COMTREND CORPORATION

CT-500S
ADSL Router
User's Manual

Version F1.0 8/19/2002

261031-002P

Preface

This manual is written for the following software version: AD6489 0814. It is written for Web management. It is designed to provide information to network administrators. It covers the installation, operation and applications of the ADSL router.

Version Notes

This software was upgraded from software Version 0725, the following default settings have been added:

1. For PPPoA (VC mux) PVC 8/65
2. For transparent bridging PVC 8/35
3. For RFC 1483 Routing PVC 87/80, WAN IP 172.16.1.1
4. DHCP (DNS 200.72.1.5)

 Warning

- Before servicing or disassembling this equipment, always disconnect all power and telephone lines from the device.

- Use an appropriate power supply and a UL Listed telephone line cord. Specification of the power supply is clearly stated in Appendix A - Specifications.

Table of Contents

Part 1: Overview

Chapter 1 Introduction

This chapter introduces the ADSL Router. It includes a product overview, description of the products features and applications, and explains the functions of the Front panel LED indictors.

1.1 Product Overview

The ADSL Router utilizes an ADI chipset to meet the specific needs of multiple users at small/home offices and remote /branch offices. It provides one 10/100 BaseT Ethernet port to connect to a LAN. It can access the Internet; Corporate LAN; or Video on demand, over one ordinary telephone line; at speeds of up to eight Mbps. In addition, it supports up to eight virtual concurrent-connections, to multiple destinations. The ADSL Router has full routing capabilities to segment/route IP protocol, and it is capable of bridging other protocols. The ADSL Router has the speed and stability to be used for multi-media applications; and it can easily be configured and monitored from a web-browser (Internet Explorer, Netscape).

1.2 Features

The ADSL Router is compact and high performance standalone unit. It supports or provides:

- One 10/100 Base-T Ethernet port for LAN connection
- Bridge/Routing function
- Auto-negotiation rate adaptation
- AAL5 for ATM over ADSL
- UBR/CBR ATM services
- VC-based and LLC multiplexing
- Up to 8 VCs
- Embedded SNMP agent and RFC MIB II
- Web-based management
- OAM F5
- Static route/RIP/RIP v2 routing function
- Dynamic IP assignment and Network Address Translation

1.3 Application

Figure 1-1 shows a possible application of the router.

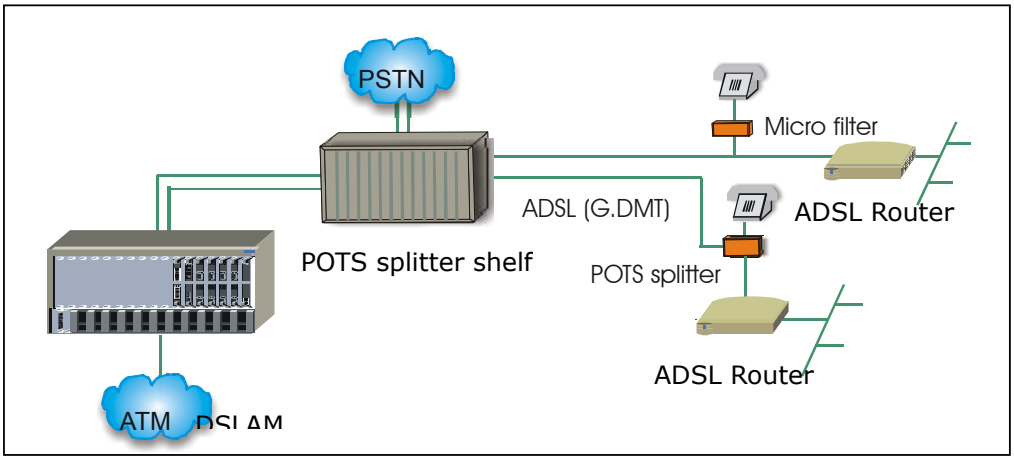
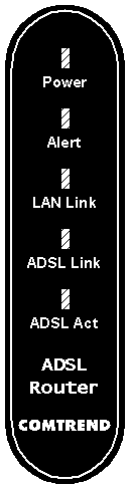


Figure 1-1 Application

1.4 Front Panel LED Indicators



LED Indicator	Color	Mode	Function
Power	Green	On	Power is supplied to the router
		Off	Power is not supplied
Alert	Red	Off	Normal operating status
		On	The ADSL link is not established
LAN Link	Green	On	An Ethernet link is established
		Off	An Ethernet link is not established
		Flash	Activity over the Ethernet link
ADSL Link	Green	Flash	ADSL link is training
		On	An ADSL link is established
		Off	ADSL link not established
ADSL Act	Green	Flash	Receiving or transmitting data over the ADSL link
		Off	Not receiving or transmitting data over the ADSL link

Chapter 2 Hardware Installation

2.1 Preparing for Installation

Installation requires the following equipment:

A VT-100 compatible terminal –

This terminal is essential to perform the initial configuration of the router. Normally this is a terminal with a VT-100 emulation program, such as Telix.

An RS232 straight-through cable to connect to the Console Port-

An RS232, DB9-to-DB9 straight-through cable is required to connect the terminal to the device.

An AC power adapter cord to connect to the Power jack-

A suitable AC-to-AC power adapter cord is shipped with the device. It is used to provide the necessary power for the device's operation.

RJ45 10/100BaseT Ethernet connector cable to connect to the LAN port:

An RJ45 LAN connector cable is used to connect the router to the Local Area Network (LAN). A cross-over cable is used to connect the router to a PC, and a straight-through cable is used to connect to a hub. The pin assignments of the RJ45 connector are listed in Appendix B.

An RJ11 connector cable to connect to the LINE port–

An RJ11 connector cable is used to connect the router to the telephone line from the telephone company. Refer to Appendix B for the pin assignments of the RJ11 connector.

Clip-on stands

Your router is shipped with two clip-on stands. It is recommended that you affix these to your router and operate the router in a vertical-upright position, in order to optimize the performance of your router.

Optional POTS splitter or micro filter

Pots splitters or micro-filters are available if required.

2.2 Installation

Figure 2-2 illustrates connections to the router backplane connectors.

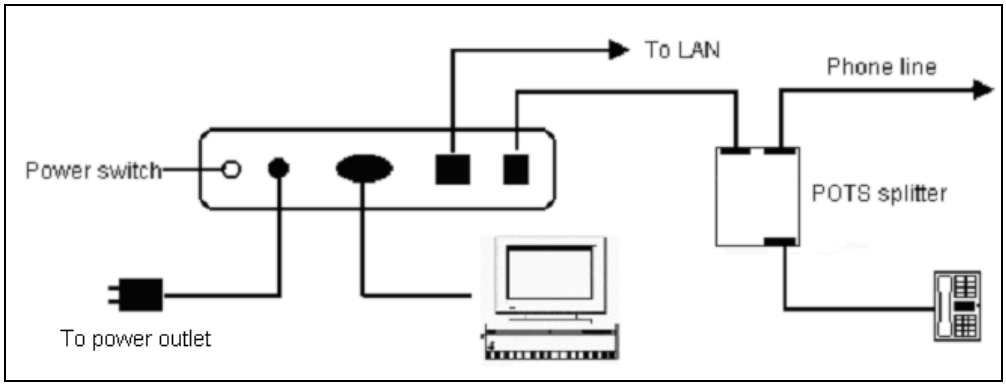


Figure 2-1 Installation

Caution: Always disconnect all telephone lines from the telephone wall-outlet before servicing or disassembling this device.

STEP 1 Connect the power adapter to the **power jack** of the device, and then plug the power adapter into the wall outlet.

STEP 2 Connect the **LAN port** to a PC with a cross-over RJ45 cable, or to a hub with a straight-through RJ45 connector cable.

STEP 3 Connect the **Console port** to a VT-100 compatible terminal with an RS232 straight-through cable.

STEP 4 Connect the **LINE port** to a POTS splitter or micro filter with an RJ11 connector cable.

STEP 5 Affix the two clip-on stands to the bottom of the router and place the router in an up-right position (this is strongly recommended in order to optimize the router's performance)

STEP 6 Turn on the power switch on the rear panel.

Note: If the device fails to power on, or it malfunctions, first verify that the power supply is correctly connected, and then power it on again.

Part 2: Console Management

Chapter 3 Access by Console

This chapter will introduce console management, if you wish to use the web to manage your device you should see Part 3 of this manual. The web section can also be referenced for more complete explanation of some parameters and procedures. In the first section of this Chapter, the conventions used by the console and by this manual to explain the console will be discussed. The second part of the chapter will explain how to establish access by console.

3.1 Conventions

Manual Conventions

1. Characters inside a box indicate that they are keys that need to be pressed. For example, Enter, represents "push the Enter key."

2. Text highlighted in gray, represents text that you may see on the screen. For example, Press Y or N

3. The user interface has a multi-level menu structure, the following style will be used to indicate menu locations: 1.Basic> 4. LAN IP This example shows that the **LAN IP** screen can be accessed form the main menu by entering the following keys: 1 Enter ; and then 4 Enter.

4. Numbers inside round brackets indicate a menu location. For example (1.4), indicates 1.Basic> 4. LAN IP.

CLI Interface Conventions

1. Values in round brackets are default or previously entered values. For example (Enabled), represents a default value or previously entered value of "enabled".

2. Values in square brackets represent the range of permissible values. For example, [8~35], indicates that a value from 8 to 35 may be entered.

Pop-up messages

You are likely to see the following pop-up messages (messages are highlighted)

Mandatory, Enter Valid Value

This message indicates that a parameter must be entered.

Optional, Press Return To Skip

This message indicates that it is optional to enter a parameter.

Do You Wish To Submit These Values [Y/N] :

This message indicates that the entered parameters will be submitted.

3.2 Console Access

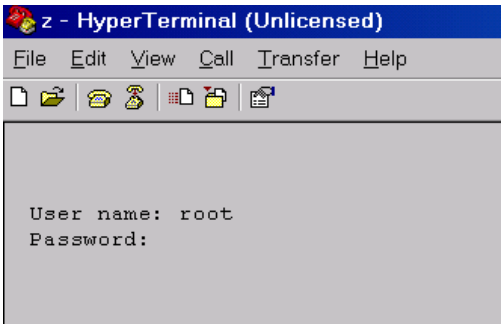
For access by console, the console PC should be installed with a standard VT-100 emulation program, such as HyperTerminal 5 or Telix. The following steps explain how to establish the console session.

STEP 1 Start a standard VT-100 program such as HyperTerminal (Ver. 5 is recommended), or Telix in the local terminal; and select an open com port.

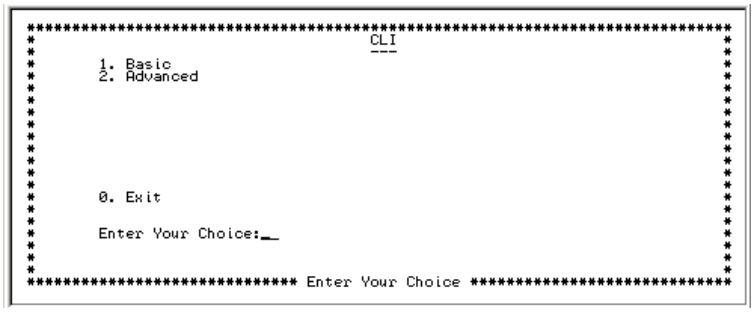
STEP 2 Enter the following port settings:

- Baud rate: 9600
- Data bits: 8
- Parity: none
- Stop bit: 1
- Flow control: none

STEP 3 You will be prompted to enter a User name and Password, enter **root** for User name and **12345** for the Password.



STEP 4 The first screen of the console interface will now display.



3.3 Saving Parameters/ Rebooting

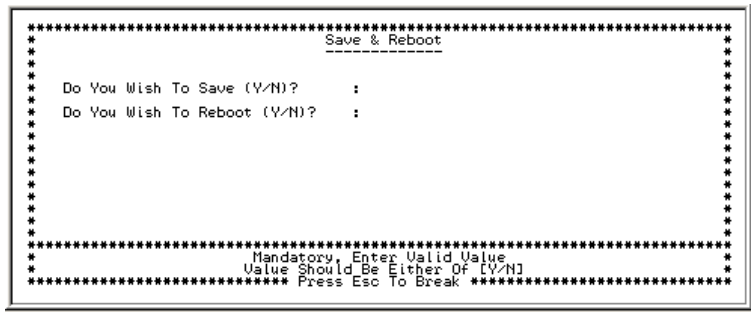
After changing parameters, in order to ensure that they are retained after rebooting or re-powering the router, you must save the parameters to flash memory. These procedures can be performed by completing the following steps:

1. Enter the **Basic** menu, select 6. Save & reboot

2. Press **Y** to save, or **N** to not save at the prompt: Do you wish to save (Y/N)?

3. Press **Y** to reboot, or **N** to not reboot at the prompt: Do you wish to reboot (Y/N)?

4. Upon completion, you will see the Success message displayed.



Part 3: Web Management

This section describes how to manage the router via a Web browser from the remote end. You can use a web browser such as Microsoft Internet Explorer, or Netscape Navigator. It is best to set your display resolution to 1024 x 768. To change the resolution you can go to the Microsoft Windows control panel and click on the **Display** icon, and change the display settings. You will find the display settings there.

Chapter 4 Login via the Web Browser

4.1 IP Address

To log on to the device using a web browser, your workstation and the device should both be on the same network segment. You can either modify the IP address of your workstation to the same domain of the device, or modify the IP address of the device to the same domain as your workstation.

You can modify the IP address of the device by using console mode (see Section 3.2), and follow the steps below:

STEP 1: Enter a console program and go to 1.Basic> 4. LAN IP

STEP 2: Change the IP address to the same domain as your workstation.

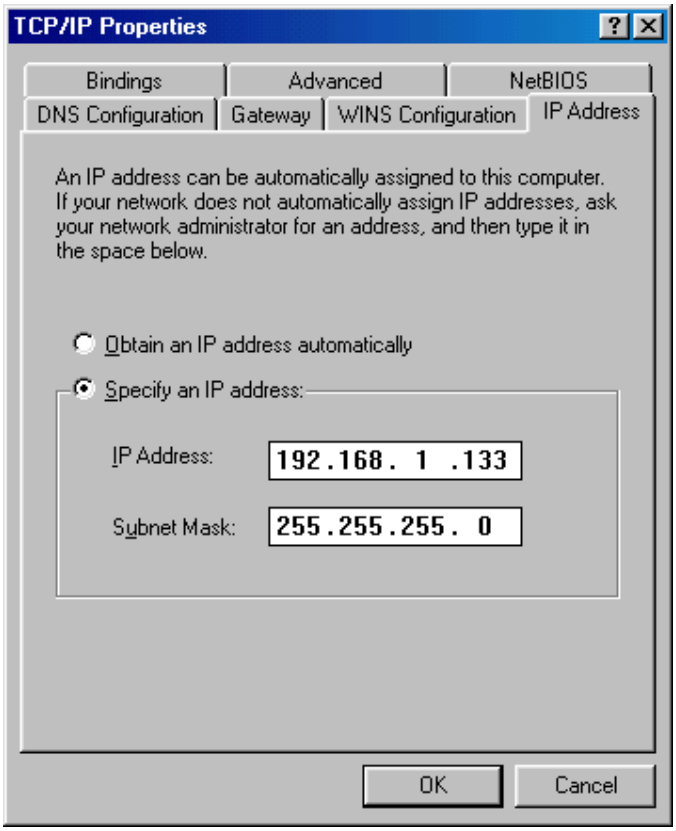
STEP 3: Save the settings to the flash and reboot the device.

Basic> 6.Save & reboot

STEP 4: Start your Internet browser with the new IP address.

You can modify the IP address of your PC by modifying its TCP/IP. Follow the steps below:

STEP 1: Enter the TCP/IP screen and change the IP address to the domain of 192.168.1.x/24. You should choose an IP address from 192.168.1.132-192.168.1.254 to avoid conflict with IP addresses reserved for the DHCP pool (192.168.1.3 to 192.168.1.131).



STEP 2: Click OK to submit the settings.

STEP 3: Start your Internet browser with the default IP address 192.168.1.1.

4.2 Login Procedure

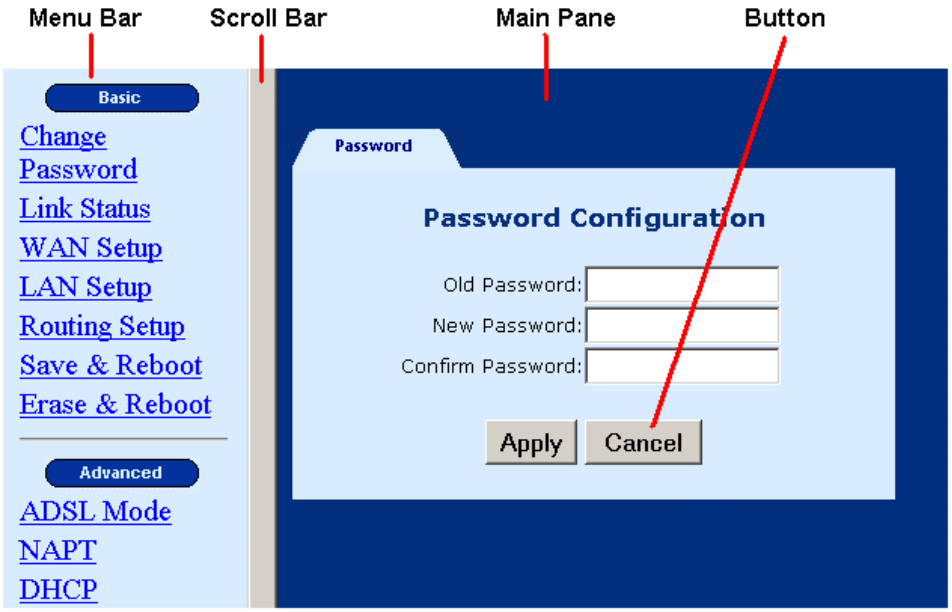
To log on to the system from the Web browser, follow the steps below:

STEP1: Start your Internet browser.

