COMTREND CORPORATION

CT-5365

ADSL2+ Wireless Router

User Manual

Version A1.0, September 11, 2008

Preface

This manual provides information related to the installation, operation, and application of this device. The individual reading this manual is presumed to have a basic understanding of telecommunications terminology and concepts.

If you find the product to be inoperable or malfunctioning, please contact technical support for immediate service by email at INT-support@comtrend.com

For product update, new product release, manual revision, or software upgrades, please visit our website at http://www.comtrend.com

Important Safety Instructions

With reference to unpacking, installation, use, and maintenance of your electronic device, the following basic guidelines are recommended:

- Do not use or install this product near water, to avoid fire or shock hazard. For example, near a bathtub, kitchen sink or laundry tub, or near a swimming pool. Also, do not expose the equipment to rain or damp areas (e.g. a wet basement).
- Do not connect the power supply cord on elevated surfaces. Allow it to lie freely. There should be no obstructions in its path and no heavy items should be placed on the cord. In addition, do not walk on, step on, or mistreat the cord.
- Use only the power cord and adapter that are shipped with this device.
- To safeguard the equipment against overheating, make sure that all openings in the unit that offer exposure to air are not blocked.
- Avoid using a telephone (other than a cordless type) during an electrical storm. There may be a remote risk of electric shock from lightening. Also, do not use the telephone to report a gas leak in the vicinity of the leak.
- Never install telephone wiring during stormy weather conditions.

CAUTION:

- To reduce the risk of fire, use only No. 26 AWG or larger telecommunication line cord.

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

⚠ **WARNING**

- Disconnect the power line from the device before servicing.
- Power supply specifications are clearly stated in Appendix C.

Copyright

NOTE:	This document is subject to change without notice.

Protect Our Environment

This symbol indicates that when the equipment has reached the end of its useful life, it must be taken to a recycling centre and processed separate from domestic waste.

The cardboard box, the plastic contained in the packaging, and the parts that make up this router can be recycled in accordance with regionally established regulations. Never dispose of this electronic equipment along with your household waste. You may be subject to penalties or sanctions under the law. Instead, ask for disposal instructions from your municipal government.

Table of Contents

Chapter 1 Summary

Comtrend's CT-5365 is an 802.11g (54Mbps) Wireless and Wired ADSL2+ Router. It comes equipped with four 10/100 Base-T Ethernet ports and an ADSL2+ port for wired connectivity. An integrated 802.11g WLAN Access Point (AP) with Wi-Fi Protected Setup (WPS) provides wireless coverage.

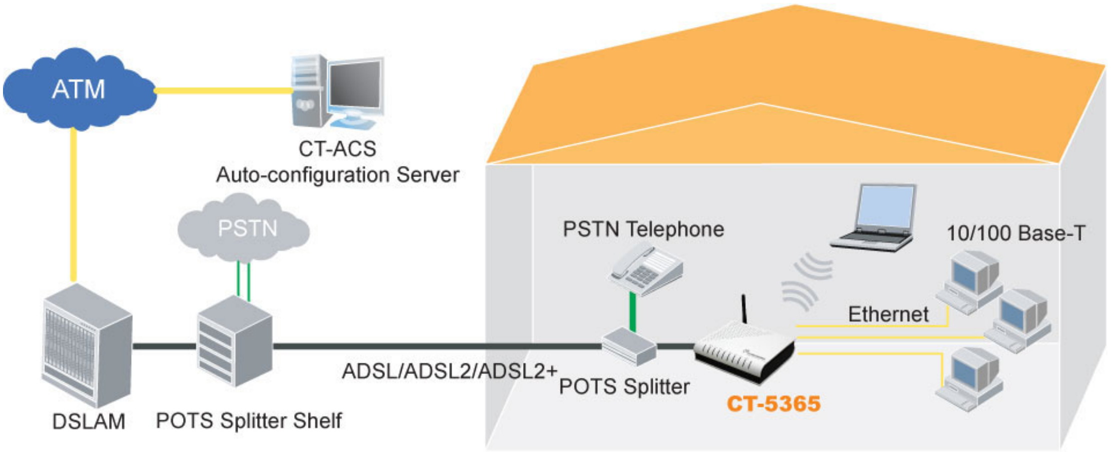
The CT-5365 contains state of the art security features, such as WPA data encryption, Firewall and VPN pass through. This model supports up to 16 contiguous virtual connections allowing for multiple simultaneous Internet connections. The front and back panels are TR-068 compliant, which means they are color-coded for easy installation and use. These features make the CT-5365 especially suited to a home or small business environment.

1.1 Features

- Dynamic IP assignment
- Up to 16 VCs
- IGMP Proxy
- Per-VC packet level QoS
- MAC address and IP filtering
- UPnP
- RADIUS client
- Embedded SNMP agent
- TR-069/TR-098/TR-111
- Remote administration
- Configuration backup and restoration
- Integrated 802.11g AP
- Optional Turbo mode in wireless (After burner)
- Auto PVC configuration
- NAT/PAT
- IP QoS & WMM
- Static and RIP v1/v2 Routing
- DNS Proxy
- FTP/TFTP server
- Web-based management
- Firmware upgrade and configuration
- DHCP Server/Relay/Client
- Backward compatible with 802.11b
- Wi-Fi Protected Setup (WPS)
- WPA/WPA2 and 802.1x security

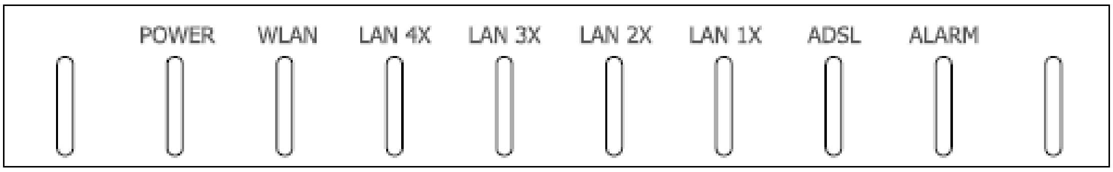
1.2 Application

The following diagram depicts the application of the CT-5365 router.



1.3 LED Indicators

The LED indicators are shown below and explained in the table that follows.



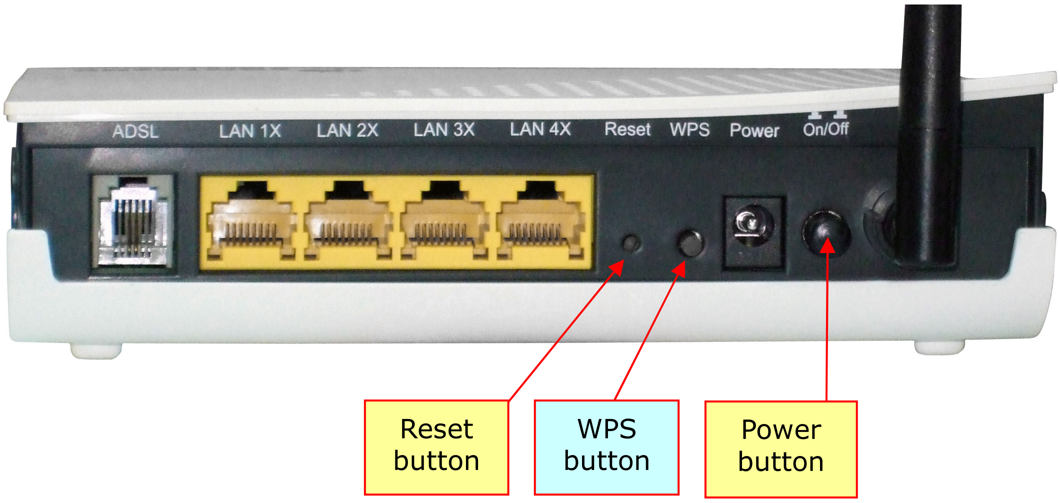
LED	Color	Mode	Function
POWER	Green	On	The router is powered up.
		Off	The router is powered down.
WLAN	Green	On	The wireless module is ready and idle.
		Off	The wireless module is not ready.
		Blink	Data transmitting or receiving over WLAN.
LAN 4x~1x	Green	On	An Ethernet Link is established.
		Off	An Ethernet Link is not established.
		Blink	Data transmitting or receiving over LAN.
ADSL	Green	On	ADSL link is established.
		Off	ADSL link is not established.
		Blink	ADSL link is becoming established.
ALARM	Red	On	The ADSL link is not available.
		Off	The ADSL link is available.

Chapter 2 Installation

2.1 Hardware Installation

Follow the instructions below to complete the hardware installation.

For your reference, the figure below shows the back panel of the CT-5365.



Connection to ADSL - Connect the ADSL line to the ADSL port with RJ11 cable.

Connection to LAN
Use RJ45 straight through or crossover MDI/X cable to connect up to four devices.

Reset Button
Restore the default settings of the device by holding down the Reset button until the front panel LED indicators blink simultaneously (~ 5 seconds). This action may be required if the router fails to respond normally or if the router configuration changes. The router has rebooted successfully when the LED indicators display as expected.

WPS button
Press this button to begin searching for WPS clients. It works if the client also enables WPS push button mode. When WPS mode is available (the WPS LED will be ON), pressing the button for 5 seconds or more will disable Wireless function.

Power ON
Press the power button to the OFF position (OUT). Connect the power adapter to the power port. Attach the power adapter to a wall outlet or other AC source. Press the power button to the ON position (IN). If the Power LED indicator lights up (GREEN) then the device is ready for setup.

Caution 1:	If the device fails to power up, or it malfunctions, first verify that the power cords are connected securely. Then power it on again. If the problem persists, contact technical support.
Caution 2:	Before servicing or disassembling this equipment, always disconnect all power cords and telephone lines from their outlets.

Chapter 3 Web User Interface

This section describes how to access the device via the web user interface using an Internet browser such as Microsoft Internet Explorer (version 5.0 and later).

3.1 Default Settings

The following are the default settings for the device.

- Local (LAN) access (**username**: root , **password**: 12345)
- Remote (WAN) access (**username**: support, **password**: support)
- User access (**username**: user, **password**: user)
- LAN IP address: 192.168.1.1 - Subnet Mask: 255.255.255.0
- WAN IP address: none
- Remote WAN access: disabled (except for ICMP)
- NAT and Firewall: enabled for PPPoE/A, disabled for Bridge/MER/IPoA
- DHCP server on LAN interface: enabled
- Wireless Access enabled
- SSID: Comtrend
- Wireless authentication open (no authentication)

This device supports the following connection types.

- PPP over Ethernet (PPPoE)
- PPP over ATM (PPPoA)
- MAC Encapsulated Routing (MER)
- IP over ATM (IPoA)
- Bridging

Technical Note:
During power on, the device initializes all settings to default values. It will then read the configuration profile from the permanent storage section of flash memory. The default attributes are overwritten when identical attributes with different values are configured. The configuration profile in permanent storage can be created via the web user interface, telnet user interface, or other management protocols. The factory default configuration can be restored either by pushing the reset button for more than five seconds or by clicking the Restore Default Configuration button on the Restore Settings screen of the web user interface.

3.2 IP Configuration

The following instructions describe how to set the IP configuration of the Ethernet connection so that a computer can connect to the CT-5365. Once this connection is established you will be able to access product features or manage the device using the web user interface described herein, or by other methods (e.g. FTP/TFTP).

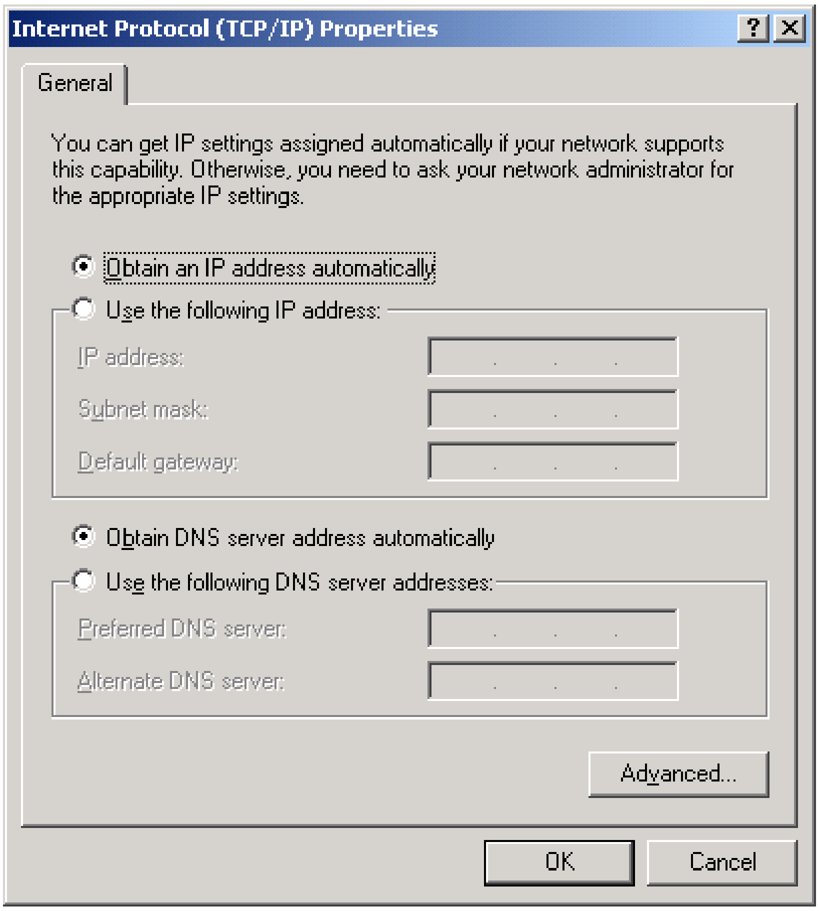
NOTE: These instructions are written for a computer running Microsoft Windows XP SP2. For other operating systems (e.g. Windows Vista, Linux, etc.), the specific steps may vary but the general procedure is the same. Check the instructions provided with your operating system for further guidance.

DHCP Mode

When the CT-5365 powers up, the DHCP server (on the device) will start automatically. To obtain an IP address automatically, DHCP mode must be activated within the Internet Protocol properties of the Local Area Connection on your computer. To check the current IP configuration, do the following:

STEP 1: From the Network Connections window, open Local Area Connection and click the **Properties** button. You may also access this screen by double-clicking the Local Area Connection icon on your taskbar.

STEP 2: Select Internet Protocol (TCP/IP) and click the **Properties** button again. DHCP mode is activated if the dialog box displays as shown below.



Internet Protocol (TCP/IP) Properties

You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.

● Obtain an IP address automatically

○ Use the following IP address:

IP address: . . .

Subnet mask: . . .

Default gateway: . . .

● Obtain DNS server address automatically

○ Use the following DNS server addresses:

Preferred DNS server: . . .

Alternate DNS server: . . .

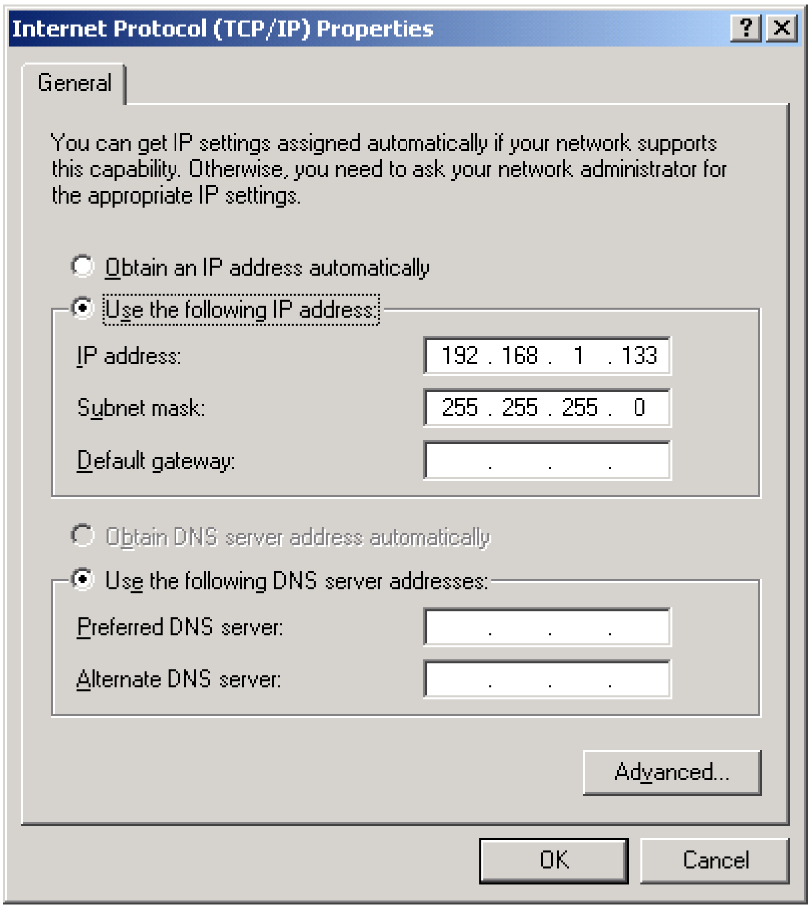
STATIC IP Mode

Using static IP configuration, your computer must have an IP address within the same subnet as the CT-5365. Follow the steps below to configure your computer to use the default subnet of **192.168.1**.x.

STEP 1: From the Network Connections window, open Local Area Connection and click the **Properties** button. You may also access this screen by double-clicking the Local Area Connection icon on your taskbar.

STEP 2: Select Internet Protocol (TCP/IP) and click the **Properties** button again.

STEP 3: On the dialog box that appears, select the radio button labeled "Use the following IP address". Enter an IP address in this format {**192.168.1**.x, where x is any number greater than 2 and less than 254}. Enter the subnet mask as **255.255.255.0**. The screen should display as follows.



Internet Protocol (TCP/IP) Properties

General

You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.

○ Obtain an IP address automatically

● Use the following IP address:

IP address:	192 . 168 . 1 . 133
Subnet mask:	255 . 255 . 255 . 0
Default gateway:	. . .

○ Obtain DNS server address automatically

● Use the following DNS server addresses:

Preferred DNS server:	. . .
Alternate DNS server:	. . .

STEP 3: Enter the default gateway and DNS server settings as provided by your ISP or enter **192.168.1.1**, which is the default IP address of the CT-5365. Click **OK** to submit these settings and thereby activate STATIC IP mode.

3.3 Login Procedure

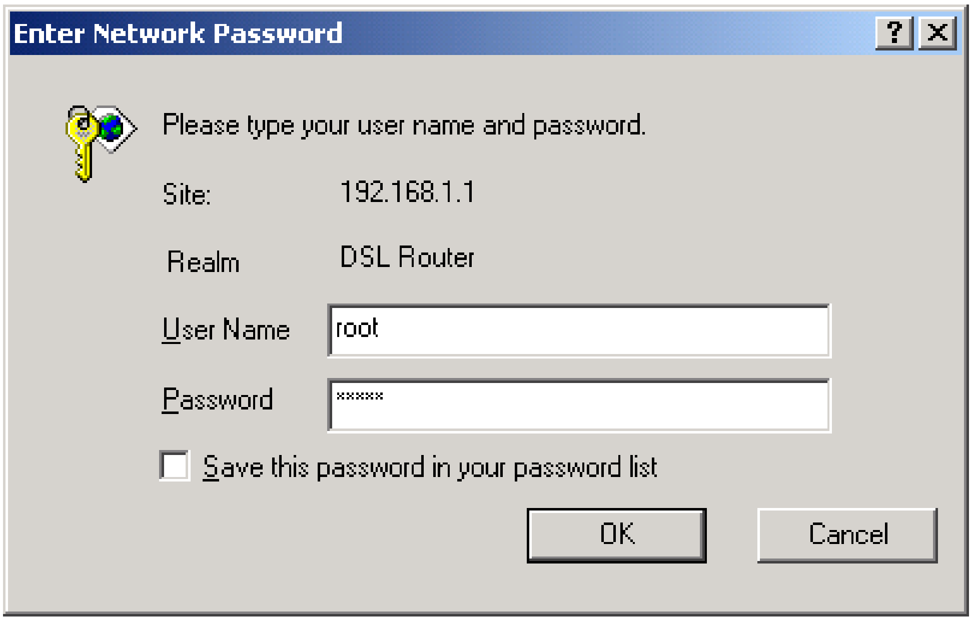
Perform the following steps to login to the web user interface.

NOTE: The default settings can be found in 3.1 Default Settings.

STEP 1: Start the Internet browser and enter the default IP address for the device in the Web address field. For example, if the default IP address is 192.168.1.1, type http://192.168.1.1.

NOTE: For local administration (i.e. LAN access), the PC running the browser must be attached to the Ethernet, and not necessarily to the device. For remote access (i.e. WAN), use the IP address shown on the Device Info - WAN screen and login with remote username and password.

STEP 2: A dialog box will appear, such as the one shown. Enter the default username and password, as defined in section 3.1 Default Settings. Click **OK** to continue.



Enter Network Password

Please type your user name and password.

Site: 192.168.1.1

Realm DSL Router

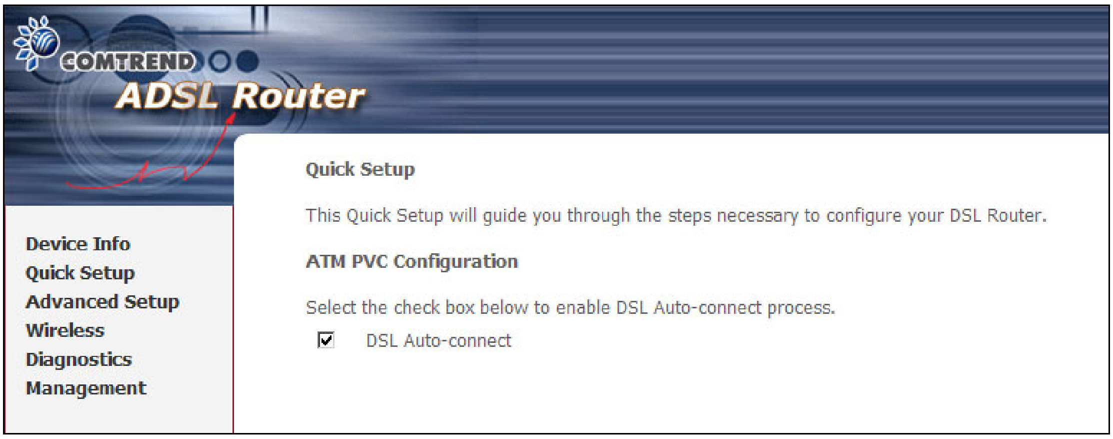
User Name: root

Password: *****

□ Save this password in your password list

NOTE:	The login password can be changed later (see section 9.6.3)

STEP 3: After successfully logging in, you will reach the **Quick Setup** screen.



Quick Setup

This Quick Setup will guide you through the steps necessary to configure your DSL Router.

ATM PVC Configuration

Select the check box below to enable DSL Auto-connect process.

☑ DSL Auto-connect

NOTE:	If a PVC connection already exists then this Quick Setup screen will be bypassed and the Device Info screen will display instead. In general, the selections available on the main menu (onscreen at left) are based upon configured connections and user account privileges.

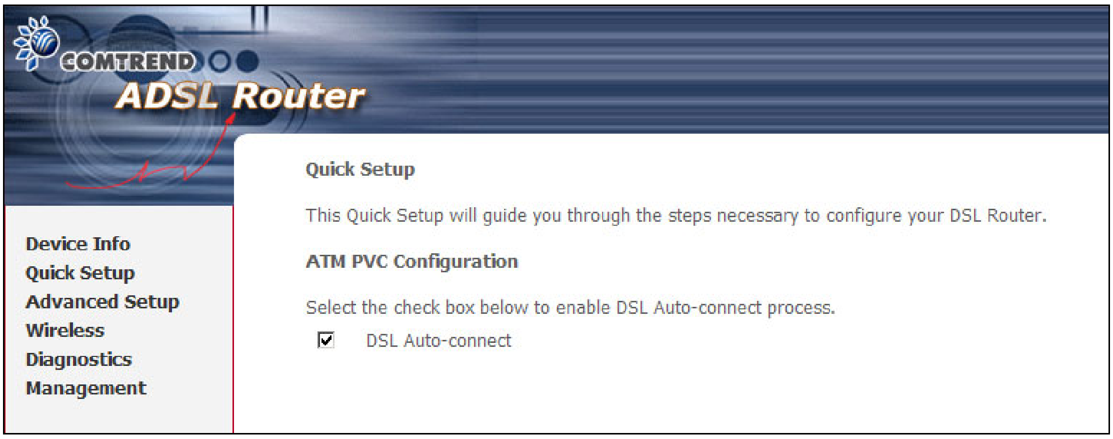
Chapter 4 Quick Setup

After login, the **Quick Setup** screen will appear. It is the default screen when no connections exist. It allows for the configuration of DSL and IP settings.

4.1 Auto Quick Setup

This function provides an automated process to quickly setup a WAN connection. The device will auto-detect the best PVC profile available, provided that the ADSL link is up. For manual setup, please go to 4.2 Manual Quick Setup.

STEP 1: Tick the **DSL Auto-connect** checkbox on the **Quick Setup** screen.



Quick Setup

This Quick Setup will guide you through the steps necessary to configure your DSL Router.

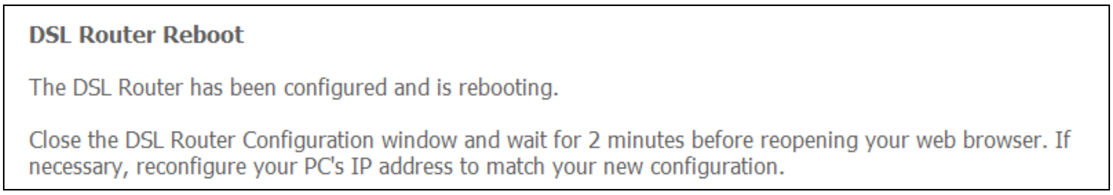
ATM PVC Configuration

Select the check box below to enable DSL Auto-connect process.

☑ DSL Auto-connect

STEP 2: Click **Next** to start the setup process. Follow the onscreen prompts.

STEP 3: After setup is complete, the device will reboot with the following shown.



DSL Router Reboot

The DSL Router has been configured and is rebooting.

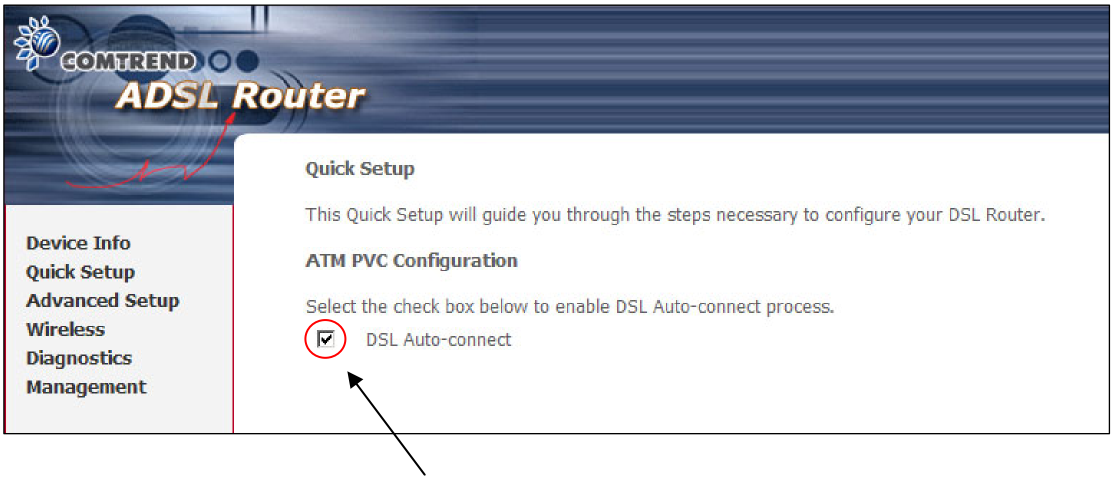
Close the DSL Router Configuration window and wait for 2 minutes before reopening your web browser. If necessary, reconfigure your PC's IP address to match your new configuration.

NOTE: After the device reboots, the Device Info screen should appear. If the browser does not refresh automatically, close it and restart. You will need to login again. If you encounter difficulty, be sure to check the IP configuration (see section 3.2 IP Configuration).

4.2 Manual Quick Setup

To setup the router manually follow these instructions.

STEP 1: Select **Quick Setup** from the main menu and uncheck the **DSL Auto-connect** checkbox ☑ to begin the manual quick setup process.



Quick Setup

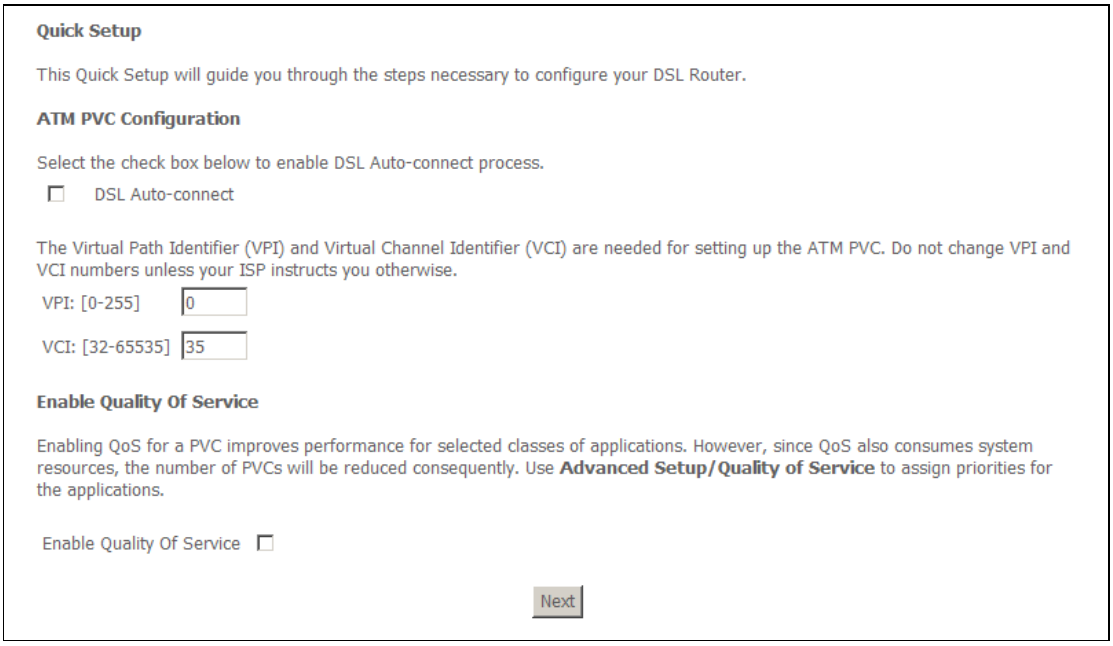
This Quick Setup will guide you through the steps necessary to configure your DSL Router.

ATM PVC Configuration

Select the check box below to enable DSL Auto-connect process.

☑ DSL Auto-connect

Uncheck to begin the manual quick setup process and display the following screen.



Quick Setup

This Quick Setup will guide you through the steps necessary to configure your DSL Router.

ATM PVC Configuration

Select the check box below to enable DSL Auto-connect process.

□ DSL Auto-connect

The Virtual Path Identifier (VPI) and Virtual Channel Identifier (VCI) are needed for setting up the ATM PVC. Do not change VPI and VCI numbers unless your ISP instructs you otherwise.

VPI: [0-255] 0

VCI: [32-65535] 35

Enable Quality Of Service

Enabling QoS for a PVC improves performance for selected classes of applications. However, since QoS also consumes system resources, the number of PVCs will be reduced consequently. Use **Advanced Setup/Quality of Service** to assign priorities for the applications.

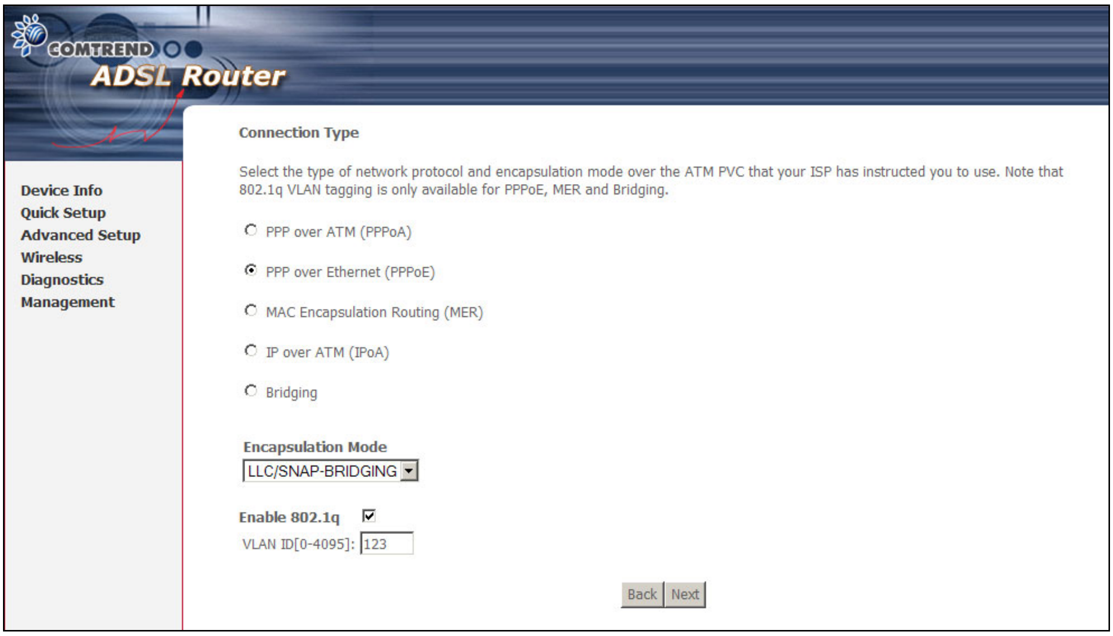
Enable Quality Of Service □

STEP 2: Adjust the VPI/VCI settings for the connection you wish to establish. Select Enable Quality Of Service if required. Click **Next** to continue.

STEP 3: On this screen, you can choose the connection type and select the appropriate encapsulation mode. The available options are shown.

- PPPoA- VC/MUX, LLC/ENCAPSULATION
- PPPoE- LLC/SNAP BRIDGING, VC/MUX
- MER- LLC/SNAP-BRIDGING, VC/MUX
- IPoA- LLC/SNAP-ROUTING, VC MUX
- Bridging- LLC/SNAP-BRIDGING, VC/MUX

You may also choose to **Enable 802.1q** (available in PPPoE, MER, and Bridge modes) and enter the VLAN ID, as shown below.



Connection Type

Select the type of network protocol and encapsulation mode over the ATM PVC that your ISP has instructed you to use. Note that 802.1q VLAN tagging is only available for PPPoE, MER and Bridging.

○ PPP over ATM (PPPoA)

● PPP over Ethernet (PPPoE)

○ MAC Encapsulation Routing (MER)

○ IP over ATM (IPoA)

○ Bridging

Encapsulation Mode: LLC/SNAP-BRIDGING

Enable 802.1q ☑

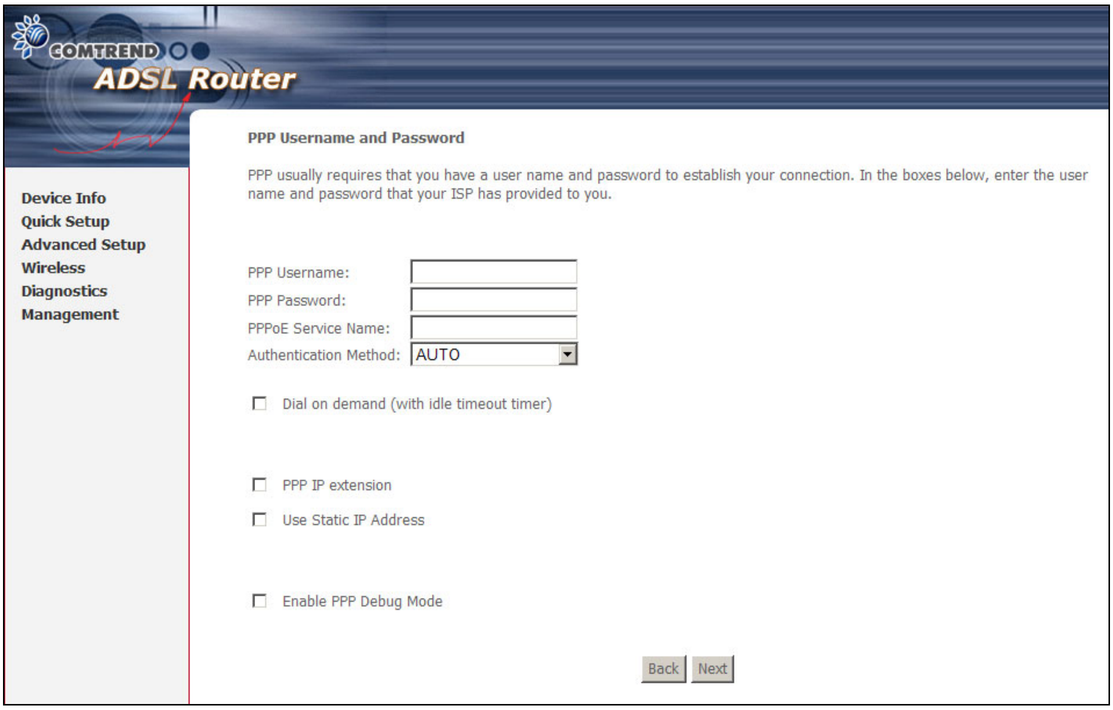
VLAN ID[0-4095]: 123

Click **Next** to continue…

NOTE: The subsections that follow continue the ATM PVC setup procedure. Enter the appropriate settings for your service. Choosing different connection types will lead to a different sequence of setup screens.

4.2.1 PPP over ATM (PPPoA) and PPP over Ethernet (PPPoE)

STEP 4: Select PPP over ATM (PPPoA) **or** PPP over Ethernet (PPPoE) and click **Next**. The following screen appears. Enter the Username and Password and select the connection options you wish. Review the descriptions below for more details. Click **Next** to continue.



PPP Username and Password

PPP usually requires that you have a user name and password to establish your connection. In the boxes below, enter the user name and password that your ISP has provided to you.

PPP Username:

PPP Password:

PPPoE Service Name:

Authentication Method: AUTO

□ Dial on demand (with idle timeout timer)

□ PPP IP extension

□ Use Static IP Address

□ Enable PPP Debug Mode

PPP Username / PPP Password
The PPP Username and the PPP password requirement are dependent on the particular requirements of the service provider. A maximum of 256 characters is allowed for the PPP user name and a maximum of 32 characters for PPP password.

PPPoE Service Name
For PPPoE service, PADI requests contain a service label. Some PPPoE servers (or BRAS) of ISP check this service label to make a connection.

Dial on Demand
The device can be configured to disconnect if there is no activity for a period of time by selecting this check box. When the checkbox is ticked, you must enter the inactivity timeout period. The timeout period ranges from 1 to 4320 minutes.

PPP IP Extension
The PPP IP Extension is a special feature deployed by some service providers. Unless your service provider specifically requires this setup, do not select it.

PPP IP Extension does the following:

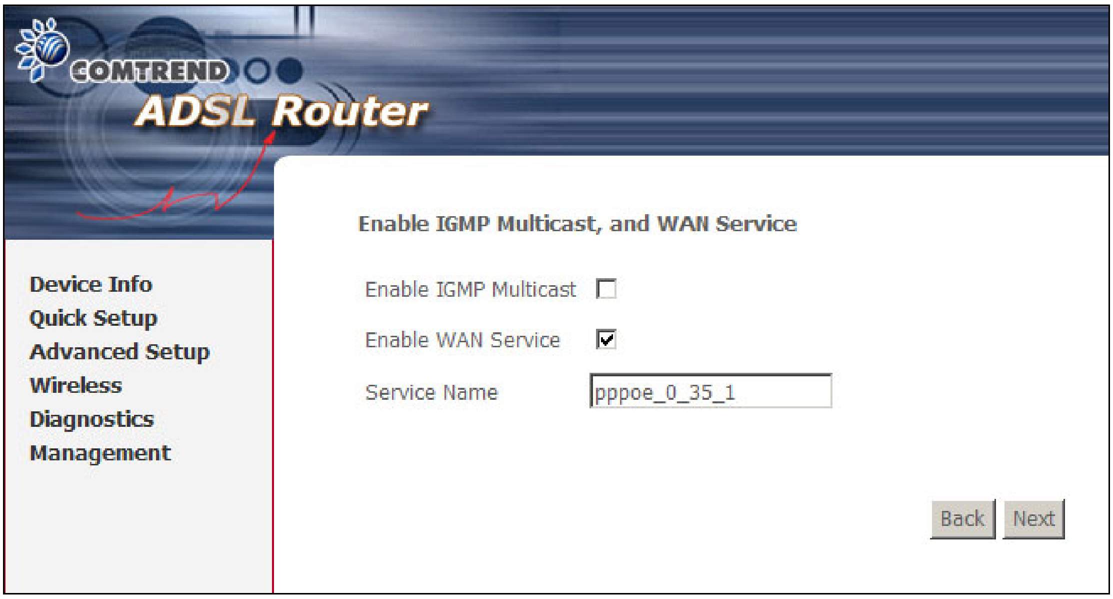
- Allows only one PC on the LAN
- The public IP address assigned by the remote side using the PPP/IPCP protocol is actually not used on the WAN PPP interface. Instead, it is forwarded to the PC LAN interface through DHCP. Only one PC on the LAN can be connected to the remote, since the DHCP server within the device has only a single IP address to assign to a LAN device.
- NAT and firewall are disabled when this option is selected.

- The device becomes the default gateway and DNS server to the PC through DHCP using the LAN interface IP address.
- The device extends the IP subnet at the remote service provider to the LAN PC. i.e. the PC becomes a host belonging to the same IP subnet.
- The device bridges the IP packets between WAN and LAN ports, unless the packet is addressed to the device's LAN IP address.

Use Static IP Address
Unless your service provider specially requires this setup, do not select the checkbox. If selected, enter the static IP address in the IP Address box. Don't forget to adjust the TCP/IP settings as described in subsection 3.2 IP Configuration.

Enable PPP Debug Mode
More PPP connection information will be listed in the System Log. This is used for debugging. Please don't enable it for normal usage as it uses system resources.

STEP 5: This screen allows the user to control IGMP Multicast and WAN Service.



Enable IGMP Multicast, and WAN Service

Enable IGMP Multicast □

Enable WAN Service ☑

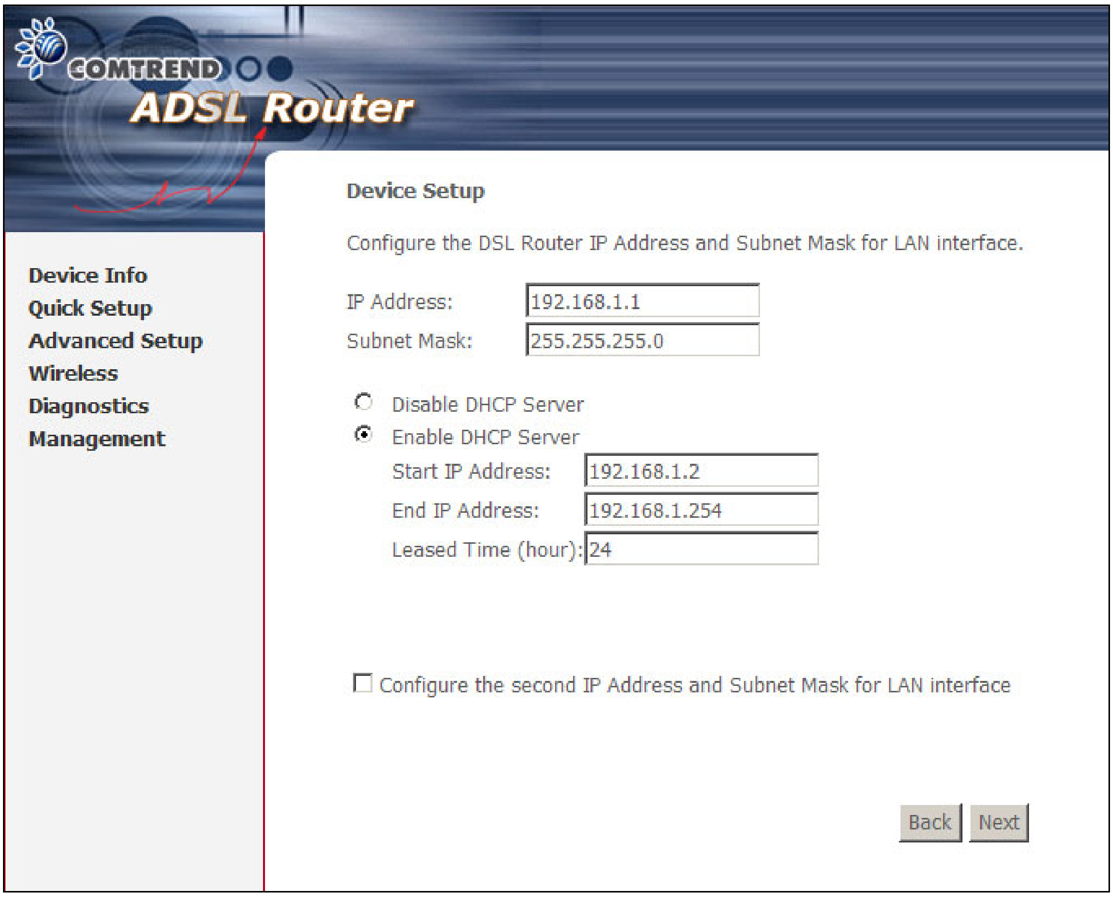
Service Name pppoe_0_35_1

Enable IGMP Multicast checkbox:
Tick the checkbox to enable IGMP multicast (proxy). IGMP (Internet Group Membership Protocol) is a protocol used by IP hosts to report their multicast group memberships to any immediately neighboring multicast routers.

Enable WAN Service checkbox:
Tick this item to enable the ATM service. Untick it to stop the ATM service.

Service Name: This is the WAN Service label.

STEP 6: After entering your settings, click **Next**. The following screen appears.



Device Setup

Configure the DSL Router IP Address and Subnet Mask for LAN interface.

IP Address: 192.168.1.1

Subnet Mask: 255.255.255.0

○ Disable DHCP Server

● Enable DHCP Server

Start IP Address: 192.168.1.2

End IP Address: 192.168.1.254

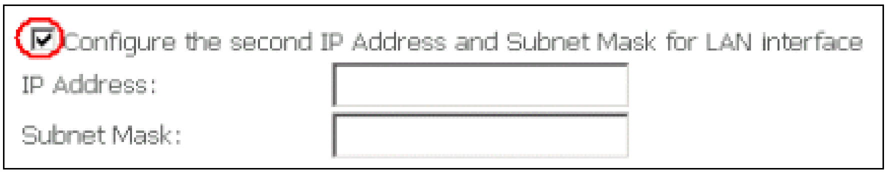
Leased Time (hour): 24

□ Configure the second IP Address and Subnet Mask for LAN interface

The Device Setup screen allows the user to configure the LAN interface IP address, subnet mask, and DHCP server. To enable DHCP, select **Enable DHCP server** and enter starting and ending IP addresses and the leased time.

This setting configures the router to automatically assign IP, default gateway and DNS server addresses to every PC on your LAN. Please be aware that the private address range (e.g. 192.168.1.2 ~ 192.168.1.254) does not include the router’s LAN interface IP address (e.g. 192.168.1.1 by default). Also, the Ethernet interface and wireless LAN share the same subnet since they are bridged within the router.

To configure a second IP address for the LAN port, click the box shown below.

