <1>, all ADSL ports <*> or a list of ADSL ports <1,3,5>. You can also include a range of ports <1,5,6~10>.

This command activates multicast bandwidth setting on the specified port.

56.5.3 IGMP Bandwidth Port Set Command

Syntax:

```
ras> switch igmpsnoop bandwidth port set <portlist> <bandwidth>
```

where

<portlist> = You can specify a single ADSL port <1>, all ADSL ports <*> or a list of ADSL ports <1,3,5>. You can also include a range of ports <1,5,6~10>.

<bandwidth> = 1..100000, in units of kbps

This command sets the bandwidth allowed for multicast traffic on the specified port(s). It does not automatically enable it, however.

56.5.4 IGMP Bandwidth Port Show Command

Syntax:

```
ras> switch igmpsnoop bandwidth port show <portlist>
```

where

<portlist> = You can specify a single ADSL port <1>, all ADSL ports <*> or a list of ADSL ports <1,3,5>. You can also include a range of ports <1,5,6~10>.

This command displays the multicast bandwidth setting on the specified port(s) and whether or not this setting is active. The following example displays the bandwidth budget for port 1.

Figure 214 IGMP Bandwidth Port Show Command Example

```

ras> switch igmpsnoop bandwidth port show 1
port  enable  bandwidth
-----
1      -      4096

```

56.6 IGMP Count Limit Commands

Use these commands to limit the number of IGMP groups a subscriber on a port can join. This allows you to control the distribution of multicast services (such as content information distribution) based on service plans and types of subscription.

IGMP count is useful for ensuring the service quality of high bandwidth services like video or Internet Protocol television (IPTV). IGMP count can limit how many channels (IGMP groups) the subscriber connected to a DSL port can use at a time. If each channel requires 4~5 Mbps of download bandwidth, and the subscriber's connection supports 11 Mbps, you can use IGMP count to limit the subscriber to using just 2 channels at a time. This also effectively limits the subscriber to using only two IPTVs with the DSL connection.

56.6.1 IGMP Count Disable Command

Syntax:

```

ras> switch igmpsnoop igmpcount disable <portlist>

```

where

<portlist> = You can specify a single ADSL port <1>, all ADSL ports <*> or a list of ADSL ports <1,3,5>. You can also include a range of ports <1,5,6~10>.

This command turns off the IGMP count limit for the specified ADSL port(s).

The following command turns off the IGMP count limit for port 4.

Figure 215 IGMP Count Disable Command Example

```

ras> switch igmpsnoop igmpcount disable 4

```

56.6.2 IGMP Count Enable Command

Syntax:

```

ras> switch igmpsnoop igmpcount enable <portlist>

```

where

<portlist> = You can specify a single ADSL port <1>, all ADSL ports <*> or a list of ADSL ports <1,3,5>. You can also include a range of ports <1,5,6~10>.

This command turns on the IGMP count limit for the specified ADSL port(s).

The following command turns on the IGMP count limit for port 4.

Figure 216 IGMP Count Enable Command Example

```
ras> switch igmpsnoop igmpcount enable 4
```

56.6.3 IGMP Count Set Command

Syntax:

```
ras> switch igmpsnoop igmpcount set <portlist> <count>
```

where

<portlist> = You can specify a single ADSL port <1>, all ADSL ports <*> or a list of ADSL ports <1,3,5>. You can also include a range of ports <1,5,6~10>.

<count> = 0..16; the maximum number of IGMP groups subscribers on the specified port(s) can join.

This command sets the IGMP count limit for the specified ADSL port(s).

The following command sets a IGMP count limit of 2 for port 4.

Figure 217 IGMP Count Set Command Example

```
ras> switch igmpsnoop igmpcount set 4 2
```

56.6.4 IGMP Count Show Command

Syntax:

```
ras> switch igmpsnoop igmpcount show [portlist]
```

where

[portlist] = You can specify a single ADSL port <1>, all ADSL ports <*> or a list of ADSL ports <1,3,5>. You can also include a range of ports <1,5,6~10>.

This command displays the IGMP count limit setting status for the specified ADSL port(s).

The following example displays the IGMP count limit settings for ports 1-5.

Figure 218 IGMP Count Show Command Example

```

ras> switch igmpsnoop igmpcount show 1~5
port enable count
-----
  1      -      5
  2      -      5
  3      -      5
  4      -      5
  5      -      5

```

56.7 IGMP Snoop Statistics Commands

Use the IGMP Snoop Statistics commands to display current IGMP settings and statistics.

56.7.1 IGMP Snoop Info Statistics Command

Syntax:

```
ras> statistics igmpsnoop info [clear]
```

This command displays the current IGMP settings and the number of IGMP-related packets received. The following figure shows an example.

Figure 219 IGMP Snoop Info Statistics Command Example

```

ras> statistics igmpsnoop info
IGMP Snooping/Proxy is Disable
number of query      = 0
number of report     = 0
number of leave      = 0
number of groups     = 0

```

56.7.2 IGMP Group Statistics Command

Syntax:

```
ras> statistics igmpsnoop group [<vid> [<mcast_ip>]]
```

where

<vid> = The VLAN ID [1 – 4094].
 <mcast_ip> = The multicast IP address.

This command displays the information about IGMP groups learned on the system, specified VLAN, or specified multicast address on the specified VLAN(s).

Figure 220 IGMP Group Statistics Command Example

```

ras> statistics igmpsnoop group
[group info]
group          vid port
-----

```

56.7.3 IGMP Port Info Statistics Command

Syntax:

```

ras> statistics igmpsnoop port info <portlist>

```

where

[portlist] = You can specify a single ADSL port <1>, all ADSL ports <*> or a list of ADSL ports <1,3,5>. You can also include a range of ports <1,5,6~10>.

This command displays the number of IGMP-related packets received on the specified port(s). The following figure shows the number of IGMP packets for port 1.

Figure 221 IGMP Port Info Statistics Command Example

```

ras> statistics igmpsnoop port info 1
port  group_cnt  query_cnt  join_cnt  leave_cnt
-----
1          0          0          0          0

```

56.7.4 IGMP Port Group Statistics Command

Syntax:

```

ras> statistics igmpsnoop port group <portlist>

```

where

[portlist] = You can specify a single ADSL port <1>, all ADSL ports <*> or a list of ADSL ports <1,3,5>. You can also include a range of ports <1,5,6~10>.

This command displays the IGMP groups a port joins. The following figure shows an example for port 1.

Figure 222 IGMP Port Group Statistics Command Example

```

ras> statistics igmpsnoop port group 1
port  vid mcast_ip      source ip
-----

```

56.8 Multicast VLAN Commands

Use these commands to configure VLAN multicast settings and set multicast port members.

Multicast VLAN allows one single multicast VLAN to be shared among different subscriber VLANs on the network. This improves bandwidth utilization by reducing multicast traffic in the subscriber VLANs and simplifies multicast group management.

56.8.1 Multicast VLAN Set Command

Syntax:

```
ras> switch igmpsnoop mvlan set <vid> <portlist>:<F<T|U>|X>
[<portlist>:<F<T|U>|X> ...] [name]
```

where

<code><vid></code>	=	The VLAN ID [1 – 4094].
<code><portlist></code>	=	You can specify a single port: <code><1></code> , all ports: <code><*></code> , a list of ports: <code><1,3,enet1></code> , you can also include a range of ports: <code><1,5,6~10,enet1,enet2></code> .
<code><F<T U> </code>	=	The <code><F></code> stands for a fixed registrar administration control flag and registers a <code><port #></code> to the static VLAN table with <code><vid></code> . For a fixed port, you also have to specify <code><T U></code> , the tag control flag. <code><T></code> has the device add an IEEE 802.1Q tag to frames going out through this port(s). <code><U></code> has the device send frames out through this port(s) without an IEEE 802.1Q tag.
<code> X></code>	=	This is the registrar administration control flag. <code><X></code> stands for forbidden and blocks a <code><port #></code> from joining the static VLAN table with <code><vid></code> .
<code>[name]</code>	=	A name to identify the SVLAN entry.

This command creates a multicast VLAN and sets the allowed/blocked port member(s).

This command is similar to the command to create a regular VLAN. See [Section 54.4.4 on page 379](#) for examples and more information.

56.8.2 Multicast VLAN Delete Command

Syntax:

```
ras> switch igmpsnoop mvlan delete <vlanlist>
```

where

<code><vlanlist></code>	=	You can specify a single VLAN: <code><1></code> , all VLAN: <code><*></code> , a list of VLAN: <code><1,3></code> , you can also include a range of VLAN: <code><1,5,6~10></code> .

This command removes the specified multicast VLAN configuration(s).

56.8.3 Multicast VLAN Disable Command

Syntax:

```
ras> switch igmpsnoop mvlan disable <vid>
```

where

<vid> = The multicast VLAN ID [1 – 4094].

This command deactivates the specified multicast VLAN. The following example disables multicast VLAN 12.

Figure 223 Multicast VLAN Disable Command Example

```
ras> switch igmpsnoop mvlan disable 12
```

56.8.4 Multicast VLAN Enable Command

Syntax:

```
ras> switch igmpsnoop mvlan enable <vid>
```

where

<vid> = The multicast VLAN ID [1 – 4094].

This command activates the specified multicast VLAN.

56.8.5 Multicast VLAN Show Command

Syntax:

```
ras> switch igmpsnoop mvlan show <vlanlist>
```

where

<vlanlist> = You can specify a single VLAN: <1>, all VLAN: <*>, a list of VLAN: <1,3>, you can also include a range of VLAN: <1,5,6~10>.

This command displays the current multicast VLAN settings. In the state column, “-” indicates the multicast VLAN is not active while “V” indicates the multicast VLAN is active.

Figure 224 Multicast VLAN Show Command Example

```
ras> switch igmpsnoop mvlan show 1
vid name          F:fixed X:forbidden  U:untag T:tag
-----
```

56.8.6 Multicast VLAN Group Set Command

Syntax:

```
ras> switch igmpsnoop mvlan group set <vid> <index> <start-mcast-ip> <end-mcast-ip>
```

where

<vid>	=	The multicast VLAN ID [1 – 4094].
<index>	=	1..16; a unique number for this setting.
<start-mcast-ip>	=	Start of the multicast IP address range.
<end-mcast-ip>	=	End of the multicast IP address range.

This command creates a multicast VLAN group. The following example creates a multicast VLAN with VID 10 and group index 1. The multicast address range is 224.224.224.1 ~ 224.224.224.10.

Figure 225 Multicast VLAN Group Set Command Example

```
ras> switch igmpsnoop mvlan group set 10 1 224.224.224.1  
224.224.224.10
```

56.8.7 Multicast VLAN Group Delete Command

Syntax:

```
ras> switch igmpsnoop mvlan group delete <vid> <index>
```

where

<vid>	=	The multicast VLAN ID [1 – 4094].
<index>	=	1..16; a unique number for this setting.

This command removes the specified multicast VLAN group setting.

56.8.8 Multicast VLAN Group Show Command

Syntax:

```
ras> switch igmpsnoop mvlan group show [<vid>]
```

where

<vid>	=	The multicast VLAN ID [1 – 4094].

This command displays a multicast to VLAN translation entry.

Packet Filter Commands

This chapter describes the packet filter commands.

57.1 Packet Filter Commands

Use the following packet filter commands to filter out specific types of packets on specific ports.

57.1.1 Packet Filter Show Command

Syntax:

```
ras> switch pktfilter show [portlist]
```

where

[portlist] = You can specify a single ADSL port <1>, all ADSL ports <*> or a list of ADSL ports <1,3,5>. You can also include a range of ports <1,5,6~10>.

This command displays the packet type filter settings on the specified ADSL port(s) or on all ADSL ports if no port is specified.

The following example displays the packet type filter settings for ADSL ports 1 and 2. “V” displays for the packet types that the IES-1248 is to accept on the port. “-” displays for packet types that the IES-1248 is to reject on the port (packet types that are not listed are accepted). When you use PPPoE only, “#” appears for all of the packet types. With PPPoE only, the IES-1248 rejects all packet types except for PPPoE (packet types that are not listed are also rejected).

Figure 226 Packet Filter Show Command Example

```
ras> switch pktfilter show 9
V: pass through, -: filter out, #:Don't care
E: Enable, D: Disable
port pppoe ip arp netbios dhcp eapol igmp | PPPoE-Only
  1  #   #   #   #   #   #   #   |   E
  2  -   V   V   -   V   V   V   |   D
```

57.1.2 Packet Filter Set Command

Syntax:

```
ras> switch pktfilter set <portlist> [filter]
```

where

- `<portlist>` = You can specify a single ADSL port `<1>`, all ADSL ports `<*>` or a list of ADSL ports `<1,3,5>`. You can also include a range of ports `<1,5,6~10>`.
- `[filter]` =
- `[pppoe]` Reject PPPoE packets. (Point-to-Point Protocol over Ethernet) relies on PPP and Ethernet. PPPoE is a specification for connecting the users on an Ethernet to the Internet through a common broadband medium, such as a single DSL line, wireless device or cable modem.
 - `[ip]` Reject IP packets. Internet Protocol. The underlying protocol for routing packets on the Internet and other TCP/IP-based networks.
 - `[arp]` Reject ARP packets. Address Resolution Protocol is a protocol for mapping an Internet Protocol address (IP address) to a physical computer address that is recognized in the local network.
 - `[netbios]` Reject NetBIOS packets. (Network Basic Input/Output System) are TCP or UDP packets that enable a computer to connect to and communicate with a LAN.
 - `[dhcp]` Reject DHCP packets. Dynamic Host Configuration Protocol automatically assigns IP addresses to clients when they log on. DHCP centralizes IP address management on central computers that run the DHCP server program. DHCP leases addresses, for a period of time, which means that past addresses are “recycled” and made available for future reassignment to other systems.
 - `[eapol]` Reject EAPoL packets. EAP (Extensible Authentication Protocol, RFC 2486) over LAN. EAP is used with IEEE 802.1x to allow additional authentication methods (besides RADIUS) to be deployed with no changes to the access point or the wireless clients.
 - `[igmp]` Reject IGMP packets. Internet Group Multicast Protocol is used when sending packets to a specific group of hosts.
 - `[none]` Accept all packets.

This command sets the packet type filter for the specified ADSL port(s).

The following example sets ADSL port 9 to reject ARP, PPPoE and IGMP packets.

Figure 227 Packet Filter Set Command Example

```
ras> switch pktfilter set 9 arp pppoe igmp
```

57.1.3 Packet Filter PPPoE Only Command

Syntax:

```
ras> switch pktfilter pppoeonly <portlist>
```

This command sets the IES-1248 to allow only PPPoE traffic on the specified ADSL port(s). The system will drop any non-PPPoE packets.

The following example sets ADSL port 1 to accept only PPPoE packets.

Figure 228 Packet Filter PPPoE Only Command Example

```
ras> switch pktfilter pppoeonly 1
```


IP Commands

This chapter shows you how to use the (standard shell) IP commands to configure the IP (Internet Protocol) parameters.

58.1 IP Commands Introduction

Use the IES-1248's management IP addresses to manage it through the network.

58.2 IP Settings and Default Gateway

Use the following command sequence to set the IES-1248's IP settings for the Ethernet 1 and 2, and DSL ports, VID and default gateway. With the Ethernet 1 and 2, and DSL ports, you must connect to the IES-1248 through a port that is a member of the management (CPU) VLAN in order to perform in-band management.

Figure 229 IP Settings and Default Gateway Address Commands

```

ras> ip set <new ip address> [</netmask>]
ras> ip gateway <ip>
ras> config save

```

where

<code><new ip address></code>	=	The IP address you want to configure for the IES-1248.
<code></netmask></code>	=	The bit number of the subnet mask of the IP address you want to configure for IES-1248's uplink, downlink and IES-1248 DSL ports. To find the bit number, convert the subnet mask to binary and add all of the 1's together. Take "255.255.255.0" for example. 255 converts to eight 1's in binary. There are three 255's, so add three eights together and you get the bit number (24).
<code><ip></code>	=	The default gateway IP address you want to configure for the IES-1248.

The first command changes the IP settings for the IES-1248's uplink, downlink and IES-1248 DSL ports. If you don't enter the subnet mask, the system automatically computes the subnet mask.

The second command changes the default gateway (next hop). This tells the IES-1248 where to send packets that have a destination IP address that is not on the same subnet as the IES-1248's IP address.

The third command saves the new configuration to the nonvolatile memory.

For example, use the following command sequence sets the IES-1248 to have 192.168.1.3 as the IP address, 255.255.255.0 for the subnet mask and 192.168.1.233 for the default gateway.

Figure 230 IP Settings and Default Gateway Address Command Example

```
ras> ip set 192.168.1.3/24
ras> ip gateway 192.168.1.233
ras> config save
```

The IES-1248 leaves the factory with a default management IP address of 192.168.1.1 and a subnet mask of 255.255.255.0, (ff:ff:ff:00 in hexadecimal notation), and the default gateway set at 192.168.1.254. Make sure that you configure the IP parameters correctly before you connect a IES-1248 to the network, otherwise, you may interrupt services already running.

58.3 General IP Commands

The following is a list of general IP commands that help with the management of the IP parameters.

58.3.1 Show

Syntax:

```
ras> ip show
```

Use the command to display the current management IP settings.

58.3.2 Ping Command

Syntax:

```
ras> ip ping <ip> [count]
```

This is an IP facility to check for network functionality by sending an echo request to another IP host and waiting for the reply.

58.3.3 Route Set Command

Syntax:

```
ras> ip route set <dst ip>[/netmask] <gateway ip> [metric] <name>
ras> ip route set default <gateway ip> <metric>
```

where

<dst ip> = The destination IP address of packets that this static route is to route.

<code>[/netmask]</code>	=	The destination subnet mask of packets that this static route is to route.
<code><gateway ip></code>	=	The IP address of the gateway that you want to send the packets through.
<code>[metric]</code>	=	The metric (hop count) of this static route.
<code><name></code>	=	A name to identify this static route. Up to 31 ASCII characters. Spaces and tabs are not allowed.
<code>default</code>	=	Use this to configure the IES-1248's default route.

This command defines a new, static IP forwarding route or edits an existing one.

58.3.4 Route Delete Command

Syntax:

```
ras> ip route delete <dst ip>[/netmask]
```

where

<code><dst ip></code>	=	The destination IP address of packets to which this static route applies.
<code>[/netmask]</code>	=	The destination subnet mask of packets to which this static route applies.

This command removes a static, IP forwarding route.

58.3.5 Route Show Command

Syntax:

```
ras> ip route show
```

This command displays the IES-1248's routing table.

An example is shown next.

Figure 231 Route Show Command Example

ras> ip route show				
index	dest	gateway	metric	name

1	192.168.1.0/24	192.168.1.1	1	
2	default	192.168.1.254	1	

58.3.6 ARP Show Command

Syntax:

```
ras> ip arp show
```

This command displays the IES-1248's IP Address Resolution Protocol table. This is the list of IP addresses and matching MAC addresses that the IES-1248 has resolved.

An example is shown next.

Figure 232 ARP Show Command Example

```
ras> ip arp show
ip                mac address
-----
172.23.14.254    00:0c:db:30:ac:00
172.23.15.254    00:0c:db:30:ac:00
```

58.3.7 ARP Flush Command

Syntax:

```
ras> ip arp flush
```

This command clears the IES-1248's IP Address Resolution Protocol table.

58.4 Statistics IP Command

Syntax:

```
ras> statistics ip
```

This command shows the statistics for the CPU IP traffic.

Port Bonding Commands

This chapter shows how to set up port bonding settings on your device.

59.1 G.bond Commands

G.bond (also known as port bonding) allows subscribers to connect to an ISP using data streams spread over multiple DSL lines. The total available bandwidth for the subscriber then becomes the sum of the bandwidth available for each of the subscriber's line connections. As well as extra bandwidth, additional DSL lines also provide backup support.

59.1.1 adsl gbond set Command

Syntax:

```
adsl gbond set <bond_name> <portlist>  
where
```

- <bond_name> = A descriptive name for the gbond group of DSL lines.
- <portlist> = The ports that connect the DSL lines on which gbond is configured.

This command sets up a gbond group on the specified group of ports. The following is an example.

```
ras> adsl gbond set group2 3,4
```

59.1.2 adsl gbond show Command

Syntax:

```
adsl gbond show [<bond_name>]  
where
```

- <bond_name> = A descriptive name for the gbond group of DSL lines.

This command displays gbond settings on the specified group of ports. The following is an example.

```
ras> adsl gbond show
name                               port list
-----
bar                                3,4
baz                                5,6
foo                                1,2
```

59.1.3 port gbond delete Command

Syntax:

```
adsl gbond delete <bond_name>
where
```

<bond_name> = A descriptive name for the gbond group of DSL lines.

This command deletes the specified gbond group. The following is an example.

```
ras> adsl gbond delete bar
ras> adsl gbond show
name                               port list
-----
baz                                5,6
foo                                1,2
```

IP Bridge Commands

This chapter explains how to set up the IP bridge function in the IES-1248.

The IP bridge function is designed for large-scale, flat, access networks, and it is ideal when the network is based on Ethernet. When the IP bridge is enabled, the IES-1248 forwards frames based on the destination IP address, instead of the destination MAC address, and it replaces the source MAC address with its own MAC address.

You can follow these steps to set up a simple IP bridge.

- 1 Create a domain. (Each domain is an ISP.)
- 2 Create one or more VLANs in the domain. (For example, one VLAN is for high-speed Internet, and another VLAN is for VoIP.)
- 3 Create the VLAN in the system using the regular screens or commands for VLANs.
- 4 Specify one or more edge routers for the domain.
- 5 Create routing table entries, so the IES-1248 forwards frames to the appropriate edge router.
- 6 Create downlink interfaces, so the IES-1248 forwards frames to the appropriate subscribers.
- 7 Create PVCs for the subscribers.

60.1 IP Bridge Domain Commands

Use these commands to set up and maintain domains in IP bridges.

A domain represents an ISP. Each domain is defined by (and dominates) the VLAN that are in it and has its own routing table and ARP table. As a result, two or more VLANs in different domains can use the same IP subnet, and one network can support multiple ISPs.

VLANs in IP bridges are exclusive. They can be in at most one domain. In addition, VLANs in IP bridges share the same VLAN space as regular VLANs, so VLANs in IP bridges must have different VLAN IDs than regular VLANs.

60.1.1 IP Bridge Domain Set Command

Syntax:

```
ras> adsl ipbpvc domain set <domain name>
```

where

<domain name> = The name of the domain. You can use 1-31 printable English keyboard characters. Spaces are allowed, but you must use double quotation marks (“”) to enclose the name. (You must use a backslash (\) before double quotation marks in the name itself.)

This command creates the domain with the specified name.

60.1.2 IP Bridge Domain Show Command

Syntax:

```
ras> adsl ipbpvc domain show [<domain name>]
```

where

<domain name> = The name of the domain.

This command displays the settings for the specified domain and the VLAN that are in the domain.

An example is shown next.

Figure 233 IP Bridge Domain Show Command Example

```
ras> adsl ipbpvc domain show example1
Domain Name:example1
DHCP VLAN: 200
VLAN
-----+-----+-----+-----+-----+-----+
 200  210  220  240  502
```

The output values correspond to the input values of other IP bridge domain commands.

60.1.3 IP Bridge Domain Delete Command

Syntax:

```
ras> adsl ipbpvc domain delete <domain name>
```

where

<domain name> = The name of the domain.

This command deletes the specified domain.



You have to remove the VLAN that are in the domain first.

60.1.4 IP Bridge Domain DHCP VLAN Enable Command

Syntax:

```
ras> adsl ipbpvc domain dhcpvlan enable <domain name> <vid>
```

where

<domain name> = The name of the domain.
<vid> = The ID (<1..4094>) of the VLAN.

This setting has no effect on DHCP packets when the IES-1248's DHCP relay settings are active. The DHCP relay settings take precedence over the IP bridge DHCP VLAN setting.)

This command specifies the VLAN where the domain's DHCP server is located. The VLAN must already be in the domain. The IES-1248 forwards subscribers' DHCP packets to the selected VLAN and changes the source MAC address to the IES-1248's MAC address.

The IES-1248 still adds whatever Option 82 information is specified and enabled for the original subscriber's VLAN in the DHCP relay settings. Option 82 settings for the DHCP VLAN are not considered. The IES-1248 adds Option 82 information according to the subscriber's VLAN setting, not the DHCP VLAN.

In the following example, domain "example3" has its DHCP server in VLAN 401.

Figure 234 IP Bridge Domain DHCP VLAN Enable Command Example

```
ras> adsl ipbpvc domain dhcpvlan enable example3 401
```

60.1.5 IP Bridge Domain DHCP VLAN Disable Command

Syntax:

```
ras> adsl ipbpvc domain dhcpvlan disable <domain name>
```

where

<domain name> = The name of the domain.

This setting has no effect on DHCP packets when the IES-1248's DHCP relay settings are active. The DHCP relay settings take precedence over the IP bridge DHCP VLAN setting.)

This command specifies that the IES-1248 does not change the VLAN but still changes the source MAC address to the IES-1248's MAC address in DHCP packets.

The IES-1248 still adds whatever Option 82 information is specified and enabled for the original subscriber's VLAN in the DHCP relay settings. Option 82 settings for the DHCP VLAN are not considered. The IES-1248 adds Option 82 information according to the subscriber's VLAN setting, not the DHCP VLAN.

60.1.6 IP Bridge Domain VLAN Registration Command

Syntax:

```
ras> adsl ipbpvc domain vlan <domain name> <vid> join|leave
```

where

<code><domain name></code>	=	The name of the domain.
<code><vid></code>	=	The ID (<1..4094>) of the VLAN.
<code>join leave</code>	=	Specifies whether you want to add the specified VLAN to (<code>join</code>) or remove the specified VLAN from (<code>leave</code>) the domain.

