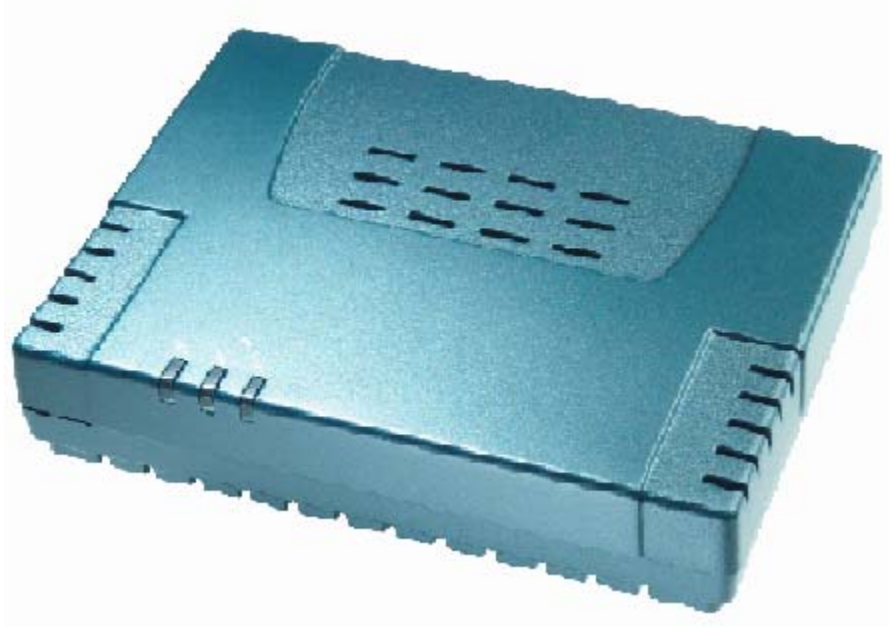

Web Interface User's Guide



SAR-600E ADSL 2/2+ Ready 1 Port Router

Solwise Ltd

www.solwiseforum.co.uk

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- Product warranty does not apply to damage caused by lightning, power surges or wrong voltage usage.
- This product is for use only in UL Listed computers.

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1. Introduction

The SAR-600E ADSL Ethernet Router is the perfect high-speed WAN bridge/router. This full-featured product is specifically designed to connect to the Internet and directly connect to your local area network via high speed 10/100 Mbps Ethernet. The ADSL Router has also full NAT firewall and DMZ services to block unwanted users from accessing your network.

For game users, the ADSL Router had already pre configured for several low latency game ports. Just click on the game you are playing on line and the rest is done for you

The ADSL Router is fully compatible with all PCs; as long as the PC supports an Ethernet interface and is running a TCP/IP protocol stack, your PC can have high-speed WAN access. So, plug in the ADSL Router (refer to easy start guide), configure it (per your ISP's requirements) and enjoy the fast Internet access like never before.

1.1 Features

ADSL/ATM Support

- ANSI T1.413 issue 2, ITU-T G.992.1 (G.dmt) and G.992.2 (G.lite) compliant
- ADSL2, ADSL2+, RE-ADSL compliant
- Rate Adaptive modem at 32 Kbps steps
- Dynamic Adaptive Equalisation to improve Carrier's service area
- Bridge Tap Mitigation support
- ATM Layer with Traffic shaping QoS Support (UBR, CBR, VBR-rt, VBR-nrt)
- AAL ATM Attributes - AAL5
- Multiple PVC up to 8 support (Bridge Support)
- Spectral compatibility with POTS
- F5 OAM Loopback/Send and Receive

Encapsulation Support

- RFC2684 Bridge and Routed LLC and VC Mux support
- RFC2364 PPPoA Client support
- RFC2516 PPPoE Client support
- RFC2225/RFC1577 Classical IP Support
- Transparent Bridge Support

Network Support

- Static IP, Dynamic RIP routing support
- IP/TCP/UDP/ICMP/ARP/RARP Application Support
- Network Address Translation (NAT)
- Port Mapping/Forwarding
- Easy setup of Port Forwarding rules for popular Games/Application
- NAT Application Level Gateway for popular applications
- DHCP Server/Relay/client
- DNS Relay Agent
- DMZ support
- Single Session IP Sec and PPTP/L2TP VPN pass through support
- PPP Always on with configurable timeout
- PPP Dial on Demand
- Universal Plug and Play Support

Management Support

- Web Based HTTP management GUI
- TFTP/FTP Support for Firmware Upgrade
- Web Based Firmware Upgrade (Local)
- Soft Factory Reset Button via Web GUI
- Diagnostic Test (DSL, OAM, Network, Ping Test)
- Telnet/CLI (Read Only)
- Syslog Support

Security Support

- NAT for basic Firewall support
- Packet Filtering Firewall Support
- Stateful Packet Inspection Support
- Protection against Denial of Service attacks
- Password Authentication to Modem

External Connectors:

- 1 x RJ-11 Telephone socket for ADSL line
- 1 x RJ45 for 10/100Base-T Ethernet (MDI-X)
- 1 x DC Jack for Power Input
- 1 x Factory Default Reset Button

2. Your gateway at a glance

2.1 Ports and buttons

Reset and Restore to Factory Defaults: This feature will set the ADSL Router back to its factory default configuration. You may need to place the ADSL Router into its factory defaults if the configuration is changed and you lose the ability to interface to the ADSL Router via the web interface, or following a software upgrade. To reset the ADSL Router, simply press the reset button for about ~ 10 seconds. The ADSL Router will be reset to its factory defaults and after about 30 ~ 40 seconds the ADSL Router will become operational again.

LAN (local area network) port(s): connect to Ethernet network devices, such as a PC, hub, switch, or routers. Some ADSL Router came with a single LAN connection and some come with four LAN connections. If connecting to a PC or auto-sensing switch/hub then you can use a straight through LAN cable. If you are connecting to a older style hub then you may need a cross over LAN cable.

Power is where you connect the power. Make sure to observe the proper power requirements. The required power is 9 volts.

DSL port: This is the WAN interface that connects directly to your phone line.

2.2 LED description

1. PWR/POWER

Lights up when power is supplied to the ADSL Router.

2. ETH/ACT

Lights up when the Ethernet cable is properly connected from your ADSL Router to the Ethernet Card.

Flickers when the ADSL is transmitting/receiving data.

3. DSL

Lights up when the DSL connection is established.

Flickers when the ADSL Router is trying to establish a connection with the ADSL Service Provider.

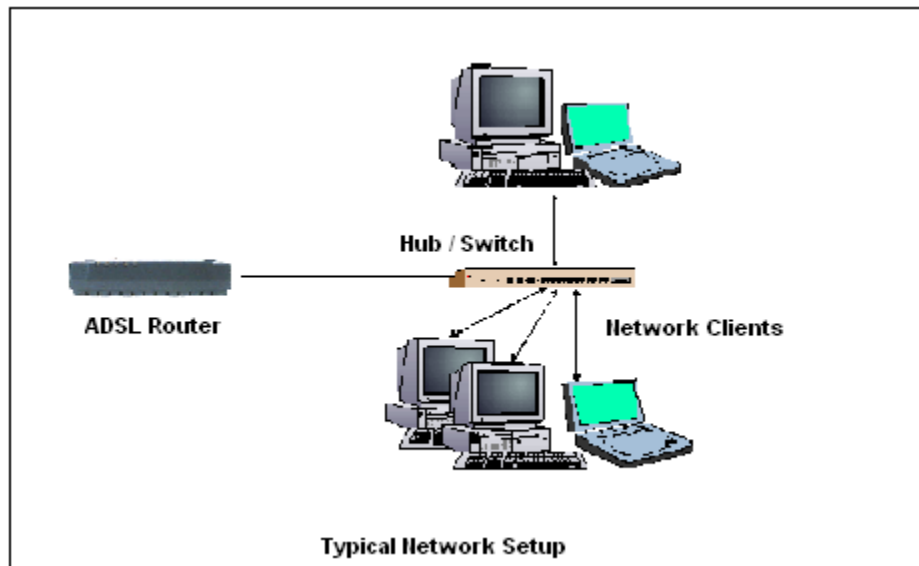
4. PPP/Internet

Lights up when the PPP connection is established.

3. Installing your ADSL Router

1. Locate an optimum location for the ADSL Router.
2. For connections to the Ethernet and DSL interfaces, please refer to the easy start guide.
3. Connect the AC Power Adapter. Depending upon the type of network, you may want to put the power supply on an uninterruptible supply. Only use the power adapter supplied with the ADSL Router. A different adapter may damage the product.

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



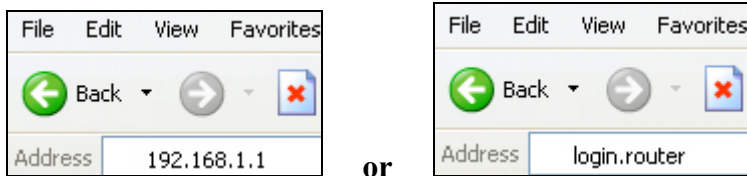
4. Setting up your ADSL Router

This section will guide you through your ADSL Router's configuration. The ADSL Router is shipped with a standard UK PPP configuration.

4.1 Log into your ADSL Router

Note: Before setting up your ADSL Router, make sure you have followed the easy start guide. You should have your computers configured for DHCP mode and have proxies disabled on your browser.

To configure your ADSL Router, open your web browser. You may get an error message at this point; this is normal. Do not panic!. Continue following these directions. Type the default IP address of the router (**192.168.1.1**) or the address **login.router**.



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: If you access the ADSL 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).

