

# **AAM6030BI**

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## **User Manual**

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Rev. 1.00

Version date: Oct. 20, 2004

## Table of Contents

1.	Introduction	4
1.1	Features & System Requirements	4
2.	Your CPE at a glance	5
2.1	Ports and buttons (Back panel)	5
2.2	LED description (Front panel)	5
2.3	LED table & parts list	5
3.	Getting Start	7
3.1	Connecting the Hardware	7
3.1.1	Connect the ADSL line	7
3.1.2	Connect the computers or a LAN	7
3.1.3	Attach the power adapter	7
3.1.4	Turn on your computer	7
3.2	Configuring Your PC	8
3.2.1	Windows XP:	8
3.2.2	Windows 2000:	8
3.2.3	Windows Me:	9
3.2.4	Windows 95, 98:	10
3.2.5	Windows NT 4.0:	11
3.2.6	Assigning IP to your PC automatically by DHCP	11
4.	Setting up your CPE	12
4.1	Log into your CPE	12
4.2	Home screen	12
4.3	Setup	13
4.3.1	Wide Area Network connection	14
4.3.2	Local Area Network connection	14
4.4	Configuring the WAN	14
4.4.1	New Connection	14
4.4.2	Modify an Existing Connection	19
4.4.3	Modem setup	19
4.5	Configuring the LAN	20
4.5.1	Enable/Disable DHCP	20
4.5.2	Changing the CPEs IP address	21
4.5.3	Firewall/NAT Services	22
4.6	Advanced	22
4.6.1	UPnP	23
4.6.2	Port Forwarding	24
4.6.3	IP QoS/IP filters	25
4.6.4	Access Control	26
4.6.5	LAN clients	26
4.6.6	Bridge Filters	26
4.6.7	Multicast/IGMP Snooping	28
4.6.8	Static Routing	29
4.6.9	Dynamic Routing	30
4.6.10	VLAN	31
4.7	Tools	32

4.7.1	System Commands	32
4.7.2	Remote Log	32
4.7.3	User Management	32
4.7.4	Update Gateway	33
4.7.5	Ping Test	33
4.7.6	Modem Test	34
4.8	Status	34
4.8.1	Network Statistics	34
4.8.2	Connection Status	34
4.8.3	DHCP Clients	34
4.8.4	Modem Status	34
4.8.5	Product Information	34
4.8.6	System Log	35
5.	Appendix A: Troubleshooting	36
5.1	The CPE is not functional	36
5.2	I can't connect to the CPE.	36
5.3	The LEDs blink in a sequential pattern.	36
5.4	The DSL Link LED continues to blink but does not go solid	37
5.5	The DSL Link LED is always off	37
6.	Router terms	38

## **1. Introduction**

Congratulations on becoming the owner of a AAM6030BI CPE (Customer Premises Equipment). Your LAN (Local Area Network) will now be able to access the Internet via the CPE's ADSL connection. This User Manual will show you how to set up the AAM6030BI CPE, and how to customize its configuration to get the most out of this product.

### **1.1 Features & System Requirements**

#### ● Features

- Equipped with a 4 Port 10/100 Ethernet
- Connects multiple PCs to the Internet with just one WAN IP Address (when configured in router mode with NAT enabled)
- Configurable through user-friendly web pages
- Supports Single-Session IPSec and PPTP Pass-Through for Virtual Private Network (VPN)
- Several popular games are already pre configured. Just enable the game and the port settings are automatically configured.
- Configurable as a DHCP Server on Your Network
- Compatible with virtually all standard Internet applications
- Industry standard and interoperable DSL interface
- Simple web based status page displays a snapshot of your system configuration, and links to the configuration pages
- Downloadable flash software upgrades
- Support for up to 8 Permanent Virtual Circuits (PVC)
- Support for up to 8 PPPOE sessions
- Layer 2 Ether switch (not a hub)
- Allow PVC assignment to the individual Ethernet Ports (i.e 0,35 -> Ethernet Port 1, 0,36 -> Ethernet Port 2, etc)
  - The modem must support the ability to map PVC's to physical Ethernet ports. This will likely be implemented via VLAN to associate the Port to the PVC. The VLAN would then be only locally significant, i.e it is untagged in both directions and does not exist in the DSLAM realm or in the customer network realm. The most important thing is to prevent multicast and broadcast traffic that hits any given port from being broadcast to all ports. A clean approach to achieve this is to segregate each VLAN into a separate bridge table. This restricts all flooding to the bridge group.
- PVC assignment must be operational in bridged mode (RFC 1483/2684)
- Wall mounted/hanged support.

#### ● System Requirements

In order to use the AAM6030BI CPE for Internet access, you must have the following:

- ▶ ADSL service subscription from your ISP.
- ▶ One computer containing an Ethernet 10BaseT/100BaseT network interface card (NIC).
- ▶ (Optional) An Ethernet hub/switch, if you are connecting the device to several computers on an Ethernet network.
- ▶ For system monitoring or configuration using the supplied web-based program: a web browser such as Internet Explorer Version 5.5 or later.

## 2. Your CPE at a glance

Your CPE has many ports, switches and LEDs. Let's take a look at the different options. Depending upon your model of CPE, your CPE may have some or all of the features listed below

### 2.1 Ports and buttons (Back panel)

- **Power** is where you connect the power.
- **LAN 1~4 (local area network) port:** connect to Ethernet network devices, such as a PC, hub, switch, or router. Some CPEs come with a single LAN connection and some come with four LAN connections. Depending on the connection, you may need a cross over cable or a straight through cable.
- **Reset Button:** The reset button is used to reset the CPE to **default setting**. You may need to reset the CPE if you lose network connectivity or you lose the ability to interface to the CPE via the web interface. To reset the CPE, simply press the reset button for about 5-10 seconds and release. After about 30 seconds the CPE will become operational.
- **DSL (Line) port:** This is the WAN interface which connects directly to your phone line.

### 2.2 LED description (Front panel)

- **Power LED:** On indicates that the power is supplied to the CPE
- **Status LED:** The Status LED serves two purposes. If the LED is continuously lit, the DSL interface is successfully connected to a device through the WAN port. If the LED is flickering, it is an indication that the modem is training.
- **Activity LED:** The Activity LED flashes during ADSL data transfer.
- **LAN 1~4 LED:** The LAN's LED serves two purposes. If the LED is continuously lit, the Ethernet interface is successfully connected to a device through the LAN port. If the LED is flickering, it is an indication of any network activity.

### 2.3 LED table & parts list

- **LED Table**  
The LEDs can help diagnose problems. If you are using an AAM6030BI CPE, you will have the LEDs shown in Table 1

Label	Color	Function
POWER	Green	On: Unit is powered on Off: Unit is powered off
STATUS	Green	On: ADSL link is established and active Flashing: Trying to create an ADSL connection Off: No ADSL link
ACTIVITY	Green	Flashing: ADSL data transfer
LAN 1~4	Green	On: LAN link is established Flashing: Data transfer at LAN connection Off: No LAN link

Table 1 (Front Panel & LEDs)

- Parts List

In addition to this document, your AAM6030BI should come with the following:

- ▶ AAM6030BI ADSL 4 Port Router
- ▶ Power adapter
- ▶ Ethernet cable (RJ45), Phone cable (RJ-11)
- ▶ User Manual CD

### **3. Getting Start**

This chapter provides basic instructions for connecting the CPE to a computer or a LAN and to the Internet via ADSL.

- ▶ Part 1 provides instructions to set up the hardware.
- ▶ Part 2 describes how to configure Internet properties on your computer(s).
- ▶ Part 3 shows you how to access your CPE.

It is assumed that you have already subscribed to ADSL service with your telephone company or other Internet service provider (ISP). These instructions provide a basic configuration that should be compatible with your home or small office network setup. Refer to the subsequent chapters for additional configuration instructions.

#### **3.1 Connecting the Hardware**

In 3.1, you should connect the device to an ADSL line, the power outlet, and your computer or network.

##### **3.1.1 Connect the ADSL line**

Connect your ADSL line to the port labeled LINE on the rear panel of the device, and connect the other end of the line to the wall phone jack directly or to an optional POTS splitter. If you use a POTS splitter to connect a telephone to the same wall jack as the CPE, follow the instructions that came with the splitter.

##### **3.1.2 Connect the computers or a LAN**

You can use the included Ethernet cable to connect your computer directly to the CPE. Attach one end of the Ethernet cable to the port labeled LAN on the rear panel of the device and connect the other end to the Ethernet port of your computer.

If your LAN has more than one computer, you can attach one end of an Ethernet cable to a hub or a switch and the other to the port labeled LAN on the CPE.

Note that either a crossover or a straight-through Ethernet cable can be used. The CPE determines and adjusts to the type of signal required.

##### **3.1.3 Attach the power adapter**

The supplied power adapter may look different than the one illustrated here.

Connect the cylindrical power plug into the POWER connector on the back of the device.

- If you have a wall-mount adapter, plug the AC adapter into a wall outlet or a power strip.
- If you have a table-top adapter, use the AC power cord to connect the adapter to a wall outlet or power strip.

##### **3.1.4 Turn on your computer**

Turn on and boot up your computer and any other LAN devices, such as hubs or switches.

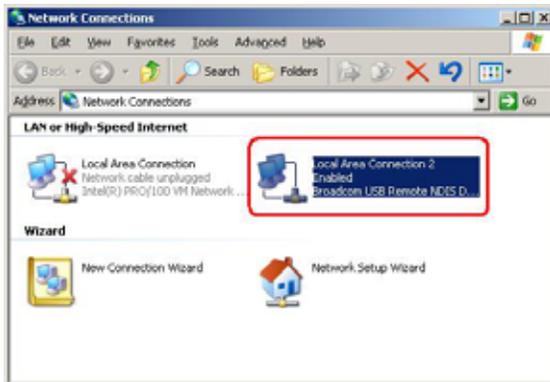
### 3.2 Configuring Your PC

Before you start to access the CPE via Ethernet, you must configure your PC's TCP/IP address to be **192.168.1.x**, where **x** is any number between 2 and 254. The subnet mask must be **255.255.255.0**. Your CPE's default IP address is **192.168.1.1**.

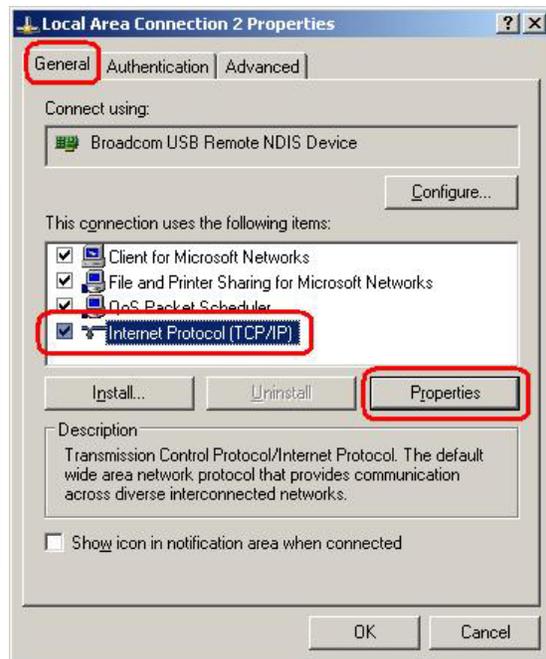
If you use Ethernet cable to connect your AAM6030BI and PC, you don't need any specific driver installation.

#### 3.2.1 Windows XP:

1. In the Windows task bar, click on the **Start** button, and then click on **Control Panel**.
2. Double-click on the **Network Connections** icon.
3. In the LAN or High-Speed Internet window, right-click on the icon corresponding to your network interface card (NIC) and select **Properties**. (Often this icon is labeled *Local Area Connection*). The **Local Area Connection** dialog box is displayed with a list of currently installed network items.
4. Ensure that the check box to the left of the item labeled **Internet Protocol (TCP/IP)** is checked, and click on  .