This command adds the specified VLAN to (`join`) or removes the specified VLAN (`leave`) from the specified domain. VLANs in IP bridges share the same VLAN space as regular VLANs, so VLANs in IP bridges must have different VLAN IDs than regular VLANs. Use the regular VLAN commands to configure the VLAN (see [Chapter 54 on page 377](#)).



You have to delete every IP bridge setting (including DHCP VLAN) that uses the selected VLAN before you can remove it from the domain.

In the following example, VLAN 402 is added to domain “example3”.

Figure 235 IP Bridge Domain VLAN Registration Command Example

```
ras> adsl ipbpvc domain vlan example3 402 join
```

60.2 IP Bridge Edge Router Commands

Use these commands to set up and maintain edge routers in an IP bridge.

Edge routers are usually the gateways that are provided to the subscribers. They can also be gateways that are specified in static routing table entries. Each edge router, in addition to its IP address, has an associated VLAN ID. When the IES-1248 forwards a frame to an edge router, it uses this VLAN ID to replace whatever VLAN ID the subscriber specified.

60.2.1 IP Bridge Edge Router Set Command

Syntax:

```
ras> adsl ipbpvc edgerouter set <ip>/<mask> <vid>
```

where

<code><ip></code>	=	IP address, in dotted decimal notation.
<code><mask></code>	=	Number of bits <1..32> in the subnet mask.
<code><vid></code>	=	The ID (<1..4094>) of the VLAN.

This command creates an edge router with the specified IP address, subnet mask, and VID. The IES-1248 uses the VLAN ID when it forwards frames to the edge router. It also uses the VLAN ID to identify the domain the edge router is in.

The following example creates edge router 192.168.1.244 with subnet mask 255.255.255.0 and VID 401.

Figure 236 IP Bridge Edge Router Set Command Example

```
ras> adsl ipbpvc edgerouter set 192.168.1.244/24 401
```

60.2.2 IP Bridge Edge Router Show Command

Syntax:

```
ras> adsl ipbpvc edgerouter show [<vid>]
```

where

<vid> = The ID (<1..4094>) of the VLAN.

This command displays the edge routers for the specified VLAN or for all VLAN.

An example is shown next.

Figure 237 IP Bridge Edge Router Show Command Example

```
ras> adsl ipbpvc edgerouter show 401
ip/netmask      vid
-----
192.168.1.244/24  401
```

The output values correspond to the input values of other IP bridge edge router commands.

60.2.3 IP Bridge Edge Router Delete Command

Syntax:

```
ras> adsl ipbpvc edgerouter delete <ip> <vid>
```

where

<ip> = IP address, in dotted decimal notation.

<vid> = The ID (<1..4094>) of the VLAN.

This command deletes the edge router with the specified IP address and VLAN ID.

The following example deletes edge router 192.168.1.244 with VID 401.

Figure 238 IP Bridge Edge Router Delete Command Example

```
ras> adsl ipbpvc edgerouter delete 192.168.1.244 401
```

60.3 IP Bridge Routing Table Commands

Use these commands to set up and maintain the routing table for each domain.

Each domain has its own routing table. Each routing table contains entries that, based on the destination IP address, control where the IES-1248 forwards packets (for upstream and downstream traffic). The IES-1248 automatically creates routing table entries for each downlink interface and for each edge router in the domain. You can create additional entries by specifying the edge router to which the IES-1248 should forward traffic for a particular destination IP address or IP subnet.

60.3.1 IP Bridge Route Set Command

Syntax:

```
ras> adsl ipbpvc route set <domain name> <ip>/<mask> <nexthop> <metric>
[<priority>]
```

where

<domain name>	=	The name of the domain.
<ip>	=	IP address, in dotted decimal notation.
<mask>	=	Number of bits <1..32> in the subnet mask.
<nexthop>	=	IP address, in dotted decimal notation.
<metric>	=	The metric <1..15> represents the “cost” of transmission for routing purposes. IP routing uses hop count as the measurement of cost, with a minimum of 1 for directly-connected networks. Select the number that approximates the cost for this link. The number need not be precise, but it must be between 1 and 15. In practice, 2 or 3 is usually a good number. If two entries have the same metric, the IES-1248 uses the one with the lower IP address.
<priority>	=	The IEEE 802.1p priority value <0..7>.

This command creates the specified entry in the routing table of the specified domain.

The <ip>/<mask> specifies the range of IP addresses to which this entry applies. If the destination IP address of a packet is in this range, the IES-1248 forwards the frame to the specified IP address <nexthop>. If <nexthop> corresponds to an edge router configured using the edge router commands (see [Section 60.2 on page 418](#)), the IES-1248 uses the associated VLAN ID. In addition,

- If the edge router is in the same domain as the entry, the entry is used for upstream traffic.
- If the edge router is in a different domain than the entry, the entry is used for downstream traffic.

If <nexthop> is not set up in the edge router screen, the IES-1248 uses the entry for downstream traffic and does not change the VLAN ID.

If the <priority> is not specified, the default value is zero. This is applied to incoming frames without a <priority> tag.

The following example creates an entry in the routing table for domain “example3”. This entry forwards traffic for IP addresses 192.168.4.0~192.168.4.255 to edge router 192.168.1.244.

Figure 239 IP Bridge Route Set Command Example

```
ras> adsl ipbpvc route set example3 192.168.4.0/24 192.168.1.244 1
```

60.3.2 IP Bridge Route Show Command

Syntax:

```
ras> adsl ipbpvc route show [<domain name> | <ip>/<mask> | <domain name>
<ip>/<mask>]
```

where

<domain name>	=	The name of the domain.
<ip>	=	IP address, in dotted decimal notation.
<mask>	=	Number of bits <1..32> in the subnet mask.

This command displays routing table entries created manually for the specified domain and/or range of IP addresses. It does not show entries added automatically by the IES-1248.

An example is shown next.

Figure 240 IP Bridge Route Show Command Example

```
ras> adsl ipbpvc route show example1
```

domain name	ip/netmask	gateway ip	metric	pri
example1	0.0.0.0/0	192.168.1.250	1	0
example1	4.4.4.0/24	5.6.7.8	2	1
example1	7.7.7.0/24	192.168.1.253	1	0
example1	172.23.37.0/24	192.168.1.251	1	0

The output values correspond to the input values of other IP bridge routing table commands.

60.3.3 IP Bridge Route Runtime Command

Syntax:

```
ras> adsl ipbpvc route runtime [<domain name> | <ip>/<mask> | <domain name>
<ip>/<mask>]
```

where

<domain name>	=	The name of the domain.
<ip>	=	IP address, in dotted decimal notation.
<mask>	=	Number of bits <1..32> in the subnet mask.

This command displays the (run-time) routing table(s) for the selected domain or range of IP addresses. This table includes all the entries, whether added automatically by the IES-1248 or provided manually.

An example is shown next.

Figure 241 IP Bridge Runtime Route Command Example

```

ras> adsl ipbpvc route runtime example2

```

domain name	ip/netmask	gateway ip	metric	pri	type
example2	192.168.1.253/32	-	-	-	U
example2	192.168.1.35/32	-	-	-	D
example2	2.2.2.0/24	-	-	-	D
example2	172.23.37.0/24	192.168.1.250	1	0	D
example2	192.168.2.0/24	192.168.1.249	1	0	D
example2	0.0.0.0/0	192.168.1.252	1	0	D

The `type` field indicates whether this entry is used for upstream traffic (**U**, or uplink interface) or downstream traffic (**D**, or downlink interface). By default, all entries are for downstream traffic, unless the **Edge Router IP** is configured in the edge router commands (see [Section 60.2 on page 418](#)).

The other output values correspond to the input values of other IP bridge routing table commands.

60.3.4 IP Bridge Route Delete Command

Syntax:

```

ras> adsl ipbpvc route delete <domain name> <ip>/<mask> <nexthop>

```

where

<domain name>	=	The name of the domain.
<ip>	=	IP address, in dotted decimal notation.
<mask>	=	Number of bits <1..32> in the subnet mask.
<nexthop>	=	IP address, in dotted decimal notation.

This command deletes the specified entry from the routing table of the specified domain. You can only remove entries that were added manually.

The following example removes the entry for 172.32.37.0~172.32.37.255 for domain “example2”.

Figure 242 IP Bridge Route Delete Command Example

```

ras> adsl ipbpvc route show example2

```

domain name	ip/netmask	gateway ip	metric	pri
example2	0.0.0.0/0	192.168.1.252	1	0
example2	172.23.37.0/24	192.168.1.250	1	0
example2	192.168.2.0/24	192.168.1.249	1	0

```

ras> adsl ipbpvc route delete example2 172.23.37.0/24 192.168.1.250
ras> adsl ipbpvc route show example2

```

domain name	ip/netmask	gateway ip	metric	pri
example2	0.0.0.0/0	192.168.1.252	1	0
example2	192.168.2.0/24	192.168.1.249	1	0

60.4 IP Bridge Downlink Interface Commands

Use these commands to set up and maintain forwarding information for downstream traffic.

Downlink interfaces provide forwarding information for downstream traffic. The IES-1248 learns some of this information by snooping DHCP packets. For static IP addresses, you should provide this information manually. In this case, specify the VLAN ID and, optionally, the PVC for a range of IP addresses. The IES-1248 uses the VLAN ID to identify the domain the downlink interface is in. Downlink interfaces in the same domain cannot have overlapping IP addresses.

60.4.1 IP Bridge Downlink Interface Set Command

Syntax:

```
ras> adsl ipbpvc interface set <ip>/<mask> <vid> [<port> <vpi> <vci>]
```

where

<ip>	=	IP address, in dotted decimal notation.
<mask>	=	Number of bits <1..32> in the subnet mask.
<vid>	=	The ID (<1..4094>) of the VLAN.
<port>	=	The port number of the PVC.
<vpi>	=	The VPI of the PVC.
<vci>	=	The VCI of the PVC.

This command creates the specified downlink interface. The <ip>/<mask> specifies the IP address and subnet mask of the VLAN or subscriber. If the destination IP address of a packet is in this range, the IES-1248 forwards the frame to the specified VLAN and PVC, if any.

The IES-1248 uses the specified VLAN ID when it forwards frames to the VLAN or subscriber. It also uses the VLAN ID to identify the domain the downlink interface is in.



Make sure you specify a valid IP bridge PVC. Do not specify PVCs that are not defined in the IPB PVC screen in [Section 60.5 on page 425](#).

The following example creates a downlink interface that forwards frames for IP addresses 192.168.3.0~192.168.3.255 to VLAN 402.

Figure 243 IP Bridge Downlink Interface Set Command Example

```
ras> adsl ipbpvc interface set 192.168.3.0/24 402
```

60.4.2 IP Bridge Downlink Interface Show Command

Syntax:

```
ras> adsl ipbpvc interface show [<ip>/<mask> | <vid> | <ip>/<mask> <vid>]
```

where

<ip>	=	IP address, in dotted decimal notation.
<mask>	=	Number of bits <1..32> in the subnet mask.
<vid>	=	The ID (<1..4094>) of the VLAN.

This command displays downlink interfaces created manually. It does not show forwarding information learned by snooping DHCP packets.

An example is shown next.

Figure 244 IP Bridge Downlink Interface Show Command Example

```

ras> adsl ipbpvc interface show 200
ip/netmask      vid port vpi   vci
-----
1.2.3.0/24      200  20 200   200
3.3.3.3/32      200   1   6     6
192.168.1.33/32 200  -   -     -
192.168.1.64/28 200   2   0    35

```

The output values correspond to the input values of other IP bridge downlink interface commands.

60.4.3 IP Bridge Downlink Interface Runtime Command

Syntax:

```

ras> adsl ipbpvc interface runtime [<ip>/<mask> | <vid> | <ip>/<mask>
<vid>]

```

where

<ip>	=	IP address, in dotted decimal notation.
<mask>	=	Number of bits <1..32> in the subnet mask.
<vid>	=	The ID (<1..4094>) of the VLAN.

This command displays the (run-time) downlink interfaces for the selected range of IP addresses and/or VLAN. This table includes all the forwarding information for downstream traffic, whether learned by snooping DHCP packets or provided manually.

An example is shown next.

Figure 245 IP Bridge Runtime Downlink Interface Command Example

```

ras> adsl ipbpvc interface runtime 210
ip/netmask      vid port vpi   vci type
-----
192.168.1.34/32  210   1  31    64 ipoa
192.168.1.37/32  210   1  20    53 ipoe

```

The `type` field specifies whether the downlink interface is running on Ethernet (**IPoE**) or on ATM (**IPoA**). The other output values correspond to the input values of other IP bridge downlink interface commands.

60.4.4 IP Bridge Downlink Interface Delete Command

Syntax:

```
ras> adsl ipbpvc interface delete <ip>/<mask> <vid>
```

where

<ip> = IP address, in dotted decimal notation.
 <mask> = Number of bits <1..32> in the subnet mask.
 <vid> = The ID (<1..4094>) of the VLAN.

This command deletes the specified downlink interface. You can only remove downlink interfaces that were added manually.

The following example removes the downlink interface for 192.168.1.33 in VLAN 200.

Figure 246 IP Bridge Downlink Interface Delete Command Example

```
ras> adsl ipbpvc interface show 200
ip/netmask      vid port vpi   vci
-----
1.2.3.0/24      200  20 200   200
3.3.3.3/32      200   1   6     6
192.168.1.33/32 200  -   -     -
192.168.1.64/28 200   2   0    35
ras> adsl ipbpvc interface delete 192.168.1.33/32 200
ras> adsl ipbpvc interface show 200
ip/netmask      vid port vpi   vci
-----
1.2.3.0/24      200  20 200   200
3.3.3.3/32      200   1   6     6
192.168.1.64/28 200   2   0    35
```

60.5 IP Bridge PVC Commands

Use these commands to set up and maintain PVCs for subscribers in an IP bridge.

IP bridge PVCs are similar to regular PVCs and are endpoints of the IP bridge. In addition, IP bridge PVCs are one of two types, IP over Ethernet or IP over ATM, depending on the underlying network.

The PVID is used to identify the domain the PVC is in, so the PVID must be in a domain.

60.5.1 IP Bridge PVC Show Command

Syntax:

```
ras> adsl ipbpvc show [<portlist> [<vpi> <vci>]]
```

where

<portlist> = You can specify a single ADSL port <1>, all ADSL ports <*> or a list of ADSL ports <1,3,5>. You can also include a range of ports <1,5,6~10>.
 [<vpi> <vci>] = The VPI and VCI of an individual PVC.

This command allows you to display the PVCs for subscribers in an IP bridge.

An example is shown next.

Figure 247 IP Bridge PVC Show Command Example

```

ras> adsl ipbpvc show
port vpi   vci   pvid pri  Type  DS/US vcprofile
-----
  1   30    63   200  0  ipoe  DEFVAL/-
  1   31    64   210  0  ipoa  DEFVAL/-
  2   10    43   200  0  ipoe  DEFVAL/-
 20  200    200  230  1  ipoe  DEFVAL/-
 48    8    35    2   0  ipoe  DEFVAL/-

```

The output values correspond to the input values of other IP bridge PVC commands.

60.5.2 IP Bridge PVC Set Command

Syntax:

```

ras> adsl ipbpvc set <portlist> <vpi> <vci> <DS vcprofile[,US vcprofile]>
super|<vid> <priority> ipoa|ipoe

```

where

- <portlist> = You can specify a single ADSL port <1>, all ADSL ports <*> or a list of ADSL ports <1,3,5>. You can also include a range of ports <1,5,6~10>.
- <vpi> = The VPI setting can be 0 to 255.
- <vci> = The VCI setting can be 32 to 65535 if the vpi is 0 or 1 to 65535 if the vpi is not 0.
- DS vcprofile = Assign a VC profile to use for this channel's downstream traffic shaping.
- [,US vcprofile]> = Assign a VC profile to use for policing this channel's upstream traffic. The IES-1248 does not perform upstream traffic policing if you do not specify an upstream VC profile.
- super|<vid> = Enable the super channel option to allow a channel forward frames belonging to multiple VLAN groups (that are not assigned to other channels). The IES-1248 forwards frames belonging to VLAN groups that are not assigned to specific channels to the super channel. The super channel functions in the same way as the channel in a single channel environment. One port can have only one super channel.

The default VID (1 to 4094). Each PVC must have a unique VID since the IES-1248 forwards traffic back to the subscribers based on the VLAN ID.

You must assign a default VID (1 to 4094) and IEEE 802.1p default priority (0 to 7) to normal channels. Each PVC must have a unique VID (since the IES-1248 forwards traffic back to the subscribers based on the VLAN ID).

- `<priority>` = This is the priority value (0 to 7) to add to incoming frames without a (IEEE 802.1p) priority tag.
- `ipoa|ipoe` = Specifies whether the PVC is running on Ethernet (`ipoe`) or on ATM (`ipoa`).

This command allows the configuration of a PVC (permanent virtual circuit) for one or a range of ADSL ports in an IP bridge.

The following example sets a PVC on ADSL port 10 with VPI 40, VCI 73, default VID 402 priority 2. It sets the DEFVAL profile for downstream traffic shaping and runs on Ethernet.

Figure 248 IP Bridge PVC Set Command Example

```

ras> adsl ipbpvc show
port vpi   vci   pvid pri Type DS/US vcprofile
-----
  1  30    63   200  0 ipoe DEFVAL/-
  1  31    64   210  0 ipoa DEFVAL/-
  2  10    43   200  0 ipoe DEFVAL/-
 20 200   200   230  1 ipoe DEFVAL/-
 48  8     35    2  0 ipoe DEFVAL/-
ras> adsl ipbpvc set 10 40 73 DEFVAL 402 2 ipoe
ras> adsl ipbpvc show
port vpi   vci   pvid pri Type DS/US vcprofile
-----
  1  30    63   200  0 ipoe DEFVAL/-
  1  31    64   210  0 ipoa DEFVAL/-
  2  10    43   200  0 ipoe DEFVAL/-
 10  40    73   402  2 ipoe DEFVAL/-
 20 200   200   230  1 ipoe DEFVAL/-
 48  8     35    2  0 ipoe DEFVAL/-

```

60.5.3 IP Bridge PVC Delete Command

Syntax:

```
ras> adsl ipbpvc delete <portlist> <vpi> <vci>
```

where

- `<portlist>` = You can specify a single ADSL port `<1>`, all ADSL ports `<*>` or a list of ADSL ports `<1,3,5>`. You can also include a range of ports `<1,5,6~10>`.
- `[<vpi> <vci>]` = The VPI and VCI of an individual PVC.

This command deletes the specified PVC channel in an IP bridge.

The following example deletes the IP bridge PVC on ADSL port 10 with VPI 40, VCI 73.

Figure 249 IP Bridge PVC Delete Command Example

```

ras> adsl ipbpvc show
port vpi   vci   pvid pri Type  DS/US vcprofile
-----
  1   30    63   200  0 ipoe  DEFVAL/-
  1   31    64   210  0 ipoa  DEFVAL/-
  2   10    43   200  0 ipoe  DEFVAL/-
 10   40    73   402  2 ipoe  DEFVAL/-
 20  200   200   230  1 ipoe  DEFVAL/-
 48   8     35    2   0 ipoe  DEFVAL/-
ras> adsl ipbpvc delete 10 40 73
ras> adsl ipbpvc show
port vpi   vci   pvid pri Type  DS/US vcprofile
-----
  1   30    63   200  0 ipoe  DEFVAL/-
  1   31    64   210  0 ipoa  DEFVAL/-
  2   10    43   200  0 ipoe  DEFVAL/-
 20  200   200   230  1 ipoe  DEFVAL/-
 48   8     35    2   0 ipoe  DEFVAL/-

```

60.6 IP Bridge ARP Proxy Commands

Use these commands to look at and flush the Address Resolution Protocol (ARP) table for each domain. You can also configure how long the IES-1248 keeps entries in the ARP table.

The IES-1248 is an ARP proxy for edge routers and subscribers in an IP bridge. You can configure basic settings for this, and you can look at (and flush, in some cases) the (PVC, MAC, IP, VID) information the IES-1248 has learned using DHCP snooping and ARP.

60.6.1 IP Bridge ARP Proxy Agingtime Set Command

Syntax:

```
ras> adsl ipbpvc arpproxy agingtime set <sec>
```

where

<sec> = The number of seconds (10~10000) the device is to keep the Address Resolution Protocol table's entries of IP addresses in IP bridges. Use 0 to disable the aging time.

This command configures how long the device stores the IP addresses of CPE devices in IP bridges in the Address Resolution Protocol table.

60.6.2 IP Bridge ARP Proxy Agingtime Show Command

Syntax:

```
ras> adsl ipbpvc arpproxy agingtime show
```

This command displays how long the device stores the IP addresses of IP bridge devices in the Address Resolution Protocol table.

The following is an example.

Figure 250 IP Bridge ARP Proxy Agingtime Show Command Example

```

ras> adsl ipbpvc arpproxy agingtime show
ipbpvc aging time (sec): 300

```

60.6.3 IP Bridge ARP Proxy Show Command

Syntax:

```

ras> adsl ipbpvc arpproxy show [domain <domain> [edgerouter <ip> <vid> |
interface <ip>/<mask> <vid>]]

```

where

<domain>	=	The name of the domain.
<ip>	=	IP address, in dotted decimal notation.
<mask>	=	Number of bits <1..32> in the subnet mask.
<vid>	=	The ID (<1..4094>) of the VLAN.

This command displays the specified ARP table entries.

An example is shown below.

Figure 251 IP Bridge ARP Proxy Show Command Example

```

ras> adsl ipbpvc arpproxy show
Domain Name: d01
ip                mac                port vpi    vci interface                vid type
-----
-
192.168.2.2       00:05:5d:03:99:3a    22   0       33 192.168.2.0/24            3   D
192.168.2.254    00:13:49:95:03:07    50   -        - 192.168.2.254            2   U
*: the ARP is learned from DHCP and can't be flushed.

```

The following table describes the labels in this screen.

Table 118 IPB ARP Proxy Show Command Output

LABEL	DESCRIPTION
Domain Name	This field displays the name of the domain which has this ARP table.
ip	This field displays the IP address assigned to the specific device.
mac	This field displays the MAC (Media Access Control) address of the device.
port	This field displays the port number to which the device is connected.
vpi/vci	This field displays the Virtual Path Identifier (VPI) and Virtual Circuit Identifier (VCI) the device is using. The VPI and VCI identify a channel on this port.
interface	This field displays the name of the interface the device is using.
vid	This field displays the VLAN ID the device is using.
type	This field indicates whether this entry is used for upstream traffic (U , or uplink interface) or downstream traffic (D , or downlink interface). By default, all entries are for downstream traffic, unless the edge router is configured using the edge router commands (see Section 60.2 on page 418).

60.6.4 IP Bridge ARP Proxy Flush Command

Syntax:

```
ras> adsl ipbpvc arpproxy flush all | edgerouter [<ip> <vid>] | interface  
[<ip>/<mask> <vid>]
```

where

all	=	All ARP table entries.
<ip>	=	IP address, in dotted decimal notation.
<mask>	=	Number of bits <1..32> in the subnet mask.
<vid>	=	The ID (<1..4094>) of the VLAN.

This command clears the specified entries in the Address Resolution Protocol table(s).

An example is shown next.

Figure 252 Statistics IP Command Example

```
ras> statistics ip  
[Ethernet]  
inet      : 172.23.14.253      netmask: 0.0.0.0  
broadcast: 172.23.255.255     mtu: 1500  
in octet  : 10728504  in unicast :      738  in multicast   :      232488  
in discard :      0  in error   :      0  in unknown proto:      0  
out octet  :  41361  out unicast:     861  out multicast   :      0  
out discard:      0  out error  :      0
```

Firmware and Configuration File Maintenance

This chapter tells you how to upload a new firmware and/or configuration file for the IES-1248.

61.1 Firmware and Configuration File Maintenance Overview

The IES-1248's built-in FTP server allows you to use any FTP client (for example, ftp.exe in Windows) to upgrade IES-1248 firmware or configuration files. The firmware or configuration file upgrade is done during operation (run-time).



Do not turn off the power to the IES-1248 during the file transfer process, as it may permanently damage your IES-1248.



The IES-1248 automatically restarts when the upgrade process is complete.

61.2 Filename Conventions

The configuration file (called config-0) contains the factory default settings in the menus such as password, IP address, VLANs and so on. The configuration file arrives with a “rom” filename extension.

The OS (Operating System) firmware (sometimes referred to as the “ras” file) has a “bin” filename extension. With many FTP and clients, the filenames are similar to those shown next.

Figure 253 FTP Put Configuration File Example

```
ftp> put firmware.bin ras
```

This is a sample from a FTP session to transfer the computer file `firmware.bin` to the IES-1248.

Figure 254 FTP Get Configuration File Example

```
ftp> get config-0 config.txt
```

This is a sample from a FTP session to transfer the IES-1248's current configuration file (including the configuration files of all the IES-1248) to the computer file `config.txt`.

If your FTP client does not allow you to have a destination filename different than the source, you will need to rename them as the IES-1248 only recognizes "config-0" and "ras". Be sure you keep unaltered copies of the files for later use.

The following table is a summary. Please note that the internal filename refers to the filename on the IES-1248 and the external filename refers to the filename not on the IES-1248, that is, on your computer, local network or FTP site and so the name (but not the extension) may vary. After uploading new firmware, use the `sys version` command on the IES-1248 to confirm that you have uploaded the correct firmware version.

Table 119 Filename Conventions

FILE TYPE	INTERNAL NAME	EXTERNAL NAME	DESCRIPTION
Configuration File	<code>config-0</code>	<code>*.dat</code>	This is the configuration filename for the IES-1248.
Firmware	<code>ras</code>	<code>*.bin</code>	This is the Operating System firmware on the IES-1248.