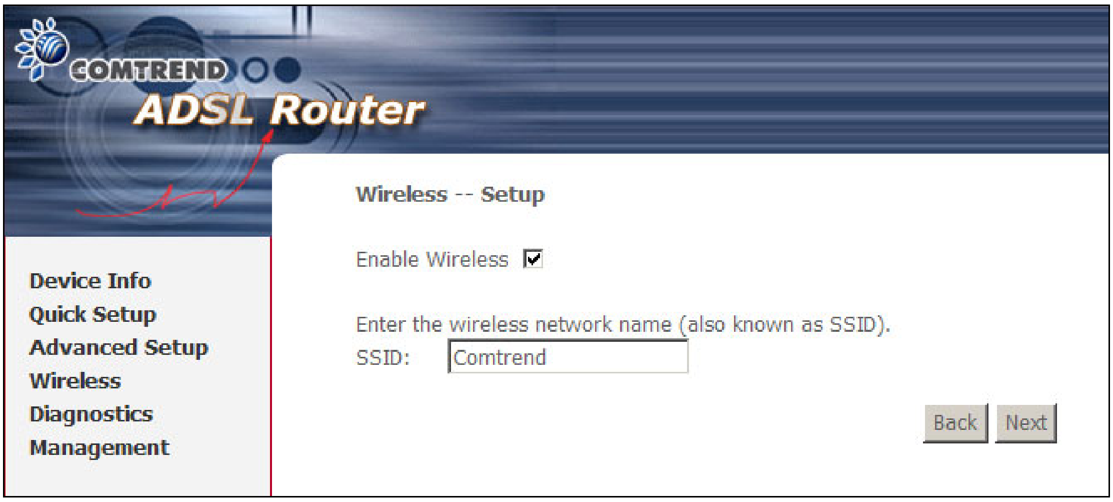


☑ Configure the second IP Address and Subnet Mask for LAN interface

IP Address:

Subnet Mask:

STEP 7: Enable (or disable) Wireless and input an SSID. Click **Next** to proceed.



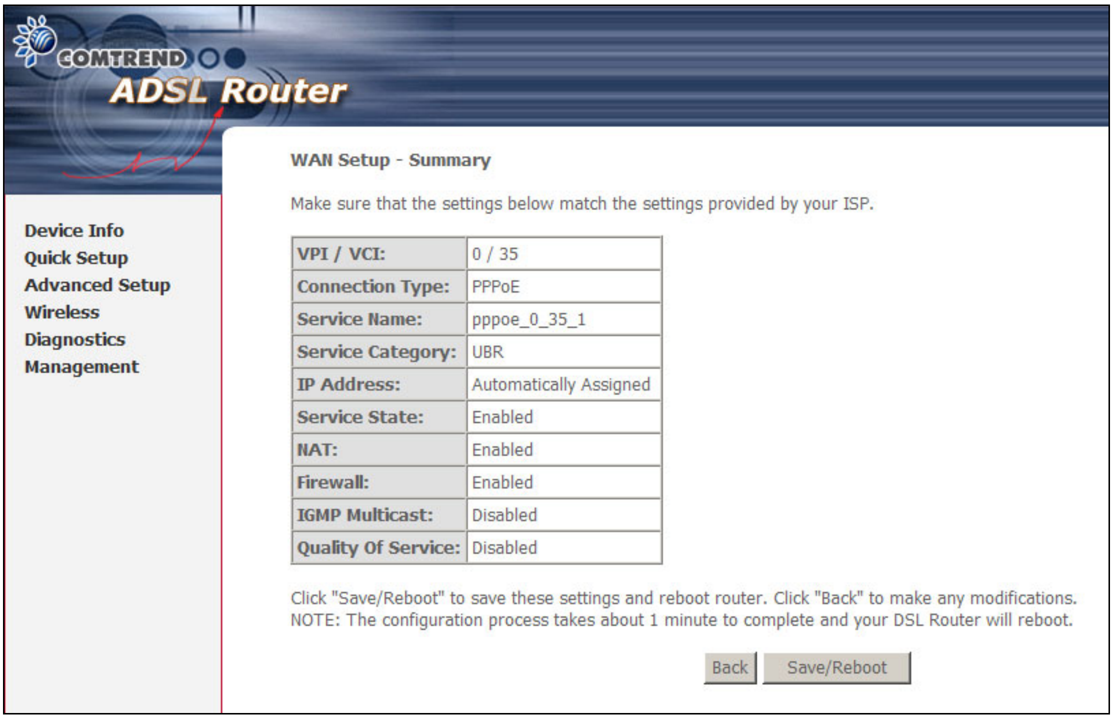
Wireless -- Setup

Enable Wireless ☑

Enter the wireless network name (also known as SSID).

SSID: Comtrend

STEP 8: Click **Next** to display the WAN Setup - Summary screen that presents the entire configuration summary. Click **Back** to modify the settings.



WAN Setup - Summary

Make sure that the settings below match the settings provided by your ISP.

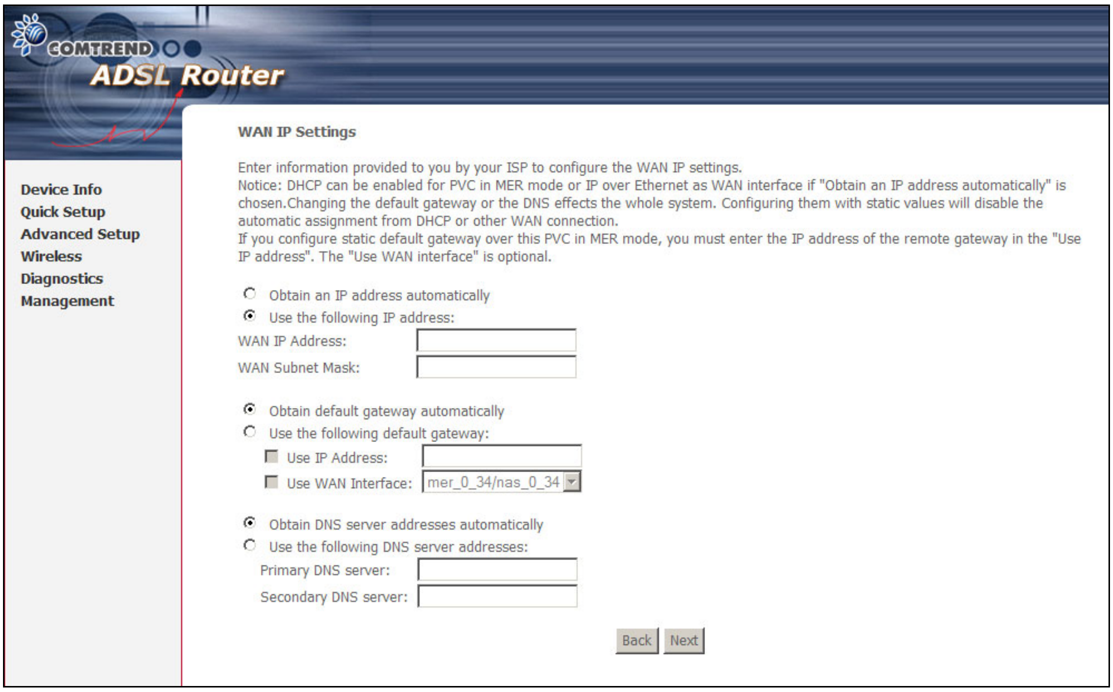
VPI / VCI:	0 / 35
Connection Type:	PPPoE
Service Name:	pppoe_0_35_1
Service Category:	UBR
IP Address:	Automatically Assigned
Service State:	Enabled
NAT:	Enabled
Firewall:	Enabled
IGMP Multicast:	Disabled
Quality Of Service:	Disabled

Click "Save/Reboot" to save these settings and reboot router. Click "Back" to make any modifications.
NOTE: The configuration process takes about 1 minute to complete and your DSL Router will reboot.

STEP 9: Click **Save/Reboot** to apply these settings. The configuration will be saved to flash memory and then the device will reboot. After the device reboots, the Web UI should refresh the browser window. If the browser does not refresh, restart the browser and login again, following the steps in subsection 3.3 Login Procedure**.**

4.2.2 MAC Encapsulation Routing (MER)

Step 4: Select MAC Encapsulation Routing (MER) and enter information provided to you by your ISP to configure the WAN IP settings. Click **Next**.



WAN IP Settings

Enter information provided to you by your ISP to configure the WAN IP settings.
Notice: DHCP can be enabled for PVC in MER mode or IP over Ethernet as WAN interface if "Obtain an IP address automatically" is chosen.Changing the default gateway or the DNS effects the whole system. Configuring them with static values will disable the automatic assignment from DHCP or other WAN connection.
If you configure static default gateway over this PVC in MER mode, you must enter the IP address of the remote gateway in the "Use IP address". The "Use WAN interface" is optional.

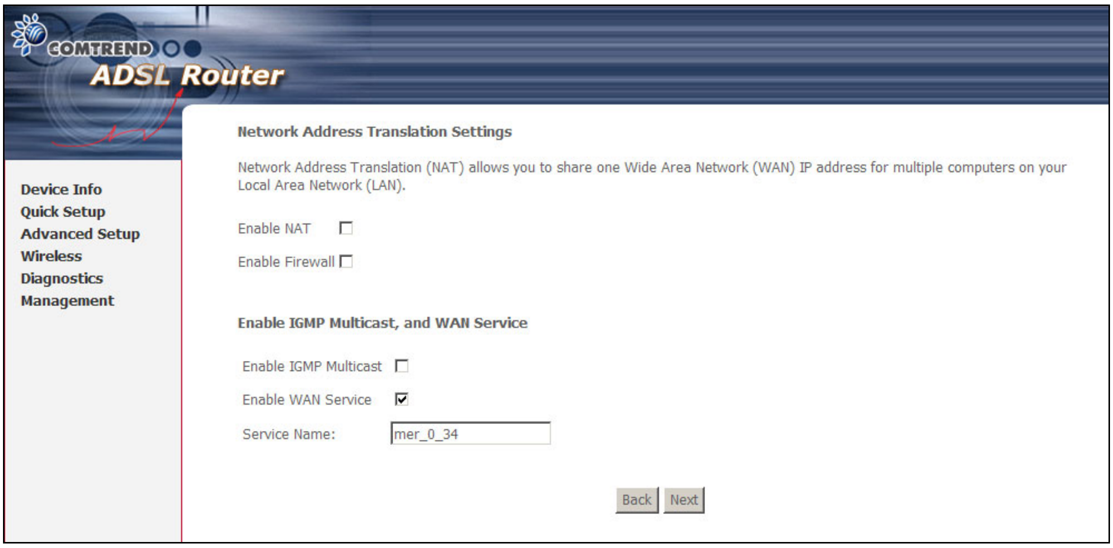
○ Obtain an IP address automatically
● Use the following IP address:
WAN IP Address:
WAN Subnet Mask:

● Obtain default gateway automatically
○ Use the following default gateway:
□ Use IP Address:
□ Use WAN Interface: mer_0_34/nas_0_34

● Obtain DNS server addresses automatically
○ Use the following DNS server addresses:
Primary DNS server:
Secondary DNS server:

DHCP is enabled in MER mode when **Obtain an IP address automatically** is chosen. Changing the default gateway or the DNS affects the whole system. Configuring them with static values will disable the automatic assignment from DHCP or other WAN connection. If you configure the static default gateway over this PVC in MER mode, you must enter the IP address of the remote gateway in the **Use IP address** field.

Step 5: This screen provides access to Network Address Translation (NAT), IGMP Multicast, and WAN Service settings. Enable each service by selecting its checkbox. When done, click **Next** to continue.



Network Address Translation Settings

Network Address Translation (NAT) allows you to share one Wide Area Network (WAN) IP address for multiple computers on your Local Area Network (LAN).

Enable NAT □

Enable Firewall □

Enable IGMP Multicast, and WAN Service

Enable IGMP Multicast □

Enable WAN Service ☑

Service Name: mer_0_34

Enable NAT
If the LAN is configured with a private IP address, the user should select this checkbox. The NAT submenu will display after the next reboot. The user can then configure NAT-related features. If a private IP address is not used on the LAN side, this checkbox should not be selected so as to free up system resources.

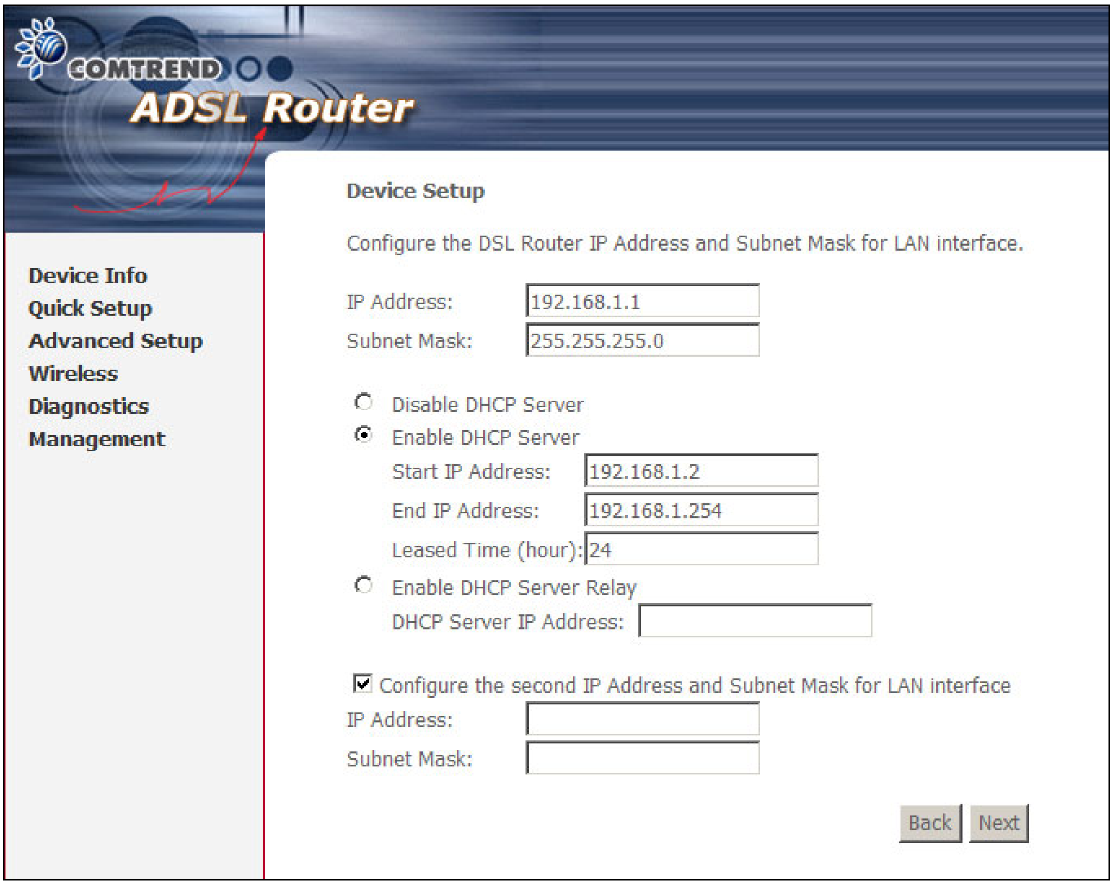
Enable Firewall
If the firewall checkbox is selected, the Security submenu will display after the next reboot. The user can then configure firewall features. If the firewall is not used, this checkbox should not be selected so as to free up system resources.

Enable IGMP Multicast (Proxy): Tick the checkbox to enable IGMP multicast. IGMP (Internet Group Membership Protocol) is a protocol used by IP hosts to report their multicast group memberships to any immediately neighboring multicast routers.

Enable WAN Service: Tick the checkbox to enable WAN service.

Service Name: This is the WAN Service label.

Step 6: Upon completion, click **Next**. The following screen appears.



Device Setup

Configure the DSL Router IP Address and Subnet Mask for LAN interface.

IP Address: 192.168.1.1
Subnet Mask: 255.255.255.0

○ Disable DHCP Server
● Enable DHCP Server
Start IP Address: 192.168.1.2
End IP Address: 192.168.1.254
Leased Time (hour): 24
○ Enable DHCP Server Relay
DHCP Server IP Address:

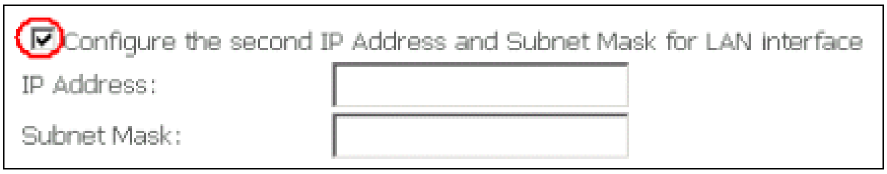
☑ Configure the second IP Address and Subnet Mask for LAN interface
IP Address:
Subnet Mask:

The Device Setup screen allows the user to configure the LAN interface IP address, subnet mask, and DHCP server. To enable DHCP, select **Enable DHCP server** and enter starting and ending IP addresses and the leased time.

This setting configures the router to automatically assign IP, default gateway and DNS server addresses to every PC on your LAN. Please be aware that the private address range (e.g. 192.168.1.2 ~ 192.168.1.254) should not include the router's LAN interface IP address (e.g. 192.168.1.1 by default). Also, the Ethernet interface and wireless LAN share the same subnet since they are bridged within the router.

Select **Enable DHCP Server Relay** (not available if **NAT** enabled), and enter the DHCP Server IP Address. This allows the Router to relay the DHCP packets to the remote DHCP server. The remote DHCP server will provide the IP address.

To configure a second IP address for the LAN port, click the box shown below.

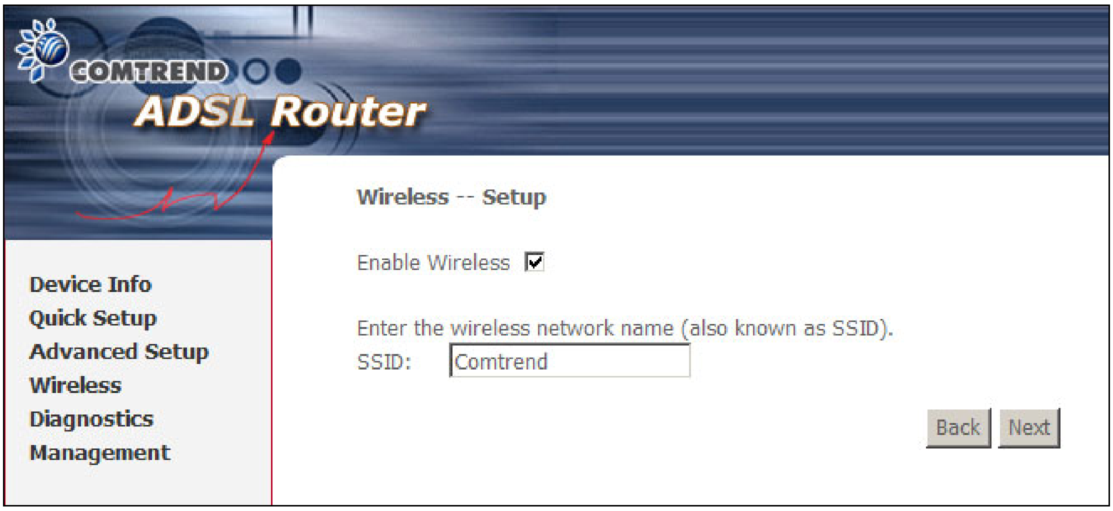


☑ Configure the second IP Address and Subnet Mask for LAN interface

IP Address:

Subnet Mask:

STEP 7: Enable (or disable) Wireless and input an SSID. Click **Next** to proceed.



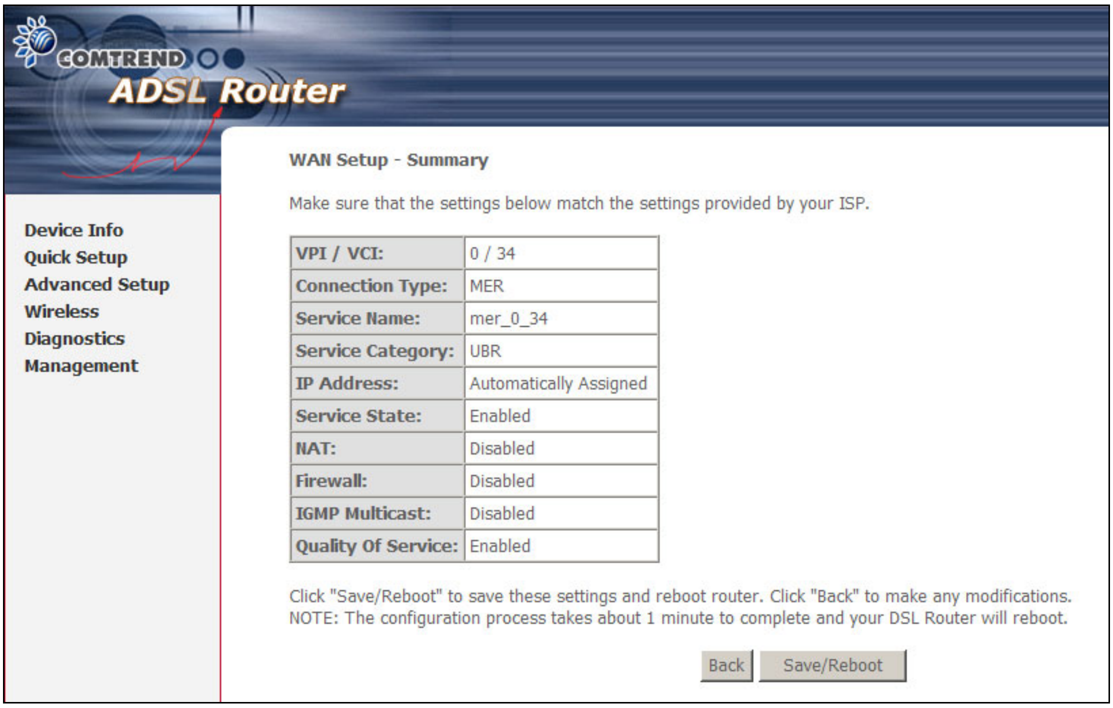
Wireless -- Setup

Enable Wireless ☑

Enter the wireless network name (also known as SSID).

SSID: Comtrend

STEP 8: Click **Next** to display the WAN Setup - Summary screen that presents the entire configuration summary. Click **Back** to modify the settings.



WAN Setup - Summary

Make sure that the settings below match the settings provided by your ISP.

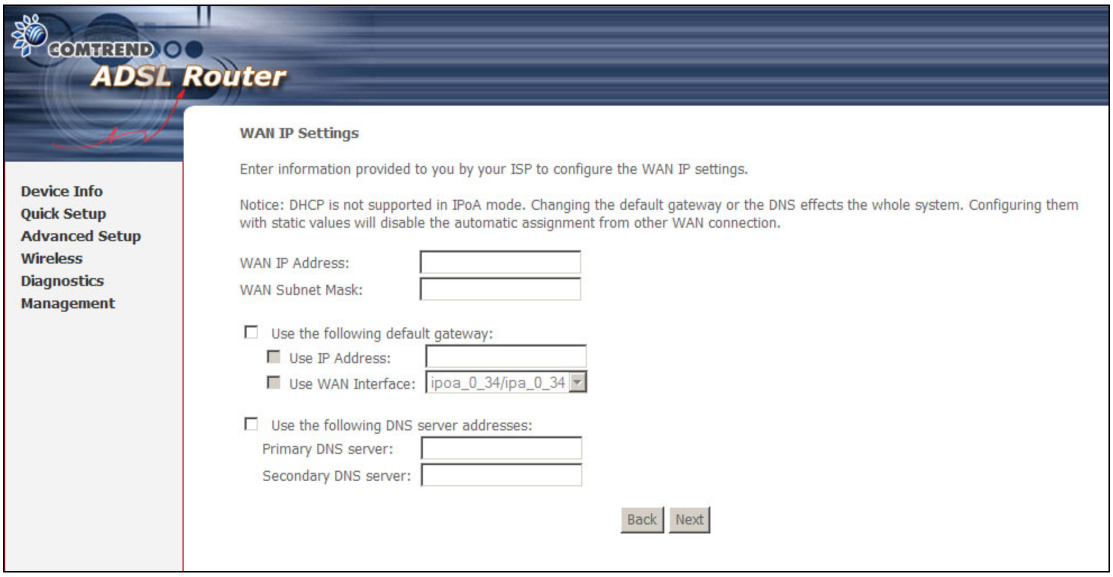
VPI / VCI:	0 / 34
Connection Type:	MER
Service Name:	mer_0_34
Service Category:	UBR
IP Address:	Automatically Assigned
Service State:	Enabled
NAT:	Disabled
Firewall:	Disabled
IGMP Multicast:	Disabled
Quality Of Service:	Enabled

Click "Save/Reboot" to save these settings and reboot router. Click "Back" to make any modifications.
NOTE: The configuration process takes about 1 minute to complete and your DSL Router will reboot.

STEP 9: Click **Save/Reboot** to apply these settings. The configuration will be saved to flash memory and then the device will reboot. After the device reboots, the Web UI should refresh the browser window. If the browser does not refresh, restart the browser and login again, following the steps in subsection 3.3 Login Procedure**.**

4.2.3 IP Over ATM

Step 4: Select IP over ATM (IPoA) and click **Next**. The following screen appears.



WAN IP Settings

Enter information provided to you by your ISP to configure the WAN IP settings.

Notice: DHCP is not supported in IPoA mode. Changing the default gateway or the DNS effects the whole system. Configuring them with static values will disable the automatic assignment from other WAN connection.

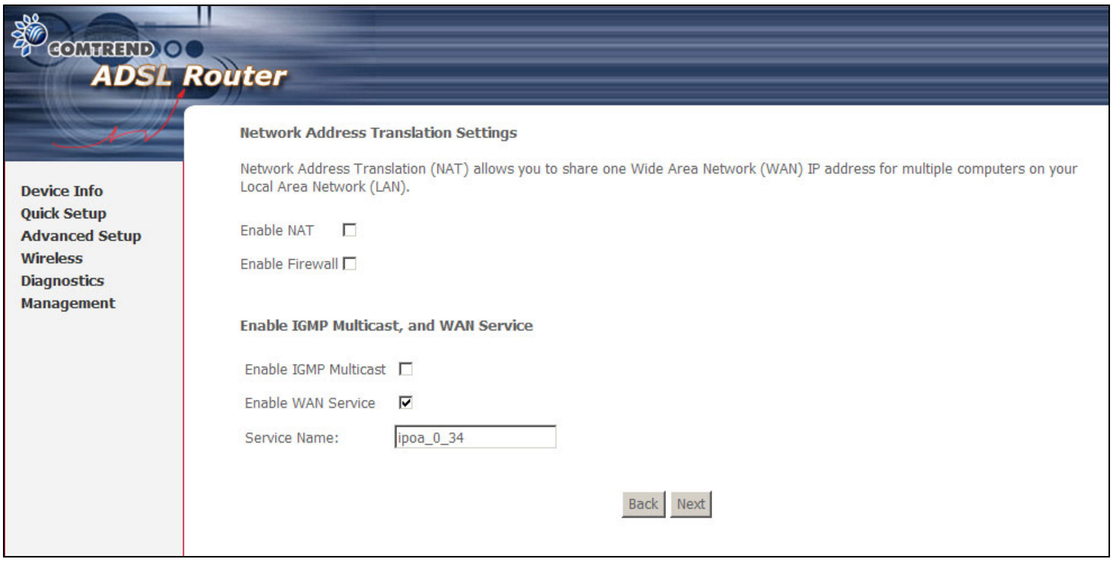
WAN IP Address:
WAN Subnet Mask:

□ Use the following default gateway:
□ Use IP Address:
□ Use WAN Interface: ipoa_0_34/ipa_0_34

□ Use the following DNS server addresses:
Primary DNS server:
Secondary DNS server:

NOTE: Since DHCP is not supported over IPoA, users must manually enter the IP address or WAN interface for the default gateway and the DNS server addresses (primary and secondary), as provided by their ISP.

Step 5: Click **Next**. The following screen appears.



Network Address Translation Settings

Network Address Translation (NAT) allows you to share one Wide Area Network (WAN) IP address for multiple computers on your Local Area Network (LAN).

Enable NAT □

Enable Firewall □

Enable IGMP Multicast, and WAN Service

Enable IGMP Multicast □

Enable WAN Service ☑

Service Name: ipoa_0_34

Enable NAT
If the LAN is configured with a private IP address, the user should select this checkbox. The NAT submenu will display after the next reboot. The user can then configure NAT-related features. If a private IP address is not used on the LAN side, this checkbox should not be selected so as to free up system resources.

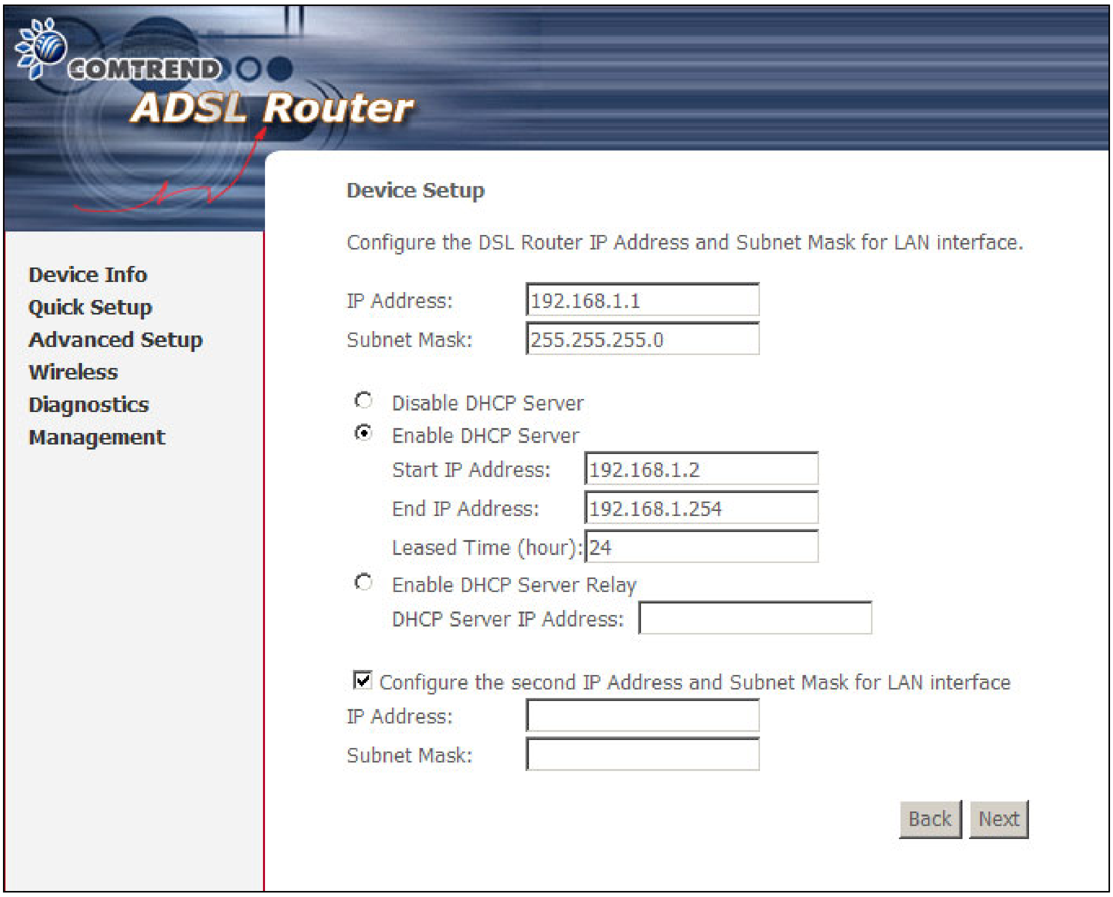
Enable Firewall
If the firewall checkbox is selected, the Security submenu will display after the next reboot. The user can then configure firewall features. If the firewall is not used, this checkbox should not be selected so as to free up system resources.

Enable IGMP Multicast (Proxy): Tick the checkbox to enable IGMP multicast. IGMP (Internet Group Membership Protocol) is a protocol used by IP hosts to report their multicast group memberships to any immediately neighboring multicast routers.

Enable WAN Service: Tick the checkbox to enable WAN service.

Service Name: This is the WAN Service label.

Step 6: Click **Next** to display the following screen.



Device Setup

Configure the DSL Router IP Address and Subnet Mask for LAN interface.

IP Address: 192.168.1.1
Subnet Mask: 255.255.255.0

○ Disable DHCP Server
● Enable DHCP Server
Start IP Address: 192.168.1.2
End IP Address: 192.168.1.254
Leased Time (hour): 24
○ Enable DHCP Server Relay
DHCP Server IP Address:

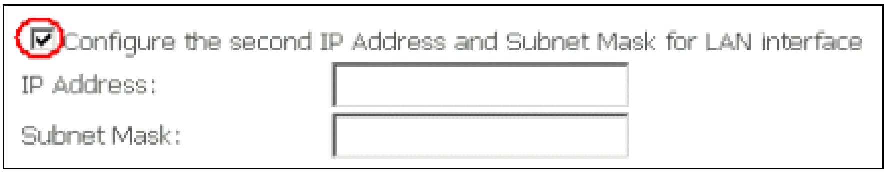
☑ Configure the second IP Address and Subnet Mask for LAN interface
IP Address:
Subnet Mask:

The Device Setup screen allows the user to configure the LAN interface IP address, subnet mask, and DHCP server. To enable DHCP, select **Enable DHCP server** and enter starting and ending IP addresses and the leased time.

This setting configures the router to automatically assign IP, default gateway and DNS server addresses to every PC on your LAN. Please be aware that the private address range (e.g. 192.168.1.2 ~ 192.168.1.254) should not include the router’s LAN interface IP address (e.g. 192.168.1.1 by default). Also, the Ethernet interface and wireless LAN share the same subnet since they are bridged within the router.

Select **Enable DHCP Server Relay** (not available if **NAT** enabled), and enter the DHCP Server IP Address. This allows the Router to relay the DHCP packets to the remote DHCP server. The remote DHCP server will provide the IP address.

To configure a second IP address for the LAN port, click the box shown below.

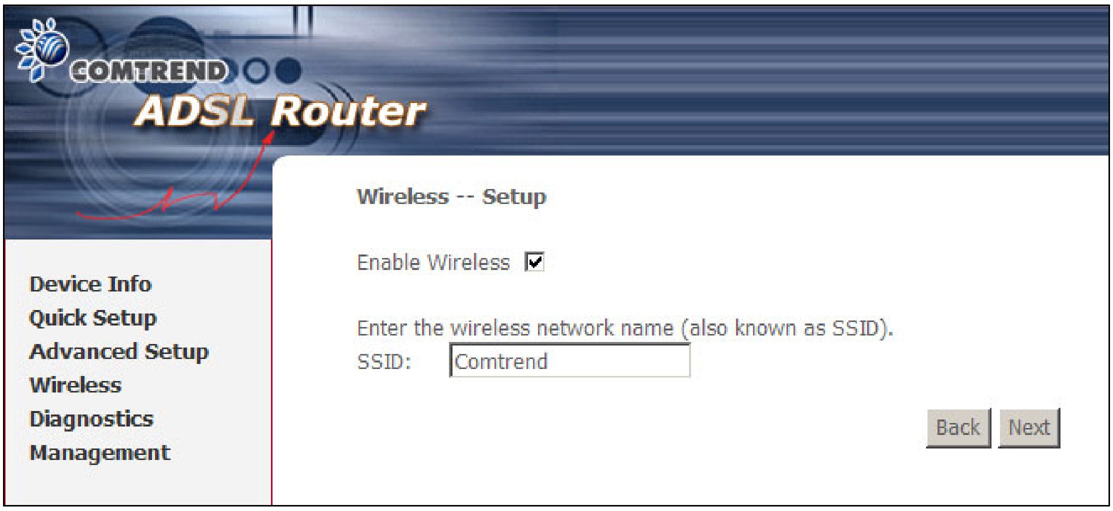


☑ Configure the second IP Address and Subnet Mask for LAN interface

IP Address:

Subnet Mask:

STEP 7: Enable (or disable) Wireless and input an SSID. Click **Next** to proceed.



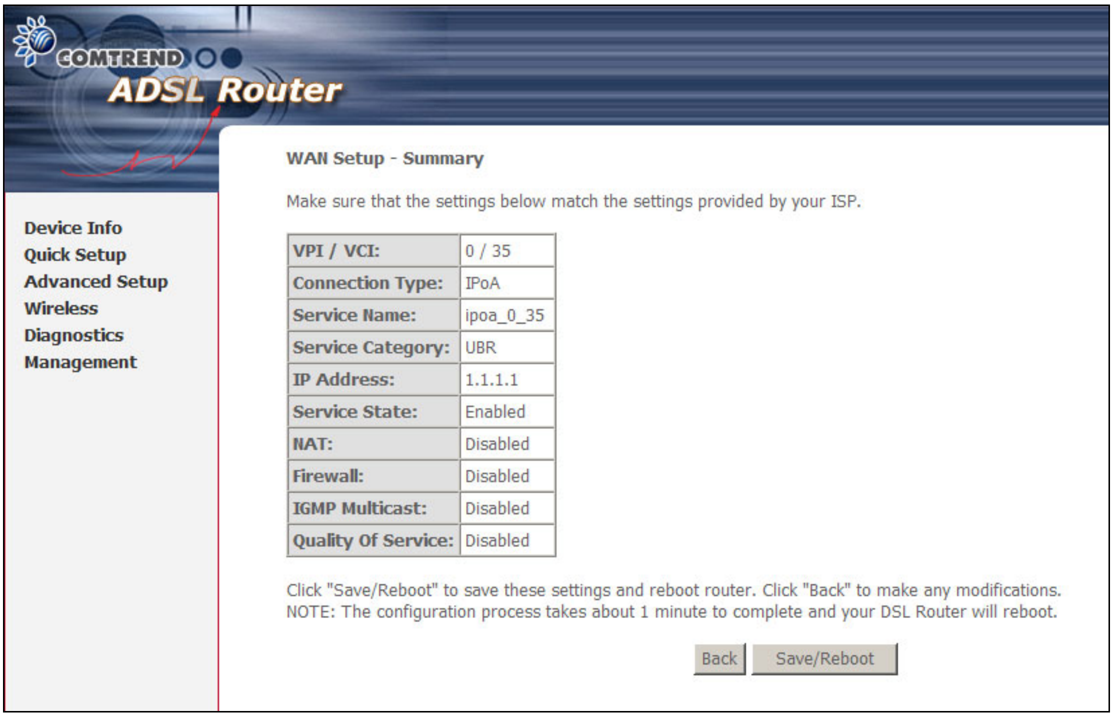
Wireless -- Setup

Enable Wireless ☑

Enter the wireless network name (also known as SSID).

SSID: Comtrend

STEP 8: Click **Next** to display the WAN Setup - Summary screen that presents the entire configuration summary. Click **Back** to modify the settings.



WAN Setup - Summary

Make sure that the settings below match the settings provided by your ISP.

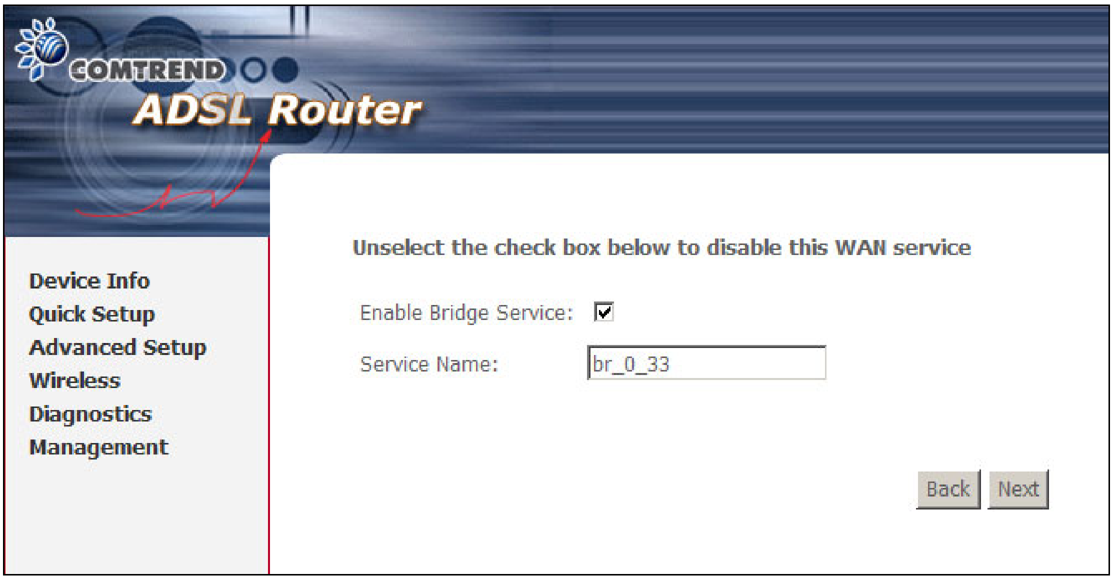
VPI / VCI:	0 / 35
Connection Type:	IPoA
Service Name:	ipoa_0_35
Service Category:	UBR
IP Address:	1.1.1.1
Service State:	Enabled
NAT:	Disabled
Firewall:	Disabled
IGMP Multicast:	Disabled
Quality Of Service:	Disabled

Click "Save/Reboot" to save these settings and reboot router. Click "Back" to make any modifications.
NOTE: The configuration process takes about 1 minute to complete and your DSL Router will reboot.

STEP 9: Click **Save/Reboot** to apply these settings. The configuration will be saved to flash memory and then the device will reboot. After the device reboots, the Web UI should refresh the browser window. If the browser does not refresh, restart the browser and login again, following the steps in subsection 3.3 Login Procedure**.**

4.2.4 Bridging

Step 4: Select Bridging and click **Next**. To enable bridging service, tick the **Enable Bridge Service** checkbox and enter a **Service Name**.

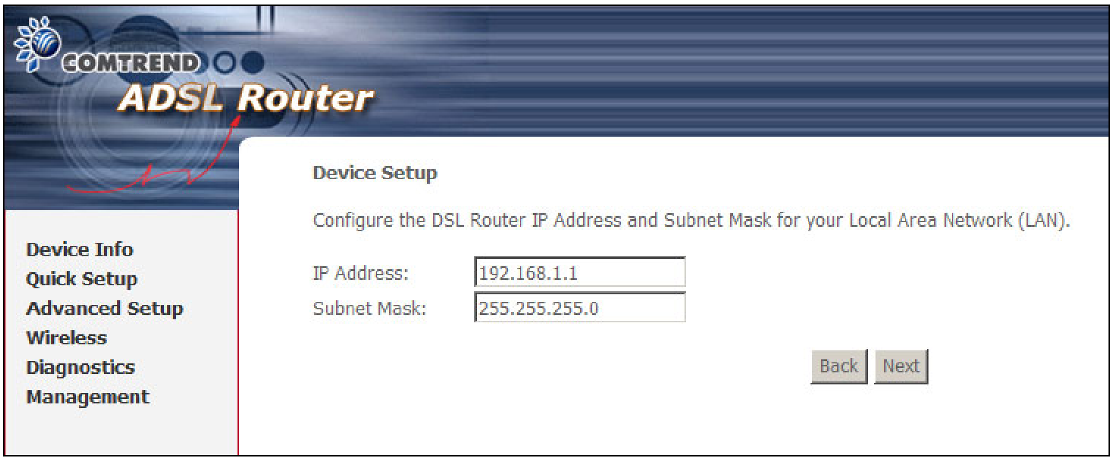


Unselect the check box below to disable this WAN service

Enable Bridge Service: ☑

Service Name: br_0_33

Step 5: Click the **Next** button to continue. On this screen, you may enter the IP address and Subnet Mask for the LAN interface. Click **Next**.



Device Setup

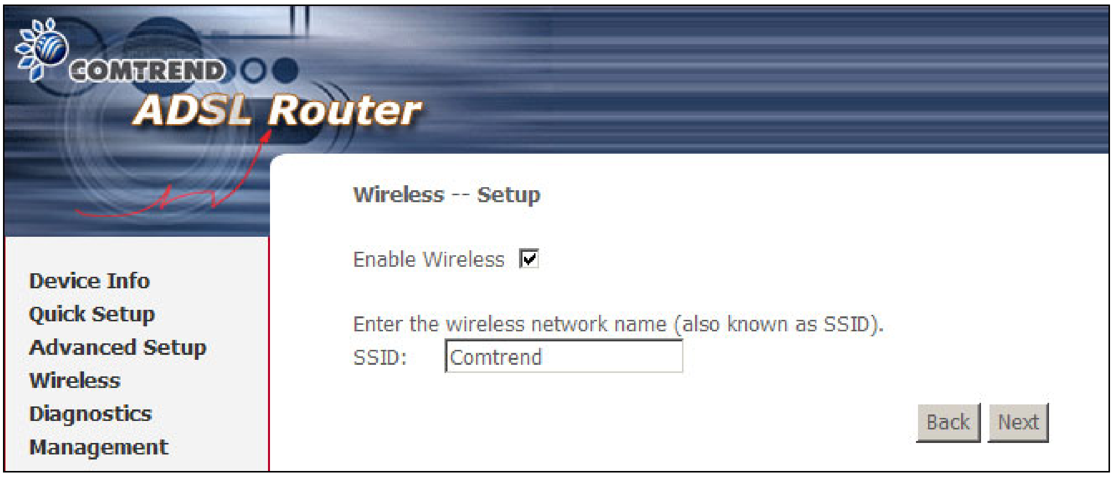
Configure the DSL Router IP Address and Subnet Mask for your Local Area Network (LAN).

IP Address: 192.168.1.1

Subnet Mask: 255.255.255.0

NOTE: The LAN IP interface in bridge mode is needed for local users to manage the device. In addition, there is no IP address for the WAN interface and therefore the device cannot be accessed remotely in this mode.

STEP 6: Enable (or disable) Wireless and input an SSID. Click **Next** to proceed.



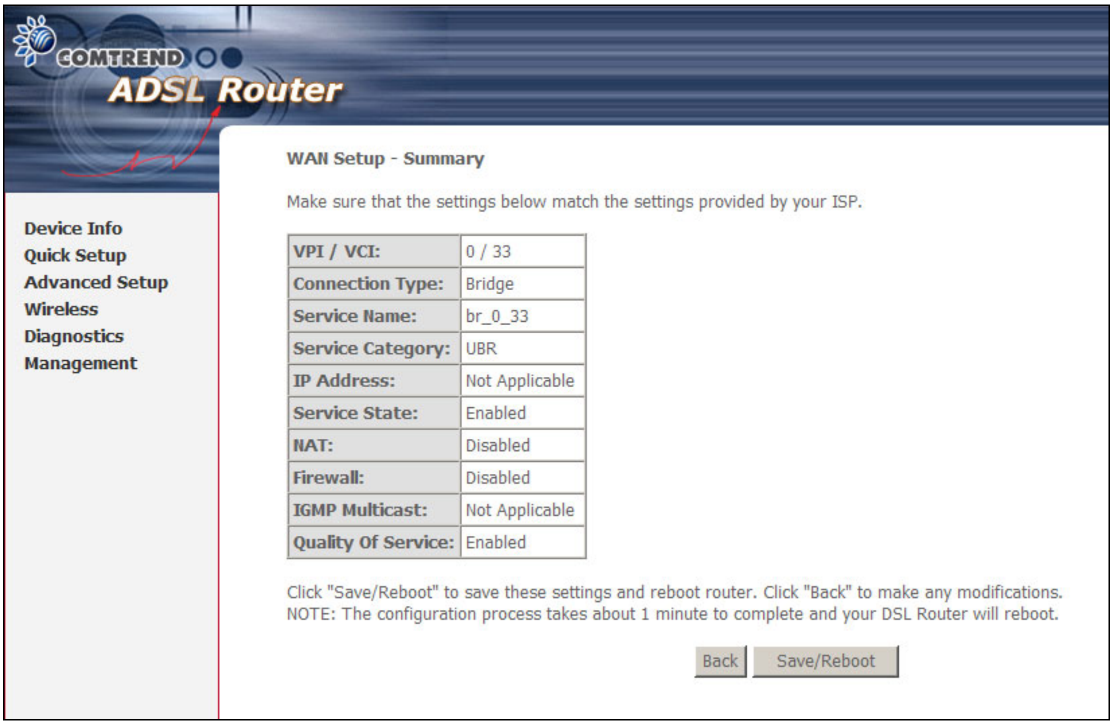
Wireless -- Setup

Enable Wireless ☑

Enter the wireless network name (also known as SSID).

SSID: Comtrend

STEP 7: Click **Next** to display the WAN Setup - Summary screen that presents the entire configuration summary. Click **Back** to modify the settings.



WAN Setup - Summary

Make sure that the settings below match the settings provided by your ISP.

VPI / VCI:	0 / 33
Connection Type:	Bridge
Service Name:	br_0_33
Service Category:	UBR
IP Address:	Not Applicable
Service State:	Enabled
NAT:	Disabled
Firewall:	Disabled
IGMP Multicast:	Not Applicable
Quality Of Service:	Enabled

Click "Save/Reboot" to save these settings and reboot router. Click "Back" to make any modifications.
NOTE: The configuration process takes about 1 minute to complete and your DSL Router will reboot.

