COMTREND CORPORATION

CT-5071
ADSL2+ Router
User's Manual

Version A1.2, February 10, 2006

261063-004

Preface

This manual provides information to network administrators. It covers the installation, operation and applications of the ADSL router.

The reader reading this manual is presumed to have a basic understanding of telecommunications. For product update, new product release, manual revision, software upgrade, technical support, etc., visit Comtrend Corporation at http://www.comtrend.com

This document is subject to change without notice.

Warning

- Before servicing or disassembling this equipment, always disconnect all power and telephone lines from the device.

- Use an appropriate power supply and a UL Listed telephone line cord. Specification of the power supply is clearly stated in Appendix B - Specifications.

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Technical support

When you find the product out of service, or that it doesn't work properly, please contact technical support engineer for immediate servicing or email to INT-support@comtrend.com

Table of Contents

Chapter 1 Introduction

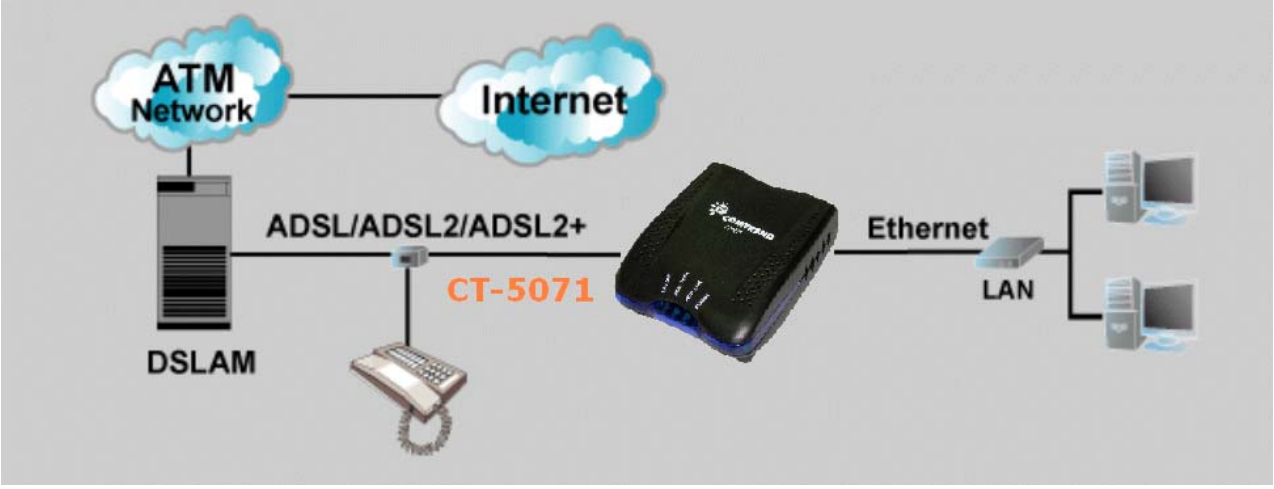
The CT-5071 is a wired Local Area Network ADSL2+ router. One 10/100 Base-T Ethernet port provides wired LAN. The CT-5071 ADSL router provides state of the art security features such as Firewall and VPN pass through. The CT-5071 is designed for residential applications that require wired connectivity to an ADSL broadband network. The CT-5071 supports up to 4 contiguous virtual connections allowing for multiple simultaneous Internet connections.

1.1 Features

- IP/MAC address filtering
- Static route/RIP/RIP v2 routing functions
- Dynamic IP assignment
- NAT/PAT
- IGMP Proxy
- DHCP Server/Relay/Client
- DNS Proxy
- Up to 4 VCs
- Web-based management
- Remote configuration and upgrade
- Configuration backup and restoration
- FTP/TFTP server

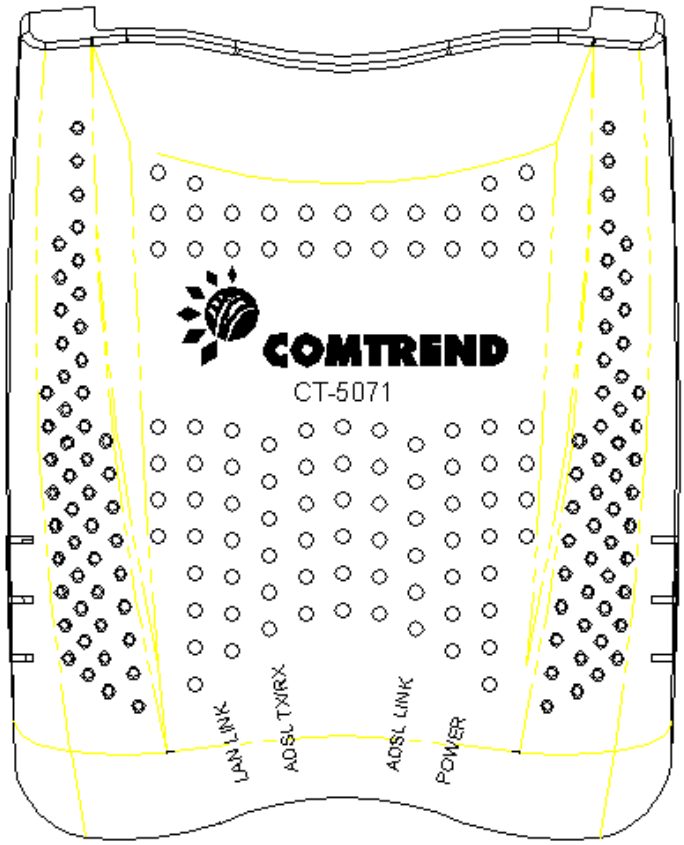
1.2 Application

The following diagram depicts the application of the CT-5071.



1.3 Front Panel LED Indicators

The front panel LEDs are shown in the picture below, followed by an explanation in the table below.

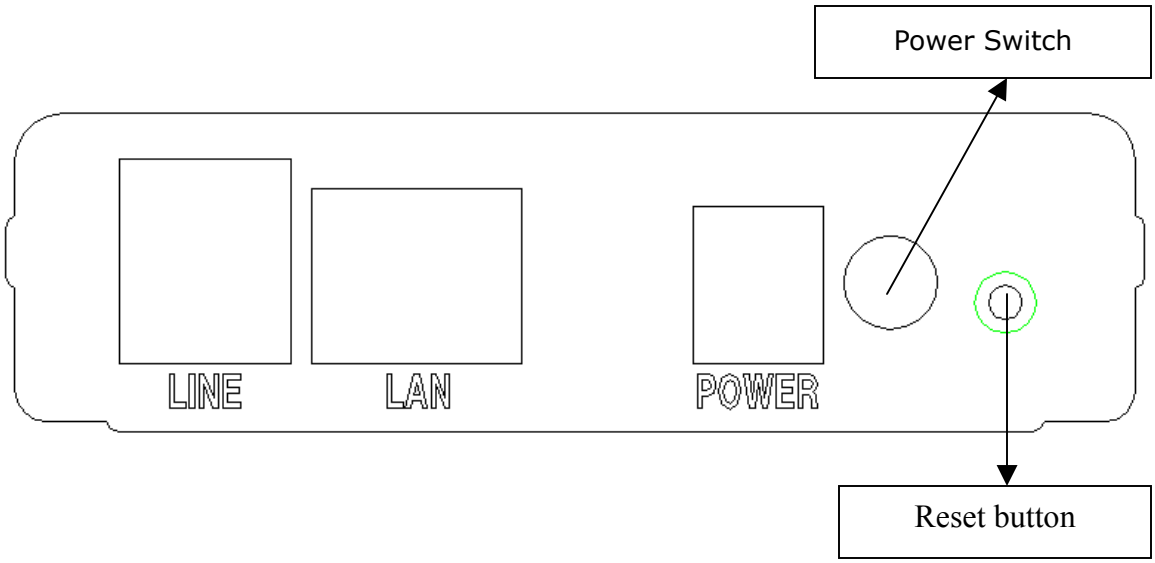


LED	Color	Mode	Function
POWER	Green	On	The router is powered up.
		Off	The router is powered down.
ADSL LINK	Green	On	The ADSL link is established.
		Off	The ADSL link is not established
	Green	Blink	The ADSL link is training
ADSL TX/RX	Green	On	Normal operating status
		Off	The ADSL link is terminated.
	Green	Blink	Data transmitting or receiving over ADSL.
LAN Link	Green	On	An Ethernet Link is established.
		Off	An Ethernet Link is not established.
	Green	Blink	Data transmitting or receiving over LAN.

Chapter 2 Installation

2.1 Hardware Installation

In the rear panel, there is a reset button. It is used to load the factory default settings. Hold down the button until the LED's start blinking simultaneously (about 5 seconds). After the device has booted successfully, the factory default settings are retrieved.



Follow the instructions below to complete the hardware connections.

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 RJ11 connection cable.

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

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, push the power-switch in, to the on position. After powering on, the router performs a self-test. Wait for a few seconds until the test is finished, then the router will be ready to operate.

Caution 1: If the router fails to power up, or it malfunctions, first verify that the power supply is connected correctly. Then power it on again. If the problem persists, contact our technical support engineers.
Caution 2: Before servicing this equipment always disconnect all power cords

and telephone lines from the wall outlet.

Chapter 3 Login via the Web Browser

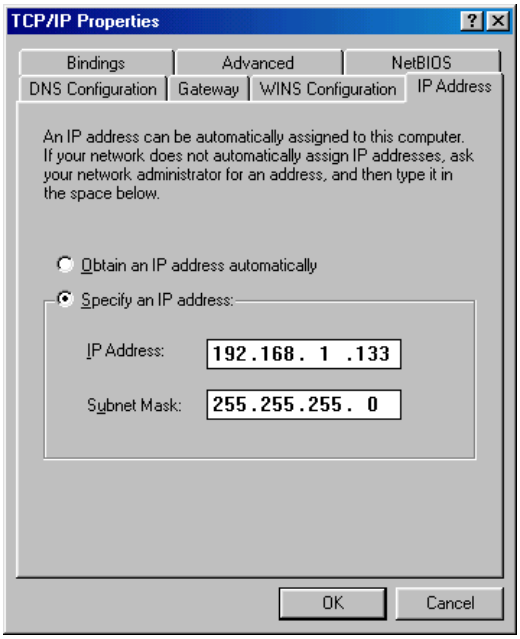
This section describes how to manage the router via a Web browser via the remote end. You can use a web browser such as Microsoft Internet Explorer, or Netscape Navigator. (The Web page is best viewed with Microsoft Internet Explorer 5.0 and later): A unique default user account is assigned with user name **root** and password **12345**. The user can change the default password later when logged in to the device.

3.1 IP Address

The default IP address of the CT-5071 (LAN port) is 192.168.1.1. To configure the CT-5071 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 screen and change the IP address to the domain of 192.168.1.x/24.



STEP 3: Click **OK** to submit the settings.

STEP 4: Start your Internet browser with the default IP address 192.168.1.1.

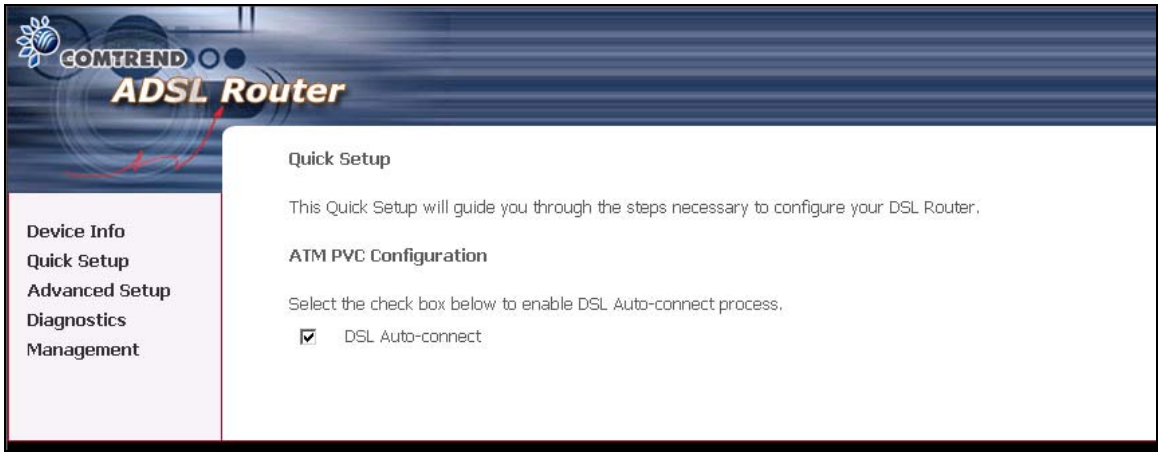
3.2 Login Procedure

Perform the following steps to bring up the Web user interface and configure the CT-5071. To log on to the system from the Web browser, follow the steps below:

STEP 1: Start your 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** in the user name and **12345** in the password field, and click **OK**. These values can be changed later in the Web User Interface by selecting the **Management** link.