61.3 Editable Configuration File

The configuration file can be downloaded as a plain-text (ASCII) file. Edits to the configuration can be made to this file before it is uploaded again to the IES-1248.



You can change the ".dat" file to a ".txt" file and still upload it back to the IES-1248.



Do not upload any invalid files to the IES-1248's configuration file, as it may permanently damage your IES-1248.

61.3.1 Editable Configuration File Backup

Configure your system, and then use FTP to backup the plain-text configuration file onto your computer. Do the following to backup the configuration file:

Use an FTP client to connect to the IES-1248.

Figure 255 Example: Use an FTP Client to Connect to the IES-1248

```
C:\> ftp <IES-1248 IP address>
Type your user name and press [ENTER].
User (172.23.15.86:(none)): admin
```

Enter the management password (1234 by default).

Figure 256 Example: Enter the Management Password

```
Password: 1234
230 Logged in
```

Use `get` to transfer the configuration file to the computer. The configuration file on the system (that you want to backup to the computer) is named `config-0`.

Figure 257 Example: Get the Configuration File `config-0`

```
ftp> get config-0
```

Quit FTP.

Figure 258 Example: Close FTP Client

```
ftp> quit
```

61.3.2 Edit Configuration File

Open the `config-0` file via Notepad (see the following example) and edit to a desired configuration.



Ensure that any changes you make to the commands in the configuration file correspond to the commands documented in this User's Guide. The wrong configuration file or an incorrectly configured configuration file can render the device inoperable.

Figure 259 Configuration File Example

```
#### sysinfo
sys info hostname ""
sys info location ""
sys info contact ""
#### snmp
sys snmp getcommunity public
sys snmp setcommunity public
sys snmp trapcommunity public
sys snmp trustedhost 0.0.0.0
sys snmp trapdst set 1 0.0.0.0 162
sys snmp trapdst set 2 0.0.0.0 162
sys snmp trapdst set 3 0.0.0.0 162
sys snmp trapdst set 4 0.0.0.0 162
#### server
sys server enable telnet
sys server enable ftp
sys server enable web
sys server enable icmp
sys server port telnet 23
sys server port ftp 21
----- Snip -----
-----
```



The `sys user set admin` command is encrypted and you cannot edit it in a text editor. Attempting to edit it and upload it to the IES-1248 will lock you out after the system restarts. If this happens you will have to use the console port to restore the default configuration file, and all of your configuration changes will be lost.

61.3.3 Editable Configuration File Upload

You can upload the configuration file by following the steps below.

Use an FTP client to connect to the IES-1248.

Figure 260 Example: Use an FTP Client to Connect to the IES-1248

```
C:\> ftp <IES-1248 IP address>
Type your user name and press [ENTER].
User (172.23.15.86:(none)): admin
```

Enter the management password (1234 by default).

Figure 261 Example: Enter the Management Password

```
Password: 1234
230 Logged in
```

Use `put` to transfer the configuration file from the computer. The configuration file on the system is named `config-0`.

Figure 262 Example: Upload the Configuration File `config-0`

```
ftp> put xxx.dat config-0
```

Quit FTP.

Figure 263 Example: Close FTP Client

```
ftp> quit
```

Wait for the update to finish. The system restarts automatically.

61.4 Firmware File Upgrade

Use the following procedure to upload firmware to the IES-1248.

Use an FTP client to connect to the IES-1248.

Figure 264 Example: Use an FTP Client to Connect to the IES-1248

```
C:\> ftp <IES-1248 IP address>
Type your user name and press [ENTER].
User (172.23.15.86:(none)): admin
```

Enter the management password (1234 by default).

Figure 265 Example: Enter the Management Password

```
Password: 1234
230 Logged in
```

Transfer the firmware file to the IES-1248. The firmware file on your computer (that you want to put onto the IES-1248 is named `firmware.bin`. The internal firmware file on the IES-1248 is named `ras`.

Figure 266 Example: Transfer the Firmware File

```
ftp> put firmware.bin ras
```

Quit FTP.

Figure 267 Example: Close FTP Client

```
ftp> quit
```

Wait for the update to finish. The IES-1248 restarts automatically.

This chapter covers Simple Network Management Protocol (SNMP) with the IES-1248.

62.1 SNMP Commands

Use these commands to configure SNMP settings. See [Chapter 38 on page 251](#) for more information about SNMP.

62.1.1 Get Community Command

Syntax:

```
ras> sys snmp getcommunity <community>
```

where

<community> = The password for the incoming Get- and GetNext- requests from the management station.

Enter this command with the community to set the password.

62.1.2 Set Community Command

Syntax:

```
ras> sys snmp setcommunity <community>
```

where

<community> = The password for the incoming Set- requests from the management station.

Enter this command with the community to set the password.

62.1.3 Trusted Host Set Command

Syntax:

```
ras> sys snmp trusthost <ip>
```

where

<ip> = The IP address of a trusted host.

Use this command to add the host IP address to the list of trusted hosts. If you enter a trusted host, your IES-1248 will only respond to SNMP messages from this address. If you leave the trusted host set to 0.0.0.0 (default), the IES-1248 will respond to all SNMP messages it receives, regardless of source.

62.1.4 Trap Community Command

Syntax:

```
ras> sys snmp trapcommunity <community>
```

where

`<community>` = The password sent with each trap to the SNMP manager.

Enter this command with the community to set the password.

62.1.5 Trap Destination Set Command

Syntax:

```
ras> sys snmp trapdst set <index> <ip> [<port>]
```

where

`<index>` = The number of the trap server (1~4).

`<ip>` = The IP address of the trap server.

`[<port>]` = The port number upon which the trap server listens for SNMP traps. The IES-1248 uses the default of 162 if you do not specify a trap port.

Use this command specify the IP address (and port number) of a trap server to which the IES-1248 sends SNMP traps. If you leave the trap destination set to 0.0.0.0 (default), the IES-1248 will not send any SNMP traps.

62.1.6 Show SNMP Settings Command

Syntax:

```
ras> sys snmp show
```

This command displays the current SNMP get community, set community, trap community, trusted hosts and trap destination settings.

ADSL Commands

This chapter describes some of the ADSL commands that allow you to configure and monitor the ADSL ports.

63.1 ADSL Commands

Use these commands to configure the ADSL ports. See [Chapter 16 on page 129](#) for background information on ADSL.

63.1.1 ADSL Show Command

Syntax:

```
ras> adsl show [portlist]
```

where

[portlist] = You can specify a single ADSL port <1>, all ADSL ports <*> or a list of ADSL ports <1,3,5>. You can also include a range of ports <1,5,6~10>.

This command shows the activation status, ADSL mode, maximum upstream and downstream rate settings, profile and name of each ADSL port.

The following example displays information on ADSL port 5.

Figure 268 ADSL Show Command Example

port	enable	mode	up/downstream	profile	name
5	-	auto	512/ 2048	DEFVAL	-

63.1.2 ADSL Enable Command

Syntax:

```
ras> adsl enable <portlist>
```

where

<portlist> = You can specify a single ADSL port <1>, all ADSL ports <*> or a list of ADSL ports <1,3,5>. You can also include a range of ports <1,5,6~10>.

This command forcibly enables the specified ADSL port(s).

63.1.3 ADSL Disable Command

Syntax:

```
ras> adsl disable <portlist>
```

where

<portlist> = You can specify a single ADSL port <1>, all ADSL ports <*> or a list of ADSL ports <1,3,5>. You can also include a range of ports <1,5,6~10>.

This command forcibly disables the specified ADSL port(s).



The factory default of all ports is enabled.

63.1.4 ADSL Profile Show Command

Syntax:

```
ras> adsl profile show [profile]
```

where

<profile> = A profile name.

This command displays the specified ADSL profile or all ADSL profiles if you do not specify one.

The following example displays the ADSL DEFVAL profile.

Figure 269 ADSL Profile Show Command Example

```

ras> adsl profile show DEFVAL
01. DEFVAL      latency mode: interleave
                up stream down stream
                -----
max rate      (kbps):          512          2048
min rate      (kbps):           32           32
latency delay (ms):             4            4
max margin    (db):             31           31
min margin    (db):              0            0
target margin (db):             6            6
up shift margin(db):            9            9
down shift margin(db):          3            3

```

63.1.5 ADSL Profile Set Command

Syntax:

```

ras> adsl profile set <profile> <fast|interleave[=<up delay>,<down delay>]>
    <up max rate> <down max rate>
    [<up target margin> <up min margin> <up max margin> <up min rate>
    <down target margin> <down min margin> <down max margin> <down min rate>
    <up down-shift margin> <up up-shift margin>
    <down down-shift margin> <down up-shift margin>]

```

where

<profile>	=	The descriptive name for the profile.
<fast interleave[=<up delay>,<down delay>]>	=	The latency mode. With interleave, you must also define the upstream and downstream delay (1-255 ms). It is recommended that you configure the same delay for both upstream and downstream.
<up max rate>	=	The maximum ADSL upstream transmission rate (64-4096 Kbps).
<down max rate>	=	The maximum ADSL downstream transmission rate (64-32000 Kbps).
<up target margin>	=	The target ADSL upstream signal/noise margin (0-31db).
<up min margin>	=	The minimum acceptable ADSL upstream signal/noise margin (0-31db).
<up max margin>	=	The maximum acceptable ADSL upstream signal/noise margin (0-31db).
<up min rate>	=	The minimum ADSL upstream transmission rate (32-4096 Kbps).
<down target margin>	=	The target ADSL downstream signal/noise margin (0-31db).
<down min margin>	=	The minimum acceptable ADSL downstream signal/noise margin (0-31db).
<down max margin>	=	The maximum acceptable ADSL downstream signal/noise margin (0-31db).
<down min rate>	=	The minimum ADSL downstream transmission rate (32-32000 Kbps).
<up down shift margin>	=	The upstream down shift noise margin (0~31 in dB).
<up up shift margin>	=	The upstream up shift noise margin (0~31 in dB).
<down down shift margin>	=	The downstream down shift noise margin (0~31 in dB).
<down up shift margin>	=	The downstream up shift noise margin (0~31 in dB).

The profile is a table that contains information on ADSL line configuration. Each entry in this table reflects a parameter defined by a manager, which can be used to configure the ADSL line.

Note that the default value will be used for any of the above fields that are omitted.

The upstream rate must be less than or equal to the downstream rate.

Even though you can specify arbitrary numbers in the profile set command, the actual rate is always a multiple of 32 Kbps. If you enter a rate that is not a multiple of 32 Kbps, the actual rate will be the next lower multiple of 32Kbps. For instance, if you specify 60 Kbps for a port, the actual rate for that port will not exceed 32 Kbps, and if you specify 66 Kbps, the actual rate will not be over 64Kbps.

The ADSL up/down shift noise margins define the threshold that triggers rate adaptation. For example:

The target SNR is 6, and the up/down shift noise margins are 9/3.

If the signal becomes better and the SNR is higher than 9, rate adaptation is triggered and the line rate becomes higher

If the signal becomes bad and the SNR is lower than 3, rate adaptation is triggered and the line rate becomes lower.

The following example creates a premium profile (named gold) for providing subscribers with very high connection speeds and no interleave delay. It also sets the upstream target signal/noise margin to 5 db, the upstream minimum acceptable signal/noise margin to 0 db, the upstream maximum acceptable signal/noise margin to 30 db, the upstream minimum ADSL transmission rate to 128 Kbps, the downstream target signal/noise margin to 5 db, the downstream minimum acceptable signal/noise margin to 0 db, the downstream maximum acceptable signal/noise margin to 30 db and the downstream minimum ADSL transmission rate to 256Kbps.

The upstream down shift noise margin is 0 dB. The upstream up shift noise margin is 6 dB. The downstream down shift noise margin is 0 dB. The downstream up shift noise margin is 6 dB.

Figure 270 ADSL Profile Set Command Example 1

```
ras> adsl profile set gold fast 1200 24000 5 0 30 128 5 0 30 256 0 6 0 6
```

This next example creates a similar premium profile (named goldi), except it sets an interleave delay of 16 ms for both upstream and downstream traffic.

Figure 271 ADSL Profile Set Command Example 2

```
ras> adsl profile set goldi interleave=16,16 1200 24000 5 0 30 128 5 0 30  
256 0 6 0 6
```

After you create an ADSL profile, you can assign it to any of the ADSL ports on the IES-1248.

63.1.6 ADSL Profile Delete Command

Syntax:

```
ras> adsl profile delete <profile>
```

where

<profile> = A profile name.

This command allows you to delete an individual ADSL profile by its name. You cannot delete a profile that is assigned to any of the DSL ports in the IES-1248. Assign a different profile to any DSL ports that are using the profile that you want to delete, and then you can delete the profile.

The following example deletes the gold ADSL profile.

Figure 272 ADSL Profile Delete Command Example

```
ras> adsl profile delete gold
```

63.1.7 ADSL Profile Map Command

Syntax: (IES-1248-51/51A)

```
ras> adsl profile map <portlist> <profile>
-> <glite|gdm|t1413|auto|adsl2|adsl2+>
```

Syntax: (IES-1248-53)

```
ras> adsl profile map <portlist> <profile>
-> <gdm|etsi|auto|adsl2|adsl2+>
```

where

<portlist>	=	You can specify a single ADSL port <1>, all ADSL ports <*> or a list of ADSL ports <1,3,5>. You can also include a range of ports <1,5,6~10>.
<profile>	=	The profile that will define the settings of this port.
<glite gdm etsi t1413 auto adsl2 adsl2+>	=	The ADSL operational mode. The IES-1248-51/51A and the IES-1248-53 have different choices.

This command assigns a specific profile to an individual port and sets the port's ADSL mode (or standard). The profile defines the maximum and minimum upstream/downstream rates, the target upstream/downstream signal noise margins, and the maximum and minimum upstream/downstream acceptable noise margins of all the ADSL ports to which you assign the profile.

When set to `auto`, the port follows whatever mode is set on the other end of the line.



When the mode is set to `auto`, the connection rates are governed by the negotiated ADSL mode regardless of the rates configured in the profile. For example, if the profile is set to use a rate of 18000 Kbps, that speed is only supported if the negotiated ADSL mode is ADSL 2+. Any other ADSL mode will limit the rate to what is supported by the specific ADSL standard. When the mode is set to `auto` in the IES-1248-51/51A, the `t1413` mode has been

removed from the `auto` mode selection list. When a profile is assigned to a line in `auto` mode, the line will not go to showtime if the modem is configured in `t1413` mode only or if it is an old modem that only supports `t1413`. You have to explicitly configure the line in `t1413` mode to make the modem initialize.

The following example sets ADSL port 1 to have the gold profile in G.dmt mode.

Figure 273 ADSL Profile Delete Command Example

```
ras> adsl profile map 1 gold gdmr
```

63.1.8 ADSL Name Command

Syntax:

```
ras> adsl name <portlist> <name>
```

where

<code><portlist></code>	=	You can specify a single ADSL port <code><1></code> , all ADSL ports <code><*></code> or a list of ADSL ports <code><1,3,5></code> . You can also include a range of ports <code><1,5,6~10></code> .
<code><name></code>	=	A descriptive name for the port. You can use up to 31 printable ASCII characters (including spaces and hyphens).

This command sets the name of an ADSL port(s).

The following example sets ADSL port 5 to have the name super.

Figure 274 ADSL Name Command Example

```
ras> adsl name 5 super
```

63.1.9 ADSL Tel Command

Syntax:

```
ras> adsl tel <portlist> <tel>
```

where

<code><portlist></code>	=	You can specify a single ADSL port <code><1></code> , all ADSL ports <code><*></code> or a list of ADSL ports <code><1,3,5></code> . You can also include a range of ports <code><1,5,6~10></code> .
<code><tel></code>	=	An ADSL subscriber's telephone number. You can use up to 15 ASCII characters (including spaces and hyphens).

This command records the telephone number of an ADSL subscriber telephone number.

The following example records the telephone number 12345678 for ADSL port 5.

Figure 275 ADSL Tel Command Example

```
ras> adsl tel 5 12345678
```


63.1.10 ADSL Loopback Command

Syntax:

```
ras> adsl loopback <portlist> < f5> <vpi> <vci>
```

where

<code><portlist></code>	=	You can specify a single ADSL port <1>, all ADSL ports <*> or a list of ADSL ports <1,3,5>. You can also include a range of ports <1,5,6~10>.
<code>< f5></code>	=	Use f5 to perform an OAMF5 loopback test on the specified DSL port. An Operational, Administration and Maintenance Function 5 test is used to test the connection between two DSL devices. First, the DSL devices establish a virtual circuit. Then the local device sends an ATM F5 cell to be returned by the remote DSL device (both DSL devices must support ATM F5 in order to use this test).
<code><vpi> <vci></code>	=	When you perform an OAMF5 loopback test, specify a VPI/VCI.

This command has the IES-1248 perform an OAMF5 loopback test on the specified ADSL port(s).

The following example has the IES-1248 perform an OAMF5 loopback test on ADSL port 1's PVC at VPI 0 and VCI 33.

Figure 276 ADSL Loopback Command Example

```
ras> adsl loopback 1 f5 0 33
port[1] OAM F5 loopback test: failed
```

63.1.11 ADSL Upstream PSD Command

Syntax:

```
ras> adsl usnompsd <portNo> [<max nominal psd>]
```

where

<code><max nominal psd></code>	=	-400 ~ 40 (unit of measure is 0.1dBm/Hz)

This command displays or sets the upstream maximum nominal transmit PSD (Power Spectral Density).

The following example sets the upstream maximum nominal transmit PSD for port 7 to -10 dBm/Hz.

Figure 277 ADSL Upstream PSD Command Example

```
ras> adsl usnompsd 7 -100
```

63.1.12 ADSL Downstream PSD Command

Syntax:

```
ras> adsl dsnompsd <portNo> [<max nominal psd>]
```

where

<max nominal psd> = -400 ~ 40 (unit of measure is 0.1dBm/Hz)

This command displays or sets the downstream maximum nominal transmit PSD (Power Spectral Density).

The following example sets the downstream maximum nominal transmit PSD for port 7 to -10 dBm/Hz.

Figure 278 ADSL Downstream PSD Command Example

```
ras> adsl dsnompsd 7 -100
```

63.1.13 ADSL Upstream Carrier Command

Syntax:

```
ras> adsl uscarrier <portNo> [<m0> <m1>]
```

where

<m0>, <m1> = The upstream subcarriers to be masked (disabled). Each <mx> can use up to 8 hexadecimal digits (00000000~ffffff). Each <mx> represents 32 carrier tones (each hexadecimal digit represents 4 tones).

<m0> = tones 0~31

<m1> = tones 32~63

The hexadecimal digit is converted to binary and a '1' disables the corresponding tone. Disabling a carrier tone turns it off so the system does not send data on it.

The hexadecimal digit is converted to binary and a '1' masks (disables) the corresponding tone. Disabling a carrier tone turns it off so the system does not send data on it.

This command displays or sets masks for upstream carrier tones from 0 to 63. Masking a carrier tone disables the use of that tone on the specified ADSL port. Use this command to have the system not use an ADSL line's tones that are known to have a high noise level. The most significant bit defines the lowest tone number in a mask.

The most significant bit defines the first tone sequentially. For example, in <m0>, 0x00000001 means tone 31. For example, you could use 0xffff0000 for <m0> to disable upstream carrier tones 0~15 and leave tones 16 ~ 31 enabled.

The following example disables upstream carrier tones 0~15 for ADSL port 5.

Figure 279 ADSL Upstream Carrier Command Example

```
ras> adsl uscarrier 5 ffff0000 00000000
```

The following example displays the results.

Figure 280 ADSL Upstream Carrier Command Display Example

```
ras> adsl uscarrier 5

      us carrier
port   m0      m1
----  |-----|-----|
      5  FFFF0000 00000000
Tone:
m0:0-31, m1:32-63
```

63.1.14 ADSL Downstream Carrier0 Command

Syntax:

```
ras> adsl dscarrier0 <port number> [<m1> <m2> <m3> <m4> <m5> <m6> <m7>]
```

where

- <m1> - <m7> = The downstream carrier tones to be masked (disabled). Each <mx> can use up to 8 hexadecimal digits (0~ffffff). Each <mx> represents 32 carrier tones (each hexadecimal digit represents 4 tones).
- <m1> = tones 32~63
- <m2> = tones 64~95
- <m3> = tones 96~127
- <m4> = tones 128~159
- <m5> = tones 160~191
- <m6> = tones 192~223
- <m7> = tones 224~255

The hexadecimal digit is converted to binary and a '1' masks (disables) the corresponding tone. Disabling a carrier tone turns it off so the system does not send data on it.

This command displays or sets masks for downstream carrier tones from 33 to 255. Masking a carrier tone disables the use of that tone on the specified ADSL port. The most significant bit defines the lowest tone number in a mask.

The following example disables downstream carrier tone 71 for ADSL port 5.

Figure 281 ADSL Downstream Carrier0 Command Example 1

```
ras> adsl dscarrier0 5 0 01000000 0 0 0 0 0
```

The following example displays the results.

Figure 282 ADSL Downstream Carrier0 Command Display Example

```

ras> adsl dscarrier0 5

ds carrier
port      m1      m2      m3      m4      m5      m6      m7
----  |-----|-----|-----|-----|-----|-----|-----|
      5  00000000 01000000 00000000 00000000 00000000 00000000 00000000
Tone:
m1:32-63, m2:64-95, m3:96-127, m4:128-159
m5:160-191, m6:192-223, m7:224-255

```

This example disables downstream carrier tones 70 and 71 for ADSL port 5.

Figure 283 ADSL Downstream Carrier0 Command Example 2

```

ras> adsl dscarrier0 5 0 03000000 0 0 0 0 0

```

63.1.15 ADSL Downstream Carrier1 Command

Syntax:

```

ras> adsl dscarrier1 <port number> [<m0> <m1> <m2> <m3> <m4> <m5> <m6> <m7>]

```

where

<m0> - <m7>	=	The downstream carrier tones to be masked (disabled). Each <mx> can use up to 8 hexadecimal digits (0~ffffff). Each <mx> represents 32 carrier tones (each hexadecimal digit represents 4 tones).
<m0>	=	tones 256~287
<m1>	=	tones 288~319
<m2>	=	tones 320~351
<m3>	=	tones 352~383
<m4>	=	tones 384~415
<m5>	=	tones 416~447
<m6>	=	tones 448~479
<m7>	=	tones 480~511

The hexadecimal digit is converted to binary and a '1' masks (disables) the corresponding tone. Disabling a carrier tone turns it off so the system does not send data on it.

This command displays or sets masks for downstream carrier tones from 256 to 511 on the specified ADSL2+ port(s). Use this command to have the system not use an ADSL line's tones that are known to have a high noise level.

The following example disables downstream carrier tone 307 for ADSL2+ port 5.

Figure 284 ADSL Downstream Carrier1 Command Example 1

```

ras> adsl dscarrier1 5 0 00001000 0 0 0 0 0 0

```

The following example disables downstream carrier tones 304 to 307 for ADSL2+ port 5.

Figure 285 ADSL Downstream Carrier1 Command Example 2

```
ras> adsl dscarrier1 5 0 0000f000 0 0 0 0 0 0
```

The following example displays the results.

Figure 286 ADSL Downstream Carrier1 Command Display Example

```
ras> adsl dscarrier1 5

ds carrier
port      m0      m1      m2      m3      m4      m5      m6      m7
-----|-----|-----|-----|-----|-----|-----|-----|
---|
5  00000000 000F0000 00000000 00000000 00000000 00000000 00000000
00000000
Tone:
m0:256-287, m1:288-319, m2:320-351, m3:352-383
m4:384-415, m5:416-447, m6:448-479, m7:480-511
```

63.1.16 PMM Parameters Command

Syntax:

```
ras> adsl pmm param <portlist> [<l0time> <l2time> <l2atpr> <l2atprt>]
      [<max_l2rate> <min_l2rate> <l0tol2_rate>]
```

where

- <portlist> = You can specify a single ADSL port <1>, all ADSL ports <*> or a list of ADSL ports <1,3,5>. You can also include a range of ports <1,5,6~10>.
- <l0time> = Set the minimum time in seconds (10~65535) that the ADSL line must stay in L0 power mode before changing to the L2 power mode.
- <l2time> = Set minimum time in seconds (10~65535) that the ADSL line must stay in the L2 power mode before reducing the power again in the L2 power mode.
- <l2atpr> = Set the maximum Aggregate Transmit Power Reduction (ATPR) in decibels (dB) that is permitted in a L2 power reduction. The system can gradually decrease the ADSL line transmission power while it is in the L2 power mode. This is the largest individual power reduction allowed in the L2 power mode. The range is 0~15(dB).
- <l2atprt> = Set the maximum Aggregate Transmit Power Reduction Total (ATPRT) in decibels (dB) that is permitted in the L2 power mode. This is the total transmit power decrease that is allowed to occur in the L2 power mode. The range is 0~15(dB).

- `<max_l2rate>` = Set the maximum transfer rate (in Kilobits per second) that is permitted while the port is in the L2 power mode. The supported range is 32~4096 Kbps in 4 Kbps increments. If you enter a number that is not a multiple of 4, the system uses the next lower multiple of 4. If you enter 39 for example, the system will use 36.
- `<min_l2rate>` = Set the minimum transfer rate (in Kilobits per second) that is permitted while the port is in the L2 power mode. The supported range is 32~4096 Kbps in 4 Kbps increments. If you enter a number that is not a multiple of 4, the system uses the next lower multiple of 4. If you enter 39 for example, the system will use 36.
- `<l0tol2_rate>` = Set the down stream transfer rate (in Kilobits per second) that serves as the threshold for whether the port is to use the L0 or the L2 power mode. The system changes from L0 mode to L2 mode when the downstream transfer rate stays below this threshold for **L0 Time**. The system changes back from L2 mode to L0 mode when the downstream transfer rate goes above this threshold. This rate must be less than or equal to one half of the **Min L2 Rate** and at least 16 Kbps.

