# USER MANUAL

# ATU-R150

*ADSL2+ Bridge/Router*

CTC Union Technologies Co., Ltd.

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***ATU-R150***
ADSL2+ Bridge/Router

User Manual
Version 1.0 Aug 2007 First Release

This manual supports the following models:
ATU-R150

This document is the first official release manual. Please check CTC Union's website for any updated manual or contact us by E-mail at info@ctcu.com. Please address any comments for improving this manual or to point out omissions or errors to marketing@ctcu.com. Thank you.

The contents of this document are subject to change at any time without notice.

## Table of Contents

# 1. Introduction

The ATU-R150 ADSL2+ modem is a high-speed WAN bridge/router that is specifically designed to connect to the Internet and to directly connect to your local area network (LAN) via high speed 10/100 Mbps Ethernet. The ATU-R150 also has full Network Address Translation (NAT) firewall and demilitarized zone (DMZ) services security support to block unwanted users from accessing your network. Quality of Service (QoS) and Policy routing (PR) are also supported.

## 1.1 Features

- Equipped with one 10/100 Ethernet port
- 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 interface
- 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
- Address Filtering, DMZ Hosting, and Much More
- 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
- Supports Classical IP over ATM (CLIP or also referred to as RFC1577 or IPoA)
- Cost effective ADSL2+ modem designed as a full-featured ADSL router

## 1.2 Specifications

**ADSL Compliance**

- Support Multi mode standards (ANSI T1.413 Issue 2, G.dmt, G.lite)
- ADSL2 G.dmt.bis (G.992.3)
- ADSL2 G.lite.bis (G.992.4)
- ADSL2+ (G.992.5)
- Reach Extended ADSL (RE ADSL)

**ATM Protocols**

- 8 PVC Support
- Adaptation Layers AAL5, AAL2 and AAL0 Support
- OAM F4/F5 Loop Back

**PPP Support**

- PPP over ATM PVC (RFC 2364&RFC1577)
- PPP over Ethernet (RFC 2516)
- PAP (Password Authentication Protocol), CHAP (Challenge Handshake Authentication Protocol) and MS-CHAP (Microsoft Challenge Handshake Authentication Protocol)

**Bridge Mode**

- RFC 1483 Bridge
- IEEE 802.1D transparent bridging
- Bridge Filtering

**Router Mode**

- RFC 1483 Route
- IPoA (RFC1577)
- RIP 1 & 2 supported
- DHCP (RFC1541) Server, Relay and Client
- Network Address Translation (NAT)/ Network Address Port Translation (NAPT)
- DNS relay
- IGMP v1 and v2
- ToS supported

**Quality of Service (QoS)**

- Constant Bit Rate (CBR), Real-Time Variable Bit Rate (VBR-rt)
- Non-Real-Time Variable Bit Rate (VBR-nrt)
- Unspecified Bit Rate (UBR)

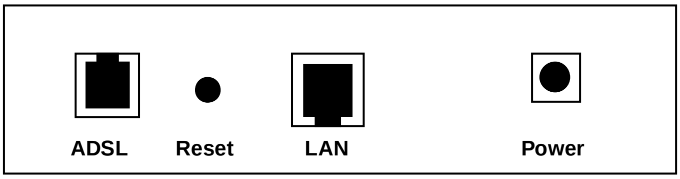
**Management**

- Remote / Local configuration & management
- Web / Telnet configuration & management
- Firmware upgrade through web management

# 2. ATU-R150 Overview

Your ATU-R150 has connection ports and LEDs. The features are listed below.

## 2.1 Ports and Buttons



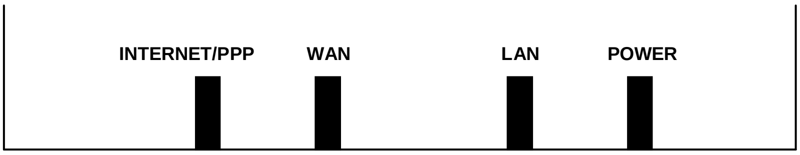
**ADSL:** This is the WAN interface which connects directly to your phone line.

**LAN (Local Area Network) port(s):** Connect to Ethernet network devices, such as a PC, hub, switch, or IP sharing device.

**Power:** Connect the power adapter that came with the ATU-R150. Using a power supply with a different voltage rating will damage this product. Make sure to observe the proper power requirements. The power adapter requirement is 9 volts AC, 1A (1000mA).

**Reset:** The Reset button will either reboot the ATU-R150 or cause it to return to its factory default settings. To reboot the modem, momentarily press the reset button and after about 30 seconds the ATU-R150 will become operational again. To reset to the factory defaults for the ATU-R150, simply press the reset button for more than 5 seconds and then release. The ATU-R150 will be reset to its factory defaults and after about 30 seconds the ATU-R150 will become operational again.

## 2.2 LED Description



**Power LED:** This LED stays lit to indicate the system is powered on properly.

**LAN LED:** This LED is lit when a connection is established to the LAN port and flashes when the LAN port is sending/receiving data.

**WAN LED:** This LED is lit when the WAN connection is established and flashes when the WAN port is sending/receiving data..

**Internet/PPP LED:** This LED is lit when a PPPoE connection is established.

## 2.3 Installing your ATU-R150

1. Locate an optimum location for the ATU-R150.
2. For connections to the Ethernet and DSL interfaces, refer to the Quick Installation Guide.
3. Connect the AC Power Adapter. Depending upon the type of network, you may want to put the power adapter on an uninterruptible power supply (UPS). Only use the power adapter supplied with the ATU-R150. A different adapter may damage the product.

Now that the hardware installation is complete, continue on to set up your ATU-R150.

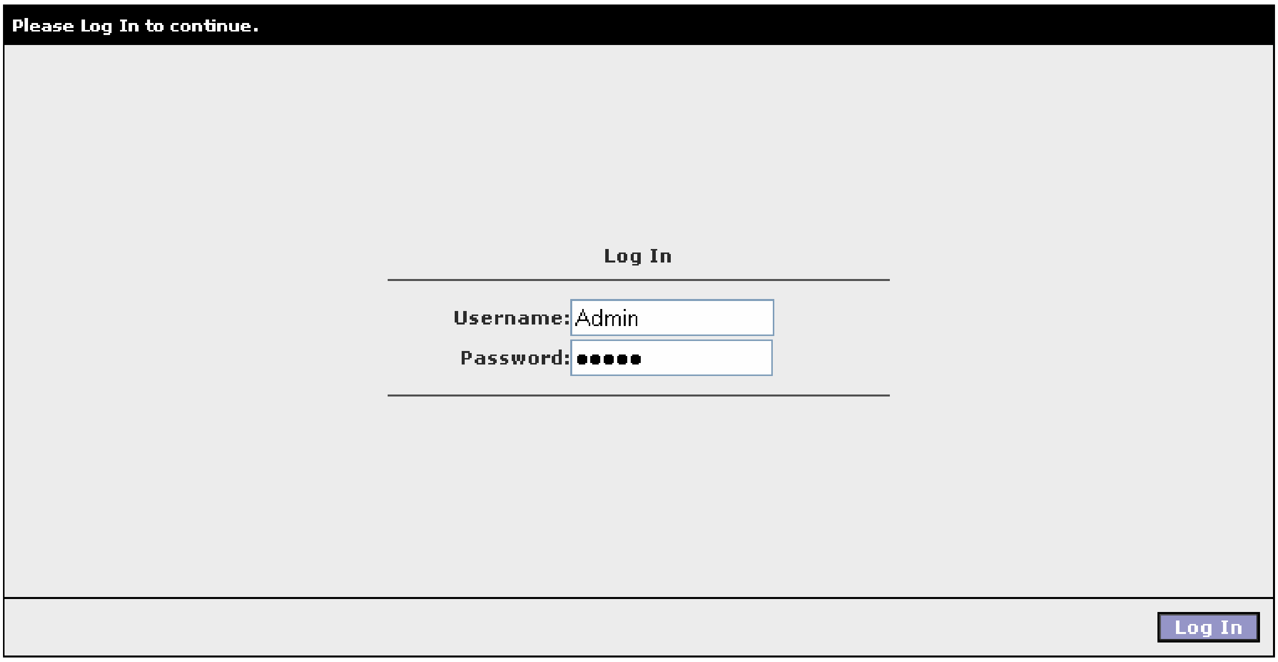
# 3. Setting up your ATU-R150

This section guides you through configuring your ATU-R150. The ATU-R150 is shipped with a standard default bridge configuration. Most users would want to change the ATU-R150 from a bridge to a router. Before setting up your ATU-R150, make sure you have followed the Quick Installation Guide. You should have your computers configured for DHCP mode and have proxies disabled on your browser. If you access the router using your web browser and see a log-in redirection page instead of the Log In page, check your browser's settings to verify that JavaScript is enabled. Also, if you do not get the page as shown below, you may need to delete your temporary Internet files by flushing the cached web pages.

## 3.1 Logon to your ATU-R150

Use the following procedures to logon to your ATU-R150.

1. Open your web browser.
   You may get an error message. This is normal. Continue on to the next step.
2. Type the default IP address of the ATU-R150 **192.168.1.1** and press Enter.
   The Log In page appears.



Please Log In to continue.

Log In

Username: Admin

Password: ●●●●●

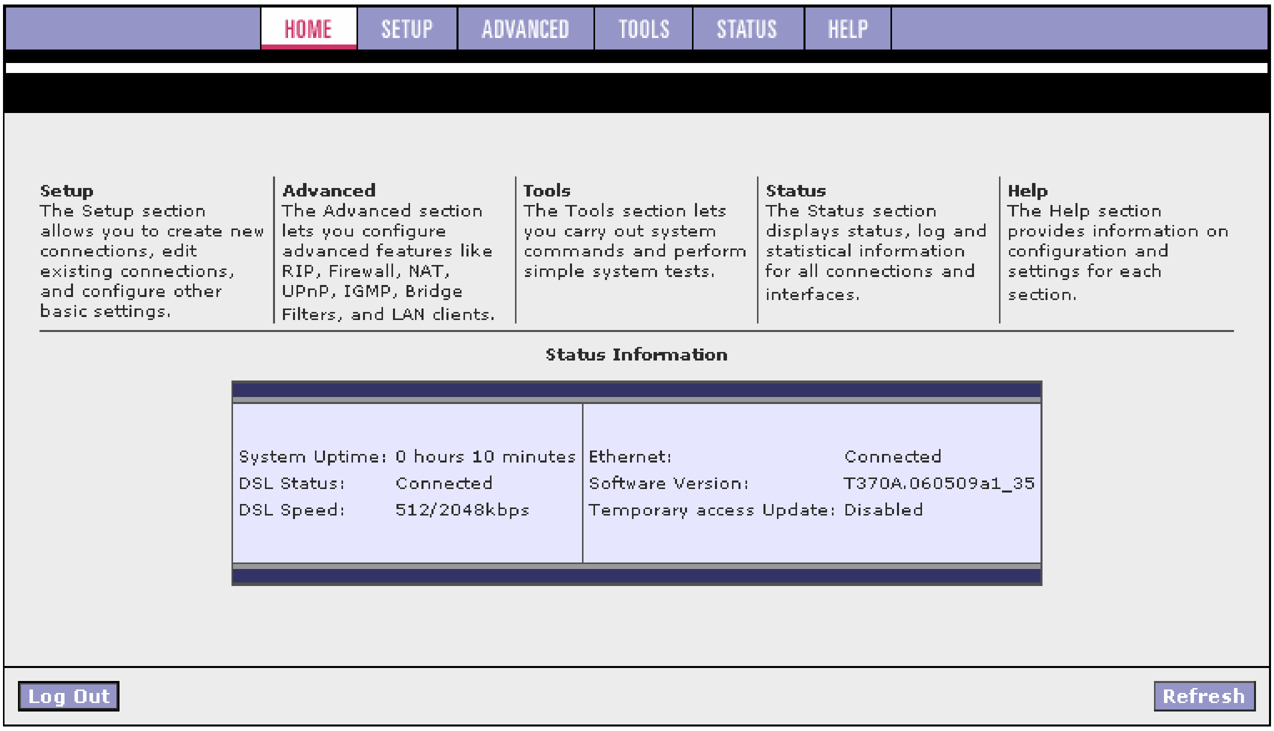
3. Enter the following information:
   - User Name: **Admin**
   - Password: **Admin**

   **Note:** Both fields are case-sensitive. Admin is the default value. The login name and password can be changed later on using the Tools/User Management menu options.
4. Click **Log In**.
   The main page appears.

## 3.2 Home Page

The first page is the **Home** page. From this page you can perform the following tasks:

- Setup the ATU-R150 (configure the LAN and WAN connection(s).
- Configure the advanced configuration options within the ATU-R150 (security, routing, and filtering).
- Obtain the status of the ATU-R150.
- View the extensive online help.



**Setup**
The Setup section allows you to create new connections, edit existing connections, and configure other basic settings.

**Advanced**
The Advanced section lets you configure advanced features like RIP, Firewall, NAT, UPnP, IGMP, Bridge Filters, and LAN clients.

**Tools**
The Tools section lets you carry out system commands and perform simple system tests.

**Status**
The Status section displays status, log and statistical information for all connections and interfaces.

**Help**
The Help section provides information on configuration and settings for each section.

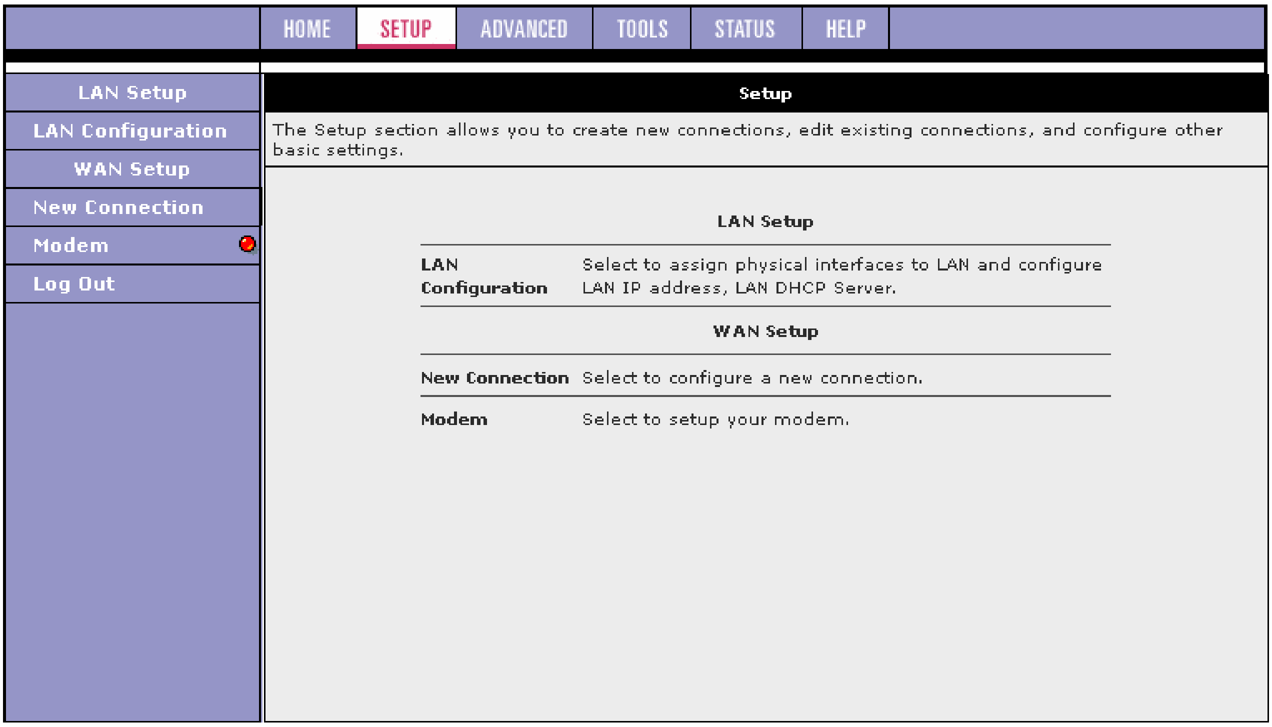
**Status Information**

| | | | |
|---|---|---|---|
| System Uptime: | 0 hours 10 minutes | Ethernet: | Connected |
| DSL Status: | Connected | Software Version: | T370A.060509a1_35 |
| DSL Speed: | 512/2048kbps | Temporary access Update: | Disabled |

The basic layout of the Home page consists of a page selection list across the top of the browser window. The lower center part of the page displays the ATU-R150 status, connection information, and other useful information. The center part of the display provides descriptions of the options supported on the other web interface pages.

## 3.3 Setup

To setup your ATU-R150 with a basic configuration, from the Main page, select **Setup**. The figure below illustrates the Setup page. The page is divided into two subsections: the LAN Setup and the WAN Setup.



**Setup**

The Setup section allows you to create new connections, edit existing connections, and configure other basic settings.

**LAN Setup**

| | |
|---|---|
| **LAN Configuration** | Select to assign physical interfaces to LAN and configure LAN IP address, LAN DHCP Server. |

**WAN Setup**

| | |
|---|---|
| **New Connection** | Select to configure a new connection. |
| **Modem** | Select to setup your modem. |

Before configuring the ATU-R150, there are several concepts that you should be familiar with on how your new ATU-R150 works. Please take a moment to familiarize yourself with these concepts, as it should make the configuration much easier.

### 3.3.1 Wide Area Network (WAN) Connection

On one side of the ATU-R150 is the WAN interface, also referred to as a broadband connection. This WAN connection is different for every WAN service provider. Most of the configuration you perform is for the WAN connection.

### 3.3.2 Local Area Network (LAN) Connection

On the other side of the ATU-R150 are LAN interfaces. This is where local hosts are connected. The ATU-R150 is normally configured to automatically provide all the hosts on the LAN network with IP addresses.

## 3.4 Configuring the WAN

Before the ATU-R150 passes any data between the LAN interfaces and the WAN interface, the WAN side of the ATU-R150 must be configured.

You need some (or all) of the information outlined below before you can properly configure the WAN:

- Your DSL line virtual path identifier (VPI) and virtual channel identifier (VCI)
- Your DSL encapsulation type and multiplexing
- Your DSL training mode (default is MultiMode)

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

- Your username and password

For RFC 2684 Static connections, you may need these values from your ISP:

- Your fixed WAN IP address
- Your subnet mask
- Your default gateway
- A set of three DNS IP addresses

Since multiple users can use the ATU-R150, the ATU-R150 can simultaneously support multiple connection types; hence, you must set up different profiles for each connection. The ATU-R150 supports the following protocols:

- RFC 2516 PPPoE
- RFC 2364 PPPoA
- RFC 2684 Static
- Dynamic host configuration protocol (DHCP)
- Bridged
- RFC 2225 classical IP over ATM (CLIP)

You can create up to eight WAN connections.

### 3.4.1 Setup a WAN Connection (New Connection)

A new WAN connection is a virtual connection over the physical DSL connection. Your ATU-R150 can support up to eight different (unique) virtual connections. If you have multiple different virtual connections, you may need to use the static and dynamic routing capabilities of the ATU-R150 to pass data correctly. Before you make a new WAN connection, you should make sure you have a available DSL connection.

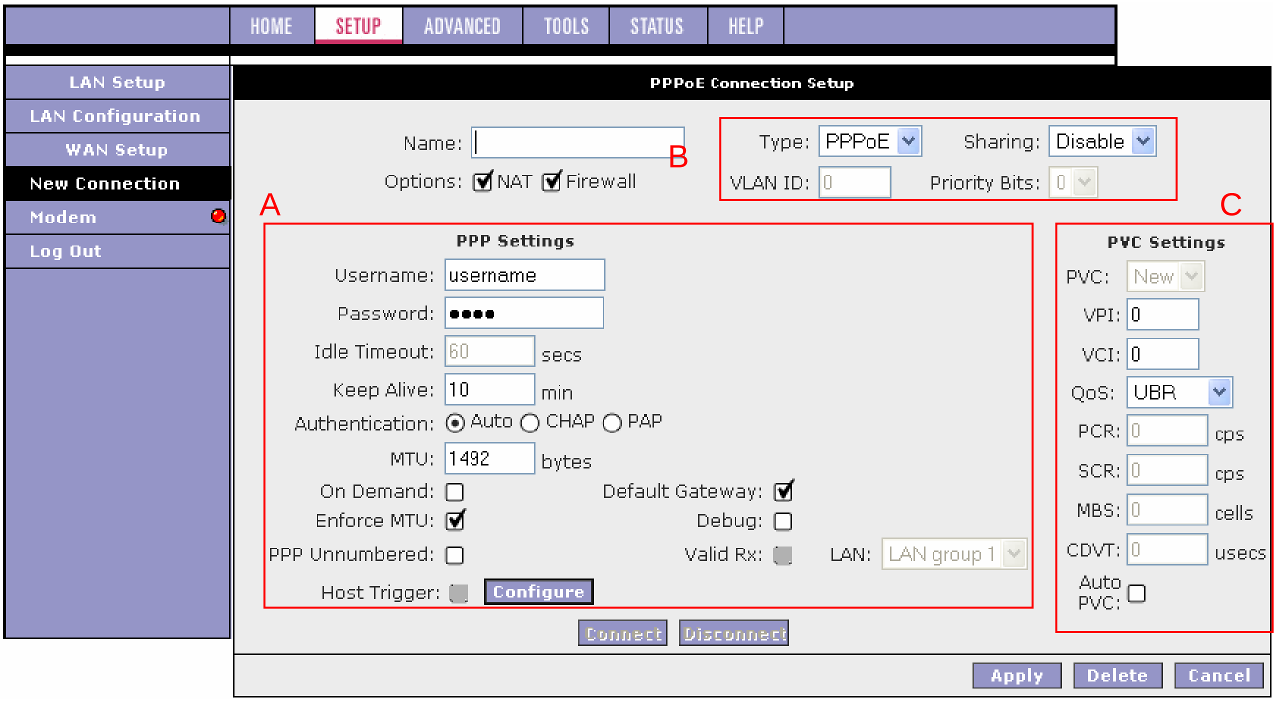
**PPPoE**

PPP, or point-to-point protocol, is a method of establishing a network connection/session between network hosts. PPPoE is a protocol for encapsulating PPP frames in Ethernet frames and is described in RFC 2516. PPPoE provides the ability to connect to a network of hosts over a simple bridging access device to a remote access concentrator. With this model, each ATU-R150 uses its own PPP stack. Access control, billing, and type of service control can all be done on a per-user rather than per-site basis.

The default New Connection Setup page, which defaults to the PPPoE Connection Setup page. Notice this page can be logically divided into three sections:

- Section A includes settings specific to the connection type
- Section B (VLAN settings)
- Section C (PVC settings) remains the same for all six connection types.

For other connection types, we will focus on the fields in Section A.



PPPoE Connection Setup

Name: |

Options: ☑ NAT ☑ Firewall

Type: PPPoE Sharing: Disable

VLAN ID: 0 Priority Bits: 0

PPP Settings

Username: username

Password: ●●●●

Idle Timeout: 60 secs

Keep Alive: 10 min

Authentication: ● Auto ○ CHAP ○ PAP

MTU: 1492 bytes

On Demand: □ Default Gateway: ☑

Enforce MTU: ☑ Debug: □

PPP Unnumbered: □ Valid Rx: □ LAN: LAN group 1

Host Trigger: □

PVC Settings

PVC: New

VPI: 0

VCI: 0

QoS: UBR

PCR: 0 cps

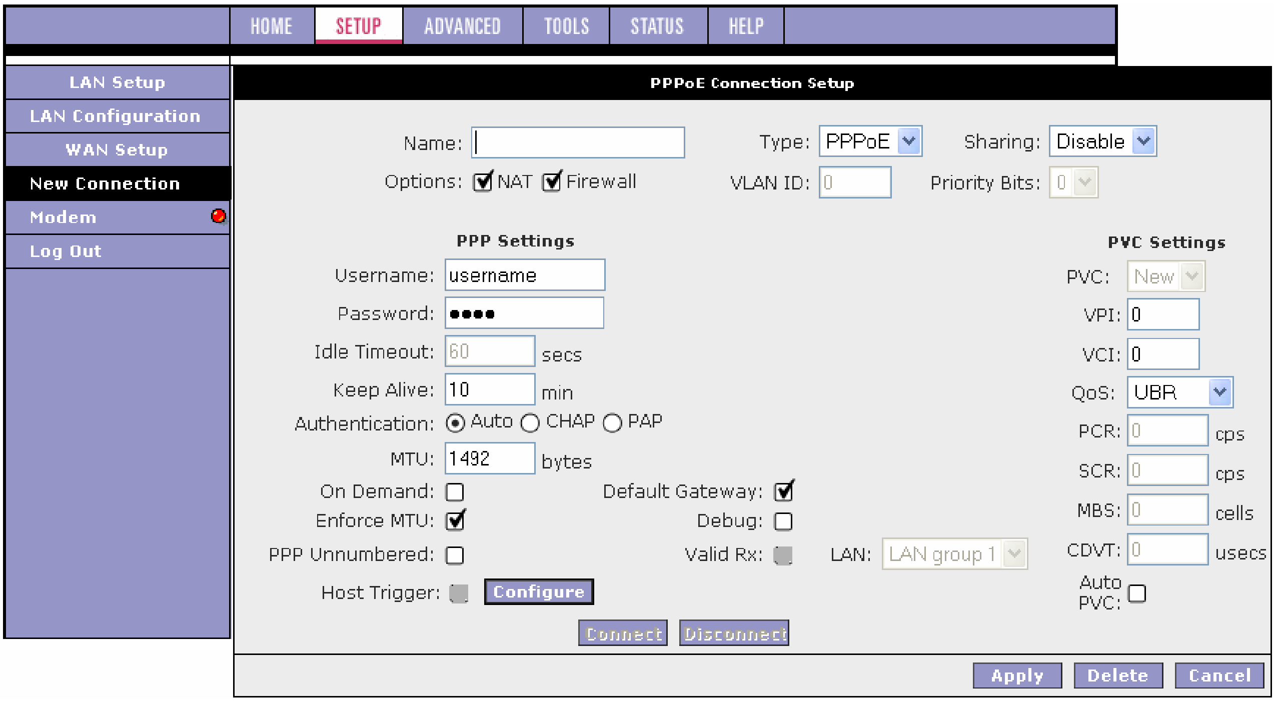
SCR: 0 cps

MBS: 0 cells

CDVT: 0 usecs

Auto PVC: □

1. At the **Setup** main page, click **New Connection**.
   The default PPPoE Connection Setup page is displayed.
2. In the **Name** field, enter a unique name for the PPPoE connection.
   The name must not have spaces and cannot begin with numbers. In this example, the unique name is PPPoE.
3. The **Network Address Translation** (NAT) and the **Firewall** options are enabled by default. Leave these in the default mode.
   **Note:** NAT enables the IP address on the LAN side to be translated to IP address on the WAN side. If NAT is disabled, you cannot access the Internet.
4. If you want to enable VLAN, refer to the table below to configure the following fields:
   - Sharing: Select VLAN to enable the **VLAN ID** and **Priority Bits** fields.
   - VLAN ID: Enter the VLAN ID.
   - Priority Bits: Select the priority bits of the VLAN.
5. In the **PPP** Settings section, enter values from DSL service provider or your ISP.
6. In the **PVC** Settings section, enter values for the **VPI** and **VCI**.
   **Note:** Your DSL service provider or your ISP supplies these values. In this example, the DSL service provider is using 0,33.
7. Select the **Quality of Service** (QoS).
   Leave the default value if you are unsure or if the ISP did not provide this information.
8. Click **Apply** to complete the connection setup. This temporarily activates this connection.



PPPoE Connection Setup

Name: | Type: PPPoE | Sharing: Disable
Options: ☑ NAT ☑ Firewall | VLAN ID: 0 | Priority Bits: 0

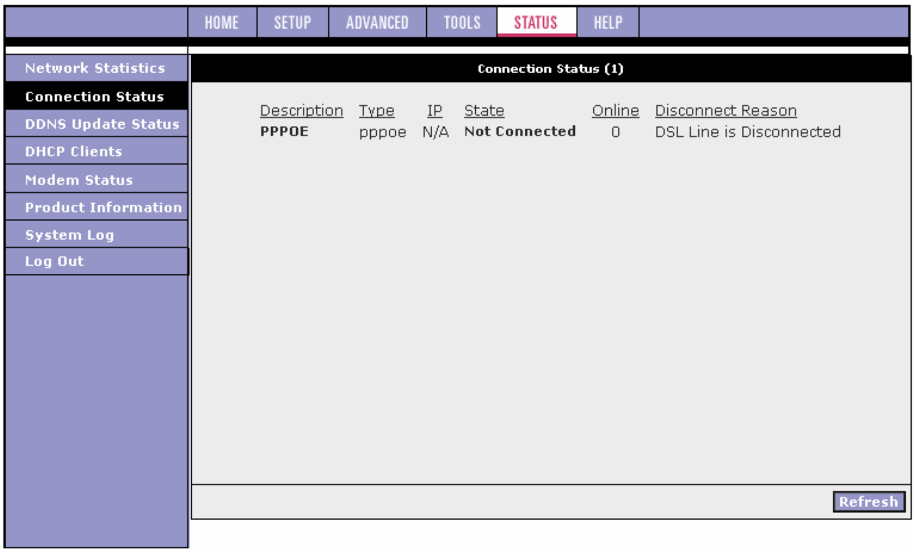
PPP Settings
Username: username
Password: ●●●●
Idle Timeout: 60 secs
Keep Alive: 10 min
Authentication: ● Auto ○ CHAP ○ PAP
MTU: 1492 bytes
On Demand: □ | Default Gateway: ☑
Enforce MTU: ☑ | Debug: □
PPP Unnumbered: □ | Valid Rx: □ | LAN: LAN group 1
Host Trigger: □

PVC Settings
PVC: New
VPI: 0
VCI: 0
QoS: UBR
PCR: 0 cps
SCR: 0 cps
MBS: 0 cells
CDVT: 0 usecs
Auto PVC: □

A new link is created for this connection in the left-hand column. You can connect, disconnect, apply, delete, or cancel this connection using the buttons at the bottom of this page.
**Note:** The changes take effect when you click **Apply**; however, if the ATU-R150 configuration is not saved, these changes will be lost upon ATU-R150 reboot.

9. To make the change permanent, click **Tools** at the top of the page and select **System Commands**.
10. At the **System Commands** page, click **Save All**.

**11.** To check the status, click **Status** at the top of the page and select **Connection Status**. The figure below shows the Connection Status page.