STEP 2: Type the IP address for the router in the Web address field. For example, if the IP address is 192.168.1.1, type **http://192.168.1.1**

STEP 3: You will be prompted to enter your user name and password. Type the password, or if the password was not changed, type the default passwords. The default USER name is **root**, and the default password is **12345**.

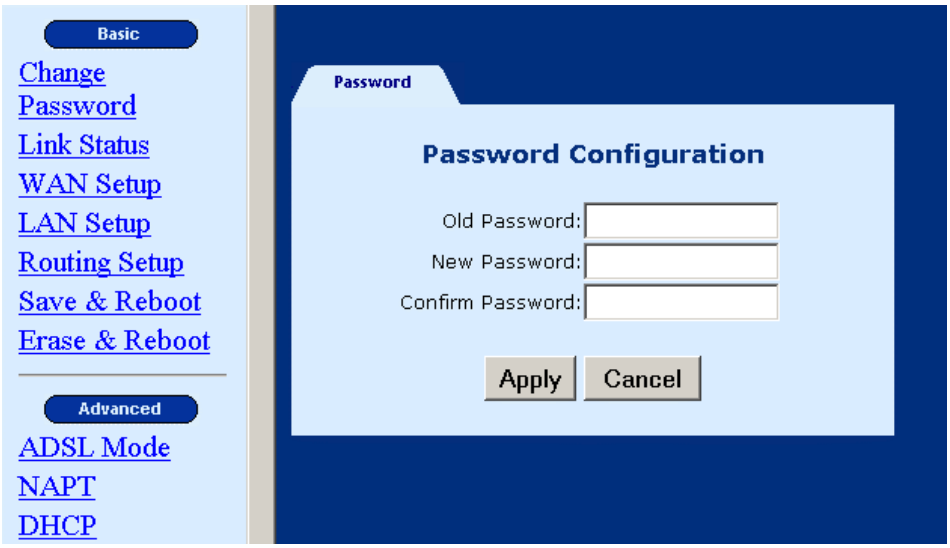
STEP 4: After successfully logging in, you will reach the main menu.



Chapter 5 Basic Configuration

From the **Basic** menu bar you can change passwords, configure the WAN/LAN interfaces, set-up routing, save settings, reboot the device, and retrieve the factory default settings.

5.1 Change the Password



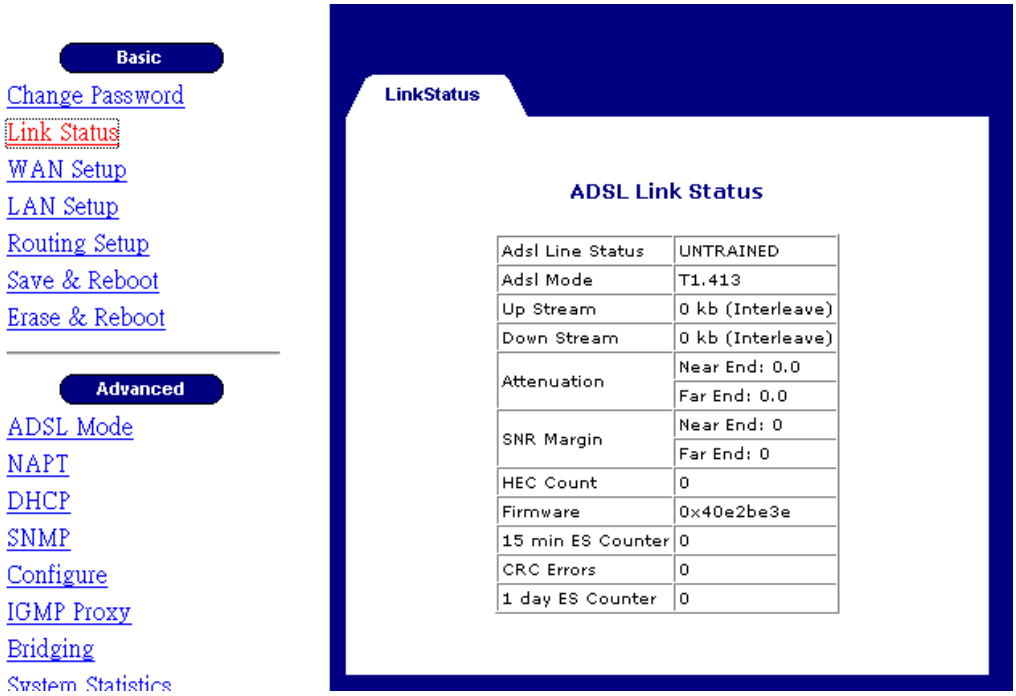
To modify the password, click **Change Password** from the menu bar. Type the old password and type the new password twice. Click **Apply** to submit the settings.

If you change the password, make sure you keep a record of it in a safe place, as you will require it next time you log-on.

5.2 ADSL Link Status

To view the ADSL link status, click **Link Status** from the tool bar. The page includes the following information:

ADSL Line Status	Shows the current status of the ADSL line
ADSL Mode	Shows the ADSL standard that is currently configured. The standards are: MULTI, T1.413, G.DMT, and G.LITE.
Upstream	Upstream data rate negotiated by DSL link (Kbit/s)
Downstream	Downstream data rate negotiated by DSL link (Kbit/s)
Attenuation	Current attenuation (dB) of both near end and far end.
SNR Margin	Current SNR margin (dB)
HEC	Number of ATM cells received with errors, since start of link.
Firmware	The version number of the firmware
15 min ES counter	Number of errored seconds for the current 15 minute period
CRC errors	Number of errors per second since training
1 day ES counter	Number of errored seconds for the current day



5.3 WAN Setup

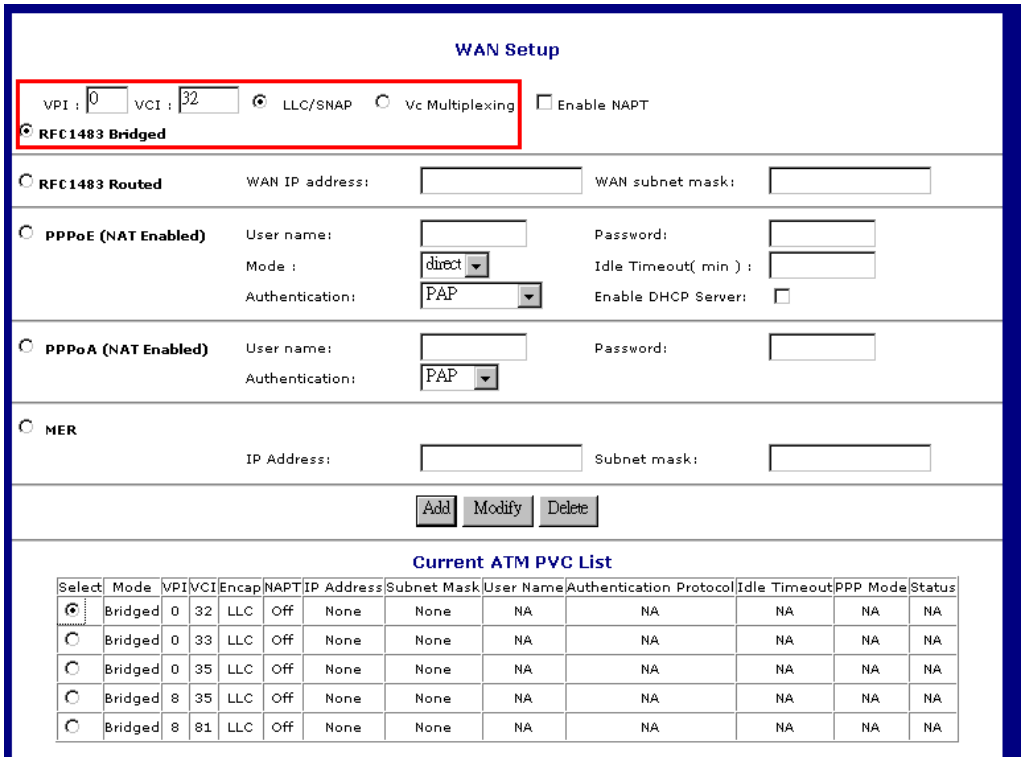
Click WAN Setup from the tool bar and configure the WAN interface for these services: RFC1483 Bridged, RFC1483 Routed, PPPoE, PPPoA, and MER. The following are the common settings to set up these services.

- VPI and VCI
- LLC Encapsulation: With LLC encapsulation, a link control header is added to the Ethernet packet that identifies the protocol type (Ethernet). This allows multiple protocols to be transmitted over the ATM Virtual Circuit.
- VC Multiplexing: With VC Multiplexing, no link control header is needed as the ATM Virtual Circuit is assumed to be carrying a single protocol.
- Enable NAPT: NAPT or Network Address Port Translation is explained further in section 6.2. This feature is available for RFC 1483 Routed, PPPoE, PPPoA, and MER. It is enabled for PPPoE.

5.3.1 RFC 1483 Bridged

When using RFC 1483 style bridging, Ethernet frames are "bridged" over ATM Virtual Circuits. The Ethernet frames are encapsulated using either LLC Encapsulation or VC Multiplexing. With LLC encapsulation, a link control header is added to the Ethernet packet that identifies the protocol type (Ethernet). This allows multiple protocols to be transmitted over the ATM Virtual Circuit. With VC Multiplexing, no link control header is needed as the ATM Virtual Circuit is assumed to be carrying a single protocol. Since the Ethernet packets are bridged, the router's only responsibility is to pass the Ethernet packets to and from the Internet Service Provider and the local network. The IP addresses of the local network are assigned by the ISP either statically or dynamically.

To set up the RFC 1483 Bridged, configure the common fields on the top of the page and click the Add button to add the entry.



To modify an entry, complete the following steps:

STEP 1: Select the entry from the **Current ATM PVC List,** at the bottom of the WAN Setup page. The current values of the selected entry will display in the upper section of the page.

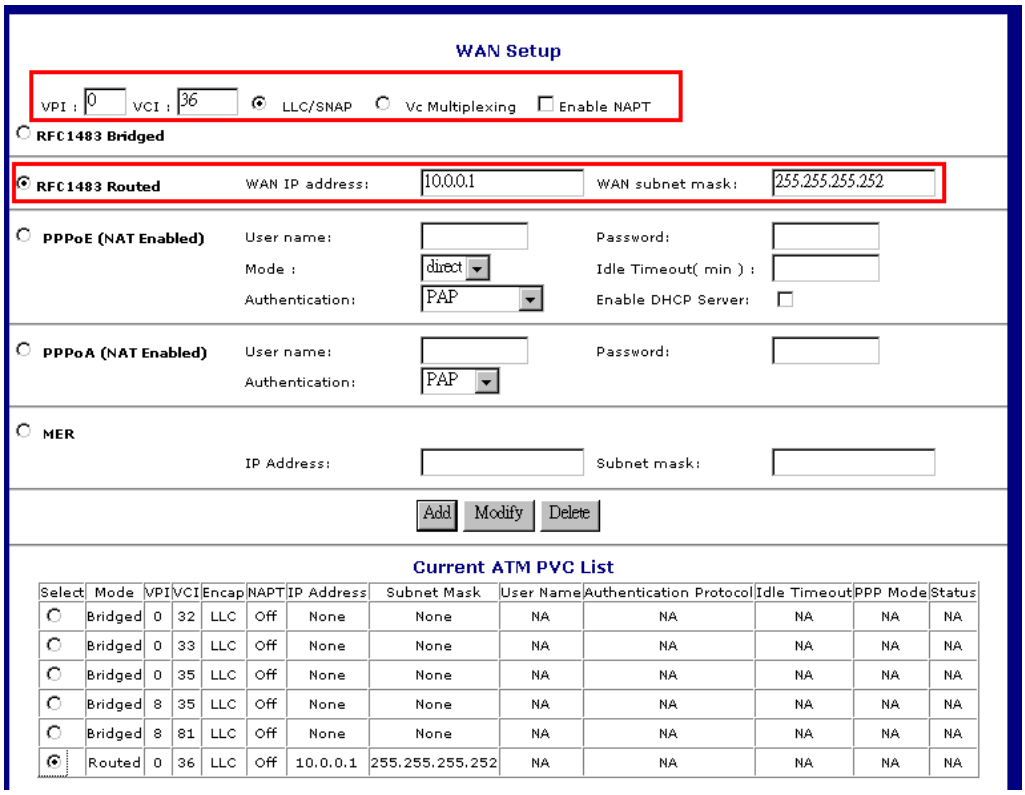
STEP 2: Change the parameters.

STEP 3: Click **Modify**.

To delete an entry, Select it from the **Current ATM PVC List,** at the bottom of the WAN Setup page, and click the **Delete** button.

5.3.2 RFC 1483 Routed

To set up the RFC 1483 Routed, configure the common settings on the top of the page, click RFC 1483 Routed and configure the specific settings (WAN IP address and WAN subnet mask). Click the Add button to add the entry.



To modify an entry, complete the following steps:

STEP 1: Select the entry from the **Current ATM PVC List,** at the bottom of the WAN Setup page. The current values of the selected entry will display in the upper section of the page.

STEP 2: Change the parameters.

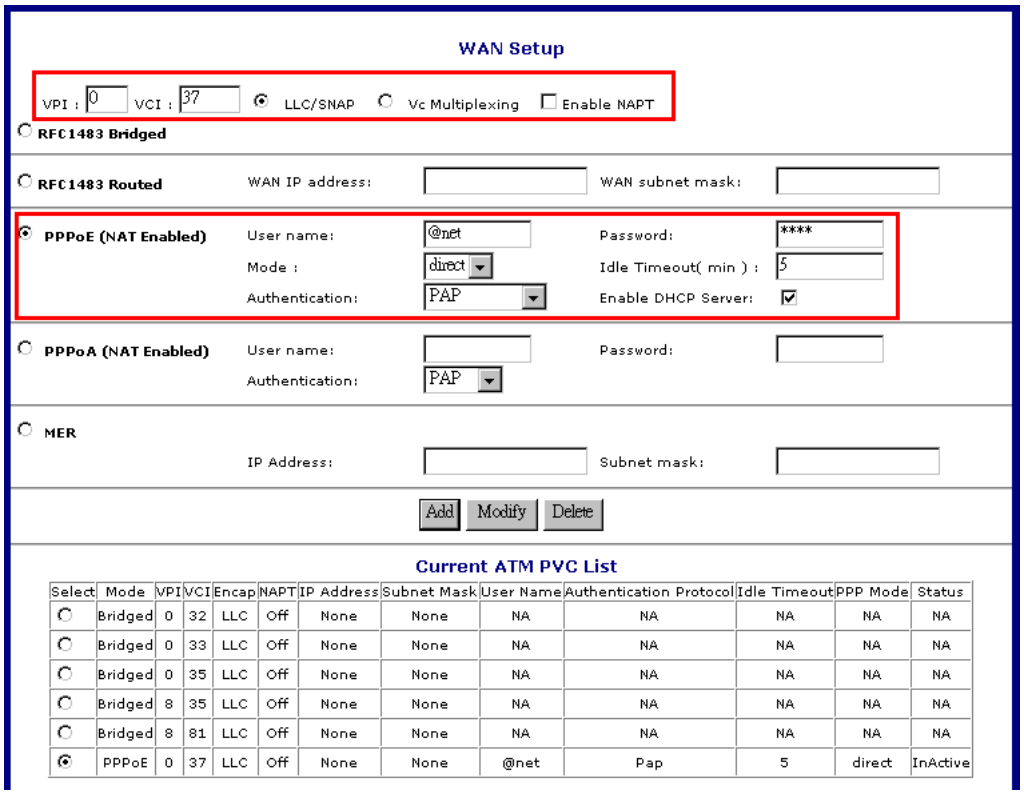
STEP 3: Click **Modify**.

To delete an entry, Select it from the **Current ATM PVC List,** at the bottom of the WAN Setup page, and click the **Delete** button.

5.3.3 PPPoE

PPPoE provides service providers similar billing and access control as present in dial-up services. And with direct support to Ethernet it provides a low cost solution to supporting multiple hosts at the customer premises. PPPoE provides session authentication using either Password Authentication Protocol (PAP) or Challenge Handshake Authentication Protocol (CHAP). Session accounting is possible and conservation of bandwidth can be done by closing down unused sessions. By utilizing PPP, link and network parameters are easily negotiated between the IAD/Router and the ISP.

When using PPPoE, the system is assigned an IP address from the Internet Service Provider as part of establishing the network connection. The system can be configured as a DHCP server for its LAN and NAT can be used to translate private addresses to public addresses. In this way, computers in the LAN do not have to have their own public IP addresses.



To set up PPPoE, click PPPoE (NAT Enabled), configure the common fields on the top of the page and the following fields. Click the Add button to add the entry.

- **User name/Password:** used for the remote customers to login during dialup.
- **Mode:** Direct and Auto. If the mode is set to AUTO the PPPoE negotiation automatically starts when the system identifies any traffic required to be transferred on the link. When DIRECT is selected the PPPoE negotiation is started manually using the "pppoestart" command. The default is DIRECT.
- **Idle Timeout:** defines the period of idle time (minutes) after which the PPPoE link will be terminated.
- **Authentication:** defines the authentication code: PAP, and CHAP
- **Enable DHCP Server:** enables the DHCP server. This field is automatically checked when PPPoE is selected. Deselect the field to disable the DHCP server. The DHCP server dynamically allocates network addresses and delivers configuration parameters to hosts.