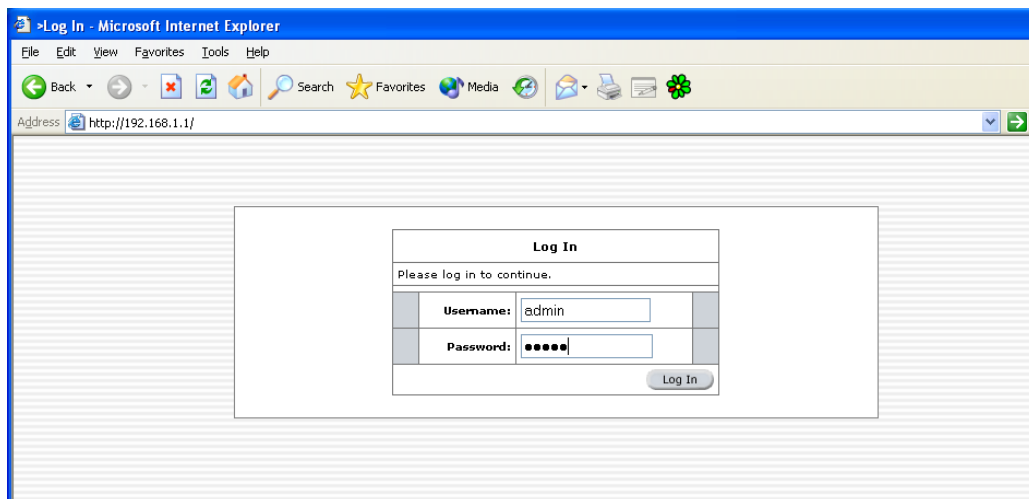
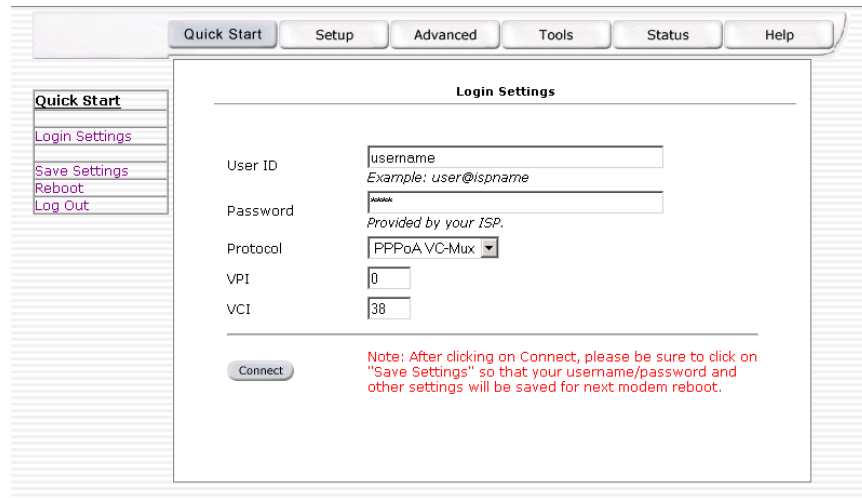


Figure 1 (Log-in screen)

4.2 Quick Start

The first screen (Figure 2) that appears (after the log in screen) is the Quick Start screen. By default the ADSL Router has being configured for a UK PPPoA connection so the user should only need to enter the username and password (as specified by the local ISP) to make a connection to the internet.

The Quick Start page is meant for basic users whom only require easy and seamless connectivity to the internet without worrying about any other advance configuration setting.



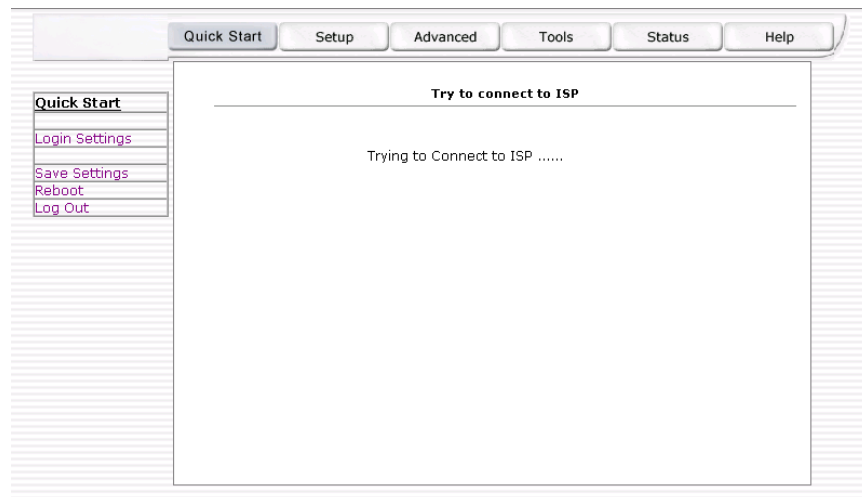
The screenshot shows the 'Quick Start' page of an ADSL router's web interface. At the top, there is a navigation bar with buttons for 'Quick Start', 'Setup', 'Advanced', 'Tools', 'Status', and 'Help'. On the left side, there is a sidebar menu with links for 'Quick Start', 'Login Settings', 'Save Settings', 'Reboot', and 'Log Out'. The main content area is titled 'Login Settings' and contains the following fields:

- User ID: (Example: user@ispname)
- Password: (Provided by your ISP.)
- Protocol: (dropdown menu)
- VPI:
- VCI:

At the bottom left of the form is a 'Connect' button. To its right, a red note reads: 'Note: After clicking on Connect, please be sure to click on "Save Settings" so that your username/password and other settings will be saved for next modem reboot.'

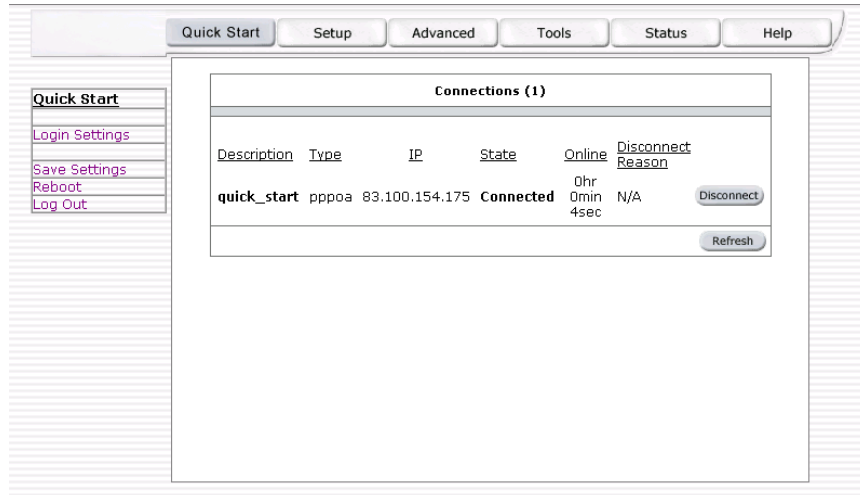
Figure 2 (Quick Start page)

Enter the username and password for your ISP Internet account. The values for Protocol, VPI, and VCI should be PPPoA VcMux, 0, 38 (UK default for BT phone line). Then click on Connect. The router will now attempt to connect to your ISP.



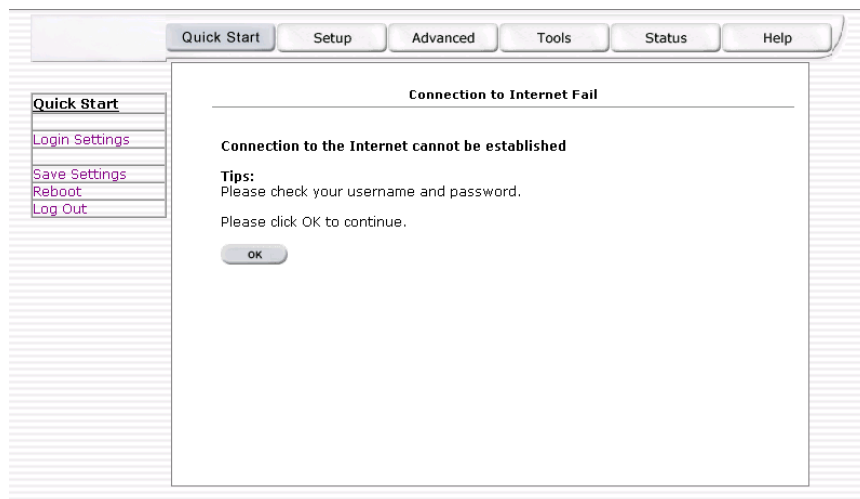
The screenshot shows the 'Quick Start' page of the ADSL router's web interface after the 'Connect' button has been clicked. The navigation bar and sidebar menu are the same as in Figure 2. The main content area is titled 'Try to connect to ISP' and displays the text 'Trying to Connect to ISP

If the router succeeds then you should see a page similar to below and you are now connected to the internet.



Now click on the Save Settings menu option to ensure your settings are stored.

But, if the router fails, then you should see a page similar to this.



You should click on OK to re-enter or check your account details.

4.3 Setup (for advance user)

From this screen the user can setup the ADSL Router (configure the LAN and WAN connection(s), configure the advanced configuration options within the ADSL Router (security, routing, and filtering), access tools that are helpful for debug purposes, obtain the status of the modem, and view the extensive online help.