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



3.2.1 Default Settings

During power on initialization, the CT-5071 initializes all configuration attributes to default values. It will then read the configuration profile from the Permanent Storage section on the flash memory. The default attributes are overridden when identical attributes with different values are configured. The configuration profile in Permanent Storage can be created via the Web user interface or telnet user interface, or other management protocols. To load the factory default settings, hold the reset button down for at least 5 seconds until the power indicator blinks, or by clicking the Restore Default Configuration option in the Restore Settings screen.

The following default settings are present when setting up the router for the first time. The PC running the browser can be attached to the Ethernet.

- LAN port IP address: 192.168.1.1
- Local administrator account name: root
- Local administrator account password: 12345
- Remote WAN access: disabled
- NAT and firewall: disabled
- DHCP server on LAN interface: disabled
- WAN IP address: none

Chapter 4 Quick Setup

The Quick Setup allows the user to configure the ADSL router for DSL connectivity and Internet access. It also guides the user though the WAN network setup first and then the LAN interface setup. You can either manually customize the router or follow the online instruction to set up the router.

The CT-5071 ADSL router supports the following five network operating modes over an ATM PVC WAN interface.

- 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 on the Central Office side 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 CT-5071 is to run the PPPoE client. The CT-5071 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, CT-5071 also supports pass-through PPPoE sessions from the LAN side while simultaneously running a PPPoE client fro non-PPPoE LAN devices.
- NAPT and firewall are always enabled when PPPoE mode is selected, but they can be enabled or disabled by the user when MER or IPoA is selected, NAPT 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 eight 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. You only need to follow the online instructions that you are prompted.

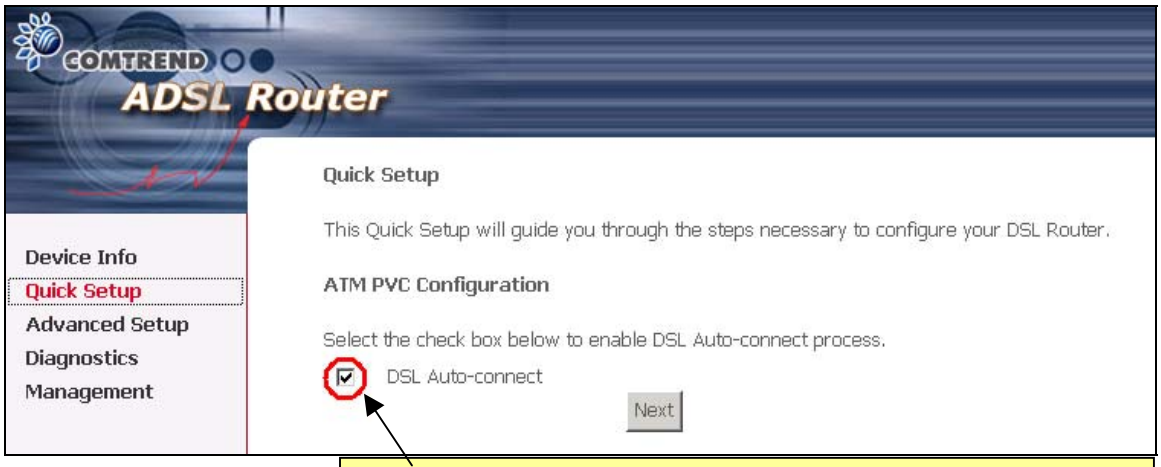
1. Select **Quick Setup** to display the DSL Quick Setup screen.

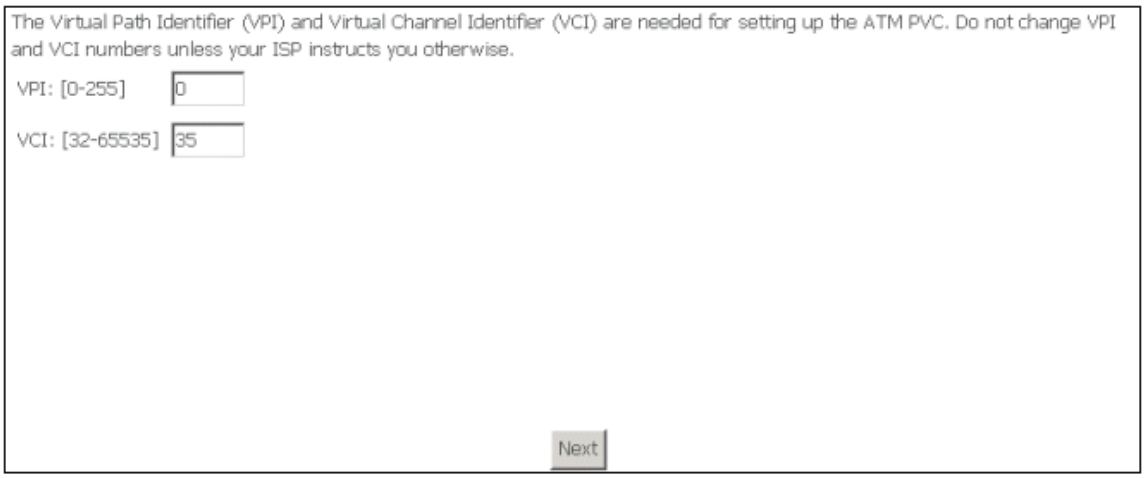
2. Click **Next** to start the setup process. Follow the online instructions to complete the setting. This procedure will skip some processes like PVC index, or encapsulation.

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

4.2 Manual Quick Setup

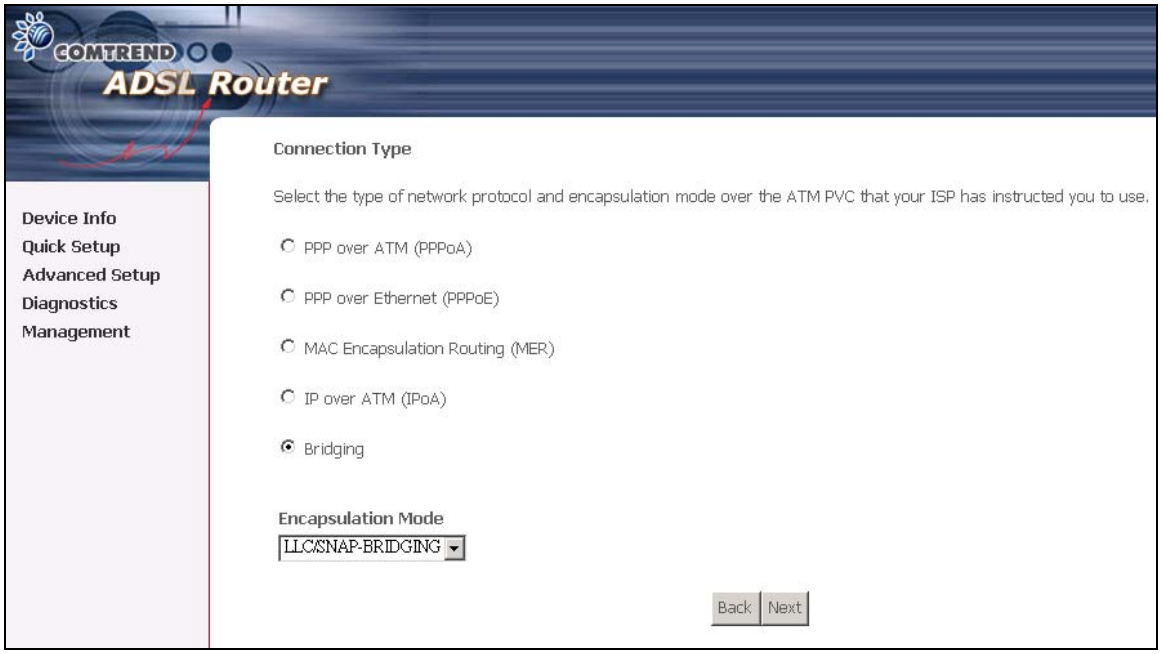
STEP 1: Click **Quick Setup** and un-tick the **DSL Auto-connect** checkbox to enable manual configuration of the connection type.





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

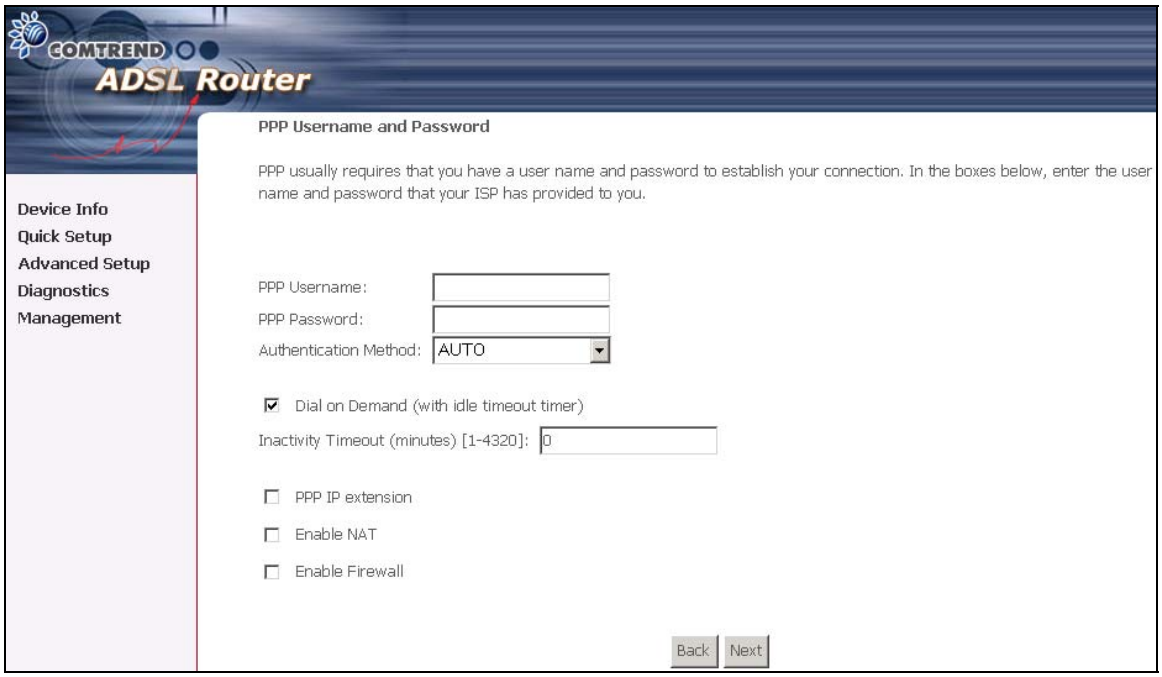
STEP 3: Then, choose the Encapsulation mode.



STEP 4: Click **Next** to display the following screen. Choosing different connection types pops up different settings requests. Enter appropriate settings that are requested by your service provider. The following descriptions state each connection type setup separately.

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

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



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.

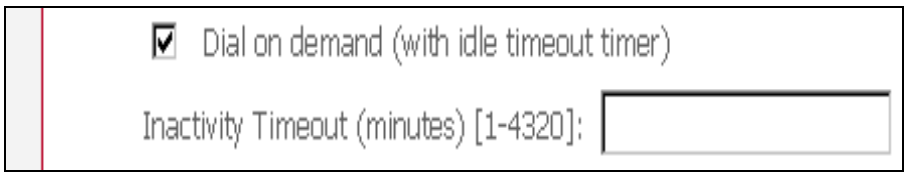
Encapsulation Mode

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

Disconnect if no activity

The CT-5071 can be configured to disconnect if there is no activity for a period of time by selecting the **Disconnect if no activity** 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.