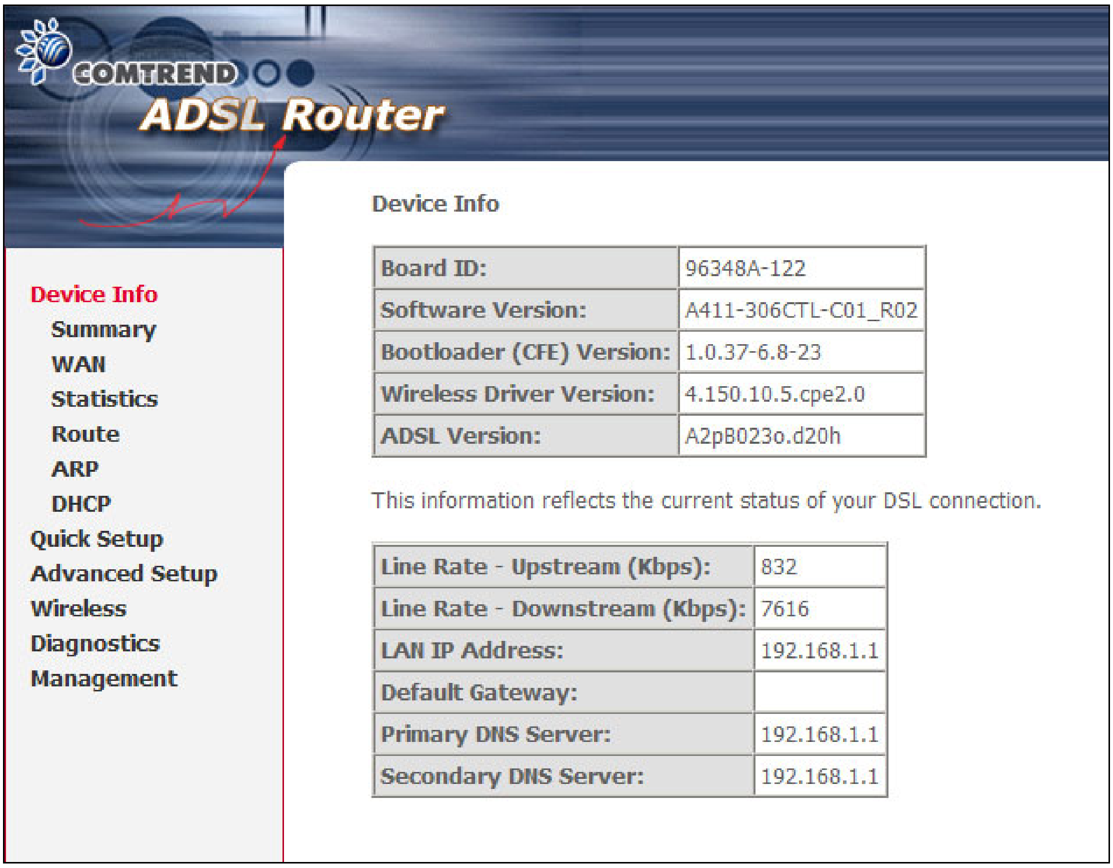
STEP 8: Click **Save/Reboot** to apply these settings. The configuration will be saved to flash memory and then the device will reboot. After the device reboots, the Web UI should refresh the browser window. If the browser does not refresh, restart the browser and login again, following the steps in subsection 3.3 Login Procedure**.**

Chapter 5 Device Information

The web user interface screen is divided into two parts, the main menu (at left) and the display screen (on the right). The main menu has the following options: Device Info, Advanced Setup, Wireless, Diagnostics, and Management. Selecting one of these options will open a submenu with more options.

NOTE:	The menu items shown are based upon the configured connection and user account privileges (i.e. local or remote). For example, in the Advanced Setup menu, if NAT and Firewall are enabled, the main menu will display the NAT and Security submenus. If either is disabled, their corresponding menu(s) will also be disabled.

Device Info is the first selection on the main menu so it will be discussed first. Subsequent chapters will introduce the other main menu options in sequence.



Device Info

Board ID:	96348A-122
Software Version:	A411-306CTL-C01_R02
Bootloader (CFE) Version:	1.0.37-6.8-23
Wireless Driver Version:	4.150.10.5.cpe2.0
ADSL Version:	A2pB023o.d20h

This information reflects the current status of your DSL connection.

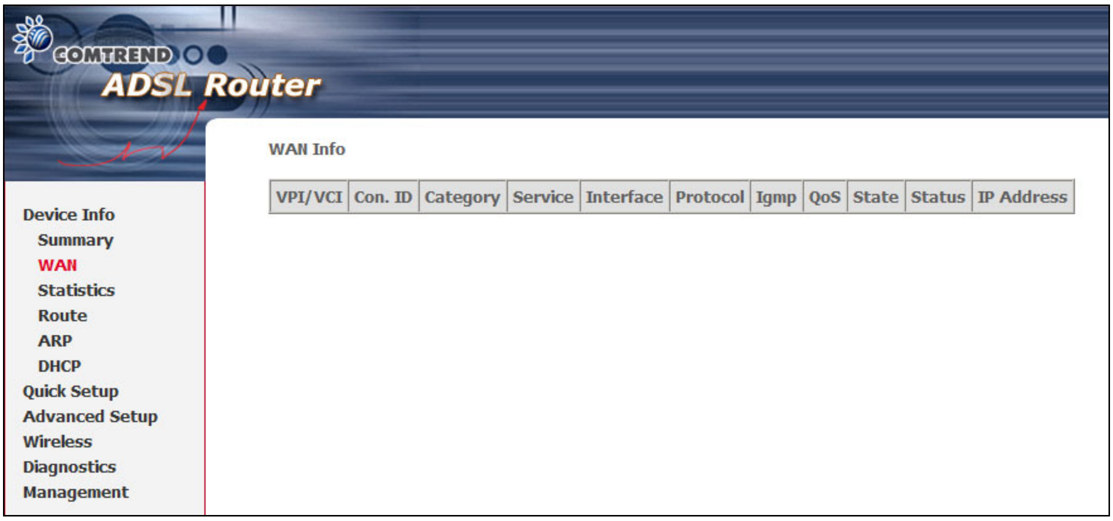
Line Rate - Upstream (Kbps):	832
Line Rate - Downstream (Kbps):	7616
LAN IP Address:	192.168.1.1
Default Gateway:	
Primary DNS Server:	192.168.1.1
Secondary DNS Server:	192.168.1.1

The Device Info Summary screen (shown above) is the default startup screen.

It provides summary information such as device hardware and software versions, data transmission (line rates) and IP Configuration settings.

5.1 WAN

Select WAN from the Device Info submenu to display the configured PVC(s).



WAN Info

VPI/VCI	Con. ID	Category	Service	Interface	Protocol	Igmp	QoS	State	Status	IP Address

The column headings above are described in the table below.

Heading	Description
VPI/VCI	Shows the values of the ATM VPI/VCI
Con. ID	Shows the connection ID
Category	Shows the ATM service classes
Service	Shows the name for WAN connection
Interface	Shows connection interfaces
Protocol	Shows the connection type, such as PPPoE, PPPoA, etc.
IGMP	Shows the state of the IGMP function
QoS	Shows if IGMP IP QoS is enabled or disabled
State	Shows the connection state of the WAN connection
Status	Lists the status of DSL link
IP Address	Shows IP address for WAN interface

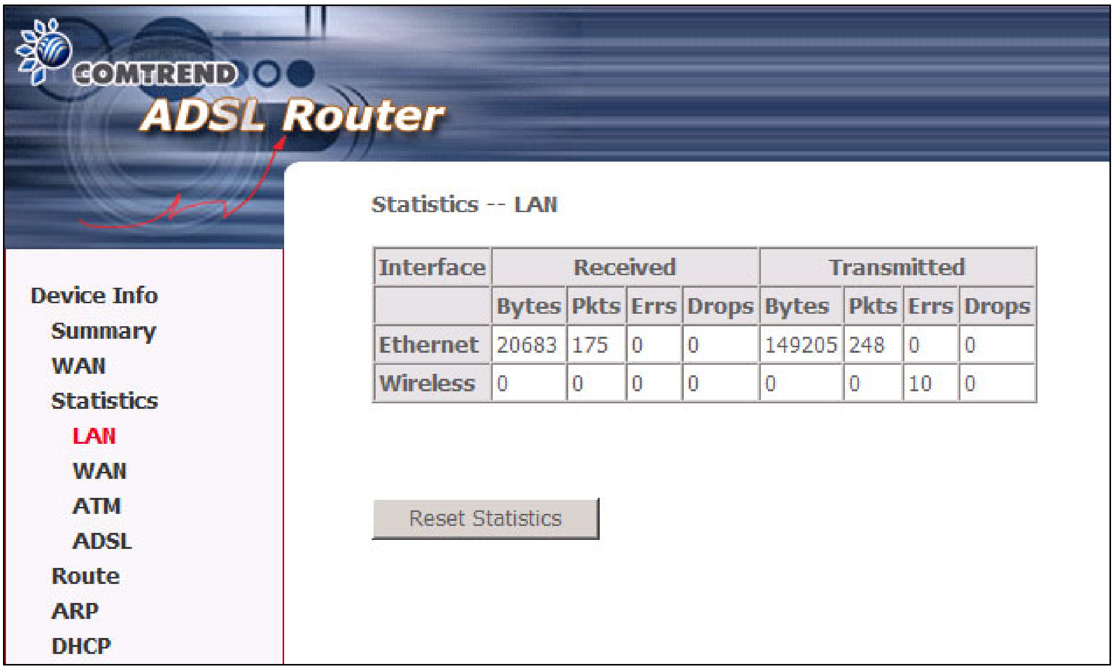
5.2 Statistics

The Statistics submenu provides detailed information for LAN and WAN interfaces.

NOTE: These statistics refresh every 15 seconds.

5.2.1 LAN Statistics

This screen shows statistics for every LAN interface.



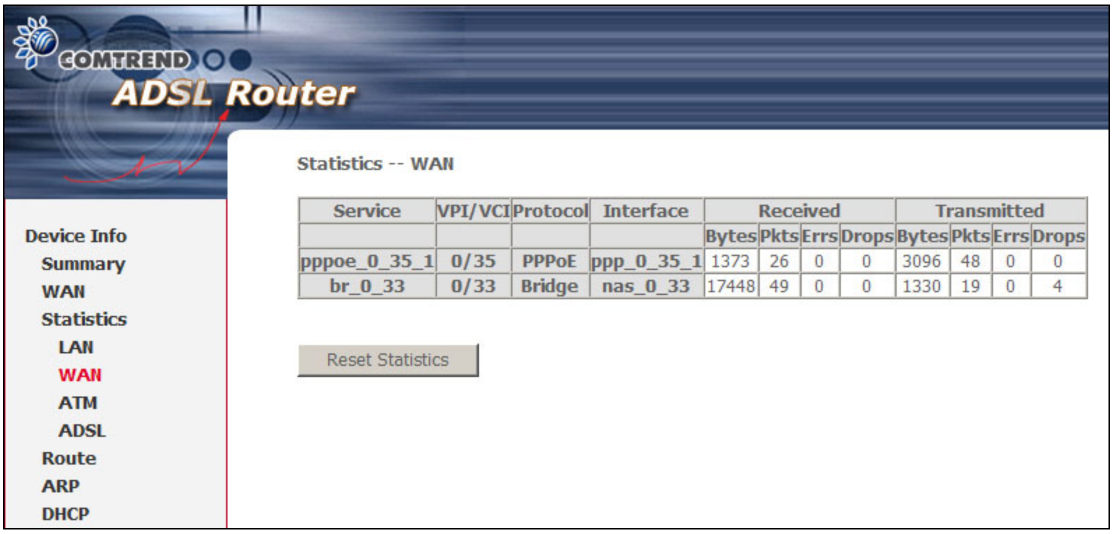
Statistics -- LAN

Interface	Received				Transmitted			
	Bytes	Pkts	Errs	Drops	Bytes	Pkts	Errs	Drops
Ethernet	20683	175	0	0	149205	248	0	0
Wireless	0	0	0	0	0	0	10	0

Heading	Description
Interface	LAN connections
Received/Transmitted - Bytes - Pkts - Errs - Drops	Rx/TX (receive/transmit) packet in bytes Rx/TX (receive/transmit) packets Rx/TX (receive/transmit) packets with errors Rx/TX (receive/transmit) packets dropped

5.2.2 WAN Statistics

This screen shows statistics for interfaces on the WAN.



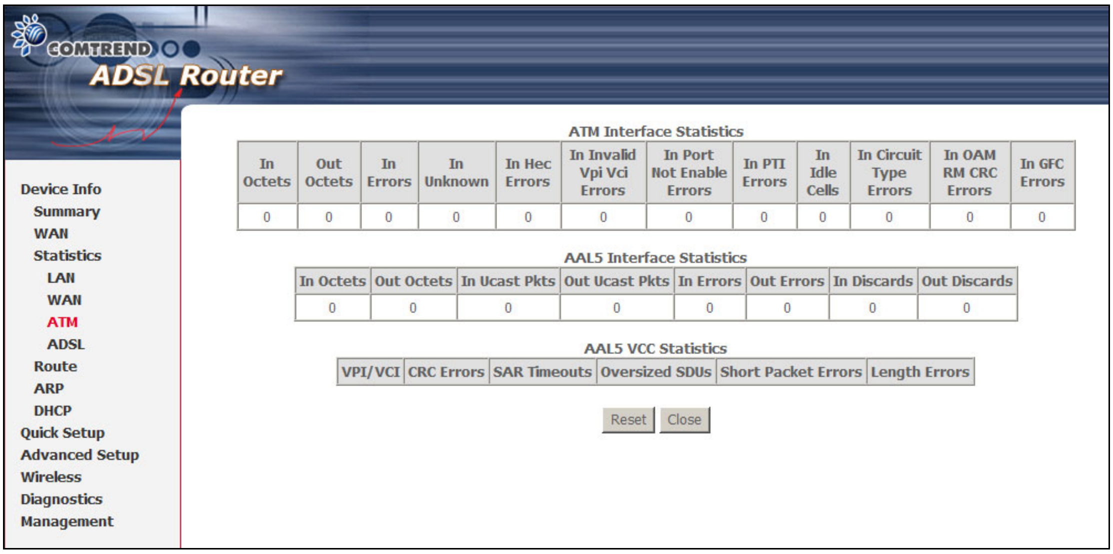
Statistics -- WAN

Service	VPI/VCI	Protocol	Interface	Received				Transmitted			
				Bytes	Pkts	Errs	Drops	Bytes	Pkts	Errs	Drops
pppoe_0_35_1	0/35	PPPoE	ppp_0_35_1	1373	26	0	0	3096	48	0	0
br_0_33	0/33	Bridge	nas_0_33	17448	49	0	0	1330	19	0	4

Heading	Description
Service	WAN service label
VPI/VCI	ATM Virtual Path/Channel Identifiers
Protocol	Connection type (e.g. PPPoE, IPoA, Bridge)
Interface	Connection interfaces are listed in the following format: ppp/nas_(VPI number_VCI number). These interface labels are auto-assigned.
Received/Transmitted - Bytes - Pkts - Errs - Drops	Rx/TX (receive/transmit) packet in bytes Rx/TX (receive/transmit) packets Rx/TX (receive/transmit) packets with errors Rx/TX (receive/transmit) packets dropped

5.2.3 ATM statistics

The following figure shows the ATM statistics screen.



ATM Interface Statistics

In Octets	Out Octets	In Errors	In Unknown	In Hec Errors	In Invalid Vpi Vci Errors	In Port Not Enable Errors	In PTI Errors	In Idle Cells	In Circuit Type Errors	In OAM RM CRC Errors	In GFC Errors
0	0	0	0	0	0	0	0	0	0	0	0

AAL5 Interface Statistics

In Octets	Out Octets	In Ucast Pkts	Out Ucast Pkts	In Errors	Out Errors	In Discards	Out Discards
0	0	0	0	0	0	0	0

AAL5 VCC Statistics

VPI/VCI	CRC Errors	SAR Timeouts	Oversized SDUs	Short Packet Errors	Length Errors

ATM Interface Statistics

Heading	Description
In Octets	Number of received octets over the interface
Out Octets	Number of transmitted octets over the interface
In Errors	Number of cells dropped due to uncorrectable HEC errors
In Unknown	Number of received cells discarded during cell header validation, including cells with unrecognized VPI/VCI values, and cells with invalid cell header patterns. If cells with undefined PTI values are discarded, they are also counted here.
In Hec Errors	Number of cells received with an ATM Cell Header HEC error
In Invalid Vpi Vci Errors	Number of cells received with an unregistered VCC address
In Port Not Enable Errors	Number of cells received on a port that has not been enabled
In PTI Errors	Number of cells received with an ATM header Payload Type Indicator (PTI) error
In Idle Cells	Number of idle cells received
In Circuit Type Errors	Number of cells received with an illegal circuit type
In OAM RM CRC Errors	Number of OAM and RM cells received with CRC errors
In GFC Errors	Number of cells received with a non-zero GFC

ATM AAL5 Layer Statistics over ADSL interface

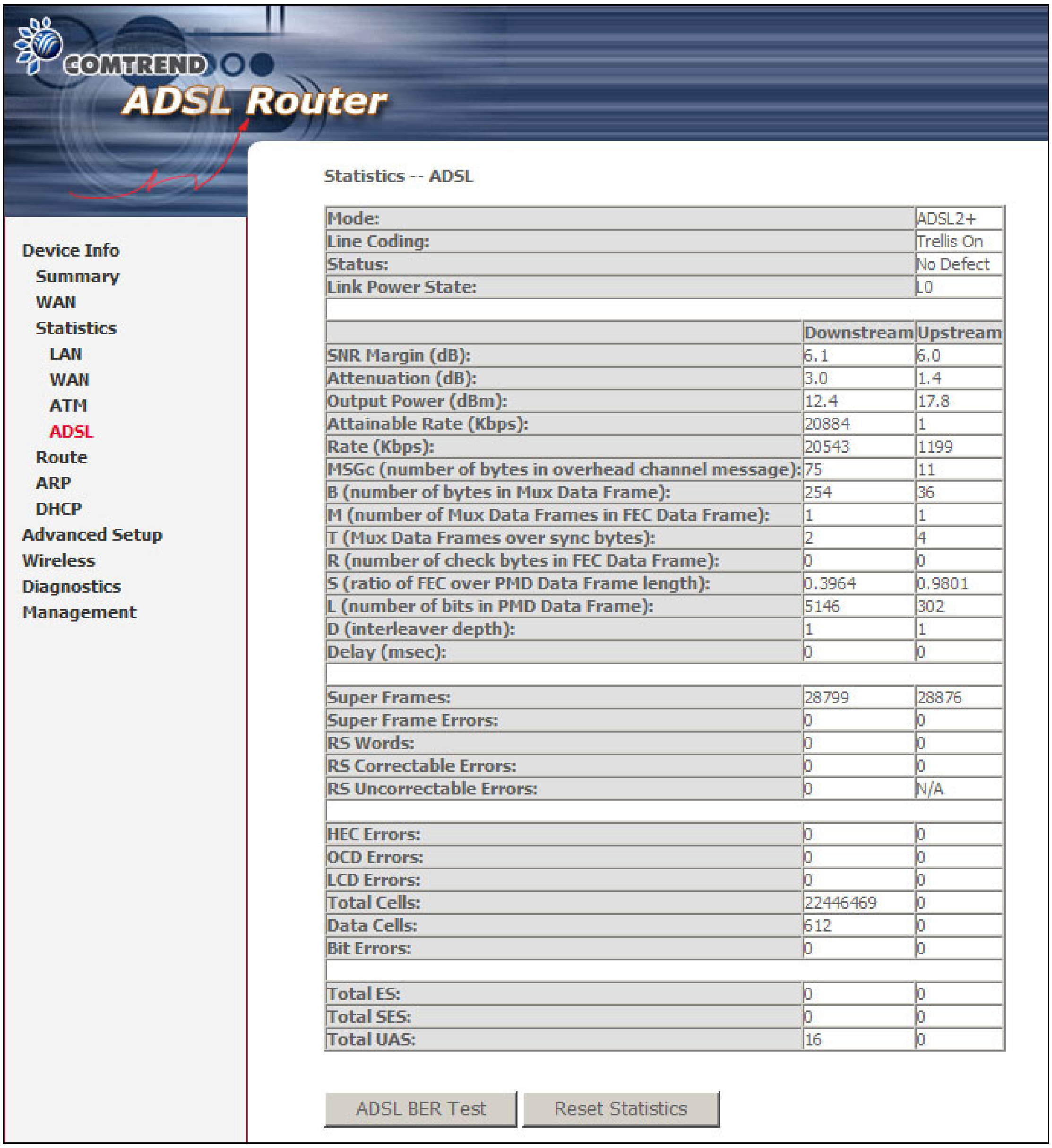
Heading	Description
In Octets	Number of received AAL5/AAL0 CPCS PDU octets
Out Octets	Number of AAL5/AAL0 CPCS PDU octets transmitted
In Ucast Pkts	Number of received AAL5/AAL0 CPCS PDU passed to a higher-layer
Out Ucast Pkts	Number of received AAL5/AAL0 CPCS PDU received from a higher layer for transmission
In Errors	Number of received AAL5/AAL0 CPCS PDU in error. The types of errors counted include CRC-32 errors.
Out Errors	Number of received AAL5/AAL0 CPCS PDU that could not be transmitted due to errors.
In Discards	Number of received AAL5/AAL0 CPCS PDU discarded due to an "input buffer overflow" condition.
Out Discards	This field is not currently used

ATM AAL5 Layer Statistics for each VCC over ADSL interface

Heading	Description
VPI/VCI	ATM Virtual Path/Channel Identifiers
CRC Errors	Number of PDUs received with CRC-32 errors
SAR Timeouts	Number of partially re-assembled PDUs that were discarded because they were not fully re-assembled within the required period of time. If the re-assembly time is not supported then, this object contains a zero value.
Over Sized SDUs	Number of PDUs discarded because the corresponding SDU was too large
Short Packet Errors	Number of PDUs discarded because the PDU length was less than the size of the AAL5 trailer
Length Errors	Number of PDUs discarded because the PDU length did not match the length in the AAL5 trailer

5.2.4 ADSL Statistics

The following figure shows the ADSL Network Statistics screen in ADSL2+ mode.



Statistics -- ADSL

Mode:		ADSL2+
Line Coding:		Trellis On
Status:		No Defect
Link Power State:		L0
	Downstream	Upstream
SNR Margin (dB):	6.1	6.0
Attenuation (dB):	3.0	1.4
Output Power (dBm):	12.4	17.8
Attainable Rate (Kbps):	20884	1
Rate (Kbps):	20543	1199
MSGc (number of bytes in overhead channel message):	75	11
B (number of bytes in Mux Data Frame):	254	36
M (number of Mux Data Frames in FEC Data Frame):	1	1
T (Mux Data Frames over sync bytes):	2	4
R (number of check bytes in FEC Data Frame):	0	0
S (ratio of FEC over PMD Data Frame length):	0.3964	0.9801
L (number of bits in PMD Data Frame):	5146	302
D (interleaver depth):	1	1
Delay (msec):	0	0
Super Frames:	28799	28876
Super Frame Errors:	0	0
RS Words:	0	0
RS Correctable Errors:	0	0
RS Uncorrectable Errors:	0	N/A
HEC Errors:	0	0
OCD Errors:	0	0
LCD Errors:	0	0
Total Cells:	22446469	0
Data Cells:	612	0
Bit Errors:	0	0
Total ES:	0	0
Total SES:	0	0
Total UAS:	16	0

Click the **Reset Statistics** button to refresh the screen.

Heading	Description
Mode	T1.413, G.lite, G.DMT, ADSL2/2+ or Re-ADSL
Type	Channel type Interleave or Fast (not shown in all modes)
Line Coding	Line Coding format, that can be selected G.dmt, G.lite, T1.413, ADSL2, Annex L and Annex M
Status	Lists the status of the DSL link
Link Power State	Link output power state.

SNR Margin (dB)	Signal to Noise Ratio (SNR) margin
Attenuation (dB)	Estimate of average loop attenuation in the downstream direction.
Output Power (dBm)	Total upstream output power
Attainable Rate (Kbps)	The sync rate you would obtain.
Rate (Kbps)	Current sync rate.

In G.DMT mode, the following section is inserted.

K	Number of bytes in DMT frame
R	Number of check bytes in RS code word
S	RS code word size in DMT frame
D	The interleaver depth
Delay	The delay in milliseconds (msec)

In ADSL2+ mode, the following section is inserted.

MSGc	Number of bytes in overhead channel message
B	Number of bytes in Mux Data Frame
M	Number of Mux Data Frames in FEC Data Frame
T	Max Data Frames over sync bytes
R	Number of check bytes in FEC Data Frame
S	Ratio of FEC over PMD Data Frame length
L	Number of bits in PMD Data Frame
D	The interleaver depth
Delay	The delay in milliseconds (msec)

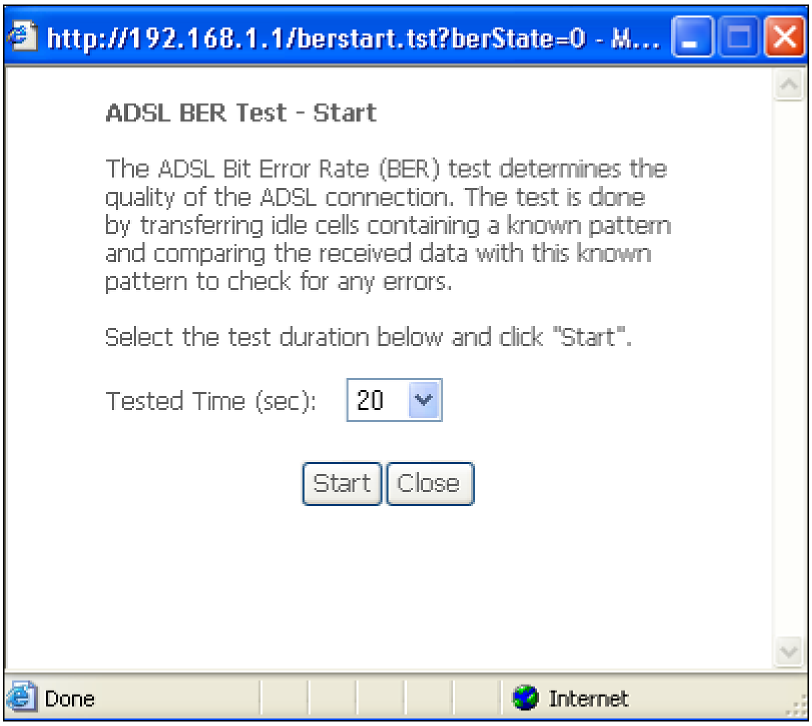
Super Frames	Total number of super frames
Super Frame Errors	Number of super frames received with errors
RS Words	Total number of Reed-Solomon code errors
RS Correctable Errors	Total Number of RS with correctable errors
RS Uncorrectable Errors	Total Number of RS words with uncorrectable errors

HEC Errors	Total Number of Header Error Checksum errors
OCD Errors	Total Number of out-of-cell Delineation errors
LCD Errors	Total number of Loss of Cell Delineation
Total Cells	Total number of ATM cells (including idle and data cells)
Data Cells	Total number of ATM data cells
Bit Errors	Total number of bit errors

In ADSL2+ mode, the following section is inserted.

Total ES:	Total Number of Errored Seconds
Total SES:	Total Number of Severely Errored Seconds
Total UAS:	Total Number of Unavailable Seconds

Within the ADSL Statistics window, a Bit Error Rate (BER) test can be started using the **ADSL BER Test** button. A small window will open when the button is pressed; it will appear as shown below. Click **Start** to start the test or **Close**.



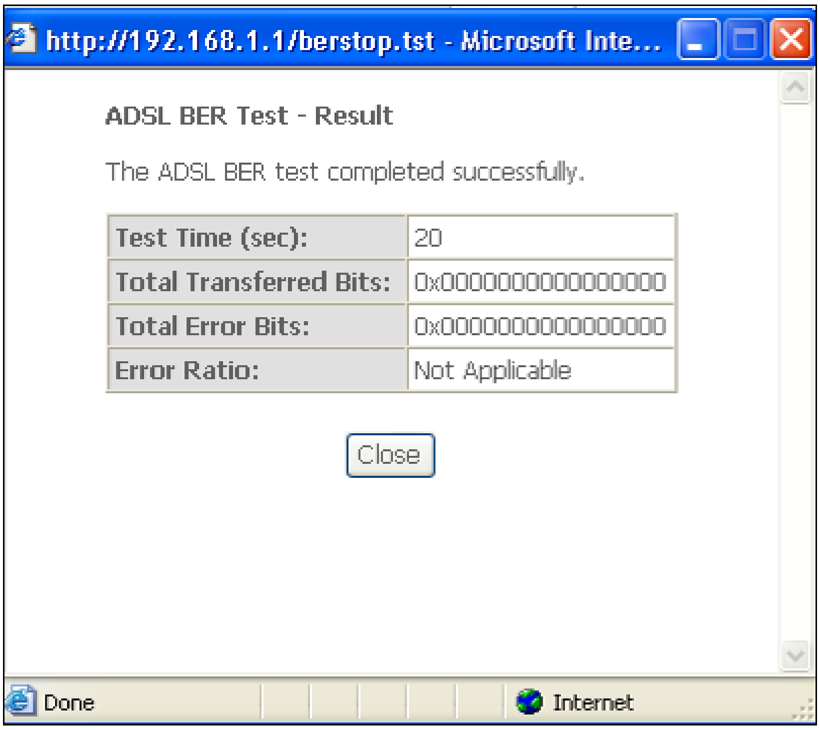
ADSL BER Test - Start

The ADSL Bit Error Rate (BER) test determines the quality of the ADSL connection. The test is done by transferring idle cells containing a known pattern and comparing the received data with this known pattern to check for any errors.

Select the test duration below and click "Start".

Tested Time (sec): 20

If the test is successful, the pop-up window will display as follows.



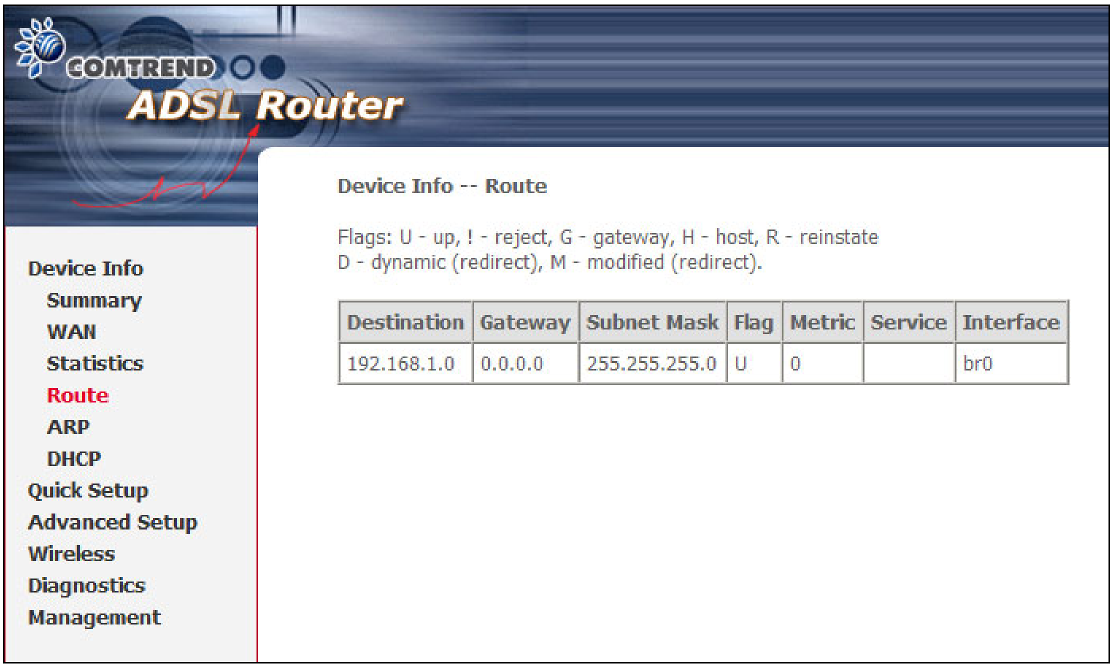
ADSL BER Test - Result

The ADSL BER test completed successfully.

Test Time (sec):	20
Total Transferred Bits:	0x0000000000000000
Total Error Bits:	0x0000000000000000
Error Ratio:	Not Applicable

5.3 Route

Choose Route to display the routes the device has found.



Device Info -- Route

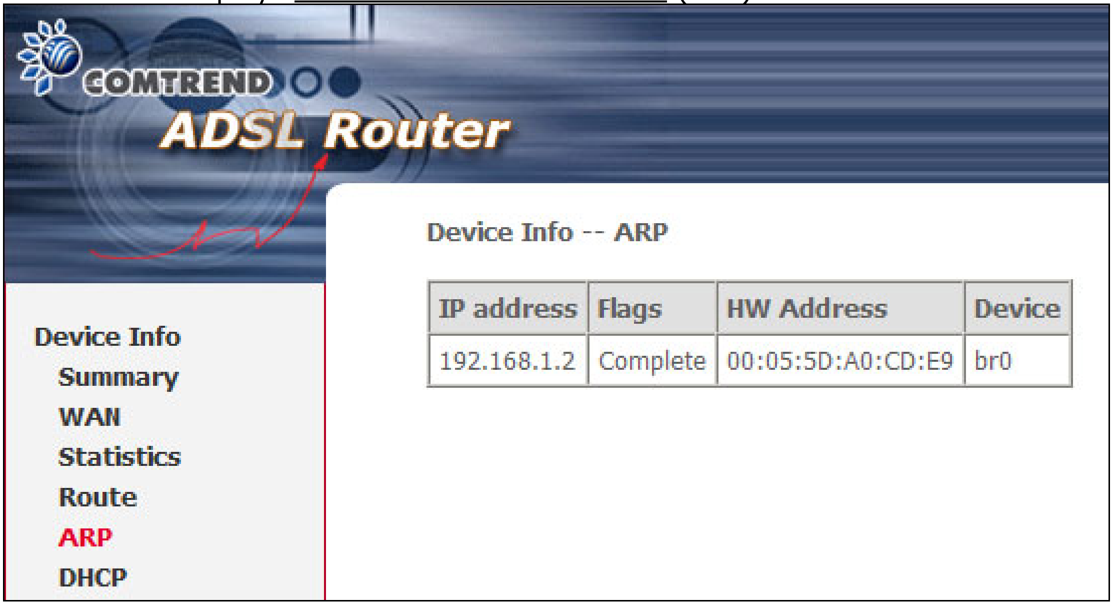
Flags: U - up, ! - reject, G - gateway, H - host, R - reinstate
D - dynamic (redirect), M - modified (redirect).

Destination	Gateway	Subnet Mask	Flag	Metric	Service	Interface
192.168.1.0	0.0.0.0	255.255.255.0	U	0		br0

Heading	Description
Destination	Destination network or destination host
Gateway	Next hub IP address
Subnet Mask	Subnet Mask of Destination
Flag	U: route is up !: reject route G: use gateway H: target is a host R: reinstate route for dynamic routing D: dynamically installed by daemon or redirect M: modified from routing daemon or redirect
Metric	The 'distance' to the target (usually counted in hops). It is not used by recent kernels, but may be needed by routing daemons.
Service	Shows the name for WAN connection
Interface	Shows connection interfaces

5.4 ARP

This screens displays Address Resolution Protocol (ARP) related information.



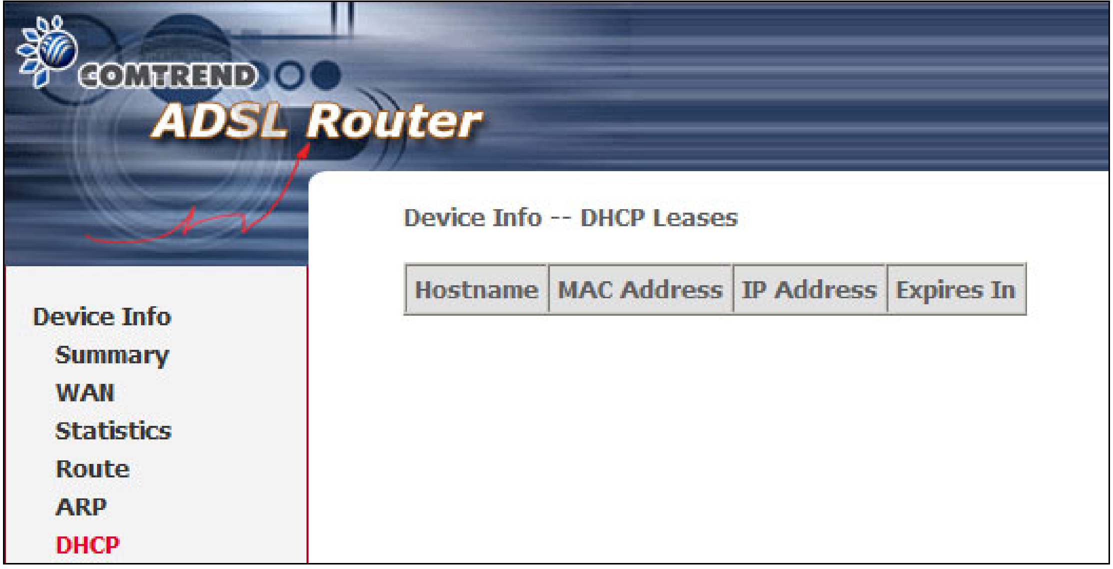
Device Info -- ARP

IP address	Flags	HW Address	Device
192.168.1.2	Complete	00:05:5D:A0:CD:E9	br0

Heading	Description
IP address	Shows IP address of host pc
Flags	Complete, Incomplete, Permanent, or Publish
HW Address	Shows the MAC address of host pc
Device	Shows the connection interface

5.5 DHCP

Click **DHCP** to display the DHCP information.



Device Info -- DHCP Leases

Hostname	MAC Address	IP Address	Expires In

Heading	Description
Hostname	Shows the device/host/PC network name
MAC Address	Shows the Ethernet MAC address of the device/host/PC
IP address	Shows IP address of device/host/PC
Expires In	Shows how much time is left for each DHCP Lease

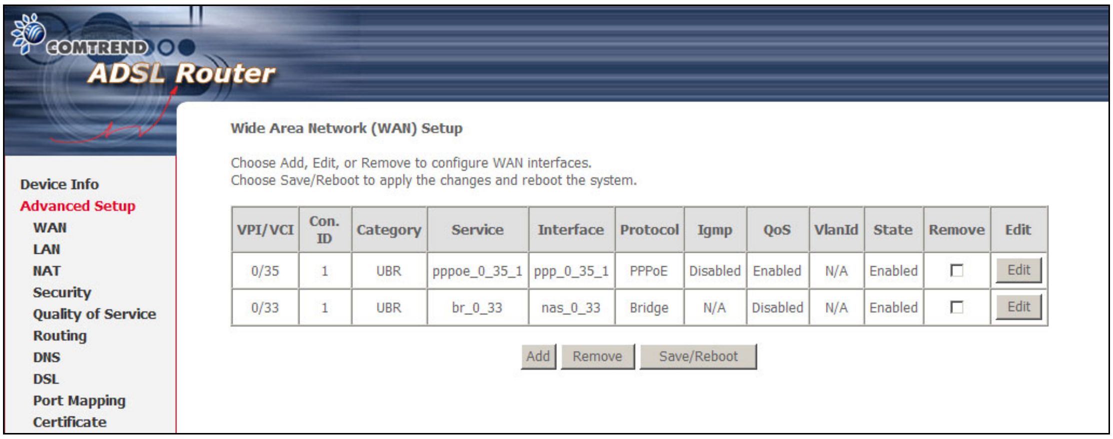
Chapter 6 Advanced Setup

This chapter explains the following advanced setup screens:

6.1 WAN

Follow these steps to configure the WAN interfaces.

STEP 1: To **Add** a new WAN connection, click the **Add** button. To edit an existing connection, click the **Edit** button next to the connection. To complete either an Add or **Edit**, go to STEP 2 in section 4.2 Manual Quick Setup.



Wide Area Network (WAN) Setup

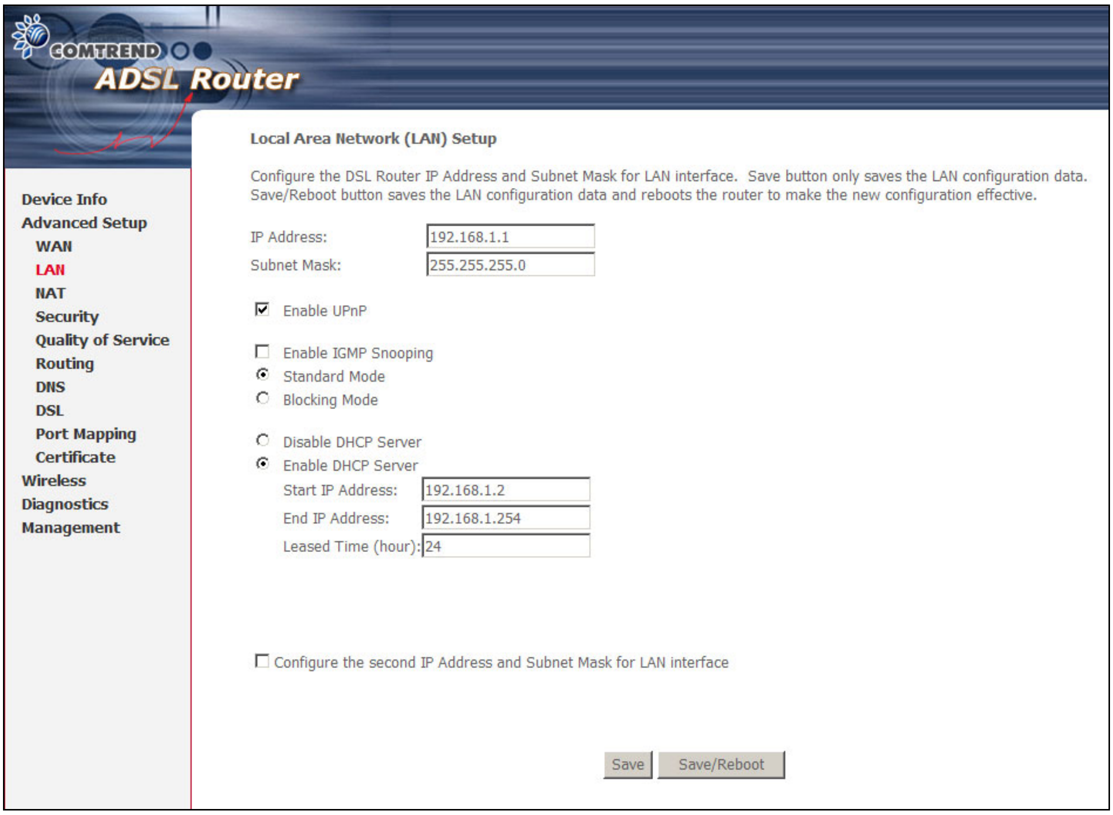
Choose Add, Edit, or Remove to configure WAN interfaces.
Choose Save/Reboot to apply the changes and reboot the system.

VPI/VCI	Con. ID	Category	Service	Interface	Protocol	Igmp	QoS	VlanId	State	Remove	Edit
0/35	1	UBR	pppoe_0_35_1	ppp_0_35_1	PPPoE	Disabled	Enabled	N/A	Enabled	□	Edit
0/33	1	UBR	br_0_33	nas_0_33	Bridge	N/A	Disabled	N/A	Enabled	□	Edit

Heading	Description
VPI/VCI	ATM VPI (0-255) / VCI (32-65535)
Con. ID	WAN connection ID number
Category	ATM service category
Service	Name of the WAN connection
Interface	Name of the interface for WAN
Protocol	Shows the connection type
IGMP	Shows enable or disable IGMP proxy
QoS	Shows if IP QoS is enabled or disabled
VlanId	VLAN ID is used for VLAN Tagging (IEEE 802.1Q)
State	Shows the connection state of the WAN connection
Remove	To remove a connection select the radio button in this column and click the **Remove** button under the table.
Edit	Used to edit connections

6.2 LAN

This screen allows the user to configure the LAN Interface on the device.



Local Area Network (LAN) Setup

Configure the DSL Router IP Address and Subnet Mask for LAN interface. Save button only saves the LAN configuration data. Save/Reboot button saves the LAN configuration data and reboots the router to make the new configuration effective.

IP Address: 192.168.1.1

Subnet Mask: 255.255.255.0

☑ Enable UPnP

□ Enable IGMP Snooping

● Standard Mode

○ Blocking Mode

○ Disable DHCP Server

● Enable DHCP Server

Start IP Address: 192.168.1.2

End IP Address: 192.168.1.254

Leased Time (hour): 24

□ Configure the second IP Address and Subnet Mask for LAN interface

NOTE: NAT is enabled above so **UPnP** is shown (see underlined notes below).

Consult the field descriptions below for more details.

IP Address: Enter the IP address for the LAN port.

Subnet Mask: Enter the subnet mask for the LAN port.

Enable UPnP: Tick the box to enable Universal Plug and Play.
This option is hidden when NAT disabled or if no PVC exists

Enable IGMP Snooping: Enable by ticking the checkbox.

Standard Mode**:** In standard mode, multicast traffic will flood all bridge ports when no client is subscribed to a multicast group.

Blocking Mode**:** In blocking mode, the multicast data traffic will be blocked and not flood all bridge ports when no client is subscribed to a multicast group.

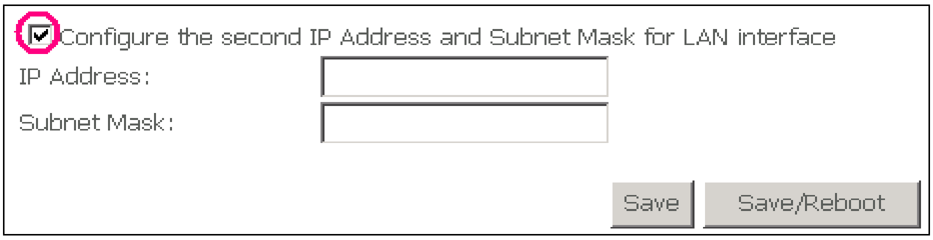
DHCP Server: To enable DHCP, select **Enable DHCP server** and enter starting and ending IP addresses and the leased time. This setting configures the router to automatically assign IP, default gateway and DNS server addresses to every PC on your LAN.

DHCP Server Relay: Enable with checkbox and enter DHCP Server IP address. This allows the Router to relay the DHCP packets to the remote DHCP server. The remote DHCP server will provide the IP address. *This option is hidden if NAT is enabled*

Configure the second IP address by ticking the checkbox shown below.

IP Address: Enter the secondary IP address for the LAN port.

Subnet Mask: Enter the secondary subnet mask for the LAN port.



☑ Configure the second IP Address and Subnet Mask for LAN interface

IP Address:

Subnet Mask:

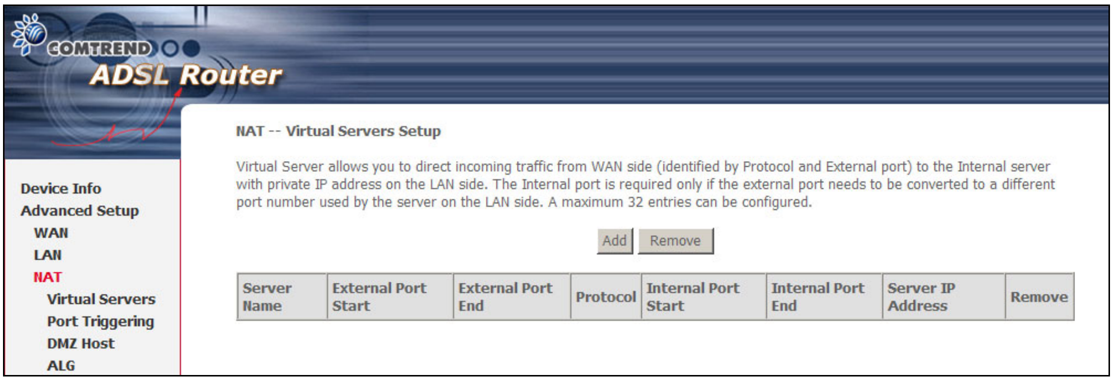
NOTE: The **Save** button saves new settings to allow continued configuration while the **Save/Reboot** button not only saves new settings but also reboots the device to apply the new configuration (i.e. all new settings).