*Figure 3.7 Network Connections in Windows XP*



*Figure 3.8 Local Area Connection Properties in Windows XP*

5. In the **Internet Protocol (TCP/IP) Properties** dialog box, click in the radio button labeled **Use the following IP address** and type **192.168.1.x** (where **x** is any number between 2 and 254) and **255.255.255.0** in the IP address field and Subnet Mask field, respectively.

#### 3.2.2 Windows 2000:

1. In the Windows task bar, click on the **Start** button, point to **Settings**, and then select **Control Panel**.
2. Double-click on the **Network and Dial-up Connections** icon.
3. In the **Network and Dial-up Connections** window, right-click on the **Local Area Connection** icon, and then select **Properties**.

The **Local Area Connection Properties** dialog box is displayed with a list of currently installed network components. If the list includes **Internet Protocol (TCP/IP)**, the protocol has already been enabled, in which case you can skip to Step 10.

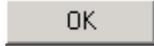
4. If **Internet Protocol (TCP/IP)** does not appear as an installed component, click on



5. In the **Select Network Component Type** dialog box, select **Protocol**, and then click on



6. Select **Internet Protocol (TCP/IP)** in the **Network Protocols** list, and then click on



You may be prompted to install files from your Windows 2000 installation CD or other media. Follow the instructions to install the files.

7. If prompted, click on  to restart your computer with the new settings.
8. After restarting your PC, double-click on the **Network and Dial-up Connections** icon in the **Control Panel**.
9. In **Network and Dial-up Connections** window, right-click on the **Local Area Connection** icon, and then select **Properties**.
10. In the **Local Area Connection Properties** dialog box, select **Internet Protocol (TCP/IP)**, and then click on .
11. In the **Internet Protocol (TCP/IP) Properties** dialog box, click in the radio button labeled **Use the following IP address** and type **192.168.1.x** (where **x** is any number between 2 and 254) and **255.255.255.0** in the IP address field and Subnet Mask field, respectively.
12. Click on  twice to confirm and save your changes, and then close the **Control Panel**.

### 3.2.3 Windows Me:

1. In the Windows task bar, click on the **Start** button, point to **Settings**, and then click **Control Panel**.
2. Double-click on the **Network and Dial-up Connections** icon.
3. In the **Network and Dial-up Connections** window, right-click on the **Network** icon, and then select **Properties**.

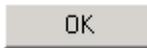
The **Network Properties** dialog box is displayed with a list of currently installed network components. If the list includes **Internet Protocol (TCP/IP)**, the protocol has already been enabled, in which case you can skip to Step 11.

4. If **Internet Protocol (TCP/IP)** does not appear as an installed component, click on .

5. In the **Select Network Component Type** dialog box, select **Protocol**, and then click



6. Select **Microsoft** in the Manufacturers box.

7. Select **Internet Protocol (TCP/IP)** in the Network Protocols list, and then click on .

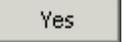
You may be prompted to install files from your Windows Me installation CD or other media. Follow the instructions to install the files.

8. If prompted, click on  to restart your computer with the new settings.
9. After restarting your PC, double-click on the **Network and Dial-up Connections** icon in the **Control Panel**.
10. In **Network and Dial-up Connections** window, right-click on the **Network** icon, and then select **Properties**.
11. In the **Network Properties** dialog box, select **TCP/IP**, and then click on .
12. In the **TCP/IP Settings** dialog box, click in the radio button labeled **Use the following IP address** and type **192.168.1.x** (where **x** is any number between 2 and 254) and **255.255.255.0** in the IP address field and Subnet Mask field, respectively.
13. Click on  twice to confirm and save your changes, and then close the **Control Panel**.

### 3.2.4 Windows 95, 98:

1. In the Windows task bar, click on the **Start** button, point to **Settings**, and then click **Control Panel**.
2. Double-click on the **Network** icon.

The **Network** dialog box is displayed with a list of currently installed network components. If the list includes **TCP/IP**, the protocol has already been enabled, in which case you can skip to Step 9.
3. If **TCP/IP** does not appear as an installed component, click on . The **Select Network Component Type** dialog box appears.
4. Select **Protocol**, and then click .
- The **Select Network Protocol** dialog box appears.
5. Click on **Microsoft** in the Manufacturers list box, and then click **TCP/IP** in the Network Protocols list box.
6. Click  to return to the **Network** dialog box, and then click  again.

You may be prompted to install files from your Windows 95/98 installation CD. Follow the instructions to install the files.
7. Click on  to restart the PC and complete the TCP/IP installation.
8. After restarting your PC, open the **Control Panel** window, and then click on the **Network** icon.
9. Select the network component labeled **TCP/IP**, and then click on .
- If you have multiple TCP/IP listings, select the listing associated with your network card or adapter.
10. In the **TCP/IP Properties** dialog box, click on the **IP Address** tab.
11. Click in the radio button labeled **Use the following IP address** and type **192.168.1.x** (where **x** is any number between 2 and 254) and **255.255.255.0** in the IP address field and Subnet Mask field, respectively.
12. Click on  twice to confirm and save your changes. You will be prompted to restart Windows. Please click on  and restart your PC again.

### 3.2.5 Windows NT 4.0:

1. In the Windows NT task bar, click on the **Start** button, point to **Settings**, and then click **Control Panel**.
2. In the **Control Panel** window, double click on the **Network** icon.
3. In the **Network** dialog box, click on the **Protocols** tab.

The Protocols tab displays a list of currently installed network protocols. If the list includes **TCP/IP**, the protocol has already been enabled, in which case you can skip to Step 9.

4. If **TCP/IP** does not appear as an installed component, click on .
5. In the **Select Network Protocol** dialog box, select **TCP/IP**, and then click on .

You may be prompted to install files from your Windows NT installation CD or other media. Follow the instructions to install the files.

After all files are installed, a window displays to inform you that a TCP/IP service called DHCP can be set up to dynamically assign IP information.

6. Click on  to continue, and then click on  if prompted to restart your computer.
7. After restarting your PC, open the **Control Panel** window, and then double-click on the **Network** icon.
8. In the **Network** dialog box, click on the **Protocols** tab.
9. In the **Protocols** tab, select **TCP/IP**, and then click on .
10. In the **Microsoft TCP/IP Properties** dialog box, click in the radio button labeled **Use the following IP address** and type **192.168.1.x** (where **x** is any number between 2 and 254) and **255.255.255.0** in the IP address field and Subnet Mask field, respectively.
11. Click on  twice to confirm and save your changes, and then close the **Control Panel**.

### 3.2.6 Assigning IP to your PC automatically by DHCP

To use the CPE's DHCP feature, click in the radio button labeled **Obtain an IP address automatically** instead of **Use the following IP address** in the above procedures.

- By default, the LAN port IP address of the CPE is **192.168.1.1**. (You can change this address, or another address can be assigned by your ISP.)

Now that the hardware installation is complete, proceed to **Chapter 4: Setting up your CPE**

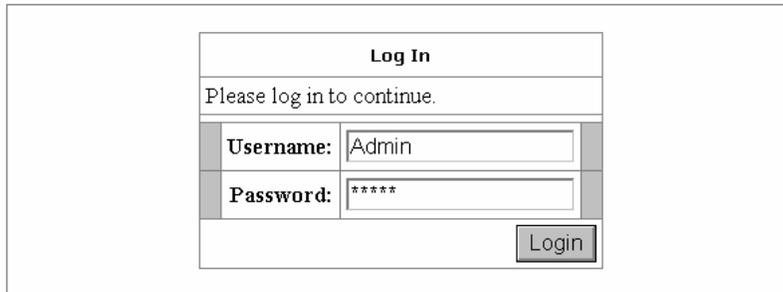
## 4. Setting up your CPE

This section will guide you through your CPE's configuration. The CPE is shipped with a standard default **bridge** configuration; for most users, you may want to change the CPE from a bridge to a router.

### 4.1 Log into your CPE

To configure your CPE, open your web browser. You may get an error message at this point; this is normal. Don't panic. Continue following these directions. Type the default IP address (**192.168.1.1**) Press the **Enter** key and the following screen, shown in Figure 1 will appear. The default user name is **Admin** (case sensitive) and the password is **Admin** (case sensitive).

Note: Before setting up your CPE, make sure you have followed the quick start guide. You should have your computers configured for DHCP mode and have proxies disabled on your browser. Also if you access the router, and instead of getting a login screen, the browser instead displays a login redirection screen, you should check your browser's setting, and verify that JavaScript support is enabled. Also, if you do not get the screen shown in Figure 1, you may need to delete your temporary Internet files (basically flush the cached web pages).



Log In	
Please log in to continue.	
Username:	Admin
Password:	*****
<input type="button" value="Login"/>	

Figure 1 (Log-in Screen)

### 4.2 Home screen

The first screen (Figure 2) that appears (after the log in screen) is the Home screen. From this screen the user can setup the modem (configure the LAN and WAN connection(s), configure the advanced configuration options within the modem (security, routing, and filtering), access tools that are helpful for debug purposes, obtain the status of the modem, and view the extensive online help.

The basic layout of the Home page consists of a page selection list across the top of the browser window. The footer displays CPE status, connection information, and other useful information. The center display is where most of the configuration will take place.

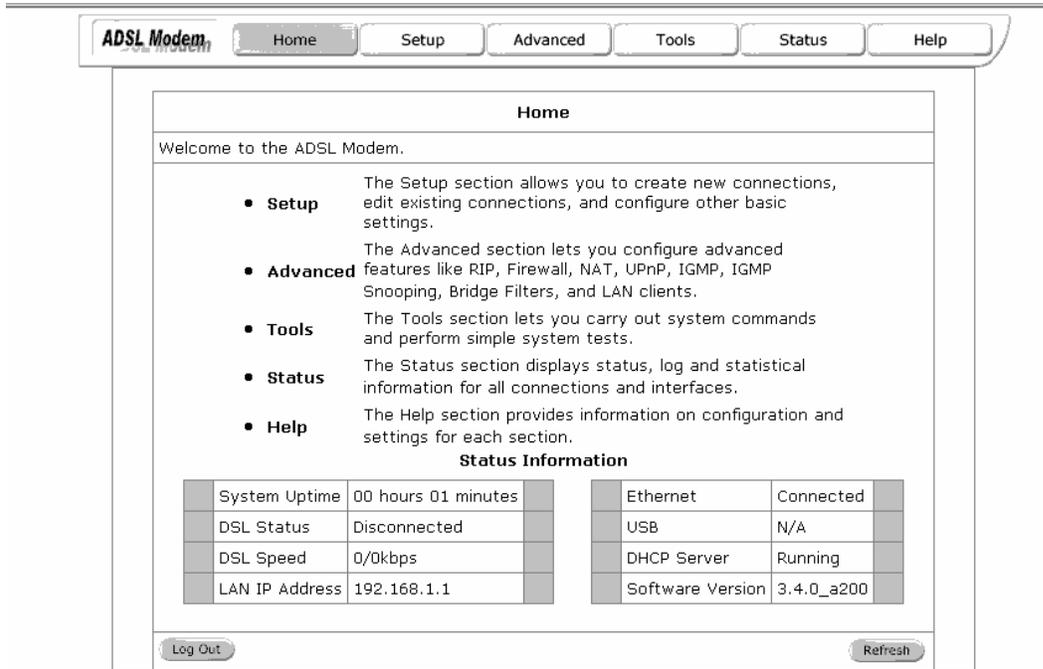


Figure 2 (Home page)

### 4.3 Setup

To setup your CPE with a basic configuration, from the Home page, select Setup. Figure 3 illustrates the setup page. The page is broken into two subsections the WAN configuration and the LAN configuration.