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:

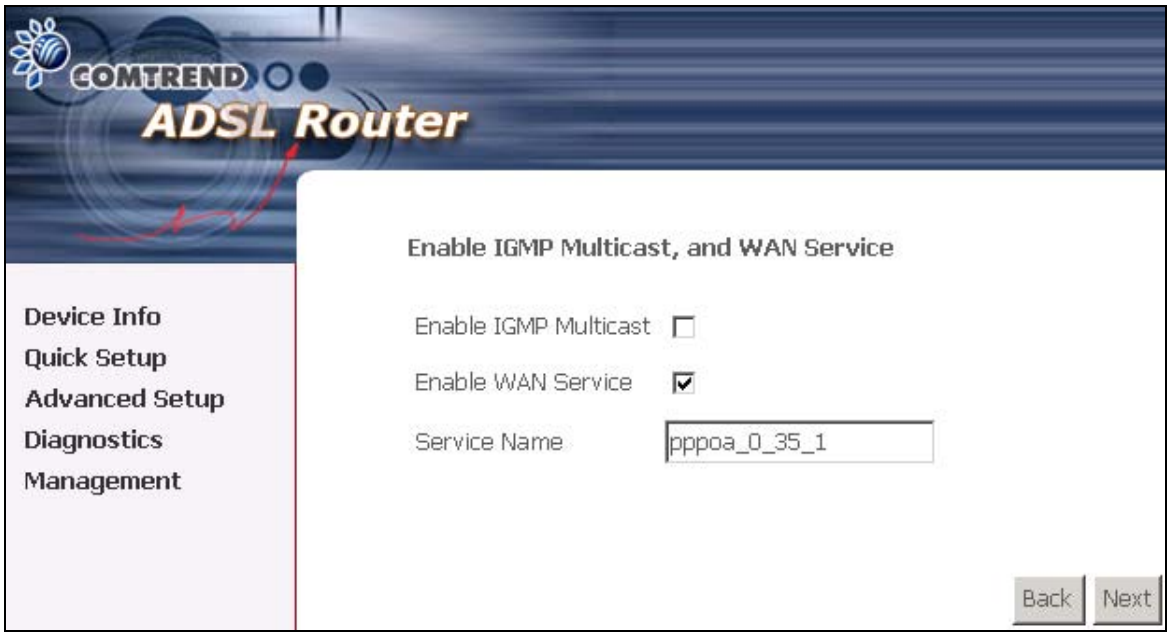
- Allows only one PC on the LAN
- The public IP address assigned by the remote side using the PPP/IPCP protocol is actually not used on the WAN PPP interface. Instead, it is forwarded to the PC's LAN interface through DHCP. Only one PC on the LAN can be connected to the remote, since the DHCP server 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.

2. Click **Next** to display the screen below.

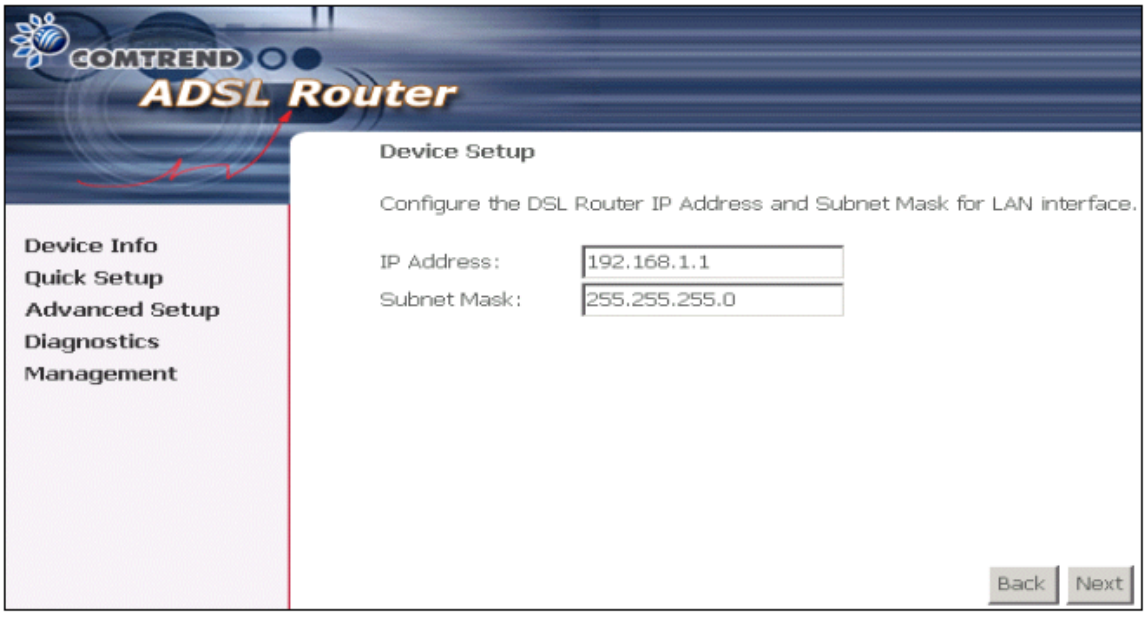
Enable IGMP Multicast checkbox: Tick the checkbox to enable IGMP multicast (proxy). IGMP (Internet Group Membership Protocol) is a protocol used by IP hosts to report their multicast group memberships to any immediately neighboring multicast routers.

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

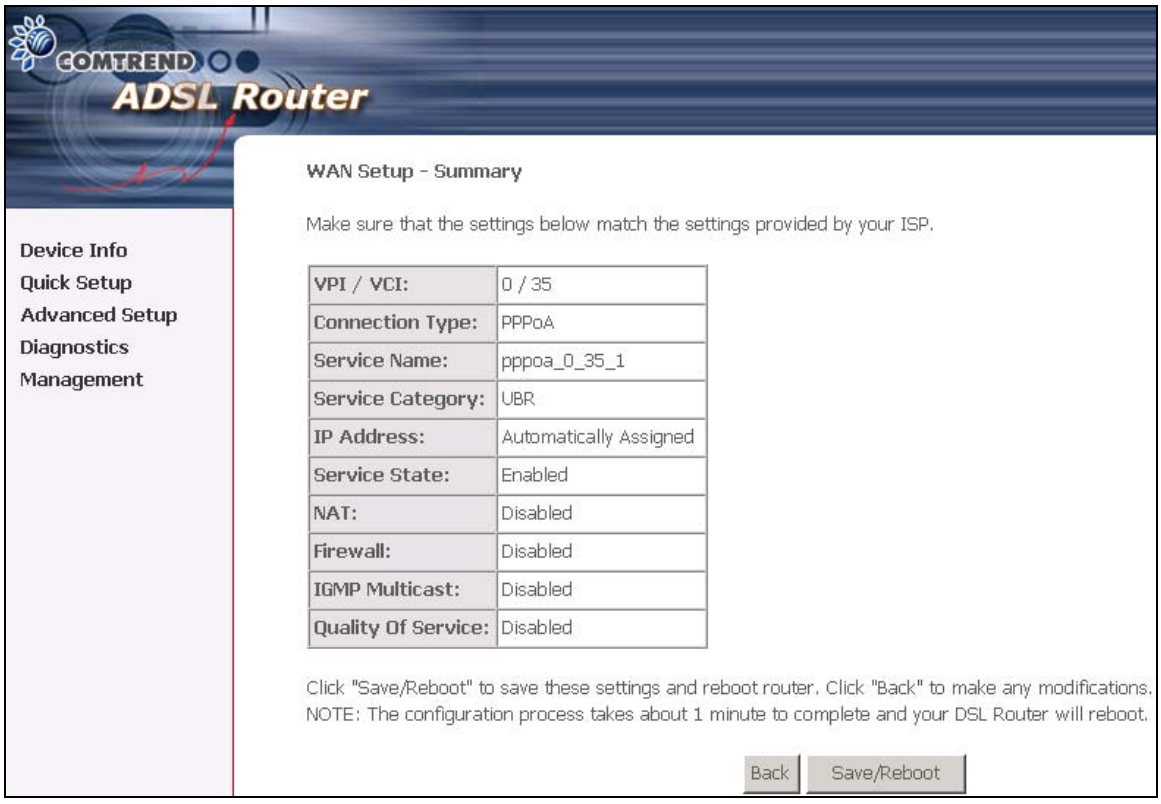
Service Name: This is user-defined.



3. After entering your settings, select **Next**. The following screen appears. This page allows the user to configure the LAN interface IP address, subnet mask and DHCP server. If the user would like this ADSL router to assign dynamic IP address, DNS server and default gateways to other LAN devices, select the button **Enable DHCP server on the LAN** to enter the starting IP address and end IP address and DHCP leased time.



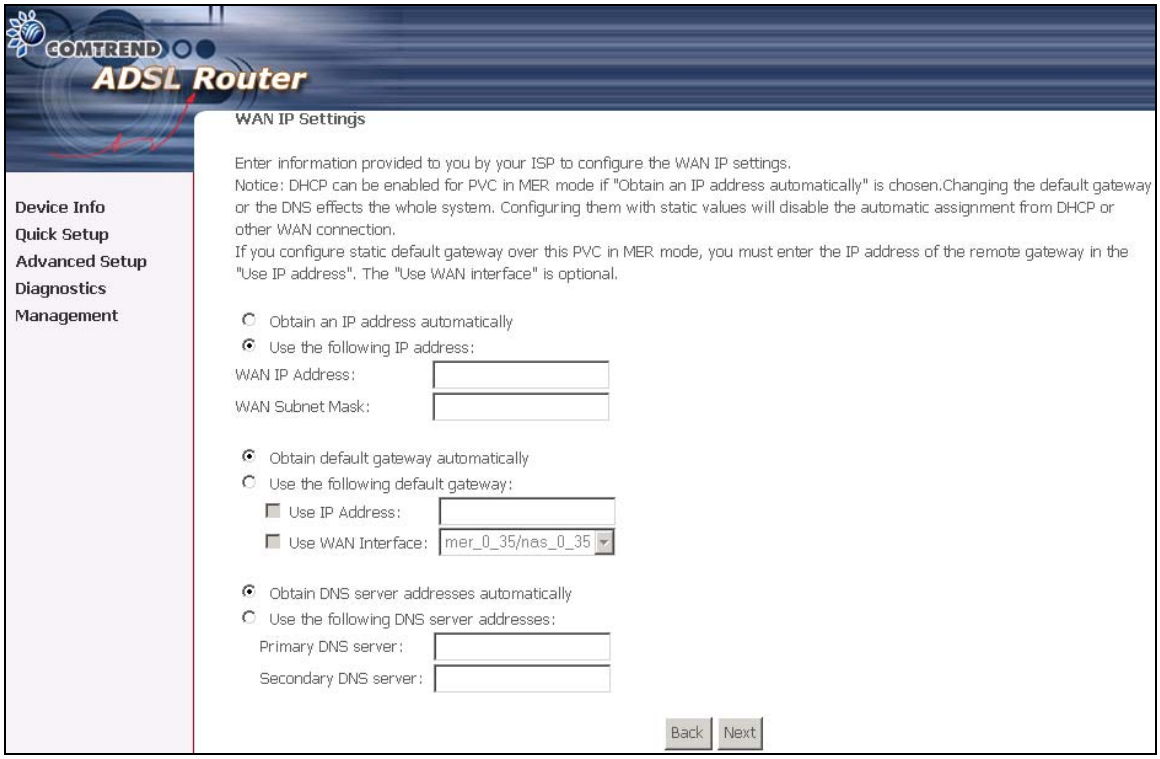
4. Click **Next** to display the WAN Setup-Summary screen that presents the entire configuration summary. Click **Save/Reboot** if the settings are correct. Click **Back** if you wish to modify the settings.



5. After clicking **Save/Reboot**, the router will save the configuration to the flash memory, and reboot. The Web UI will not respond until the system is brought up again. After the system is up, the Web UI will refresh to the Device Info page automatically. The CT-5071 is ready for operation and the LEDs display as described in the LED description tables.

- MAC Encapsulation Routing (MER)

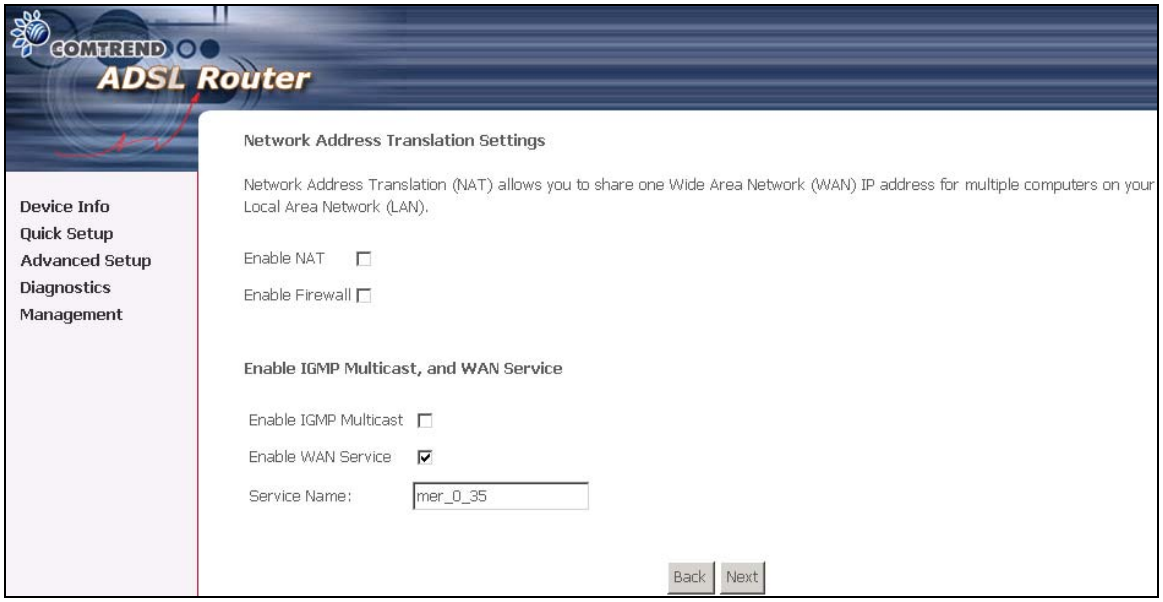
To configure MER, do the following.
1. Select **Quick Setup** and click **Next**.
2. Enter the PVC Index provided by the ISP and click **Next** and click **Next**
3. Select the MAC Encapsulation Routing (MER) radio button, and click **Next**. The following screen appears.