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

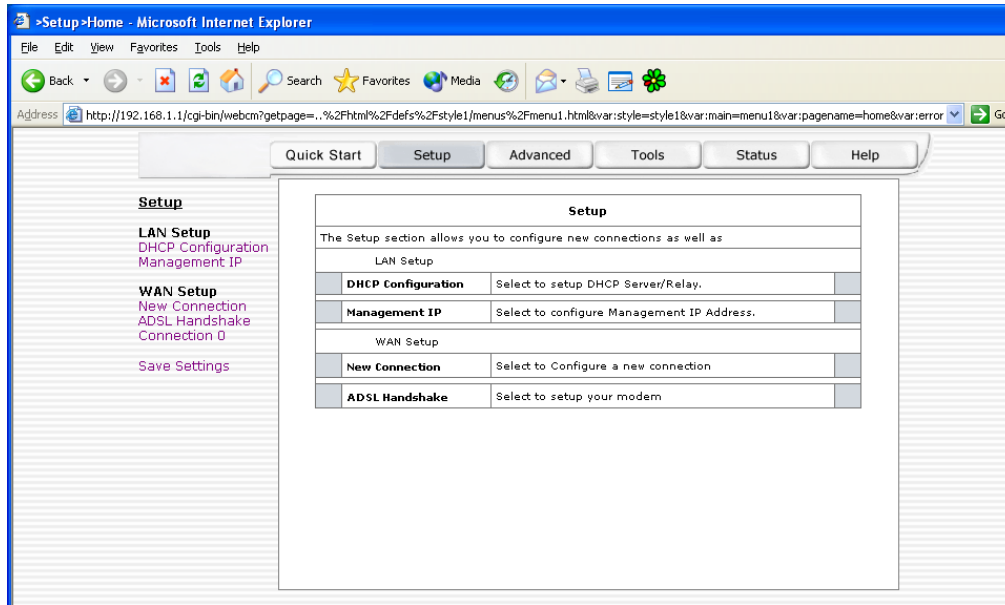


Figure 3 (Setup page)

4.3.1 Local Area Network connection

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

4.3.2 Wide Area Network connection

On the other side of the ADSL 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.

4.4 Configuring the WAN

Before the gateway 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 (default is MMODE)
- You also need your username and password

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

- DHCP
- RFC2364 / PPPoA
- RFC2516 / PPPoE
- Static
- Bridged
- RFC1577 / CLIP

4.4.1 New Connection

A new connection is basically a virtual connection. Your ADSL Router 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.

Please note that only PPPoA connectivity is supported in the UK (at present). So, although the other types of connection are discussed, only the PPPoA type is applicable.

4.4.1.1 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 ADSL Router to terminate the PPPoA connection. The advantage is that the PPPoA termination is done within the ADSL Router and not on your PC; this frees up your PC resources and allows multiple users to utilize the PPPoA connection.

To configure the gateway for PPPoA, click on Setup and then click on **New Connection**. The default PPPoE connection setup should be displayed so you need to 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 – for BT lines the value should be 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; the default for a BT line is 0,38. 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.

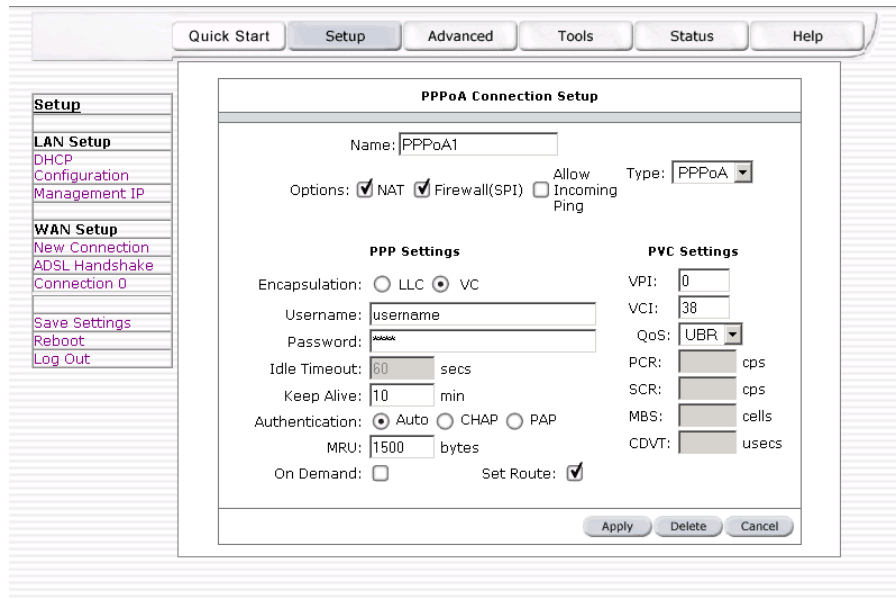


Figure 5 (PPPoA Connection Setup)

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 **Save Setting** (at the side of the page). At the system commands page, click on **Save All**.

4.4.1.2 Bridged gateway profile and Connection

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

To configure the ADSL Router as a bridge, 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 **Bridge**. 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 **0,100**. Also select the quality of service (QoS); leave the default value if you are unsure or the ISP did not provide this information.

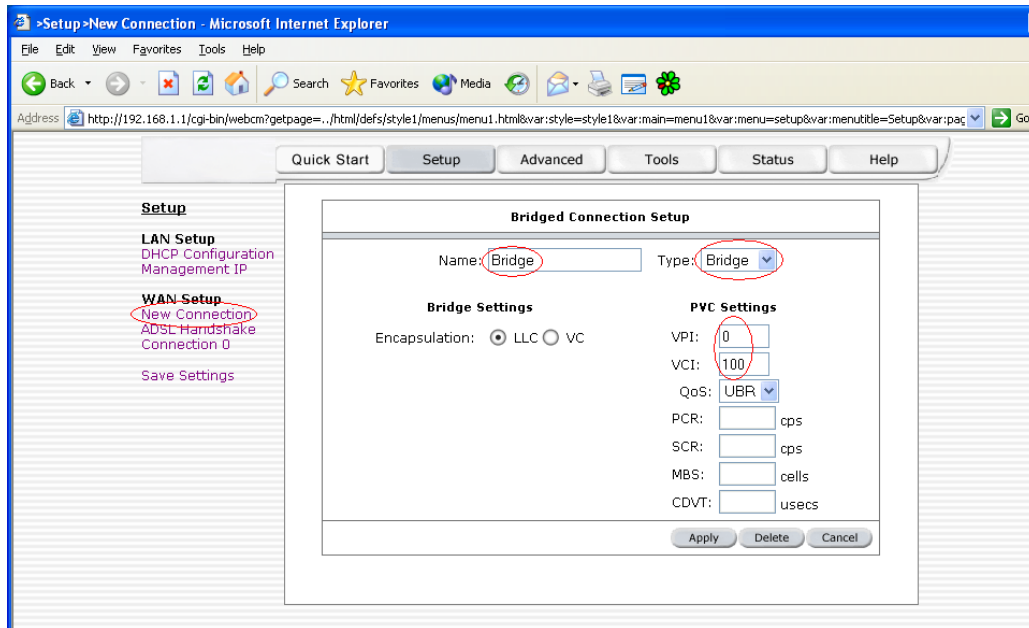


Figure 4 (Bridge Connection Setup)

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 **Save Settings**. 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 gateway 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 **0,100**. 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:

- h. Username: The username for the PPPoE access; this is provided by your DSL service provider or your ISP.
- i. Password: The password for the PPPoE access; this is provided by your DSL service provider or your ISP.
- j. On-Demand: Enables on-demand mode. The connection will disconnect if no activity is detected after the specified idle timeout value.
- k. 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.
- l. 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.

- m. Set Route: Specify this connection as the default-route.
- n. 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.
- o. 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.

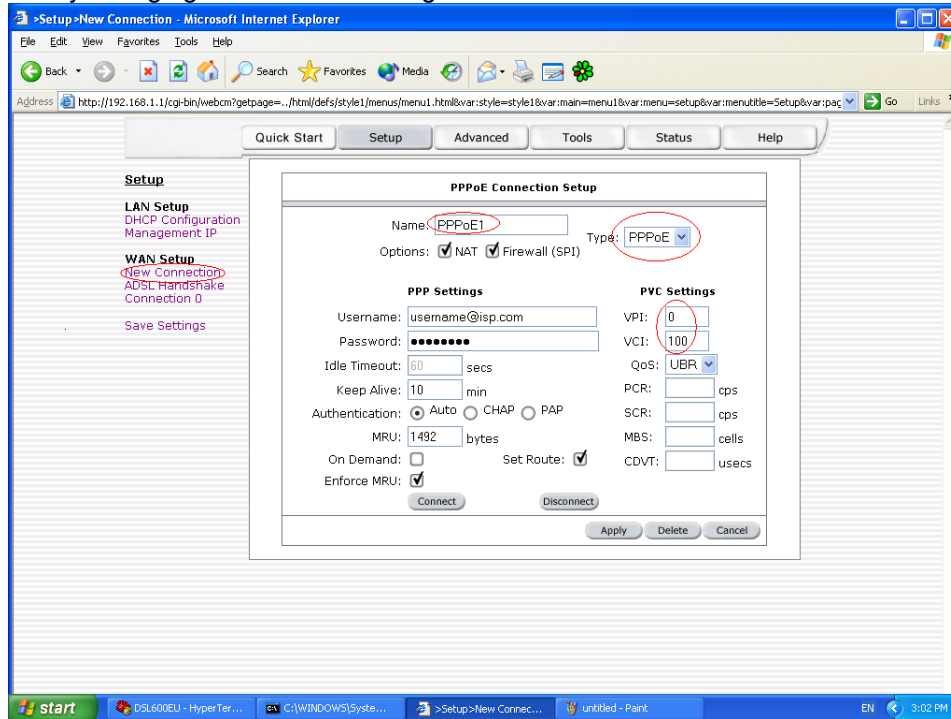


Figure 6 (PPPOE Connection Setup)

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 **Save Setting** (at the side of the page). At the system commands page, click on **Save All**.

4.4.1.4 DHCP Connection Setup

Dynamic Host Configuration Protocol (DHCP) allows the ADSL Router 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 ADSL Router 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 **0,100**. 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 gateway will retrieve an IP address, Subnet mask, and Gateway 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.

