COMTREND CORPORATION

NexusLink 5631
Wireless ADSL2+ Bonded Router
User Manual

Version C1.3, February 19, 2008

261076-005

Warning

- Before servicing or disassembling this equipment, always disconnect all power and telephone lines from the device.
- Use an appropriate power supply and UL Listed telephone line cord. Appendix D: Specifications clearly states these requirements.

Preface

This manual provides information for network administrators. It covers the installation, operation and applications of this device. The individual reading this manual is presumed to have a basic understanding of telecommunications.

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Technical support

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

Save Our Environment

This symbol means 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 device can be recycled in accordance with regionally established regulations.

Never throw-out this electronic equipment along with your household waste. You may be subject to penalties or sanctions under the law. Instead, ask for instructions from your municipal government on how to correctly dispose of it. Please be responsible and protect our environment.

Table of Contents

Chapter 1 Introduction

The NexusLink 5631 Wireless ADSL2+ Bonded Router features flexible networking connectivity with dual ADSL line capability, four 10/100 Ethernet ports, two USB ports and an 802.11g wireless LAN access point. It has robust routing capabilities to segment and direct data streams and allows for multiple data encapsulations.

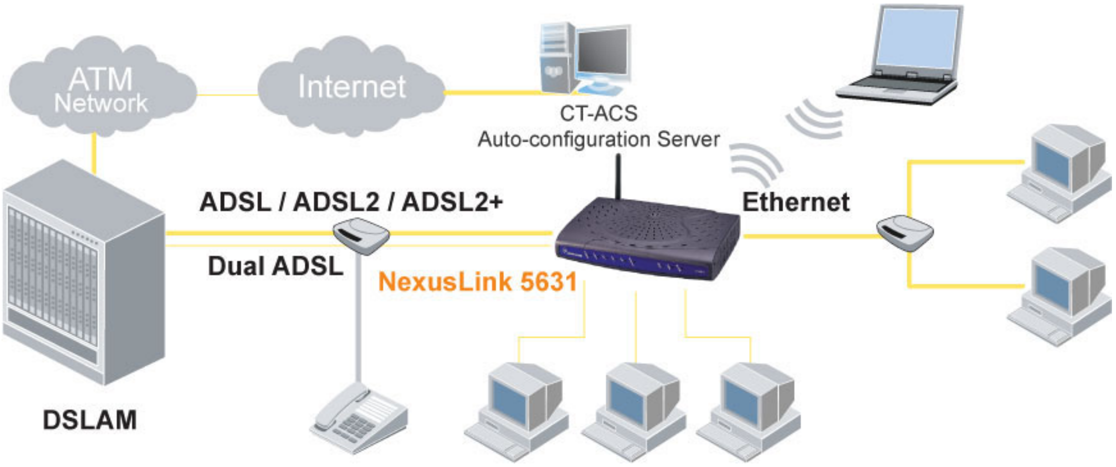
The NexusLink 5631 is a black box solution for deploying Triple Play architectures, doubling bandwidth (48Mbps) performance over traditional ADSL2+ modems. It provides higher level performance with embedded security, QoS, VPN and remote management functions. As an added bonus, the USB host acts as a printer hub and will enable future product enhancements available by software upgrade.

1.1 Features

- Dual ADSL2+ bonded
- UPnP installation
- Integrated 802.11g (WiFi) Access Point
- WPA and 802.1x
- RADIUS client
- IP /MAC address filtering
- Static route/RIP/RIP v2 routing functions
- Dynamic IP assignment
- NAT/PAT
- IGMP Proxy and fast leave
- DHCP Server/Relay/Client
- DNS Relay
- Auto PVC configuration
- Supports 16 VCs
- Embedded SNMP agent
- Web-based management
- Remote configuration and upgrade
- Supports TR-069/TR-098/TR-111 For Remote Management
- Configuration backup and restoration
- FTP server
- TFTP server

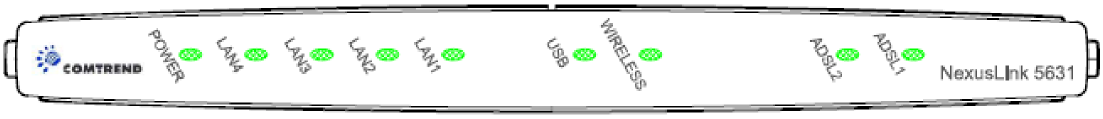
1.2 Application

This diagram depicts the application of the NexusLink 5631 on a wireless network.



1.3 Front Panel LED Indicators

The front panel LED indicators are pictured below with detailed explanation provided in the table underneath.

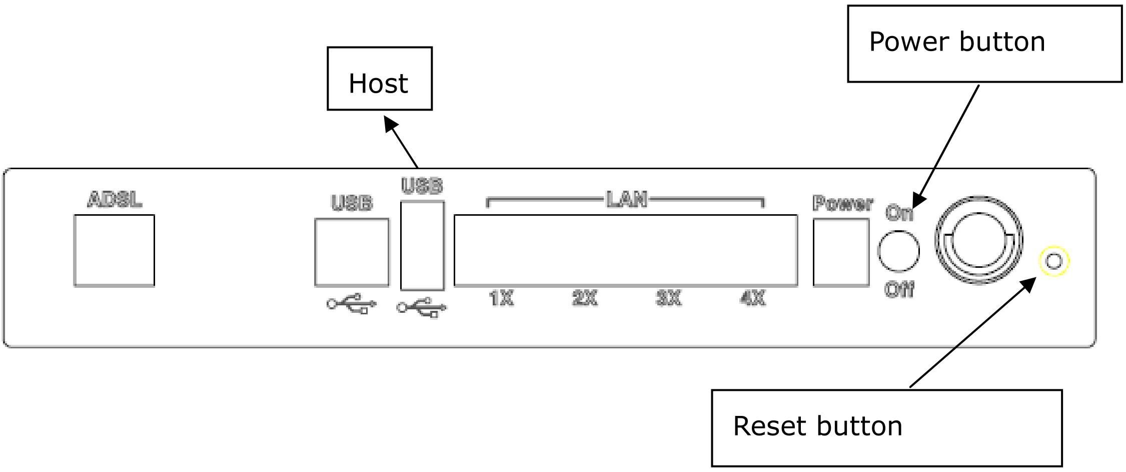


LED	Color	Mode	Function
POWER	Green	On	The router is powered up.
		Off	The router is powered down.
LAN 1~4	Green	On	An Ethernet Link is established.
		Off	An Ethernet Link is not established.
	Green	Blink	Data transmitting or receiving over LAN.
USB	Green	On	A USB link is established.
		Off	A USB link is not established.
	Green	Blink	Data transmitting or receiving over USB.
WIRELESS	Green	On	The Wireless is ready and idle.
		Off	The Wireless is not installed.
	Green	Blink	Data transmitting or receiving over Wireless
ADSL 1~2	Green	On	The ADSL link is established.
		Off	The ADSL link is not established.

Chapter 2 Installation

2.1 Hardware Installation

Follow the instructions below to complete the hardware installation.
A diagram of the back panel of the router is shown below for reference.



Connection to Power

Connect the power jack to the shipped power cord. Attach the power adapter to the wall outlet or other AC source. After all connections have been made, press the power button to turn on the device. After powering on, the router will perform a self-test. Wait a few moments and the device will be ready to operate.

Caution 1: If the device fails to power up, or if it malfunctions, first verify that the power supply is connected correctly. 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 the wall outlet.

Reset Button

In the rear panel, there is a reset button. To load the factory default settings, hold the reset button down for 5 to 10 seconds.

Connection to USB port

Connect the USB port to a PC with a standard USB cable.

Connection to USB host port

This device is equipped with one high-speed USB 2.0 host connection. With software support, users can connect USB devices such as printers and a hard disc to the router. For this software release, printer service is supported.

Connection to LAN port

To connect to a hub or PC, use a RJ45 cable. You can connect the router to four LAN devices. The ports are auto-sensing MDI/X and either straight-through cable or crossover cable can be used.

Connection to LINE port

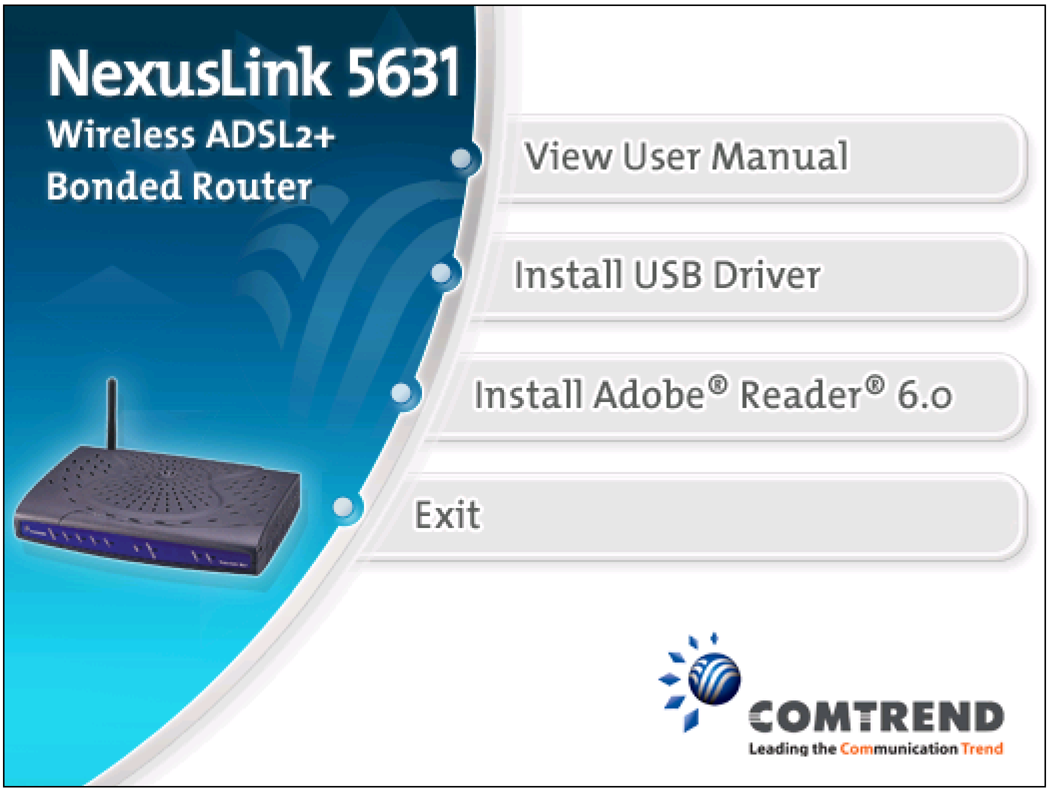
If you wish to connect both the router and a telephone, connect the LINE port to a POTS splitter with a RJ14 cable.

2.2 USB Driver Autorun Installation

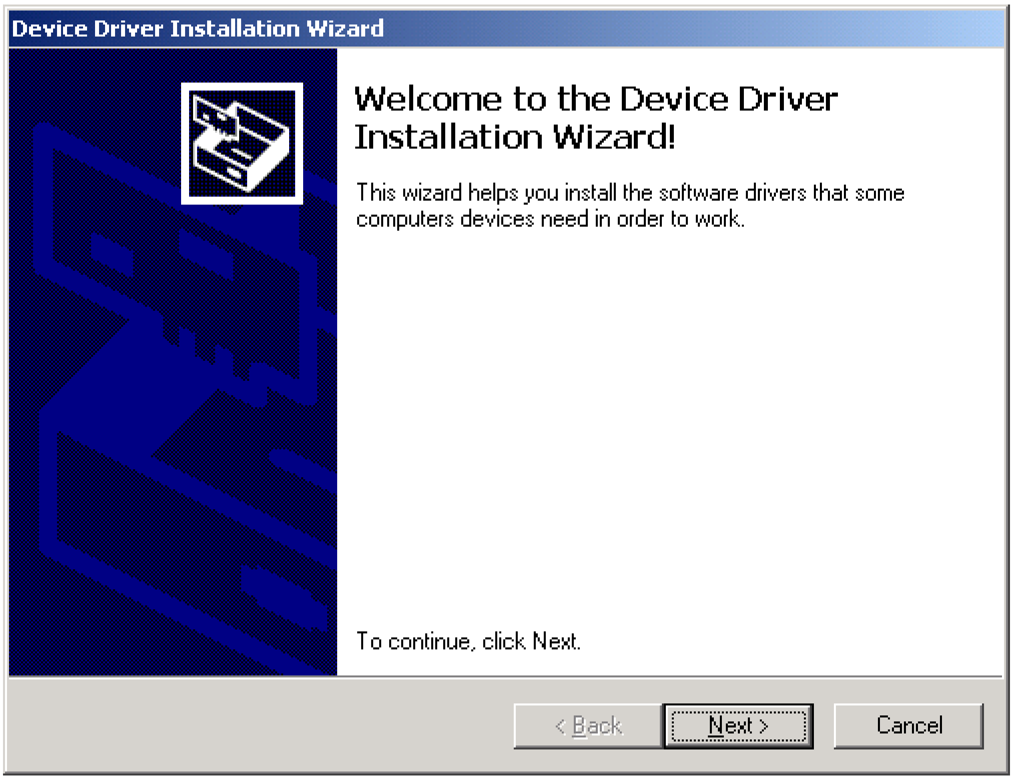
Before connecting the NexusLink 5631 to a PC with USB, the correct drivers must be installed. The auto-run USB driver installation supports Win ME, Win 98, Win 2000, Win XP (32 bit) and Vista (32 bit). For those using Windows XP 64 bit, the driver must be installed manually (please see section 2.3 below for details).

Follow the procedure below to install the standard (32 bit) USB driver

STEP 1: Insert the Installation CD and select **Install USB Driver** from the autostart menu options shown below.



STEP 2: The following window will be displayed. Click the **Next** button to continue.



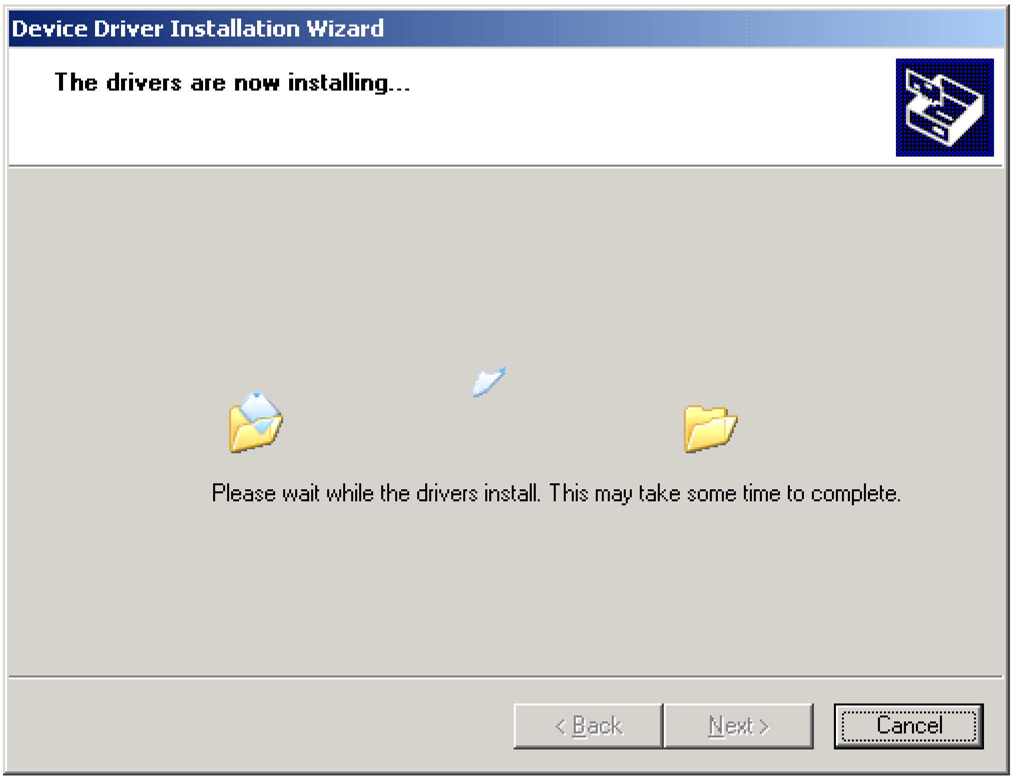
Device Driver Installation Wizard

Welcome to the Device Driver Installation Wizard!

This wizard helps you install the software drivers that some computers devices need in order to work.

To continue, click Next.

STEP 3: When the window displays as below, wait for the drivers to fully install.

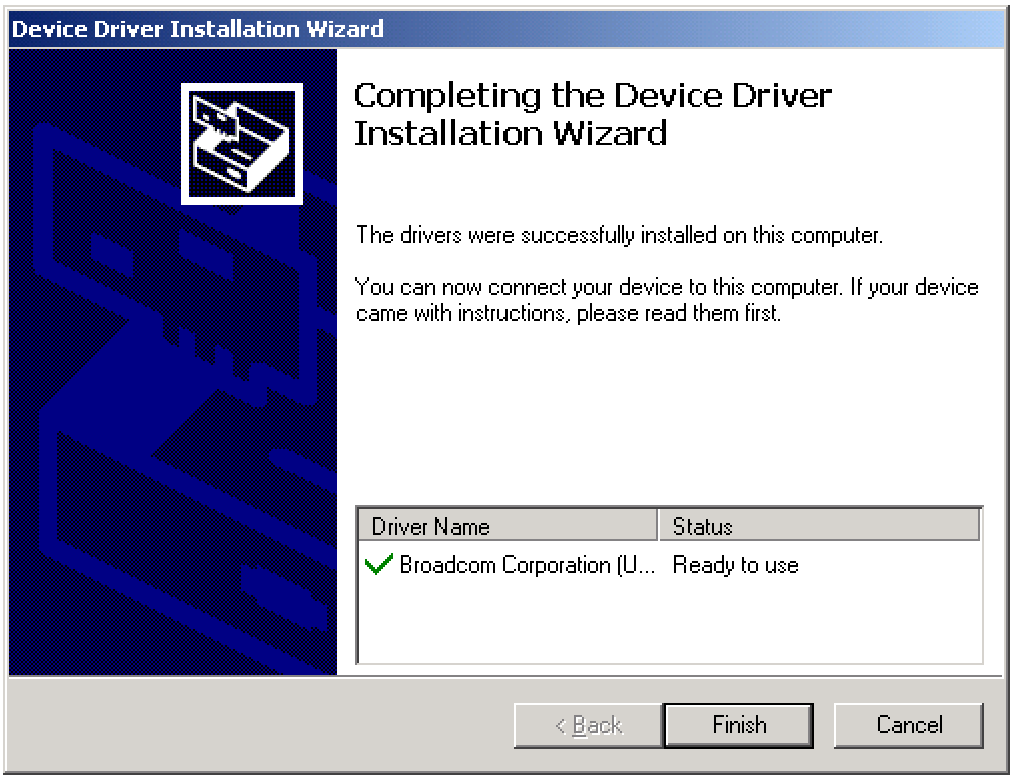


Device Driver Installation Wizard

The drivers are now installing...

Please wait while the drivers install. This may take some time to complete.

STEP 4: Click the **Finish** button, when the window displays as below.



Completing the Device Driver Installation Wizard

The drivers were successfully installed on this computer.

You can now connect your device to this computer. If your device came with instructions, please read them first.

Driver Name	Status
✓ Broadcom Corporation (U...	Ready to use

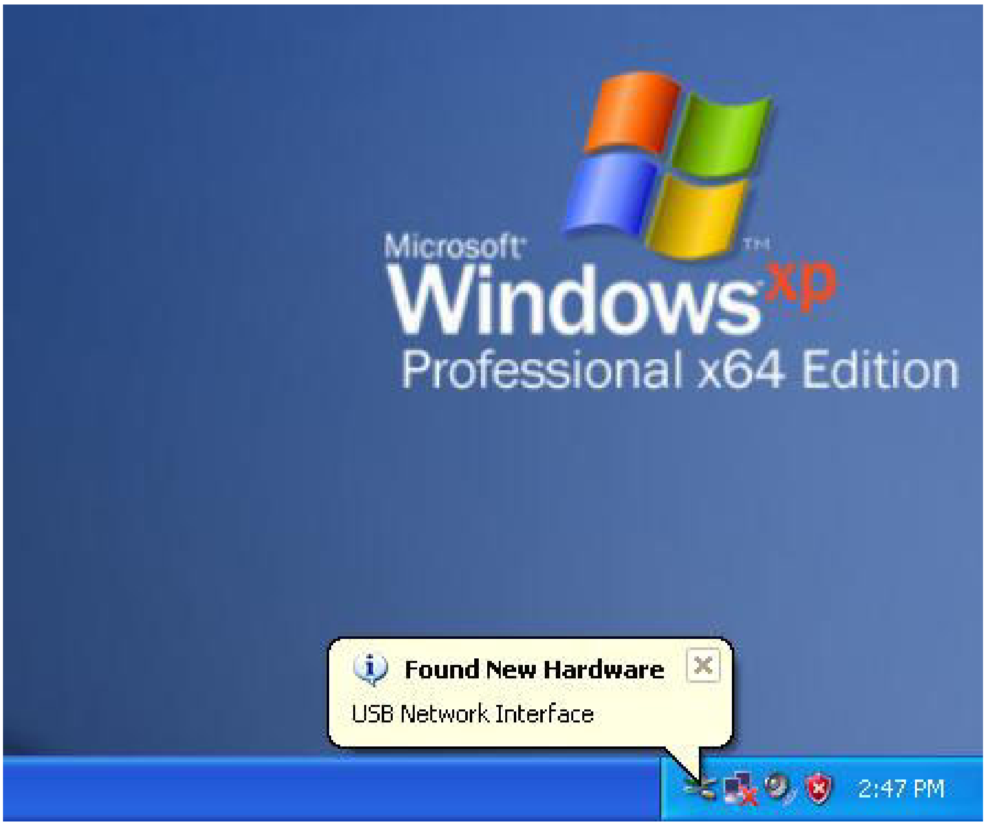
STEP 5: The installation is complete. You can now connect the device to your PC using a standard USB cable.

2.3 USB Driver Manual Installation (64bit OS)

Before connecting this router to a PC with USB, the correct drivers must be installed.

Follow the procedure below to manually install the 64bit USB driver

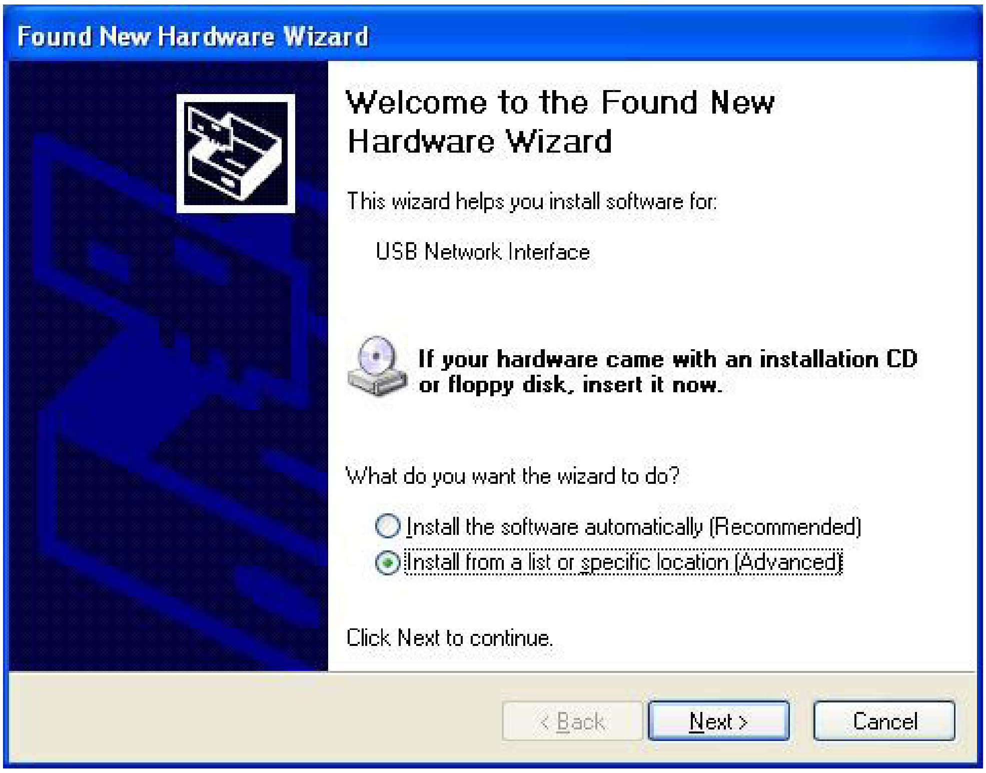
STEP 1: Connect the USB port to the PC by plugging the flat connector of a standard USB cable into your PC and plugging the square connector into the device. After a moment, the connection should be detected by your PC and if so the screen will display a notice to that effect, as shown below:



Found New Hardware

USB Network Interface

STEP 2: When the window displays as below, select **Install from a list or specific location (Advanced)** and then click the **Next** button.



Found New Hardware Wizard

Welcome to the Found New Hardware Wizard

This wizard helps you install software for:

USB Network Interface

If your hardware came with an installation CD or floppy disk, insert it now.

What do you want the wizard to do?

○ Install the software automatically (Recommended)

● Install from a list or specific location (Advanced)

Click Next to continue.

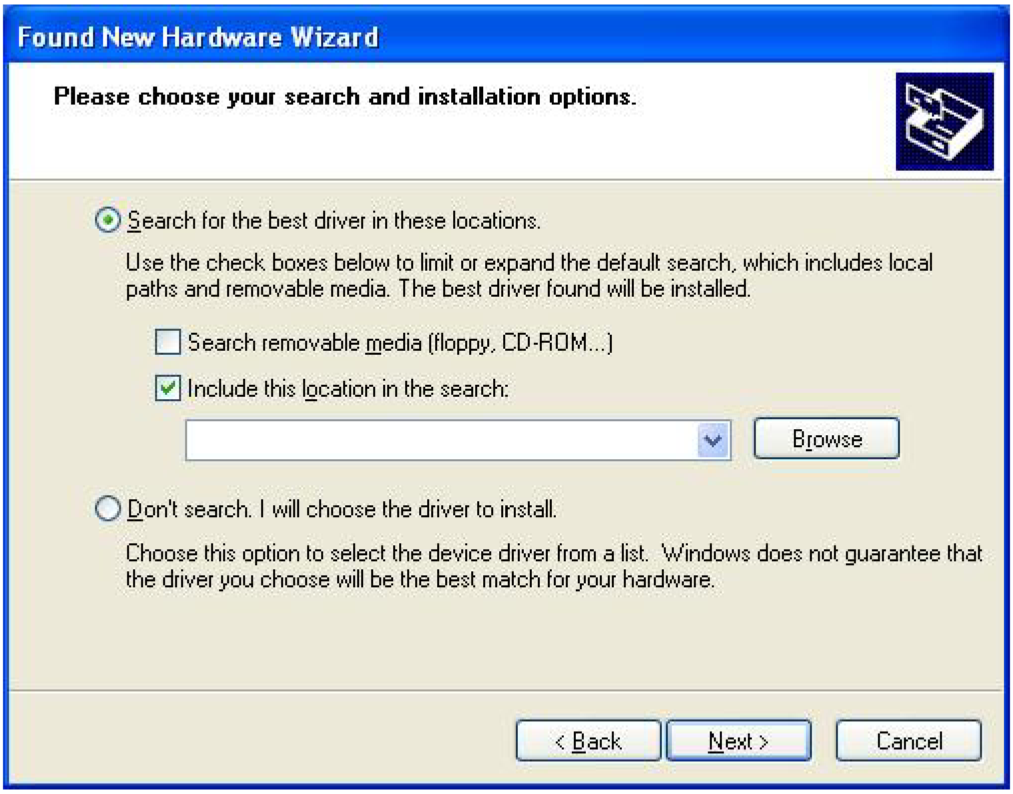
Note: This window won't display if the USB Driver has been previously installed. In this case, contact technical support for assistance.

STEP 3: Insert the installation CD.

Note: If you see the autostart menu (as shown in **step 1** of previous section)

CLICK -

and continue with the manual installation process.



Found New Hardware Wizard

Please choose your search and installation options.

● Search for the best driver in these locations.

Use the check boxes below to limit or expand the default search, which includes local paths and removable media. The best driver found will be installed.

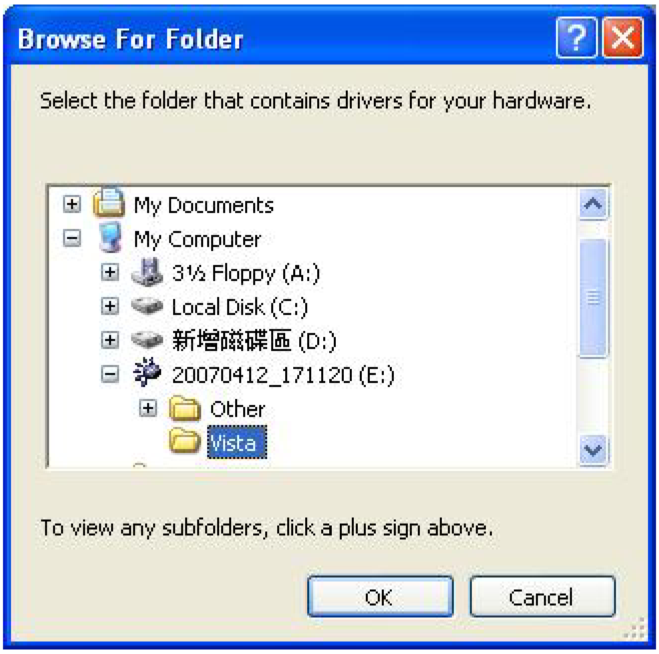
□ Search removable media (floppy, CD-ROM...)

☑ Include this location in the search:

○ Don't search. I will choose the driver to install.

Choose this option to select the device driver from a list. Windows does not guarantee that the driver you choose will be the best match for your hardware.

STEP 4: Select the location of the file using the **Browse** button, as shown above. Normally, the file is on the CD-ROM shipped with the device.



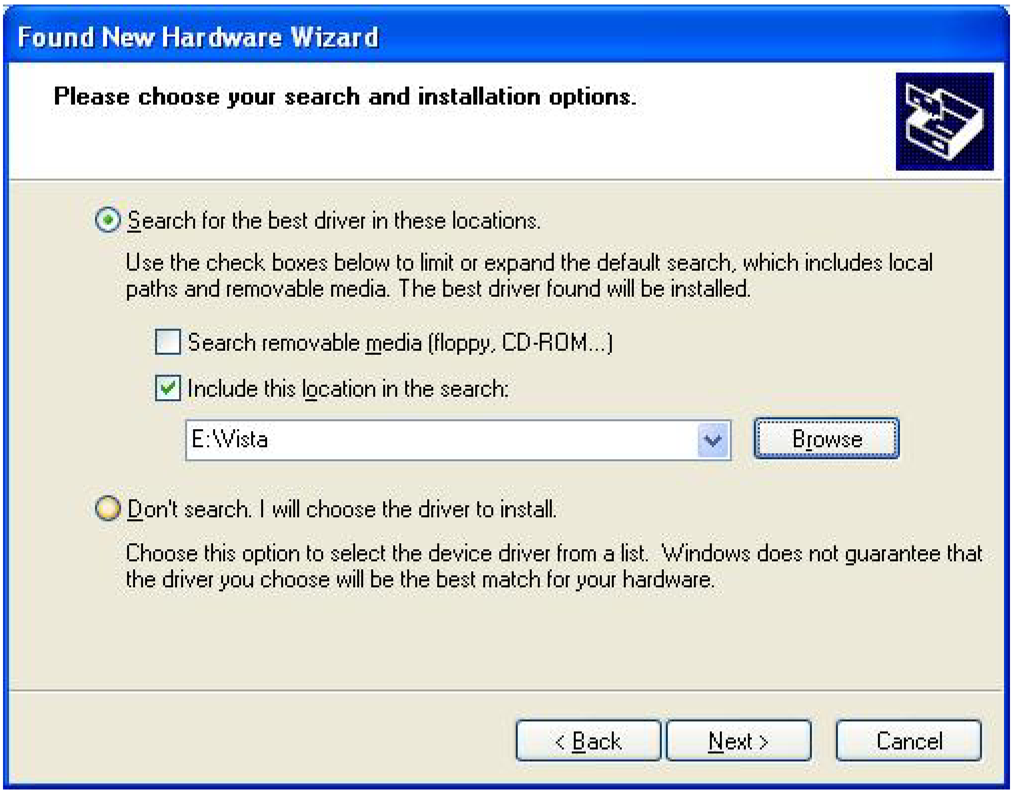
Browse For Folder

Select the folder that contains drivers for your hardware.

To view any subfolders, click a plus sign above.

STEP 5: Locate the **Vista** folder, and click **OK**.

STEP 6: When the window displays as below, click the **NEXT** button and wait.



Found New Hardware Wizard

Please choose your search and installation options.

● Search for the best driver in these locations.

Use the check boxes below to limit or expand the default search, which includes local paths and removable media. The best driver found will be installed.

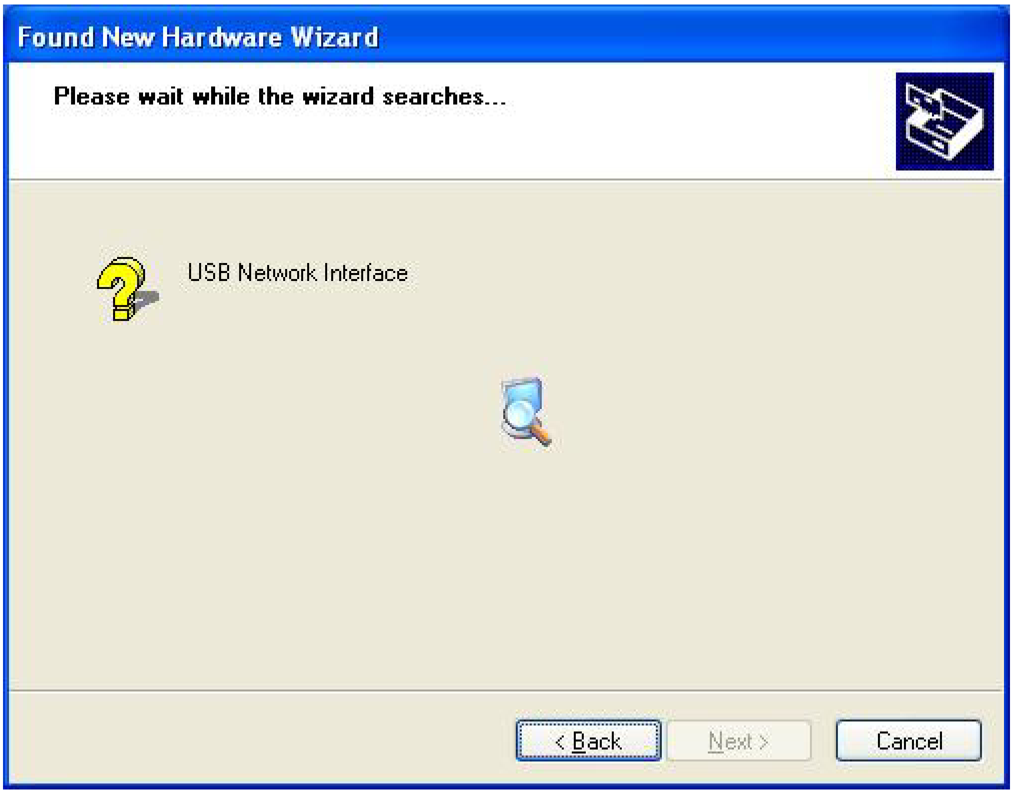
□ Search removable media (floppy, CD-ROM...)

☑ Include this location in the search:

E:\Vista

○ Don't search. I will choose the driver to install.

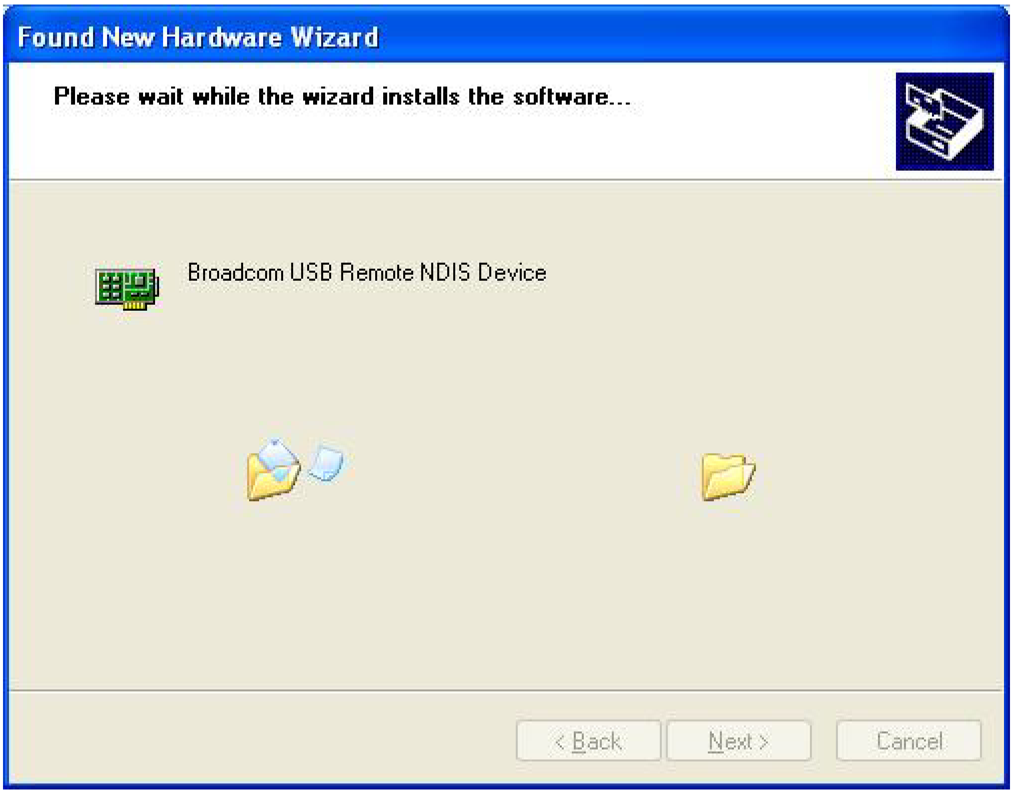
Choose this option to select the device driver from a list. Windows does not guarantee that the driver you choose will be the best match for your hardware.



Found New Hardware Wizard

Please wait while the wizard searches...

USB Network Interface

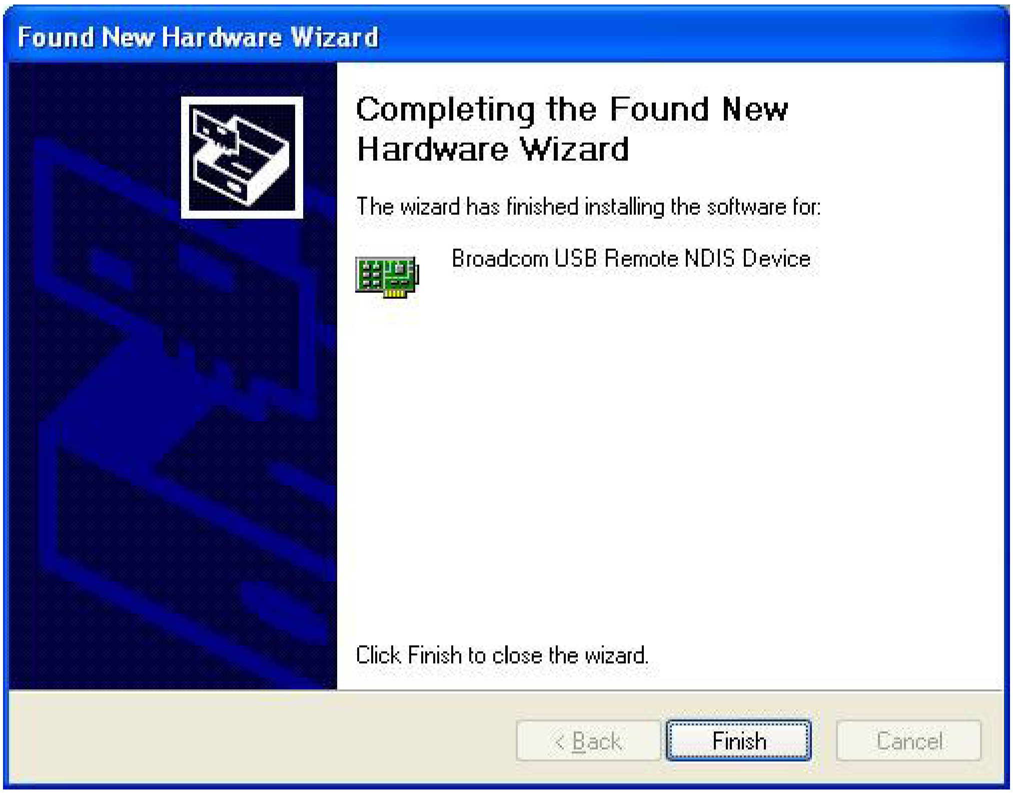


Found New Hardware Wizard

Please wait while the wizard installs the software...

Broadcom USB Remote NDIS Device

STEP 7: Click the **Finish** button when the window displays as below.



Found New Hardware Wizard

Completing the Found New Hardware Wizard

The wizard has finished installing the software for:

Broadcom USB Remote NDIS Device

Click Finish to close the wizard.

STEP 8: Installation is complete.

Chapter 3 Web User Interface

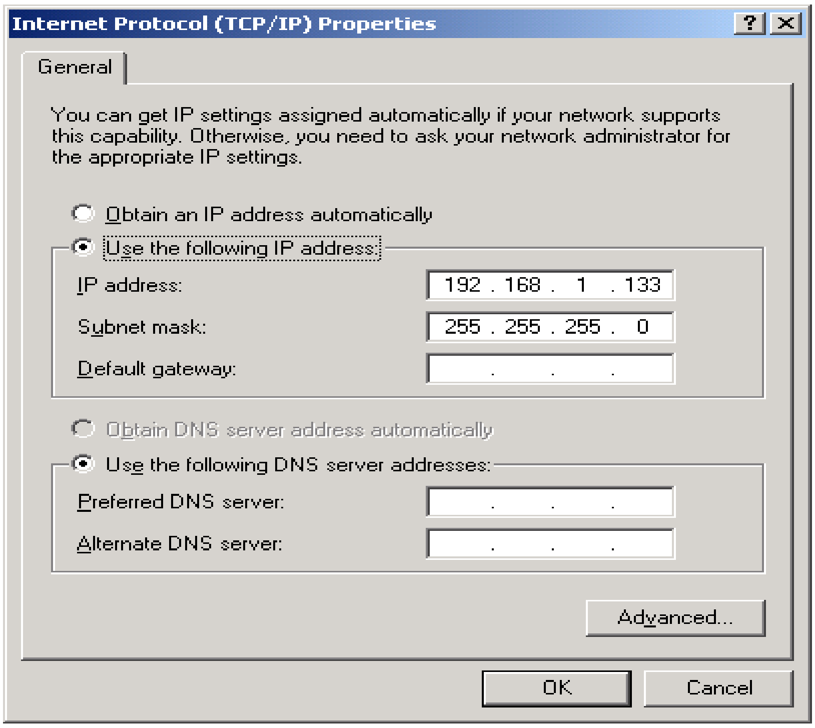
This section describes how to manage the router via a web browser. The web page is best viewed with Microsoft Internet Explorer 5.0 and later. A unique default user account is assigned with user name **root** and password **12345**. The user can change the default password later when logged in to the device.

3.1 TCP/IP Settings

The default IP address of the router (LAN port) is 192.168.1.1. To configure the router for the first time, the configuration PC must have a static IP address within the 192.168.1.x subnet. Follow the steps below to configure your PC IP address to use subnet 192.168.1.x.

STEP 1: Right click on the Local Area Connection under the Network and Dial-Up connection window and select **Properties**.

STEP 2: Enter the TCP/IP window and change the IP address to **192.168.1.x/24**.



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: . . .

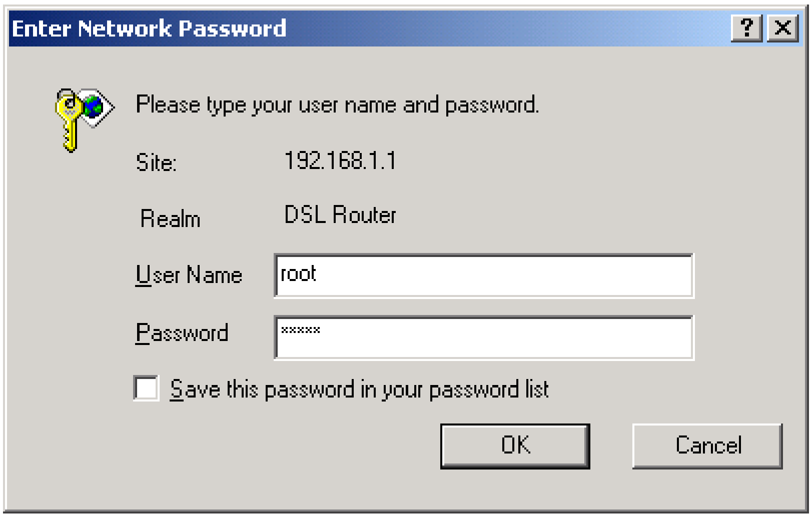
STEP 3: Click OK to submit settings.

3.2 Login Procedure

Perform the following steps to bring up the web browser and configure the router.

STEP 1: Start the Internet browser. Type the IP address for the router in the Web address field. For example, if the IP address is 192.168.1.1, type http://192.168.1.1

STEP 2: You will be prompted to enter your user name and password. Type root for the user name and **12345** as the password, then click **OK**. These values can be changed later (see section 9.6.3Passwords).



Please type your user name and password.

Site: 192.168.1.1

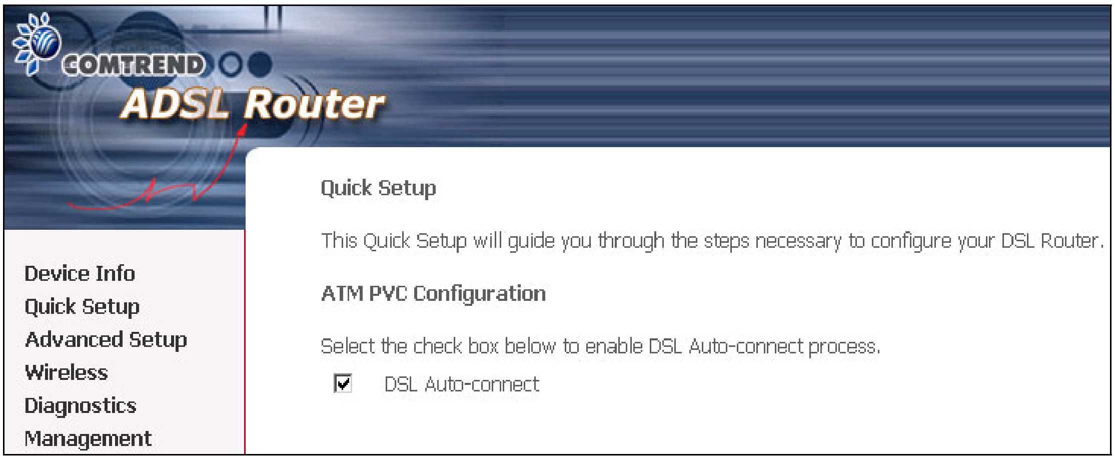
Realm DSL Router

User Name root

Password *****

□ Save this password in your password list

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



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

3.3 Default Settings

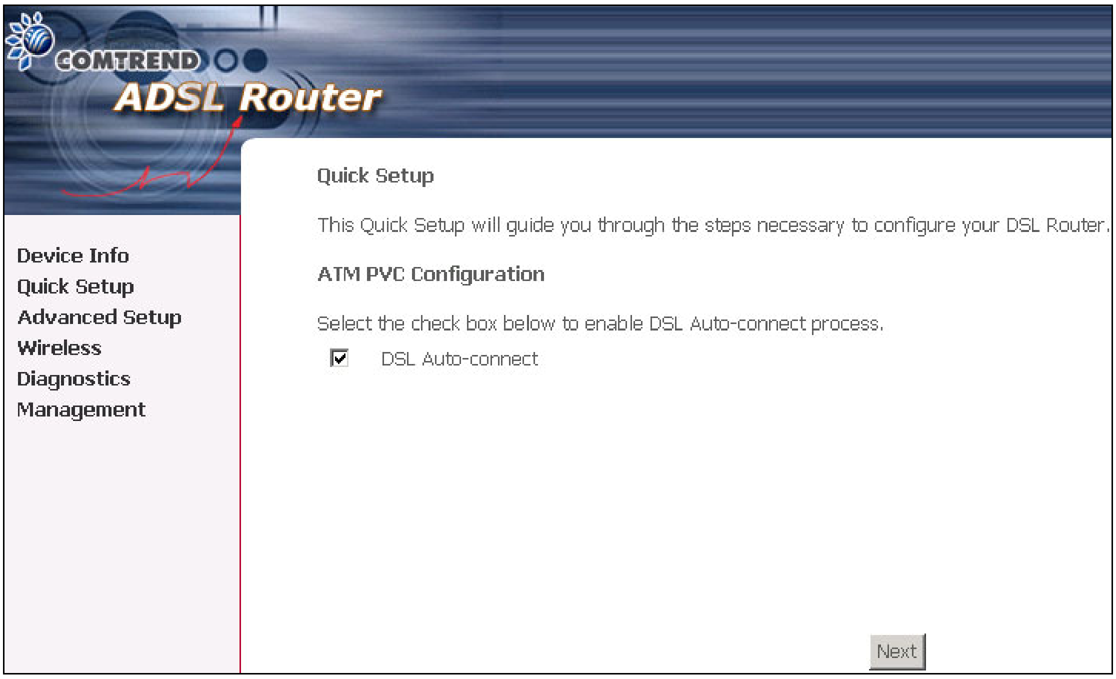
During power on initialization, the router sets all configuration attributes to default values. It will then read the configuration profile from flash memory. The default attributes are overwritten when identical attributes with different values are configured. The configuration profile can be created via the web browser, telnet user interface or other management protocols. The factory default configuration can be restored either by resetting the device or selecting the Restore Default option in Management → Settings (see section 9.1.3 Restore Default).

The following list shows the factory default settings for this router.

- LAN port IP address(es): 192.168.1.1 (ADSL1) and 192.168.1.2 (ADSL2)
- Local administrator account name: root
- Local administrator account password: 12345
- Local non-administrator account name: user
- Local non-administrator account password: user
- Remote WAN access: disabled
- Remote WAN access account name: support
- Remote WAN access account password: support
- NAT and firewall: Disabled for MER, IPoA and Bridge modes
  Enabled for PPPoE and PPPoA modes
- DHCP server on LAN interface: enabled
- WAN IP address: none
- Wireless access: enabled
- SSID: Comtrend
- Wireless authentication: open (no authentication)
- Annex M enabled (all other modes disabled)

Chapter 4 Quick Setup

After login, the **Quick Setup** screen will appear as shown.



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: The selections available on the main menu are based upon the configured connection type and user account privileges.