To modify an entry, complete the following steps:

STEP 1: Select the entry from the **Current ATM PVC List,** at the bottom of the WAN Setup page. The current values of the selected entry will display in the upper section of the page.

STEP 2: Change the parameters.

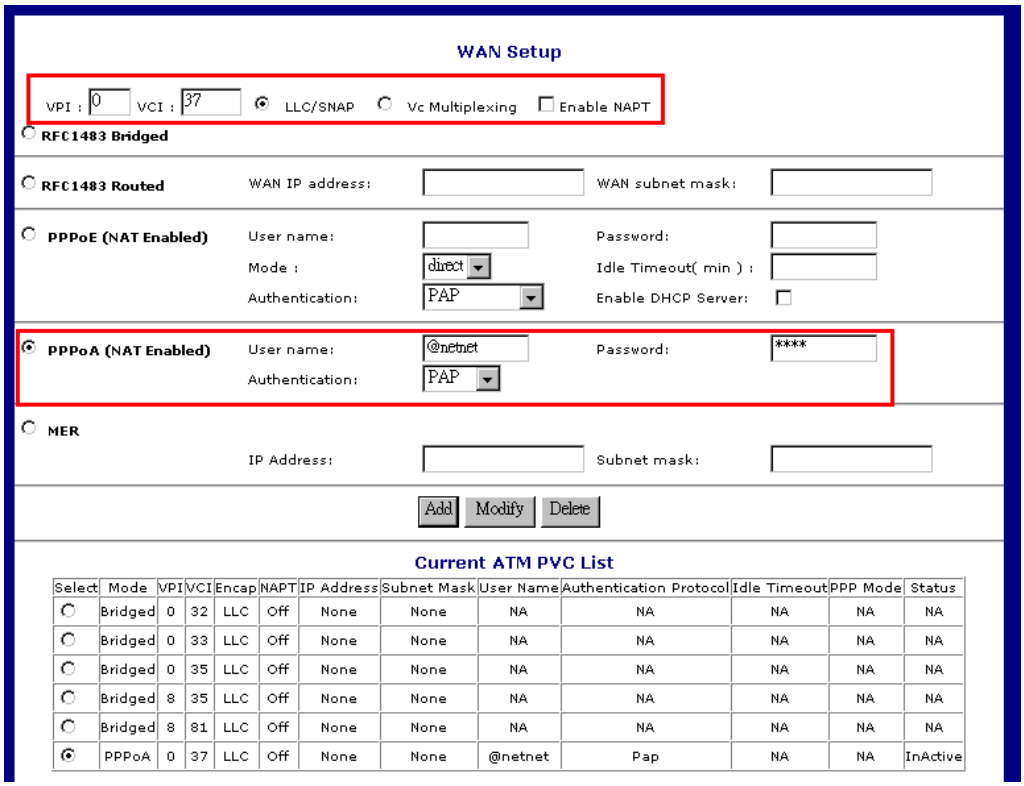
STEP 3: Click **Modify**.

To delete an entry, Select it from the **Current ATM PVC List,** at the bottom of the WAN Setup page, and click the **Delete** button.

5.3.4 PPPoA

To set up PPPoA, click PPPoA, configure the common fields and the following fields. Click the Add button to add the entry.

- **User name** and **Password:** used for remote customers to login upon dialup. PPPoA is manually activated by entering startup commands from the page: Advanced>Configure PPPoA. The **Authentication** field defines the authentication code: PAP or CHAP.
- **Authentication:** defines the authentication code (PAP, CHAP).



To modify an entry, complete the following steps:

STEP 1: Select the entry from the **Current ATM PVC List,** at the bottom of the WAN Setup page. The current values of the selected entry will display in the upper section of the page.

STEP 2: Change the parameters.

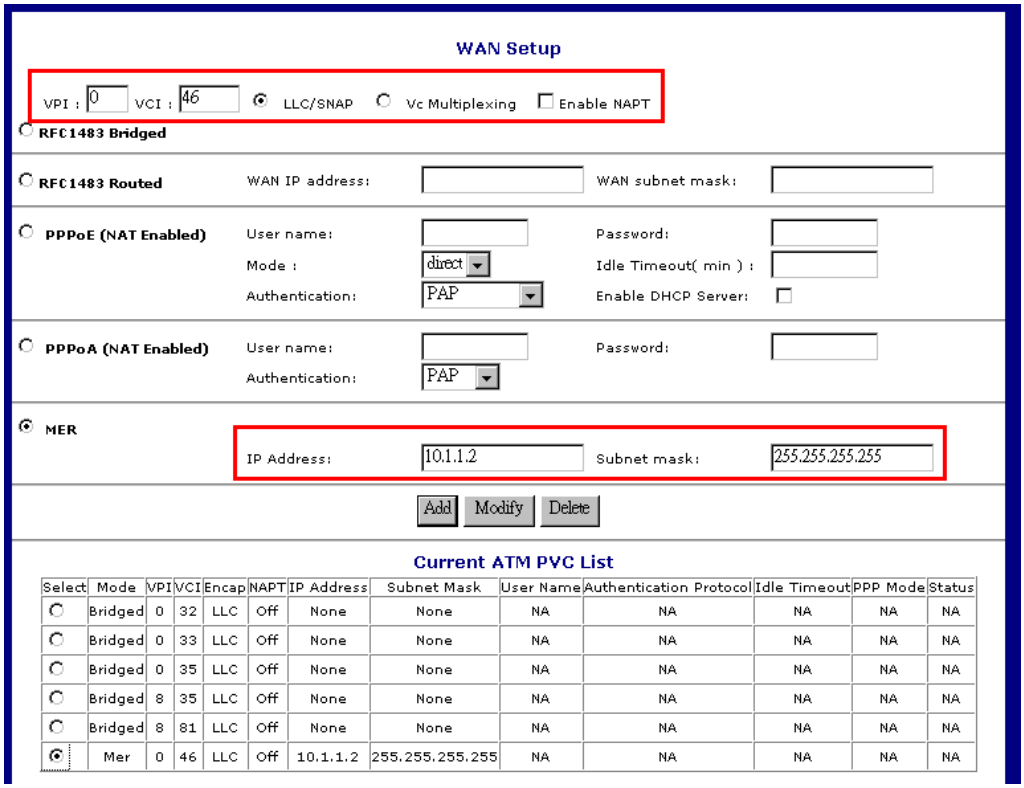
STEP 3: Click **Modify**.

To delete an entry, Select it from the **Current ATM PVC List,** at the bottom of the WAN Setup page, and click the **Delete** button.

5.3.5 MER

MAC Encapsulation Routing (MER) implements router features over RFC1483 bridged link. MER enables the ATU-R to send and receive IP packets encapsulated as bridged frames with MAC address. The ATU-R runs with full router functions, including NAPT, virtual server, RIP, DHCP, and so on. MER utilizes network address translation (NAT) to allow multiple PCs with different private IP addresses on the LAN to share a public IP addresses. The functions of NAT and allocation of an ATM virtual channel improves the security of network access on the RFC 1483 Bridged link.

To set up the MER service, configure the common fields, and the IP Address and Subnet Mask fields that are highlighted on the screen. Click the Add button to add the entry.



To modify an entry, complete the following steps:

STEP 1: Select the entry from the **Current ATM PVC List,** at the bottom of the WAN Setup page. The current values of the selected entry will display in the upper section of the page.

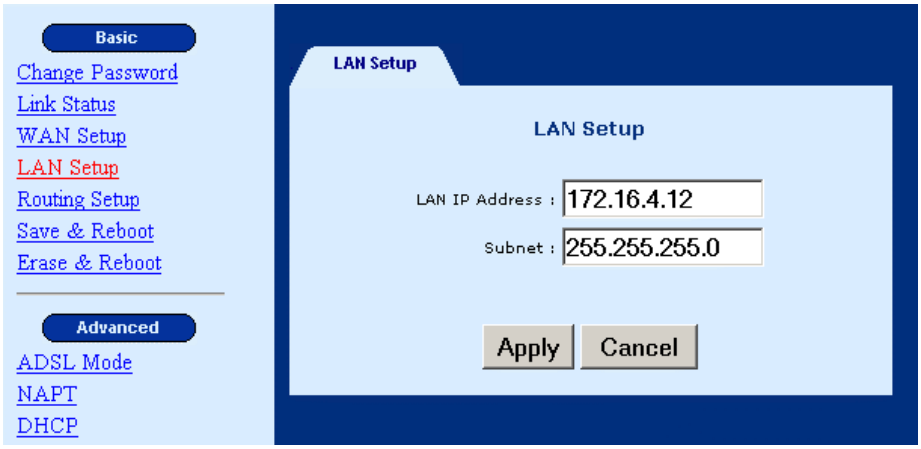
STEP 2: Change the parameters.

STEP 3: Click **Modify**.

To delete an entry, Select it from the **Current ATM PVC List,** at the bottom of the WAN Setup page, and click the **Delete** button.

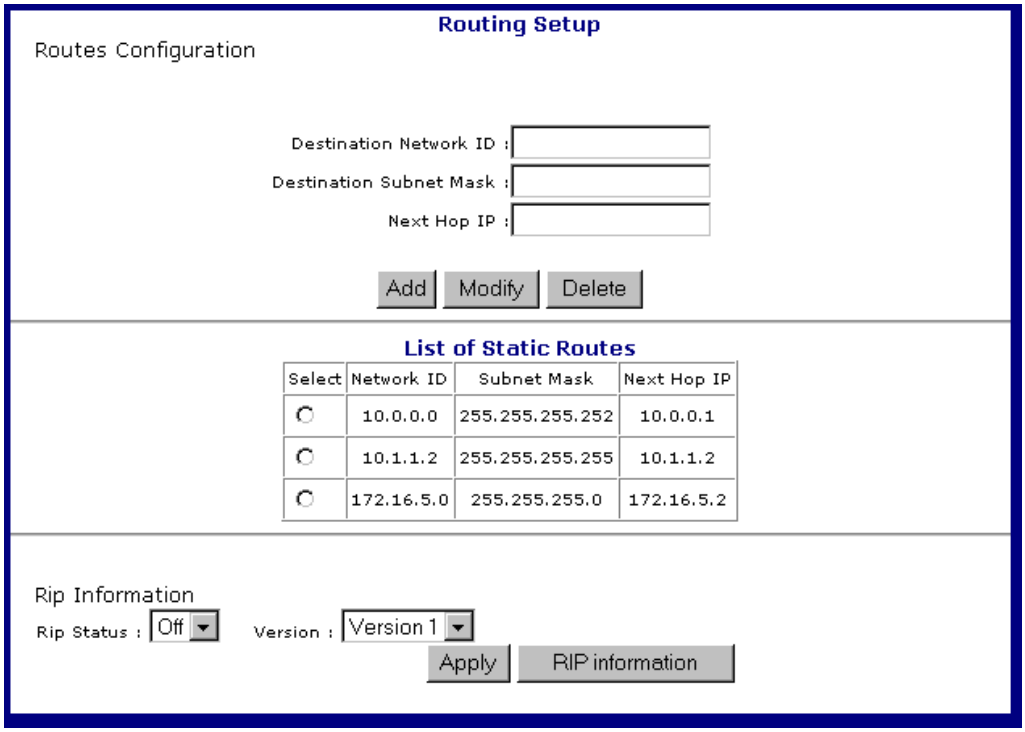
5.4 LAN IP Address

Click **LAN Setup** from the menu bar to configure the LAN IP address. Type the **IP address** and **subnet mask**. Click **Apply** to submit the settings. When the new IP address is applied, the Web configuration will be interrupted. Use the new IP address to login.



5.5 Routing

Click **Routing Setup** from the menu bar to configure the routing functions. Routing functions includes RIP and static routing. You can display the RIP information by clicking the **RIP information button**.



The default static routes table has three static routes:

Network ID	Subnet Mask	Next hop IP
10.0.0.0.	255.255.255.252	10.0.0.1
10.11.1.0	255.255.255.255	10.11.1.2
192.168.1.0	255.255.255.0	192.168.1.1

5.5.1 Enable RIP

To enable the RIP, complete the following steps:

STEP 1: Click **Routing Setup** from the menu bar

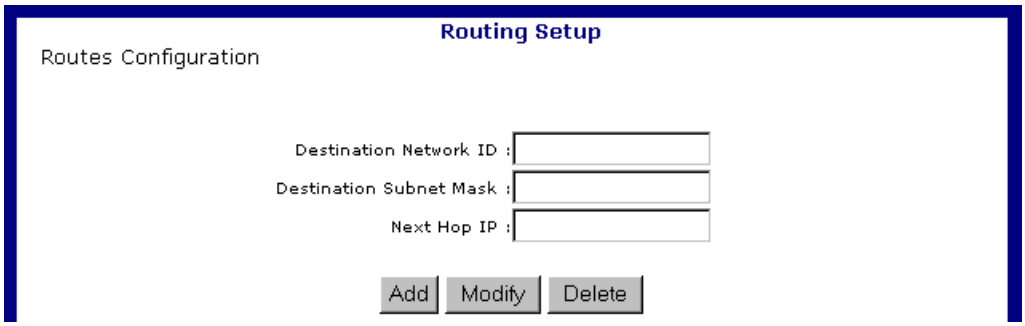
STEP 2: Select **On** in the Rip Status field.

STEP 3: Select a RIP Version (Version 1 or Version 2) from the Version field.

STEP 4: Click **Apply** to submit the settings.

5.5.2 Static route configuration

The Routes Configuration field allows you to add, modify, and delete a static route. Type the Destination Network ID, subnet mask, and next hop IP and click a button below to perform the requested function.



Add:

To add a static route complete the following steps:

STEP 1: Click **Routing Setup** from the menu bar

STEP 2: Enter parameters for **Destination Network ID**, **Subnet Mask**, **Next Hop IP**

STEP 3: Click the **ADD** button

Modify:

To modify a static route complete the following steps:

STEP 1: Select the entry you wish to modify from the List of Static Routes

STEP 2: Change the parameters

STEP 3: Click the **Modify** button

Delete:

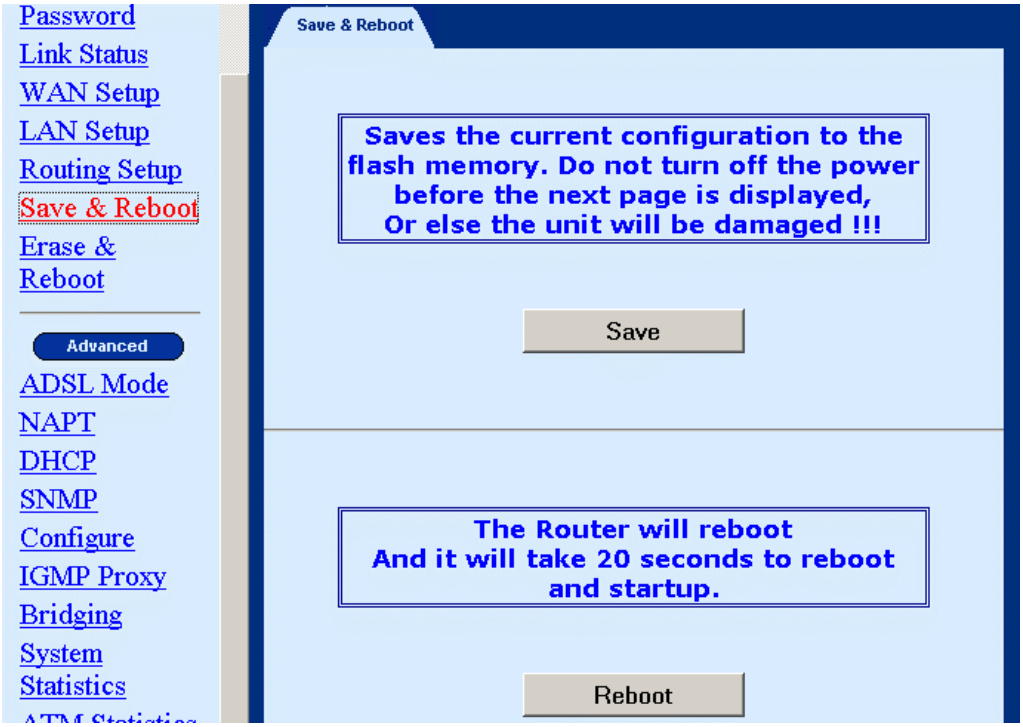
STEP 1: Select the entry you wish to **delete** from the List of Static Routes

STEP 2: Change the parameters

STEP 3: Click the **Delete** button

5.6 Save

To save the settings to Flash, click Save & Reboot from the menu bar. In the main pane, click **Save**.