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

Notice: DHCP can be enabled for PVC in MER mode 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.
The ISP should provide the values that must be entered in the entry fields.

4. Click **Next** to display the following screen appears.



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.

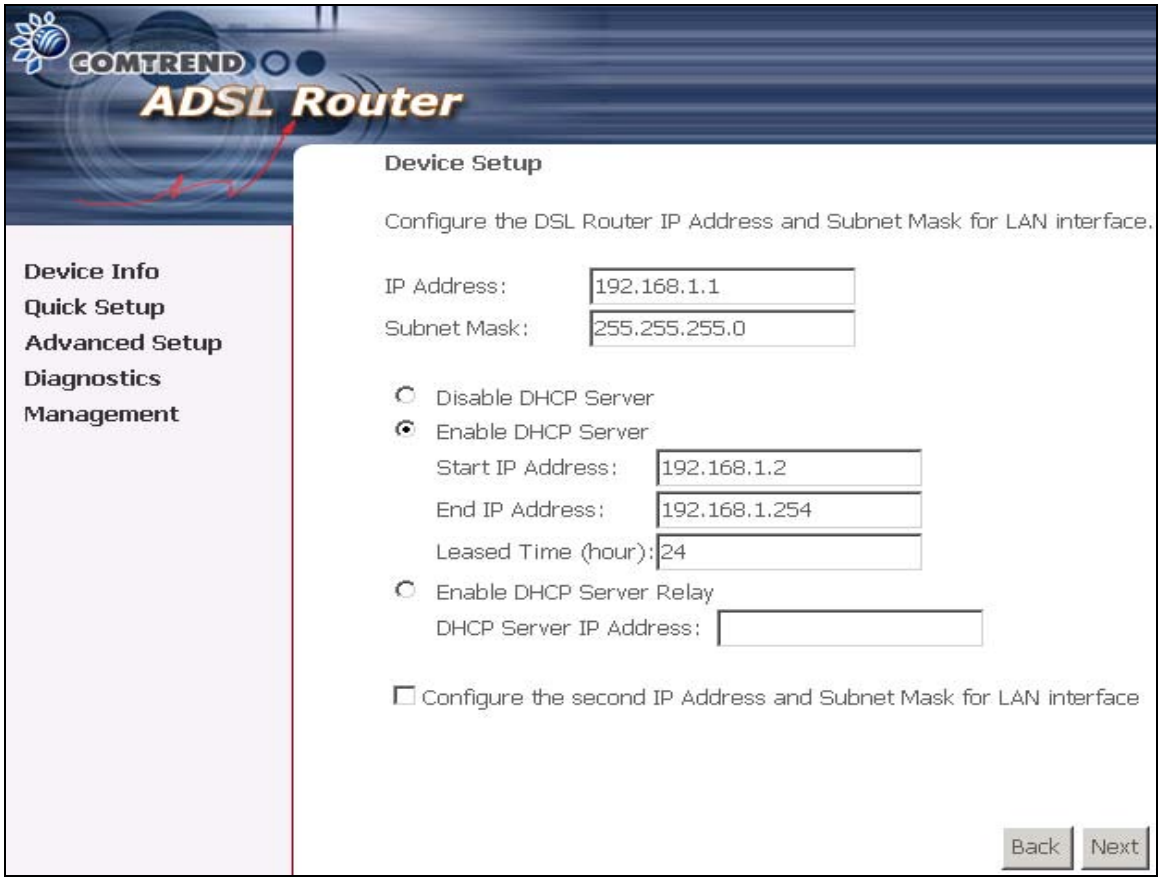
Enable Firewall checkbox: If the firewall checkbox is selected, the firewall submenu on the left side main panel will be displayed after system reboot. The user can then configure firewall features after the system comes up. If firewall is not used, this checkbox should be de-selected to free up system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

Service Name: This is User-defined.

5. Upon completion, click **Next**. The following screen appears.

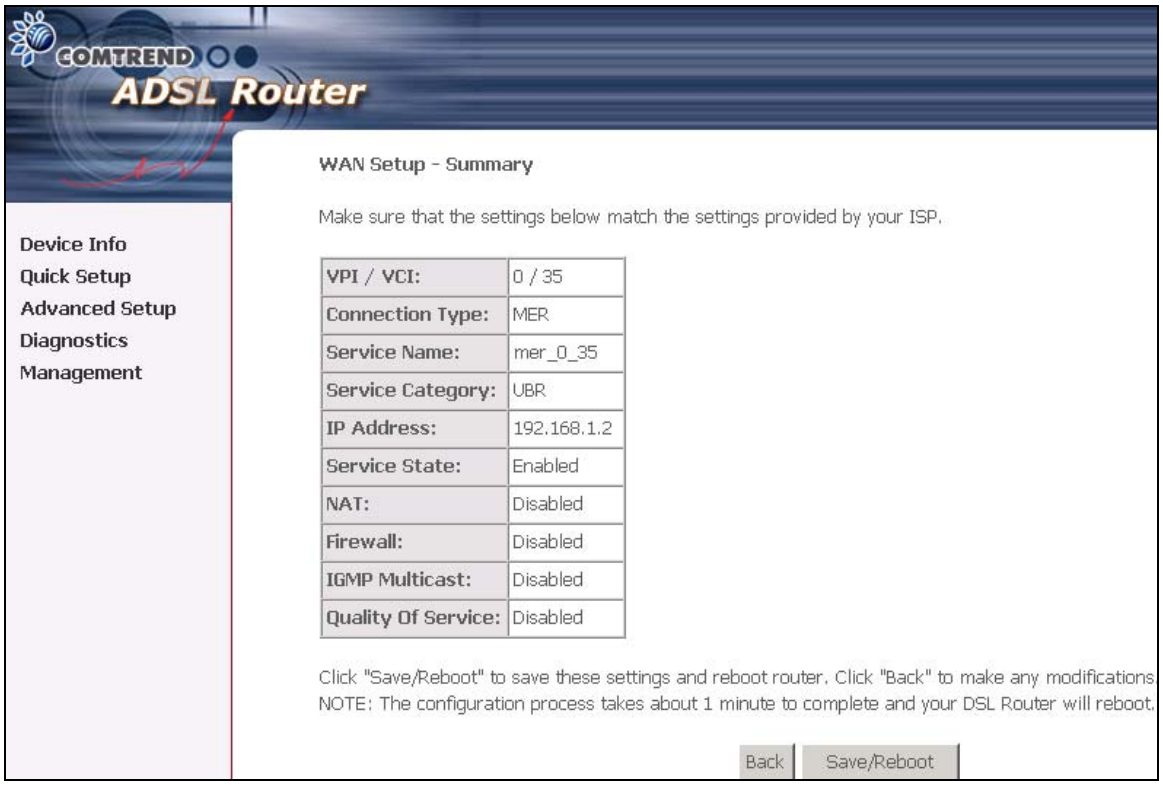


The Device Setup page allows the user to configure the LAN interface IP address and DHCP server. If the user would like this ADSL router to assign dynamic IP addresses, DNS server and default gateway to other LAN devices, select the radio box **Enable DHCP server on the LAN** to enter the starting IP address and end IP address and DHCP lease time. This configures the router to automatically assign IP addresses, default gateway address and DNS server addresses to each of your PCs.

Note that the router's default IP address is 192.168.1.1 and the default private address range provided by the ISP server in the router is 192.168.1.2 through 192.168.1.254.

6. After entering your settings, select **Next** to display the following screen. The WAN Setup-Summary screen presents the entire configuration summary. Click **Save/Reboot** if the settings are correct. Click **Back** if you wish to modify the settings.

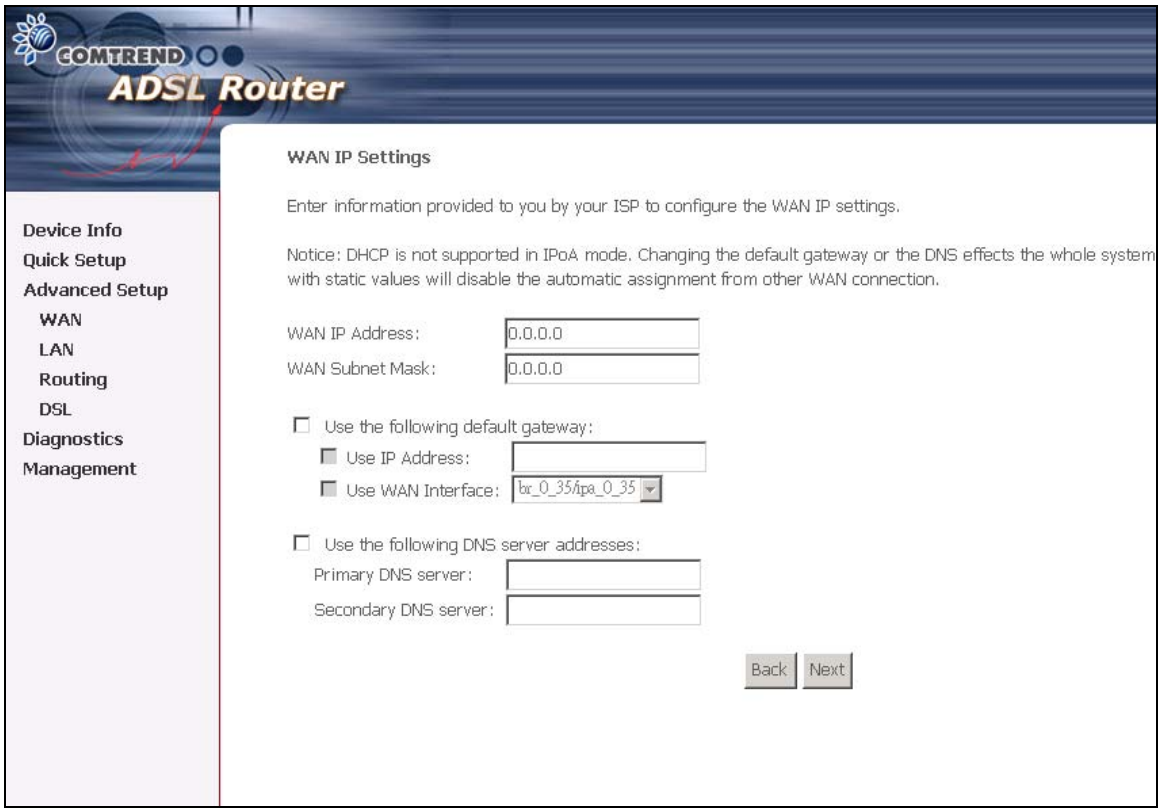
The following screen will be displayed.



After clicking **Save/Reboot**, the router will save the configuration to the flash memory, and reboot. The Web UI will not respond until the system is brought up again. After the system is up, the Web UI will refresh to the Device Info page automatically. The CT-5071 is ready for operation and the LEDs display as described in the LED description tables.

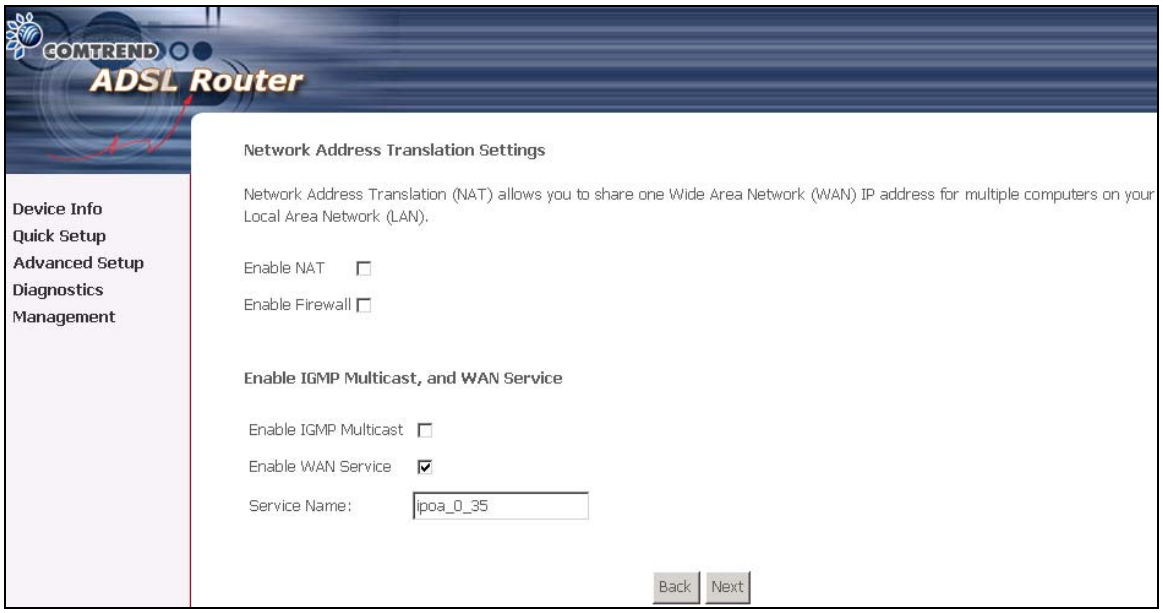
- IP Over ATM (IPoA)

To configure IP Over ATM,
1. Select **Quick Setup** and click **Next**.
2. Enter the PVC Index and click **Next**.
3. Type the VPI and VCI values provided by the ISP and click **Next**.
4. Select the IP over ATM (IPoA) radio button and click **Next**. The following screen appears.