The Quick Setup screen allows the user to configure the NexusLink 5631 for ADSL connectivity and Internet access. It also guides the user though the WAN network setup first and then the LAN interface setup. You can either do this manually or follow the auto quick setup (i.e. DSL Auto-connect) instructions.

This router supports the following data encapsulation methods.

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

The following configuration considerations apply:

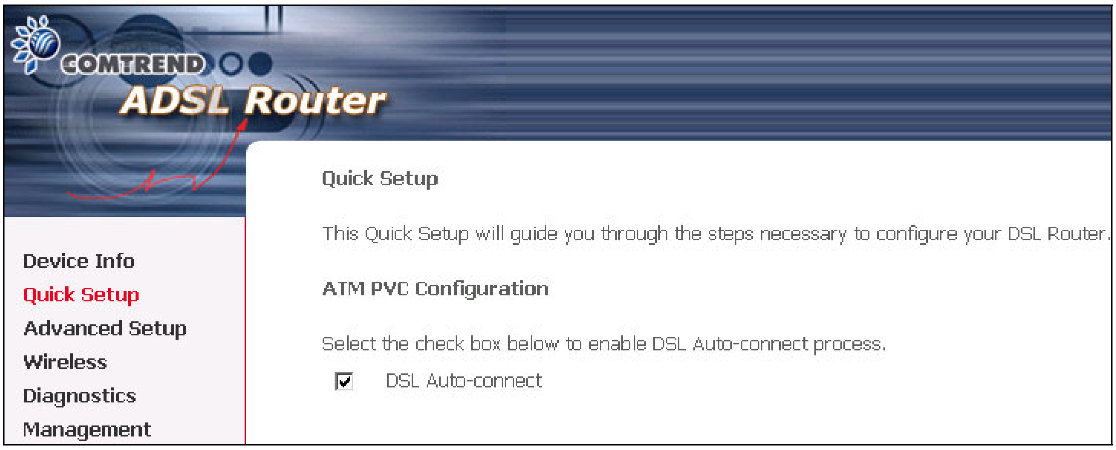
- The WAN network operating mode operation depends on the service provider's configuration in the Central Office and Broadband Access Server for the PVC
- If the service provider provides PPPoE service, then the connection selection depends on whether the LAN-side device (typically a PC) is running a PPPoE client or whether the router is to run the PPPoE client. The router can support both cases simultaneously.
- If some or none of the LAN-side devices do not run PPPoE client, then select PPPoE. If every LAN-side device is running a PPPoE client, then select Bridge In PPPoE mode, the device also supports pass-through PPPoE sessions from the LAN side while simultaneously running a PPPoE client from non-PPPoE LAN devices. In most cases, NAT and firewall should always be enabled when PPPoE or PPPoA mode are selected, but they can be enabled or disabled by the user when MER or IPoA is selected, NAT and firewall are always disabled when Bridge mode is selected.
- Depending on the network operating mode, and whether NAPT and firewall are enabled or disabled, the main panel will display or hide the NAPT/Firewall menu. For instance, at initial setup, the default network operating mode is Bridge. The main panel will not show the NAPT and Firewall menu.

NOTE: Up to sixteen PVC profiles can be configured and saved on the flash memory. To activate a particular PVC profile, you need to navigate all the Quick Setup pages until the last summary page, then click on the Finish button and reboot the system.

4.1 Auto Quick Setup

The auto quick setup requires the ADSL link to be up.   The ADSL router will automatically detect the PVC, so just follow the easy online instructions.

STEP 1: Select **Quick Setup** to display this 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.

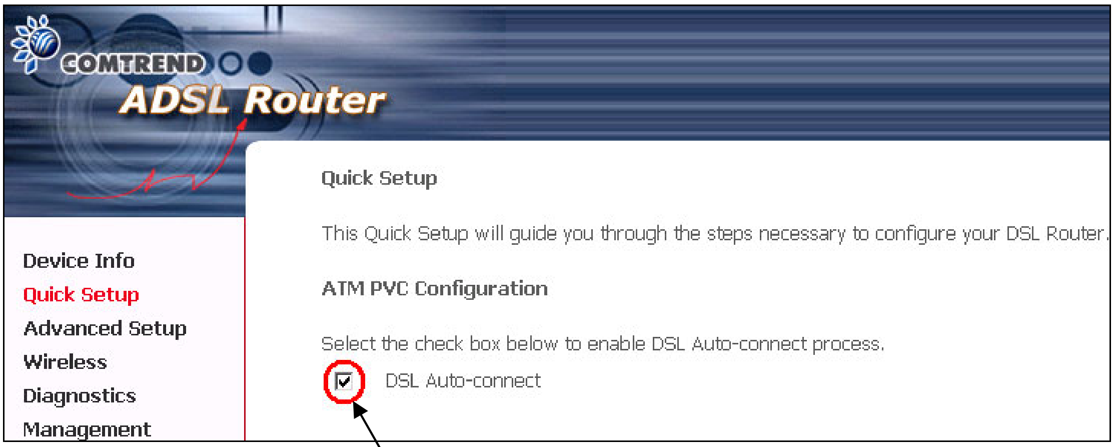
☑ DSL Auto-connect

STEP 2: Click **Next** to start the setup process. Follow the online instructions to complete the settings.   This procedure will skip some processes such as the PVC index and encapsulation mode selection.

STEP 3: After the settings are complete, you can use the ADSL service.

4.2 Manual Quick Setup

STEP 1: Click **Quick Setup** and un-tick the **DSL Auto-connect** checkbox to enable manual configuration of the connection type.



Quick Setup

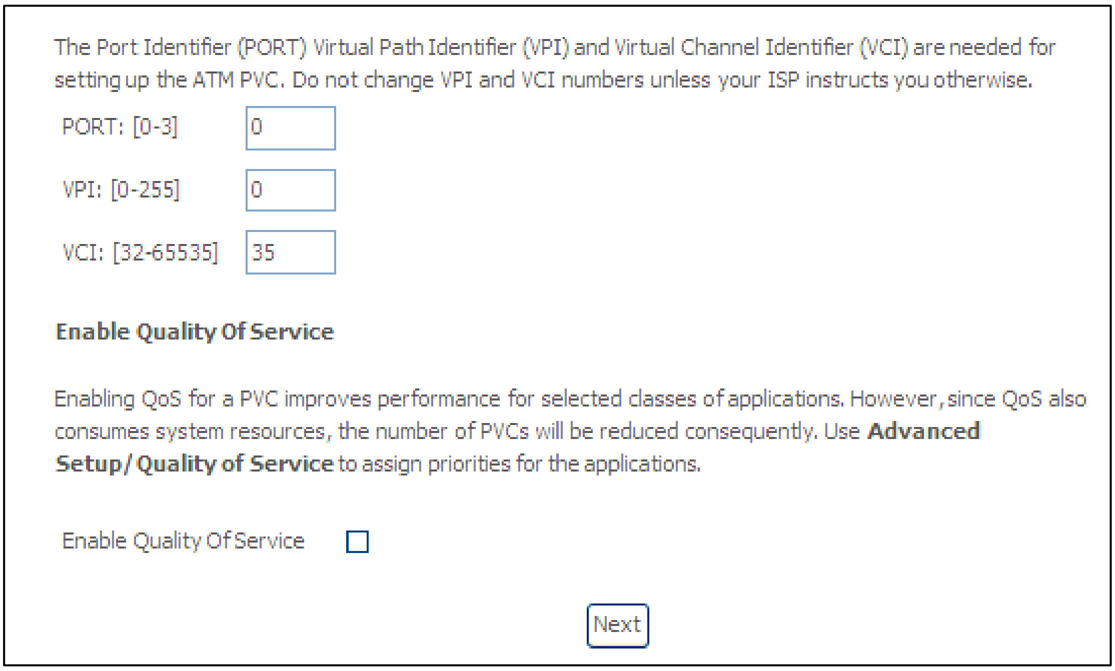
This Quick Setup will guide you through the steps necessary to configure your DSL Router.

ATM PVC Configuration

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

☑ DSL Auto-connect

Untick this checkbox to enable manual setup and display the following screen.



The Port Identifier (PORT) 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.

PORT: [0-3] 0

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.

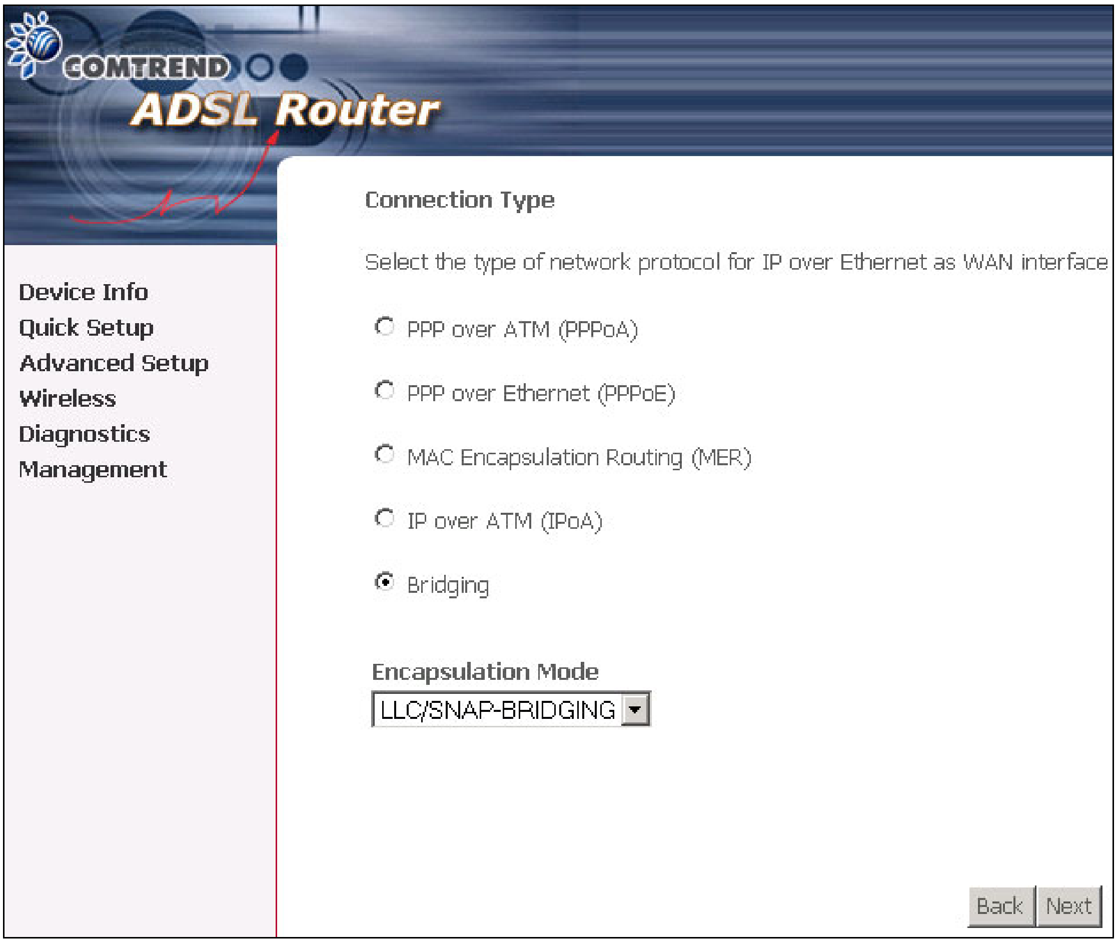
Enable Quality Of Service □

STEP 2: Enter the PORT, Virtual Path Identifier (VPI) and Virtual Channel Identifier (VCI) values. Select Enable Quality Of Service if required and click **Next**.

STEP 3: Choose an Encapsulation mode.

Choosing different connection types provides different encapsulation modes.

- 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



Connection Type

Select the type of network protocol for IP over Ethernet as WAN interface

○ PPP over ATM (PPPoA)

○ PPP over Ethernet (PPPoE)

○ MAC Encapsulation Routing (MER)

○ IP over ATM (IPoA)

● Bridging

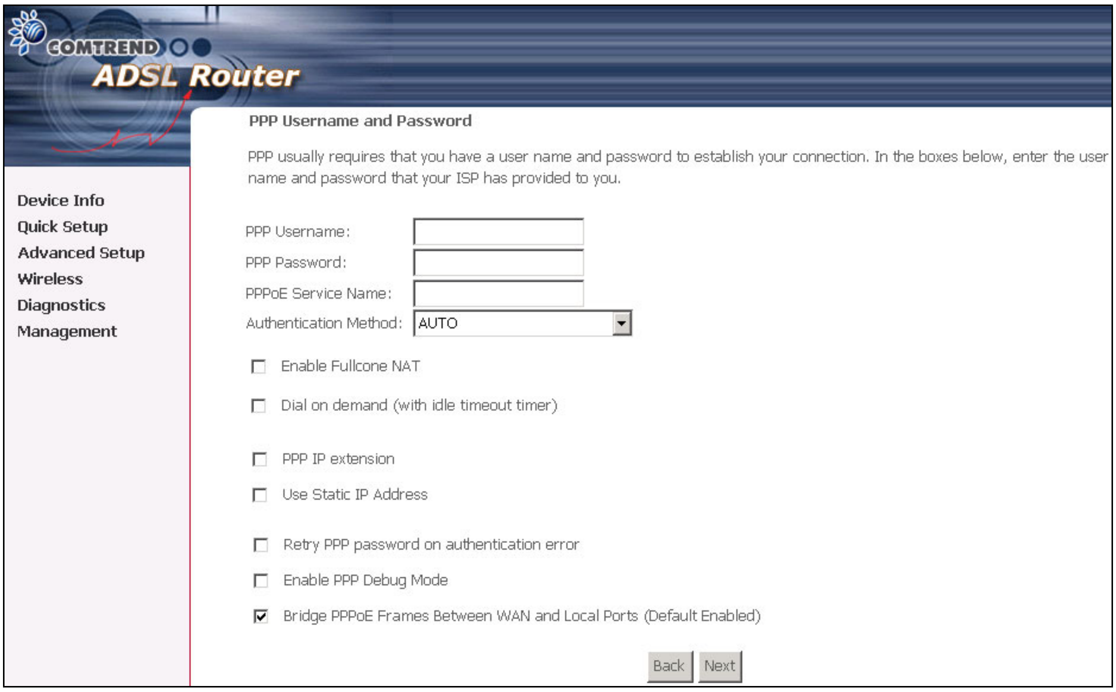
Encapsulation Mode

LLC/SNAP-BRIDGING

NOTE: Subsections 4.2.1 - 4.2.4 describe the PVC setup procedure further. Choosing different connection types pops up different settings requests. Enter appropriate settings that are required by your service provider.

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

STEP 4: Select the PPP over ATM (PPPoA) or PPP over Ethernet (PPPoE) radio button and click **Next**. The following screen appears.



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

□ Enable Fullcone NAT

□ Dial on demand (with idle timeout timer)

□ PPP IP extension

□ Use Static IP Address

□ Retry PPP password on authentication error

□ Enable PPP Debug Mode

☑ Bridge PPPoE Frames Between WAN and Local Ports (Default Enabled)

Enable Fullcone NAT

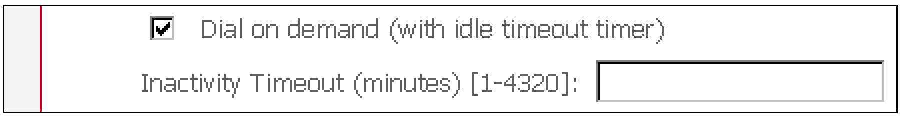
Known as one-to-one NAT, all requests from the same internal IP address and port are mapped to the same external IP address and port. An external host can send a packet to the internal host, by sending a packet to the mapped external address.

PPP Username/PPP Password

The PPP Username and the PPP password requirement are dependent on the particular requirements of the ISP or the ADSL service provider. The WEB user interface allows a maximum of 256 characters in the PPP user name and a maximum of 32 characters in PPP password.

Disconnect if no activity

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



☑ Dial on demand (with idle timeout timer)

Inactivity Timeout (minutes) [1-4320]:

PPP IP Extension

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

The PPP IP Extension supports the following conditions:

- 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 ADSL router has a single IP address to assign to a LAN device.
- NAPT and firewall are disabled when this option is selected.
- The ADSL router becomes the default gateway and DNS server to the PC through DHCP using the LAN interface IP address.
- The ADSL router extends the IP subnet at the remote service provider to the LAN PC.   That is, the PC becomes a host belonging to the same IP subnet.
- The ADSL router bridges the IP packets between WAN and LAN ports, unless the packet is addressed to the router’s LAN IP address.

Use Static IP Address

Unless your service provider specially requires this setup, do not select it.

If selected, enter your static IP address.

Retry PPP password on authentication error

Tick the box to select.

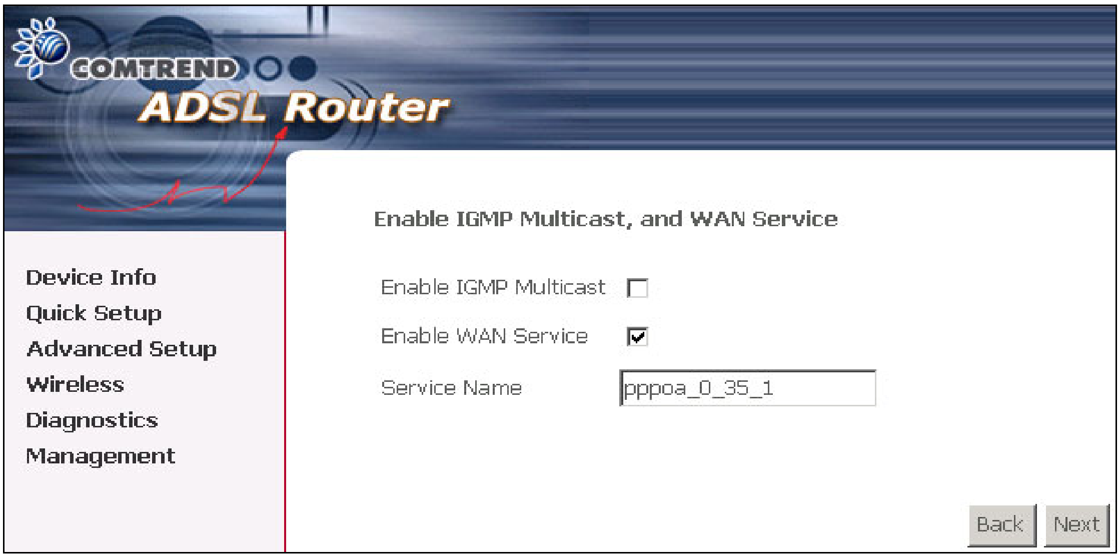
Enable PPP Debug Mode

Enable the PPPoE debug mode. The system will put more PPP connection information in System Log.   This is used for debugging purposes.

Bridge PPPoE Frames Between WAN and Local Ports (Default Enabled)

If Enabled, the function can create a local PPPoE connection to the WAN side.

STEP 5: Click **Next** to display the following screen.



Enable IGMP Multicast, and WAN Service

Enable IGMP Multicast □

Enable WAN Service ☑

Service Name: pppoa_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.

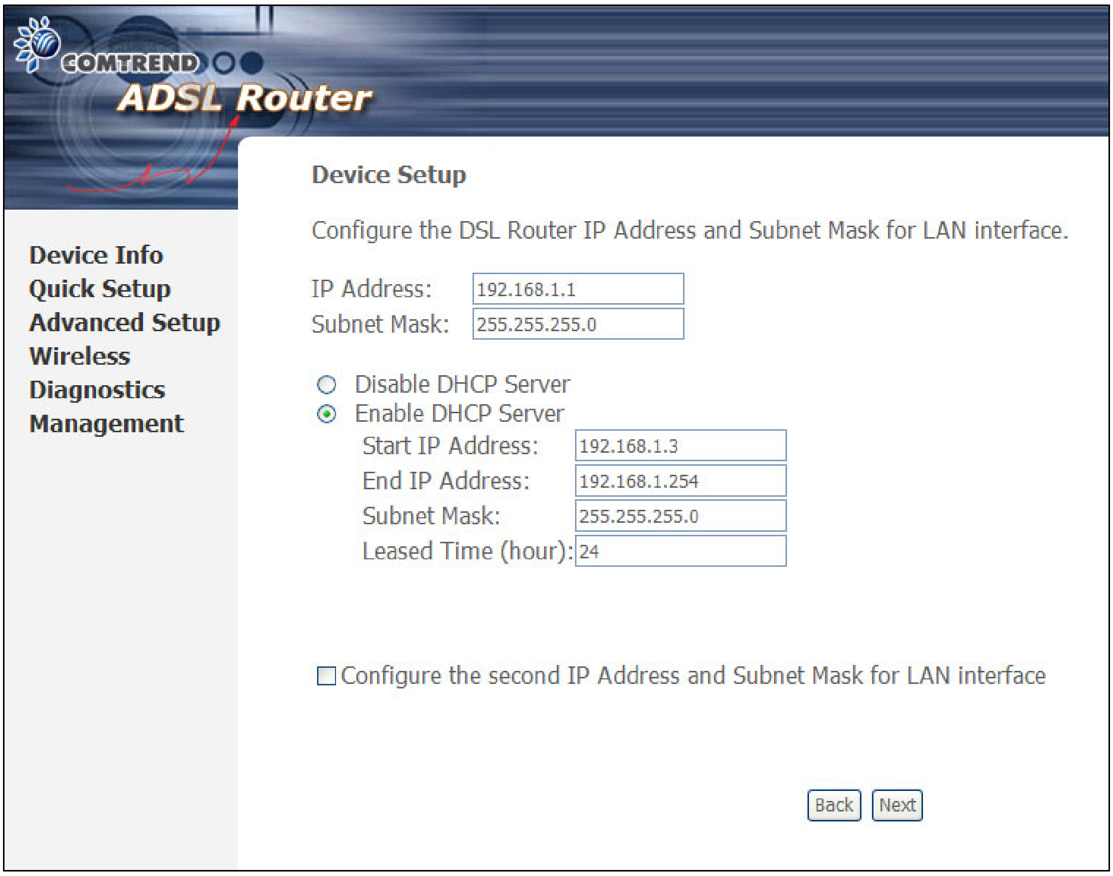
Enable WAN Service checkbox:

Tick this item to enable the ATM service. Untick it to stop the ATM service.

Service Name:

This is user-defined.

STEP 6: After entering your settings, select **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

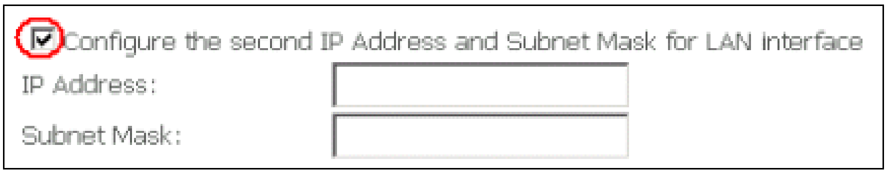
○ Disable DHCP Server
● Enable DHCP Server
Start IP Address: 192.168.1.3
End IP Address: 192.168.1.254
Subnet Mask: 255.255.255.0
Leased Time (hour): 24

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

This screen allows the user to configure the LAN interface IP address, subnet mask and DHCP server. To assign dynamic IP address, DNS server and default gateway to other LAN devices, select the button **Enable DHCP server on the LAN** and enter the start and end IP addresses and DHCP leased time.

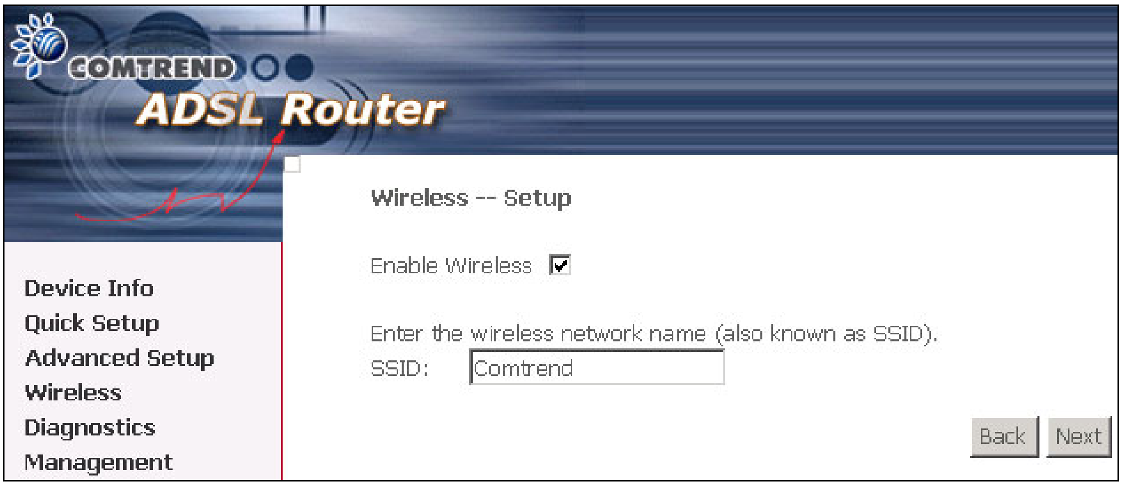
Since the router occupies the first two IP addresses (192.168.1.1 and 192.168.1.2), the default private address range provided by the ISP server in the router is 192.168.1.3 through 192.168.1.254.

To configure a secondary IP address for the LAN port, click the checkbox, as shown.



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

STEP 7: Click **Next** to continue. To enable the wireless function, select the radio button (as shown), input a new SSID (if desired) and click **Next**.

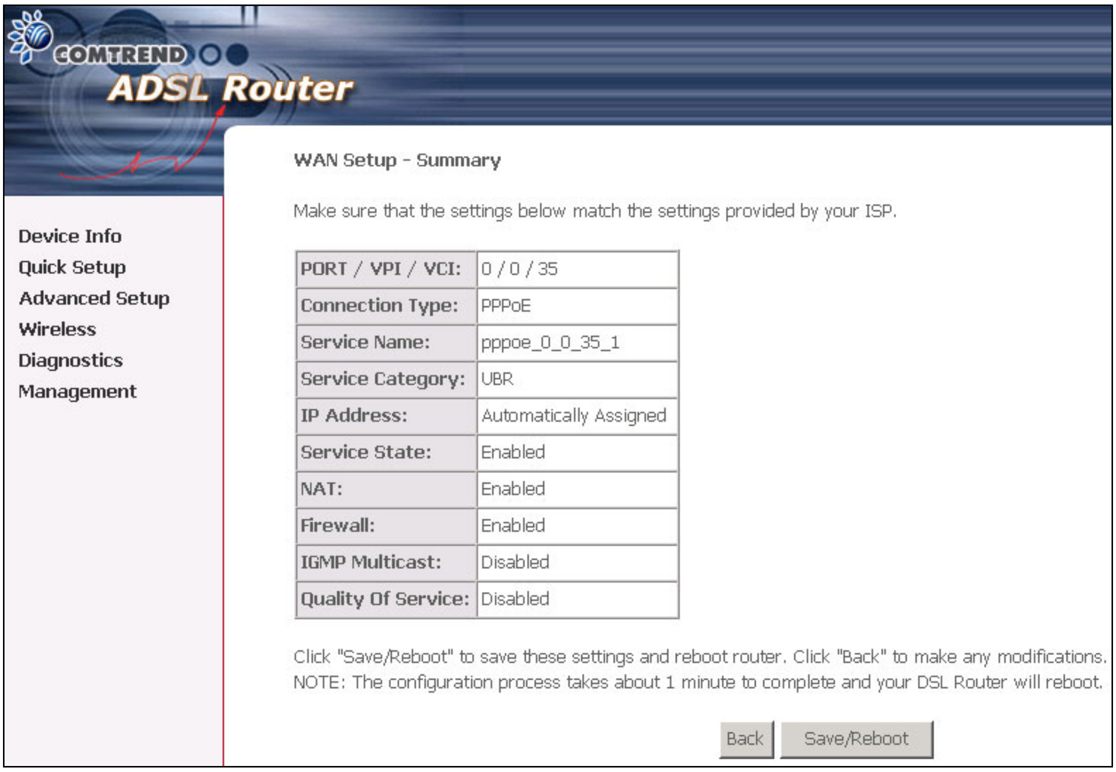


Wireless -- Setup

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 **Save/Reboot** if the settings are correct. Click **Back** if you wish to modify the settings.



WAN Setup - Summary

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

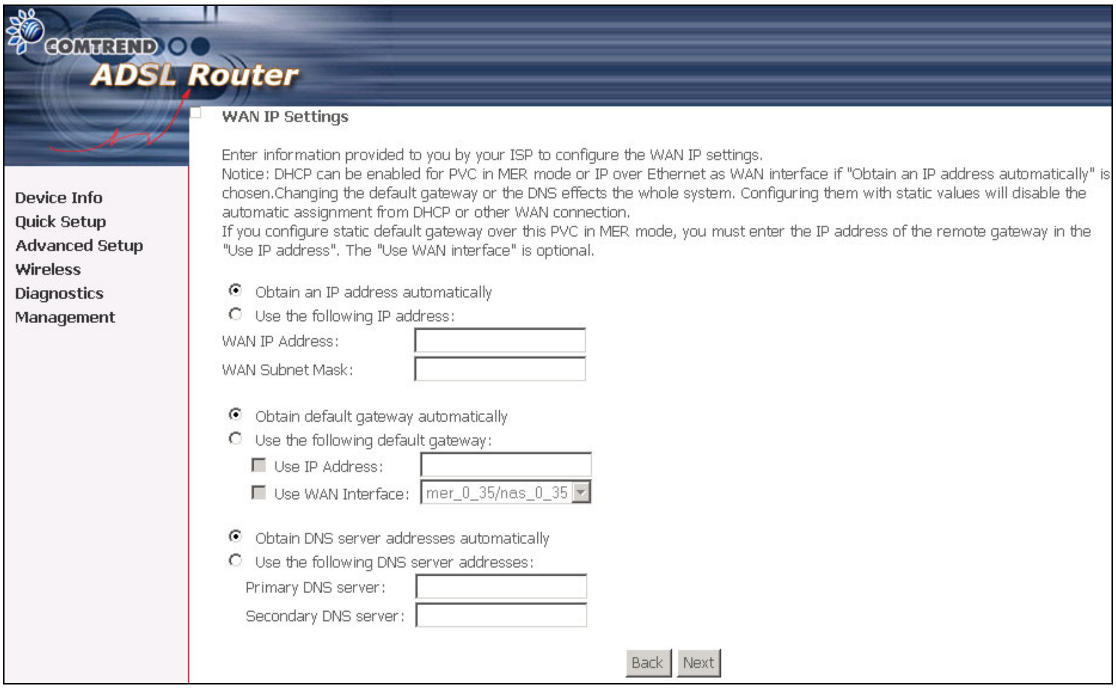
PORT / VPI / VCI:	0 / 0 / 35
Connection Type:	PPPoE
Service Name:	pppoe_0_0_35_1
Service Category:	UBR
IP Address:	Automatically Assigned
Service State:	Enabled
NAT:	Enabled
Firewall:	Enabled
IGMP Multicast:	Disabled
Quality Of Service:	Disabled

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: After clicking **Save/Reboot**, the router will save the configuration to flash memory and reboot. After the device reboots, the Web UI will refresh to the Device Info screen. The router is ready for operation when the LED indicators display correctly, as described in section 1.3.

4.2.2 MAC Encapsulation Routing (MER)

Step 4: Select the MAC Encapsulation Routing (MER) radio button and 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_35/nas_0_35

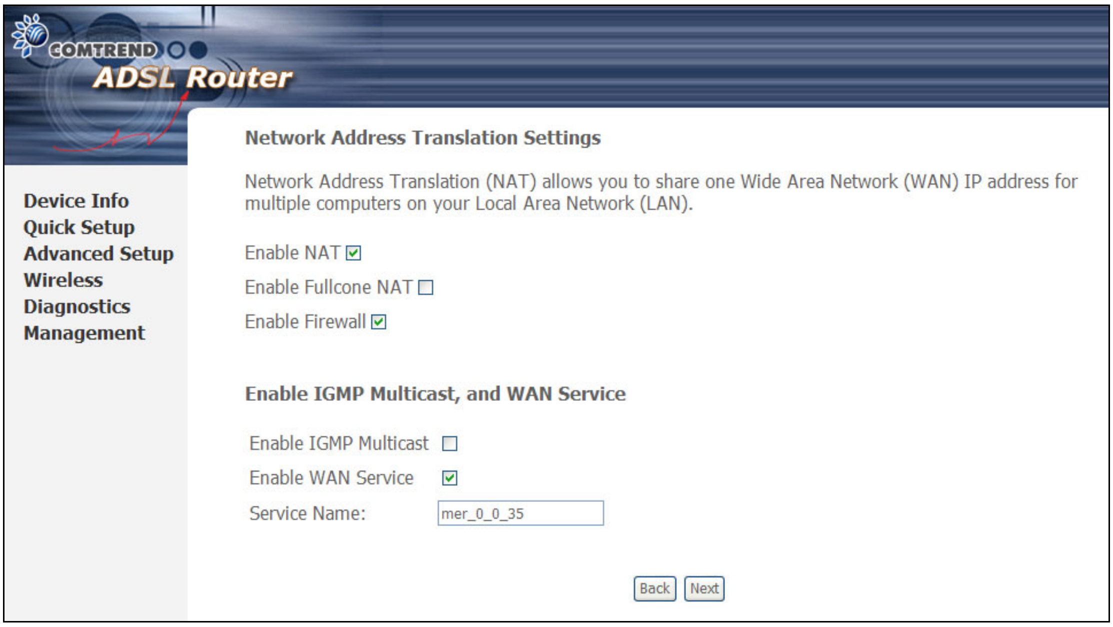
● Obtain DNS server addresses automatically
○ Use the following DNS server addresses:
Primary DNS server:
Secondary DNS server:

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

NOTE: DHCP can be enabled for PVC in MER mode if **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 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. Your ISP should provide the values to be entered in these fields.

Step 5: Click **Next** to display the following screen.



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 Fullcone NAT □

Enable Firewall ☑

Enable IGMP Multicast, and WAN Service

Enable IGMP Multicast □

Enable WAN Service ☑

Service Name: mer_0_0_35

Enable NAT checkbox: If the LAN is configured with a private IP address, the user should select this checkbox. The NAT submenu on the left side main panel will be displayed after reboot. The user can then configure NAT-related features after the system comes up. If a private IP address is not used on the LAN side, this checkbox should be de-selected to free up system resources for better performance. When the system comes back after reboot, the NAT submenu will not be displayed on the left main panel.

Enable Fullcone NAT: This option becomes available when NAT is enabled. Known as one-to-one NAT, all requests from the same internal IP address and port are mapped to the same external IP address and port. An external host can send a packet to the internal host, by sending a packet to the mapped external address.

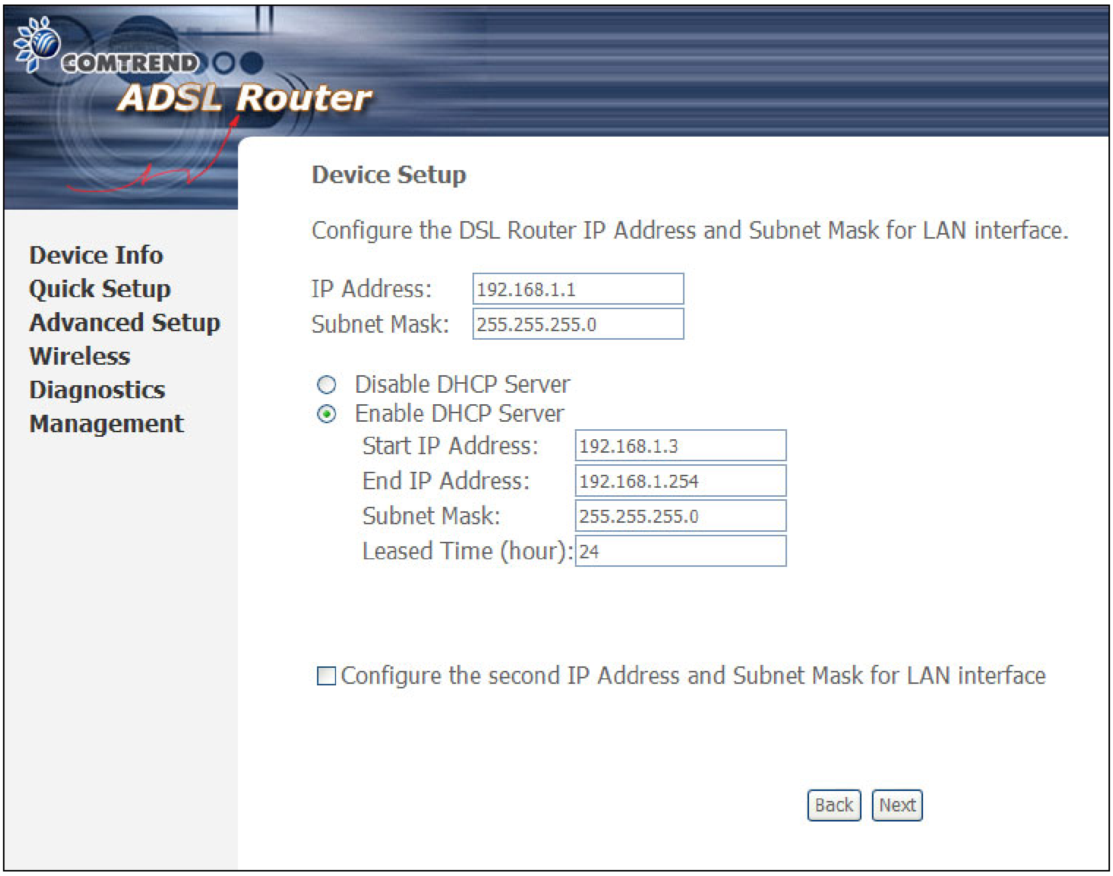
Enable Firewall checkbox: If the firewall checkbox is selected, the Security submenu on the left side main panel will be displayed after system reboot. The user can then configure firewall features after the system comes up. If firewall is not used, this checkbox should be de-selected to free up system resources for better performance. When system comes back after reboot, the Security submenu will not be displayed on the left main panel.

Enable IGMP Multicast: 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: Tick the checkbox to enable the WAN service. If this item is not selected, you will not be able to use the WAN service.

Service Name: This is a user defined 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: 192.168.1.3
End IP Address: 192.168.1.254
Subnet Mask: 255.255.255.0
Leased Time (hour): 24

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

Consult the following paragraphs for more details about these settings.

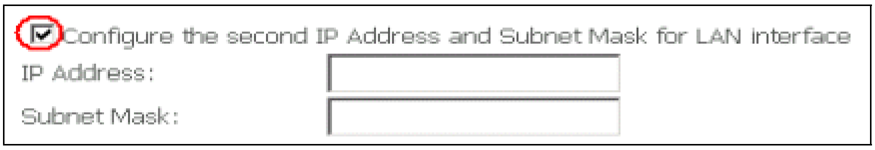
This screen allows the user to configure the LAN interface IP address, subnet mask and DHCP server. To assign dynamic IP address, DNS server and default gateway to other LAN devices, select **Enable DHCP server** and enter the start and end IP addresses and DHCP leased time.

Since the router occupies the first two IP addresses (192.168.1.1 and 192.168.1.2), the default private address range provided by the ISP server in the router is 192.168.1.3 through 192.168.1.254.

Select **Enable DHCP Server Relay** (if available, see note below), and enter the DHCP Server IP Address. This allows the router to relay the DHCP packets from the remote DHCP server. The remote DHCP server will provide the IP address.

NOTE: If the NAT function is enabled (default), **Enable DHCP Server Relay** won't be displayed as an option.

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

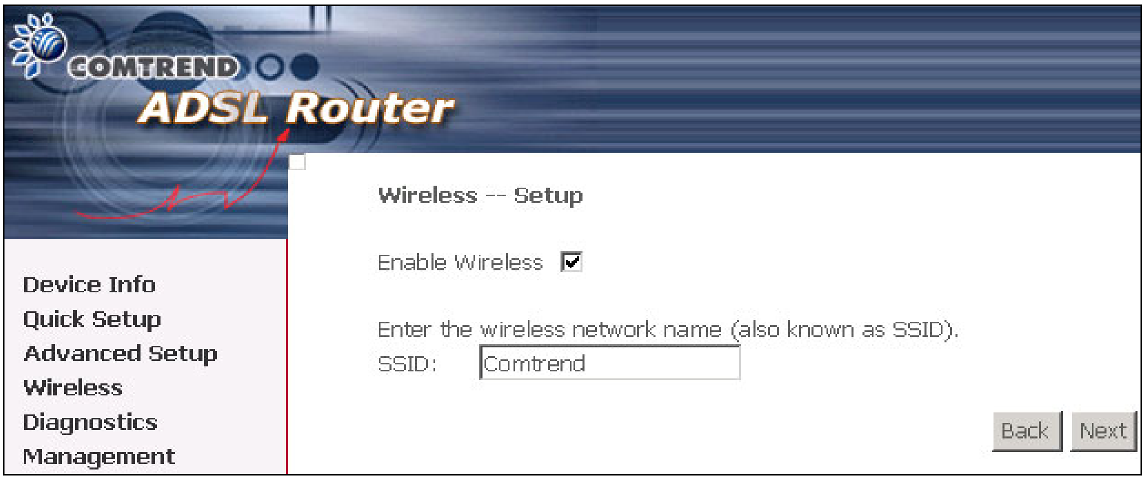


☑ Configure the second IP Address and Subnet Mask for LAN interface

IP Address:

Subnet Mask:

Step 7: Click **Next** to continue. To enable the wireless function, select the radio button (as shown), input a new SSID (if desired).



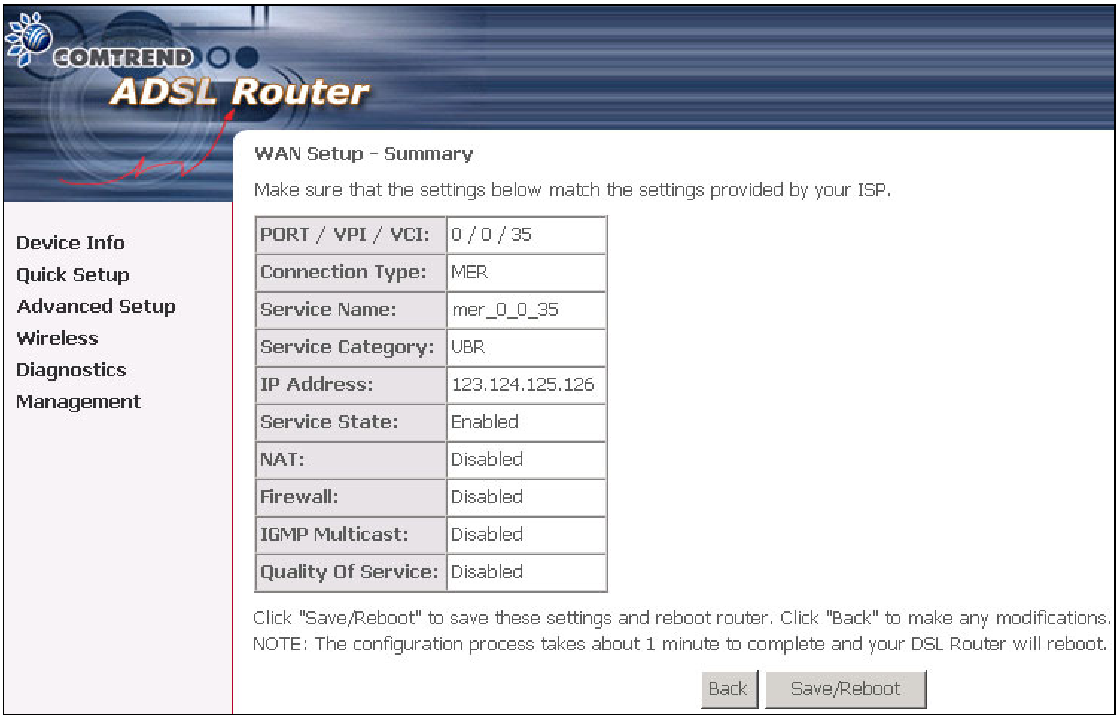
Wireless -- Setup

Enable Wireless ☑

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

SSID: Comtrend

Click **Next** to display the final setup screen.



WAN Setup - Summary

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

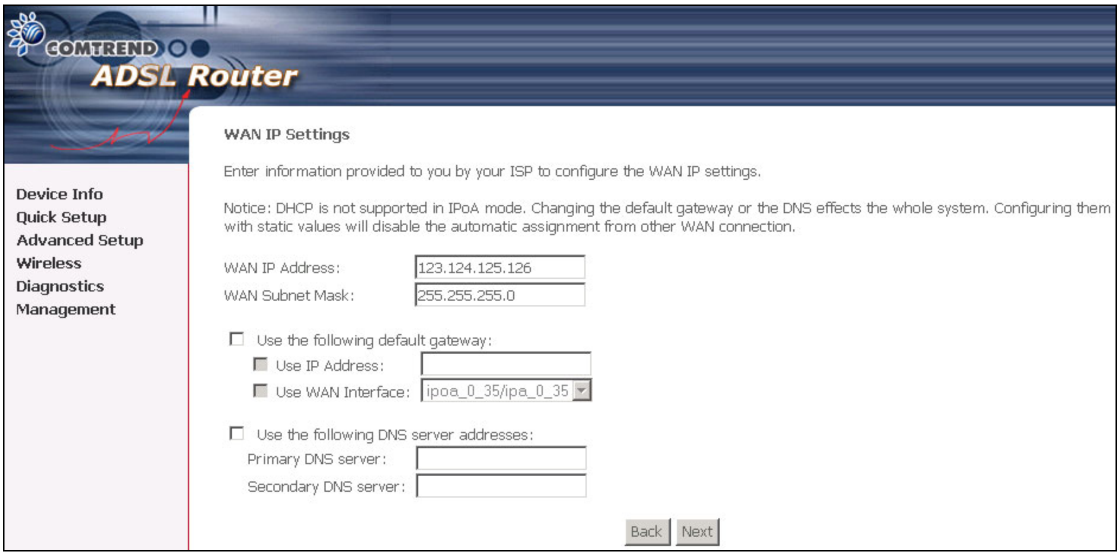
PORT / VPI / VCI:	0 / 0 / 35
Connection Type:	MER
Service Name:	mer_0_0_35
Service Category:	UBR
IP Address:	123.124.125.126
Service State:	Enabled
NAT:	Disabled
Firewall:	Disabled
IGMP Multicast:	Disabled
Quality Of Service:	Disabled

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 8: After clicking **Save/Reboot**, the router will save the configuration to flash memory and reboot. After the device reboots, the Web UI will refresh to the Device Info screen. The router is ready for operation when the LED indicators display correctly, as described in section 1.3.

4.2.3 IP Over ATM

Step 4: Select the IP over ATM (IPoA) radio button and click **Next**.



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: 123.124.125.126

WAN Subnet Mask: 255.255.255.0

□ Use the following default gateway:

□ Use IP Address:

□ Use WAN Interface: ipoa_0_35/ipa_0_35

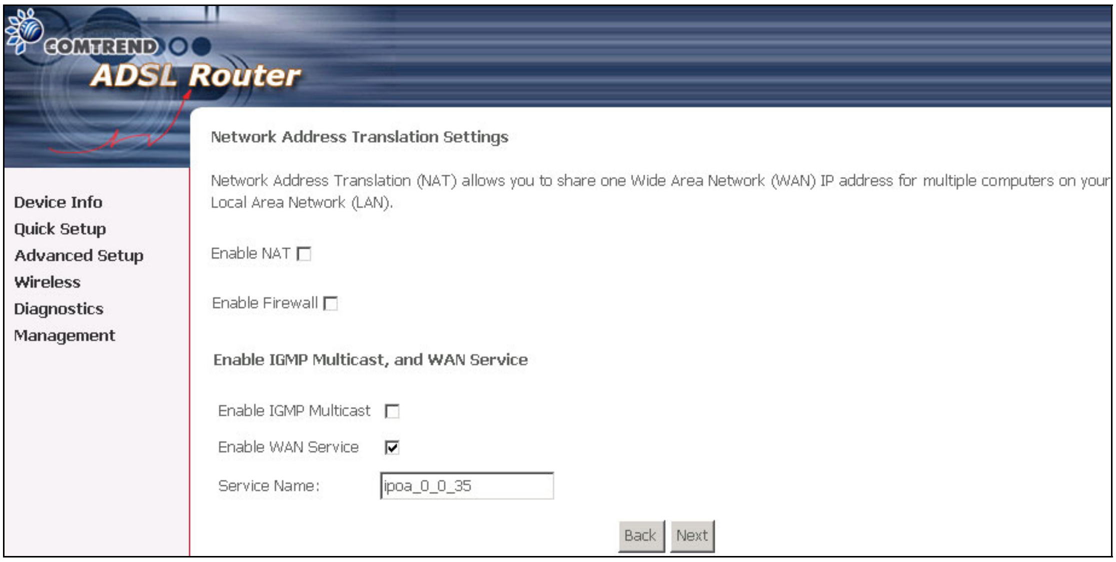
□ Use the following DNS server addresses:

Primary DNS server:

Secondary DNS server:

NOTE:	DHCP is not supported over IPoA. The user must enter the IP address or WAN interface for the default gateway setup and the DNS server addresses 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_0_35

Enable NAT checkbox: If the LAN is configured with a private IP address, the user should select this checkbox. The NAT submenu on the left side main panel will be displayed after reboot. The user can then configure NAT-related features. If a private IP address is not used on the LAN side (i.e. the LAN side is using a public IP), this checkbox should not be selected. When the system comes back after reboot, the NAT submenu will not be displayed on the left main panel.

Enable Fullcone NAT: This option becomes available when NAT is enabled. Known as one-to-one NAT, all requests from the same internal IP address and port are mapped to the same external IP address and port. An external host can send a packet to the internal host, by sending a packet to the mapped external address.