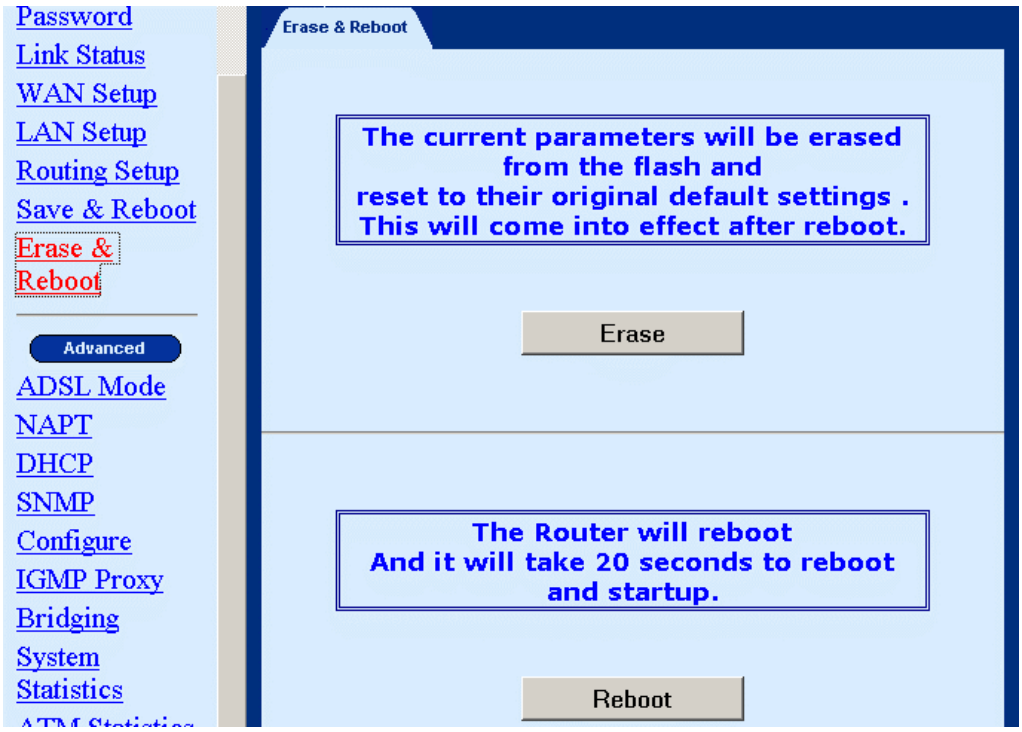


5.7 Reboot

To reboot the router, click **Save & Reboot** from the menu bar. In the main pane, click on **Reboot**.

5.8 Retrieve default settings

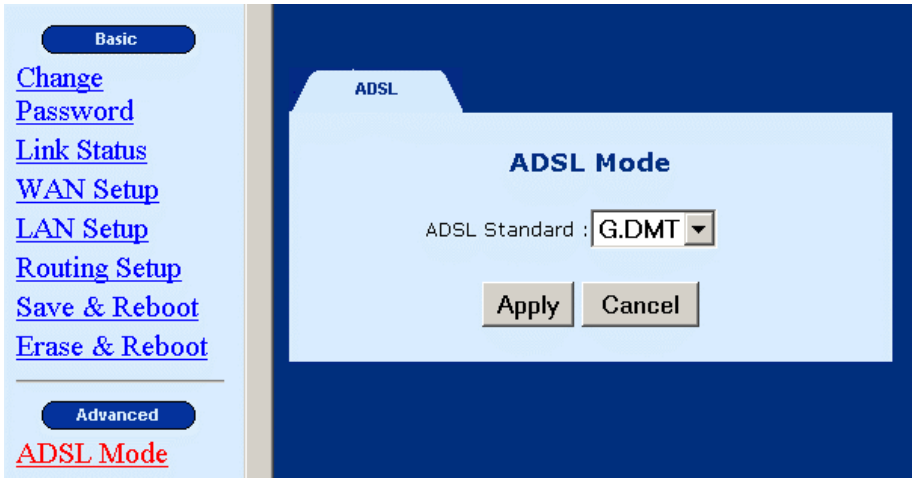
To retrieve the default settings, click **Erase & Reboot** from the menu bar. In the main pane, click **Erase**.



Chapter 6 Advanced Configuration

6.1 ADSL Mode

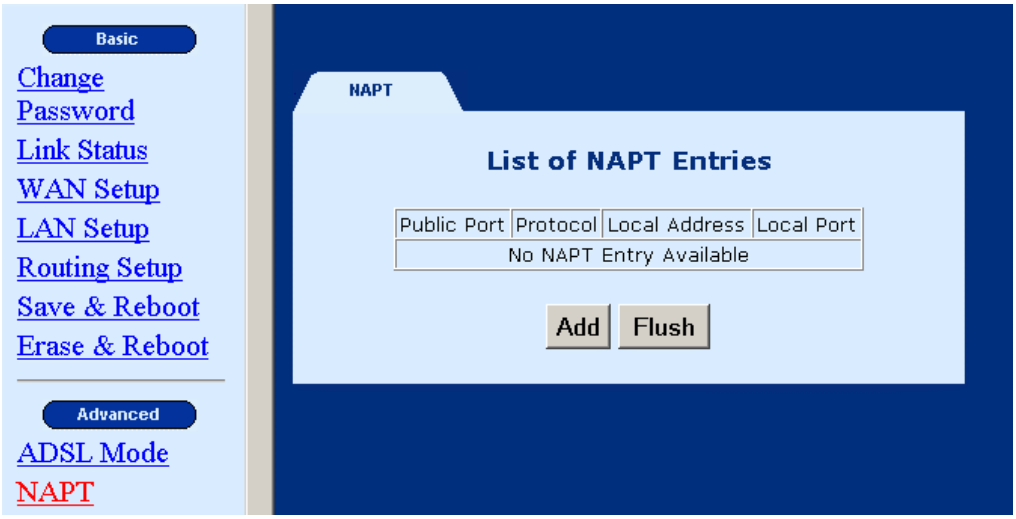
There are four ADSL modes: MULTI, T1.413, G.DMT, and G.LITE. The default ADSL mode is MULTI. MULTI mode enables the device to auto-adjust its mode to match the remote CO DLSAM. You can specify an ADSL mode on this page, and click the Apply button to submit the settings.



6.2 NAPT (Port Translation)

The discussion in this section is for port translation. For IP address translation, refer to Section 17.1.2 WAN Interface. NAPT, also called overloading, is a form of NAT that maps multiple Private IP addresses to a single Public IP address. PAT allows several virtually addressed workstations to share a single global address. PAT uses the TCP and UDP port numbers to map multiple virtual addresses to a single global address.

Click NAPT on the Advanced menu bar to configure the NAPT (Network Address Port Translation). If any NAPT entries have already been configured, they will appear on the right side of the screen.



6.2.1 Add a NAPT

To **add a NAPT**, complete the following steps:

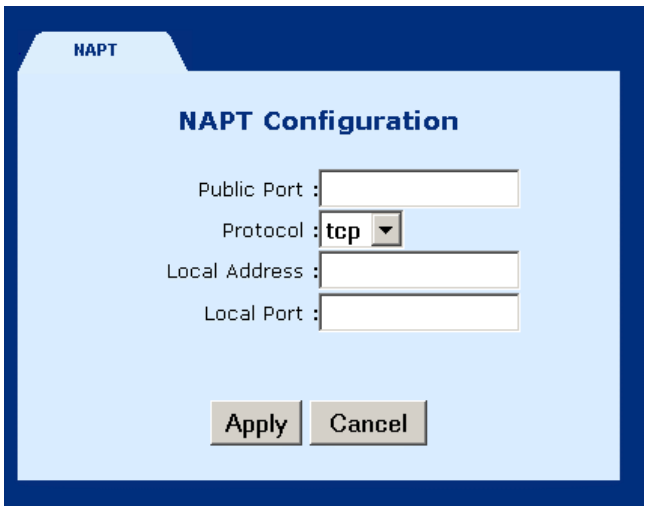
STEP 1: Click NAPT from the Advanced menu bar

STEP 2: Click **Add**.

STEP 3: Enter the following parameters:

Public Port	Enter the **public** port number. Any packet whose IP header contains the specified destination **port** will be mapped or redirected.
Protocol	Specifies whether the ports numbers for these arguments are TCP or UDP port numbers.
Local Address	Enter the **IP address** of the machine on the local LAN.
Local Port	Enter the **port number** of the machine on the local LAN.

STEP 4: Click **Apply** to accept the parameters.



6.2.2 Flush NAPT Entries

To flush (delete) all NAPT entries click the **Flush** button on the NAPT screen.

6.3 DHCP

The Dynamic Host Configuration Protocol (DHCP) provides a centralized approach to allocating IP addresses. It allows IP addresses to be dynamically assigned on an as needed basis, from a pool of addresses. The DHCP function of the device is disabled by factory default.

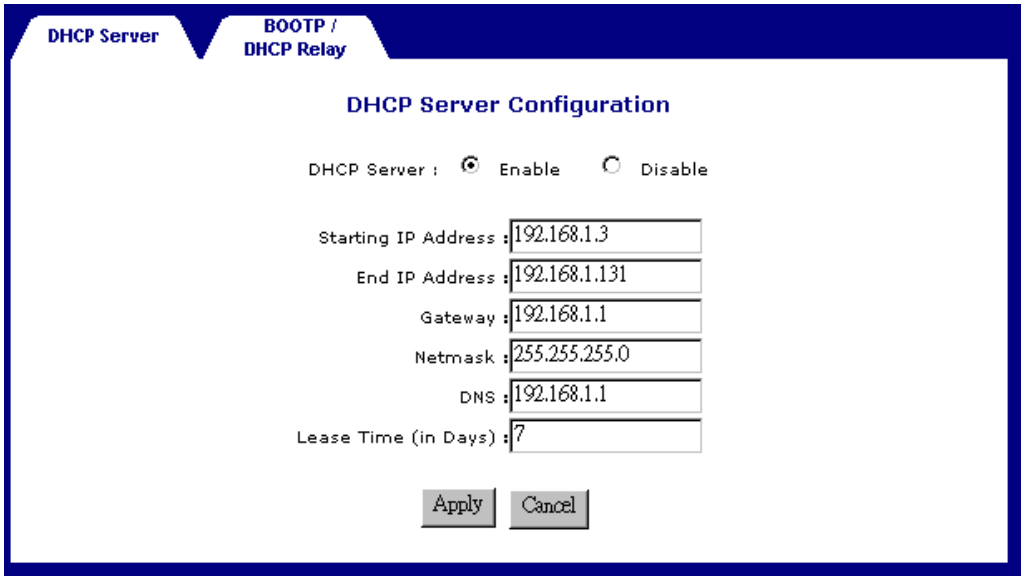
6.3.1 Enable DHCP

STEP 1: Click **DHCP** from the menu bar to configure the DHCP parameters.

STEP 2: Click **Enable** and fill out the following fields:

- **Starting IP Address:** The first IP address of the address pool in the DHCP server. Note the IP address should be in the same subnet as the router's LAN IP address.
- **End IP Address:** The last IP address of the address pool in the DHCP server. Note the IP address should be in the same subnet as the router's LAN IP address.
- **Gateway:** The gateway IP address
- **Netmask:** The subnet mask of the IP network
- **DNS:** The IP address of the Domain Name Server
- **Lease Time (in Days):** Upon login, the remote workstation will obtain an IP address. This field defines the period of time that the workstation can use this IP address to access the Internet.

STEP 3: Click **Apply** to submit the settings.



6.3.2 Disable the DHCP

STEP 1: Click **DHCP** from the menu bar to configure the DHCP parameters.

STEP 2: Click **Disable**.

STEP 3: Click **Apply**.

6.4 Boot P/DHCP Relay

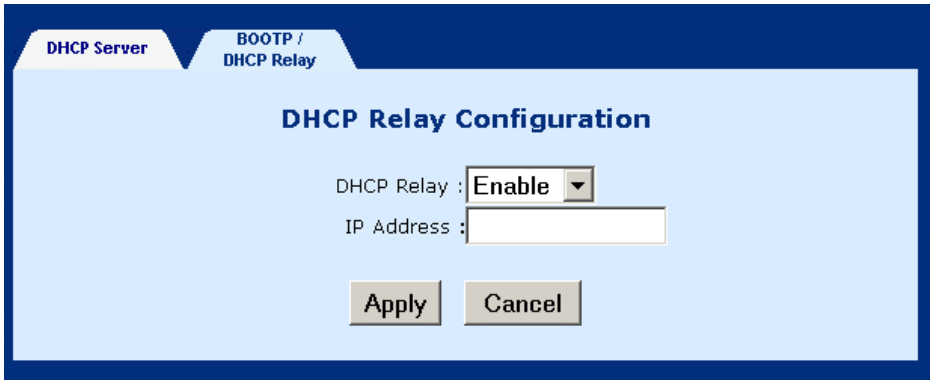
The DHCP packet format is based on a BootP packet. As a result, DHCP uses the BootP relay agent to forward DHCP packets. This scheme provides interoperability between existing BootP clients and DHCP servers. The BootP relay agent uses the same criteria and methods for forwarding both DHCP and BootP packets. The DHCP Relay is disabled by default. To enable it complete the following steps:

STEP 1: Access the BootP/DHCP Relay screen by clicking on **DHCP Server** on the Advanced Menu, and then click the **BootP/DHCP Relay** tab.

STEP 2: In the DHCP Relay field, select **Enable**.

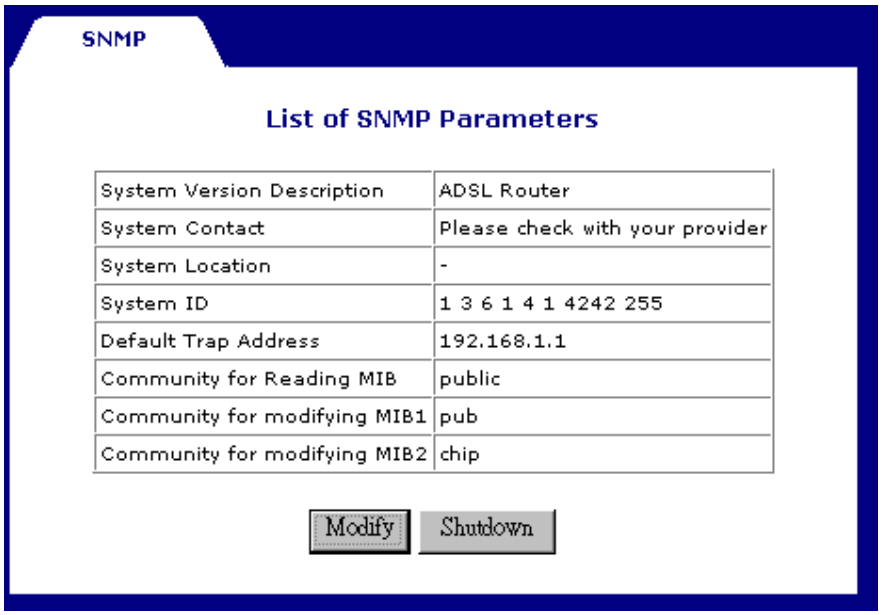
STEP 3: Enter the IP Address of a numbered network interface that you want to receive BOOTREQUEST or DHCP packets from clients.

STEP 4: Click on the **Apply** button.



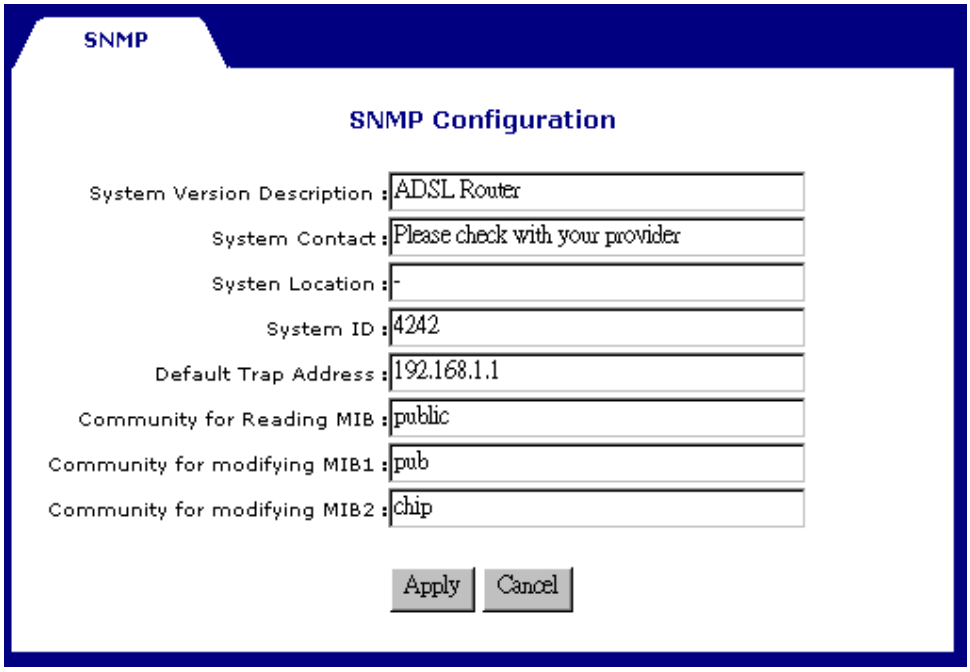
6.5 SNMP

SNMP is a software entity that responds to information and action request messages sent by a network management station. The messages exchanged enable you to access and manage objects in an active or inactive (stored) MIB on a particular router. To configure the SNMP parameters, click the **SNMP** button on the Advanced menu bar. The window displays the SNMP parameters.