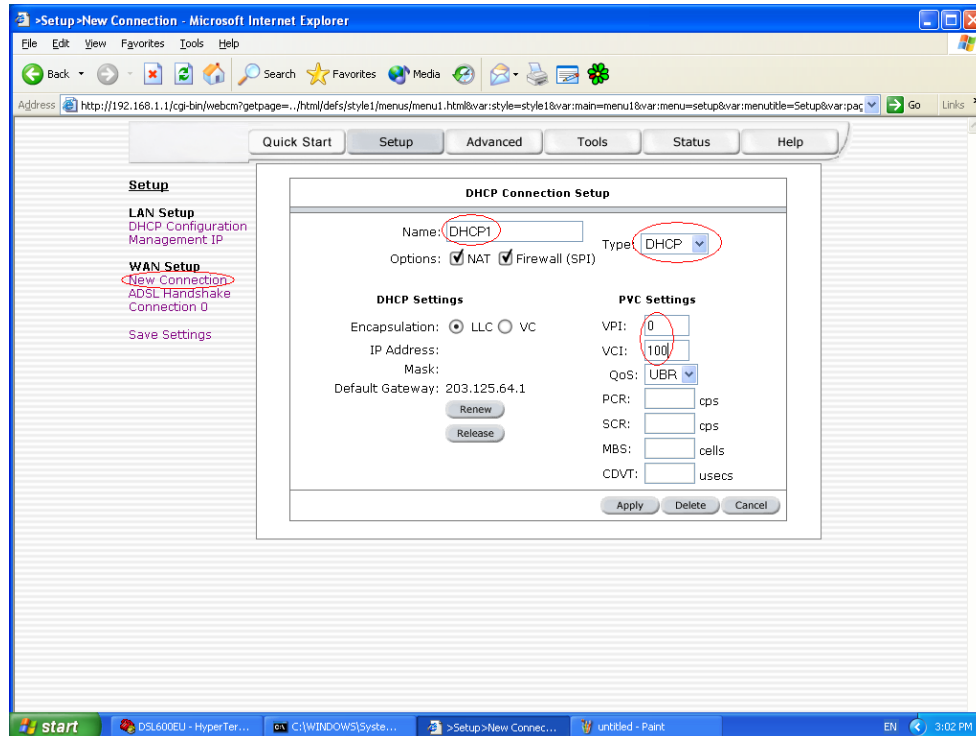


Figure 7 (DHCP Connection Setup)

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 **Save Settings** (at the side of the page). 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 gateway 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 ADSL Router 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 Gateway (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.

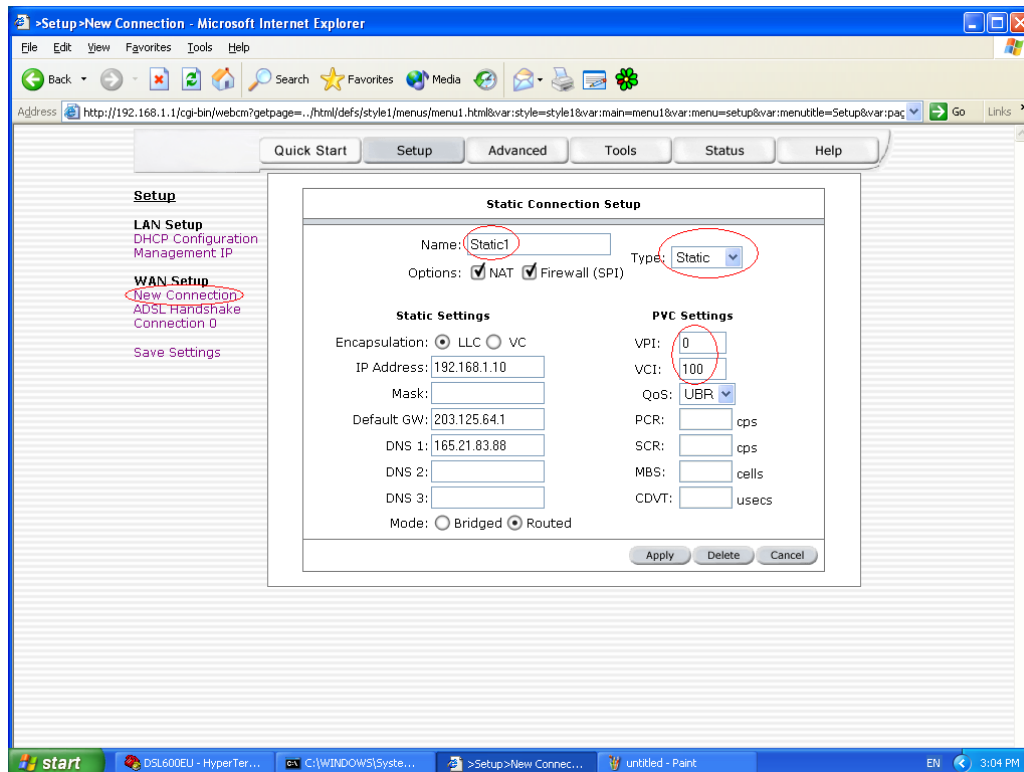


Figure 8 (Static IP Connection Setup)

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 **Save Settings** (at the side of the page). At the system commands page, click on **Save All**.

4.4.1.6 Classical IP over ATM (CLIP, defined in RFC1577) Connection Setup

The Classical IP over ATM (CLIP) support provides the ability to transmit IP packets over an ATM network, CLIP support will encapsulate IP in an AAL5 packet data unit (PDU) frame using RFC1577 and it utilizes an ATM aware version of the ARP protocol (ATMARP. support only allows for PVC support; it does not support SVC).

To configure the ADSL Router for a CLIP connection, click on Setup and then click on **New Connection**. The default CLIP connection setup is displayed. At the Type field select **CLIP** and the CLIP connection setup page is displayed; figure 9 illustrates a typical CLIP configuration. Give your CLIP connection a unique name; the name must not have spaces and cannot begin with numbers. In this case the unique name is called **CLIP1**. 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 **0,101**. 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.

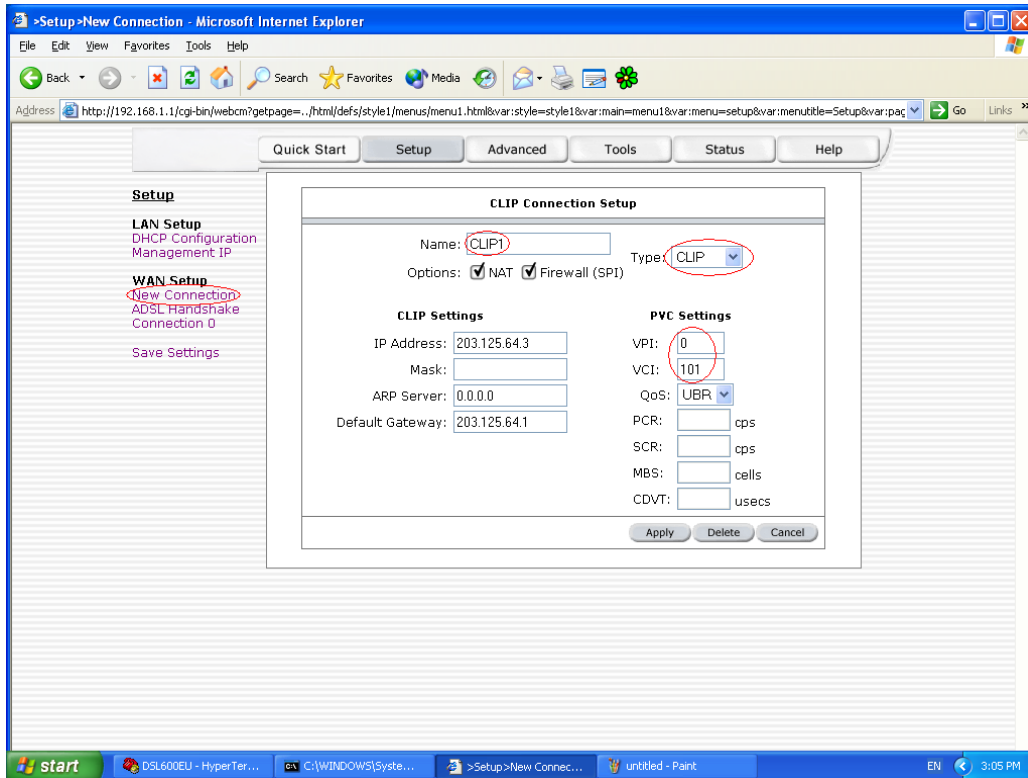


Figure 9 (CLIP Connection Setup)

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 **Save Settings** (at the side of the page). At the system commands page, click on **Save All**.

4.4.2 Modify an Existing Connection

To modify an existing connection, click setup and then click the connection you want to modify. The connections are listed as Connection1 through Connection 7

As a note, if you delete the connection, to make the change permanent you need to click on **Save Settings** (at the side of the page). At the system commands page, click on **Save All**.

4.4.3 Modem setup

To configure the DSL modulation type, 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 **Save Settings** (at the side of the page). At the system commands page, click on **Save All**.

4.5 Configuring the LAN

By default, your ADSL Router 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, Click setup. Under LAN Setup, select DHCP Configuration. This will bring up the screen shown in Figure 10.

The Start IP Address is where the DHCP server starts issuing IP addresses. This value must be greater than the ADSL Router IP address value. For example if the ADSL Router IP address is 192.168.1.1 (default) than the starting IP address must be 192.168.1. 2 (or higher).

The End IP Address is where the DHCP server stops issuing IP addresses. The ending address cannot exceed a subnet limit of 254. Hence the max value for our default gateway is 192.168.1.254. If the DHCP server runs out of DHCP addresses, users will not get access to network resources. If this happens you can increase the Ending IP address (to the limit of 255) or reduce the lease time.

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

Note: If you change the start or end values, make sure the values are still within the same subnet as the gateways IP address. In other words, if the gateways IP address is 192.168.1.1 (default) and you change the DHCP start/end IP addresses to be 192.128.1.2/192.128.1.100, you will not be able to communicate to the ADSL Router if your PC has DHCP enabled.