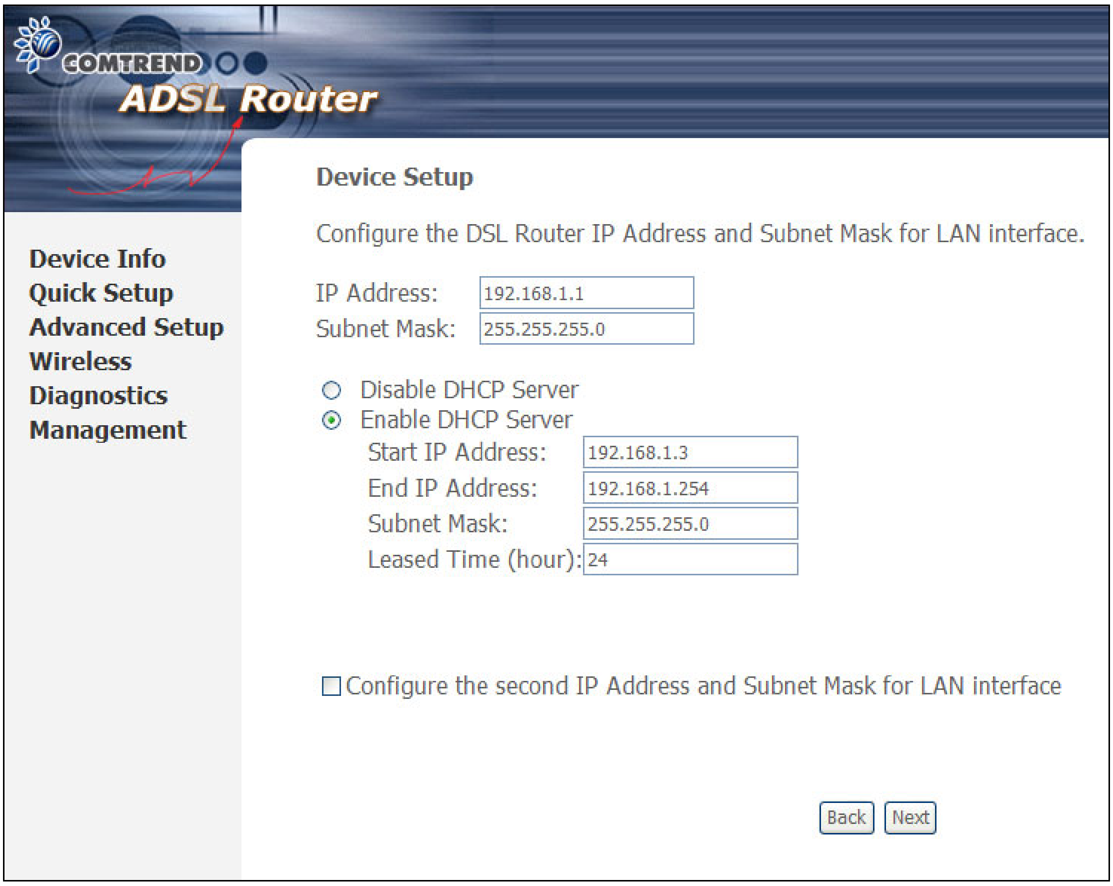
Enable Firewall checkbox: If the firewall checkbox is selected, the Security submenu on the left side main panel will be displayed after system reboot. The user can then configure firewall features after the system comes up. If firewall is not used, this checkbox should be de-selected to free up system resources for better performance. When system comes back after reboot, the Security submenu will not be displayed on the left main panel.

Enable IGMP Multicast: 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: Tick the checkbox to enable the WAN service. If this item is not selected, you will not be able to use the WAN service.

Service Name: This is a user defined 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: 192.168.1.3
End IP Address: 192.168.1.254
Subnet Mask: 255.255.255.0
Leased Time (hour): 24

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

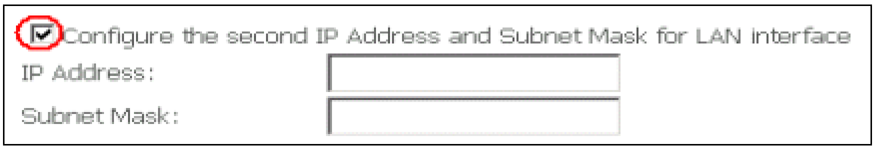
This screen allows the user to configure the LAN interface IP address, subnet mask and DHCP server. To assign dynamic IP address, DNS server and default gateway to other LAN devices, select the button **Enable DHCP server on the LAN** and enter the start and end IP addresses and DHCP leased time.

Since the router occupies the first two IP addresses (192.168.1.1 and 192.168.1.2), the default private address range provided by the ISP server in the router is 192.168.1.3 through 192.168.1.254.

Select **Enable DHCP Server Relay** (if available, see note below), and enter the DHCP Server IP Address. This allows the router to relay the DHCP packets from the remote DHCP server. The remote DHCP server will provide the IP address.

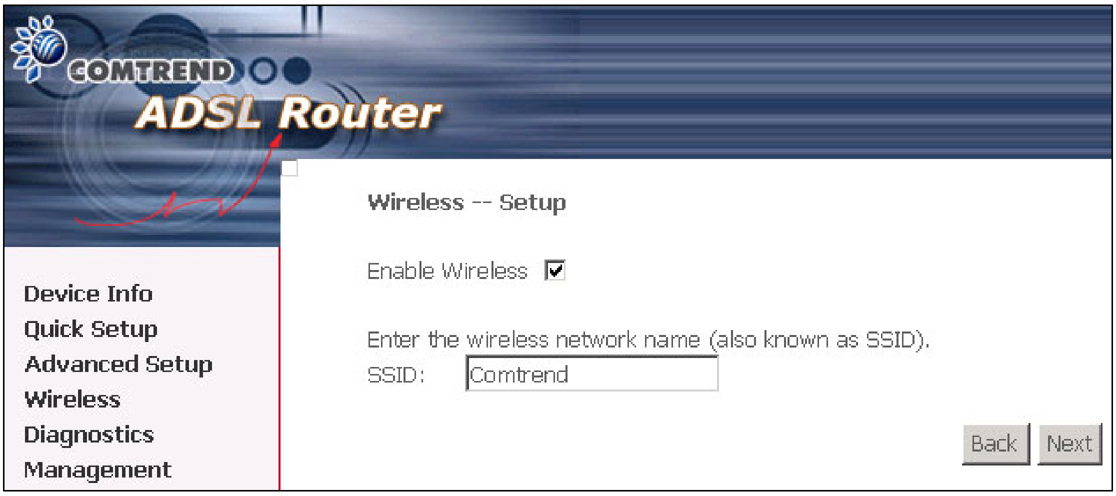
NOTE: If the NAT function is enabled, **Enable DHCP Server Relay** won't be displayed as an option.

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



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

STEP 7: Click **Next** to continue. To enable the wireless function, select the radio button (as shown) and input a new SSID (if desired).



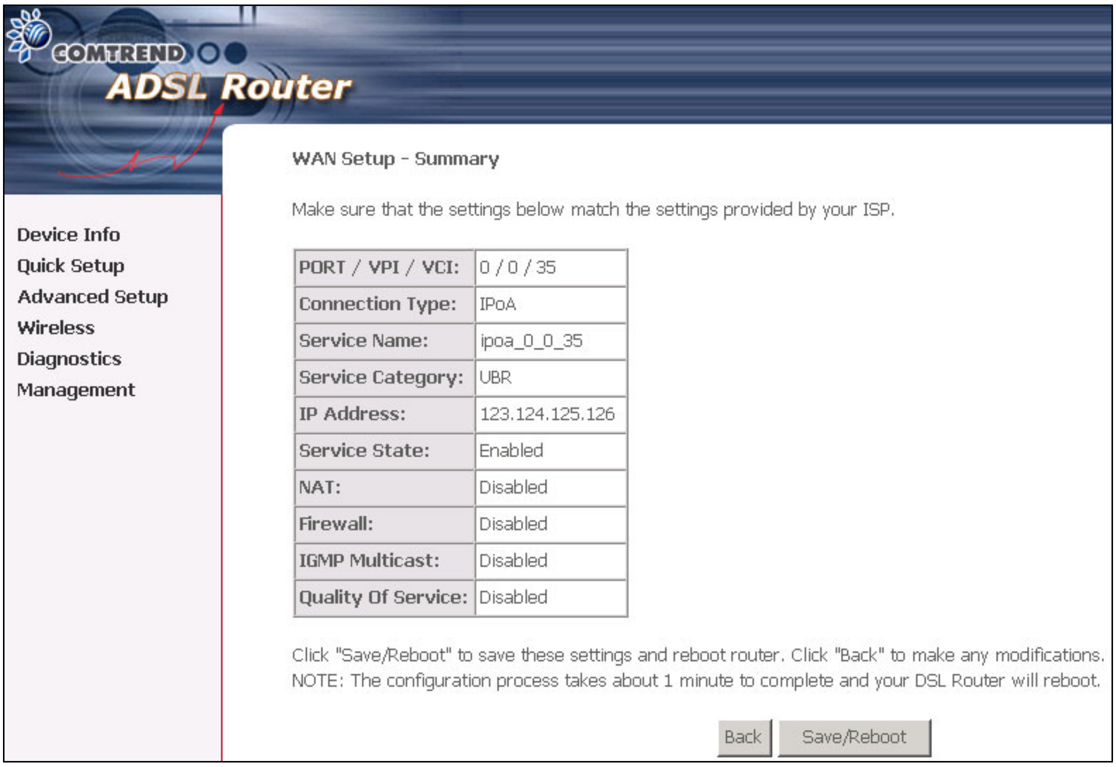
Wireless -- Setup

Enable Wireless ☑

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

SSID: Comtrend

Click **Next** to continue.



WAN Setup - Summary

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

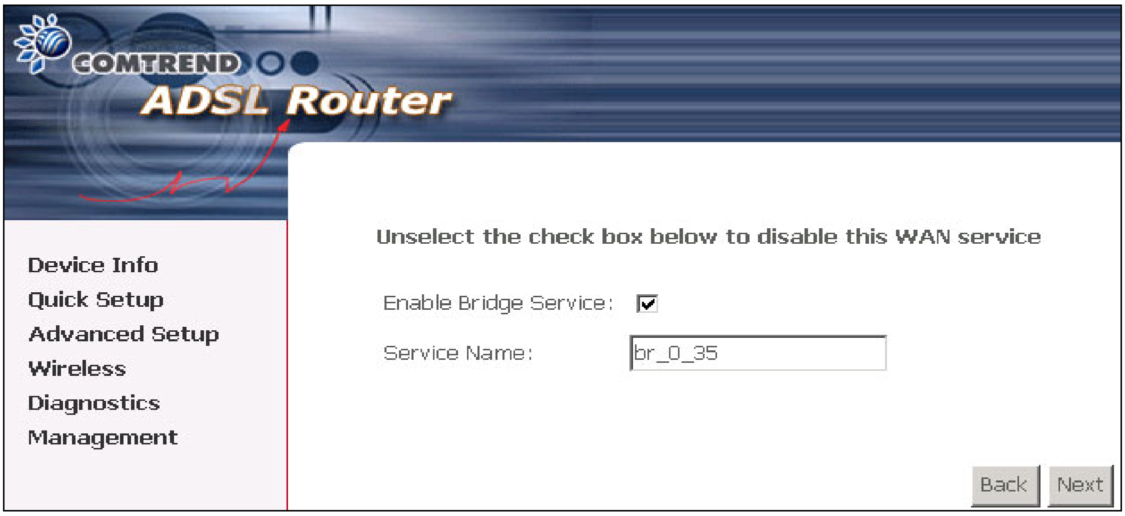
PORT / VPI / VCI:	0 / 0 / 35
Connection Type:	IPoA
Service Name:	ipoa_0_0_35
Service Category:	UBR
IP Address:	123.124.125.126
Service State:	Enabled
NAT:	Disabled
Firewall:	Disabled
IGMP Multicast:	Disabled
Quality Of Service:	Disabled

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 8: After clicking **Save/Reboot**, the router will save the configuration to flash memory and reboot. After the device reboots, the Web UI will refresh to the Device Info screen. The router is ready for operation when the LED indicators display correctly, as described in section 1.3.

4.2.4 Bridging

Step 4: Select the Bridging radio button and click **Next**. The following screen appears. To use the bridge service, tick the checkbox, Enable Bridge Service, and enter the service name.

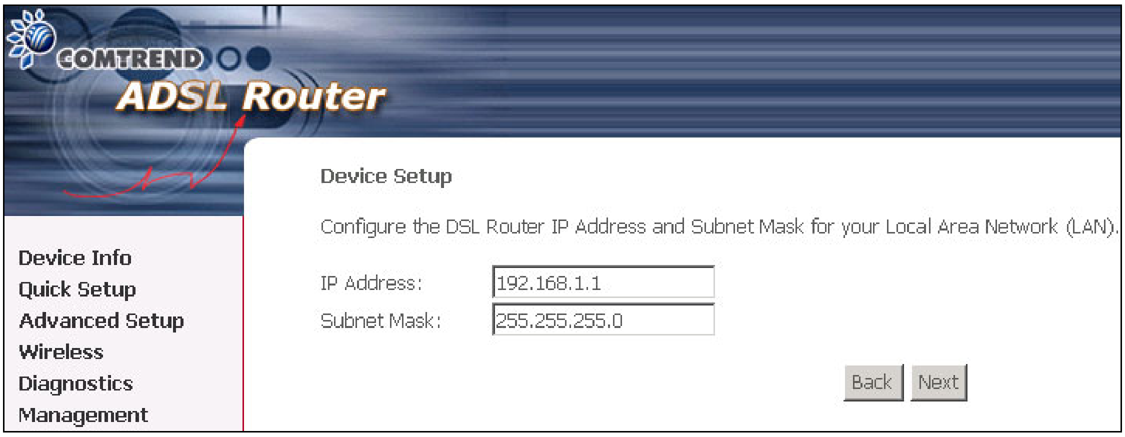


Unselect the check box below to disable this WAN service

Enable Bridge Service: ☑

Service Name: br_0_35

Step 5: Click the **Next** button to continue. Enter the IP address for the LAN interface. The default IP address is 192.168.1.1. The LAN IP interface in bridge operating mode is needed for local users to manage the ADSL router. Notice that there is no IP address for the WAN interface in bridge mode, and technical support cannot access the ADSL router remotely.



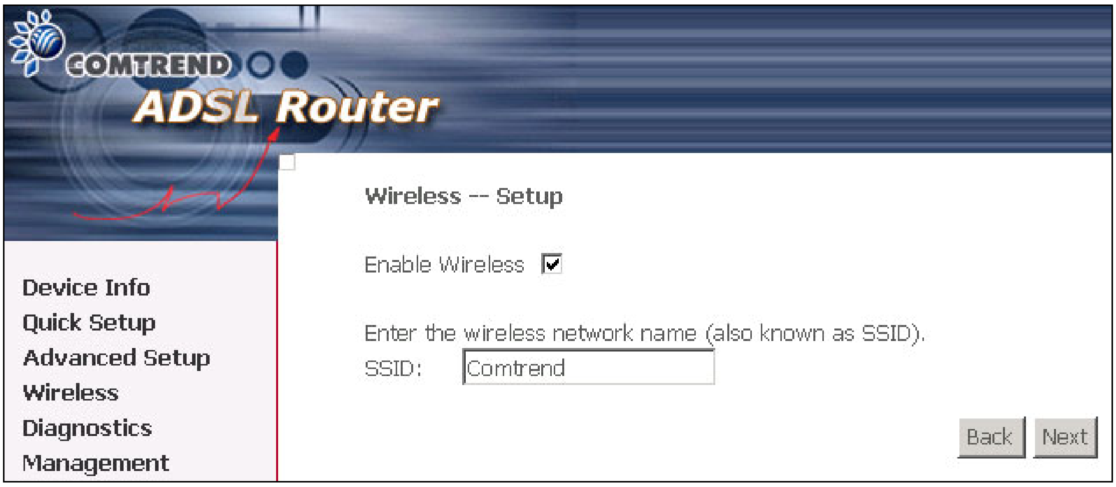
Device Setup

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

STEP 6: Click **Next** to continue. To enable the wireless function, select the radio button (as shown), input a new SSID (if desired) and click **Next**.



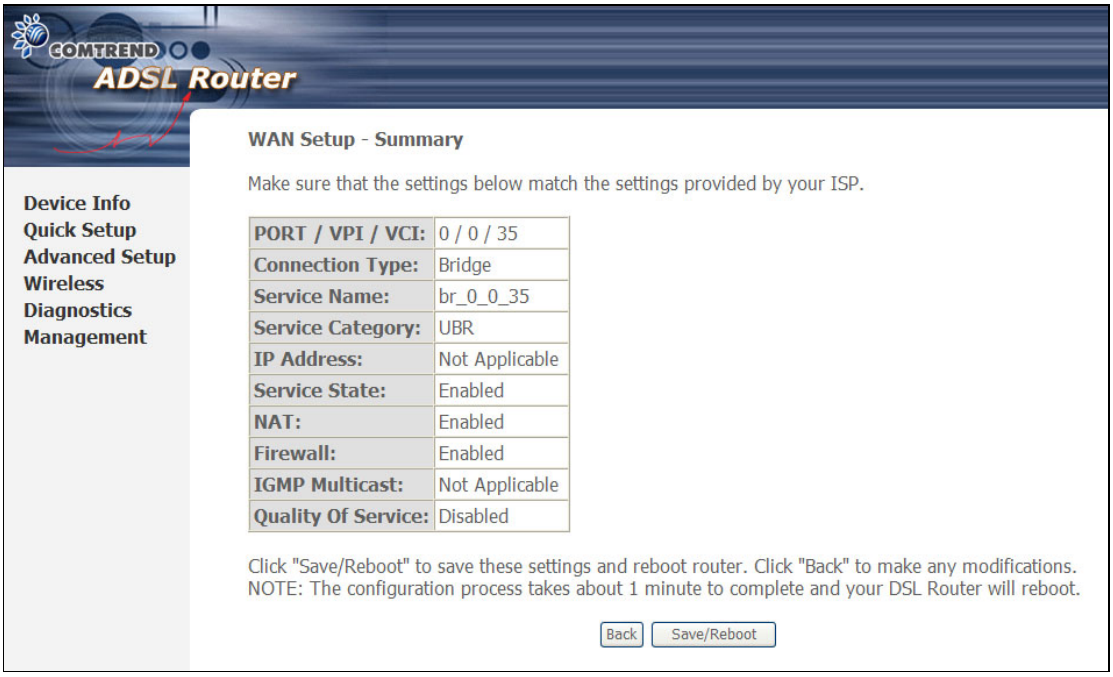
Wireless -- Setup

Enable Wireless ☑

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

SSID: Comtrend

The following screen will be displayed.



WAN Setup - Summary

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

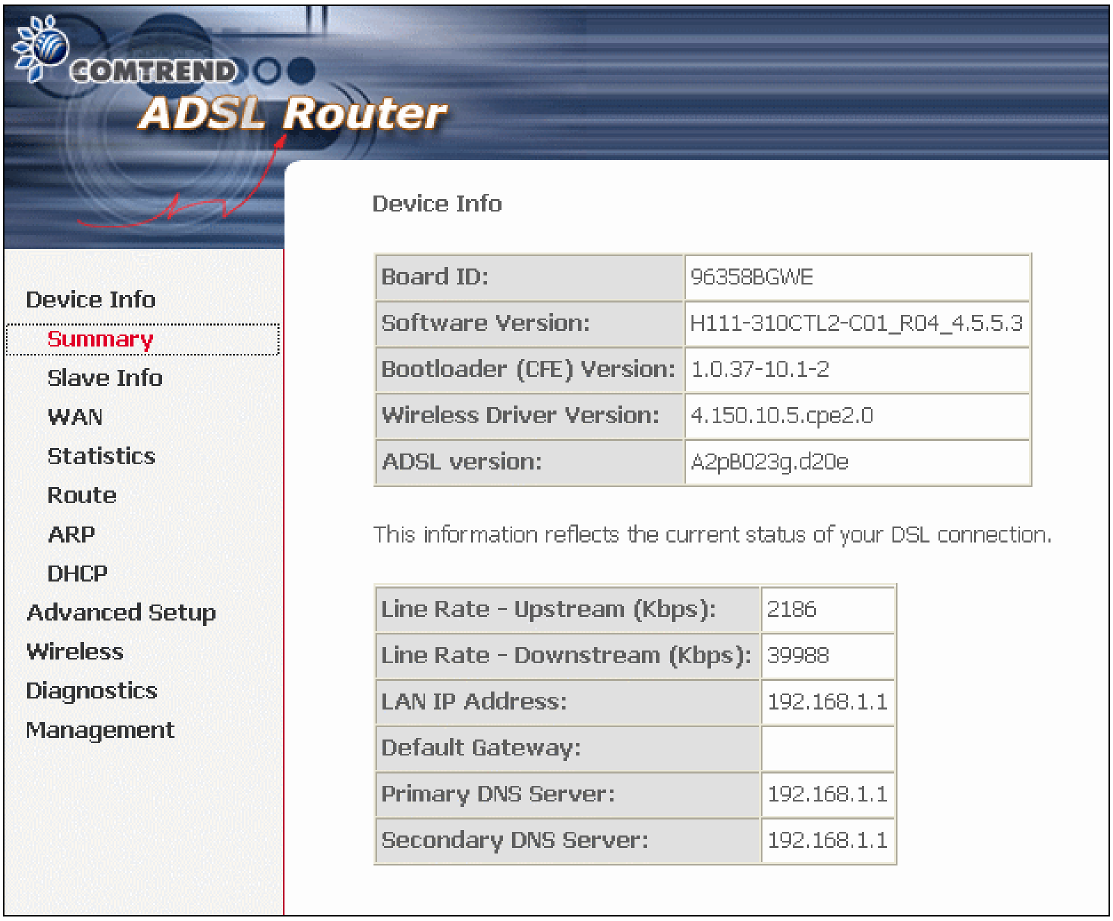
PORT / VPI / VCI:	0 / 0 / 35
Connection Type:	Bridge
Service Name:	br_0_0_35
Service Category:	UBR
IP Address:	Not Applicable
Service State:	Enabled
NAT:	Enabled
Firewall:	Enabled
IGMP Multicast:	Not Applicable
Quality Of Service:	Disabled

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 7: After clicking **Save/Reboot**, the router will save the configuration to flash memory and reboot. After the device reboots, the Web UI will refresh to the Device Info screen. The router is ready for operation when the LED indicators display correctly, as described in section 1.3.

Chapter 5 Device Info

Select **Device Info** from the main menu to display Summary information as below.



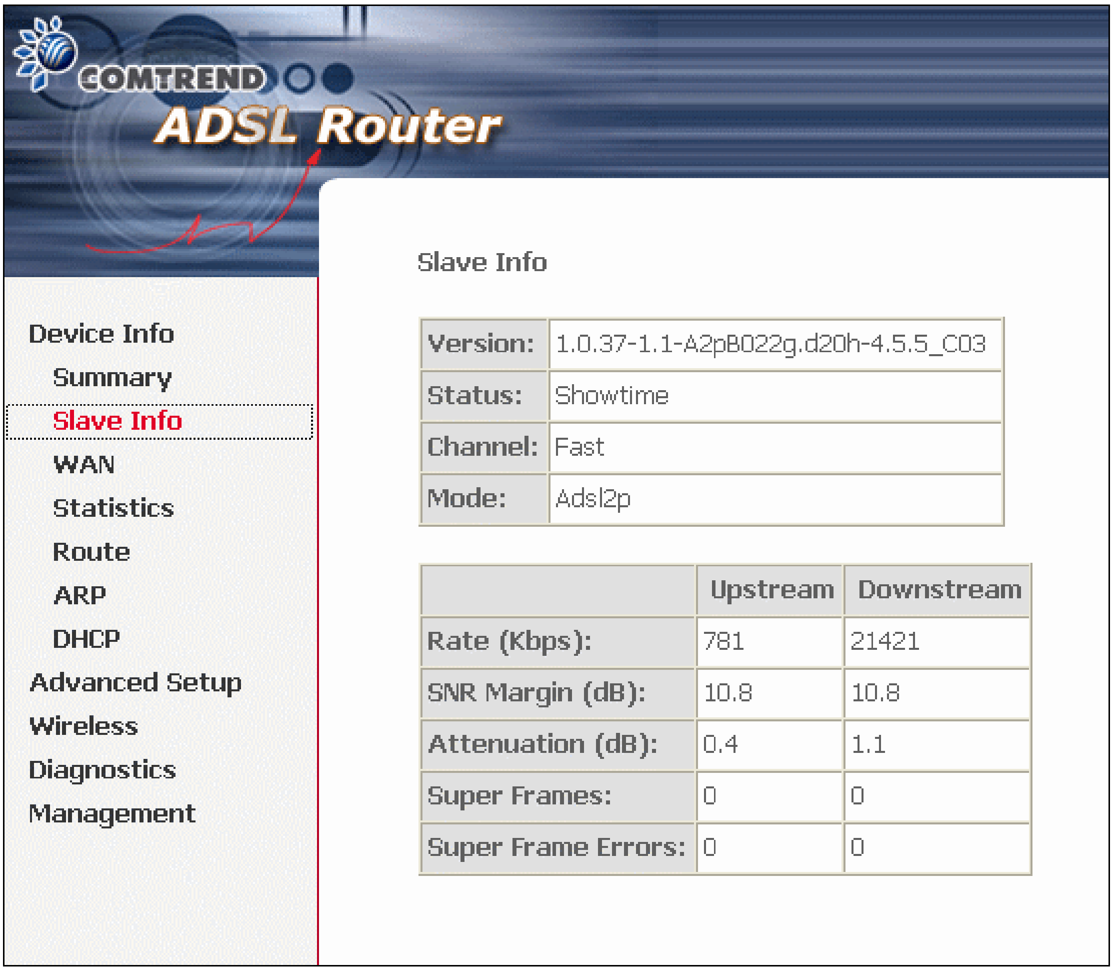
Device Info

Board ID:	96358BGWE
Software Version:	H111-310CTL2-C01_R04_4.5.5.3
Bootloader (CFE) Version:	1.0.37-10.1-2
Wireless Driver Version:	4.150.10.5.cpe2.0
ADSL version:	A2pB023g.d20e

This information reflects the current status of your DSL connection.

Line Rate - Upstream (Kbps):	2186
Line Rate - Downstream (Kbps):	39988
LAN IP Address:	192.168.1.1
Default Gateway:	
Primary DNS Server:	192.168.1.1
Secondary DNS Server:	192.168.1.1

NOTE: The screen above gives a DSL status summary for **ADSL1**. For the status of **ADSL2** consult the next selection on the menu: **Slave Info**.



Slave Info

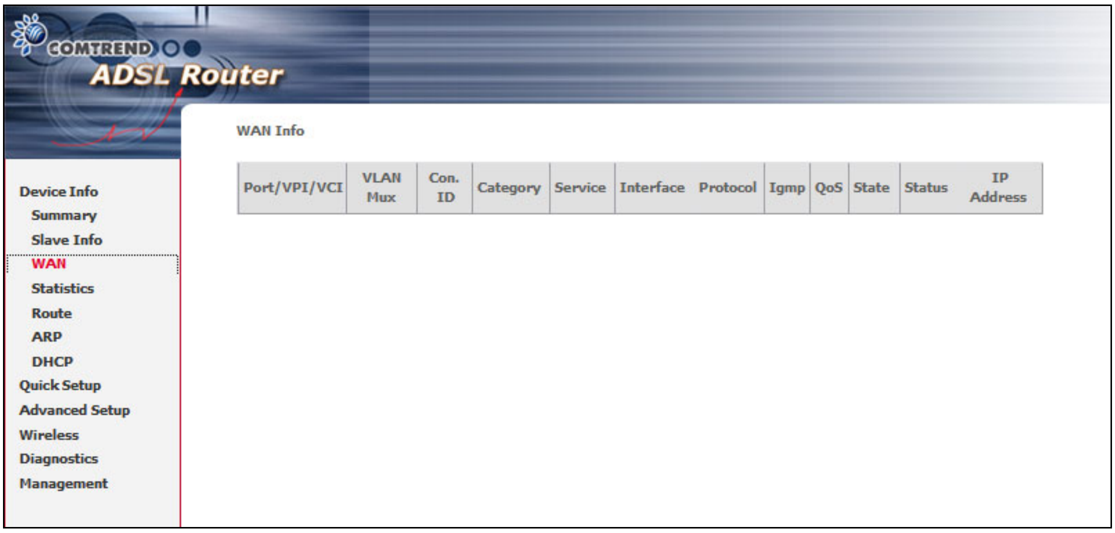
Version:	1.0.37-1.1-A2pB022g.d20h-4.5.5_C03
Status:	Showtime
Channel:	Fast
Mode:	Adsl2p

	Upstream	Downstream
Rate (Kbps):	781	21421
SNR Margin (dB):	10.8	10.8
Attenuation (dB):	0.4	1.1
Super Frames:	0	0
Super Frame Errors:	0	0

Version	The software version for the second CPU.
Status	The status of the second CPU.
Channel	Channel type Interleave or Fast for the second CPU. ADSL supports two modes of transport called the fast channel and interleaved channel. The fast channel is meant to transfer latency-critical but error tolerant data streams like real time video. The interleaved path is a slower but reliable path, and can be used for data that is intolerant to errors like file transfer.
Mode	Modulation protocol for the second CPU.
Rate (kbps)	Current sync rate for the second CPU.
SNR Margin (dB)	Signal to Noise Ratio (SNR) margin for the second CPU.
Attenuation (dB)	Estimate of average loop attenuation in the downstream direction for the second CPU.
Super Frames	Total number of super frames for the second CPU.
Super Frame Errors	Number of super frames received with errors for the second CPU.

5.1 WAN

Select WAN from the Device Info menu to display the status of all configured PVC(s).



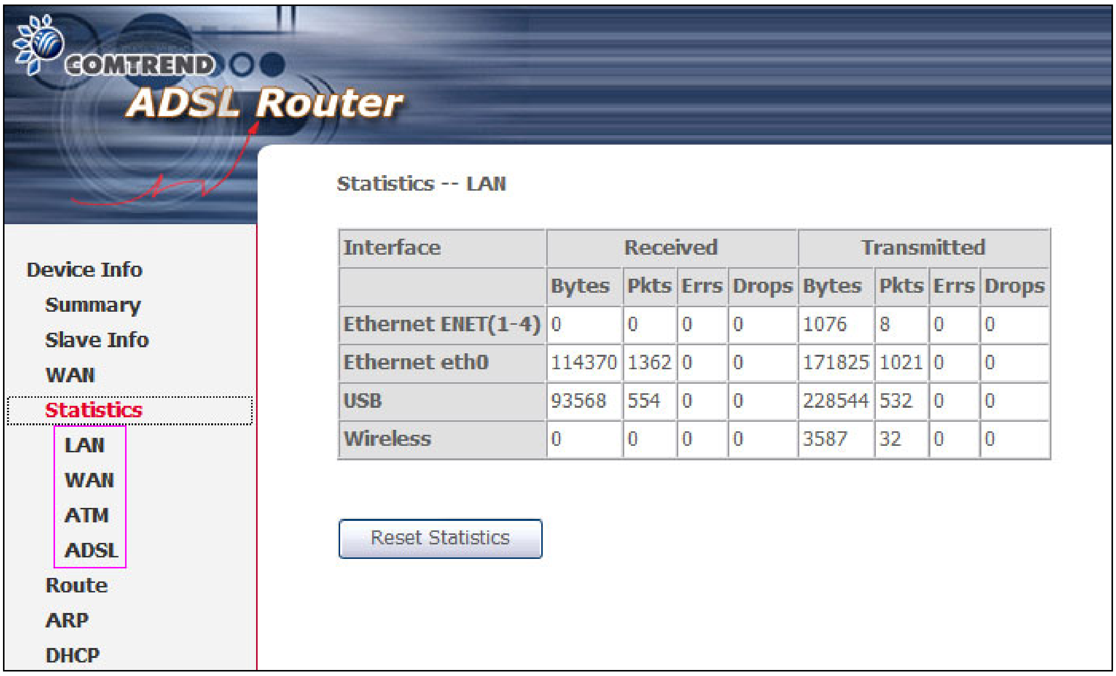
WAN Info

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

Port/VPI/VCI	Shows the values of the ATM Port/VPI/VCI
VLAN Mux	Shows 802.1Q VLAN ID
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 statue of the IGMP function
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

Selection of the Statistics option provides statistics for the Network Interface of LAN, WAN, ATM and ADSL.   These statistics screens are updated every 15 seconds.

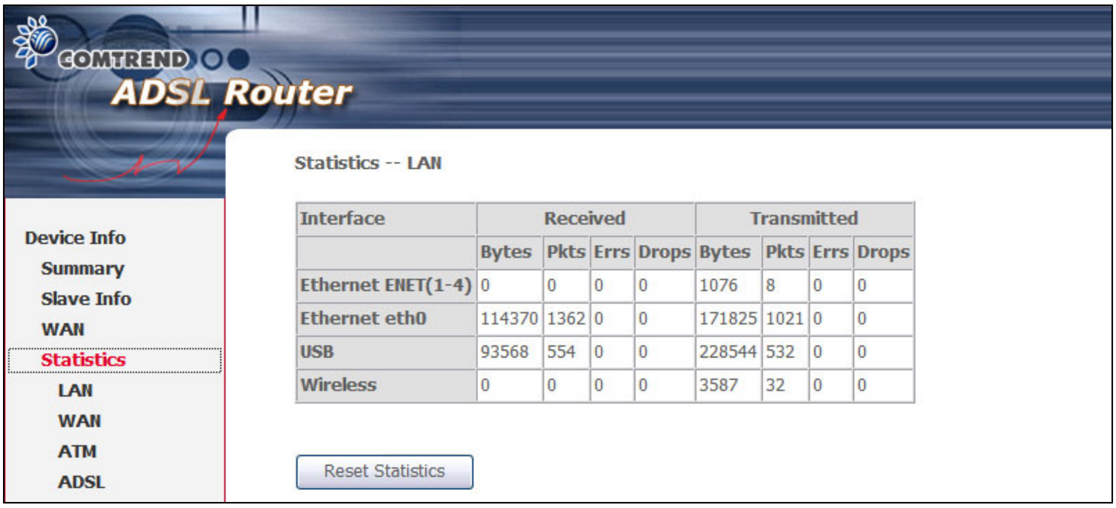


Statistics -- LAN

Interface	Received				Transmitted			
	Bytes	Pkts	Errs	Drops	Bytes	Pkts	Errs	Drops
Ethernet ENET(1-4)	0	0	0	0	1076	8	0	0
Ethernet eth0	114370	1362	0	0	171825	1021	0	0
USB	93568	554	0	0	228544	532	0	0
Wireless	0	0	0	0	3587	32	0	0

5.2.1 LAN Statistics

The Network Statistics screen shows interface statistics for Ethernet and Wireless interfaces. (The Network Statistics screen shows interface statistics for LAN of Ethernet interface. Here provides byte transfer, packet transfer, Error and Drop statistics for the LAN interface.)

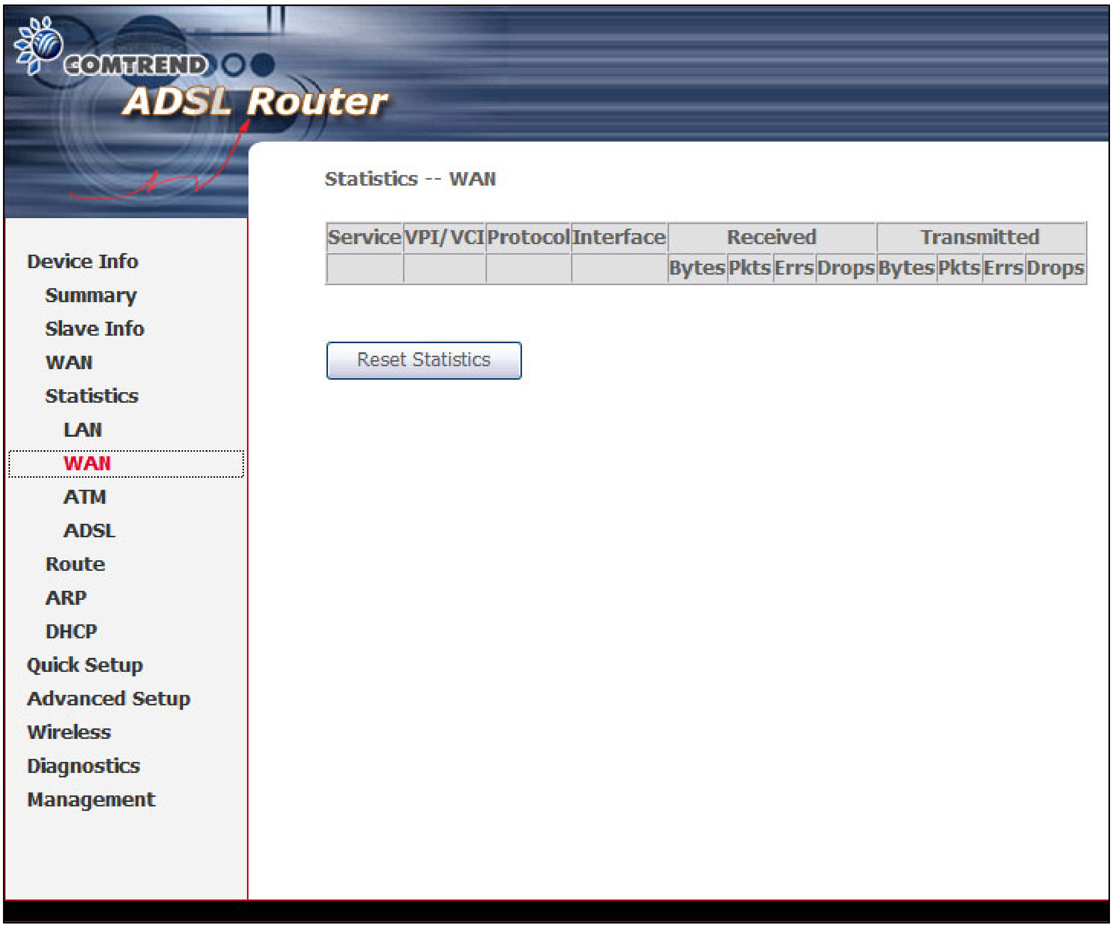


Statistics -- LAN

Interface	Received				Transmitted			
	Bytes	Pkts	Errs	Drops	Bytes	Pkts	Errs	Drops
Ethernet ENET(1-4)	0	0	0	0	1076	8	0	0
Ethernet eth0	114370	1362	0	0	171825	1021	0	0
USB	93568	554	0	0	228544	532	0	0
Wireless	0	0	0	0	3587	32	0	0

eth0: Communication interface between internal CPUs.

5.2.2 WAN Statistics

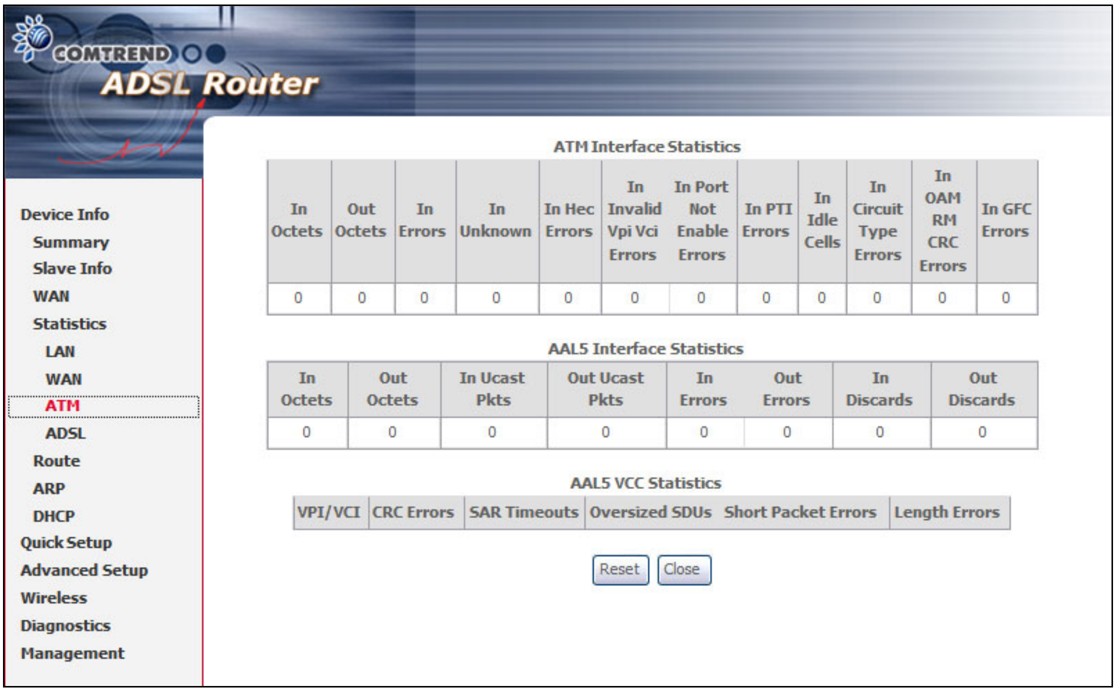


Statistics -- WAN

Service	VPI/VCI	Protocol	Interface	Received				Transmitted			
				Bytes	Pkts	Errs	Drops	Bytes	Pkts	Errs	Drops

Service	Shows the service type
VPI/VCI	Shows the values of the ATM VPI/VCI
Protocol	Shows the connection type, such as PPPoE, PPPoA, etc.
Interface	Shows connection interfaces
Received/Transmitted - Bytes - Pkts - Errs - Drops	Rx/TX (receive/transmit) packets in bytes Rx/TX (receive/transmit) packets Rx/TX (receive/transmit) packets with errors Rx/TX (receive/transmit) dropped packets

5.2.3 ATM statistics



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

Field	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 HEX error
In Invalid Vpi Vci Errors	Number of cells received with an unregistered VCC address.
In Port Not Enabled 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

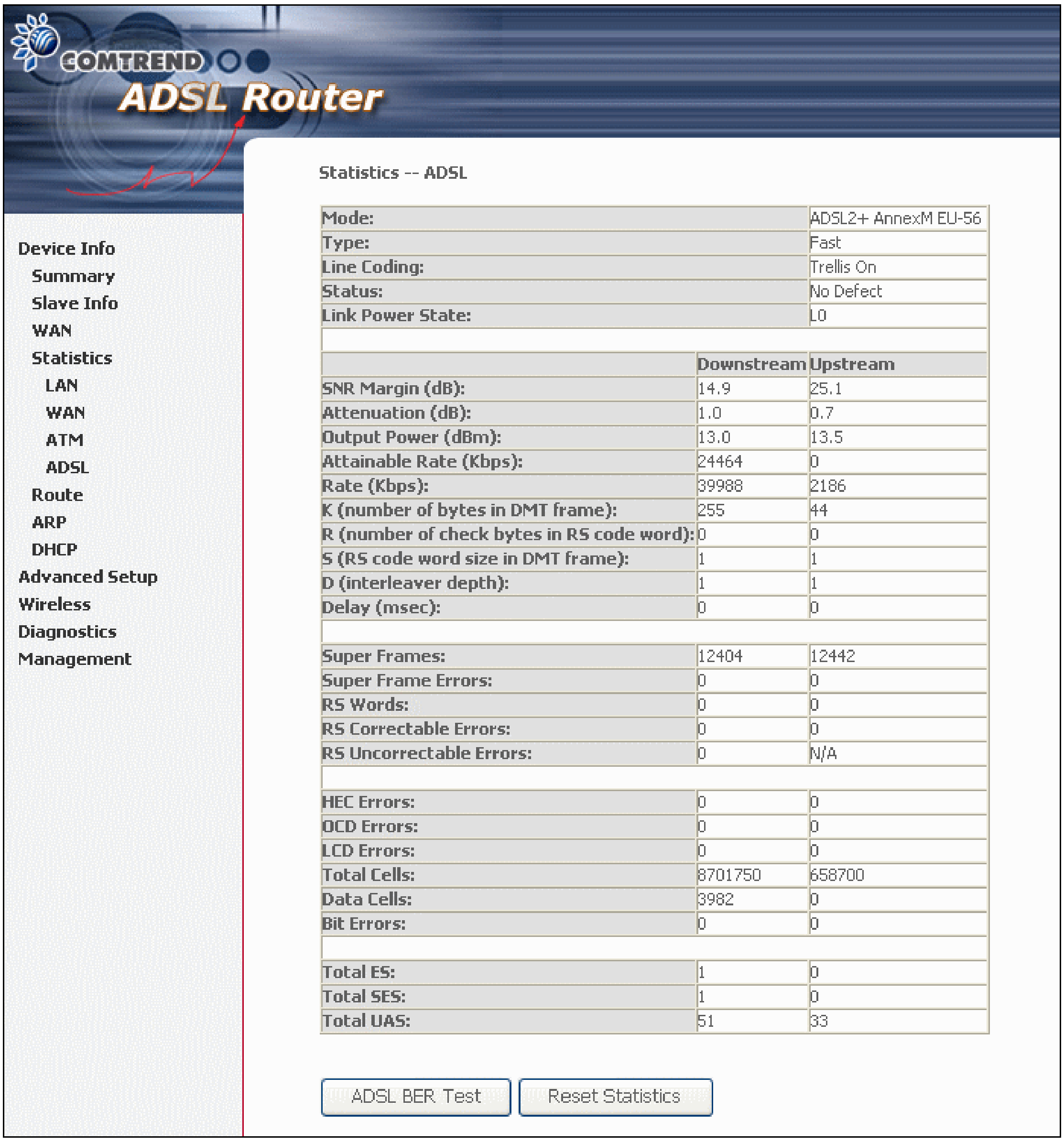
Field	Description
In Octets	Number of received AAL5/AAL0 CPCS PDU octets
Out Octets	Number of received AAL5/AAL0 CPCS PDUs octets transmitted
In Ucst Pkts	Number of received AAL5/AAL0 CPCS PDUs passed to a higher-layer for transmission
Out Ucast Pkts	Number of received AAL5/AAL0 CPCS PDUs received from a higher layer for transmissions
In Errors	Number of received AAL5/AAL0 CPCS PDUs received that contain an error. The types of errors counted include CRC-32 errors.
Out Errors	Number of received AAL5/AAL0 CPCS PDUs that could be transmitted due to errors.
In Discards	Number of received AAL5/AAL0 CPCS PDUs 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

Field	Description
CRC Errors	Number of PDUs received with CRC-32 errors
SAR TimeOuts	Number of partially re-assembled PDUs which 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 Packets 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 graphic shows the ADSL Network Statistics screen. Within the ADSL Statistics window, a Bit Error Rate (BER) test can be done using the **ADSL BER Test** button. The **Reset Statistics** button refreshes the statistics.



Statistics -- ADSL

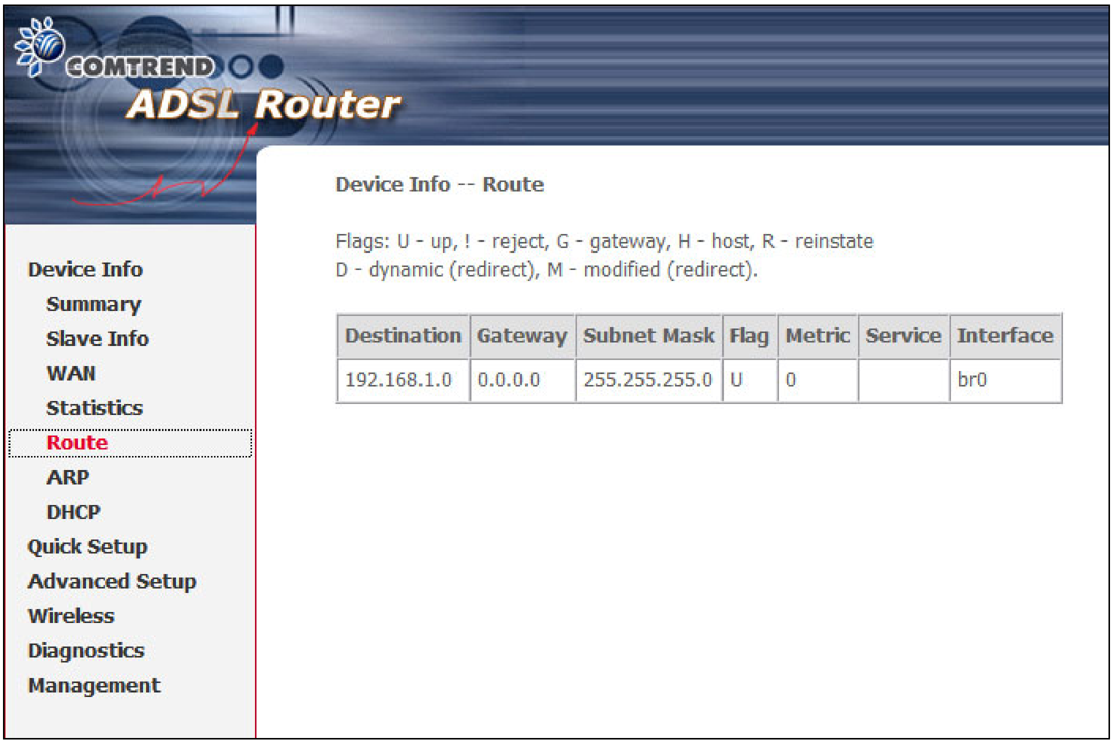
Mode:		ADSL2+ AnnexM EU-56
Type:		Fast
Line Coding:		Trellis On
Status:		No Defect
Link Power State:		L0
	Downstream	Upstream
SNR Margin (dB):	14.9	25.1
Attenuation (dB):	1.0	0.7
Output Power (dBm):	13.0	13.5
Attainable Rate (Kbps):	24464	0
Rate (Kbps):	39988	2186
K (number of bytes in DMT frame):	255	44
R (number of check bytes in RS code word):	0	0
S (RS code word size in DMT frame):	1	1
D (interleaver depth):	1	1
Delay (msec):	0	0
Super Frames:	12404	12442
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:	8701750	658700
Data Cells:	3982	0
Bit Errors:	0	0
Total ES:	1	0
Total SES:	1	0
Total UAS:	51	33

NOTE: This screen displays information for **ADSL1**. Please refer to Slave Info at the beginning of this chapter for **ADSL2**.

Consult the table that follows for descriptions of each field in the table.