Notice that 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 the ISP.

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

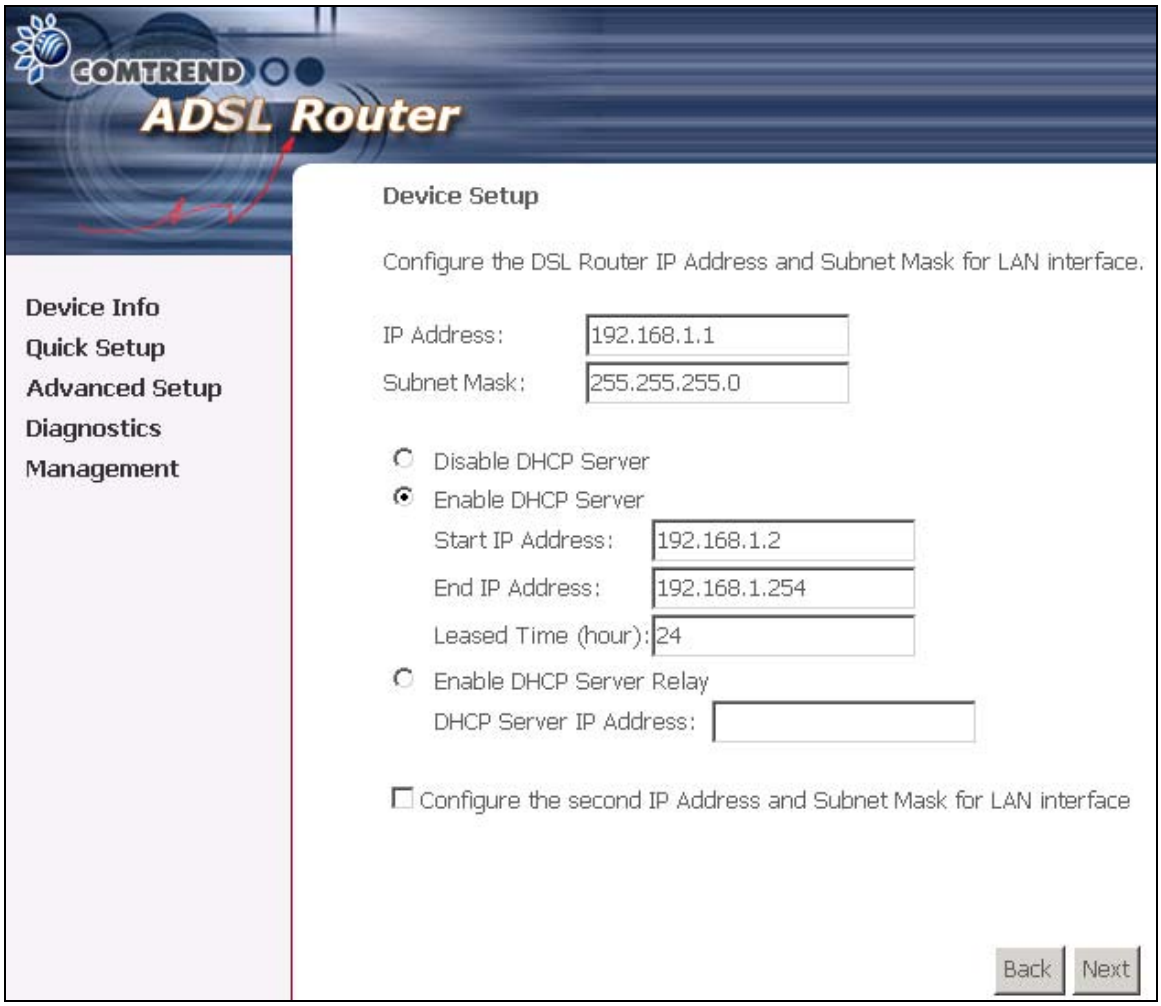


Enable NAT checkbox
If the LAN is configured with a private IP address, the user should select this checkbox. The NAT submenu on the left side main panel will be displayed after reboot. The user can then configure NAT-related features after the system comes up. If a private IP address is not used on 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 Firewall checkbox
If the firewall checkbox is selected, the firewall 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 Firewall submenu will not be displayed on the left main panel.

Enable Quality Of Service
Enabling IP QoS for a PVC improves performance for selected classes of applications. However, since IP 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.

6. Click **Next** to display the following screen. The Device Setup page allows the user to configure the LAN interface IP address and DHCP server if the user would like this ADSL router to assign dynamic IP addresses, DNS server and default gateway to other LAN devices. Select the button Enable DHCP server on the LAN to enter the starting IP address and end IP address and DHCP lease time.

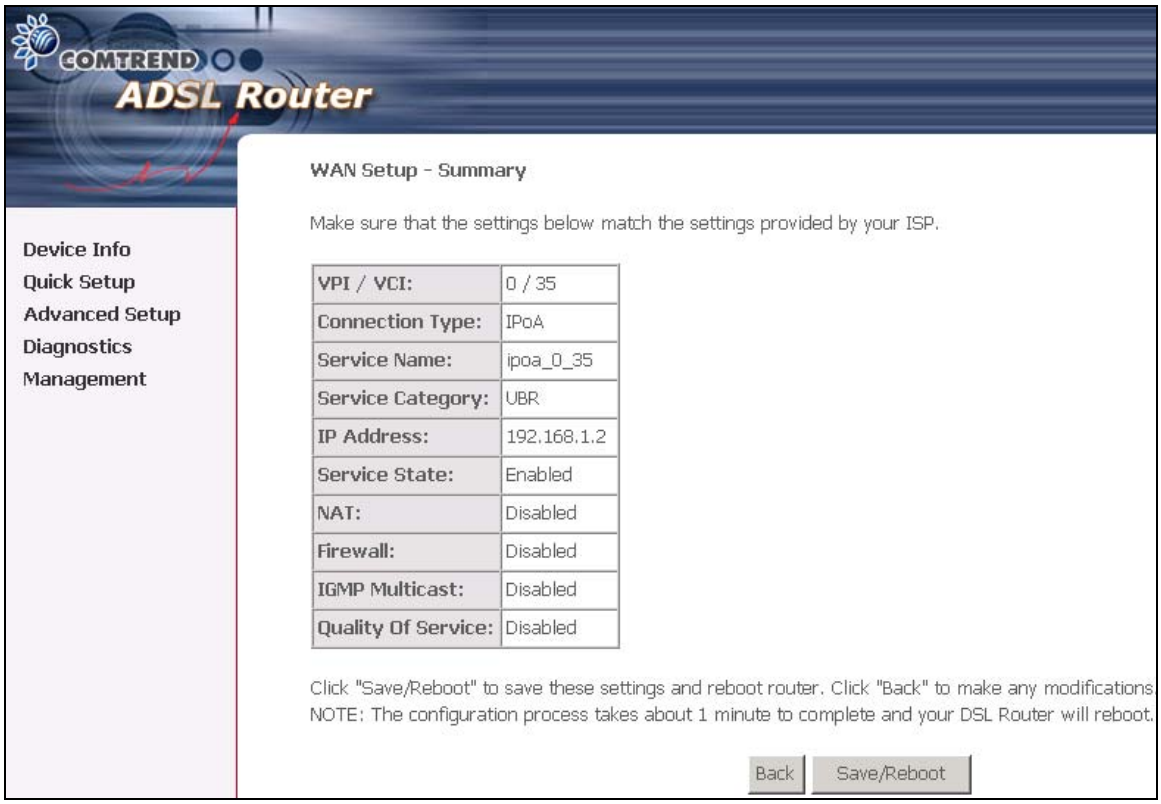


The user must configure the IP Address and the Subnet Mask. To use the DHCP service on the LAN, select the **Enable DHCP server** checkbox, and enter the Start IP addresses, the End IP address and DHCP lease time. This configures the router to automatically assign IP addresses, default gateway address and DNS server addresses to each of your PCs.

Note that the router's default IP address is 192.168.1.1 and the default private address range provided by ISP server in the router is 192.168.1.2 through 192.168.1.254.

7. The WAN Setup-Summary screen presents the entire configuration summary. Click **Save/Reboot** if the settings are correct. Click **Back** if you wish to modify the settings.

The following screen will be displayed.

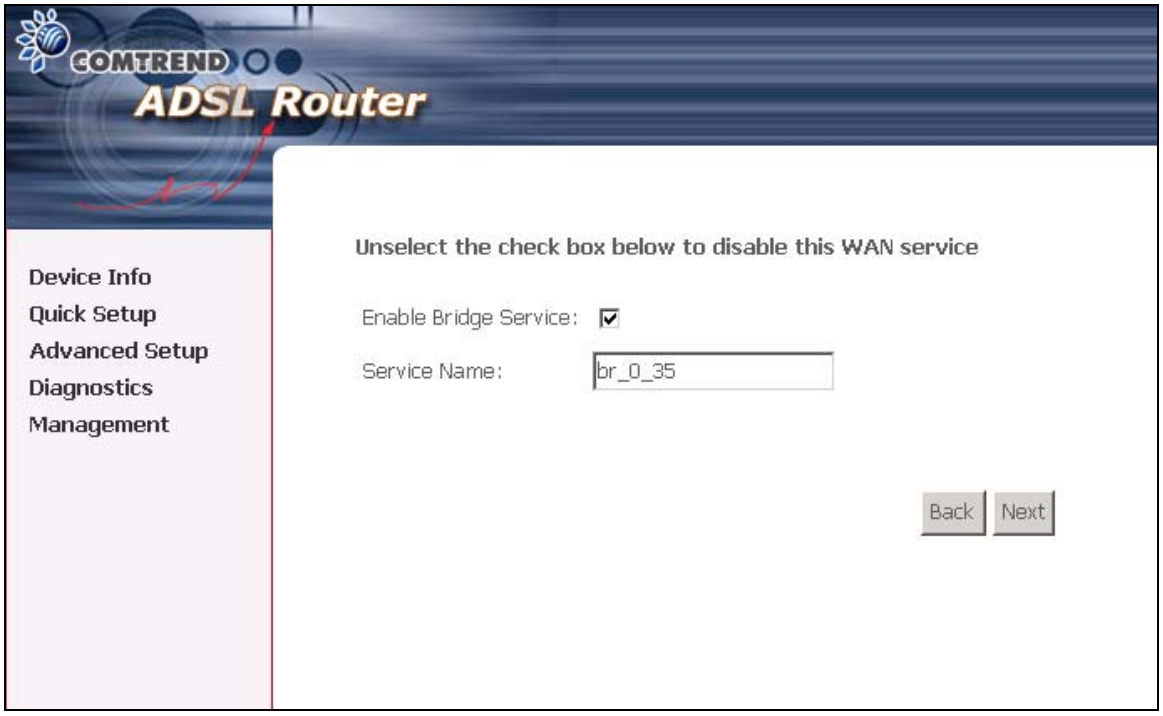


9. After clicking **Save/Reboot**, the router will save the configuration to the flash memory, and reboot. The Web UI will not respond until the system is brought up again. After the system is up, the Web UI will refresh to the Device Info page automatically. The CT-5071 is ready for operation and the LEDs display as described in the LED description tables.

- Bridging

Select the bridging mode. To configure Bridging, do the following.