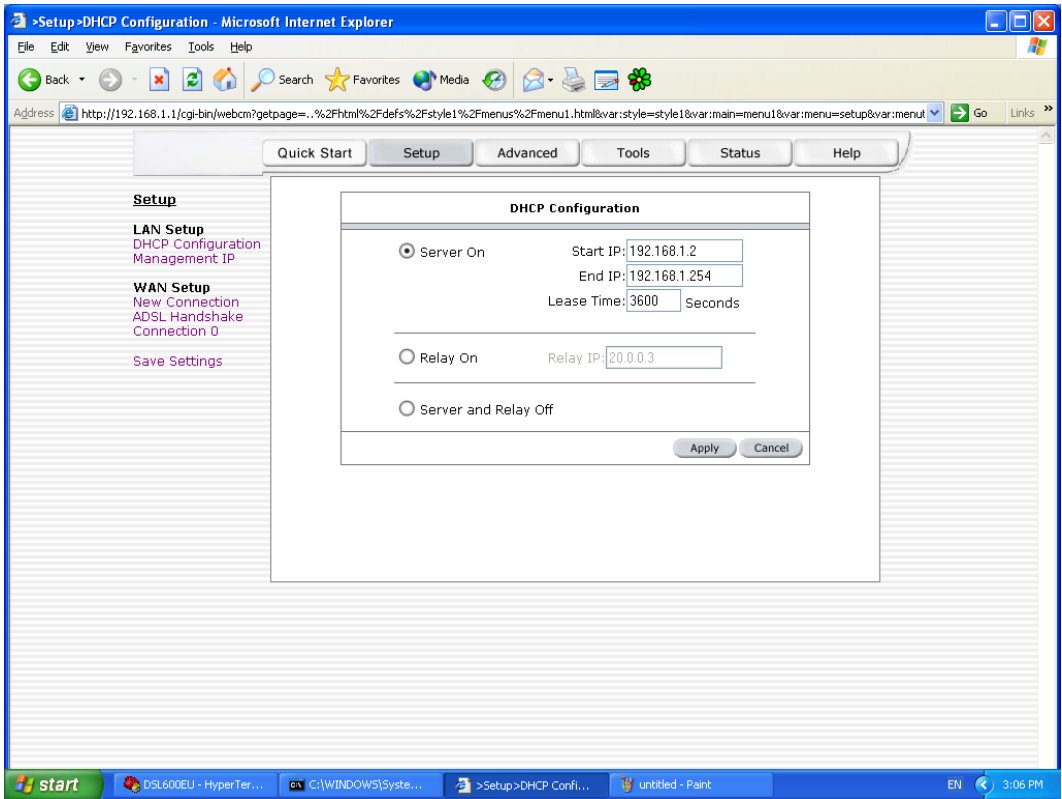


Figure 10 (DHCP Server configuration)

In addition to the DHCP server feature, the ADSL Router supports the DHCP relay function. When the ADSL Router is configured as DHCP server, it assigns the IP addresses to the LAN clients. When the ADSL Router is configured as DHCP relay, it is responsible for forwarding the requests and responses negotiating between the DHCP clients and the server. See figure 11.

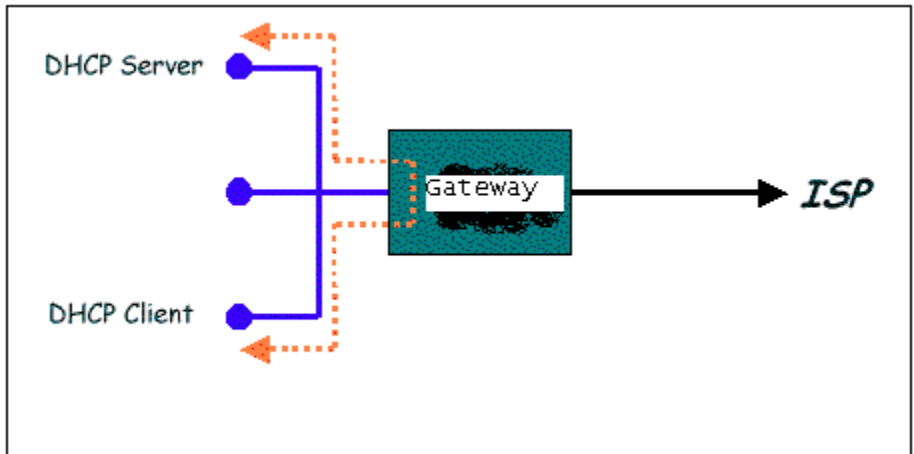


Figure 11 (Example of a DHCP Relay configuration)

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 ADSL Router 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 **Save Settings** (at the side of the page). At the system commands page, click on **Save All**.

4.5.2 Changing the ADSL Router IP address

You can change the ADSL Router's IP address by, clicking Setup and under LAN Setup, select Management. This will bring up the screen shown in Figure 12.

4.5.2.1 Static IP address assignment

Your ADSL Router's default IP address and subnet mask are 192.168.1.1/255.255.255.0; this subnet mask will allow the ADSL Router 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 gateways' IP address and you have DHCP enabled, the DHCP configuration must reside within the same subnet

The default gateway 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 gateway Address. Figure 12 shows a default gateway address of 203.125.64.1 because this was the default gateway defined when the CLIP connection was configured. If you are unsure then leave this entry blank and the router will automatically get the correct setting when it connects.

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 gateway. To access the ADSL Router's web pages the user can type 192.168.1.1 (the default IP address) or type login.router.

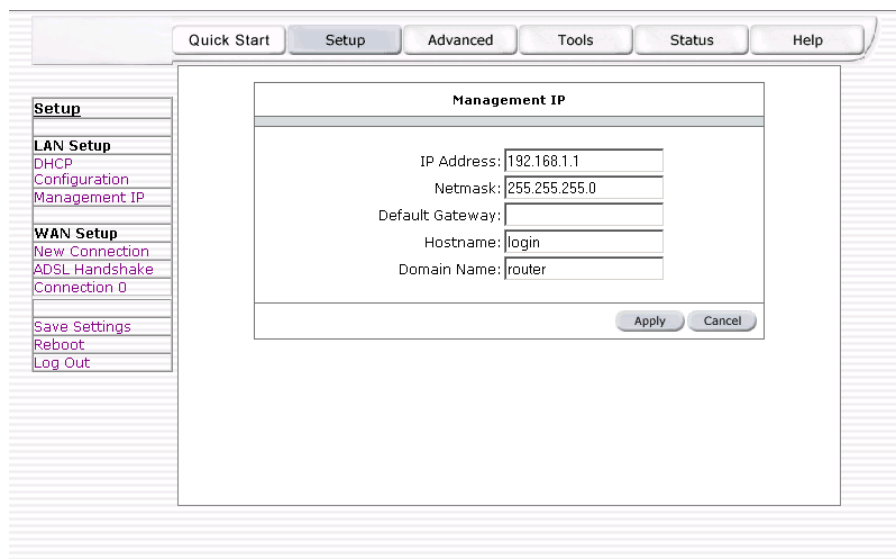


Figure 12 (Management IP address)

The apply button will temporarily save this connection. To make the change permanent you need to click on **Save Settings** (at the side of the page). At the system commands page, click on **Save All**.

4.5.3 Firewall/NAT Services

You can enable or disable Firewall and NAT by clicking on 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 **Save Settings** (at the side of the page). At the system commands page, click on **Save All**.

4.6 Advanced (for advance user only)

The ADSL Router supports a host of advanced features. For basic ADSL 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 ADSL 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, click Advanced and under Advanced, select UPnP. This will bring up the screen shown in Figure 13. You must enable UPnP and then select which connection will utilize UPnP. In this case the PPPoA connection is enabled.

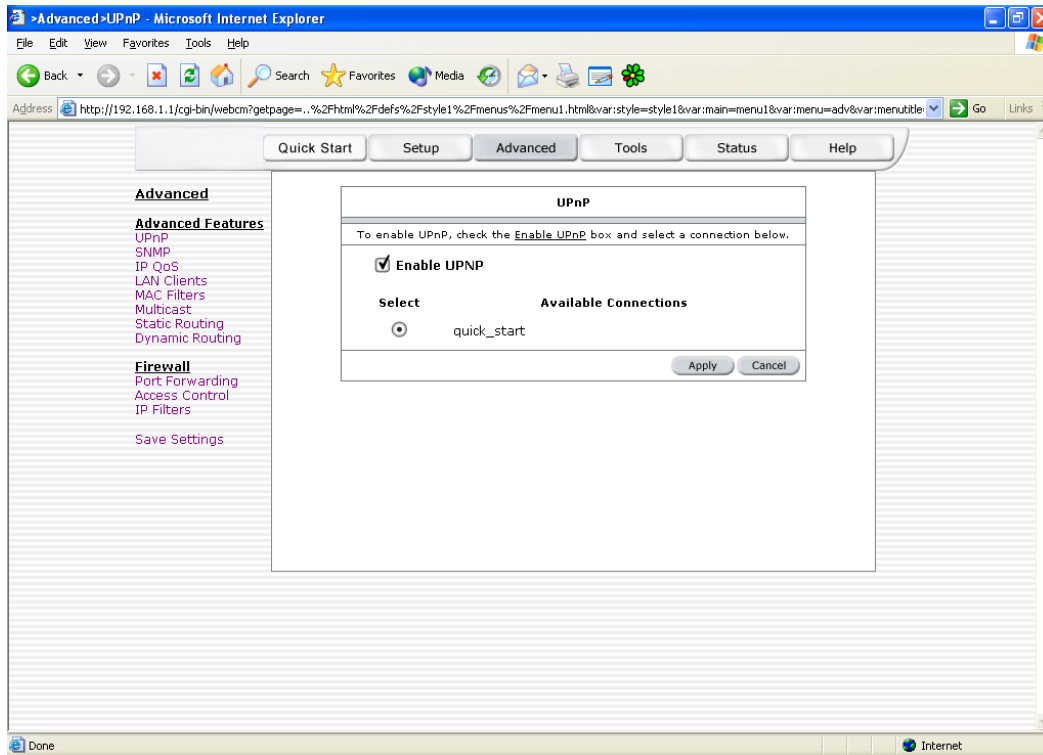


Figure 13 (Management IP address)

The apply button will temporarily save this connection. To make the change permanent you need to click on **Save Settings** (at the side of the page). 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 ADSL 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.