Field	Description
Mode	Line Coding format
Type	Channel type: Interleave or Fast
Line Coding	Trellis On/Off
Status	Lists the status of the ADSL 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.
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)
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
Total ES:	Total Number of Errored Seconds
Total SES:	Total Number of Severely Errored Seconds
Total UAS:	Total Number of Unavailable Seconds

5.3 Route

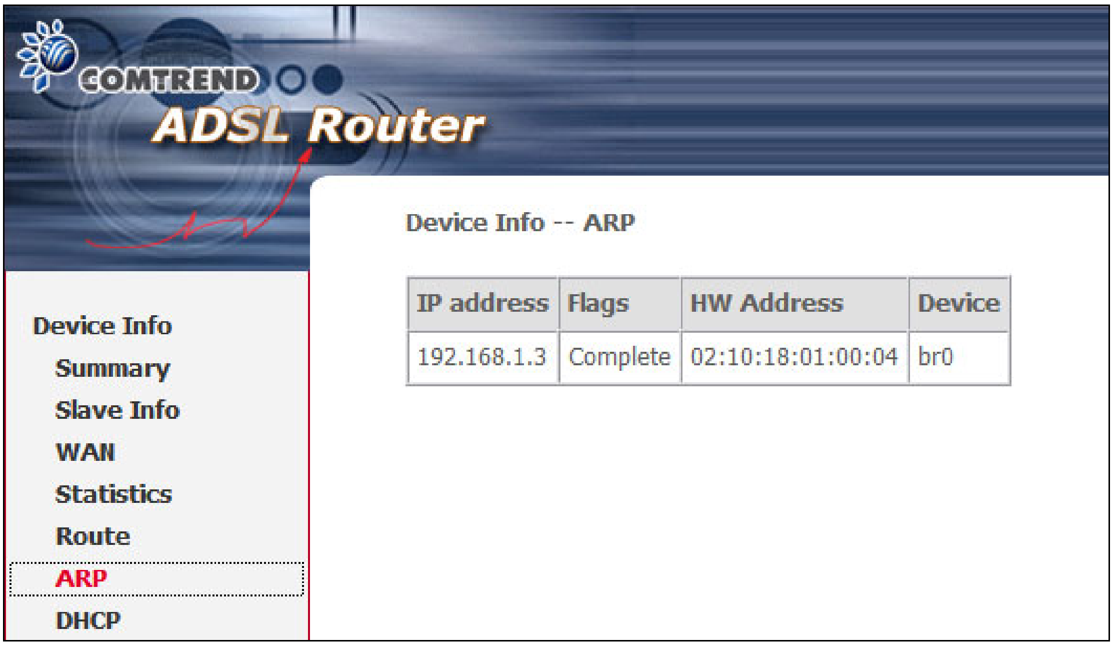


Device Info -- Route

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

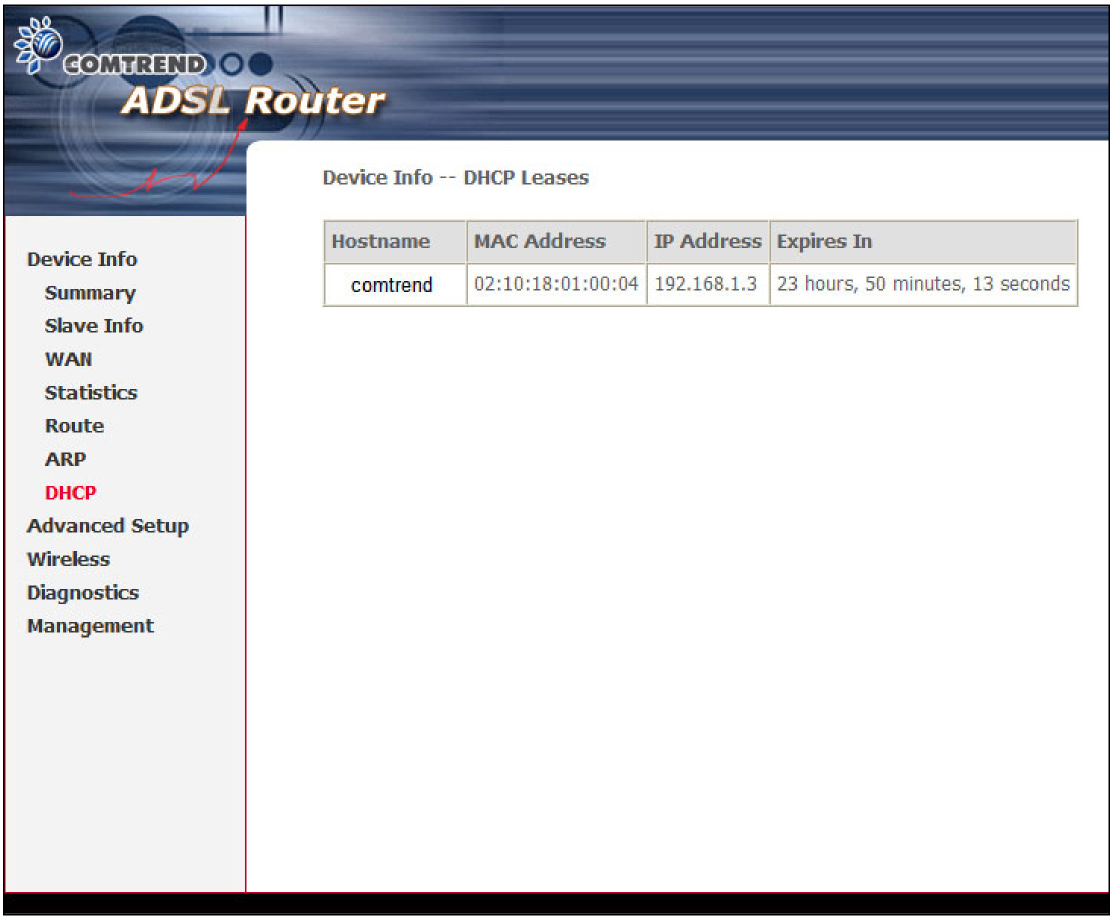
5.4 ARP



Device Info -- ARP

IP address	Flags	HW Address	Device
192.168.1.3	Complete	02:10:18:01:00:04	br0

5.5 DHCP



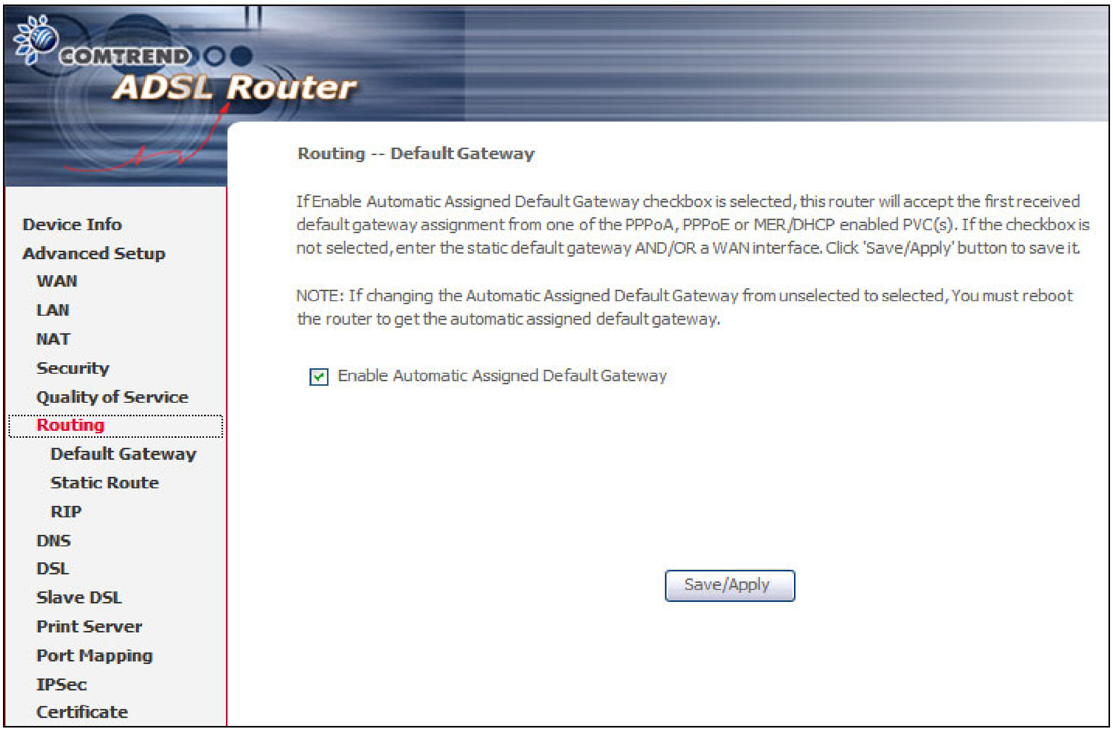
Device Info -- DHCP Leases

Hostname	MAC Address	IP Address	Expires In
comtrend	02:10:18:01:00:04	192.168.1.3	23 hours, 50 minutes, 13 seconds

Chapter 6 Advanced Setup

This chapter explains: WAN, LAN, NAT, Security, QoS, Routing, DNS, DSL ……

NOTE: Shown below are the menu options for each connection type.



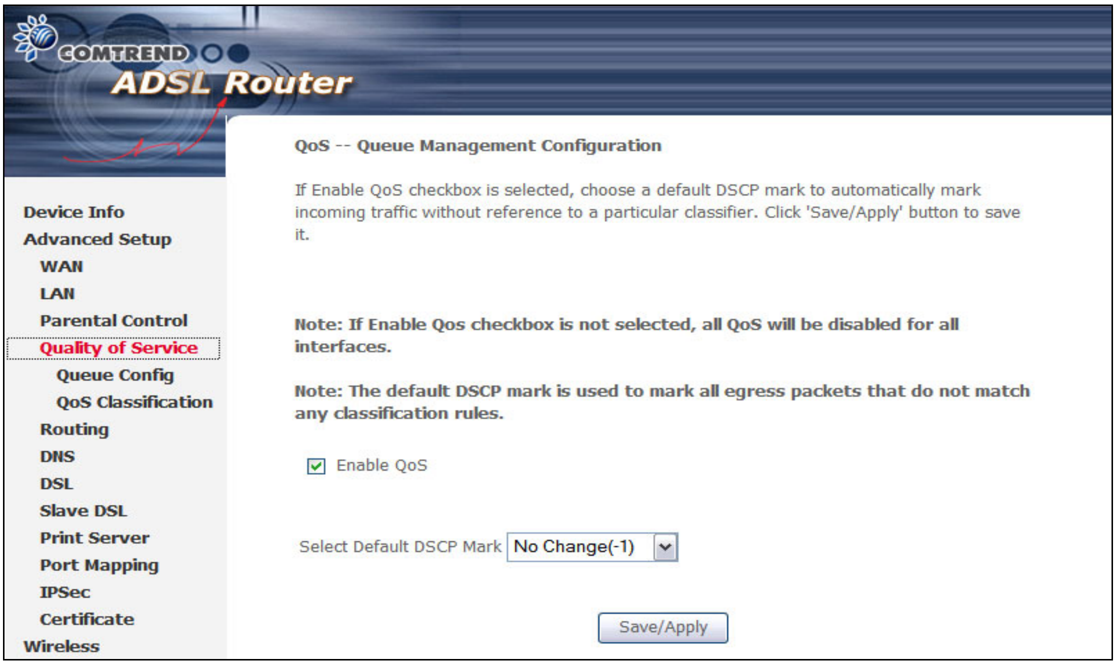
Routing -- Default Gateway

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

This screenshot is for PPPoE and PPPoA encapsulations.



QoS -- Queue Management Configuration

If Enable QoS checkbox is selected, choose a default DSCP mark to automatically mark incoming traffic without reference to a particular classifier. Click 'Save/Apply' button to save it.

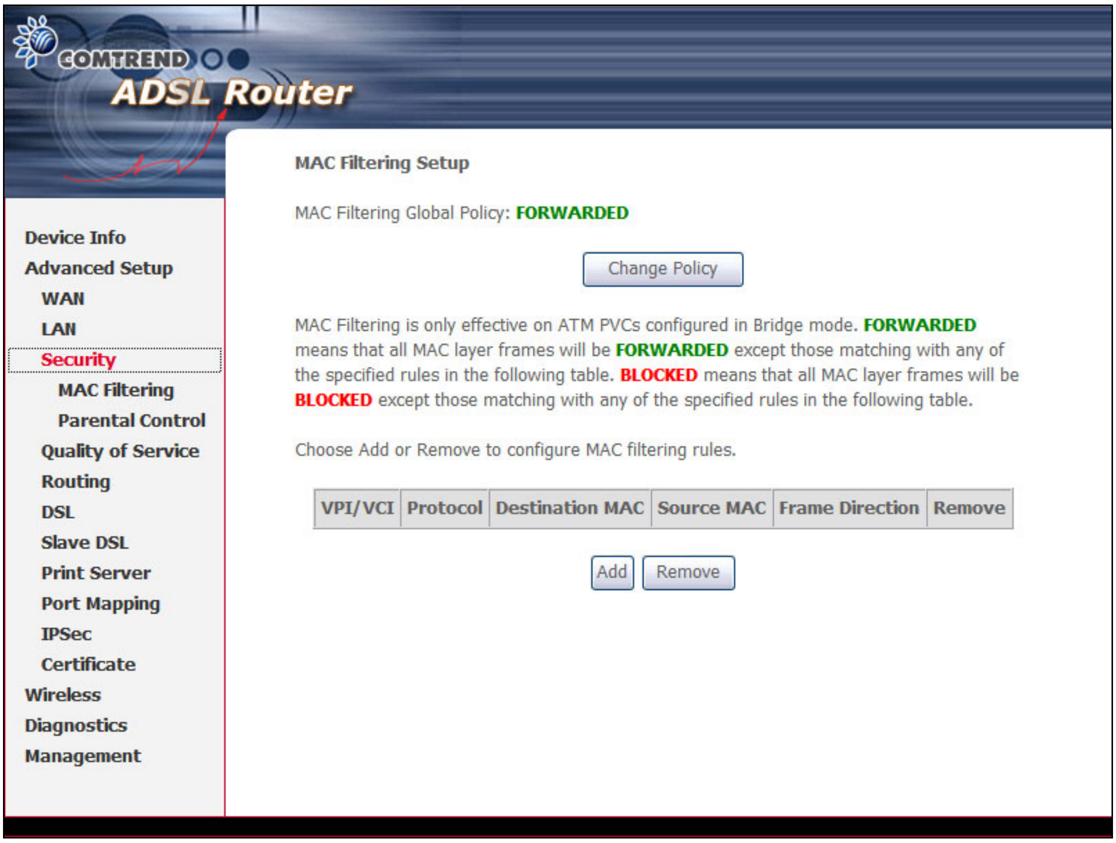
Note: If Enable Qos checkbox is not selected, all QoS will be disabled for all interfaces.

Note: The default DSCP mark is used to mark all egress packets that do not match any classification rules.

☑ Enable QoS

Select Default DSCP Mark No Change(-1)

This screenshot is for MER and IPoA encapsulations.



MAC Filtering Setup

MAC Filtering Global Policy: FORWARDED

Change Policy

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.

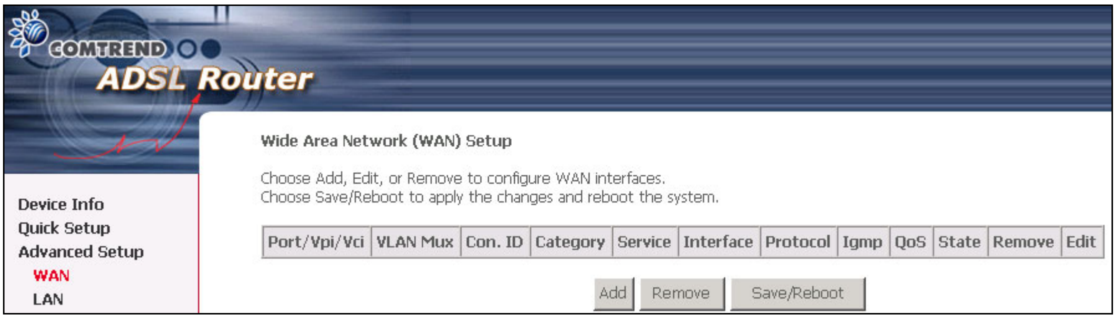
Choose Add or Remove to configure MAC filtering rules.

VPI/VCI	Protocol	Destination MAC	Source MAC	Frame Direction	Remove

Add Remove

This screenshot shows MAC Filtering which is available only with Bridge connections.

6.1 WAN



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.

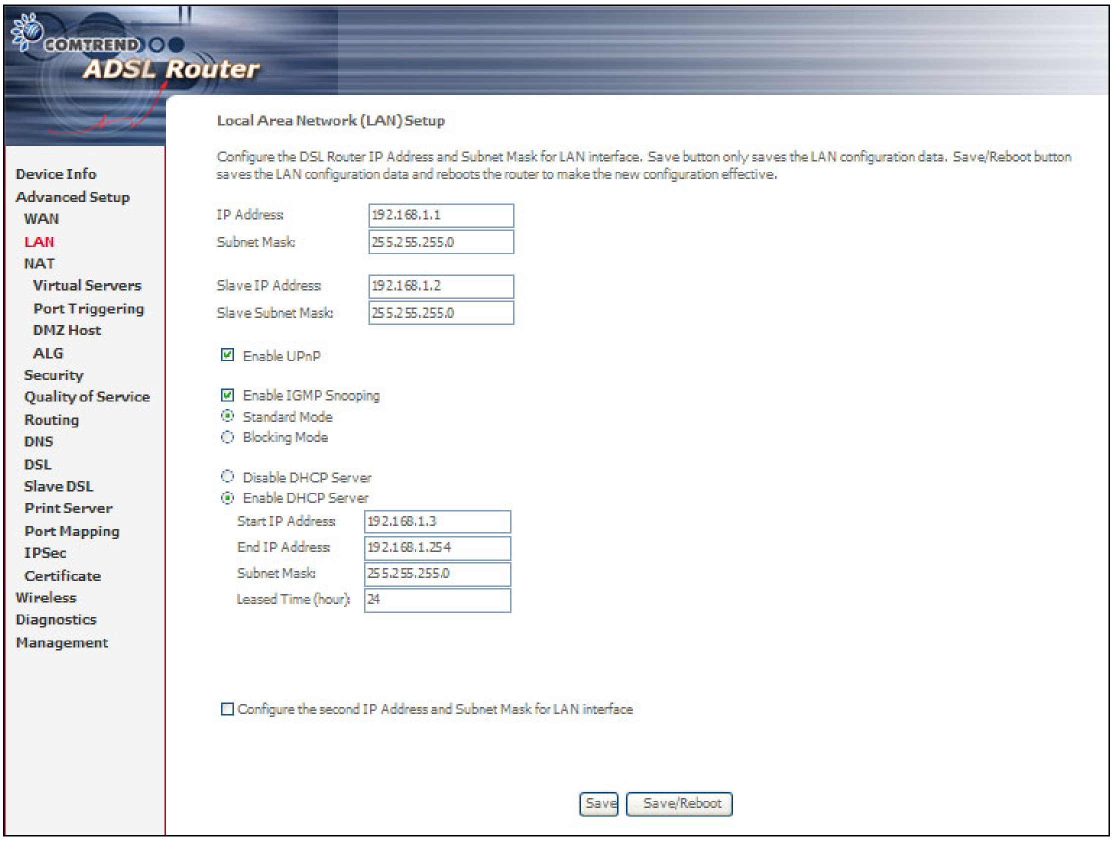
Port/Vpi/Vci	VLAN Mux	Con. ID	Category	Service	Interface	Protocol	Igmp	QoS	State	Remove	Edit

Add Remove Save/Reboot

Port/VPI/VCI	ATM Port (0-3) / VPI (0-255) / VCI (32-65535)
VLAN Mux	Shows 802.1Q VLAN ID
Con. ID	ID for WAN connection
Category	ATM service category, e.g. UBR, CBR…
Service	Name of the WAN connection
Interface	Name of the interface for WAN
Protocol	Shows bridge or router mode
IGMP	Shows enable or disable IGMP proxy
QoS	Shows enable or disable QoS
State	Shows enable or disable WAN connection

6.2 LAN

Configure the ADSL 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 device to make the new configuration effective.



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

Slave IP Address: 192.168.1.2
Slave Subnet Mask: 255.255.255.0

☑ Enable UPnP

☑ Enable IGMP Snooping
● Standard Mode
○ Blocking Mode

○ Disable DHCP Server
● Enable DHCP Server
Start IP Address: 192.168.1.3
End IP Address: 192.168.1.254
Subnet Mask: 255.255.255.0
Leased Time (hour): 24

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

(Slave) IP Address: Enter the IP address for the LAN port.

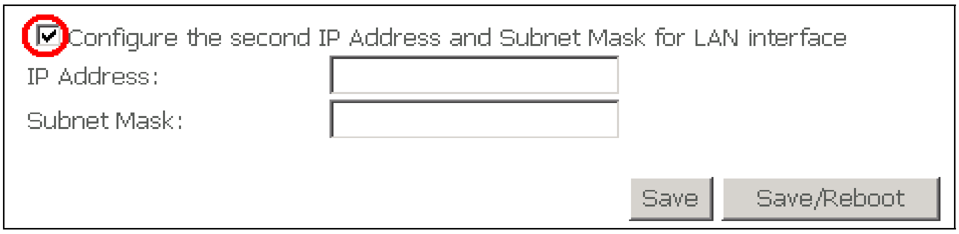
(Slave) Subnet Mask: Enter the subnet mask for the LAN port.

Enable IGMP Snooping: Enable /Disable the function that is IGMP Snooping.

Standard Mode: In standard mode, as in all prior releases, multicast traffic will flood to all bridge ports when there is no client subscribes to any multicast group – even when IGMP snooping is enabled.

Blocking Mode: In blocking mode, the multicast data traffic will be blocked and not flood to all bridge ports when there are no client subscriptions to any multicast group.

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



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

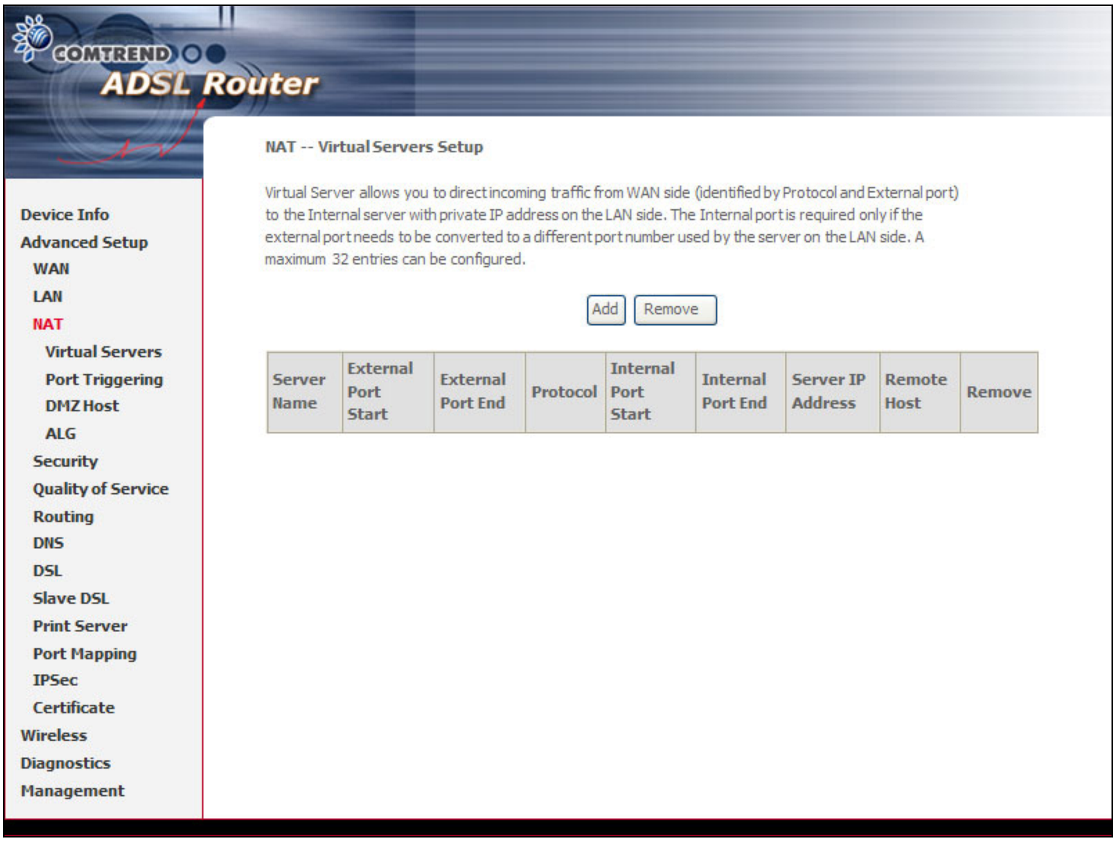
IP Address:	
Subnet Mask:	

6.3 NAT

To display the NAT function, the NAT option must be enabled in WAN Setup.

6.3.1 Virtual Servers

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.



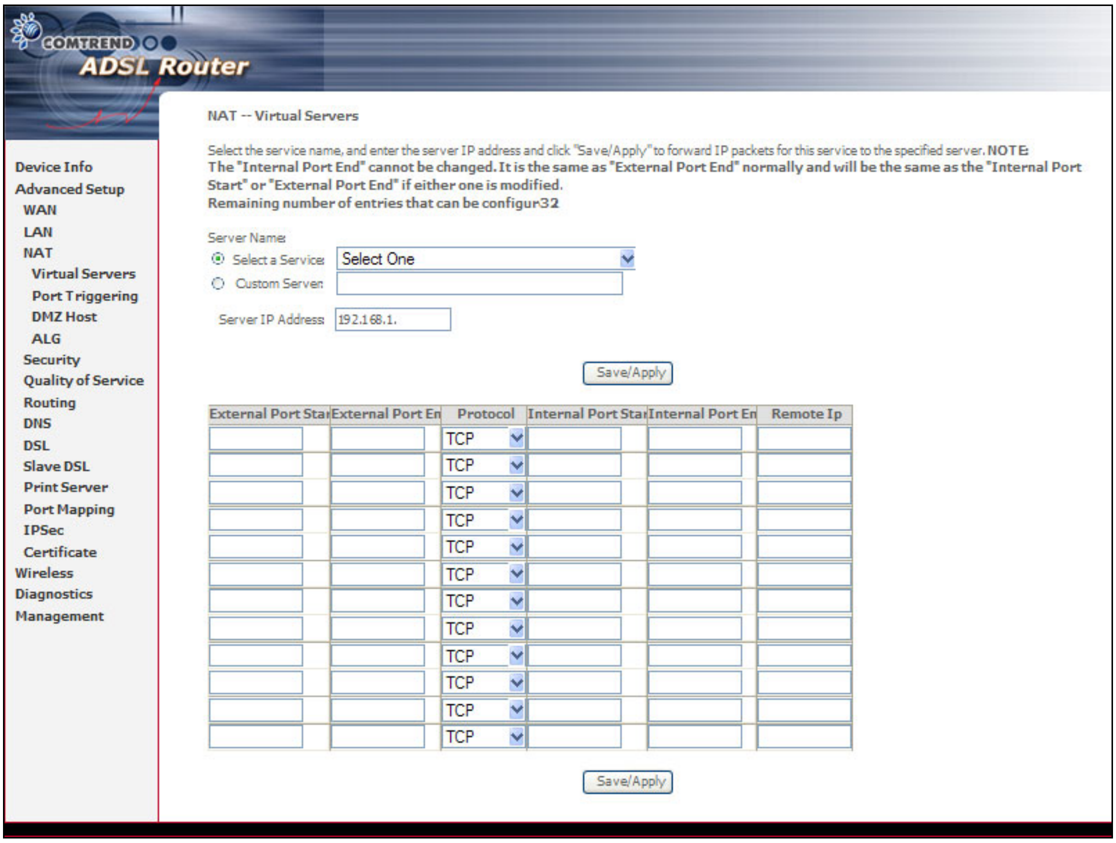
NAT -- Virtual Servers Setup

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	Remote Host	Remove

To add a Virtual Server, simply click the **Add** button.

The following screen 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 configur32

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

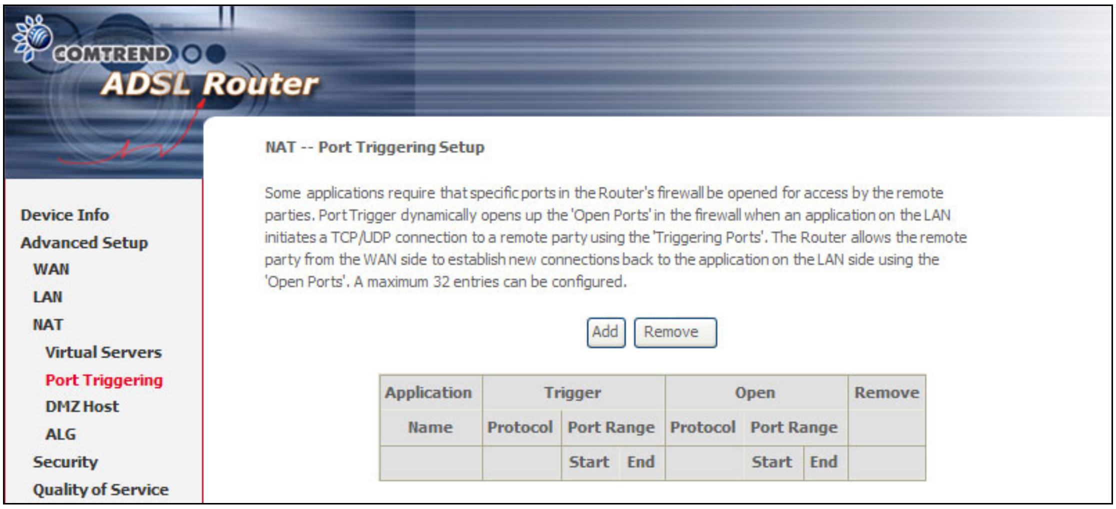
Server IP Address: 192.168.1.

External Port Star	External Port En	Protocol	Internal Port Star	Internal Port En	Remote Ip
		TCP			
		TCP			
		TCP			
		TCP			
		TCP			
		TCP			
		TCP			
		TCP			
		TCP			
		TCP			
		TCP			
		TCP			

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 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.

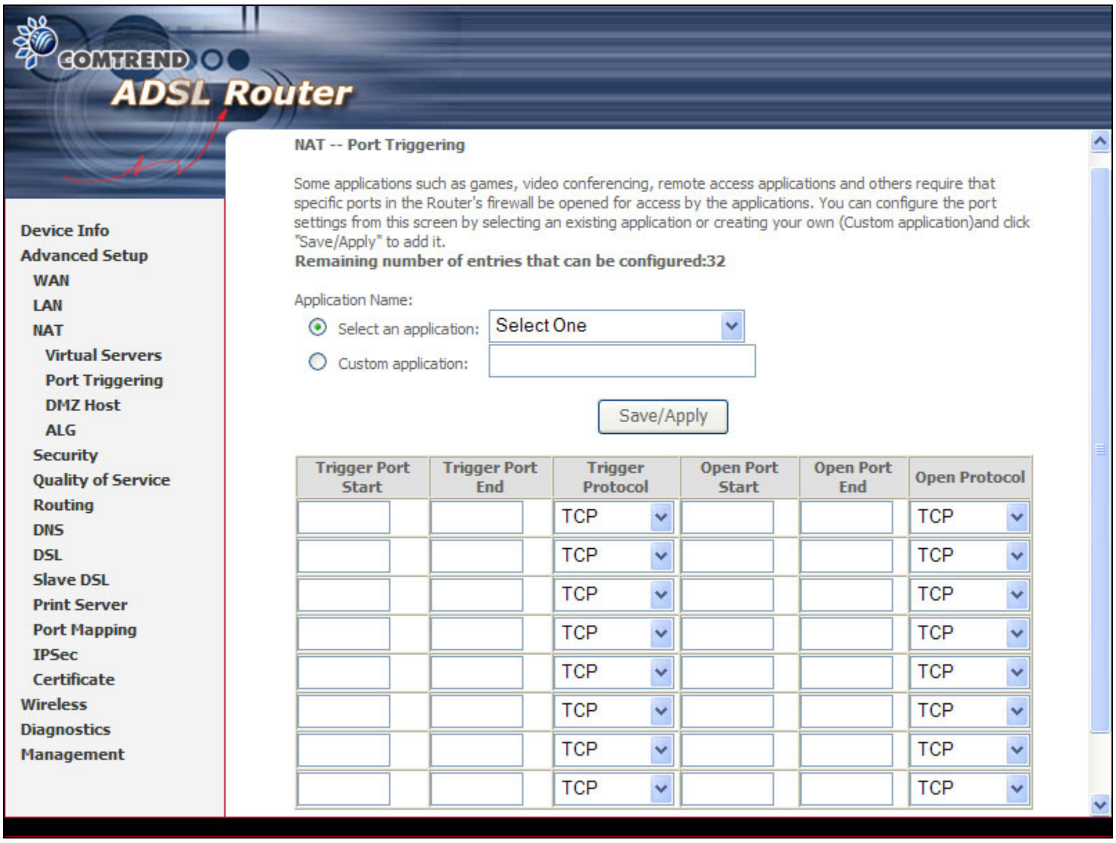


NAT -- Port Triggering Setup

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, simply click the **Add** button. The following will be displayed.



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

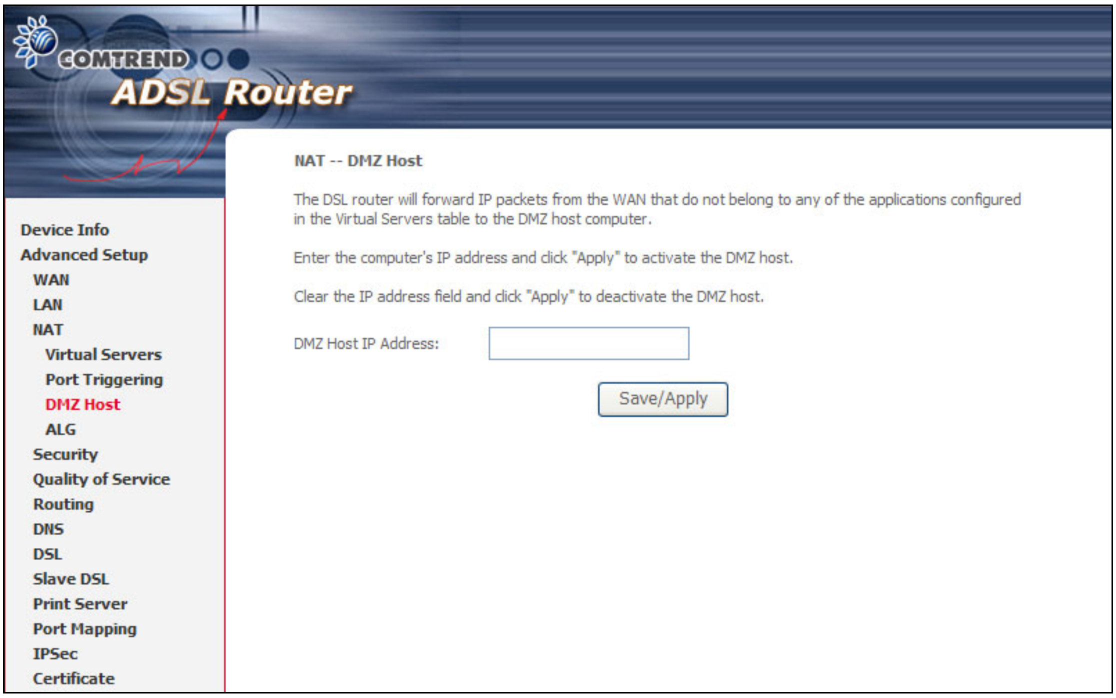
○ Custom application:

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 ending trigger port number (when you select 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 ending open port number (when you select 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 ADSL 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.



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.

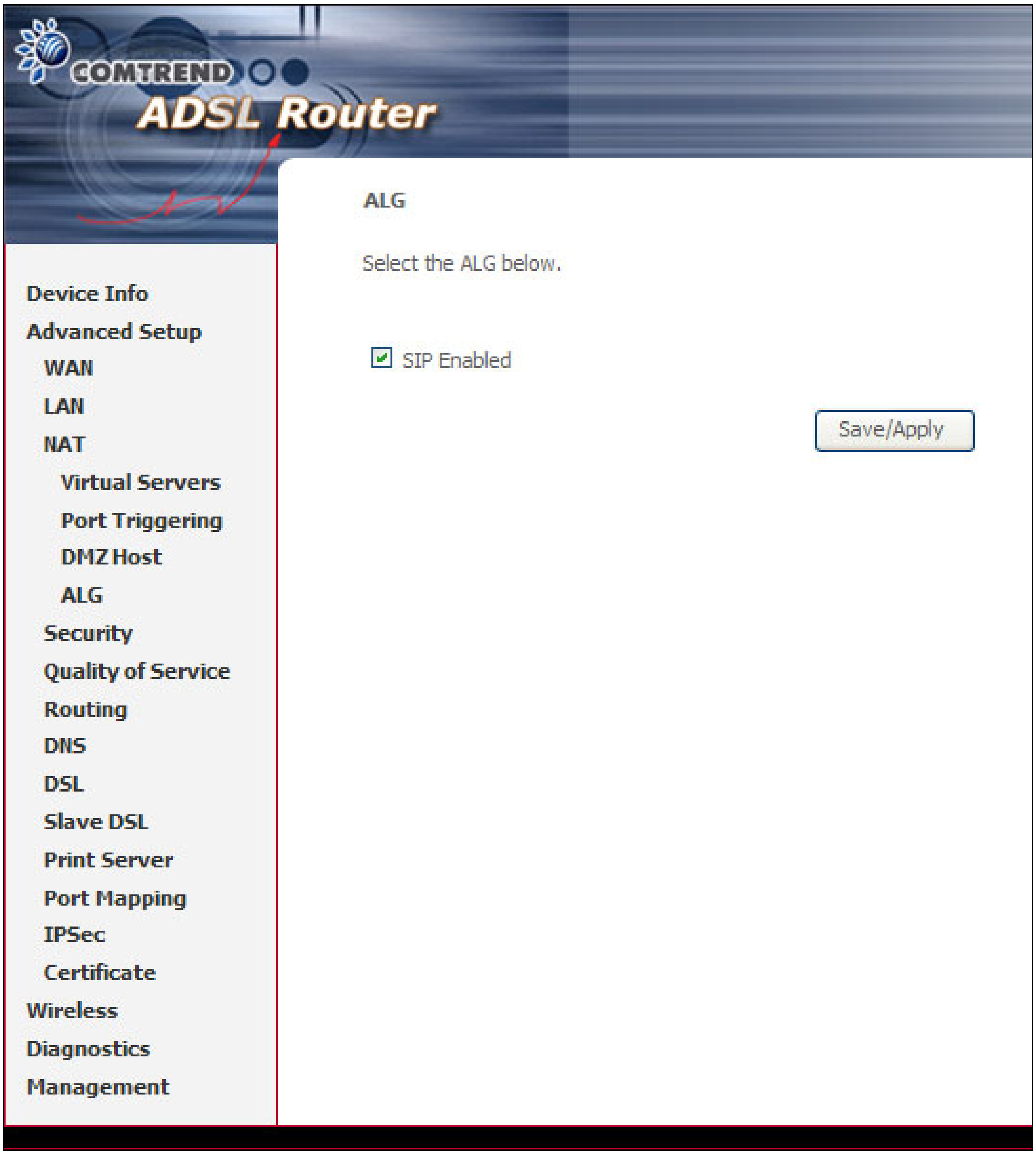
Clear the IP address field and click "Apply" to deactivate the DMZ host.

DMZ Host IP Address:

Enter the computer’s IP address and click **Save/Apply** to activate the DMZ host. Clear the IP address field and click **Save/Apply** to deactivate the DMZ host.

6.3.4 ALG

SIP ALG is Application layer gateway. If the user has an IP phone (SIP) or VoIP gateway (SIP) behind the ADSL router, the SIP ALG can help VoIP packet passthrough the router (NAT enabled).



ALG

Select the ALG below.

☑ SIP Enabled

NOTE: SIP (Session Initiation Protocol, RFC3261) is the protocol of choice for most VoIP (Voice over IP) phones to initiate communication. This ALG is only valid for SIP protocol running UDP port 5060.

6.4 Security

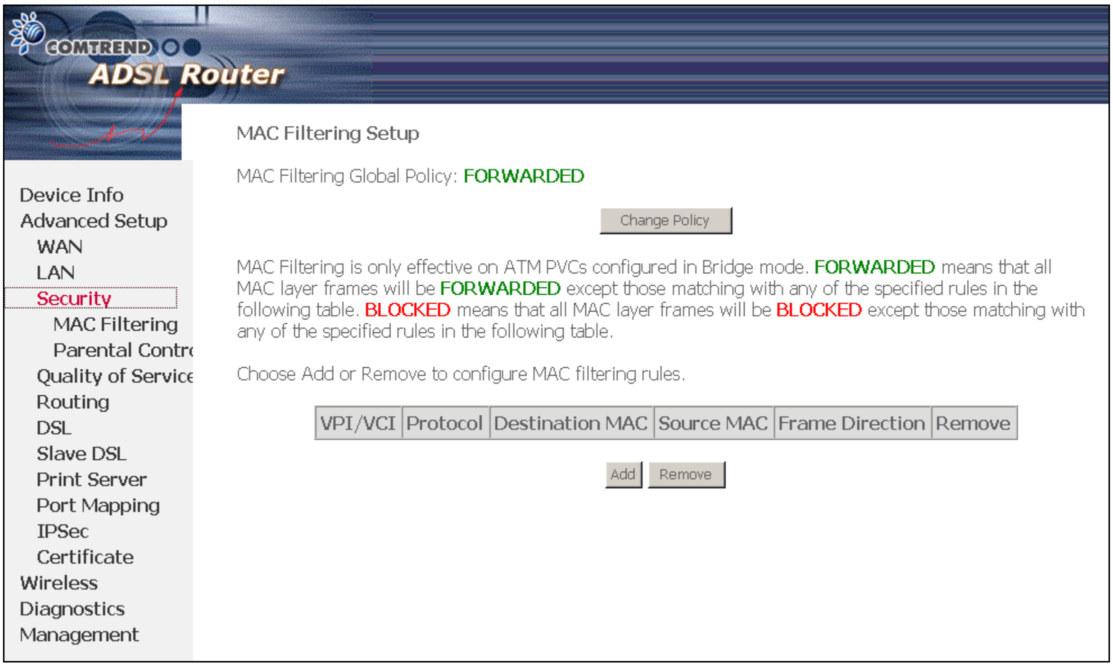
To display the Security function, the firewall option must be enabled in WAN Setup.

6.4.1 MAC Filtering

Each network device has a unique MAC address. You can block or forward the packets based on the MAC addresses. The MAC Filtering Setup screen allows for the setup of the MAC filtering policy and rules.

NOTE: This function is only available when in bridge mode. Instead of MAC filtering, the other connection types use IP Filtering (pg. 62).

The policy **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. The default is **FORWARDED**; this is changed by clicking the **Change Policy** button.



MAC Filtering Setup

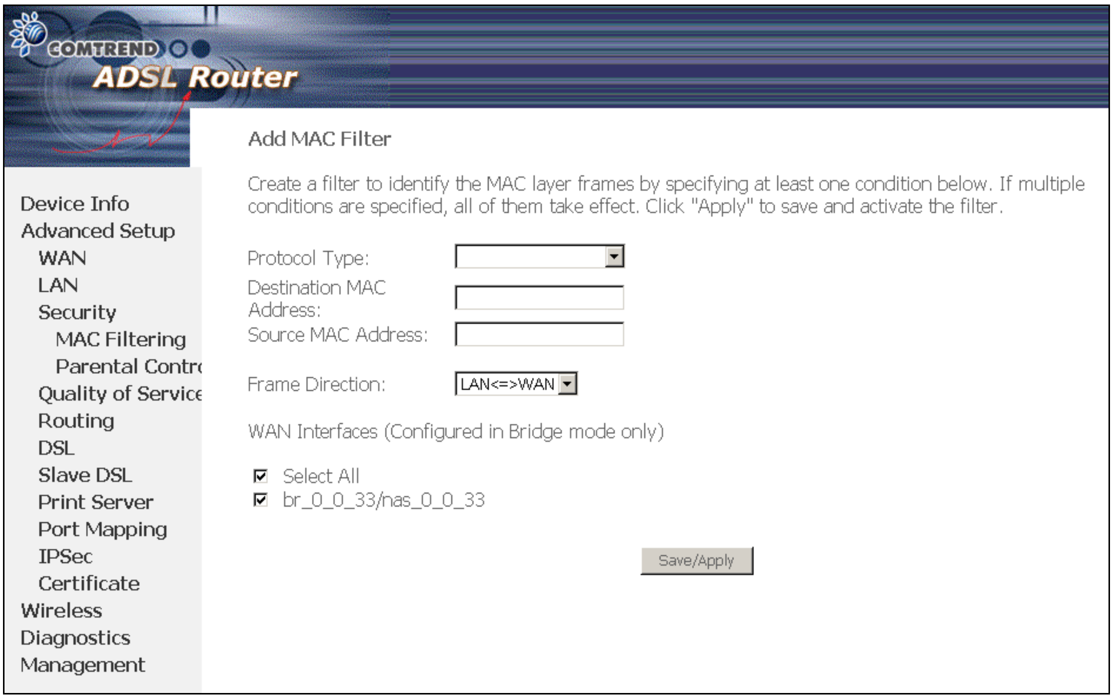
MAC Filtering Global Policy: FORWARDED

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 pops up 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 take effect. Click **Save/Apply** to save and activate the filter.



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_0_33/nas_0_0_33

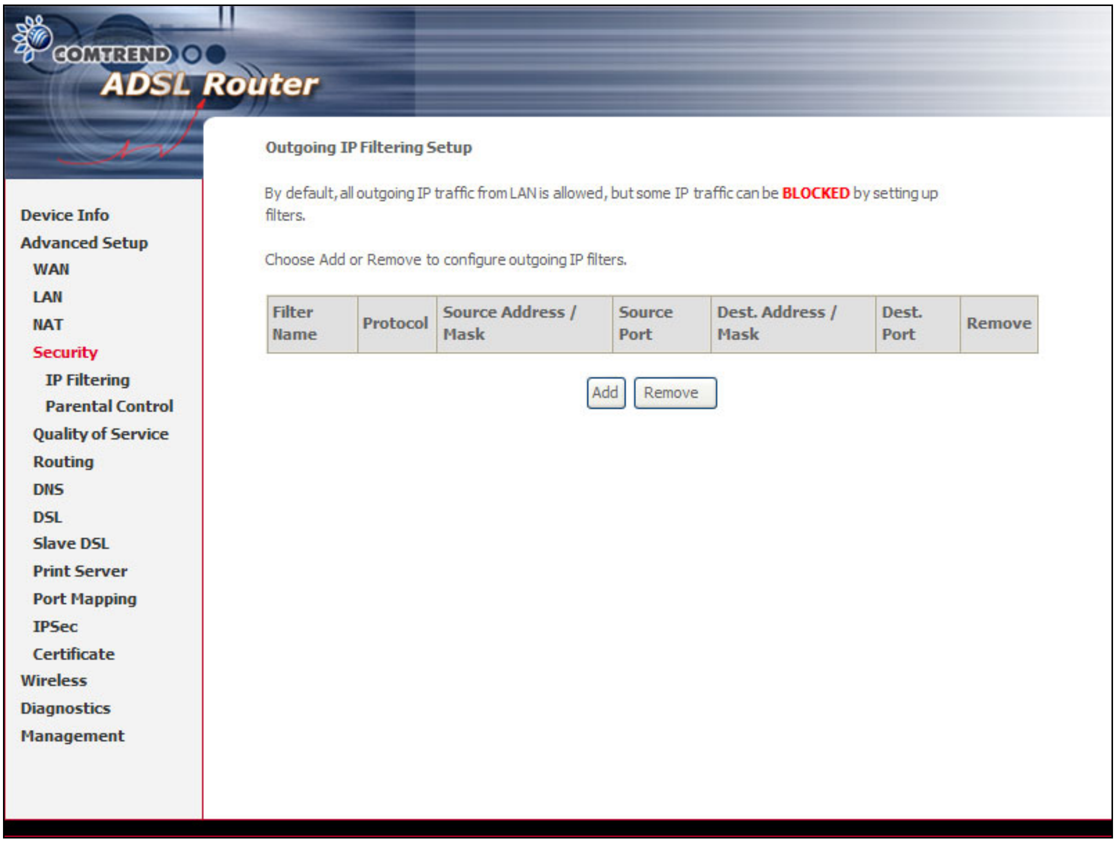
Field	**Description**
Protocol type	PPPoE, IPv4, IPv6, AppleTalk, IPX, NetBEUI, IGMP
Destination MAC Address	Defines the destination MAC address
Source MAC Address	Defines the source MAC address
Frame Direction	Select the incoming/outgoing packet interface

6.4.2 IP Filtering

IP filtering allows you to create a filter rule to identify outgoing/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.

Outgoing

The default setting for all Outgoing traffic is **ACCEPTED**.



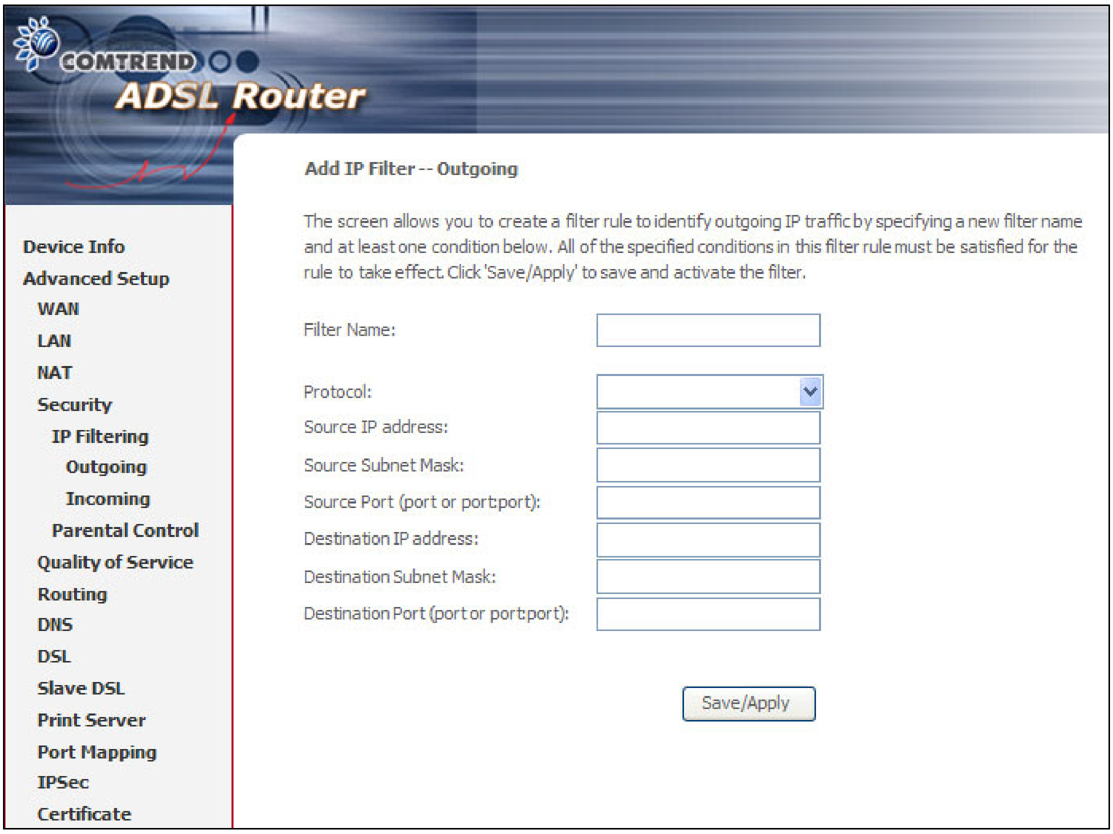
Outgoing IP Filtering Setup

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 be displayed.



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:

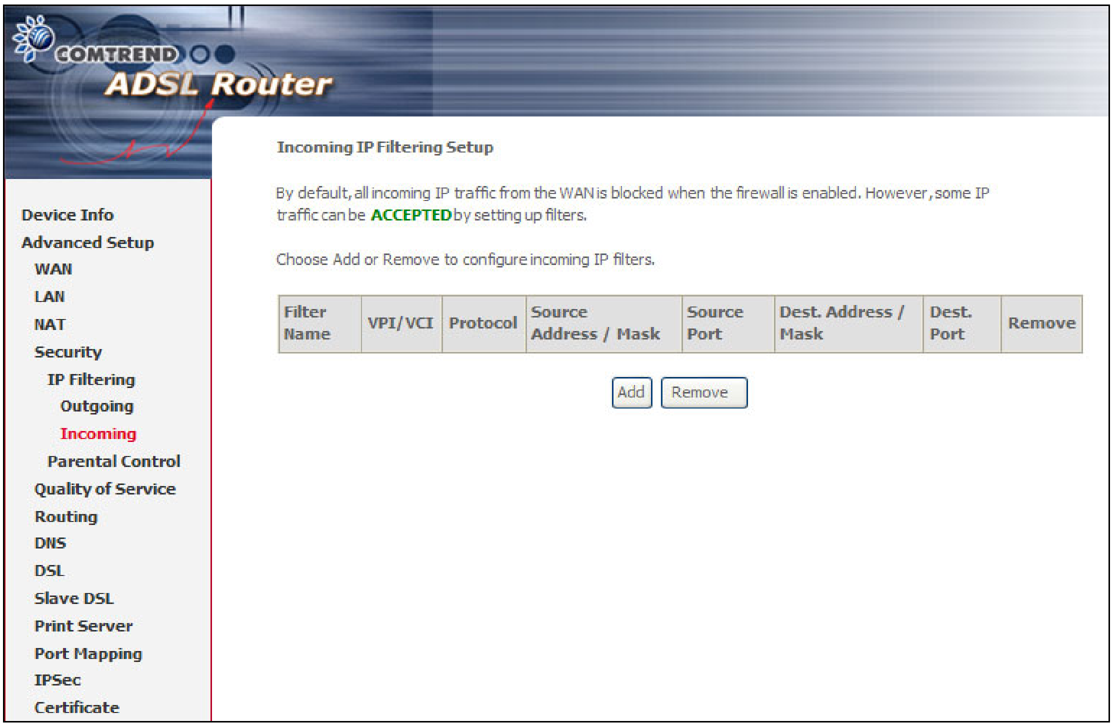
Destination Subnet Mask:

Destination Port (port or port:port):

Filter Name	Type a name for the filter rule.
Protocol	User can select: 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.
Destination IP address	Enter destination IP address.
Destination Subnet Mask	Enter destination subnet mask.
Destination port (port or port:port)	Enter destination port number.