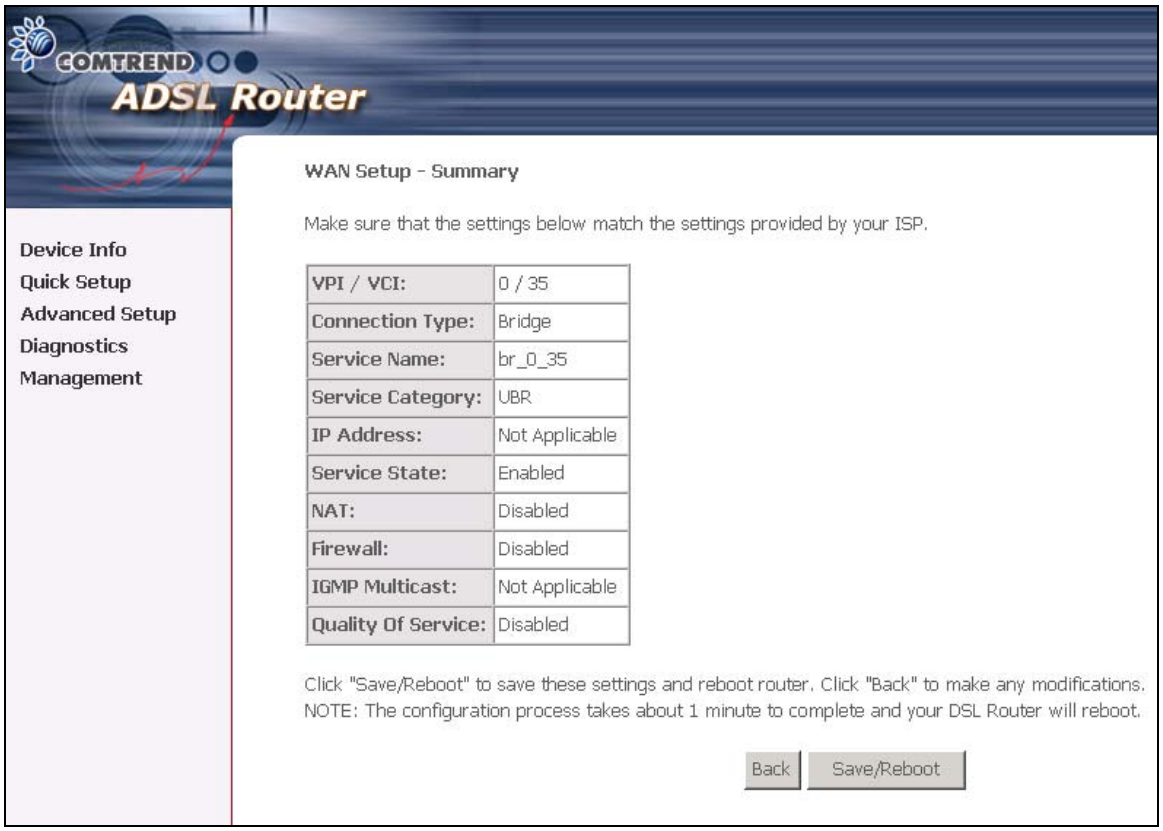
1. Select Quick Setup and click **Next**.
2. Enter the PVC Index and click **Next**.
3. Type in the VPI and VCI values provided by the ISP and click Next.
4. Select the Bridging radio button and click **Next**. The following screen appears. To use the bridge service, tick the checkbox, Enable Bridge Service, and enter the service name.



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 the remote technical support cannot access the ADSL router.

6. Click the **Next** button

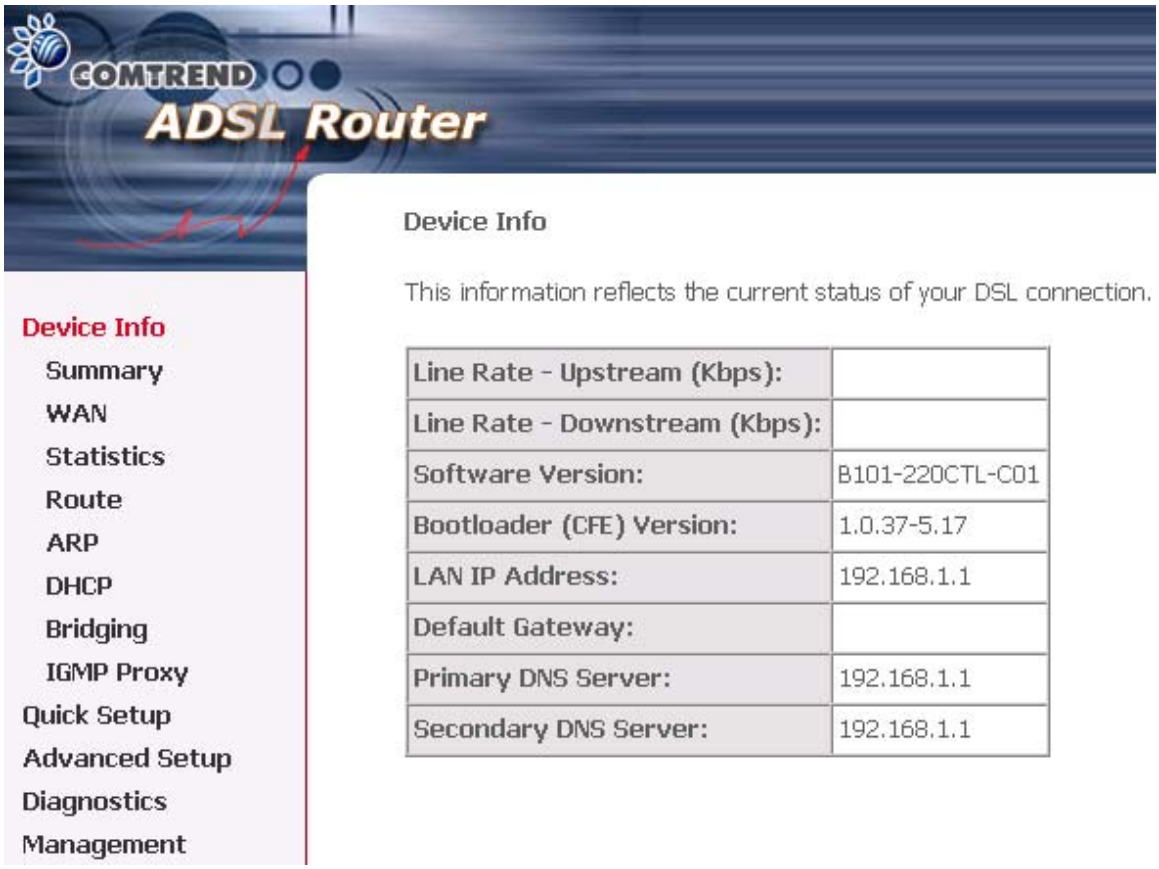
The following screen will be displayed.



The WAN Setup-Summary screen presents the entire configuration summary. Click **Save/Reboot** if the settings are correct. Click **Back** if you wish to modify the settings.

Chapter 5 Device Info

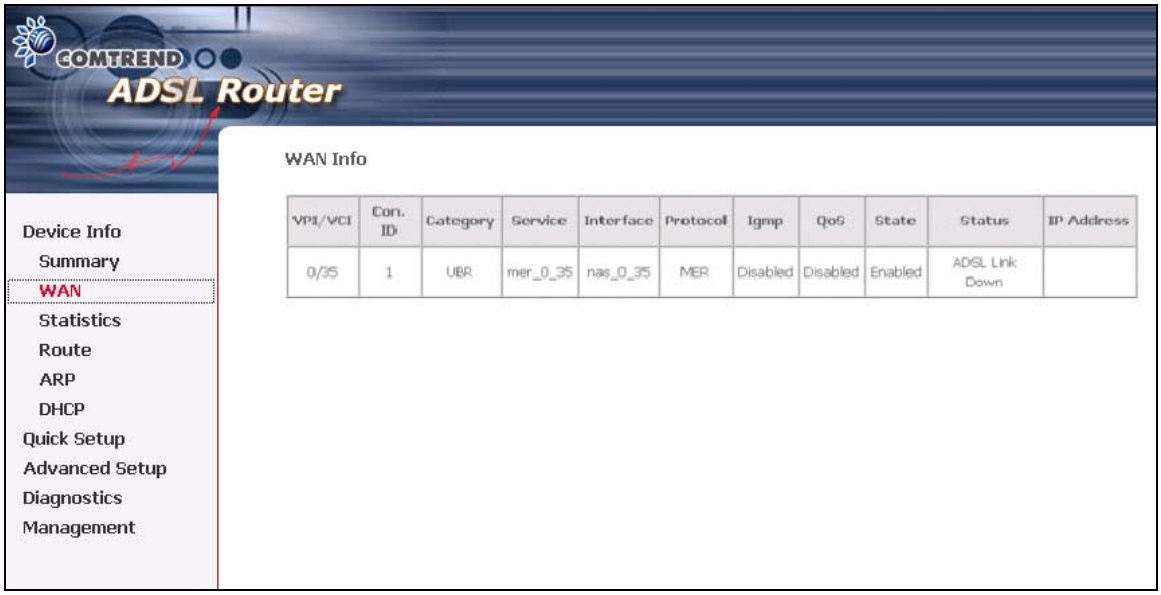
After login, the **Device Info** screen appears as shown.



Note: The selections available on the left side of menu are based upon the configured connection.

5.1 WAN

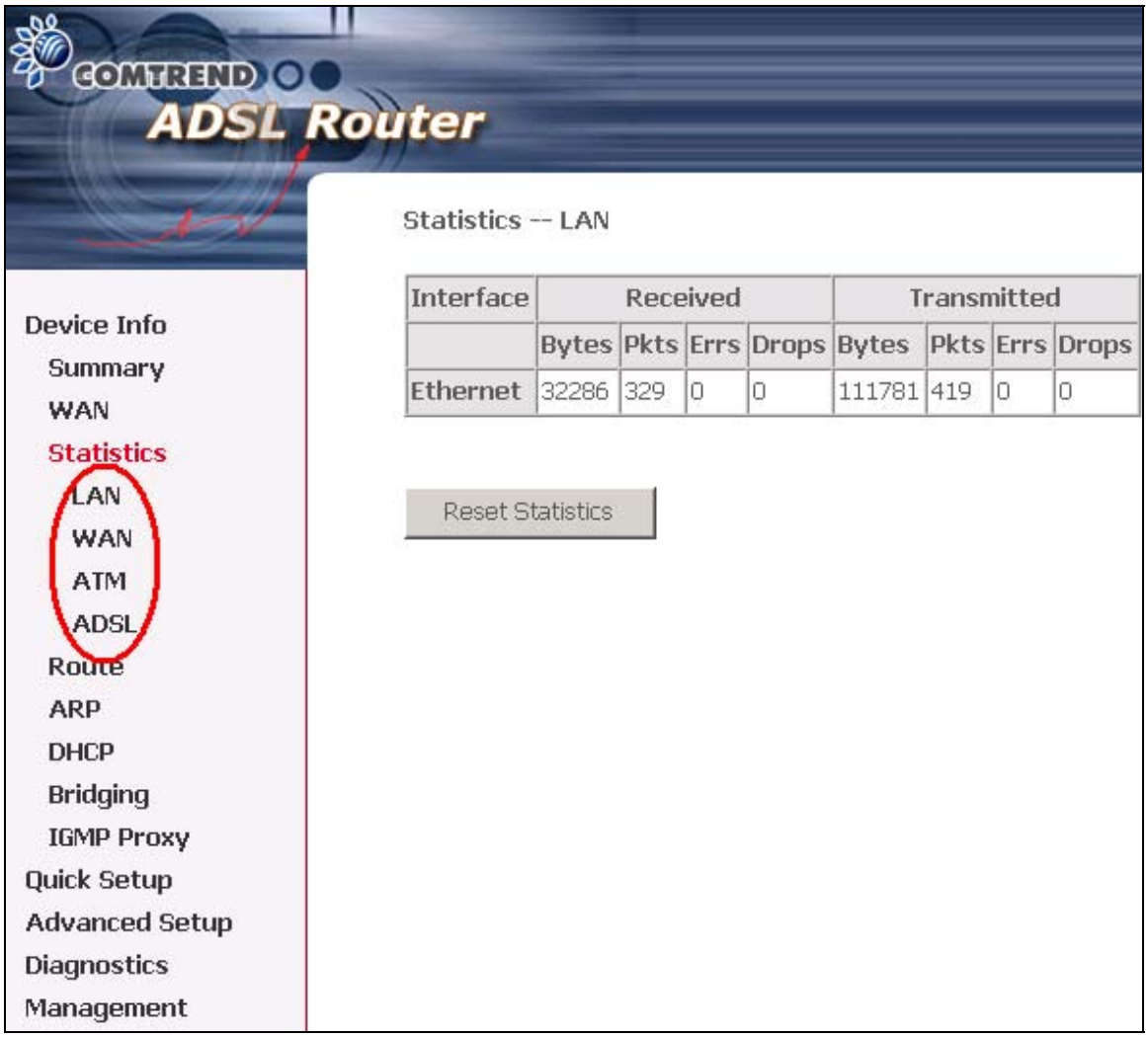
Click **WAN** on the Device Info menu bar to display the configured PVC(s) and the status.