Connection Status (1)

| Description | Type | IP | State | Online | Disconnect Reason |
|---|---|---|---|---|---|
| PPPOE | pppoe | N/A | Not Connected | 0 | DSL Line is Disconnected |

**Field Description (Section A)**

| **Field** | **Definition/Description** |
|---|---|
| **Username** | Your user name for the PPPoE access provided by your DSL service provider or your ISP. This field is alpha-numeric and the maximum length is 64 characters. It cannot start with a number. The character type restrictions do not apply for CLI-based configuration. |
| **Password** | Your password for the PPPoE access provided by your DSL service provider or your ISP. This field is alpha-numeric and the maximum length is 128 characters. The character type restrictions do not apply for CLI-based configuration. |
| **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 and is enabled only when the On Demand field is checked. To ensure that the link is always active, enter a 0 in this field. You can also enter a value larger than 10 (secs). |
| **Keep Alive** | When the On Demand option is not enabled, 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. You can also enter any positive integer value in this field. |
| **Authentication** | Three authentication options are available:<br>● Auto<br>● Challenge handshake authentication protocol (CHAP)<br>● Password authentication protocol (PAP)<br>Microsoft CHAP v2 is also supported in the Auto and CHAP options. However, MS CHAP v1 is not supported. |
| **MTU** | Maximum transmit unit the DSL connection can transmit. It is a negotiated value that packets of no more than n bytes can be sent to the service provider. The PPPoE interface default MTU is 1492 (max) and PPPoA default MTU is 1500 (max). The minimum MTU value is 64. |
| **On Demand** | Enables On Demand mode. The connection disconnects if no activity is detected after the specified idle timeout value. When checked, this field enables the following fields:<br>● Idle Timeout<br>● Host Trigger<br>● Valid Rx |
| **Default Gateway** | If checked, this WAN connection acts as the default gateway to the Internet. |
| **Enforce MTU** | This feature is enabled by default. It forces all TCP traffic to conform with PPP MTU by changing TCP maximum segment size to PPP MTU. If it is disabled, you may issues accessing some Internet sites. |

| | |
|---|---|
| **Debug** | Enables PPPoE connection debugging facilities. This option is used by ISP technical support and ODM/OEM testers to simulate packets going through the network from the WAN side. |
| **PPP Unnumbered** | PPP Unnumbered is a special feature. It enables the ISP to designate a block of public IP addresses to the customer where it is statically assigned on the LAN side. PPP Unnumbered is, in essence, like a bridged connection. |
| **LAN** | The LAN field is associated with the PPP Unnumbered field and is enabled when the PPP Unnumbered field is checked. You can specify the LAN group the packets need to go to when the PPP Unnumbered feature is activated. |

**Field Description (Section B)**

| **Field** | **Definition/Description** |
|---|---|
| **Sharing** | The following options are available:<br>● Disable: Disables connection sharing.<br>● Enable: Enables connection sharing.<br>● VLAN: The VLAN ID and Priority Bits fields are activated when VLAN is selected, which enable you to create VLAN. |
| **VLAN ID** | VLAN Identification. Multiple connections over the same PVC are supported, which requires the WAN network to have VLAN support and for the DSLAMS and Routers on the ISP to handle VLAN Tags.<br>Extended support is also available, which allows multiple connections to be placed over the single PVC without VLAN support (VLAN Tag of 0 is this special case). In this mode of operation, a received packet is flooded on all the connections that reside over it. |
| **Priority Bits** | Priority is given to a VLAN connection from 0-7. All packets sent over the VLAN connection have the Priority bits set to the configured value. |

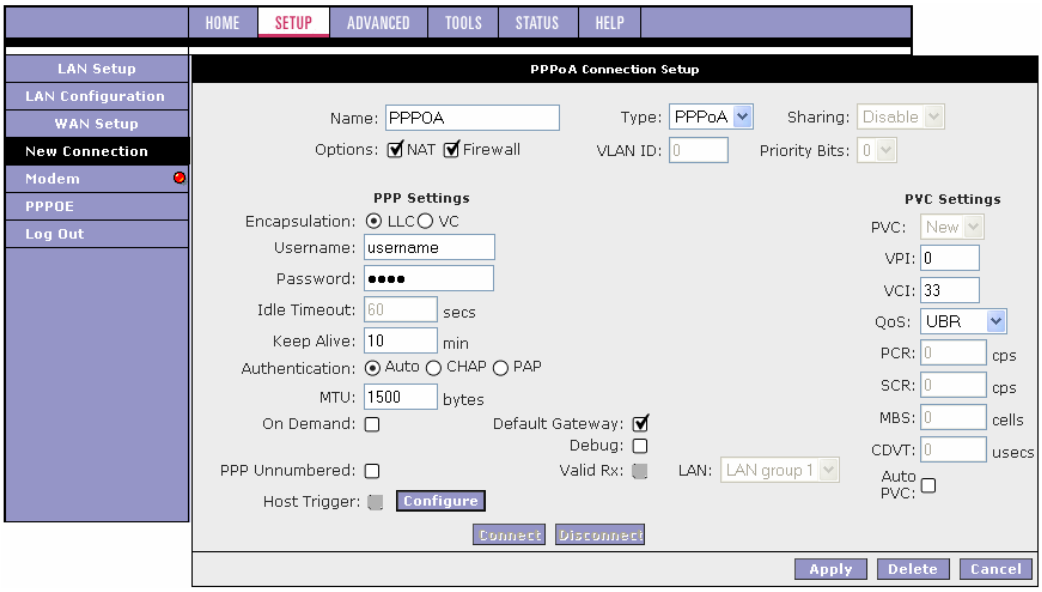
**Field Description (Section C)**

| **Field** | **Definition/Description** |
|---|---|
| **PVC** | Permanent virtual circuit. This is a fixed virtual circuit between two users.<br>It is the public data network equivalent of a leased line. No call setup or clearing procedures are needed. |
| **VPI** | Virtual path identifier, equivalent to the virtual path connection (VPC). |
| **VCI** | Virtual channel identifier. A 16-bit field in the header of an ATM cell. The VCI, together with the VPI, is used to identify the next destination of a cell as it passes through to the ATM switch. |
| **QoS** | Quality of service, a characteristic of data transmission that measures how accurately and how quickly a message or data is transferred from a source host to a destination host over a network. The three QoS options are:<br>● Undefined Bit Rate (UBR): When UBR is selected, the PCR, SCR, MBS, and CDVT fields are disabled.<br>● Constant Bit Rate (CBR): When CBR is selected, the PCR and CDVT fields are enabled.<br>● Variable Bit Rate (VBR): When VBR is selected, the PCR, SCR, MBS, and CDVT fields are enabled. |
| **PCR** | Peak Cell Rate, measured in cells/sec, is the cell rate which the source may never exceed. |
| **SCR** | Sustained cell rate, measured in cells/sec, is the average cell rate over the duration of the connection. |
| **MBS** | Maximum burst size, a traffic parameter that specifies the maximum number of cells that can be transmitted at the Peak Cell Rate. |
| **CDVT** | Cell delay variation tolerance, the maximum amount of cell delay variation that can be accommodated. Cell delay variation measures the random inter-arrival times of cells within an ATM connection due to cell transfer delay caused by buffering, multiplexing, and so on. |

| | |
|---|---|
| **Auto PVC** | Auto-Sensing permanent virtual circuit. The overall operation of the auto-sensing PVC feature relies on end-to-end OAM pings to defined PVCs. There are two groups of PVCs: customer default PVCs which are defined by the OEM/ISP and the backup PVCs. The customer default must have 0/35 as the first default PVC. The backup list of PVCs must be of the following VPI/VCI: 0/35, 8/35, 0/43, 0/51, 0/59, 8/43, 8/51, and 8/59. The list of PVCs is defined in XML and is configurable. The Auto-Sensing PVC feature itself is also configurable in that the auto-search mechanism can be disabled.<br>Upon DSL synchronization, end-to-end OAM pings will be conducted for every defined PVC. The result of the pings will be recorded in an array for later use to determine the usability of the particular PVC for connectivity. This list helps the PVC manage the available PVC for use, and needs to be synchronized with connections made without Auto-Sensing PVC. Update to this list is performed for any change in DSL synchronization.<br>During connection establishment, the PVC module will first search through the list of defined default PVCs. If a PVC is found from the default list that is ping-able and not in use, the PVC module will update for that particular PVC as in-use from the list and continues processing. If a PVC is not found in the default, the backup PVC list is used. If no PVC is found again, the module will let the end-user know that no available VCC was found.<br>With the connection established, the PVC is stored in flash as the connection default PVC. Therefore upon reboot, this PVC is automatically chosen as the PVC for that connection. This saved PVC in environment space of flash overrides the PVC connection saved in XML configuration space of flash for that connection. During the connection establishment processing, the saved PVC will be checked to see whether a connection can be made with the PVC. If the PVC is OAM ping-able, the connection process continues. If the PVC is not OAM ping-able, the search for an available PVC starts. The process of PVC selection is the same as described above.<br>The list of default PVCs and backup PVCs need to be global for the management of all connections, non Auto-Sensing PVC connection, as well as, Auto-Sensing PVC connections. These lists allow the end-users to establish connectivity without keeping track of the PVC used. |

### PPPoA Connection Setup

PPPoA is also known as RFC 2364. It is a method of encapsulating PPP packets in ATM cells that 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. Logical link control (LLC) and virtual circuit (VC) are two different methods of encapsulating the PPP packet. Contact your ISP to determine which encapsulation is being used on your DSL connection.



PPPoA Connection Setup

Name: PPPOA
Type: PPPoA
Sharing: Disable
Options: ☑ NAT ☑ Firewall
VLAN ID: 0
Priority Bits: 0

PPP Settings

Encapsulation: ● LLC ○ VC
Username: username
Password: ●●●●
Idle Timeout: 60 secs
Keep Alive: 10 min
Authentication: ● Auto ○ CHAP ○ PAP
MTU: 1500 bytes
On Demand: □
Default Gateway: ☑
Debug: □
PPP Unnumbered: □
Valid Rx: □
LAN: LAN group 1
Host Trigger: □

PVC Settings

PVC: New
VPI: 0
VCI: 33
QoS: UBR
PCR: 0 cps
SCR: 0 cps
MBS: 0 cells
CDVT: 0 usecs
Auto PVC: □

To configure the ATU-R150 for PPPoA:

1. On the **Setup** main page, click **New Connection**.
   The default PPPoE Connection Setup page isdisplayed.
2. From **Type** drop-down box, select **PPPoA**.
   The default PPPoA Connection Setup page is displayed.
3. Enter a unique name for the PPPoA connection in the **Name** field.
   The name must not have spaces and cannot begin with numbers. In this example, the unique name is PPPoA.
4. The **Network Address Translation** (NAT) and the **Firewall** options are enabled by default. Leave these in the default mode.
5. If you want to enable VLAN, refer to the table on section 3.4.1 to configure the following fields:
   - Sharing: Select VLAN to enable the **VLAN ID** and **Priority Bits** fields.
   - VLAN ID: Enter the VLAN ID.
   - Priority Bits: Select the priority bits of the VLAN.
6. In the **PPP** Settings section, select the encapsulation type (LLC or VC).
   Note: If you are not sure, just use the default mode.
7. In the **PVC** Settings section, enter values for the **VPI** and **VCI**.
   **Note:** Your DSL service provider or your ISP supplies these values. In this example, the DSL service provider is using 0,33.
8. Select the **Quality of Service** (QoS). Leave the default value if you are unsure or if the ISP did not provide this information.
   The **PCR**, **SCR**, **MBS**, and **CDVT** fields are enabled/disabled depending on the **QoS** selection. Enter the values provided by the ISP or leave the defaults.
9. Click **Apply** to complete the connection setup. This temporarily activates this connection.
   A new link has been created for this connection in the left-hand column. You can connect, disconnect, apply, delete, or cancel this connection using this page by clicking the Connection Name to return to its Connection Setup page.
   **Note:** The changes take effect when you click **Apply**; however, if the ATU-R150 configuration is not saved, these changes will be lost upon ATU-R150 reboot.

10. To make the change permanent, click **Tools** at the top of the page and select **System Commands**.
11. At the **System Commands** page, click **Save All**.
12. To check the status, click **Status** and select **Connection Status**.

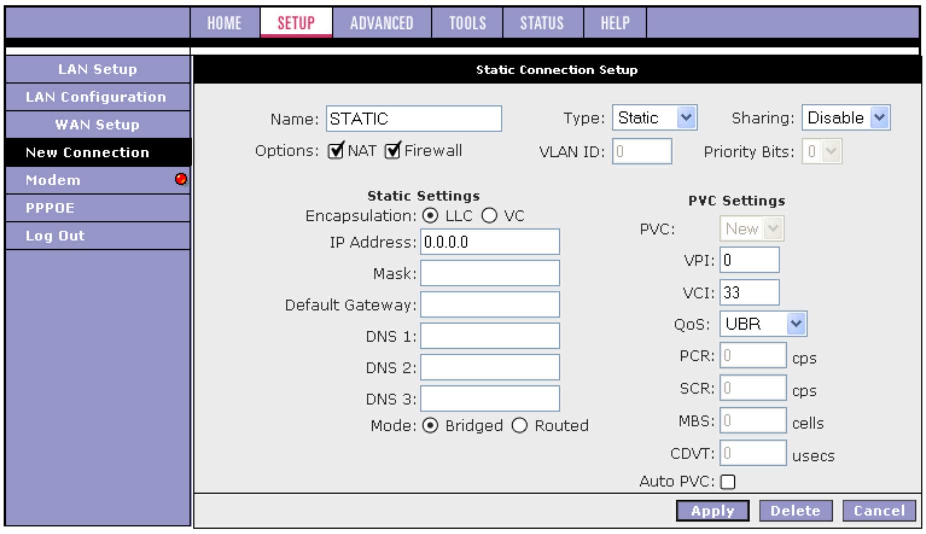
**Field Description**

| **Field** | **Definition/Description** |
|---|---|
| **Encapsulation** | The technique used by layered protocols in which a layer adds header information to the protocol data unit (PDU) from the layer above. As an example, in Internet terminology, a packet would contain a header from the data link layer, followed by a header from the network layer (IP), followed by a header from the transport layer (TCP), followed by the application protocol data. Two options are provided: Logical Link Control (LLC) and Virtual Channel (VC). |
| **Username** | Your user name for the PPPoA access provided by your DSL service provider or your ISP. This field is alpha-numeric and the maximum length is 64 characters. It cannot start with a number. The character type restrictions do not apply for CLI-based configuration. |
| **Password** | Your password for the PPPoA access provided by your DSL service provider or your ISP. This field is alpha-numeric and the maximum length is 128 characters. The character type restrictions do not apply for CLI-based configuration. |
| **Idle Timeout** | Specifies that the 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. You can also enter a value larger than 10 (secs). |
| **Keep Alive** | When the On Demand option is not enabled, 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. You can also enter any positive integer value in this field.<br>Authentication Three authentication options are available:<br>● Auto<br>● Challenge Handshake Authentication protocol (CHAP)<br>● Password Authentication Protocol (PAP)<br>Microsoft CHAP v2 is also supported in the Auto and CHAP options. However, MS CHAP v1 is not supported. |
| **MTU** | Maximum transmit unit the DSL connection can transmit. It is a negotiated value that packets of no more than n bytes can be sent to the service provider. The PPPoE interface default MTU is 1492 (max) and PPPoA default MTU is 1500 (max). The minimum MTU value is 64. |
| **On Demand** | Enables On Demand mode. The connection disconnects if no activity is detected after the specified Idle Timeout value. |
| **Default Gateway** | If checked, this WAN connection acts as the default gateway to the Internet. |
| **Debug** | Enables PPPoA connection debugging facilities. This allows the ISP technical support and ODM/OEM testers to simulate packets going through from WAN side. |

For VLAN and PVC field descriptions, please refer to section 3.4.1.

### Static Connection Setup

Static connection type is used whenever a known static IP address is assigned to the ATU-R150. Additional addressing information such as the subnet mask and the default gateway must also be specified. Up to three domain name server (DNS) addresses can be identified. These servers resolve the name of the computer to the IP address mapped to it and thus enable you to access other web servers by typing the symbolic name (host name).



Static Connection Setup

Name: STATIC  Type: Static  Sharing: Disable

Options: ☑ NAT ☑ Firewall  VLAN ID: 0  Priority Bits: 0

Static Settings

Encapsulation: ● LLC ○ VC

IP Address: 0.0.0.0

Mask:

Default Gateway:

DNS 1:

DNS 2:

DNS 3:

Mode: ● Bridged ○ Routed

PVC Settings

PVC: New

VPI: 0

VCI: 33

QoS: UBR

PCR: 0 cps

SCR: 0 cps

MBS: 0 cells

CDVT: 0 usecs

Auto PVC: □

1. At the **Setup** main page, click **New Connection**.
   The default PPPoE Connection Setup page is displayed.
2. At the **Type** field select Static.
   The Static Connection Setup page is displayed.
3. In the **Name** field, enter a unique name for the Static connection.
   The name must not have spaces and cannot begin with numbers. In this example, the unique name is Static.
4. The **Network Address Translation** (NAT) and the **Firewall** options are enabled by default. Leave these in the default mode.
5. In the **Static Settings** section, select the **Encapsulation** Type (LLC or VC).
   **Note:** If you are not sure, just use the default mode.
6. 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).
7. For the static configuration, you can also select a **Bridged** connection or a **Routed** connection.
8. In the **PVC** Settings section, enter values for the **VPI** and **VCI**.
   **Note:** Your DSL service provider or your ISP supplies these values. In this example, the DSL service provider is using 0,33.
9. Select the **Quality of Service** (QoS). Leave the default value if you are unsure or if the ISP did not provide this information.
   The **PCR**, **SCR**, **MBS**, and **CDVT** fields are enabled/disabled depending on the **QoS** selection. Enter the values provided by the ISP or leave the defaults.
10. Click **Apply** to complete the connection setup. This temporarily activates this connection.
    A new link has been created for this connection in the left-hand column. You can apply, delete, or cancel this connection using the buttons on this page.
    A new link is created for this connection in the left-hand column. You can connect, disconnect, apply, delete, or cancel this connection using the buttons at the bottom of this page.
    **Note:** The changes take effect when you click **Apply**; however, if the ATU-R150 configuration is not saved, these changes will be lost upon ATU-R150 reboot.
11. To make the change permanent, click **Tools** at the top of the page and select **System Commands**.
12. At the **System Commands** page, click **Save All**.
13. To check the status, click **Status** at the top of the page and select **Connection Status**.

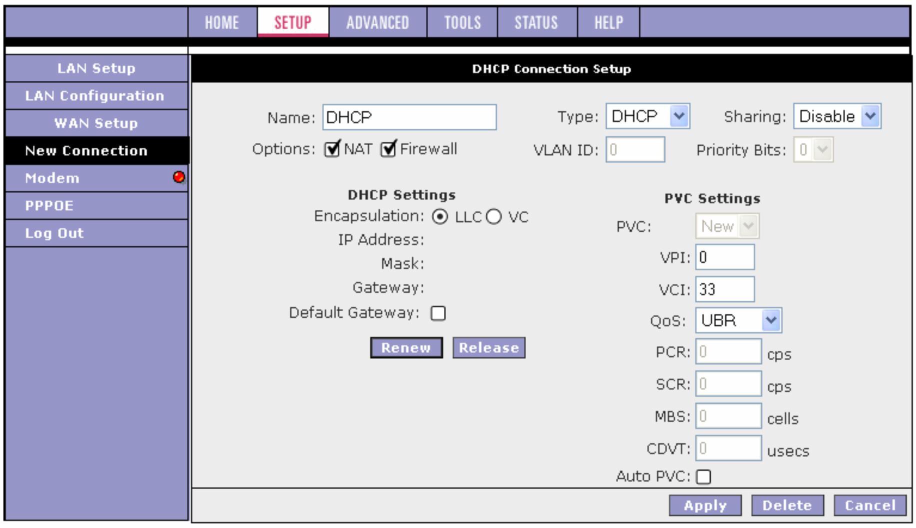
**Field Description**

| **Field** | **Definition/Description** |
|---|---|
| **Encapsulation** | The technique used by layered protocols in which a layer adds header information to the protocol data unit (PDU) from the layer above. As an example, in Internet terminology, a packet would contain a header from the data link layer, followed by a header from the network layer (IP), followed by a header from the transport layer (TCP), followed by the application protocol data. Two options are provided: Logical Link Control (LLC) and Virtual Channel (VC). |
| **IP Address** | IP address of the static connection provided by the ISP. |
| **Mask** | Subnet mask provided by your ISP. |
| **Gateway** | The IP address of your gateway provided by the ISP. |
| **Default Gateway** | The IP address of the default gateway to the Internet provided by the ISP. |
| **DNS** | Domain name server IP address provided by your ISP. You can configure up to three DNS IP addresses. |
| **Mode** | Two modes are available: Bridged and Routed. |

For VLAN and PVC field descriptions, please refer to section 3.4.1.

**DHCP Connection Setup**

DHCP allows the ATU-R150 to automatically obtain the IP address from the server. This option is commonly used in situations where the IP is dynamically assigned and is not known prior to assignment.



DHCP Connection Setup

Name: DHCP  Type: DHCP  Sharing: Disable

Options: ☑ NAT ☑ Firewall  VLAN ID: 0  Priority Bits: 0

DHCP Settings

Encapsulation: ● LLC ○ VC

IP Address:

Mask:

Gateway:

Default Gateway: □

PVC Settings

PVC: New

VPI: 0

VCI: 33

QoS: UBR

PCR: 0 cps

SCR: 0 cps

MBS: 0 cells

CDVT: 0 usecs

Auto PVC: □

1. On the **Setup** main page, click **New Connection**.
   The default **DHCP Connection Setup** page is displayed.
2. From the **Type** drop-down box, select **DHCP**.
   The default **DHCP Connection Setup** page is displayed.
3. Enter a unique name for the DHCP connection in the **Name** field.
   The name must not have spaces and cannot begin with numbers. In this example, the unique name is DHCP.
4. The **Network Address Translation** (NAT) and the **Firewall** options are enabled by default. Leave these in the default mode.
5. If your DSL line is connected and your DSL/IPS provider is supporting DHCP, you can click **Renew** and the ATU-R150 retrieves an IP Address, Subnet Mask, and Gateway Address.
   At any time, you can release the DHCP address by clicking **Release**, and renew the DHCP address by clicking **Renew**.
6. Under **PVC** Settings, enter values for the **VPI** and **VCI**.
   Note: Your DSL service provider or your ISP supplies these values. In this example, the DSL service provider is using 0,33.
7. Select the **Quality of Service** (QoS). Leave the default value if you are unsure or if the ISP did not provide this information.
   The **PCR**, **SCR**, **MBS**, and **CDVT** fields are enabled/disabled depending on the **QoS** selection. Enter the values provided by the ISP or leave the defaults.
8. Click **Apply** to complete the connection setup. This temporarily activates this connection.
   A new link has been created for this connection in the left-hand column. You can apply, delete, or cancel this connection using the buttons on this page.
   Note: The changes take effect when you click Apply; however, if the ATU-R150 configuration is not saved, these changes will be lost upon ATU-R150 reboot.
9. To make the change permanent, click **Tools** at the top of the page and select **System Commands**.
10. At the **System Commands** page, click **Save All**.
11. To check the status, click **Status** at the top of the page and select **Connection Status**.

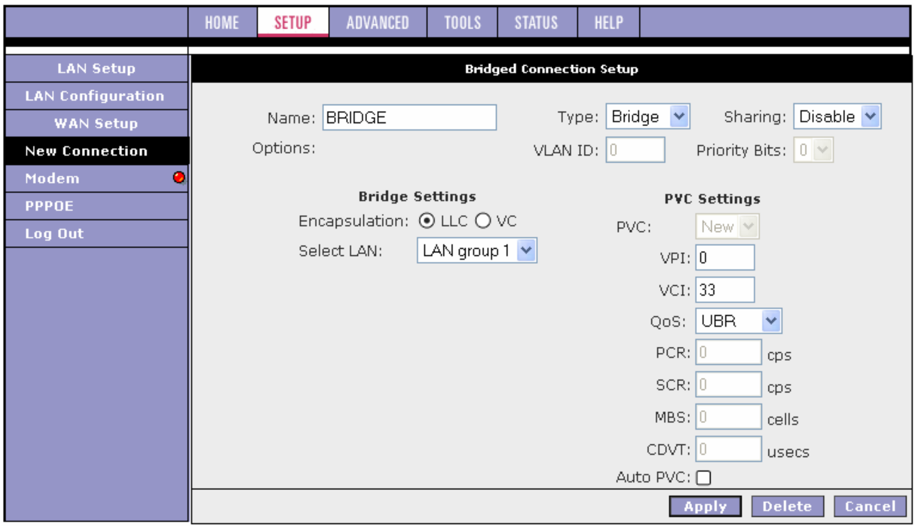
**Field Description**

| Field | Definition/Description |
|---|---|
| **Encapsulation** | The technique used by layered protocols in which a layer adds header information to the protocol data unit (PDU) from the layer above. As an example, in Internet terminology, a packet would contain a header from the data link layer, followed by a header from the network layer (IP), followed by a header from the transport layer (TCP), followed by the application protocol data. Two options are provided: Logical Link Control (LLC) and Virtual Channel (VC). |
| **IP Address** | IP address assigned by the DHCP server. |
| **Mask** | The subnet mask assigned by the DHCP server. |
| **Gateway** | The IP address of your gateway. |
| **Default Gateway** | If checked, this WAN connection acts as the default gateway to the Internet. |

For VLAN and PVC field descriptions, please refer to section 3.4.1.

### Bridged Profile and Connection

A pure bridged connection does not assign any IP address to the WAN interface. NAT and firewall rules are not enabled. This connection method makes the ATU-R150 act as a bridge for passing packets between the WAN interface and the LAN interface.



Bridged Connection Setup

Name: BRIDGE
Type: Bridge
Sharing: Disable
Options:
VLAN ID: 0
Priority Bits: 0

Bridge Settings
Encapsulation: ● LLC ○ VC
Select LAN: LAN group 1

PVC Settings
PVC: New
VPI: 0
VCI: 33
QoS: UBR
PCR: 0 cps
SCR: 0 cps
MBS: 0 cells
CDVT: 0 usecs
Auto PVC: □

1. On the **Setup** main page, click **New Connection**.
   The default PPPoE Connection Setup page is displayed.
2. From **Type** drop-down box, select **Bridge**.
   The default **Bridged Connection Setup** page is displayed.
3. Enter a unique name for the Bridged connection in the **Name** field.
   The name must not have spaces and cannot begin with numbers. In this example, the unique name is Bridge.
4. The **Network Address Translation** (NAT) and the **Firewall** options are enabled by default. Leave these in the default mode.
5. In the **Bridge Settings** section, select the **Encapsulation** Type (LLC or VC).
   **Note:** If you are not sure, just use the default mode.
6. In the **PVC** Settings section, enter values for the **VPI** and **VCI**.
   **Note:** Your DSL service provider or your ISP supplies these values. In this example, the DSL service provider is using 0,33.
7. Select the **Quality of Service** (QoS). Leave the default value if you are unsure or if the ISP did not provide this information.
   The **PCR**, **SCR**, **MBS**, and **CDVT** fields are enabled/disabled depending on the **QoS** selection. Enter the values provided by the ISP or leave the defaults.
8. Click **Apply** to complete the connection setup. This temporarily activates this connection.
   A new link has been created for this connection in the left-hand column. You can apply, delete, or cancel this connection using this page.
   **Note:** The changes take effect when you click Apply; however, if the ATU-R150 configuration is not saved, these changes will be lost upon ATU-R150 reboot.
9. To make the change permanent, click **Tools** at the top of the page and select **System Commands**.
10. At the **System Commands** page, click **Save All**.
11. To check the status, click **Status** and select **Connection Status**.

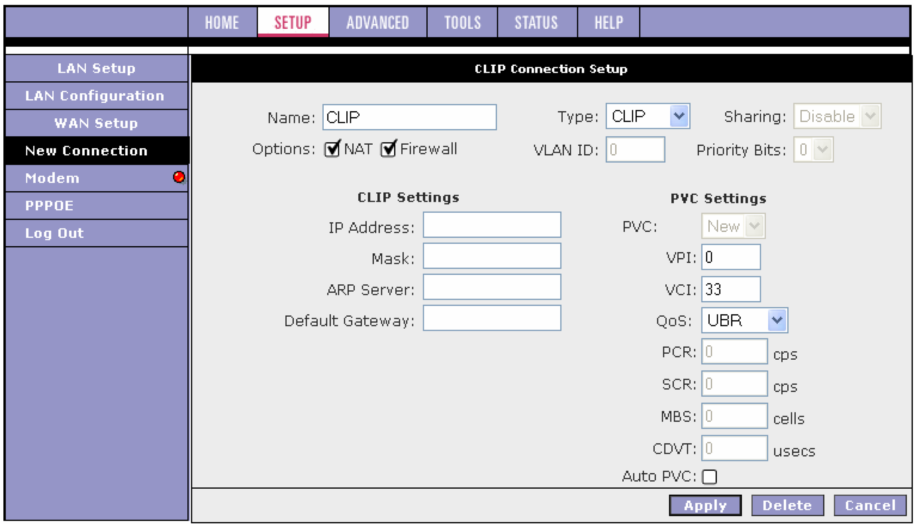
**Field Description**

| **Field** | **Definition/Description** |
|---|---|
| **Encapsulation** | The technique used by layered protocols in which a layer adds header information to the protocol data unit (PDU) from the layer above. As an example, in Internet terminology, a packet would contain a header from the data link layer, followed by a header from the network layer (IP), followed by a header from the transport layer (TCP), followed by the application protocol data. Two encapsulation options are provided:<br>● Logical Link Control (LLC)<br>● Virtual Channel (VC) |
| **Select LAN** | Select the LAN group for the bridged connection. The following options are available:<br>● LAN Group 1<br>● LAN Group 2<br>● LAN Group 3<br>● None<br>This bridged connection will be added to the selected LAN group. If you select None, the connection is not added to any LAN group but to the Interfaces box on the **LAN Configuration** page, which can be configured to a LAN group on the same page. |

For VLAN and PVC field descriptions, please refer to section 3.4.1.

### Classical IP over ATM Connection Setup

CLIP (aka. IPoA), defined in RFC 2225, provides the ability to transmit IP packets over an ATM network. This ATU-R150's CLIP support encapsulates an IP datagram in an AAL5 PDU frame using RFC 2225 and it uses an ATM-aware version of the address resolution protocol (ATMARP). Its CLIP support only allows support for PVCs, SVCs are not supported by the ATU-R150.



CLIP Connection Setup

Name: CLIP
Type: CLIP
Sharing: Disable
Options: ☑ NAT ☑ Firewall
VLAN ID: 0
Priority Bits: 0

CLIP Settings
IP Address:
Mask:
ARP Server:
Default Gateway:

PVC Settings
PVC: New
VPI: 0
VCI: 33
QoS: UBR
PCR: 0 cps
SCR: 0 cps
MBS: 0 cells
CDVT: 0 usecs
Auto PVC: □

1. On the **Setup** main page, click **New Connection**.
   The default **PPPoE Connection Setup** page is displayed.
2. From **Type** drop-down box, select **CLIP**.
   The default **CLIP Connection Setup** page is displayed.
3. Enter a unique name for the static connection in the **Name** field.
   The name must not have spaces and cannot begin with numbers. In this example, the unique name is Clip.
4. The **Network Address Translation** (NAT) and the **Firewall** options are enabled by default. Leave these in the default mode.
5. Based upon the information your DSL/ISP provided, enter your assigned **IP Address**, **Mask**, **ARP Server**, and **Default Gateway**.
6. In the **PVC** Settings section, enter values for the **VPI** and **VCI**.
   **Note:** Your DSL service provider or your ISP supplies these values.
7. Select the **Quality of Service** (QoS); leave the default value if you are unsure or if the ISP did not provide this information.
   The **PCR**, **SCR**, **MBS**, and **CDVT** fields are enabled/disabled depending on the **QoS** selection. Enter the values provided by the ISP or leave the defaults.
8. Click **Apply** to complete the connection setup. This temporarily activates this connection.
   A new link has been created for this connection in the left-hand column. You can apply, delete, or cancel this connection using this page.
   **Note:** The changes take effect when you click **Apply**; however, if the ATU-R150 configuration is not saved, these changes will be lost upon ATU-R150 reboot.
9. To make the change permanent, click **Tools** at the top of the page and select **System Commands**.
10. At the **System Commands** page, click **Save All**.
11. To check the status, click **Status** at the top of the page and select **Connection Status**.