6.3 NAT

To display this option, NAT must be enabled in at least one PVC shown on the Advanced WAN Setup screen. (*NAT is not an available option in Bridge mode*)

6.3.1 Virtual Servers

Virtual Servers allow you to direct incoming traffic from the WAN side (identified by Protocol and External port) to the Internal server with private IP addresses on the LAN side. The Internal port is required only if the external port needs to be converted to a different port number used by the server on the LAN side.
A maximum of 32 entries can be configured.

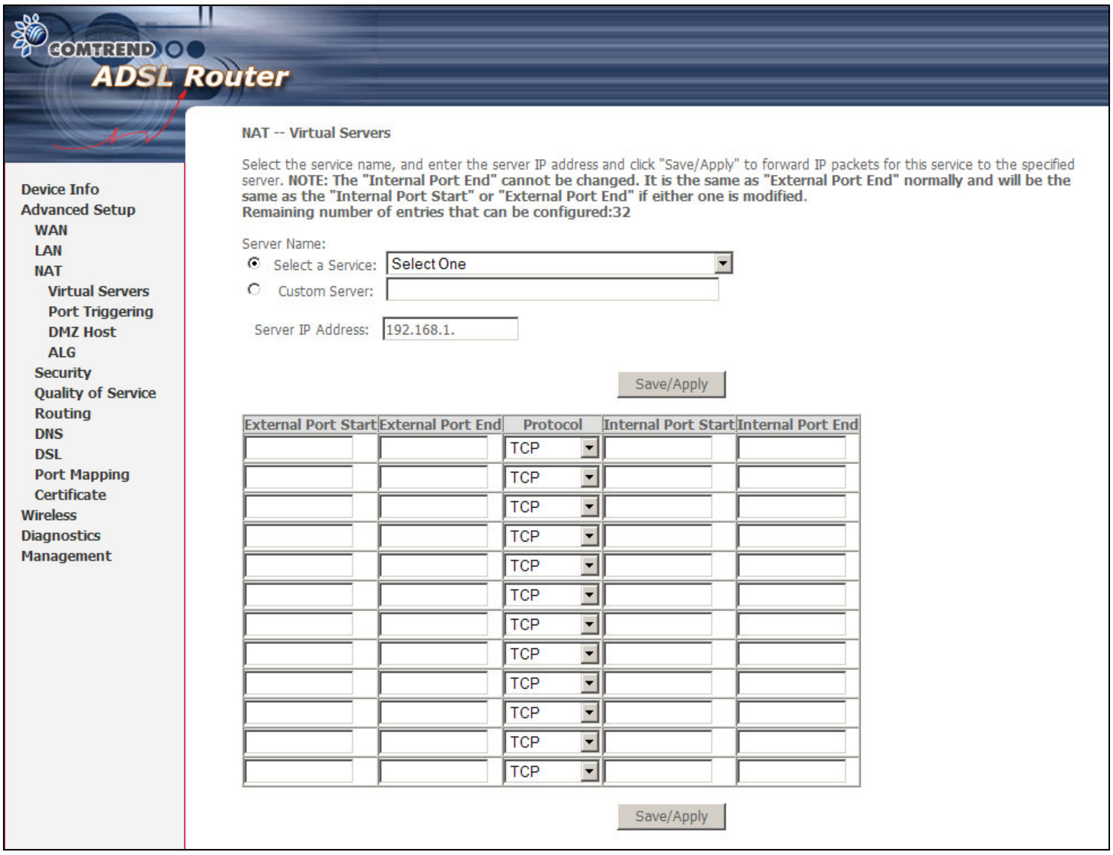


NAT -- Virtual Servers Setup

Virtual Server allows you to direct incoming traffic from WAN side (identified by Protocol and External port) to the Internal server with private IP address on the LAN side. The Internal port is required only if the external port needs to be converted to a different port number used by the server on the LAN side. A maximum 32 entries can be configured.

Server Name	External Port Start	External Port End	Protocol	Internal Port Start	Internal Port End	Server IP Address	Remove

To add a Virtual Server, simply click the **Add** button. The following will be displayed.



NAT -- Virtual Servers

Select the service name, and enter the server IP address and click "Save/Apply" to forward IP packets for this service to the specified server. **NOTE: The "Internal Port End" cannot be changed. It is the same as "External Port End" normally and will be the same as the "Internal Port Start" or "External Port End" if either one is modified.**
Remaining number of entries that can be configured:32

Server Name:
● Select a Service: Select One
○ Custom Server:

Server IP Address: 192.168.1.

Save/Apply

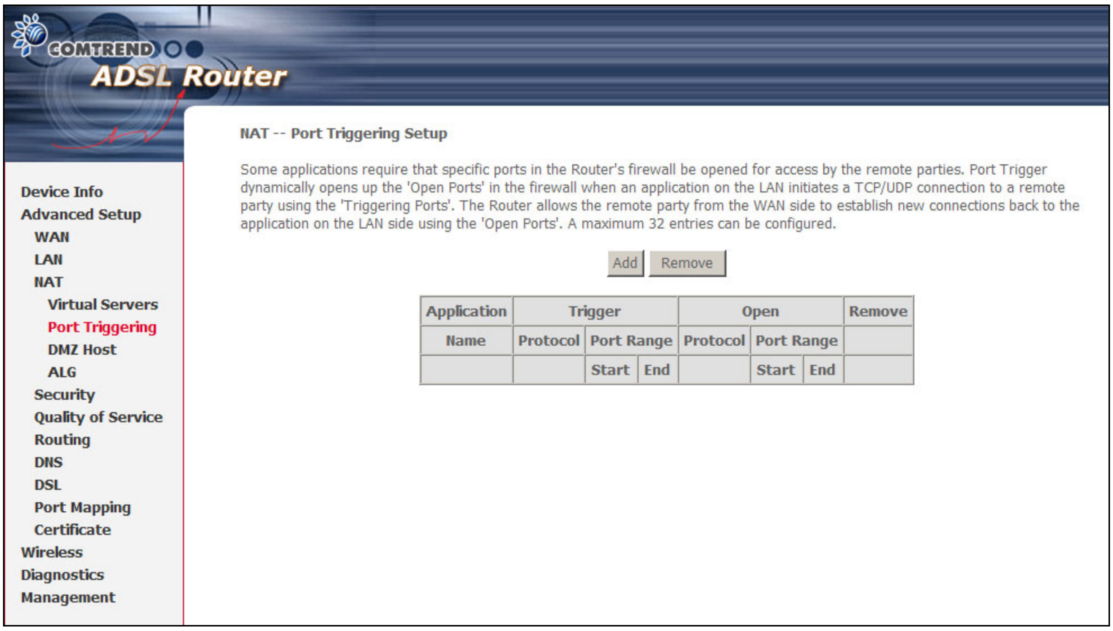
External Port Start	External Port End	Protocol	Internal Port Start	Internal Port End
		TCP		
		TCP		
		TCP		
		TCP		
		TCP		
		TCP		
		TCP		
		TCP		
		TCP		
		TCP		
		TCP		
		TCP		

Save/Apply

Select a Service **or** Custom Server	User should select the service from the list. **or** User can enter the name of their choice.
Server IP Address	Enter the IP address for the server.
External Port Start	Enter the starting external port number (when you select Custom Server). When a service is selected, the port ranges are automatically configured.
External Port End	Enter the ending external port number (when you select Custom Server). When a service is selected, the port ranges are automatically configured.
Protocol	User can select from TCP, TCP/UDP, or UDP.
Internal Port Start	Enter the internal port starting number (when you select Custom Server). When a service is selected the port ranges are automatically configured
Internal Port End	Enter the internal port ending number (when you select Custom Server). When a service is selected, the port ranges are automatically configured.

6.3.2 Port Triggering

Some applications require that specific ports in the firewall be opened for access by remote parties. Port Triggering dynamically opens the 'Open Ports' in the firewall when an application on the LAN initiates a TCP/UDP connection to a remote party using the 'Trigger Ports'. The router allows the remote party from the WAN side to establish new connections back to the application on the LAN side using the 'Open Ports'. A maximum of 32 entries can be configured.

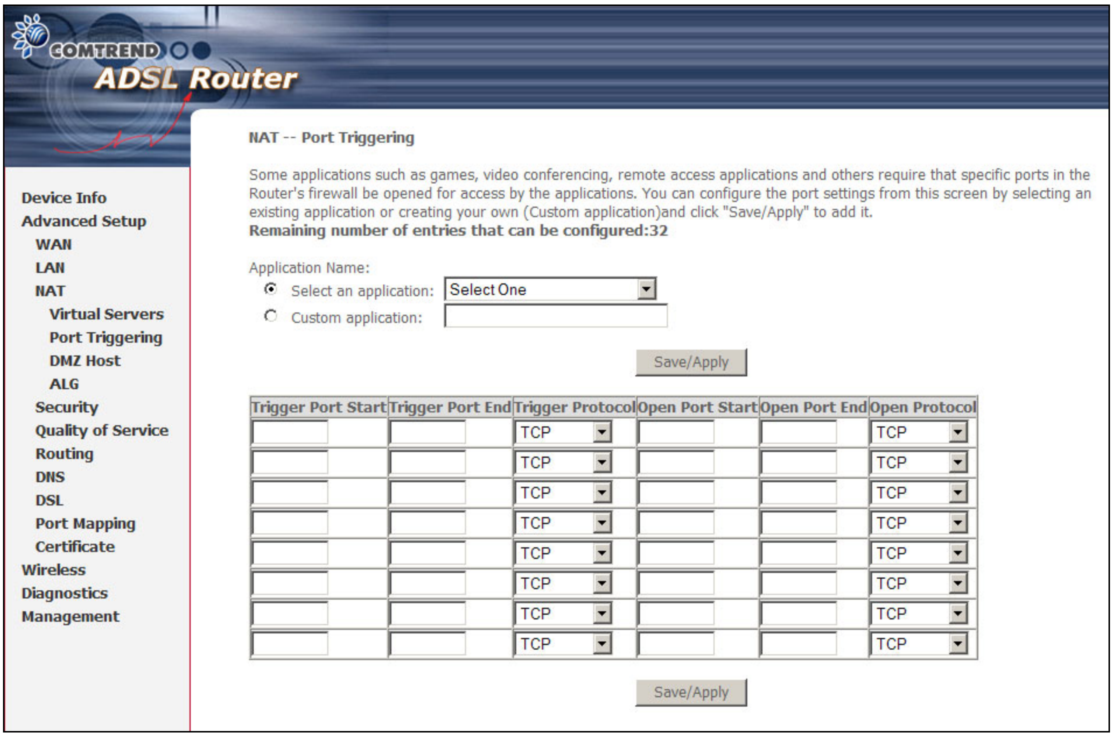


NAT -- Port Triggering Setup

Some applications require that specific ports in the Router's firewall be opened for access by the remote parties. Port Trigger dynamically opens up the 'Open Ports' in the firewall when an application on the LAN initiates a TCP/UDP connection to a remote party using the 'Triggering Ports'. The Router allows the remote party from the WAN side to establish new connections back to the application on the LAN side using the 'Open Ports'. A maximum 32 entries can be configured.

Application	Trigger			Open			Remove
Name	Protocol	Port Range		Protocol	Port Range		
		Start	End		Start	End	

To add a Trigger Port, click the **Add** button. The following screen will display.



NAT -- Port Triggering

Some applications such as games, video conferencing, remote access applications and others require that specific ports in the Router's firewall be opened for access by the applications. You can configure the port settings from this screen by selecting an existing application or creating your own (Custom application)and click "Save/Apply" to add it.
Remaining number of entries that can be configured:32

Application Name:
● Select an application: Select One
○ Custom application:

Trigger Port Start	Trigger Port End	Trigger Protocol	Open Port Start	Open Port End	Open Protocol
		TCP			TCP
		TCP			TCP
		TCP			TCP
		TCP			TCP
		TCP			TCP
		TCP			TCP
		TCP			TCP
		TCP			TCP

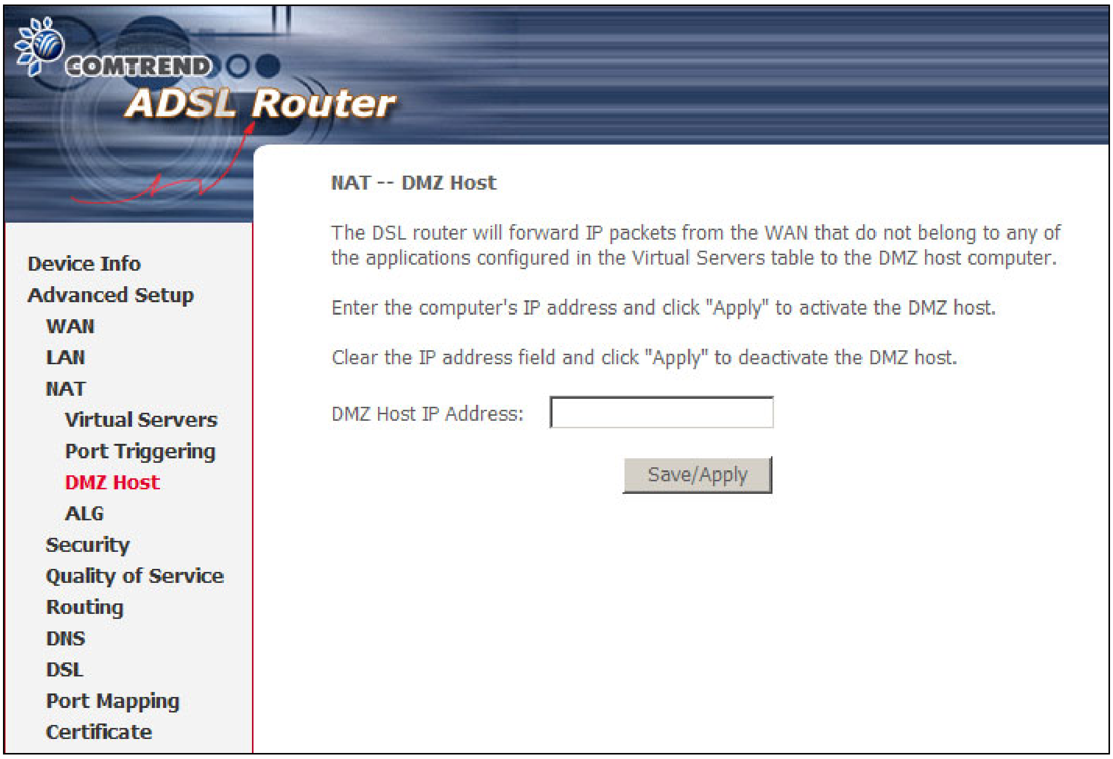
Select an Application **or** Custom Application	User should select the application from the list. **or** User can enter the name of their choice.
Trigger Port Start	Enter the starting trigger port number (when you select custom application). When an application is selected, the port ranges are automatically configured.
Trigger Port End	Enter the trigger port end number (for custom application). When an application is selected, the port ranges are automatically configured.
Trigger Protocol	User can select from TCP, TCP/UDP, or UDP.
Open Port Start	Enter the starting open port number (when you select custom application). When an application is selected, the port ranges are automatically configured.
Open Port End	Enter the open port end number (for custom application). When an application is selected, the port ranges are automatically configured.
Open Protocol	User can select from TCP, TCP/UDP, or UDP.

6.3.3 DMZ Host

The device will forward IP packets that do not belong to any of the applications configured in the Virtual Servers table, from the WAN to the DMZ host computer.

Enter the computer's IP address and click **Apply** to activate the DMZ host.

Clear the IP address field and click **Apply** to deactivate the DMZ host.



NAT -- DMZ Host

The DSL router will forward IP packets from the WAN that do not belong to any of the applications configured in the Virtual Servers table to the DMZ host computer.

Enter the computer's IP address and click "Apply" to activate the DMZ host.

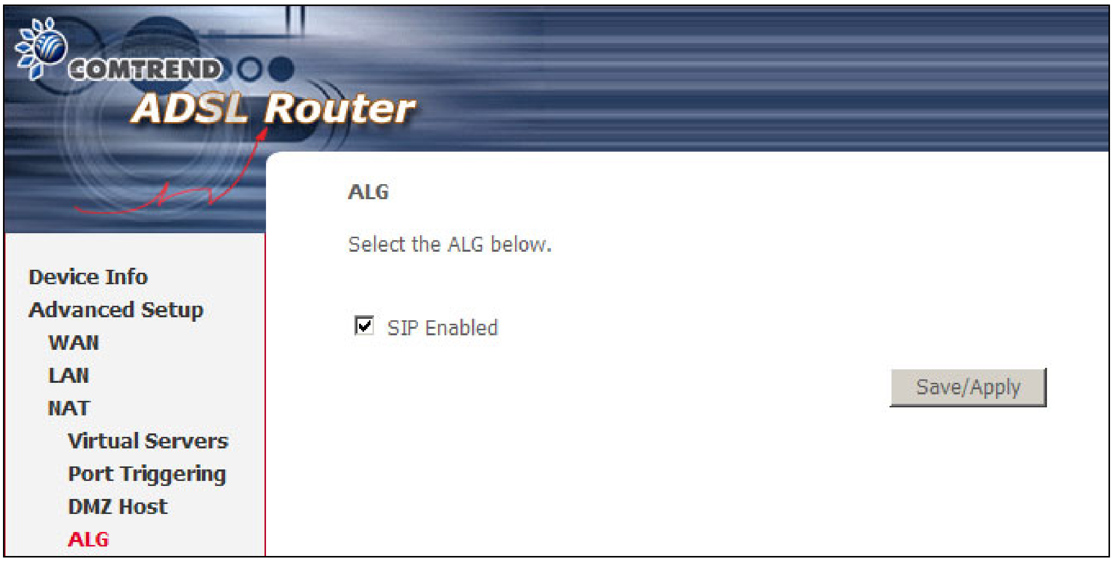
Clear the IP address field and click "Apply" to deactivate the DMZ host.

DMZ Host IP Address:

6.3.4 ALG

SIP (Session Initiation Protocol, RFC3261) is the protocol of choice for most VoIP (Voice over IP) devices to initiate communication. A SIP ALG (Application Layer Gateway) assists VoIP packet traffic from a SIP-compliant IP phone or VoIP gateway to passthrough a NAT enabled router.

To enable the SIP ALG select the **SIP Enabled** checkbox, enter an UDP port value (default is 5060) and click **Save/Apply**.



ALG

Select the ALG below.

☑ SIP Enabled

NOTE: ALG is only valid for SIP protocol running on UDP port 5060.

6.4 Security

To display this option, the Firewall checkbox must be enabled in at least one PVC shown on the Advanced WAN Setup screen.

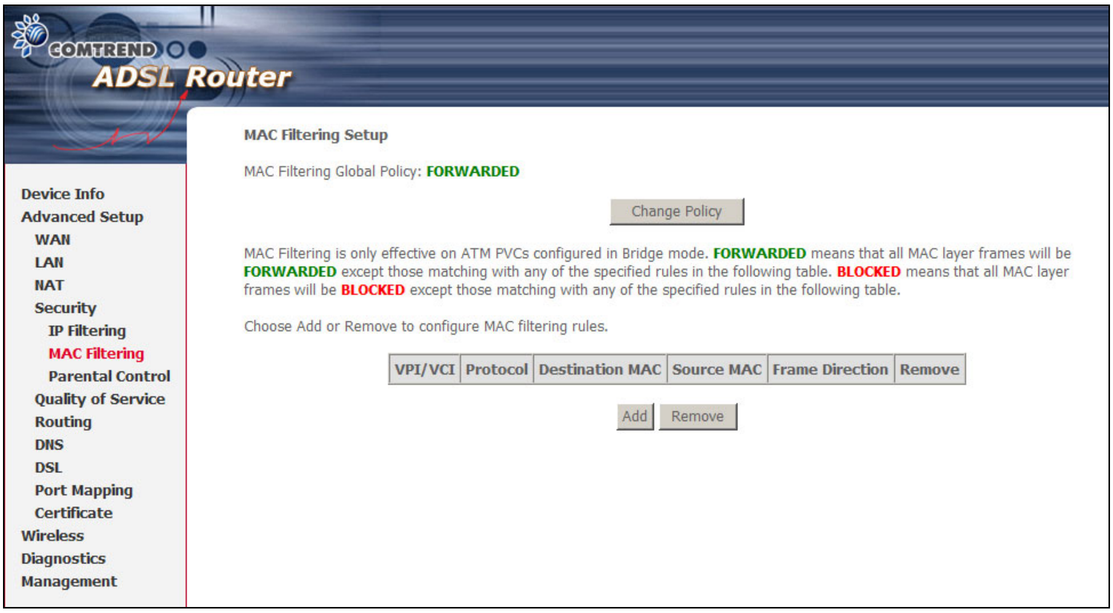
NOTE: For a more technical discussion of this topic, see Appendix A: Security.

6.4.1 MAC Filtering

NOTE: This function is only available when in bridge mode. Other connection modes use IP Filtering (pg. 47) which performs a similar function.

Each network device has a unique 48-bit MAC address. This can be used to filter (block or forward) packets based on the originating device ID. MAC filtering policy and rules can be set by following the procedure below.

The policy **FORWARDED** means that all MAC layer frames will be **FORWARDED** except those matching the rules specified in the following table. **BLOCKED** means that all MAC layer frames will be **BLOCKED** except those matching the rules specified in the following table. The default policy is **FORWARDED**. This can be changed by clicking the **Change Policy** button.



MAC Filtering Setup

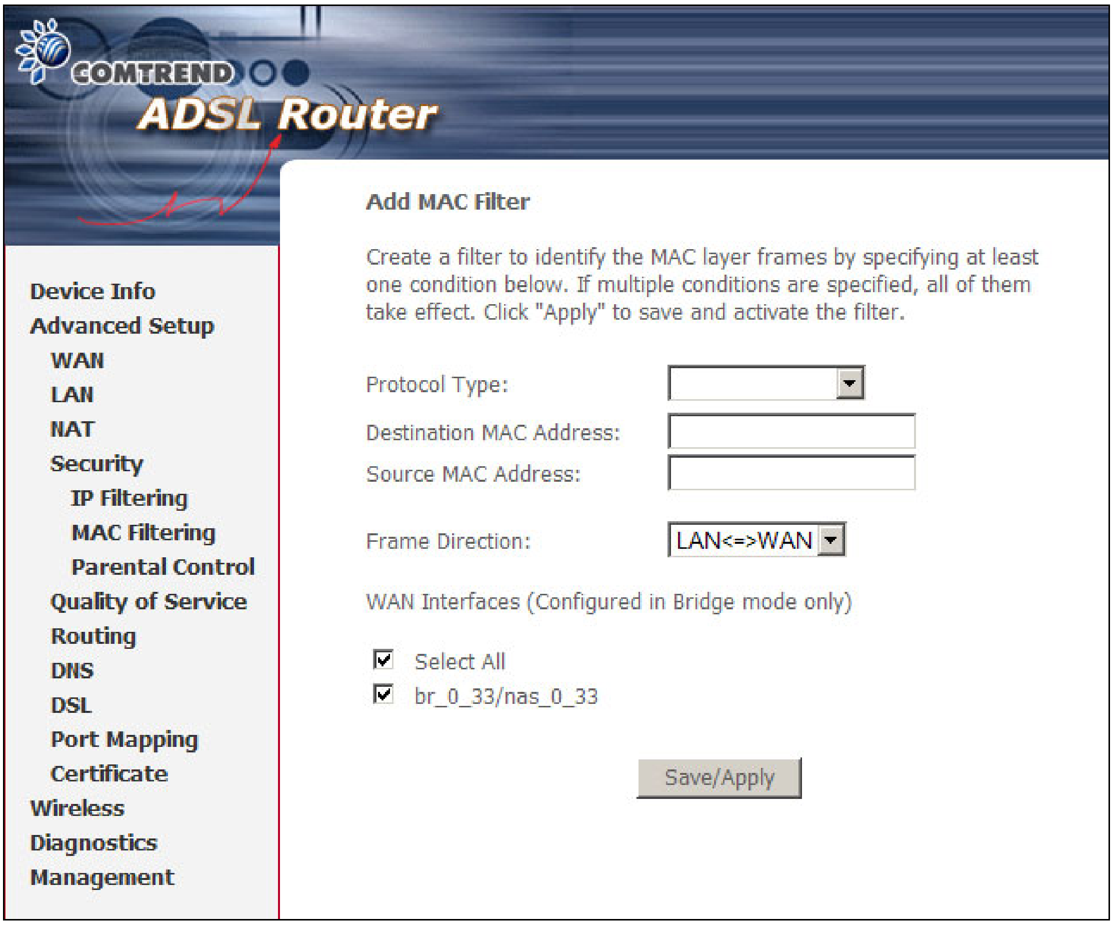
MAC Filtering Global Policy: FORWARDED

MAC Filtering is only effective on ATM PVCs configured in Bridge mode. FORWARDED means that all MAC layer frames will be FORWARDED except those matching with any of the specified rules in the following table. BLOCKED means that all MAC layer frames will be BLOCKED except those matching with any of the specified rules in the following table.

Choose Add or Remove to configure MAC filtering rules.

VPI/VCI	Protocol	Destination MAC	Source MAC	Frame Direction	Remove

Choose **Add** or **Remove** to configure MAC filtering rules. The following screen will appear when you click **Add**. Create a filter to identify the MAC layer frames by specifying at least one condition below. If multiple conditions are specified, all of them must be met. Click **Save/Apply** to save and activate the filter rule.



Add MAC Filter

Create a filter to identify the MAC layer frames by specifying at least one condition below. If multiple conditions are specified, all of them take effect. Click "Apply" to save and activate the filter.

Protocol Type:

Destination MAC Address:

Source MAC Address:

Frame Direction: LAN<=>WAN

WAN Interfaces (Configured in Bridge mode only)

☑ Select All

☑ br_0_33/nas_0_33

Field	Description
Protocol Type	PPPoE, IPv4, IPv6, AppleTalk, IPX, NetBEUI, IGMP
Destination MAC Address	Defines the destination MAC address

Source MAC Address	Defines the source MAC address
Frame Direction	Select the incoming/outgoing packet interface
WAN Interfaces	Applies filter to selected PVCs (bridge mode only). Filter rules are arranged according to PVC, as shown under the VPI/VCI heading on the previous screen.

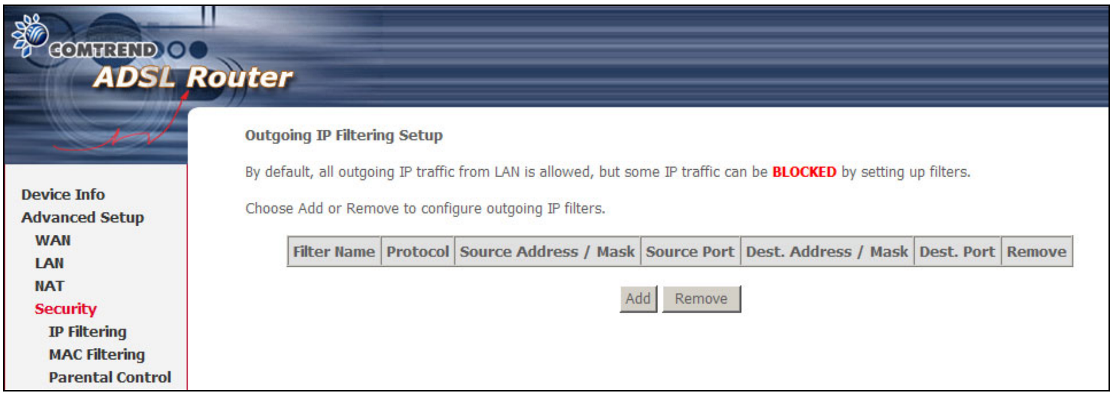
6.4.2 IP Filtering

This screen sets filter rules that limit IP traffic (Outgoing/Incoming). Multiple filter rules can be set and each applies at least one limiting condition. For individual IP packets to pass the filter all conditions must be fulfilled.

NOTE: This function is not available when in bridge mode. Instead of IP Filtering, MAC Filtering (pg. 45) performs a similar function.

Outgoing IP Filter

The default setting for Outgoing traffic is **ACCEPTED**. Under this condition, all outgoing IP packets that match the filter rules will be **BLOCKED**.



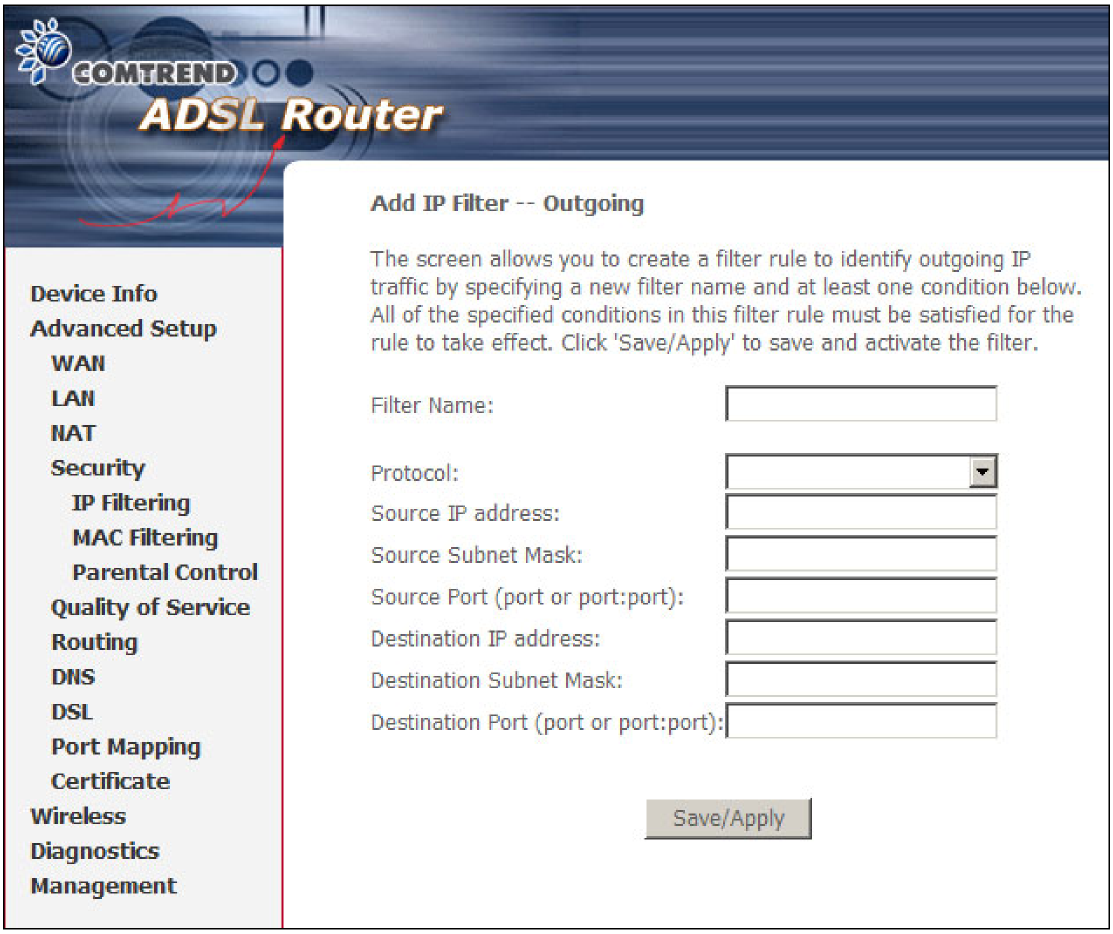
Outgoing IP Filtering Setup

By default, all outgoing IP traffic from LAN is allowed, but some IP traffic can be **BLOCKED** by setting up filters.

Choose Add or Remove to configure outgoing IP filters.

Filter Name	Protocol	Source Address / Mask	Source Port	Dest. Address / Mask	Dest. Port	Remove

To add a filtering rule, click the **Add** button. The following screen will display.



Add IP Filter -- Outgoing

The screen allows you to create a filter rule to identify outgoing IP traffic by specifying a new filter name and at least one condition below. All of the specified conditions in this filter rule must be satisfied for the rule to take effect. Click 'Save/Apply' to save and activate the filter.

Filter Name:

Protocol:

Source IP address:

Source Subnet Mask:

Source Port (port or port:port):

Destination IP address:

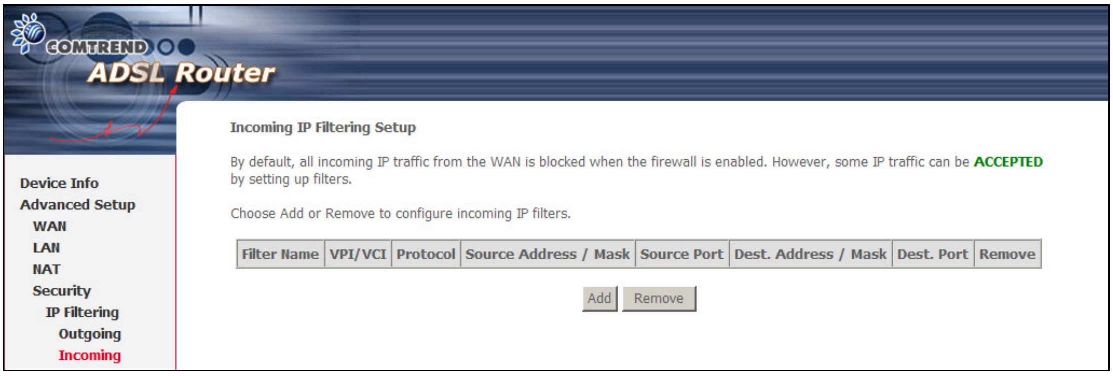
Destination Subnet Mask:

Destination Port (port or port:port):

Field	Description
Filter Name	The filter rule label
Protocol	TCP, TCP/UDP, UDP, or ICMP.
Source IP address	Enter source IP address.
Source Subnet Mask	Enter source subnet mask.
Source Port (port or port:port)	Enter source port number or port range.
Destination IP address	Enter destination IP address.
Destination Subnet Mask	Enter destination subnet mask.
Destination port (port or port:port)	Enter destination port number or range.

Click **Save/Apply** to save and activate the filter.

Incoming IP Filter
The default setting for all Incoming traffic is **BLOCKED**. Under this condition, only those incoming IP packets that match the filter rules will be **ACCEPTED**.



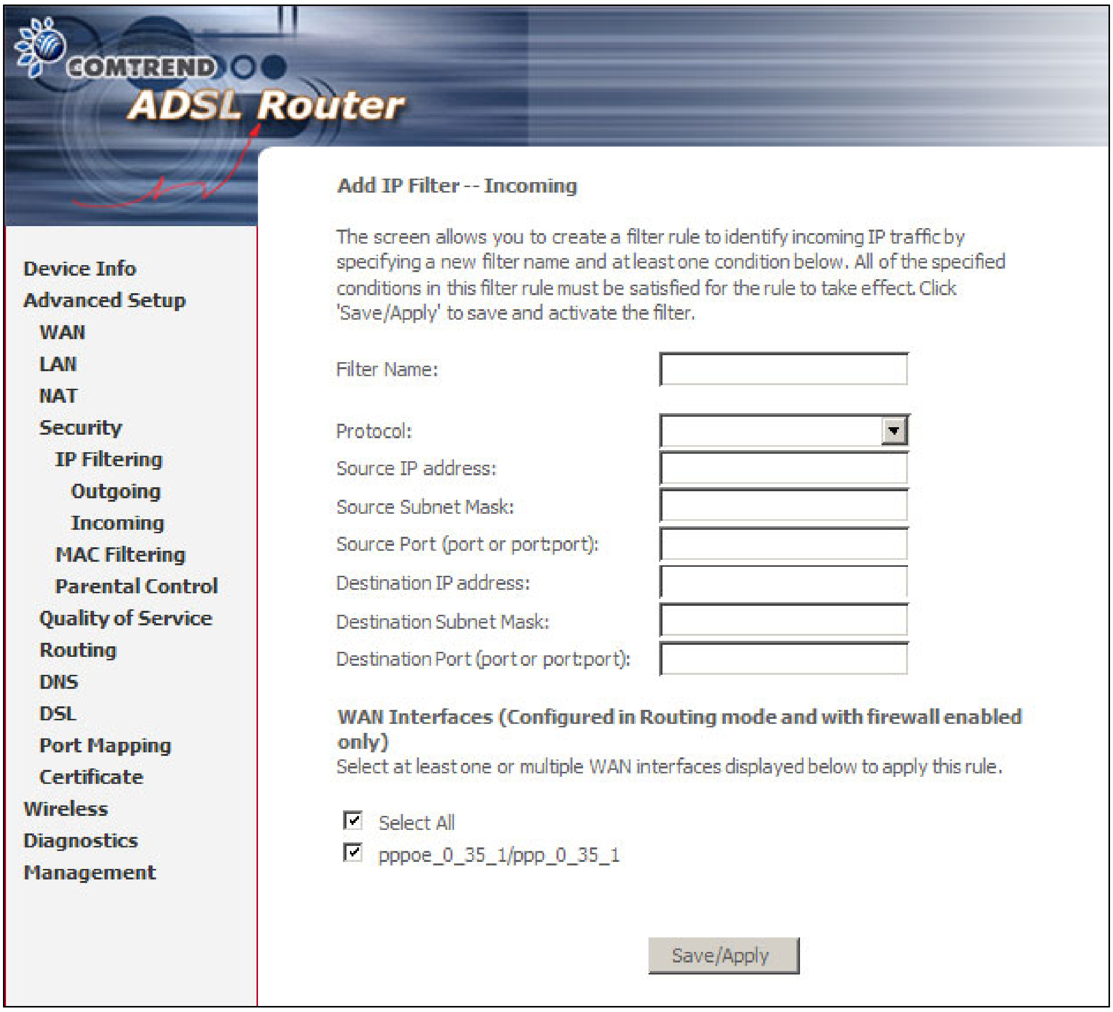
Incoming IP Filtering Setup

By default, all incoming IP traffic from the WAN is blocked when the firewall is enabled. However, some IP traffic can be **ACCEPTED** by setting up filters.

Choose Add or Remove to configure incoming IP filters.

Filter Name	VPI/VCI	Protocol	Source Address / Mask	Source Port	Dest. Address / Mask	Dest. Port	Remove

To add a filtering rule, click the **Add** button. The following screen will display.



Add IP Filter -- Incoming

The screen allows you to create a filter rule to identify incoming IP traffic by specifying a new filter name and at least one condition below. All of the specified conditions in this filter rule must be satisfied for the rule to take effect. Click 'Save/Apply' to save and activate the filter.

Filter Name:

Protocol:

Source IP address:

Source Subnet Mask:

Source Port (port or port:port):

Destination IP address:

Destination Subnet Mask:

Destination Port (port or port:port):

WAN Interfaces (Configured in Routing mode and with firewall enabled only)

Select at least one or multiple WAN interfaces displayed below to apply this rule.

☑ Select All

☑ pppoe_0_35_1/ppp_0_35_1

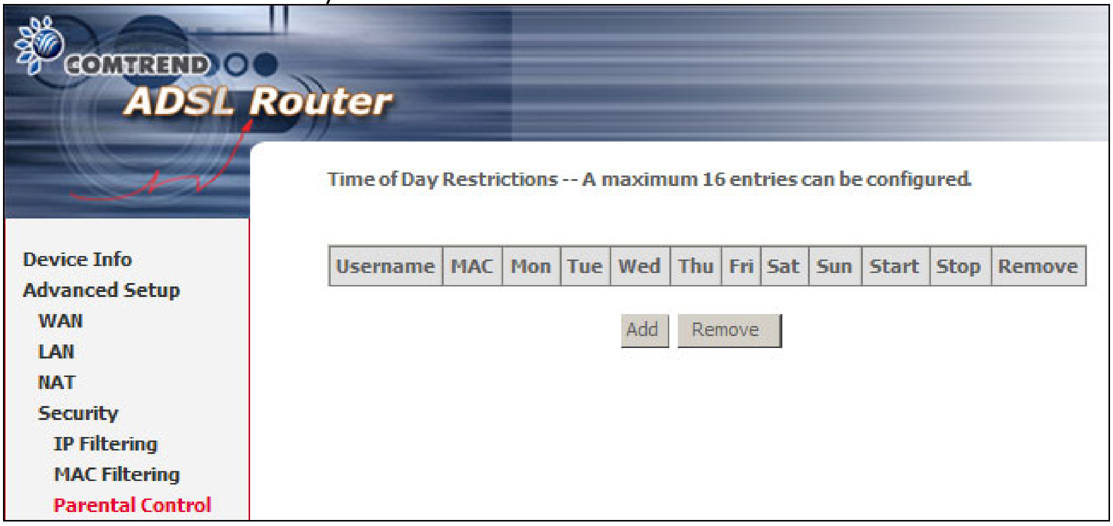
For detailed field descriptions, please reference the Outgoing IP Filter table.

Under WAN Interfaces, select the PVCs (routing mode with firewall only) where the filter rule will apply. You may select every PVC or just a subset. Filter rules are arranged by PVC as shown under the VPI/VCI heading on the previous screen.

Click **Save/Apply** to save and activate the filter.

6.4.3 Parental Control

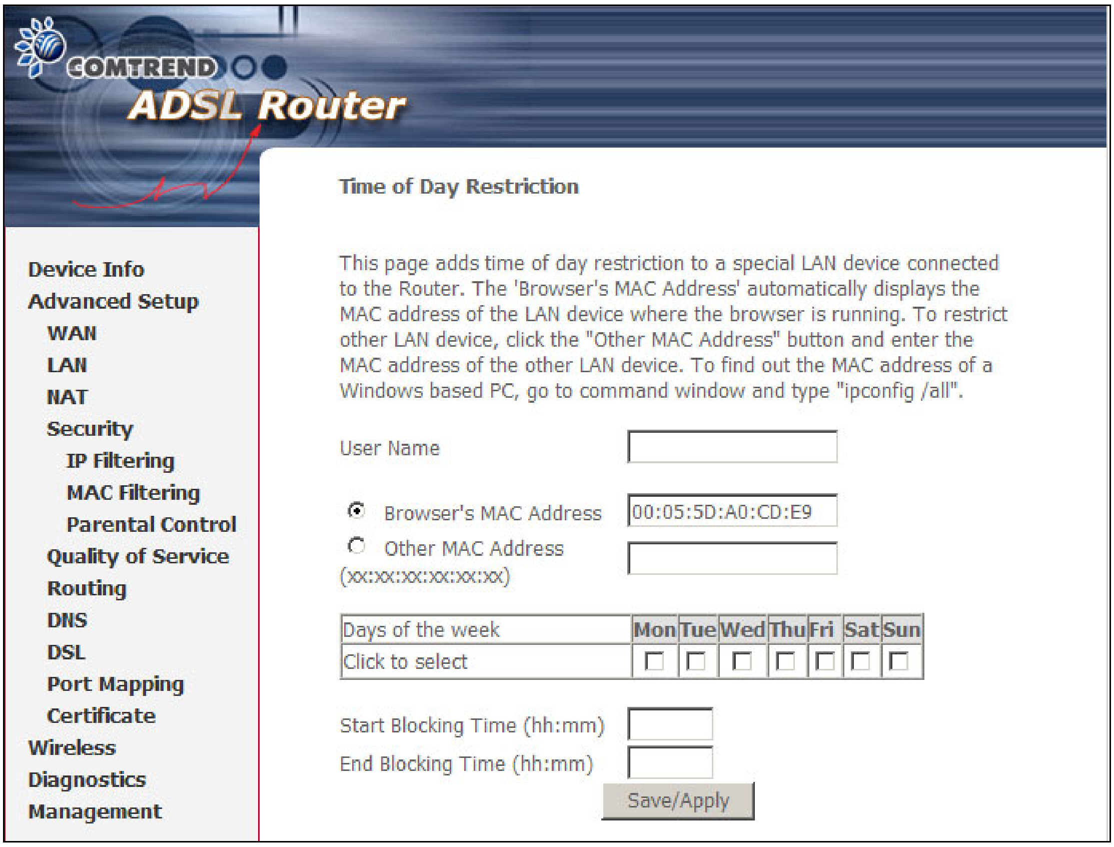
This feature restricts access from a LAN device to an outside network through the device on selected days at certain times. Make sure to activate the Internet Time server synchronization as described in section 9.5 Internet Time, so that the scheduled times match your local time.



Time of Day Restrictions -- A maximum 16 entries can be configured.

Username	MAC	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Start	Stop	Remove

Click **Add** to display the following screen.



Time of Day Restriction

This page adds time of day restriction to a special LAN device connected to the Router. The 'Browser's MAC Address' automatically displays the MAC address of the LAN device where the browser is running. To restrict other LAN device, click the "Other MAC Address" button and enter the MAC address of the other LAN device. To find out the MAC address of a Windows based PC, go to command window and type "ipconfig /all".

User Name

● Browser's MAC Address 00:05:5D:A0:CD:E9

○ Other MAC Address
(xx:xx:xx:xx:xx:xx)

Days of the week	Mon	Tue	Wed	Thu	Fri	Sat	Sun
Click to select	□	□	□	□	□	□	□

Start Blocking Time (hh:mm)

End Blocking Time (hh:mm)

See below for instructions. Click **Save/Apply** to apply the settings.

User Name: A user-defined label for this restriction.

Browser's MAC Address: MAC address of the PC running the browser.

Other MAC Address: MAC address of another LAN device.

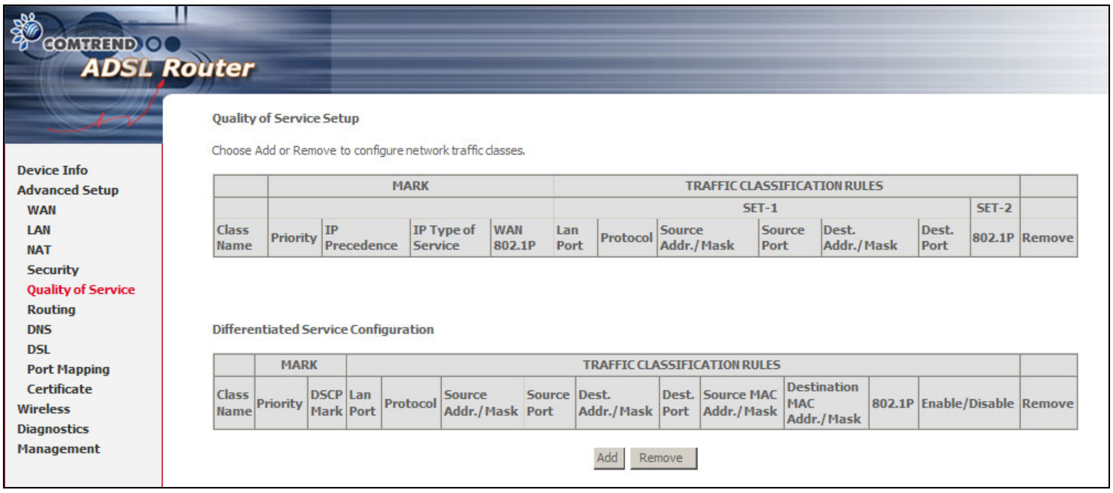
Days of the Week: The days the restrictions apply.

Start Blocking Time: The time the restrictions start.

End Blocking Time: The time the restrictions end.

6.5 Quality of Service

NOTE: QoS must be enabled in at least one PVC to display this option.
(see Advanced WAN Setup for detailed PVC setup instructions).