Incoming

The default setting for all Incoming traffic is Blocked.



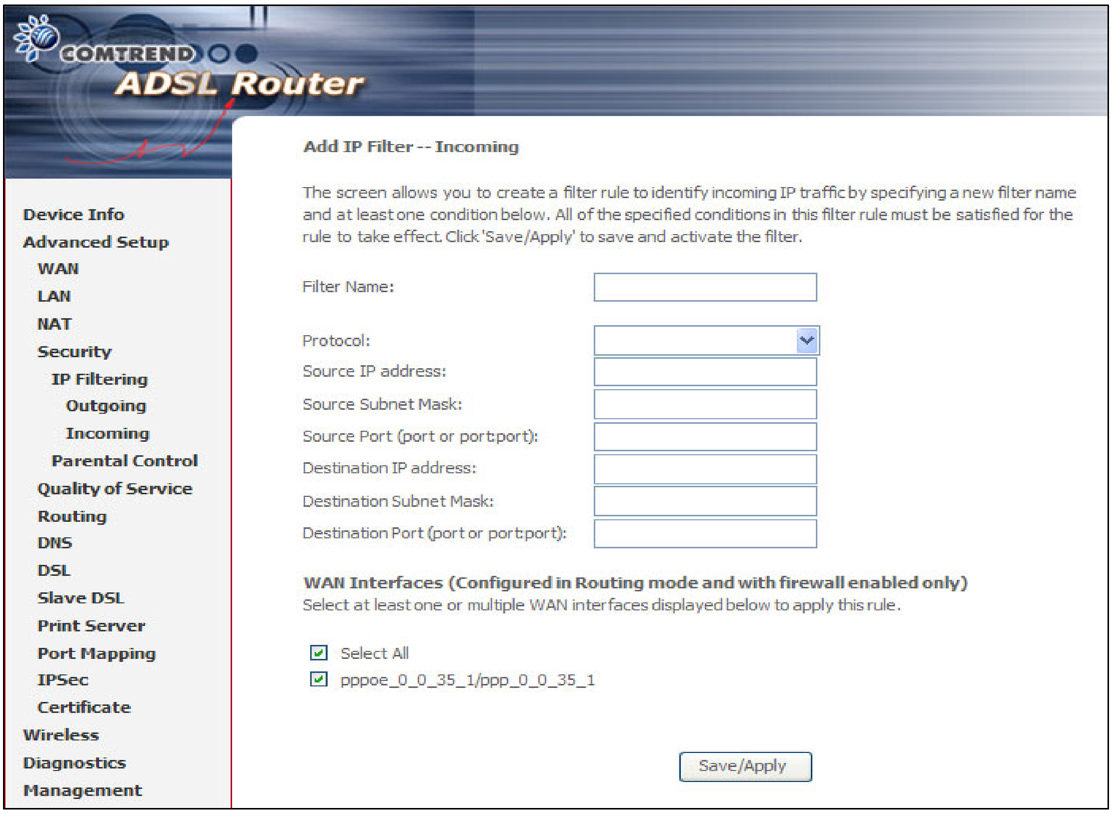
Incoming IP Filtering Setup

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 be displayed.



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.

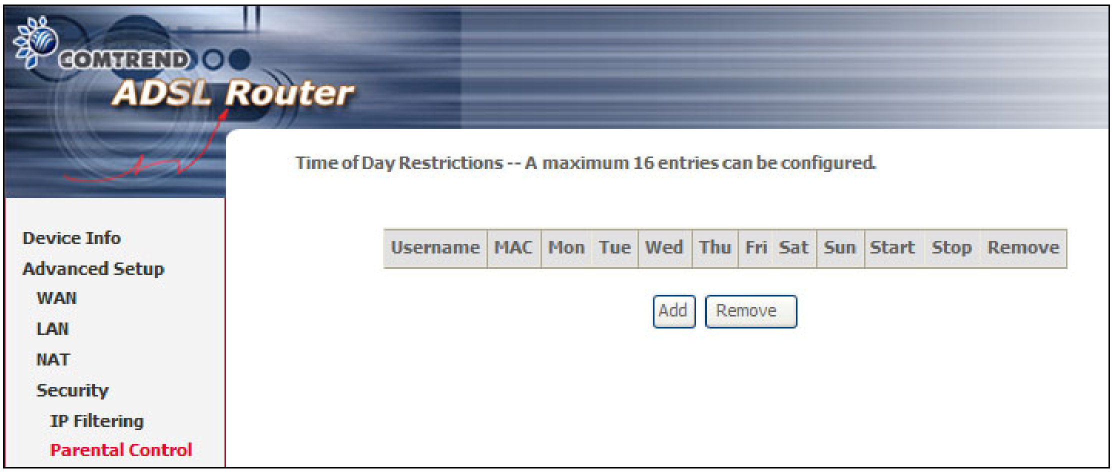
☑ Select All

☑ pppoe_0_0_35_1/ppp_0_0_35_1

To configure the parameters, please reference **Outgoing** table above.

6.4.3 Parental Control

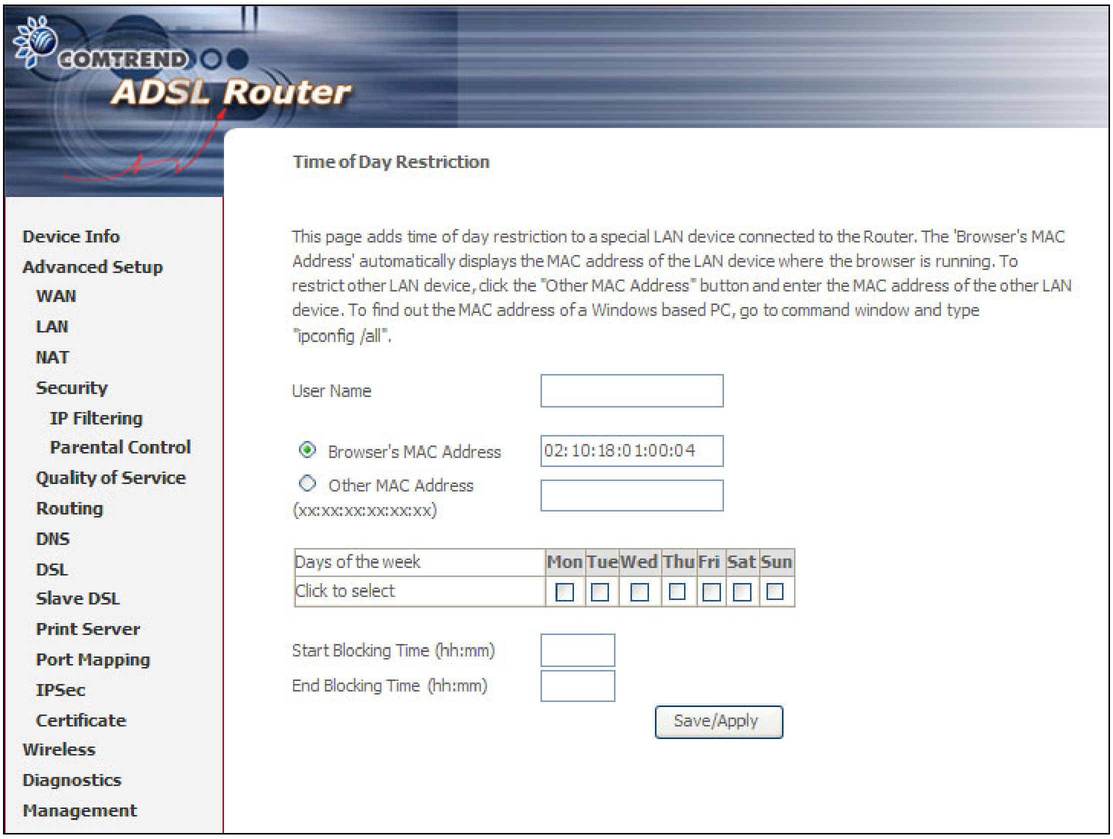
This allows parents, schools, and libraries to set access times for Internet use.



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

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

To add a parental control click the **Add** button and the following screen will display.



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 02:10:18:01:00:04

○ 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)

Username	Name of the Filter.
MAC Address	Displays MAC address of the LAN device on which the browser is running.
Days of the week (Mon – Sun)	Days when the restrictions are applied.
Start/End Blocking Times	The times when restrictions start and stop.

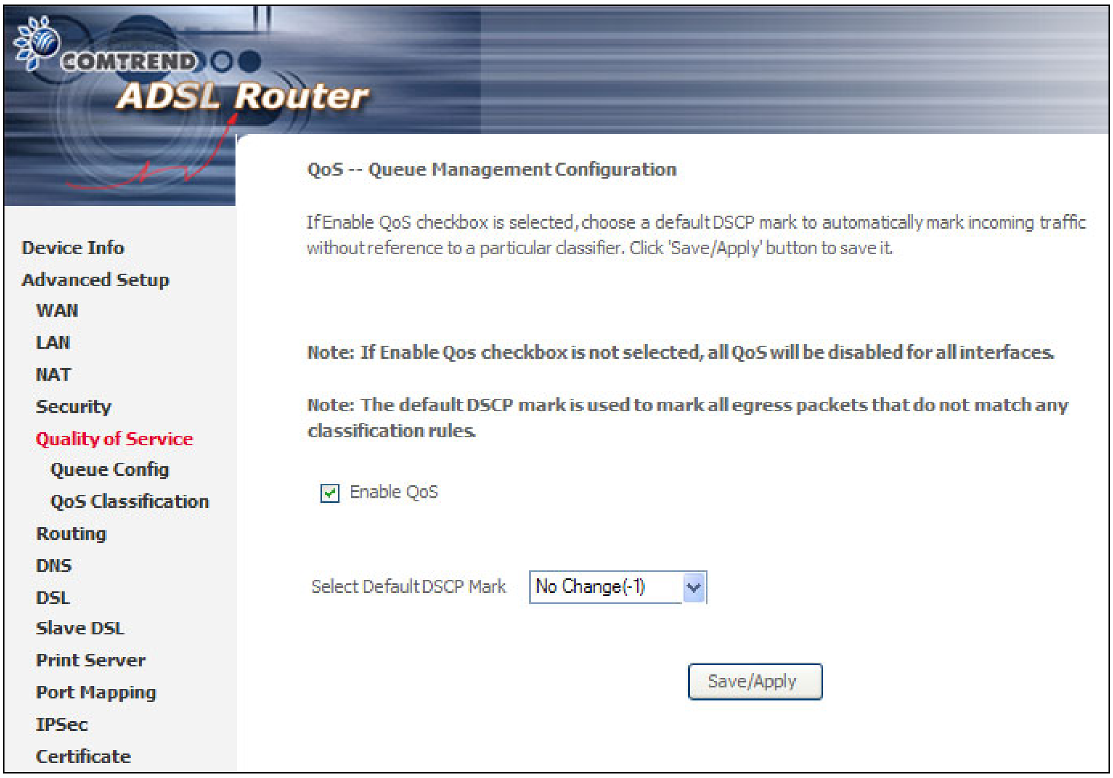
6.5 Quality of Service

NOTE: QoS is not yet supported for bonded routers. However, it is included here in the event that a future firmware upgrade supports this feature.

6.5.1 Queue Management Configuration

Quality of service: Quality of Service can provide different priority to different users or data flows, or guarantee a certain level of performance to a data flow in accordance with requests from Queue Prioritization.

Differentiated Services Code Point (DSCP): You can assign DSCP mark that specifies the per hop behavior for a given flow of packets in the Internet Protocol (IP) header.



QoS -- Queue Management Configuration

If Enable QoS checkbox is selected, choose a default DSCP mark to automatically mark incoming traffic without reference to a particular classifier. Click 'Save/Apply' button to save it.

Note: If Enable Qos checkbox is not selected, all QoS will be disabled for all interfaces.

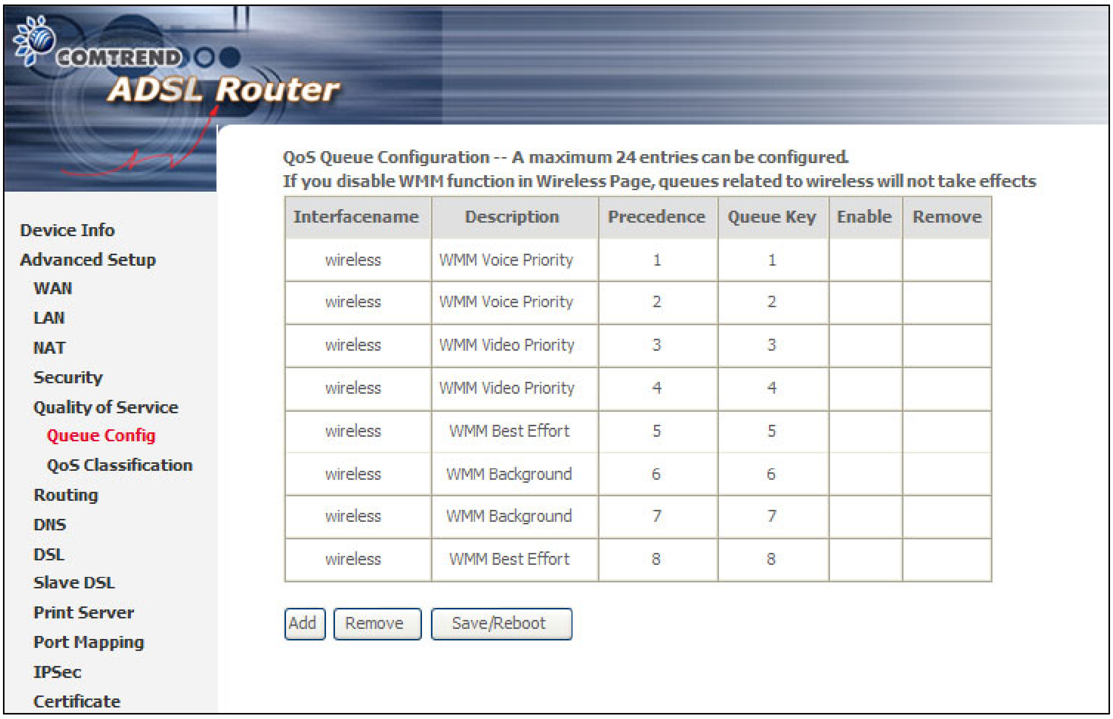
Note: The default DSCP mark is used to mark all egress packets that do not match any classification rules.

☑ Enable QoS

Select Default DSCP Mark: No Change(-1)

6.5.2 QoS Queue Configuration

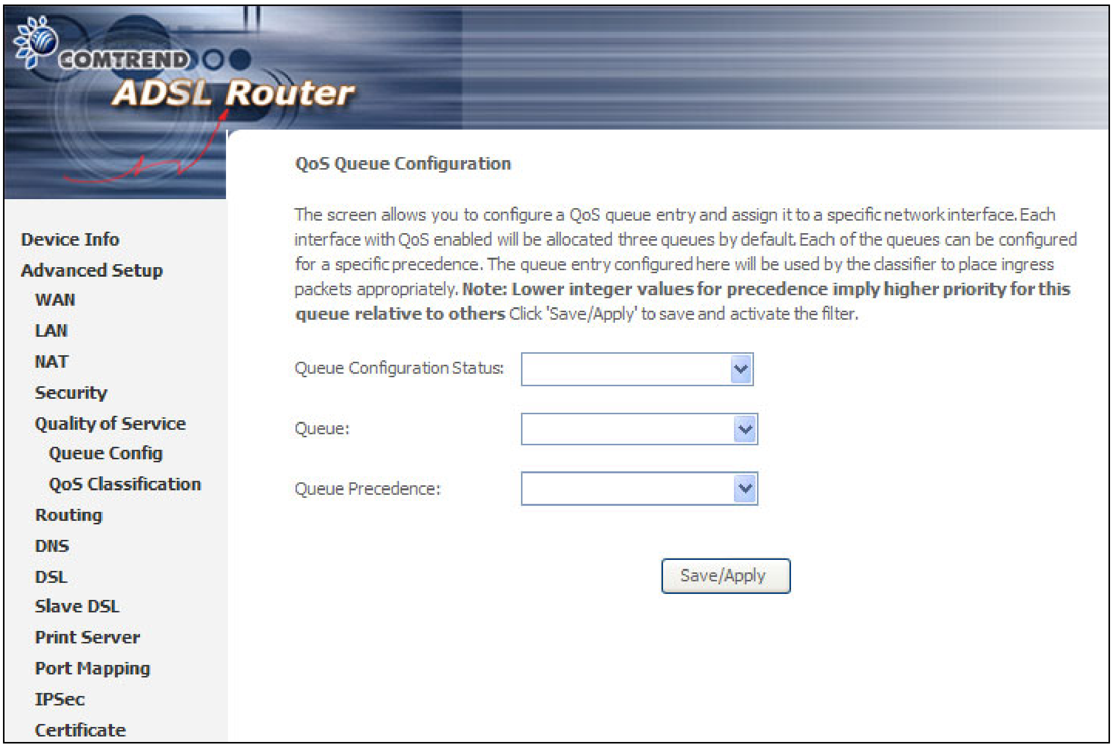
This follows the "Differentiated Services" rule of IP QoS. You can create a new Queue rule by assigning interface, Enable/Disable and Precedence. This router uses various queuing strategies to tailor performance to requirements.



QoS Queue Configuration -- A maximum 24 entries can be configured.
If you disable WMM function in Wireless Page, queues related to wireless will not take effects

Interfacename	Description	Precedence	Queue Key	Enable	Remove
wireless	WMM Voice Priority	1	1		
wireless	WMM Voice Priority	2	2		
wireless	WMM Video Priority	3	3		
wireless	WMM Video Priority	4	4		
wireless	WMM Best Effort	5	5		
wireless	WMM Background	6	6		
wireless	WMM Background	7	7		
wireless	WMM Best Effort	8	8		

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



QoS Queue Configuration

The screen allows you to configure a QoS queue entry and assign it to a specific network interface. Each interface with QoS enabled will be allocated three queues by default. Each of the queues can be configured for a specific precedence. The queue entry configured here will be used by the classifier to place ingress packets appropriately. **Note: Lower integer values for precedence imply higher priority for this queue relative to others** Click 'Save/Apply' to save and activate the filter.

Queue Configuration Status:

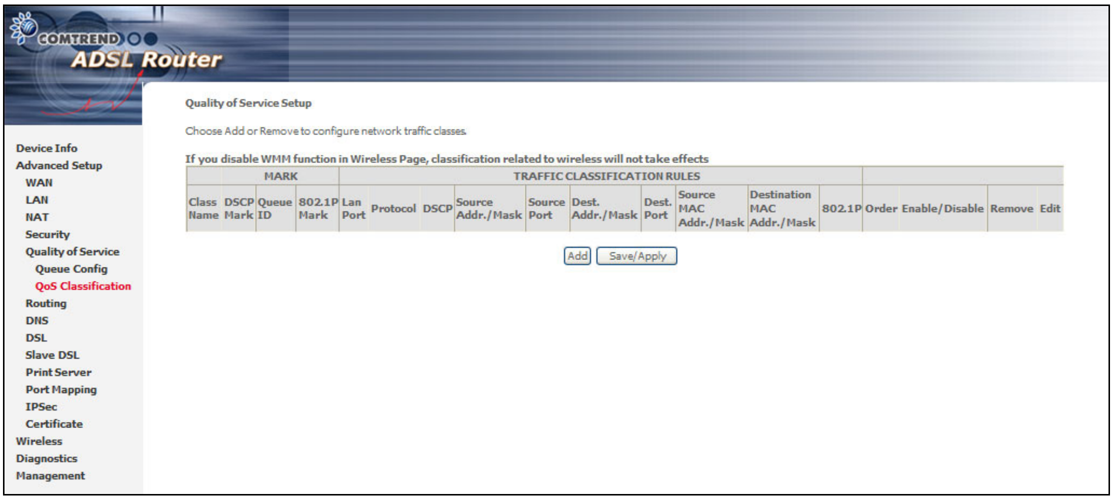
Queue:

Queue Precedence:

Queue Configuration Status: Make the queue Enable/Disable.

Queue: Assign queue to a specific network interface whose QoS is enabled.

Queue Precedence: Configure precedence for queue. Lower integer values for precedence imply higher priority for this queue relative to others.



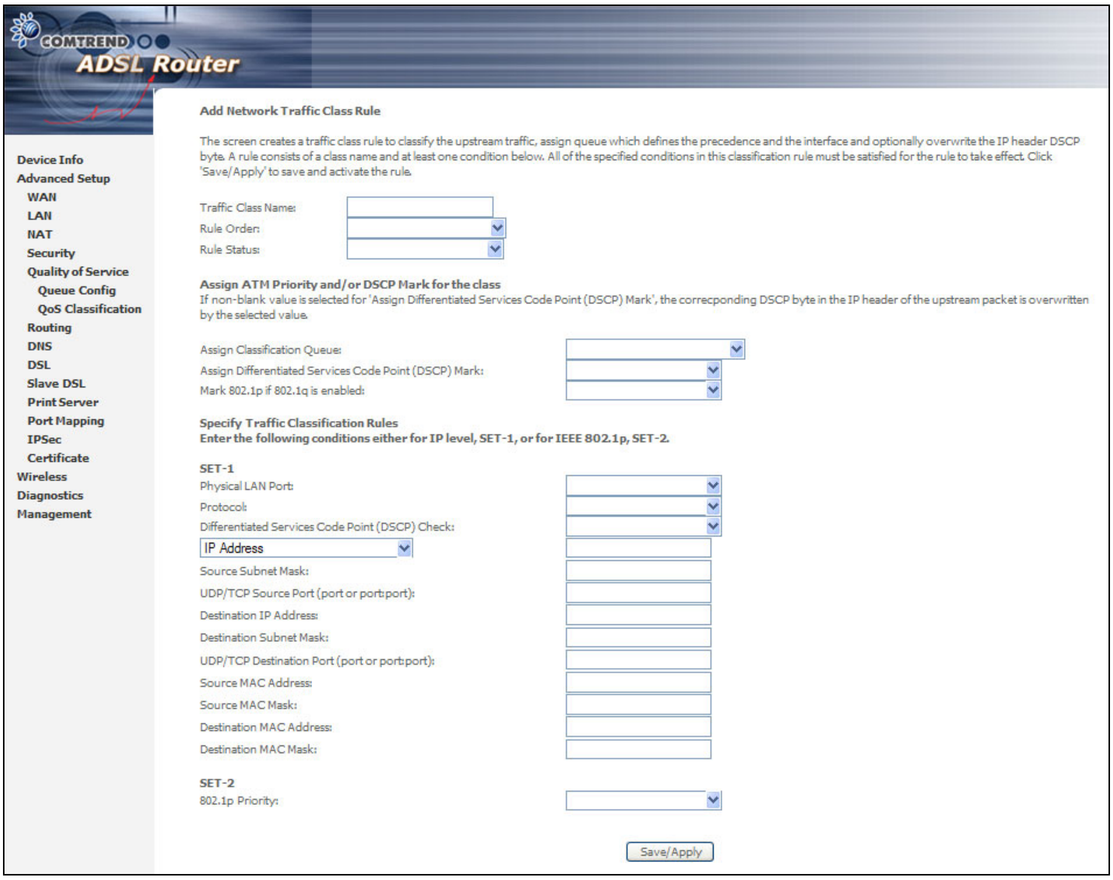
Quality of Service Setup

Choose Add or Remove to configure network traffic classes.

If you disable WMM function in Wireless Page, classification related to wireless will not take effects

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

Click **Add** to configure network traffic classes.



Add Network Traffic Class Rule

The screen creates a traffic class rule to classify the upstream traffic, assign queue which defines the precedence and the interface and optionally overwrite the IP header DSCP 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:
Rule Order:
Rule Status:

Assign ATM Priority and/or DSCP Mark for the class
If non-blank value is selected for 'Assign Differentiated Services Code Point (DSCP) Mark', the correcponding DSCP byte in the IP header of the upstream packet is overwritten by the selected value.

Assign Classification Queue:
Assign Differentiated Services Code Point (DSCP) Mark:
Mark 802.1p if 802.1q is enabled:

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:
Differentiated Services Code Point (DSCP) Check:
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:

This 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.

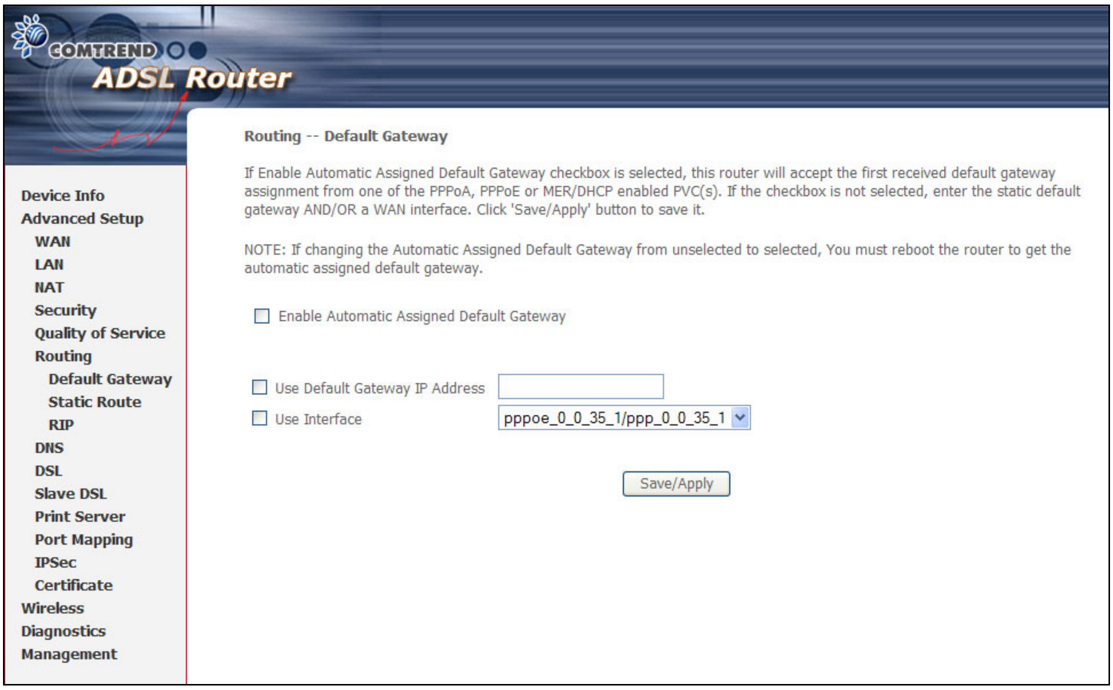
6.6 Routing

6.6.1 Default Gateway

If the **Enable Automatic Assigned Default Gateway** checkbox is selected, the default gateway will be assigned based on a DHCP enabled PVC. If the checkbox is not selected, enter the static default gateway AND/OR WAN interface.

Click **Save/Apply** to save it.

NOTE:	After enabling the **Automatic Assigned Default Gateway**, you must reboot the router to activate 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

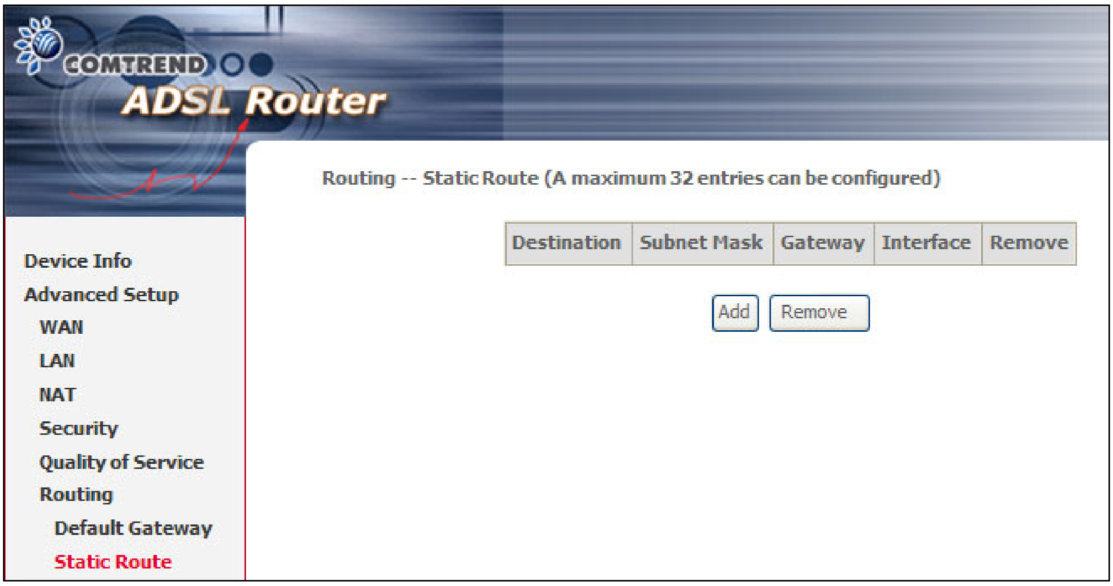
□ Use Default Gateway IP Address

□ Use Interface pppoe_0_0_35_1/ppp_0_0_35_1

Save/Apply

6.6.2 Static Route

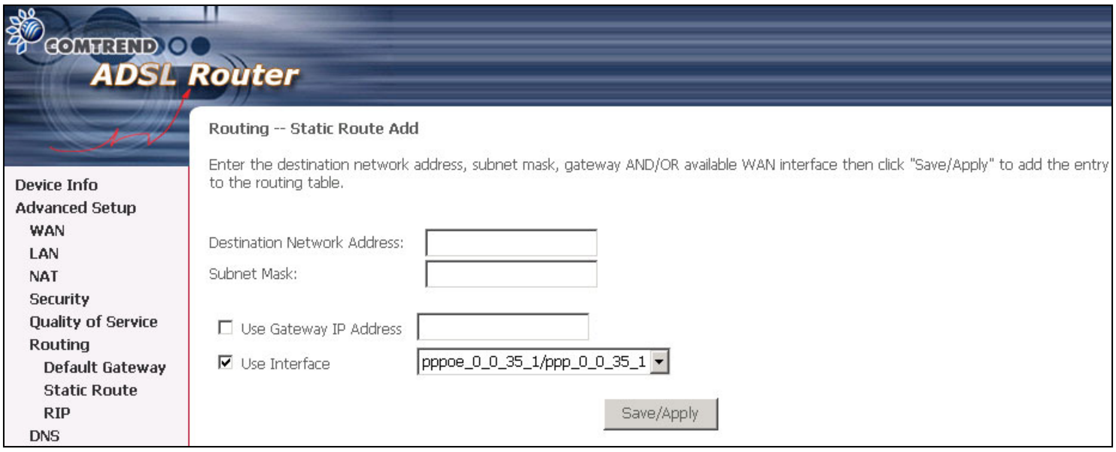
This screen lists the configured static routes and allows configuring of static routes. Choose **Add** or **Remove** to configure the static routes.



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

Destination	Subnet Mask	Gateway	Interface	Remove

To add static route, click the **Add** button to display the following screen. 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.



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:

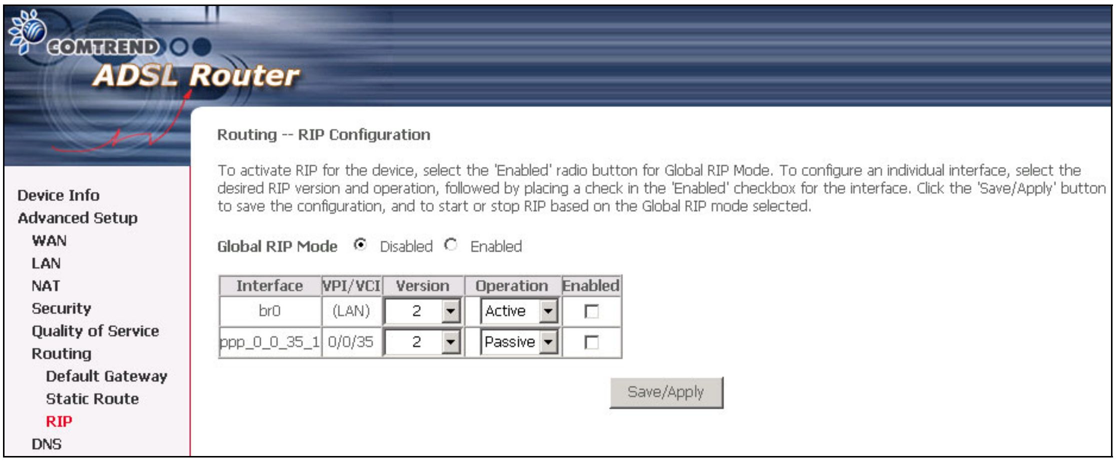
□ Use Gateway IP Address

☑ Use Interface pppoe_0_0_35_1/ppp_0_0_35_1

6.6.3 RIP

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 **Save/Apply** to start/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

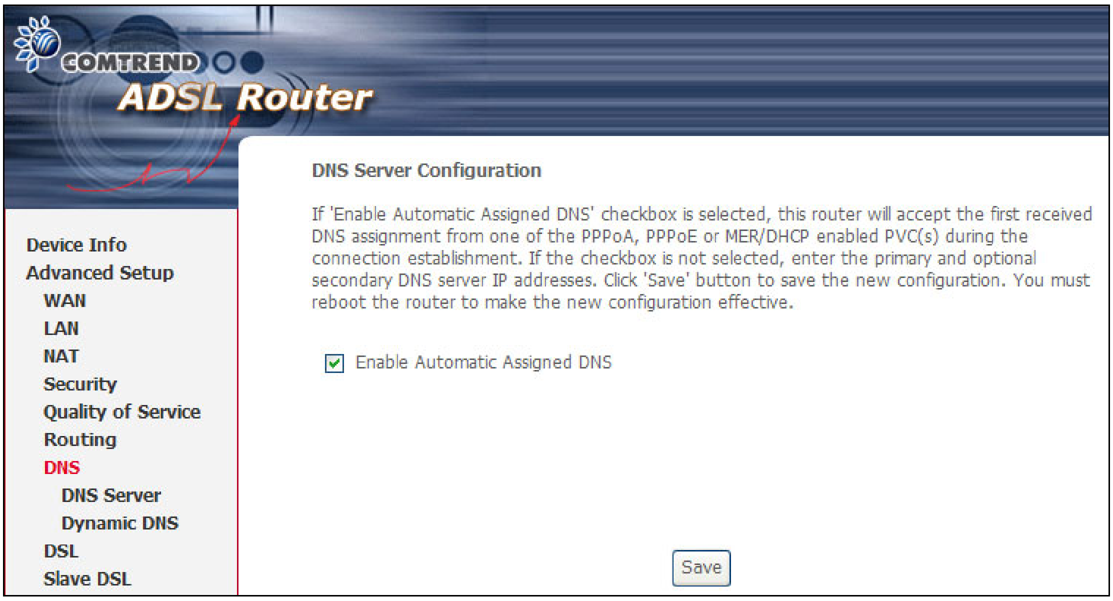
Interface	VPI/VCI	Version	Operation	Enabled
br0	(LAN)	2	Active	□
ppp_0_0_35_1	0/0/35	2	Passive	□

NOTE: This screenshot is based on PPPoE encapsulation.

6.7 DNS

6.7.1 DNS Server

If **Enable Automatic Assigned DNS** checkbox is selected, this router will accept the first received DNS assignment from one of the DHCP enabled PVCs during the connection establishment. If the checkbox is not selected, enter the primary and optional secondary DNS server IP addresses. Click the **Save** button to save the new configuration. You must reboot the router to make the new configuration effective.



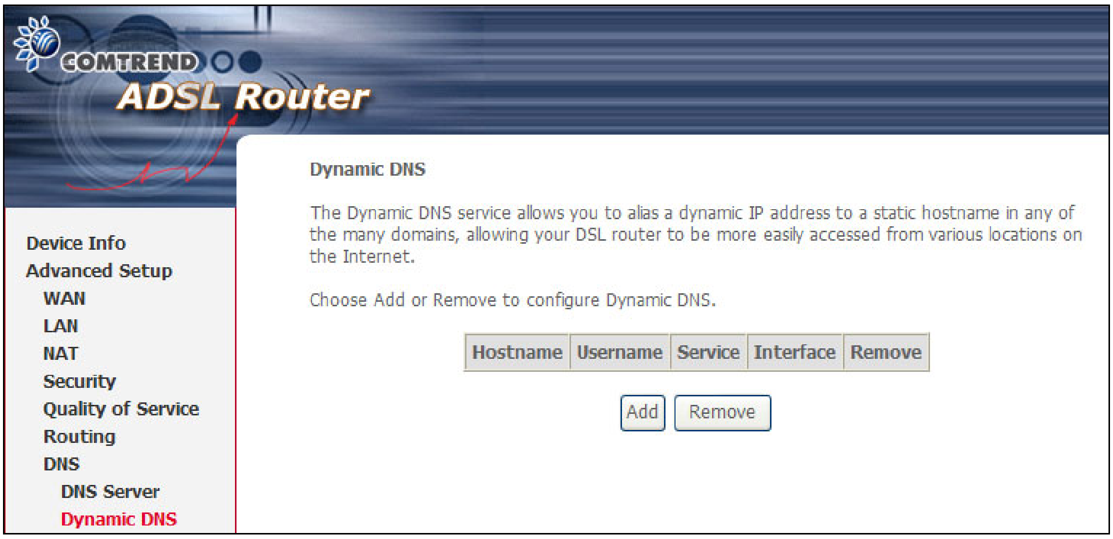
DNS Server Configuration

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

6.7.2 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 ADSL router to be more easily accessed from various locations on the Internet.



Dynamic DNS

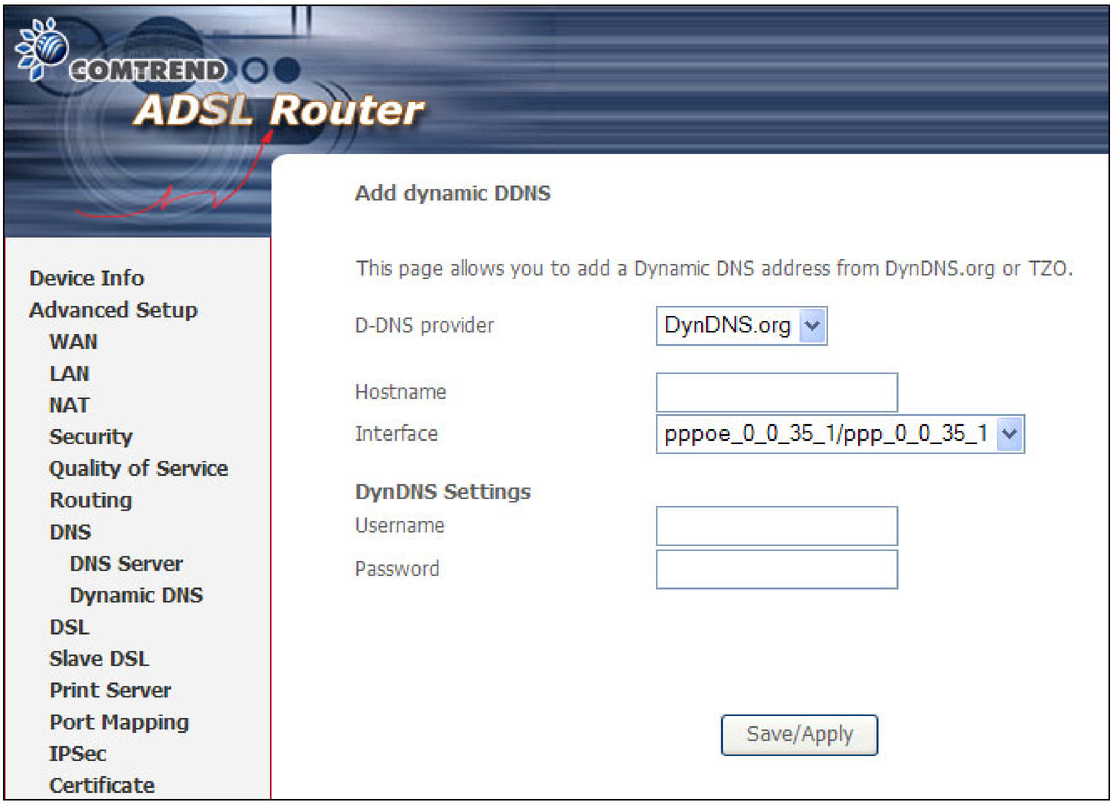
The Dynamic DNS service allows you to alias a dynamic IP address to a static hostname in any of the many domains, allowing your DSL router to be more easily accessed from various locations on the Internet.

Choose Add or Remove to configure Dynamic DNS.

Hostname	Username	Service	Interface	Remove

NOTE: The **Add** and **Remove** buttons will only be displayed if the CPE has already been assigned an IP address from the remote server.

To add a dynamic DNS service, click **Add** and the following screen will be displayed:



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_0_35_1/ppp_0_0_35_1

DynDNS Settings

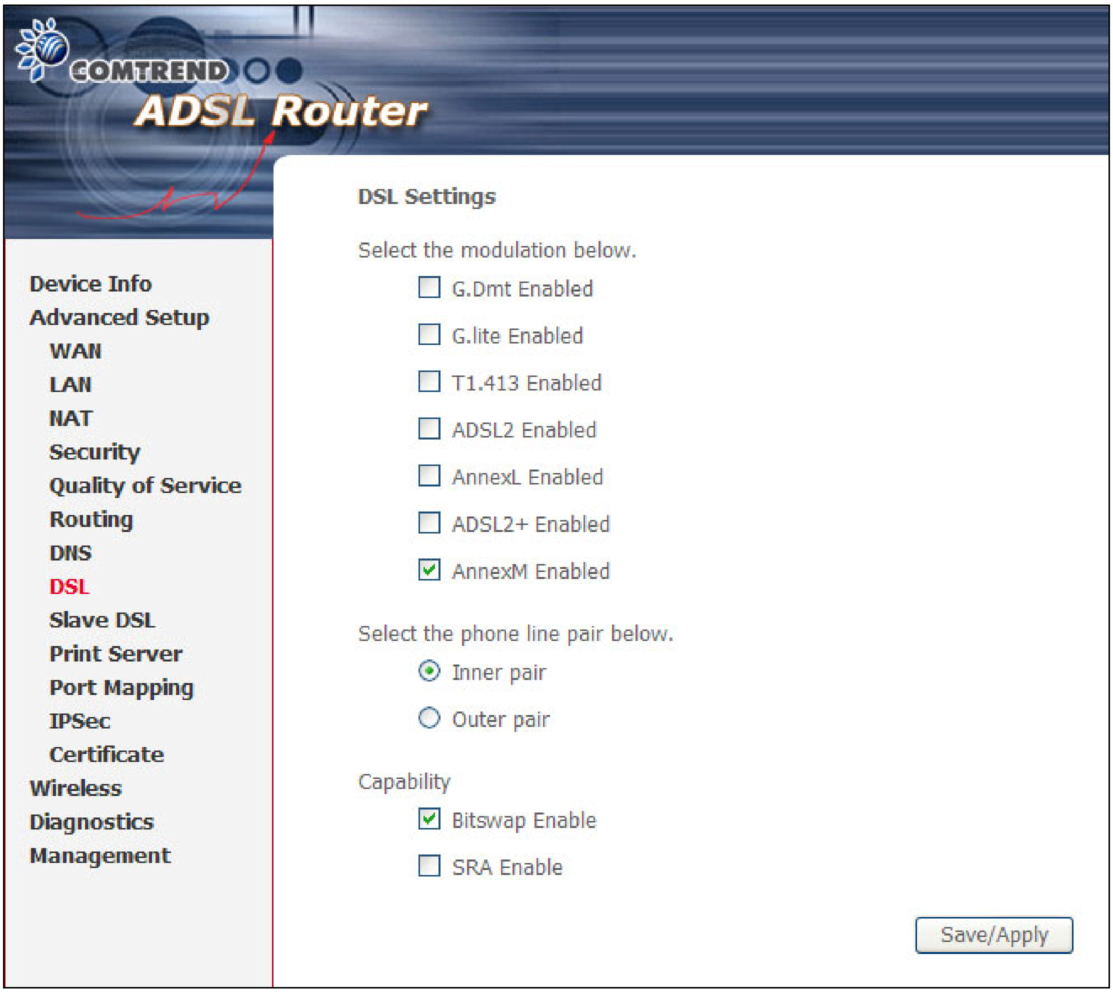
Username:

Password:

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 / Slave DSL

To access the ADSL settings, first click On **Advanced Setup** and then click on **DSL**. This screen shows the settings available for **ADSL1**. For **ADSL2** use **Slave DSL**.



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.

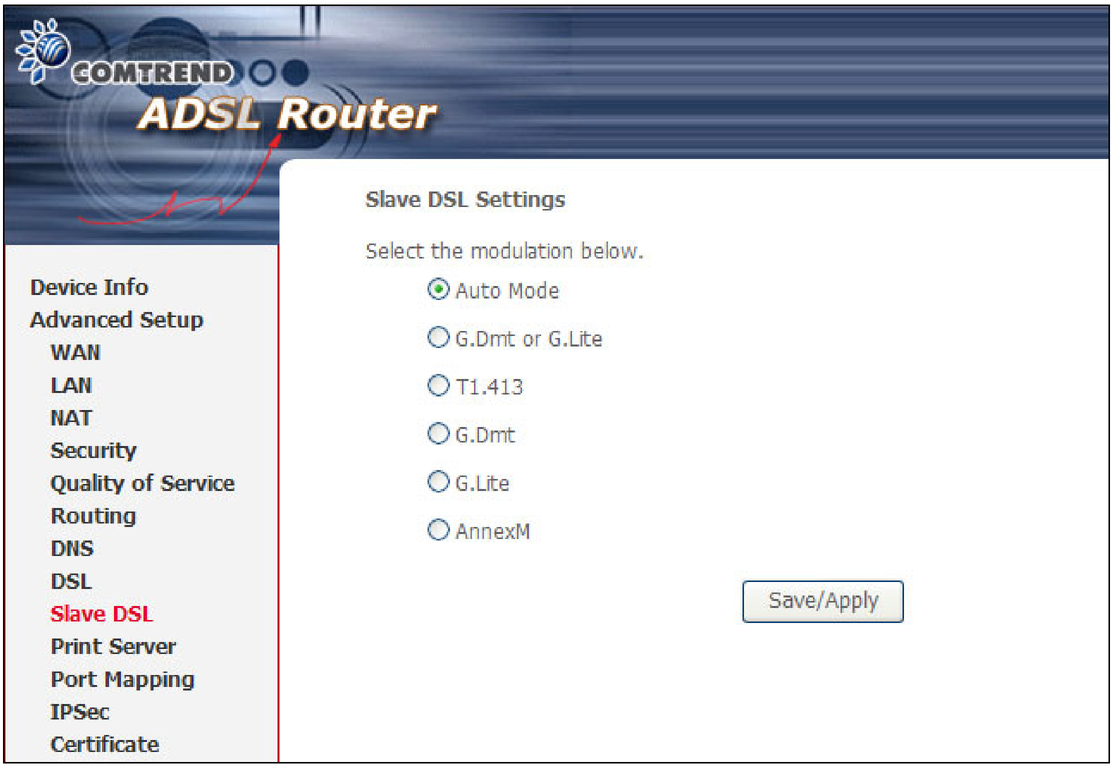
- ● Inner pair
- ○ Outer pair

Capability

- ☑ Bitswap Enable
- □ SRA Enable

NOTE: Annex M is enabled by default for this router.

The **Slave DSL** settings screen is shown below.



Slave DSL Settings

Select the modulation below.

● Auto Mode

○ G.Dmt or G.Lite

○ T1.413

○ G.Dmt

○ G.Lite

○ AnnexM

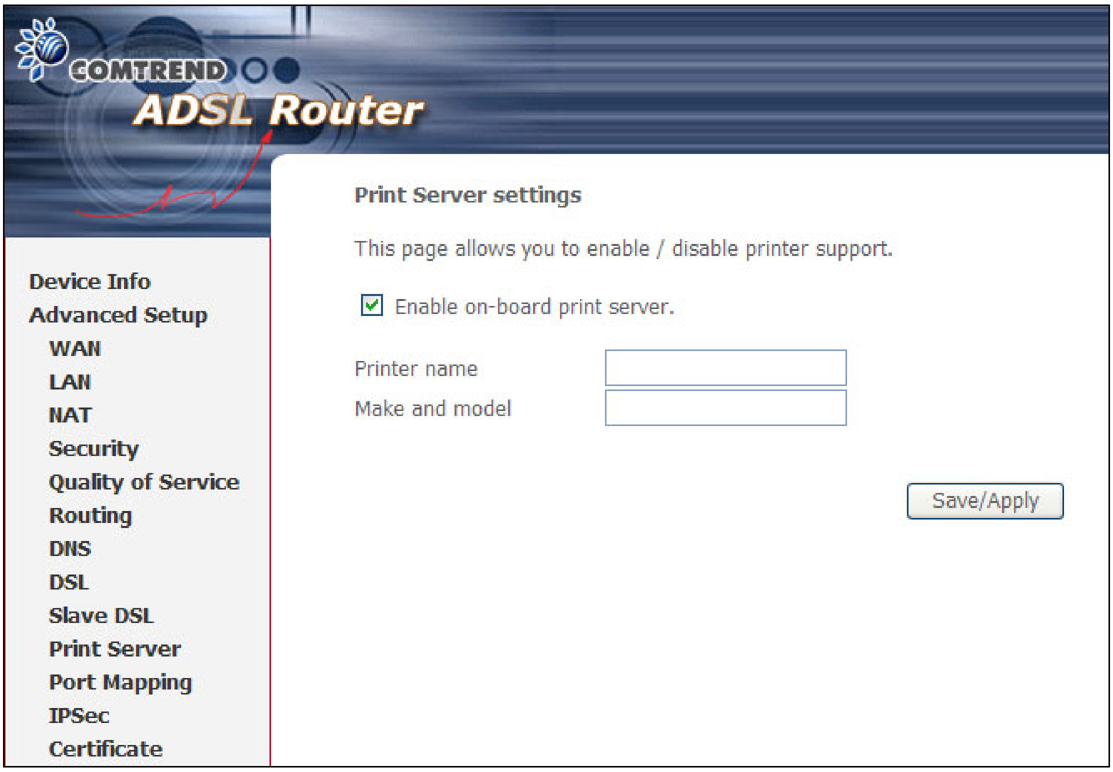
This table describes the DSL settings.