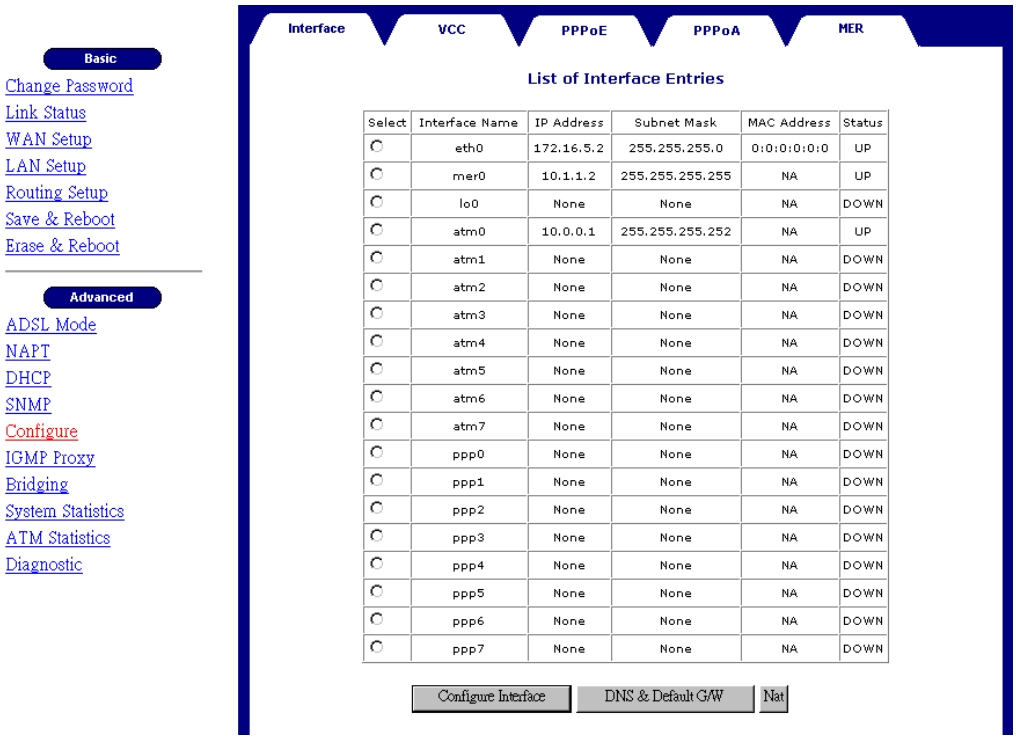
6.5.1 Modifying SNMP Parameters

To modify the SNMP parameters, click the Modify button at the bottom of the screen. Click Apply to submit the settings.



6.6 Configure

From this page you can configure LAN and WAN interfaces, VCC, PPPoE, PPPoA, DNS & Default Gateway, and NAT.



6.6.1 Configure Interface

To configure an interface, select it by clicking in the round-box on the left in the screen. Then click on the Configure Interface button at the bottom of the screen. Note the following:

Interfaces:

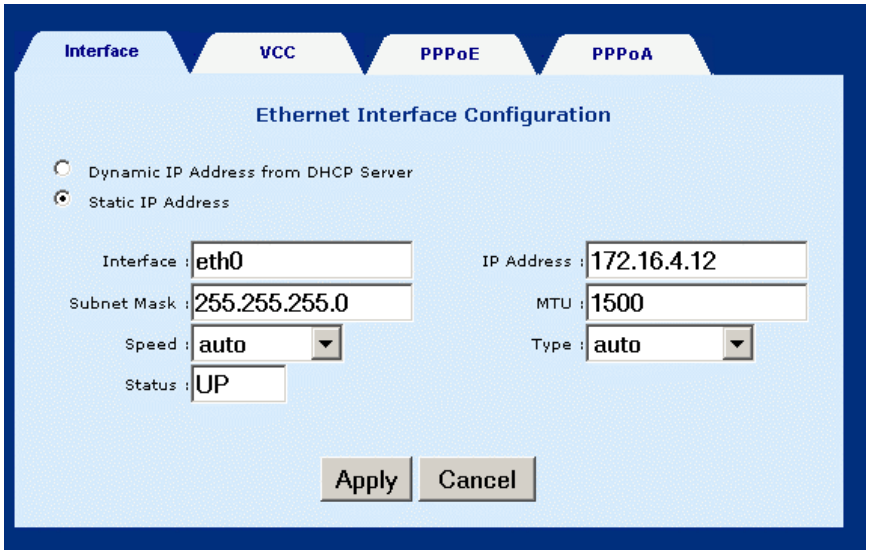
- **Interface mer0** usage is reserved; its status is always **Down**.
- **Interface lo0** is the loopback interface. When an OAM loopback is performed, the status field displays UP.
- **Interfaces Atm1 to Atm 7** display the interfaces configured for RFC1483 Bridged mode or RFC 1483 Routed mode.

- **Interfaces pppo to ppp7** display the interfaces configured for PPPoE or PPPoA.

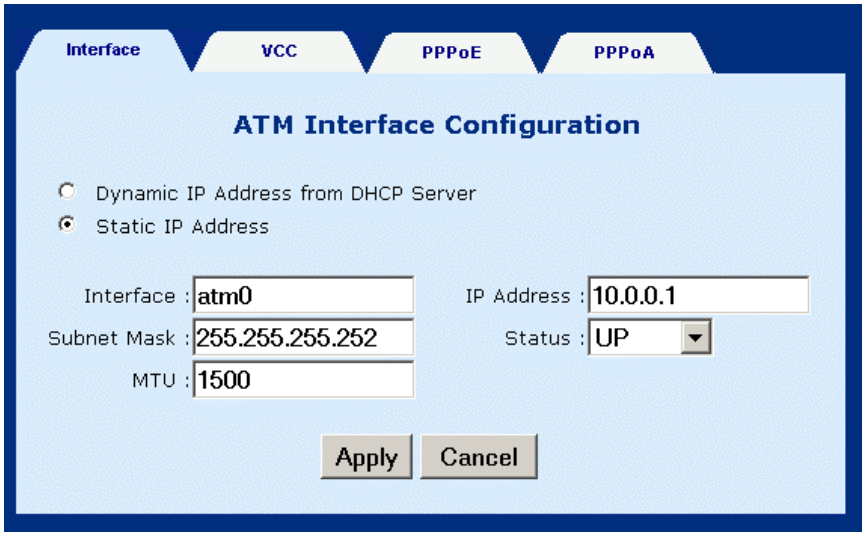
Parameters:

- **Dynamic IP address from DHCP:** Selects the IP address to be assigned by the DHCP server.
- **Static IP address:** Selects the IP address to be statically assigned.
- **Interface:** The name of the interface currently selected.
- **IP address:** The IP address of the selected interface.
- **Subnet Mask:** The subnet mask of the selected interface.
- **MTU:** Sets the maximum transmission unit of the interface. The MTU is used to limit the size of packets that are transmitted on an interface. Not all interfaces support the MTU parameter, and some interfaces, like Ethernet, have range restrictions (80 - 1500).
- **Speed:** Auto, 10 Mbps, or 100 Mbps
- **Status:** UP and Down. When an interface is set to **Down**, the system will not attempt to transmit messages through that interface. When set to **UP**, messages can be transmitted through the interface.

The following is the screen shot for the LAN interface (eth0).



The following is a screen shot for the ATM interface.



6.6.2 DNS & Default Gateway:

To configure the DNS and default gateway, complete the following steps:

STEP 1: Click on **Configure** in the menu bar.

STEP 2: Click on **DNS and default gateway** at the bottom of the configuration page.

STEP 3: Complete the fields below:

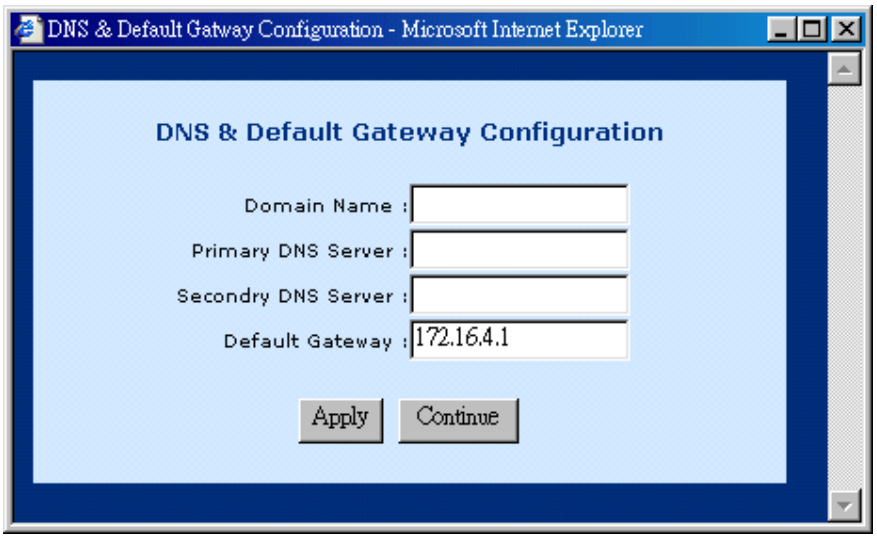
Domain Name: user-defined

Primary DNS server: Enter the primary server IP address.

Secondary DNS server: Enter the secondary server IP address that will be used in the event that the primary server IP address fails or is not available

Default Gateway: The gateway IP address of the IP network

STEP 4: Submit the settings by clicking **Apply**.



6.6.3 NAT

When NAT is enabled for a WAN interface, all private addresses are mapped to the IP address of the specified WAN interface. To enable or disable NAT on an ATM interface complete the following steps:

STEP 1: Click on **Configure** in the menu bar.

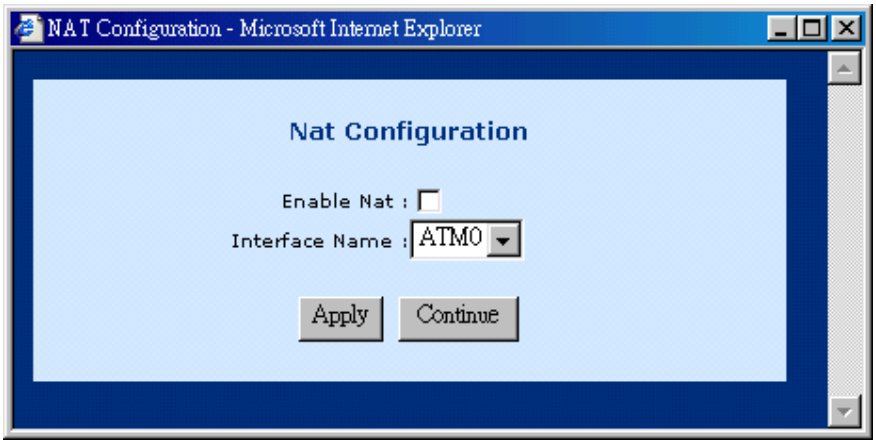
STEP 2: Click on **NAT** at the bottom of the configuration page.

STEP 3: Complete the fields described below:

Enable NAT Tick this box to **enable** NAT or leave it blank to **disable** it.

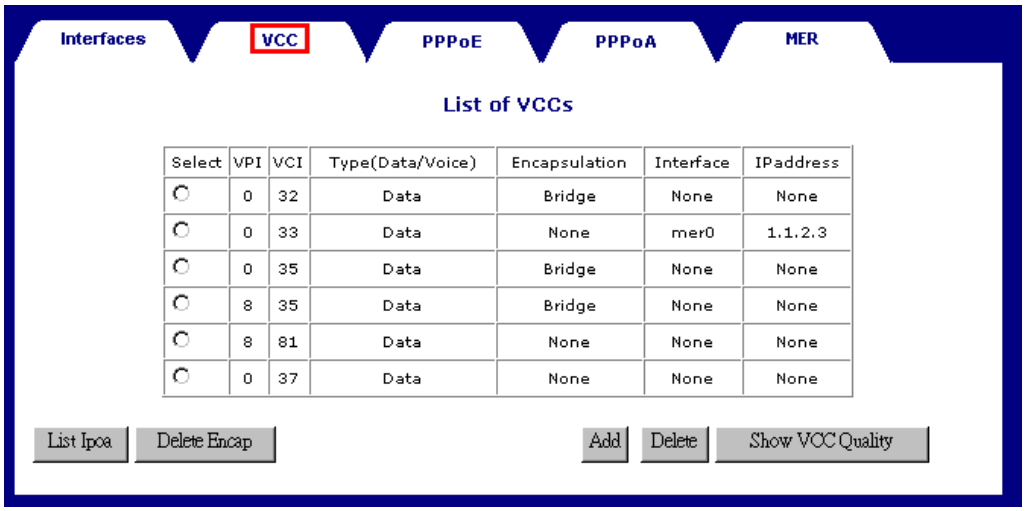
Interface Name select an interface from ATM 0 to ATM 7

STEP 4: Click **Apply** to submit the setting.



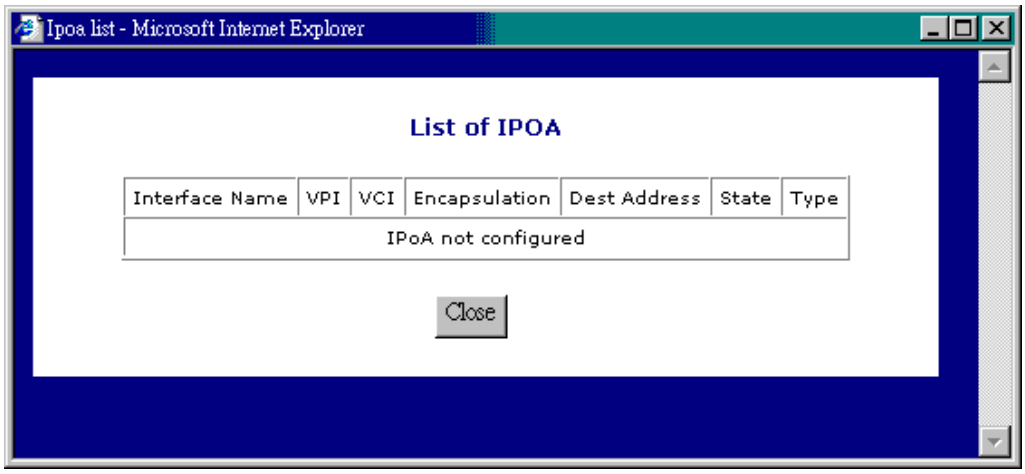
6.7 VCC

This screen lists all current VCC entries in the middle of the screen. From this screen you can also: List IPoA, Delete Encapsulation, Add a VCC, Delete a VCC, and Show VCC quality.

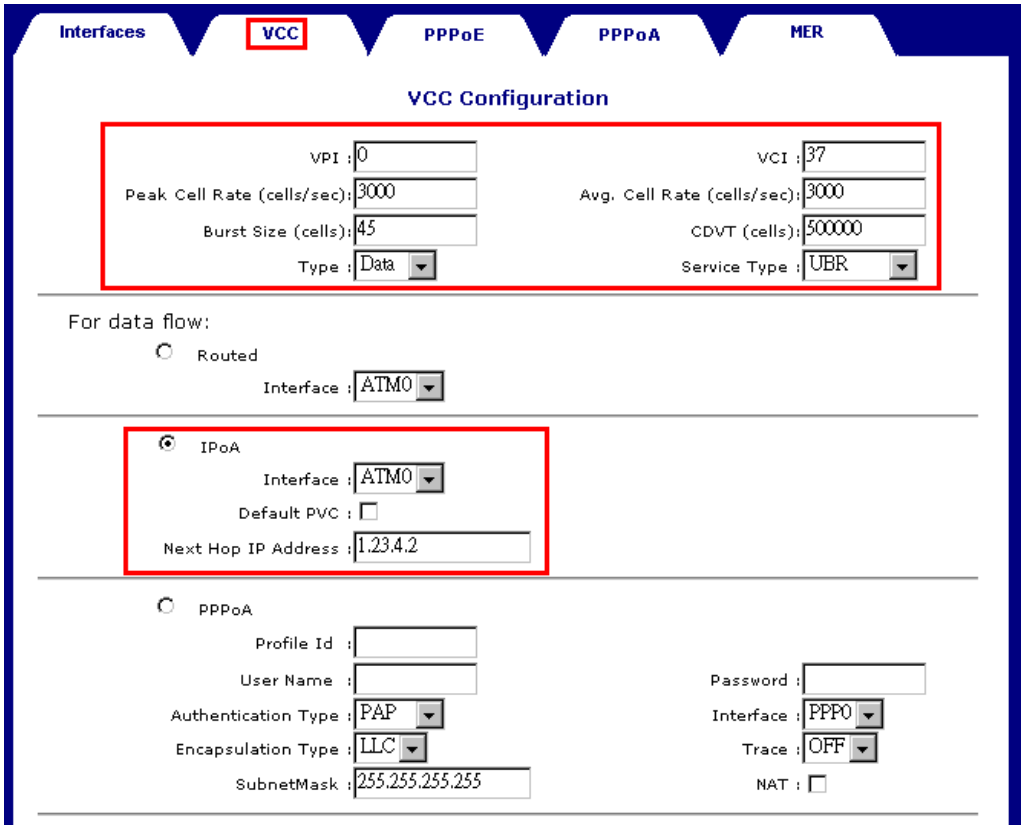


6.7.1 List IPoA

To list IP over ATM information click on the **IPoA** button at the bottom-left of the screen.



The IPoA entry is set up from Advanced>Configure>VCC。 Click the Add button on the List of VCC screen.



6.7.2 Delete Encapsulation

To delete encapsulation first select a VCC entry and then click the **Delete Encap** button.