Quality of Service Setup

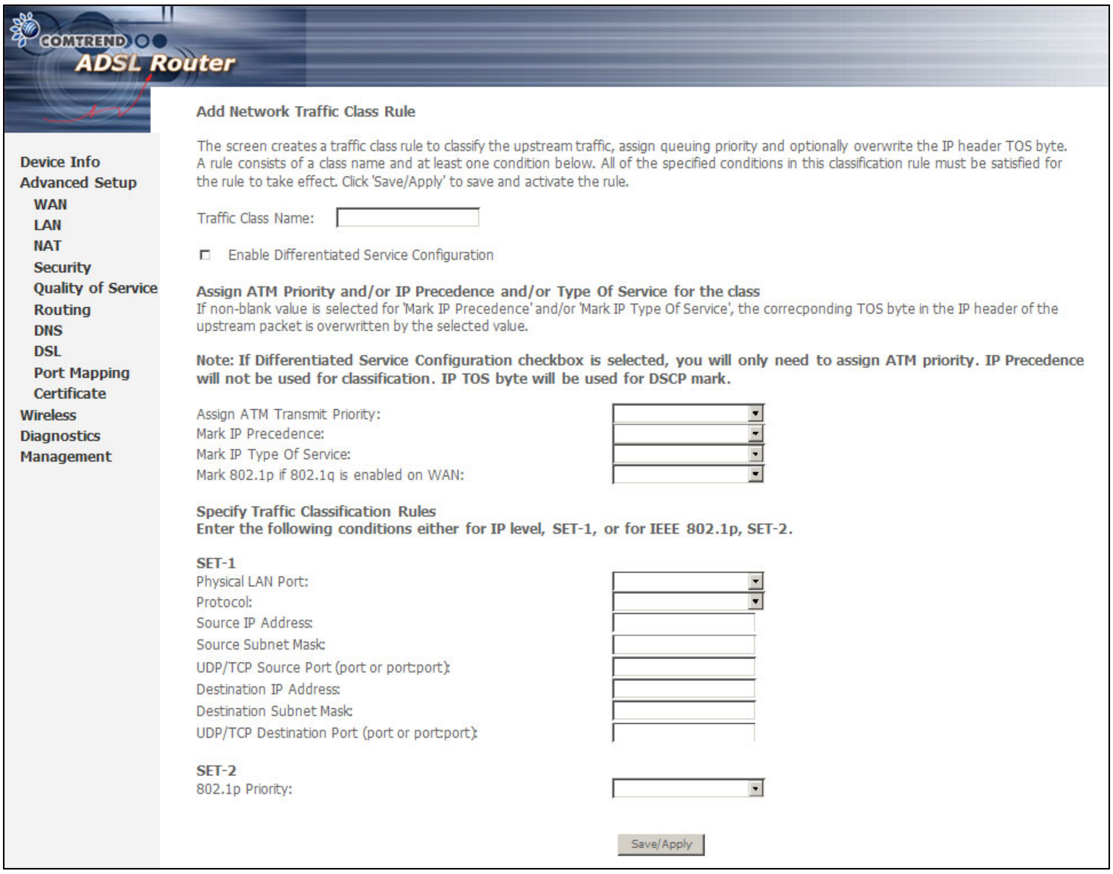
Choose Add or Remove to configure network traffic classes.

	MARK				TRAFFIC CLASSIFICATION RULES							
					SET-1						SET-2	
Class Name	Priority	IP Precedence	IP Type of Service	WAN 802.1P	Lan Port	Protocol	Source Addr./Mask	Source Port	Dest. Addr./Mask	Dest. Port	802.1P	Remove

Differentiated Service Configuration

	MARK		TRAFFIC CLASSIFICATION RULES										
Class Name	Priority	DSCP Mark	Lan Port	Protocol	Source Addr./Mask	Source Port	Dest. Addr./Mask	Dest. Port	Source MAC Addr./Mask	Destination MAC Addr./Mask	802.1P	Enable/Disable	Remove

Click **Add** to configure network traffic classes. The following screen will display:



Add Network Traffic Class Rule

The screen creates a traffic class rule to classify the upstream traffic, assign queuing priority and optionally overwrite the IP header TOS byte. A rule consists of a class name and at least one condition below. All of the specified conditions in this classification rule must be satisfied for the rule to take effect. Click 'Save/Apply' to save and activate the rule.

Traffic Class Name:

□ Enable Differentiated Service Configuration

Assign ATM Priority and/or IP Precedence and/or Type Of Service for the class
If non-blank value is selected for 'Mark IP Precedence' and/or 'Mark IP Type Of Service', the correcponding TOS byte in the IP header of the upstream packet is overwritten by the selected value.

Note: If Differentiated Service Configuration checkbox is selected, you will only need to assign ATM priority. IP Precedence will not be used for classification. IP TOS byte will be used for DSCP mark.

Assign ATM Transmit Priority:
Mark IP Precedence:
Mark IP Type Of Service:
Mark 802.1p if 802.1q is enabled on WAN:

Specify Traffic Classification Rules
Enter the following conditions either for IP level, SET-1, or for IEEE 802.1p, SET-2.

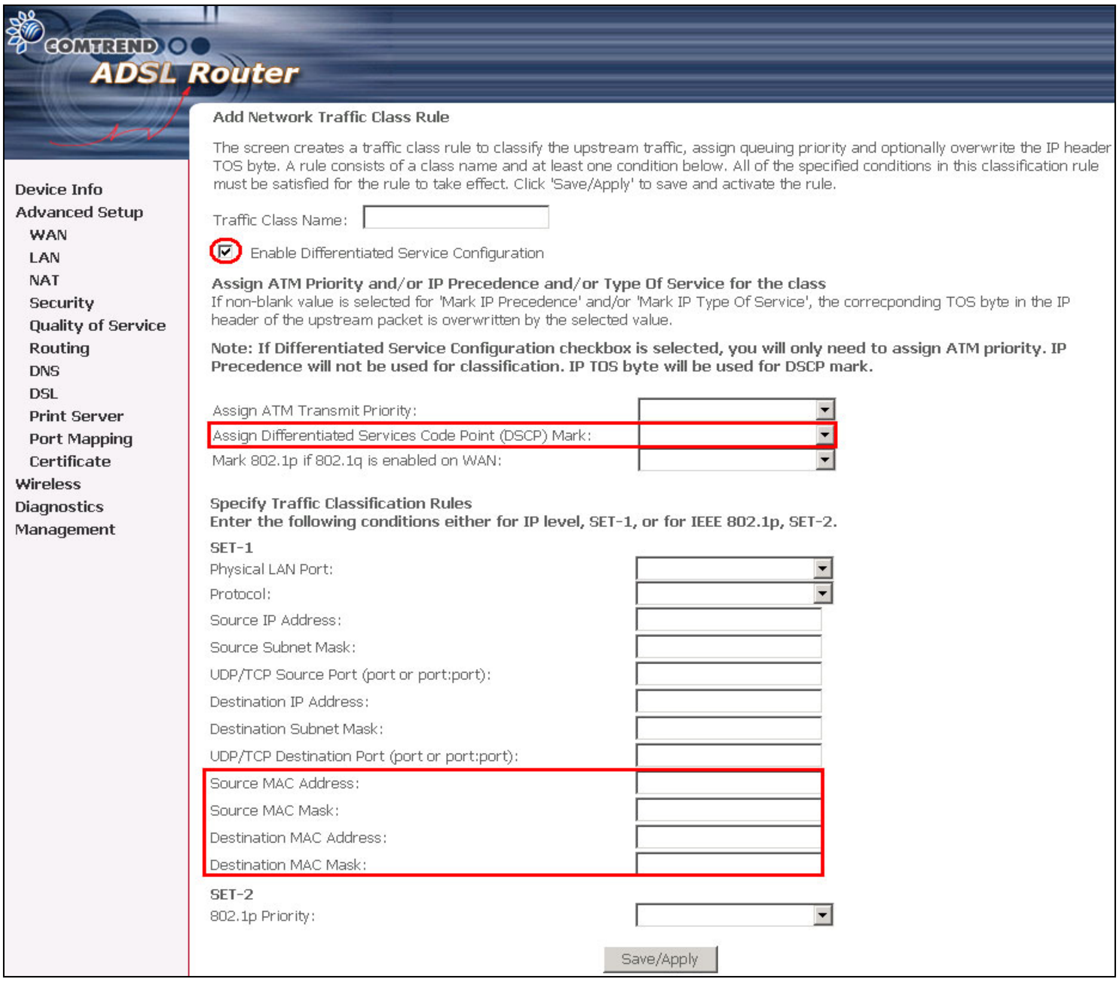
SET-1
Physical LAN Port:
Protocol:
Source IP Address:
Source Subnet Mask:
UDP/TCP Source Port (port or port:port):
Destination IP Address:
Destination Subnet Mask:
UDP/TCP Destination Port (port or port:port):

SET-2
802.1p Priority:

Field	**Description**
Traffic Class Name	Enter name for traffic class.
Assign ATM Transmit Priority	Select Low, Medium or High.
Mark IP Precedence	Select between 0-7. The lower the digit shows the higher the priority.

Mark IP Type Of Service	Select either: Normal Service, Minimize Cost, Maximize Reliability, Maximize Throughput, Minimize Delay
Mark 802.1p if 802.1q is enabled on WAN	Select between 0-7. The lower the digit shows the higher the priority.
SET-1	
Physical LAN Port	Select between eth0, Wireless and Wireless_Guest.
Protocol	TCP, TCP/UDP, UDP, or ICMP.
Source IP Address	Enter the source IP address.
Source Subnet Mask	Enter the subnet mask for the source IP address.
Source Port (port or port:port)	Enter source port number or port range.
Destination IP address	Enter destination IP address.
Destination Subnet Mask	Enter destination subnet mask.
Destination Port (port or port:port)	Enter destination port number or port range.
SET-2	
802.1p Priority	Select between 0-7. The lower the digit shows the higher the priority

If the **Enable Differentiated Service Configuration** checkbox ☑ is selected, some additional fields will display, as shown below.



Add Network Traffic Class Rule

The screen creates a traffic class rule to classify the upstream traffic, assign queuing priority and optionally overwrite the IP header TOS byte. A rule consists of a class name and at least one condition below. All of the specified conditions in this classification rule must be satisfied for the rule to take effect. Click 'Save/Apply' to save and activate the rule.

Traffic Class Name:

☑ Enable Differentiated Service Configuration

Assign ATM Priority and/or IP Precedence and/or Type Of Service for the class
If non-blank value is selected for 'Mark IP Precedence' and/or 'Mark IP Type Of Service', the correcponding TOS byte in the IP header of the upstream packet is overwritten by the selected value.

Note: If Differentiated Service Configuration checkbox is selected, you will only need to assign ATM priority. IP Precedence will not be used for classification. IP TOS byte will be used for DSCP mark.

Assign ATM Transmit Priority:
Assign Differentiated Services Code Point (DSCP) Mark:
Mark 802.1p if 802.1q is enabled on WAN:

Specify Traffic Classification Rules
Enter the following conditions either for IP level, SET-1, or for IEEE 802.1p, SET-2.

SET-1
Physical LAN Port:
Protocol:
Source IP Address:
Source Subnet Mask:
UDP/TCP Source Port (port or port:port):
Destination IP Address:
Destination Subnet Mask:
UDP/TCP Destination Port (port or port:port):
Source MAC Address:
Source MAC Mask:
Destination MAC Address:
Destination MAC Mask:

SET-2
802.1p Priority:

Field	Description
Assign Differentiated Services Code Point (DSCP) Mark	The selected Code Point gives the corresponding priority to the packets that satisfies the rules set below.
Source MAC Address	A packet belongs to SET-1, if a binary-AND of its source MAC address with the Source MAC Mask is equal to the binary-AND of the Source MAC Mask and this field.
Source MAC Mask	This is the mask used to decide how many bits are checked in Source MAC Address.
Destination MAC Address	A packet belongs to SET-1 then the result that the Destination MAC Address of its header binary-AND to the Destination MAC Mask must equal to the result that this field binary-AND to the Destination MAC Mask.
Destination MAC Mask	This is the mask used to decide how many bits are checked in Destination MAC Address.

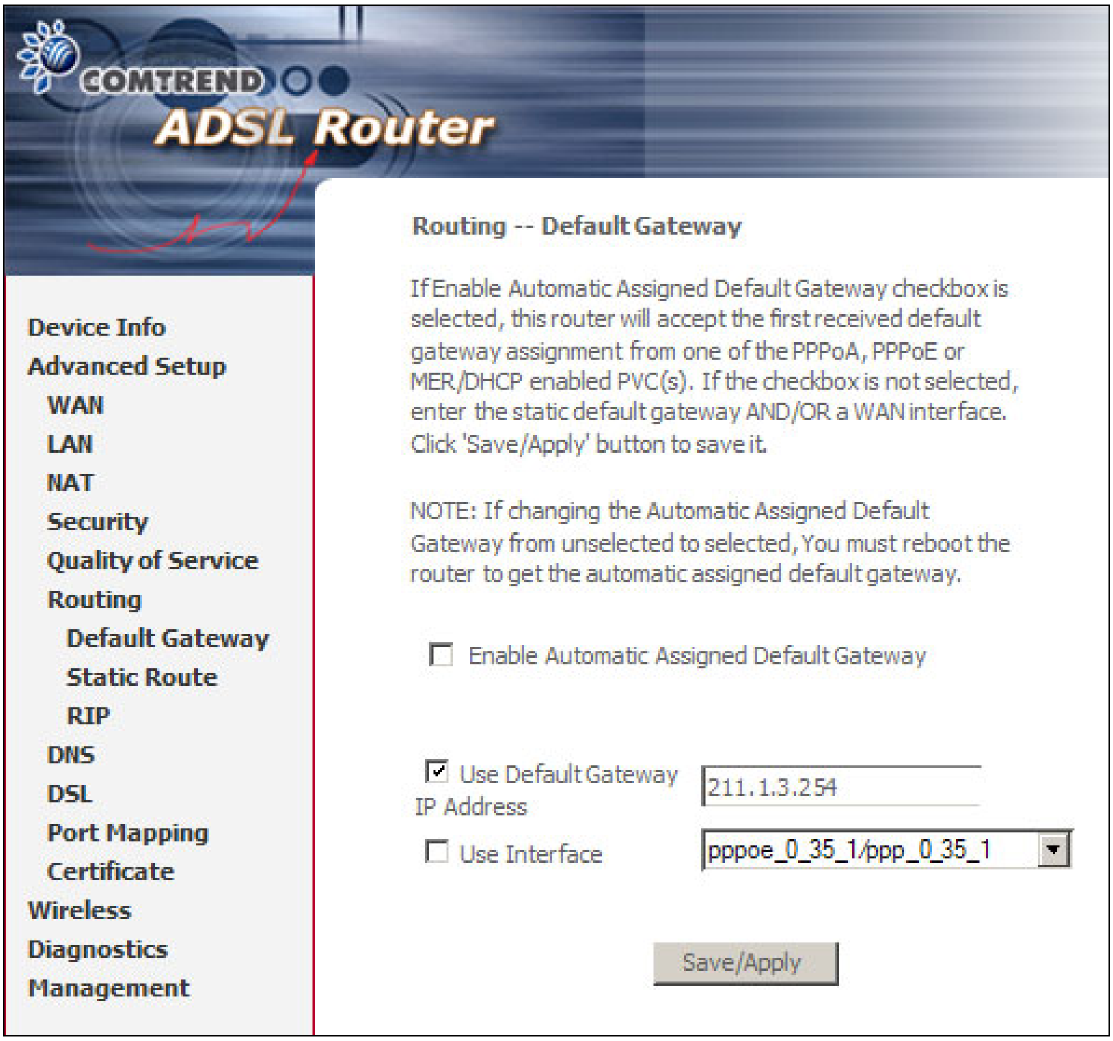
6.6 Routing

This option allows for Default Gateway, Static Route, and RIP configuration.

NOTE:	In bridge mode, the RIP screen is hidden while the Default Gateway and Static Route configuration screens are shown but ineffective.

6.6.1 Default Gateway

If the **Enable Automatic Assigned Default Gateway** checkbox is selected, this device will accept the first received default gateway assignment from one of the enabled PVC(s). If the checkbox is not selected, enter the static default gateway and/or WAN interface. Click **Save/Apply** button to save it.



Routing -- Default Gateway

If Enable Automatic Assigned Default Gateway checkbox is selected, this router will accept the first received default gateway assignment from one of the PPPoA, PPPoE or MER/DHCP enabled PVC(s). If the checkbox is not selected, enter the static default gateway AND/OR a WAN interface. Click 'Save/Apply' button to save it.

NOTE: If changing the Automatic Assigned Default Gateway from unselected to selected, You must reboot the router to get the automatic assigned default gateway.

□ Enable Automatic Assigned Default Gateway

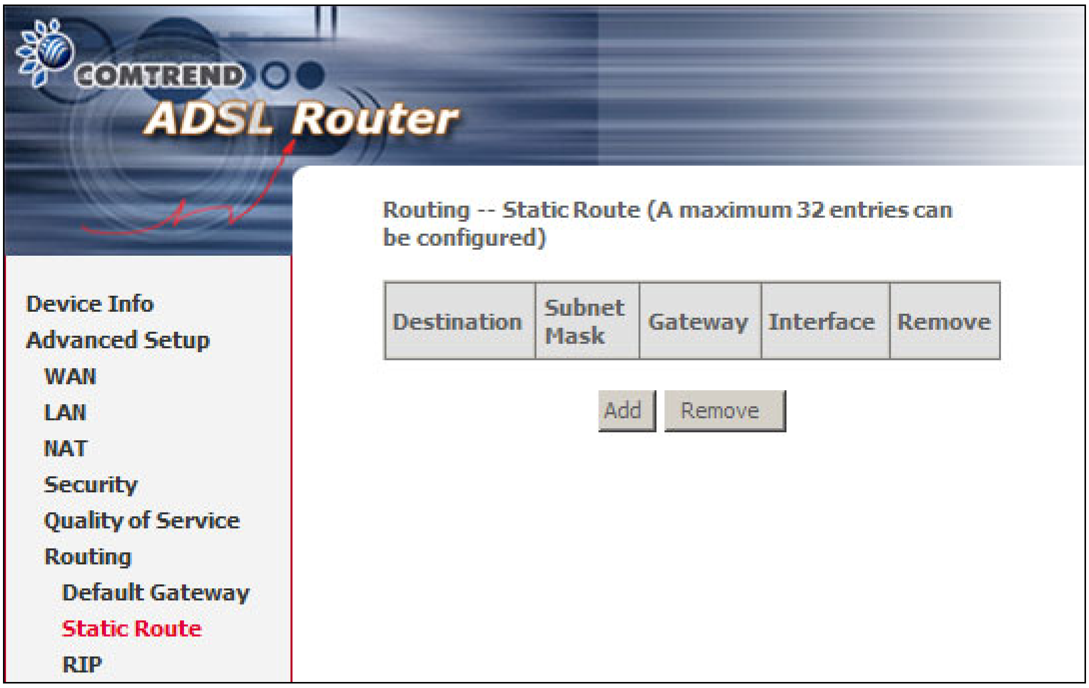
☑ Use Default Gateway IP Address: 211.1.3.254

□ Use Interface: pppoe_0_35_1/ppp_0_35_1

NOTE:	After enabling the Automatic Assigned Default Gateway, the device must be rebooted to activate the assigned default gateway.

6.6.2 Static Route

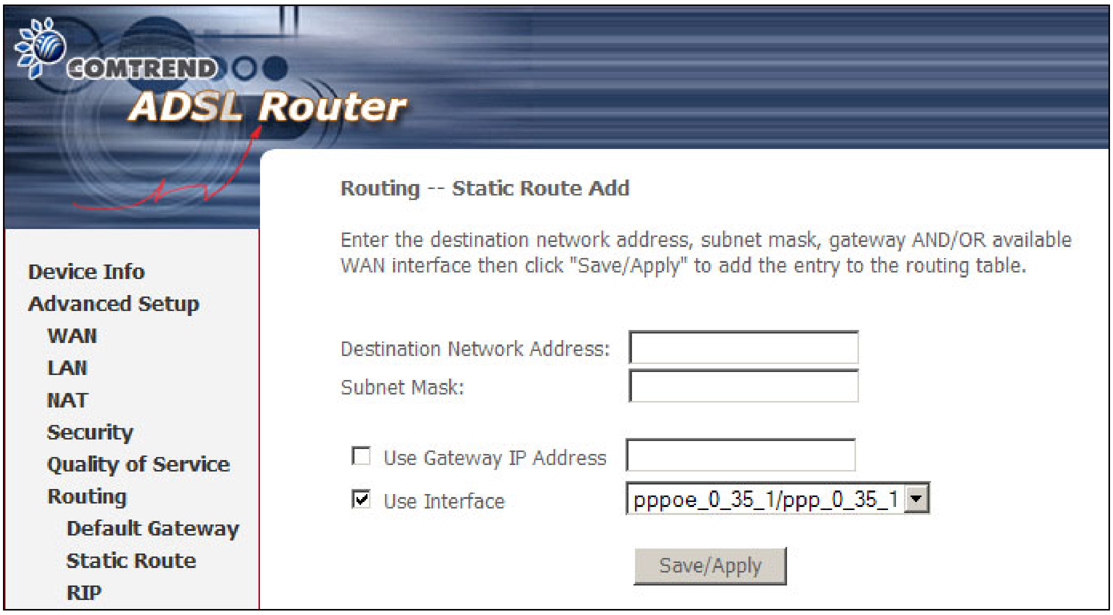
The Static Route screen lists the configured static routes.
Click the **Add** or **Remove** buttons to change settings.



Routing -- Static Route (A maximum 32 entries can be configured)

Destination	Subnet Mask	Gateway	Interface	Remove

Click the **Add** button to display the following screen.



Routing -- Static Route Add

Enter the destination network address, subnet mask, gateway AND/OR available WAN interface then click "Save/Apply" to add the entry to the routing table.

Destination Network Address:

Subnet Mask:

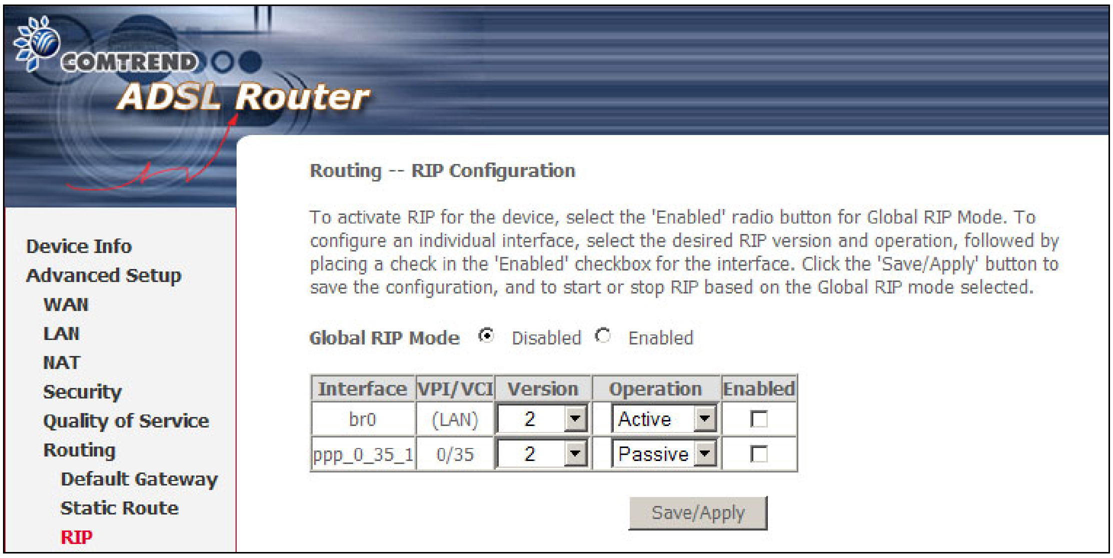
□ Use Gateway IP Address

☑ Use Interface pppoe_0_35_1/ppp_0_35_1

Enter Destination Network Address, Subnet Mask, Gateway IP Address, and/or WAN Interface. Then click **Save/Apply** to add the entry to the routing table.

6.6.3 RIP

To activate this option, select the **Enabled** radio button for **Global RIP Mode**. To configure an individual interface, select the desired RIP version and operation, followed by placing a check in the **Enabled** checkbox for the interface. Click the **Save/Apply** button to save the configuration and to start or stop RIP based on the Global RIP mode selected.



Routing -- RIP Configuration

To activate RIP for the device, select the 'Enabled' radio button for Global RIP Mode. To configure an individual interface, select the desired RIP version and operation, followed by placing a check in the 'Enabled' checkbox for the interface. Click the 'Save/Apply' button to save the configuration, and to start or stop RIP based on the Global RIP mode selected.

Global RIP Mode ● Disabled ○ Enabled

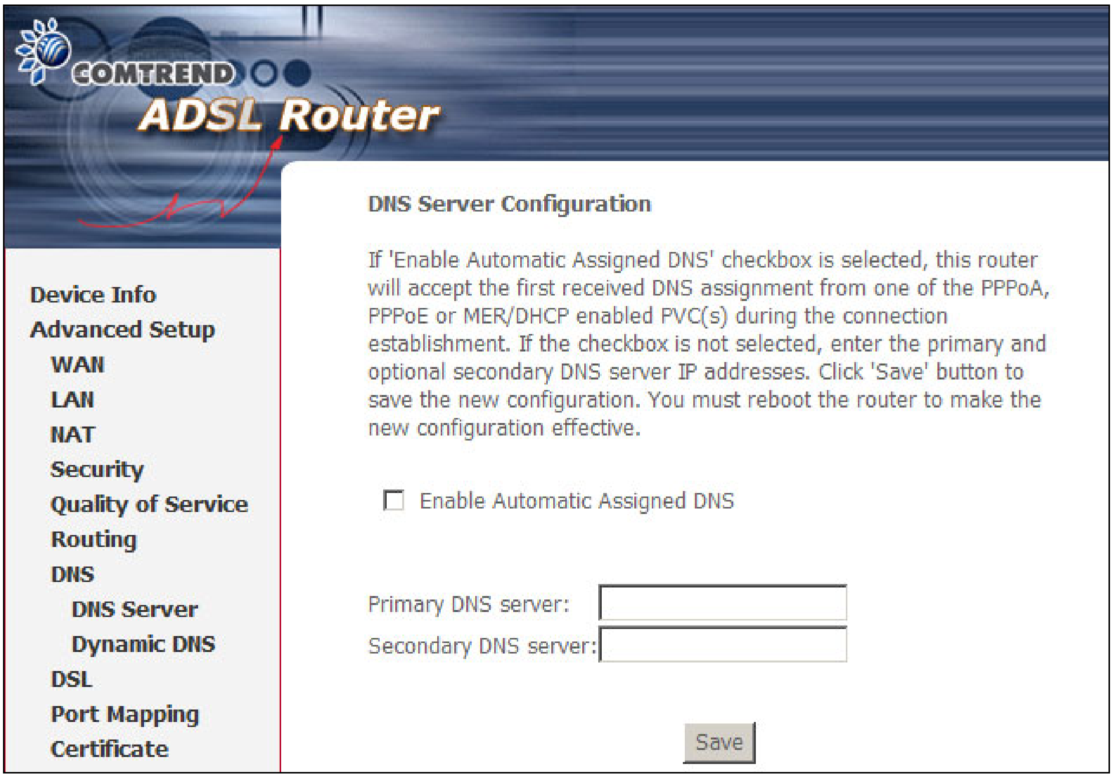
Interface	VPI/VCI	Version	Operation	Enabled
br0	(LAN)	2	Active	□
ppp_0_35_1	0/35	2	Passive	□

Save/Apply

6.7 DNS

6.7.1 DNS Server

If the **Enable Automatic Assigned DNS** checkbox is selected, this device will accept the first received DNS assignment from one of the DHCP enabled PVC(s) – (PPPoA, PPPoE, or MER) during the connection establishment. If the checkbox is not selected, enter the primary and optional secondary DNS server IP addresses.



DNS Server Configuration

If 'Enable Automatic Assigned DNS' checkbox is selected, this router will accept the first received DNS assignment from one of the PPPoA, PPPoE or MER/DHCP enabled PVC(s) during the connection establishment. If the checkbox is not selected, enter the primary and optional secondary DNS server IP addresses. Click 'Save' button to save the new configuration. You must reboot the router to make the new configuration effective.

☐ Enable Automatic Assigned DNS

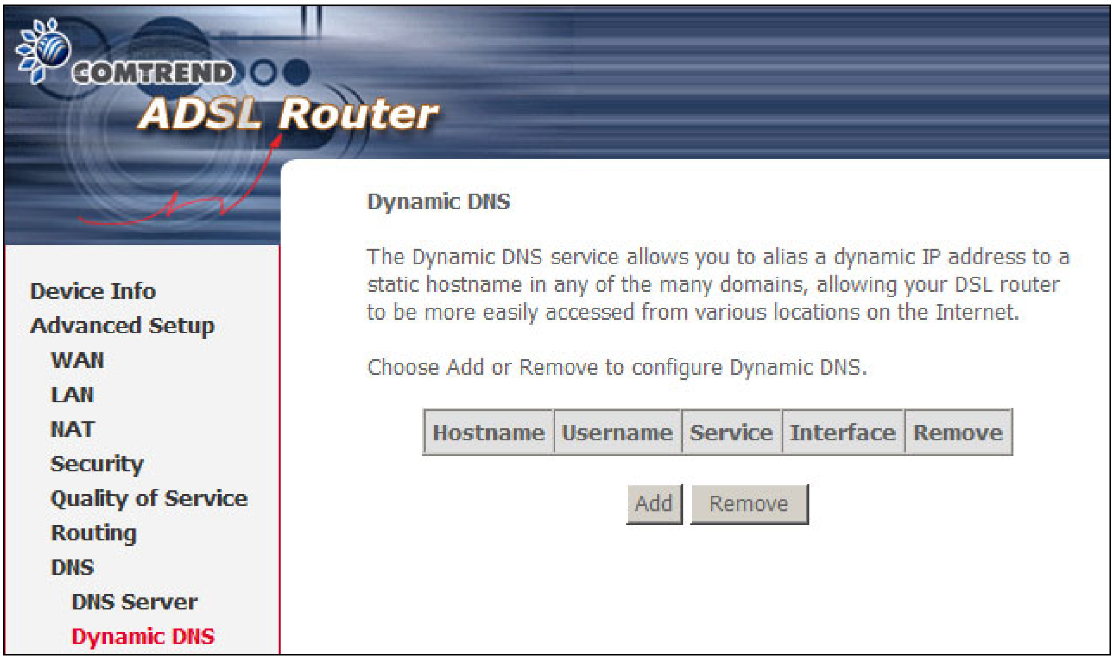
Primary DNS server:

Secondary DNS server:

NOTE: Click the **Save** button to save the new configuration. Remember, the device must be rebooted to make the new configuration effective.

6.7.2 Dynamic DNS

The Dynamic DNS service allows a dynamic IP address to be aliased to a static hostname in any of many domains, allowing the CT-5365 to be more easily accessed from various locations on the Internet.



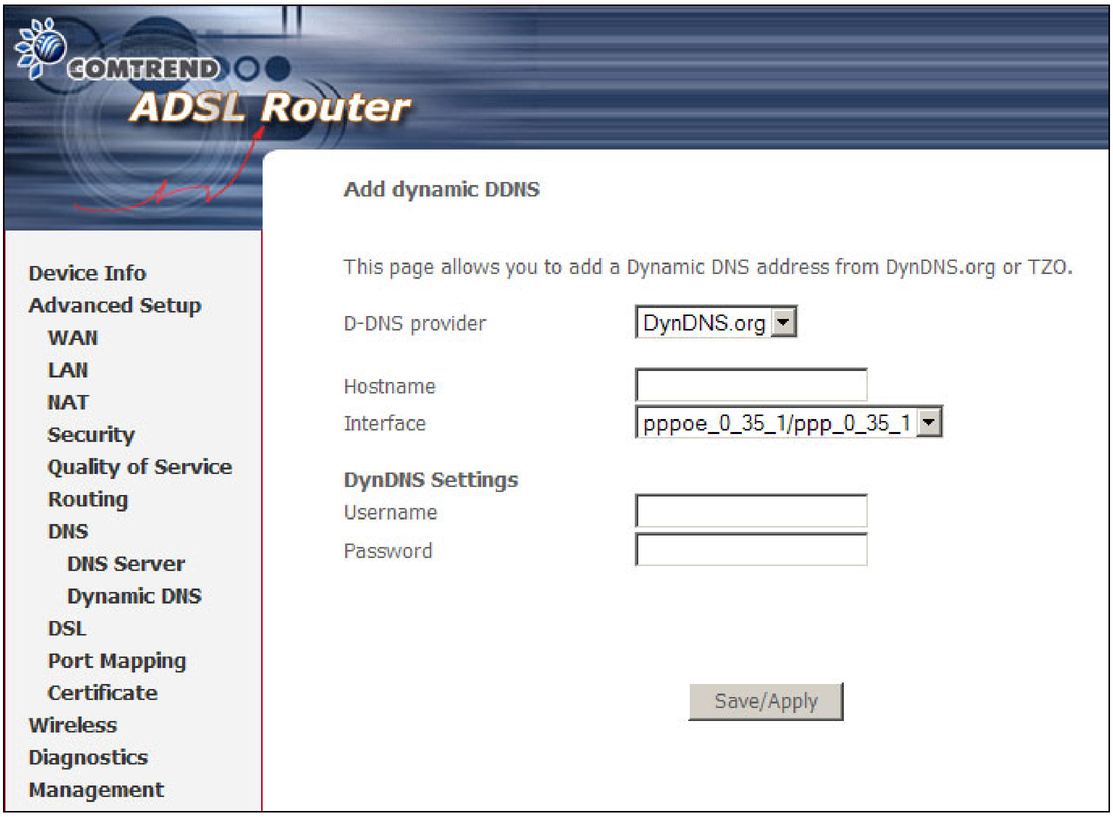
Dynamic DNS

The Dynamic DNS service allows you to alias a dynamic IP address to a static hostname in any of the many domains, allowing your DSL router to be more easily accessed from various locations on the Internet.

Choose Add or Remove to configure Dynamic DNS.

Hostname	Username	Service	Interface	Remove

To add a dynamic DNS service, click the **Add** button and this screen will display.



Add dynamic DDNS

This page allows you to add a Dynamic DNS address from DynDNS.org or TZO.

D-DNS provider: DynDNS.org

Hostname:

Interface: pppoe_0_35_1/ppp_0_35_1

DynDNS Settings

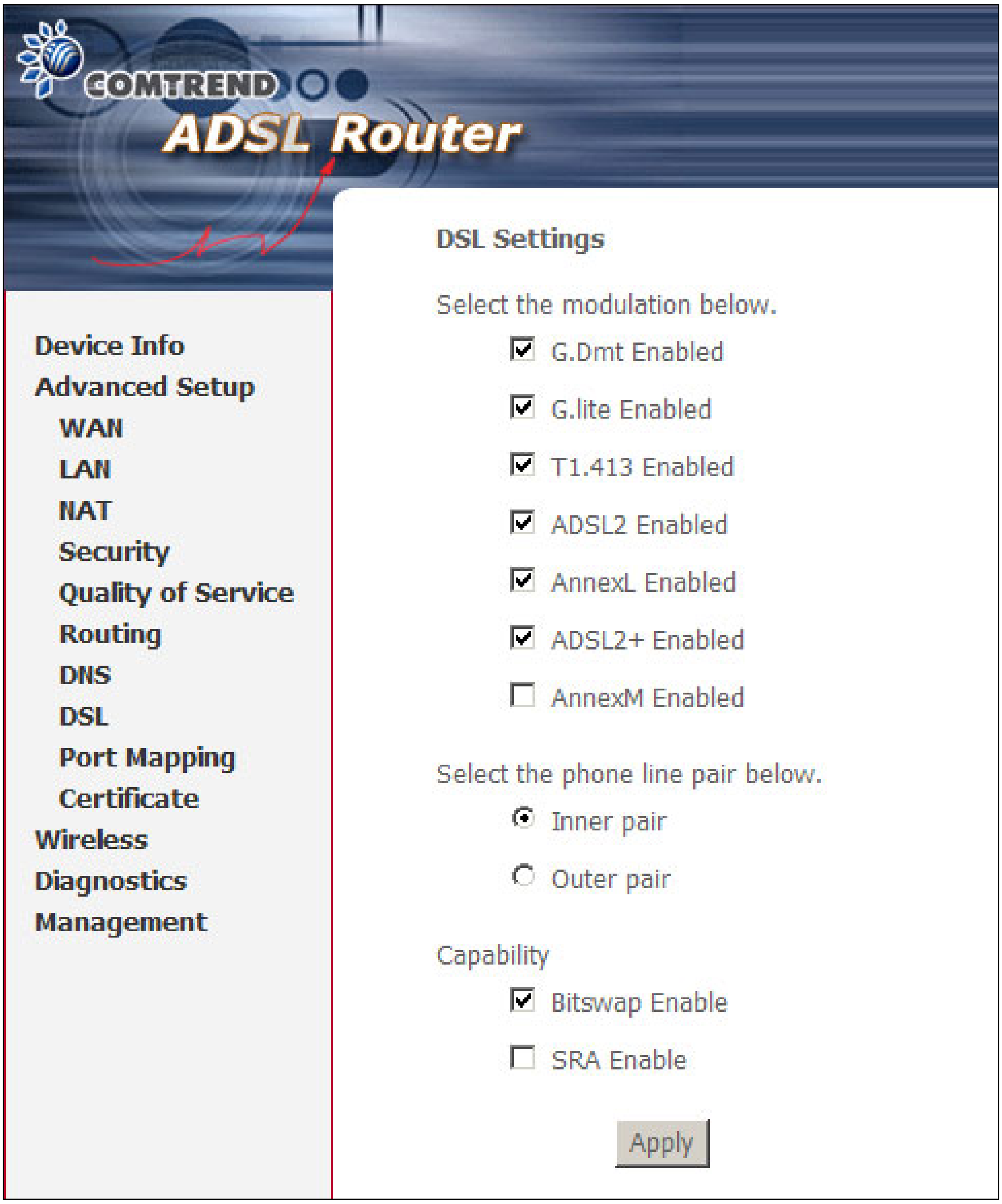
Username:

Password:

Field	Description
D-DNS provider	Select a dynamic DNS provider from the list.
Hostname	Enter the name for the dynamic DNS server.
Interface	Select the interface from the list.
Username	Enter the username for the dynamic DNS server.
Password	Enter the password for the dynamic DNS server.

6.8 DSL

The DSL Settings screen allows for the selection of DSL modulation modes. For optimum performance, the modes selected should match those of your ISP.



DSL Settings

Select the modulation below.

☑ G.Dmt Enabled

☑ G.lite Enabled

☑ T1.413 Enabled

☑ ADSL2 Enabled

☑ AnnexL Enabled

☑ ADSL2+ Enabled

□ AnnexM Enabled

Select the phone line pair below.

● Inner pair

○ Outer pair

Capability

☑ Bitswap Enable

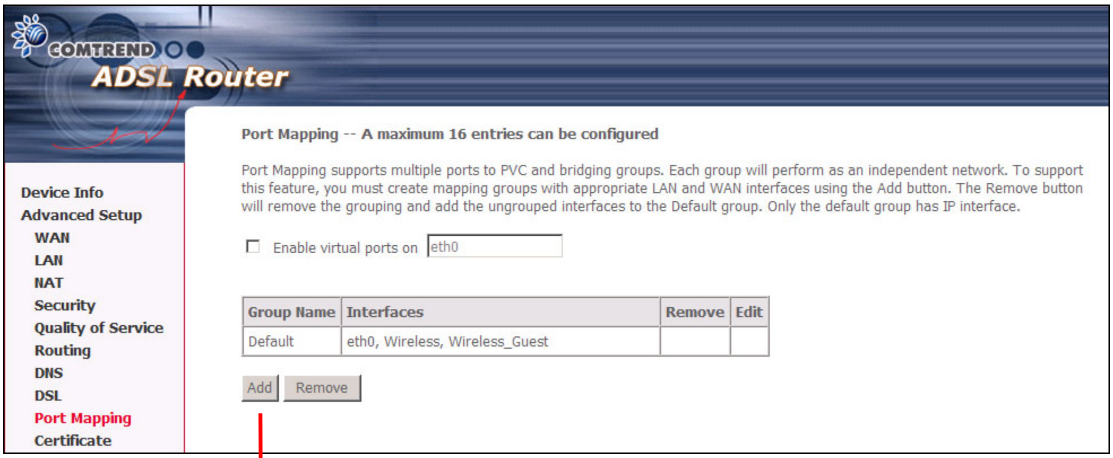
□ SRA Enable

Modulation	Data Transmission Rate - Mbit/s (Megabits per second)
G.Dmt	Downstream: 12 Mbit/s Upstream: 1.3 Mbit/s
G.lite	Downstream: 4 Mbit/s Upstream: 0.5 Mbit/s
T1.413	Downstream: 8 Mbit/s Upstream: 1.0 Mbit/s
ADSL2	Downstream: 12 Mbit/s Upstream: 1.0 Mbit/s
AnnexL	Supports longer loops but with reduced transmission rates
ADSL2+	Downstream: 24 Mbit/s Upstream: 1.0 Mbit/s
AnnexM	Downstream: 24 Mbit/s Upstream: 3.5 Mbit/s

Options	Description
Inner/Outer Pair	Select the inner or outer pins of the twisted pair (RJ11 cable)
Bitswap Enable	Enables adaptive handshaking functionality
SRA Enable	Enables Seamless Rate Adaptation (SRA)

6.9 Port Mapping

Port Mapping supports multiple port to PVC and bridging groups. Each group will perform as an independent network. To support this feature, you must create mapping groups with appropriate LAN and WAN interfaces using the **Add** button. The **Remove** button will remove the grouping and add the ungrouped interfaces to the Default group. As shown below, when you tick the **Enable virtual ports on**, the LAN interfaces (eth0) in the default group will separate.

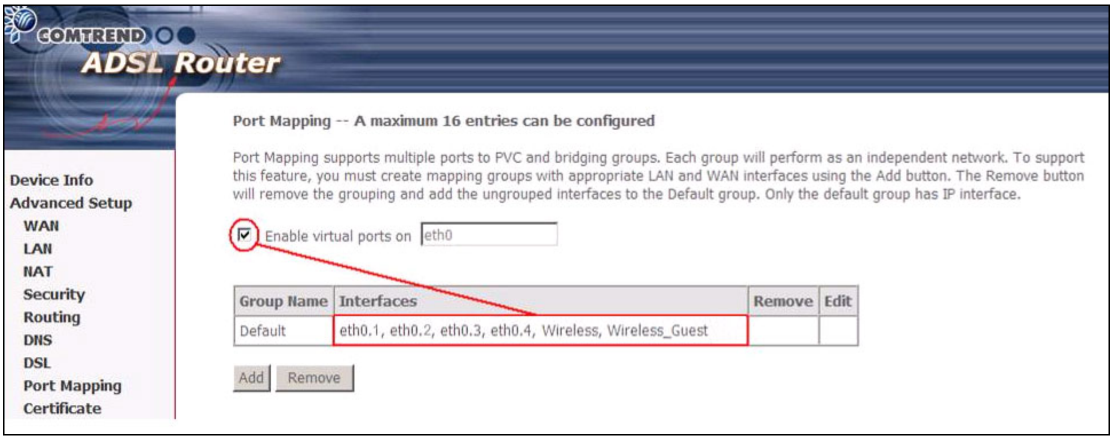


Port Mapping -- A maximum 16 entries can be configured

Port Mapping supports multiple ports to PVC and bridging groups. Each group will perform as an independent network. To support this feature, you must create mapping groups with appropriate LAN and WAN interfaces using the Add button. The Remove button will remove the grouping and add the ungrouped interfaces to the Default group. Only the default group has IP interface.

☐ Enable virtual ports on eth0

Group Name	Interfaces	Remove	Edit
Default	eth0, Wireless, Wireless_Guest		



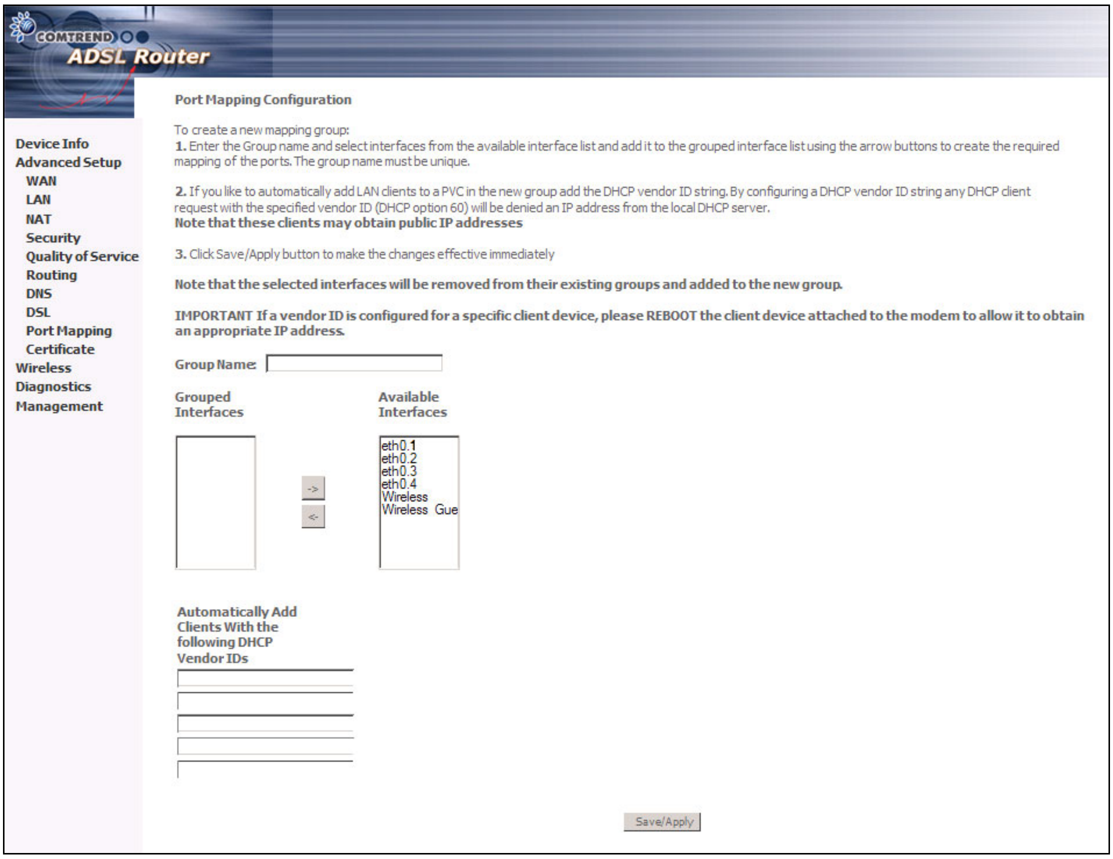
Port Mapping -- A maximum 16 entries can be configured

Port Mapping supports multiple ports to PVC and bridging groups. Each group will perform as an independent network. To support this feature, you must create mapping groups with appropriate LAN and WAN interfaces using the Add button. The Remove button will remove the grouping and add the ungrouped interfaces to the Default group. Only the default group has IP interface.

☑ Enable virtual ports on eth0

Group Name	Interfaces	Remove	Edit
Default	eth0.1, eth0.2, eth0.3, eth0.4, Wireless, Wireless_Guest		

To add a port-mapping group, click the **Add** button.



Port Mapping Configuration

To create a new mapping group:
1. Enter the Group name and select interfaces from the available interface list and add it to the grouped interface list using the arrow buttons to create the required mapping of the ports. The group name must be unique.

2. If you like to automatically add LAN clients to a PVC in the new group add the DHCP vendor ID string. By configuring a DHCP vendor ID string any DHCP client request with the specified vendor ID (DHCP option 60) will be denied an IP address from the local DHCP server.
Note that these clients may obtain public IP addresses

3. Click Save/Apply button to make the changes effective immediately

Note that the selected interfaces will be removed from their existing groups and added to the new group.

IMPORTANT If a vendor ID is configured for a specific client device, please REBOOT the client device attached to the modem to allow it to obtain an appropriate IP address.

Group Name:

Grouped Interfaces

Available Interfaces

Automatically Add Clients With the following DHCP Vendor IDs

To create a group from the list, first enter the group name and then select from the available interfaces on the list.

Automatically Add Clients With the Following DHCP Vendor IDs:
Add support to automatically map LAN interfaces to PVC's using DHCP vendor ID (option 60). The local DHCP server will decline and send the requests to a remote DHCP server by mapping the appropriate LAN interface. This will be turned on when PortMapping is enabled.

There are four PVCs (0/33, 0/36, 0/37, and 0/38). 0/33 is for PPPoE and the others are for IP setup-box (video). The LAN interfaces are eth0.1, eth0.2, eth0.3, eth0.4 and Wireless. Port mapping configuration is:

1. Default: eth0.1, eth0.2, eth0.3, eth0.4, Wireless, and Wireless_Guest.
2. Video: nas_0_36, nas_0_37, and nas_0_38. The DHCP vendor ID is "Video".

The CPE's DHCP server is now running on "Default". In addition, ISP's DHCP server is running on PVC 0/36. It is for setup-box use only.