Use this command to display or set Power Management (PMM) parameters for the specified ADSL port(s).

The following example sets ADSL port 5 to use the following PMM settings.

- Stay in the L0 power mode for 180 seconds before a change to the L2 power mode is permitted.
- Once in L2 power mode, wait for 90 seconds before further reducing the transmission power.
- Each L2 power mode power reduction can only be 2 dB or less.
- The total power reduction allowed in the L2 power mode is 40 dB.

Figure 287 PMM Parameters Command Example

```
ras> adsl pmm param 5 180 90 2 40
```

63.1.17 Impulse Noise Protection Command

Syntax:

```
ras> adsl inp <portlist> [<usINP> [, <dsINP>] ]
```

where

- `<usINP>` = Sets the minimum upstream (us) impulse noise protection setting. Use 0~3 to define a number of DMT symbols. 0 = 0 DMT symbols, 1 = 0.5 DMT symbols, 2 = 1 DMT symbols, 3 = 2 DMT symbols.
- `<dsINP>` = Sets the minimum downstream (ds) impulse noise protection setting. Use 0~3 to define a number of DMT symbols. 0 = 0 DMT symbols, 1 = 0.5 DMT symbols, 2 = 1 DMT symbols, 3 = 2 DMT symbols.

This command sets the upstream (us) and downstream (ds) impulse noise protection minimum setting on the specified ADSL port(s). Sudden spikes in the line's noise level (impulse noise) can cause errors and result in lost packets. Set the impulse noise protection minimum to have a buffer to protect the ADSL physical layer connection against impulse noise. This buffering causes a delay that reduces transfer speeds. It is recommended that you use a non-zero setting for real time traffic that has no error correction (like videoconferencing).

The following example sets the impulse noise protection minimum to 1 DMT symbols for upstream and 0.5 DMT symbols for downstream for ADSL port 5.

Figure 288 Impulse Noise Protection Command Example

```
ras> adsl inp 5 2 1
```

63.1.18 Annex L Enable Command

This command is available for the IES-1248-51 and IES-1248-51A.

Syntax:

```
ras> adsl annexl enable <portlist>
```

This command turns on the Annex L reach extended feature on the specified ADSL2 port(s). Annex L can be used with Annex A (ADSL over POTS), not Annex B (ADSL over ISDN).

The following example turns on the Annex L feature for port 5.

Figure 289 Annex L Enable Command Example

```
ras> adsl annexl enable 5
```

63.1.19 Annex L Disable Command

This command is available for the IES-1248-51 and IES-1248-51A.

Syntax:

```
ras> adsl annexl disable <portlist>
```

This command turns off the Annex L reach extended feature on the specified ADSL2 port(s).

The following example turns off the Annex L feature for port 5.

Figure 290 Annex L Disable Command Example

```
ras> adsl annexl disable 5
```

63.1.20 Annex M Enable Command

This command is available for the IES-1248-51 and IES-1248-51A.

Syntax:

```
ras> adsl annexm enable <portlist>
```

This command turns on the Annex M double upstream feature on the specified ADSL2/2+ port(s). This has the upstream connection use tones 6 to 63.

The following example turns on the Annex M feature for port 5.

Figure 291 Annex M Enable Command Example

```
ras> adsl annexm enable 5
```

63.1.21 Annex M Disable Command

This command is available for the IES-1248-51 and IES-1248-51A.

Syntax:

```
ras> adsl annexm disable <portlist>
```

This command turns off the Annex M double upstream feature on the specified ADSL2/2+ port(s).

The following example turns off the Annex M feature for port 5.

Figure 292 Annex M Disable Command Example

```
ras> adsl annexm disable 5
```

63.2 Statistics ADSL Commands

Use these commands to display ADSL port statistics.

63.2.1 ADSL Show Command

Syntax:

```
ras> statistics adsl show [portlist]
```

where

[portlist]	=	You can specify a single ADSL port <1>, all ADSL ports <*> or a list of ADSL ports <1,3,5>. You can also include a range of ports <1,5,6~10>.

This command displays ADSL port connection statistics including the status (V for enabled, - for disabled), ADSL operational mode, upstream and downstream maximum rates, up time and the number of errored seconds.

The following example displays connection statistics for ADSL port 1.

Figure 293 ADSL Show Command Example

ras> statistics adsl show 1							
port	status	mode	up/downstream		up time	error	second(15M/24H)
1	V	adsl2	512/	9089	00000:00:04:59		15/15

63.2.2 Gbond Command

Syntax:

```
ras> statistics adsl gbond [<bond-name>]
```

where

<bond-name> = The name of the port bonding group.

This command displays data about the specified port bonding group.

Figure 294 ADSL Gbond Command Example

ras> statistics adsl gbond			
name	port list	us rate(kbps)	ds rate(kbps)
baz	5,6	0	0
foo	1,2	0	0

63.2.3 Linedata Command

Syntax:

```
ras> statistics adsl linedata <portlist>
```

where

<portlist> = You can specify a single ADSL port <1>, all ADSL ports <*> or a list of ADSL ports <1,3,5>. You can also include a range of ports <1,5,6~10>.

This command shows the line bit allocation of an ADSL port.

Discrete Multi-Tone (DMT) modulation divides up a line’s bandwidth into tones. This command displays the number of bits transmitted for each tone. This can be used to determine the quality of the connection, whether a given sub-carrier loop has sufficient margins to support ADSL transmission rates, and possibly to determine whether certain specific types of interference or line attenuation exist. See the ITU-T G.992.1 recommendation for more information on DMT.

The better (or shorter) the line, the higher the number of bits transmitted for a DMT tone. The maximum number of bits that can be transmitted per DMT tone is 15.

“upstream carrier load” displays the number of bits transmitted per DMT tone for the upstream channel (from the subscriber’s DSL modem or router to the IES-1248).

“downstream carrier load” displays the number of bits received per DMT tone for the downstream channel (from the IES-1248 to the subscriber’s DSL modem or router).

The bit allocation contents are only valid when the link is up.

In the following example, the upstream channel is carried on tones 7 to 39 and the downstream channel is carried on tones 53 to 259 (space is left between the channels to avoid interference).

Figure 295 Linedata Command Example

```

ras> statistics adsl linedata 1
[port 1]
up stream carrier load: number of bits per symbol(tone):
tone   0- 19: 00 00 00 00 00 00 02 03 04 05 - 06 07 07 07 07 07 07 08 08
tone  20- 39: 08 08 07 08 08 07 07 06 06 05 - 04 03

down stream carrier load: number of bits per symbol(tone):
tone   0- 19: 00 00 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00 00
tone  20- 39: 00 00 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00 00
tone  40- 59: 00 00 00 00 00 00 00 00 00 00 - 00 00 00 01 01 01 01 01 02
tone  60- 79: 02 02 02 02 00 02 02 02 02 02 - 02 02 02 02 02 02 02 02 02
tone  80- 99: 02 02 02 02 02 02 02 02 02 02 - 02 02 02 02 02 02 02 02 02
tone 100-119: 02 02 02 02 02 02 02 02 02 02 - 02 02 02 02 02 02 02 02 02
tone 120-139: 02 02 02 02 02 02 02 02 02 02 - 02 02 02 02 02 02 02 02 02
tone 140-159: 02 02 02 02 02 02 02 02 02 02 - 02 02 02 02 02 02 02 02 02
tone 160-179: 02 02 02 02 02 02 02 02 02 02 - 02 02 02 02 02 02 02 02 02
tone 180-199: 02 02 02 02 02 02 02 02 02 02 - 02 02 02 02 02 02 02 02 02
tone 200-219: 02 02 02 02 02 02 02 02 02 02 - 02 02 02 02 02 02 02 02 02
tone 220-239: 02 02 02 02 02 02 02 02 02 02 - 02 02 02 02 02 02 02 02 02
tone 240-259: 02 02 02 02 02 02 02 02 02 02 - 02 02 02 02 02 02

```

63.2.4 Lineinfo Command

Syntax:

```
ras> statistics adsl lineinfo <portlist>
```

where

<portlist> = You can specify a single ADSL port <1>, all ADSL ports <*> or a list of ADSL ports <1,3,5>. You can also include a range of ports <1,5,6~10>.

This command shows the line operating values of an ADSL port.

An example is shown next.

Figure 296 Lineinfo Command Example

```

ras> statistics adsl lineinfo 8
[port 8]
operating modes:
- service type in operation: adsl2+
- TRELLIS operation mode    : on
connection detail:
- down/up stream interleaved delay (ms): 3/ 2
- total transceiver DS output power  (dbm): -2.5
- total transceiver US output power  (dbm): 11.5

atuc information:
- vendor id:      30304235303035300000000000000000
- version number: 66323330323030300000000000000000
- serial number :
30323030306530336539303030370000000000000000000000000000000000
00
atur information:
- vendor id:      b5004244434d00000000000000000000
- version number: 41327042303139610000000000000000
- serial number :
00000000000000000000000000000000000000000000000000000000000000

```

The service type in operation is the ADSL standard that the port is using: G.dmt (IES-1248-51/51A), G.dmt Annex B (IES-1248-53), ETSI (IES-1248-53), G.lite (IES-1248-51/51A), ANSI T1.413 issue 2 (IES-1248-51/51A), ADSL2, or ADSL2+.

Trellis coding helps to reduce the noise in ADSL transmissions. Trellis may reduce throughput but it makes the connection more stable.⁴

The numbers of milliseconds of interleave delay for downstream and upstream transmissions are listed. The total output power of the transceiver varies with the length and line quality. The farther away the subscriber's ADSL modem or router is or the more interference there is on the line, the higher the power will be. "DS" refers to the power output of the IES-1248 "US" refers to the power output of the subscriber's ADSL modem or router.

Information obtained prior to training to steady state transition will not be valid or will be old information.

The `atuc` information fields show data acquired from the ATUC (ADSL Termination Unit – Central), in this case IES-1248, during negotiation/provisioning message interchanges.

The `atur` information fields show data acquired from the ATUR (ADSL Termination Unit – Remote), in this case the subscriber's ADSL modem or router, during negotiation/provisioning message interchanges. This information can help in identifying the subscriber's ADSL modem or router.

The vendor ID, vendor version number and product serial number are obtained from vendor ID fields (see ITU-T G.994.1) or R-MSG1 (see T1.413).

4. At the time of writing, the IES-1248 always uses Trellis coding.

63.2.5 Lineperf Command

Syntax:

```
ras> statistics adsl lineperf <portlist>
```

where

<portlist> = You can specify a single ADSL port <1>, all ADSL ports <*> or a list of ADSL ports <1,3,5>. You can also include a range of ports <1,5,6~10>.

This command shows the line performance counters of an ADSL port.

An example is shown next.

Figure 297 Lineperf Command Example

```

ras> statistics adsl lineperf 1
[port 1] Perf since boot up
nfebe-I/nfebe-ni      :      46/          0 (Far End CRC)
ncrc-I/ncrc-ni       :       5/          0 (Near End CRC)
nfecc-I/nfecc-ni      :       0/          0 (Far End Corrected FEC)
nfec-I/nfec-ni       :      28/          0 (Near End Corrected FEC)
init-atuc/init-atur   :      23/          -
es-atuc /es-atur      :      27/         92
ses-atuc /ses-atur    :      26/         60
uas-atuc /uas-atur    :     1515/       1515
lpr-atuc /lpr-atur    :       -/          2

```

These counters display line performance data that has been accumulated since the system started. In the list above the definitions of near end/far end will always be relative to the ATU-C (ADSL Termination Unit-Central Office). Downstream (ds) refers to data from the ATU-C and upstream (us) refers to data from the ATU-R. “I” stands for interleaved and “ni” stands for non-interleaved (fast mode).

A block is a set of consecutive bits associated with the path; each bit belongs to one and only one block. Consecutive bits may not be contiguous in time.

Table 120 Line Performance Counters

LABEL	DESCRIPTION
nfebe	The Number of Far End Block Errors (Cyclic Redundancy Check).
ncrc	Near end Cyclic Redundancy Check errors.
nfecc	The Far End blocks repaired by Forward Error Correction.
nfec	The Near End blocks repaired by Forward Error Correction.
init	The number of link ups and link downs.
es	The Number of Errored Seconds. This is how many seconds contained at least one errored block or at least one defect.
ses	The Number of Severely Errored Seconds. This is how many seconds contained 30% or more errored blocks. This is a subset of n-es.
uas	The Number of Unavailable Seconds.
lpr	The Number of Loss of Power Seconds (on the ATUR) that have occurred.

63.2.6 15 Minute Performance Command

Syntax:

```
ras> statistics adsl 15mperf <portlist> [count <0..96>]
```

where

- <portlist> = You can specify a single ADSL port <1>, all ADSL ports <*> or a list of ADSL ports <1,3,5>. You can also include a range of ports <1,5,6~10>.
- [count <0..96>] = Specify for which 15-minute interval (0~96) you want to display performance statistics. 0 is the current 15 minutes.

This command displays line performance statistics for the current and previous 15-minute periods.

An example is shown next.

Figure 298 15 Minute Performance Command Example

```
ras> statistics adsl 15mperf 10
Port 10 Current 15 Min elapsed time:833 sec (Link UP)
  Current 15 Min PM:      ATUC      ATUR
                        lofs:      0      0
                        loss:      0      0
                        lols:      0      -
                        lprs:      -      0
                        eSs:      0      0
                        inits:     0      -
                        sesl:      0      0
                        uasl:      0      0
  History 15 Min PM-1:    ATUC      ATUR
                        lofs:      0      0
                        loss:      0      0
                        lols:      0      -
                        lprs:      -      0
                        eSs:      0      0
                        inits:     1      -
                        sesl:      0      0
                        uasl:      0      0
  History 15 Min PM-2:    ATUC      ATUR
                        lofs:      0      0
                        loss:      0      0
                        lols:      0      -
                        lprs:      -      0
                        eSs:      0      0
                        inits:     0      -
                        sesl:      0      0
                        uasl:      0      0
```

The following table explains these counters.

Table 121 15 Minute Performance Counters

LABEL	DESCRIPTION
atuc	Upstream. These statistics are for the connection (or traffic) coming from the subscriber's device to the IES-1248.
atur	Downstream. These statistics are for the connection (or traffic) going from the IES-1248 to the subscriber's device.
lofs	The number of Loss Of Frame seconds that have occurred within the 15-minute period.
loss	The number of Loss Of Signal seconds that have occurred within the 15-minute period.
lols	The number of Loss Of Link seconds that have occurred within the 15-minute period.
lprs	The number of Loss of Power seconds (on the ATUR) that have occurred within the 15-minute period.
eSs	The number of Errored Seconds that have occurred within the 15-minute period.
inits	The number of link ups and link downs that have occurred within the 15-minute period.
sesl	The number of Severely Errored Seconds that have occurred within the 15-minute period.
uasl	The number of UnAvailable Seconds that have occurred within the 15-minute period.

These counters are also used in the alarm profiles (see [Section 63.2.10 on page 461](#)).

63.2.7 1 Day Performance Command

Syntax:

```
ras> statistics adsl ldayperf <portlist>
```

where

<portlist> = You can specify a single ADSL port <1>, all ADSL ports <*> or a list of ADSL ports <1,3,5>. You can also include a range of ports <1,5,6~10>.

This command displays line performance statistics for the current and previous 24 hours.

An example is shown next.

Figure 299 1Day Performance Command Example

```

ras> statistics adsl 1dayperf 10
Port 10 current 1 day elapsed time:7827 sec (Link UP)
Current 1 Day Perf      ATUC      ATUR
      lofs      0      0
      loss      0      0
      lols      0      -
      lprs      -      0
      eSs      0      0
      inits      1      -
      sesl      1      0
      uasl      0      0

Port 10 previous 1 day elapsed time:0 sec
Previous 1 Day Perf      ATUC      ATUR
      lofs      0      0
      loss      0      0
      lols      0      -
      lprs      -      0
      eSs      0      0
      inits      0      -
      sesl      0      0
      uasl      0      0

```

See [Table 121 on page 458](#) for details about these counters.

63.2.8 Line Diagnostics Set Command

Syntax:

```

ras> adsl linediag setld <port number>

```

This command has the IES-1248 perform line diagnostics on the specified port. The ADSL port must be set to ADSL2 or ADSL2+ ADSL operational mode and have a connection. It takes about one minute for the line diagnostics to finish.

The following example performs line diagnostics on ADSL port 1. The screen displays a message confirming upon which ADSL port line diagnostics will be performed.

Figure 300 Line Diagnostics Set Command Example

```

ras> adsl linediag setld 1
Line- 1 set to Line Diagnostic Mode

```

63.2.9 Line Diagnostics Get Command

Syntax:

```

ras> adsl linediag getld <port number>

```

Use this command to display the line diagnostics results after using the line diagnostics set command on an ADSL port. Use the line diagnostics results to analyze problems with the physical ADSL line.



Wait at least one minute after using the line diagnostic set command before using this command.

The following example displays the line diagnostics results for ADSL port 1.

Figure 301 Line Diagnostics Get Command Example

```

ras> adsl linediag getld 1
Line_Diagnostics_Parameter,_channel: 0

number_of_subcarries: 256      32
hlinScale: 19625      32767
latn: 54      0
satn: 52      8
snrm: 60      60
attndr: 12140000      1120000
farEndActatp: 75      125
i      li.rl  li.im  log      QLN      SNR
0      32768  32768  1023    255    255
1      32768  32768  1023    255    255
2      32768  32768  1023    255    255
3      32768  32768  1023    255    255
4      32768  32768  1023    255    255
5      32768  32768  1023    255    255
6      11604  4752   83     191    132
7      17794  5598   48     190    139
8      22385  5567   30     184    147
9      24903  5163   21     163    152
10     26768  5013   15     185    159
11     29179  5494   8      175    165
12     31605  6574   1      172    168
13     32766  8020   1023   186    170
14     32159  9597   1023   183    173
15     30990  11350  1023   182    173
16     30432  13730  1023   186    172
17     30259  16694  1023   182    170
18     29137  19570  1023   171    170
19     26499  21554  1023   186    172
20     23288  22973  0      173    174

```

The following table lists the line diagnostics test parameters that display, see the ITU-T's G.992.3 for more information.

Table 122 Line Diagnostics Get Command

LABEL	DESCRIPTION
number_of_subcarries	Discrete Multi-Tone (DMT) modulation divides up a line's bandwidth into sub-carriers (sub-channels) of 4.3125 kHz each. The first number is the total number of DMT sub-carriers the ADSL connection is using. The second number indicates how many upstream DMT sub-carriers the ADSL connection is using.
hlinScale:	The channel characteristics function is represented in linear format by a scale factor and a complex number. These are the maximum upstream and downstream scale factors used in producing the channel characteristics function.

Table 122 Line Diagnostics Get Command (continued)

LABEL	DESCRIPTION
latn:	This is the upstream and downstream Line Attenuation (in .1 dB).
satn:	This is the upstream and downstream Signal Attenuation (in .1 dB).
snrm:	This is the upstream and downstream Signal-to-Noise Ratio Margin (in .1 dB). A DMT sub-carrier's SNR is the ratio between the received signal power and the received noise power. The signal-to-noise ratio margin is the maximum that the received noise power could increase with the IES-1248 still being able to meet its transmission targets.
attndr:	This is the upstream and downstream Attainable Net Data Rate (in bit/s).
farEndActatp:	This is the upstream and downstream Far End Actual Aggregate Transmit Power (in .1 dBm)
i	This is the index number of the DMT sub-carrier.
li.rl	The channel characteristics function is represented in linear format by a scale factor and a complex number. This is the real part of the complex number used in producing the channel characteristics function for this sub-carrier.
li.im	The channel characteristics function is represented in linear format by a scale factor and a complex number. This is the imaginary part of the complex number used in producing the channel characteristics function for this sub-carrier
log	This is a format for providing channel characteristics. It provides magnitude values in a logarithmic scale. This can be used in analyzing the physical condition of the ADSL line.
QLN	The Quiet Line Noise for a DMT sub-carrier is the rms (root mean square) level of the noise present on the line, when no ADSL signals are present. It is measured in dBm/Hz. The QLN can be used in analyzing crosstalk.
SNR	This is the upstream and downstream Signal-to-Noise Ratio (in .1 dB). A DMT sub-carrier's SNR is the ratio between the received signal power and the received noise power. The SNR can be used in analyzing time dependent changes in crosstalk levels and line attenuation (such as those caused by temperature variations and moisture).

63.2.10 Line Diagnostics Get 992.3 Command

Syntax:

```
ras> adsl linediag getld992_3 <port number>
```

Use this command to display the line diagnostics results in the format defined in the ITU-T G.992.3 standard after using the line diagnostics set command on an ADSL port. Use the line diagnostics results to analyze problems with the physical ADSL line.



Wait at least one minute after using the line diagnostic set command before using this command.

The following example displays the line diagnostics results for ADSL port 1.

Figure 302 Line Diagnostics Get 992.3 Command Example

```

ras> adsl linediag getld992_3 1
port: 1

number_of_subcarriers:      256      32
hlinScale:                  17024    32767
latn:                       2.0      0.2
satn:                       2.0      0.0
snrm:                       -0.0     6.0
attnr:                      10398468 1152000
farEndActatp:               20.4     12.4

i      li.rl      li.im      log (dB)      QLN (dBm)      SNR (dB)
0      N/A        N/A        N/A          N/A          N/A
1      N/A        N/A        N/A          N/A          N/A
2      N/A        N/A        N/A          N/A          N/A
3      N/A        N/A        N/A          N/A          N/A
4      N/A        N/A        N/A          N/A          N/A
5      N/A        N/A        N/A          N/A          N/A
6      0.31557    0.00796    -9.9         -120.5       8.5
7      0.43477    -0.31599   -5.3         -120.0       42.0
8      0.28313    -0.67576   -2.6         -119.5       44.5
9      -0.01016   -0.86645   -1.1         -119.0       46.5
10     -0.28423   -0.89969   -0.4         -118.5       51.5
11     -0.48750   -0.85403   -0.1         -118.0       52.0
12     -0.63495   -0.79630   0.2          -118.0       54.5
13     -0.75373   -0.75644   0.6          -117.5       56.5
14     -0.84457   -0.72510   1.0          -117.0       56.5
15     -0.89389   -0.68549   1.1          -116.5       56.5
16     -0.90713   -0.64631   1.0          -114.5       56.5
17     -0.91955   -0.63196   1.0          -116.0       57.0
18     -0.95053   -0.64860   1.3          -116.0       57.0
19     -0.97781   -0.67563   1.6          -115.5       57.0
20     -0.97161   -0.69211   1.6          -115.5       57.5

```

The following table lists the line diagnostics test parameters that display, see the ITU-T's G.992.3 for more information.

Table 123 Line Diagnostics Get 992.3 Command

LABEL	DESCRIPTION
number_of_subcarriers	Discrete Multi-Tone (DMT) modulation divides up a line's bandwidth into sub-carriers (sub-channels) of 4.3125 KHz each. The first number is the total number of DMT sub-carriers the ADSL connection is using. The second number indicates how many upstream DMT sub-carriers the ADSL connection is using.
hlinScale:	The channel characteristics function is represented in linear format by a scale factor and a complex number. These are the maximum upstream and downstream scale factors used in producing the channel characteristics function.
latn:	This is the upstream and downstream Line Attenuation (in dB).
satn:	This is the upstream and downstream Signal Attenuation (in dB).

Table 123 Line Diagnostics Get 992.3 Command (continued)

LABEL	DESCRIPTION
snrm:	This is the upstream and downstream Signal-to-Noise Ratio Margin (in dB). A DMT sub-carrier's SNR is the ratio between the received signal power and the received noise power. The signal-to-noise ratio margin is the maximum that the received noise power could increase with the IES-1248 still being able to meet its transmission targets.
attndr:	This is the upstream and downstream Attainable Net Data Rate (in bit/s).
farEndActatp:	This is the upstream and downstream Far End Actual Aggregate Transmit Power (in dBm)
i	This is the index number of the DMT sub-carrier.
li.rl	The channel characteristics function is represented in linear format by a scale factor and a complex number. This is the real part of the complex number used in producing the channel characteristics function for this sub-carrier.
li.im	The channel characteristics function is represented in linear format by a scale factor and a complex number. This is the imaginary part of the complex number used in producing the channel characteristics function for this sub-carrier
log	This is a format for providing channel characteristics. It provides magnitude values in a logarithmic scale. It is measured in dB. This can be used in analyzing the physical condition of the ADSL line.
QLN	The Quiet Line Noise for a DMT sub-carrier is the rms (root mean square) level of the noise present on the line, when no ADSL signals are present. It is measured in dBm. The QLN can be used in analyzing crosstalk.
SNR	This is the upstream and downstream Signal-to-Noise Ratio (in dB). A DMT sub-carrier's SNR is the ratio between the received signal power and the received noise power. The SNR can be used in analyzing time dependent changes in crosstalk levels and line attenuation (such as those caused by temperature variations and moisture).

63.2.11 SELT Diagnostic Set Command

Syntax:

```
ras> adsl linediag setselt <port number>
```

This command has the IES-1248 perform a single end line test on the specified port. This test checks the distance to the subscriber's location.



The port must have an open loop. There cannot be a DSL device, phone, fax machine or other device connected to the subscriber's end of the telephone line.

The test takes at least 15 seconds. You can run the [SELT Diagnostic Get Command](#) to check the status of the test and to look at the results.

The following example starts a SELT test on ADSL port 1.