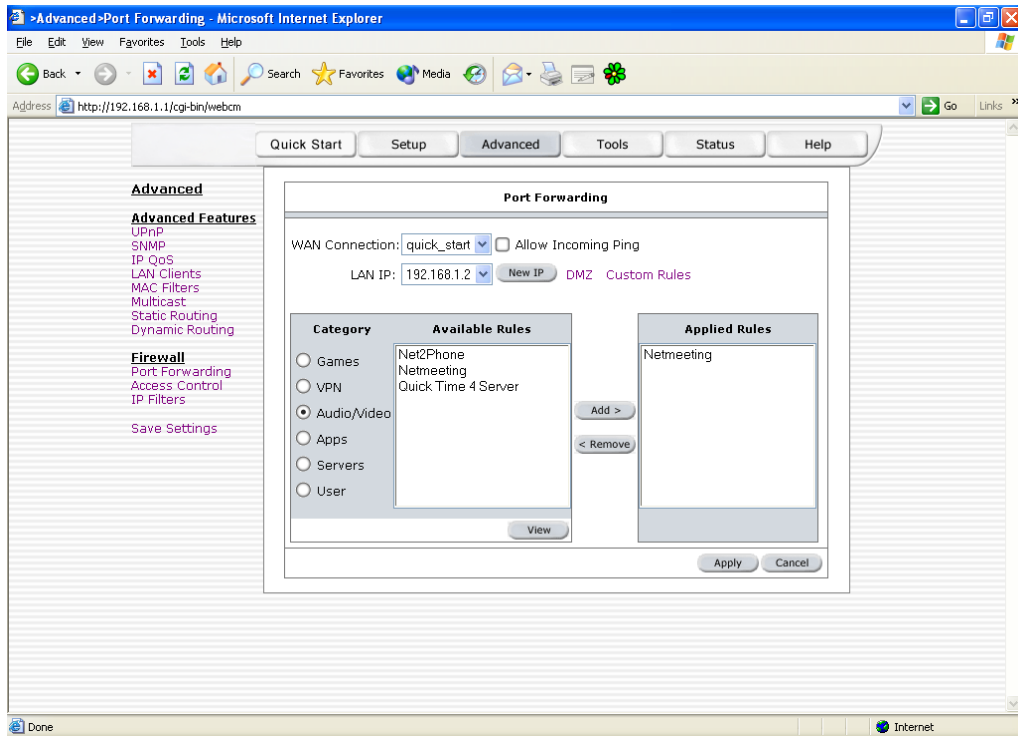


Figure 13 (Port Forwarding: Netmeeting)

The apply button will temporarily save this connection. To make the change permanent you need to click on **Save Settings** (at the side of the page). At the system commands page, click on **Save All**.

4.6.3 Advanced Security

In the presence of the firewall, anonymous Internet traffic is blocked. Using the advanced security features, you can redirect this traffic to a dedicated computer on your local network (DMZ) or open the access from the Internet to the ADSL Router's management ports (web, telnet). The ADSL Router's firewall and NAT services (port forwarding, access control) can be disabled for all interfaces by un-checking the "Enable Firewall and NAT Service"

To enable any of the advanced security features, click Advanced and configure the option under Firewall. Figure 14 illustrates the typical advanced security in Access Control configuration.

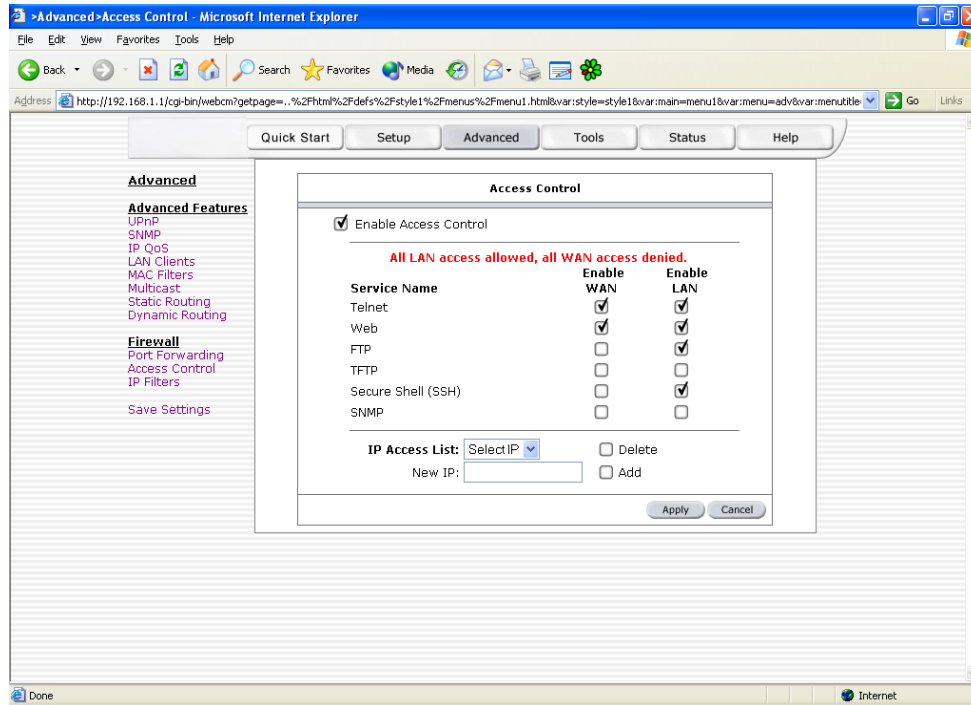


Figure 14 (Access Control)

The apply button will temporarily save this connection. To make the change permanent you need to click on **Save Settings** (at the side of the page). At the system commands page, click on **Save All**.

4.6.3.1 DMZ configuration

Setting a computer (on your local network) as a DMZ forwards any network traffic that is not redirected to another computer via the port-forwarding feature to the computer's IP address. This opens the access to the DMZ computer from the Internet.

4.6.3.2 Enable Web from WAN

Enabling the Web from WAN on your local network allows Web requests that come from the Internet to be re-routed to a Web Server that is on a different subnet. This is different that the Web server rule that is configurable via the port-forwarding page. In this case, the web server is on a different subnet.

4.6.3.3 Enable Remote Telnet

Enabling the Remote Web on your local network allows telnet requests that come from the Internet to be re-routed to a telnet Server that is on a different LAN IP subnet. This is different that the telnet server rule that is configurable via the port-forwarding page. In this case, the telnet server is on a different subnet.

4.6.3.4 Enable Incoming ICMP Ping

Enabling the Incoming Internet Control Message Protocol (ICMP) Ping will allow Echo requests to come into the gateway. The gateway will respond with an ICMP Echo response message. The option allows the DSL provider or ISP to determine the following:

- a. The status of the network.

- b. Tracking and isolating hardware and software problems.
- c. Testing, measuring, and managing networks.

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, 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 **Save Settings** (at the side of the page). At the system commands page, click on **Save All**.

4.6.5 LAN clients

To add a LAN client, 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 **Save Settings** (at the side of the page). At the system commands page, click on **Save All**.

4.6.6 MAC Address Filters

The MAC 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 MAC filter will only examined frames from interfaces that are part of the bridge itself. Twenty filter rules are supported with MAC filtering. To enable MAC Filters, click Advanced and under Advanced, select MAC Filters. Figure 15 illustrates a typical Bridge filter configuration.

The User Interface for MAC 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 MAC Filters" button allow the user to enable or disable MAC 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.

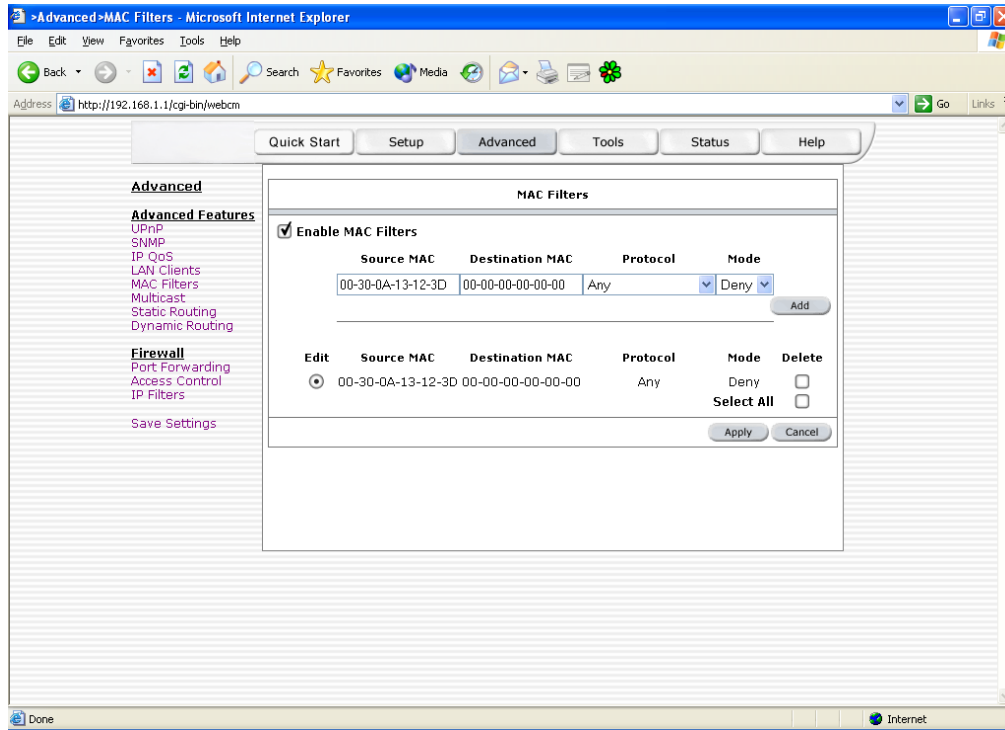


Figure 15 (MAC Filters)

Note: The MAC 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, at a dos prompt type **ipconfig /all**.

The apply button will temporarily save this connection. To make the change permanent you need to click on **Save Settings** (at the side of the page). At the system commands page, click on **Save All**.

4.6.7 Multicast

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.