Before configuring the router, there are several concepts that you should be familiar with on how your new router works. Please take a moment to familiarize yourself with these concepts, as it should make the configuration much easier.

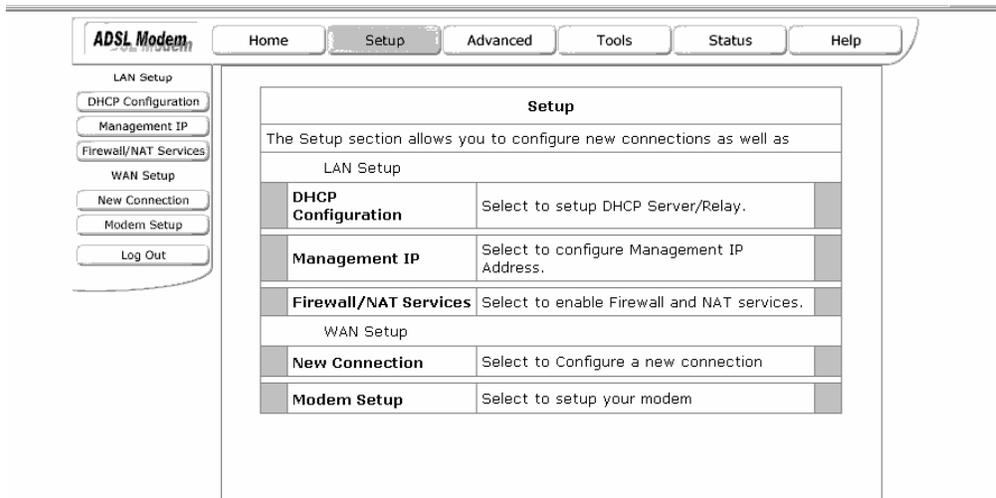


Figure 3 (Setup page)

#### **4.3.1 Wide Area Network connection**

On the other side of the router is where your Wide Area Network (WAN) connection; also referred to as a broadband connection. This WAN connection is different for every WAN supplier. Most of the configuration you will perform will be in this area. Local Area Network Connection(s)

#### **4.3.2 Local Area Network connection**

On one side of your router, you have your own Local Area network (LAN) connections. This is where you plug in your local computers to the router. The router is normally configured to automatically provide all the PC's on your network with Internet addresses.

### **4.4 Configuring the WAN**

Before the CPE will pass any data between the LAN interface(s) and the WAN interface, the WAN side of the modem must be configured. Depending upon your DSL service provider or your ISP, you will need some (or all) of the information outlined below before you can properly configure the WAN:

- Your DSL line VPI and VCI
- Your DSL encapsulation type and multiplexing
- Your DSL training mode

For **PPPoA** or **PPPoE** users, you also need these values from your ISP:

- Your username and password

For **RFC 1483** users, you may need these values from your ISP:

- Your DSL fixed Internet IP address
- Your Subnet Mask
- Your Default CPE
- Your primary DNS IP address

Since multiple users can use the CPE, the CPE can simultaneously support multiple connection types; hence, the user must set up different profiles for each connection. The CPE supports the following protocols:

- DHCP
- RFC 2364 PPPoA
- RFC2516 PPPoE
- Static
- Bridged
- CLIP

#### **4.4.1 New Connection**

A new connection is basically a virtual connection. Your CPE can support up to 8 different (unique) virtual connections. If you have multiple different virtual connections, you may need to utilize the static and dynamic routing capabilities of the modem to pass data correctly.

##### **4.4.1.1 Bridged CPE profile and Connection**

A pure bridged connection does not assign an IP address to the WAN interface. NAT and firewall rules are not enabled. This connection method makes the router act as a hub, and just passes packets across the WAN interface to the LAN interface.

To configure the CPE as a bridge, from the Home page, click on Setup and then click on New Connection. The default PPPoE connection setup is displayed. At the Type field select Bridge and the Bridge connection setup page is displayed (see Figure 4). Give your Bridge connection a unique name; the name must not have spaces and cannot begin with numbers. In this case the unique name is called bridge1. Select the encapsulation type (LLC or VC); if you are not sure just use the default mode. Select the VPI

and VCI settings; your DSL service provider or your ISP will supply these; in this case the DSL service provider is using 0,35. Also select the quality of service (QoS); leave the default value if you are unsure or the ISP did not provide this information.

Figure 4 (Bridge Connection Setup)

To complete the connection you must now click the apply button. The apply button will temporarily save this connection. To make the change permanent you need to click on **Tools** (at the top of the page) and select **System Commands**. At the system commands page, click on **Save All**.

#### 4.4.1.2 PPPoA Connection Setup

PPPoA is also known as RFC 2364. It is a method of encapsulating PPP packets over ATM cells which are carried over the DSL line. PPP or Point-to-Point protocol is a method of establishing a network connection / session between network hosts. It usually provides a mechanism of authenticating users. LLC and VC are two different methods of encapsulating the PPP packet. Contact your ISP to make sure which encapsulation is being supported.

By selecting PPPoA, you are forcing your CPE to terminate the PPPoA connection. The advantage is that the PPPoA termination is done within the CPE and not on your PC; this frees up your PC resources and allows multiple users to utilize the PPPoA connection.

To configure the CPE for PPPoA, click on Setup and then click on New Connection. The default PPPoE connection setup is displayed. At the Type field select PPPoA and the PPPoA connection setup page is displayed; figure 5 illustrates a typical PPPoA configuration. Give your PPPoA connection a unique name; the name must not have spaces and cannot begin with numbers. In this case the unique name is called PPPOA1. Select the encapsulation type (LLC or VC); if you are not sure just use the default mode. Select the VPI and VCI settings; your DSL service provider or your ISP will supply these; in this case the DSL service provider is using 0,40. Also select the quality of service (QoS); leave the default value if you are unsure or the ISP did not provide this information.

Following is a description of the different options:

- a. Username: The username for the PPPoA access; this is provided by your DSL service provider or your ISP.
- b. Password: The password for the PPPoA access; this is provided by your DSL service provider or your ISP.

- c. On-Demand: Enables on-demand mode. The connection will disconnect if no activity is detected after the specified idle timeout value.
- d. Idle Timeout: Specifies that PPPoA connection should disconnect if the link has no activity detected for n seconds. This field is used in conjunction with the On-Demand feature. To ensure that the link is always active, enter a 0 in this field.
- e. Keep Alive: When on-demand option is not enable, this value specifies the time to wait without being connected to your provider before terminating the connection. To ensure that the link is always active, enter a 0 in this field.
- f. Set Route: Specify this connection as the default-route.
- g. MRU: Maximum Receive Unit the DSL connection can receive. It is a negotiated value that asks the provider to send packets of no more than n bytes. The maximum specified value is 1500 although some DSL/ISP providers require a larger value. The minimum MRU value is 128.
- h. Debug: Enables PPPoA connection debugging facilities. Debugging is talked about later.

Figure 5 (PPPoA Connection Setup)

To complete the connection you must now click the apply button. The apply button will temporarily save this connection. To make the change permanent you need to click on **Tools** (at the top of the page) and select **System Commands**. At the system commands page, click on **Save All**.

#### 4.4.1.3 PPPoE Connection Setup

PPPoE is also known as RFC 2516. It is a method of encapsulating PPP packets over Ethernet. PPP or Point-to-Point protocol is a method of establishing a network connection/session between network hosts. It usually provides a mechanism of authenticating users.

To configure the CPE for PPPoE, click on Setup and then click on New Connection. The default PPPoE connection setup is displayed. At the Type field select PPPoE and the PPPoE connection setup page is displayed; figure 6 illustrates a typical PPPoE configuration. Give your PPPoE connection a unique name; the name must not have spaces and cannot begin with numbers. In this case the unique name is called PPPOE1. Select the encapsulation type (LLC or VC); if you are not sure just use the default mode. Select the VPI and VCI settings; your DSL service provider or your ISP will supply these; in this case the DSL

service provider is using 0,30. Also select the quality of service (QoS); leave the default value if you are unsure or the ISP did not provide this information.

Following is a description of the different options:

- a. Username: The username for the PPPoE access; this is provided by your DSL service provider or your ISP.
- b. Password: The password for the PPPoE access; this is provided by your DSL service provider or your ISP.
- c. On-Demand: Enables on-demand mode. The connection will disconnect if no activity is detected after the specified idle timeout value.
- d. Idle Timeout: Specifies that PPPoE connection should disconnect if the link has no activity detected for n seconds. This field is used in conjunction with the On-Demand feature. To ensure that the link is always active, enter a 0 in this field.
- e. Keep Alive: When on-demand option is not enable, this value specifies the time to wait without being connected to your provider before terminating the connection. To ensure that the link is always active, enter a 0 in this field.
- f. Set Route: Specify this connection as the default-route.
- g. MRU: Maximum Receive Unit the DSL connection can receive. It is a negotiated value that asks the provider to send packets of no more than n bytes. The maximum specified value is 1500 although some DSL/ISP providers require a larger value. The minimum MRU value is 128.
- h. Enforce MRU: Check this box if you experience problems accessing the Internet over a PPPoE connection. This feature will force all TCP traffic to conform with PPP MRU by changing TCP Maximum Segment Size to PPP MRU.
- i. Debug: Enables PPPoE connection debugging facilities. Debugging is talked about later.

The screenshot shows the 'ADSL Modem' configuration interface. The main menu includes Home, Setup, Advanced, Tools, Status, and Help. The left sidebar lists various configuration sections: LAN Setup, DHCP Configuration, Management IP, Firewall/NAT Services, WAN Setup, New Connection, Modem Setup, Connection 1, and Log Out. The central pane is titled 'PPPoE Connection Setup' and contains the following fields and options:

- Name:** PPPOE1
- Type:** PPPoE
- Options:**  NAT,  Firewall (SPI)
- PPP Settings:**
  - Username: username
  - Password: \*\*\*\*
  - Idle Timeout: 60 secs
  - Keep Alive: 10 min
  - Authentication:  Auto,  CHAP,  PAP
  - MRU: 1492 bytes
  - On Demand:
  - Enforce MRU:
  - Enable Bridge:
- PVC Settings:**
  - VPI: 0
  - VCI: 30
  - QoS: UBR
  - PCR: \_\_\_\_\_ cps
  - SCR: \_\_\_\_\_ cps
  - MBS: \_\_\_\_\_ cells
  - CDVT: \_\_\_\_\_ usecs

Buttons at the bottom include 'Connect', 'Disconnect', 'Apply', 'Delete', and 'Cancel'.

Figure 6 (PPPOE Connection Setup)

To complete the connection you must now click the apply button. The apply button will temporarily save this connection. To make the change permanent you need to click on **Tools** (at the top of the page) and select **System Commands**. At the system commands page, click on **Save All**.

#### 4.4.1.4 DHCP Connection Setup

Dynamic Host Configuration Protocol (DHCP) allows the CPE to automatically obtain the IP address from the server. This option is commonly used in situations where IP is dynamically assigned and is not known prior to assignment.

To configure the CPE for a DHCP connection, click on Setup and then click on New Connection. The default DHCP connection setup is displayed. At the Type field select DHCP and the DHCP connection setup page is displayed; figure 7 illustrates a typical DHCP configuration. Give your DHCP connection a unique name; the name must not have spaces and cannot begin with numbers. In this case the unique name is called DHCP1. Select the encapsulation type (LLC or VC); if you are not sure just use the default mode. Select the VPI and VCI settings; your DSL service provider or your ISP will supply these; in this case the DSL service provider is using 0,35. Also select the quality of service (QoS); leave the default value if you are unsure or the ISP did not provide this information.

If your DSL line is connected and your DSL/IPS provider is supporting DHCP, you can click the renew button and the CPE will retrieve an IP address, Subnet mask, and CPE address. At anytime, you can renew the DHCP address by clicking on the renew button; in most cases you will never have to use this button.