Figure 303 SELT Diagnostic Set Command Example

```
ras> adsl linediag setselt 1
```

63.2.12 SELT Diagnostic Get Command

Syntax:

```
ras> adsl linediag getselt <port number>
```

Use this command to display the status and the results of the SELT test on the specified port. The report tells you what gauge of telephone wire is connected to the port and the approximate length of the line measured both in meters and thousands of feet.

The following example displays the status and results SELT diagnostic results for ADSL port 1.

Figure 304 Line Diagnostics Get Command Example

```
ras> adsl linediag getselt 1
port      inprogress      cableType  loopEstimateLength
-----
1          INPROGRESS      24AWG      0 m(0.00 kFt)
ras> adsl linediag getselt 1
port      inprogress      cableType  loopEstimateLength
-----
1          DONE            24AWG      0 m(0.00 kFt)
```

63.2.13 Tone Diagnostics 992.3 Command

Syntax:

```
ras> adsl linediag toneDiag <port number>
```

Use this command to display the tone diagnostics for a port in the format defined in the ITU-T G.992.3 standard. You do not need to use the line diagnostics set command first. Use the tone diagnostics to analyze problems with the physical ADSL line.

The following example displays the tone diagnostics results for ADSL port 8.

Figure 305 Tone Diagnostics Command Example

```

ras> ad lined toneD 1
port: 1

number_of_subcarries:      512      32
latn:                     24.1      2.7
satn:                     24.1      61.3
snrm:                     30.2      25.0
attndr:                   28008000  1248000
farEndActatp:             -31.0     11.9
  i   log (dB)  QLN (dBm)  SNR (dB)
  0      N/A      N/A      N/A
  1      N/A      N/A      N/A
  2      N/A      N/A      N/A
  3      N/A      N/A      N/A
  4      N/A      N/A      N/A
  5      N/A      N/A      N/A
  6    -21.1    -125.5    17.5
  7    -15.3    -124.0    26.0
  8     -9.9    -123.0    31.0
  9     -5.7    -120.5    38.0
-----Snip-----

509      6.0    -124.0    29.0
510      6.0    -124.0    29.0
511      6.0    -123.0    26.5

```

The following table lists the tone diagnostic parameters. See the ITU-T's G.992.3 for more information.

Table 124 ToneDiag Command

LABEL	DESCRIPTION
number_of_subcarries	Discrete Multi-Tone (DMT) modulation divides up a line's bandwidth into sub-carriers (sub-channels) of 4.3125 KHz each. This number indicates how many upstream and downstream DMT sub-carriers the ADSL connection is using.
hlinScale:	The channel characteristics function is represented in linear format by a scale factor and a complex number. This is the maximum upstream and downstream scale factor used in producing the channel characteristics function.
latn:	This is the upstream and downstream Line Attenuation (in dB).
satn:	This is the upstream and downstream Signal Attenuation (in dB).
snrm:	This is the upstream and downstream Signal-to-Noise Ratio Margin (in dB). A DMT sub-carrier's SNR is the ratio between the received signal power and the received noise power. The signal-to-noise ratio margin is the maximum that the received noise power could increase with the IES-1248 still being able to meet its transmission targets.
attndr:	This is the upstream and downstream Attainable Net Data Rate (in bit/s).
farEndActatp:	This is the upstream and downstream Far End Actual Aggregate Transmit Power (in dBm)
i	This is the index number of the DMT sub-carrier.

Table 124 ToneDiag Command (continued)

LABEL	DESCRIPTION
log (dB)	This is a format for providing channel characteristics. It provides magnitude values in a logarithmic scale. This can be used in analyzing the physical condition of the ADSL line.
QLN (dBm)	The Quiet Line Noise for a DMT sub-carrier is the rms (root mean square) level of the noise present on the line, when no ADSL signals are present. It is measured in dBm/Hz. The QLN can be used in analyzing crosstalk.
SNR (dB)	This is the upstream and downstream Signal-to-Noise Ratio (in dB). A DMT sub-carrier's SNR is the ratio between the received signal power and the received noise power. The SNR can be used in analyzing time dependent changes in crosstalk levels and line attenuation (such as those caused by temperature variations and moisture).

63.3 Alarm Profile Commands

Configure alarm profiles to set alarm settings and thresholds for the ADSL ports.

63.3.1 Alarm Profile Show Command

Syntax:

```
ras> adsl alarmprofile show [profile]
```

where

[profile] = The name of an alarm profile.

Displays the settings of the specified alarm profile (or all of them if you do not specify one).

The following example displays the default alarm profile (DEFVAL).

Figure 306 Alarm Profile Show Command Example

ras> adsl alarmprofile show DEFVAL			
01. DEFVAL			
		ATU-C	ATU-R
		-----	-----
Thresh15MinLofs	(sec) :	0	0
Thresh15MinLoss	(sec) :	0	0
Thresh15MinLols	(sec) :	0	---
Thresh15MinLprs	:	0	0
Thresh15MinESs	(sec) :	0	0
ThreshFastRateUp	(bps) :	0	0
ThreshInterleaveRateUp	(bps) :	0	0
ThreshFastRateDown	(bps) :	0	0
ThreshInterleaveRateDown	(bps) :	0	0
InitFailureTrap (1-enable, 2-disable) :		2	---
Thresh15MinFailedFast	:	0	---
Thresh15MinSes	(sec) :	0	0
Thresh15MinUas	(sec) :	0	0

63.3.2 Alarm Profile Set Command

Syntax:

```
ras> adsl alarmprofile set <profile> [<atuc lofs> <atur lofs> <atuc loss>
<atur loss> <atuc lols> <atur lols> <atuc lprs> <atur lprs> <atuc ess> <atur ess> <atuc
fast rateup> <atur fast rateup> <atuc interleave rateup> <atur interleave
rateup> <atuc fast ratedown> <atur fast ratedown> <atuc interleave ratedown>
<atur interleave ratedown> <init fail enable> <atuc fail fast> <atuc ses>
<atur ses> <atuc uas> <atur uas>]
```

where

<profile>	=	A name for the alarm profile (up to 31 ASCII characters).
atuc	=	Upstream. These parameters are for the connection (or traffic) coming from the subscriber's device to the IES-1248.
atur	=	Downstream. These parameters are for the connection (or traffic) going from the IES-1248 to the subscriber's device.
<atuc lofs> <atur lofs>	=	The number of Loss Of Frame seconds that are permitted to occur within 15 minutes.
<atuc loss> <atur loss>	=	The number of Loss Of Signal seconds that are permitted to occur within 15 minutes.
<atuc lols>	=	The number of Loss Of Link seconds that are permitted to occur within 15 minutes.
<atuc lprs> <atur lprs>	=	The number of Loss of Power seconds that are permitted to occur (on the ATUR) within 15 minutes.
<atuc ess> <atur ess>	=	The number of Errored Seconds that are permitted to occur within 15 minutes.
<atuc fast rateup> <atur fast rateup>	=	A rate in kilobits per second (kbps). If a fast mode connection's upstream transmission rate increases by more than this number, then a trap is sent.
<atuc interleave rateup> <atur interleave rateup>	=	A rate in kilobits per second (kbps). If an interleave mode connection's upstream transmission rate increases by more than this number, then a trap is sent.
<atuc fast ratedown> <atur fast ratedown>	=	A rate in kilobits per second (kbps). If a fast mode connection's downstream transmission rate decreases by more than this number, then a trap is sent.
<atuc interleave ratedown> <atur interleave ratedown>	=	A rate in kilobits per second (kbps). If an interleave mode connection's upstream transmission rate decreases by more than this number, then a trap is sent.
<init fail enable>	=	"1" sets the profile to trigger an alarm for an initialization failures trap. "2" sets the profile to not trigger an alarm for an initialization failures trap.
<atuc fail fast>	=	The number of failed fast retrains that are permitted to occur within 15 minutes.

<code><atuc ses></code>	=	The number of Severely Errored Seconds that are permitted to occur within 15 minutes.
<code><atur ses></code>		
<code><atuc uas></code>	=	The number of UnAvailable Seconds that are permitted to occur within 15 minutes.
<code><atur uas></code>		

This command configures settings and thresholds that define when the IES-1248 is to send an alarm trap and generate a syslog entry.

Configure alarm profiles first and then use the `alarmprofile map` command to set the IES-1248 to use them with specific ADSL ports.

The following example sets an alarm profile named `SESalarm` that has the IES-1248 send an alarm trap and generate a syslog whenever the upstream connection's number of severely errored seconds exceeds three within a 15 minute period.

Figure 307 Alarm Profile Set Command Example

```
ras> adsl alarmprofile set SESalarm 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 2 0 3
0 0 0
```

63.3.3 Alarm Profile Delete Command

Syntax:

```
ras> adsl alarmprofile delete <profile>
```

where

<code><profile></code>	=	The name of an alarm profile.

This command allows you to delete an individual ADSL alarm profile by its name. You cannot delete the `DEFVAL` alarm profile.

The following example deletes the `SESalarm` alarm profile.

Figure 308 Alarm Profile Delete Command Example

```
ras> adsl alarm profile delete SESalarm
```

63.3.4 Alarm Profile Map Command

Syntax:

```
ras> adsl alarmprofile map <portlist> <profile>
```

where

<code><portlist></code>	=	You can specify a single ADSL port <code><1></code> , all ADSL ports <code><*></code> or a list of ADSL ports <code><1,3,5></code> . You can also include a range of ports <code><1,5,6~10></code> .
<code><profile></code>	=	The name of an alarm profile.

Sets the IES-1248 to use an (already-configured) alarm profile with the specified ADSL ports.

The following example sets the IES-1248 to use the SESalarm alarm profile with ADSL port 5.

Figure 309 Alarm Profile Map Command Example

```
ras> adsl alarmprofile map SESalarm 5
```

63.3.5 Alarm Profile Showmap Command

Syntax:

```
ras> adsl alarmprofile showmap [profile]
```

where

[profile] = The name of an alarm profile.

Displays which alarm profiles the IES-1248 is set to use for specific (or all) ADSL ports.

The following example displays which alarm profile the IES-1248 is set to use for ADSL port 5.

Figure 310 Alarm Profile Showmap Command Example

```
ras> adsl alarmprofile showmap 5
ADSL alarm profile mapping:
Port 5: Alarm Profile = DEFVAL
```


Virtual Channel Management

This chapter shows you how to use commands to configure virtual channels.

64.1 Virtual Channel Management Overview

See [Chapter 16 on page 129](#) for background information on virtual channels and ATM QoS.

64.2 Virtual Channel Profile Commands

Use the following commands to configure virtual channel profiles.

64.2.1 Show Virtual Channel Profile Command

Syntax:

```
ras> adsl vcprofile show [vcprofile]
```

where

[vcprofile] = The name of the virtual channel profile (up to 31 ASCII characters).

Displays the settings of the specified virtual channel profile (or all of them if you do not specify one).

64.2.2 Set Virtual Channel Profile Command

Syntax:

```
ras> adsl vcprofile set <vcprofile> <vc|llc> <ubr|cbr> <pcr> <cdvt>
ras> adsl vcprofile set <vcprofile> <vc|llc> <vbr(rt-vbr)|nrt-vbr> <pcr>
<cdvt> <scr> <bt>
```

where

<vcprofile>	=	The name of the virtual channel profile (up to 31 ASCII characters). You cannot change the DEFVAL or DEFVAL_VC profiles.
<vc llc>	=	The type of encapsulation (vc or llc).
<ubr cbr>	=	The ubr (unspecified bit rate) or cbr (constant bit rate) or ATM traffic class.

<code><pcr></code>	=	Peak Cell Rate (150 to 300000), the maximum rate (cells per second) at which the sender can send cells.
<code>[cdvt]</code>	=	Cell Delay Variation Tolerance is the accepted tolerance of the difference between a cell's transfer delay and the expected transfer delay (number of cells). 0 to 255 cells or * (means 0).
<code><vbr (rt-vbr) nrt-vbr></code>	=	The real-time (vbr) or non real-time (nrt-vbr) Variable Bit Rate ATM traffic class.
<code><scr></code>	=	The Sustained Cell Rate sets the average cell rate (long-term) that can be transmitted (cells per second). SCR applies with the vbr traffic class.
<code><bt></code>	=	Burst Tolerance this is the maximum number of cells that the port is guaranteed to handle without any discards (number of cells). BT applies with the vbr traffic class.

This command creates a virtual channel profile. After you create a virtual channel profile, you can assign it to any of the ADSL ports on any of the ADSL IES-1248 in the IES-1248.

The following example creates a virtual channel profile named gold that uses LLC encapsulation. It uses constant bit rate and has the maximum rate (peak cell rate) set to 300,000 cells per second. The acceptable tolerance of the difference between a cell's transfer delay and the expected transfer delay (CDVT) is set to 5 cells.

Figure 311 Set Virtual Channel Profile Command Example 1

```
ras> adsl vcprofile set gold llc cbr 300000 5
```

The following example creates a virtual channel profile named silver that uses VC encapsulation. It uses real-time variable bit rate and has the maximum rate (peak cell rate) set to 250,000 cells per second. The acceptable tolerance of the difference between a cell's transfer delay and the expected transfer delay (CDVT) is set to 5 cells. The average cell rate that can be transmitted (SCR) is set to 100,000 cells per second. The maximum number of cells that the port is guaranteed to handle without any discards (BT) is set to 200.

Figure 312 Set Virtual Channel Profile Command Example 2

```
ras> adsl vcprofile set silver vc vbr 250000 5 100000 200
```

The following example creates a virtual channel profile named economy that uses LLC encapsulation. It uses unspecified bit rate and has the maximum rate (peak cell rate) set to 50,000 cells per second. The acceptable tolerance of the difference between a cell's transfer delay and the expected transfer delay (CDVT) is set to 100 cells.

Figure 313 Set Virtual Channel Profile Command Example 3

```
ras> adsl vcprofile set gold llc cbr 50000 100
```

64.2.3 Delete Virtual Channel Profile Command

Syntax:

```
ras> adsl vcprofile delete <vcprofile>
```

where

`<vcprofile>` = The name of the virtual channel profile (up to 31 ASCII characters). You cannot delete the DEFVAL or DEFVAL_VC profiles.

You cannot delete a virtual channel profile that is assigned to any of the ADSL ports. Assign a different profile to any ADSL ports that are using the profile that you want to delete, and then you can delete the profile.

The following example deletes the silver virtual channel profile.

Figure 314 Delete Virtual Channel Profile Command Example

```
ras> adsl vcprofile delete silver
```

64.3 PVC Channels

Channels (also called Permanent Virtual Circuits or PVCs) let you set priorities for different services or subscribers. You can define up to eight channels on each DSL port and use them for different services or levels of service. You set the PVID that is assigned to untagged frames received on each channel. You also set an IEEE 802.1p priority for each of the PVIDs. In this way you can assign different priorities to different channels (and consequently the services that get carried on them or the subscribers that use them). Use the following commands to define channels.

64.3.1 PVC Show Command

Syntax:

```
ras> adsl pvc show [portlist] [<vpi> <vci>]
```

where

`<portlist>` = You can specify a single ADSL port `<1>`, all ADSL ports `<*>` or a list of ADSL ports `<1,3,5>`. You can also include a range of ports `<1,5,6~10>`.

`[<vpi> <vci>]` = The VPI and VCI of an individual PVC.

This command allows you to display the PVC parameters of the specified ADSL port(s) or all of the ADSL ports if you do not specify any.

64.3.2 PVC Set Command

Syntax:

```
ras> adsl pvc set <portlist> <vpi> <vci> <super |vid = 1..4094 <priority>>
<DS vcprofile[,US vcprofile]>
```

where

`<portlist>` = You can specify a single ADSL port `<1>`, all ADSL ports `<*>` or a list of ADSL ports `<1,3,5>`. You can also include a range of ports `<1,5,6~10>`.

`<vpi>` = The VPI setting can be 0 to 255.

- `<vci>` = The VCI setting can be 32 to 65535 if the vpi is 0 or 1 to 65535 if the vpi is not 0.
- `<super |vid` = Enable the super channel option to allow a channel forward frames belonging to multiple VLAN groups (that are not assigned to other channels). The IES-1248 forwards frames belonging to VLAN groups that are not assigned to specific channels to the super channel. The super channel functions in the same way as the channel in a single channel environment. One port can have only one super channel.
- The default VID (1 to 4094). Each PVC must have a unique VID since the IES-1248 forwards traffic back to the subscribers based on the VLAN ID.
- You must assign a default VID (1 to 4094) and IEEE 802.1p default priority (0 to 7) to normal channels. Each PVC must have a unique VID (since the IES-1248 forwards traffic back to the subscribers based on the VLAN ID).
- `<priority>` = This is the priority value (0 to 7) to add to incoming frames without a (IEEE 802.1p) priority tag.
- `DS vcprofile` = Assign a VC profile to use for this channel's downstream traffic shaping.
- `[,US
vcprofile]>` = Assign a VC profile to use for policing this channel's upstream traffic. The IES-1248 does not perform upstream traffic policing if you do not specify an upstream VC profile.

This command allows the configuration of a PVC (permanent virtual circuit) for one or a range of ADSL ports.

The following example sets a PVC on ADSL port 1 with VPI 1, VCI 34, default VID 100 priority 3. It sets the "platinum" profile for downstream traffic shaping and a VC profile named "plus" for upstream traffic policing.

Figure 315 PVC Set Command Example

```
ras> adsl pvc set 1 1 34 100 3 platinum,plus
```

64.3.3 PVC Delete Command

Syntax:

```
ras> adsl pvc delete <portlist> <vpi> <vci>
```

where

- `<portlist>` = You can specify a single ADSL port <1>, all ADSL ports <*> or a list of ADSL ports <1,3,5>. You can also include a range of ports <1,5,6~10>.
- `[<vpi> <vci>]` = The VPI and VCI of an individual PVC.

This command deletes the specified PVC channel.

64.4 Priority-based PVCs

A PPVC (Priority-based PVC) allows you to give different priorities to PVCs that are members of the same VLAN.

The IES-1248 uses eight priority queues (also called levels) for the member PVCs. The system maps frames with certain IEEE 802.1p priorities to a PVC with a particular priority queue. See [Chapter 16 on page 129](#) for the factory default mapping.

Use these commands to configure PPVCs and add and remove member PVCs.

64.4.1 PPVC Set Command

Syntax:

```
ras> adsl ppvc set <portlist> <vpi> <vci> <encap> <pvid> <priority>
```

where

<code><portlist></code>	=	You can specify a single ADSL port <code><1></code> , all ADSL ports <code><*></code> or a list of ADSL ports <code><1,3,5></code> . You can also include a range of ports <code><1,5,6~10></code> .
<code><vpi></code>	=	The VPI setting can be 0 to 255.
<code><vci></code>	=	The VCI setting can be 32 to 65535 if the vpi is 0 or 1 to 65535 if the vpi is not 0. This PVC channel is for internal use. The operator does not need to create this PVC on the subscriber's device (the CPE).
<code><encap></code>	=	The type of encapsulation: llc, vc mux
<code><pvid></code>	=	Type a PVID (Port VLAN ID) to assign to untagged frames received on this PPVC.
<code><priority></code>	=	This is the priority value (0 to 7) to add to incoming frames without a (IEEE 802.1p) priority tag.

This command creates a PPVC.

The following example creates a PPVC with VPI 8 and VCI 35 for port 5. The PPVC uses llc encapsulation and default VID 25. Any frames received without an IEEE 802.1p priority tag will be assigned a priority of 3. The IES-1248 uses this PVC channel internally. This PVC is not needed on the subscriber's device.

Figure 316 PPVC Set Command Example

```
ras> adsl ppvc set 5 8 35 llc 25 3
```

64.4.2 PPVC Member Set Command

Syntax:

```
ras> adsl ppvc member set <portlist> <vpi> <vci> <member vpi> <member vci>  
<DS vcprofile[,US vcprofile]> <level>
```

where

<code><portlist></code>	=	The port(s) of the PPVC. You can specify a single ADSL port <code><1></code> , all ADSL ports <code><*></code> or a list of ADSL ports <code><1,3,5></code> . You can also include a range of ports <code><1,5,6~10></code> .
<code><vpi></code>	=	The VPI of the PPVC.
<code><vci></code>	=	The VCI of the PPVC. This PVC channel is for internal use. The subscriber does not need to create this PVC.
<code><member vpi></code>	=	The VPI of the individual PVC that you are adding to the PPVC. The VPI setting can be 0 to 255.
<code><member vci></code>	=	The VCI of the individual PVC that you are adding to the PPVC. The VCI setting can be 32 to 65535 with a VPI of 0 or 1 to 65535 if the VPI is not 0. The subscriber's device must create this PVC.
<code>DS vcprofile</code>	=	Assign a VC profile to use for this channel's downstream traffic shaping.
<code>[,US vcprofile]></code>	=	Assign a VC profile to use for policing this channel's upstream traffic. The IES-1248 does not perform upstream traffic policing if you do not specify an upstream VC profile.
<code><level></code>	=	The priority queue (0~7) to use for this PVCs traffic. 7 is the highest priority.

This command adds a member PVC to a PPVC. You must create the PPVC before you use this command to add a member.



Only the member PVCs need to be created on the subscriber's device.

The following example adds a PVC to a PPVC with VPI 8 and VCI 35 for port 5. The PVC uses VPI 8 and VCI 36. It sets the DEFVAL profile for downstream traffic shaping and for upstream traffic policing. It uses priority queue 2.

Figure 317 PPVC Member Set Command Example

```
ras> adsl ppvc member set 5 8 35 8 36 DEFVAL,DEFVAL 2
```

64.5 PPVC Member Delete Command

Syntax:

```
ras> adsl ppvc member delete <portlist> <vpi> <vci> <member vpi> <member vci>
```


where

<portlist>	=	The port(s) of the PPVC. You can specify a single ADSL port <1>, all ADSL ports <*> or a list of ADSL ports <1,3,5>. You can also include a range of ports <1,5,6~10>.
<vpi>	=	The VPI of the PPVC.
<vci>	=	The VCI of the PPVC.
<member vpi>	=	The VPI of the individual PVC that you are removing from the PPVC.
<member vci>	=	The VCI of the individual PVC that you are removing from the PPVC.

This command removes a PVC from a PPVC.

The following example removes a PVC that uses VPI 8 and VCI 36 from a PPVC with VPI 8 and VCI 35 for port 5.

Figure 318 PPVC Member Delete Command Example

```
ras> adsl ppvc member delete 5 8 35 8 36
```

64.6 PPVC Member Show Command

Syntax:

```
ras> adsl ppvc member show [<portlist> [<vpi> <vci>]]
```

where

<portlist>	=	The port(s) of the PPVC. You can specify a single ADSL port <1>, all ADSL ports <*> or a list of ADSL ports <1,3,5>. You can also include a range of ports <1,5,6~10>.
<vpi>	=	The VPI of the PPVC.
<vci>	=	The VCI of the PPVC.
<member vpi>	=	The VPI of the individual PVC that you are displaying.
<member vci>	=	The VCI of the individual PVC that you are displaying.

This command displays the PVCs that are members of a PPVC.

The following example displays the PVCs that are members of a PPVC for port 5.

Figure 319 PPVC Member Show Command Example

```
ras> adsl ppvc member show 5
port vpi  vci mvpi  mvci  level DS/US vcprofile
-----
   5    8   35    8   36      2 DEFVAL/DEFVAL
```

64.6.1 PPVC Show Command

Syntax:

```
ras> adsl ppvc show [<portlist> [<vpi> <vci>]]
```

where

<portlist>	=	The port(s) of the PPVC. You can specify a single ADSL port <1>, all ADSL ports <*> or a list of ADSL ports <1,3,5>. You can also include a range of ports <1,5,6~10>.
<vpi>	=	The VPI of the PPVC.
<vci>	=	The VCI of the PPVC.

This command displays the runtime configured PPVCs.

The following example displays the PPVCs configured on DSL port 5.

Figure 320 PPVC Show Command Example

```
ras> adsl ppvc show 5
port  vpi    vci  encap  pvid  pri
=====
   5      8    35   llc    25    6
```

64.6.2 PPVC Delete Command

Syntax:

```
ras> adsl ppvc delete <portlist> <vpi> <vci>
```

where

<portlist>	=	The port(s) of the PPVC. You can specify a single ADSL port <1>, all ADSL ports <*> or a list of ADSL ports <1,3,5>. You can also include a range of ports <1,5,6~10>.
<vpi>	=	The VPI of the PPVC.
<vci>	=	The VCI of the PPVC.

This command removes a PPVC. Removing a PPVC also deletes all of the member PVCs.

The following example removes a PPVC with VPI 8 and VCI 35 for port 5.

Figure 321 PPVC Delete Command Example

```
ras> adsl ppvc delete 5 8 35
```

64.7 2684 Routed Mode Commands

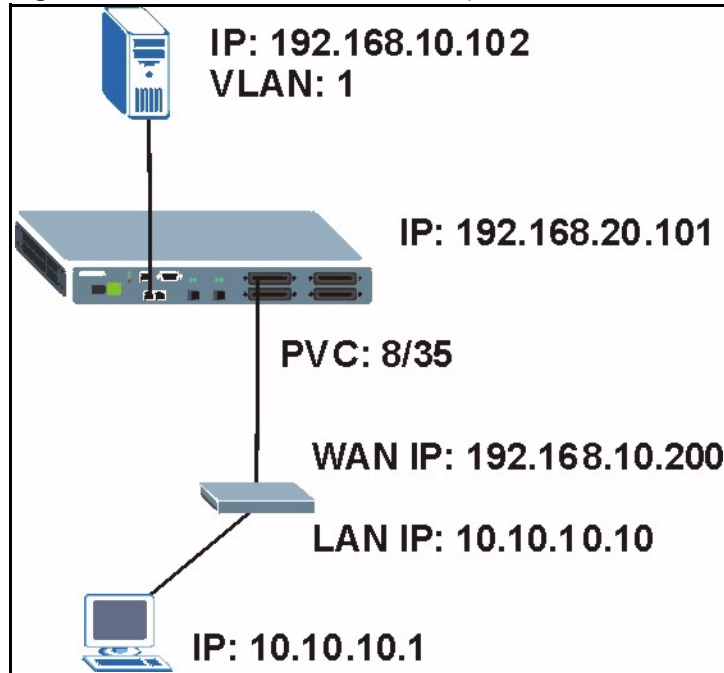
Use the 2684 routed mode to have the IES-1248 add MAC address headers to 2684 routed mode traffic from a PVC that connects to a subscriber device that uses 2684 routed mode. You can also specify the gateway to which the IES-1248 sends the traffic and the VLAN ID tag to add. See RFC-2684 for details on routed mode traffic carried over AAL type 5 over ATM.