Option	Description
G.dmt Enabled	Sets G.Dmt if you want the system to use G.Dmt mode.
G.Lite Enabled	Sets G.Lite if you want the system to use G.Lite mode.
T1.413 Enabled	Sets the T1.413 if you want the system to use only T1.413 mode.
ADSL2 Enabled	The device can support the functions of the ADSL2.
AnnexL Enabled	The device can support/enhance the long loop test.
ADSL2+ Enabled	The device can support the functions of the ADSL2+.
AnnexM Enabled	Covers a higher "upstream" data rate version, by making use of some of the downstream channels.
Inner Pair	Reserved only
Outer Pair	Reserved only
Bitswap Enable	Allows bitswapping function
SRA Enable	Allows seamless rate adaptation

6.9 Print Server

This router is equipped with one high-speed USB2.0 host connection.   With software support, users can connect USB devices such as a printer and hard disc to the router. For this software release, printer server is supported.

Please refer to Appendix A: Printer Server for detailed installation instructions.



Print Server settings

This page allows you to enable / disable printer support.

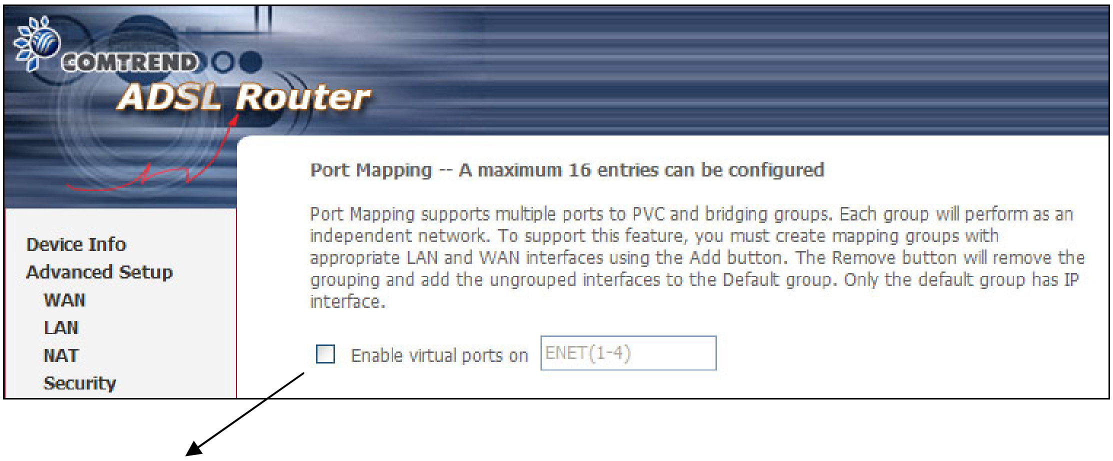
☑ Enable on-board print server.

Printer name	
Make and model	

6.10 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.

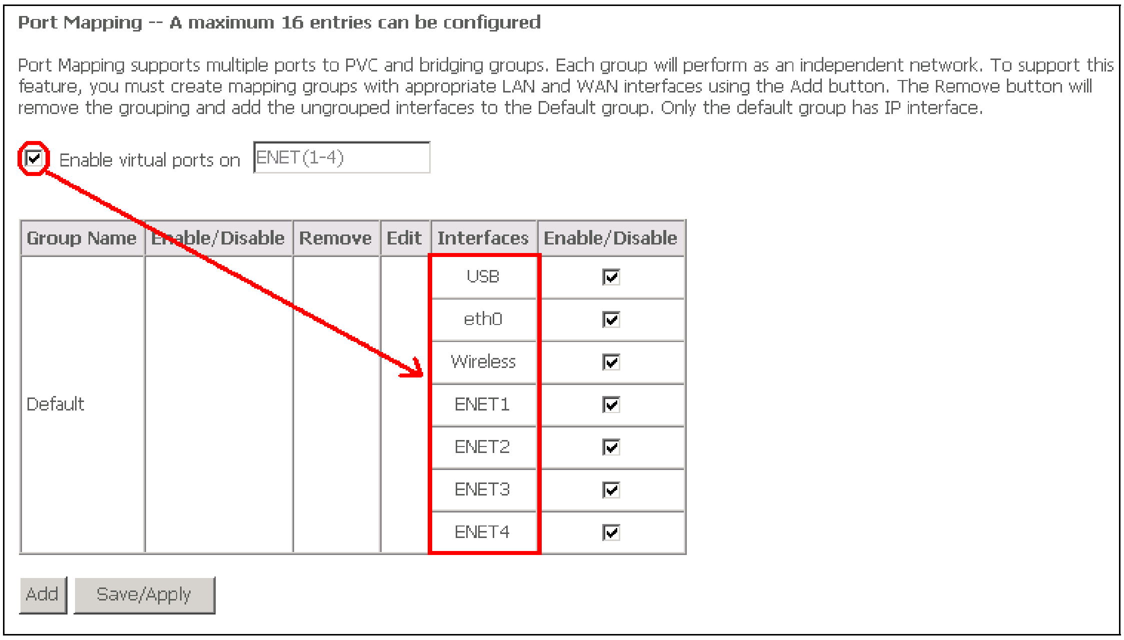
As shown below, when you tick the **Enable virtual ports on** checkbox, all of the LAN interfaces will be grouped together.



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 ENET(1-4)



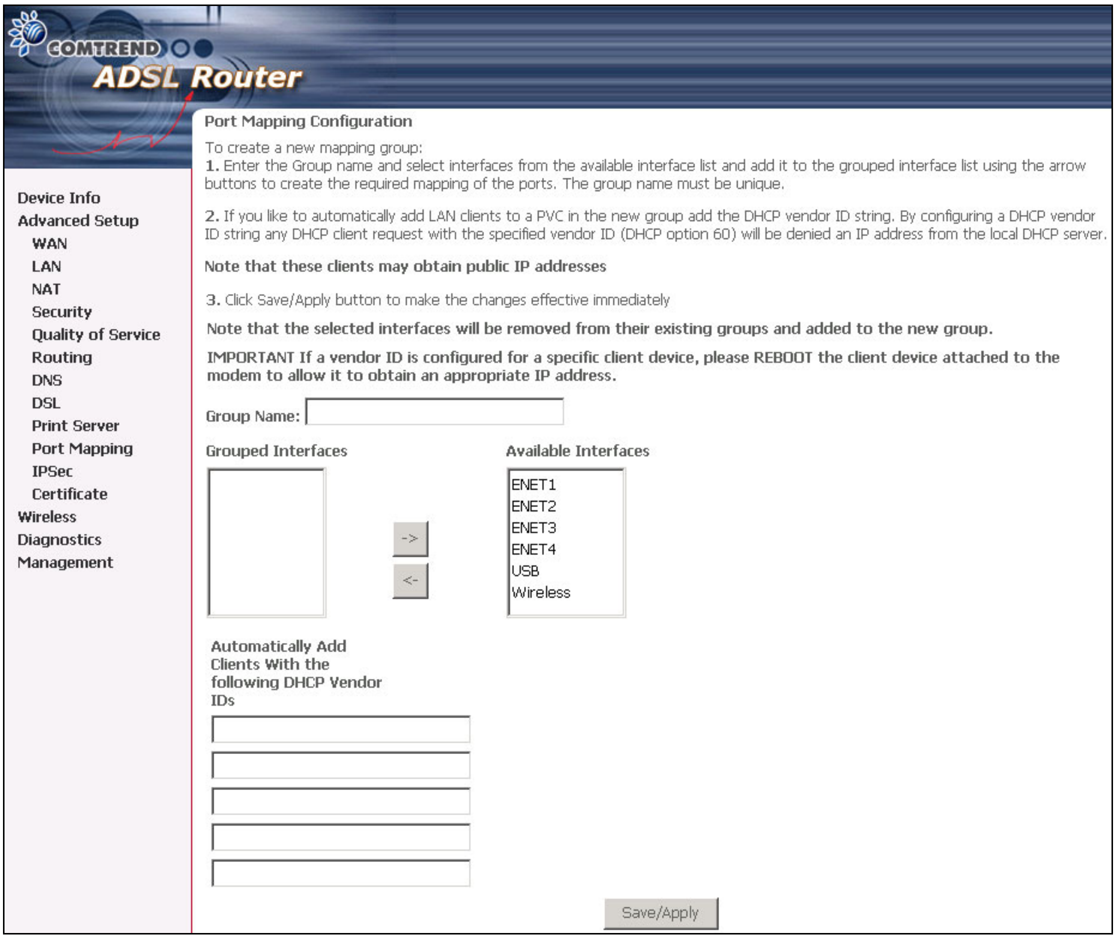
Port Mapping -- A maximum 16 entries can be configured

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 ENET(1-4)

Group Name	Enable/Disable	Remove	Edit	Interfaces	Enable/Disable
Default				USB	☑
				eth0	☑
				Wireless	☑
				ENET1	☑
				ENET2	☑
				ENET3	☑
				ENET4	☑

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

ENET1
ENET2
ENET3
ENET4
USB
Wireless

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 including Wireless and USB 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 4 PVCs (0/33, 0/36, 0/37, 0/38). VPI/VCI=0/33 is for PPPoE and the others are for IP set-top box (video). The LAN interfaces are ENET1, ENET2, ENET3, ENET4, Wireless and USB.

The Port Mapping configuration is:

1. Default: ENET1, ENET2, ENET3, ENET4, Wireless and USB.

2. Video: nas_0_36, nas_0_37 and nas_0_38. The DHCP vendor ID is "Video".

The CPE deco server is running on "Default". And ISP's deco server is running on PVC 0/36. It is for set-top box use only.

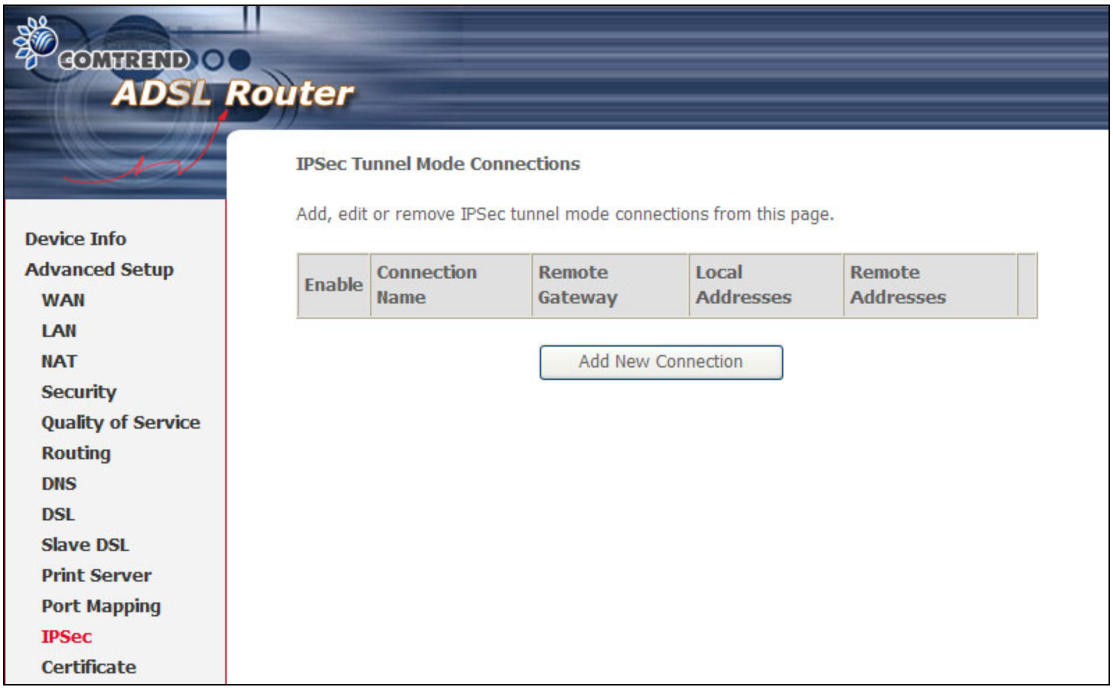
On the LAN side, the PC can get IP address from CPE deco server and access the Internet via PPPoE (0/33).

If the set-top box was connected with interface "ENET1" and send a deco request with vendor id "Video", the CPE deco server would forward this request to ISP's deco server.   Then the CPE will change the PortMapping configuration automatically.

The Port Mapping configuration will become:
1. Default: ENET2, ENET3, ENET4, Wireless and USB.
2. Video: nas_0_36, nas_0_37, nas_0_38 and ENET1.

6.11 IPSec

You can add, edit or remove IPSec tunnel mode connections from this page.



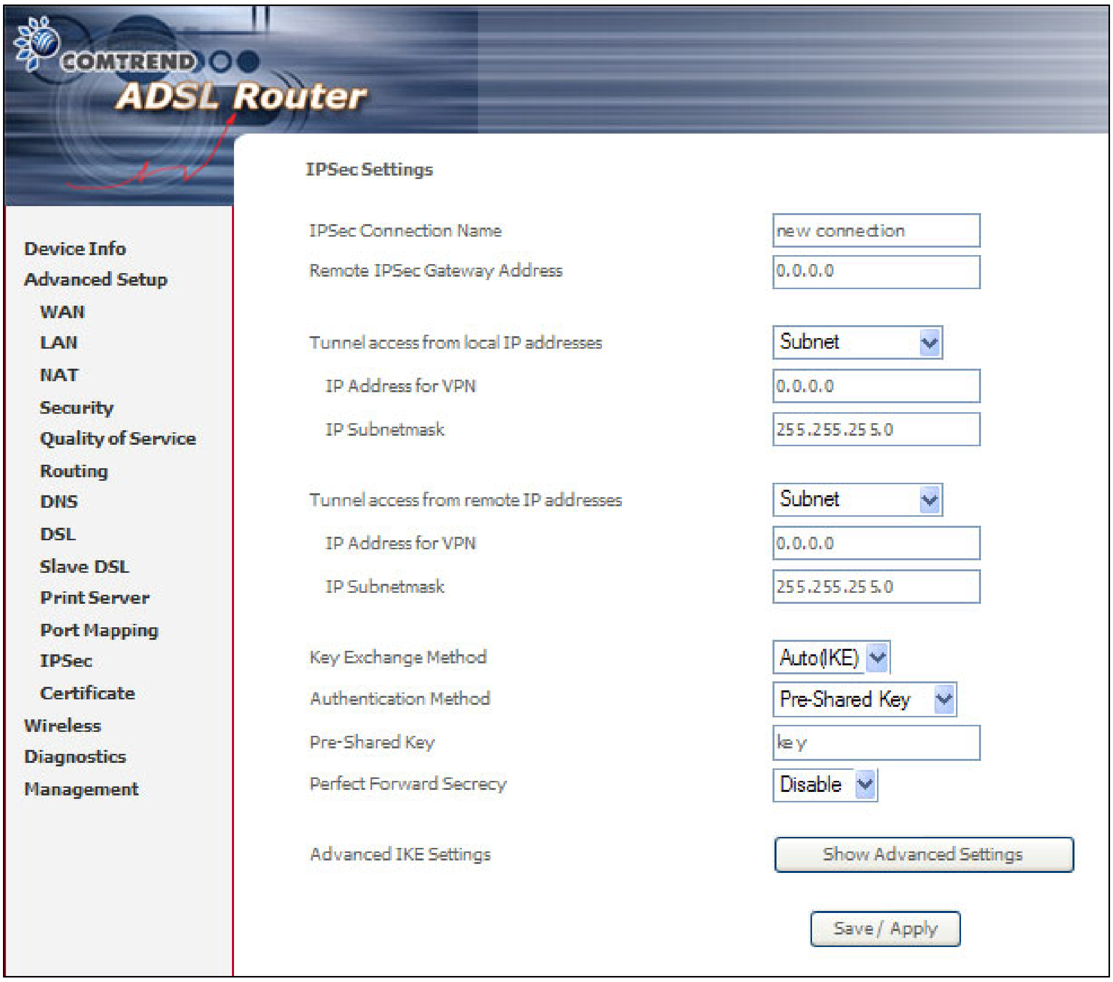
IPSec Tunnel Mode Connections

Add, edit or remove IPSec tunnel mode connections from this page.

Enable	Connection Name	Remote Gateway	Local Addresses	Remote Addresses

By clicking **Add New Connection**, you can add a new IPSec termination rule.

The following screen will display.



IPSec Settings

IPSec Connection Name	new connection
Remote IPSec Gateway Address	0.0.0.0
Tunnel access from local IP addresses	Subnet
IP Address for VPN	0.0.0.0
IP Subnetmask	255.255.255.0
Tunnel access from remote IP addresses	Subnet
IP Address for VPN	0.0.0.0
IP Subnetmask	255.255.255.0
Key Exchange Method	Auto(IKE)
Authentication Method	Pre-Shared Key
Pre-Shared Key	key
Perfect Forward Secrecy	Disable
Advanced IKE Settings	Show Advanced Settings

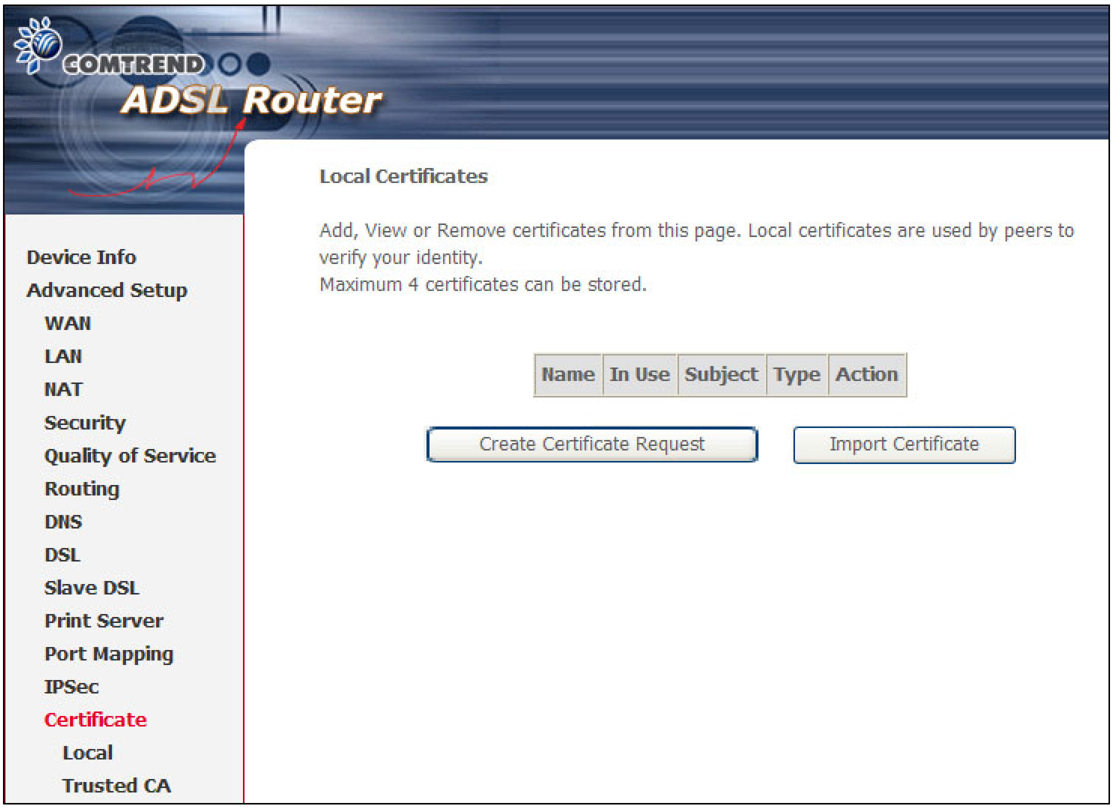
IPSec Connection Name	User-defined label
Remote IPSec Gateway Address (IP or Domain Name)	The IP address of remote tunnel Gateway, and you can use numeric address and domain name
Tunnel access from local IP addresses	It chooses methods that specify the acceptable host IP on the local side. It has single and subnet.
IP Address for VPN	If you choose "single", please entry the host IP address for VPN. If you choose "subnet", please entry the subnet information for VPN.
Tunnel access from remote IP addresses	It chooses methods that specify the acceptable host IP on the remote side. It has single and subnet.
IP Address for VPN	If you choose "single", please entry the host IP address for VPN. If you choose "subnet", please entry the subnet information for VPN.

Key Exchange Method	It has two modes. One is auto and the other is manual.
Authentication Method	It has either pre-shared key or x.509.
Pre-Shared Key	Input Pre-shared key
Perfect Forward Secrecy	Enable/disable the method that is Perfect Forward Secrecy.
Advanced IKE Settings	On IPSec Auto mode, you need to choose the setting of two phases. Click the button then choose which modes, Encryption Algorithm, Integrity Algorithm, Select Diffie-Hellman Group for Key Exchange, key time on different phases.

6.12 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, this indicates that these signatories have verified that the certificate is valid.

6.12.1 Local



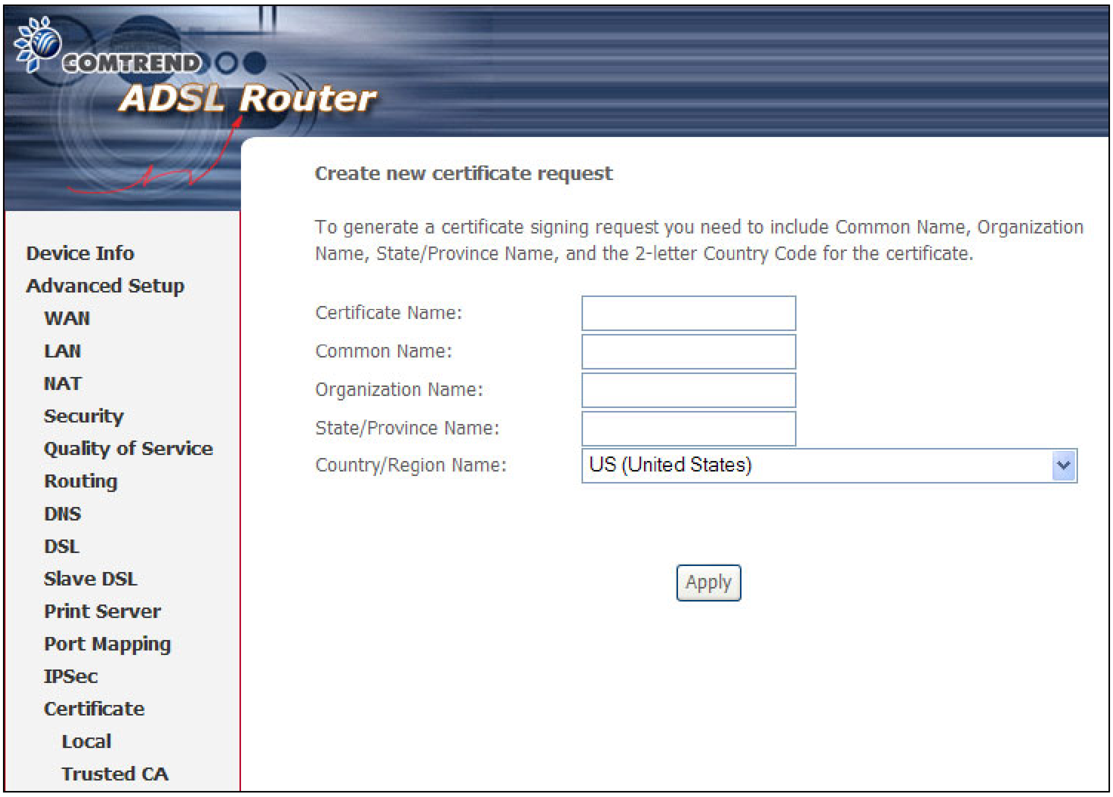
Local Certificates

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

Certificate Name	A user-defined name for the certificate.
Common Name	Usually, it is the fully qualified domain name for 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.

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. Actually, your vendor/ISP/ITSP will ask you to provide the information they require and to provide the information in the format they regulate. The explanation for each column in the following table is only for reference.



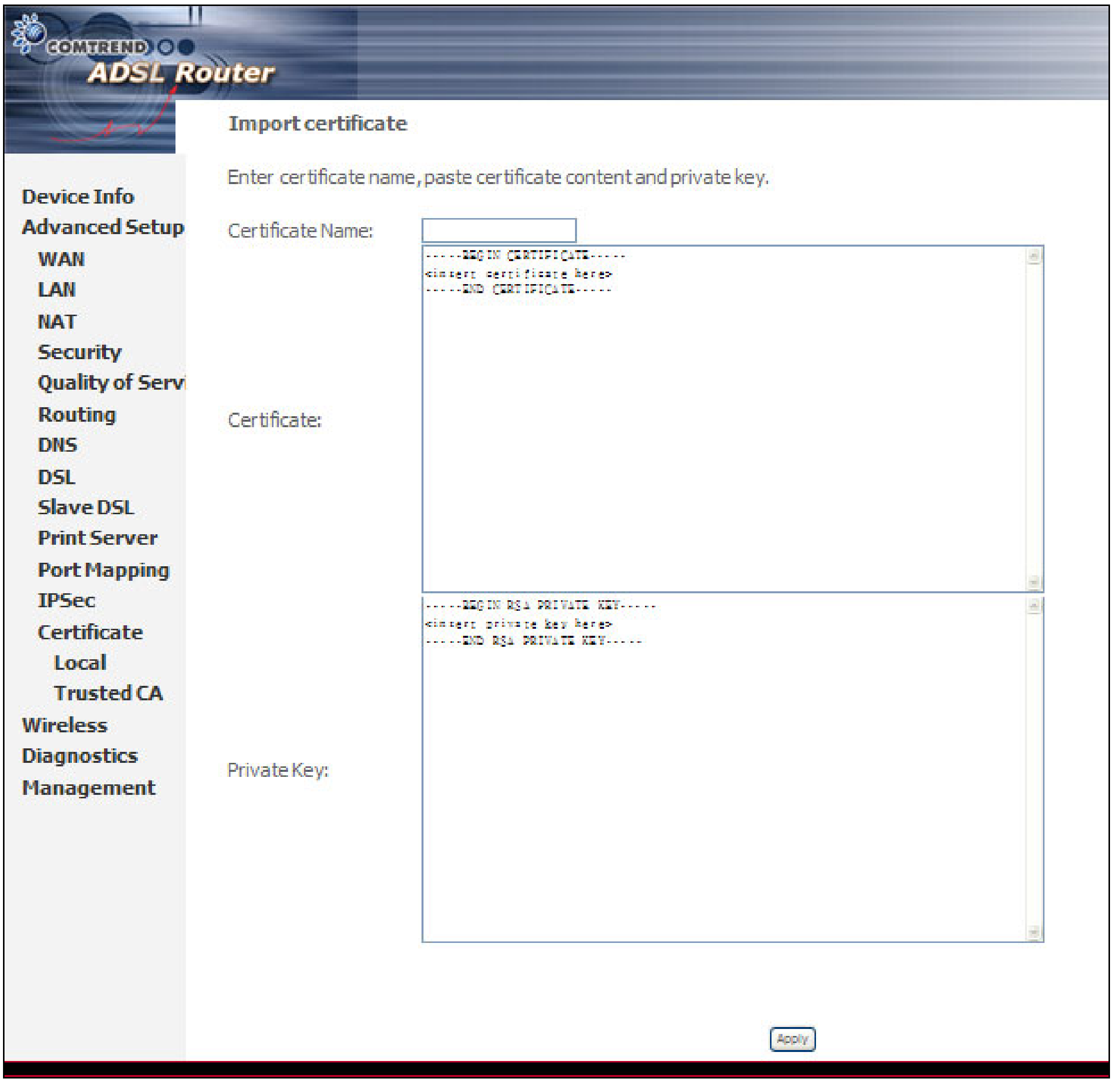
Create new certificate request

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.



Import certificate

Enter certificate name, paste certificate content and private key.

Certificate Name:

Certificate:

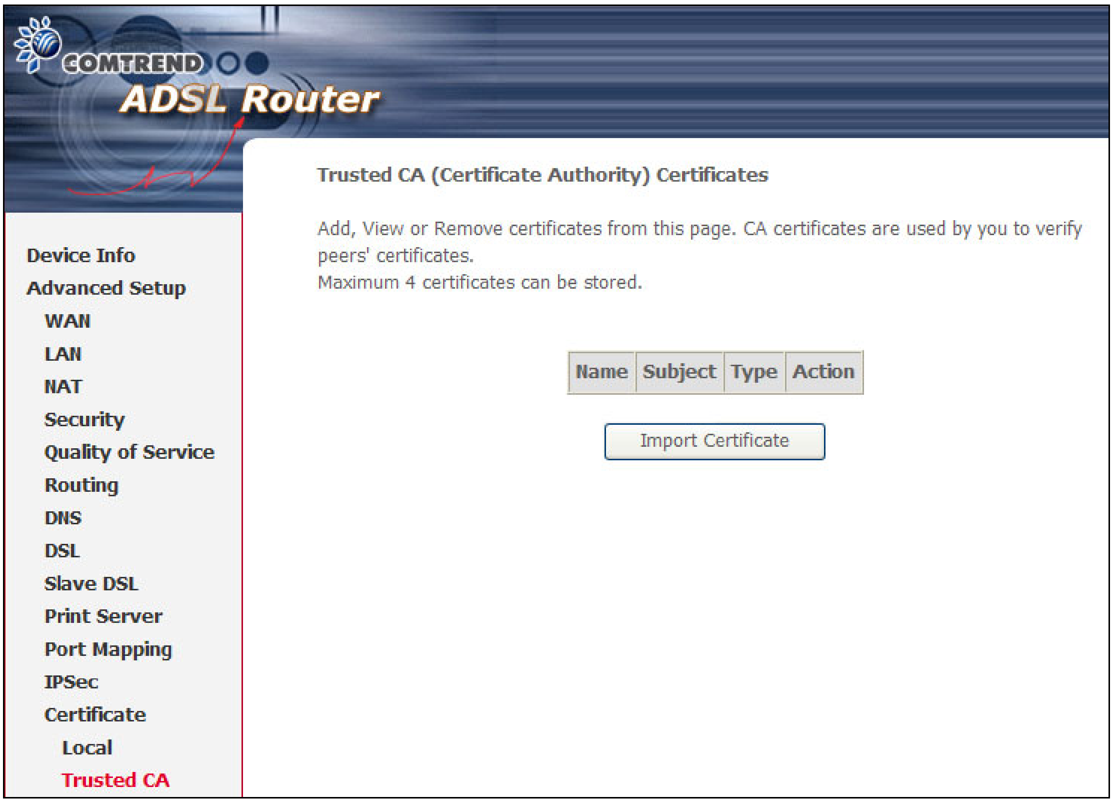
```
-----BEGIN CERTIFICATE-----
<insert certificate here>
-----END CERTIFICATE-----
```

Private Key:

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

6.12.2 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 the owner information of that certificate is correct.

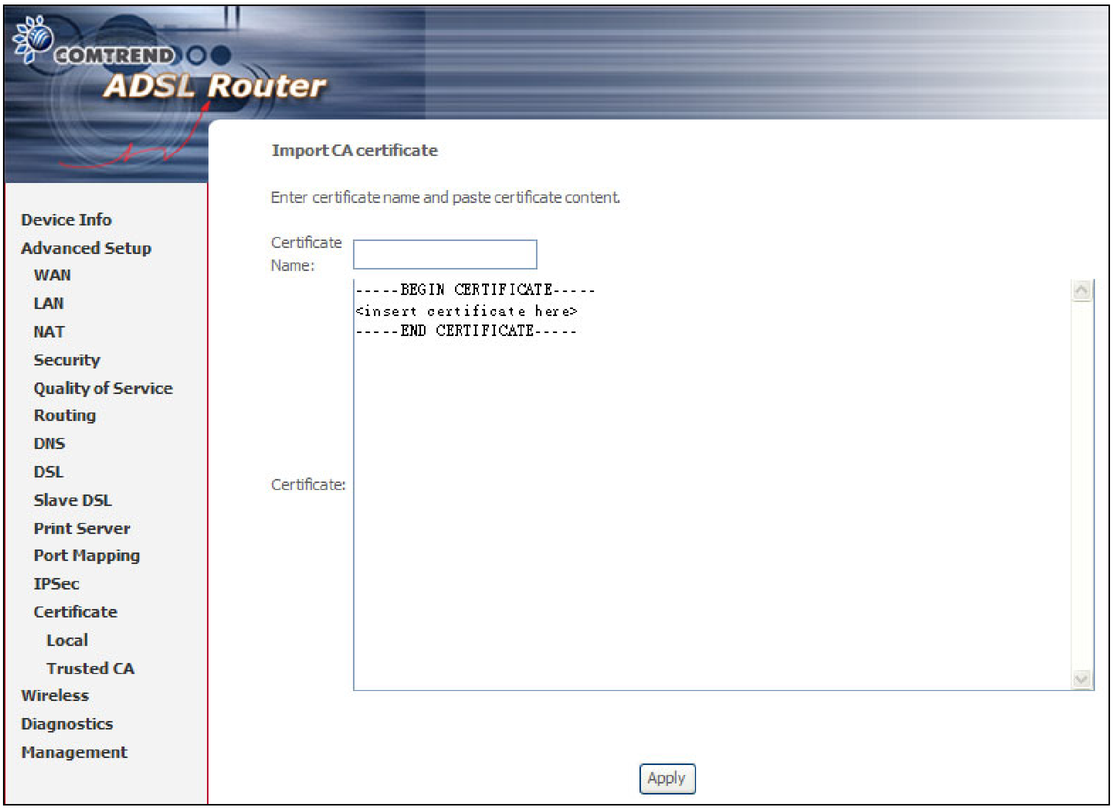


Trusted CA (Certificate Authority) Certificates

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. Generally speaking, 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:

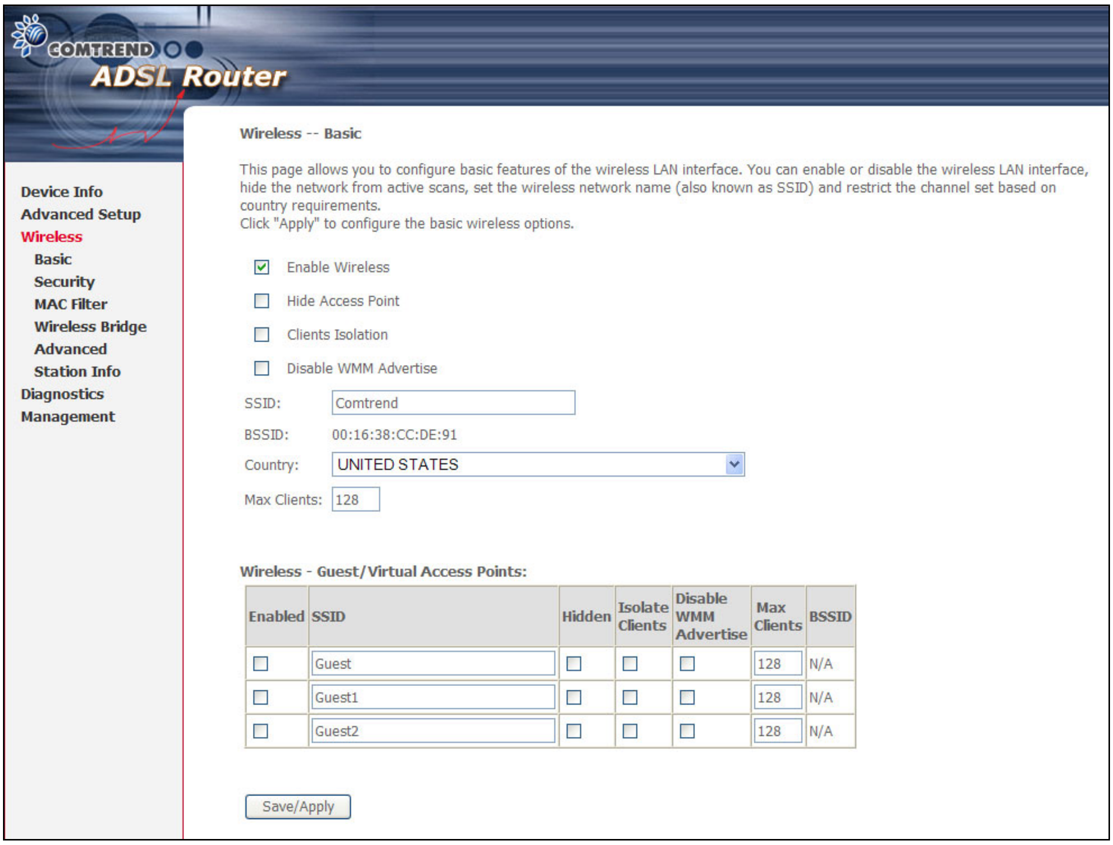
```
-----BEGIN CERTIFICATE-----
<insert certificate here>
-----END CERTIFICATE-----
```

Chapter 7 Wireless

The Wireless dialog box allows you to enable the wireless capability, hide the access point, set the wireless network name and restrict the channel set.

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.



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

□ Clients Isolation

□ Disable WMM Advertise

SSID: Comtrend

BSSID: 00:16:38:CC:DE:91

Country: UNITED STATES

Max Clients: 128

Wireless - Guest/Virtual Access Points:

Enabled	SSID	Hidden	Isolate Clients	Disable WMM Advertise	Max Clients	BSSID
□	Guest	□	□	□	128	N/A
□	Guest1	□	□	□	128	N/A
□	Guest2	□	□	□	128	N/A

Save/Apply

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

Consult the table below for descriptions of these options.

Option	**Description**
Enable Wireless	A checkbox that enables or disables the wireless LAN interface. When selected, the Web UI displays Hide Access point, SSID, and County settings. Wireless is enabled by default.

Hide Access Point	Select Hide Access Point to protect the access point from detection by wireless active scans. If you do not want the access point to be automatically detected by a wireless station, this checkbox should be de-selected. The station will not discover this access point. To connect a station to the available access points, the station must manually add this access point name in its wireless configuration. In Windows XP, go to the Network → Programs function to view all of the available access points. You can also use other software programs such as NetStumbler to view available access points.
Clients Isolation	1. Prevents clients PC from seeing one another in My Network Places or Network Neighborhood. 2. Prevents one wireless client communicating with another wireless client.
Disable WMM Advertise	Stops the router from 'advertising' its Wireless Multimedia (WMM) functionality, which provides basic quality of service for time-sensitive applications (e.g. VoIP, Video). (wireless software version 3.10 and above)
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. The naming conventions are: Minimum is one character and maximum number of characters: 32 bytes.
BSSID	The BSSID is a 48bit identity used to identify a particular BSS (Basic Service Set) within an area. In Infrastructure BSS networks, the BSSID is the MAC (Medium 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 county listed in the menu enforces specific regulations limiting channel range: • US= worldwide • Japan=1-14 • Jordan= 10-13 • Israel= 1-13
Max Clients	The maximum number of clients that can access the router.

Wireless - Guest / Virtual Access Points	This router supports multiple SSIDs called Guest SSIDs or Virtual Access Points. To enable one or more Guest SSIDs select the radio buttons under the **Enable** heading. To hide a Guest SSID select its radio button under the **Hidden** heading. Do the same for **Isolate Client** and **Disable WMM Advertise** functions. For a description of these two functions, see the entries for "Clients Isolation" and "Disable WMM Advertise" in this table. Similarly, for **Max Clients** and **BSSID** headings, consult the matching entries in this table. **NOTE:** Remote wireless hosts are unable to scan Guest SSIDs.

7.2 Security

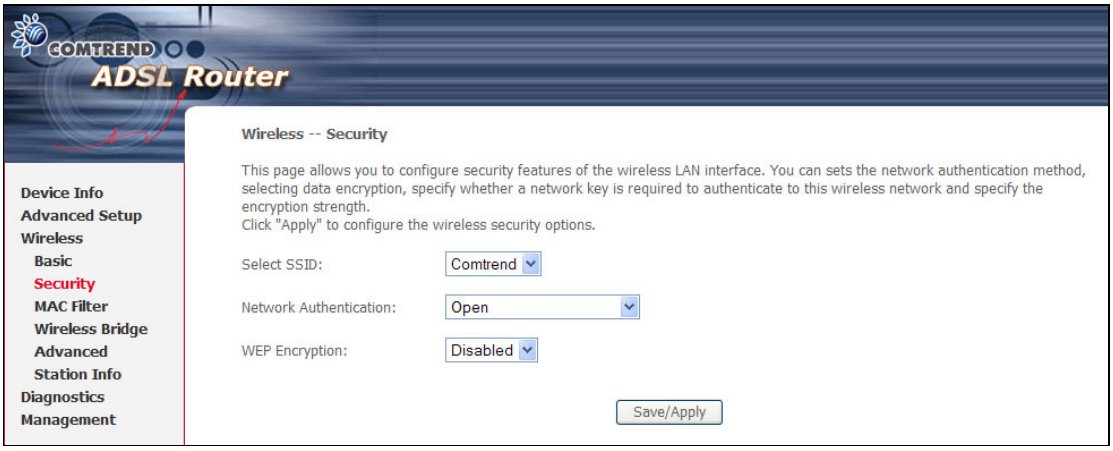
Security options include authentication and encryption services based on the wired equivalent privacy (WEP) algorithm. WEP is a set of security services used to protect 802.11 networks from unauthorized access, such as eavesdropping; in this case, the capture of wireless network traffic. When data encryption is enabled, secret shared encryption keys are generated and used by the source station and the destination station to alter frame bits, thus avoiding disclosure to eavesdroppers.

802.11 supports two subtypes 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.

Under shared key authentication, each wireless station is assumed to have received a secret shared key over a secure channel that is independent from 802.11 wireless network communications channel.

The following screen appears when Security is selected. The Security page allows you to configure security features of the wireless LAN interface. 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 **Apply** to configure the wireless security options.



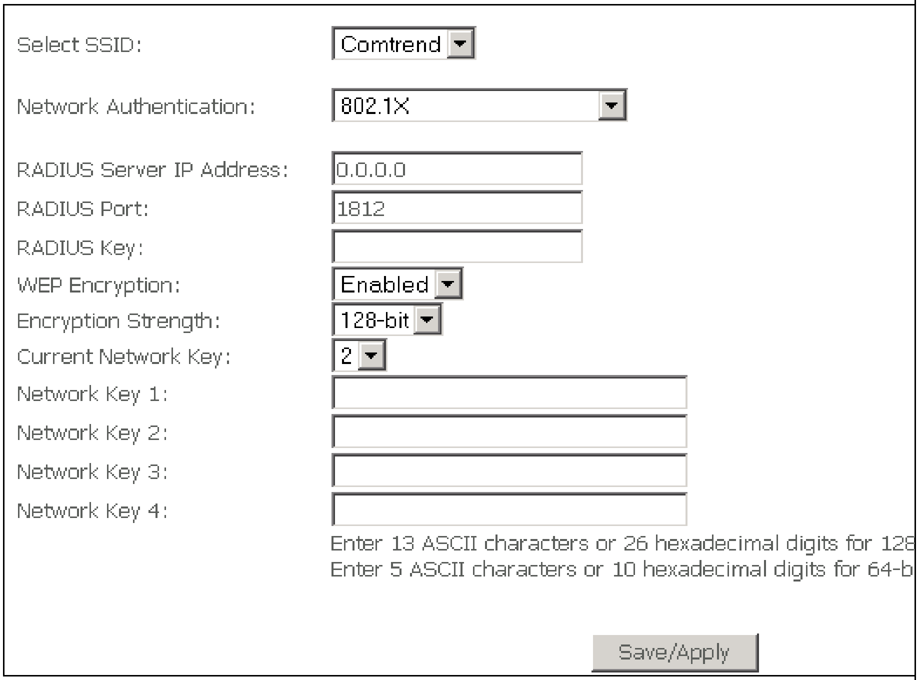
Wireless -- Security

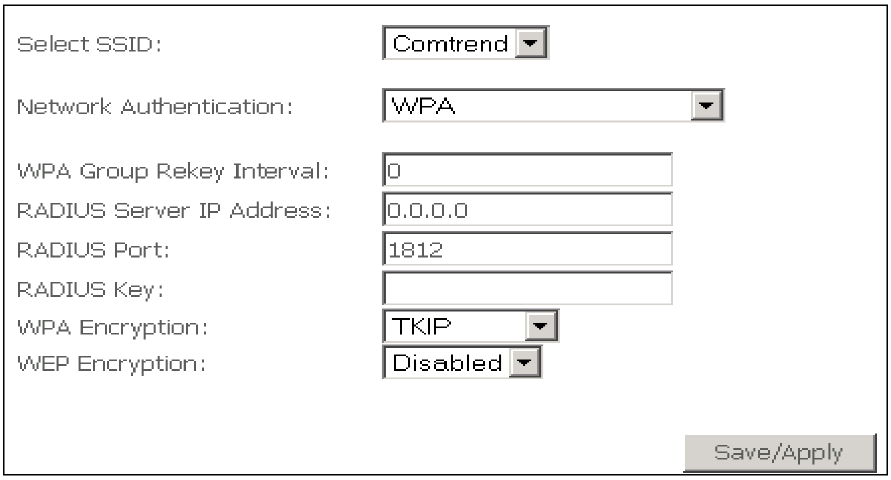
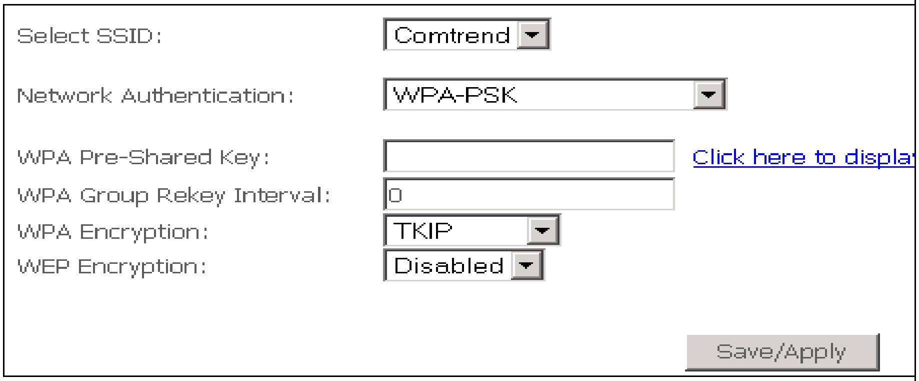
This page allows you to configure security features of the wireless LAN interface. You can sets the network authentication method, selecting data encryption, specify whether a network key is required to authenticate to this wireless network and specify the encryption strength.
Click "Apply" to configure the wireless security options.

Select SSID: Comtrend

Network Authentication: Open

WEP Encryption: Disabled

Option	**Description**
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. The naming conventions are: Minimum is one character and maximum number of characters: 32 bytes.
Network Authentication	It specifies the network authentication. When this checkbox is selected, it specifies that a network key be used for authentication to the wireless network. If the Network Authentication (Shared mode) checkbox is not shared (that is, if open system authentication is used), no authentication is provided. Open system authentication only performs identity verifications. Different authentication type pops up different settings requests. Choosing **802.1X**, enter RADIUS Server IP address, RADIUS Port, and RADIUS key. Also, enable WEP Encryption and the Encryption Strength.  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 Enter 5 ASCII characters or 10 hexadecimal digits for 64-b Select the Current Network Key and enter 13 ASCII characters or 26 hexadecimal digits for 128-bit encryption keys and enter 5 ASCII characters or 10 hexadecimal digits for 64-bit encryption keys.

	Choosing **WPA**, you must enter WPA Group Rekey Interval.  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 Save/Apply Choosing **WPA-PSK**, you must enter WPA Pre-Shared Key and Group Rekey Interval.  Select SSID: Comtrend Network Authentication: WPA-PSK WPA Pre-Shared Key: Click here to displa WPA Group Rekey Interval: 0 WPA Encryption: TKIP WEP Encryption: Disabled Save/Apply
WEP Encryption	It specifies that a network key is used to encrypt the data is sent over the network. When this checkbox is selected, it enables data encryption and prompts the Encryption Strength drop-down menu. Data Encryption (WEP Enabled) and Network Authentication use the same key.
Encryption strength	A session's key strength is proportional to the number of binary bits comprising the session key file. This means that session keys with a greater number of bits have a greater degree of security, and are considerably more difficult to forcibly decode. This drop-down menu sets either a 64 8-bit (5-ASCII character or 10-hexadecimal character) or 128 8-bit (13-ASCII character or 26-hexadecimal character) key. If you set a minimum 128-bit key strength, users attempting to establish a secure communications channel with your server must use a browser capable of communicating with a 128-bit session key. The Encryption Strength settings do not display unless the network Authentication (shared Mode) check box is selected.

7.3 MAC Filter

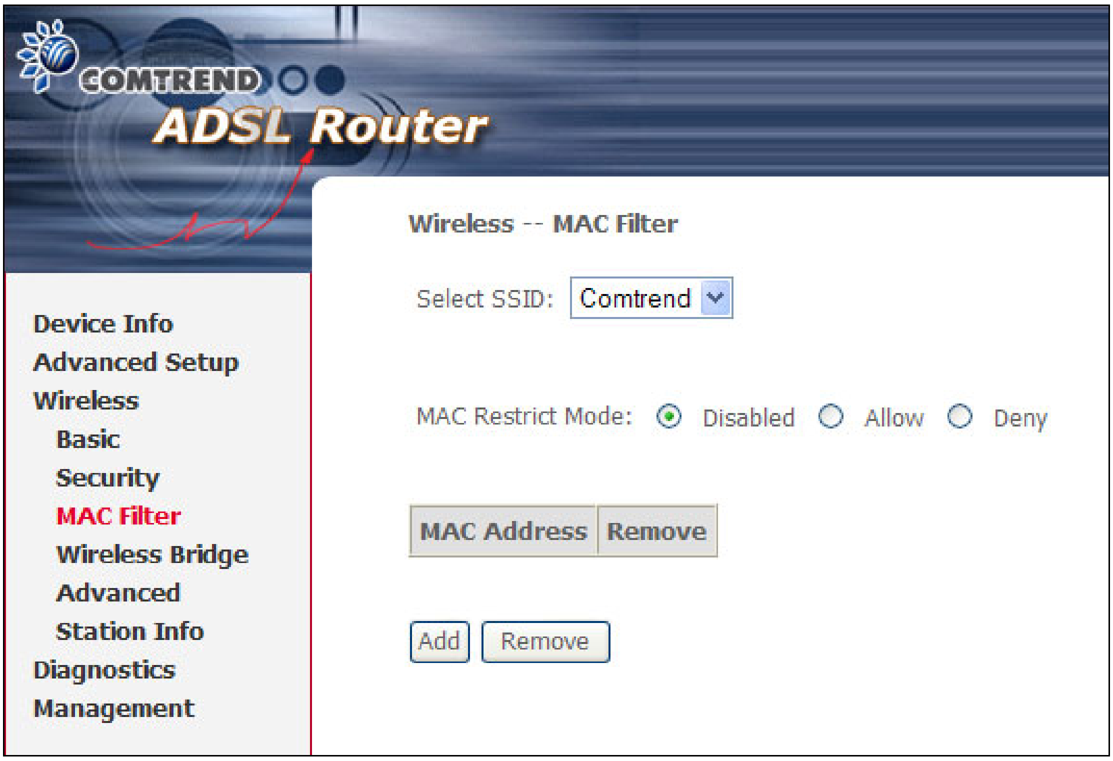
This MAC Filter page allows access to be restricted or allowed based on a MAC address. All NICs have a unique 48-bit MAC address burned into the ROM chip on the card. When MAC address filtering is enabled, you are restricting the NICs that are allowed to connect to your access point. Therefore, an access point will grant access to any computer that is using a NIC whose MAC address is on its "allows" list.