**Field Description**

| **Field** | **Definition/Description** |
|---|---|
| **IP Address** | IP address of the CLIP connection provided by your ISP. |
| **Mask** | Subnet mask provided by your ISP. |
| **ARP Server** | IP address of the Address Resolution Protocol (ARP) server provided by your ISP. |
| **Default Gateway** | If checked, this WAN connection acts as the default gateway to the Internet. |

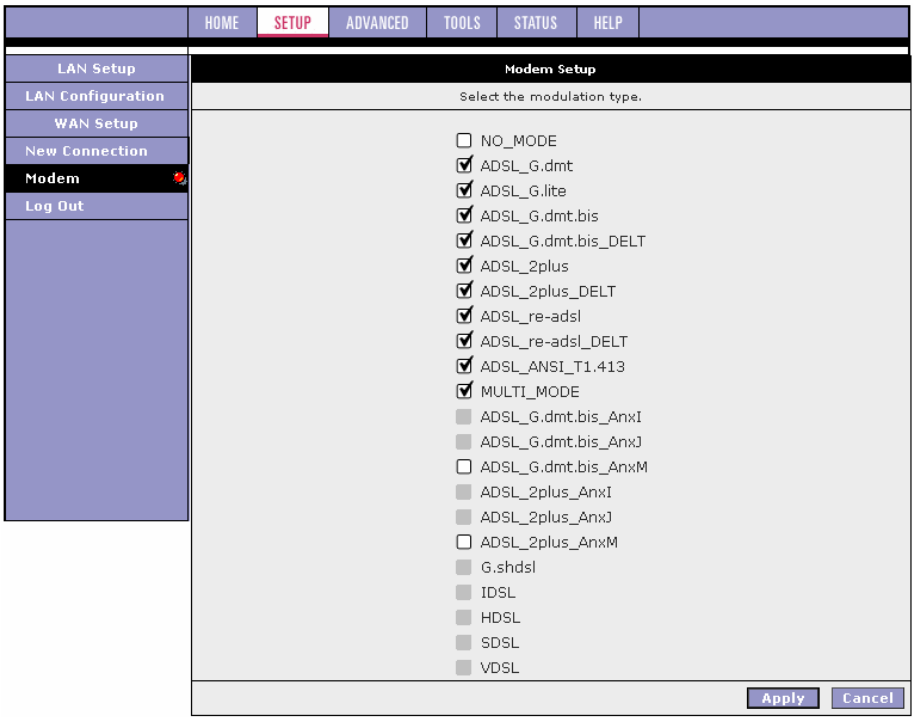
For VLAN and PVC field descriptions, please refer to section 3.4.1.

### 3.4.2 Modify an Existing Connection

1. On the **Setup** main page, select the connection you want to modify from the left-hand column. The connections are listed as Connection 1 through Connection 8.
   **Note:** Up to eight WAN connections of all types are supported.
2. Make modifications on the individual connection page.
   **Note:** Some fields are disabled after initial creation.
3. Click **Apply** to temporarily activate the changes you made.
   **Note:** The changes take effect when you click **Apply**; however, if the ATU-R150 configuration is not saved, these changes will be lost upon ATU-R150 reboot.
4. To make the change permanent, click **Tools** at the top of the page and select **System Commands**.
5. At the **System Commands** page, click **Save All**.

### 3.4.3 Modem Setup

The Modem Setup page allows you to select any combination of DSL training modes.



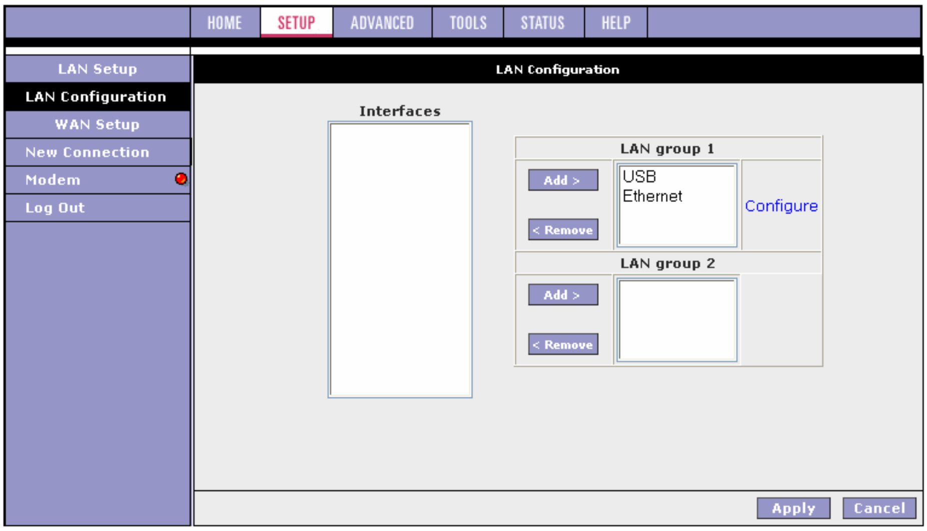
Modem Setup

Select the modulation type.

- □ NO_MODE
- ☑ ADSL_G.dmt
- ☑ ADSL_G.lite
- ☑ ADSL_G.dmt.bis
- ☑ ADSL_G.dmt.bis_DELT
- ☑ ADSL_2plus
- ☑ ADSL_2plus_DELT
- ☑ ADSL_re-adsl
- ☑ ADSL_re-adsl_DELT
- ☑ ADSL_ANSI_T1.413
- ☑ MULTI_MODE
- □ ADSL_G.dmt.bis_AnxI
- □ ADSL_G.dmt.bis_AnxJ
- □ ADSL_G.dmt.bis_AnxM
- □ ADSL_2plus_AnxI
- □ ADSL_2plus_AnxJ
- □ ADSL_2plus_AnxM
- □ G.shdsl
- □ IDSL
- □ HDSL
- □ SDSL
- □ VDSL

## 3.5 Configuring the LAN

The LAN can be configured with static IP address, dynamic IP address, or be unmanaged (no IP).



LAN Configuration

Interfaces

LAN group 1

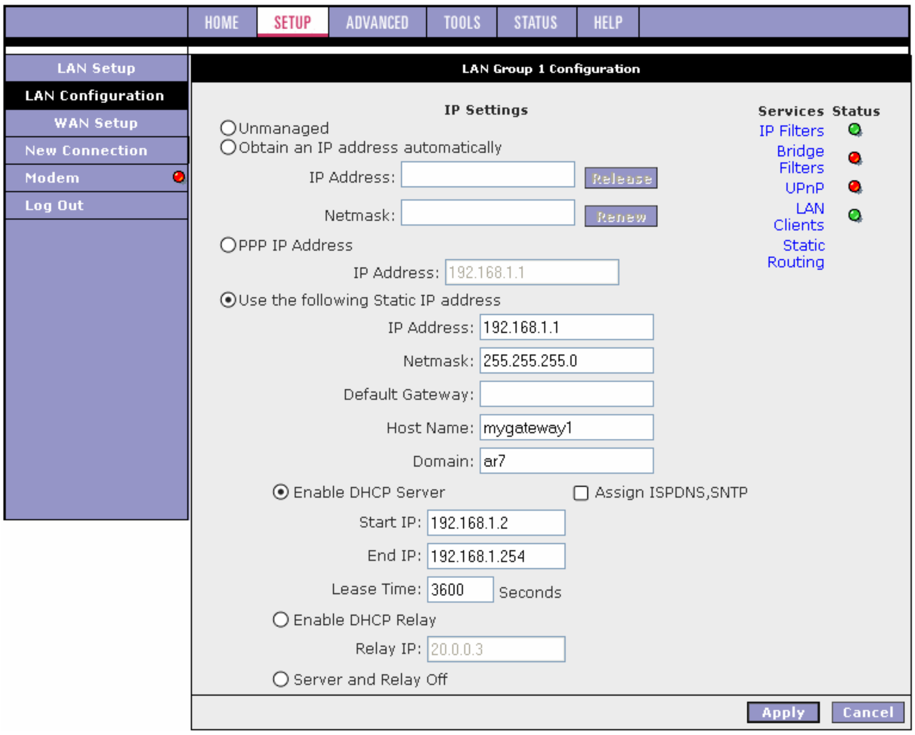
USB
Ethernet

Configure

LAN group 2

### 3.5.1 LAN Group Configuration

The LAN Group Configuration page allows you to configure settings for each defined LAN group.
Notice that you can also view the status of advanced services that can be applied to this LAN group. A green status indicates that the services have been enabled, while a red status indicates that the service is currently disabled.



LAN Group 1 Configuration

IP Settings

○ Unmanaged
○ Obtain an IP address automatically
IP Address:
Netmask:
○ PPP IP Address
IP Address: 192.168.1.1
● Use the following Static IP address
IP Address: 192.168.1.1
Netmask: 255.255.255.0
Default Gateway:
Host Name: mygateway1
Domain: ar7
● Enable DHCP Server □ Assign ISPDNS,SNTP
Start IP: 192.168.1.2
End IP: 192.168.1.254
Lease Time: 3600 Seconds
○ Enable DHCP Relay
Relay IP: 20.0.0.3
○ Server and Relay Off

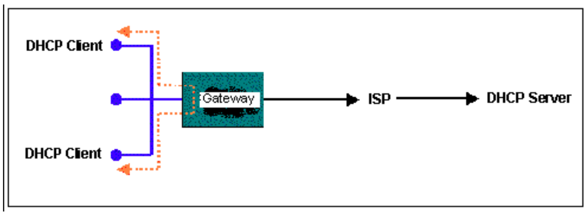
| Services | Status |
|---|---|
| IP Filters | 🟢 |
| Bridge Filters | 🔴 |
| UPnP | 🔴 |
| LAN Clients | 🟢 |
| Static Routing | |

**Field Description**

| **Category/Field** | **Field** | **Definition/Description** |
|---|---|---|
| **Unmanaged** | | Unmanaged is a state when the LAN group is not configured and no IP address has been assigned to the bridge. |
| **Obtain an IP address automatically** | | When this function is enabled, your ATU-R150 acts like a client and requests an IP address from the DHCP server on the LAN side. |
| | IP Address | You can retrieve/renew an IP address from the DHCP server using the Release and Renew buttons. |
| | Netmask | The subnet mask of your Gateway. |
| **PPP IP Address** | | Enables/disables PPP unnumbered feature. |
| | IP Address | The IP address should be different from, but in the same subnet as the WAN-side IP address. |
| **Use the following Static IP address** | | This field enables you to change the IP address of the ATU-R150. |
| | IP Address | The default IP address of the ATU-R150 is 192.168.1.1. |
| | Netmask | The default subnet mask of your ATU-R150 is 255.255.255.0. This subnet allows the ATU-R150 to support 254 users. If you want to support a larger number of users you can change the subnet mask. |
| | Default Gateway | 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 provides you with the IP address of the default gateway. |
| | Host Name | The host name is used in conjunction with the domain name to uniquely identify the ATU-R150. It can be any alphanumeric word that does not contain spaces.<br>Domain The domain name is used in conjunction with the host name to uniquely identify the ATU-R150. To access the web pages of the ATU-R150 you can type 192.168.1.1 (the IP address) or mygateway1.ar7 (Host Name.Domain). |
| **Enable DHCP Server** | | Enables/disables DHCP. By default, your ATU-R150 has the 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. |
| | Assign ISP DNS, SNTP | Enable/disables the **Assign ISP DNS, SNTP** feature when the DHCP server of your ATU-R150 has been enabled. To learn more about the **Assign ISP DNS, SNTP** feature, refer to ‘‘Assign ISP DNS, SNTP’’. |
| | Start IP | The Start IP Address is where the DHCP server starts issuing IP addresses. This value must be greater than the IP address value of the ATU-R150. For example, if the IP address of the ATU-R150 is 192.168.1.1 (default), then the starting IP address must be 192.168.1.2 (or higher).<br>Note: If you change the start or end values, make sure the values are still within the same subnet as the ATU-R150. In other words, if the IP address of the ATU-R150 is 192.168.1.1 (default) and you change the DHCP start/end IP addresses to be 192.168.1.2/192.168.1.100, you cannot communicate with the ATU-R150 if your host has DHCP enabled. |
| | End IP | 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 the default gateway is 192.168.1.254. If the DHCP server runs out of DHCP addresses, users do not get access to network resources. If this happens, you can increase the Ending IP address (to the limit of 254) or reduce the lease time.<br>Note: If you change the start or end values, make sure the values are still within the same subnet as the IP address of the |

| | | |
|---|---|---|
| | | ATU-R150. In other words, if the IP address of the ATU-R150 is 192.168.1.1 (default) and you change the DHCP start/end IP addresses to be 192.168.1.2/192.168.1.100, you cannot communicate with the ATU-R150 if your host has DHCP enabled. |
| | Lease Time | The Lease Time is the amount of time that a network user is allowed to maintain a network connection to the ATU-R150 using the current dynamic IP address. At the end of the Lease Time, the lease is either renewed or a new IP is issued by the DHCP server. The amount of time is in units of seconds. The default value is 3600 seconds (1 hour). The maximum value is 999999 seconds (about 278 hours). |
| **Enable DHCP Relay** | | In addition to the DHCP server feature, the ATU-R150 supports the DHCP relay function. When the ATU-R150 is configured as DHCP server, it assigns the IP addresses to the LAN clients. When the ATU-R150 is configured as DHCP relay, it is responsible for forwarding the requests and responses negotiated between the DHCP clients and the server. |
| | Relay IP | The IP address of the DHCP relay server. |
| **Server and Relay Off** | | When the DHCP server and relay functions are turned off, the network administrator must carefully configure the IP address, Subnet Mask, and DNS settings of every host on your network. Do not assign the same IP address to more than one host. Also, your ATU-R150 must reside on the same subnet as all the other hosts. |

**Example of a DHCP Relay configuration**



### 3.5.1.1 Assign ISP DNS, SNTP

When you enable the DHCP server on the LAN side, the ATU-R150 dynamically assigns IP addresses to the hosts on the local network. The ATU-R150 provides its own LAN IP address (192.168.1.1) as both the gateway and the DNS server.

On the WAN side, the ATU-R150 receives the following data (among other data) from the ISP:

- IP: 10.10.10.101
- Gateway: 10.10.10.1
- DNS: 10.10.10.5

The ATU-R150 has a choice of advertising its own IP address (192.168.1.1) to the LAN side hosts as the DNS server, or providing the DNS that was received from the WAN side (10.10.10.5). This can be configured by enabling/ disabling Assign ISP DNS SNTP on the LAN Group Configuration page.

**Note:** This section only applies when you have enabled DHCP server on the LAN Group Configuration page.

## 3.6 ADVANCED

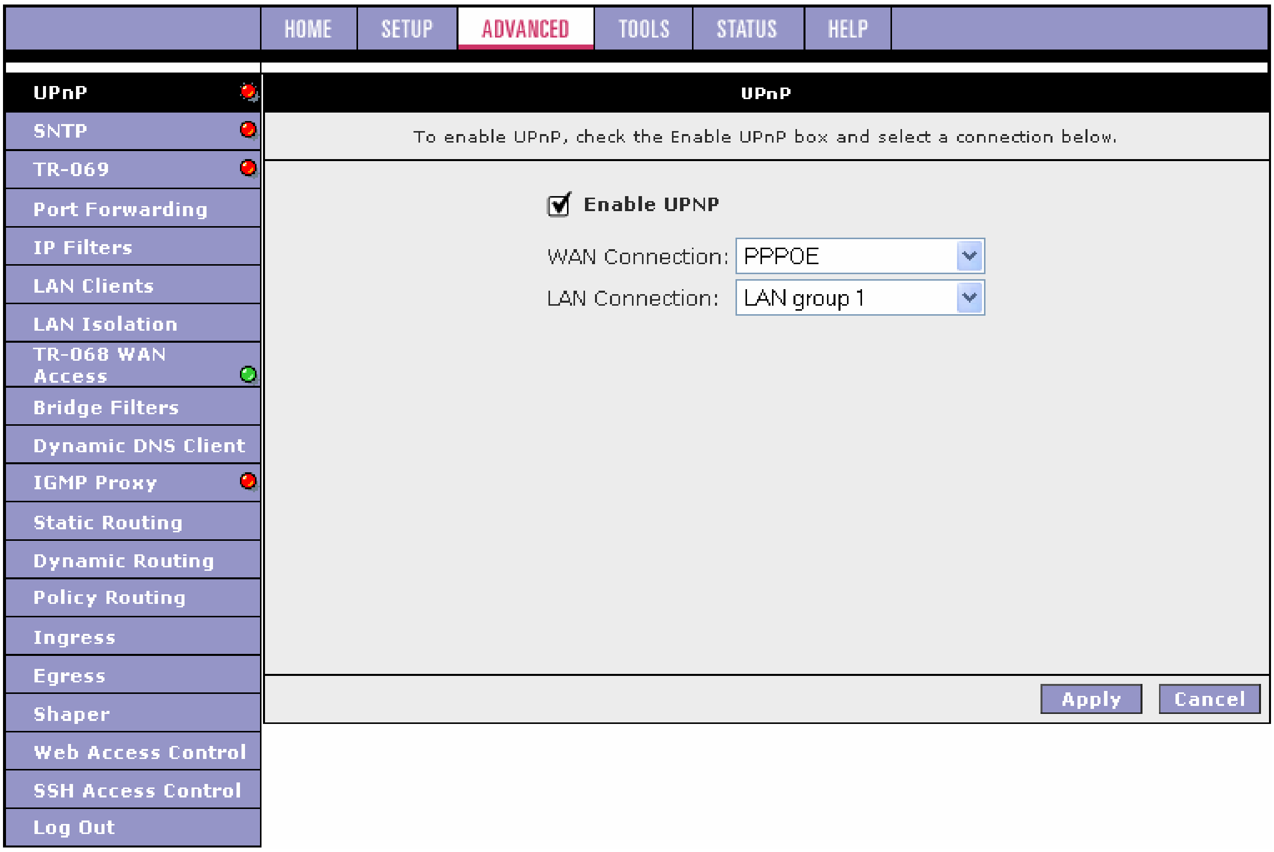
The Advanced tab allows you to perform advanced configuration functions for existing connections including:

- Enabling and disabling of key features including voice, voice provision, UPnP, SNTP, TR-069, IP QoS, RIP, access control, TR-068 WAN access, and multicasting
- QoS (ingress, egress, shaper) and policy routing
- Management of LAN port interfaces, packet flow, and filtering

At least one WAN connection must be configured before implementing advanced WAN configuration features. At least one LAN group must be defined before implementing advanced LAN configuration features.

### 3.6.1 UPnP

Universal plug and play (UPnP), NAT, and firewall traversal allow traffic to pass through the ATU-R150 for applications using the UPnP protocol. This feature requires one active WAN connection. In addition, the PC should support this feature. In the presence of multiple WAN connections, select a connection on which the incoming traffic is present, for example, the default WAN connection.



To enable UPnP, check the Enable UPnP box and select a connection below.

☑ Enable UPNP

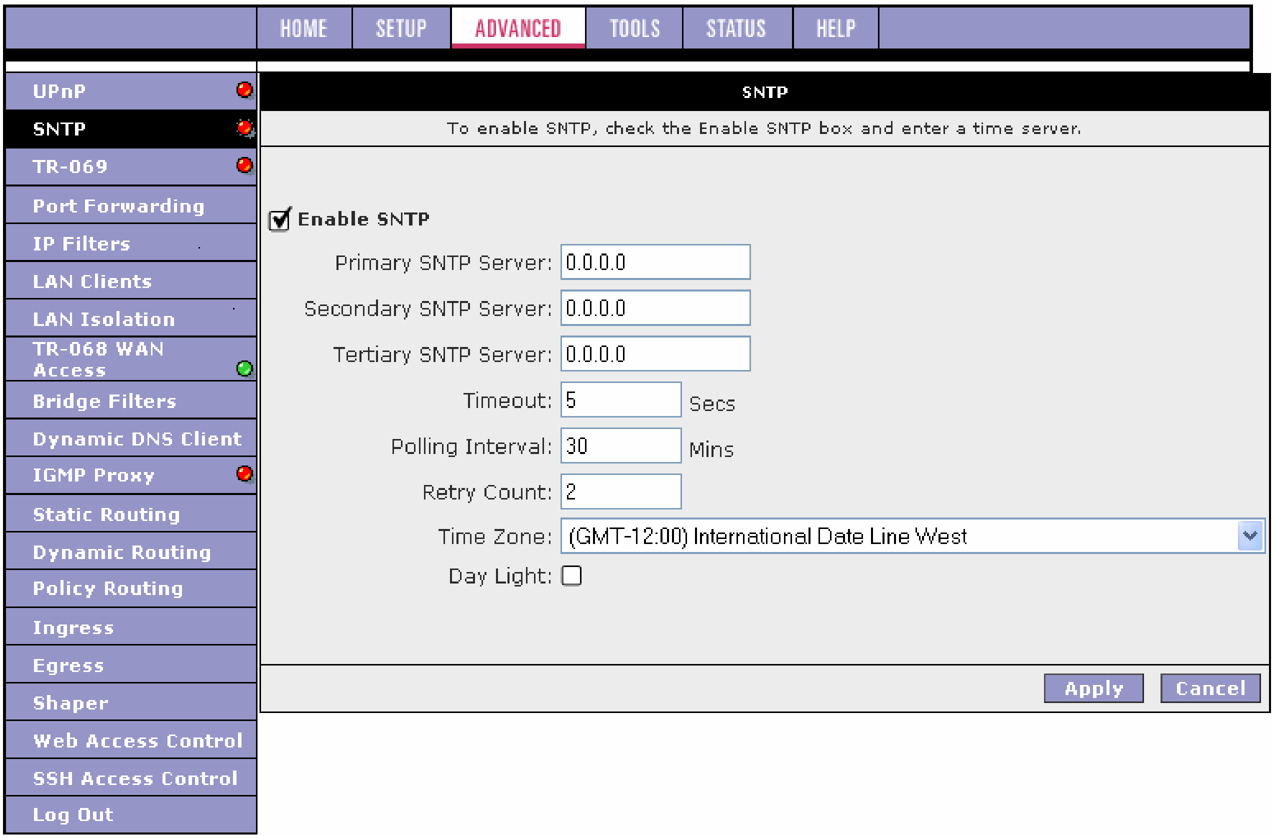
WAN Connection: PPPOE

LAN Connection: LAN group 1

1. Check **Enable UPnP**.
   This enables the WAN Connection and LAN Connection fields.
2. Select the WAN Connection and LAN Connection that will use UPnP from the drop-down lists.
3. Click **Apply** to temporarily activate the settings.
   **Note:** The changes take effect when you click Apply; however, if the ATU-R150 configuration is not saved, these changes will be lost upon ATU-R150 reboot.
4. To make the change permanent, click **Tools** at the top of the page and select **System Commands**.
5. At the **System Commands** page, click **Save All**.

### 3.6.2 SNTP

Simple network timing protocol (SNTP) is a protocol used to synchronize the system time to the public SNTP servers. It uses the UDP protocol on port 123 to communicate between clients and servers. The figure below shows the default SNTP page.



SNTP

To enable SNTP, check the Enable SNTP box and enter a time server.

☑ Enable SNTP

Primary SNTP Server: 0.0.0.0

Secondary SNTP Server: 0.0.0.0

Tertiary SNTP Server: 0.0.0.0

Timeout: 5 Secs

Polling Interval: 30 Mins

Retry Count: 2

Time Zone: (GMT-12:00) International Date Line West

Day Light: □

When the SNTP feature is enabled, your ATU-R150 starts querying for the time clock information from the primary SNTP server. If it fails to get a valid response within the Timeout period, it makes additional attempts based on the number specified in the Retry Count field before moving to the Secondary SNTP server.
If it fails to get a valid response from Secondary STNP server within the specified retry count, it starts querying the Tertiary SNTP server. If it fails to get a valid response from all the servers, then the program stops. Once a valid response is received from one of the servers, the program goes to sleep for number of minutes specified in the Polling Interval field before starting the whole process again.

1. Check **Enable SNTP**.
2. Use the table below as a reference and configure the following fields:
   - Primary SNTP Server
   - Secondary SNTP Server
   - Tertiary SNTP Server
   - Timeout
   - Polling Interval
   - Retry Count
   - Time Zone
   - Day Light
3. Click **Apply** to temporarily activate the settings.
   **Note:** The changes take effect when you click Apply; however, if the ATU-R150 configuration is not saved, these changes will be lost upon ATU-R150 reboot.
4. To make the change permanent, click **Tools** at the top of the page and select **System Commands**.
5. At the **System Commands** page, click **Save All**.

**Field Description**

| **Field** | **Definition/Description** |
|---|---|
| **Primary SNTP Server** | The IP address or the host name of the primary SNTP server. This can be provided by ISP or user-defined. |
| **Secondary SNTP Server** | The IP address or the host name of the secondary SNTP server. This can be provided by ISP or user-defined. |
| **Tertiary SNTP Server** | The IP address or the host name of the tertiary SNTP server. This can be provided by ISP or user-defined. |
| **Timeout** | If the ATU-R150 failed to connect to a SNTP server within the Timeout period, it retries the connection. |
| **Polling Interval** | The amount of time between a successful connection with a SNTP server and a new attempt to connect to an SNTP server. |
| **Retry Count** | The number of times the ATU-R150 tries to connect to an SNTP server before it tries to connect to the next server in line. |
| **Time Zone** | The time zone in which the ATU-R150 resides. |
| **Day Light** | Check/uncheck this option to enable/disable daylight saving time (DST).<br>**Note:** DST is not automatically enabled or disabled. You need to manually enable and disable it. |

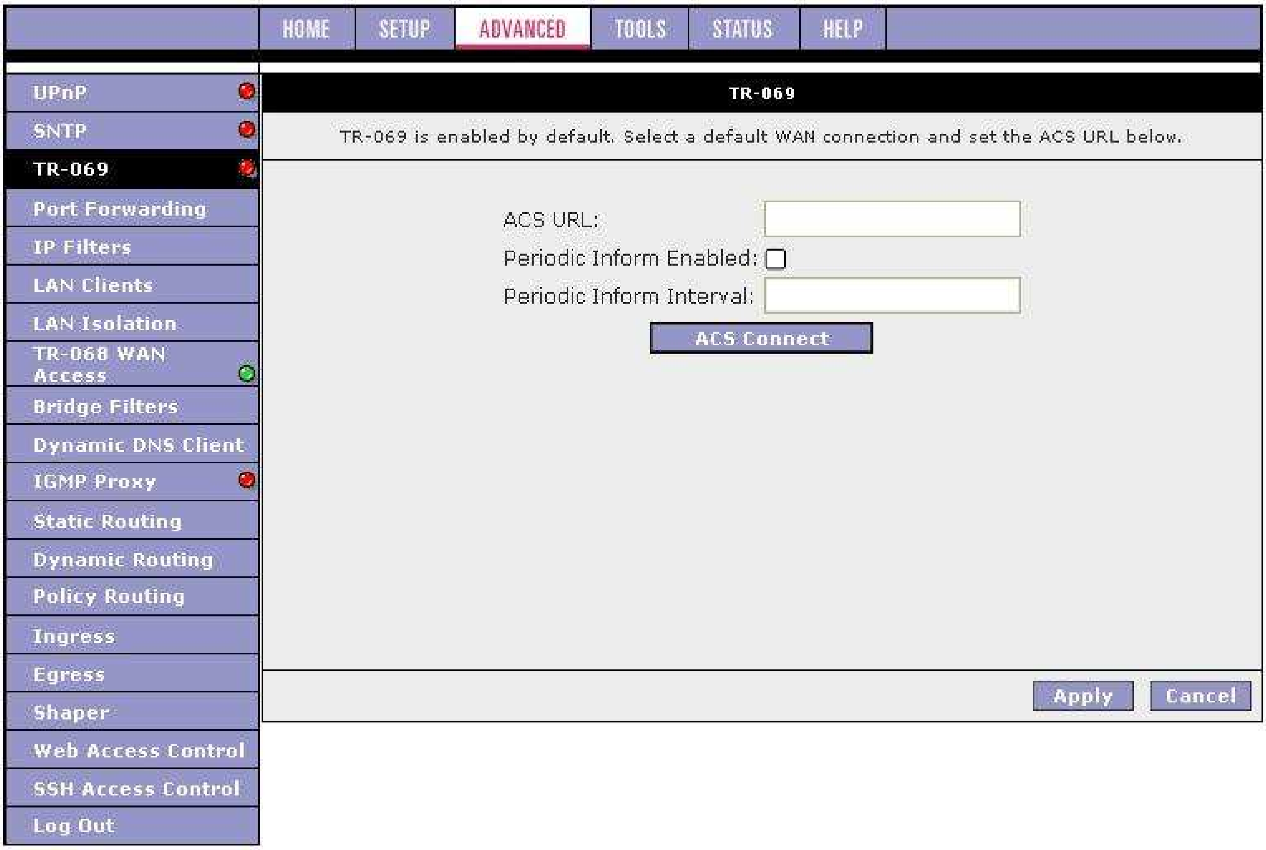
### 3.6.3 TR-069 (Optional)

TR-069 is CPE Management Protocol from WAN side, intended for communication between a CPE and Auto-Configuration Server (ACS). The CPE WAN Management Protocol defines a mechanism that encompasses secure auto-configuration of a CPE, and also incorporates other CPE management functions into a common framework.

The CPE WAN Management Protocol is intended to support a variety of functionalities to manage a collection of CPE, including the following primary capabilities:

- Auto-configuration and dynamic service provisioning
- Software/firmware image management
- Status and performance monitoring
- Diagnostics

The TR-069 page allows you to set up connection parameters and may not be seen by the end user. The figure below shows the default TR-069 page.



TR-069

TR-069 is enabled by default. Select a default WAN connection and set the ACS URL below.

ACS URL:

Periodic Inform Enabled: □

Periodic Inform Interval:

**Field Description**

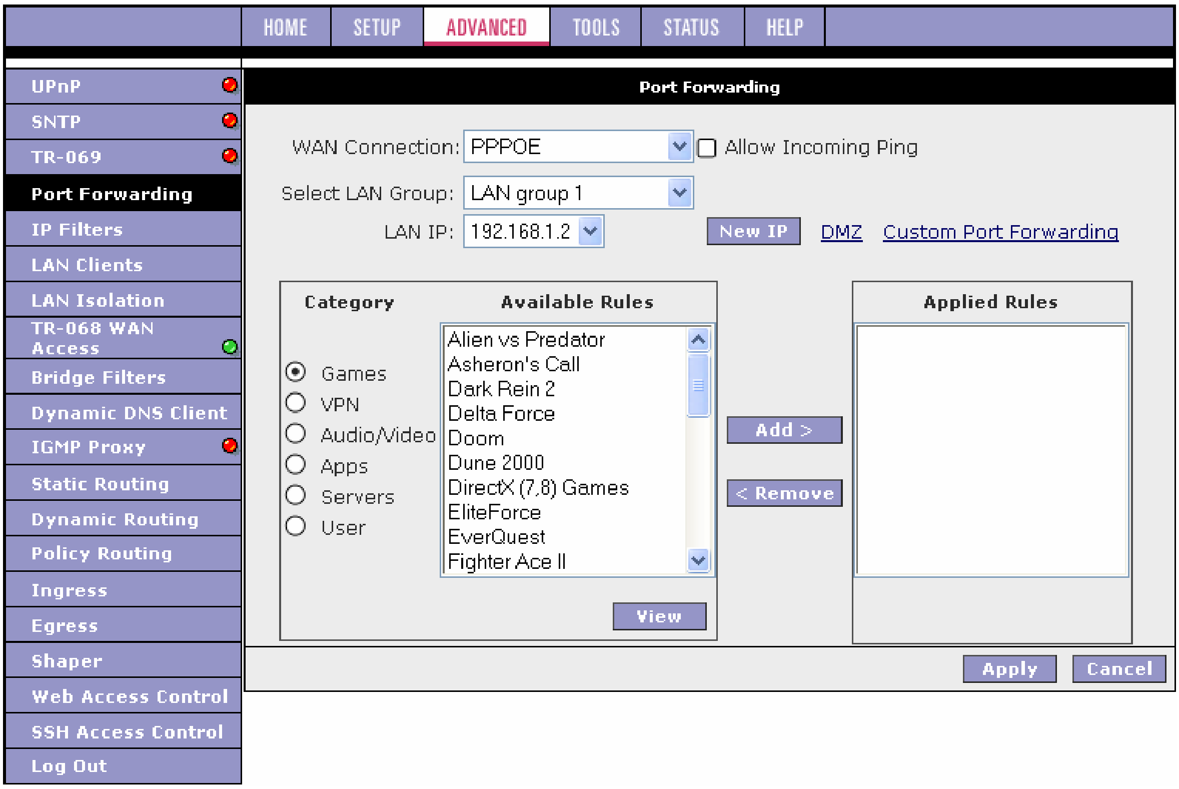
| **Field** | **Definition/Description** |
|---|---|
| **ACS URL** | URL of the auto configuration server (ACS) provided by the ISP. |
| **Periodic Inform Enabled** | Enable/disables the modem to connect to the ACS periodically. If you enable this feature, you should enter a value in the Periodic Inform Interval field. |
| **Periodic Inform Interval** | This field is enabled only when the Periodic Inform Enabled field is checked. It defines the amount of time (in seconds) between a successful connection with an ACS server and a new attempt to connect to an ACS server. A recommended value is 86400 seconds (1 day). |
| **ACS Connect** | By clicking the ACS Connect button, you manually connect the Modem to the ACS. |

Please refer to TR-69 “Field Description” and follow procedure below to configure the parameters.