The screenshot shows the 'ADSL Modem' interface with a 'Setup' tab selected. The left sidebar contains a 'LAN Setup' section with 'DHCP Configuration' highlighted, and a 'WAN Setup' section with 'New Connection' selected. The main panel is titled 'DHCP Connection Setup' and includes the following fields and controls:

- Name:** DHCP1
- Type:** DHCP (dropdown menu)
- Options:**  NAT  Firewall (SPI)
- DHCP Settings:**
  - Mode:**  Bridged  Routed
  - Encapsulation:**  LLC  VC
  - IP Address:** (empty field)
  - Mask:** (empty field)
  - Default Gateway:** (empty field)
- PVC Settings:**
  - VPI:** 0
  - VCI:** 35
  - QoS:** UBR (dropdown menu)
  - PCR:** (empty field) cps
  - SCR:** (empty field) cps
  - MBS:** (empty field) cells
  - CDVT:** (empty field) usecs

Buttons for 'Renew', 'Release', 'Apply', 'Delete', and 'Cancel' are located at the bottom of the form.

Figure 7 (DHCP Connection Setup)

To complete the connection you must now click the apply button. The apply button will temporarily save this connection. To make the change permanent you need to click on **Tools** (at the top of the page) and select **System Commands**. At the system commands page, click on **Save All**.

#### 4.4.1.5 Static Connection Setup

Static is used whenever a known static IP is assigned. The accompanying information such as the Subnet mask and the CPE should also be specified. Up to three Domain Name Server (DNS) addresses can also be specified. These servers would enable you to have access to other web servers. Valid IP addresses range is from 0.0.0.0 to 255.255.255.255.

To configure the CPE for a Static connection, click on Setup and then click on New Connection. The default Static connection setup is displayed. At the Type field select Static and the Static connection setup page is displayed; figure 8 illustrates a typical Static configuration. Give your Static connection a unique

name; the name must not have spaces and cannot begin with numbers. In this case the unique name is called STATIC1. Select the encapsulation type (LLC or VC); if you are not sure just use the default mode. Select the VPI and VCI settings; your DSL service provider or your ISP will supply these; in this case the DSL service provider is using 0,35. Also select the quality of service (QoS); leave the default value if you are unsure or the ISP did not provide this information. You can also enable Network Address Translation (NAT) and the Firewall options. If you are unsure, leave these in the default mode.

Based upon the information your DSL/ISP provided, enter your assigned IP address, Subnet Mask, Default CPE (if provided), and Domain Name Services (DNS) values (if provided). For the static configuration, you can also select a bridge connection or a routed connection. Since static IP address is typically used to host WEB servers, you may want to use a bridge connection.

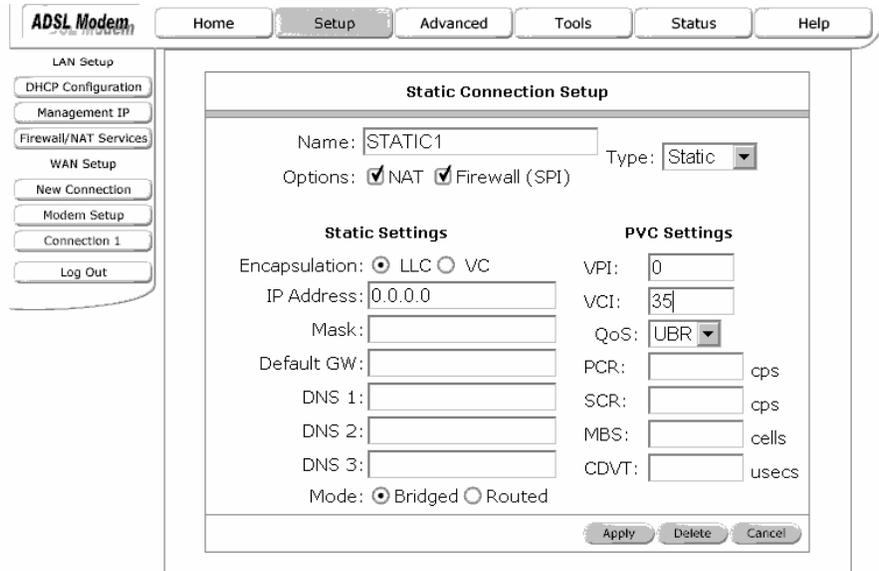


Figure 8 (Static IP Connection Setup)

To complete the connection you must now click the apply button. The apply button will temporarily save this connection. To make the change permanent you need to click on **Tools** (at the top of the page) and select **System Commands**. At the system commands page, click on **Save All**.

#### 4.4.2 Modify an Existing Connection

To modify an existing connection, from the Home screen, click setup and then click the connection you want to modify. The connections are listed as Connection 1 through Connection 8

As a note, if you delete the connection, to make the change permanent you need to click on **Tools** (at the top of the page) and select **System Commands**. At the system commands page, click on **Save All**.

#### 4.4.3 Modem setup

To configure the DSL modulation type, go to the Home screen, Click setup. Under WAN Setup, select Modem Setup. This will bring up the modem setup screen. Leave the default value if you are unsure or the DSL/ISP did not provide this information. For most all cases, this screen should not be modified.

The apply button will temporarily save this connection. To make the change permanent you need to click on **Tools** (at the top of the page) and select **System Commands**. At the system commands page, click on **Save All**.

## 4.5 Configuring the LAN

By default, your CPE has DHCP server (LAN side) enabled. If you already have a DHCP server running on your network, you *must* disable one of the two DHCP servers; if you plug a second DHCP server into the network, you will experience network errors and the network will not function normally.

### 4.5.1 Enable/Disable DHCP

To enable or disable DHCP go to the Home screen, Click setup. Under LAN Setup, select DHCP Configuration. This will bring up the screen shown in Figure 9.

The Start IP Address is where the DHCP server starts issuing IP addresses and the End IP Address is where the DHCP server stops issuing IP addresses.

The Lease Time is the amount of time a network user will be allowed connection to the Router with their current dynamic IP address. The amount of time is in units of minutes; the default value is 3600 sec (60 minutes).

Note: If you change the start or end values, make sure the values are still within the same subnet as the CPEs IP address.

The screenshot shows the 'ADSL Modem' web interface. At the top, there are navigation tabs: Home, Setup (selected), Advanced, Tools, Status, and Help. On the left side, there is a sidebar menu with options: LAN Setup, DHCP Configuration (selected), Management IP, Firewall/NAT Services, WAN Setup, New Connection, Modem Setup, and Log Out. The main content area is titled 'DHCP Configuration' and contains three radio button options: 'Server On' (selected), 'Relay On', and 'Server and Relay Off'. The 'Server On' option has input fields for 'Start IP:' (192.168.1.2), 'End IP:' (192.168.1.254), and 'Lease Time:' (3600) Seconds. The 'Relay On' option has a 'Relay IP:' field (20.0.0.3). At the bottom right of the configuration area, there are 'Apply' and 'Cancel' buttons.

Figure 9 (DHCP Server configuration)

In addition to the DHCP server feature, the CPE supports the DHCP relay function. When the CPE is configured as DHCP server, it assigns the IP addresses to the LAN clients. When the CPE is configured as DHCP relay, it is responsible for forwarding the requests and responses negotiating between the DHCP clients and the server. See figure 10.

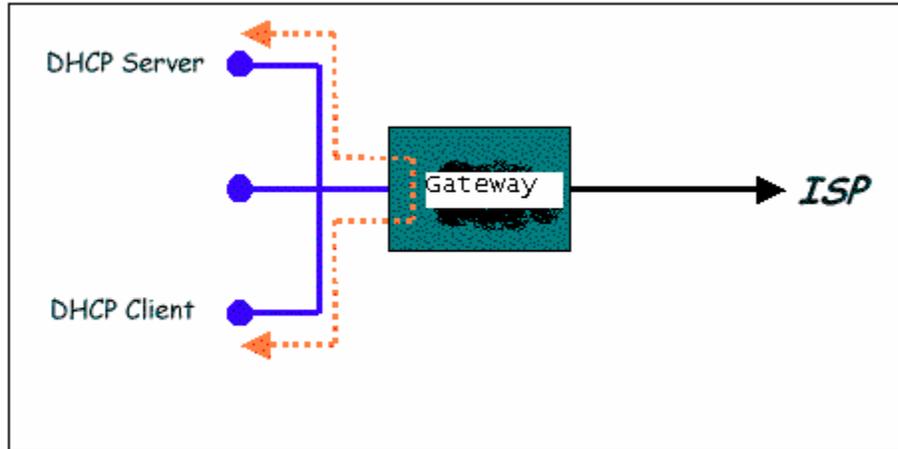


Figure 10 (Example of a DHCP Relay configuration)

By turning off the DHCP server and relay the network administrator must carefully configure the IP address, Subnet Mask and DNS settings of every computer on your network. Do not assign the same IP address to more than one computer and your CPE must be on the same subnet as all the other computers.

The apply button will temporarily save this connection. To make the change permanent you need to click on **Tools** (at the top of the page) and select **System Commands**. At the system commands page, click on **Save All**.

#### 4.5.2 Changing the CPEs IP address

You can change the CPE's IP address by going to the Home screen, click setup and under LAN Setup, select Management. This will bring up the screen shown in Figure 11.

##### 4.5.2.1 Static IP address assignment

Your CPE's default IP address and subnet mask are 192.168.1.1/255.255.255.0; this subnet mask will allow the CPE to support 254 users. If you want to support a larger number of users you can change the subnet mask; but remember. The DHCP server is defaulted to only give out **255** IP addresses. Further remember that if you change your CPEs' IP address and you have DHCP enabled, the DHCP configuration must reside within the same subnet

The default CPE is the routing device used to forward all traffic that is not addressed to a station within the local subnet. Your ISP will provide you with the default CPE Address. Figure 11 shows a default CPE address of 192.168.1.1 because this was the default CPE defined when the CLIP connection was configured.

The hostname can be any alphanumeric word that does not contain spaces. The domain name is used to in conjunction with the host name to uniquely identify the CPE. To access the CPE's web pages the user can type 192.168.1.1 (the CPE's default IP address) or type **mygateway**.

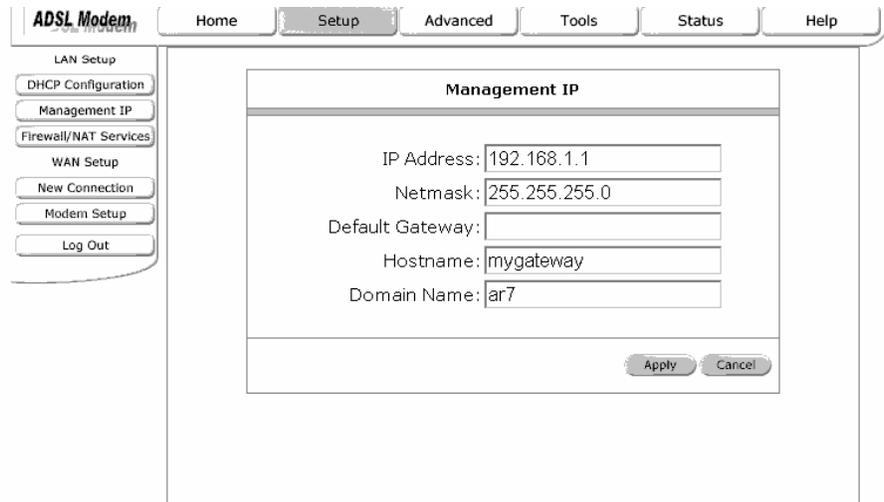


Figure 11 (Management IP address)

The apply button will temporarily save this connection. To make the change permanent you need to click on **Tools** (at the top of the page) and select **System Commands**. At the system commands page, click on **Save All**.