Use the commands in the following order to set up a 2684 routed mode PVC.

- 1 Use the `adsl rpvc gateway` commands to configure gateway settings.
- 2 Use the `adsl rpvc set` command to configure RPVCs (2684 routed mode PVCs) for 2684 routed mode traffic.
- 3 Use the `adsl rpvc route set` command to configure domains for 2684 routed mode traffic. The domain is the range of IP addresses behind the subscriber's device (the CPE or Customer Premises Equipment). This includes the CPE device's LAN IP addresses and the IP addresses of the LAN computers.
- 4 Use the `adsl rpvc arp` commands to view the Address Resolution Protocol table of IP addresses of CPE devices using 2684 routed mode and configure how long the device is to store them.
- 5 For upstream traffic: Since the subscriber's device will not send out a MAC address, after the IES-1248 reassembles the Ethernet packets from the AAL5 ATM cells, the IES-1248 will append the routed mode gateway's MAC address and the IES-1248's MAC address as the destination/source MAC address.
- 6 For downstream traffic: When the IES-1248 sees the destination IP address is specified in the RPVC (or RPVC domain), the IES-1248 will strip out the MAC header and send them to the corresponding RPVC.

64.7.1 2684 Routed Mode Example

The following figure shows an example RFC 2684 (formerly RFC 1483) routed mode set up. The gateway server uses IP address 192.168.10.102 and is in VLAN 1. The IES-1248 uses IP address 192.168.20.101. The subscriber's device (the CPE) is connected to DSL port 1 on the IES-1248 and the 2684 routed mode traffic is to use the PVC identified by VPI 8 and VCI 35. The CPE device's WAN IP address is 192.168.10.200. The routed domain is the LAN IP addresses behind the CPE device. The CPE device's LAN IP address is 10.10.10.10 and the LAN computer's IP address is 10.10.10.1. This includes the CPE device's LAN IP addresses and the IP addresses of the LAN computers.

Figure 322 2684 Routed Mode Example

Note the following.

- The CPE device's WAN IP (192.168.10.200 in this example) must be in the same subnet as the gateway's IP address (192.168.10.102 in this example).
- The IES-1248's management IP address can be any IP address, it doesn't have any relationship to the WAN IP address or routed gateway IP address.
- The IES-1248's management IP address should not be in the same subnet as the one defined by the WAN IP address and netmask of the subscriber's device. It is suggested that you set the netmask of the subscriber's WAN IP address to 32 to avoid this problem.
- The IES-1248's management IP address should not be in the same subnet range of any RPVC and RPVC domain. It will make the IES-1248 confused if the IES-1248 receives a packet with this IP as destination IP.
- The IES-1248's management IP address also should not be in the same subnet as the one defined by the LAN IP address and netmask of the subscriber's device. Make sure you assign the IP addresses properly.
- In general deployment, the computer must set the CPE device's LAN IP address (10.10.10.10 in this example) as its default gateway.
- The subnet range of any RPVC and RPVC domain must be unique.

Use the following command sequence to configure the IES-1248 for this example set up.

Figure 323 2684 Routed Mode Commands Example

```

ras> adsl rpvc gateway set 192.168.10.102 1
ras> adsl rpvc set 1 8 35 DEFVAL 192.168.10.200/32 192.168.10.102
ras> adsl rpvc route set 1 8 35 10.10.10.1/24

```

64.7.2 RPVC Gateway Set Command

Syntax:

```
ras> adsl rpvc gateway set <gateway ip> <vlan id> [<priority>]
```

where

- <gateway ip> = The IP address of the gateway to which you want to send the traffic that the system receives from this PVC. Enter the IP address in dotted decimal notation.
- <vlan id> = The VLAN Identifier to add to Ethernet frames that the system routes to this gateway.
- [<priority>] = Set the IEEE 802.1p priority (0~7) to add to the traffic that you send to this gateway.

This command adds a gateway IP address to use for 2684 routed mode traffic.

The following example has the device use a VLAN ID of 1 and IEEE 802.1p priority of 3 when sending 2684 routed mode traffic to a gateway at IP address 192.168.10.102.

Figure 324 RPVC Gateway Set Command Example

```
ras> adsl rpvc gateway set 192.168.10.102 1 3
```

64.7.3 RPVC Gateway Show Command

Syntax:

```
ras> adsl rpvc gateway show
```

This command displays the gateway IP addresses that are configured for use with 2684 routed mode traffic.

The following is an example.

Figure 325 RPVC Gateway Show Command Example

```
ras> adsl rpvc gateway show
gateway ip      vid
-----
192.168.10.102  1
```

64.7.4 RPVC Gateway Delete Command

Syntax:

```
ras> adsl rpvc gateway delete <gateway ip>
```

where

- <gateway ip> = The IP address of the gateway to which you no longer want the device to send the traffic that the system receives from this PVC. Enter the IP address in dotted decimal notation.

This command removes a gateway IP address that the device was set to use for 2684 routed mode traffic.

The following example has the device remove a 2684 routed mode traffic gateway entry for IP address 192.168.10.102.

Figure 326 RPVC Gateway Delete Command Example

```
ras> adsl rpvc gateway delete 192.168.10.102
```

64.7.5 RPVC Set Command

Syntax:

```
ras> adsl rpvc set <portlist> <vpi> <vci> <DS vcprofile[,US vcprofile]>
<ip>/<netmask> <gateway ip>
```

where

<portlist>	=	The port(s) of the RPVC. You can specify a single ADSL port <1>, all ADSL ports <*> or a list of ADSL ports <1,3,5>. You can also include a range of ports <1,5,6~10>.
<vpi>	=	The VPI of the RPVC.
<vci>	=	The VCI of the RPVC.
DS vcprofile	=	Assign a VC profile to use for this channel's downstream traffic shaping.
[,US vcprofile]>	=	Assign a VC profile to use for policing this channel's upstream traffic. The IES-1248 does not perform upstream traffic policing if you do not specify an upstream VC profile.
<ip>	=	The subscriber's CPE WAN IP address in dotted decimal notation.
/<netmask>	=	The bit number of the subnet mask of the subscriber's IP address. To find the bit number, convert the subnet mask to binary and add all of the 1's together. Take "255.255.255.0" for example. 255 converts to eight 1's in binary. There are three 255's, so add three eights together and you get the bit number (24). Make sure that the routed PVC's subnet does not include the IES-1248's IP address.
<gateway ip>	=	The IP address of the gateway to which you want to send the traffic that the system receives from this PVC. Enter the IP address in dotted decimal notation.

This command adds a PVC to handle 2684 routed mode traffic.



You must use the `rpvc gateway set` command to configure the gateway's settings before you use the `rpvc set` command.

The following example adds a PVC for 2684 routed mode traffic. It is for DSL port 1, VPI 8, VCI 35. It sets the DEFVAL profile for downstream traffic shaping and for upstream traffic policing. The CPE device's WAN IP address is 192.168.10.200 with a netmask of 32 and the gateway's IP address is 192.168.10.102.

Figure 327 RPVC Set Command Example

```
ras> adsl rpvc set 1 8 35 DEFVAL,DEFVAL 192.168.10.200/32 192.168.10.102
```

64.7.6 RPVC Show Command

Syntax:

```
ras> adsl rpvc show <portlist>
```

where

<portlist> = The port(s) for which you want to display the RPVCs.
You can specify a single ADSL port <1>, all ADSL ports <*> or a list of ADSL ports <1,3,5>. You can also include a range of ports <1,5,6~10>.

This command lists the PVCs for handling 2684 routed mode traffic (RPVCs).

The following example displays the RPVCs for DSL port 1.

Figure 328 RPVC Show Command Example

```
ras> adsl rpvc show 1
port vpi vci ip/netmask gateway ip DS/US vcprofile
-----
-
1 8 35 192.168.10.200/32 192.168.10.102 DEFVAL/DEFVAL
```

64.7.7 RPVC Delete Command

Syntax:

```
ras> adsl rpvc delete <portlist> <vpi> <vci>
```

where

<portlist> = The port(s) of the RPVC.
You can specify a single ADSL port <1>, all ADSL ports <*> or a list of ADSL ports <1,3,5>. You can also include a range of ports <1,5,6~10>.

<vpi> = The VPI of the RPVC.

<vci> = The VCI of the RPVC.

This command removes a PVC for 2684 routed mode traffic.

The following example removes a PVC for 2684 routed mode traffic. It is for DSL port 1, VPI 8, VCI 35.

Figure 329 RPVC Delete Command Example

```
ras> adsl rpvc delete 1 8 35
```

64.7.8 RPVC Route Set Command

Syntax:

```
ras> adsl rpvc route set <port number> <vpi> <vci> <ip>/<netmask>
```

where

<port number>	=	The port of the RPVC. Specify a single ADSL port <1>.
<vpi>	=	The VPI of the RPVC.
<vci>	=	The VCI of the RPVC.
<ip>	=	The subscriber's CPE LAN IP address in dotted decimal notation.
/<netmask>	=	The bit number of the subnet mask of the subscriber's IP address. To find the bit number, convert the subnet mask to binary and add all of the 1's together. Take "255.255.255.0" for example. 255 converts to eight 1's in binary. There are three 255's, so add three eights together and you get the bit number (24).

This command adds a domain for 2684 routed mode traffic. The domain includes the subscriber's LAN IP addresses.



You must use the `rpvc gateway set` and the `rpvc set` commands before you use the `rpvc route set` command.

The following example adds a domain for a CPE device is connected to DSL port 1 on the IES-1248 and the 2684 routed mode traffic is to use the PVC identified by VPI 8 and VCI 35. The CPE device's LAN IP address is 10.10.10.10 and uses a subnet mask of 255.255.255.0. This includes the CPE device's LAN IP addresses and the IP addresses of the LAN computers.

Figure 330 RPVC Route Set Command Example

```
ras> adsl rpvc route set 1 8 35 10.10.10.1/24
```

64.7.9 RPVC Route Show Command

Syntax:

```
ras> adsl rpvc route show <portlist>
```


where

`<portlist>` = The port(s) of the RPVC.
 You can specify a single ADSL port `<1>`, all ADSL ports `<*>` or a list of ADSL ports `<1,3,5>`. You can also include a range of ports `<1,5,6~10>`.

This command lists the domains for 2684 routed mode traffic.

The following example displays the domains for 2684 routed mode traffic for devices connected to DSL ports 1 and 2.

Figure 331 RPVC Route Show Command Example

```

ras> adsl rpvc route show 1,2
port vpi vci ip/netmask
-----
  1   8  35 10.10.10.0/24
  2   8  35 10.10.11.0/24

```

64.7.10 RPVC Route Delete Command

Syntax:

```

ras> adsl rpvc route delete <port number> <vpi> <vci> <ip>/<netmask>

```

where

`<port number>` = The port of the RPVC. Specify a single ADSL port `<1>`.
`<vpi>` = The VPI of the RPVC.
`<vci>` = The VCI of the RPVC.
`<ip>` = The subscriber's CPE LAN IP address in dotted decimal notation.
`/<netmask>` = The bit number of the subnet mask of the subscriber's IP address. To find the bit number, convert the subnet mask to binary and add all of the 1's together. Take "255.255.255.0" for example. 255 converts to eight 1's in binary. There are three 255's, so add three eights together and you get the bit number (24).

This command removes a domain for 2684 routed mode traffic. The domain includes the subscriber's LAN IP addresses.

The following example removes a domain for a CPE device is connected to DSL port 1 on the IES-1248 and the 2684 routed mode traffic is to use the PVC identified by VPI 8 and VCI 35. The CPE device's LAN IP address is 10.10.10.10 and uses a subnet mask of 255.255.255.0. This includes the CPE device's LAN IP addresses and the IP addresses of the LAN computers.

Figure 332 RPVC Route Delete Command Example

```

ras> adsl rpvc route delete 1 8 35 10.10.10.1/24

```

64.7.11 RPVC ARP Agingtime Set Command

Syntax:

```
ras> adsl rpvc arp agingtime set <sec>
```

where

<sec> = The number of seconds (10~10000) the device is to keep the Address Resolution Protocol table's entries of IP addresses of 2684 routed mode gateways. Use 0 to disable the aging time.

This command configures how long the device stores the IP addresses of CPE devices using 2684 routed mode in the Address Resolution Protocol table.

The following example sets the device to store the IP addresses 2684 routed mode gateways in the Address Resolution Protocol table for 500 seconds.

Figure 333 RPVC ARP Agingtime Command Example

```
ras> adsl rpvc arp agingtime set 500
```

64.7.12 RPVC ARP Agingtime Show Command

Syntax:

```
ras> adsl rpvc arp agingtime show
```

This command displays how long the device stores the IP addresses of 2684 routed mode gateways in the Address Resolution Protocol table.

The following is an example.

Figure 334 RPVC ARP Agingtime Show Command Example

```
ras> adsl rpvc arp agingtime show
rpvc aging time (sec): 500
```

64.7.13 RPVC ARP Show Command

Syntax:

```
ras> adsl rpvc arp show
```

This command displays how long the device stores the IP addresses of 2684 routed mode gateways in the Address Resolution Protocol table.

The following is an example.

Figure 335 RPVC ARP Agingtime Show Command Example

```
ras> adsl rpvc arp show
gateway ip      vid  mac
-----  ---  -----
192.168.10.102    1  00:0d:9d:d9:43:3b
```

64.7.14 RPVC ARP Flush Command

Syntax:

```
ras> adsl rpvc arp flush
```

This command clears the IP addresses of 2684 routed mode gateways from the Address Resolution Protocol table.

64.8 PPPoA to PPPoE (PAE) Commands

You can use these commands to create PVCs for PAE translation.

64.8.1 PAE PVC Delete Command

Syntax:

```
ras> adsl paepvc delete <portlist> <vpi> <vci>
```

where

<portlist>	=	The port number of the PAE PVC. You can specify a single ADSL port <1>, all ADSL ports <*> or a list of ADSL ports <1,3,5>. You can also include a range of ports <1,5,6~10>.
<vpi>	=	The VPI of the PAE PVC.
<vci>	=	The VCI of the PAE PVC.

This command removes a PAE PVC.

64.8.2 PAE PVC Set Command

Syntax:

```
ras> adsl paepvc set <portlist> <vpi> <vci> <DS vcprofile[,US vcprofile]>
<pvid> <priority> [acname <acname>] [srvcname <srvcname>] [hellotime
<hellotime>]
```

where

<portlist>	=	The port number of the PAE PVC. You can specify a single ADSL port <1>, all ADSL ports <*> or a list of ADSL ports <1,3,5>. You can also include a range of ports <1,5,6~10>.
<vpi>	=	The VPI of the PAE PVC.
<vci>	=	The VCI of the PAE PVC.
<DS vcprofile	=	Assign a VC profile to use for this channel's downstream traffic shaping.
[,US vcprofile]>	=	Assign a VC profile to use for policing this channel's upstream traffic. The IES-1248 does not perform upstream traffic policing if you do not specify an upstream VC profile.
<pvid>	=	1 – 4094; the VLAN Identifier to add to Ethernet frames that the system routes using this PVC.

<code><priority></code>	=	Set the IEEE 802.1p priority (0~7) to add to the traffic that uses this PVC.
<code><acname></code>	=	This field is optional. Specify the hostname of a remote access concentrator if there are two access concentrators (or BRAS) on the network or that you want to allow PAE translation to the specified access concentrator.
<code><srvcname></code>	=	This field is optional. Specify the name of the service that uses this PVC. This must be a service name that you configure on the remote access concentrator.
<code><hellotime></code>	=	0 - 600; specify the timeout, in seconds, for the PPPoE session. Enter 0 if there is no timeout.

This command creates a PPPoA-to-PPPoE PVC to allow communication between the ATM (CPE) and Ethernet network (BRAS) segments. The PVC is mapped to a PPPoE session that connects to the specified BRAS.

The following example creates a PPPoA-to-PPPoE PVC (1/33) for port 1. The VLAN ID is 1, and the IEEE 802.1p priority is 0. This configuration is for the `video` service on the `vom` access concentrator. The switch waits 10 seconds before terminating the PPPoE session.

Figure 336 PAE PVC Set Command Example

```
ras> adsl paepvc set 1 1 33 DEFVAL 1 0 acname vom srvcname video hellotime 10
```

64.8.3 PAE PVC Show Command

Syntax:

```
ras> adsl paepvc show <portlist> [<vpi> <vci>]
```

where

<code><portlist></code>	=	The port number of the PAE PVC. You can specify a single ADSL port <1>, all ADSL ports <*> or a list of ADSL ports <1,3,5>. You can also include a range of ports <1,5,6~10>.
<code><vpi></code>	=	The VPI of the PAE PVC.
<code><vci></code>	=	The VCI of the PAE PVC.

This command displays the PPPoA-to-PPPoE PVC settings for the specified port(s) or PVCs. The following example displays the settings for port 1.

Figure 337 PAE PVC Show Command Example

```

ras> adsl paepvc show 1
port vpi   vci pvid pri htime US/DS vcprofile/acname/srvcname
-----
   1    1    33   1   0    10 dsprofile: DEFVAL
                                usprofile:
                                acname   : vom
                                srvcname  : video

```

64.8.4 PAE PVC Session Command

Syntax:

```
ras> adsl paepvc session <portlist> [<vpi> <vci>]
```

where

<portlist> = The port number of the PAE PVC. You can specify a single ADSL port <1>, all ADSL ports <*> or a list of ADSL ports <1,3,5>. You can also include a range of ports <1,5,6~10>.

<vpi> = The VPI of the PAE PVC.

<vci> = The VCI of the PAE PVC.

This command displays the status of PPPoA-to-PPPoE PVC sessions on the specified port(s) or PVCs.

The following example displays the settings for port 1.

Figure 338 PAE PVC Session Command Example

```

ras> adsl paepvc session 1
pvc 1-1/33
session state : down
session id    : 0
session uptime: 0 secs
acname       :
srvcname     :

```

64.8.5 PAE PVC Counter Command

Syntax:

```
ras> adsl paepvc counter <portlist> [<vpi> <vci>]
```

where

<portlist> = The port number of the PAE PVC. You can specify a single ADSL port <1>, all ADSL ports <*> or a list of ADSL ports <1,3,5>. You can also include a range of ports <1,5,6~10>.

<vpi> = The VPI of the PAE PVC.

<vci> = The VCI of the PAE PVC.

This command displays statistics about PPPoA-to-PPPoE PVC activity.

The following example displays the statistics for port 1.

Figure 339 PAE PVC Counter Command Example

```

ras> adsl paepvc counter 1
pvc 1-1/33

```

	tx	rx
	-----	-----
ppp lcp config-request :	-	0
ppp lcp echo-request :	-	0
ppp lcp echo-reply :	-	0
pppoe padi :	0	-
pppoe pado :	-	0
pppoe padr :	0	-
pppoe pads :	-	0
pppoe padt :	0	0
pppoe srvcname error :	-	0
pppoe ac system error :	-	0
pppoe generic error :	0	0

Each value is described below.

tx/rx	=	The values in these columns are for packets transmitted (tx) or received (rx) by the IES-1248.
ppp lcp config-request	=	The number of config-request PDUs received by the IES-1248 from the CPE (client) device.
ppp lcp echo-request	=	The number of echo-request PDUs received by the IES-1248 from the CPE (client) device.
ppp lcp echo-reply	=	The number of echo-reply PDUs received by the IES-1248 from the CPE (client) device.
pppoe padi	=	The number of padi PDUs sent by the IES-1248 to the BRAS.
pppoe pado	=	The number of pado PDUs sent by the BRAS to the IES-1248.
pppoe padr	=	The number of padr PDUs sent by the IES-1248 to the BRAS.
pppoe pads	=	The number of pads PDUs sent by the BRAS to the IES-1248.
pppoe padt	=	The number of padt PDUs sent and received by the IES-1248.
pppoe srvcname error	=	The number of service name errors; for example, the IES-1248's specified service is different than the BRAS's setting.
pppoe ac system error	=	The number of times the access concentrator experienced an error while performing the Host request; for example, when resources are exhausted in the access concentrator. This value does not include the number of times the IES-1248 checks the AC name field in the BRAS's reply PDU and finds a mismatch, however.

pppoe generic error = The number of other types of errors that occur in the PPPoE session between the IES-1248 and the BRAS.

64.9 Transparent LAN Service (TLS) Commands



You CANNOT configure PPPoA-to-PPPoE and TLS settings on the same PVC.

64.9.1 TLS PVC Delete Command

Syntax:

```
ras> adsl tlspvc delete <portlist> <vpi> <vci>
```

where

<portlist> = The port number of the TLS PVC. You can specify a single ADSL port <1>, all ADSL ports <*> or a list of ADSL ports <1,3,5>. You can also include a range of ports <1,5,6~10>.

<vpi> = The VPI of the TLS PVC.

<vci> = The VCI of the TLS PVC.

This command clears TLS settings for the PVC.

64.9.2 TLS PVC Set Command

Syntax:

```
ras> adsl tlspvc set <portlist> <vpi> <vci> <DS vcprofile[,US vcprofile]>
<pvid> <priority>
```

where

<portlist> = The port number of the TLS PVC. You can specify a single ADSL port <1>, all ADSL ports <*> or a list of ADSL ports <1,3,5>. You can also include a range of ports <1,5,6~10>.

<vpi> = The VPI of the TLS PVC.

<vci> = The VCI of the TLS PVC.

<DS vcprofile = Assign a VC profile to use for this channel's downstream traffic shaping.

[,US vcprofile]> = Assign a VC profile to use for policing this channel's upstream traffic. The IES-1248 does not perform upstream traffic policing if you do not specify an upstream VC profile.

<pvid> = 1 – 4094; the (second) VLAN Identifier to add to Ethernet frames that the system routes using this PVC.

`<priority>` = Set the IEEE 802.1p priority (0~7) to add to the traffic that uses this PVC.

This command sets the second VLAN tag to add to the packets from the PVC.

The following example adds VLAN tag 100 to traffic using the `DEFVAL` ATM profile on PVC (1/33) on port 2.

Figure 340 TLS PVC Set Command Example

```
ras> adsl tlspvc set 2 1 33 DEFVAL 100 0
```

64.9.3 TLS PVC Show Command

Syntax:

```
ras> adsl tlspvc show <portlist> [<vpi> <vci>]
```

where

`<portlist>` = The port number of the TLS PVC. You can specify a single ADSL port `<1>`, all ADSL ports `<*>` or a list of ADSL ports `<1,3,5>`. You can also include a range of ports `<1,5,6~10>`.

`<vpi>` = The VPI of the TLS PVC.

`<vci>` = The VCI of the TLS PVC.

This command displays the TLS settings for the specified port(s) or PVC(s). The following example shows the TLS settings on port 2.

Figure 341 TLS PVC Show Command Example

```
ras> adsl tlspvc show 2
port vpi   vci   pvid pri DS/US vcprofile
-----
  2    1    33   100  0  DEFVAL
```

64.10 IP Bridge PVC Commands

Use the commands in [Section 60.5 on page 425](#) to set up and maintain PVCs for subscribers in an IP bridge.

64.11 PVC Upstream Limit Commands

Use these commands to limit the transmission rate for upstream traffic by PVC.



You can set this limit for regular PVCs, priority PVCs, TLS PVCs, and IP bridge PVCs.

64.11.1 Show PVC Upstream Limit Command

Syntax:

```
ras> adsl uslimit show [<portlist> [<vpi> <vci>]]
```

where

<portlist> = The port number of the PVC. You can specify a single ADSL port <1>, all ADSL ports <*> or a list of ADSL ports <1,3,5>. You can also include a range of ports <1,5,6~10>.

<vpi> = The VPI of the PVC.

<vci> = The VCI of the PVC.

This command displays the limit(s) on the transmission rate for upstream traffic for the specified port(s) or PVC(s). The following example shows the limits for port 1.

Figure 342 Show PVC Upstream Limit Command Example

```

ras> adsl uslimit show 1
port vpi  vci   rate enable type
-----
  1    0    33   65535    -   pvc
  1   30    63   65535    -  ipbpvc
  1   31    64   65535    -  ipbpvc

```

64.11.2 Enable PVC Upstream Limit Command

Syntax:

```
ras> adsl uslimit enable <portlist> <vpi> <vci>
```

where

<portlist> = The port number of the PVC. You can specify a single ADSL port <1>, all ADSL ports <*> or a list of ADSL ports <1,3,5>. You can also include a range of ports <1,5,6~10>.

<vpi> = The VPI of the PVC.

<vci> = The VCI of the PVC.

This command turns on the limit on the transmission rate for upstream traffic for the specified PVC. The following example turns on the limit for the default PVC on port 1 (VPI 0, VCI 33).