1. Leave the default URL in the **ACS URL** field .
2. Check **Periodic Inform Enabled** and enter a value in the **Periodic Inform Interval** field. or Click **ACS Connect** to manually connect to the ACS. Once a connection is established, the ACS can update all three fields: **ACS URL**, **Periodic Inform Enabled**, and **Periodic Inform Interval**.
3. Click **Apply** when you finish to temporarily activate the settings. **Note:** The changes take effect when you click Apply; however, if the Modem configuration is not saved, these changes will be lost upon Modem reboot.
4. To make the change permanent, click **Tools** at the top of the page and select **System Commands**.
5. At the **System Commands** page, click **Save All**.

### 3.6.4 Port Forwarding

The port forwarding (or virtual server) feature allows you to direct incoming traffic to specific LAN hosts based on a protocol port number and protocol. Using the Port Forwarding page, you can provide local services (for example, web hosting) for people on the Internet or play Internet games. Port forwarding is configurable per LAN group. A database of predefined port forwarding rules allows you to apply one or more rules to one or more members of a defined LAN group. You can view the rules associated with a predefined category and add the available rules for a given category. You can also create, edit, or delete your own port forwarding rules.



Port Forwarding

WAN Connection: PPPOE □ Allow Incoming Ping

Select LAN Group: LAN group 1

LAN IP: 192.168.1.2

Category: ● Games ○ VPN ○ Audio/Video ○ Apps ○ Servers ○ User

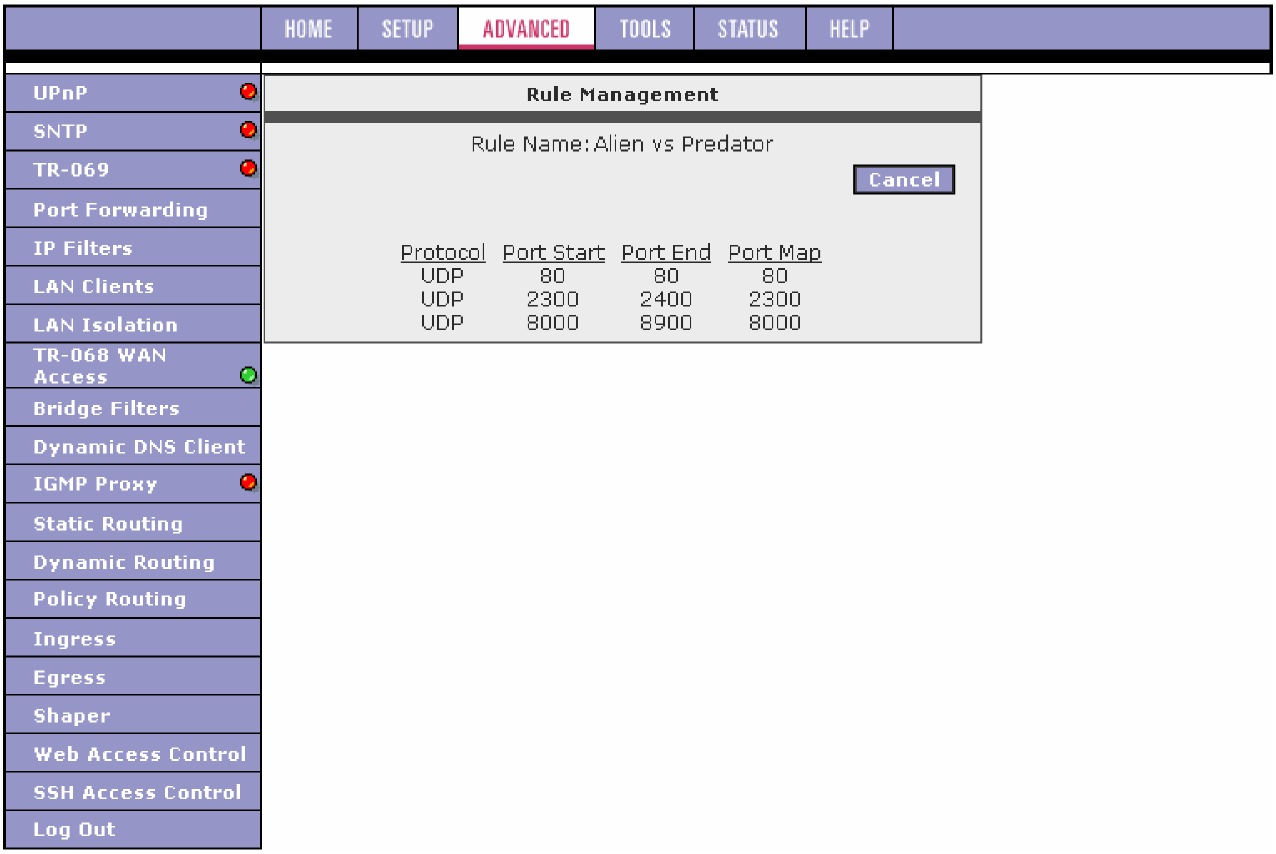
Available Rules: Alien vs Predator, Asheron's Call, Dark Rein 2, Delta Force, Doom, Dune 2000, DirectX (7,8) Games, EliteForce, EverQuest, Fighter Ace II

Applied Rules

**Field Description**

| **Field** | **Definition/Description** |
|---|---|
| **WAN Connection** | Select the WAN connection to which port forwarding is applied. |
| **Select LAN Group** | Select the LAN Group to which port forwarding is applied. |
| **LAN IP** | Select the IP address to host the service. |
| **Allow Incoming Ping** | Enabling incoming ping (ICMP) requests on the Port Forwarding page allows the ATU-R150 to respond to a ping from the Internet. |
| **DMZ** | Demilitarized zone. More information on DMZ is available in "DMZ Settings Page". |
| **Custom Port Forwarding** | This link takes you to the Custom Port Forwarding page. More information is available in "Custom Port Forwarding Page". |
| **Category** | Custom and user-defined categories. |
| **Available Rules** | Predefined and user-defined IP filtering rules for each category. |
| **Applied Rules** | Lists the IP filtering rules you elect to apply for each given category. |

6. On the **Port Forwarding Configuration** page, select WAN Connection, LAN Group, and LAN IP. If the desired LAN IP is not available in the LAN IP drop-down menu, you can add it using the LAN Client page, which is accessed by clicking New IP.
7. Select the available rules for a given category and click **Add** to apply the rule for this category. **Note:** You can click **View** to view the rule associated with a predefined filter on the Rule Management page.

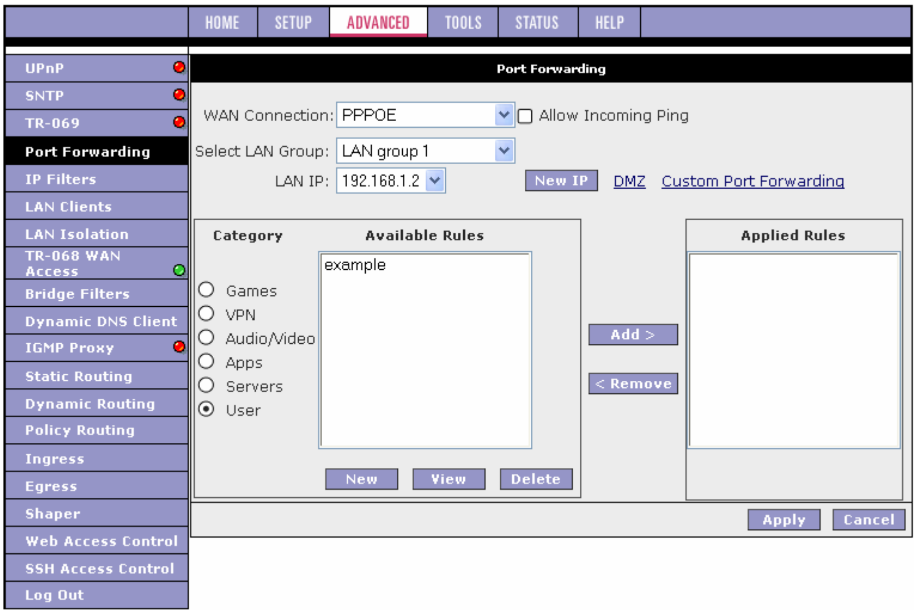


Rule Management

Rule Name: Alien vs Predator

| Protocol | Port Start | Port End | Port Map |
|---|---|---|---|
| UDP | 80 | 80 | 80 |
| UDP | 2300 | 2400 | 2300 |
| UDP | 8000 | 8900 | 8000 |

**8.** If a rule is not in the list, you can create your own rule in the User category. Select **User**, then click **New**



Port Forwarding

WAN Connection: PPPOE ☐ Allow Incoming Ping

Select LAN Group: LAN group 1

LAN IP: 192.168.1.2

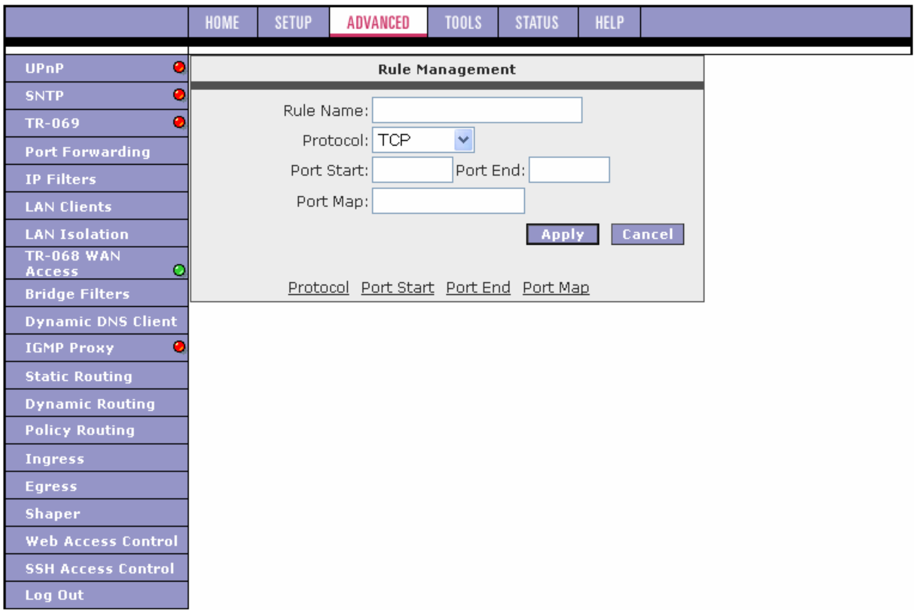
Category
○ Games
○ VPN
○ Audio/Video
○ Apps
○ Servers
● User

Available Rules
example

Applied Rules

**Note:** The New, View, and Delete buttons become available only when the User category is selected. All the custom rules you create fall under the User Category.

**9.** The Rule Management page populates for you to create new rules. Enter Rule Name, Protocol, Port Start, Port End, and Port Map fields, then click **Apply**.



Rule Management

Rule Name:

Protocol: TCP

Port Start: Port End:

Port Map:

The rules you create become available in the User category. You are able to view or delete the rules you create.

**10.** Continue to add rules as they apply from each category.

**11.** Click **Apply** when you finish to temporarily activate the settings.
**Note:** The changes take effect when you click Apply; however, if the ATU-R150 configuration is not saved, these changes will be lost upon ATU-R150 reboot.

**12.** To make the change permanent, click **Tools** at the top of the page and select **System Commands**.

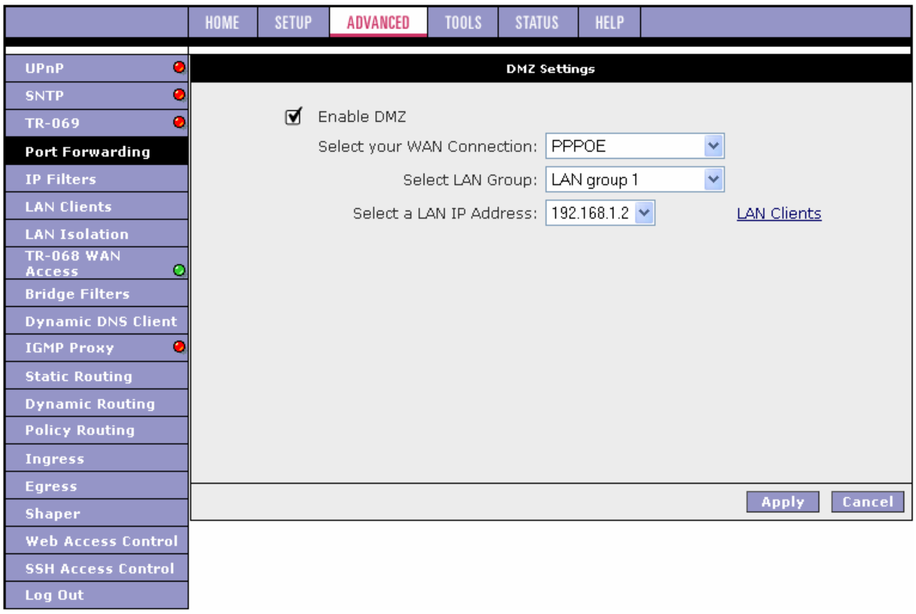
**13.** At the **System Commands** page, click **Save All**.

**Note:** You can also use the Custom Port Forwarding link to add programs to the existing list.

**DMZ Settings Page**

Setting a host on your local network as demilitarized zone (DMZ) forwards any network traffic that is not redirected to another host via the port forwarding feature to the IP address of the host. This opens the access to the DMZ host from the Internet. This function is disabled by default. By enabling DMZ, you add an extra layer of security protection for hosts behind the firewall.

1. On the **Port Forwarding** page, click the **DMZ** link.
   You are taken to the DMZ Settings page.



DMZ Settings

☑ Enable DMZ

Select your WAN Connection: PPPOE

Select LAN Group: LAN group 1

Select a LAN IP Address: 192.168.1.2

LAN Clients

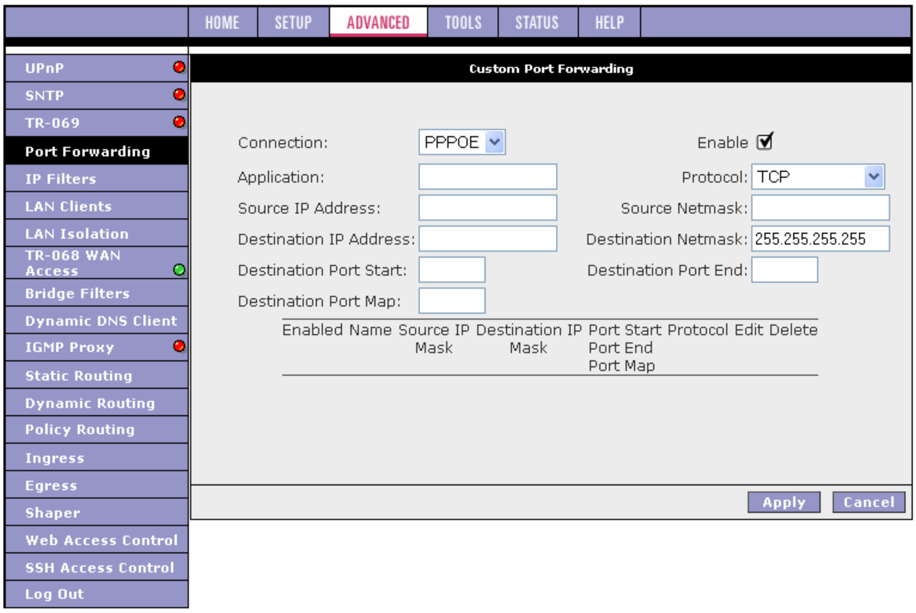
2. Check the **Enable DMZ** box.
3. Select the WAN Connection, LAN Group, and LAN IP Address.
   DMZ is configurable per LAN segment.
4. Click **Apply** when you finish to temporarily activate the settings.
   **Note:** You can access the LAN Clients page by clicking the LAN Clients link.
   **Note:** The changes take effect when you click **Apply**; however, if the ATU-R150 configuration is not saved, these changes will be lost upon ATU-R150 reboot.
5. To make the change permanent, click **Tools** at the top of the page and select **System Commands**.
6. At the **System Commands** page, click **Save All**.

**Field Description**

| **Field** | **Definition/Description** |
|---|---|
| **Enable DMZ** | Enables/disables the Demilitarized Zone feature. This field is unchecked (disabled) by default. |
| **Select your WAN Connection** | Select the WAN connection on which the DMZ feature is applied. |
| **Select LAN Group** | Select the LAN Group on which the DMZ feature is applied. |
| **Select a LAN IP Address** | Select the LAN IP address you are going to use as the DMZ host. This host is exposed to the Internet. Be aware that this feature may expose your local network to security risks. |
| **LAN Clients** | This link takes you to the LAN Clients page. More information on LAN Clients can be found in "LAN Clients Page". |

**Custom Port Forwarding Page**

The Custom Port Forwarding page allows you to create up to 15 custom port forwarding entries to support specific services or applications, such as concurrent NAT/NAPT operation.



Custom Port Forwarding

Connection: PPPOE Enable ☑

Application: Protocol: TCP

Source IP Address: Source Netmask:

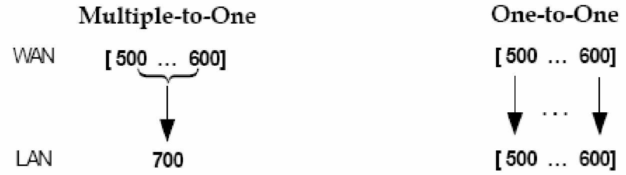
Destination IP Address: Destination Netmask: 255.255.255.255

Destination Port Start: Destination Port End:

Destination Port Map:

| Enabled | Name | Source IP Mask | Destination IP Mask | Port Start Port End Port Map | Protocol | Edit | Delete |
|---|---|---|---|---|---|---|---|

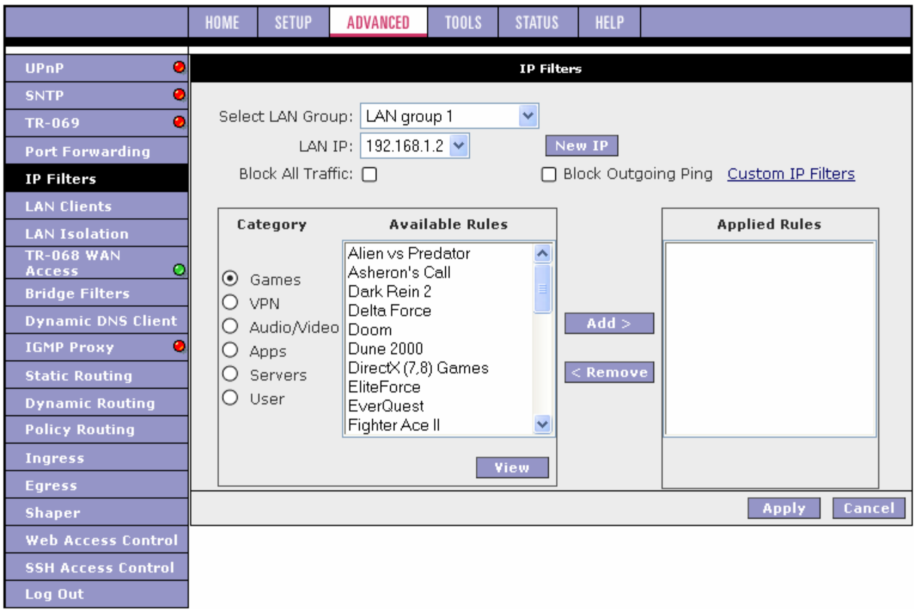
**Field Description**

| **Field** | **Definition/Description** |
|---|---|
| **Connection** | Select the WAN connection on which the Custom Port Forwarding rule is to be applied. |
| **Enable** | The Enable button is checked by default, meaning this rule is automatically applied when you click the Apply button. |
| **Application** | Name of the application for which your ports will be opened. |
| **Protocol** | There are three options available: TCP, UDP, and TCP and UDP. |
| **Source IP Address** | You can define the source IP address from which the incoming traffic is allowed. Enter 0.0.0.0 for all. |
| **Source Netmask** | Netmask of the source IP address. Enter 255.255.255.255 for all. |
| **Destination IP Address** | The LAN-side destination IP address for incoming traffic. |
| **Destination Netmask** | The LAN-side destination netmask for incoming traffic. The default value of this field is 255.255.255.255. |
| **Destination Port Start** | The starting port number that is made open for this application. |
| **Destination Port End** | The ending port number that is made open for this application. |
| **Destination Port Map** | Destination port mapped on the LAN (destination) side to which packets are forwarded. There are two types of port mapping:<br>● One-to-one (one port mapped to one)<br>● Multiple-to-one (multiple ports mapped to one port)<br><br> Multiple-to-One<br>One-to-One<br>WAN<br>[ 500 … 600]<br>[ 500 … 600]<br>LAN<br>700<br>…<br>[ 500 … 600] |
| **Note:** Wildcard (*) entries are allowed for IP Address/Netmask and Port range fields. | |

### 3.6.5 IP Filters

The IP filtering feature allows you to block specific applications/services based on the IP address of a LAN device. You can use the IP Filters page to block specific traffic (for example, block web access) or any traffic from a host on your local network.

A database of predefined IP filters allows you to apply one or more filtering rules to one or more members of a defined LAN group. You can view the rules associated with a predefined filter and add the available rules for a given category. You can also create, edit, or delete your own IP filter rules.



Select LAN Group: LAN group 1

LAN IP: 192.168.1.2

Block All Traffic: □

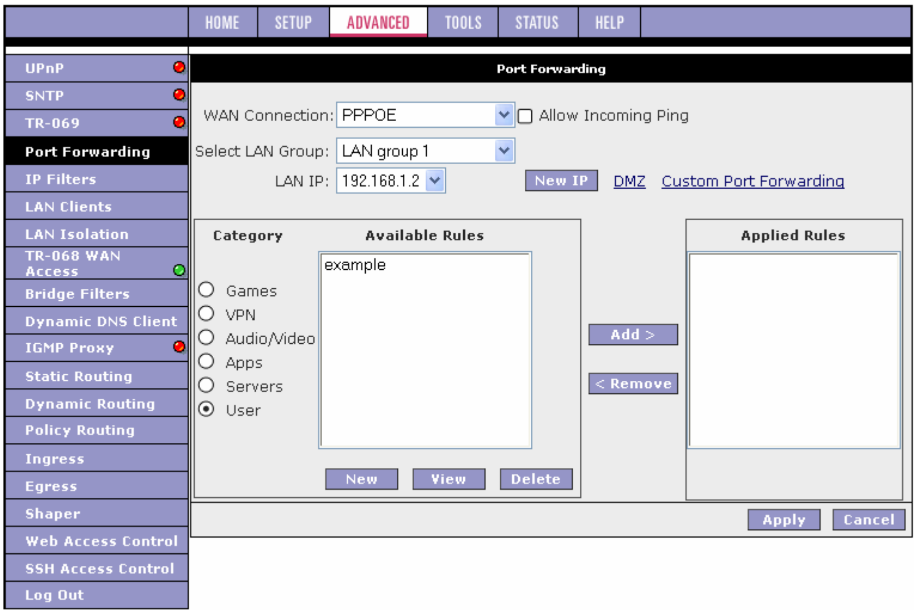
□ Block Outgoing Ping

| Category | Available Rules | Applied Rules |
|---|---|---|
| ● Games<br>○ VPN<br>○ Audio/Video<br>○ Apps<br>○ Servers<br>○ User | Alien vs Predator<br>Asheron's Call<br>Dark Rein 2<br>Delta Force<br>Doom<br>Dune 2000<br>DirectX (7,8) Games<br>EliteForce<br>EverQuest<br>Fighter Ace II | |

**Field Description**

| Field | Definition/Description |
|---|---|
| **Select LAN Group** | Select the LAN group to which the IP fIlters feature will be applied. |
| **LAN IP** | Select the IP address in the given LAN group to which the IP Filters feature will be applied. |
| **Block All Traffic** | When checked, complete network access is blocked for the specific IP address. |
| **Block Outgoing Ping** | Blocking outgoing ping (ICMP) generated from a particular LAN IP can be used if your host has a virus that attempts a Ping-of-Death Denial of Service attack. |
| **Custom IP Filters** | This link takes you to the Custom IP Filters page. More information is available in "Custom IP Filters Page". |
| **Available Rules** | Predefined and user-defined IP filtering rules for each category. |
| **Applied Rules** | Lists the IP filtering rules you elect to apply for each given category. |

1. On the **IP Filters** page, select LAN Group and LAN IP.
   If the desired LAN IP is not available in the LAN IP drop-down menu, you can add it using the LAN Client page, which is accessed by clicking New IP.
2. Select the available rules for a given category. Click **View** to view the rule associated with a predefined filter. Click **Add** to apply the rule for this category.
3. If a rule is not in the list, you can create your own rule in the User category.
   Select User, then click **New**.



Port Forwarding

WAN Connection: PPPOE □ Allow Incoming Ping

Select LAN Group: LAN group 1

LAN IP: 192.168.1.2

| Category | Available Rules | Applied Rules |
|---|---|---|
| ○ Games<br>○ VPN<br>○ Audio/Video<br>○ Apps<br>○ Servers<br>● User | example | |

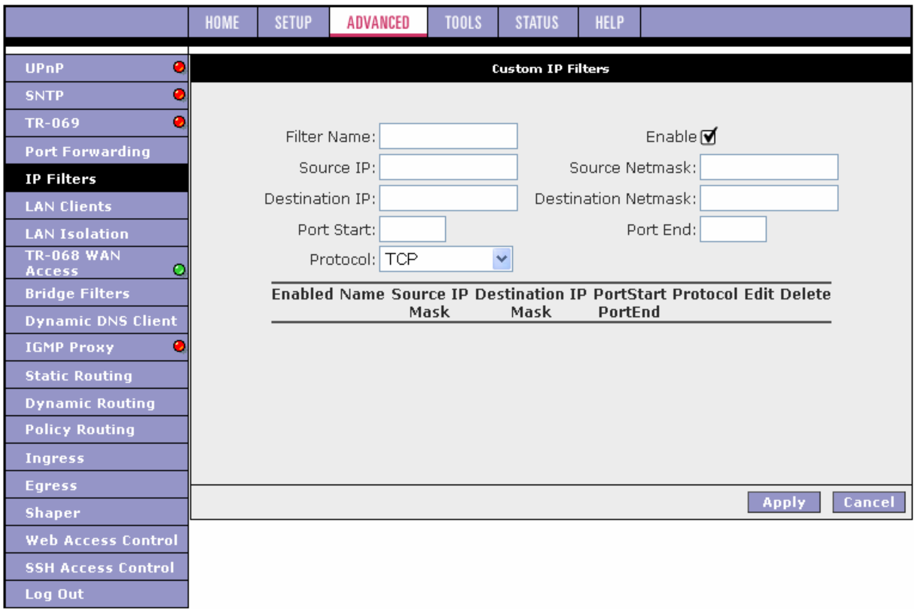
**Note:** The New, View, and Delete buttons become available only when the User category is selected. All the custom rules you create fall under the User Category.

4. The Rule Management page populates for you to create new rules. Enter Rule Name, Protocol, Port Start, Port End, and Port Map fields, then click **Apply**.
   The rules you create appear in the Available Rules box in the User category.
   You can view or delete the rules you create.
5. Continue to add rules as they apply from each category using the Add button.
6. Click **Apply** when you finish to temporarily activate the settings.
   Note: The changes take effect when you click Apply; however, if the ATU-R150 configuration is not saved, these changes will be lost upon ATU-R150 reboot.
7. To make the change permanent, click **Tools** at the top of the page and select **System Commands**.
8. At the **System Commands** page, click **Save All**.

### Custom IP Filters Page

The Custom IP Filters page allows you to define up to 20 custom IP filtering entries to block specific services or applications based on:

- Source/destination IP address and netmask
- TCP port (ranges supported)
- Protocol
- TCP
- UDP
- TCP and UDP
- ICMP
- Any



Custom IP Filters

Filter Name: Enable ☑

Source IP: Source Netmask:

Destination IP: Destination Netmask:

Port Start: Port End:

Protocol: TCP

| Enabled | Name | Source IP Mask | Destination IP Mask | PortStart PortEnd | Protocol | Edit | Delete |
|---|---|---|---|---|---|---|---|

### Field Description

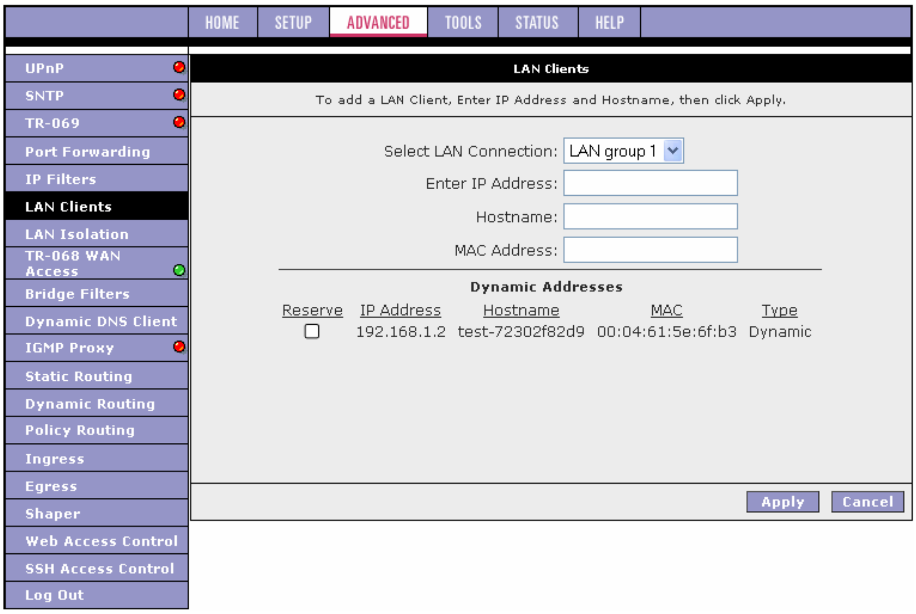
| Field | Definition/Description |
|---|---|
| **Filter Name** | Name of the IP filter rule you are creating. |
| **Enable** | The Enable button is checked by default, meaning this rule is automatically applied when you click Apply. |
| **Source IP** | The LAN-side source IP address assigned to outgoing traffic on which filtering is applied. |
| **Source Netmask** | Netmask of the source IP on your LAN side. |
| **Destination IP** | You can define the destination IP address to which your source IP will be banned access. Enter 0.0.0.0 for all. |
| **Destination Netmask** | Netmask of the destination IP. Enter 255.255.255.255 for all. |
| **Port Stat** | The starting port number that will be blocked for this application. |
| **Port End** | The ending port number that will be blocked for this application. |
| **Protocol** | There are five options available: TCP, UDP, TCP and UDP, ICMP, and Any. |

### 3.6.6 LAN Clients

The LAN clients feature allows you to see all the hosts on the LAN segment. Each host is qualified to be either dynamic (host obtained a lease from this ATU-R150) or static (host has a manually-configured IP address).