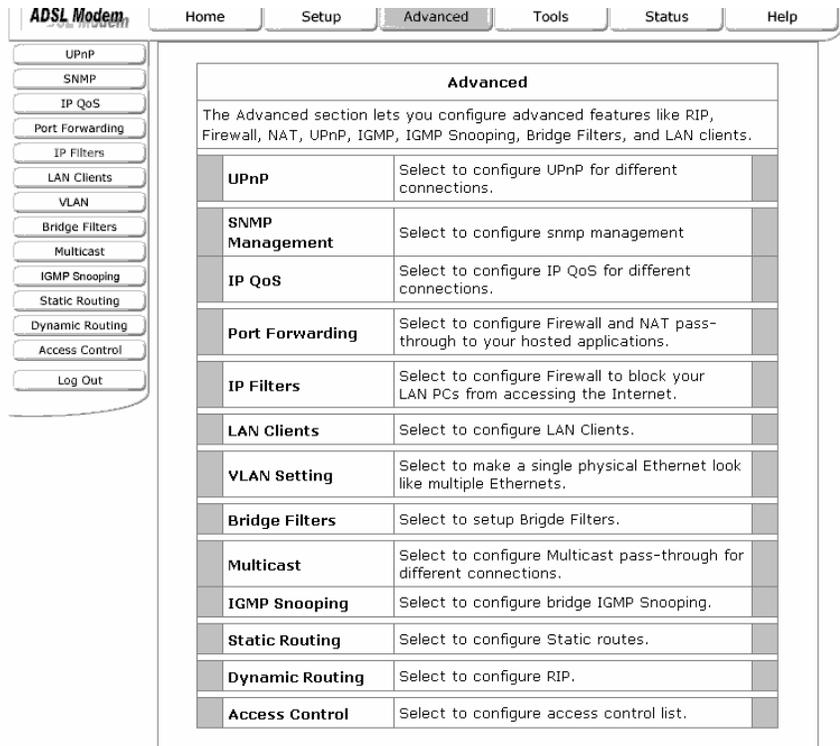
#### 4.5.3 Firewall/NAT Services

You can enable or disable Firewall and NAT by going to the Home screen, click setup and under LAN Setup, select Firewall/NAT Services. By unselecting the “Enable Firewall and NAT Services” button the firewall and NAT services is disabled for all WAN connections.

The apply button will temporarily save this connection. To make the change permanent you need to click on **Tools** (at the top of the page) and select **System Commands**. At the system commands page, click on **Save All**.

#### 4.6 Advanced

The CPE supports a host of advanced features. For basic router functionality, the user does not need to utilize these advanced features. The features help with routing, security, port configuration, and plug and play capability.



#### 4.6.1 UPnP

UPnP NAT and Firewall Traversal allow traffic to pass-thru the router for applications using the UPnP protocol. This feature requires one active DSL connection. In presence of multiple DSL connections, select the one over which the incoming traffic will be present, for example the default Internet connection.

To enable UPnP, you must first have a WAN connection configured. Once a WAN connection is configured, from the Home screen, click Advanced and under Advanced, select UPnP. This will bring up the screen shown in Figure 12. You must enable UPnP and then select which connection will utilize UPnP. In this case the PPPoA connection is enabled.

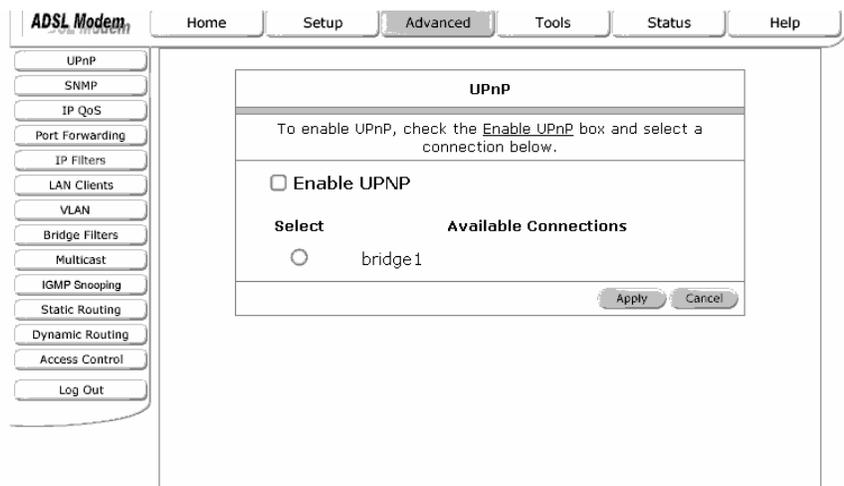


Figure 12 UPnP

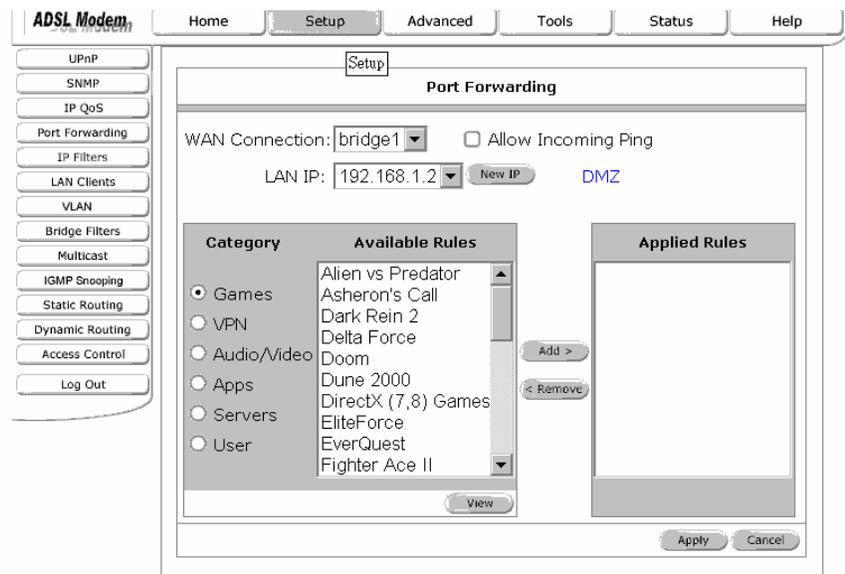
The apply button will temporarily save this connection. To make the change permanent you need to click on **Tools** (at the top of the page) and select **System Commands**. At the system commands page, click on **Save All**.

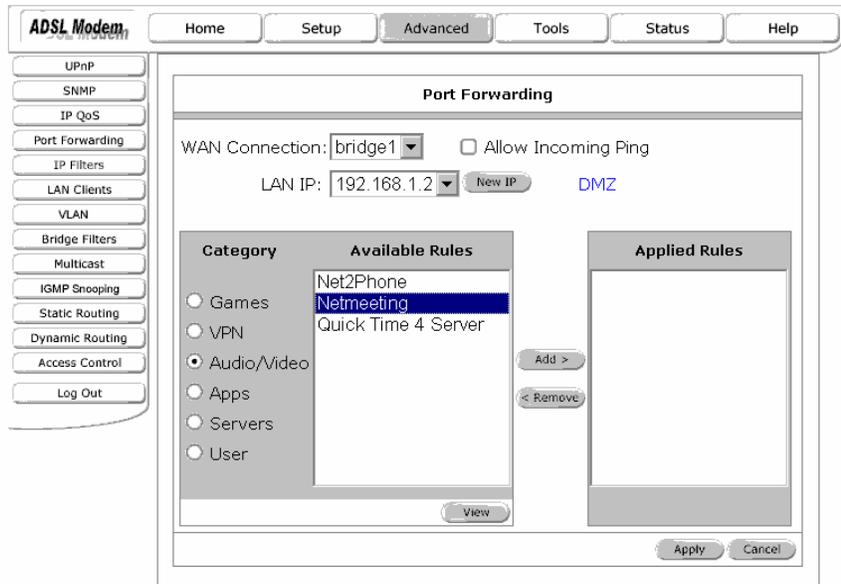
#### 4.6.2 Port Forwarding

Using the Port Forwarding page, you can provide local services (for example web hosting) for people on the Internet or play Internet games. When users send this type of request to your network via the Internet, the Router will forward those requests to the appropriate PC. Port forwarding can be used with DHCP assigned addresses but remember that a DHCP address is dynamic (not static). For example, if you were configuring a Netmeeting server, you would want to assign this server a static IP address so that the IP address is not reassigned. Also remember that if an Internet user is trying to access an Internet application, they must use the WAN IP address. The port forwarding will translate the WAN IP address into a LAN IP address.

To configure a service, game, or other application select the external connection (for example the Internet connection), from the Home screen, click Advanced and under Advanced, select Port Forwarding. Next select the computer hosting the service and add the corresponding firewall rule. If you want to add a custom application, select the User category, click New and fill in the port, protocols and description for your application.

For example, if you want to host a Netmeeting session, from the Home screen, click Advanced and under Advanced, select Port Forwarding. First select the IP address for your Netmeeting server. Next select the Audio/Video category and add Netmeeting to the applied rules box. To view the management rules, highlight Netmeeting and select view; this will display the pre configured protocols and ports that Netmeeting will use. Now assuming that your WAN connection is correct, you can run Netmeeting from your server and call users that are on the Internet. If you know your WAN IP address, users can call you.





**Figure 13 (Port Forwarding & Netmeeting)**

The apply button will temporarily save this connection. To make the change permanent you need to click on **Tools** (at the top of the page) and select **System Commands**. At the system commands page, click on **Save All**.

#### 4.6.3 IP QoS/IP filters

The QoS setup page allows you to configure IP QoS for a connection, to view the configured QoS rules and to add/delete a QoS rule.

**Choose a connection:** This field allows you choose a connection from the list of available connections. For e.g. Choose a WAN connection to enable IP QoS for the Upstream traffic of the Modem. On the other hand choose the LAN connection (Ethernet and USB Bridged) for the downstream traffic.

**Low/Medium priority weights:** These 2 fields will allow you to select the weights of the Medium and Low priority queues in increments of 10 percent, so that that the sum of the weights of these 2 queues is equal to 100 percent.

**Enable IP QoS:** This field allows you to enable/disable IP QoS for the chosen connection.

**Trusted Mode:** The NSP has two primary modes of operation with regard to queue traffic prioritization - Trusted and Un-trusted. This field allows you to choose the mode - Trusted (checked) and Un-trusted (Unchecked).

In "Trusted mode" all the rules will be applied first, regardless of the setting of the TOS bits. After the rules have been exhausted the existing TOS bit settings will be honored. The "Un-trusted" mode will match first against all rules as in "Trusted" mode. The difference is that if there is no match then a default rule will be used. The default rule will have an associated queuing priority - Low.

**Note:** If IP QoS is enabled and no rules are defined, a Default Rule is added which is hidden. The Default Rule puts all the Traffic to be transmitted in the Low Priority Queue.