VPI/VCI	Shows the values of the ATM VPI/VCI
Con. ID	Shows the connection ID
Category	Shows the ATM service classes
Service	Shows the name for WAN connection
Interface	Shows connection interfaces
Protocol	Shows the connection type, such as PPPoE, PPPoA, etc.
IGMP	Shows the statue of the IGMP function
QoS	Shows the statue of the QoS 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

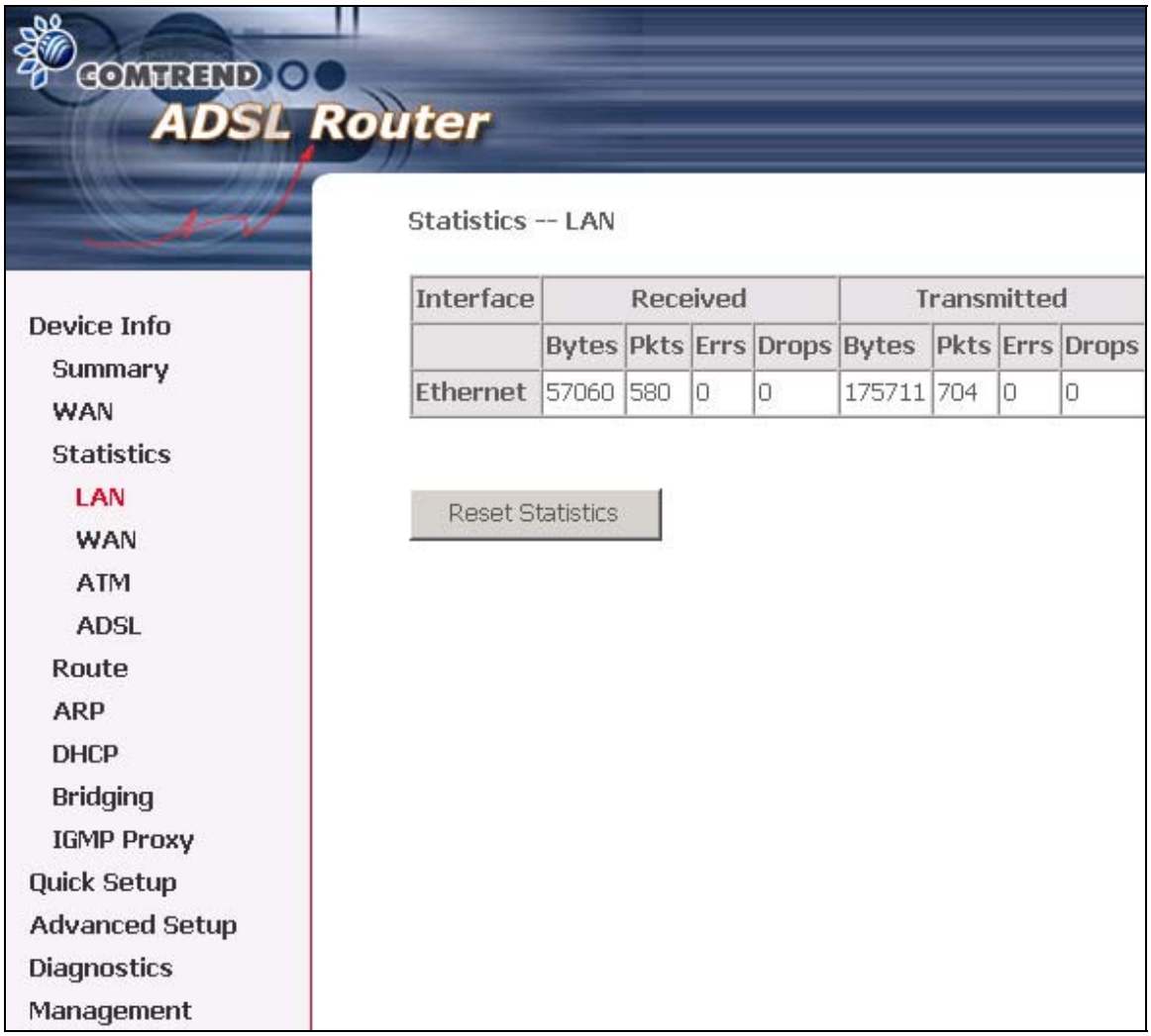
5.2 Statistics

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

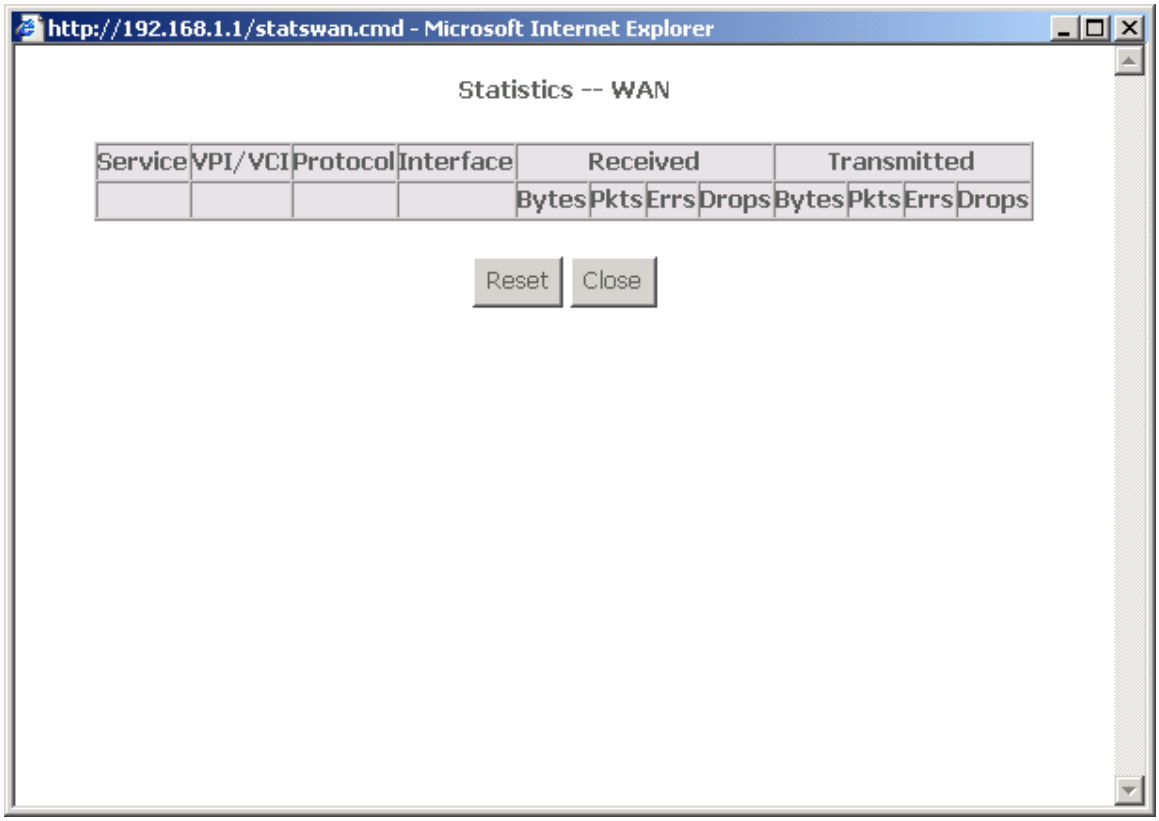


5.2.1 LAN Statistics

The Network Statistics screen shows interface statistics for ATM AAL5 interface and Ethernet interfaces. (The Network Statistics screen shows interface statistics for LAN of Ethernet interfaces. This shows byte transfer, packet transfer, Error and Drop statistics for the LAN interface.)


COMTREND
ADSL Router
Device Info
Summary
WAN
Statistics
LAN
WAN
ATM
ADSL
Route
ARP
DHCP
Bridging
IGMP Proxy
Quick Setup
Advanced Setup
Diagnostics
Management
Statistics -- LAN
Interface
Received
Transmitted
Bytes
Pkts
Errs
Drops
Bytes
Pkts
Errs
Drops
Ethernet
57060
580
0
0
175711
704
0
0
Reset Statistics

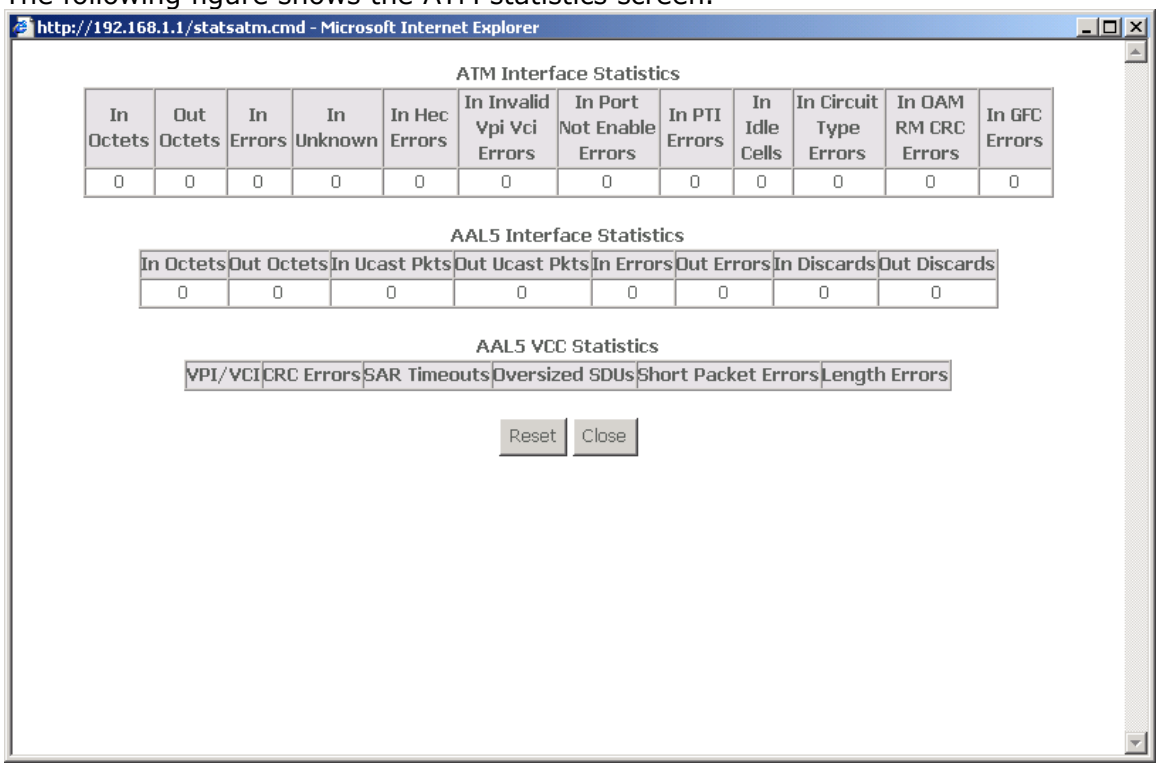
5.2.2 WAN Statistics



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) packet in Byte Rx/TX (receive/transmit) packets Rx/TX (receive/transmit) the packets which are errors, Rx/TX (receive/transmit) the packets which are dropped

5.2.3 ATM statistics

The following figure shows the ATM statistics screen.