You can add a static IP address (belonging to the ATU-R150's LAN subnet) using the LAN Clients page. Any existing static entry falling within the DHCP server's range can be deleted and the IP address is made available for future allocation.

**Note:** Dynamic clients show up in the list only when the DHCP server is running.



LAN Clients

To add a LAN Client, Enter IP Address and Hostname, then click Apply.

Select LAN Connection: LAN group 1

Enter IP Address:

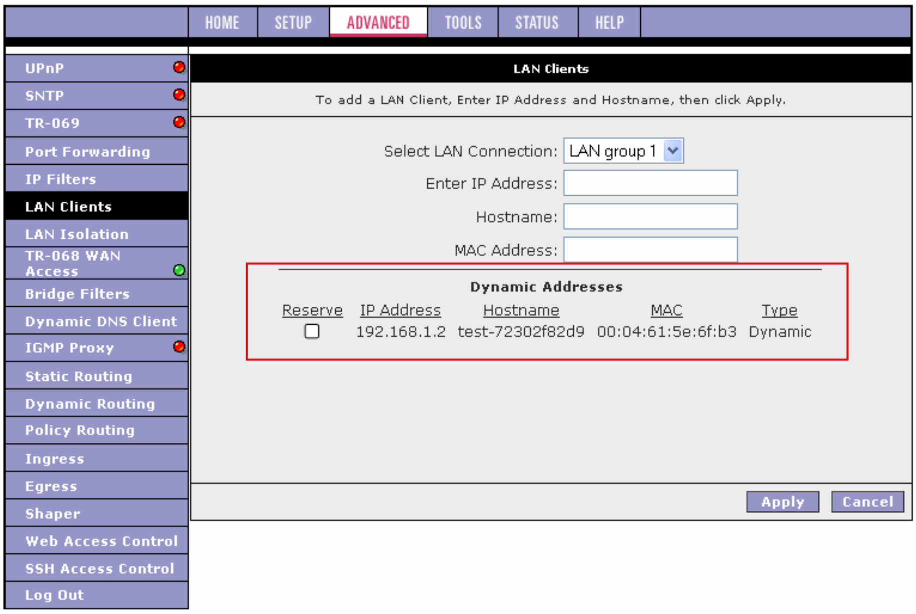
Hostname:

MAC Address:

Dynamic Addresses

| Reserve | IP Address | Hostname | MAC | Type |
|---|---|---|---|---|
| □ | 192.168.1.2 | test-72302f82d9 | 00:04:61:5e:6f:b3 | Dynamic |

1. On the **LAN Clients** page, select LAN Connection, and enter IP Address, Hostname, and MAC Address.
2. Click **Apply**.
   The IP address is allocated and it shows up in the list of LAN clients as a Dynamic entry.



LAN Clients

To add a LAN Client, Enter IP Address and Hostname, then click Apply.

Select LAN Connection: LAN group 1

Enter IP Address:

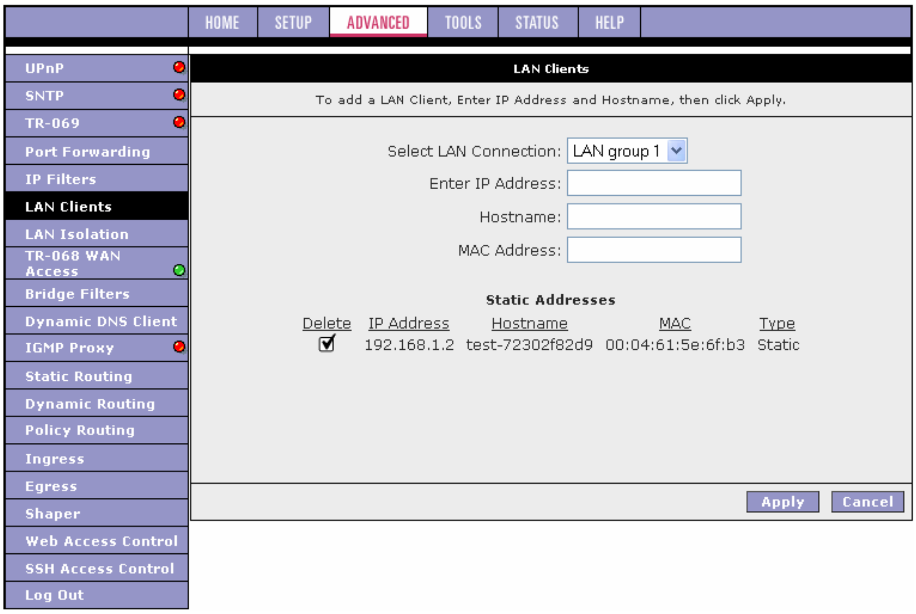
Hostname:

MAC Address:

Dynamic Addresses

| Reserve | IP Address | Hostname | MAC | Type |
|---|---|---|---|---|
| □ | 192.168.1.2 | test-72302f82d9 | 00:04:61:5e:6f:b3 | Dynamic |

3. You can convert the dynamic entry into a static entry by clicking **Reserve**, then **Apply**. As shown in figure below, the IP is now changed to a Static address. You can delete this entry by selecting **Delete**.



LAN Clients

To add a LAN Client, Enter IP Address and Hostname, then click Apply.

Select LAN Connection: LAN group 1

Enter IP Address:

Hostname:

MAC Address:

Static Addresses

| Delete | IP Address | Hostname | MAC | Type |
|---|---|---|---|---|
| ☑ | 192.168.1.2 | test-72302f82d9 | 00:04:61:5e:6f:b3 | Static |

4. When you finish, click **Apply** to temporarily activate the settings.
**Note:** The changes take effect when you click Apply; however, if the ATU-R150 configuration is not saved, these changes will be lost upon ATU-R150 reboot.

5. To make the change permanent, click **Tools** at the top of the page and select **System Commands**.

6. At the **System Commands** page, click **Save All**.

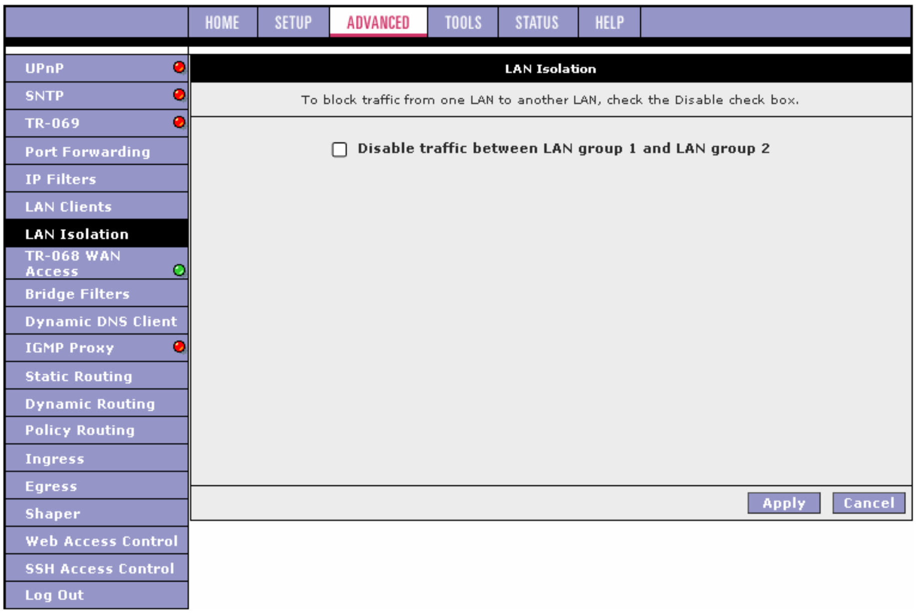
**Note:** The firewall rules that are applied to a Dynamic IP address will be removed after the release time expires.

**Field Description**

| Field | Definition/Description |
|---|---|
| **Select LAN Connection** | Select the LAN connection to which the client is to be added. |
| **Enter IP Address** | Assign the dynamic IP address to the host here. This is a mandatory field. |
| **Hostname** | Hostname of the client. This is an optional field. |
| **MAC Address** | MAC address of the host. This is an optional field. |

### 3.6.7 LAN Isolation

The LAN Isolation page allows you to disable the flow of packets between two user-defined LAN groups. This allows you to secure information in private portions of the LAN (such as a hot spot deployment) from other publicly accessible LAN segments.



LAN Isolation

To block traffic from one LAN to another LAN, check the Disable check box.

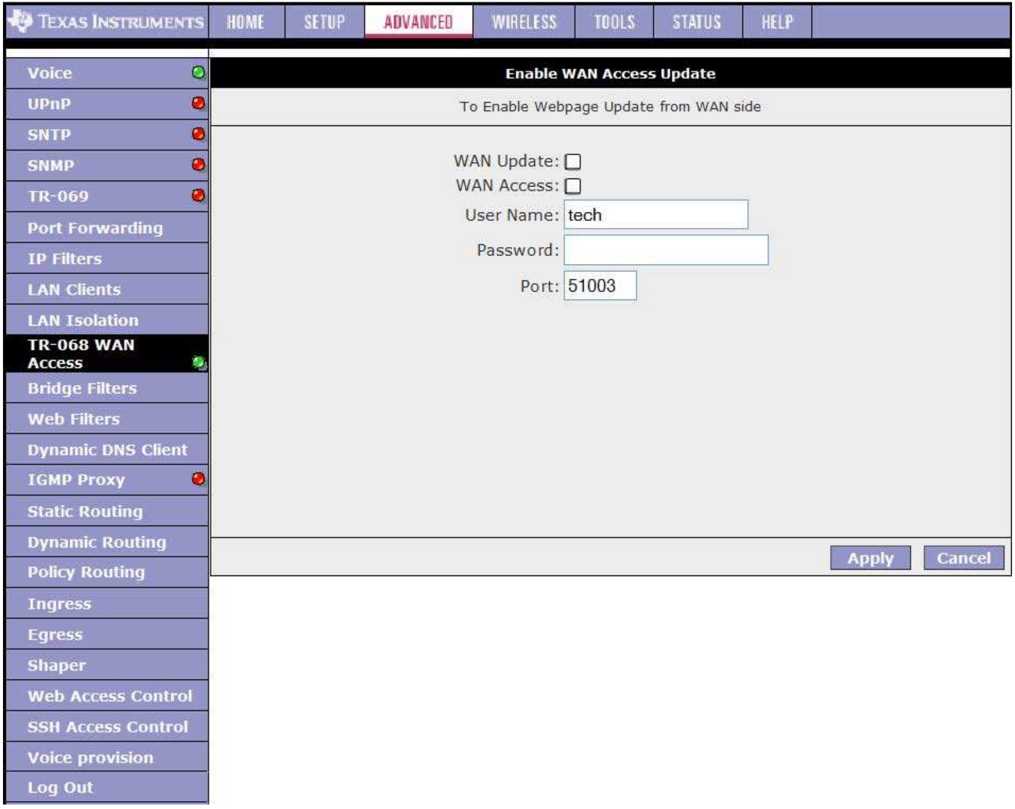
□ Disable traffic between LAN group 1 and LAN group 2

1. Check the LAN group combinations that define which traffic will be blocked.
2. Click **Apply** to temporarily activate the settings.
   **Note:** The changes take effect when you click **Apply**; however, if the ATU-R150 configuration is not saved, these changes will be lost upon ATU-R150 reboot.
3. To make the change permanent, click **Tools** at the top of the page and select **System Commands**.
4. At the **System Commands** page, click **Save All**.

### 3.6.8 TR-068 WAN Access

The TR-068 WAN Access page (Figure 20) enables you to give temporary permission to someone (such as technical support staff) to be able to access your Router/Gateway from the WAN side. From the moment the account is enabled, the user is expected to log in within 20 active minutes, otherwise the account expires. Once the user has logged in, if the session remains inactive for more than 20 minutes, the user will be logged out and the account expires.

**Figure 20 TR-068 WAN Access Page**



Enable WAN Access Update

To Enable Webpage Update from WAN side

WAN Update: □
WAN Access: □
User Name: tech
Password:
Port: 51003

**Table 10 TR-068 WAN Access Field Descriptions**

| Field | Definition/ Description |
|---|---|
| **WAN Update** | Check this field to give the account read and write access. |
| **WAN Access** | Check this field to give the account read-only access. |
| **User Name** | User name of the WAN access account. |
| **Password** | Password of the WAN access account. |
| **Port** | Enter the port number to be opened for the temporary WAN access. |

**Create Temporary User Account (WAN-Side)**

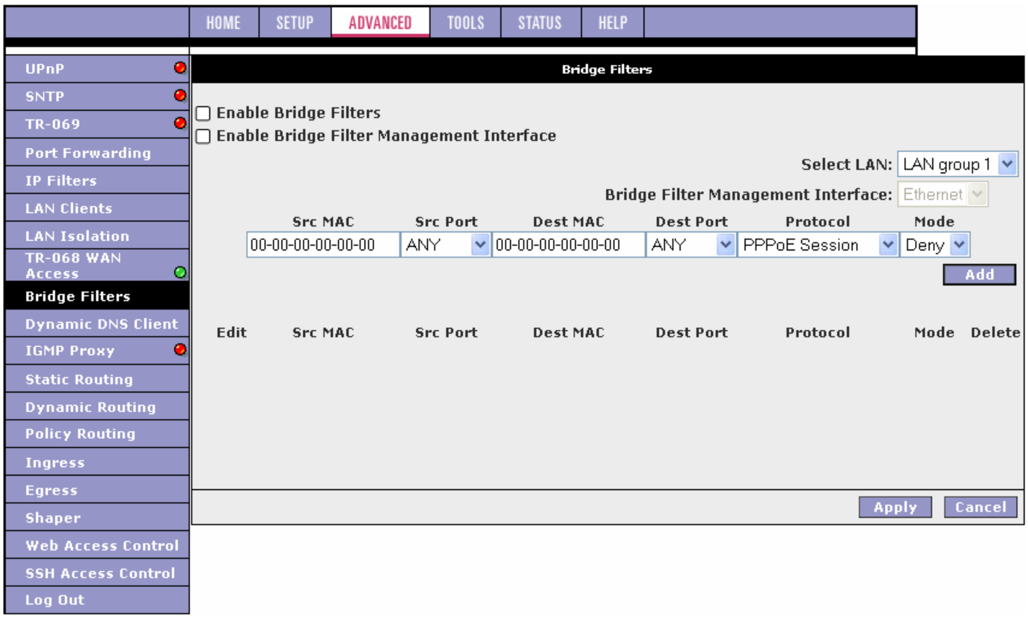
**Step – Action**

1 Check **WAN Update** to enable write privilege of the RG.
2 Check **WAN Access** to enable read privilege of the RG.
3 Enter a user name and password in the **User Name** and **Password** fields.
4 Enter a port number In the **Port** field (for example, *51003*).
5 Click **Apply to** temporarily activate the settings on the page.
**Note—**The changes take effect when you click **Apply**; however, if the RG configuration is not saved, these changes will be lost upon RG reboot.
6 To make the change permanent, click **Tools** and select **System Commands**. On the **System Commands** page (Figure 5-2 on page 5-3), click **Save All**.
7 To access your RG remotely, enter the following in the URL: *http(s)://10.10.10.5:51003*
Syntax: http(s)://***WAN IP of RG***:***Port Number***

### 3.6.9 Bridge Filters

The bridge filtering mechanism provides a way for you to define rules to allow or deny frames through the bridge based on source MAC address, destination MAC address, frame type, and physical ports. When bridge filtering is enabled, each frame is examined against every defined filter rule in sequence. When a match is found, the appropriate filtering action (allow or deny) is performed.

Note that the bridge filter only examines frames from interfaces that are part of the bridge itself. Up to 20 filter rules are supported with bridge filtering.



Bridge Filters

□ Enable Bridge Filters
□ Enable Bridge Filter Management Interface

Select LAN: LAN group 1

Bridge Filter Management Interface: Ethernet

| Src MAC | Src Port | Dest MAC | Dest Port | Protocol | Mode |
|---|---|---|---|---|---|
| 00-00-00-00-00-00 | ANY | 00-00-00-00-00-00 | ANY | PPPoE Session | Deny |

| Edit | Src MAC | Src Port | Dest MAC | Dest Port | Protocol | Mode | Delete |
|---|---|---|---|---|---|---|---|

1. Check **Enable Bridge Filters**.
2. To add a rule, enter the source MAC address, destination MAC address, and frame type with desired filtering type, then click **Add**.
**Note:** You can also edit a rule that you created using the Edit checkbox. You can delete a rule using Delete.
3. Click **Apply** to temporarily activate the settings.
**Note:** The changes take effect when you click **Apply**; however, if the ATU-R150 configuration is not saved, these changes will be lost upon ATU-R150 reboot.
4. To make the change permanent, click **Tools** at the top of the page and select **System Commands**.
5. At the **System Commands** page, click **Save All**.

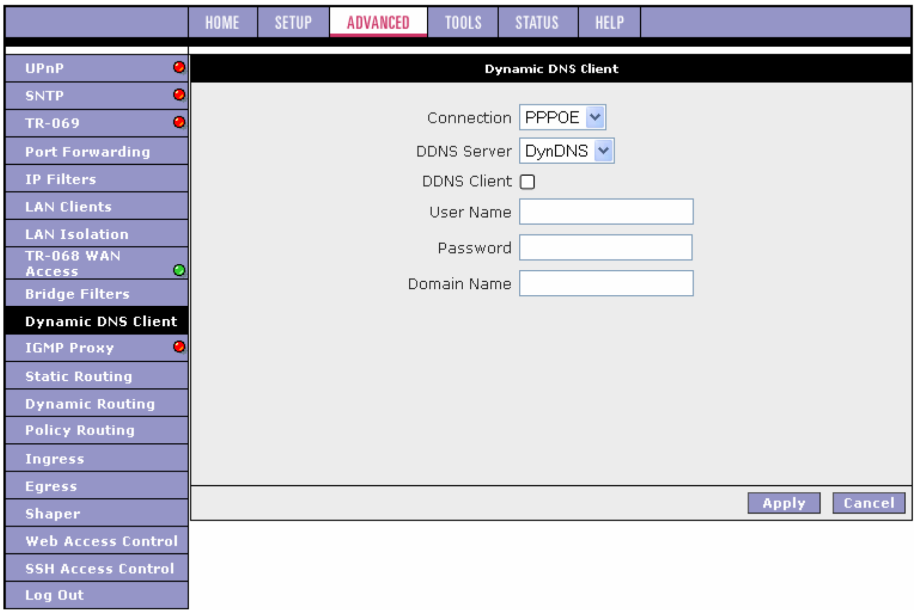
**Note:** There are four hidden filter rules within the bridge filter table. These rules are entered to ensure you do not "lock" yourself out of the ATU-R150 on a particular port. The rules pertain to the combination of source/destination MAC addresses, source/destination ports, and protocols.

**Field Description**

| Field | Definition/Description |
|---|---|
| **Enable Bridge Filters** | Enables/disables bridge filtering. It can be set/unset during any add, edit, or delete operation. It can also be set/unset independently by clicking Apply. |
| **Enable Bridge Filter Management Interface** | When checked, it enables the Bridge Filter Management Interface field. This ensures that you do not get locked out of the ATU-R150 on the interface of the LAN group specified in the next two fields. |
| **Select LAN** | Select your LAN group to enable the Bridge Filter Management Interface feature. |
| **Bridge Filter Management Interface** | Select the interface of the LAN group to have the Bridge Filter Management Interface feature enabled. |
| **SRC MAC** | The source MAC address. It 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 are also considered as don't care. |
| **SRC Port** | Source port. You can choose Any or Ethernet port for the particular bridge. If any of the selections are not available, please check your DSL connection. |
| **Dest MAC** | The destination MAC address. |
| **Dest Port** | Destination port. You can choose Any or Ethernet port. |
| **Protocol** | You can choose from the following options: PPPoE Session, PPPoE Discovery, IPX - Ethernet II, RARP, IPv6, IPv4, and Any. |
| **Mode** | There are two filtering modes: Deny and Allow. |

### 3.6.10 Dynamic DNS Client

Each time your ATU-R150 connects to the Internet, your ISP assigns a different IP address to your ATU-R150. In order for you or other users to access your ATU-R150 from the WAN-side, you need to manually track the IP that is currently used. The Dynamic DNS feature allows you to register your ATU-R150 with a DNS server and access your ATU-R150 each time using the same host name. The Dynamic DNS Client page allows you to enable/disable the Dynamic DNS feature.



Dynamic DNS Client

Connection PPPOE

DDNS Server DynDNS

DDNS Client □

User Name

Password

Domain Name

1. On the **Dynamic DNS Client** page, configure the following fields:
   - Connection
   - DDNS Server
   - DDNS Client
   - User Name
   - Password
   - Domain Name

2. Click **Apply** to temporarily activate the settings.
   **Note:** The changes take effect when you click **Apply**; however, if the ATU-R150 configuration is not saved, these changes will be lost upon ATU-R150 reboot.
3. To make the change permanent, click **Tools** at the top of the page and select **System Commands**.
4. At the **System Commands** page, click **Save All**.

**Field Description**

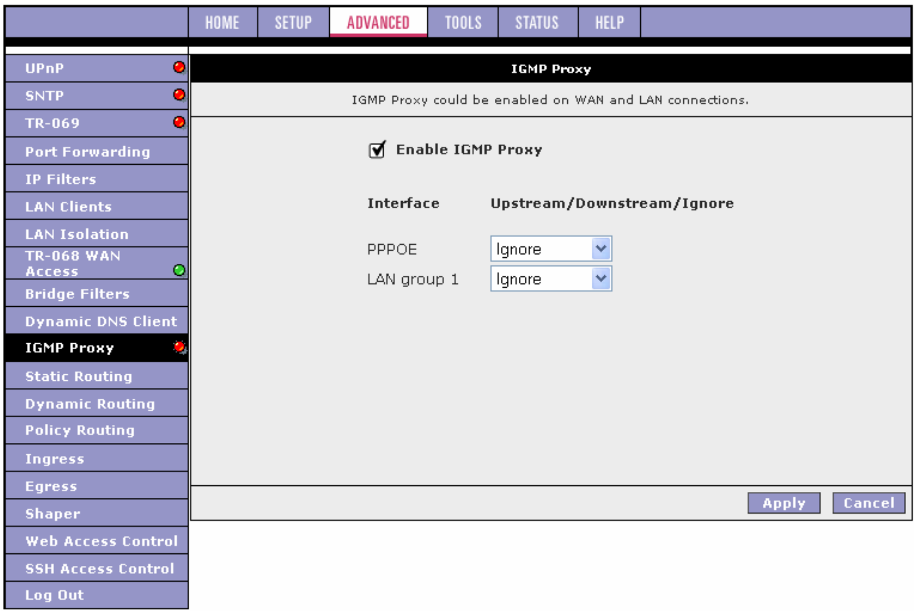
| **Field** | **Definition/Description** |
|---|---|
| **Connection** | This field defaults to your ATU-R150's WAN connection over which your ATU-R150 will be accessed. |
| **DDNS Server** | This is where you select the server from different DDNS service providers. A charge may occur depends on the service you select. |
| **DDNS Client** | Enables/disables the DDNS client feature for the WAN connection. This field is disabled by default. |
| **User Name** | User name assigned by the DDNS service provider. |
| **Password** | Password assigned by the DDNS service provider. |
| **Domain Name** | Domain name to be registered with the DDNS server. |

### 3.6.11 IGMP Proxy

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 one or more hosts identified by a single IP destination 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 the same data needs to be sent to more than one 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. The multicast feature also enables you to receive multicast video streams from multicast servers.
IP hosts use Internet group management protocol (IGMP) to report their multicast group memberships to neighboring routers. Similarly, multicast routers use IGMP to discover which of their hosts belong to multicast groups.
Your ATU-R150 supports IGMP proxy that handles IGMP messages. When enabled, your ATU-R150 acts as a proxy for a LAN host making requests to join and leave multicast groups, or a multicast router sending multicast packets to multicast groups on the WAN side.



IGMP Proxy

IGMP Proxy could be enabled on WAN and LAN connections.

☑ Enable IGMP Proxy

| Interface | Upstream/Downstream/Ignore |
|---|---|
| PPPOE | Ignore |
| LAN group 1 | Ignore |

The IGMP Proxy page allows you to enable multicast on available WAN and LAN connections. You can configure the WAN or LAN interface as one of the following:

1. Upstream: The interface that IGMP requests from hosts are sent to the multicast router.
2. Downstream: The interface data from the multicast router are sent to hosts in the multicast group database.
3. Ignore: No IGMP request nor data multicast are forwarded.

You can perform one of the two options:

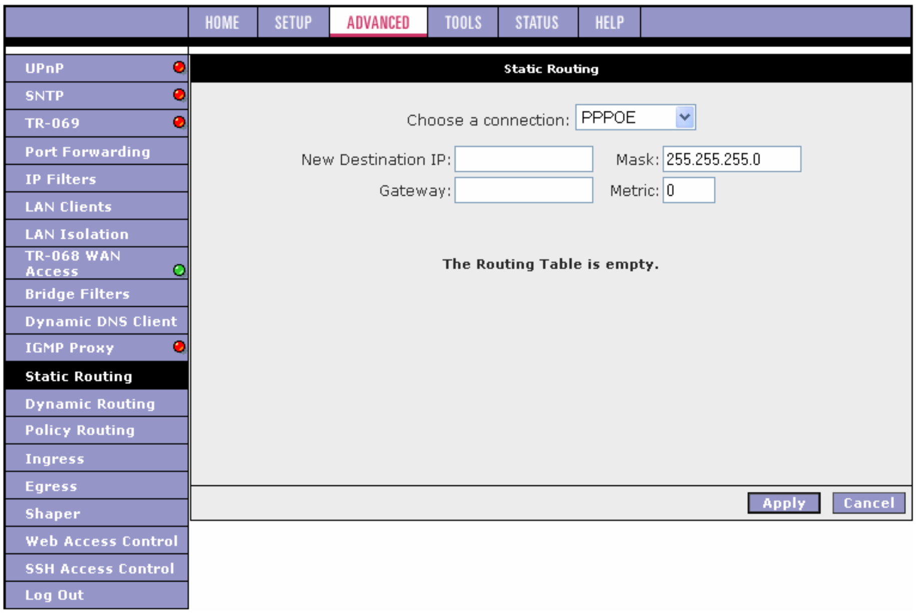
1. Configure one or more WAN interface as the upstream interface.
2. Configure the LAN interface as the upstream interface.

**Field Description**

| **Field** | **Definition/Description** |
|---|---|
| **Enable IGMP Proxy** | Enables/disables IGMP multicast feature of the ATU-R150. |
| **Connections** | There are three types of configuration for each WAN /LAN connection:<br>● Upstream<br>● Downstream<br>● Ignore |

### 3.6.12 Static Routing

The Static Routing page enables you to define routes for specific subnets on the WAN/LAN side. The ATU-R150 allows you to manually program the ATU-R150's routing table. Up to 16 static routes can be added.



Static Routing

Choose a connection: PPPOE

New Destination IP: 　 Mask: 255.255.255.0

Gateway: 　 Metric: 0

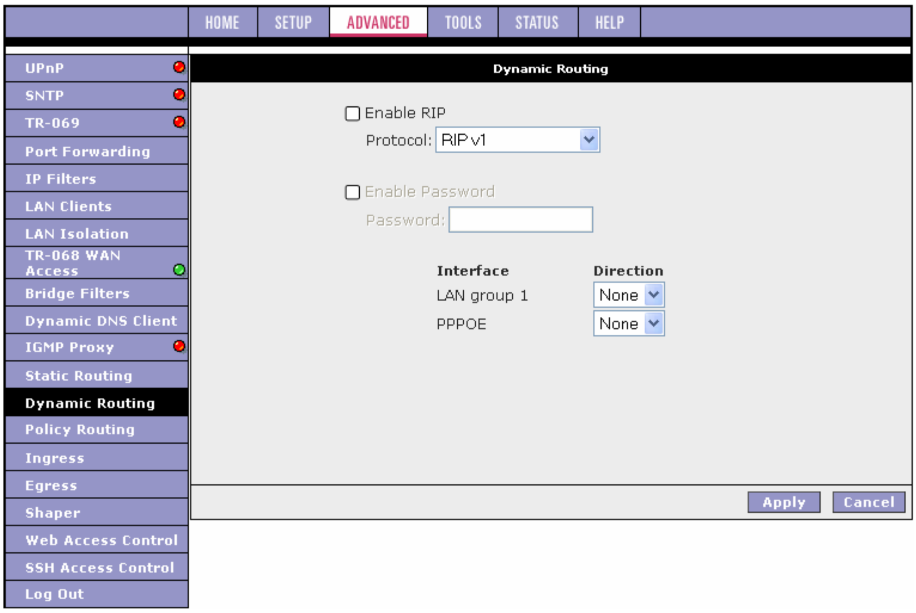
The Routing Table is empty.

**Field Description**

| **Field** | **Definition/Description** |
|---|---|
| **Select a Connection** | Select the LAN group or WAN connection to which a static routing subnet is to be applied. |
| **New Destination IP** | The network IP address of the subnet. (You can also enter the IP address of each individual station in the subnet). |
| **Mask** | The network mask of the destination subnet. |
| **Gateway** | The IP address of the next hop through which traffic will flow towards the destination subnet. |
| **Metric** | Defines the number of hops the between network nodes that data packets travel. The default value is 0, which means that the subnet is directly one hop away on the local LAN network. |

### 3.6.13 Dynamic Routing

The dynamic routing feature enables the ATU-R150 to dynamically define routes for WAN and LAN subnets. Dynamic routing uses routing information protocol (RIP) for exchanging routing information with other routers in the network. It is supported across both WAN and LAN interfaces. Any RIP-enabled router sends out automatic update packets containing its own routing table on a periodic basis (every 30 secs). Similarly, it accepts such periodic updates from other routers and adds, deletes, or modifies routes in its own routing table accordingly. The router is also expected to receive requests for its routing table and respond accordingly. Use the Dynamic Routing page to define dynamic routing routes for the available interfaces.