On the LAN side, the PC can get an IP address from CPE's DHCP server and access the Internet via PPPoE (0/33).

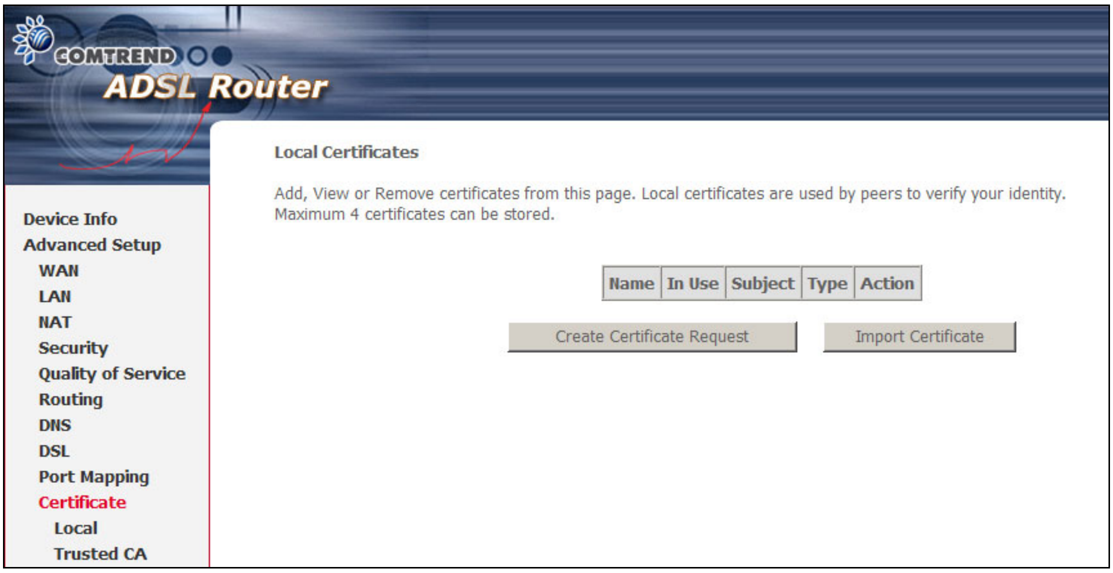
If the setup-box was connected with interface "eth0.1" and sent a DHCP request with vendor id "Video", CPE's DHCP server will forward this request to ISP's DHCP server; and CPE will change the port-mapping configuration automatically. The port-mapping configuration will become:

1. Default: eth0.2, eth0.3, eth0.4, Wireless, and Wireless_Guest.
2. Video: nas_0_36, nas_0_37, nas_0_38, and eth0.1.

6.10 Certificate

A certificate is a public key, attached with its owner's information (company name, server name, personal real name, contact e-mail, postal address, etc) and digital signatures. There will be one or more digital signatures attached to the certificate, indicating that these entities have verified that this certificate is valid.

6.10.1 Local



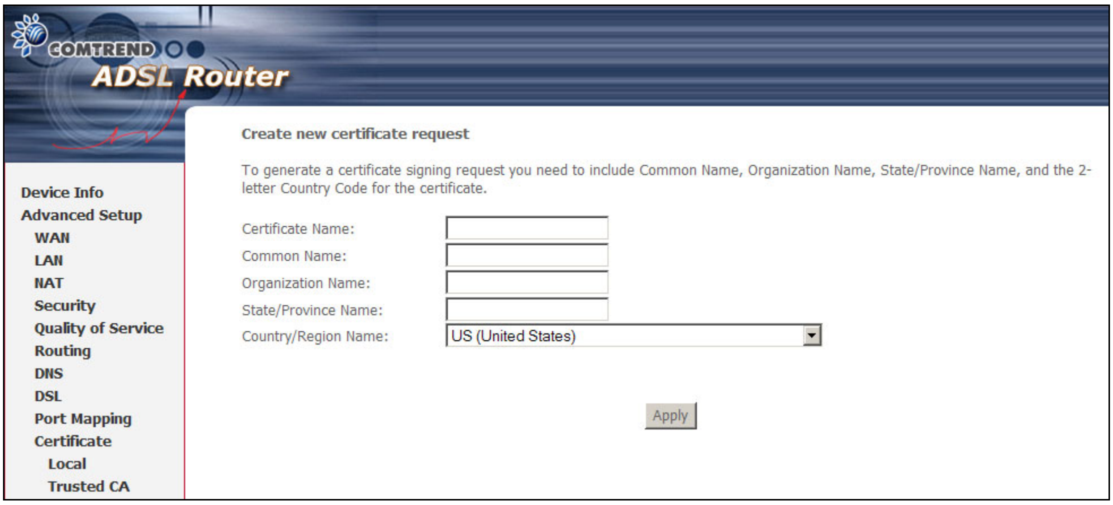
Local Certificates

Add, View or Remove certificates from this page. Local certificates are used by peers to verify your identity. Maximum 4 certificates can be stored.

Name	In Use	Subject	Type	Action

Click **Create Certificate Request** to generate a certificate-signing request.

The certificate-signing request can be submitted to the vendor/ISP/ITSP to apply for a certificate. Some information must be included in the certificate-signing request. Your vendor/ISP/ITSP will ask for information about when they need.



Create new certificate request

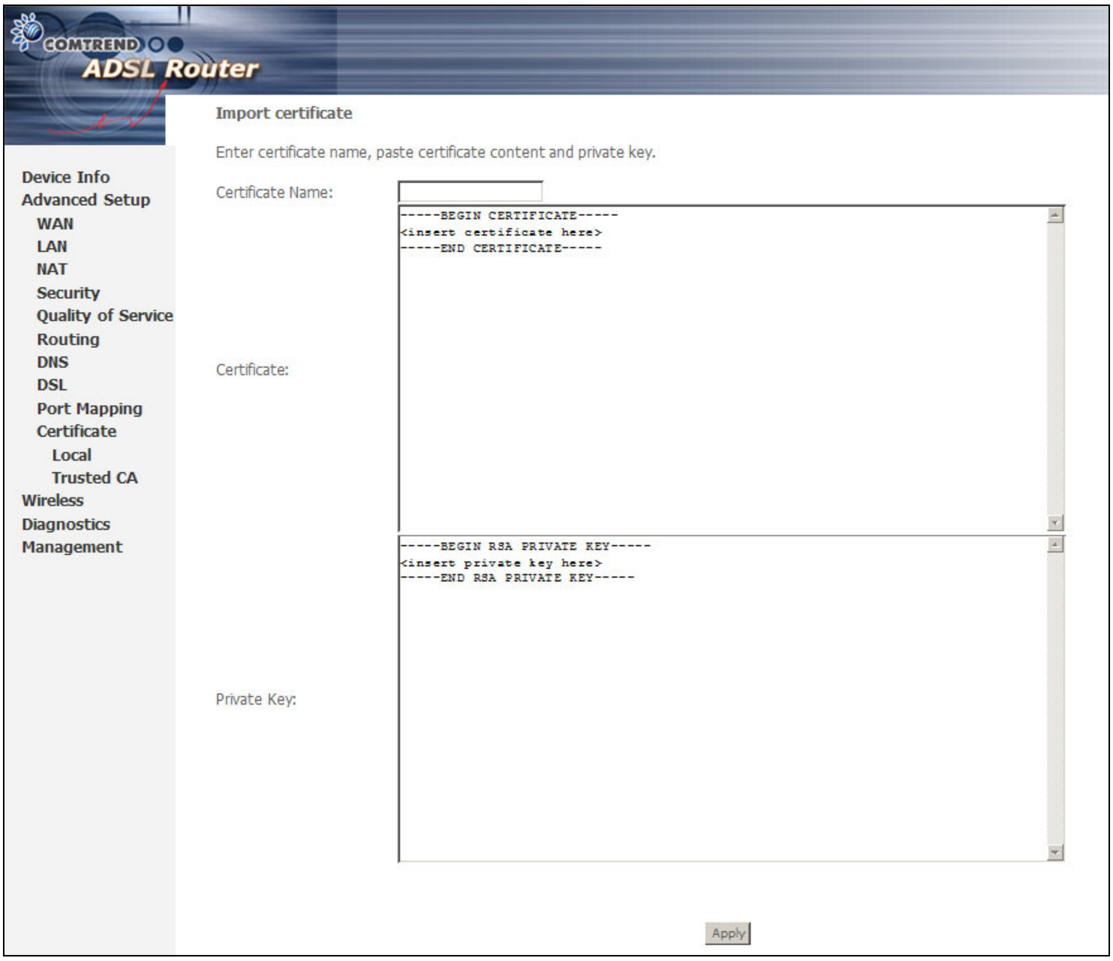
To generate a certificate signing request you need to include Common Name, Organization Name, State/Province Name, and the 2-letter Country Code for the certificate.

Certificate Name:
Common Name:
Organization Name:
State/Province Name:
Country/Region Name: US (United States)

Click **Apply** to generate a private key and a certificate-signing request.

This screen is used to paste the certificate content and the private key provided by your vendor/ISP/ITSP.

Field	Description
Certificate Name	A user-defined name for the certificate.
Common Name	Usually, the fully qualified domain name of the machine.
Organization Name	The exact legal name of your organization. Do not abbreviate.
State/Province Name	The state or province where your organization is located. It cannot be abbreviated.
Country/Region Name	The two-letter ISO abbreviation for your country.



Import certificate

Enter certificate name, paste certificate content and private key.

Certificate Name:

Certificate:

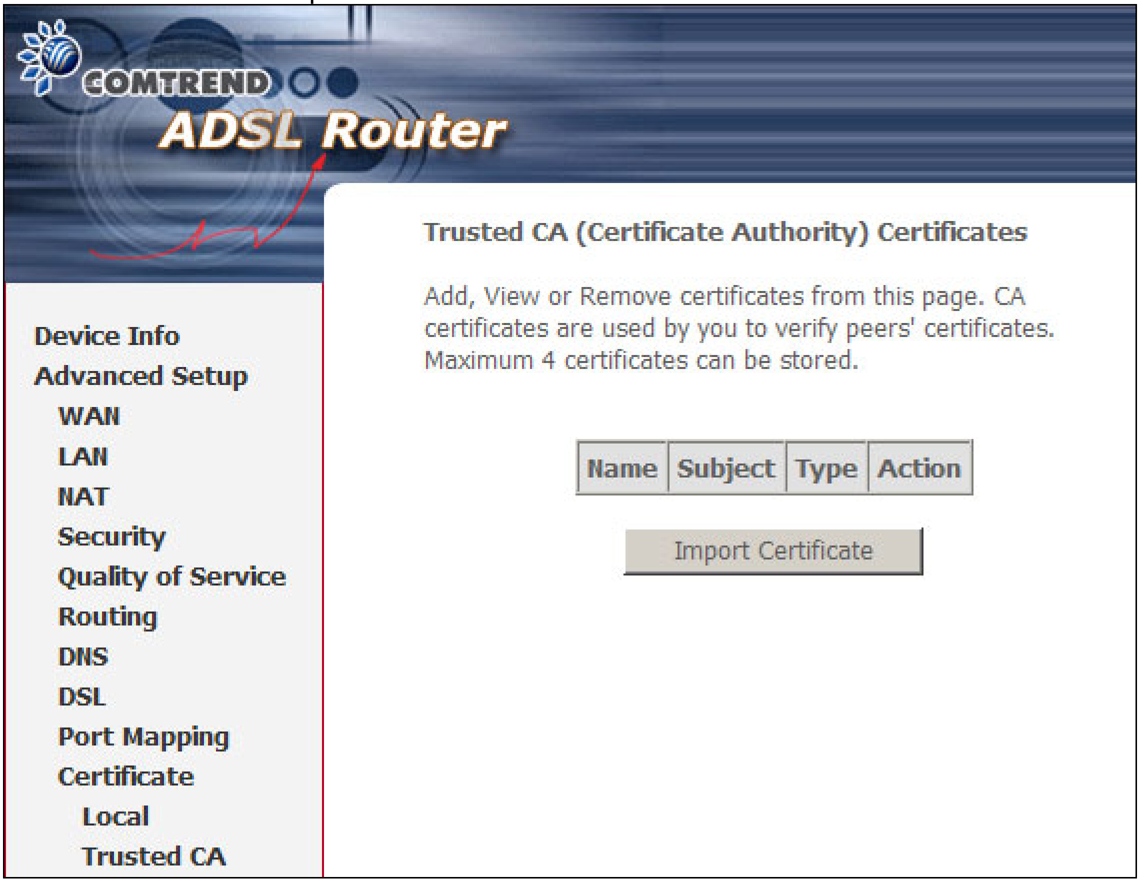
```
-----BEGIN CERTIFICATE-----
<insert certificate here>
-----END CERTIFICATE-----
```

Private Key:

```
-----BEGIN RSA PRIVATE KEY-----
<insert private key here>
-----END RSA PRIVATE KEY-----
```

6.10.2 Trusted CA

CA is the abbreviation for Certificate Authority. CA is a part of the X.509 system. It is itself a certificate, attached with the owner information of this certificate authority; but its purpose is not to do encryption/decryption. Its purpose is to sign and issue certificates in order to prove that the certificate is valid.

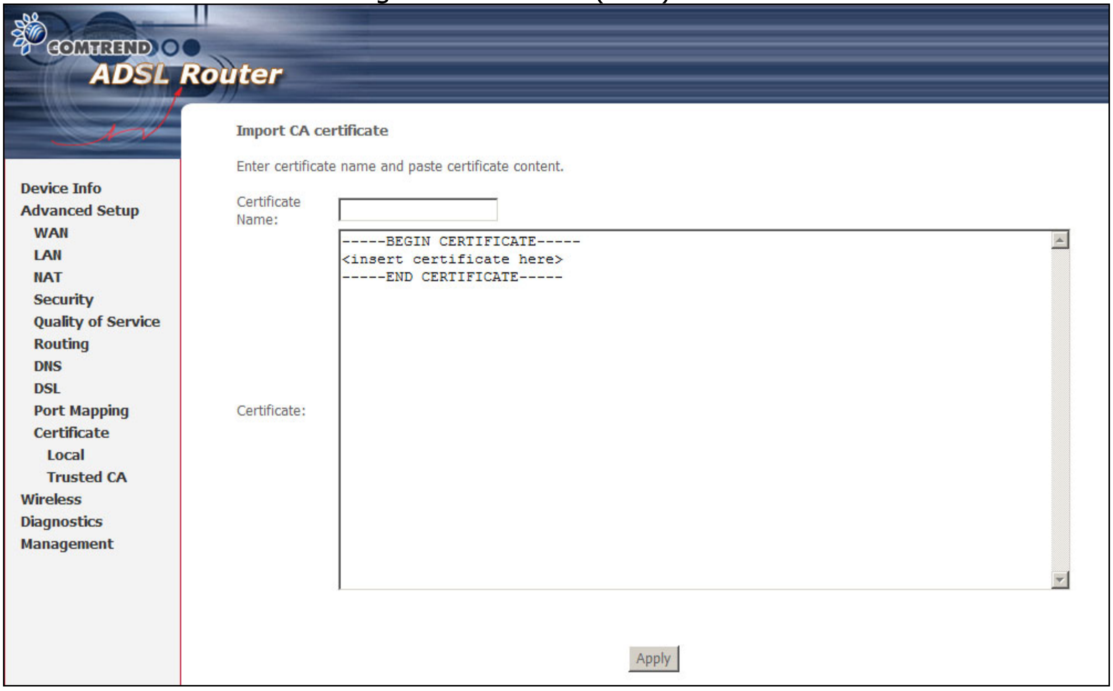


Trusted CA (Certificate Authority) Certificates

Add, View or Remove certificates from this page. CA certificates are used by you to verify peers' certificates. Maximum 4 certificates can be stored.

Name	Subject	Type	Action

Click **Import Certificate** to paste the certificate content of your trusted CA. The certificate content will be provided by your vendor/ISP/ ITSP and is used to authenticate the Auto-Configuration Server (ACS) that the CPE will connect to.



Import CA certificate

Enter certificate name and paste certificate content.

Certificate Name:

Certificate:

```
-----BEGIN CERTIFICATE-----
<insert certificate here>
-----END CERTIFICATE-----
```

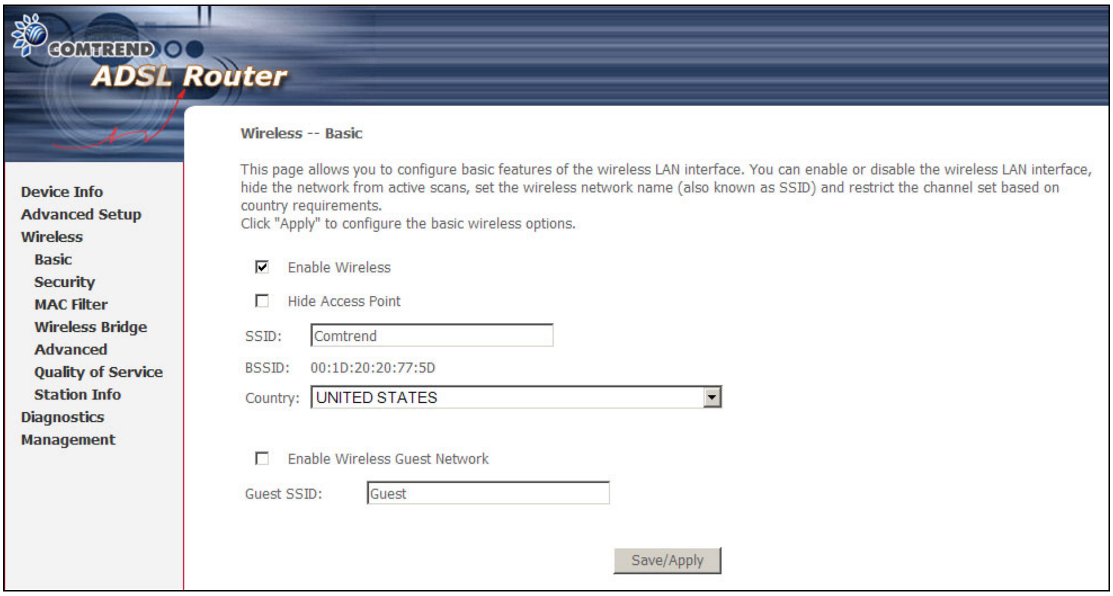
Chapter 7 Wireless

The Wireless submenu provides access to WLAN configuration settings including wireless network name, channel restrictions (based on country), security, and quality of services features, access point or bridging behavior and station info.

7.1 Basic

The Basic option allows you to configure basic features of the wireless LAN interface. You can enable or disable the wireless LAN interface, hide the network from active scans, set the wireless network name (also known as SSID) and restrict the channel set based on country requirements.

Click **Save/Apply** to configure the basic wireless options.



Wireless -- Basic

This page allows you to configure basic features of the wireless LAN interface. You can enable or disable the wireless LAN interface, hide the network from active scans, set the wireless network name (also known as SSID) and restrict the channel set based on country requirements.
Click "Apply" to configure the basic wireless options.

☑ Enable Wireless

□ Hide Access Point

SSID: Comtrend

BSSID: 00:1D:20:20:77:5D

Country: UNITED STATES

□ Enable Wireless Guest Network

Guest SSID: Guest

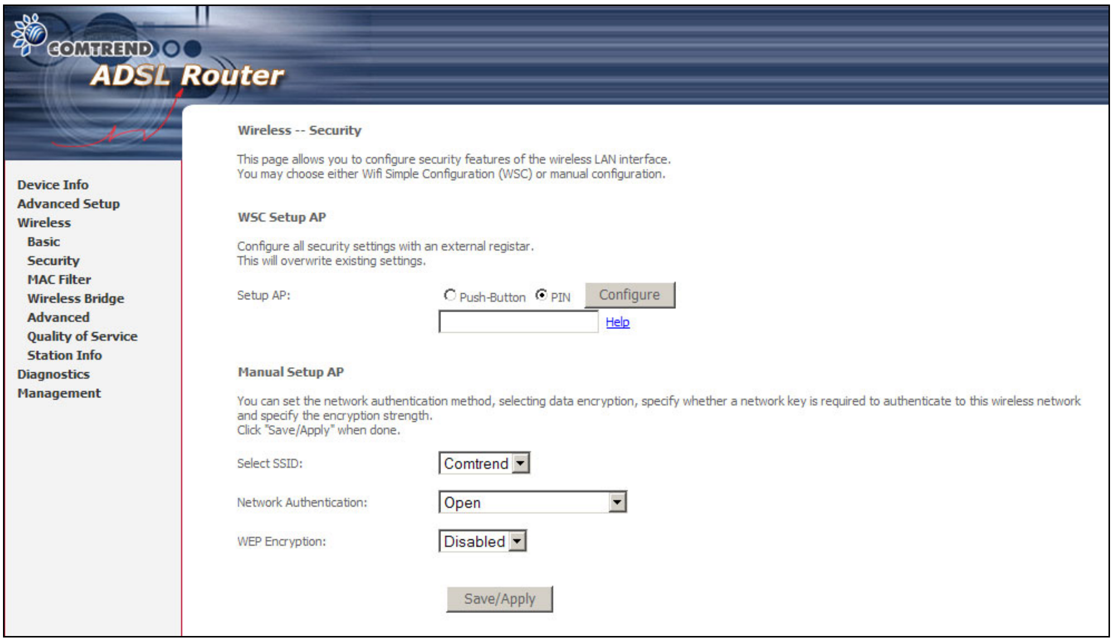
Field	Description
Enable Wireless	A checkbox that enables (default) or disables the wireless LAN interface. When selected, the Web UI displays Hide Access point, SSID, BSSID and Country settings.
Hide Access Point	Select Hide Access Point to protect the access point from detection by wireless active scans. To check AP status in Windows XP, open **Network Connections** from the **start** Menu and select **View Available Network Connections**. If the access point is hidden, it will not be listed there. To connect a client to a hidden access point, the station must add the access point manually to its wireless configuration.
SSID [1-32 characters]	Sets the wireless network name. SSID stands for Service Set Identifier. All stations must be configured with the correct SSID to access the WLAN. If the SSID does not match, that user will not be granted access.
BSSID	The BSSID is a 48-bit identity used to identify a particular BSS (Basic Service Set) within an area. In Infrastructure BSS networks, the BSSID is the MAC (Media Access Control) address of the AP (Access Point); and in Independent BSS or ad hoc networks, the BSSID is generated randomly.

Country	A drop-down menu that permits worldwide and specific national settings. Each country listed below enforces specific regulations limiting channel range: • US= worldwide • Japan=1-14 • Jordan= 10-13 • Israel= 1-13
Wireless Guest Network	The Guest SSID (Virtual Access Point) can be enabled by selecting the **Enable Wireless Guest Network** checkbox. Rename the Wireless Guest Network as you wish. **NOTE:** Remote wireless hosts cannot scan Guest SSIDs.

7.2 Security

WIRELESS SECURITY

The wireless security screen (shown below) allows for configuration of wireless security settings according to WiFi Simple Configuration (WSC) or Manual Setup AP methods. The WSC method automatically configures security settings using Wi-Fi Protected Setup (WPS). In comparison, the Manual method requires the user to select and enter all these settings for every device on the network.



Wireless -- Security

This page allows you to configure security features of the wireless LAN interface.
You may choose either Wifi Simple Configuration (WSC) or manual configuration.

WSC Setup AP

Configure all security settings with an external registar.
This will overwrite existing settings.

Setup AP: ○ Push-Button ● PIN

Manual Setup AP

You can set the network authentication method, selecting data encryption, specify whether a network key is required to authenticate to this wireless network and specify the encryption strength.
Click "Save/Apply" when done.

Select SSID: Comtrend

Network Authentication: Open

WEP Encryption: Disabled

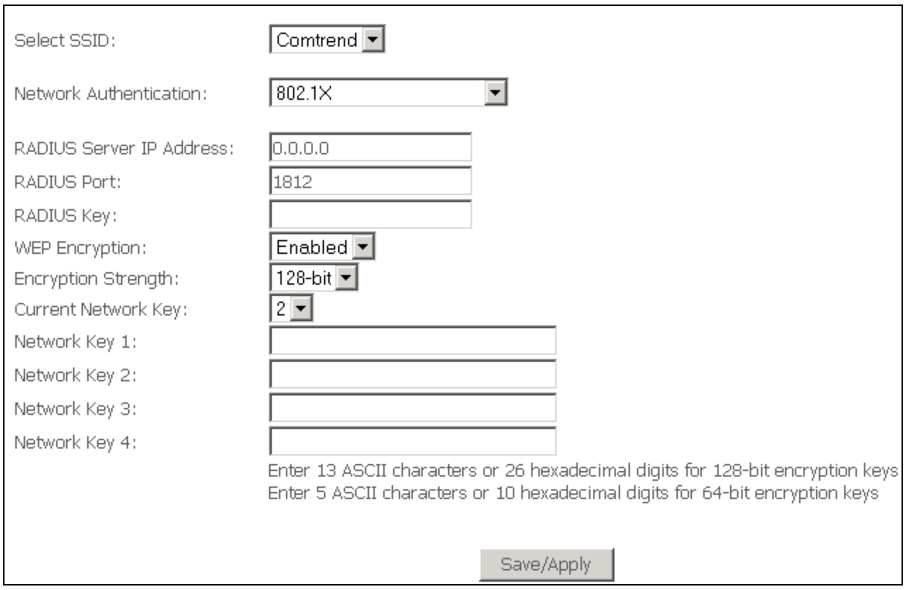
Manual Setup AP settings are described in the table below.

Select SSID
Sets the wireless network name. SSID stands for Service Set Identifier. All stations must be configured with the correct SSID to access the WLAN. If the SSID does not match, that user will not be granted access. 802.11 protocols support two types of network authentication services: open system and shared key. Under open system authentication, any wireless station can request authentication. The system that needs to authenticate with another wireless station sends an authentication management frame that contains the identity of the sending station. The receiving station then sends back a frame that indicates whether it recognizes the identity of the sending station.

Network Authentication

This option specifies whether a network key is used for authentication to the wireless network. If network authentication is set to Open, then no authentication is provided. Despite this, the identity of the client is still verified.

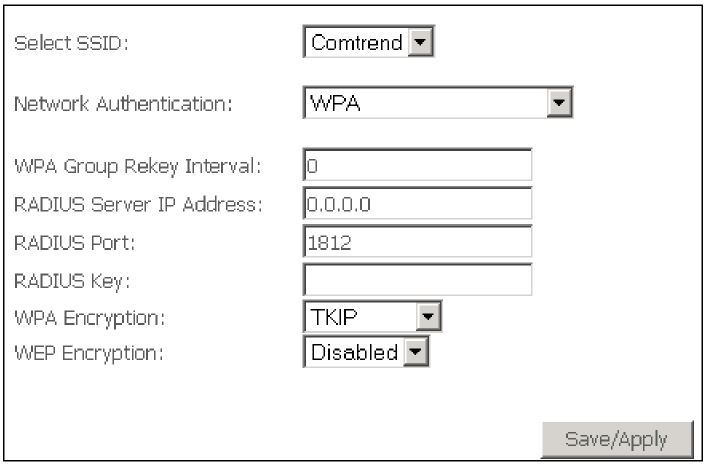
Each authentication type has its own settings. For example, selecting 802.1X authentication will reveal the RADIUS Server IP address, Port and Key fields. WEP Encryption will also be enabled as shown below.



Select SSID:	Comtrend
Network Authentication:	802.1X
RADIUS Server IP Address:	0.0.0.0
RADIUS Port:	1812
RADIUS Key:	
WEP Encryption:	Enabled
Encryption Strength:	128-bit
Current Network Key:	2
Network Key 1:	
Network Key 2:	
Network Key 3:	
Network Key 4:	

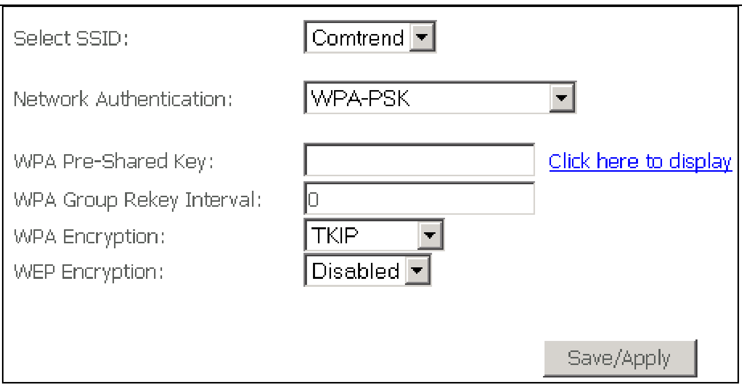
Enter 13 ASCII characters or 26 hexadecimal digits for 128-bit encryption keys
Enter 5 ASCII characters or 10 hexadecimal digits for 64-bit encryption keys

The settings for WPA authentication are shown below.



Select SSID:	Comtrend
Network Authentication:	WPA
WPA Group Rekey Interval:	0
RADIUS Server IP Address:	0.0.0.0
RADIUS Port:	1812
RADIUS Key:	
WPA Encryption:	TKIP
WEP Encryption:	Disabled

The settings for WPA-PSK authentication are shown below.



Select SSID: Comtrend

Network Authentication: WPA-PSK

WPA Pre-Shared Key: Click here to display

WPA Group Rekey Interval: 0

WPA Encryption: TKIP

WEP Encryption: Disabled

WEP Encryption

This option specifies whether data sent over the network is encrypted. The same network key is used for data encryption and network authentication. Four network keys can be defined although only one can be used at any one time. Use the Current Network Key list box to select the appropriate network key.

Encryption Strength

This drop-down list box will display when WEP Encryption is enabled. The key strength is proportional to the number of binary bits comprising the key. This means that keys with a greater number of bits have a greater degree of security and are considerably more difficult to crack. Encryption strength can be set to either 64-bit or 128-bit. A 64-bit key is equivalent to 5 ASCII characters or 10 hexadecimal numbers. A 128-bit key contains 13 ASCII characters or 26 hexadecimal numbers. FYI: Each key contains a 24-bit header (an initiation vector) which enables parallel decoding of multiple streams of encrypted data.

WPS

WPS is an industry standard that simplifies wireless security setup for certified network devices. Every WPS certified device has both a PIN number and a push button, located on the device or accessed through device software. This router has both a WPS button on the rear panel and a virtual button accessed from the web user interface (WUI).

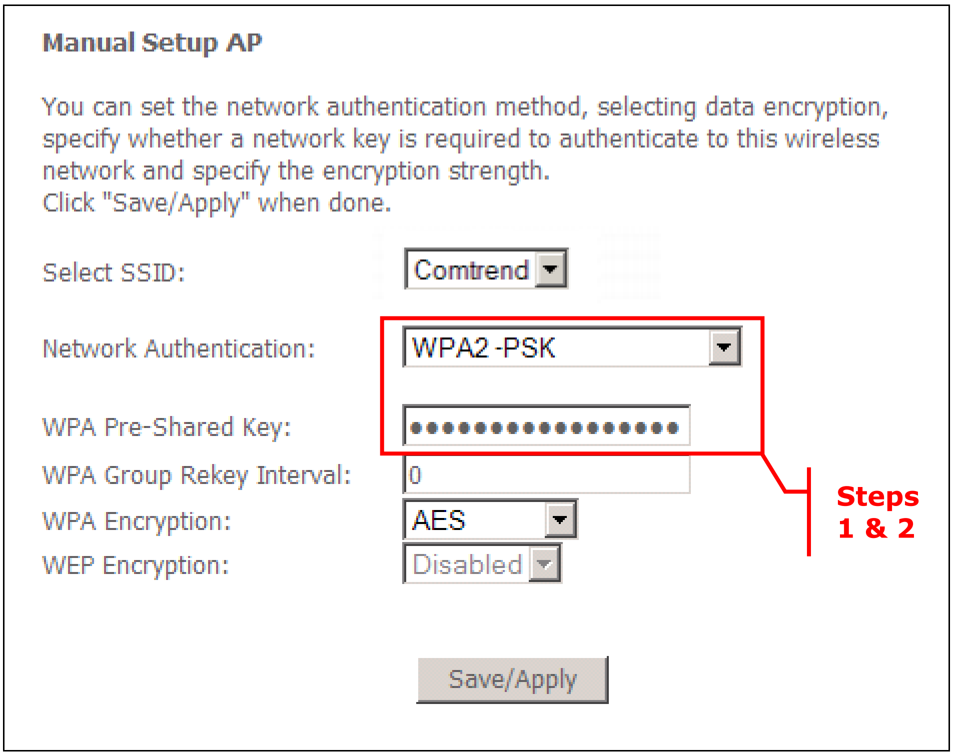
Devices with the WPS logo (shown here) support WPS. However, the WPS logo might not be present on your device. In this case, check the device documentation for the phrase "Wi-Fi Protected Setup".

NOTE: WPS is only available in WPA-PSK, WPA2-PSK or Mixed WPA2/WPA-PSK network authentication modes. Other authentication modes do not use WPS so they must be configured manually.

To configure security settings with WPS, follow the procedure below. You must choose either the Push-Button or PIN configuration method for Steps 4 and 5.

I. SELECT NETWORK AUTHENTICATION MODE

Step 1: Select WPA-PSK, WPA2-PSK or Mixed WPA2/WPA-PSK network authentication mode from the Manual Setup AP section of the Wireless Security screen. The example below shows WPA2-PSK mode.



Manual Setup AP

You can set the network authentication method, selecting data encryption, specify whether a network key is required to authenticate to this wireless network and specify the encryption strength.
Click "Save/Apply" when done.

Select SSID: Comtrend

Network Authentication: WPA2 -PSK

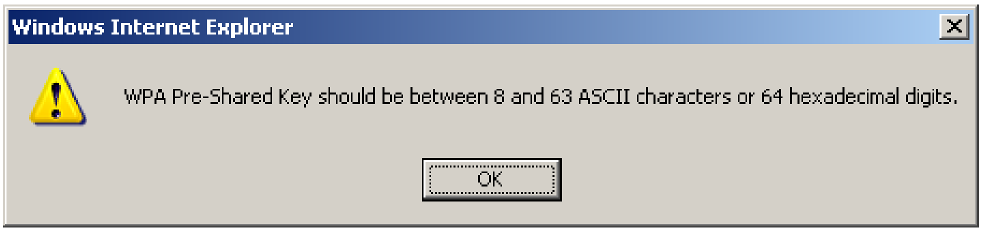
WPA Pre-Shared Key: •••••••••••••••••

WPA Group Rekey Interval: 0

WPA Encryption: AES

WEP Encryption: Disabled

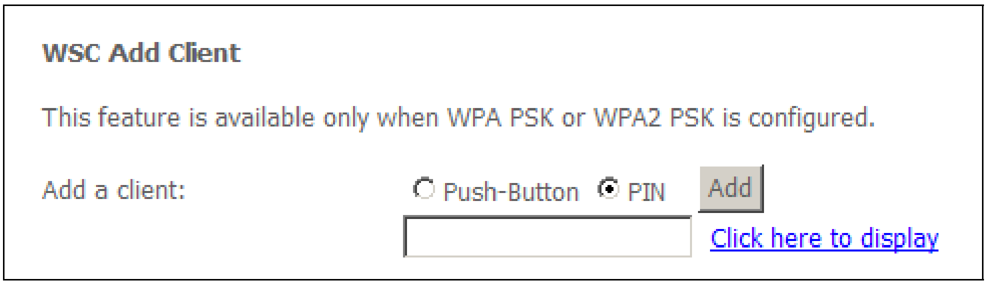
Step 2: Enter a WPA Pre-Shared Key and click the **Save/Apply** button. You will see the following dialog box if the Key is too short or too long.



Windows Internet Explorer

WPA Pre-Shared Key should be between 8 and 63 ASCII characters or 64 hexadecimal digits.

Step 3: The WSC Add Client section should now appear, as shown below.



WSC Add Client

This feature is available only when WPA PSK or WPA2 PSK is configured.

Add a client: ○ Push-Button ● PIN

IIa. PUSH-BUTTON CONFIGURATION

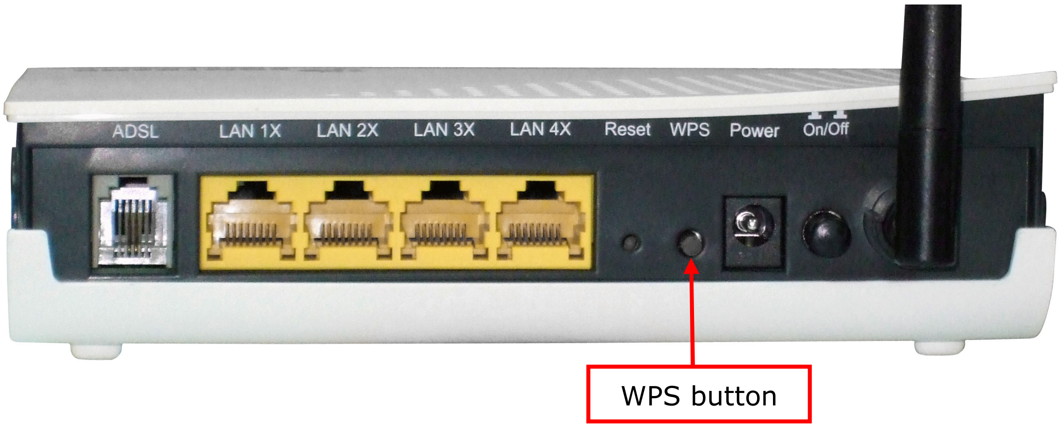
The WPS push-button configuration provides a semi-automated configuration method. The WPS button on the rear panel of the router can be used for this purpose or the Web User Interface (WUI) can be used exclusively.

The WPS push-button configuration is described in the procedure below. It is assumed that the Wireless function is Enabled and that the router is configured as the Wireless Access Point (AP) of your wireless LAN. In addition, the wireless client must also be configured correctly and turned on, with WPS function enabled.

NOTE:	The wireless AP on the router will search for WPS clients for 2 minutes. If the router stops searching before you complete Step 5, then return to Step 4 and try again.

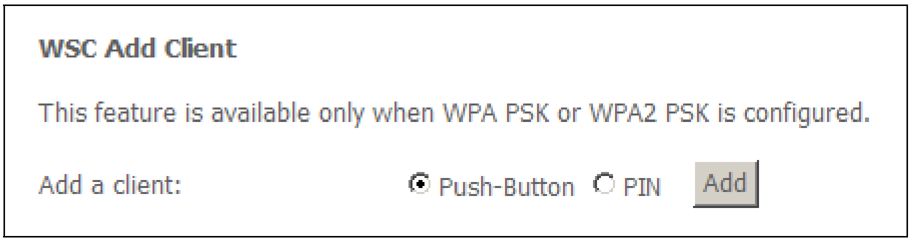
Step 4: **1st method: WPS button**

Press the WPS button on the rear panel of the router. The WPS LED will blink to show that the router has begun searching for WPS clients.



2nd method: WUI virtual button

From the WUI, select the Push-Button radio button in the WSC Add Client section of the Wireless Security screen. Then click the Add button.

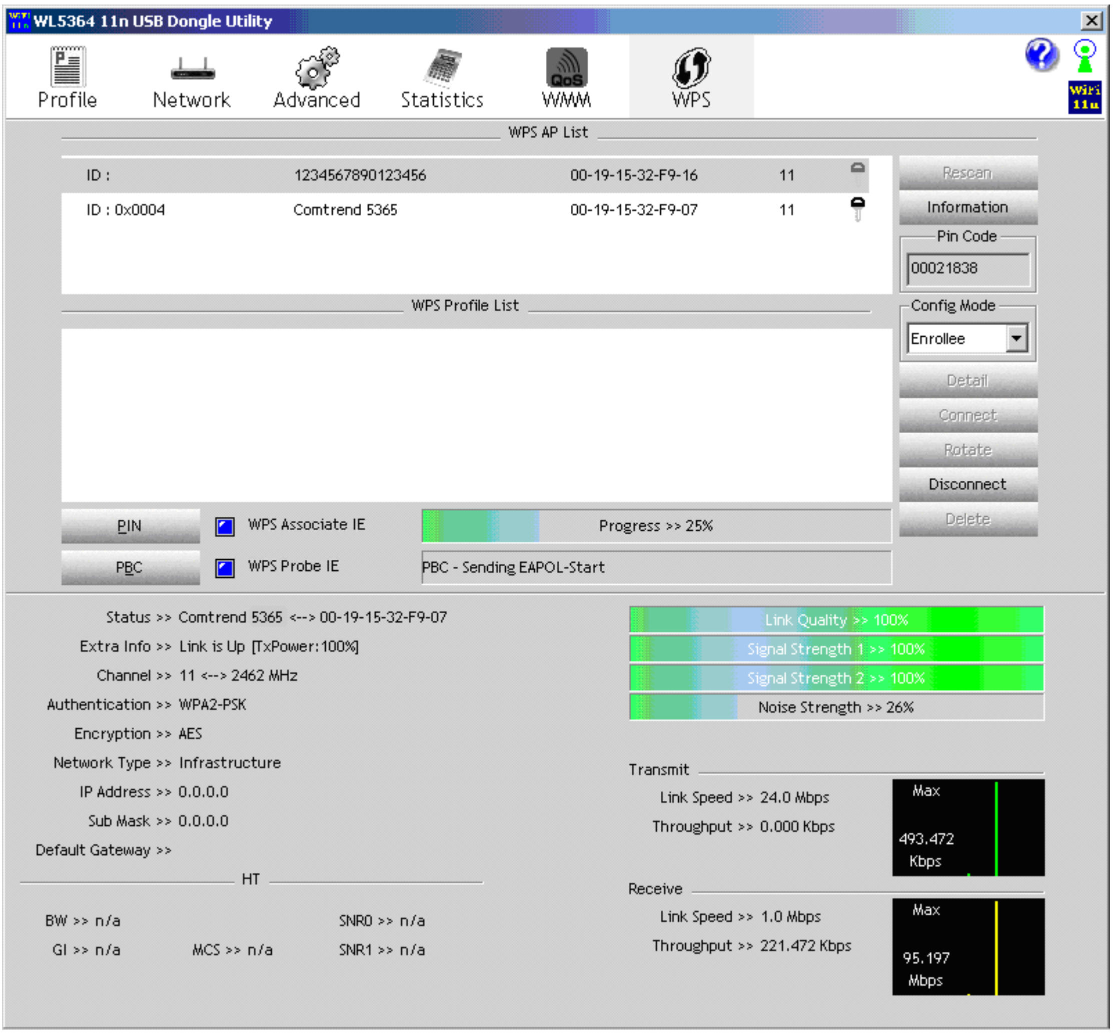


WSC Add Client

This feature is available only when WPA PSK or WPA2 PSK is configured.

Add a client: ● Push-Button ○ PIN Add

Step 5: Go to your WPS wireless client and activate the push-button function. A screenshot of typical WPS client software is given below as an example.



WPS AP List

ID :	1234567890123456	00-19-15-32-F9-16	11	
ID : 0x0004	Comtrend 5365	00-19-15-32-F9-07	11	

Pin Code: 00021838

Config Mode: Enrollee

WPS Profile List

☑ WPS Associate IE

☑ WPS Probe IE

Progress >> 25%

PBC - Sending EAPOL-Start

Status >> Comtrend 5365 <--> 00-19-15-32-F9-07

Extra Info >> Link is Up [TxPower:100%]

Channel >> 11 <--> 2462 MHz

Authentication >> WPA2-PSK

Encryption >> AES

Network Type >> Infrastructure

IP Address >> 0.0.0.0

Sub Mask >> 0.0.0.0

Default Gateway >>

HT

BW >> n/a

GI >> n/a

MCS >> n/a

SNR0 >> n/a

SNR1 >> n/a

Link Quality >> 100%

Signal Strength 1 >> 100%

Signal Strength 2 >> 100%

Noise Strength >> 26%

Transmit

Link Speed >> 24.0 Mbps

Throughput >> 0.000 Kbps

Max 493.472 Kbps

Receive

Link Speed >> 1.0 Mbps

Throughput >> 221.472 Kbps

Max 95.197 Mbps

You can now proceed to Step 6 to check your connection.

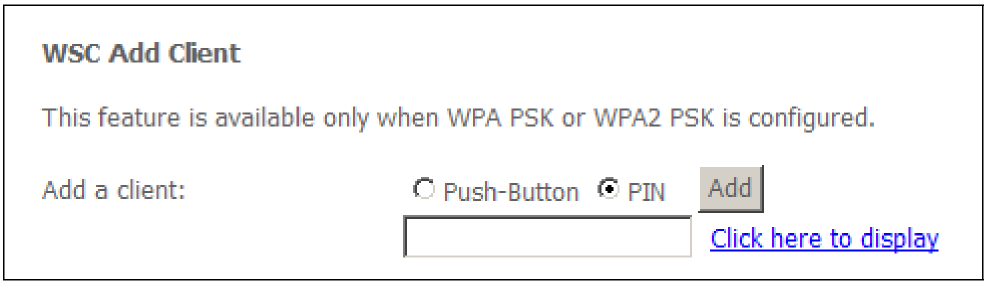
IIb. WPS – PIN CONFIGURATION

Using this method, a client is configured by the router AP using a personal identification number (PIN). The PIN can be found on the device itself or within the client software. The PIN may be generated randomly in the latter case. To obtain a PIN number for your client, check device documentation for specific instructions.

The WPS PIN configuration is described in the procedure below. It is assumed that the Wireless function is Enabled and that the router is configured as the Wireless Access Point (AP) of your wireless LAN. In addition, the wireless client must also be configured correctly and turned on, with WPS function enabled.

NOTE: The wireless AP on the router will search for WPS clients for 2 minutes. If the router stops searching before you complete Step 5, then return to Step 4 and try again.

Step 4: Select the PIN radio button in the WSC Add Client section of the Wireless Security screen. Enter the client PIN in the box provided and click Add.



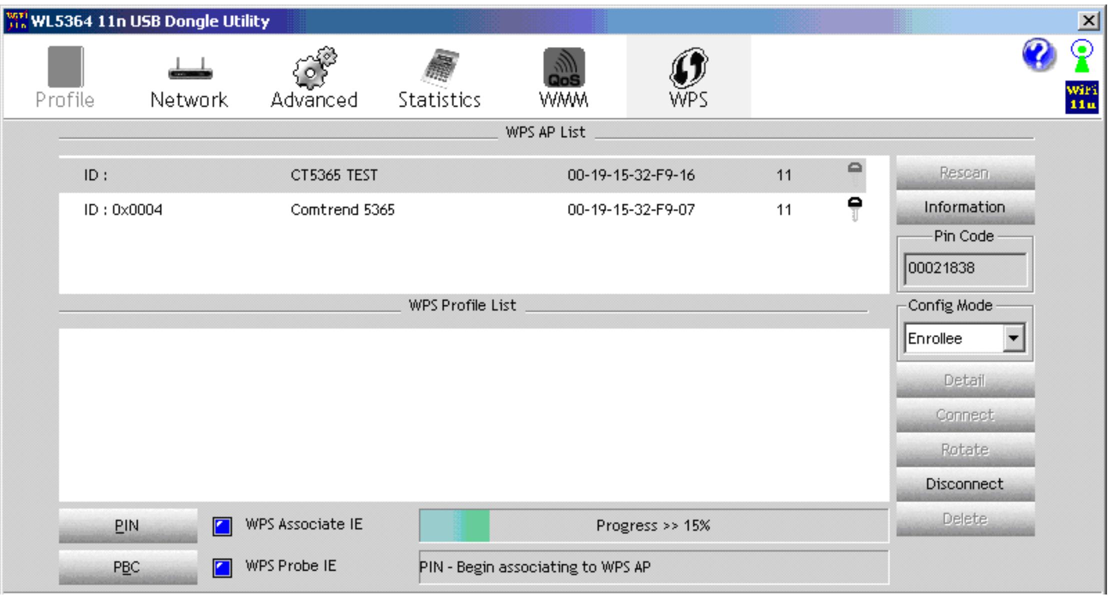
WSC Add Client

This feature is available only when WPA PSK or WPA2 PSK is configured.

Add a client: ○ Push-Button ● PIN Add

Click here to display

Step 4: Go to your WPS certified client device and activate the PIN function. A screenshot of typical WPS client software is given below as an example.