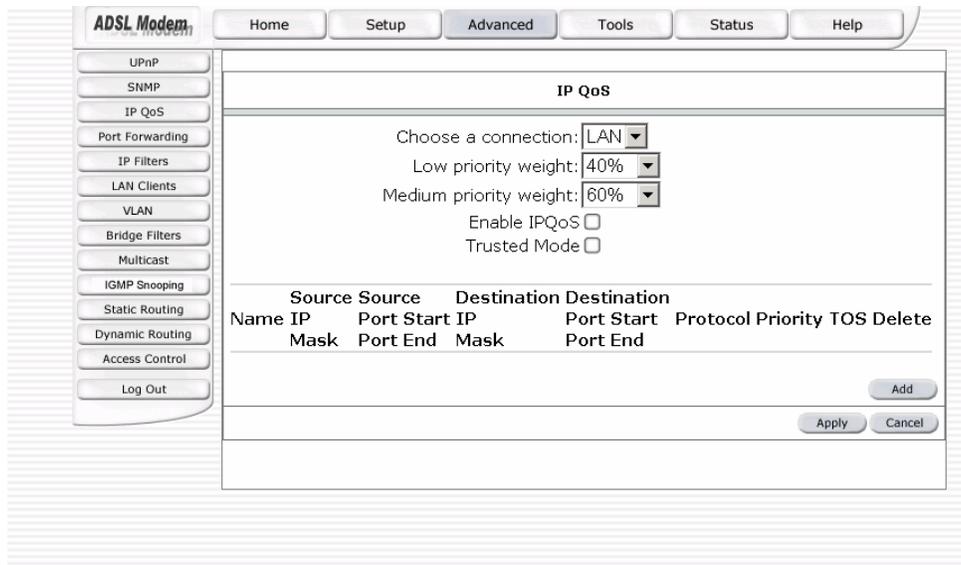


Figure 14 (IP QoS)

#### IP Filters

This firewall feature allows you to block network access based on a user's computer IP address. You can use this page to block specific traffic (for example block web access) or any traffic from a computer on your local network. To configure an IP Filter rule select the computers' IP address and add the corresponding firewall traffic definition from the Firewall Policy Database. If the traffic type is set to "Any" all network traffic from that computer will be blocked.

#### 4.6.4 Access Control

Access control can also be called port blocking. Specific types of traffic that is destined to a selected LAN IP address can be blocked. To enable any of the Access Control features, from the Home screen, click Advanced and under Advanced, select Access Control. A page similar to the port-forwarding page appears. Similar to the port-forwarding page, an IP address can be added to a rule. All Access Control rules have precedence over rules that were added via the port-forwarding page.

The apply button will temporarily save this connection. To make the change permanent you need to click on **Tools** (at the top of the page) and select **System Commands**. At the system commands page, click on **Save All**.

#### 4.6.5 LAN clients

To add a LAN client, from the Home screen, click Advanced and under Advanced, select LAN Clients. If DHCP is used, all DHCP clients are automatically assigned. If a fixed IP address server is on the LAN and you want this server to be visible via the WAN, you must add its IP address. Once the IP address has been added to you can apply Port Forwarding and Access Control rules to this IP address.

The apply button will temporarily save this connection. To make the change permanent you need to click on **Tools** (at the top of the page) and select **System Commands**. At the system commands page, click on **Save All**.

#### 4.6.6 Bridge Filters

The bridge filtering mechanism provides a way for the users to define rules to allow/deny frames through the bridge based on source MAC address, destination MAC address and/or frame type. When bridge filtering is enabled, each frame is examined against the defined filter rules sequentially, and when a matched is determined, the appropriate filtering action (determined by the access type selected ... i.e. allow

or deny) is performed. The user should note that the bridge filter will only examine frames from interfaces which are part of the bridge itself. Twenty filter rules are supported with bridge filtering. To enable Bridge Filters, from the Home screen, click Advanced and under Advanced, select Bridge Filters. Figure 15 illustrates a typical Bridge filter configuration.

The User Interface for Bridge Filter allows the user to add/edit/delete, as well as, enables the filter rules. To add rules, simply define the source MAC address, destination MAC address and frame type with desired filtering type (i.e. allow/deny), and press the “Add” button. The MAC address must be in a xx-xx-xx-xx-xx-xx format, with 00-00-00-00-00-00 as “don’t care”. Blanks can be used in the MAC address space, and would be considered also as “don’t care”.

To edit/modify an existing filter rule, select the desired rule created previously from “Add” in the “Edit” select box. The selected filter rule will appear on top section, as with the “Add” filter rule. Make the desired change to the MAC address, frame type and/or access type, and press “Apply”.

To delete filter rule(s), select the filter rule entry to delete in the “Delete” selection box. Note that multiple deletions are possible. Once all the desired filter rule(s) is/are selected for deletion, press the “Apply” button. The “Select All” select box can also be used to delete the entire filter rule. It provides a quick method of selecting all filter rules for deletion.

The “Enable Bridge Filters” button allow the user to enable or disable bridge filtering. It can be set/unset during any add/edit/delete operation. It can also be set/unset independently by just pressing the “Apply” button.

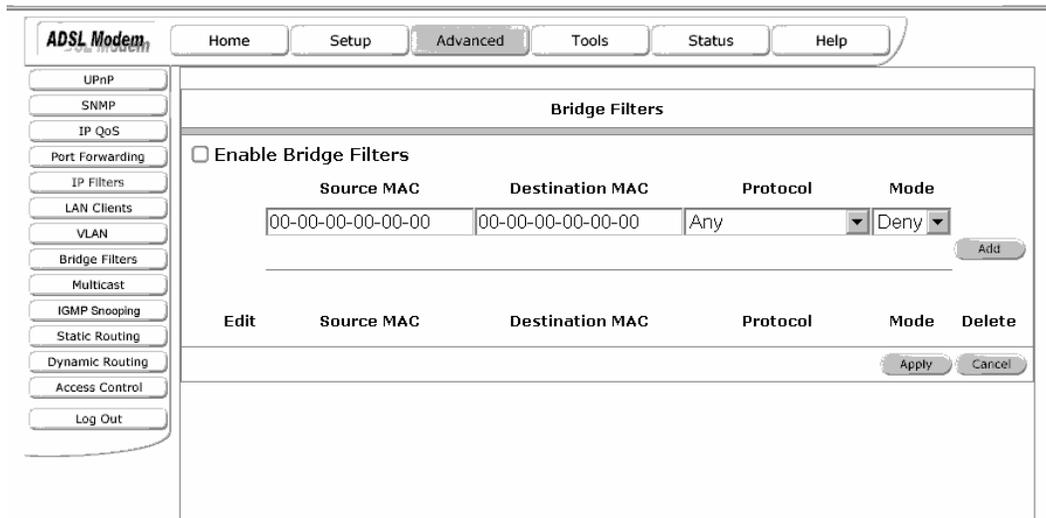


Figure 15 (Bridge Filters)

Note: The bridge filter table contains 3 hidden rules. These rules are entered automatically by the system to ensure the user does not "lock" them out of the system. The first rule allows any and all ARP frames through the system. The second rule allows all IPv4 frames with the destination MAC address of the bridge to go through. The third rule allows all IPv4 frames with the source MAC address of the bridge to go through.

Note: On a windows based machine, to find a MAC address, ad a dos prompt type **ipconfig /all**.

The apply button will temporarily save this connection. To make the change permanent you need to click on **Tools** (at the top of the page) and select **System Commands**. At the system commands page, click on **Save All**.

#### 4.6.7 Multicast/IGMP Snooping

Multicasting is a form of limited broadcast. UDP is used to send datagrams to all hosts that belong to what is called a "host group." A host group is a set of zero or more hosts identified by the same destination IP address. The following statements apply to host groups.

- Anyone can join or leave a host group at will.
- There are no restrictions on a host's location.
- There are no restrictions on the number of members that may belong to a host group.
- A host may belong to multiple host groups.
- Non-group members may send UDP datagrams to the host group.

Multicasting is useful when data needs to be sent to more than one other device. For instance, if one device is responsible for acquiring data that many other devices need, then multicasting is a natural fit. Note that using multicasting as opposed to sending the same data to individual devices uses less network bandwidth.

To enable Multicasting, from the Home screen, click Advanced and under Advanced, select Multicast. Figure 16-1 illustrates a typical Multicast configuration.

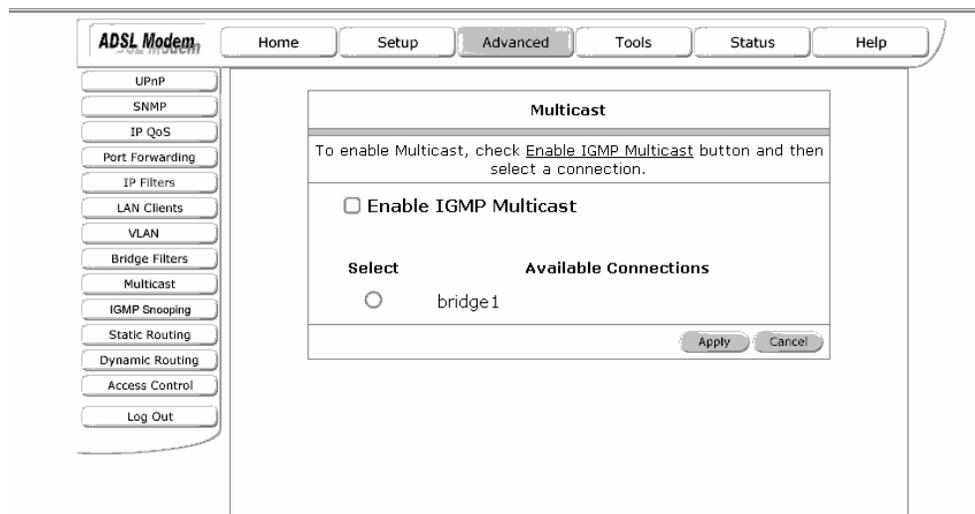
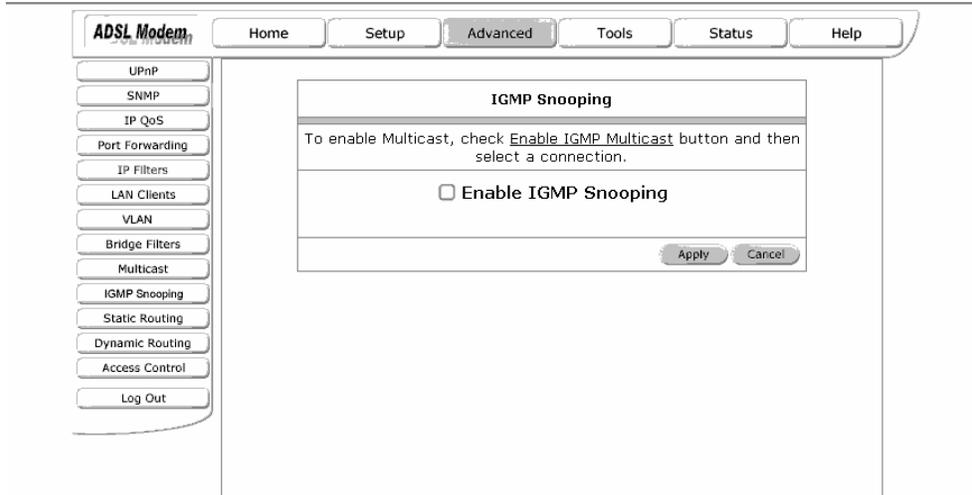


Figure 16-1 (Multicast)

The apply button will temporarily save this connection. To make the change permanent you need to click on **Tools** (at the top of the page) and select **System Commands**. At the system commands page, click on **Save All**.

To enable IGMP Snooping, click Advanced and under Advanced, select IGMP Snooping. Figure 16-2 illustrates a typical IGMP Snooping configuration.