- a. Anyone can join or leave a host group at will.
- b. There are no restrictions on a host's location.
- c. There are no restrictions on the number of members that may belong to a host group.
- d. A host may belong to multiple host groups.
- e. 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, click on Advanced and under Advanced, select Multicast. Figure 16 illustrates a typical Multicast configuration.

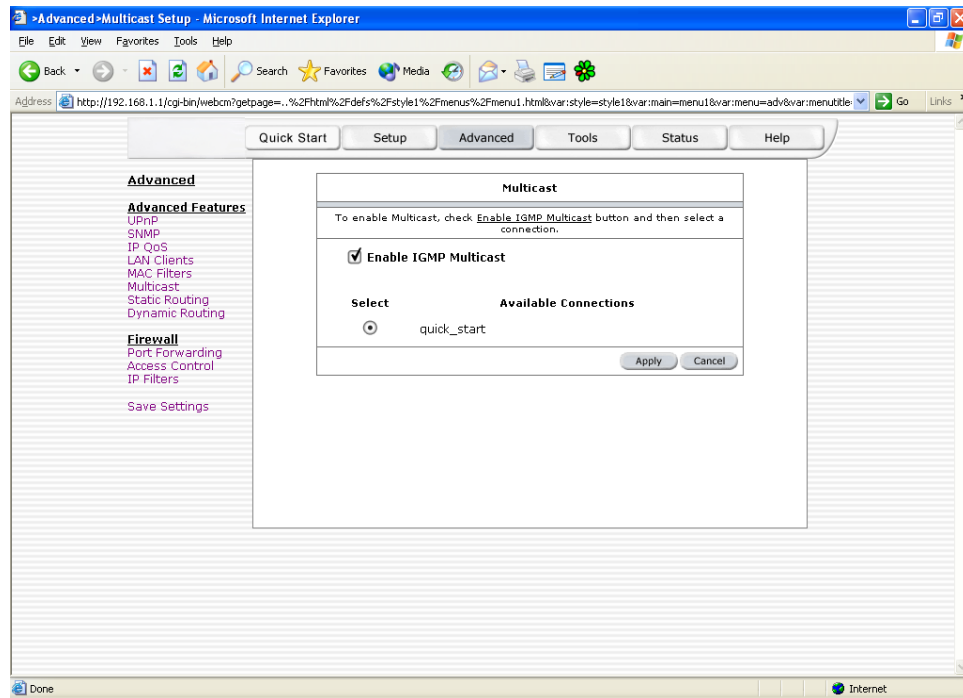


Figure 16 (Multicast)

The apply button will temporarily save this connection. To make the change permanent you need to click on **Save Settings** (at the side of the page). At the system commands page, click on **Save All**.

4.6.8 Static Routing

If the ADSL Router 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 ADSL Router.

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 Gateway IP address should be the IP address of the gateway device that allows for contact between the Gateway 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.

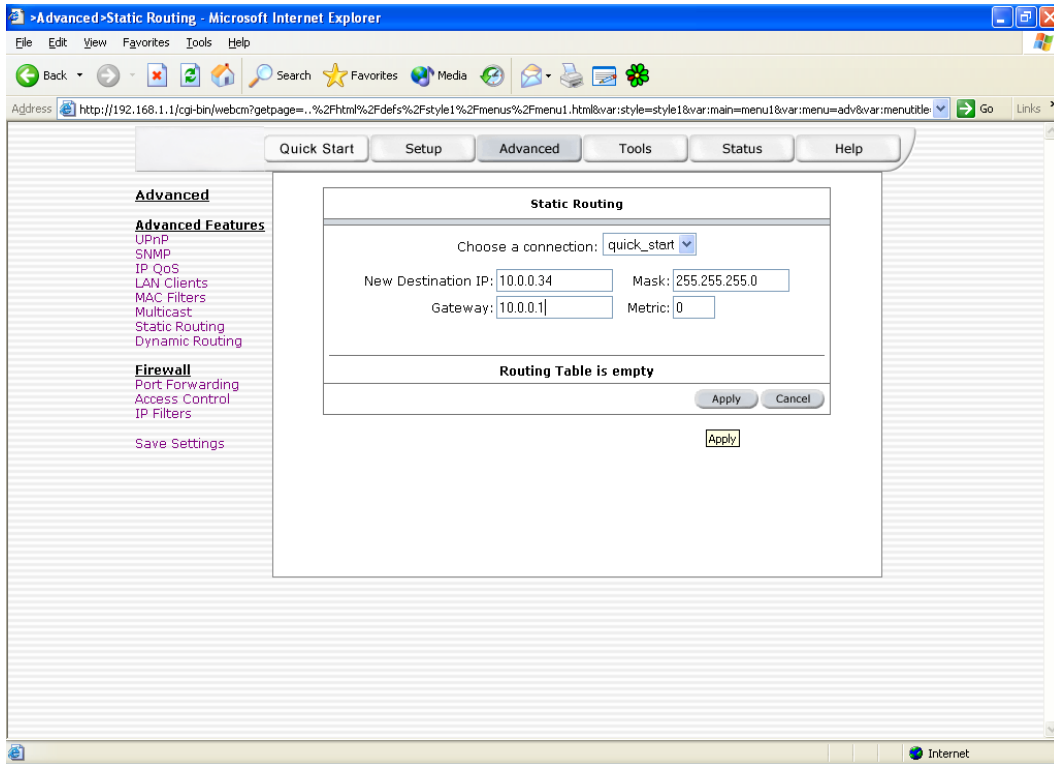


Figure 17 (Static Routing)

The apply button will temporarily save this connection. To make the change permanent you need to click on **Save Settings** (at the side of the page). At the system commands page, click on **Save All**.

4.6.9 Dynamic Routing

Dynamic Routing allows the ADSL Router to automatically adjust to physical changes in the network. The ADSL Router, 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 ADSL Routers on the network.

The Direction determines the direction that RIP routes will be updated. Selecting In means that the ADSL Router will only incorporate received RIP information. Selecting Out means that the ADSL Router will only send out RIP information. Selecting both means that the ADSL Router 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, click Advanced and under Advanced, select Dynamic Routing. Figure 18 illustrates a typical Dynamic Route.

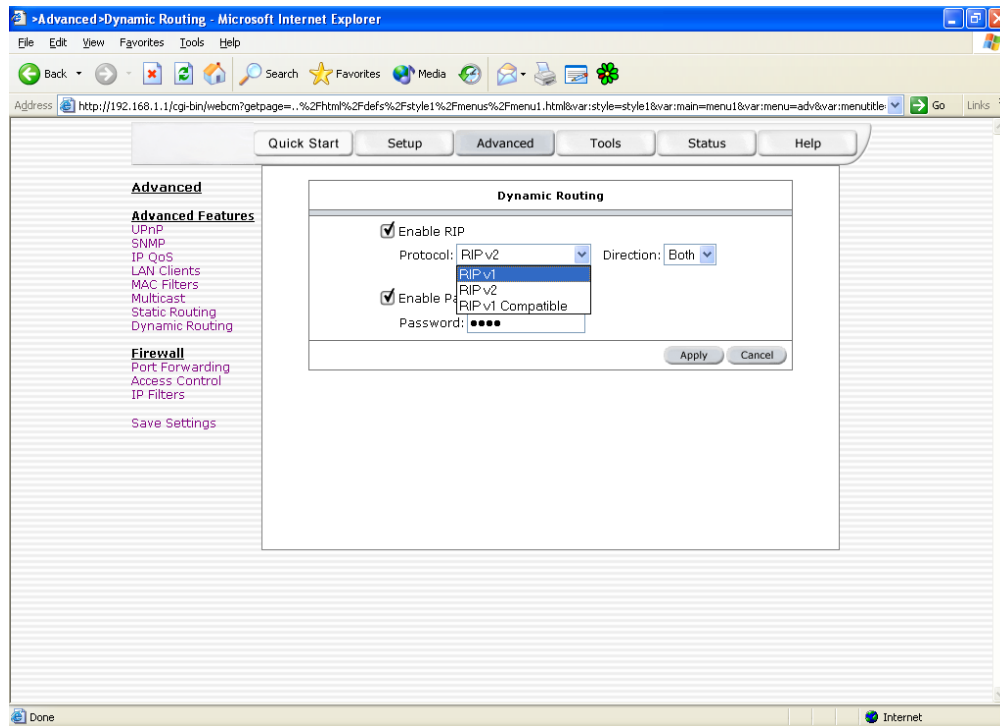


Figure 18 (Dynamic Routing)

The apply button will temporarily save this connection. To make the change permanent you need to click on **Save Settings** (at the side of the page). At the system commands page, click on **Save All**.

4.7 Tools

The ADSL Router supports a host of tools that will allow you to customize and debug your ADSL Router.

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 gateway:

- Save all: Press this button in order to permanently save the current configuration of the ADSL Router. If you do re-start the system without saving your configuration, the ADSL Router will revert back to the previously saved configuration.
- Restart: Use this button to re-start the system. If you have not saved your configurations, the ADSL Router will revert back to the previously saved configuration upon re-starting.
- 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.

NOTE: Connectivity to the unit will be lost. You can reconnect after the unit reboots.

4.7.2 User Management

You can change your ADSL Router's username and password by clicking on 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 ADSL Router 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 ADSL Router 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 **Save Settings** (at the side of the page). At the system commands page, click on **Save All**.

4.7.3 Update Firmware

You can remotely upgrade the ADSL Router's firmware, clicking on Update Firmware under the **Tools** page. This will bring up the screen shown in Figure 19. The upgrade file shall be in *.img format.

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 ADSL Router will reboot. You will need to log back onto the ADSL Router after the firmware upgrade is completed.

The firmware upgrade should take about 5 minutes to complete.

Note: Do not remove power from the ADSL Router during the firmware upgrade procedure.