Dynamic Routing

☐ Enable RIP

Protocol: RIP v1

☐ Enable Password

Password:

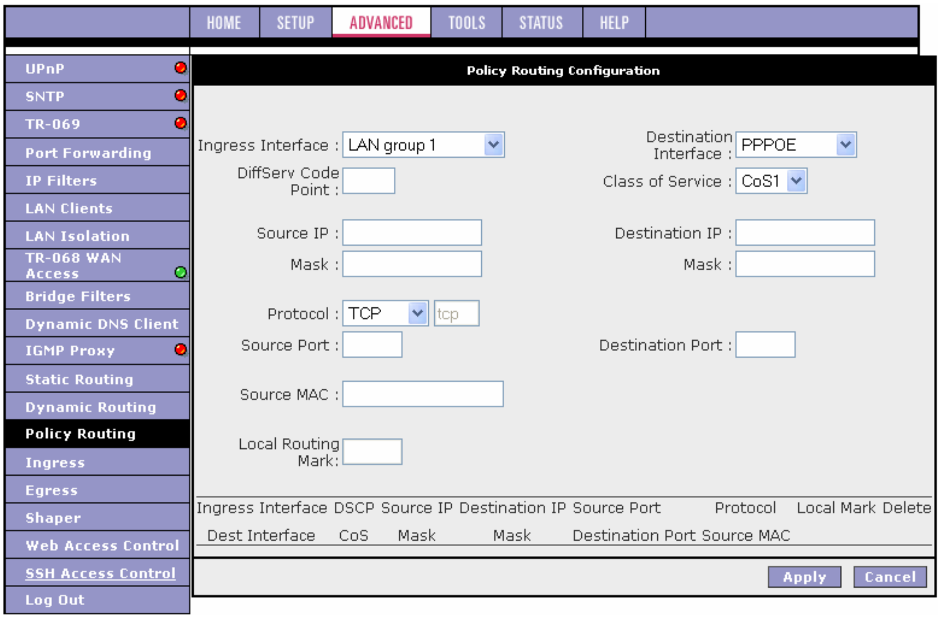
| Interface | Direction |
|---|---|
| LAN group 1 | None |
| PPPOE | None |

**Field Description**

| Field | Definition/Description |
|---|---|
| **Enable RIP** | Enables/disables RIP. |
| **Protocol** | The following three RIP versions are available:<br>● RIP v1 (UDP protocol)<br>● RIP v2 (multicast protocol)<br>● RIP v1 compatible (UDP protocol with multicast format)<br>**Note:** Routers using RIP v1 or RIP v1-compatible protocol can talk to each other, but not to routers using RIP v2 protocol. |
| **Enable Password** | This is an optional field. RIP version v2 compatibility allows you to provide simple plain-text password-based authentication to RIP packets.<br>This field is disabled if RIP v1 protocol is selected. |
| **Password** | The password can be up to 16 characters long. |
| **Direction** | Normally when RIP is enabled on a router, it dynamically learns/provides routes on all its configured interfaces. This parameter allows you to select the interfaces on which RIP is expected to learn and distribute routing information. This feature allows you to control how and which routes get distributed through the network. For example, by selecting In only mode, routes to private LAN networks are prevented from being sent over to the WAN-side router. The following four direction options are available:<br>● Both: Receive updates on the interface and also send its routing table to other routers connected to that interface.<br>● In: Receive routing updates from other routers connected to that interface but do NOT send routing updates on that interface.<br>● Out: Send routing updates but do NOT receive updates on this interface from the other routers connected to that interface.<br>● None: Ignore this interface and do not send or receive routing updates through this interface. |

### 3.6.14 Policy Routing

The Policy Routing Configuration page is accessed by selecting Policy Routing on the Advanced home page. This page enables you to configure policy routing and QoS. The policy routing configuration is discussed as follows. The QoS configuration is discussed in ''Ingress Payload Database Configuration''.



Policy Routing Configuration

Ingress Interface : LAN group 1

Destination Interface : PPPOE

DiffServ Code Point :

Class of Service : CoS1

Source IP :

Destination IP :

Mask :

Mask :

Protocol : TCP tcp

Source Port :

Destination Port :

Source MAC :

Local Routing Mark:

| Ingress Interface | DSCP | Source IP | Destination IP | Source Port | Protocol | Local Mark | Delete |
|---|---|---|---|---|---|---|---|
| Dest Interface | CoS | Mask | Mask | Destination Port | Source MAC | | |

**Field Description**

| **Field** | **Definition/Description** |
|---|---|
| **Ingress Interface** | The incoming traffic interface for a Policy Routing rule. Selections include LAN interfaces, WAN interfaces, Locally generated (traffic), and not applicable. Examples of Locally generated traffic are: voice packets, packets generated by applications such as DNS, DHCP, etc. |
| **Destination Interface** | The outgoing traffic interfaces for a Policy Routing rule. Selections include LAN Interfaces and WAN interfaces. |
| **DiffServ Code Point** | The DiffServ code point (DSCP) field value ranges from 1 to 255. This field cannot be configured alone, additional fields like IP, Source MAC, and/or Ingress Interface should be configured. |
| **Class of Service** | The selections are (in the order of priority): CoS1, CoS2, CoS3, CoS4, CoS5, CoS6, and N/A. |
| **Source IP** | The IP address of the traffic source. |
| **Mask** | The source IP netmask. This field is required if the source IP has been entered. |
| **Destination IP** | The IP address of the traffic destination. |
| **Mask** | The netmask of the destination. This field is required if the destination IP has been entered. |
| **Protocol** | The selections are TCP, UDP, ICMP, Specify, and none. If you choose Specify, you need to enter the protocol number in the box next to the Protocol field.<br>This field cannot be configured alone, additional fields like IP, Source MAC, and/or Ingress Interface should be configured.<br>This field is also required if the source port or destination port has been entered. |
| **Source Port** | The source protocol port. You cannot configure this field without entering the protocol first. |
| **Destination Port** | The destination protocol port or port range. You cannot configure this field without entering the protocol first. |
| **Source MAC** | The MAC address of the traffic source. |

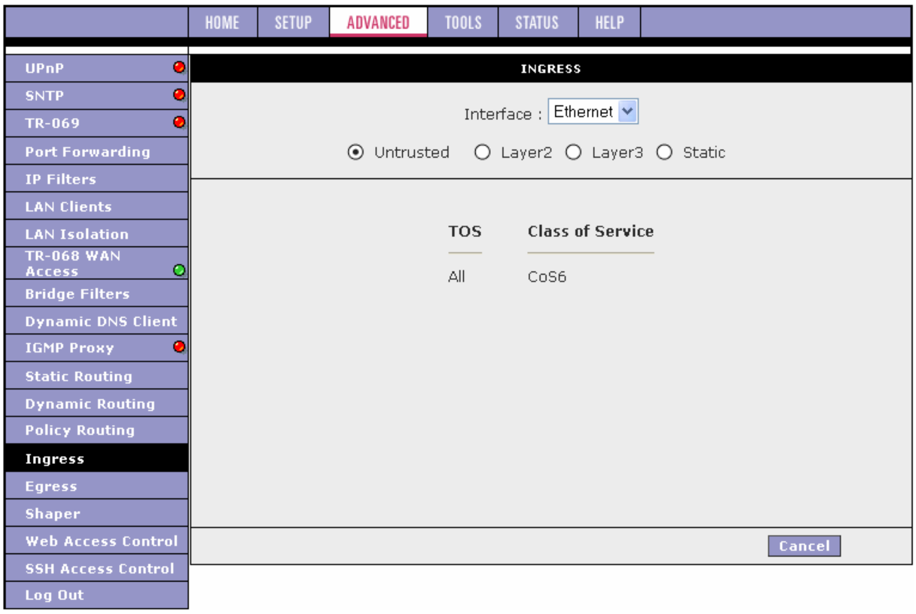
| | |
|---|---|
| **Local Routing Mark** | This field is enabled only when Locally Generated is selected in the Ingress Interface field. The mark for DNS traffic generated by different applications are described below:<br>● Dynamic DNS: 0xE1<br>● Dynamic Proxy: 0xE2<br>● Web Server: 0xE3<br>● MSNTP: 0xE4<br>● DHCP Server: 0xE5<br>● IPtables Utility: 0xE6<br>● PPP Deamon: 0xE7<br>● IP Route: 0xE8<br>● ATM Library: 0xE9<br>● NET Tools: 0xEA<br>● RIP: 0xEB<br>● RIP v2: 0xEC<br>● UPNP: 0xEE<br>● Busybox Utility: 0xEF<br>● Configuration Manager: 0xF0<br>● DropBear Utility: 0xF1<br>● Voice: 0 |
| **Note:** Wildcard (*) entries are allowed for IP Address/Netmask and Port range fields. | |

Currently routing algorithms make decision based on destination address, i.e., only Destination IP address and subnet mask is supported. The Policy Routing page enables you to route packets on the basis of various fields in the packet. The following fields can be configured for Policy Routing:

- Destination IP address/mask
- Source IP address/mask
- Source MAC address
- Protocol (TCP, UDP, ICMP, etc)
- Source port
- Destination port
- Incoming interface
- DSCP

### 3.6.15 Ingress

The Ingress page enables you to configure QoS for packets as soon as they come into the ATU-R150. The domain mappings are converted to CoS (the common language) so that the priority marking is carried over.



INGRESS

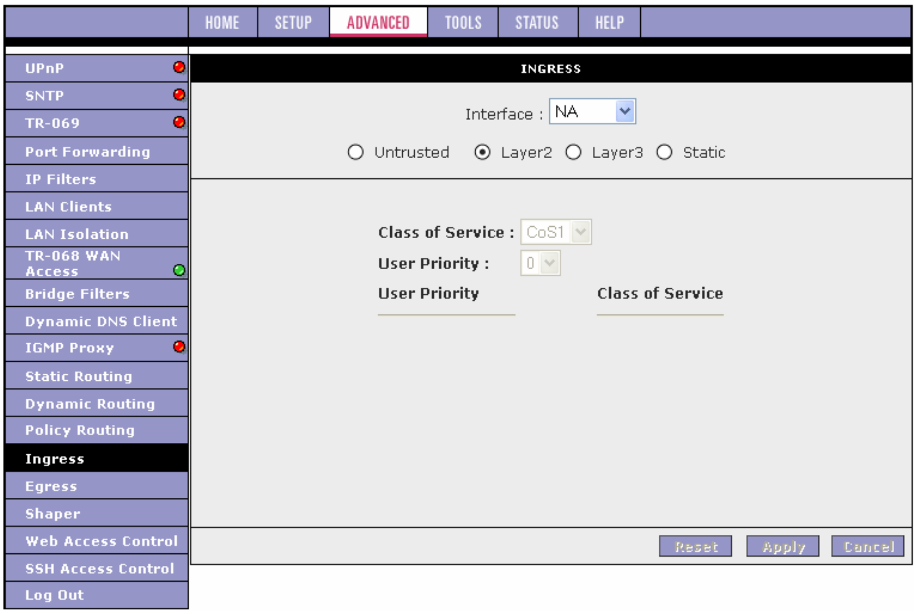
Interface : Ethernet

● Untrusted ○ Layer2 ○ Layer3 ○ Static

| TOS | Class of Service |
|---|---|
| All | CoS6 |

There are four modes that are discussed below:

- Ingress Untrusted Mode
  Untrusted is the default Ingress page setting for all interfaces. In this mode, no domain mapping is honoured in the ATU-R150. All packets are treated as CoS6 (best effort) as shown in previous figure.
- Layer2 enables you to map an incoming packet with VLAN priority to CoS. This feature is only configurable on the WAN interfaces as VLAN is only supported on the WAN side in the current software release.



INGRESS

Interface : NA

○ Untrusted ● Layer2 ○ Layer3 ○ Static

Class of Service : CoS1

User Priority : 0

| User Priority | Class of Service |
|---|---|

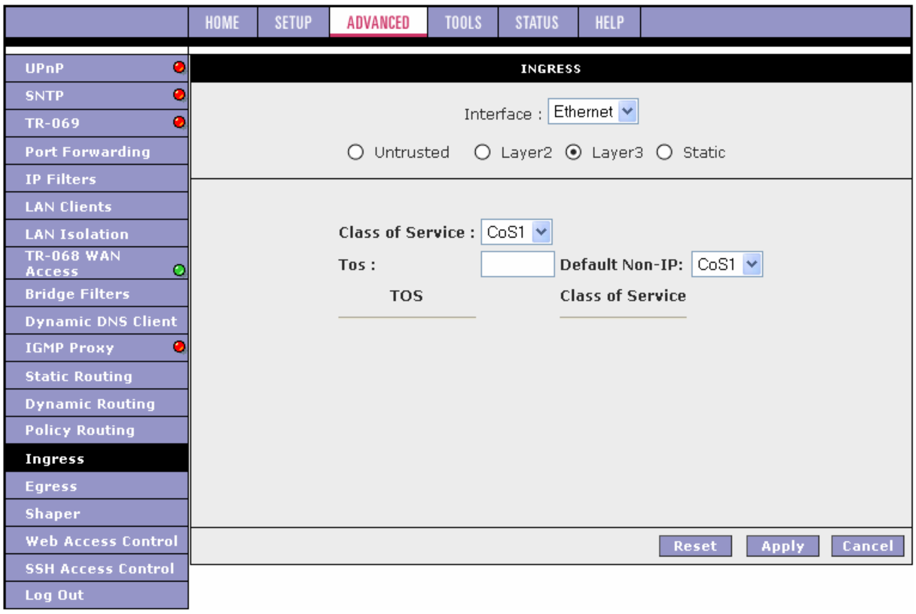
**Field Description**

| **Field** | **Definition/Description** |
|---|---|
| **Interface** | Select the WAN interface here to configure the CoS for incoming traffic. Only WAN interface can be selected as VLAN is currently supported only on the WAN side. |
| **Class of Service** | The selections are (in the order of descending priority): CoS1, CoS2, CoS3, CoS4, CoS5, and CoS6. |
| **User Priority** | The selections are 0, 1, 2, 3, 4, 5, 6 and 7. |

Follow the procedure below to configure Ingress Layer 2 QoS settings:

1. From Interface drop-down box, select PPPoE1.
   You are configuring QoS on this WAN interface.
2. Select CoS1 in Class of Service and 5 in Priority Bits.
   Any packets with priority marking 5 is mapped to CoS1, the highest priority that is normally given to the voice packets.
3. Click Apply to temporarily activate the settings.
4. Select CoS2 in the Class of Service field and 1 in the Priority Bits field.
   Any packets that have a priority bits of 1 is mapped to CoS2, which is the second highest priority. This is given to the high priority packets such as video.
5. Click **Apply** to temporarily activate the settings.
   **Note:** The changes take effect when you click **Apply**; however, if the ATU-R150 configuration is not saved, these changes will be lost upon ATU-R150 reboot.
6. Repeat step 2-5 to add more rules to PPPoE1.
   Up to eight rules can be configured for each interface.
   **Note:** Any priority bits that have not been mapped to a CoS default to CoS6, the lowest priority.
7. Repeat step 1-6 to create rules to another WAN interface.
   **Note:** Any WAN interface that is not configured has the default Untrusted mode.
8. To make the change permanent, click **Tools** at the top of the page and select **System Commands**.
9. At the **System Commands** page, click **Save All**.

- Ingress Layer 3 Configuration



INGRESS

Interface : Ethernet

○ Untrusted ○ Layer2 ● Layer3 ○ Static

Class of Service : CoS1

Tos :

Default Non-IP: CoS1

| TOS | Class of Service |
|---|---|

The Layer 3 page allows you to map ToS bits of incoming packets from the IP network to CoS for each WAN/LAN interface.

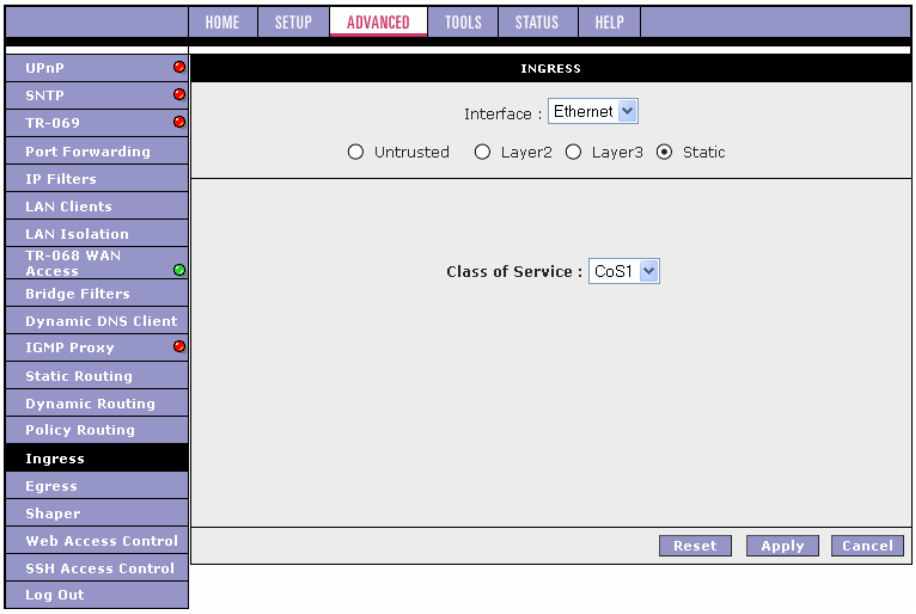
**Field Description**

| Field | Definition/Description |
|---|---|
| **Interface** | For both WAN and LAN interfaces, you can configure QoS for layer 3 (IP) data traffic. |
| **Class of Service** | This CoS field allows you to map incoming layer 3 WAN/LAN packets to one of the following CoS (in the order of descending priority): CoS1, CoS2, CoS3, CoS4, CoS5, and CoS6. |
| **ToS** | The type of service field takes values from 0 to 255. |
| **Default Non IP** | A static CoS can be assigned to all layer 3 incoming packets (per interface) that do not have an IP header, such as PPP control packets and ARP packets. The default is CoS1 (recommended). |

1. From Interface drop-down box, select LAN Group 1.
   You are configuring QoS on this interface.
2. Select CoS1 in Class of Service and enter 22 in Type of Service (ToS).
   Any incoming packet from LAN Group 1 (layer 3) with a ToS of 22 is mapped to CoS1, the highest priority, which is normally given to the voice packets.
3. Leave the default value CoS1 in Default Non-IP.
   Any incoming packet from LAN Group 1 without an IP is mapped to CoS1, the highest priority.
4. Click **Apply** to temporarily activate the settings.
   **Note:** The changes take effect when you click **Apply**; however, if ATU-R150 configuration is not saved, these changes will be lost upon ATU-R150 reboot.
5. Repeat step 2-4 to add more rules to LAN Group 1.
   Up to 255 rules can be configured for each interface.
   **Note:** Any ToS that have not been mapped to a CoS is treated as CoS6, the lowest priority.
6. Repeat step 1-5 to create rules to another WAN/LAN interface.
   **Note:** Any WAN/LAN interface that is not configured has the default Untrusted mode.
7. To make the change permanent, click **Tools** at the top of the page and select **System Commands**.
8. At the **System Commands** page, click **Save All**.

- Ingress Static Configuration

The Ingress - Static page enables you to configure a static CoS for all packets received on a WAN or LAN interface.



Interface : Ethernet

○ Untrusted ○ Layer2 ○ Layer3 ● Static

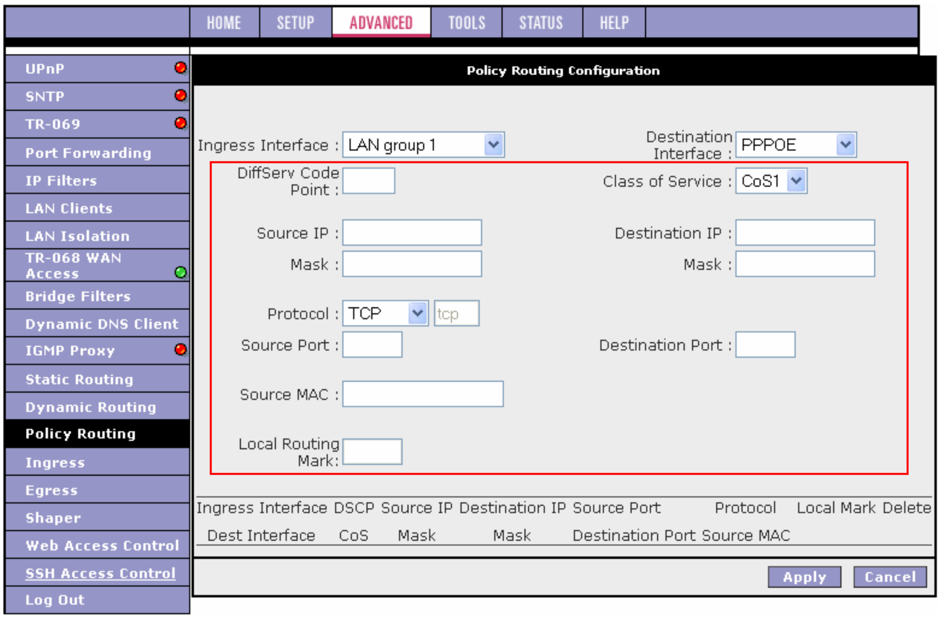
Class of Service : CoS1

Follow the procedure below to configure Ingress static QoS settings:

1. At the Interface drop-down box, select Ethernet.
   You are configuring QoS on this interface only.
2. Select CoS1 in Class of Service.
   All incoming traffic from the Ethernet interface receives CoS1, the highest priority.
3. Click **Apply** to temporarily activate the settings.
   **Note:** The changes take effect when you click **Apply**; however, if the ATU-R150 configuration is not saved, these changes will be lost upon ATU-R150 reboot.
4. To make the change permanent, click **Tools** at the top of the page and select **System Commands**.
5. At the **System Commands** page, click **Save All**.

**Ingress Payload Database Configuration**

The Policy Routing Configuration page is accessed by selecting Policy Routing on the Advanced home page. This page enables you to configure QoS payload database and policy routing. The QoS payload database configuration will be discussed here. The policy routing configuration will be discussed in ‘‘Policy Routing’’.



Policy Routing Configuration

Ingress Interface : LAN group 1

Destination Interface : PPPOE

DiffServ Code Point :

Class of Service : CoS1

Source IP :

Mask :

Destination IP :

Mask :

Protocol : TCP tcp

Source Port :

Destination Port :

Source MAC :

Local Routing Mark:

| Ingress Interface<br>Dest Interface | DSCP<br>CoS | Source IP<br>Mask | Destination IP<br>Mask | Source Port<br>Destination Port | Protocol<br>Source MAC | Local Mark | Delete |
|---|---|---|---|---|---|---|---|

QoS can be configured in the Ingress and Egress pages on a per interface basis. The Policy Routing page enables you to classify packets on the basis of various fields in the packet.

The following fields can be configured for QoS:

- CoS
- Source IP address/mask
- Destination IP address/mask
- Protocol
- Source port
- Destination port
- Source Mac address

You can configure any or all field as needed.

**Field Description**

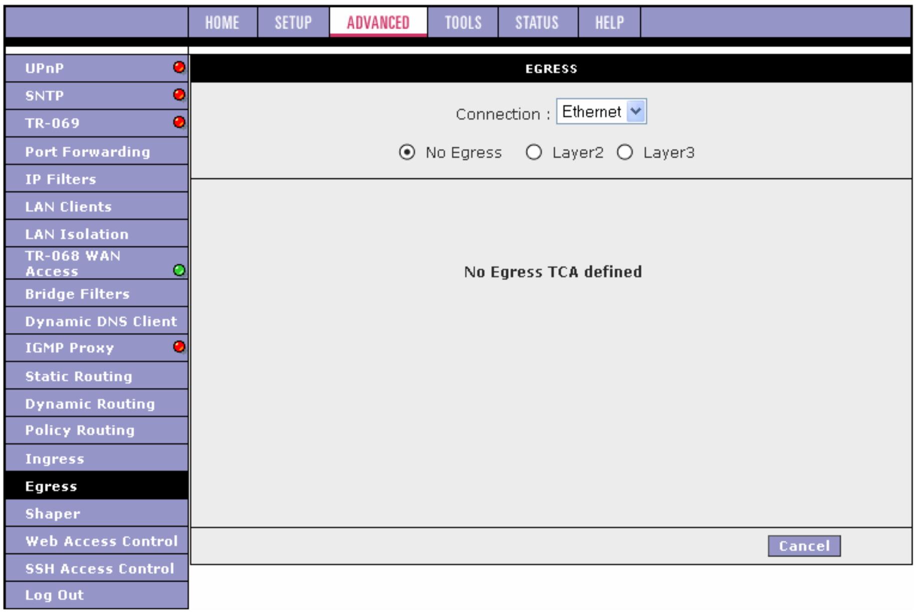
| **Field** | **Definition/Description** |
|---|---|
| **Ingress Interface** | This field is applicable for policy routing configuration only and will be discussed in ‘‘Policy Routing’’. |
| **Destination Interface** | This field is applicable for policy routing configuration only and will be discussed in ‘‘Policy Routing’’. |
| **DiffServ Code Point** | This field is applicable for policy routing configuration only and will be discussed in ‘‘Policy Routing’’. |
| **Class of Service** | The selections are (in the order of priority): CoS1, CoS2, CoS3, CoS4, CoS5, CoS6, and N/A. |
| **Source IP** | The IP address of the traffic source. |
| **Mask** | The source IP netmask. This field is required if the source IP has been entered. |
| **Destination IP** | The IP address of the traffic destination. |
| **Mask** | The netmask of the destination. This field is required if the destination IP has been entered. |
| **Protocol** | The selections are TCP, UDP, ICMP, Specify, and none. If you choose Specify, you need to enter the protocol number in the box next to the Protocol field.<br>This field cannot be configured alone, additional fields like IP and/or Source MAC should be configured.<br>This field is also required if the source port or destination port has been entered. |
| **Source Port** | The source protocol port. You cannot configure this field without entering the protocol first. |
| **Destination Port** | The destination protocol port. You cannot configure this field without entering the protocol first. |
| **Source MAC** | The MAC address of the traffic source. |
| **Local Routing Mark** | This field is applicable for policy routing configuration only and will be discussed in ‘‘Policy Routing’’. |
| **Note:** Wildcard (*) entries are allowed for IP Address/Netmask and Port range fields. | |

### 3.6.16 Egress

For packets going out of the ATU-R150, the marking (CoS) need to be translated to the mappings understood by the network domains. The reverse CoS and domain mapping is configured using the Egress page.

**No Egress Mode**

The default Egress page setting for all interfaces is No Egress. In this mode, the domain mappings of the packets are untouched.



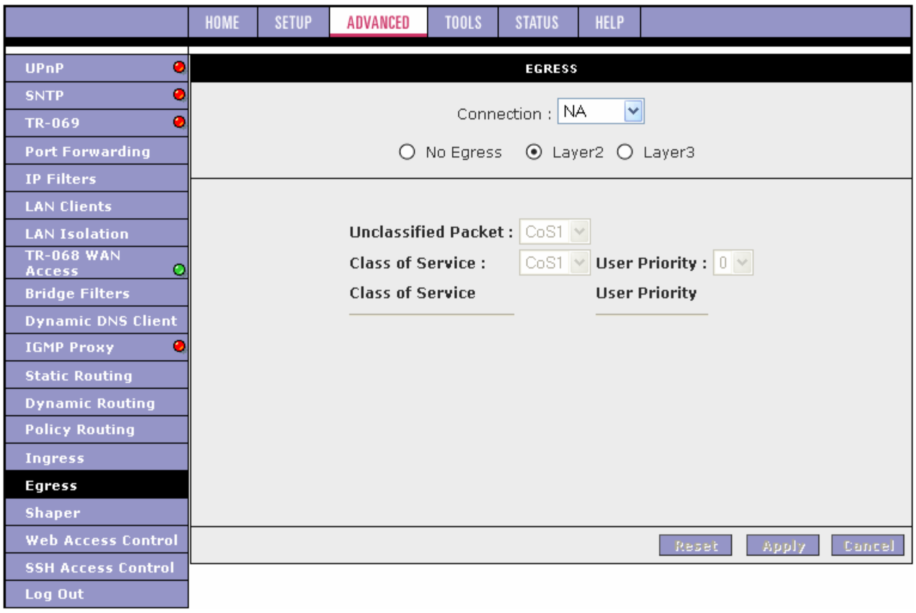
Connection : Ethernet

● No Egress ○ Layer2 ○ Layer3

No Egress TCA defined

**Egress Layer 2 Configuration**

The Egress Layer 2 page enables you to map the CoS of an outgoing packet to user priority bits, which is honoured by the VLAN network. Again, this feature is only configurable on the WAN interfaces as VLAN is only supported on the WAN side in the current release.



Connection : NA

○ No Egress ● Layer2 ○ Layer3

Unclassified Packet : CoS1

Class of Service : CoS1 User Priority : 0

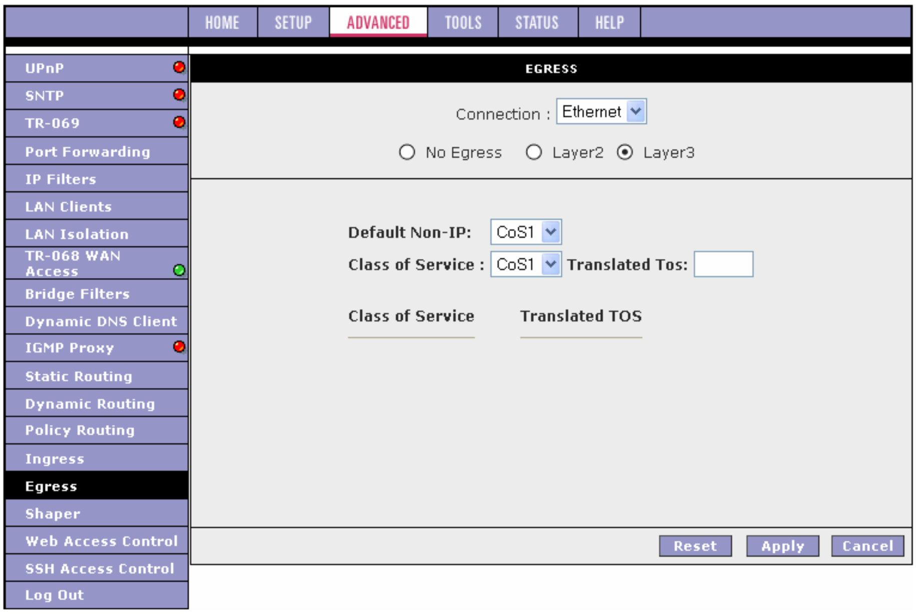
| Class of Service | User Priority |
|---|---|

**Field Description**

| **Field** | **Definition/Description** |
|---|---|
| **Interface** | Select the WAN interface to configure the QoS for outgoing packets. LAN interface can not be selected as VLAN is currently supported on the WAN side only. |
| **Unclassified Packet** | Some locally generated packets might not have been classified and thus do not have a CoS value, such as PPP control packet and ARP packet. You can define the CoS for all unclassified outgoing packets on layer 2 using this field, which will then pick up the user priority bits based on the mapping rules you create. The selections are (in the order of descending priority): CoS1, CoS2, CoS3, CoS4, CoS5, and CoS6. The default value is CoS1 (recommended) |
| **User Priority** | The selections are 0, 1, 2, 3, 4, 5, 6, 7. |
| **Class of Service** | The selections are (in the order of descending priority): CoS1, CoS2, CoS3, CoS4, CoS5, and CoS6. |

### Egress Layer 3 Configuration

The Egress Layer 3 page enables you to map CoS to ToS so that the priority marking of outgoing packets can be carried over to the IP network.