Figure 343 Enable PVC Upstream Limit Command Example

```

ras> adsl uslimit enable 1 0 33
ras> adsl uslimit show 1
port vpi   vci   rate enable type
-----
  1    0    33  65535    V   pvc
  1   30    63  65535    -  ipbpvc
  1   31    64  65535    -  ipbpvc

```

64.11.3 Disable PVC Upstream Limit Command

Syntax:

```
ras> adsl uslimit disable <portlist> <vpi> <vci>
```

where

<portlist> = The port number of the PVC. You can specify a single ADSL port <1>, all ADSL ports <*> or a list of ADSL ports <1,3,5>. You can also include a range of ports <1,5,6~10>.

<vpi> = The VPI of the PVC.

<vci> = The VCI of the PVC.

This command turns off the limit on the transmission rate for upstream traffic for the specified PVC. The following example turns off the limit for the default PVC on port 1 (VPI 0, VCI 33).

Figure 344 Disable PVC Upstream Limit Command Example

```

ras> adsl uslimit disable 1 0 33
ras> adsl uslimit show 1
port vpi   vci   rate enable type
-----
  1    0    33  65535    -   pvc
  1   30    63  65535    -  ipbpvc
  1   31    64  65535    -  ipbpvc

```

64.11.4 Set PVC Upstream Limit Command

Syntax:

```
ras> adsl uslimit set <portlist> <vpi> <vci> <rate>
```

where

<portlist> = The port number of the PVC. You can specify a single ADSL port <1>, all ADSL ports <*> or a list of ADSL ports <1,3,5>. You can also include a range of ports <1,5,6~10>.

<vpi> = The VPI of the PVC.

<vci> = The VCI of the PVC.

`<rate>` = The limit on the transmission rate, in kbps, for upstream traffic.
`<1..65535>`

This command sets the limit on the transmission rate for upstream traffic for the specified PVC. This has no effect if this limit is disabled, however. The following example sets the limit for the default PVC on port 1 (VPI 0, VCI 33).

Figure 345 Set PVC Upstream Limit Command Example

```
ras> adsl uslimit set 1 0 33 10000
ras> adsl uslimit show 1
```

port	vpi	vci	rate	enable	type
1	0	33	10000	-	pvc
1	30	63	65535	-	ipbpvc
1	31	64	65535	-	ipbpvc

ACL Commands

An ACL (Access Control Logic) profile allows the system to classify and perform actions on the upstream traffic. Use the ACL Profile commands to set up ACL profiles and the ACL Assignment commands to apply them to PVCs.

65.1 ACL Profile Commands

Use these commands to set up ACL profiles.

65.1.1 ACL Profile Set Command

Syntax:

```
ras> switch acl profile set <name> <rule> <action>
```

where

<code><name></code>	=	The name of the ACL profile.
<code><rule></code>	=	The rule that classifies traffic flows. See below.
<code><action></code>	=	One or more actions to perform on the classified packets. You can select one or more of the following actions. • <code>rate <rate></code> = Sets the transmission rate (1~65535 in kbps) for the matched traffic. • <code>rvlan <rvlan></code> = Replaces the VLAN ID with this VLAN ID (1~4094). • <code>rpri <rpri></code> = Replaces the priority with this priority (0 ~7) of the matched packets. • <code>deny</code> = Drops the packets.

This command configures an ACL rule to classify the upstream traffic and perform action(s) on the classified traffic.

The following lists the set of criteria you can configure for rules in ACL profiles. The rules are listed in sequence from highest priority to lowest priority. The criteria within a rule are position-independent.

- `etype <etype> vlan <vid>`
- `etype <etype> smac <mac>`
- `etype <etype> dmac <mac>`
- `vlan < vid > smac <mac>`
- `vlan < vid > dmac <mac>`
- `smac < mac > dmac <mac>`

- `vlan <vid> priority <priority>`
- `etype <etype>`
- `vlan <vid>`
- `smac <mac>`
- `dmac <mac>`
- `priority <priority>`
- `protocol <protocol>`
- `srcip <ip>/<mask> [dstip <ip>/<mask> [tos <tos> [srcport <sport> <eport> [dstport <sport> <eport>]]]]]`

where

- `etype <etype>` = Ethernet type (0~65535).
- `vlan <vid>` = VLAN ID (1~4094).
- `smac <mac>` = Source MAC address.
- `dmac <mac>` = Destination MAC address.
- `priority <priority>` = Priority (0 ~ 7)
- `protocol <protocol>` = Protocol type: tcp, udp, ospf, igmp, ip, gre, icmp or user specified IP protocol number <0 ~ 255>.
- `srcip <ip>/<mask>` = Source IP address and subnet mask (0~32).
- `dstip <ip>/<mask>` = Destination IP address and subnet mask (0~32).
- `tos <stos> <etos>` = Sets the ToS (Type of Service) range between 0 and 255.
- `srcport <sport> <eport>` = Source port range (0~65535).
- `dstport <sport> <eport>` = Destination port range (0~65535).

The following guidelines apply to classifiers.

- You can apply one classifier for a protocol on a port's PVC.
- You cannot create a classifier that contains matching criteria for layer 2 and layer 3 fields. For example `switch acl profile set test protocol tcp vlan 15 deny` is not allowed as protocol type and VLAN do not belong to the same network layer.
- Each type of criteria can only be used once in a classifier. For example, `profile acl set test protocol tcp protocol udp deny` is not allowed. For this example, you need to create a separate classifier for each protocol and apply them to the same PVC(s).

The following example creates an ACL rule example named `test` for traffic from VLAN 10 with a priority level of 2. This rule limits the rate on the classified traffic to 1000 kbps and changes the priority level to 7.

Figure 346 ACL Profile Set Command Example

```
ras> switch acl profile set test vlan 10 priority 2 rate 1000 rpri 7
```

65.1.2 ACL Profile Delete Command

Syntax:

```
ras> switch acl profile delete <name>
```

where

<name> = The name of the ACL profile.

This command removes the specified ACL profile.



You cannot remove the ACL profile(s) that is currently in use.

65.1.3 ACL Profile Show Map Command

Syntax:

```
ras> switch acl profile showmap <name>
```

where

<name> = The name of the ACL profile.

This command displays the DSL port(s) to which the specified ACL profile is applied.

The following example displays the port mapping table for the `example` ACL profile.

Figure 347 ACL Profile Show Map Command Example

```

ras> switch acl profile showmap test
profile: test
port type    vpi    vci
----

```

65.1.4 ACL Profile Show Command

Syntax:

```
ras> switch acl profile show [<name>]
```

where

<name> = The name of the ACL profile.

This command lists the names of every ACL profile or displays the detailed settings of the specified ACL profile.

Figure 348 ACL Profile Show Command Example

```
ras> switch acl profile show test
profile test:
rule:
  vlan      :10
  priority:2

action:
  rpri      :7
  rate      :1000
```

65.2 ACL Assignment Commands

Use these commands to apply ACL profiles to PVCs.

65.2.1 ACL Assignment Set Command

Syntax:

```
ras> switch acl set <portlist> <vpi> <vci> <profile>
```

where

<portlist>	=	The port number of the PVC. You can specify a single ADSL port <1>, all ADSL ports <*> or a list of ADSL ports <1,3,5>. You can also include a range of ports <1,5,6~10>.
<vpi>	=	The VPI of the PVC.
<vci>	=	The VCI of the PVC.
<profile>	=	The name of the ACL profile.

This command allows you to apply an ACL profile to the specified port(s). You can apply up to eight profiles to a subscriber port.

The following example applies the ACL profile “test” to a PVC.

Figure 349 ACL Assignment Set Command Example

```
ras> switch acl set 1 0 33 test
```

65.2.2 ACL Assignment Delete Command

Syntax:

```
ras> switch acl delete <portlist> <vpi> <vci> <profile>
```


where

- `<portlist>` = The port number of the PVC. You can specify a single ADSL port `<1>`, all ADSL ports `<*>` or a list of ADSL ports `<1,3,5>`. You can also include a range of ports `<1,5,6~10>`.
- `<vpi>` = The VPI of the PVC.
- `<vci>` = The VCI of the PVC.
- `<profile>` = The name of the ACL profile.

This command allows you to remove an ACL profile from the specified PVC.

65.2.3 ACL Assignment Show Command

Syntax:

```
ras> switch acl show [<portlist>] [<vpi> <vci>]
```

where

- `<portlist>` = The port number of the PVC. You can specify a single ADSL port `<1>`, all ADSL ports `<*>` or a list of ADSL ports `<1,3,5>`. You can also include a range of ports `<1,5,6~10>`.
- `<vpi>` = The VPI of the PVC.
- `<vci>` = The VCI of the PVC.

This command displays the current ACL profiles applied to the specified PVC(s). The following figure shows an example.

Figure 350 ACL Assignment Show Command Example

```

ras> switch acl show
port vpi   vci type profile
-----
   1    0   33 PVC  test

```


Troubleshooting

This chapter covers potential problems and possible remedies. After each problem description, some steps are provided to help you to diagnose and solve the problem.

66.1 The SYS or PWR LED Does Not Turn On

The SYS/PWR LED does not turn on.

Table 125 SYS LED Troubleshooting

STEP	CORRECTIVE ACTION
1	(IES-1248-51, IES-1248-53) Make sure the power wires are properly connected to the power supply and the power supply is operating normally. Make sure you are using the correct power source (see Appendix on page 513). (IES-1248-51A only) Make sure the power cord is properly connecting the device's power socket to an appropriate power outlet. Make sure you are using the correct power source (see Appendix on page 513).
2	Make sure the power wires are connected properly.
3	(IES-1248-51A only) Make sure the fuse is not burnt-out. Replace the fuse if it is burnt out. See Appendix C on page 525 for instructions.
3	The LED itself or the unit may be faulty; contact your vendor.

66.2 The ALM LED Is On

The ALM (alarm) LED lights when the IES-1248 is overheated, the fans are not working properly, the voltage readings are outside the tolerance levels or an alarm has been detected on the ALARM input pins.

Table 126 ALM LED Troubleshooting

STEP	CORRECTIVE ACTION
1	Use the statistics monitor command to verify the cause of the alarm. See step 2 if the unit is overheated, step 3 if the problem is with the fans and step 4 if the voltages are out of the allowed ranges.
2	Ensure that the IES-1248 is installed in a well-ventilated area and that normal operation of the fans is not inhibited. Keep the bottom, top and all sides clear of obstructions and away from the exhaust of other equipment.
3	Make sure you can feel and/or hear the fans working - working fans emit a low buzz and blow air.
4	If the voltage levels are outside the allowed range, take a screen shot of the statistics monitor command display and contact your vendor.

66.3 SFP LNK LEDs Do Not Turn On

The LEDs for one of the SFP slots do not turn on.

Table 127 SFP LNK LED Troubleshooting

STEPS	CORRECTIVE ACTION
1	Make sure that the Ethernet port's mode is set to match that of the peer Ethernet device.
2	Check the cable and connections between the SFP slot and the peer Ethernet device.
3	Check the mini GBIC transceiver.
4	Make sure that the peer Ethernet device is functioning properly. If the cable, transceiver and peer Ethernet device are all OK and the LEDs stay off, there may be a problem with the SFP slot. Contact the distributor.

66.4 100/1000 LEDs Do Not Turn On

A 100/1000 Ethernet port's LEDs do not turn on.

Table 128 100/1000 LED Troubleshooting

STEPS	CORRECTIVE ACTION
1	Each 100/1000M RJ-45 Ethernet port is paired with a mini GBIC slot. The IES-1248 uses one connection per pair.
2	Check the Speed Mode settings in the ENET Port Setup screen. Make sure that the 100/1000 Ethernet port's connection speed is set to match that of the port on the peer Ethernet device. When an Ethernet port is set to Auto , the IES-1248 tries to make a fiber connection first and does not attempt to use the RJ-45 port if the fiber connection is successful.
3	Check the Ethernet cable and connections between the 100/1000 Ethernet port and the peer Ethernet device. Use 1000Base-T 4-pair (8 wire) UTP Cat. 5 Ethernet cables with the RJ-45 interface.
4	Make sure that the peer Ethernet device is functioning properly. If the Ethernet cable and peer Ethernet device are both OK and the LEDs still stay off, there may be a problem with the port. Contact the distributor.

66.5 100/1000 Ethernet Port Data Transmission

The Ethernet port's LED is on, but data cannot be transmitted.

Table 129 Troubleshooting Data Transmission

STEPS	CORRECTIVE ACTION
1	Make sure that the Ethernet port has the appropriate mode setting.
2	Make sure that the IES-1248's IP settings are properly configured.
3	Check the VLAN configuration.
4	Ping the IES-1248 from a computer behind the peer Ethernet device.

Table 129 Troubleshooting Data Transmission (continued)

STEPS	CORRECTIVE ACTION
5	If you cannot ping, check the Ethernet cable and connections between the Ethernet port and the Ethernet switch or router.
6	Check the switch mode. In daisychain mode, if you have a loop topology and enable RSTP, it is possible for RSTP to disable Ethernet port 1 (the uplink port). Note: It is not recommended to use daisychain mode in a loop topology.

66.6 DSL Data Transmission

The DSL link is up, but data cannot be transmitted.

Table 130 DSL Data Transmission Troubleshooting

STEPS	CORRECTIVE ACTION
1	Check the switch mode and port isolation settings. Check to see that the VPI/VCI and multiplexing mode (LLC/VC) settings in the subscriber's ADSL modem or router match those of the ADSL port. If the subscriber is having problems with a video or other high-bandwidth services, make sure the IES-1248's ADSL port's data rates are set high enough.
2	Check the VLAN configuration.
3	Ping the IES-1248 from the computer behind the ADSL modem or router.
4	If you cannot ping, connect a DSL modem to an ADSL port (that is known to work). If the ADSL modem or router works with a different ADSL port, there may be a problem with the original port. Contact the distributor.
5	If using a different port does not work, try a different ADSL modem or router with the original port.

66.7 There Is No Voice on an ADSL Connection

The IES-1248 has internal POTS (Plain Old Telephone Service) splitters and CO side Telco-50 connectors that allow the telephone wiring used for ADSL connections to also simultaneously carry normal voice conversations.

Table 131 ADSL Voice Troubleshooting

STEP	CORRECTIVE ACTION
1	Make sure the subscriber has a POTS splitter properly installed.
2	Check the ADSL line pin assignments shown in Appendix B on page 521 .
3	Check the telephone wire connections between the subscriber and the MDF(s).
4	Check the telephone wire and connections between the MDF(s) and USER port(s).
5	Check the telephone wire and connections between the MDF(s) and the CO connector(s). Check the connection from the MDF(s) to the telephone company or the PBX.
6	Check the telephone wire mapping on the MDF(s).
7	Make sure the in-house wiring works and is connected properly.
8	Repeat the steps above using a different ADSL port.

66.8 Testing Wiring

Use the following tests if there is no voice.

Systematically test wiring using a functioning telephone to determine if there is a wiring problem. If the connection is good, the telephone will return a dial tone. Letters in the figure shown next indicate the systematic tests to be done. Suppose you're using installation scenario "B" as shown in the chapter on MDF connections. The logic for other scenarios should be similar.

Use steps A-D if there is no voice but you can transmit data. Use all of the steps if there is no voice and you cannot transmit data.

Table 132 Wiring Tests

TEST	DESCRIPTION
A.	Test A determines if there is a wiring problem between the TELCO (telephone company) and MDF 1.
B.	Test B determines if there is a wiring problem between MDF 1 and MDF 2.
C.	Test C determines if there is a wiring problem between MDF 2 and your device.
D.	Test D determines if there is a problem with your device's internal splitter.
E.	Test E determines if there is a wiring problem between your device and MDF 3.
F.	Test F determines if there is a building-wiring problem between the subscriber's wall jack and MDF 3.

Figure 351 Testing In-house Wiring

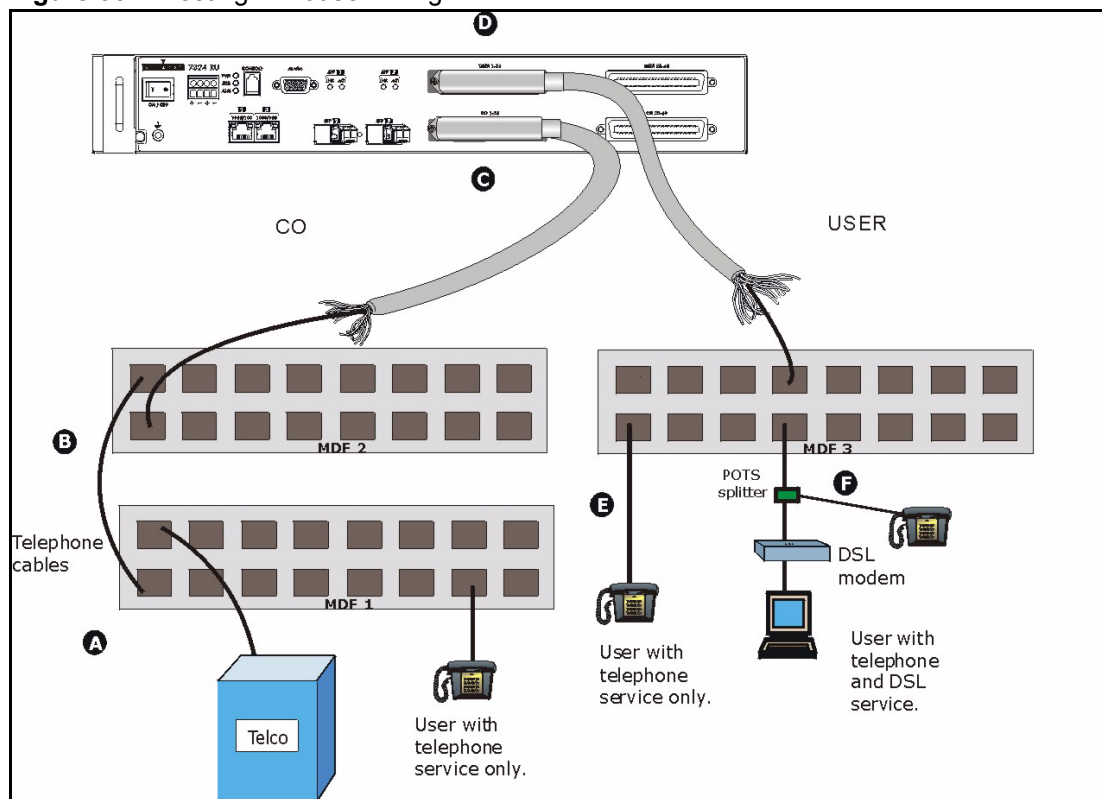


Table 133 Testing In-house Wiring

STEP	TEST
A	Connect a standard telephone to MDF 1. If there is no dial tone, then a problem with the wire or wire connections between MDF 1 and the TELCO exists. Contact your telephone company for troubleshooting.
B	Connect a telephone to the upper port of MDF 2. If there is no dial tone, then the problem is between MDF 1 and MDF 2. Check the telephone wire and connections between MDFs 1 and 2.
C	Disconnect the telephone wire from CO . Connect a telephone to the telephone wire. If there is no dial tone, then the problem is between your device and MDF 2. Check the telephone wire's pin assignments (see Appendix B on page 521 for the proper pin assignments). Replace the telephone wire if the pin assignments are OK and there is still no dial tone.
D	Reconnect the telephone wire to CO . Disconnect the telephone wire from USER . Connect a telephone to USER (see Appendix B on page 521 for the proper pin assignments). If there is no dial tone, your device's internal splitter may be faulty, contact your vendor.
E	Reconnect the telephone wire to USER . Connect a telephone to a lower port of MDF 3. If there is no dial tone, then the problem is between your device and MDF 3. Check the pin assignments of the telephone wire's connector that connects to USER . Replace the telephone wire connecting your device to MDF 3. If there is no dial tone, then MDF 3 may be faulty. Contact the telephone company if that is the case.
F	Disconnect the DSL modem from the wall jack and connect the telephone to the wall jack. If there is no dial tone, then there is a problem with the building wiring between the DSL subscriber's home and the MDF. Contact your telephone company for troubleshooting.

66.9 Local Server

The computer behind a DSL modem or router cannot access a local server connected to the IES-1248.

Table 134 Troubleshooting a Local Server

STEPS	CORRECTIVE ACTION
1	See Section 66.6 on page 505 to make sure that the subscriber is able to transmit to the IES-1248.
2	Make sure the computer behind the DSL device has the correct gateway IP address configured.
3	Check the VLAN configuration (see Chapter 20 on page 167).
4	Check the cable and connections between the IES-1248 and the local server.
5	Try to access another local server. If data can be transmitted to a different local server, the local server that could not be accessed may have a problem.

66.10 Data Rate

The SYNC-rate is not the same as the configured rate.

Table 135 Troubleshooting the SYNC-rate

STEPS	CORRECTIVE ACTION
1	Connect the ADSL modem or router directly to the ADSL port using a different telephone wire.
2	If the rates match, the quality of the telephone wiring that connects the subscriber to the ADSL port may be limiting the speed to a certain rate. If they do not match when a good wire is used, contact the distributor.

66.11 Configured Settings

The configured settings do not take effect.

Table 136 Troubleshooting the IES-1248's Configured Settings

CORRECTIVE ACTION
Use the "config save" command after you finish configuring to save the IES-1248's settings.

66.12 Password

If you forget your password, you will need to use the console port to reload the factory-default configuration file (see [Section 66.16 on page 509](#)).

66.13 System Lockout

Any of the following could also lock you and others out from using in-band management (managing through the data ports).

- 1 Deleting the management VLAN (default is VLAN 1).
- 2 Incorrectly configuring the CPU VLAN.
- 3 Incorrectly configuring the access control settings.
- 4 Disabling all ports.



Be careful not to lock yourself and others out of the system.

If you lock yourself (and others) out of the system, you can try using the console port to reconfigure the system. See [Section 66.16 on page 509](#).

66.14 SNMP

The SNMP manager server cannot get information from the IES-1248.

Table 137 Troubleshooting the SNMP Server

STEPS	CORRECTIVE ACTION
1	Ping the IES-1248 from the SNMP server. If you cannot, check the cable, connections and IP configuration.
2	Check to see that the community (or trusted host) in the IES-1248 matches the SNMP server's community.
3	Make sure that your computer's IP address matches a configured trusted host IP address or secured client IP address (if configured).
4	Incorrectly configuring the access control settings may lock you out from using in-band management. Try using the console port to reconfigure the system.

66.15 Telnet

I cannot telnet into the IES-1248.

Table 138 Troubleshooting Telnet

STEPS	CORRECTIVE ACTION
1	Make sure that the number of current telnet sessions does not exceed the maximum allowed number. You cannot have more than five telnet sessions at one time.
2	Make sure that your computer's IP address matches a configured secured client IP address (if configured). The IES-1248 immediately disconnects the telnet session if secured host IP addresses are configured and your computer's IP address does not match one of them.
3	Make sure that you have not disabled the Telnet service or changed the server port number that the IES-1248 uses for Telnet.
4	Ping the IES-1248 from your computer. If you are able to ping the IES-1248 but are still unable to telnet, contact the distributor. If you cannot ping the IES-1248, check the cable, connections and IP configuration.
5	Incorrectly configuring the access control settings may lock you out from using in-band management. Try using the console port to reconfigure the system.

66.16 Resetting the Defaults

If you lock yourself (and others) from the IES-1248, you will need to reload the factory-default configuration file. Uploading the factory-default configuration file replaces the current configuration file with the factory-default configuration file. This means that you will lose all previous configurations and the speed of the console port will be reset to the default of 9600bps with 8 data bit, no parity, one stop bit and flow control set to none. The user name will be reset to "admin" and the password will be reset to "1234" and the IP address to 192.168.1.1.

66.16.1 Resetting the Defaults Via Command

If you know the password, you can reload the factory-default configuration file via Command Line Interface (CLI) command. Use the following procedure.

- 1 Connect to the console port using a computer with terminal emulation software. See chapters 2-6 for details.
- 2 Enter your password.
- 3 Type `config restore`.
- 4 Type `y` at the question “Do you want to restore default ROM file(y/n)?”
- 5 The IES-1248 restarts.

Figure 352 Resetting the Switch Via Command

```
ras> config restore

System will reboot automatically after restoring default configuration.
Do you want to proceed(y/n)? >
restoring configuration...
saving configuration to flash...
```

The IES-1248 is now reinitialized with a default configuration file including the default user name of “admin” and the default password of “1234”.

66.16.2 Uploading the Default Configuration File

If you forget your password or cannot access the IES-1248, you will need to reload the factory-default configuration file. Uploading the factory-default configuration file replaces the current configuration file with the factory-default configuration file. This means that you will lose all previous configurations and the speed of the console port will be reset to the default of 9600bps with 8 data bit, no parity, one stop bit and flow control set to none. The password will also be reset to “1234” and the IP address to 192.168.1.1.

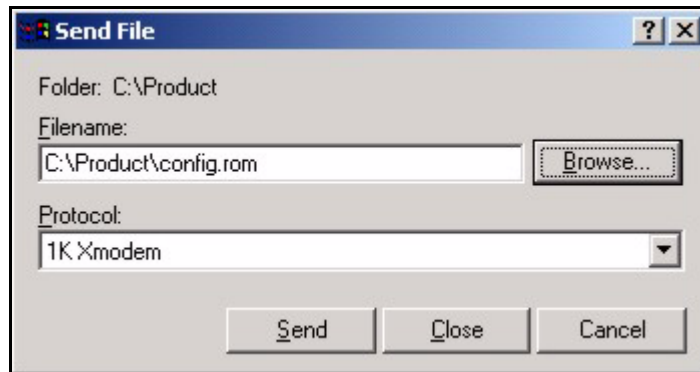


Uploading the factory default configuration file erases the IES-1248’s entire configuration.

Obtain the default configuration file, unzip it and save it in a folder. Use a console cable to connect a computer with terminal emulation software to the IES-1248’s console port. Turn the IES-1248 off and then on to begin a session. When you turn on the IES-1248 again you will see the initial screen. When you see the message `Press any key to enter Debug Mode` within 3 seconds press any key to enter debug mode.