WL5364 11n USB Dongle Utility

WPS AP List

ID :	CT5365 TEST	00-19-15-32-F9-16	11
ID : 0x0004	Comtrend 5365	00-19-15-32-F9-07	11

Pin Code: 00021838

Config Mode: Enrollee

WPS Profile List

☑ WPS Associate IE

☑ WPS Probe IE

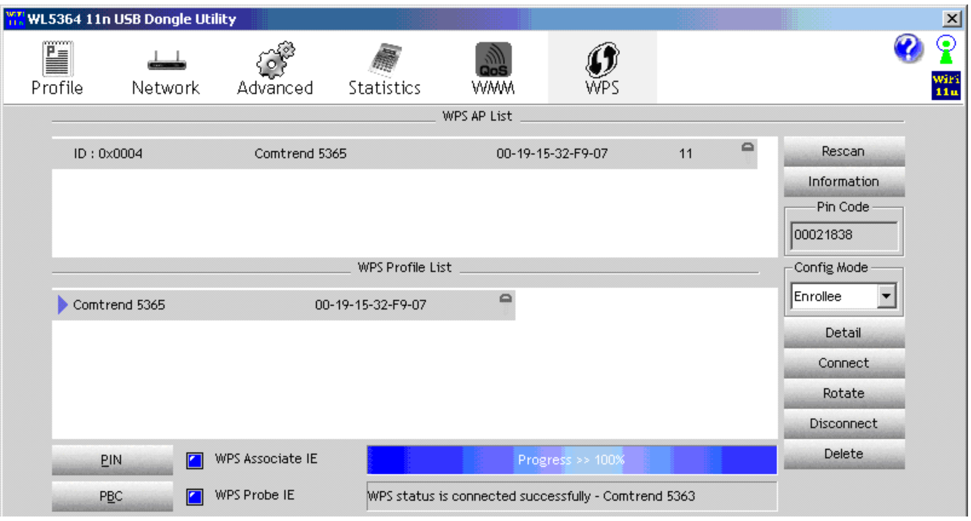
Progress >> 15%

PIN - Begin associating to WPS AP

You can now proceed to Step 6 to check your connection.

III. CHECK CONNECTION

Step 6: If the WPS setup method was successful, you will be able access the wireless AP from the client. The client software should show the status. The example below shows that the connection established successfully.



WPS AP List

ID : 0x0004 Comtrend 5365 00-19-15-32-F9-07 11

Pin Code: 00021838

Config Mode: Enrollee

WPS Profile List

Comtrend 5365 00-19-15-32-F9-07

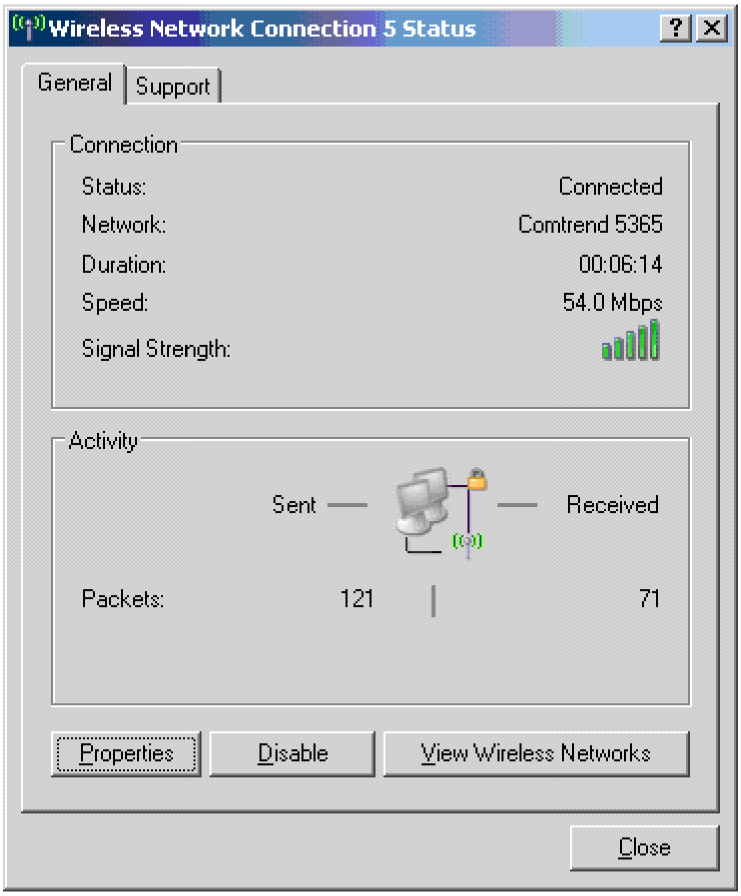
☑ WPS Associate IE

☑ WPS Probe IE

Progress >> 100%

WPS status is connected successfully - Comtrend 5363

Double-click the Wireless Network Connection icon from the Network Connections window (or the system tray) to confirm the new connection. It should appear as shown in the dialog-box below.



Connection

Status: Connected

Network: Comtrend 5365

Duration: 00:06:14

Speed: 54.0 Mbps

Signal Strength:

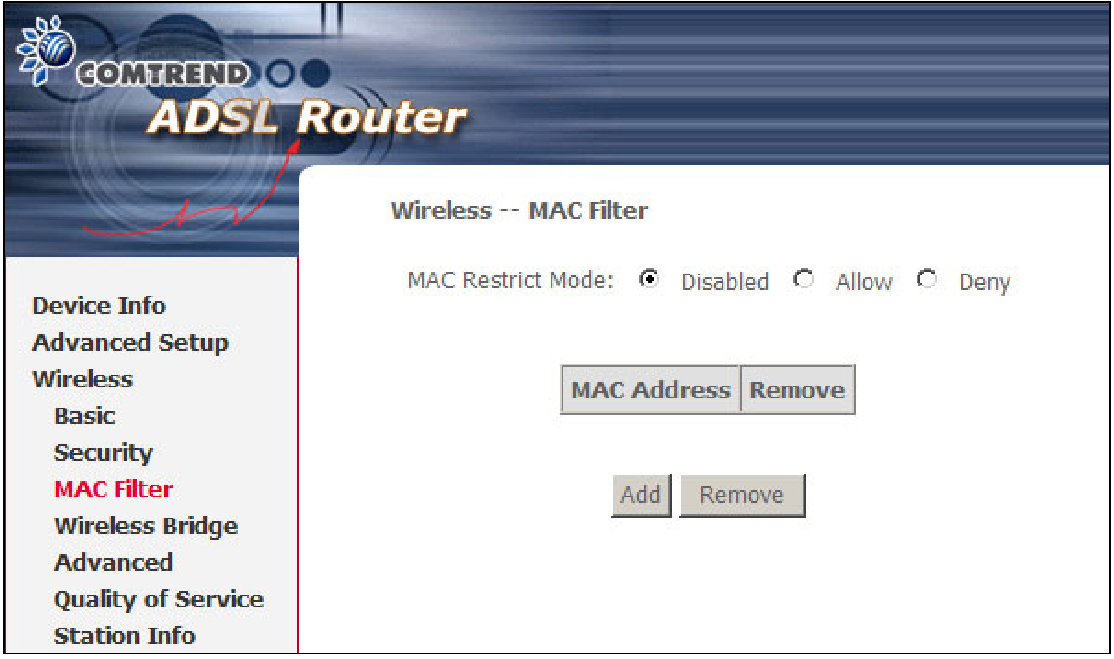
Activity

Packets: 121 | 71

7.3 MAC Filter

This option allows access to the router to be restricted based upon MAC addresses. Every network device has a unique 48-bit MAC address. When MAC address filtering is enabled, it restricts the devices that can connect to your access point.

To add a MAC Address filter, click the **Add** button shown below.
To delete a filter**,** select it from the table below and click the **Remove** button.



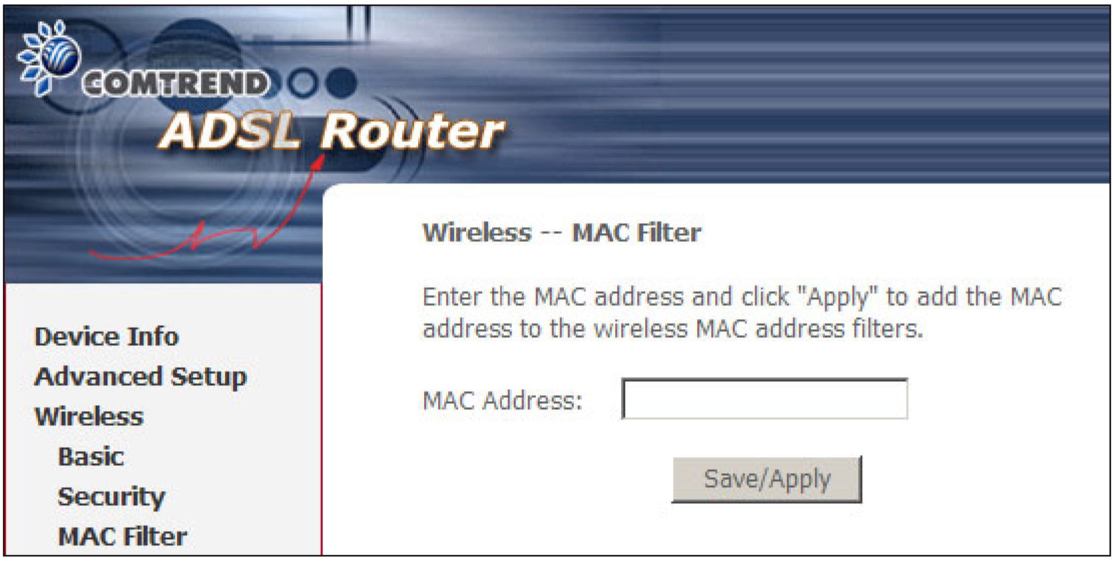
Wireless -- MAC Filter

MAC Restrict Mode: ● Disabled ○ Allow ○ Deny

MAC Address	Remove

Option	Description
MAC Restrict Mode	Off – Disables MAC filtering Allow – Permits access for the specified MAC addresses Deny – Rejects access for the specified MAC addresses
MAC Address	Lists the MAC addresses subject to the MAC Restrict Mode. The **Add** button prompts an entry field that requires you type in a MAC address in a two-character, 6-byte convention: xx:xx:xx:xx:xx:xx where xx are hexadecimal numbers. A maximum of 60 MAC addresses can be added.

Enter the MAC address on the screen below and click **Save/Apply**.



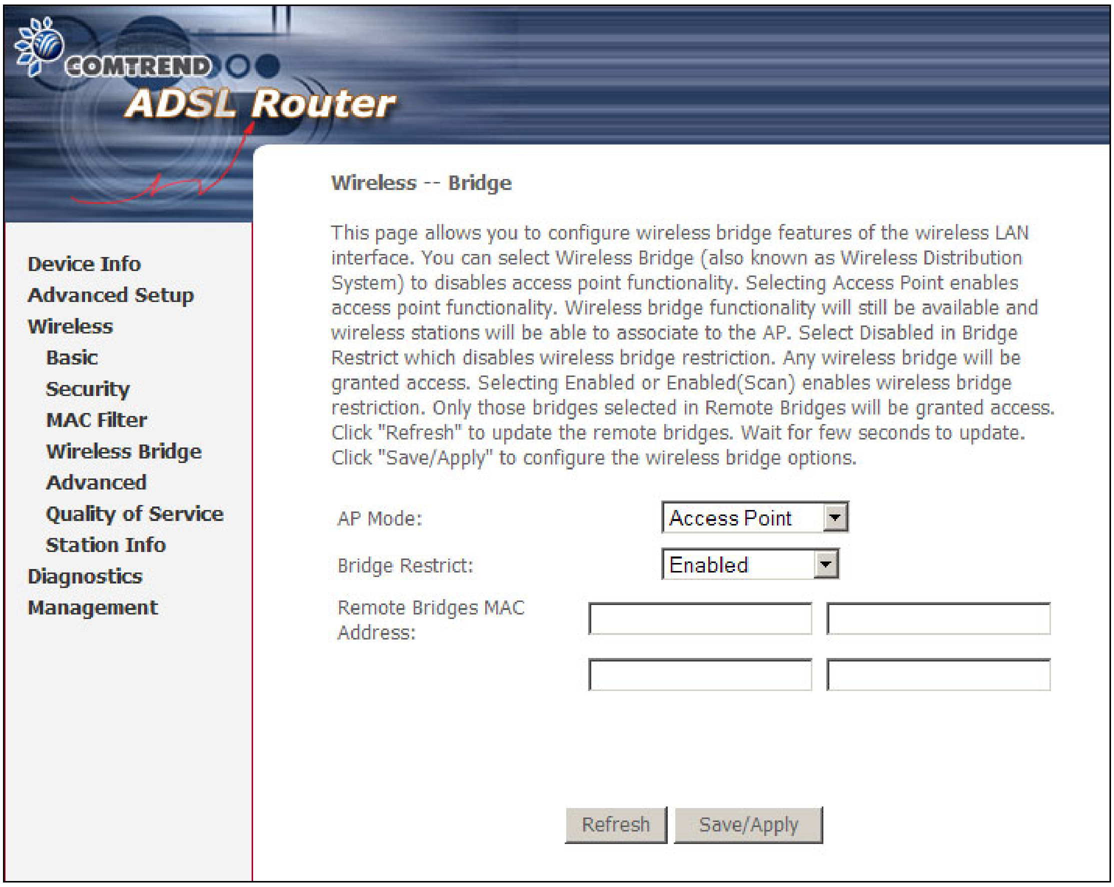
Wireless -- MAC Filter

Enter the MAC address and click "Apply" to add the MAC address to the wireless MAC address filters.

MAC Address:

7.4 Wireless Bridge

This screen allows for the configuration of wireless bridge features of the WLAN interface. See the table beneath for detailed explanations of the various options. Click **Save/Apply** to implement new configuration settings.



Wireless -- Bridge

This page allows you to configure wireless bridge features of the wireless LAN interface. You can select Wireless Bridge (also known as Wireless Distribution System) to disables access point functionality. Selecting Access Point enables access point functionality. Wireless bridge functionality will still be available and wireless stations will be able to associate to the AP. Select Disabled in Bridge Restrict which disables wireless bridge restriction. Any wireless bridge will be granted access. Selecting Enabled or Enabled(Scan) enables wireless bridge restriction. Only those bridges selected in Remote Bridges will be granted access. Click "Refresh" to update the remote bridges. Wait for few seconds to update. Click "Save/Apply" to configure the wireless bridge options.

AP Mode: Access Point

Bridge Restrict: Enabled

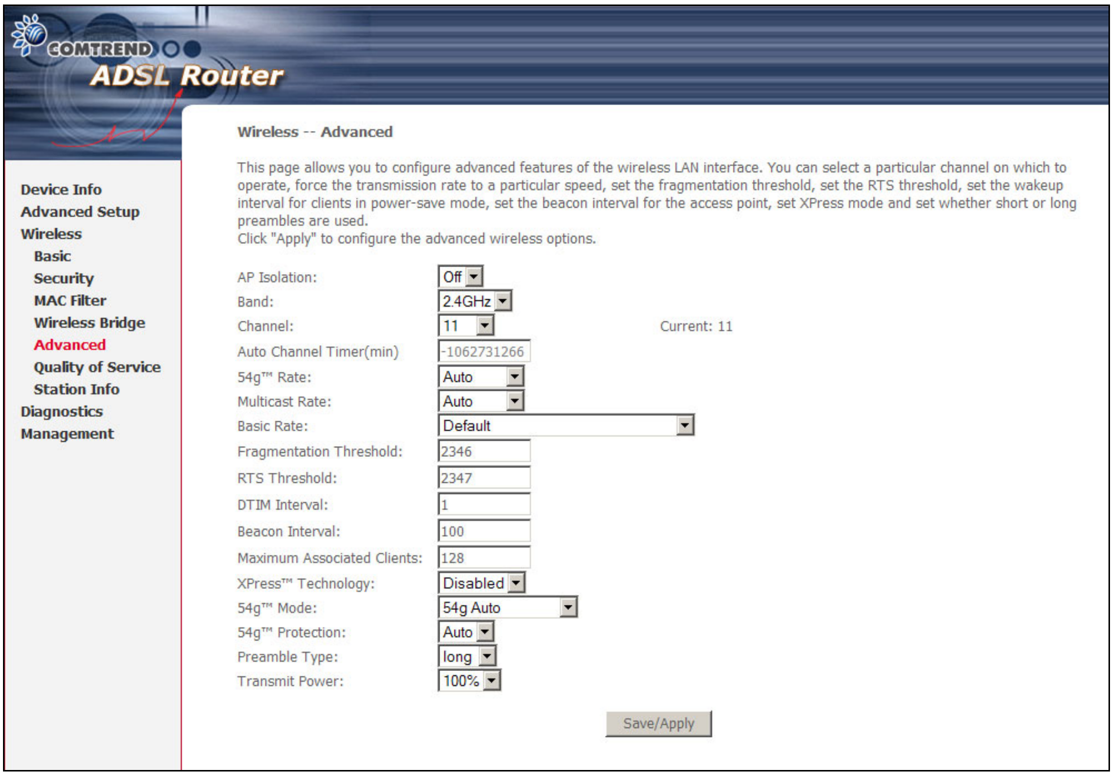
Remote Bridges MAC Address:

AP Mode	Description
Access Point	Selecting **Wireless Bridge** (aka Wireless Distribution System) disables Access Point (AP) functionality, while selecting **Access Point** enables AP functionality. In **Access Point** mode, wireless bridge functionality will still be available and wireless stations will be able to associate to the AP.
Bridge Restrict	Selecting **Disabled** in Bridge Restrict disables wireless bridge restriction, which means that any wireless bridge will be granted access. Selecting Enabled or Enabled (Scan) enables wireless bridge restriction. Only those bridges selected in Remote Bridges will be granted access. Click **Refresh** to update the station list when Bridge Restrict is enabled.

7.5 Advanced

The Advanced page allows you to configure advanced features of the WLAN interface. Among other things, you can select a particular channel on which to operate, force the transmission rate to a particular speed, set the fragmentation threshold, set the RTS threshold, set the wakeup interval for clients in power-save mode, set the beacon interval for the access point, set XPress mode and set whether short or long preambles are used.

Click **Save/Apply** to set new advanced wireless options.



Wireless -- Advanced

This page allows you to configure advanced features of the wireless LAN interface. You can select a particular channel on which to operate, force the transmission rate to a particular speed, set the fragmentation threshold, set the RTS threshold, set the wakeup interval for clients in power-save mode, set the beacon interval for the access point, set XPress mode and set whether short or long preambles are used.
Click "Apply" to configure the advanced wireless options.

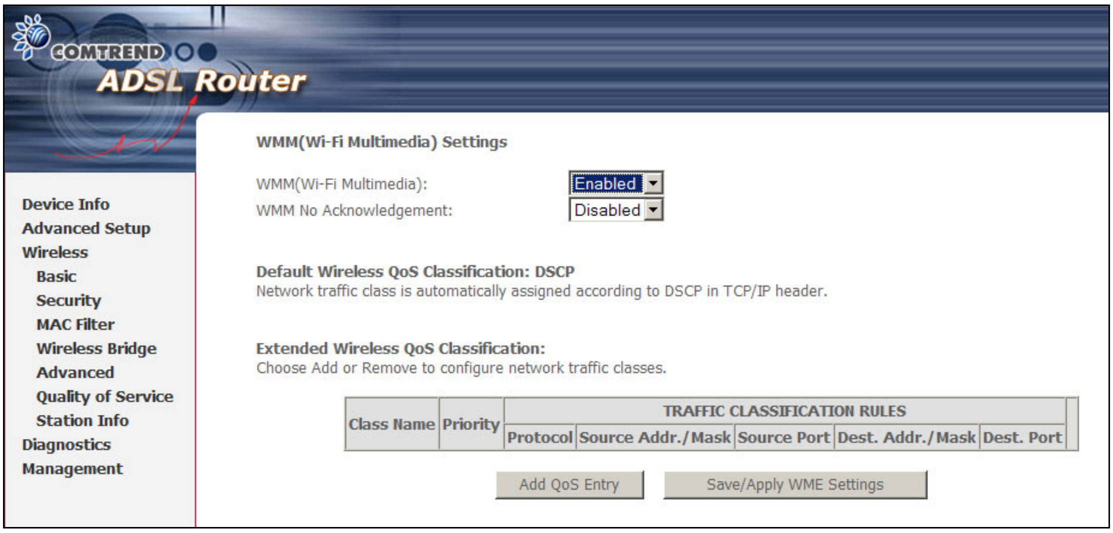
AP Isolation: Off
Band: 2.4GHz
Channel: 11 Current: 11
Auto Channel Timer(min) -1062731266
54g™ Rate: Auto
Multicast Rate: Auto
Basic Rate: Default
Fragmentation Threshold: 2346
RTS Threshold: 2347
DTIM Interval: 1
Beacon Interval: 100
Maximum Associated Clients: 128
XPress™ Technology: Disabled
54g™ Mode: 54g Auto
54g™ Protection: Auto
Preamble Type: long
Transmit Power: 100%

Field	**Description**
AP Isolation	Select On or Off. By enabling this feature, wireless clients associated with the Access Point can be linked.
Band	The new amendment allows IEEE 802.11g units to fall back to speeds of 11 Mbps, so IEEE 802.11b and IEEE 802.11g devices can coexist in the same network. The two standards apply to the 2.4 GHz frequency band. IEEE 802.11g creates data-rate parity at 2.4 GHz with the IEEE 802.11a standard, which has a 54 Mbps rate at 5 GHz. (IEEE 802.11a has other differences compared to IEEE 802.11b or g, such as offering more channels.)
Channel	Allows selection of a specific channel (1-11) or **Auto** mode. Current channel shown to the right.
Auto Channel Timer (min)	Auto channel scan timer in minutes (0 to disable).
54g Rate	Specifies a data transmission rate. In **Auto** mode (default) it uses the maximum rate if possible but drops to lower rates when necessary. The appropriate setting is dependent on signal strength. Other rates are discrete values between 1 to 54 Mbps.
Multicast Rate	Setting for multicast packet transmission rate. (1-54 Mbps)
Basic Rate	Setting basic transmission rate.

Fragmentation Threshold	A threshold, specified in bytes, that determines whether packets will be fragmented and at what size. On an 802.11 WLAN, packets that exceed the fragmentation threshold are split into smaller units suitable for the circuit size. Packets smaller than the specified fragmentation threshold value are not fragmented. Values between 256 and 2346 can be entered. The value should remain at its default setting of 2346, if possible, since setting the Fragmentation Threshold too low may result in poor performance. If you experience a high packet error rate, try to slightly increase the Fragmentation Threshold.
RTS Threshold	Request to Send, set in bytes, specifies the packet size beyond which the WLAN Card invokes its RTS/CTS mechanism. Packets that exceed the specified RTS threshold trigger the RTS/CTS mechanism. Smaller packets are sent without using RTS/CTS. The default setting of 2347 (maximum length) disables RTS Threshold altogether.
DTIM Interval	Delivery Traffic Indication Message (DTIM) is also known as Beacon Rate. The entry range is a value between 1 and 65535. A DTIM is a countdown variable that informs clients of the next window for listening to broadcast and multicast messages. When the AP has buffered broadcast or multicast messages for associated clients, it sends the next DTIM with a DTIM Interval value. AP Clients hear the beacons and awaken to receive the broadcast and multicast messages. The default is 1.
Beacon Interval	The amount of time between beacon transmissions in milliseconds. The default is 100 ms and the acceptable range is 1 – 65535. The beacon transmissions identify the presence of an access point. By default, network devices passively scan all RF channels listening for beacons coming from access points. Before a station enters power save mode, the station needs the beacon interval to know when to wake up to receive the beacon (and learn whether there are buffered frames at the access point).
Maximum Associated Clients	The maximum number of clients allowed to connect to the router.
Xpress ™ Technology	Xpress Technology is compliant with draft specifications of two planned wireless industry standards. Default is **disabled**.
54g ™ Mode	Select **Auto** mode for greatest compatibility. Select **Performance** mode for the fastest performance among 54g certified equipment. Select **LRS** mode if you are experiencing difficulty with legacy 802.11b equipment. If this does not work, you may also try **802.11b only** mode.
54g Protection	In Auto mode, the router will use RTS/CTS to improve 802.11g performance in mixed 802.11g/802.11b networks. Turning protection **Off** will maximize 802.11g throughput under most conditions.
Preamble Type	Short preamble is intended for applications where maximum throughput is desired but it does not work with legacy equipment. Long preamble works with the current 1 and 2 Mbit/s DSSS specification as described in IEEE Std 802.11-1999
Transmit Power	Set the power output (by percentage) as desired.

7.6 Quality of Service

WMM provides advanced quality of service (QoS) features for Wi-Fi networks to improve the end-user experience by prioritizing audio, video and voice traffic and optimizing the way shared network resources are allocated among competing applications. To enable WMM, select **Enabled** in the WMM (Wi-Fi Multimedia) drop down list box. The screen will display as shown below.



WMM(Wi-Fi Multimedia) Settings

WMM(Wi-Fi Multimedia): Enabled

WMM No Acknowledgement: Disabled

Default Wireless QoS Classification: DSCP

Network traffic class is automatically assigned according to DSCP in TCP/IP header.

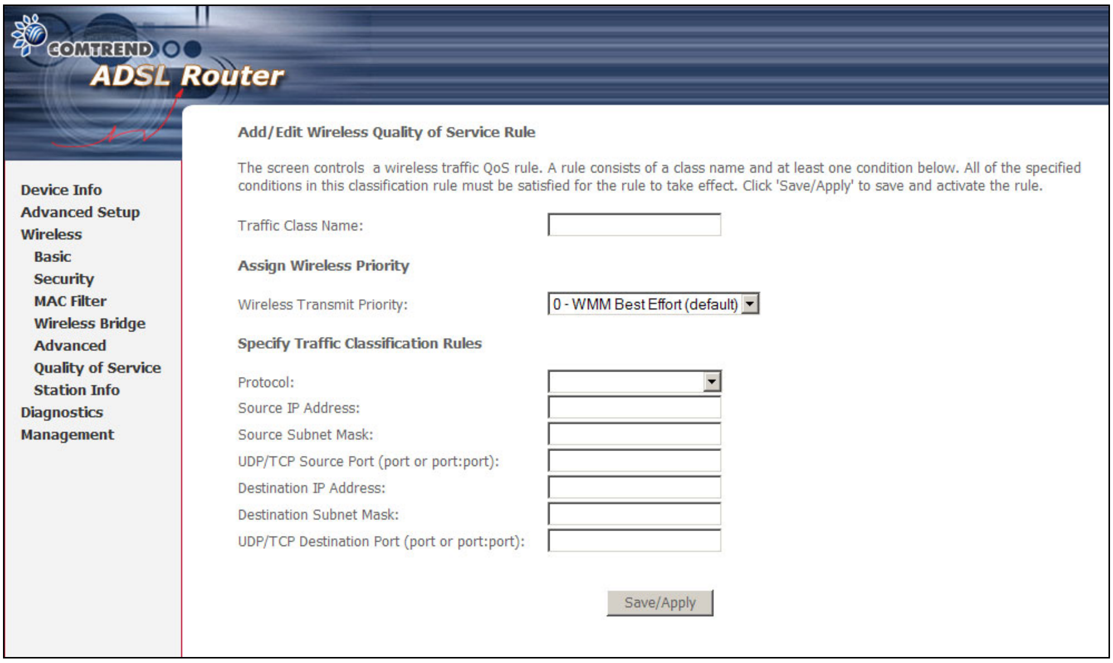
Extended Wireless QoS Classification:

Choose Add or Remove to configure network traffic classes.

Class Name	Priority	TRAFFIC CLASSIFICATION RULES				
		Protocol	Source Addr./Mask	Source Port	Dest. Addr./Mask	Dest. Port

Field	Description
WMM (Wi-Fi Multimedia)	This technology maintains the priority of audio, video and voice applications in a Wi-Fi network. It ensures that multimedia services get higher priority.
WMM No Acknowledgement	Refers to the acknowledge policy used at the MAC level. Enabling no Acknowledgement can result in more efficient throughput but higher error rates in a noisy Radio Frequency (RF) environment.

To add an **Extended Wireless QoS Classification**, click **Add QoS Entry**.
The following screen will display.



Add/Edit Wireless Quality of Service Rule

The screen controls a wireless traffic QoS rule. A rule consists of a class name and at least one condition below. All of the specified conditions in this classification rule must be satisfied for the rule to take effect. Click 'Save/Apply' to save and activate the rule.

Traffic Class Name:

Assign Wireless Priority

Wireless Transmit Priority: 0 - WMM Best Effort (default)

Specify Traffic Classification Rules

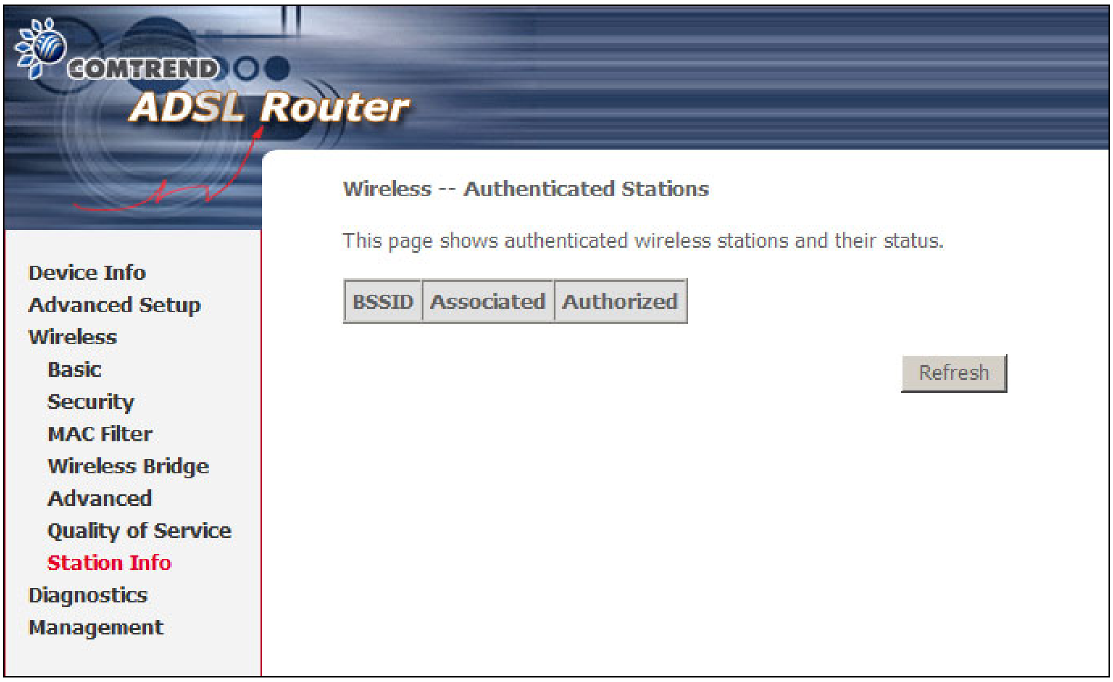
Protocol:
Source IP Address:
Source Subnet Mask:
UDP/TCP Source Port (port or port:port):
Destination IP Address:
Destination Subnet Mask:
UDP/TCP Destination Port (port or port:port):

Enter a **Traffic Class Name** and assign the **Wireless Transmit Priority** from the drop-down list box. **Specify Traffic Classification Rules** by choosing the desired parameters under this heading. Click **Save/Apply** to add the Wireless QoS rule.

When finished adding rules, click **Save/Apply WME Settings** on the main screen.

7.7 Station Info

This page shows authenticated wireless stations and their status. Click the **Refresh** button to update the list of stations in the WLAN.



Wireless -- Authenticated Stations

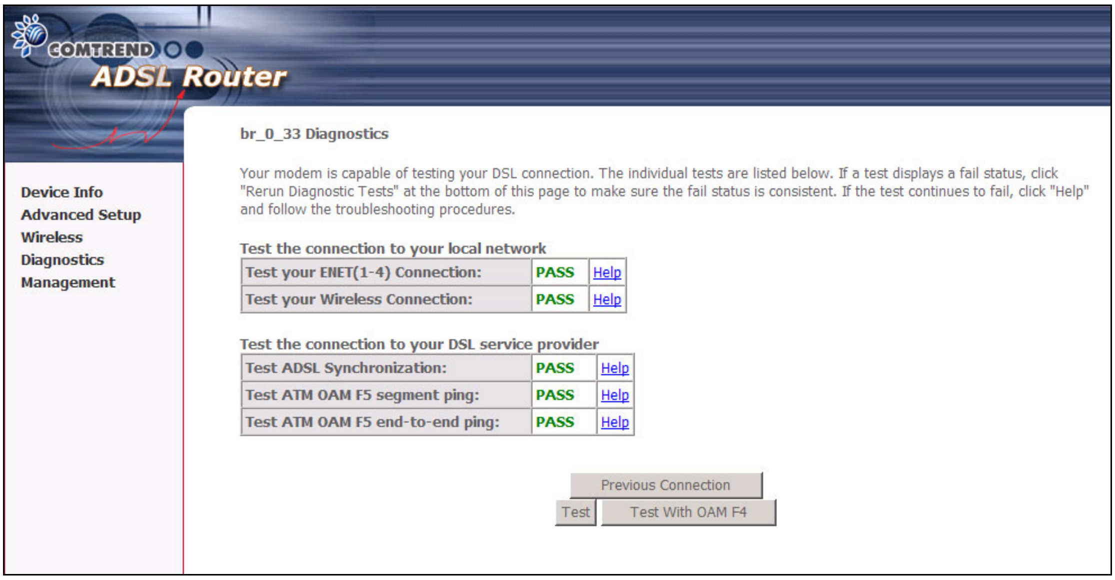
This page shows authenticated wireless stations and their status.

BSSID	Associated	Authorized

Field	Description
BSSID	The BSSID is a 48-bit identity used to identify a particular BSS (Basic Service Set) within an area. In Infrastructure BSS networks, the BSSID is the MAC (Media Access Control) address of the AP (Access Point); and in Independent BSS or ad hoc networks, the BSSID is generated randomly.
Associated	Lists all the stations that are associated with the Access Point, along with the amount of time since packets were transferred to and from each station. If a station is idle for too long, it is removed from this list.
Authorized	Lists those devices with authorized access.

Chapter 8 Diagnostics

The Diagnostics menu provides feedback on the connection status of the device. The individual tests are listed below. If a test displays a fail status, click **Rerun Diagnostic Tests** at the bottom of the screen to retest and confirm the error. If the test continues to fail, click **Help** and follow the troubleshooting procedures.



br_0_33 Diagnostics

Your modem is capable of testing your DSL connection. The individual tests are listed below. If a test displays a fail status, click "Rerun Diagnostic Tests" at the bottom of this page to make sure the fail status is consistent. If the test continues to fail, click "Help" and follow the troubleshooting procedures.

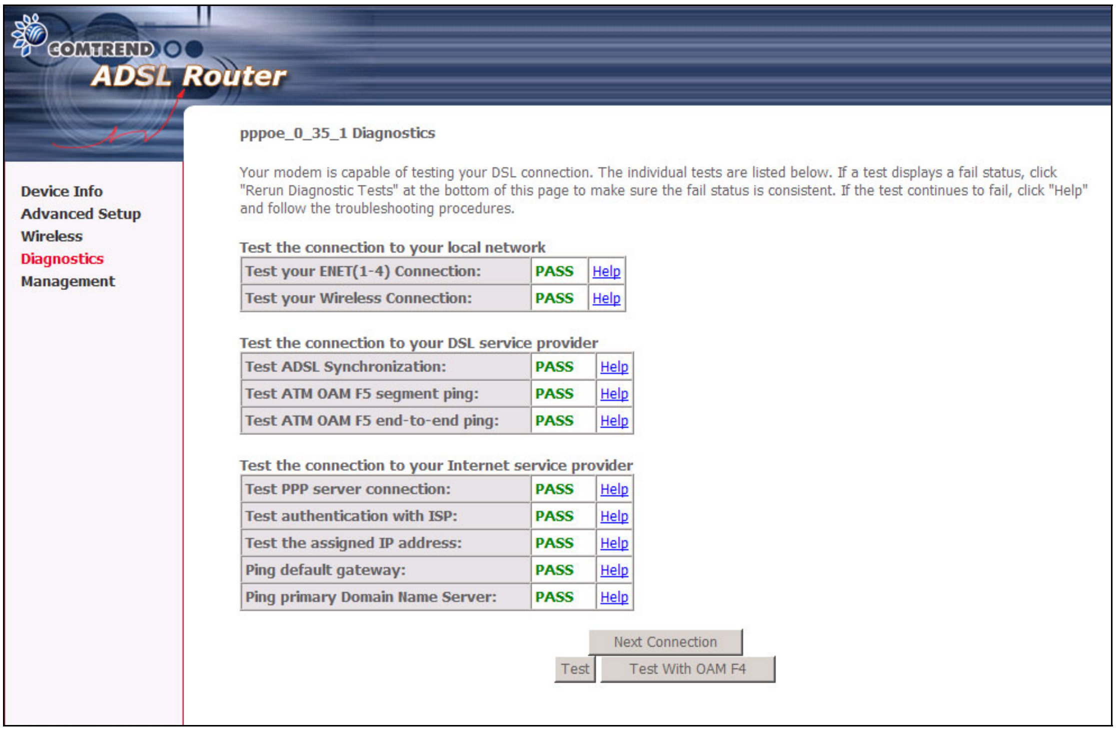
Test the connection to your local network

Test your ENET(1-4) Connection:	PASS	Help
Test your Wireless Connection:	PASS	Help

Test the connection to your DSL service provider

Test ADSL Synchronization:	PASS	Help
Test ATM OAM F5 segment ping:	PASS	Help
Test ATM OAM F5 end-to-end ping:	PASS	Help

The figure above shows the Diagnostics screen in bridge mode.



pppoe_0_35_1 Diagnostics

Your modem is capable of testing your DSL connection. The individual tests are listed below. If a test displays a fail status, click "Rerun Diagnostic Tests" at the bottom of this page to make sure the fail status is consistent. If the test continues to fail, click "Help" and follow the troubleshooting procedures.

Test the connection to your local network

Test your ENET(1-4) Connection:	PASS	Help
Test your Wireless Connection:	PASS	Help

Test the connection to your DSL service provider

Test ADSL Synchronization:	PASS	Help
Test ATM OAM F5 segment ping:	PASS	Help
Test ATM OAM F5 end-to-end ping:	PASS	Help

Test the connection to your Internet service provider

Test PPP server connection:	PASS	Help
Test authentication with ISP:	PASS	Help
Test the assigned IP address:	PASS	Help
Ping default gateway:	PASS	Help
Ping primary Domain Name Server:	PASS	Help

The figure above shows the Diagnostics screen in PPPoE mode.

Consult the table below for field descriptions.

Test	Condition
ENET Connection	Pass: Indicates that the Ethernet interface on your computer is connected to the LAN port of this device. Fail: Indicates that the device does not detect the Ethernet interface on your computer.
Wireless connection	Pass: Indicates the wireless card on the device is ON. Down: Indicates that the wireless card is OFF.
ADSL Synchronization	Pass: Indicates that the DSL modem has detected a DSL signal from the telephone company. A solid ADSL LED on the device also indicates the detection of a DSL signal from the telephone company Fail: Indicates that the DSL modem does not detect a signal from the telephone company's DSL network. The ADSL LED will turn off.
Ping Default Gateway	Pass: Indicates that the device can communicate with the first entry point to the network. It is usually the IP address of the ISP local router. Fail: Indicates that the device was unable to communicate with the first entry point on the network. It may not have an effect on your Internet connectivity. Therefore, if this test fails but you are still able to access the Internet, there is no need to troubleshoot this issue.
Ping Primary Domain Name Server	Pass: Indicates that the device can communicate with the primary Domain Name Server (DNS). Fail: Indicates that the device was unable to communicate with the primary Domain Name Server (DNS). It may not have an effect on your Internet connectivity. Therefore, if this test fails but you are still able to access the Internet, there is no need to troubleshoot this issue.

NOTE: This table describes the basic test set (i.e. no PVC configured). For help with other tests click on the **Help** link next to each test condition.

Chapter 9 Management

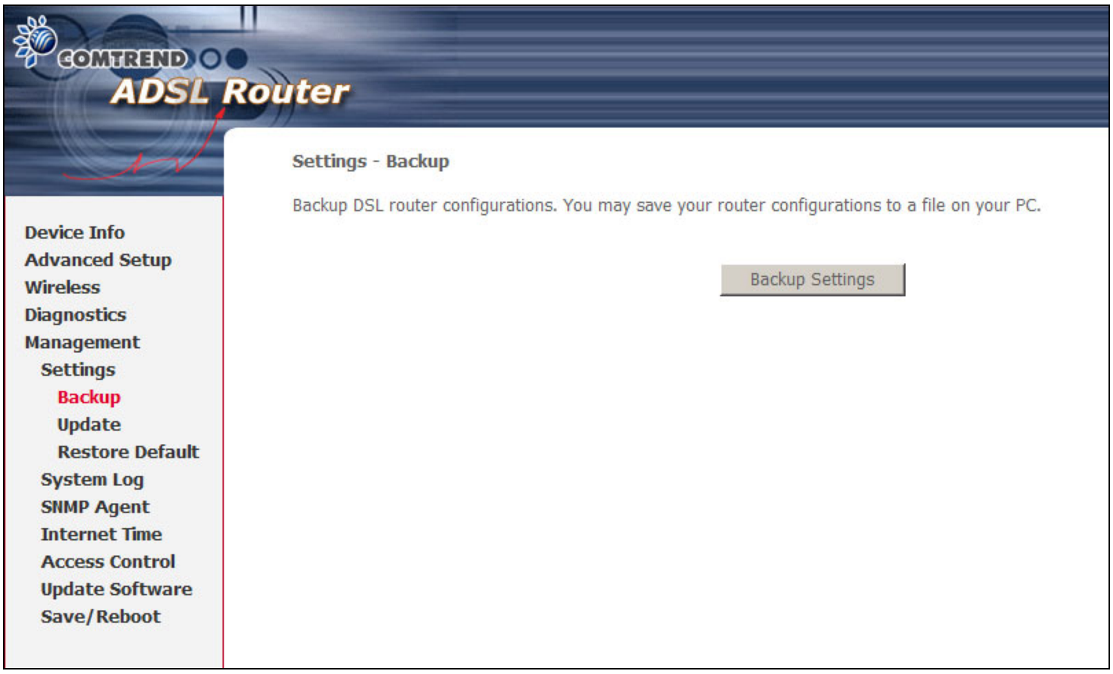
The Management menu has the following maintenance functions and processes:

9.1 Settings

The Settings screen allows for the backup, retrieval, and restoration of settings.

9.1.1 Backup

Select **Backup** from the **Settings** submenu to access the screen shown below. Click the **Backup Settings** button to save the current configuration settings. You will be prompted to define the location of a backup file to save to your PC.

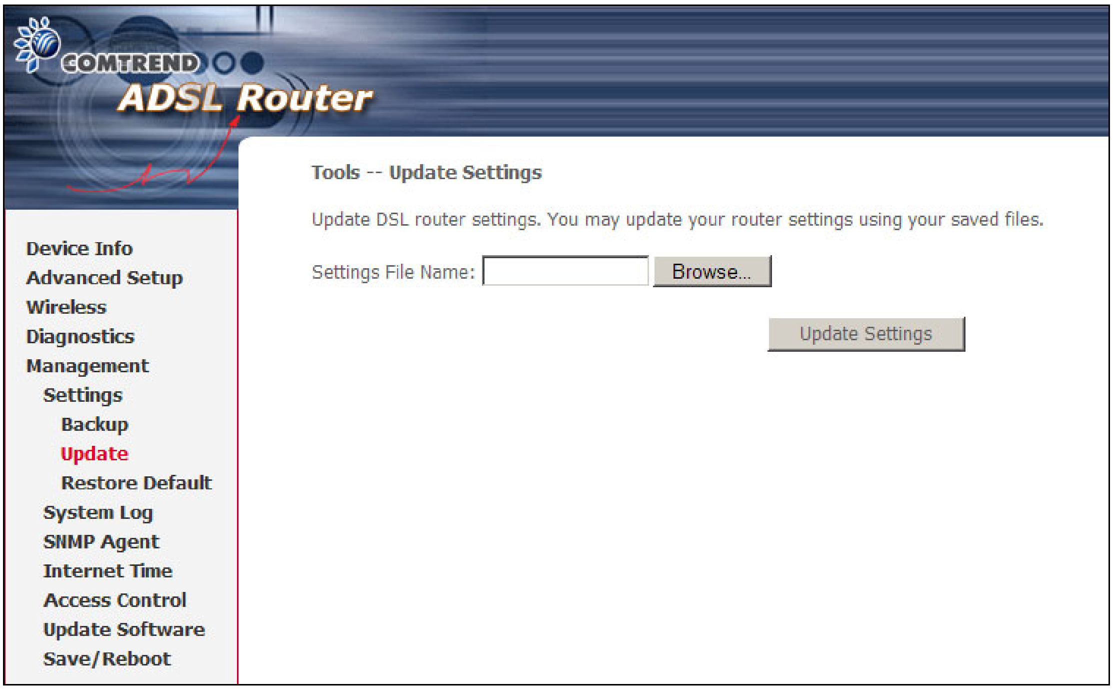


Settings - Backup

Backup DSL router configurations. You may save your router configurations to a file on your PC.

9.1.2 Update Settings

Select **Update** from the **Settings** submenu to access the screen shown below. Enter a previously saved configuration backup file in the **Settings File Name** field and click the **Update Settings** button to load it. If you forget the filename and path, you can search your PC by clicking on the **Browse** button.



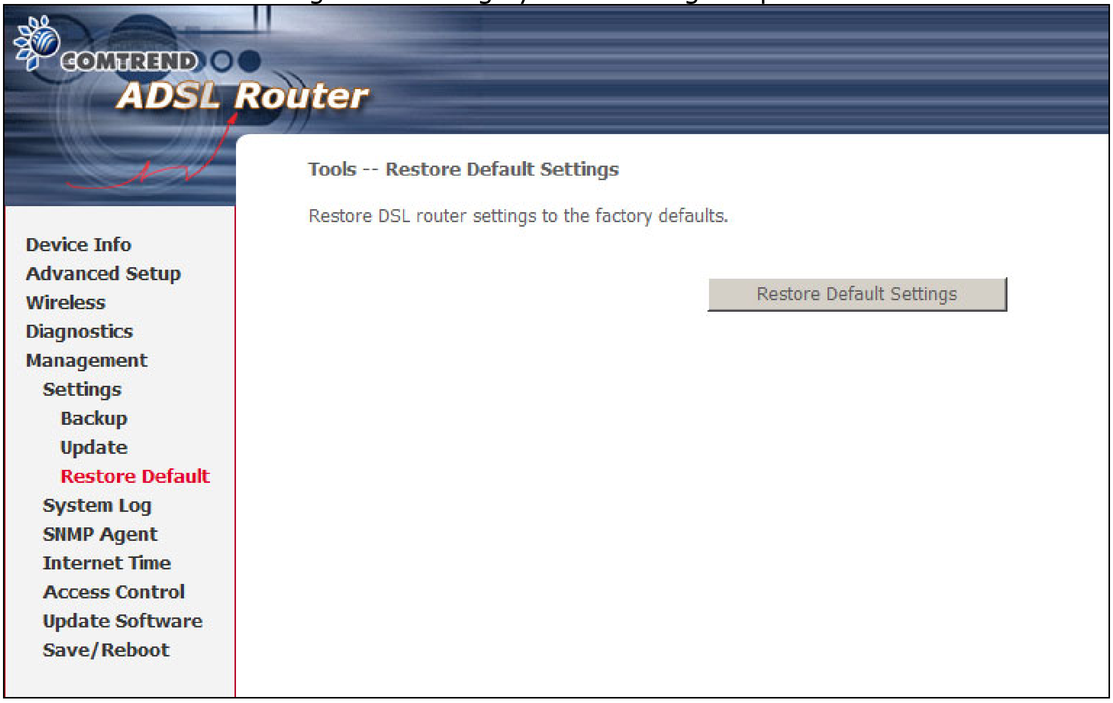
Tools -- Update Settings

Update DSL router settings. You may update your router settings using your saved files.

Settings File Name:

9.1.3 Restore Default

Select **Restore Default** from the **Settings** submenu to access the screen shown below. Click the **Restore Default Settings** button to restore the device to the default firmware settings. Restoring system settings require a device reboot.