Connection : Ethernet

○ No Egress ○ Layer2 ● Layer3

Default Non-IP: CoS1

Class of Service : CoS1 Translated Tos:

Class of Service | Translated TOS

**Egress - Layer 3 Page Descriptions**

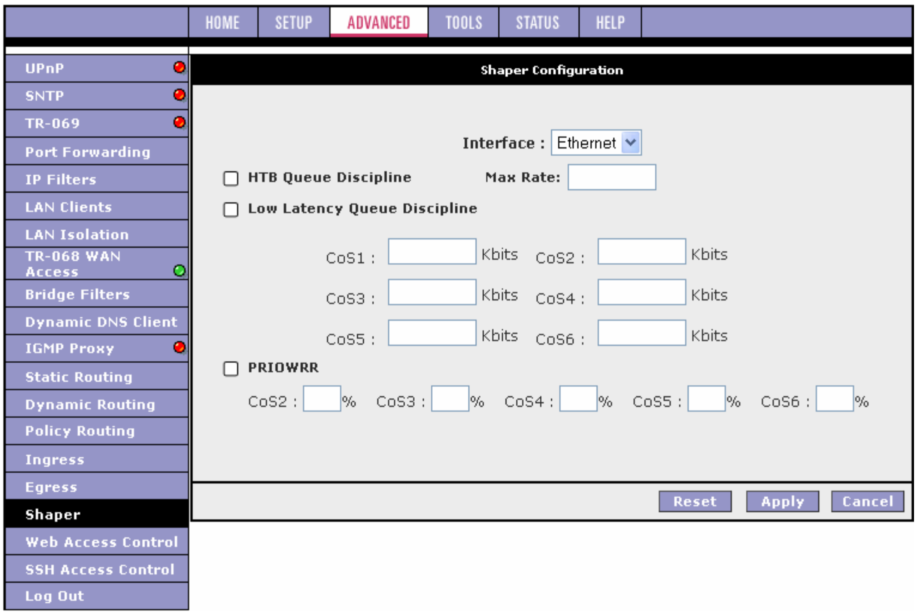
| **Field** | **Definition/Description** |
|---|---|
| **Interface** | Select the WAN/LAN interface here to configure the QoS for outgoing traffic to the IP network. |
| **Default Non-IP** | Locally generated packets (such as ARP packets) do not have a CoS marking. You can define the CoS for all unclassified outgoing packets on layer 3 using this field. The selections are (in the order of descending priority): CoS1, CoS2, CoS3, CoS4, CoS5, and CoS6. The default value is CoS1 (recommended). |
| **Translated ToS** | The Type of Service field takes values from 1 to 255. The selections are 0, 1, 2, 3, 4, 5, 6, 7. |
| **Class of Service** | The selections are (in the order of descending priority): CoS1, CoS2, CoS3, CoS4, CoS5, and CoS6. |

### 3.6.17 Shaper

The Shaper Configuration page is accessed by selecting Shaper on the Advanced main page. Three shaper algorithms are supported:

- HTB
- Low Latency Queue Discipline
- PRIOWRR

**Note:** Egress TCA is required if shaper is configured for that interface.



Shaper Configuration

Interface : Ethernet

□ HTB Queue Discipline Max Rate:

□ Low Latency Queue Discipline

CoS1 : Kbits CoS2 : Kbits

CoS3 : Kbits CoS4 : Kbits

CoS5 : Kbits CoS6 : Kbits

□ PRIOWRR

CoS2 : % CoS3 : % CoS4 : % CoS5 : % CoS6 : %

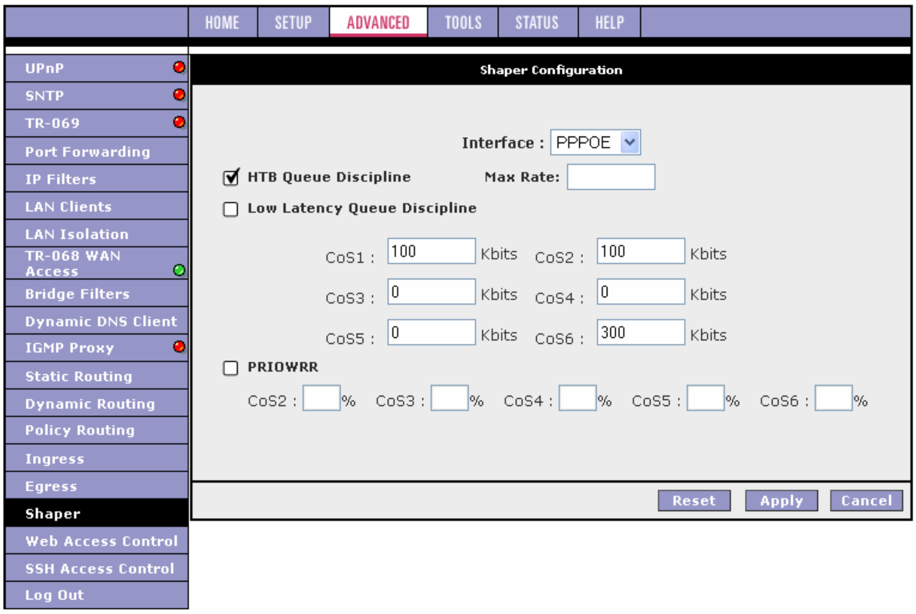
**Field Description**

| Field | Definition/Description |
|---|---|
| **Interface** | The selections are WAN and LAN interfaces. This field needs to be selected before shaper configuration. |
| **Max Rate** | This field is applicable for the HTB Queue Discipline and Low Latency Queue Discipline, both are rate-based shaping algorithms. |
| **HTB Queue Discipline** | The hierarchical token bucket queue discipline is a rate-based shaping algorithm. This algorithm rate shapes the traffic of a class over a specific interface. All CoSx traffic is assigned a specific rate to which data will be shaped to. For example: If CoS1 is configured to 100Kbps then even if 300Kbps of CoS1 data is being transmitted to the interface only 100Kbps will be sent out. |
| **Low Latency Queue Discipline** | This is similar to the above algorithm except that CoS1 is not rate limited. So in the example above CoS1 data is not rate limited to 100Kbps but instead all 300Kbps is transmitted. The side effect is that a mis-configured stream can potentially take all bandwidth. |
| **PRIOWRR** | This is a priority based weighted round robin algorithm operating on CoS2-CoS6. CoS1 queues have the highest priority and are not controlled by the WRR algorithm. |

Of the three shaping algorithms available on the Shaper Configuration page, only one can be enabled at a time. An example of each configuration is given as follows.

**Example 1: HTB Queue Discipline Enabled**

In the example below, HTB Queue Discipline is enabled. The PPPoE connection has a total of 300 kbits of bandwidth, of which 100 kbits is given to CoS1 and another 100 kbits is given to CoS2. When there is no CoS1 or CoS2 packets, CoS6 packets have the whole 300 kbits of bandwidth.



Shaper Configuration

Interface : PPPOE

☑ HTB Queue Discipline Max Rate:

□ Low Latency Queue Discipline

CoS1 : 100 Kbits CoS2 : 100 Kbits

CoS3 : 0 Kbits CoS4 : 0 Kbits

CoS5 : 0 Kbits CoS6 : 300 Kbits

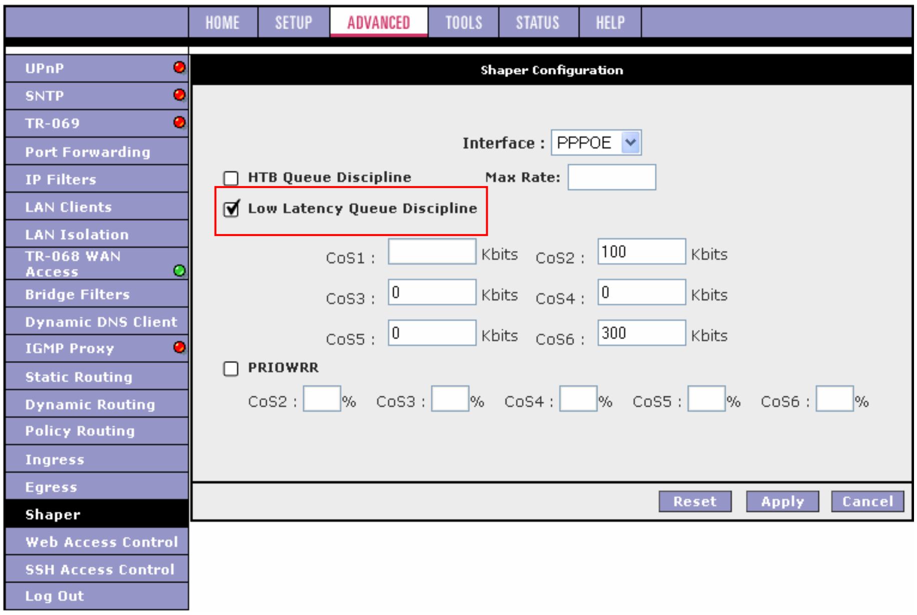
□ PRIOWRR

CoS2 : % CoS3 : % CoS4 : % CoS5 : % CoS6 : %

**Example 2: Low Latency Queue Discipline Enabled**

In this second example, Low Latency Queue Discipline is enabled.

CoS1 is not rate controlled (hence the field is disabled). CoS2 takes 100 kbits when there is no CoS1 packet. CoS6 has 300 kbits when there is no CoS1 or CoS2 packets. This is similar to the HTB queue discipline as they are both rate-based algorithm, except that CoS1 is handled differently.



Shaper Configuration

Interface : PPPOE

□ HTB Queue Discipline Max Rate:

☑ Low Latency Queue Discipline

CoS1 : Kbits CoS2 : 100 Kbits

CoS3 : 0 Kbits CoS4 : 0 Kbits

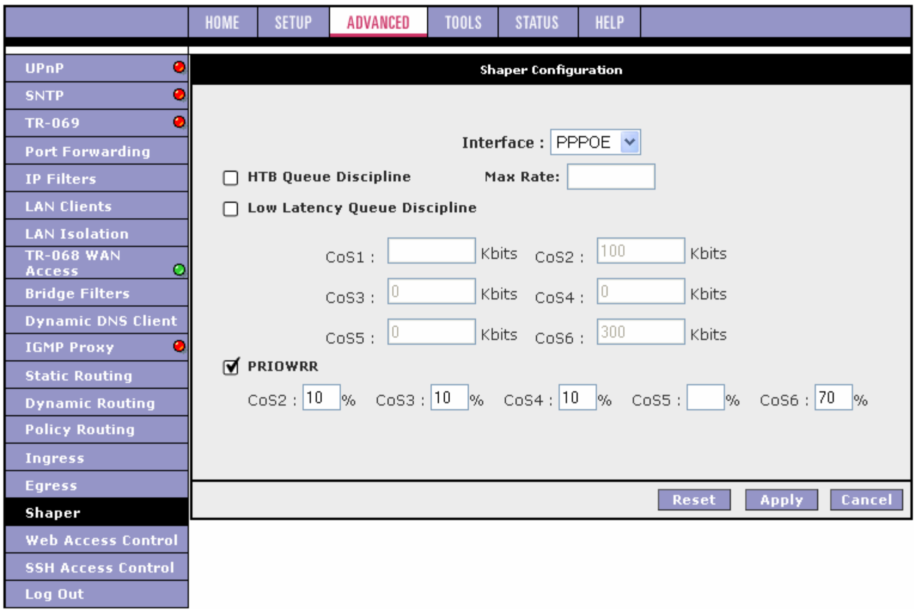
CoS5 : 0 Kbits CoS6 : 300 Kbits

□ PRIOWRR

CoS2 : % CoS3 : % CoS4 : % CoS5 : % CoS6 : %

**Example 3: PRIOWRR Enabled**

In this third example, PRIOWRR is enabled. Since PRIOWRR operates only on the number of packets being transmitted, the max rate field has been disabled. Only percentage can be assigned to the CoS2 - CoS6. CoS1 is not rate controlled (hence the field is not displayed). When there is no CoS1 packet, CoS2, CoS3, CoS4 each has 10 percent, and CoS6 has 70 percent. This is similarly to the Low Latency Queue discipline, except that one is packet-based, and the other is rate-based.



Shaper Configuration

Interface : PPPOE

□ HTB Queue Discipline Max Rate:

□ Low Latency Queue Discipline

CoS1 : Kbits CoS2 : 100 Kbits

CoS3 : 0 Kbits CoS4 : 0 Kbits

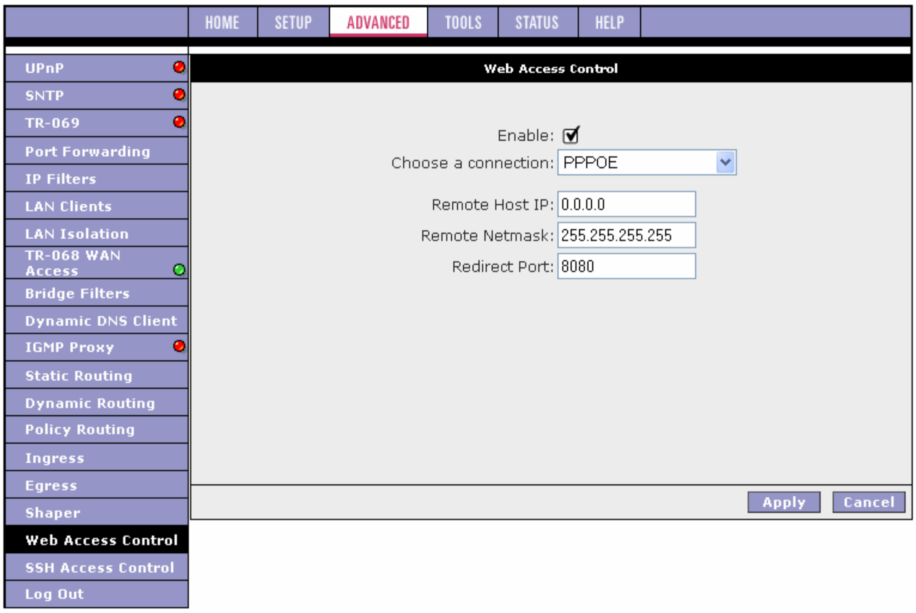
CoS5 : 0 Kbits CoS6 : 300 Kbits

☑ PRIOWRR

CoS2 : 10 % CoS3 : 10 % CoS4 : 10 % CoS5 : % CoS6 : 70 %

### 3.6.18 Web Access Control

The Web Access Control page allows you to access the ATU-R150 remotely via the web from the WAN side.



Web Access Control

Enable: ☑

Choose a connection: PPPOE

Remote Host IP: 0.0.0.0

Remote Netmask: 255.255.255.255

Redirect Port: 8080

If you want to access your ATU-R150 at home from a remote location such as your office, use the table below as a reference and follow the procedure below to configure your WAN IP address.

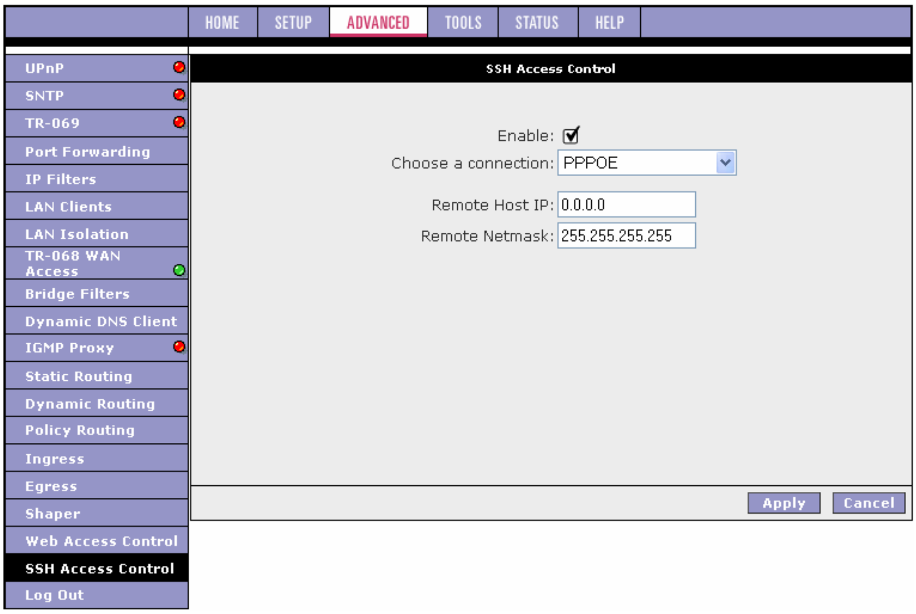
1. Check Enable to enable the Web access control feature.
2. In the Choose a Connection field, leave the default WAN connection selected.
3. In the Remote Host IP field, enter the WAN-side IP address you will use to access your ATU-R150 (for example, 10.10.10.1).
4. In the Remote Netmask field, enter the netmask of your WAN-side IP address.
5. Enter a port number In the Redirect Port field (for example, 80).
6. Click Apply to temporarily activate the settings on the page.
   This WAN address is added to the IP Access List. This allows you to access you ATU-R150 at home from a WAN IP (10.10.10.1) via Web.
   **Note:** The changes take effect when you click Apply; however, if the ATU-R150 configuration is not saved, these changes will be lost upon ATU-R150 reboot.
7. To make the change permanent, click **Tools** at the top of the page and select **System Commands**.
8. At the **System Commands** page, click **Save All**.
9. To access your ATU-R150 from the remote IP (10.10.10.1), enter the following in the URL:
   *http(s)://10.10.10.5:80*
   *Syntax: http(s)://**WAN IP of ATU-R150:Port Number***

**Field Description**

| **Field** | **Definition/Description** |
|---|---|
| **Enable** | Enables/disables the remote web access feature. |
| **Choose a connection** | Select the WAN connect over which the remote web access feature is enabled. |
| **Remote** | Host IP Enter the IP address of the remote host. |
| **Remote Netmask** | Enter the netmask of the remote host. |
| **Redirect Port** | You can enter a port number in this field that is different from the well-known IP port number 80. The port number that you enter will be viewed externally and mapped to port 80 internally in the ATU-R150. |

### 3.6.19 SSH Access Control

The SSH Access Control page allows you to access the ATU-R150 remotely via SSH from the WAN side.



SSH Access Control

Enable: ☑

Choose a connection: PPPOE

Remote Host IP: 0.0.0.0

Remote Netmask: 255.255.255.255

The configuration of a WAN IP address for SSH access control is very similar to the configuration of a WAN IP address for Web access control. Refer to ‘‘Web Access Control Page’’ for field descriptions and configuration procedures.

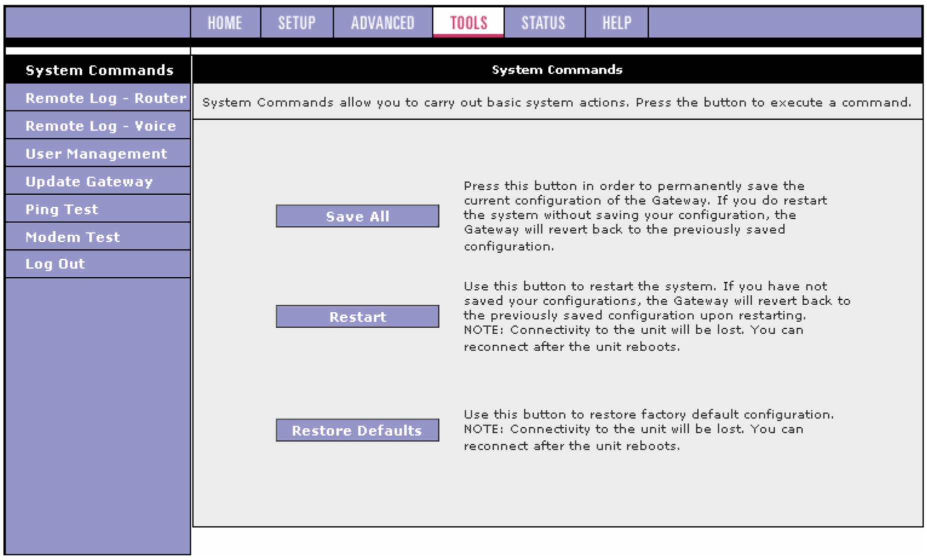
## 3.7 Tools

The ATU-R150 supports a host of tools which will allow you to customize and debug your ATU-R150.

### 3.7.1 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 ATU-R150:

- **Save all:** Press this button in order to permanently save the current configuration of the ATU-R150. If you do re-start the system without saving your configuration, the ATU-R150 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 ATU-R150 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.
- **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.



System Commands

System Commands allow you to carry out basic system actions. Press the button to execute a command.

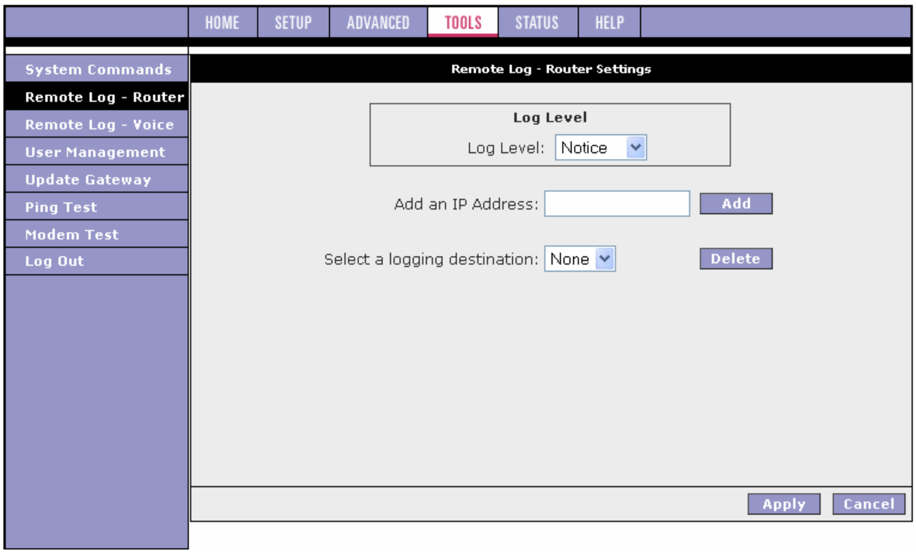
Press this button in order to permanently save the current configuration of the Gateway. If you do restart the system without saving your configuration, the Gateway will revert back to the previously saved configuration.

Use this button to restart the system. If you have not saved your configurations, the Gateway will revert back to the previously saved configuration upon restarting. NOTE: Connectivity to the unit will be lost. You can reconnect after the unit reboots.

Use this button to restore factory default configuration. NOTE: Connectivity to the unit will be lost. You can reconnect after the unit reboots.

### 3.7.2 Remote Log - Router

The remote log feature is used in conjunction with the PC tool (software provided with your ATU-R150). For PPPoE and PPPoA connections, you can select Debug in the Log Level field if you want to log the connection information. This is helpful when trying to debug connection problems. The remote log feature allows you to forward all logged information to one (or more) remote syslog server. The type of information forwarded to the remote server depends upon the Log level. Each log message is assigned a severity level, which indicates how seriously the triggering event affects ATU-R150 functions. When you configure logging, you must specify a severity level. Log messages that are rated at that level or higher are sent to the syslog server and can be viewed using the syslog server application, which can be downloaded from the web or comes with a linux machine. To view the log information on the web, refer to ‘‘System Log Page’’.



Remote Log - Router Settings

Log Level

Log Level: Notice

Add an IP Address:

Select a logging destination: None

The remote log configuration procedure is as below:

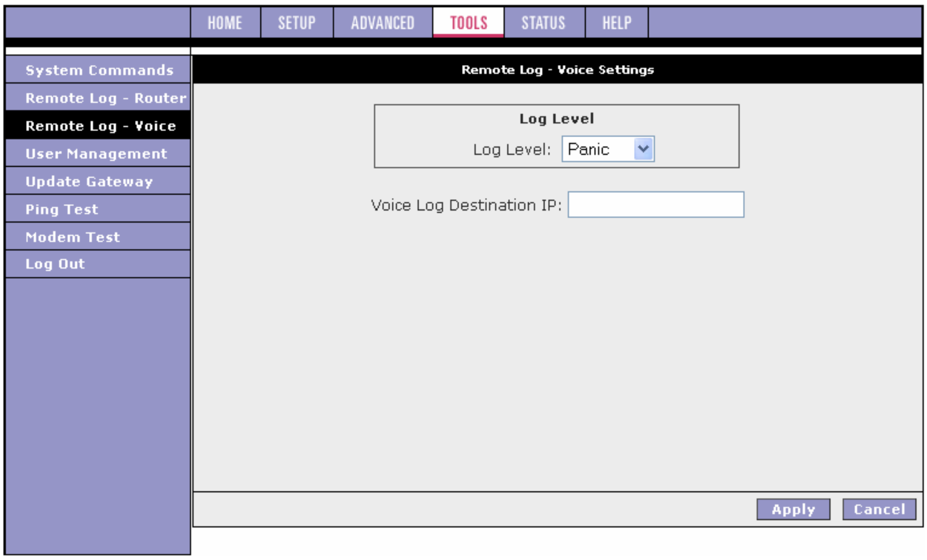
1. Select you desired Log Level from the drop-down list.
   **Note:** When you select a log level, all log information within this severity level and levels above (meaning, more severe levels) are sent to the remote station.
2. Enter the IP Address of the remote station (for example, the syslog server) that the log information is to be sent to, and click Add.
   This station is added to the drop-down list of the Select a Logging Destination field.
3. Select the Logging Destination.
   You can edit the logging destination list using the Add and Delete buttons.
4. Click **Apply**.

**Field Description**

| Field | Definition/Description |
|---|---|
| **Log Level** | There are eight log levels listed below in order of severity:<br>● Panic: System panic or other condition that causes the ATU-R150 to stop functioning.<br>● Alert: Conditions that require immediate correction, such as a corrupted system database.<br>● Critical: Critical conditions, such as hard drive errors.<br>● Error: Error conditions that generally have less serious consequences than errors in the emergency, alert, and critical levels.<br>● Warning: Conditions that warrant monitoring.<br>● Notice: Conditions that are not errors but might warrant special handling.<br>● Info: Events or non-error conditions of interest.<br>● Debug: Software debugging message. Specify the level only when so directed by a technical support representative.<br>The default log level is Notice.<br>**Note:** When you select a log level, all log information within this severity level and levels above (meaning, more severe levels) will be sent to the remote host. |
| **Add an IP Address** | You should enter the IP address of the remote host to which you want the log information be forwarded. You can add more than more IP address, and any IP address you add here appears in the drop-down list of the next field: Select a logging destination. |
| **Select a Logging Destination** | You can select a destination IP address from the drop-down list. This defines where the log information will be sent. You can customize the destination list using the Add and Delete buttons. |

### 3.7.3 Remote Log - Voice

Remote Log - Voice Settings page can be accessed by clicking the Remote Log - Voice link at the left of the Tools page.



Remote Log - Voice Settings

Log Level

Log Level: Panic

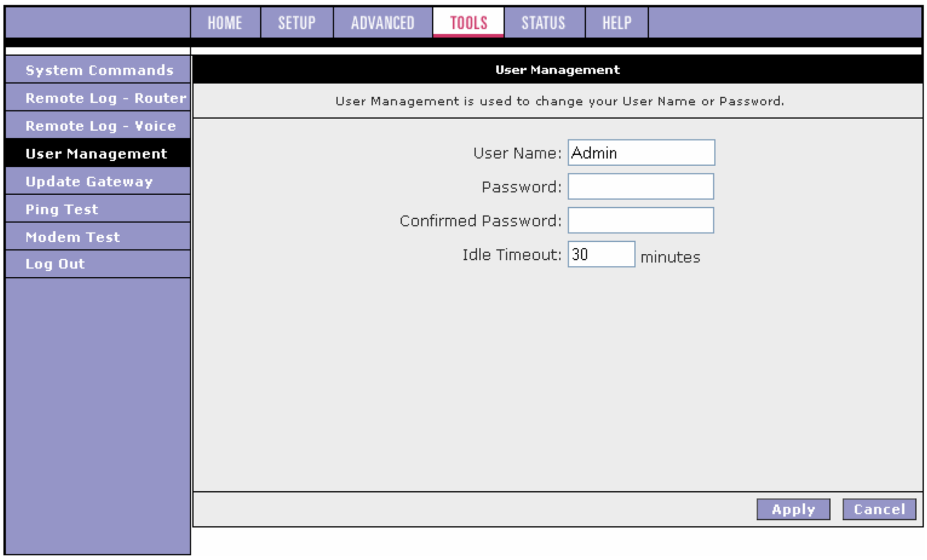
Voice Log Destination IP:

**Field Description**

| **Field** | **Definition/Description** |
|---|---|
| **Log Level** | There are eight log levels listed below in order of severity:<br>● Panic<br>● Alert:<br>● Critical<br>● Error<br>● Warning<br>● Notice<br>● Info<br>● Debug<br>The default log level is Panic.<br>Refer to previous table for more information on each log level. |
| **Add an IP Address** | You should enter the IP address of the remote host to which you want the log information be forwarded. You can add more than more IP address, and any IP address you add here appears in the drop-down list of the next field: Select a logging destination. |
| **Select a Logging Destination** | You can select a destination IP address from the drop-down list. This defines where the log information will be sent. You can customize the destination list using the Add and Delete buttons. |

### 3.7.4 User Management

This page allows you to change your login name and password.



User Management

User Management is used to change your User Name or Password.

User Name: Admin

Password:

Confirmed Password:

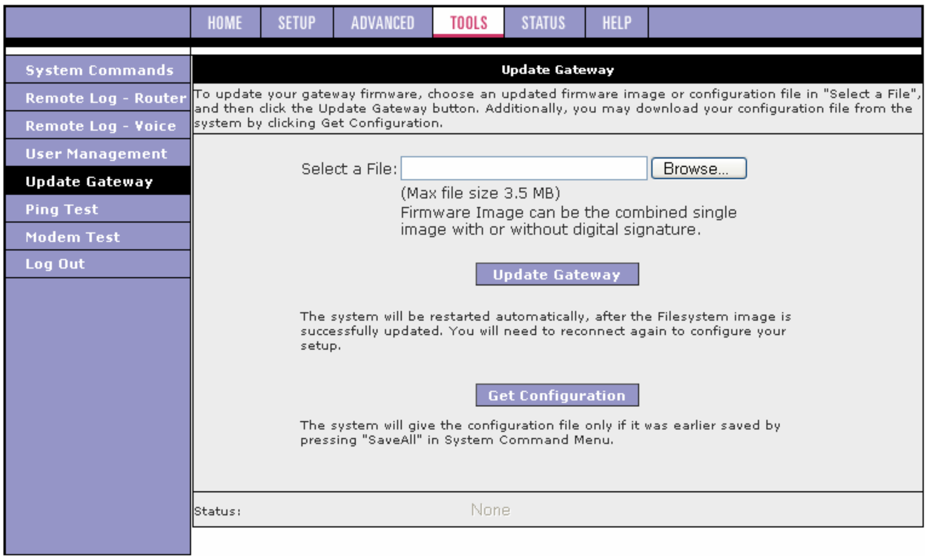
Idle Timeout: 30 minutes

**Field Description**

| **Field** | **Definition/Description** |
|---|---|
| **User Name** | Admin is your default user name. You can enter your new user name here. |
| **Password** | Admin is your default password. You can enter your new password here.<br>**Note:** If you forget your password, you can press and hold the reset to factory default button for 10 seconds (or more). The ATU-R150 will reset to its factory default configuration and all custom configuration will be lost. |
| **Confirmed Password** | Enter your new password here again to confirm. |
| **Idle Timeout** | The default is 30 minutes. You will need to log back onto the ATU-R150 after your session has been inactive for 30 minutes. You can change the timeout here. |

### 3.7.5 Update ATU-R150

This page allows you to update the ATU-R150's firmware or configurations files.



Update Gateway

To update your gateway firmware, choose an updated firmware image or configuration file in "Select a File", and then click the Update Gateway button. Additionally, you may download your configuration file from the system by clicking Get Configuration.