6.7.3 Add a VCC

To add a VCC entry, complete the following steps:

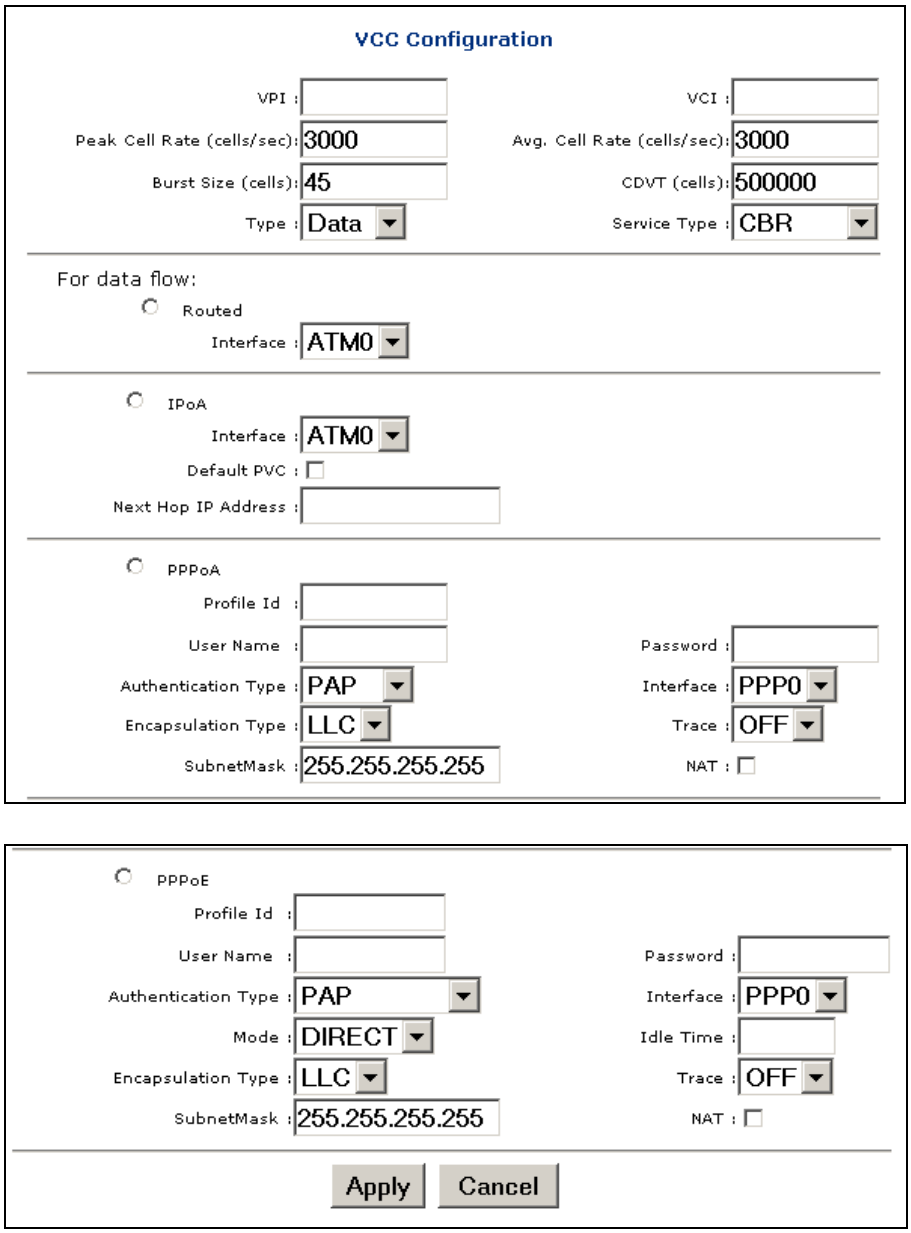
STEP 1: Click on the Add VCC button, the VCC screen will appear.

STEP 2: Enter values for the parameters (explained below).

STEP 3: Click the **Apply** button at the bottom of the page.

vpi:	Virtual Path Identifier (VPI) that identifies this ATM connection. The vpi is integer numbers which can range from 0 to 4095.
vci:	Virtual Channel Identifier (VCI) that identifies this ATM connection. The vci is an integer number which can range from 65,535.
Peak Cell rate (cells/sec):	Defines the fastest rate a user can send cells to the network. It is expressed in units of cells per second.
Average Cell rate (cells/sec):	Defines the maximum sustainable/average rate a user can send cells to the network. It is expressed in cells per second. This specifies the bandwidth utilization. This value must always be less than or equal to the Peak Cell Rate.
Burst size (cells):	Maximum number of cells the user can send at the peak rate in a burst, within a sustainable rate.
CDVT (cells):	Constrains the number of cells the user can send to the network at the maximum line rate.
Type:	Select data or voice
Service Type: **cbr** Constant Bit Rate: **rtvbr** Real Time Variable Bit Rate: **Nrtvbr** Non Real Time Variable Bit Rate:	Supports real-time applications requiring a fixed amount of bandwidth. The applications produce data at regular intervals such as a video stream. The user can specify how much bandwidth they wish to reserve. Supports time-sensitive applications such as voice. In these applications the rate at which cells arrive are varied. Supports applications that have no constraints on delay and delay variation, but still have variable-rate and bursty traffic characteristics.

Ubr Unspecified Bit Rate:	Best effort service that does not require tightly constrained delay and delay variation. UBR provides no specific quality of service or guaranteed throughput.



6.7.4 Delete a VCC

To delete a VCC entry, select the entry from the list of VCCs and then click on the **delete** button, at the bottom-right of the page.

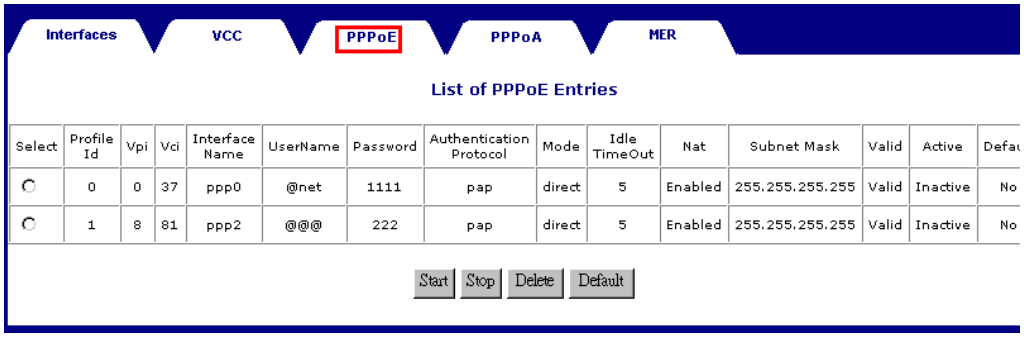
6.7.5 Show VCC quality

To view information regarding the VCC quality, click on the **Show VCC Quality** button, at the bottom-right of the page.

6.7.6 PPPoE

This section will describe how to start, stop, delete, and set a default PPPoE entry. To configure a PPPoE entry in more detail, refer to Chapter 9 Add A VC.

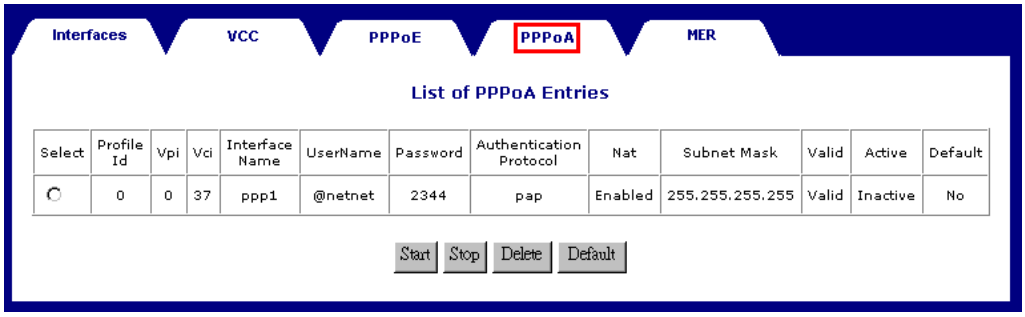
The PPPoE page can be accessed by clicking on **Configure** in the Advanced menu bar. To start, stop, delete, or set as default a PPPoE entry first select the entry from the List of PPPoE entries, and then click the corresponding button at the bottom of the page.



6.8 PPPoA

This section will describe how to start, stop, delete, and set a default PPPoA entry. To configure a PPPoA entry in more detail, refer to Chapter 9 Add A VC.

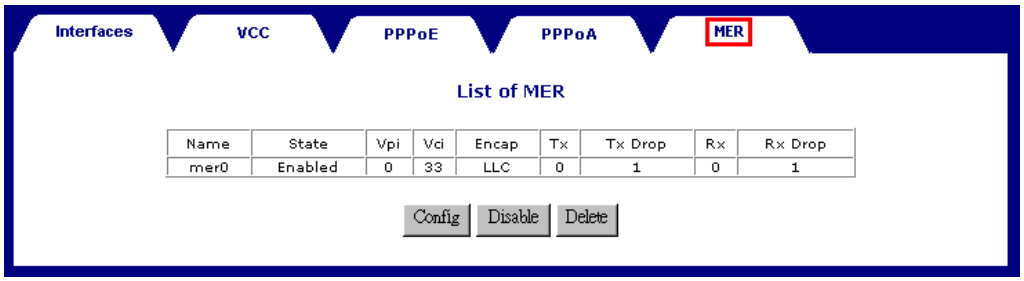
The PPPoA page can be accessed by clicking on **Configure** in the Advanced menu bar. To start, stop, delete, or set as default a PPPoA entry first select the entry from the List of PPPoA entries, and then click the corresponding button at the bottom of the page.



6.9 MER

This section will describe how to configure, enable, disable, or delete a MER entry. The ATU-R supports one MER entry (named mer0). To configure a MER entry in more detail, refer to Chapter 9 Add A VC.

The MER page can be accessed by clicking on **Configure** in the Advanced menu bar, and click the MER's tab. The page allows configuring, enabling, disabling, or deleting a MER entry. The Enable button displays when no MER entry is established or when mer0 is disabled. If a MER entry was established, the Disable button displays on the screen.



6.10 IGMP

IGMP (Internet Group Membership Protocol) is a protocol used by IP hosts to report their multicast group memberships to any immediately neighboring multicast routers.

6.10.1 Add an IGMP entry

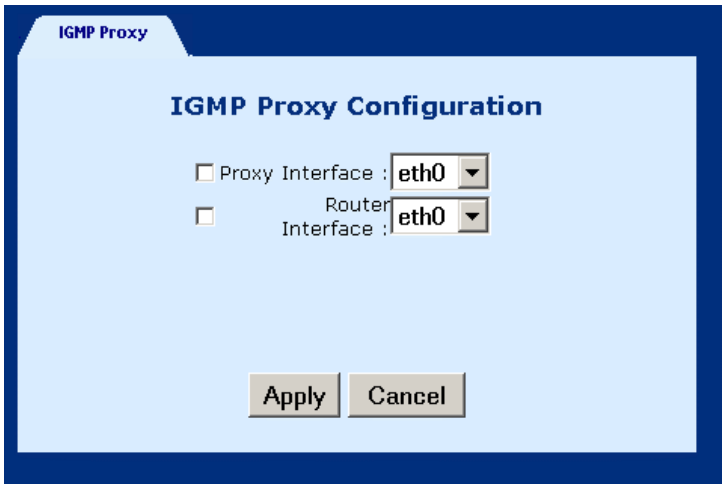
To add an IGMP proxy, complete the following steps:

STEP 1: Select **IGMP Proxy**, from the menu bar.

STEP 2: Click **Add** at the bottom of the screen.

STEP 3: Select Proxy interface, router interface, or both, by checking the box next to the interface and then use the pull-down menu to the left to select the eth, atm, or ppp Interface.

STEP 4: Click **Apply** to activate the parameters.



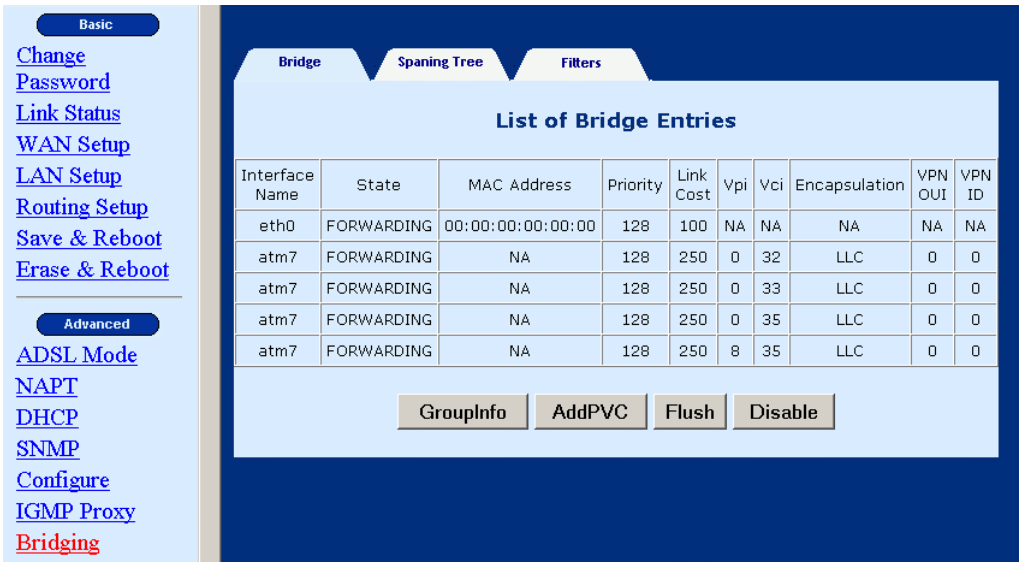
6.10.2 Delete an IGMP entry

To delete an entry, select an entry from the list, and click **Delete**.

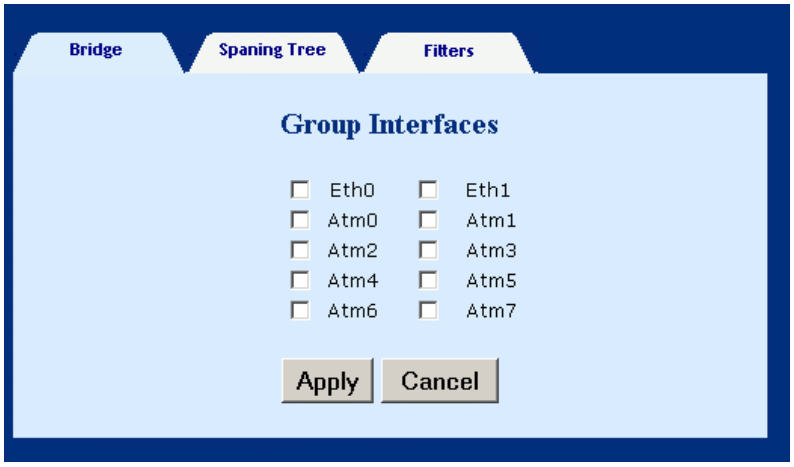
6.11 Bridging

6.11.1 Bridge

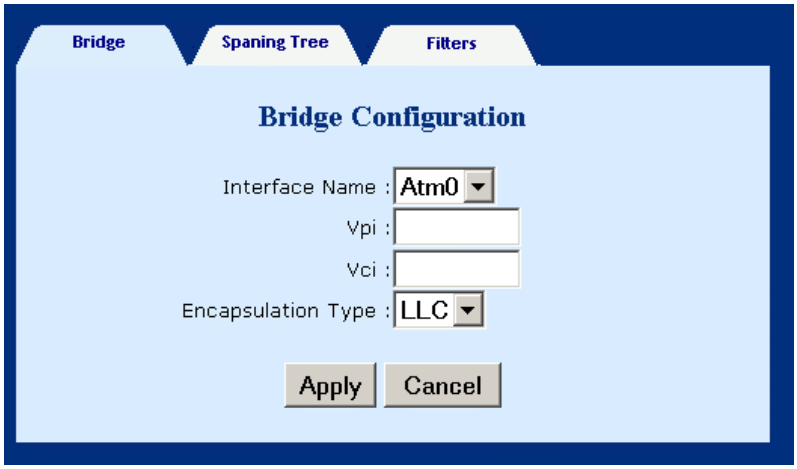
The Bridge window displays the configured Bridging PVC entries of the interfaces. There are four buttons at the bottom of the main-pane: Group Info, Add PVC, Flush, and Disable.



- **GroupInfo:** This configures the LAN packets that will travel through the LAN interface to the selected WAN interfaces. If you wish to change the interfaces that are configured you must first click on the **Flush button** (to remove the current ocnfiguration), and then click on the **Group Info** button, select the group interfaces and then click the **Apply** button. You must select eth0, as eth1 is not enabled for this product version.



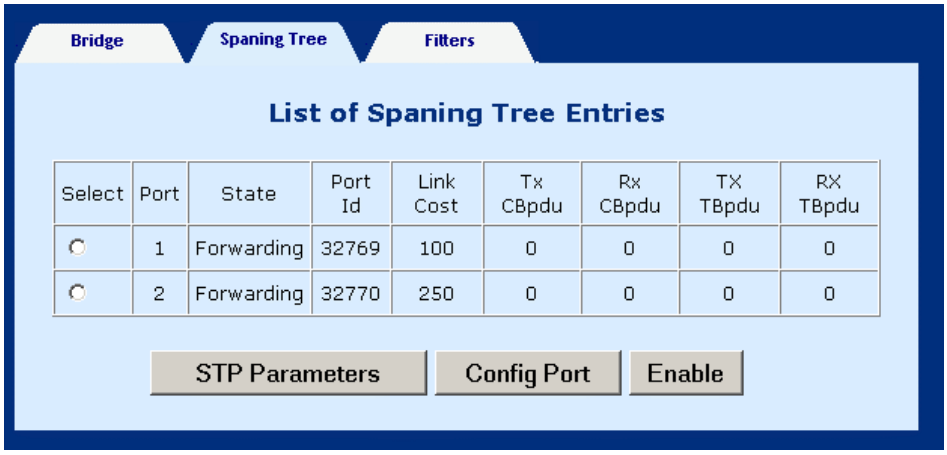
- **AddPVC:** You can add a PVC to the ATM interface. From the **Bridging** screen, select an ATM interface Vpi, Vci and Encapsulation type and then click **Apply**.



- **Flush:** Selecting this command from the **Bridging** screen, will flush all PVC entries.
- **Disable:** Selecting this command from the **Bridging** screen, will disable the PVCs but retain the parameters, so that they can be enabled at a later point.