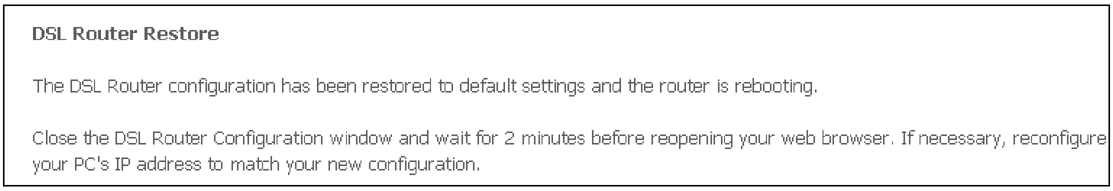


Tools -- Restore Default Settings

Restore DSL router settings to the factory defaults.

NOTE: The default settings can be found in section 3.1 Default Settings.

After the Restore Default Configuration button is selected, the following screen appears. Close the device Configuration window and wait for 2 minutes before reopening the browser. If necessary, reconfigure your PC IP address to match your new configuration (see section 3.2 IP Configuration for details).



DSL Router Restore

The DSL Router configuration has been restored to default settings and the router is rebooting.

Close the DSL Router Configuration window and wait for 2 minutes before reopening your web browser. If necessary, reconfigure your PC's IP address to match your new configuration.

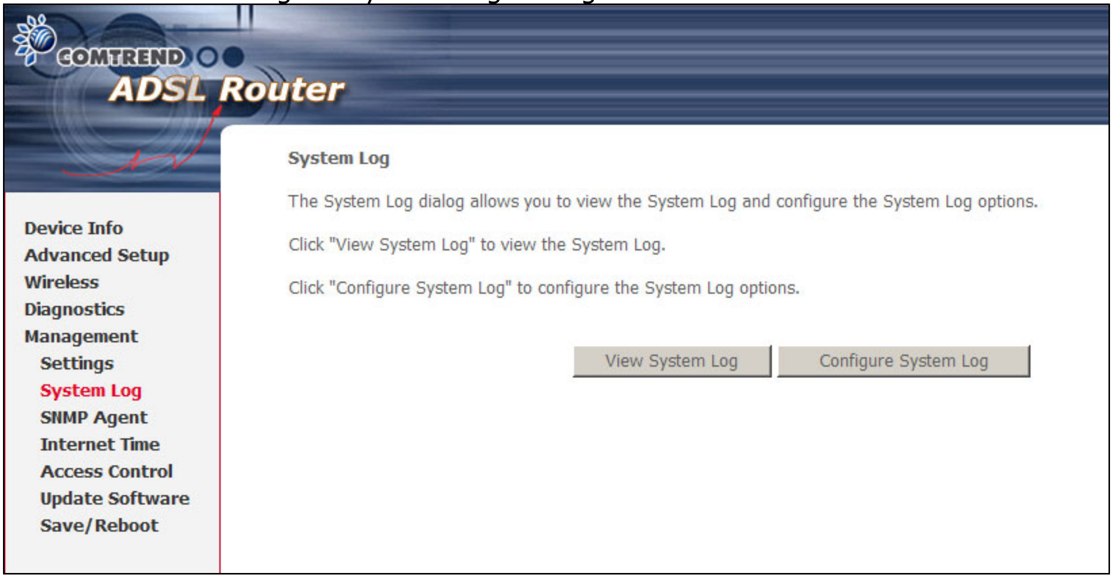
After a successful reboot, the browser will return to the Device Info screen. If the browser does not refresh to the default screen, close and restart the browser.

NOTE: The Restore Default function has the same effect as the reset button. The device board hardware and the boot loader support the reset to default button. If the reset button is continuously pushed for more than 5 seconds (and not more than 12 seconds), the boot loader will erase the configuration settings saved on flash memory.

9.2 System Log

The **System Log** option under **Management** allows for the viewing of system events and configuration of related options. The default setting for the System Log is enabled. Follow the steps below to enable and view the System Log.

STEP 1: Click Configure System Log to begin.



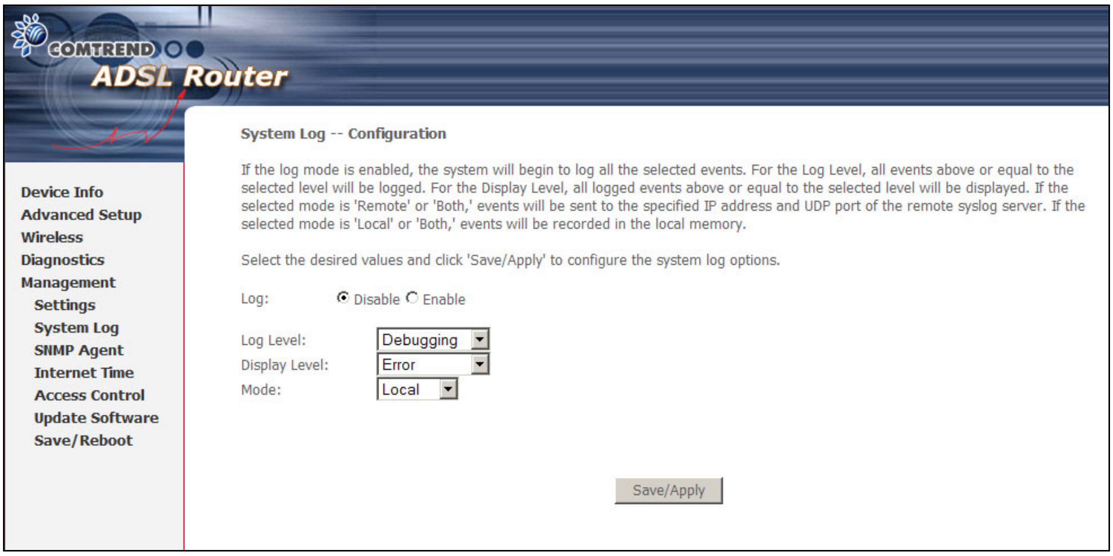
System Log

The System Log dialog allows you to view the System Log and configure the System Log options.

Click "View System Log" to view the System Log.

Click "Configure System Log" to configure the System Log options.

Step 2: Select the system log options (see table below) and click Save/Apply.



System Log -- Configuration

If the log mode is enabled, the system will begin to log all the selected events. For the Log Level, all events above or equal to the selected level will be logged. For the Display Level, all logged events above or equal to the selected level will be displayed. If the selected mode is 'Remote' or 'Both,' events will be sent to the specified IP address and UDP port of the remote syslog server. If the selected mode is 'Local' or 'Both,' events will be recorded in the local memory.

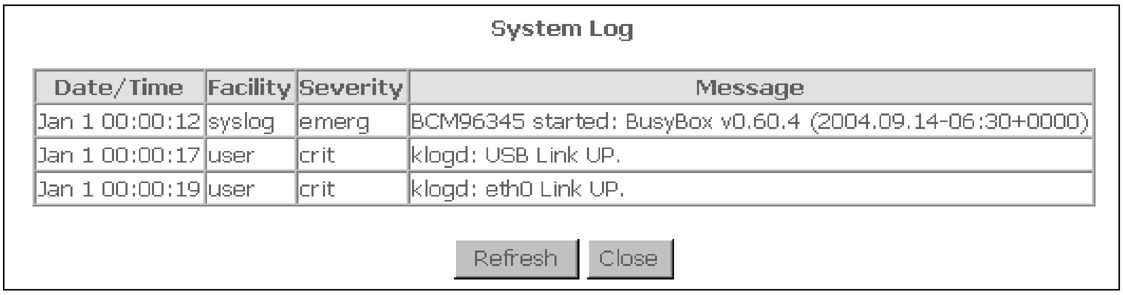
Select the desired values and click 'Save/Apply' to configure the system log options.

Log: ● Disable ○ Enable

Log Level: Debugging
Display Level: Error
Mode: Local

Field	Description
Log	Indicates whether the system is currently recording events. The user can enable or disable event logging. By default, it is disabled.
Log level	Allows you to configure the event level and filter out unwanted events below this level. The events ranging from the highest critical level "Emergency" down to this configured level will be recorded to the log buffer. When the log buffer is full, the newer event will wrap up to the top of the log buffer and overwrite the old event. By default, the log level is "Debugging" which is the lowest critical level. The log levels are defined as follows: • Emergency = system is unusable • Alert = action must be taken immediately • Critical = critical conditions • Error = Error conditions • Warning = normal but significant condition • Notice= normal but insignificant condition • Informational= provides information for reference • Debugging = debug-level messages Emergency is the most serious event level, whereas Debugging is the least important. For instance, if the log level is set to Debugging, all the events from the lowest Debugging level to the most critical level Emergency level will be recorded. If the log level is set to Error, only Error and the level above will be logged.
Display Level	Allows the user to select the logged events and displays on the View System Log window for events of this level and above to the highest Emergency level.
Mode	Allows you to specify whether events should be stored in the local memory, or be sent to a remote syslog server or both simultaneously. If remote mode is selected, view system log will not be able to display events saved in the remote syslog server. When either Remote mode or Both modes are configured, the WEB UI will prompt the user to enter the Server IP address and Server UDP port.

3. Click View System Log. The results are displayed as follows.

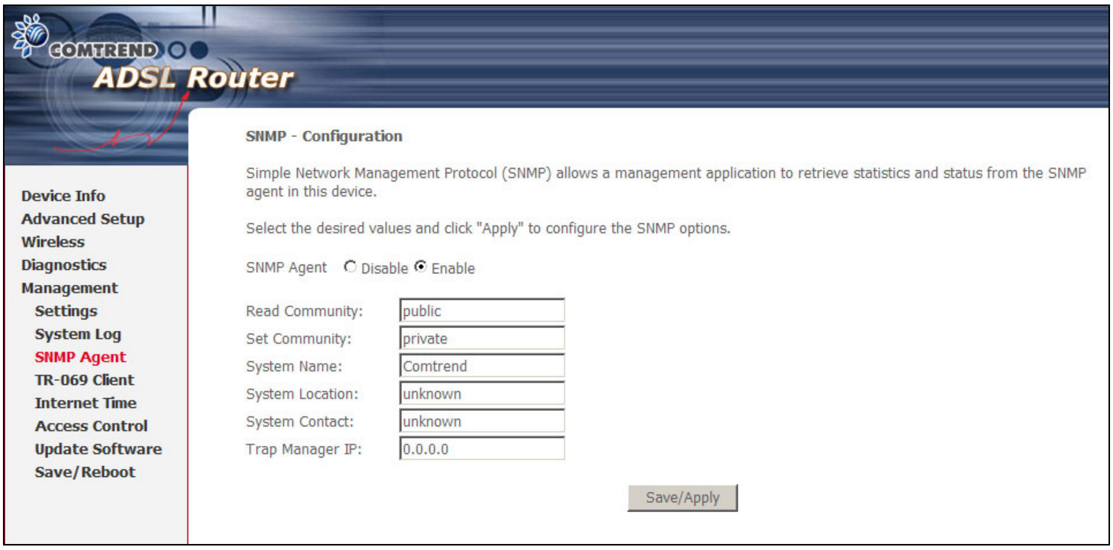


System Log

Date/Time	Facility	Severity	Message
Jan 1 00:00:12	syslog	emerg	BCM96345 started: BusyBox v0.60.4 (2004.09.14-06:30+0000)
Jan 1 00:00:17	user	crit	klogd: USB Link UP.
Jan 1 00:00:19	user	crit	klogd: eth0 Link UP.

9.3 SNMP Agent

Simple Network Management Protocol (SNMP) allows a management application to retrieve statistics and status from the SNMP agent in this device. Select the **Enable** radio button, configure options, and click **Save/Apply** to activate SNMP.



SNMP - Configuration

Simple Network Management Protocol (SNMP) allows a management application to retrieve statistics and status from the SNMP agent in this device.

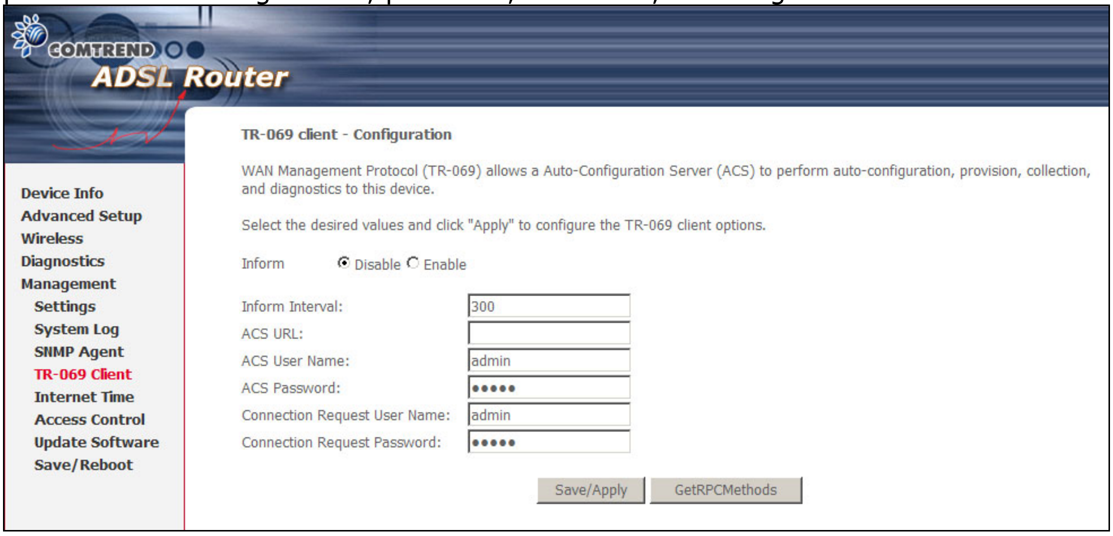
Select the desired values and click "Apply" to configure the SNMP options.

SNMP Agent ○ Disable ● Enable

Read Community:	public
Set Community:	private
System Name:	Comtrend
System Location:	unknown
System Contact:	unknown
Trap Manager IP:	0.0.0.0

9.4 TR-069 Client

WAN Management Protocol (TR-069) allows an Auto-Configuration Server (ACS) to perform auto-configuration, provision, collection, and diagnostics to this router.



TR-069 client - Configuration

WAN Management Protocol (TR-069) allows a Auto-Configuration Server (ACS) to perform auto-configuration, provision, collection, and diagnostics to this device.

Select the desired values and click "Apply" to configure the TR-069 client options.

Inform ● Disable ○ Enable

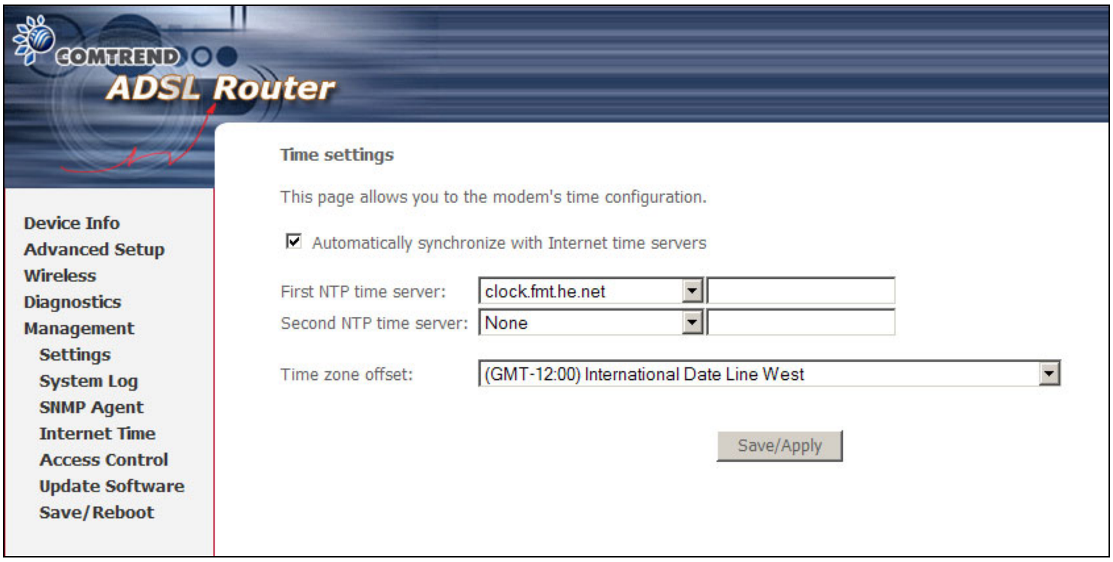
Inform Interval:	300
ACS URL:	
ACS User Name:	admin
ACS Password:	●●●●●
Connection Request User Name:	admin
Connection Request Password:	●●●●●

Option	Description
Inform	Disable/Enable TR-069 client on the CPE.
Inform Interval	The duration in seconds of the interval for which the CPE MUST attempt to connect with the ACS and call the Inform method.
ACS URL	URL for the CPE to connect to the ACS using the CPE WAN Management Protocol. This parameter MUST be in the form of a valid HTTP or HTTPS URL. An HTTPS URL indicates that the ACS supports SSL. The "host" portion of this URL is used by the CPE for validating the certificate from the ACS when using certificate-based authentication.
ACS User Name	Username used to authenticate the CPE when making a connection to the ACS using the CPE WAN Management Protocol. This username is used only for HTTP-based authentication of the CPE.
ACS Password	Password used to authenticate the CPE when making a connection to the ACS using the CPE WAN Management Protocol. This password is used only for HTTP-based authentication of the CPE.
Connection Request	
User Name	Username used to authenticate an ACS making a Connection Request to the CPE.
Password	Password used to authenticate an ACS making a Connection Request to the CPE.

The **Get RPC Methods** button forces the CPE to establish an immediate connection to the ACS. This may be used to discover the set of methods supported by the ACS or CPE. This list may include both standard TR-069 methods (those defined in this specification or a subsequent version) and vendor-specific methods. The receiver of the response MUST ignore any unrecognized methods.

9.5 Internet Time

The Internet Time option under the Management submenu configures the time settings of the device. To automatically synchronize with Internet timeservers, tick the corresponding box displayed on this screen shown below.



Time settings

This page allows you to the modem's time configuration.

☑ Automatically synchronize with Internet time servers

First NTP time server: clock.fmt.he.net

Second NTP time server: None

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

First NTP timeserver: Select the required server.
Second NTP timeserver: Select second timeserver, if required.
Time zone offset: Select the local time zone.

Configure these options and then click **Save/Apply** to activate.

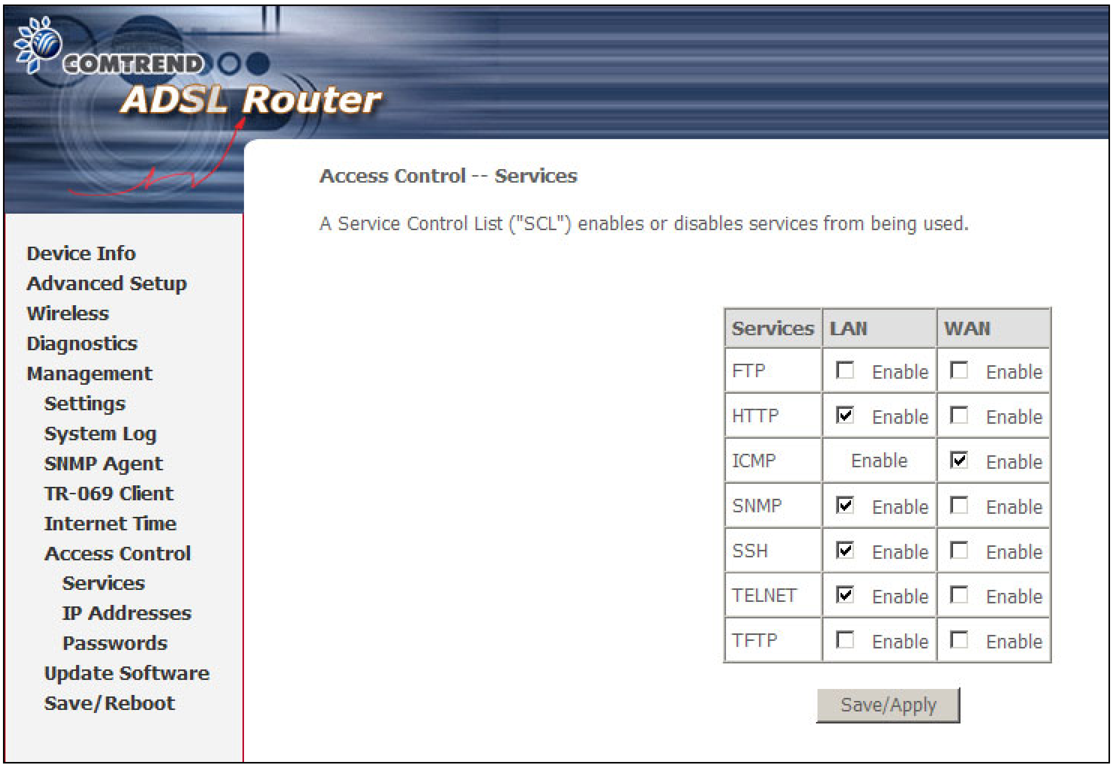
NOTE: Internet Time must be activated to use Parental Control (page 50). In addition, this menu item is not displayed when in bridge mode since the router would not be able to connect to the NTP timeserver.

9.6 Access Control

The Access Control option under the Management menu bar configures access related parameters in three areas: Services, IP Addresses, and Passwords. Use Access Control to control local and remote management settings for the device.

9.6.1 Services

The Services option limits or opens the access services over the LAN or WAN. These access services are available: FTP, HTTP, ICMP, SNMP, SSH, TELNET and TFTP. Enable a service by ticking its checkbox. Click **Save/Apply** to activate.



Access Control -- Services

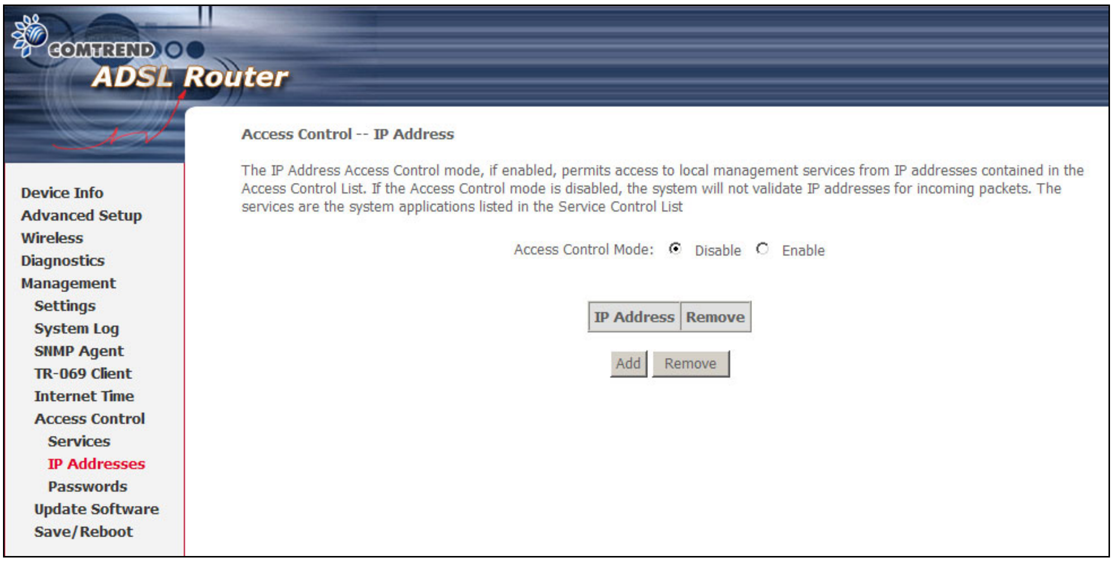
A Service Control List ("SCL") enables or disables services from being used.

Services	LAN	WAN
FTP	□ Enable	□ Enable
HTTP	☑ Enable	□ Enable
ICMP	Enable	☑ Enable
SNMP	☑ Enable	□ Enable
SSH	☑ Enable	□ Enable
TELNET	☑ Enable	□ Enable
TFTP	□ Enable	□ Enable

NOTE: The WAN column is present if the WAN interface is active. Only the LAN side will be displayed if the WAN interface is down. Also, Appendix D: SSH Client contains a quick introduction to SSH clients.

9.6.2 IP Addresses

The IP Addresses option limits local access by IP address. When the **Access Control Mode** is enabled, only the IP addresses listed here can access the device. Before enabling **Access Control Mode**, add IP addresses with the **Add** button.



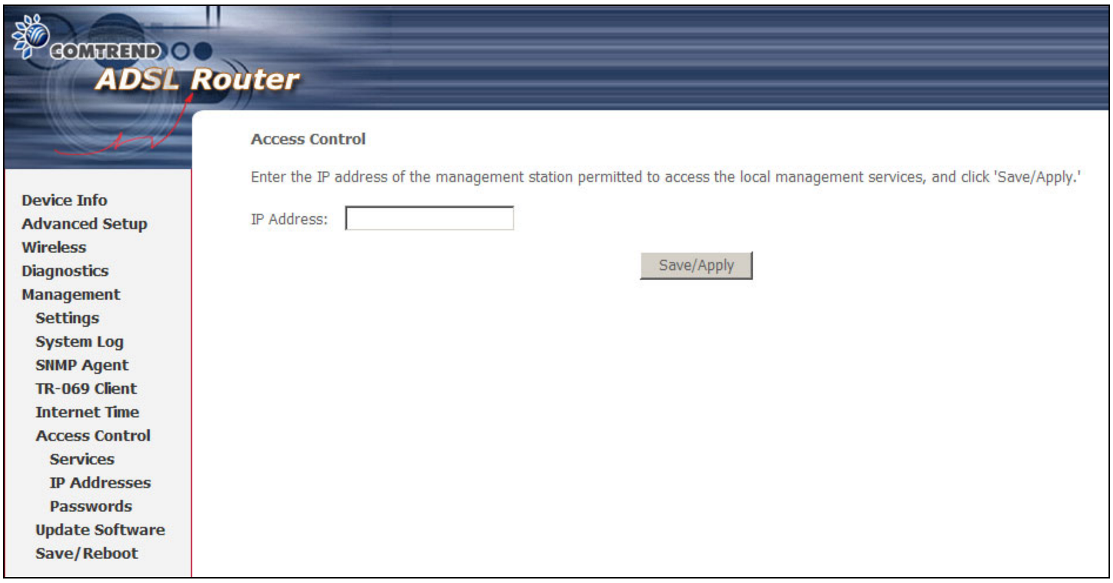
Access Control -- IP Address

The IP Address Access Control mode, if enabled, permits access to local management services from IP addresses contained in the Access Control List. If the Access Control mode is disabled, the system will not validate IP addresses for incoming packets. The services are the system applications listed in the Service Control List

Access Control Mode: ● Disable ○ Enable

IP Address	Remove

On this screen, enter the IP address, subnet mask, and interface to which you wish to give management permissions. Click **Save/Apply** to continue**.**



Access Control

Enter the IP address of the management station permitted to access the local management services, and click 'Save/Apply.'

IP Address:

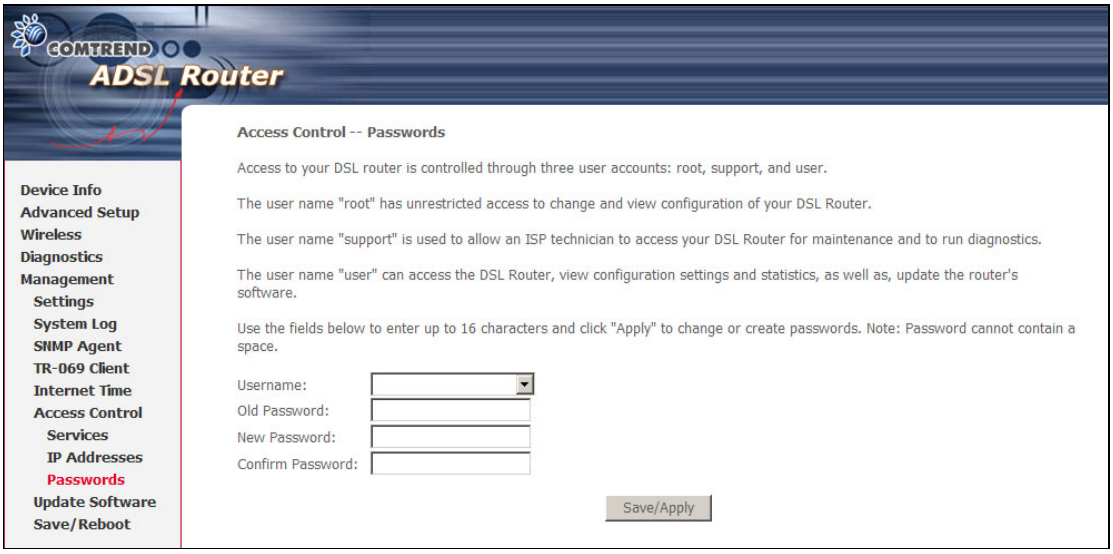
9.6.3 Passwords

The Passwords option configures the user account access passwords for the device. Access to the device is limited to the following three user accounts:

- **root** is to be used for local unrestricted access control.
- **support** is to be used for remote maintenance of the device
- **user** is to be used to view information and update device firmware.

NOTE: Default passwords for these three user accounts can be found in section 3.1 Default Settings

Use the fields in the screen below to select a username and change its password. Passwords must be 16 characters or less. Click **Save/Apply** to continue.



Access Control -- Passwords

Access to your DSL router is controlled through three user accounts: root, support, and user.

The user name "root" has unrestricted access to change and view configuration of your DSL Router.

The user name "support" is used to allow an ISP technician to access your DSL Router for maintenance and to run diagnostics.

The user name "user" can access the DSL Router, view configuration settings and statistics, as well as, update the router's software.

Use the fields below to enter up to 16 characters and click "Apply" to change or create passwords. Note: Password cannot contain a space.

Username:

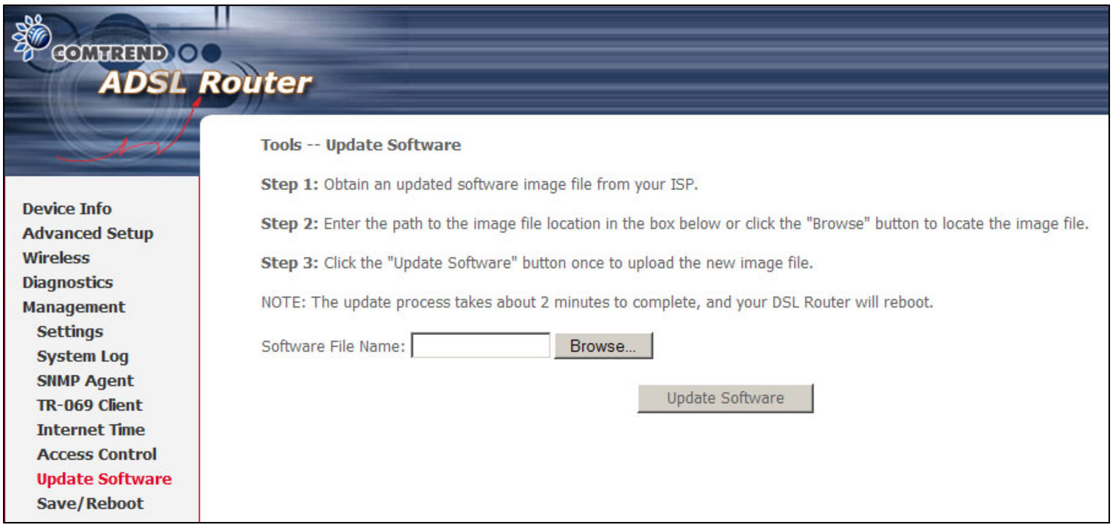
Old Password:

New Password:

Confirm Password:

9.7 Update Software

The **Update Software** screen allows for firmware updates. Manual device upgrades from a locally stored file can be performed using the following screen.



Tools -- Update Software

Step 1: Obtain an updated software image file from your ISP.

Step 2: Enter the path to the image file location in the box below or click the "Browse" button to locate the image file.

Step 3: Click the "Update Software" button once to upload the new image file.

NOTE: The update process takes about 2 minutes to complete, and your DSL Router will reboot.

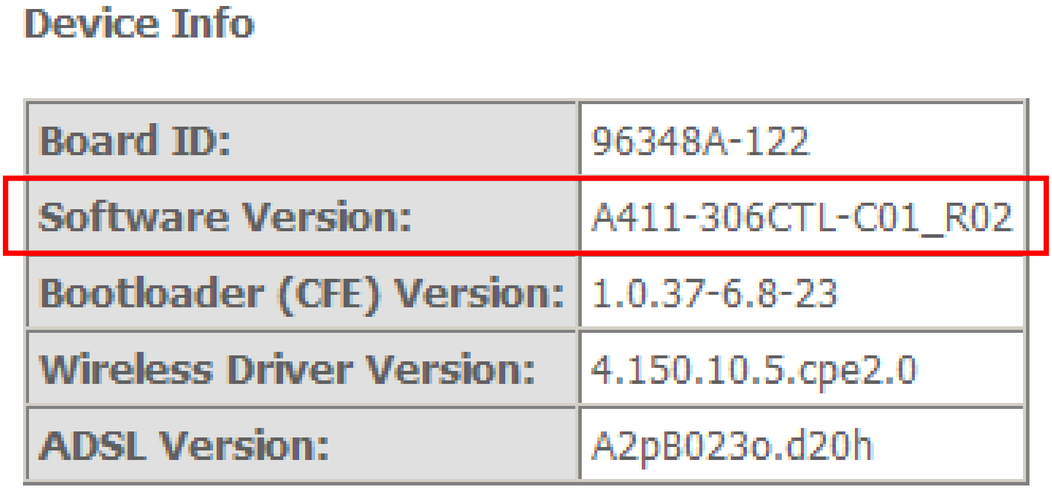
Software File Name: [ ] Browse...

Update Software

Step 1: Obtain an updated software image file from your ISP.
Step 2: Enter the path and filename of the firmware image file in the **Software File Name** field or click the **Browse** button to locate the image file.
Step 3: Click the **Update Software** button once to upload and install the file.

NOTE 1: The update process will take about 2 minutes to complete. The device will reboot and the browser window will refresh to the default screen upon successful installation.

It is recommended that you compare the **Software Version** at the top of the **Device Info** Summary screen (see graphic below) with the firmware version installed, to confirm the installation was successful.

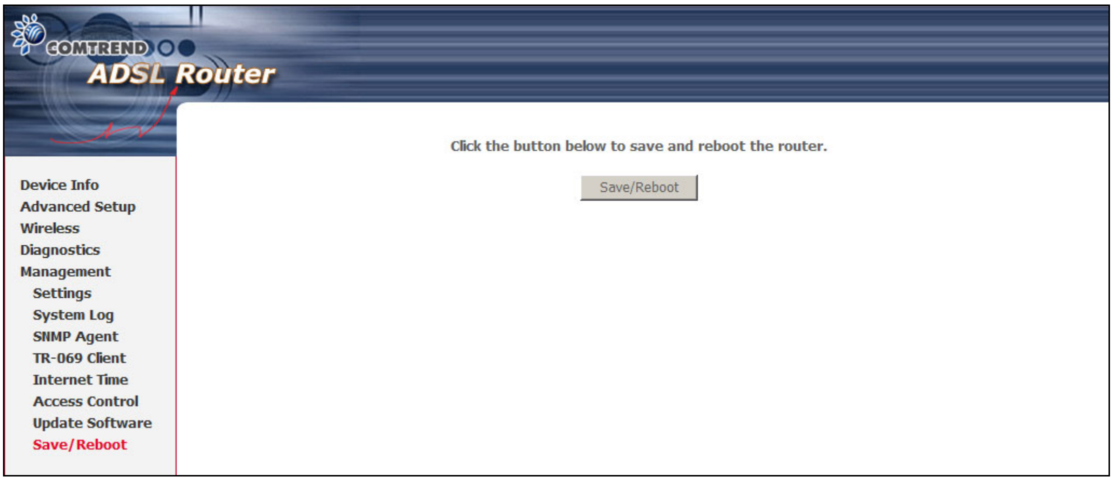


Device Info

Board ID:	96348A-122
Software Version:	A411-306CTL-C01_R02
Bootloader (CFE) Version:	1.0.37-6.8-23
Wireless Driver Version:	4.150.10.5.cpe2.0
ADSL Version:	A2pB023o.d20h

9.8 Save and Reboot

This function saves the current configuration settings and reboots the device.



Click the button below to save and reboot the router.

Save/Reboot

NOTE: You may need to reconfigure the TCP/IP settings after rebooting. For example, if the DHCP server is disabled Static IP settings must be configured. See section 3.2 IP Configuration for detailed instructions.

NOTE: If you lose all access to the web user interface (WUI), you may need to close the browser, wait for two minutes, and then restart the WUI. If this does not work, then press the reset button on the rear panel of the device for 5-7 seconds to restore to default settings.

Appendix A: Security

Stateful Packet Inspection
Refers to an architecture, where the firewall keeps track of packets on each connection traversing all its interfaces and makes sure they are valid. This is in contrast to static packet filtering which only examines a packet based on the information in the packet header.

Denial of Service Attack
Is an incident in which a user or organization is deprived of the services of a resource they would normally expect to have. Various DoS attacks the device can withstand are ARP Attack, Ping Attack, Ping of Death, Land, SYN Attack, Smurf Attack, and Tear Drop.

TCP/IP/Port/Interface Filter
These rules help in the filtering of traffic at the Network layer i.e. Layer 3.
When a Routing interface is created, Enable Firewall must be checked.
Navigate to Advanced Setup -> Security -> IP Filtering.

Outgoing IP Filter
Helps in setting rules to DROP packets from the LAN interface. By default if Firewall is Enabled all IP traffic from LAN is allowed. By setting up one or more filters, particular packet types coming from the LAN can be dropped.

Filter Name: User defined Filter Name.

Protocol: Can take on any values from: TCP/UDP, TCP, UDP or ICMP

Source IP Address/Source Subnet Mask: Packets with the particular "Source IP Address/Source Subnet Mask" combination will be dropped.

Source Port: This can take on either a single port number or a range of port numbers. Packets having a source port equal to this value or falling within the range of port numbers (portX : portY) will be dropped.

Destination IP Address/Destination Subnet Mask: Packets with the particular "Destination IP Address/Destination Subnet Mask" combination will be dropped.

Destination Port: This can take on either a single port number or a range of port numbers. Packets having a destination port equal to this value or falling within the range of port numbers (portX : portY) will be dropped.

Example 1:

Filter Name	: Out_Filter1
Protocol	: TCP
Source Address	: 192.168.1.45
Source Subnet Mask	: 255.255.255.0
Source Port	: 80
Destination Address	: NA
Destination Subnet Mask	: NA
Destination Port	: NA

This filter will Drop all TCP packets coming from LAN with IP Address/Sub. Mask 192.168.1.45/24 having a source port of 80 irrespective of the destination. All other packets will be Accepted.

Example 2:

Filter Name	: Out_Filter2
Protocol	: UDP
Source Address	: 192.168.1.45
Source Subnet Mask	: 255.255.255.0
Source Port	: 5060:6060
Destination Address	: 172.16.13.4
Destination Subnet Mask	: 255.255.255.0
Destination Port	: 6060:7070

This filter will drop all UDP packets coming from LAN with IP Address/ Subnet Mask 192.168.1.45/24 and a source port in the range of 5060 to 6060, destined to 172.16.13.4/24 and a destination port in the range of 6060 to 7070.

Incoming IP Filtering:
Helps in setting rules to ACCEPT packets from the WAN interface. By default, all incoming IP traffic from the WAN is Blocked, if the Firewall is Enabled. By setting up one or more filters, particular packet types coming from the WAN can be Accepted.

Filter Name: User defined Filter Name.

Protocol: Can take on any values from TCP/UDP, TCP, UDP or ICMP

Source IP Address/Source Subnet Mask: Packets with the particular "Source IP Address/Source Subnet Mask" combination will be accepted.

Source Port: This can take on either a single port number or a range of port numbers. Packets having a source port equal to this value or falling within the range of port numbers (portX : portY) will be accepted.

Destination IP Address/Destination Subnet Mask: Packets with the particular "Destination IP Address/Destination Subnet Mask" combination will be accepted.

Destination Port: This can take on either a single port number or a range of port numbers. Packets having a destination port equal to this value or falling within the range of port numbers (portX : portY) will be accepted.

The WAN interface on which these rules apply needs to be selected by user.

Example 1:

Filter Name	: In_Filter1
Protocol	: TCP
Source Address	: 210.168.219.45
Source Subnet Mask	: 255.255.0.0
Source Port	: 80
Destination Address	: NA
Destination Submask	: NA
Destination Port	: NA

Selected WAN interface: mer_0_35/nas_0_35

This filter will ACCEPT all TCP packets coming from WAN interface mer_0_35/nas_0_35 with IP Address/Sub. Mask 210.168.219.45/16 having a source port of 80 irrespective of the destination. All other incoming packets on this interface are DROPPED.

Example 2:

Filter Name	: In_Filter2
Protocol	: UDP
Source Address	: 210.168.219.45
Source Subnet Mask	: 255.255.0.0
Source Port	: 5060:6060
Destination Address	: 192.168.1.45
Destination Subnet Mask	: 255.255.255.0
Destination Port	: 6060:7070

This rule will ACCEPT all UDP packets coming from WAN interface mer_0_35/nas_0_35 with IP Address/Subnet Mask 210.168.219.45/16 and a source port in the range of 5060 to 6060, destined to 192.168.1.45/24 and a destination port in the range of 6060 to 7070. All other incoming packets on this interface are DROPPED.

MAC Layer Filtering: These rules help in the filtering of traffic at the Layer 2. MAC Filtering is only effective on ATM PVCs configured in Bridge mode. After a Bridge mode PVC is created, navigate to Advanced Setup - Security - MAC Filtering.

Global Policy: When set to Forwarded the default filter behavior is to Forward all MAC layer frames except those explicitly stated in the rules. Setting it to Blocked changes the default filter behavior to Drop all MAC layer frames except those explicitly stated in the rules.

Protocol Type: Either PPPoE, IPv4, IPv6, AppleTalk, IPX, NetBEUI, IGMP.

Destination MAC Address: Of the form, XX:XX:XX:XX:XX:XX. Frames with this particular destination address will be Forwarded/Dropped depending on whether the Global Policy is Blocked/Forwarded.

Source MAC Address: Of the form, XX:XX:XX:XX:XX:XX. Frames with this particular source address will be Forwarded/Dropped depending on whether the Global Policy is Blocked/Forwarded.

Frame Direction: (User must select interface on which this rule is applied)

LAN <=> WAN --> All Frames coming/going to/from LAN or to/from WAN.
WAN => LAN --> All Frames coming from WAN destined to LAN.
LAN => WAN --> All Frames coming from LAN destined to WAN

Example 1:

Global Policy: Forwarded
Protocol Type: PPPoE
Destination MAC Address: 00:12:34:56:78:90
Source MAC Address: NA
Frame Direction: LAN => WAN
WAN Interface Selected: br_0_34/nas_0_34

Addition of this rule drops all PPPoE frames going from LAN-side to WAN-side with a Destination MAC Address of 00:12:34:56:78:90 irrespective of its Source MAC Address on the br_0_34 WAN interface. All other frames on this interface are forwarded.

Example 2:

Global Policy: Blocked
Protocol Type: PPPoE
Destination MAC Addr: 00:12:34:56:78:90
Source MAC Addr: 00:34:12:78:90:56
Frame Direction: WAN => LAN
WAN Interface Selected: br_0_34/nas_0_34

Addition of this rule forwards all PPPoE frames going from WAN-side to LAN-side with a Destination MAC Address of 00:12:34:56:78 and Source MAC Address of 00:34:12:78:90:56 on the br_0_34 WAN interface. All other frames on this interface are dropped.

Daytime Parental Control

This feature restricts access of a selected LAN device to an outside Network through the device, as per chosen days of the week and the chosen times.

User Name: Name of the Filter.

Browser MAC Address: Displays MAC address of the LAN device on which the browser is running.

Other MAC Address: If restrictions are to be applied to a device other than the one on which the browser is running, the MAC address of that LAN device is entered.

Days of the Week: Days of the week, when the restrictions are applied.

Start Blocking Time: The time when restrictions on the LAN device begin.

End Blocking Time: The time when LAN device restrictions are lifted.

Example:

User Name: FilterJohn
Browser's MAC Address: 00:25:46:78:63:21
Days of the Week: Mon, Wed, Fri
Start Blocking Time: 14:00
End Blocking Time: 18:00

When this rule i.e. FilterJohn is entered, a LAN device with MAC Address of 00:25:46:78:63:21 will be restricted access to the outside network on Mondays, Wednesdays, and Fridays, from 2pm to 6pm. On all other days and time, this device will have access to the outside Network.

Appendix B: Pin Assignments

Line Port (RJ11)

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

LAN Port (RJ45)

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

Appendix C: Specifications

Rear Panel

RJ-11 X1 for ADSL2+, RJ-45 X 4 for LAN, Reset Button X 1, WPS Button X 1, Power Jack X 1, Power button X 1, Wi-Fi Antenna x 1

ADSL

Standard ITU-T G.992.5, ITU-T G.992.3, ITU-T G.992.1, ANSI T1.413 Issue 2

G.992.5 (ADSL2+)	Downstream: 24 Mbps	Upstream: 1.3 Mbps
G.992.3 (ADSL2)	Downstream: 12 Mbps	Upstream: 1.3 Mbps
G.DMT	Downstream: 8 Mbps	Upstream: 0.8 Mbps
AnnexM		

Ethernet

Standard ....IEEE 802.3, IEEE 802.3u
10/100 BaseT ....Auto-sense
MDI/MDX support.....Yes

Wireless

Standard IEEE802.11b/g
Encryption...............64/128-bit WEP
Channels.................11 (US, Canada), 13 (Europe), 14 (Japan)
Data Rate................Up to 54Mbps
WPA/WPA2 ....Yes
IEEE 802.1x ....Yes
WMM ....Yes
WPS ....Yes
MAC Filtering ....Yes
Afterburner mode.....Optional

ATM Attributes

RFC 2364 (PPPoA), RFC 2684 (RFC 1483) Bridge/Route; RFC 2516 (PPPoE); RFC 1577 (IPoA), Annex M
Support PVCs 16
AAL type AAL5
ATM service class .....UBR/CBR/VBR
ATM UNI support......UNI3.1/4.0
OAM F4/F5 ....Yes

Management

SNMP, Telnet, Web-based management, Configuration backup and restoration, Software upgrade via HTTP, TFTP, or FTP server, Supports TR-069/TR-098/TR-111 for Remote Management

Bridge Functions

Transparent bridging and learning ....IEEE 802.1d
VLAN support ....Yes
Spanning Tree Algorithm ....Yes
IGMP Proxy ....Yes

Routing Functions

Static route, RIP v1/v2, NAT/PAT, DHCP Server/Relay/Client, DNS Proxy, ARP

Security Functions

Authentication protocols..........................PAP, CHAP
TCP/IP/Port filtering rules, Port triggering/Forwarding, Packet and MAC address filtering, Access Control, SSH

QoS
L3 policy-based QoS, IP QoS, ToS

Application Passthrough

PPTP, L2TP, IPSec, VoIP, Yahoo messenger, ICQ, RealPlayer, NetMeeting, MSN, X-box

Power Supply

External power adapter...........................Input 110 Vac or 240 Vac

Environment Condition

Operating temperature ....0 ~ 50 degrees Celsius
Relative humidity ....5 ~ 95% (non-condensing)

Kit Weight

1 X (CT-5365, RJ11 and RJ45 cables, Power Adapter, CD-ROM) = 0.97 kg

Dimensions ....205 mm (W) x 47 mm (H) x 145 mm (D)

Certifications.........FCC Part 15 class B

NOTE: Specifications are subject to change without notice.

Appendix D: SSH Client

Linux OS comes with a ssh client. Microsoft Windows does not have ssh client but there is a public domain one called “putty” that you can download here:

http://www.chiark.greenend.org.uk/~sgtatham/putty/download.html

To access the router using Linux ssh client:
From LAN: Use the router WEB UI to enable SSH access from LAN.
(default is enabled)
type: ssh -l root 192.168.1.1

From WAN: Use WEB UI to enable SSH access from WAN.
type: ssh -l support router-WAN-ip-address
To access the router using the Windows “putty” ssh client:
From LAN: Use the router WEB UI to enable SSH access from LAN
(default is enabled)
type: putty -ssh -l admin 192.168.1.1

From WAN: In the router, use WEB UI to enable SSH access from WAN.
type: putty -ssh -l support router-WAN-ip-address