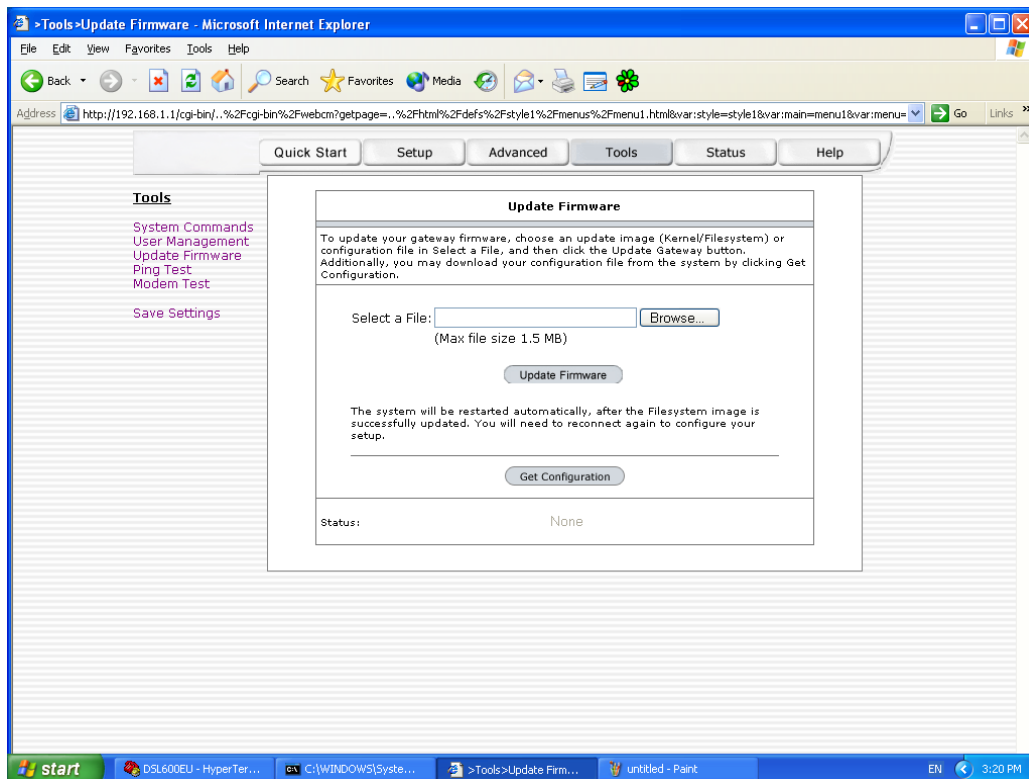


Figure 19 (Update Firmware)

4.7.4 Ping Test

Once you have your ADSL Router configured, it is a good idea to make sure you can ping the network. You can get to the Ping page under the Tools title, by clicking on Ping Test. Type the target address that you want to ping. If you have your PC connected to the ADSL Router 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 ADSL Router will ping itself 3 times. As shown in Figure 20, the ADSL Router 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 ADSL Router.

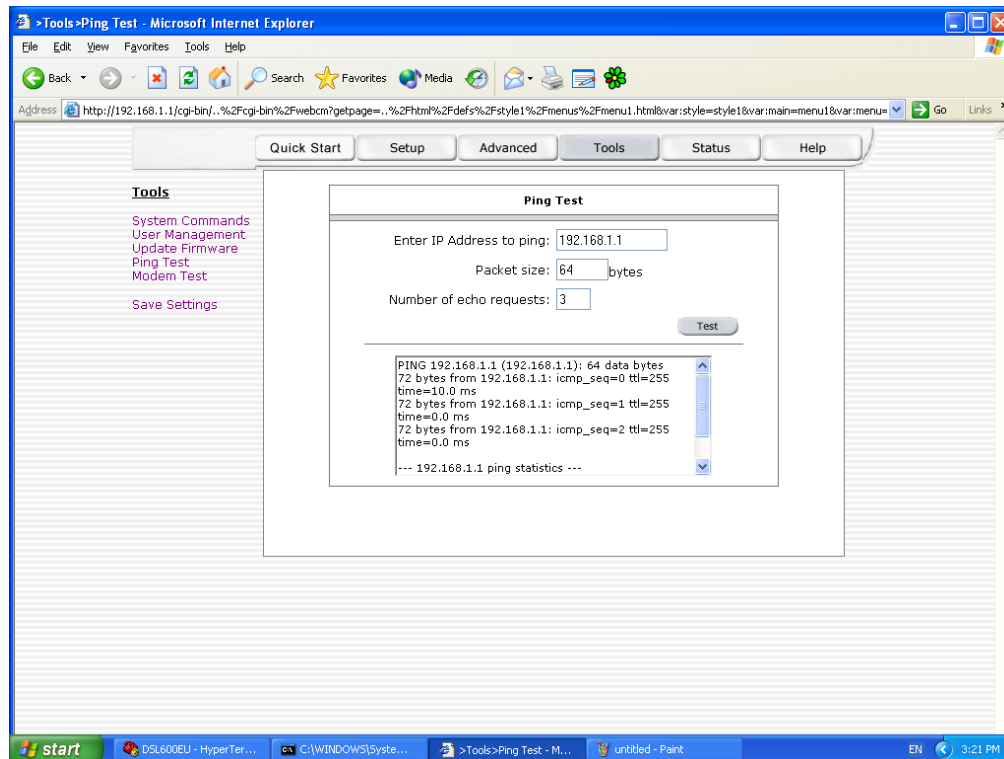


Figure 20 (Ping test)

4.7.5 Modem Test

The Modem Test is used to check whether your ADSL Router 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/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 ADSL Router's driver and run-time information by going under Status title and click on Product Information. Figure 21 illustrates the typical product information, which is provided.

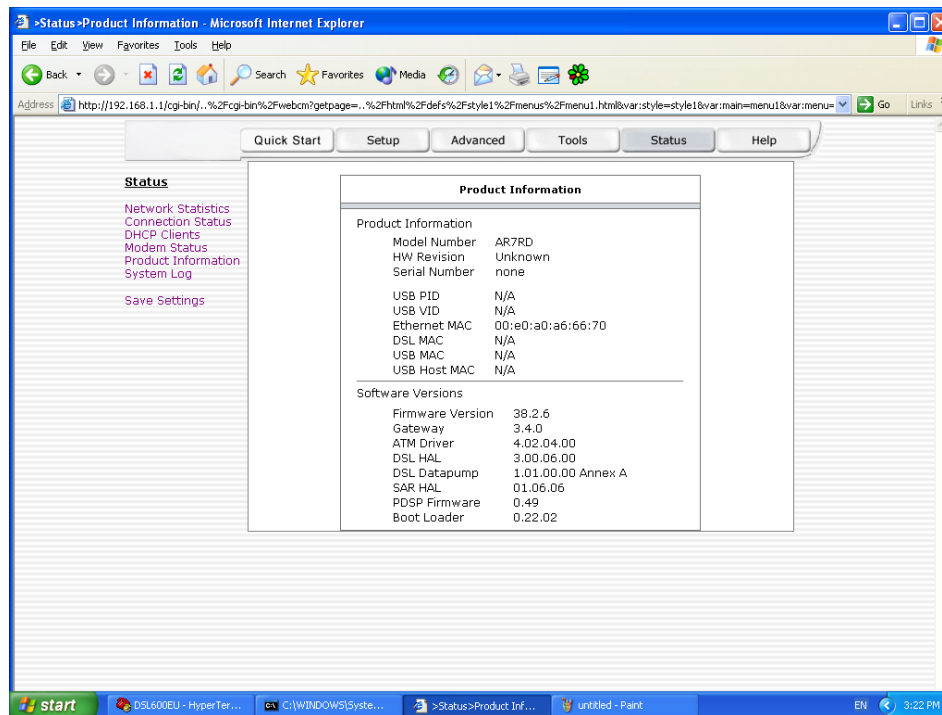


Figure 21 (Product Information)

4.8.6 System Log

You can display the ADSL Router's log by going 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 to solve your problem.

5.1 The ADSL Router is not functional

1. Check to see that the power LED is green and than the network cables are installed correctly. Refer to the easy start guide for more details.
2. Check to see that the ETH/LAN and PPP/WAN LEDs are green.
3. Check to see that the DSL LED is green
4. Check the settings on your PC. Again, refer to the easy start guide for more details
5. Check the ADSL Router's settings.
6. From your PC, can you PING the ADSL Router? Assuming that the ADSL Router has DHCP enabled and your PC is on the same subnet as the gateway, you should be able to PING the gateway.
7. Can you PING the WAN IP? Your ISP should have provided the IP address of their server. If you can ping the ADSL Router and your protocols are configured correctly, you should be able to ping the ISPs network. If you cannot PING the ISPs network, make sure you are using the correct protocols with the correct VPI/VCI values.
8. Make sure NAT is enabled for your connection. If NAT is disabled the ADSL Router will not route frames correctly (except in Bridge connection).

5.2 I can't connect to the ADSL Router.

1. Check to see that the power LED is green and that the network cables are installed correctly; see the easy start guide for more details.
2. Make sure that your PC and the ADSL Router is on the same network segment. The ADSL Router'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 gateway is within the same 192.168.1.x subnet.
3. Also, your PC's Subnet Mask should match the gateways subnet mask. The gateway has a default subnet mask of 255.255.255.0.
4. If this still does not work, press the reset button for 10 seconds. This will place the gateway into its factory default state. Go through the above procedures again.
5. Make sure NAT is enabled for your connection. If NAT is disabled the ADSL Router will not route frames correctly (except in Bridge connection).

5.3 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.
2. Verify that the phone line is connected directly to the wall and to the line input on the ADSL Router.
3. Make sure that for every parallel phone line connected to telephone or fax to install with a micro filter.

5.4 The DSL Link LED is always off

1. Make sure you have DSL service. You should get some kind of information from your ISP that 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 ADSL Router. If the phone line is connected to the phone side of the ADSL Router or you have a splitter installed on the phone line, the DSL light will not come on.

6. ADSL 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 ADSL 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 ADSL 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 ADSL 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 ADSL Router. The ADSL 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 Gateway?

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 gateways 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 gateway. 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 gateway.