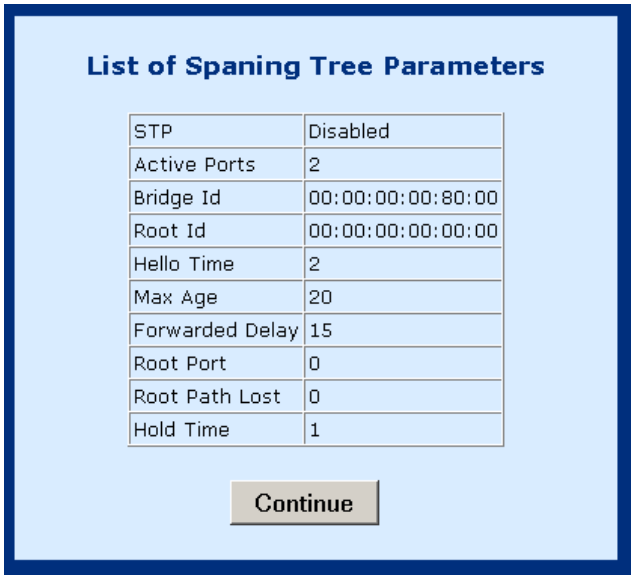
6.11.2 Spanning tree

To access the spanning tree menu click the **Spanning Tree** tab, located at the top of the **Bridging** screen.



6.11.3 View STP parameters

To view the STP parameters, click the **STP parameters** tab, located at the bottom of the Spanning Tree screen.



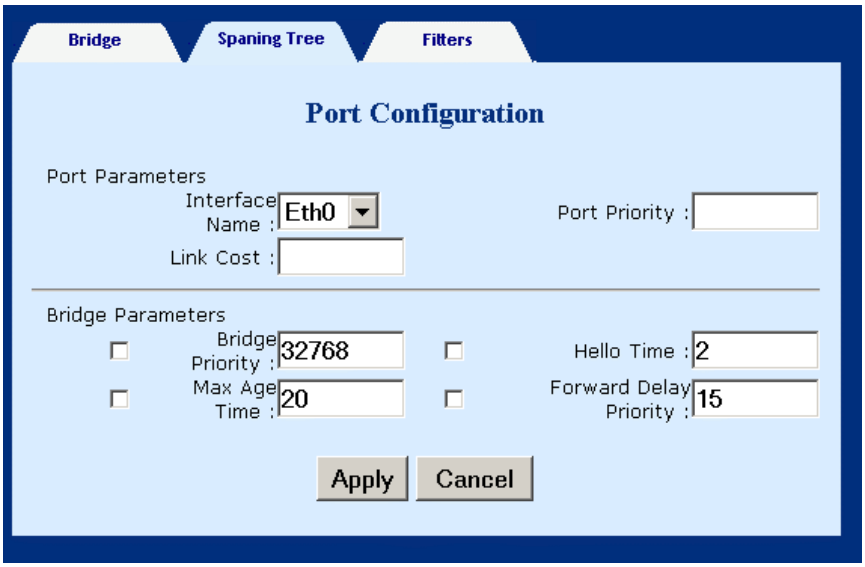
6.11.4 To configure STP parameters

STEP 1: click the **Spanning Tree** tab, located at the top of the **Bridging** screen.

STEP 2: Click the Configure Port button.

STEP 3: Configure the parameters.

STEP 4: Click the Apply button.

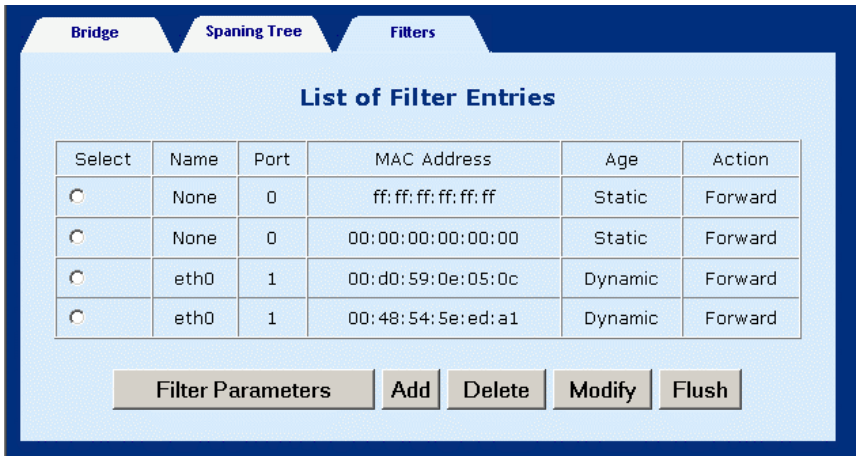


6.11.5 Enable/Disable STP

If you wish to Enable/Disable a STP entry, select the entry and then click the **Enable** or **Disable** Button, which is located at the bottom-right of the Spanning Tree screen. Note that if the entry is already enabled the Disable button will be present. Conversely, if the entry is disabled then the Enable button will be present.

6.12 Filtering

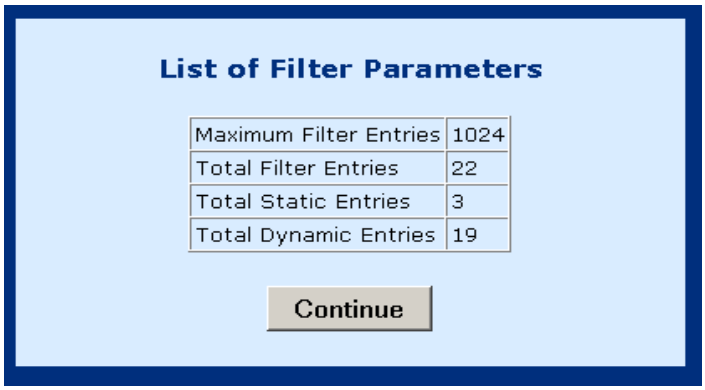
Filtering is a type of firewall that is useful to increase network security or to limit unwanted traffic. Filters for this device are based on MAC addresses. The page opens with a list of the currently configured filter entries. From this page, you can also view Filter Parameters, add a filter, delete a filter, modify a filter, or flush filter parameters. These functions are described below.



6.12.1 List of filter entries

To display a list of filter parameters click the **Filter parameters** button at the bottom of the Filters page. The following parameters are displayed:

Maximum filter entries	The number of filter entries that can potentially be set
Total filter entries	The number of filter entries that are currently set
Total static entries	The number of static entries that are currently set
Total dynamic entries	The number of dynamic entries that are currently set



6.12.2 Add a filter entry

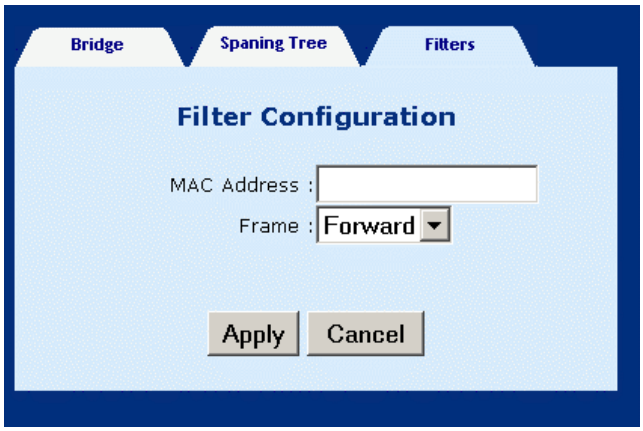
To add a filtering entry, complete the following steps:

STEP 1: Click the **Add** button at the bottom of the Filters page.

STEP 2: Enter the MAC address

STEP 3: Set the Frame to **forward** to forward packets which match the MAC address, or **Drop**, to drop matching packets.

STEP 4: Click **Apply**



6.12.3 Delete a filter entry

To delete a filtering entry Select an entry and then click the **Delete** button at the bottom of the Filters page.

6.12.4 Modify a filter entry

To modify a filter select the entry and then click the **Modify** button at the bottom of the Filters page.

6.12.5 Flush filter entries

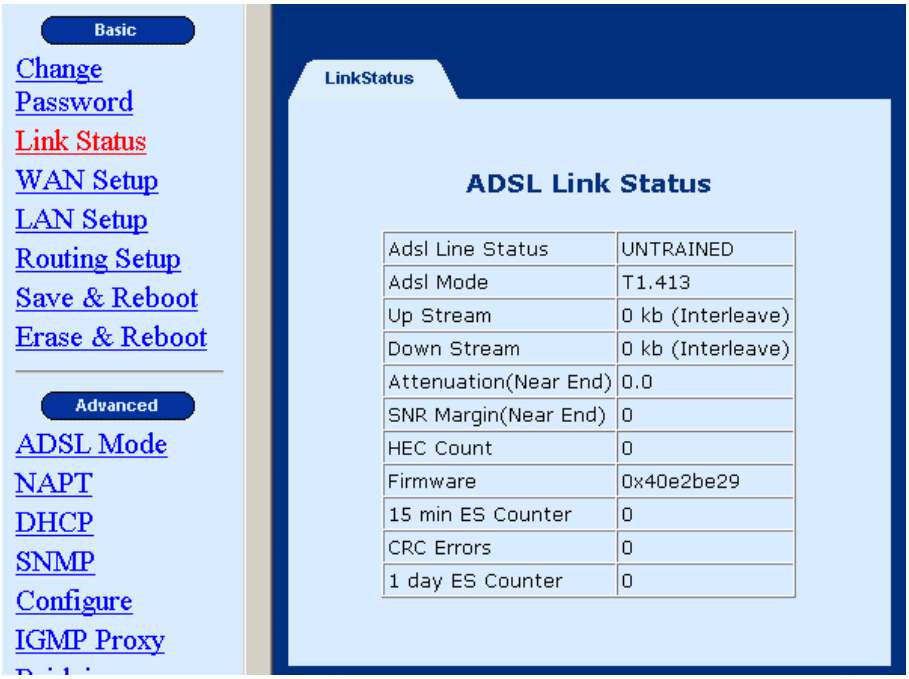
To flush all the filtering entries, click the **Flush** button at the bottom of the Filters page.

Chapter 7 Performance monitoring

7.1 ADSL Link Status

To view the ADSL link status, click **Link Status** on the tool bar.

ADSL Line Status	Shows the current status of the ADSL line
ADSL Mode	Shows the ADSL standard that is currently configured. The standards are: MULTI, T1.413, G.DMT, and G.LITE.
Upstream	Upstream data rate negotiated by DSL link (Kbit/s)
Downstream	Downstream data rate negotiated by DSL link (Kbit/s)
Attenuation	Current attenuation (dB)
SNR Margin	Current SNR margin (dB)
HEC	Number of ATM cells received with errors since start of link.
Firmware	The version number of the firmware
15 min ES counter	Number of errored seconds for the current 15 minute period
CRC errors	Number of errors per second since training
1 day ES counter	Number of errored seconds for the current day



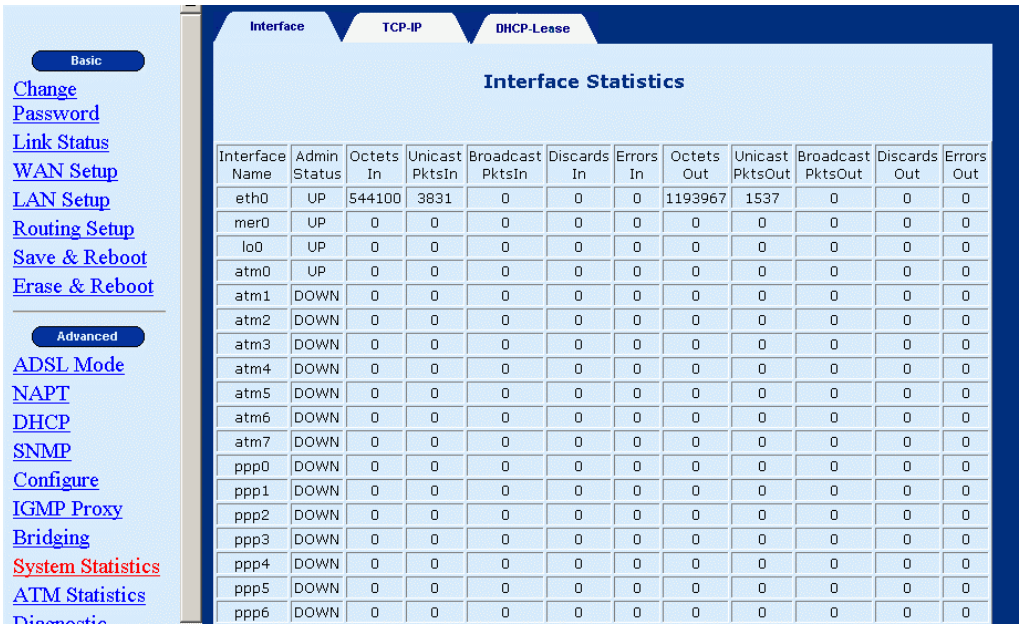
7.2 System statistics

To view the system statistics, click on the **System Statistics** button located near the bottom of the menu-bar. Statistics are recorded regarding Interfaces, TCP-IP, and DHCP-Lease.

7.2.1 Interface Statistics

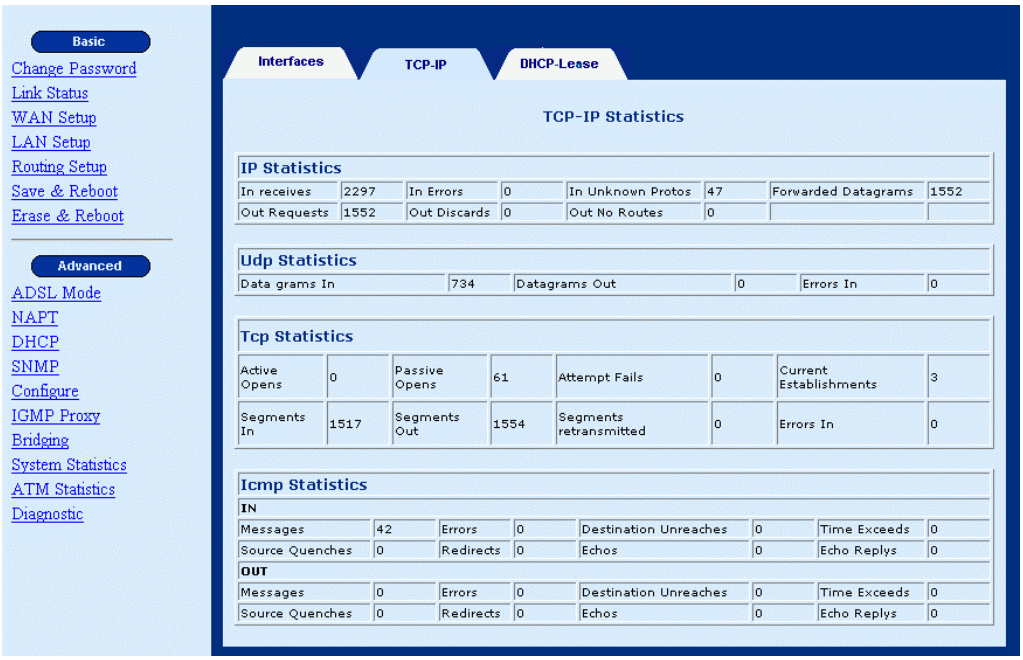
To display the interface statistics, click the **Interface** tab, located at the top-left of the System Statistics screen. The Interface Statistics page displays statistics for all interfaces. The following information is displayed:

Interface Name	The name of the interface
Admin Status	Indicates whether the interface is Up or Down
Octets In	The number of Octets (bytes) recieved
Unicast PktsIn	The number of unicast packets received
Broadcast PktsIn	The number of broadcast packets received
Discards In	The number of packets received that were discarded
Errors In	The number of inward errors
Octets Out	The number of Octets (bytes) transmitted
Unicast PktsOut	The number of unicast packets transmitted
Broadcast PktsOut	The number of broadcast packets transmitted
Discards Out	The number of packets transmitted that were discarded
Errors Out	The number of outward errors



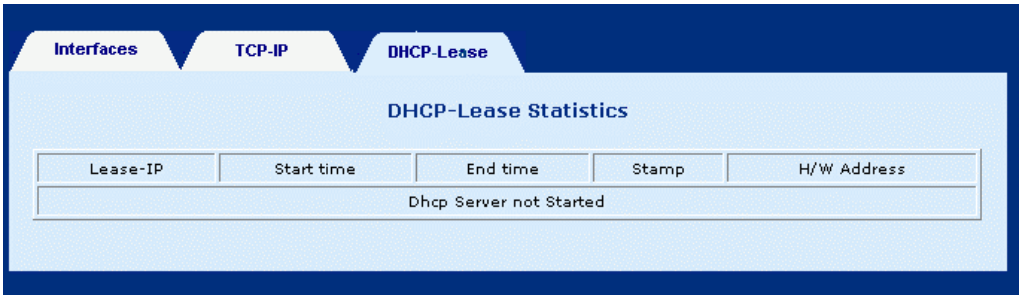
7.2.2 TCP-IP

To view TCP-IP statistics click on the **TCP-IP** tab at the top of the System Statistics page. The TCP-IP page displays the IP statistics, UDP statistics, TCP statistics, and ICMP statistics.



7.2.3 DHCP-Lease

To view TCP-IP statistics click on the **DHCP-Lease** tab at the top of the System Statistics page. The DHCP-Lease page shows the PCs that obtained an IP address from the DHCP pool.