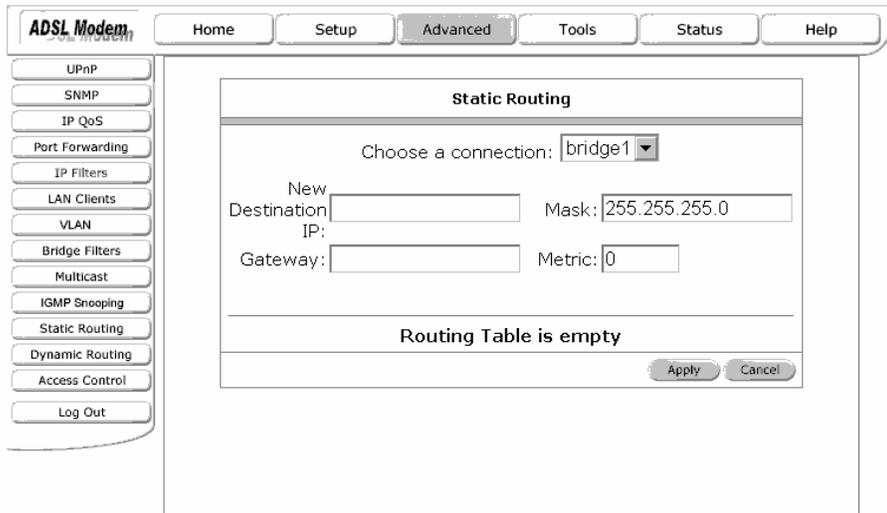
**Figure 16-2 (IGMP SNOOPING)**

#### 4.6.8 Static Routing

If the CPE is connected to more than one network, you may need to set up a static route between them. A static route is a pre-defined pathway that network information must travel to reach a specific host or network. You can use static routing to allow different IP domain users to access the Internet through the CPE.

The New Destination IP is the address of the remote LAN network or host to which you want to assign a static route. Enter the IP address of the host for which you wish to create a static route here. For a standard Class C IP domain, the network address is the first three fields of the New Destination IP, while the last field should be 0. The Subnet Mask identifies which portion of an IP address is the network portion, and which portion is the host portion. For a full Class C Subnet, the Subnet Mask is 255.255.255.0. The CPE IP address should be the IP address of the CPE device that allows for contact between the CPE and the remote network or host. The Hop Count determines the maximum number of steps between network nodes that data packets will travel. A node is any device on the network (such as a router or switch)

To enable Static Routing, from the Home screen, click Advanced and under Advanced, select Static Routing. Figure 17 illustrates a typical Static Route.



**Figure 17 (Static Routing)**

The apply button will temporarily save this connection. To make the change permanent you need to click on **Tools** (at the top of the page) and select **System Commands**. At the system commands page, click on **Save All**.

#### 4.6.9 Dynamic Routing

Dynamic Routing allows the CPE to automatically adjust to physical changes in the network. The CPE, using the RIP protocol, determines the network packets' route based on the fewest number of hops between the source and the destination. The RIP protocol regularly broadcasts routing information to other routers on the network.

The Direction determines the direction that RIP routes will be updated. Selecting In means that the CPE will only incorporate received RIP information. Selecting Out means that the CPE will only send out RIP information. Selecting both means that the CPE will incorporate received RIP information and send out updated RIP information.

The protocol is dependent upon the entire network. Most networks support Rip v1. If RIP v1 is selected, routing data will be sent in RIP v1 format. If Rip V2 is selected, routing data will be sent in RIP v2 format using subnet broadcasting. If Rip V1 Compatible is selected, routing data will be sent in RIP v2 format using multicasting.

To enable Dynamic Routing, from the Home screen, click Advanced and under Advanced, select Dynamic Routing. Figure 18 illustrates a typical Dynamic Route.

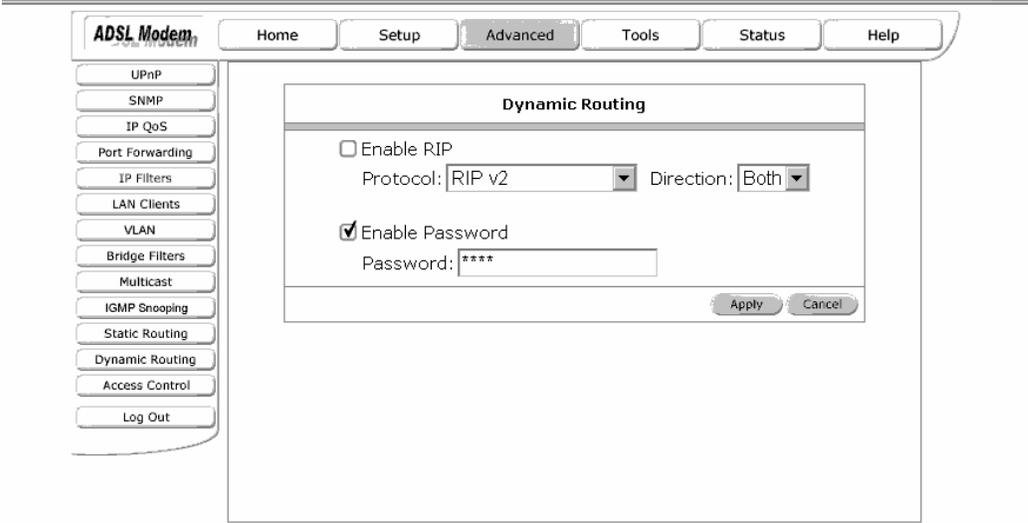


Figure 18 (Dynamic Routing)

The apply button will temporarily save this connection. To make the change permanent you need to click on **Tools** (at the top of the page) and select **System Commands**. At the system commands page, click on **Save All**.

4.6.10 VLAN

Select to make a single physical Ethernet look like multiple Ethernet

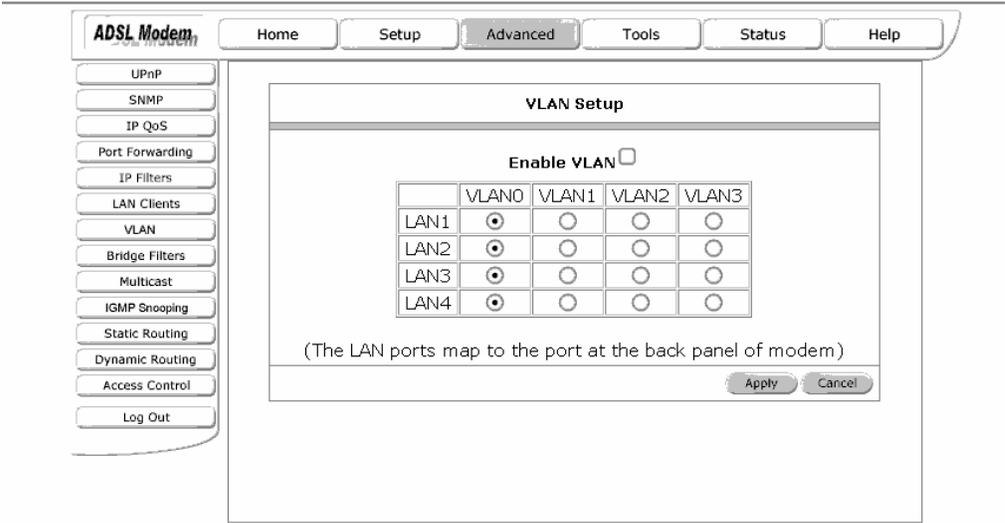


Figure 19 (VLAN Setup)

## 4.7 Tools

The CPE supports a host of tools which will allow you to customize and debug your CPE.

### 4.7.1 System Commands

To make the changes permanent you need to click on **Tools** (at the top of the page) and select **System Commands**. The following commands are used to configure the CPE:

- a. Save all: Press this button in order to permanently save the current configuration of the CPE. If you do re-start the system without saving your configuration, the CPE will revert back to the previously saved configuration.
- b. Restart: Use this button to re-start the system. If you have not saved your configurations, the CPE will revert back to the previously saved configuration upon re-starting. NOTE: Connectivity to the unit will be lost. You can reconnect after the unit reboots.
- c. Restore Defaults: Use this button to restore factory default configuration. NOTE: Connectivity to the unit will be lost. You can reconnect after the unit reboots.

### 4.7.2 Remote Log

The remote log feature is used in conjunction with the PC tool (software provided with your CPE). For PPPoE and PPPoA connections, you can select debug if you want to log the connection information. This is helpful when trying to debug connection problems.

The remote log feature will forward all logged information to the remote PC. The type of information forwarded to the remote PC depends upon the Log level. Each log message is assigned a severity level, which indicates how seriously the triggering event affects router functions. When you configure logging, you must specify a severity level for each facility; messages that belong to the facility and are rated at that level or higher are logged to the destination

Table 1 defines the different severity levels.

To forward logging information, you need to click on **Tools** (at the top of the page) and select **Remote Log**.

Severity Level	Description
panic	System panic or other condition that causes the router to stop functioning.
alert	Conditions that require immediate correction, such as a corrupted system database.
critical	Critical conditions, such as hard drive errors.
error	Error conditions that generally have less serious consequences than errors in the emergency, alert, and critical levels.
warning	Conditions that warrant monitoring.
notice	Conditions that are not errors but might warrant special handling.
info	Events or non-error conditions of interest.
debug	Software debugging messages. Specify this level only when so directed by a technical support representative.

Table 1 (Severity Level)

### 4.7.3 User Management

You can change your CPE's username and password by going to the Home screen, under the tools menu, click User Management. From here you can change the login name and password. You can also change the idle timeout; you will need to log back onto the CPE once the timeout expires.

If you forget your password, you can press and hold the reset to factory defaults button for 10 seconds (or more). The CPE will reset to its factory default configuration and all custom configurations will be lost.

The apply button will temporarily save this connection. To make the change permanent you need to click on **Tools** (at the top of the page) and select **System Commands**. At the system commands page, click on **Save All**.

#### 4.7.4 Update Gateway

You can remotely upgrade the CPE's firmware by going to the Home screen, under the tools title, click Update Gateway. This will bring up the screen shown in Figure 19. TI will provide two different images; one image is the kernel (operating system) and the other image is the file system.

To upgrade the firmware, click browse, find the firmware file to download. Make sure this is the correct file. Click on upgrade firmware (as shown in Figure 19). Once the upgrade is complete the CPE will reboot. You will need to log back onto the CPE after the firmware upgrade is complete.

The firmware upgrade should take less that 5 minutes to complete. If it takes longer than 5 minutes, something has gone wrong.

**Note: Do not remove power from the CPE during the firmware upgrade procedure.**

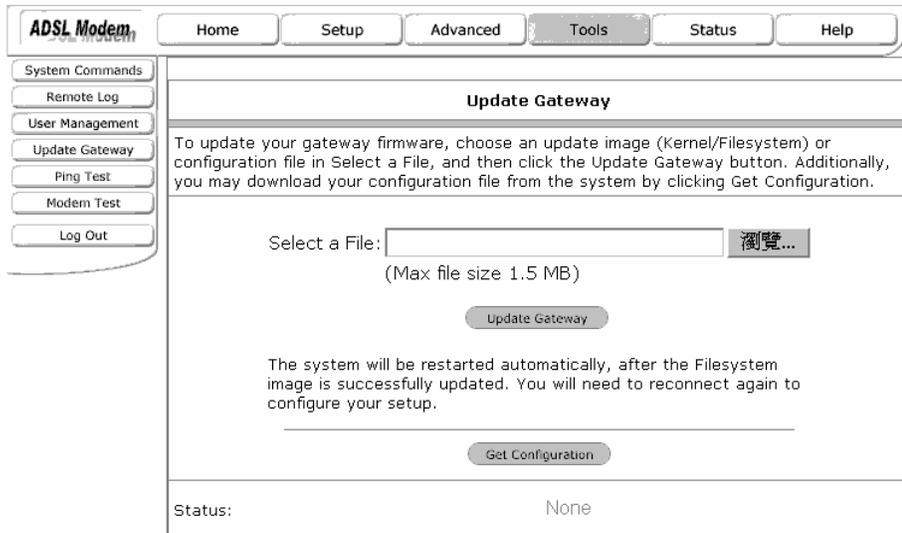
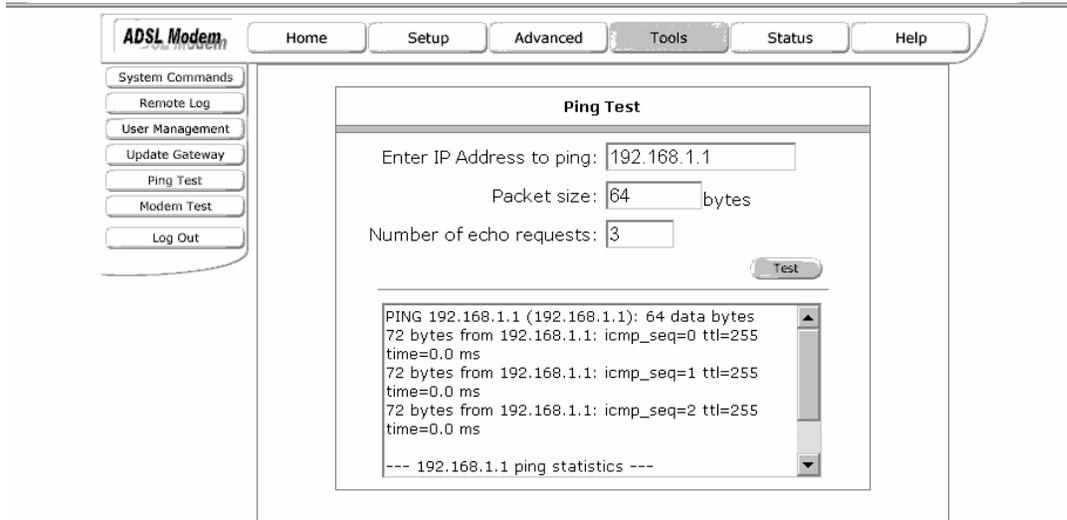