To upload the configuration file, do the following:

- 1 Type `atlc` after the `Enter Debug Mode` message.
- 2 Wait for the `Starting XMODEM` upload message before activating XMODEM upload on your terminal.
- 3 This is an example Xmodem configuration upload using HyperTerminal. Click **Transfer**, then **Send File** to display the following screen.

Figure 353 Example Xmodem Upload

Type the configuration file's location, or click **Browse** to search for it. Choose the **1K Xmodem** protocol. Then click **Send**.

- 4 After a successful configuration file upload, type `atgo` to restart the IES-1248.

The IES-1248 is now reinitialized with a default configuration file including the default password of "1234".

66.17 Recovering the Firmware

Usually you should use FTP or the web configurator to upload the IES-1248's firmware. If the IES-1248 will not start up, the firmware may be lost or corrupted. Use the following procedure to upload firmware to the IES-1248 only when you are unable to upload firmware through FTP.

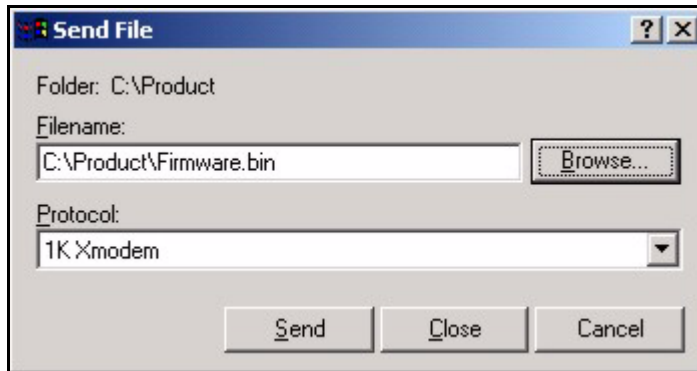


This procedure is for emergency situations only.

- 1 Obtain the firmware file, unzip it and save it in a folder on your computer.
- 2 Connect your computer to the console port and use terminal emulation software configured to the following parameters:
 - VT100 terminal emulation
 - 9600 bps
 - No parity, 8 data bits, 1 stop bit
 - No flow control
- 3 Turn off the IES-1248 and turn it back on to restart it and begin a session.
- 4 When you see the message `Press any key to enter Debug Mode within 3 seconds`, press a key to enter debug mode.
- 5 Type `atba5` after the `Enter Debug Mode` message (this changes the console port speed to 115200 bps).
- 6 Change the configuration of your terminal emulation software to use 115200 bps and reconnect to the IES-1248.
- 7 Type `atur` after the `Enter Debug Mode` message.

- 8 Wait for the `Starting XMODEM` upload message before activating XMODEM upload on your terminal.
- 9 This is an example Xmodem configuration upload using HyperTerminal. Click **Transfer**, then **Send File** to display the following screen.

Figure 354 Example Xmodem Upload



Type the firmware file's location, or click **Browse** to search for it. Choose the **1K Xmodem** protocol. Then click **Send**.

- 10 After a successful firmware upload, type `atgo` to restart the IES-1248. The console port speed automatically changes back to 9600 bps when the IES-1248 restarts.

IES-1248 Specifications

This chapter provides the specifications for the IES-1248.

Physical Specifications

The IES-1248 is 19 inch (482.6mm) rack-mountable.

Telco-50 Connectors

The IES-1248 has 4 Telco-50 connectors. Connect the two **USER** Telco-50 connectors to the subscribers and two **CO** Telco-50 connectors to the PSTN switch.

Dimensions

1.5U 439.8 mm (W) x 251 mm (D) x 66 mm (H)

Weight

7.8 kg (IES-1248-51A)

7.6 kg (IES-1248-51, IES-1248-53)

Wire Gauge Specifications

The following table shows the specifications for wire gauge.



Make sure you use wires of the specified wire gauge.

Table 139 Wire Gauge Specifications

WIRE TYPE	REQUIRED AWG NO. (DIAMETER)
Ground Wire	18 or larger
Telephone Wire	26 or larger
IES-1248 Power Wire	18 or larger

AWG (American Wire Gauge) is a measurement system for wire that specifies its thickness. As the thickness of the wire increases, the AWG number decreases.

Power Input

The following table lists the power input specifications.

Table 140 Power Input Specifications

IES-1248-51 AND IES-1248-53	IES-1248-51A
-36 ~ -72 VDC, 2.5 A maximum.	100~240 VAC, 50~60 Hz, 1.7A Max

Power Consumption

The following table lists the power consumption.

Table 141 Power Input Specifications

IES-1248-51 AND IES-1248-53	IES-1248-51A
90 W maximum	100 W maximum

Fuse Rating

The following specifications are for the IES-1248-51A.

Table 142 Fuse Specifications (IES-1248-51A only)

FUSE LOCATION	FUSE RATING
Front panel (AC inlet)	250 VAC, Fast T4A



Changing fuses for the IES-1248-51 and IES-1248-53 requires disassembly of the device. Only a qualified technician should perform this.

The following specifications are for the IES-1248-51 and IES-1248-53.

Table 143 Fuse Specifications (IES-1248-51, IES-1248-53)

FUSE LOCATION	FUSE RATING
Mother Board	250 VAC, T5.0A
DC Switch Board	250 VAC, T6.3A

ALARM Port Power

The maximum power rating for the **ALARM** port is as follows:

- Input: no power, dry contact; use open or short circuits without any external input power
- Output: 20 V, 500 mA

Operating Environment

- Temperature: -40 - 65°C (IES-1248-51, IES-1248-53)
- Temperature: 0 - 50°C (IES-1248-51A)
- Humidity: 10% - 95% (non-condensing)

Storage Environment

- Temperature: -40 - 70°C
- Humidity: 5% - 95% (non-condensing)

MAC Table

The MAC address table can hold up to 14K entries (128 per ADSL port, 4K per Ethernet port)

PART VI

Appendices and Index



The appendices provide general information. Some details may not apply to your IES-1248.

[Default Settings \(519\)](#)
[IES-1248 Specifications \(513\)](#)
[Pin Assignments \(521\)](#)
[Removing and Installing a Fuse \(525\)](#)
[Legal Information \(527\)](#)
[Customer Support \(531\)](#)
[Index \(537\)](#)

Default Settings

This section lists the default configuration of the IES-1248.

Table 144 Default Settings

VLAN Default Settings	One VLAN is created (this is also the management VLAN).	
VID:	1	
Registration:	Fixed for the Ethernet and ADSL ports	
Tagging:	Untagged for all ports	
ADSL Default Settings		
Enable/Disable State:	Enabled	
Operational Mode:	auto	
(ADSL) Port Profile Default Settings		
Name:	DEFVAL	
Profile Status:	Active	
Latency Mode:	Interleave	
	Upstream ADSL Settings:	Downstream ADSL Settings:
Max Rate	512 Kbps	2048 Kbps
Min Rate	64 Kbps	64 Kbps
Latency Delay	4 ms	4 ms
Max SNR	31 db	31 db
Min SNR	0 db	0 db
Target SNR	6 db	6 db
Up Shift Margin	9 db	9 db
Down Shift Margin	3 db	3 db
Name:	DEFVAL_MAX (Factory Default)	
Profile Status:	Active	
Latency Mode:	Interleave	
	Upstream ADSL Settings:	Downstream ADSL Settings:
Max Rate	512 Kbps	9088 Kbps
Min Rate	32 Kbps	32 Kbps
Latency Delay	4 ms	4 ms

Table 144 Default Settings (continued)

Max Margin	31 db	31 db
Min Margin	0 db	0 db
Target Margin	6 db	6 db
Up Shift Margin	9 db	9 db
Down Shift Margin	3 db	3 db
Virtual Channel Default Settings^A.		
Super channel:	Enabled	
VPI:	0	
VCI:	33	
VC Profile:	DEFVAL (factory default)	
Default VC Profile Settings		
DEFVAL Profile Settings		
Encapsulation:	RFC 1483, RFC 2684	
Multiplexing:	LLC-based	
Traffic Class:	UBR	
PCR:	300000 cells/second	
CDVT:	0	
DEFVAL_VC Profile Settings		
Encapsulation:	RFC 1483, RFC 2684	
Multiplexing:	VC-based	
Traffic Class:	UBR	
PCR:	300000 cells/second	
CDVT:	0	
Default IGMP Filter Profile Settings	The DEFVAL IGMP filter profile is assigned to all of the ADSL ports by default. It allows a port to join all multicast IP addresses (224.0.0.0~239.255.255.255).	

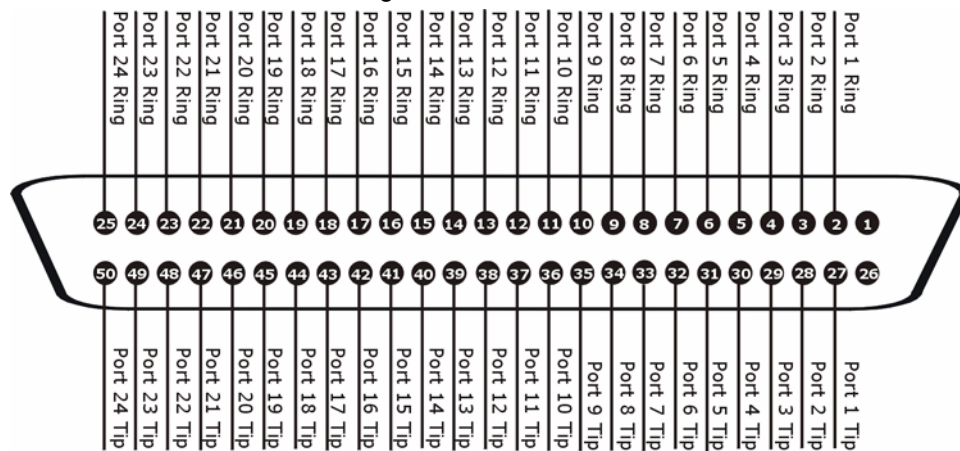
A. The IES-1248 ADSL ports' PVCs use ATM Adaptation Layer (AAL) 5.

Pin Assignments

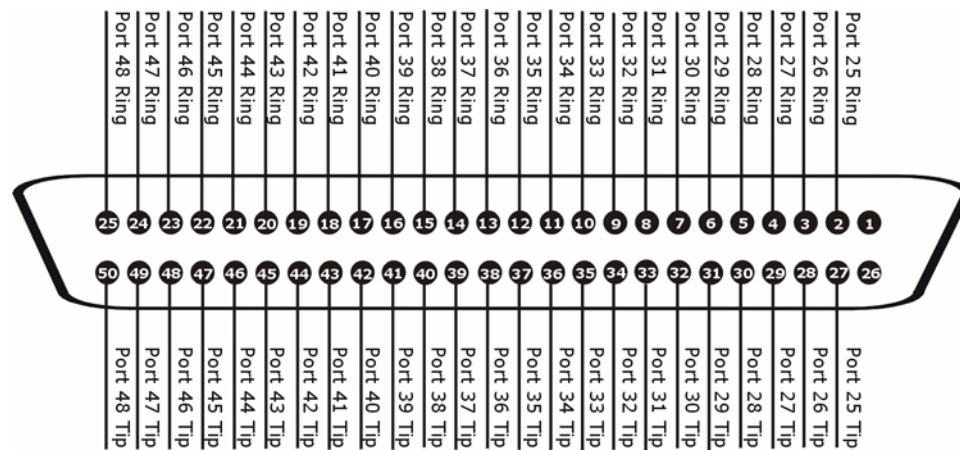
Hardware Telco-50 Connector Pin Assignments

The following diagram shows the pin assignments of the **USER** Telco-50 connectors.

Figure 355 USER Telco-50 Pin Assignments



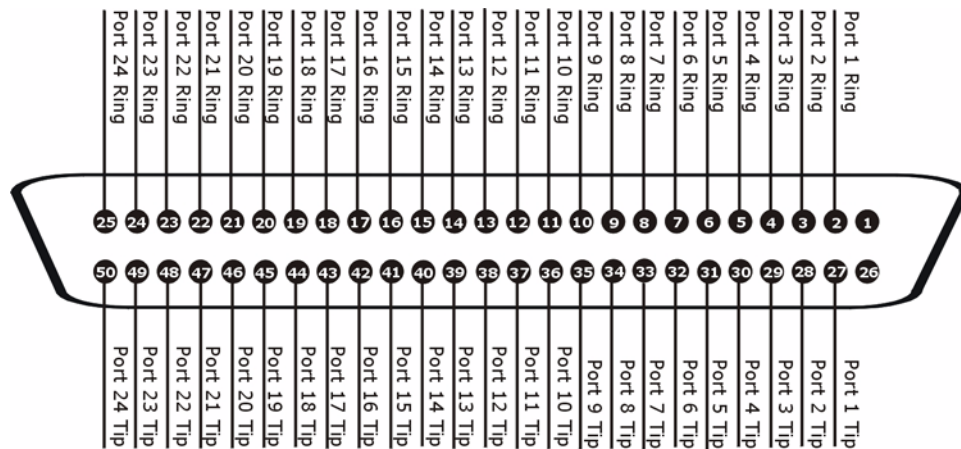
USER 1~24 PORT (FEMALE)



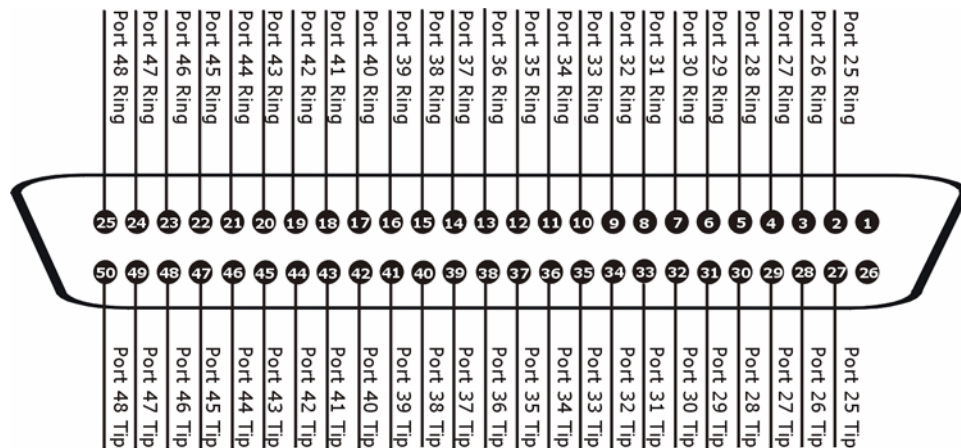
USER 25~48 PORT (FEMALE)

The following diagram shows the phone port pin assignments of the **CO** Telco-50 connectors.

Figure 356 CO Telco-50 Pin Assignments



CO 1~24 PORT (FEMALE)



CO 25~48 PORT (FEMALE)

The following table lists the ports and matching pin numbers for the hardware **USER 1~24** and **CO 1~24** Telco-50 connectors.

Table 145 Hardware 1~24 Telco-50 Connector Port and Pin Numbers

PORT NUMBER	PIN NUMBER
1	2, 27
2	3, 28
3	4, 29
4	5, 30
5	6, 31

Table 145 Hardware 1~24 Telco-50 Connector Port and Pin Numbers (continued)

PORT NUMBER	PIN NUMBER
6	7, 32
7	8, 33
8	9, 34
9	10, 35
10	11, 36
11	12, 37
12	13, 38
13	14, 39
14	15, 40
15	16, 41
16	17, 42
17	18, 43
18	19, 44
19	20, 45
20	21, 46
21	22, 47
22	23, 48
23	24, 49
24	25, 50

The following table lists the ports and matching pin numbers for the hardware **USER 25~48** and **CO 25~48** Telco-50 connectors.

Table 146 Hardware Telco-50 Connector Port and Pin Numbers

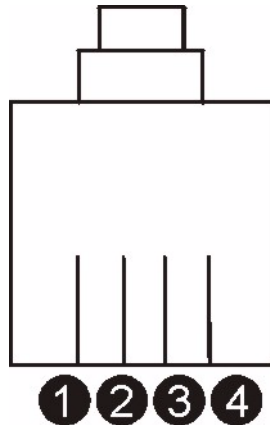
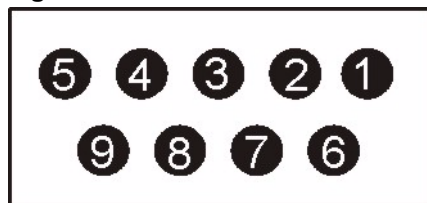
PORT NUMBER	PIN NUMBER
25	2, 27
26	3, 28
27	4, 29
28	5, 30
29	6, 31
30	7, 32
31	8, 33
32	9, 34
33	10, 35
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Console Cable Pin Assignments

The following diagrams and chart show the pin assignments of the console cable.

Figure 357 Console Cable RJ-11 Male Connector**Figure 358** Console Cable DB-9 Female Connector**Table 147** Console Cable Connector Pin Assignments

RJ-11 MALE	DB-9 FEMALE
Pin 2: TXD	Pin 2
Pin 3: RXD	Pin 3
Pin 4: GND	Pin 5

Removing and Installing a Fuse

This appendix shows you how to remove and install fuses for the IES-1248-51A.

If you need to install a new fuse, follow the procedure below.



If you use a fuse other than the included fuses, make sure it matches the fuse specifications in [Appendix on page 513](#).

Removing a Fuse



Disconnect all power from the IES-1248 before you begin this procedure.

- 1 Remove the power cord from the unit.
- 2 The fuse housing is located between the power switch and the power port. Use a small flat-head screwdriver to carefully pry out the fuse housing.
- 3 A burnt-out fuse is blackened, darkened or cloudy inside its glass casing. A working fuse has a completely clear glass casing. Pull gently, but firmly, to remove the burnt out fuse from the fuse housing. Dispose of the burnt-out fuse.

Installing a Fuse

- 1 The IES-1248 is shipped from the factory with one spare fuse included in a box-like section of the fuse housing. Push the middle part of the box-like section to access the spare fuse. Put another spare fuse in its place in order to always have one on hand.
- 2 Push the replacement fuse into the fuse housing until you hear a click.
- 3 Firmly, but gently, push the fuse housing back into the IES-1248 until you hear a click.
- 4 Plug the power cord back into the unit.

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“+” is the (prefix) number you dial to make an international telephone call.

Corporate Headquarters (Worldwide)

- Support E-mail: support@zyxel.com.tw
- Sales E-mail: sales@zyxel.com.tw
- Telephone: +886-3-578-3942
- Fax: +886-3-578-2439
- Web: www.zyxel.com
- Regular Mail: ZyXEL Communications Corp., 6 Innovation Road II, Science Park, Hsinchu 300, Taiwan

China - ZyXEL Communications (Beijing) Corp.

- Support E-mail: cso.zycn@zyxel.cn
- Sales E-mail: sales@zyxel.cn
- Telephone: +86-010-82800646
- Fax: +86-010-82800587
- Address: 902, Unit B, Horizon Building, No.6, Zhichun Str, Haidian District, Beijing
- Web: <http://www.zyxel.cn>

China - ZyXEL Communications (Shanghai) Corp.

- Support E-mail: cso.zycn@zyxel.cn
- Sales E-mail: sales@zyxel.cn
- Telephone: +86-021-61199055
- Fax: +86-021-52069033

- Address: 1005F, ShengGao International Tower, No.137 XianXia Rd., Shanghai
- Web: <http://www.zyxel.cn>

Costa Rica

- Support E-mail: soporte@zyxel.co.cr
- Sales E-mail: sales@zyxel.co.cr
- Telephone: +506-2017878
- Fax: +506-2015098
- Web: www.zyxel.co.cr
- Regular Mail: ZyXEL Costa Rica, Plaza Roble Escazú, Etapa El Patio, Tercer Piso, San José, Costa Rica

Czech Republic

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

Denmark

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

Finland

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

France

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

Germany

- Support E-mail: support@zyxel.de
- Sales E-mail: sales@zyxel.de
- Telephone: +49-2405-6909-69
- Fax: +49-2405-6909-99
- Web: www.zyxel.de
- Regular Mail: ZyXEL Deutschland GmbH., Adenauerstr. 20/A2 D-52146, Wuerselen, Germany

Hungary

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

India

- Support E-mail: support@zyxel.in
- Sales E-mail: sales@zyxel.in
- Telephone: +91-11-30888144 to +91-11-30888153
- Fax: +91-11-30888149, +91-11-26810715
- Web: <http://www.zyxel.in>
- Regular Mail: India - ZyXEL Technology India Pvt Ltd., II-Floor, F2/9 Okhla Phase -1, New Delhi 110020, India

Japan

- Support E-mail: support@zyxel.co.jp
- Sales E-mail: zyp@zyxel.co.jp
- Telephone: +81-3-6847-3700
- Fax: +81-3-6847-3705
- Web: www.zyxel.co.jp
- Regular Mail: ZyXEL Japan, 3F, Office T&U, 1-10-10 Higashi-Gotanda, Shinagawa-ku, Tokyo 141-0022, Japan

Kazakhstan

- Support: <http://zyxel.kz/support>
- Sales E-mail: sales@zyxel.kz
- Telephone: +7-3272-590-698
- Fax: +7-3272-590-689
- Web: www.zyxel.kz
- Regular Mail: ZyXEL Kazakhstan, 43 Dostyk Ave., Office 414, Dostyk Business Centre, 050010 Almaty, Republic of Kazakhstan

Malaysia

- Support E-mail: support@zyxel.com.my
- Sales E-mail: sales@zyxel.com.my
- Telephone: +603-8076-9933
- Fax: +603-8076-9833
- Web: <http://www.zyxel.com.my>
- Regular Mail: ZyXEL Malaysia Sdn Bhd., 1-02 & 1-03, Jalan Kenari 17F, Bandar Puchong Jaya, 47100 Puchong, Selangor Darul Ehsan, Malaysia

North America

- Support E-mail: support@zyxel.com
- Support Telephone: +1-800-978-7222
- Sales E-mail: sales@zyxel.com
- Sales Telephone: +1-714-632-0882
- Fax: +1-714-632-0858
- Web: www.zyxel.com
- Regular Mail: ZyXEL Communications Inc., 1130 N. Miller St., Anaheim, CA 92806-2001, U.S.A.

Norway

- Support E-mail: support@zyxel.no
- Sales E-mail: sales@zyxel.no
- Telephone: +47-22-80-61-80
- Fax: +47-22-80-61-81
- Web: www.zyxel.no
- Regular Mail: ZyXEL Communications A/S, Nils Hansens vei 13, 0667 Oslo, Norway

Poland

- E-mail: info@pl.zyxel.com
- Telephone: +48-22-333 8250
- Fax: +48-22-333 8251
- Web: www.pl.zyxel.com
- Regular Mail: ZyXEL Communications, ul. Okrzei 1A, 03-715 Warszawa, Poland

Russia

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

Singapore

- Support E-mail: support@zyxel.com.sg
- Sales E-mail: sales@zyxel.com.sg
- Telephone: +65-6899-6678
- Fax: +65-6899-8887
- Web: <http://www.zyxel.com.sg>
- Regular Mail: ZyXEL Singapore Pte Ltd., No. 2 International Business Park, The Strategy #03-28, Singapore 609930

Spain

- Support E-mail: support@zyxel.es
- Sales E-mail: sales@zyxel.es
- Telephone: +34-902-195-420
- Fax: +34-913-005-345
- Web: www.zyxel.es
- Regular Mail: ZyXEL Communications, Arte, 21 5ª planta, 28033 Madrid, Spain

Sweden

- Support E-mail: support@zyxel.se
- Sales E-mail: sales@zyxel.se
- Telephone: +46-31-744-7700
- Fax: +46-31-744-7701
- Web: www.zyxel.se
- Regular Mail: ZyXEL Communications A/S, Sjöporten 4, 41764 Göteborg, Sweden

Taiwan

- Support E-mail: support@zyxel.com.tw
- Sales E-mail: sales@zyxel.com.tw
- Telephone: +886-2-27399889
- Fax: +886-2-27353220
- Web: <http://www.zyxel.com.tw>
- Address: Room B, 21F., No.333, Sec. 2, Dunhua S. Rd., Da-an District, Taipei

Thailand

- Support E-mail: support@zyxel.co.th
- Sales E-mail: sales@zyxel.co.th
- Telephone: +662-831-5315
- Fax: +662-831-5395
- Web: <http://www.zyxel.co.th>
- Regular Mail: ZyXEL Thailand Co., Ltd., 1/1 Moo 2, Ratchaphruk Road, Bangrak-Noi, Muang, Nonthaburi 11000, Thailand.

Turkey

- Support E-mail: cso@zyxel.com.tr
- Telephone: +90 212 222 55 22
- Fax: +90-212-220-2526
- Web: <http://www.zyxel.com.tr>
- Address: Kaptanpasa Mahallesi Piyalepasa Bulvari Ortadogu Plaza N:14/13 K:6 Okmeydani/Sisli Istanbul/Turkey

Ukraine

- Support E-mail: support@ua.zyxel.com
- Sales E-mail: sales@ua.zyxel.com
- Telephone: +380-44-247-69-78
- Fax: +380-44-494-49-32
- Web: www.ua.zyxel.com
- Regular Mail: ZyXEL Ukraine, 13, Pimonenko Str., Kiev 04050, Ukraine

United Kingdom

- Support E-mail: support@zyxel.co.uk
- Sales E-mail: sales@zyxel.co.uk
- Telephone: +44-1344-303044, 0845 122 0301 (UK only)
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- Web: www.zyxel.co.uk
- Regular Mail: ZyXEL Communications UK Ltd., 11 The Courtyard, Eastern Road, Bracknell, Berkshire RG12 2XB, United Kingdom (UK)

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