Select a File:

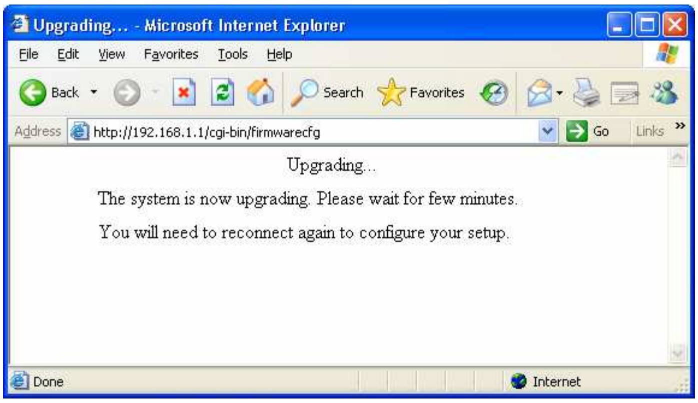
(Max file size 3.5 MB)
Firmware Image can be the combined single image with or without digital signature.

The system will be restarted automatically, after the Filesystem image is successfully updated. You will need to reconnect again to configure your setup.

The system will give the configuration file only if it was earlier saved by pressing "SaveAll" in System Command Menu.

Status: None

1. Upload firmware: Click **Browse** and select the firmware image to upload. The file name should look something like this: nsp.ar7vw.firmware.upgrade.img. The file for web upload should have “upgrade” in the name. The file without “upgrade” in the name is for upload using the serial connection.
2. Click **Update Gateway**.
   The status of the uploading appears at the bottom of the page and all LEDs are off. This may take few minutes. When the upload is finished, the ATU-R150 reboots (Power and LAN LEDs light again) and you will need to log in again.



http://192.168.1.1/cgi-bin/firmwarecfg

Upgrading...

The system is now upgrading. Please wait for few minutes.

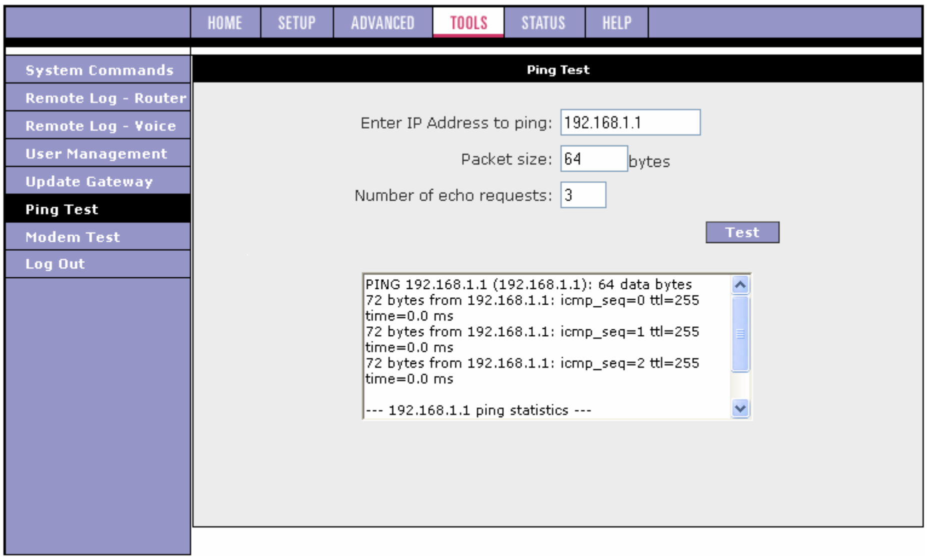
You will need to reconnect again to configure your setup.

**Note:** If you are loading multiple files, it is recommended that you upload the firmware image at last as the system reboots after loading firmware image.

3. At the login prompt, enter your **Username** and **Password** to log back in.
4. If you want to make sure the firmware is properly upgraded, go to Status/Product Information and check on the ATU-R150 version information on the Product Information page.
5. Upload configuration file: You can use the same procedure to update the configuration file (config.bin).
6. You can download to your hard drive a copy of the configuration file (config.bin) that has been saved to the ATU-R150 flash. To do so, click **Get Configuration** and follow the prompt.
7. You can also upload a saved configuration file (config.bin) back to the ATU-R150. To do so, click **Browse** and select the file, then click **Update Gateway**.

### 3.7.6 Ping Test

Once you have your ATU-R150 configured, it is a good idea to make sure you can ping the network. If you can ping an IP on the WAN side successfully, you should be able to surf the Internet.



Enter IP Address to ping: 192.168.1.1

Packet size: 64 bytes

Number of echo requests: 3

```
PING 192.168.1.1 (192.168.1.1): 64 data bytes
72 bytes from 192.168.1.1: icmp_seq=0 ttl=255
time=0.0 ms
72 bytes from 192.168.1.1: icmp_seq=1 ttl=255
time=0.0 ms
72 bytes from 192.168.1.1: icmp_seq=2 ttl=255
time=0.0 ms

--- 192.168.1.1 ping statistics ---
```

1. Click **Ping Test** from the Tools menu to access the Ping Test page.
2. Change or leave the default settings of the following fields:
   - Enter the IP Address to Ping
   - Packet Size
   - Number of Echo Requests
3. Click **Test**.
   The ping results are displayed in the box on the page. If the ping test was successful, it means that the TCP/IP protocol is up and running. If the Ping test failed, you should restart the ATU-R150.

**Field Description**

| **Field** | **Definition/Description** |
|---|---|
| **Enter IP Address to Ping** | Enter the WAN-side IP address that you want to ping. The default is set to the default IP address of your ATU-R150 (192.168.1.1). |
| **Packet Size** | You can define the packet size of the ping test. The default is 64 bytes. |
| **Number of Echo Requests** | You can define how many times the IP address will be pinged. The default is 3 times. |

### 3.7.7 Modem Test

The Modem Test page is used to check the connectivity to the WAN. This test may take a few seconds to complete. Before running this test, make sure you ave at least one WAN connection configured and have a valid DSL link. If the DSL link is not connected, the test will fail. Also make sure the DSLAM supports this feature. Not all DSLAMs have F4 and F5 support. F4/F5 cells are used for operation, administration, and maintenance (OAM) at the ATM level. They are used for two main purposes:

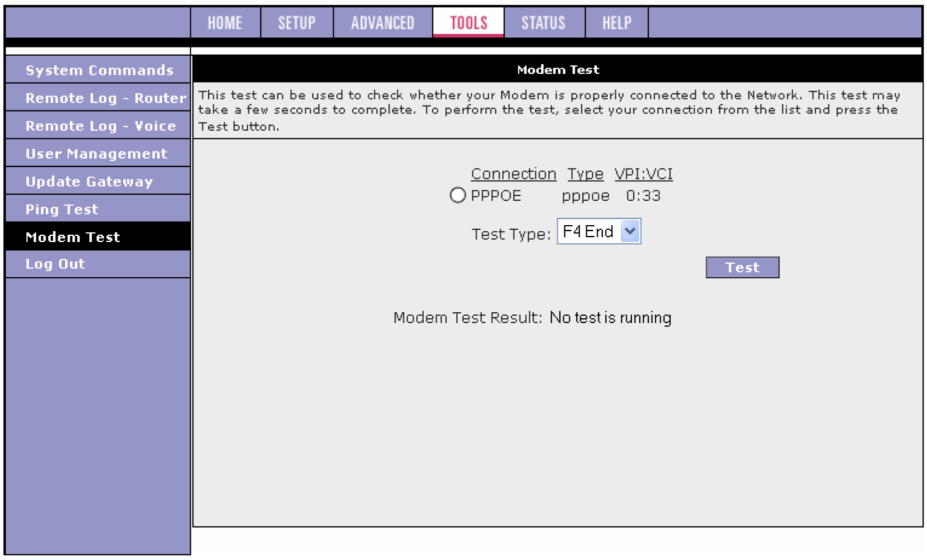
- Fault management (detection and notification)
- Loopback testing and link integrity

The ATM OAM is divided into several levels:

- F4: VP level. OAM information flows between network elements (NEs) used within virtual paths to report an unavailable path or a virtual path (VP) that cannot be guaranteed. Segment flows are processed, as well as end-to-end flows that terminate in the management processor.
- F5: VC level. OAM information flows between network elements (NEs) used within virtual connections to report degraded virtual channel (VC) performance such as late arriving cells, lost cells, and cell insertion problems. Segment flows are processed, as well as end-to-end flows that terminate in the management processor.

Both F4 and F5 flows can be configured as one of the test types:

- Segment: This test verifies that ATM continuity exists between the virtual channel link segment from the ATU-R150 to the DSL provider network (typically this is a DSLAM at the DSL provider site).
- End-to-End: This test verifies ATM connectivity of the virtual channel link with the ATM endpoint, such as a remote broadband access router located at the DSL provider or ISP site.



Modem Test

This test can be used to check whether your Modem is properly connected to the 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.

| Connection | Type | VPI:VCI |
|---|---|---|
| ○ PPPOE | pppoe | 0:33 |

Test Type: F4 End

Modem Test Result: No test is running

The figure above shows the Modem Test page with one WAN connection (PPPoE) pre-configured.

**Perform a Connectivity Test**

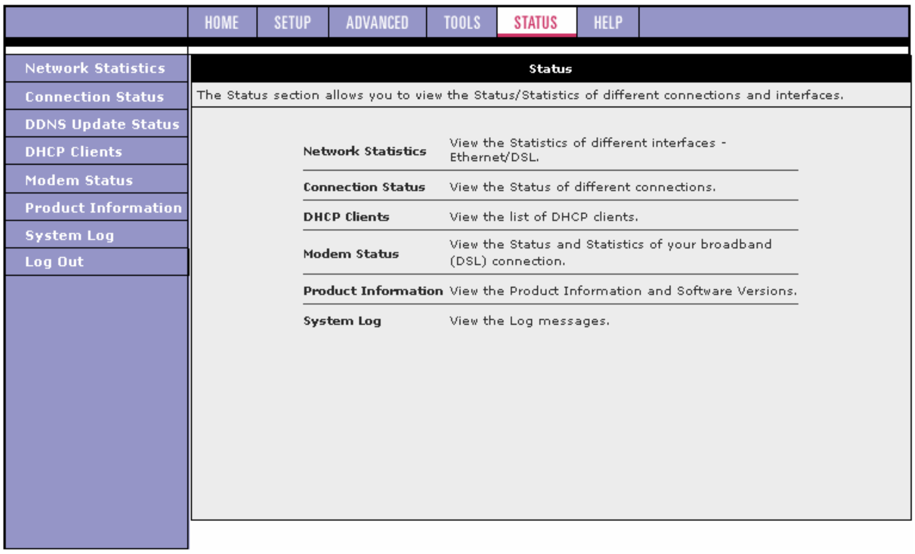
1. Click **Modem Test** at the Tools main page to access the Modem Test page.
2. Select the Connection you want to test and the Test Type.
3. Click **Test**.
   The modem test results are displayed on the page.

**Field Description**

| Field | Definition/Description |
|---|---|
| **Connection** | Select the WAN connection on which you want to run the modem test.<br>**Note:** You will not be able to perform a modem test without any WAN connections configured. |
| **Type** | The type of the WAN connection. |
| **VPI/VCI** | Virtual path identifier/virtual channel identifier. |
| **Test Type** | There are four test types:<br>● F4 End: F4 end to end.<br>● F4 Seg: F4 segment.<br>● F5 End: F5 end to end.<br>● F5 Seg: F5 segment. |

## 3.8 Status

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



**Status**

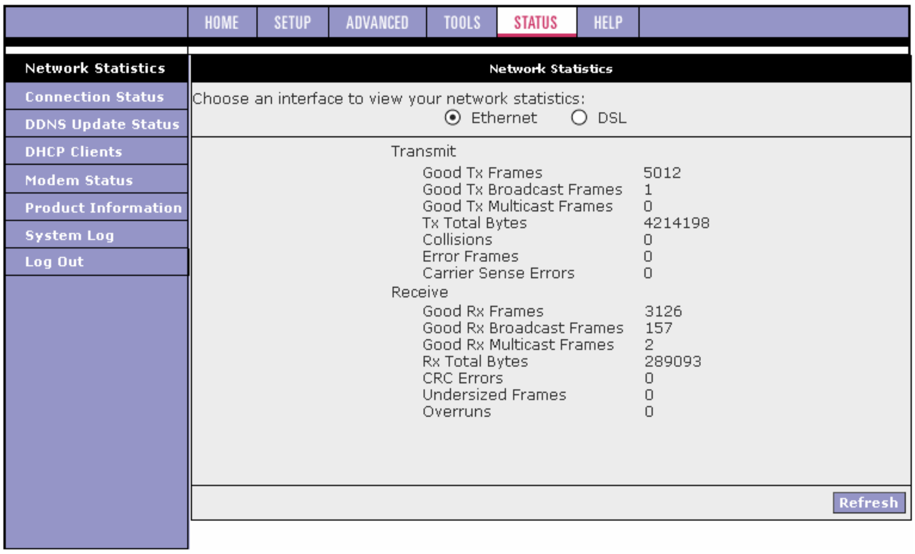
The Status section allows you to view the Status/Statistics of different connections and interfaces.

| | |
|---|---|
| **Network Statistics** | View the Statistics of different interfaces - Ethernet/DSL. |
| **Connection Status** | View the Status of different connections. |
| **DHCP Clients** | View the list of DHCP clients. |
| **Modem Status** | View the Status and Statistics of your broadband (DSL) connection. |
| **Product Information** | View the Product Information and Software Versions. |
| **System Log** | View the Log messages. |

### 3.8.1 Network Statistics

You can access the Network Statistics page by clicking the Network Statistics link from the Status main page. Click to view the statistics of the following interfaces:

- Ethernet
- DSL



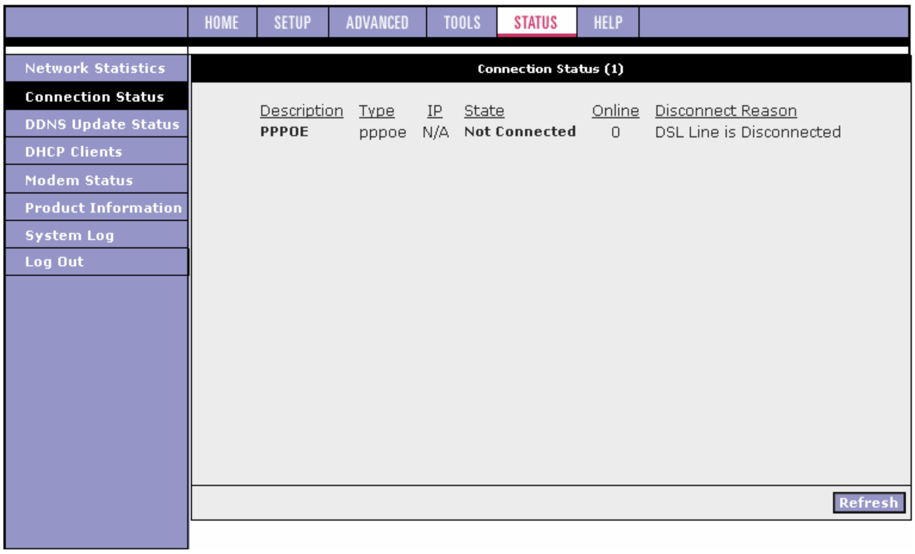
**Network Statistics**

Choose an interface to view your network statistics:
● Ethernet ○ DSL

```
Transmit
    Good Tx Frames              5012
    Good Tx Broadcast Frames    1
    Good Tx Multicast Frames    0
    Tx Total Bytes              4214198
    Collisions                  0
    Error Frames                0
    Carrier Sense Errors        0
Receive
    Good Rx Frames              3126
    Good Rx Broadcast Frames    157
    Good Rx Multicast Frames    2
    Rx Total Bytes              289093
    CRC Errors                  0
    Undersized Frames           0
    Overruns                    0
```

### 3.8.2 Connection Status

You can view the status of different connections from the Connection Status page.

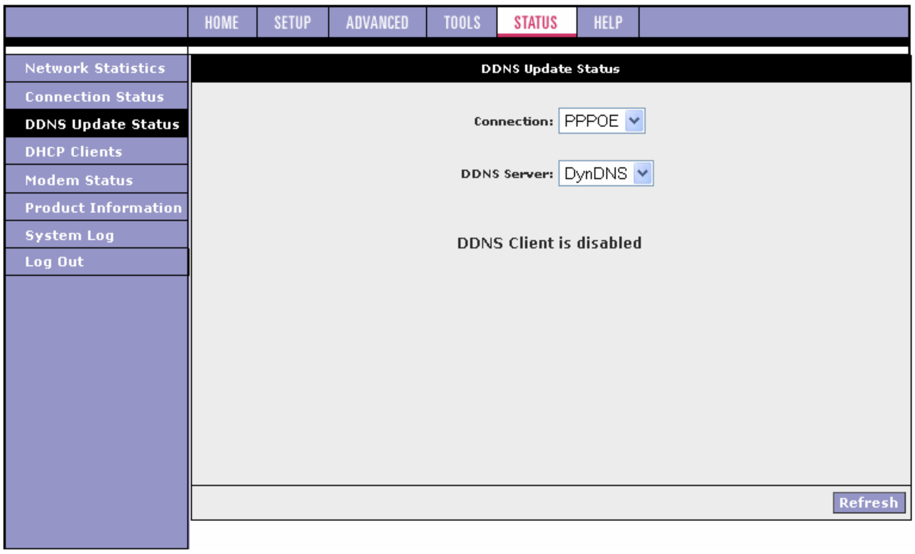


Connection Status (1)

| Description | Type | IP | State | Online | Disconnect Reason |
|---|---|---|---|---|---|
| PPPOE | pppoe | N/A | Not Connected | 0 | DSL Line is Disconnected |

### 3.8.3 DDNS Update Status

You can view the DDNS update status of your WAN connection from the DDNS Status page.



DDNS Update Status

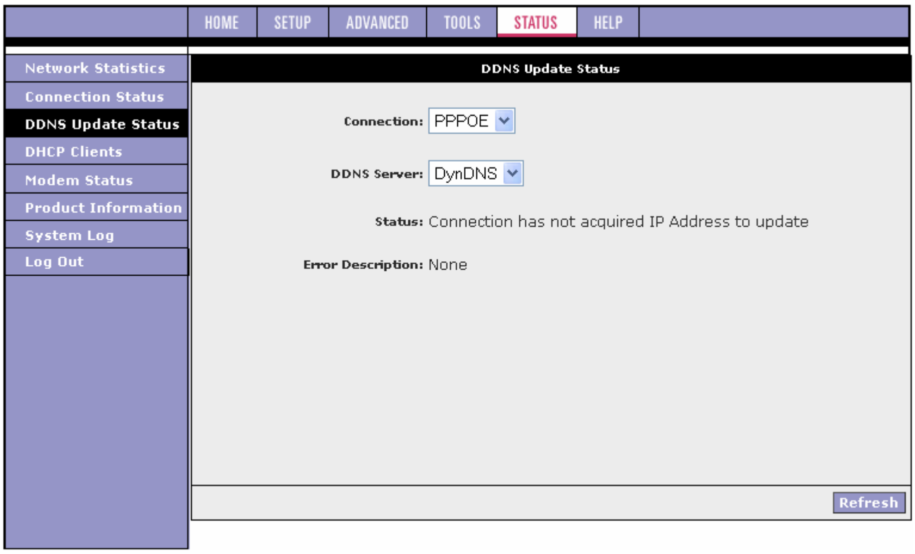
Connection: PPPOE

DDNS Server: DynDNS

DDNS Client is disabled

As you can see from this page, the DDNS client is disabled by default for your ATU-R150. When DDNS client is enabled, the DDNS client updates every time the ATU-R150 gets a new IP address. The DDNS Status page provides you the DDNS update status of your ATU-R150.

### DDNS Status Page



DDNS Update Status

Connection: PPPOE

DDNS Server: DynDNS

Status: Connection has not acquired IP Address to update

Error Description: None

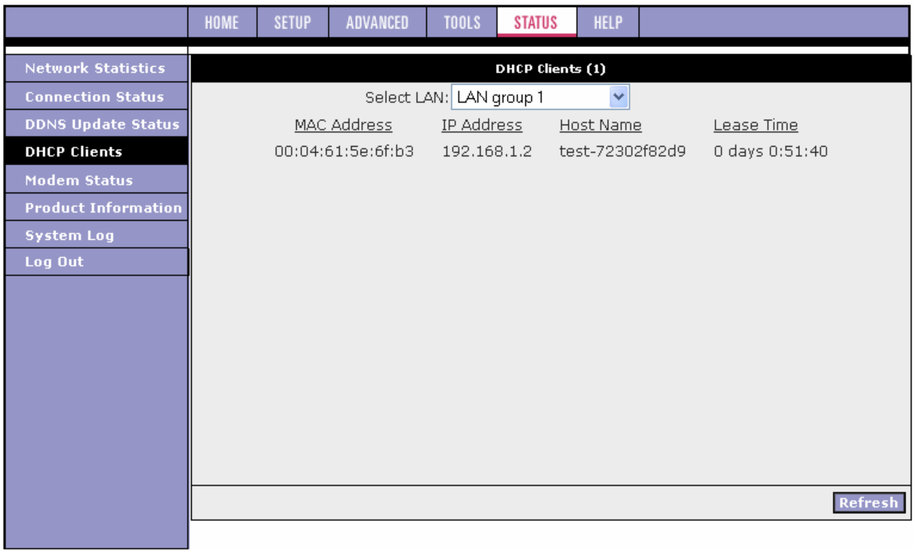
### Field Description

| Field | Definition/Description |
|---|---|
| **Connection** | This field defaults to your ATU-R150's WAN connection over which your ATU-R150 will be accessed. |
| **DDNS Server** | This is where you select the server from different DDNS service providers. Only DynDNS and TZO are supported by your ATU-R150 at this time. |
| **Status** | The status could be one of the following:<br>● Updated: The IP address of the client has been changed and an update has been sent to the DDNS server.<br>● No change: The IP address of the client has not been changed.<br>● Error: There is an error with the DDNS update. |
| **Error Description** | If the DDNS update status is Error, this field gives a description of the error. |

### 3.8.4 DHCP Clients

If you have enabled the DHCP server, you can view a list of the DHCP clients from the DHCP Clients page. From the Status main page, click the DHCP Clients link, select the LAN Group, and the following information of the DHCP LAN clients is displayed:

- MAC Address
- IP Address
- Host Name
- Lease Time



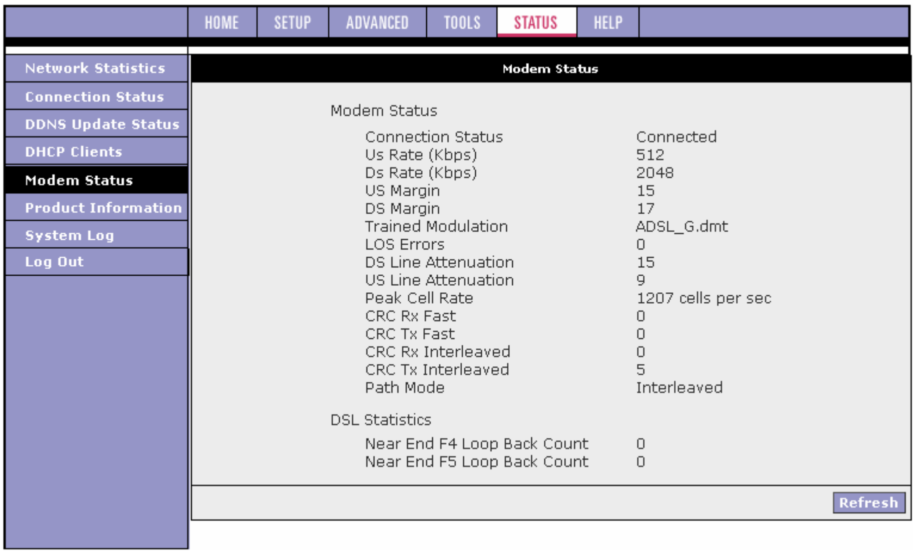
DHCP Clients (1)

Select LAN: LAN group 1

| MAC Address | IP Address | Host Name | Lease Time |
|---|---|---|---|
| 00:04:61:5e:6f:b3 | 192.168.1.2 | test-72302f82d9 | 0 days 0:51:40 |

### 3.8.5 Modem Status

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



Modem Status

Modem Status

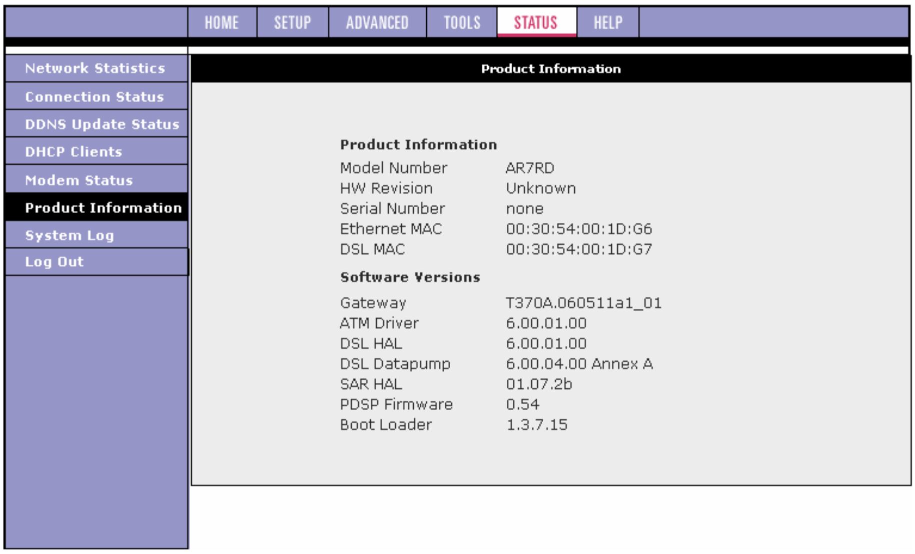
| | |
|---|---|
| Connection Status | Connected |
| Us Rate (Kbps) | 512 |
| Ds Rate (Kbps) | 2048 |
| US Margin | 15 |
| DS Margin | 17 |
| Trained Modulation | ADSL_G.dmt |
| LOS Errors | 0 |
| DS Line Attenuation | 15 |
| US Line Attenuation | 9 |
| Peak Cell Rate | 1207 cells per sec |
| CRC Rx Fast | 0 |
| CRC Tx Fast | 0 |
| CRC Rx Interleaved | 0 |
| CRC Tx Interleaved | 5 |
| Path Mode | Interleaved |

DSL Statistics

| | |
|---|---|
| Near End F4 Loop Back Count | 0 |
| Near End F5 Loop Back Count | 0 |

### 3.8.6 Product Information

This page shows the hardware and software information for your ATU-R150.



Product Information

**Product Information**

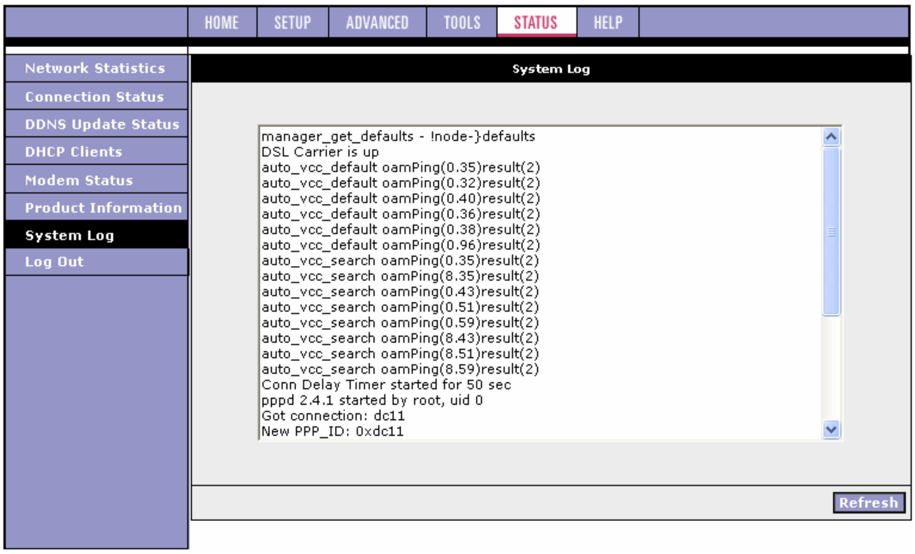
| | |
|---|---|
| Model Number | AR7RD |
| HW Revision | Unknown |
| Serial Number | none |
| Ethernet MAC | 00:30:54:00:1D:G6 |
| DSL MAC | 00:30:54:00:1D:G7 |

**Software Versions**

| | |
|---|---|
| Gateway | T370A.060511a1_01 |
| ATM Driver | 6.00.01.00 |
| DSL HAL | 6.00.01.00 |
| DSL Datapump | 6.00.04.00 Annex A |
| SAR HAL | 01.07.2b |
| PDSP Firmware | 0.54 |
| Boot Loader | 1.3.7.15 |

### 3.8.7 System Log

The System Log page allows you to view all logged information. Depending upon the severity level, the logged information generates log reports to a remote host (if remote logging is enabled). Up to 32 logs can be displayed on this page.



```
manager_get_defaults - !node-}defaults
DSL Carrier is up
auto_vcc_default oamPing(0.35)result(2)
auto_vcc_default oamPing(0.32)result(2)
auto_vcc_default oamPing(0.40)result(2)
auto_vcc_default oamPing(0.36)result(2)
auto_vcc_default oamPing(0.38)result(2)
auto_vcc_default oamPing(0.96)result(2)
auto_vcc_search oamPing(0.35)result(2)
auto_vcc_search oamPing(8.35)result(2)
auto_vcc_search oamPing(0.43)result(2)
auto_vcc_search oamPing(0.51)result(2)
auto_vcc_search oamPing(0.59)result(2)
auto_vcc_search oamPing(8.43)result(2)
auto_vcc_search oamPing(8.51)result(2)
auto_vcc_search oamPing(8.59)result(2)
Conn Delay Timer started for 50 sec
pppd 2.4.1 started by root, uid 0
Got connection: dc11
New PPP_ID: 0xdc11
```

# Appendix: 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.

## The ATU-R150 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 configuration guide for more details.
2. Check to see that the LAN and WAN LEDs are green.
3. Check the settings on your PC. Again, refer to the quick configuration guide for more details.
4. Check the ATU-R150's settings.
5. From your PC, can you PING the ATU-R150? Assuming that the ATU-R150 has DHCP enabled and your PC is on the same subnet as the ATU-R150, you should be able to PING the ATU-R150.
6. Can you PING the WAN? Your ISP should have provided the IP address of their server. If you can ping the ATU-R150 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.
7. Make sure NAT is enabled for your connection. If NAT is disabled you the ATU-R150 will not route frames correctly.

## I can't connect to the ATU-R150.

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 that your PC and the ATU-R150 is on the same network segment. The ATU-R150'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 ATU-R150 is within the same 192.168.1.x subnet.
3. Also, your PC's Subnet Mask should match the ATU-R150's subnet mask. The ATU-R150 has a default subnet mask of 255.255.255.0.
4. If this still does not work, press the reset button. This will place the ATU-R150 into its factory default state. Go through the above procedures again.
5. Make sure NAT is enabled for your connection. If NAT is disabled you the ATU-R150 will not route frames correctly.

## The WAN 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.

## The WAN 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 ATU-R150. If the phone line is connected to the phone side of the ATU-R150 or you have a splitter installed on the phone line, the WAN light will not come on.

# Transmission Series

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