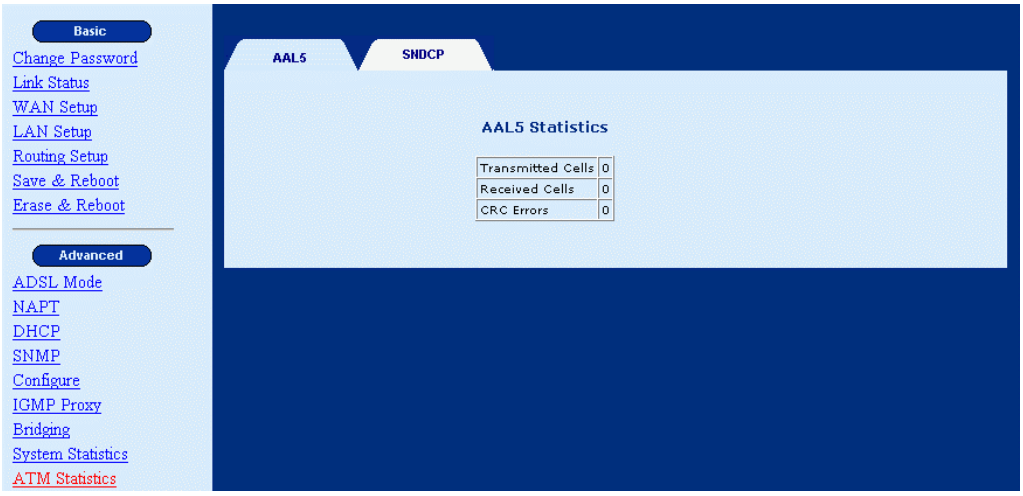


7.3 ATM statistics

Click on **ATM Statistics** on the menu-bar to display the ATM Statistics. The ATM Statistics page monitors information for AAL5 and Encapsulation.

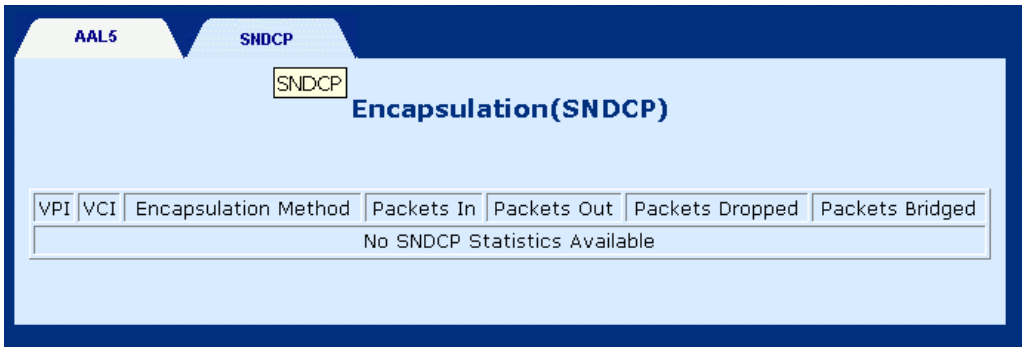
7.3.1 AAL5

The AAL5 page shows the AAl5 statistics.



7.3.2 Encapsulation

Click on the **SNDCP** tab to display encapsulation statistics. This page displays the VCs that are running. (SNDCP stands for sub-network dependency convergency protocol).



Chapter 8 Diagnostics

To access the Diagnostics screen, click the **Diagnostics** button, which is located on the menu bar. The Diagnostics screen has two test functions: OAM Loopback and Ping test.

8.1 OAM Loopback

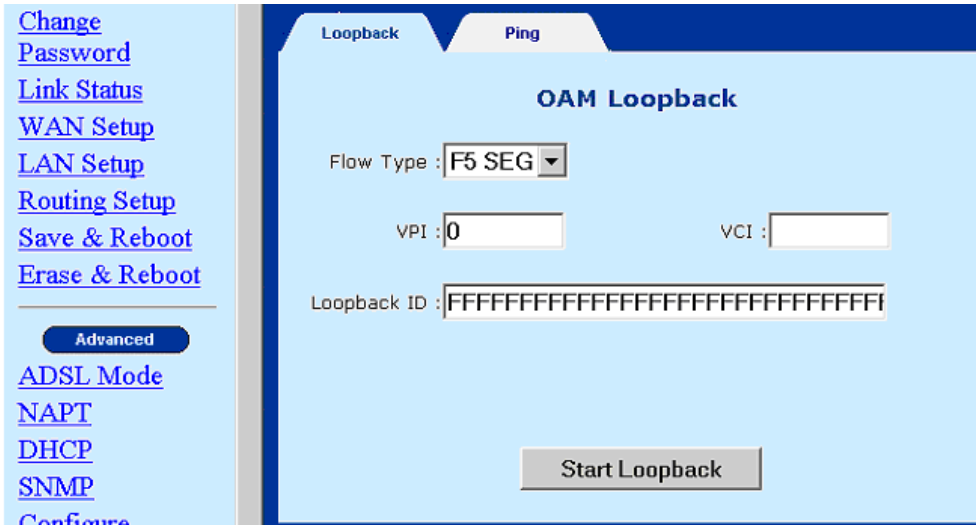
STEP 1: click the **Diagnostics** button, on the menu bar.

STEP 2: Click the **Loopback** tab on the Diagnostics screen.

STEP 3: Enter the following information to run the OAM loopback:

- Flow type: F5 SEG (Segment to Segment) and F5 ETE (End-to-End). The **SEG** loopback is from ATUR to DSLAM. The **ETE** loopback is from ATUR to the ISP RAS.
- VPI and VCI: Specify the virtual channel that will run the OAM loopback.
- Loopback ID: Type the loopback pattern for the loopback

STEP 4: Click the **Start Loopback** button at the bottom of the screen.

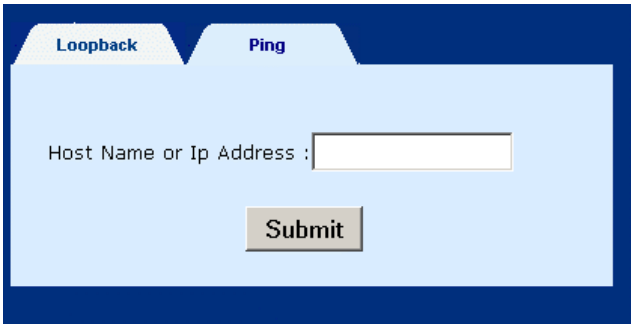


8.2 Ping

A Ping test is used to verify the status of a network connection after the RIP or static route function is enabled. Ping sends a request message to the host and waits for a return message. This diagnostic function can verify if the remote host is reachable. Ping can also measure the round-trip time to the remote host.

To access the Ping test screen, click the **Ping** tab on the Diagnostics screen.

Enter the **Host Name** or **IP address** of the remote terminal and click **Submit** to start the ping and display the results.



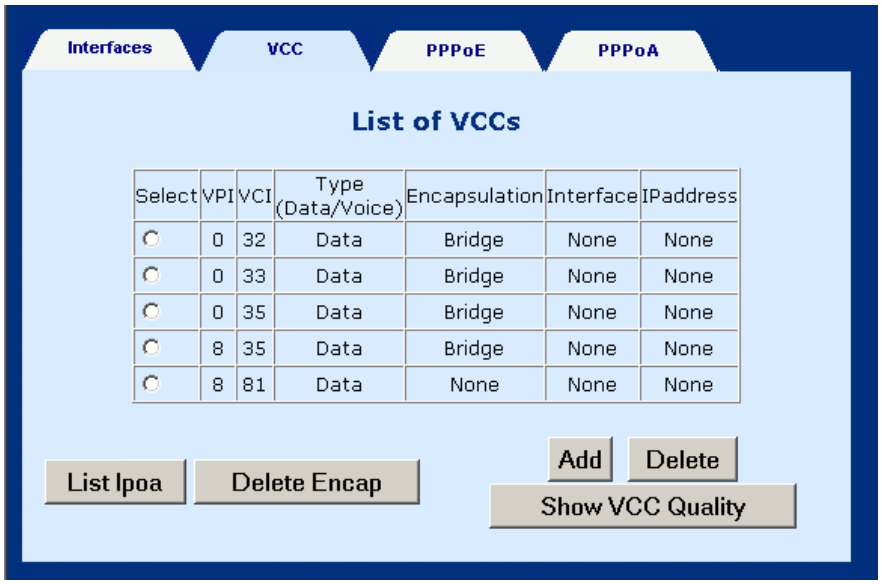
The following is an example of the ping result. The information displayed is as follows:

Packets transmitted	The number of packets that were transmitted
Packets received	The number of packets that were received
Packets lost	The number of packets lost (transmitted-received)
Minimum round trip time	The fastest round-trip time
Maximum round trip time	The slowest round-trip time

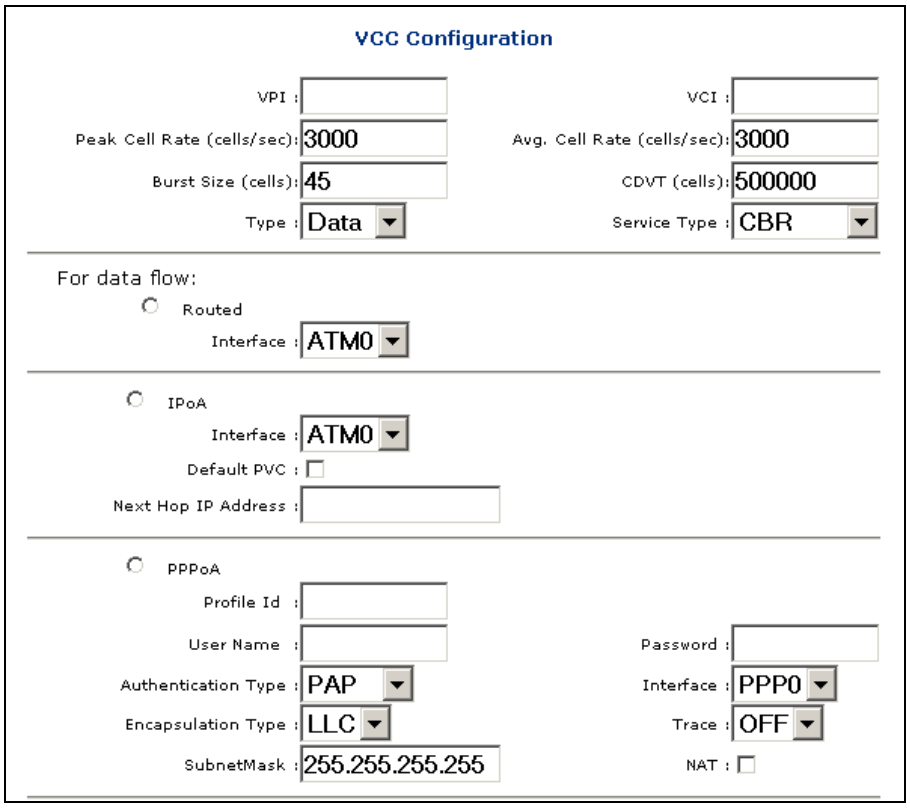
Chapter 9 Adding a PVC

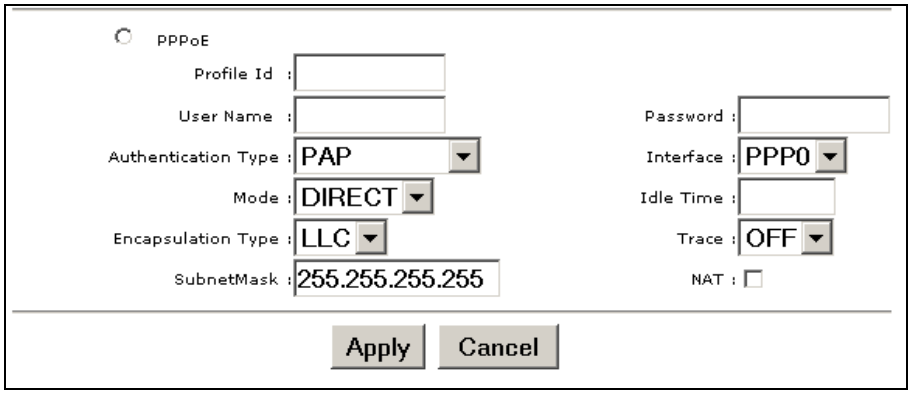
STEP 1: Click Configure from the Advanced menu bar.

STEP 2: Click the VCC tab.



STEP 3: Click **Add**

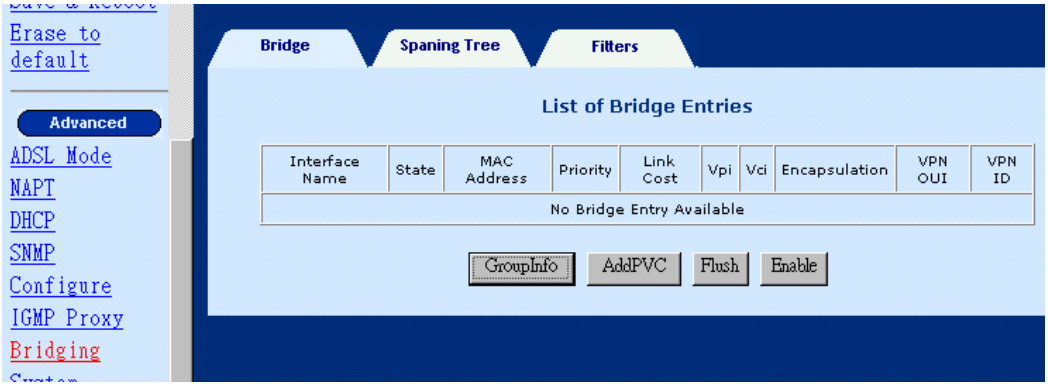




STEP 4: Configure the parameters on this page and click **Apply** to submit the settings.

STEP 5: Save the settings and reboot the device.

STEP 6: Click **Bridging** on the Advanced menu bar.

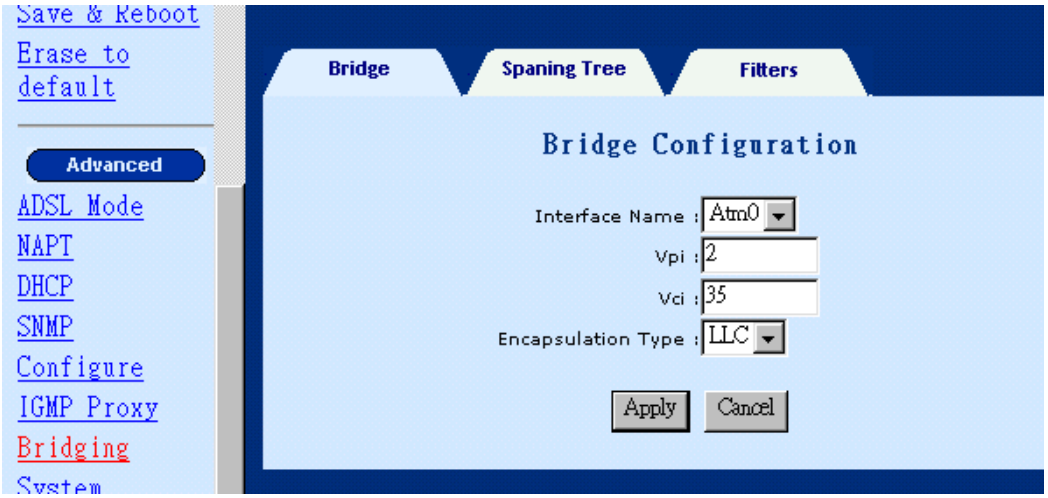


STEP 7: Click the **GroupInfo** button.

STEP 8: Specify the interfaces that data will be transmitted to the Internet from the LAN port (eth0). The item eth0 must be checked, and also check the ATM interface (s) that data can be forwarded from the LAN interface.

STEP 9: Click Apply to submit the settings.

STEP 10: Return to the previous page and click **AddPVC**.



STEP 11: Type the VPI and VCI values that were established in Step 4, and select an Encapsulation type. Click Apply to submit the settings.

STEP 12: Return to the previous page and select an bridging entry from the List of entries, and click **Enable** to enable the PVC.

Appendix A: Specifications

- **WAN interface (one ADSL port)**

Item	Specifications
ADSL standard	DMT
G.DMT data rate	Downstream: 8 Mbps
	Upstream: 1 Mbps

- **ATM attributes**

Item	Specifications
PPP over AAL5	RFC2364
Multi-protocol over AAL5	RFC2684 (1483)
VCs	8
AAL type	AAL5
ATM service class	UBR/CBR/VBR
ATM UNI support	UNI 3.1 PVC
OAM F4/F5	Yes

- **Management**

Item	Specifications
Console port	RS232/DB9
SNMP	Yes
TR-006 ADSL line MIB	Yes
Telnet	Yes
Web-based management	Yes
Configuration backup and restoration	Yes
LED indicators	ADSL status, LAN status, Power

- **Local interface (1 port Ethernet Switch)**

Item	Specifications
Standard	IEEE 802.3 10/100BaseT
Transparent bridging and learning	Yes

- **Routing functions**

Item	Specifications
IP static route	Yes
RIP and RIPv2	Yes

- **Network functions**

Item	Specifications
ARP	Yes
DNS, NAT/PAT, DHCP/BOOTP	Yes
PAP, CHAP	Yes

- **Power supply**

Item	Specifications
Power source	110 VAC or 220 VAC (50 or 60 Hz)

- **Environmental conditions**

Item	Specifications
Operating temperature	0 to 50 degrees Celsius
Relative humidity	5% to 90% (non-condensing)

Appendix B: Pin Assignments

Console Port (RS232 DB9)

Pin number	Definition		Pin number
1	NC		6
2	TD		7
3	RD		8
4	NC		9
5	GND		

Pin Assignments of the Console Port

Line port (RJ11)

Pin	Definition	Pin	Definition
1	-	4	ADSL_TIP
2	-	5	-
3	ADSL_RING	6	-

Pin Assignments of the RJ11 Port

LAN Port (RJ45)

Pin number	Definition	Pin number	Definition
1	Transmit data+	5	NC
2	Transmit data-	6	Receive data-
3	Receive data+	7	NC
4	NC	8	NC

Pin assignments of the LAN Port