WiFi devices and access points that support MAC filtering let you specify a list of MAC addresses that may connect to the access point, and thus dictate what devices are authorized to access the wireless network. When a device is using MAC filtering, any address not explicitly defined will be denied access.

MAC Restrict mode: **Off**- disables MAC filtering; **Allow** – permits **access** for the specified MAC address; **deny**; reject access of the specified MAC address, then click the **SET** button.

To delete an entry**,** select the entry at the bottom of the screen and then click the **Remove** button, located on the right hand side of the screen.

To add a MAC entry, click **Add** and enter MAC address



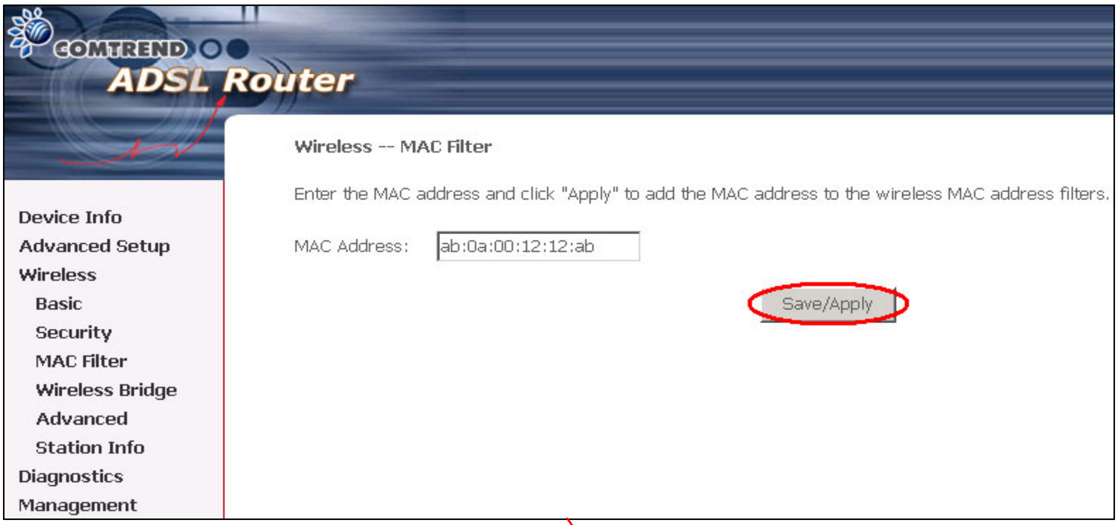
Wireless -- MAC Filter

Select SSID: Comtrend

MAC Restrict Mode: ● Disabled ○ Allow ○ Deny

MAC Address	Remove

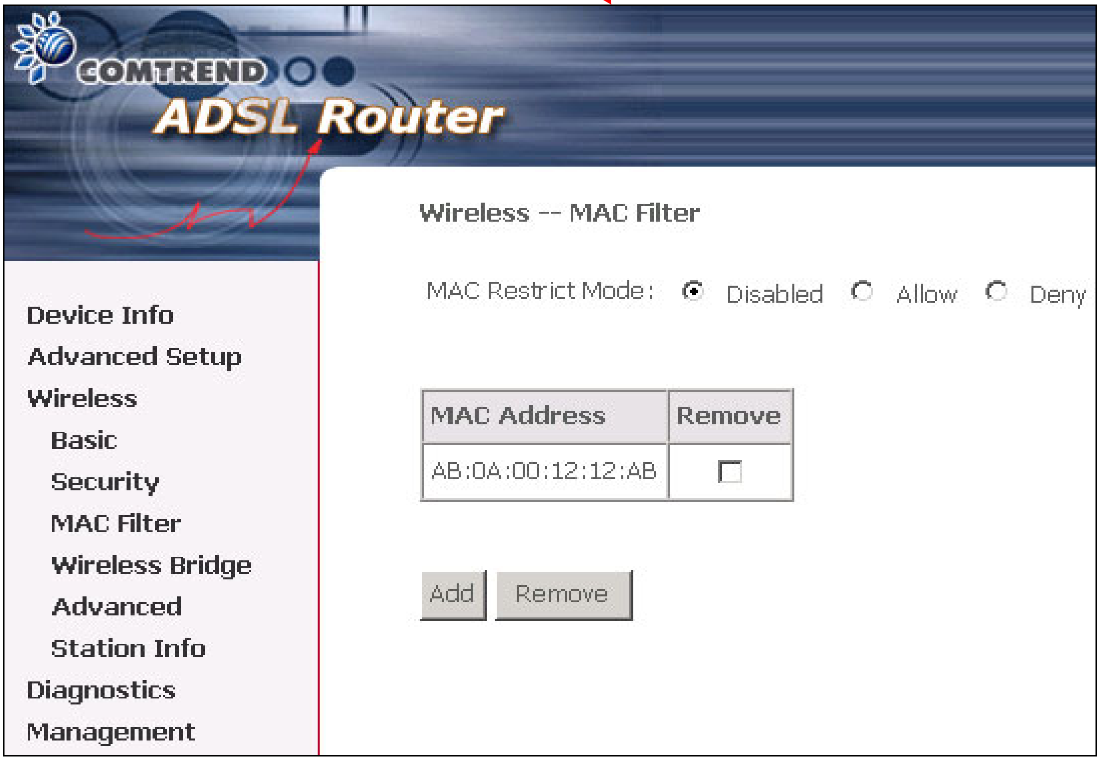
After clicking the **Add** button, the following screen appears. Enter the MAC address and click **Apply** to add the MAC address to the wireless MAC address filters.



Wireless -- MAC Filter

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

MAC Address: ab:0a:00:12:12:ab



Wireless -- MAC Filter

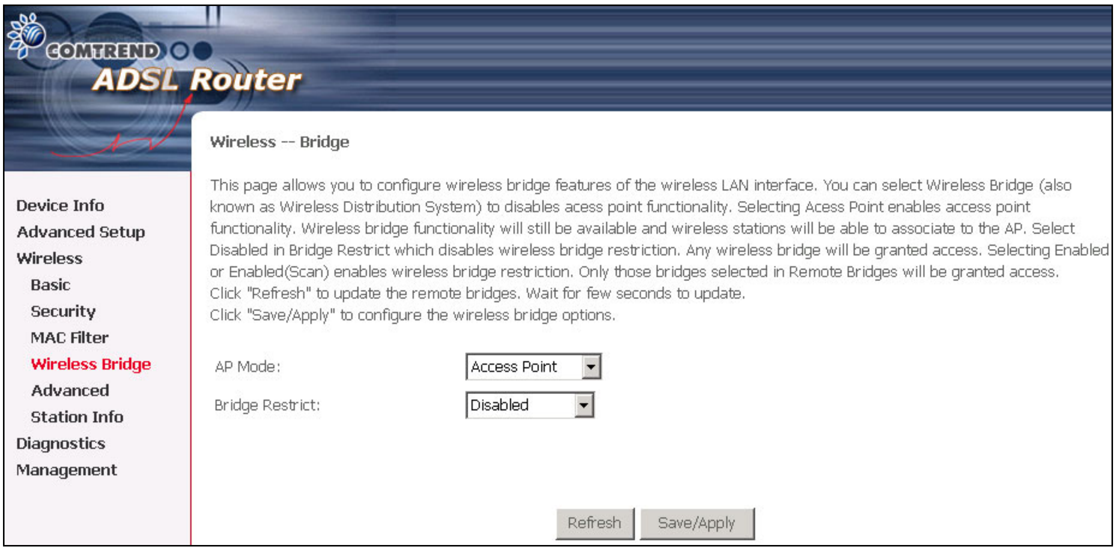
MAC Restrict Mode: ● Disabled ○ Allow ○ Deny

MAC Address	Remove
AB:0A:00:12:12:AB	□

Option	Description
MAC Restrict Mode	Radio buttons that allow settings of; Off: MAC filtering function is disabled. Allow: Permits PCs with listed MAC addresses to connect to access point. Deny: Prevents PCs with listed MAC from connecting to the access point.
MAC Address	Lists the MAC addresses subject to the Off, Allow, or Deny instruction. 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. The maximum number of MAC addresses that can be added is 60.

7.4 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 disable 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.



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 acess point functionality. Selecting Acess 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

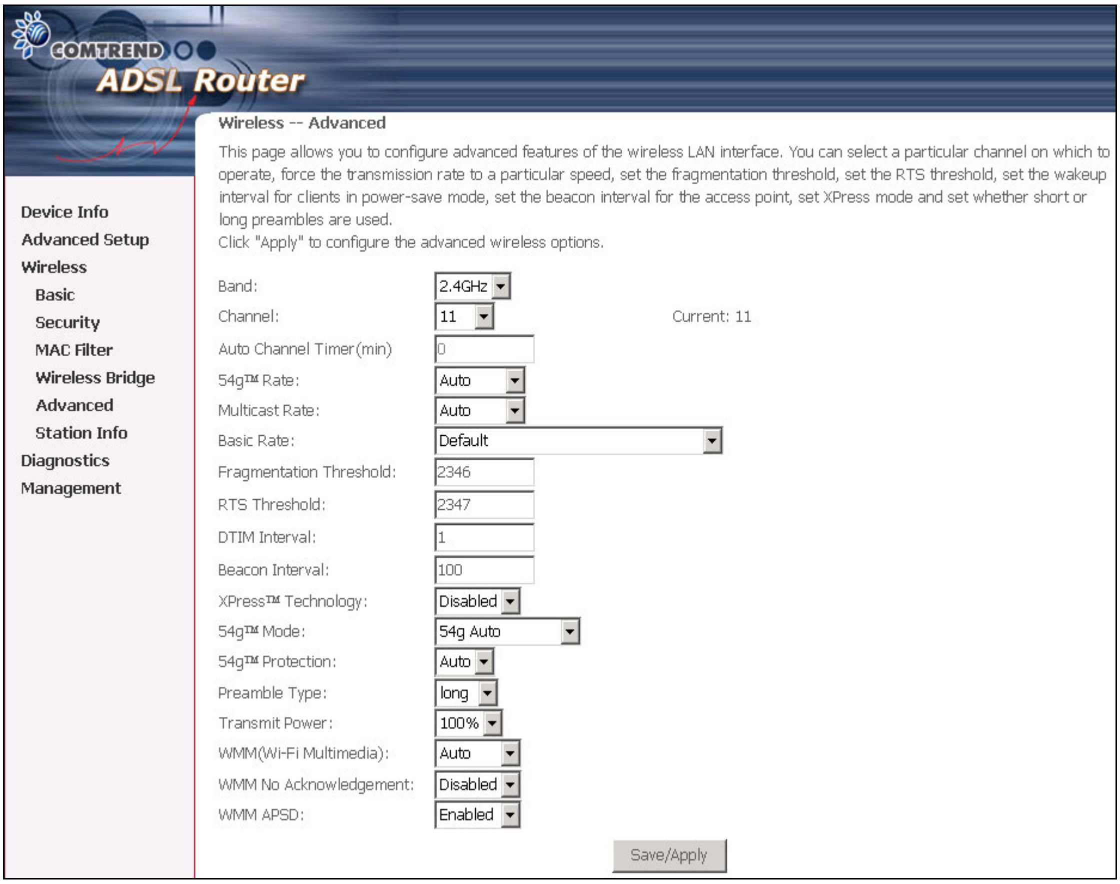
Bridge Restrict: Disabled

Feature	Options
AP Mode	Access Point Wireless Bridge
Bridge Restrict	Enabled Enabled (Scan) Disabled

7.5 Advanced

The Advanced 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.



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.

Band:	2.4GHz	
Channel:	11	Current: 11
Auto Channel Timer(min)	0	
54g™ Rate:	Auto	
Multicast Rate:	Auto	
Basic Rate:	Default	
Fragmentation Threshold:	2346	
RTS Threshold:	2347	
DTIM Interval:	1	
Beacon Interval:	100	
XPress™ Technology:	Disabled	
54g™ Mode:	54g Auto	
54g™ Protection:	Auto	
Preamble Type:	long	
Transmit Power:	100%	
WMM(Wi-Fi Multimedia):	Auto	
WMM No Acknowledgement:	Disabled	
WMM APSD:	Enabled	

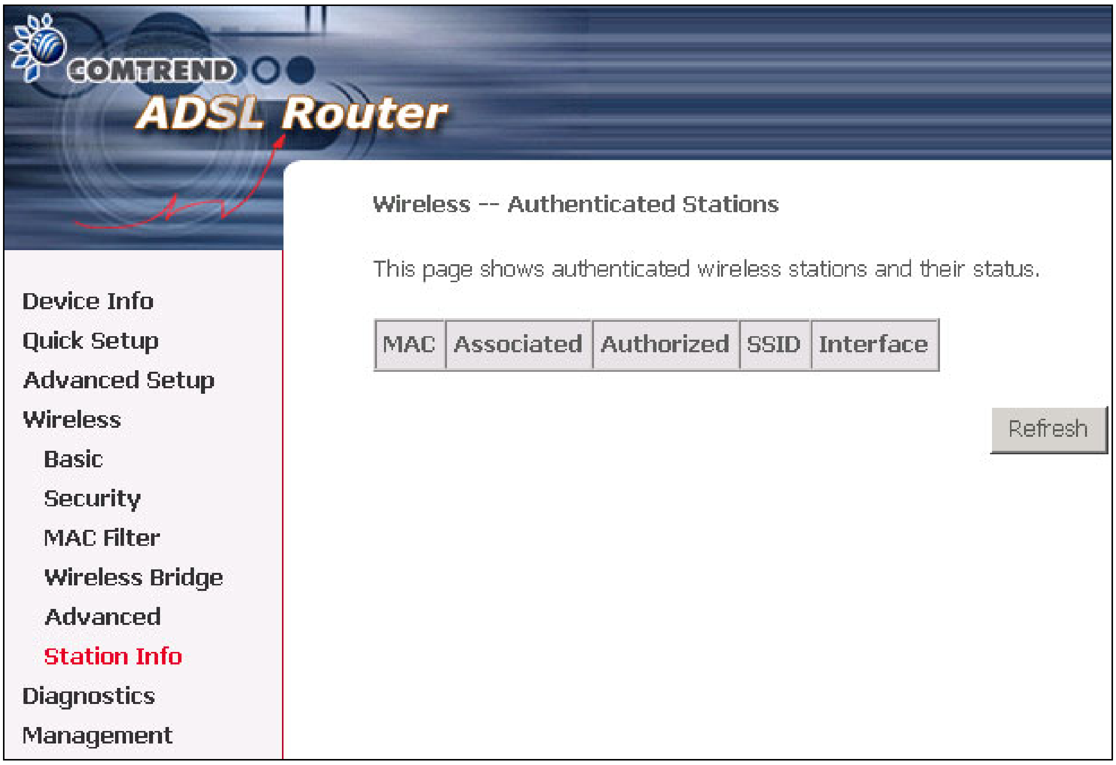
Option	**Description**
Band	The new amendment allows IEEE 802.11g units to fall back to speeds of 11 Mbps, so IEEE 802.11b and IEEE 802.11g devices can coexist in the same network. The two standards apply to the 2.4 GHz frequency band. IEEE 802.11g creates data-rate parity at 2.4 GHz with the IEEE 802.11a 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	Drop-down menu that allows selection of a specific channel.
Auto Channel Timer (min)	Auto channel scan timer in minutes (0 to disable)
54g Rate	Drop-down menu that specifies the following fixed rates: Auto: Default. Uses the 11 Mbps data rate when possible but drops to lower rates when necessary. 1 Mbps, 2Mbps, 5.5Mbps, or 11Mbps fixed rates. The appropriate setting is dependent on signal strength.
Multicast Rate	Setting multicast packet transmit rate.

Basic Rate	Setting basic transmit 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 fragmented, i.e., split into, smaller units suitable for the circuit size. Packets smaller than the specified fragmentation threshold value are not fragmented. Enter a value between 256 and 2346. If you experience a high packet error rate, try to slightly increase your Fragmentation Threshold. The value should remain at its default setting of 2346. Setting the Fragmentation Threshold too low may result in poor performance.
RTS Threshold	Request to Send, when 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. The NIC transmits smaller packet without using RTS/CTS. The default setting of 2347 (maximum length) disables RTS Threshold.
DTIM Interval	Delivery Traffic Indication Message (DTIM), also known as Beacon Rate. The entry range is a value between 1 and 65535. A DTIM is a countdown informing 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. Each beacon transmission identifies the presence of an access point. By default, radio NICs passively scan all RF channels and listen for beacons coming from access points to find a suitable access point. 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). The entered value is represented in ms. Default is 100. Acceptable entry range is 1 to 0xffff (65535)

Xpress ™ Technology	Xpress Technology is compliant with draft specifications of two planned wireless industry standards.
54g ™ Mode	Set the mode to 54g Auto for the widest compatibility. Select the mode to 54g Performance for the fastest performance among 54g certified equipment. Set the mode to 54g LRS if you are experiencing difficulty with legacy 802.11b equipment.
54g Protection	In Auto mode the router will use RTS/CTS to improve 802.11g performance in mixed 802.11g/802.11b networks. Turn protection off to maximize 802.11g throughput under most conditions.
Preamble Type	Short preamble is intended for application where maximum throughput is desired but it doesn’t cooperate with the legacy. Long preamble interoperates with the current 1 and 2 Mbit/s DSSS specification as described in IEEE Std 802.11-1999
Transmit Power	The router will set different power output (by percentage) according to this selection.
WMM (Wi-Fi Multimedia)	The technology maintains the priority of audio, video and voice applications in a Wi-Fi network. It allows multimedia service 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.
WMM APSD	This is Automatic Power Save Delivery. It saves power.

7.6 Station Info

This page shows authenticated wireless stations and their status.



Wireless -- Authenticated Stations

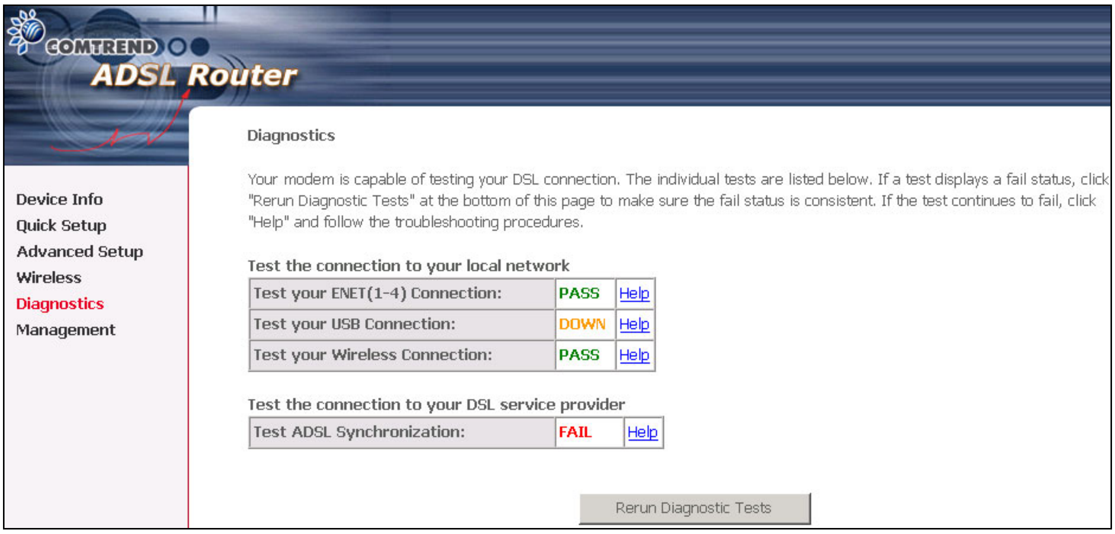
This page shows authenticated wireless stations and their status.

MAC	Associated	Authorized	SSID	Interface

MAC	Lists the MAC address of all the stations.
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.
SSID	Lists which SSID of the modem that the stations connect to.
Interface	Lists which interface of the modem that the stations connect to.

Chapter 8   Diagnostics

The Diagnostics screen provides feedback on the connection status of the router and the ADSL link.   The individual tests are listed below. If a test displays a fail status, click the **Test** button, to determine whether the fail status is consistent. If the test continues to fail, click **Help** and follow the troubleshooting procedures.



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

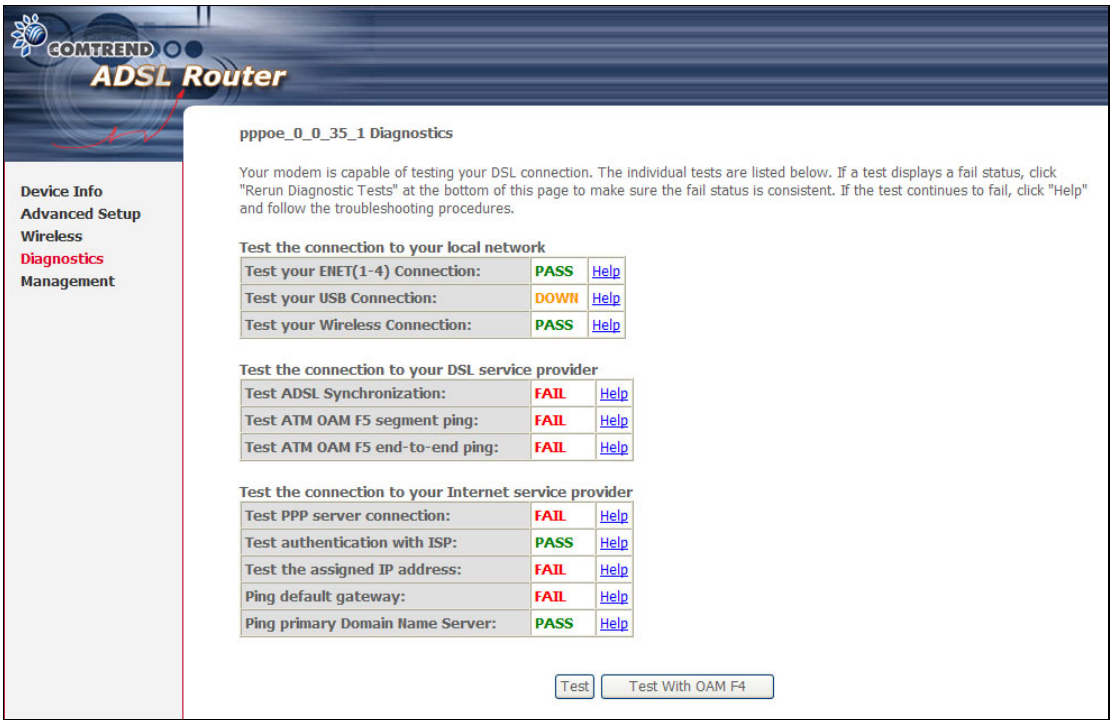
Test your ENET(1-4) Connection:	PASS	Help
Test your USB Connection:	DOWN	Help
Test your Wireless Connection:	PASS	Help

Test the connection to your DSL service provider

Test ADSL Synchronization:	FAIL	Help

Test	Description
Ethernet Connection	**Pass:** indicates that the Ethernet interface from your computer is connected to the LAN port of your router. A flashing or solid green LAN LED on the router also signifies that an Ethernet connection is present and that this test is successful. **Fail:** Indicates that the router does not detect the Ethernet interface on your computer.
USB Connection	**Pass:** Indicates that the USB interface from your computer is connected to router properly. **Down:** Indicates that the router does not detect the signal from USB interface.
Wireless Connection	**Pass:** Indicates that the Wireless interface from your computer is connected to the wireless network. **Down:** Indicates that the ADSL router does not detect the wireless network.
ADSL Synchronization	**Pass:** Indicates that the router has detected an ADSL signal from the telephone company. A solid WAN LED on the router also indicates the detection of an ADSL signal from the telephone company. **Fail:** Indicates that the router does not detect a signal from the telephone company's DSL network. The WAN LED will continue to flash green.

If router mode is PPPoE the following screen will be displayed (for your reference).



pppoe_0_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 USB Connection:	DOWN	Help
Test your Wireless Connection:	PASS	Help

Test the connection to your DSL service provider

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

Test the connection to your Internet service provider

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

Chapter 9 Management

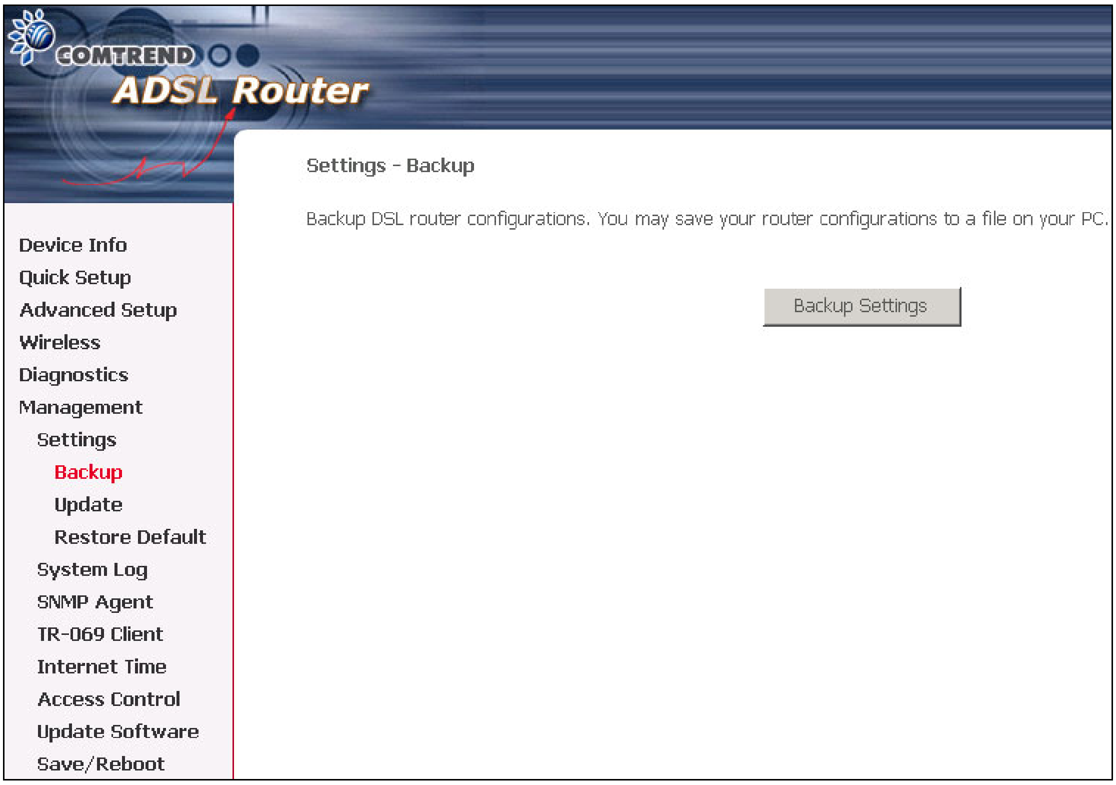
The Management section includes the following functions and processes.

9.1 Settings

The Settings submenu allows for backup of settings, retrieval of settings and restoring to factory default settings.

9.1.1 Backup

The Backup option under Management → Settings saves your router configurations to a file on your PC. Click Backup Settings in the main menu. You will be prompted to define the location of the backup file to save. After choosing the file location, click **Backup Settings.** The file will then be saved to the assigned location.

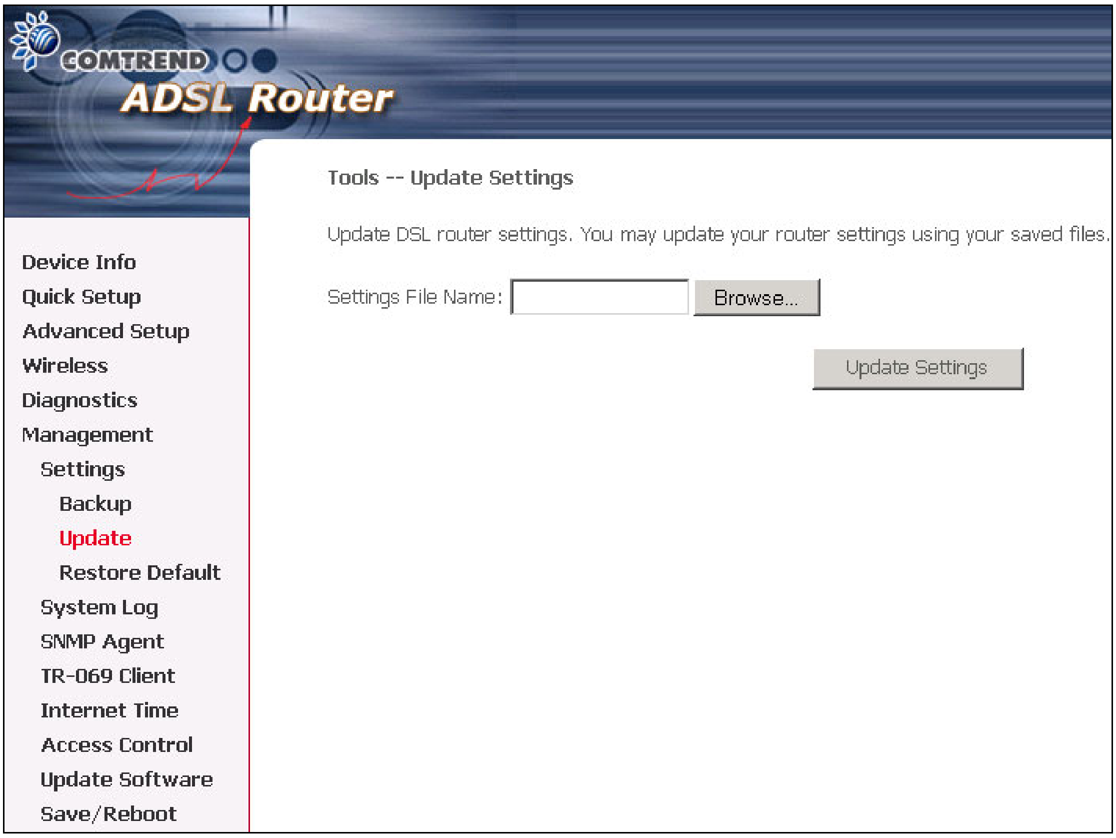


Settings - Backup

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

9.1.2 Update Settings

The Update option under Management → Settings updates your router settings using your saved files.



Tools -- Update Settings

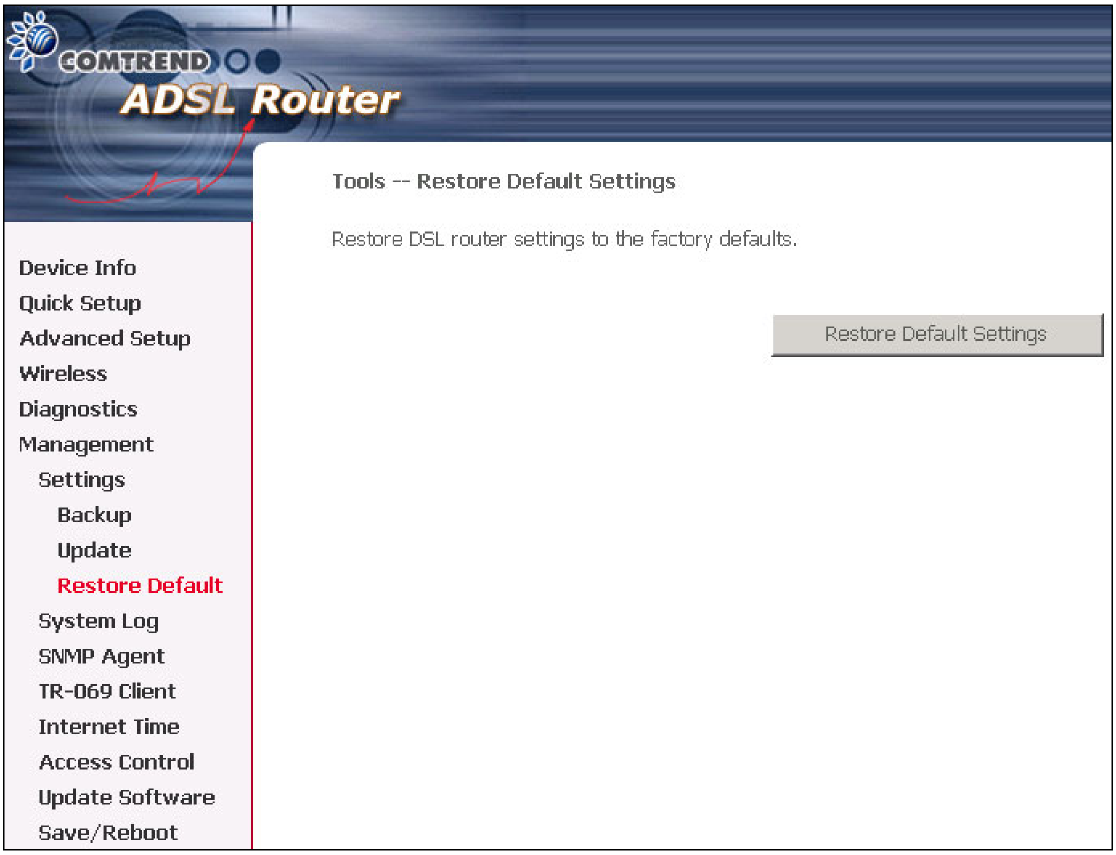
Update DSL router settings. You may update your router settings using your saved files.

Settings File Name: [ ] Browse...

Update Settings

9.1.3 Restore Default

Click the **Restore Default Settings** button to restore the device to its original factory installed settings (see section 3.3 Default Settings).



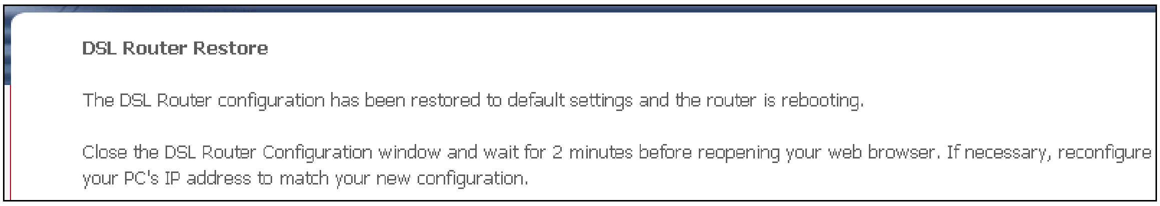
Tools -- Restore Default Settings

Restore DSL router settings to the factory defaults.

NOTE 1: This entry has the same effect as the hardware reset-to-default 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, the boot loader will erase the entire configuration data saved on the flash memory.

NOTE 2: Restoring system settings requires a system reboot. This necessitates that the current Web UI session be closed and restarted. Before restarting the connected PC must be configured with a static IP address in the 192.168.1.x subnet in order to configure the device.

After the Restore Default Configuration button is selected, the following screen appears. Close the window and wait for 2 minutes before reopening your web browser. If necessary, reconfigure your PC IP address to match your new configuration (see section 3.1 TCP/IP Settings for instructions)



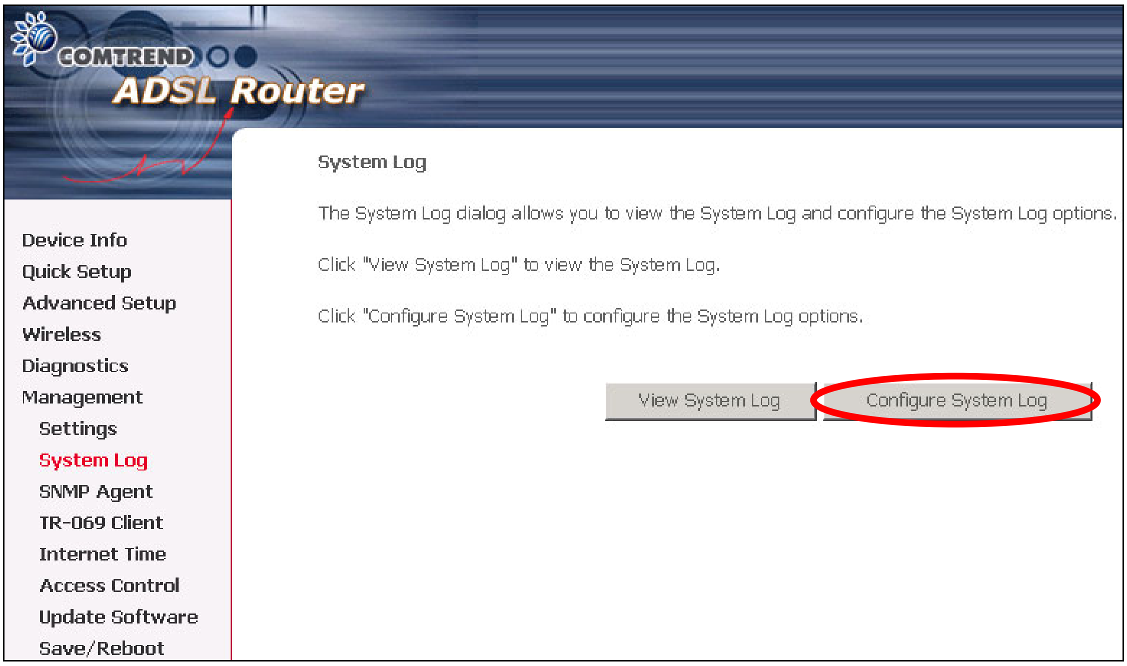
DSL Router Restore

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.

9.2 System Log

The System Log option under Management → Settings allows you to view the system events log, or to configure the System Log options. The default setting of system log is disabled. Follow the steps below to enable and view the system log.



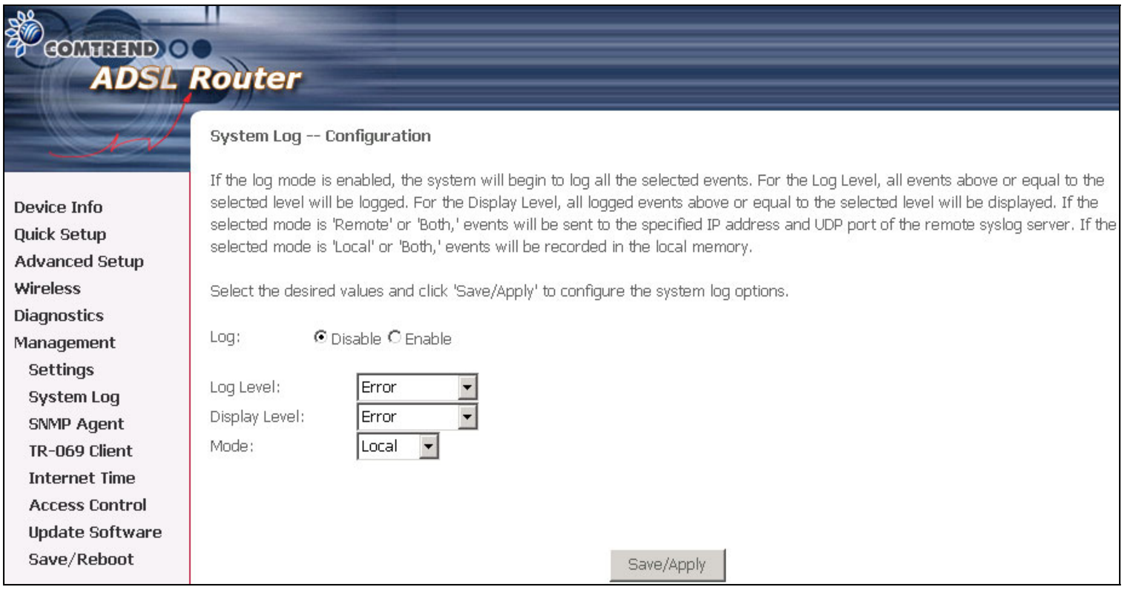
System Log

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 1: Click **Configure System Log** to display the following screen.



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: Error

Display Level: Error

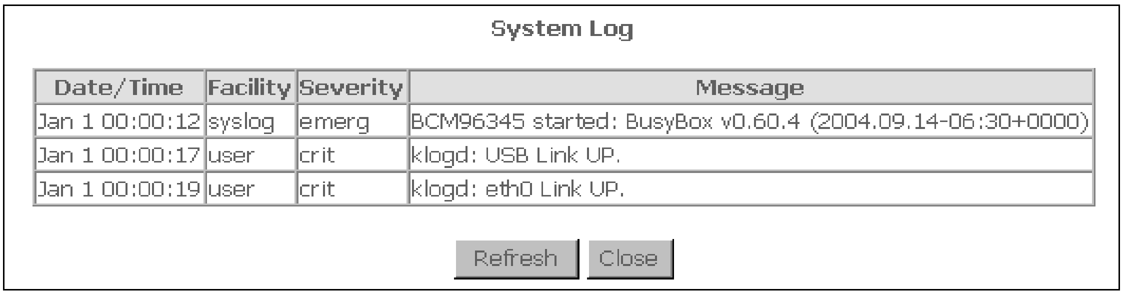
Mode: Local

Step 2: Select desired log options (described below) and click **Save/Apply**.

Option	**Description**
Log	Indicates whether the system is currently recording events. The user can enable or disable event logging. By default, it is disabled. To enable it, tick Enable and then Apply button.
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 on the device SDRAM. 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 following log levels are • 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** page 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 mode is configured, the WEB UI will prompt the user to enter the Server IP address and Server UDP port.

Step 3: Click **View System Log**. The results are displayed in a new browser window. An example is shown below.

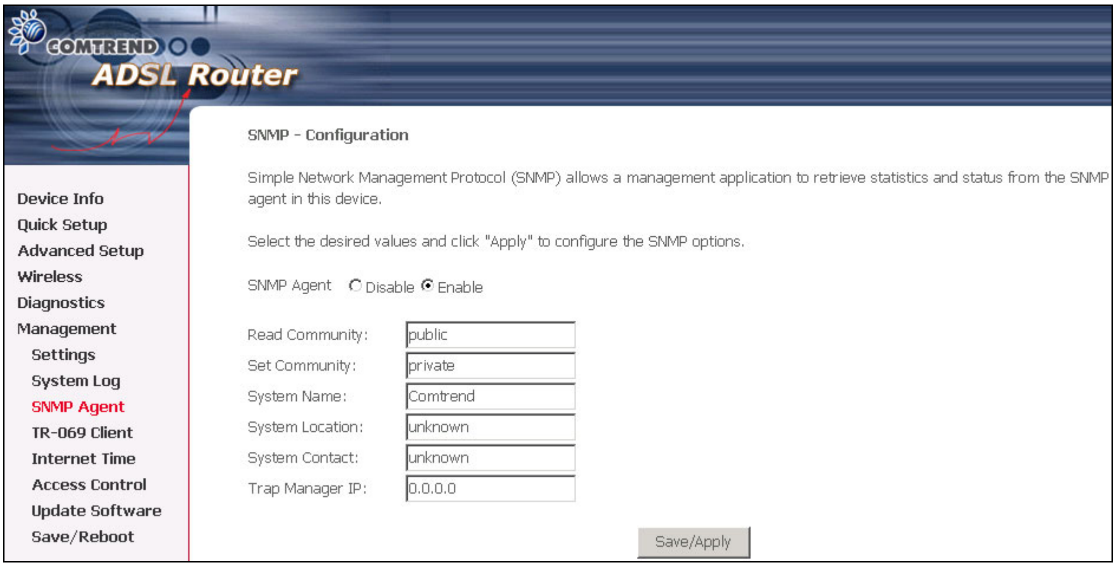


System Log

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 desired values and click **Save/Apply** to configure SNMP options.



SNMP - Configuration

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

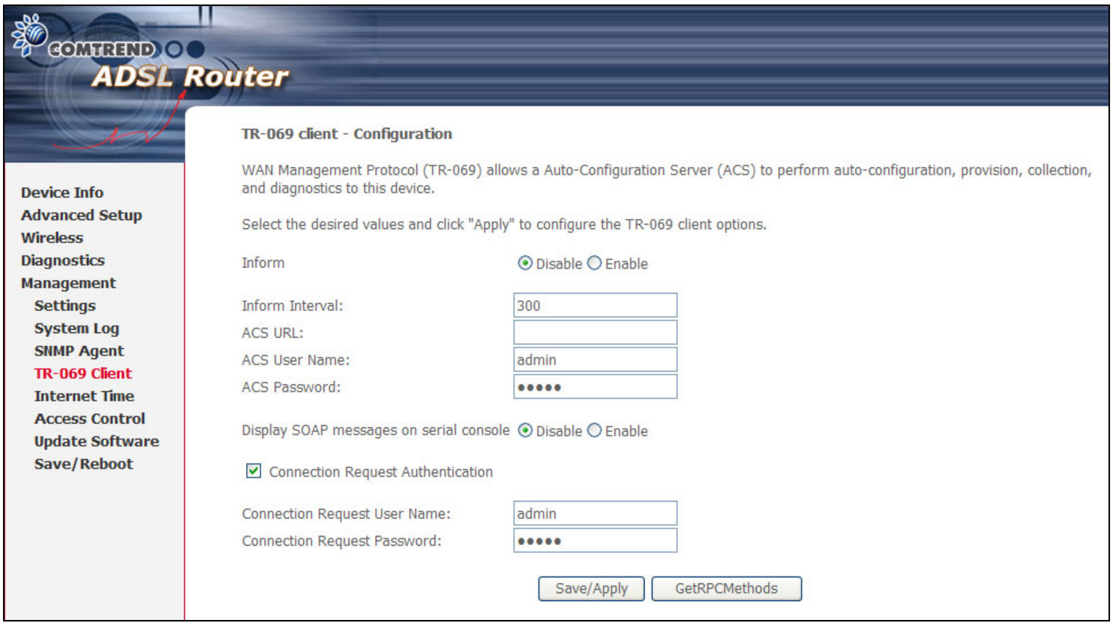
Select the desired values and click "Apply" to configure the SNMP options.

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 device. Select desired values and click **Save/Apply** to configure TR-069 client options.



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: •••••

Display SOAP messages on serial console ● Disable ○ Enable

☑ Connection Request Authentication

Connection Request User Name: admin

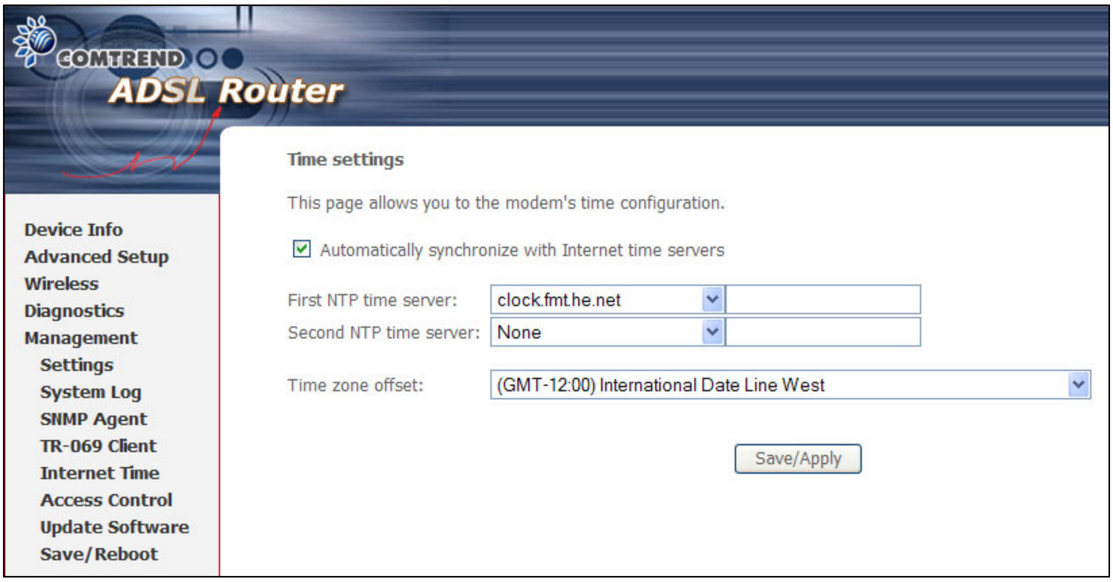
Connection Request Password: •••••

Option	Description
Inform	Disable/Enable the TR-069 client.
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.

Display SOAP messages on serial console	Enable/Disable SOAP messages on serial console. This option is used for advanced troubleshooting of the device.
Connection Request Authentication	Enable/Disable authentication of ACS making a Connection Request to the CPE.
Connection Request User Name	Username used to authenticate an ACS making a Connection Request to the CPE.
Connection Request Password	Password used to authenticate an ACS making a Connection Request to the CPE.
Get RPC Methods	This may be used by a CPE or ACS to discover the set of methods supported by the ACS or CPE it is in communication with. 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. Click this button to force the CPE to establish an immediate connection to the ACS.

9.5 Internet Time

This option configures time settings by synchronizing with Internet time servers. To do so, tick the checkbox and then choose NTP time servers and time zone offset. Click **Save/Apply** to activate time synchronization.



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

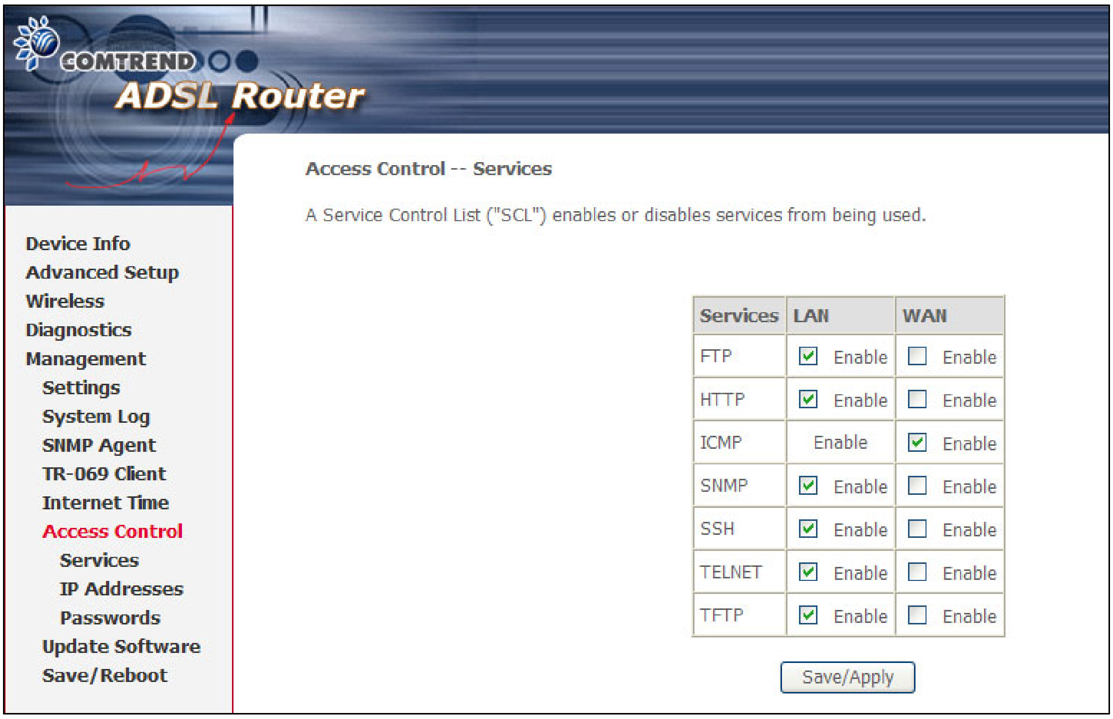
NOTE: This menu item is not displayed when in Bridge mode since the router would not be able to connect to the NTP time server.