Figure 19 (Update Gateway)

#### 4.7.5 Ping Test

Once you have your CPE configured, it is a good idea to make sure you can Ping the network. You can get to the Ping web page by going to the Home screen, under the Tools title, click Ping Test. Type the target address that you want to pin. If you have your PC connected to the CPE via the default DHCP configuration, you should be able to Ping the network address 192.168.1.1. If your ISP has provided their server address you can try to ping the address. If the pings for both the WAN and the LAN side complete, and you have the proper protocols configured, you should be able to surf the Internet.

By default when you select ping test, the CPE will ping itself 3 times. As shown in Figure 20, the CPE passed the Ping test; this basically means that the TCP/IP protocol is up and running. If this first Ping test does not pass, the TCP/IP protocol is not loaded for some reason; you should restart the modem.



**Figure 20 (Ping test)**

#### 4.7.6 Modem Test

The Modem Test is used to check whether your Modem is properly connected to the WAN Network. This test may take a few seconds to complete. To perform the test, select your connection from the list and press the Test button. Before running this test, make sure you have a valid DSL link; if the DSL link is not connected, this test will always fail.

Also the DSLAM must support this feature; not all DSLAMs have F4 and F5 support.

#### 4.8 Status

The Status section allows you to view the Status/Statistics of different connections and interfaces

##### 4.8.1 Network Statistics

Select to view the Statistics of different interfaces - Ethernet/USB/DSL.

##### 4.8.2 Connection Status

Select to view the Status of different connections.

##### 4.8.3 DHCP Clients

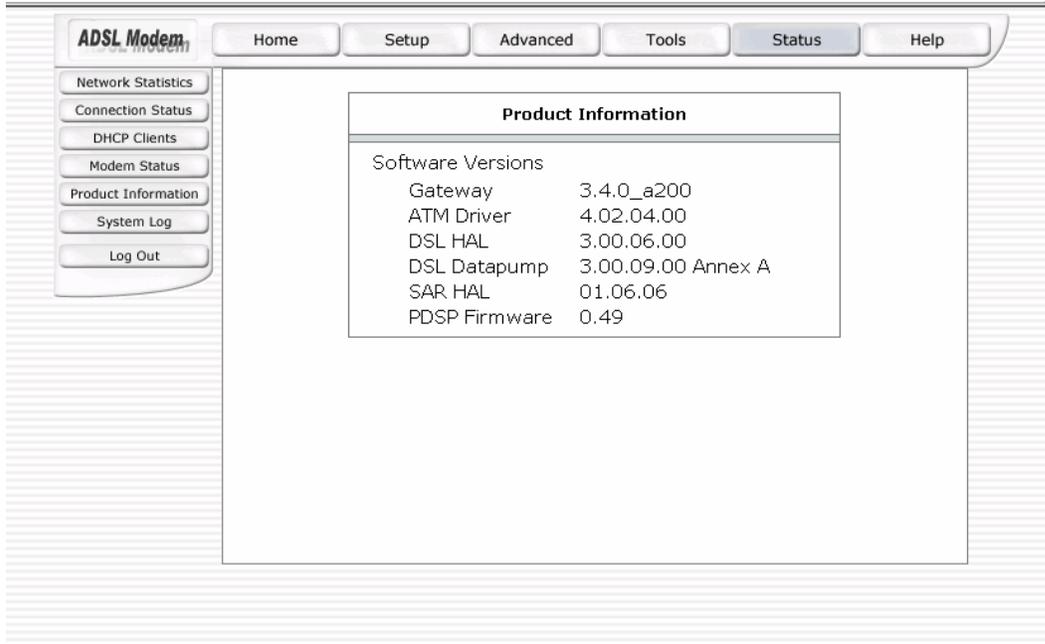
Select to view the list of DHCP clients.

##### 4.8.4 Modem Status

Select to view the Status and Statistics of your broadband (DSL) connection.

##### 4.8.5 Product Information

You can display the CPE's driver and run-time information by going to the **Home** screen, under the **Status** title, click Product Information.



#### **4.8.6 System Log**

You can display the CPE's log by going to the Home screen, under the Status title, click System log. From here you can view all logged information. Depending upon the severity level, this logged info will generate log reports to a remote host (if remote logging is enabled).

## **5. Appendix A: Troubleshooting**

Below is a list of commonly asked questions. Before calling technical support, please look through these issues to see if they help solve your problem.

### **5.1 The CPE is not functional**

1. Check to see that the power LED is green and than the network cables are installed correctly. Refer to the quick start guide for more details.
2. Check to see that the LAN and WAN LEDs are green.
3. Check to see that the DSL LED is green
4. Make sure you are not connecting the USB and the Ethernet port at the same time. You must only use 1 interface at a time.
5. Check the settings on your PC. Again, refer to the quick start guide for more details
6. Check the CPE's settings.
7. From your PC, can you PING the CPE? Assuming that the CPE has DHCP enabled and your PC is on the same subnet as the CPE, you should be able to PING the CPE.
8. Can you PING the WAN? Your ISP should have provided the IP address of their server. If you can ping the CPE and your protocols are configured correctly, you should be able to ping the ISPs network. If you cannot PING the ISPs network, make sure your using the correct protocols with the correct VPI/VCI values.
9. Make sure NAT is enabled for your connection. If NAT is disabled you the CPE will not route frames correctly.

### **5.2 I can't connect to the CPE.**

1. Check to see that the power LED is green and that the network cables are installed correctly; see the quick start guide for more details.
2. Make sure you are not connecting the USB and the Ethernet port at the same time. You must only use 1 interface at a time.
3. Make sure that your PC and the CPE is on the same network segment. The CPE's default IP address is 192.168.1.1. If you are running a Windows based PC, you can open a DOS window and type IPCONFIG; make sure that the network adapter that is connected to the CPE is within the same 192.168.1.x subnet.
4. Also, your PC's Subnet Mask should match the CPEs subnet mask. The CPE has a default subnet mask of 255.255.255.0.
5. If this still does not work, press the reset button for 10 seconds. This will place the CPE into its factory default state. Go through the above procedures again.
6. Make sure NAT is enabled for your connection. If NAT is disabled you the CPE will not route frames correctly.

### **5.3 The LEDs blink in a sequential pattern.**

This typically means that either the kernel or flash file system is corrupted. The only way to recover from this type of failure is via the PC tool. You need to install the PC tool that was provided with TI's build and perform the following steps:

1. In windows disable all network adapters except the one, which is connected to the CPE.
2. Disable zone alarm or any IP blocking software that is running of the PC.
3. Run the PC tool application. At the IP address prompt, type 192.168.1.1 and retrieve/assign IP address. The PC application should come back with information about the CPE. You then need to load the kernel image, flash file system, and config.xml file to the flash.
4. Once all three codes have been loaded into the CPE, the CPE will automatically reboot. As long as there is no problem with the Flash memory, the CPE should be functional and the LEDs should light correctly.

**5.4 The DSL Link LED continues to blink but does not go solid**

1. This means that the DSL line is trying to train but for some reason it cannot establish a valid connection. The main cause of this is that you are too far away from the central office. Contact your DSL service provider for further assistance.

Common Problems and Solutions

**5.5 The DSL Link LED is always off**

1. Make sure you have DSL service. You should get some kind of information from your ISP which states that DSL service is installed. You can usually tell if the service is installed by listening to the phone line; you will hear some high-pitched noise. If you do not hear high-pitched noise, contact your ISP.
2. Verify that the phone line is connected directly to the wall and to the line input on the CPE. If the phone line is connected to the phone side of the CPE or you have a splitter installed on the phone line, the DSL light will not come on.

## **6. Router terms**

### **What is a firewall?**

A firewall is protection between the Internet and your local network. It acts similarly to the firewall in your car, protecting the interior of the car from the engine. Your car's firewall has very small opening that allow desired connections from the engine into the cabin (gas pedal connection, etc), but if something happens to your engine, you are protected.

The firewall in the router is very similar. Only the desired connections that you allow are passed through the firewall. These connections are normally originating from the local network; such as web browsing, checking your email, downloading a file, and playing a game. However, in some cases, you can allow incoming connections so that you can run programs like a web server.

### **What is NAT?**

NAT stands for Network Address Translation. Another name for it is Connection Sharing. What does this mean? Your ISP provides you with a single network address for you to access the Internet through. However, you may have several machines on your local network that want to access the Internet at the same time. The router provides NAT functionality that converts your local network addresses to the single network address provided by your ISP. It keeps track of all these connections and makes sure that the correct information gets to the correct local machine.

Occasionally, there are certain programs that don't work well through NAT. Some games, and some specialty applications have a bit of trouble. The router contains special functionality to handle the vast majority of these troublesome programs and games. NAT does cause problems when you want to run a SERVER though. When running a server, please see the DMZ section below.

### **What is a DMZ?**

DMZ really stands for Demilitarized Zone. It is a way of separating out part of your local network so that is more open to the Internet. Suppose that you want to run a web-server, or a game server. Normal servers like these are blocked from working by the NAT functionality. The solution is to "isolate" the single local computer into a DMZ. This makes the single computer look like it is directly on the Internet, and others can access this machine.

Your machine isn't really directly connected to the Internet, and it really has an internal local network address. When you provide the servers network address to others, you must provide the address of the router. The router "fakes" the connection to your machine.

You should use the DMZ when you want to run a server that others will access from the Internet. Internal programs and servers (like print servers, etc) should NOT be connected to the DMZ

### **What is a CPE?**

The Internet is so large that a single network cannot handle all of the traffic and still deliver a reasonable level of service. To overcome this limitation, the network is broken down into smaller segments or subnets that can deliver good performance for the stations attached to that segment. This segmentation solves the problem of supporting a large number of stations, but introduces the problem of getting traffic from one subnet to another.

To accomplish this, devices called routers or CPEs are placed between segments. If a machine wishes to contact another device on the same segment, it transmits to that station directly using a simple discovery technique. If the target station does not exist on the same segment as the source station, then the source actually has no idea how to get to the target.

One of the configuration parameters transmitted to each network device is its default CPE. This address is configured by the network administrators and it informs each personal computer or other network device where to send data if the target station does not reside on the same subnet as the source. If your machine can reach all stations on the same subnet (usually a building or a sector within a building), but cannot communicate outside of this area, it is usually because of an incorrectly configured default CPE.