9.6 Access Control

The Access Control option under the Management menu configures three access-related parameters:

9.6.1 Services

The Services Control List provides access options to the device over the LAN or WAN. Enable each option by ticking the corresponding checkbox. Click **Save/Apply**.



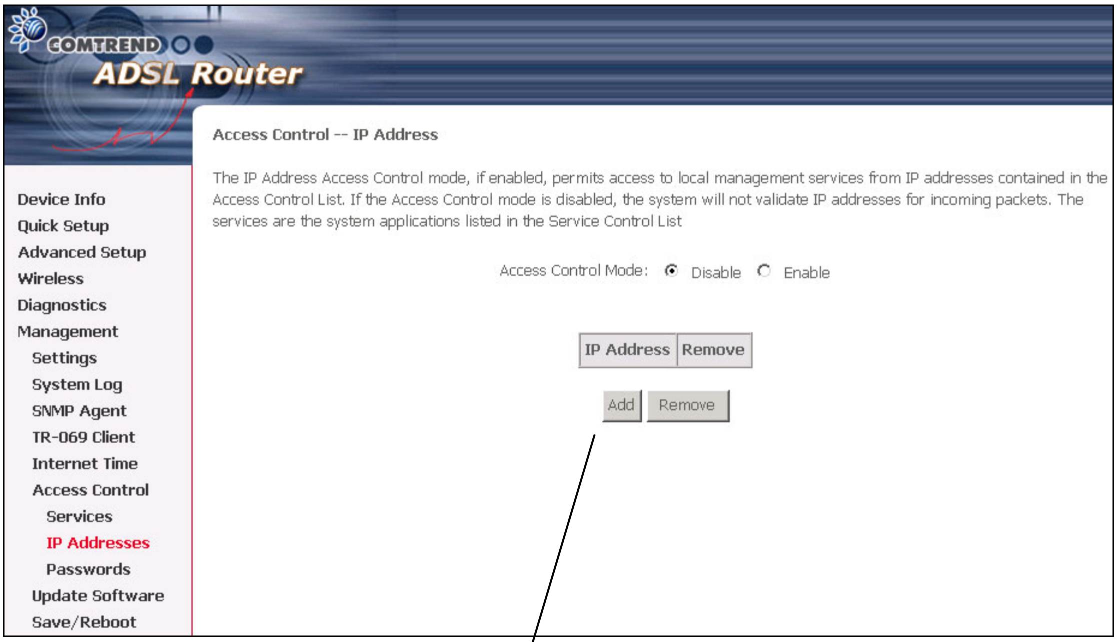
Access Control -- Services

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

9.6.2 IP Addresses

The IP Addresses option limits access by IP address. If **Access Control Mode** is enabled, only the IP addresses listed here can access the router. Before enabling it, configure the IP addresses by clicking the **Add** button. Enter the IP address and click **Apply** to allow the PC with this IP address to manage the device.

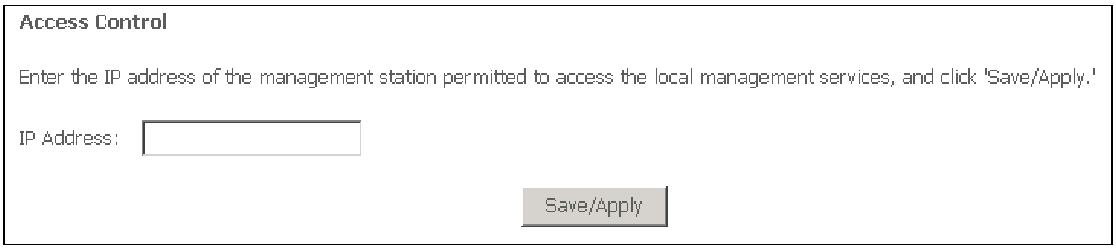


Access Control -- IP Address

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



Access Control

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

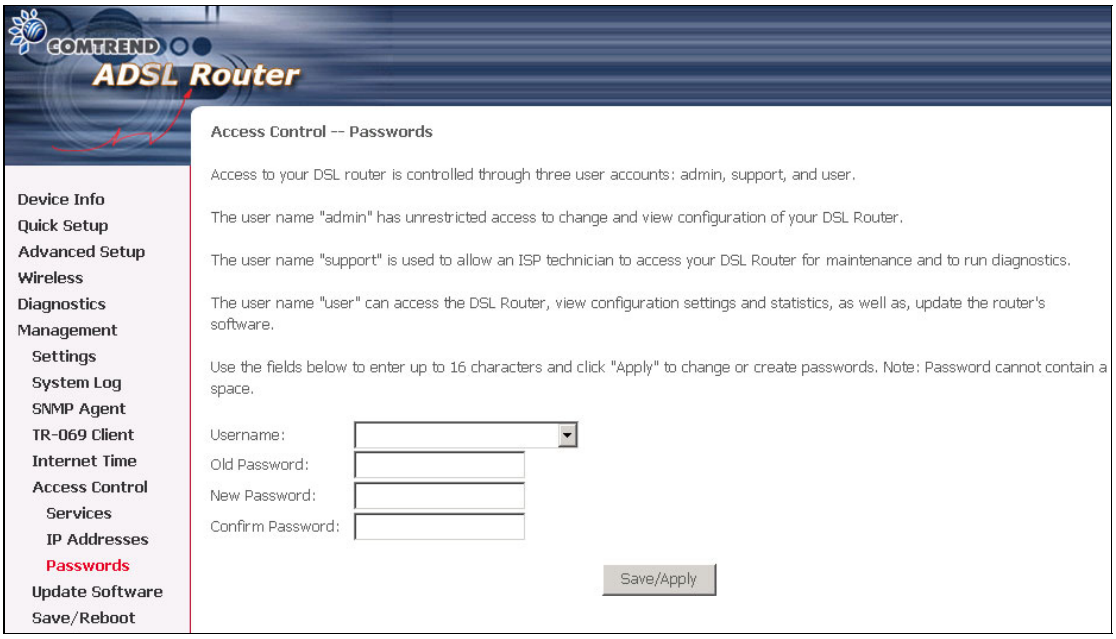
IP Address:

9.6.3 Passwords

The Passwords option configures the access passwords for the router. Access to your router is controlled through three user accounts: root, support, and user.

- **root** has unrestricted access to change and view the configuration of your router. It is the top administrative account.
- **support** is intended to allow limited access so that a technical support representative can conduct maintenance and run diagnostics.
- **user** provides the least access control but allows for viewing configuration settings and statistics, as well as, updating software.

Use the fields below to enter up to 16 characters and click Apply to change or create passwords. See section 3.3 Default Settings for default password settings.



Access Control -- Passwords

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

The user name "admin" 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.

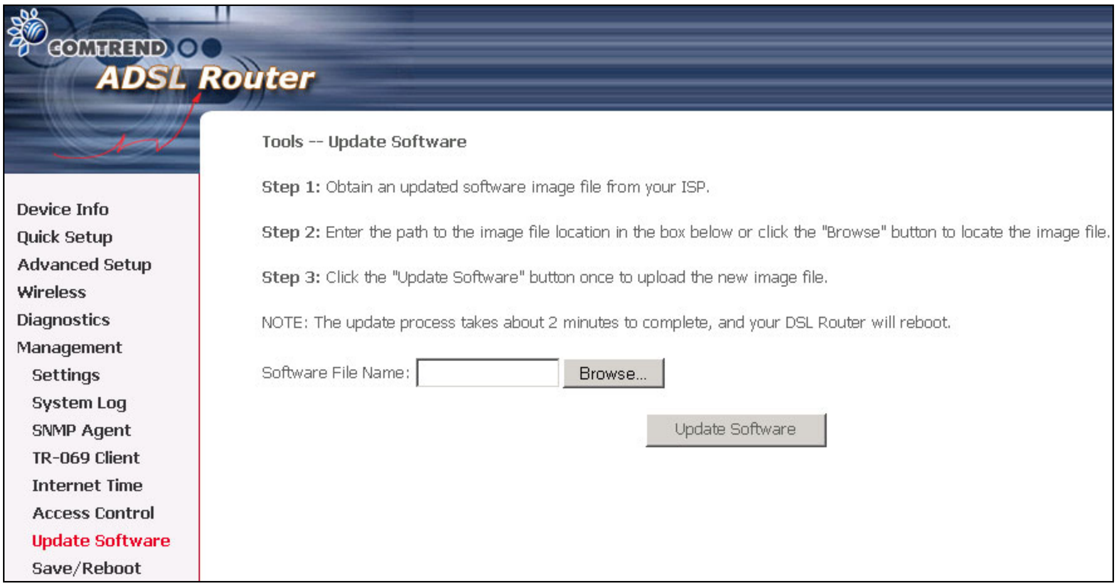
The user name "user" can access the DSL Router, view configuration settings and statistics, as well as, update the router's software.

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 you to update the software of the device. Manual software upgrades from a locally stored file can be performed using the following screen.   Your ISP will provide this file to you, if necessary.



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.

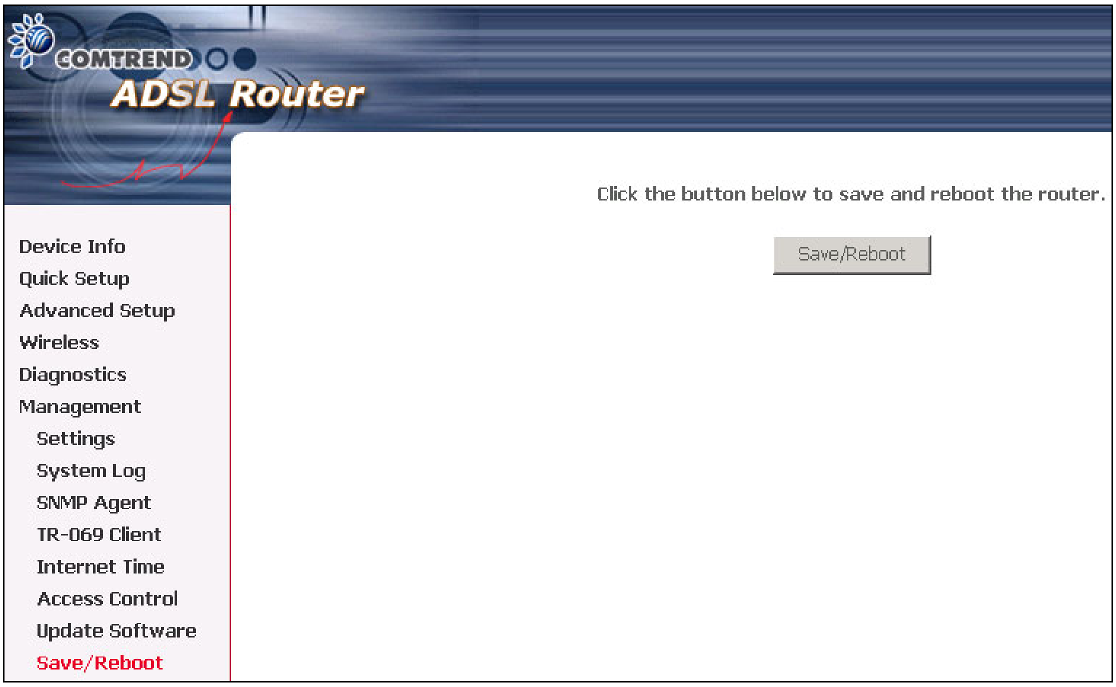
Step 2: Enter the path to the image file location in the box below or click the **Browse** button to locate the image file.

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

NOTE: The update process takes about 2 minutes to complete since your router will reboot.   Please be patient and restart the browser if necessary.

9.8 Save and Reboot

Click **Save/Reboot** to save current settings and reboot the device. The browser window should refresh automatically; but if it does not, close and restart the browser. It may also be necessary to reconfigure your TCP/IP settings to match your new configuration (see section 3.1 TCP/IP Settings for detailed instructions).



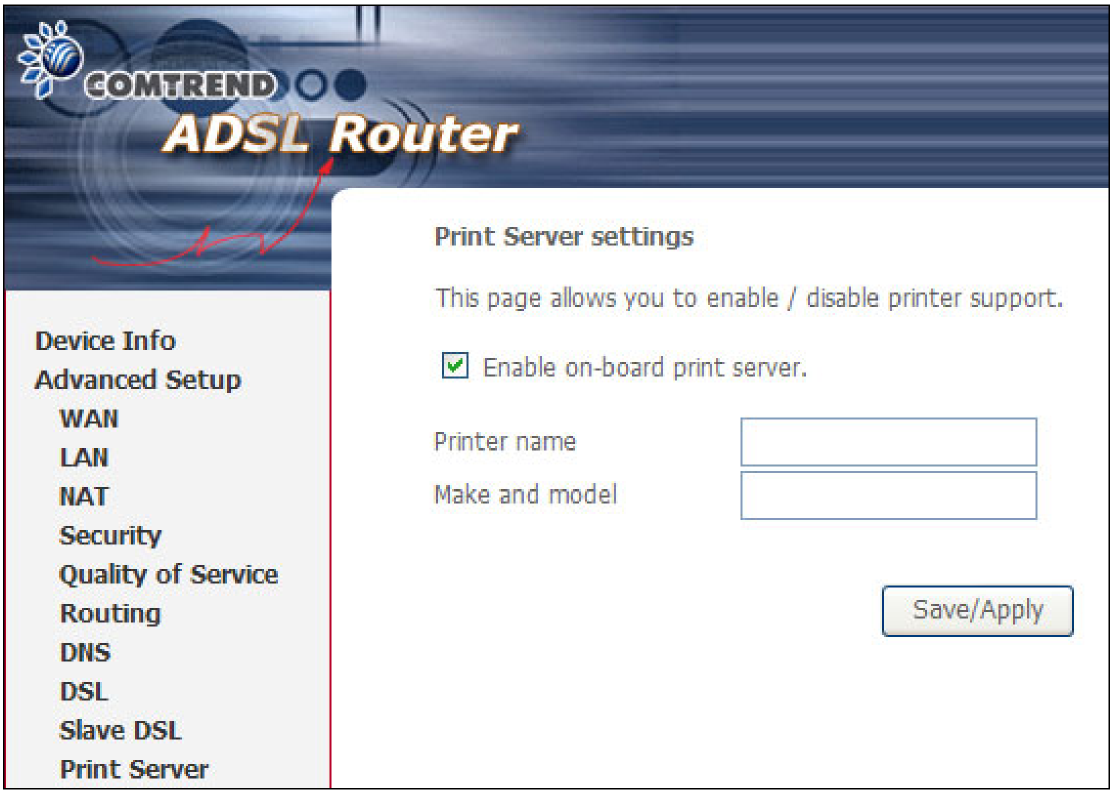
Click the button below to save and reboot the router.

Appendix A: Printer Server

These steps explain the procedure for enabling the Printer Server.

Step 1: Enable Print Server from Web User Interface.
Select **Enable on-board print server** checkbox and
enter **Printer name** and **Make and model**

NOTE: The **Printer name** can be any text string up to 40 characters.
The **Make and model** can be any text string up to 128 characters.



Print Server settings

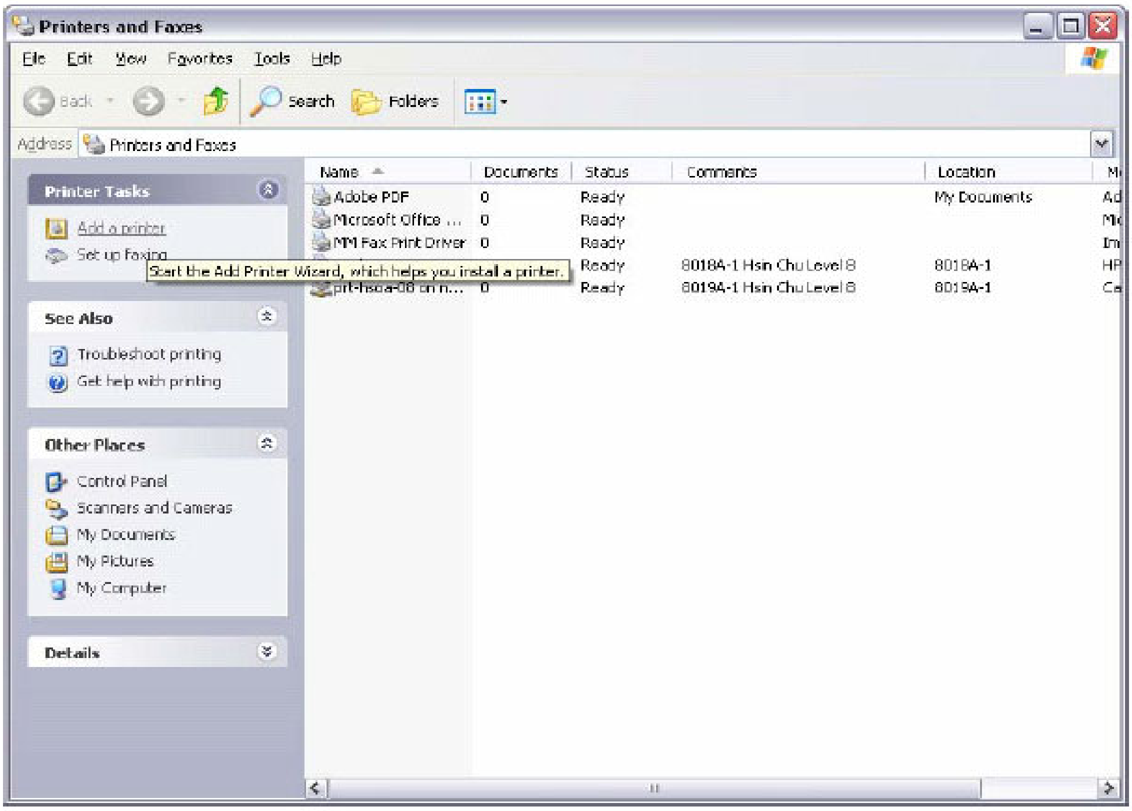
This page allows you to enable / disable printer support.

☑ Enable on-board print server.

Printer name

Make and model

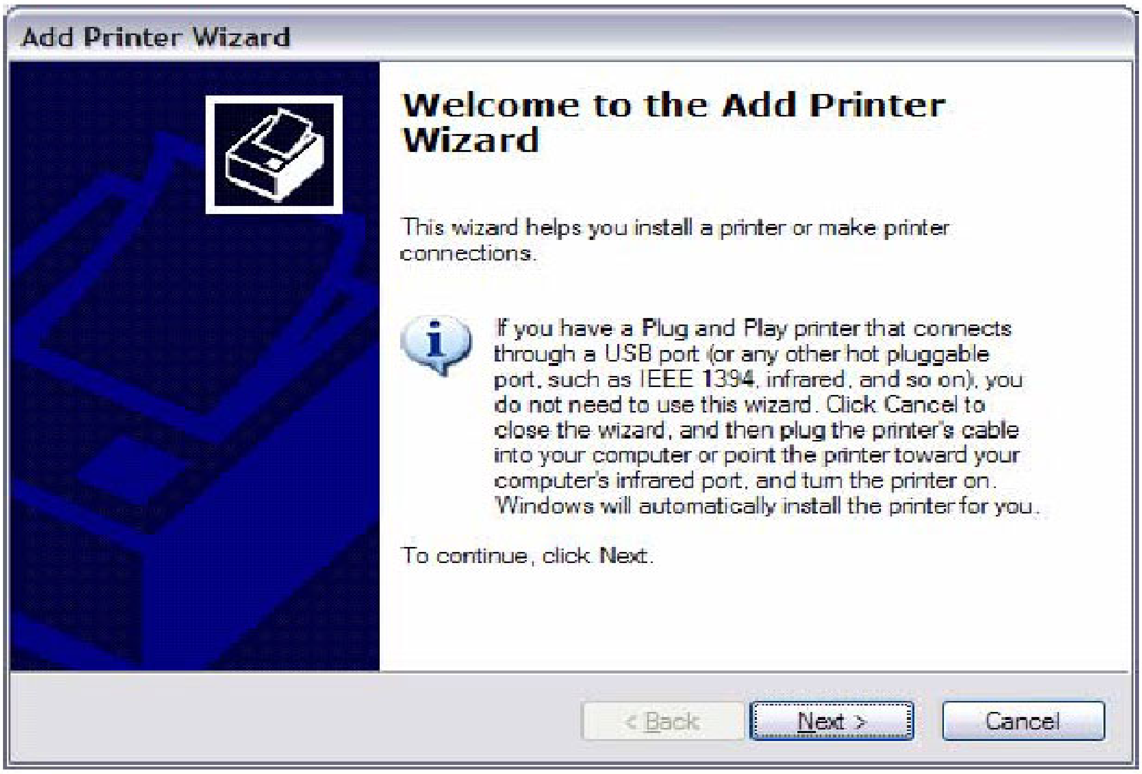
Step 2: Go to the **Printers and Faxes** application in the **Control Panel** and select the **Add a printer** function (as located on the side menu below).



Start the Add Printer Wizard, which helps you install a printer.

Name	Documents	Status	Comments	Location	M
Adobe PDF	0	Ready		My Documents	Ad
Microsoft Office ...	0	Ready			Mi
MM Fax Print Driver	0	Ready			Im
		Ready	8018A-1 Hsin Chu Level 8	8018A-1	HP
prt-hsoa-08 on n...	0	Ready	8019A-1 Hsin Chu Level 8	8019A-1	Ca

Step 3: Click **Next** to continue when you see the dialog box below.



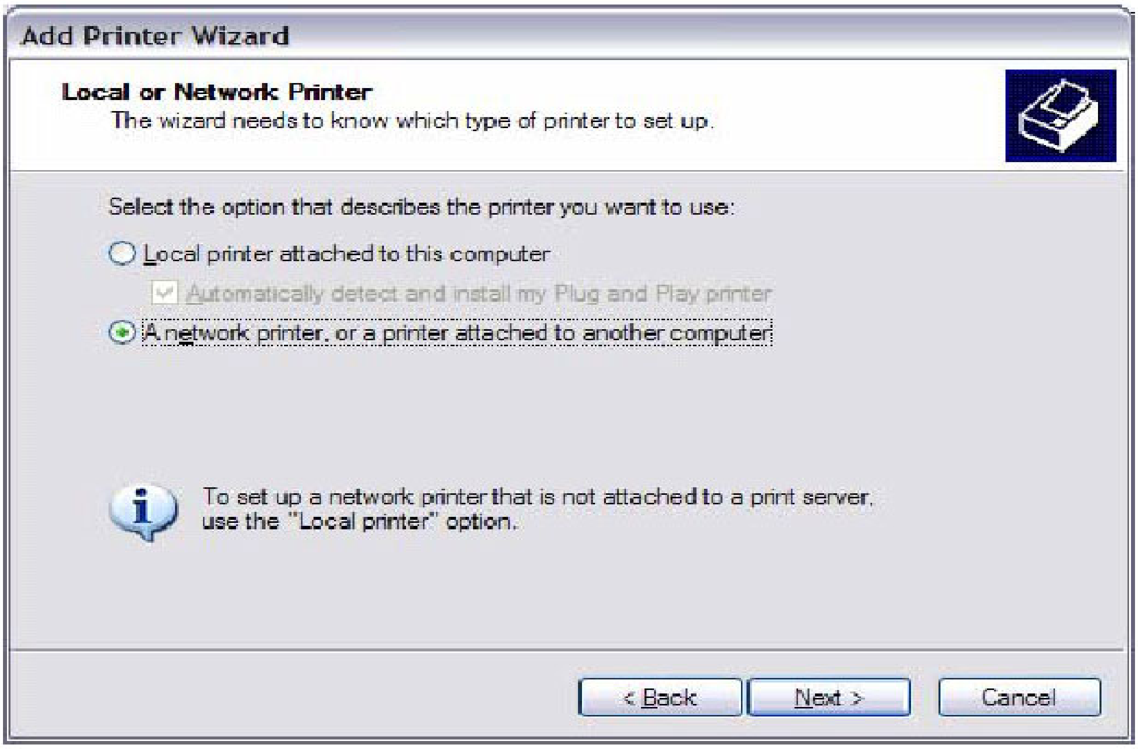
Welcome to the Add Printer Wizard

This wizard helps you install a printer or make printer connections.

If you have a Plug and Play printer that connects through a USB port (or any other hot pluggable port, such as IEEE 1394, infrared, and so on), you do not need to use this wizard. Click Cancel to close the wizard, and then plug the printer's cable into your computer or point the printer toward your computer's infrared port, and turn the printer on. Windows will automatically install the printer for you.

To continue, click Next.

Step 4: Select **Network Printer** and click **Next**.



Add Printer Wizard

Local or Network Printer

The wizard needs to know which type of printer to set up.

Select the option that describes the printer you want to use:

○ Local printer attached to this computer

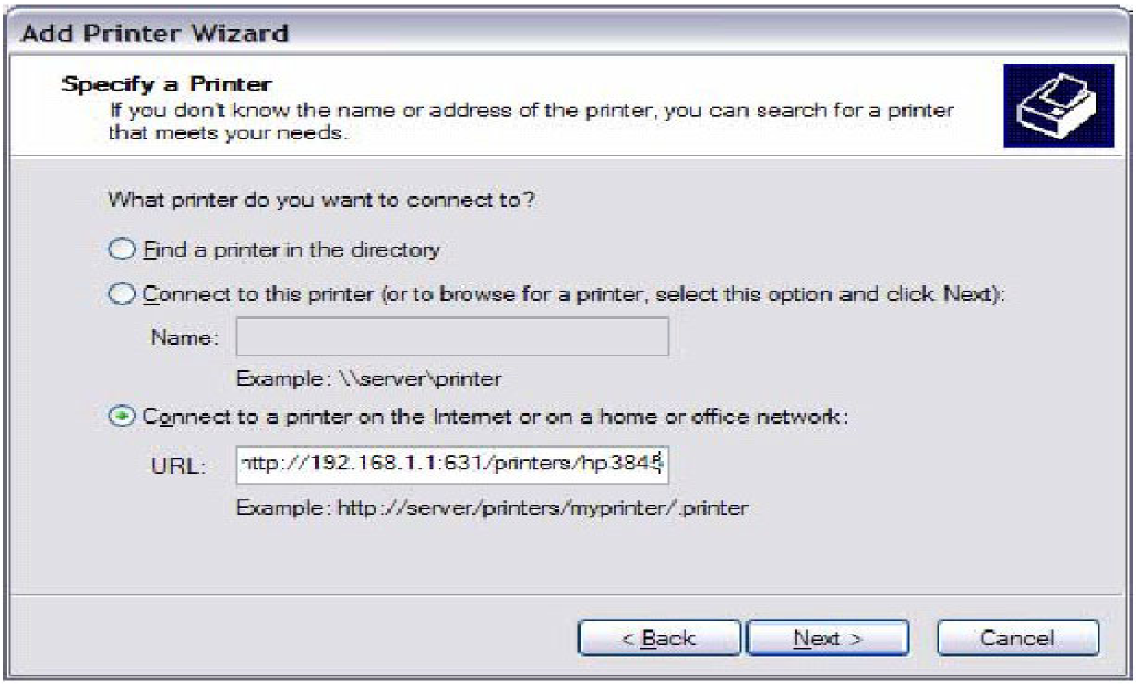
☑ Automatically detect and install my Plug and Play printer

● A network printer, or a printer attached to another computer

To set up a network printer that is not attached to a print server, use the "Local printer" option.

Step 5: Select Connect to a printer on the Internet and enter your printer link. (e.g. http://192.168.1.1:631/printers/hp3845) and click **Next**.

NOTE: The printer name must be the same name entered in the ADSL modem WEB UI "printer server setting" as in step 1.



Add Printer Wizard

Specify a Printer

If you don't know the name or address of the printer, you can search for a printer that meets your needs.

What printer do you want to connect to?

○ Find a printer in the directory

○ Connect to this printer (or to browse for a printer, select this option and click Next):

Name:

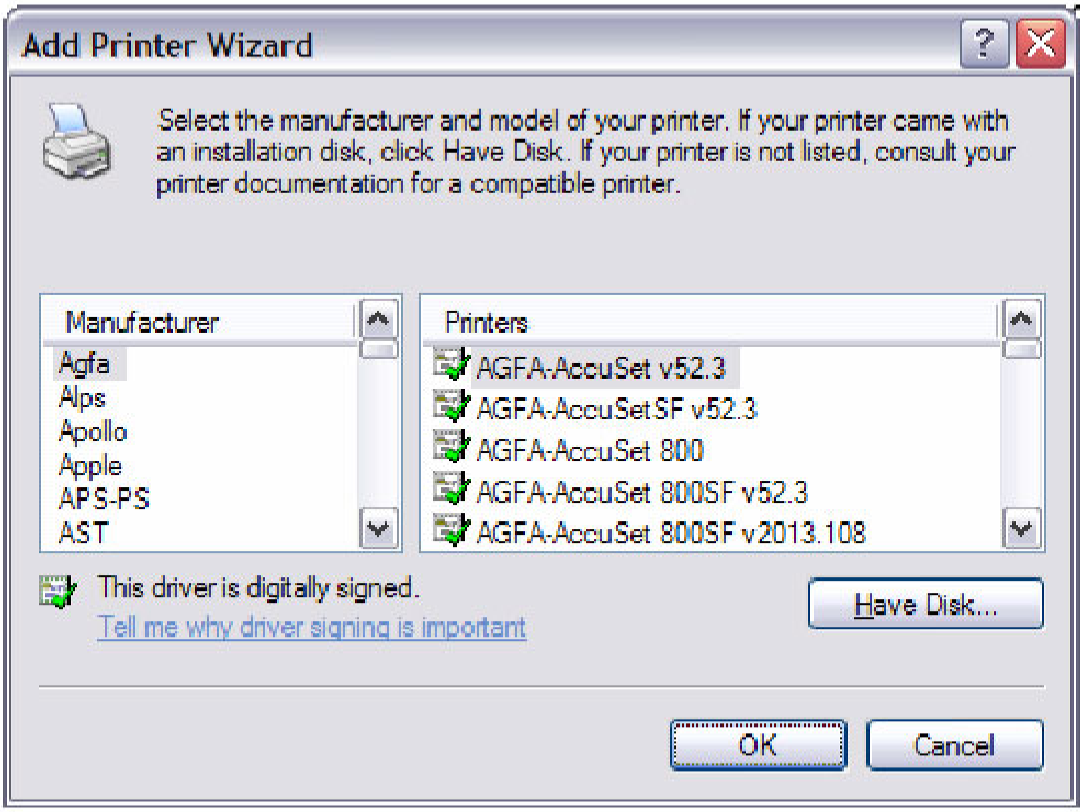
Example: \\server\printer

● Connect to a printer on the Internet or on a home or office network:

URL: http://192.168.1.1:631/printers/hp3845

Example: http://server/printers/myprinter/.printer

Step 6: Click **Have Disk** and insert the printer driver CD.



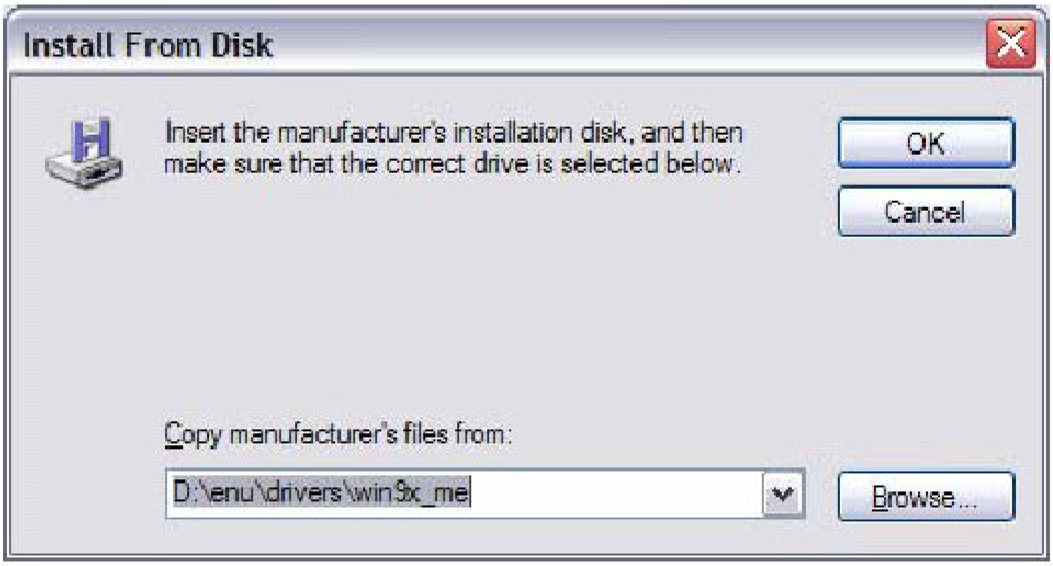
Add Printer Wizard

Select the manufacturer and model of your printer. If your printer came with an installation disk, click Have Disk. If your printer is not listed, consult your printer documentation for a compatible printer.

Manufacturer	Printers
Agfa	AGFA-AccuSet v52.3
Alps	AGFA-AccuSet SF v52.3
Apollo	AGFA-AccuSet 800
Apple	AGFA-AccuSet 800SF v52.3
APS-PS	AGFA-AccuSet 800SF v2013.108
AST	

This driver is digitally signed.
Tell me why driver signing is important

Step 7: Select driver file directory on CD-ROM and click **OK**.

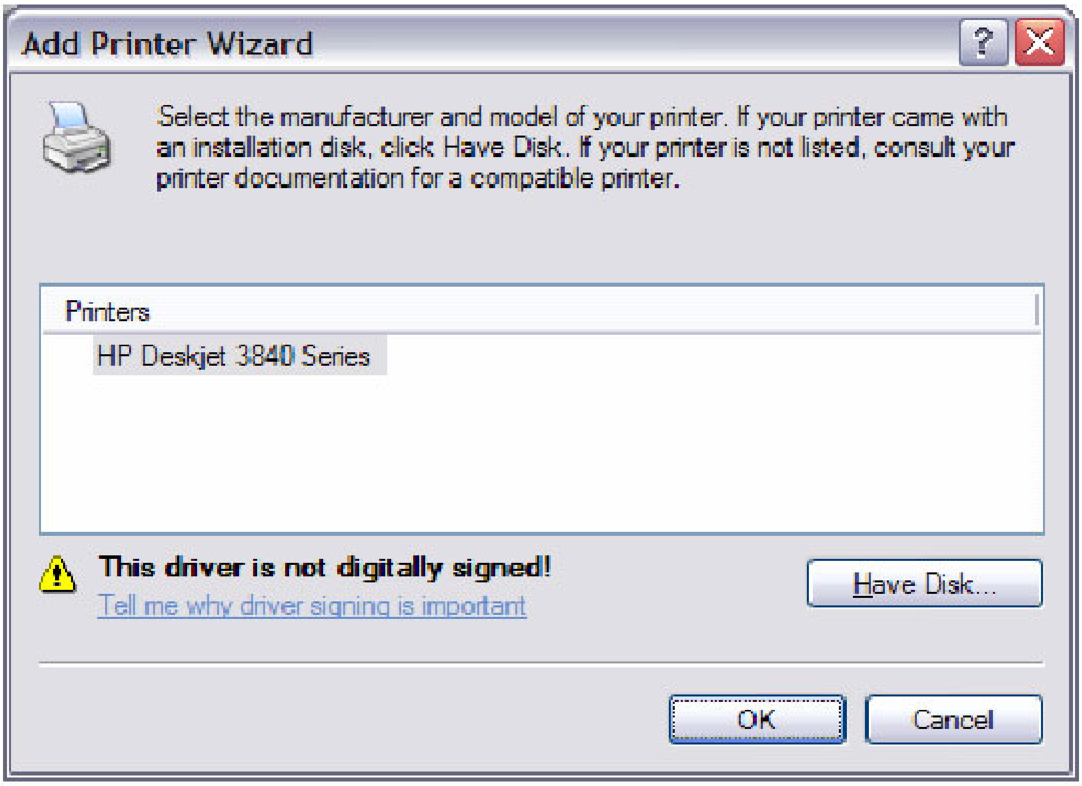


Install From Disk

Insert the manufacturer's installation disk, and then make sure that the correct drive is selected below.

Copy manufacturer's files from:
D:\enu\drivers\win9x_me

Step 8: Once the printer name appears, click **OK**.


Add Printer Wizard

Select the manufacturer and model of your printer. If your printer came with an installation disk, click Have Disk. If your printer is not listed, consult your printer documentation for a compatible printer.

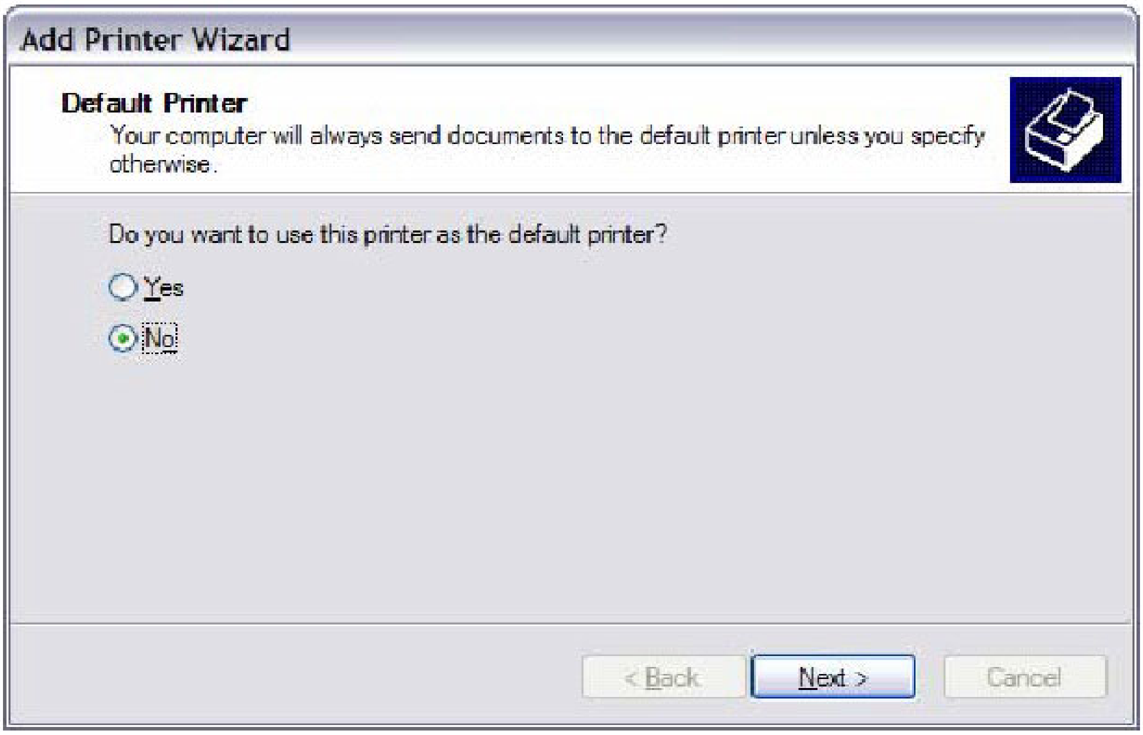
Printers

HP Deskjet 3840 Series

This driver is not digitally signed!

Tell me why driver signing is important

Step 9: Choose **Yes** or **No** for default printer setting and click **Next.**


Add Printer Wizard

Default Printer

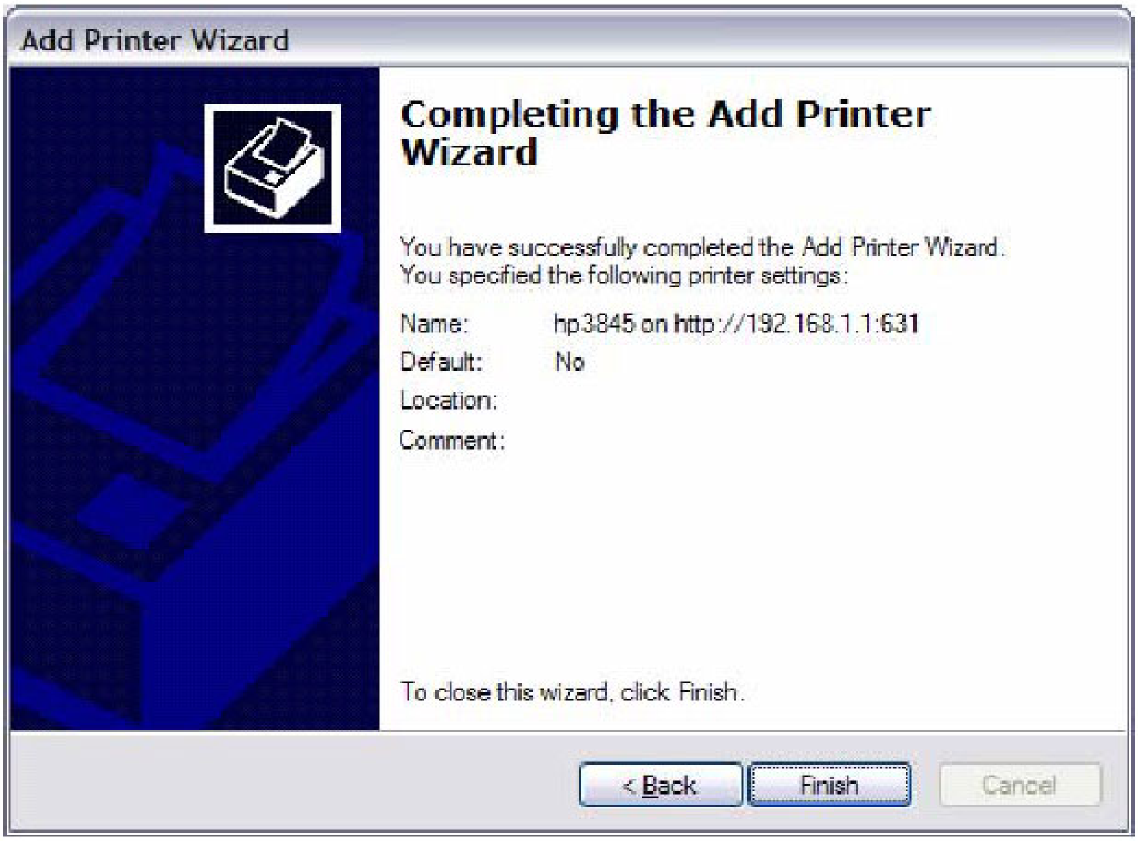
Your computer will always send documents to the default printer unless you specify otherwise.

Do you want to use this printer as the default printer?

○ Yes

● No

Step 10: Click **Finish**.



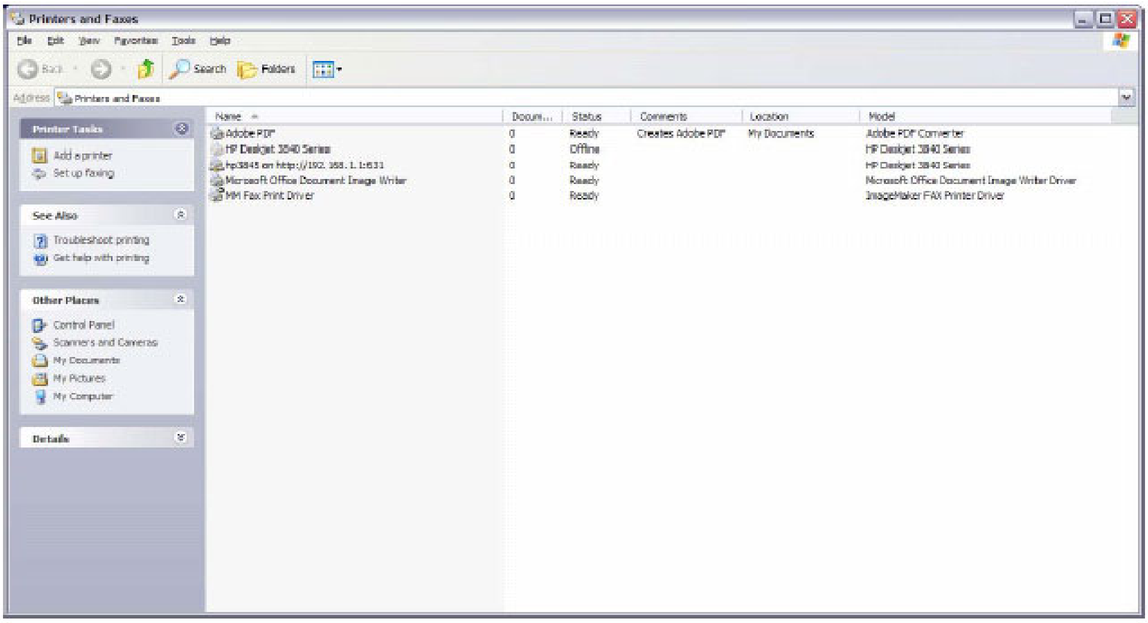
Completing the Add Printer Wizard

You have successfully completed the Add Printer Wizard.
You specified the following printer settings:

Name: hp3845 on http://192.168.1.1:631
Default: No
Location:
Comment:

To close this wizard, click Finish.

Step 11: Check the status of printer from Windows Control Panel, printer window. Status should show as **Ready**.



Name	Docum...	Status	Comments	Location	Model
Adobe PDF	0	Ready	Creates Adobe PDF	My Documents	Adobe PDF Converter
HP Deskjet 3840 Series	0	Offline			HP Deskjet 3840 Series
hp3845 on http://192.168.1.1:631	0	Ready			HP Deskjet 3840 Series
Microsoft Office Document Image Writer	0	Ready			Microsoft Office Document Image Writer Driver
MM Fax Print Driver	0	Ready			ImageMaker FAX Printer Driver

Appendix B: Firewall

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 filtering rules

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, web page.

Outgoing IP Filtering: 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.

Examples:

1.	Filter Name	: Out_Filter1
	Protocol	: TCP
	Source Address	: 192.168.1.45
	Source Subnet Mask	: 255.255.255.0
	Source Port	: 80
	Dest. Address	: NA
	Dest. Sub. Mask	: NA
	Dest. 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.

2.	Filter Name	: Out_Filter2
	Protocol	: UDP
	Source Address	: 192.168.1.45
	Source Subnet Mask	: 255.255.255.0
	Source Port	: 5060:6060
	Dest. Address	: 172.16.13.4
	Dest. Sub. Mask	: 255.255.255.0
	Dest. Port	: 6060:7070

This filter will drop all UDP packets coming from LAN with IP Address/Sub. 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 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 the user.

Examples:

1.	Filter Name	: In_Filter1
	Protocol	: TCP
	Source Address	: 210.168.219.45
	Source Subnet Mask	: 255.255.0.0
	Source Port	: 80
	Dest. Address	: NA
	Dest. Sub. Mask	: NA
	Dest. 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.

2.	Filter Name	: In_Filter2
	Protocol	: UDP
	Source Address	: 210.168.219.45
	Source Subnet Mask	: 255.255.0.0
	Source Port	: 5060:6060
	Dest. Address	:192.168.1.45
	Dest. Sub. Mask	: 255.255.255.0
	Dest. Port	: 6060:7070

This rule will ACCEPT all UDP packets coming from WAN interface mer_0_35/nas_0_35 with IP Address/Sub. 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 web page.

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.

To setup a rule:

Protocol Type: Can be PPPoE, IPv4, IPv6, AppleTalk, IPX, NetBEUI or 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:
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

User needs to select the interface on which this rule is applied.

Examples:
1.
Global Policy: Forwarded
Protocol Type: PPPoE
Dest. MAC Addr: 00:12:34:56:78
Source MAC Addr: 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 Dest. MAC Addr. of 00:12:34:56:78 irrespective of its Source MAC Addr. on the br_0_34 WAN interface. All other frames on this interface are forwarded.

2.
Global Policy: Blocked
Protocol Type: PPPoE
Dest. 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 Dest. MAC Addr. of 00:12:34:56:78 and Source MAC Addr. 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 router, as per chosen days of the week and the chosen times.

User Name: Name of the Filter.

Browser's 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 are put into effect.

End Blocking Time: The time when restrictions on the LAN device 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 C: Pin Assignments

Line port (RJ14)

Pin	Definition	Pin	Definition
1	-	4	ADSL_TIP1
2	ADSL_TIP2	5	ADSL_RING2
3	ADSL_RING1	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 D: Specifications

Rear Panel

RJ14 X1 for ADSL2+ bonded, RJ45 X 4 for LAN, Reset Button X 1, Power switch X 1, optional USB host/device

ADSL

ADSL standard	ITU-T G.992.5, ITU-T G.992.3, ITU-T G.992.1, ANSI T1.413 Issue 2 AnnexM
ADSL2+ Bonded	Downstream : 48 Mbps Upstream : 2.6 Mbps

Ethernet

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

Wireless

Standard	IEEE802.11g, backward compatible with 802.11b
Encryption	64, 128-bit Wired Equivalent Privacy (WEP) Data Encryption
Channels	11 Channels (US, Canada) 13 Channels (Europe) 14 Channels (Japan)
Data Rate	Up to 54Mbps
WPA/WPA2	Yes
IEEE 802.1x	Yes
WMM	Yes
IEEE 802.1x	Yes

ATM Attributes

RFC 2364 (PPPoA), RFC 2684 (RFC 1483) Bridge/Route; RFC 2516 (PPPoE); RFC 1577 (IPoA)

Support PVCs	16
AAL type	AAL5
ATM service class	UBR/CBR/VBR
ATM UNI support	UNI3.1/4.0
OAM F4/F5	Yes

Management

Telnet, Web-based management, Configuration backup and restoration

Software upgrade via HTTP, TFTP server, 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, and RIPv2, NAT/PAT, DHCP Server/DHCP Relay, DNS Relay, ARP

Security Functions

Authentication protocols: PAP, CHAP, TCP/IP/Port filtering rules, Port triggering/Forwarding, Packet and MAC address filtering, access control, SSH

Application Passthrough

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

OS Supported for USB driver

Windows 2000/XP/ME/98SE

Power Supply

External power adapter 110 VDC or 220 VDC, 15VDC /1.6A

Environment Condition

Operating temperature 0 ~ 45 degrees Celsius

Relative humidity 5 ~ 95% (non-condensing)

Dimensions: 205 mm (W) x 48 mm (H) x 145 mm (D)

Certifications: FCC Part 15 class B, FCC Part 68, CE

NOTE: Specifications are subject to change without notice

Appendix E: SSH Client

Linux OS comes with ssh client. Microsoft Windows does not have ssh client but there is a public domain one “putty” that you can download.
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 admin 192.168.1.1

From WAN: From the router, use WEB UI to enable SSH access from WAN.
type: ssh -l support xx.xx.xx.xx (router WAN IP address)

To access the router using 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: From the router, use WEB UI to enable SSH access from WAN.
type: putty -ssh -l support xx.xx.xx.xx (router WAN IP address)