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

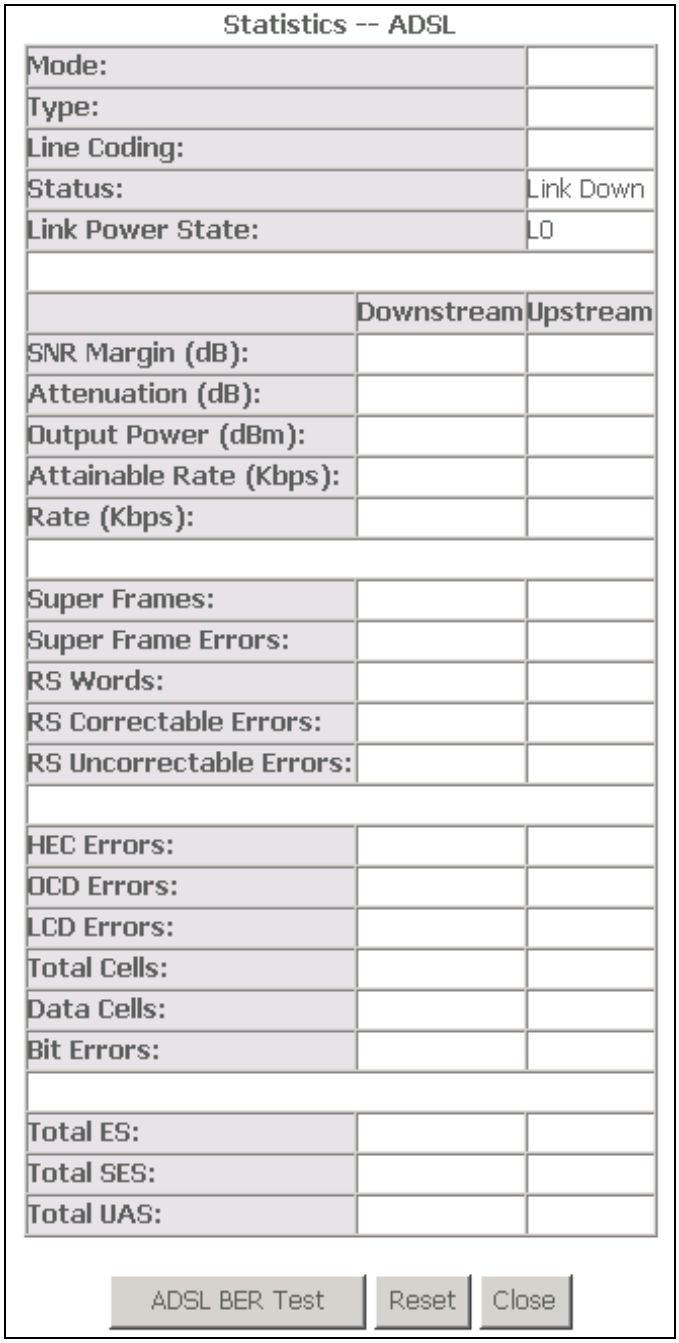
Field	Description
In Octets	Number of received AAL5/AAL0 CPCS PDU octets
Out Octets	Number of received AAL5/AAL0 CPCS PDUs octets transmitted
In Ucst Pkts	Number of received AAL5/AAL0 CPCS PDUs passed to a higher-layer for transmission
Out Ucast Pkts	Number of received AAL5/AAL0 CPCS PDUs received from 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	Descriptions
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

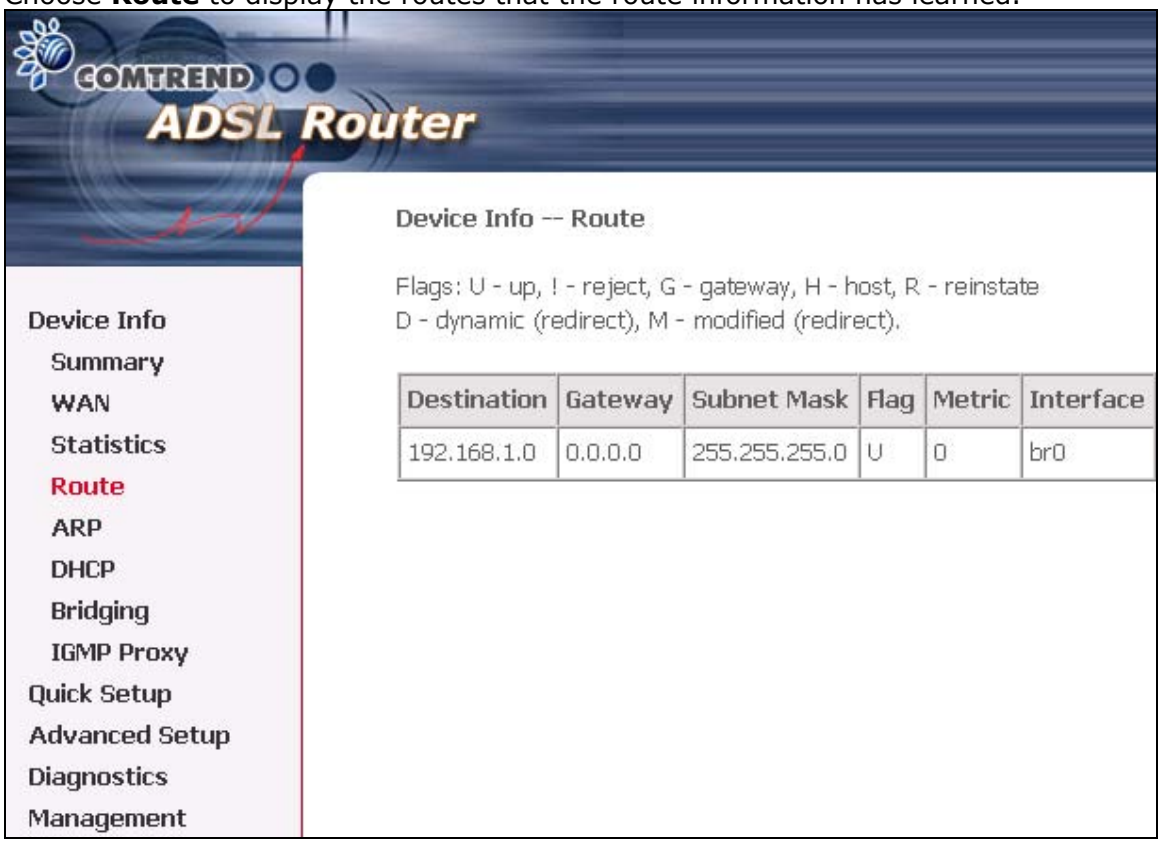
The following figure shows the ADSL Network Statistics screen. Within the ADSL Statistics window, a bit Error Rate Test can be started using the ADSL BER Test button. The Reset button resets the statistics.



Field	Description
Mode	Modulation protocol G.DMT or T1.413
Type	Channel type Interleave or Fast
Line Coding	Line Coding format, that can be selected G.dmt, G.lite, T1.413, ADSL2, Annex L and Annex M
Status	Lists the status of the DSL link
Link Power State	Link output power state.
SNR Margin (dB)	Signal to Noise Ratio (SNR) margin
Attenuation (dB)	Estimate of average loop attenuation in the downstream direction.
Output Power (dBm)	Total upstream output power
Attainable Rate (Kbps)	The sync rate you would obtain.
Rate (Kbps)	Current sync rate.
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

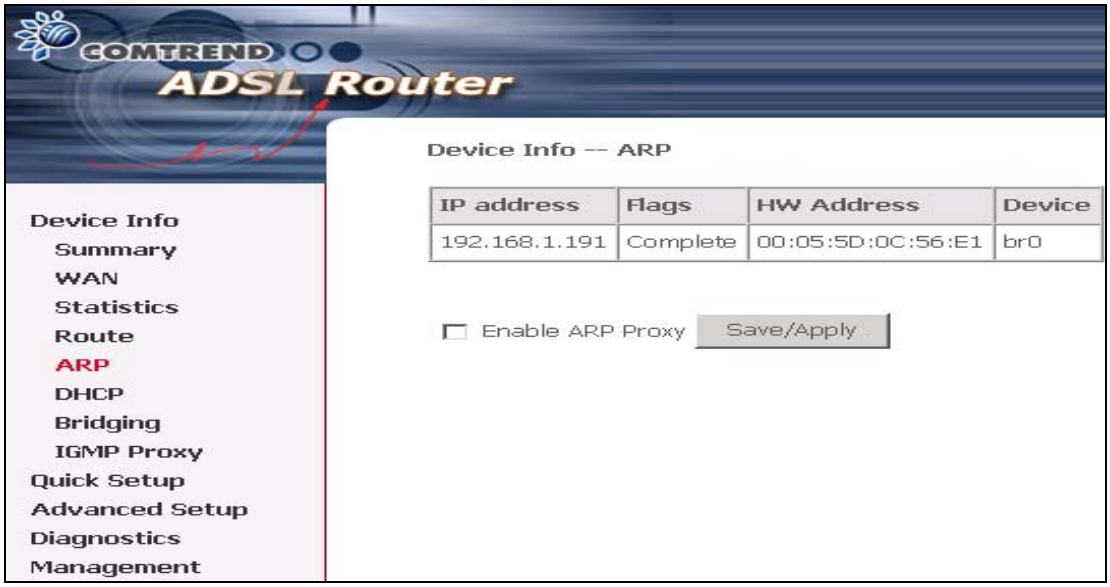
5.2.5 Route

Choose **Route** to display the routes that the route information has learned.



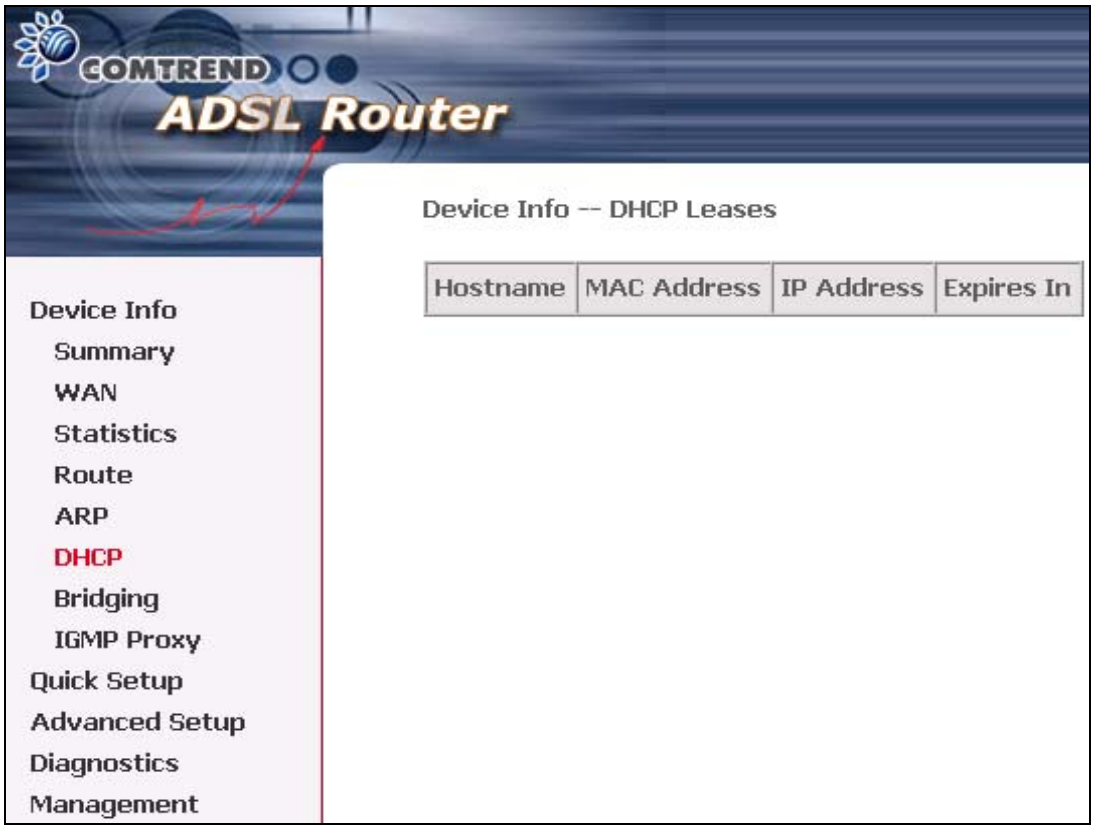
5.2.6 ARP

Click **ARP** to display the ARP information.



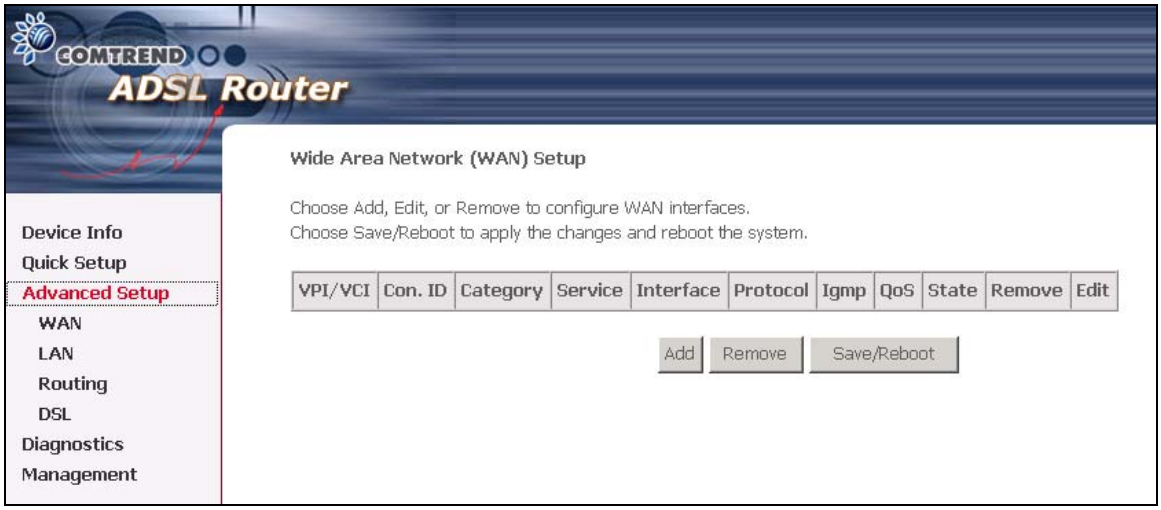
5.2.7 DHCP

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



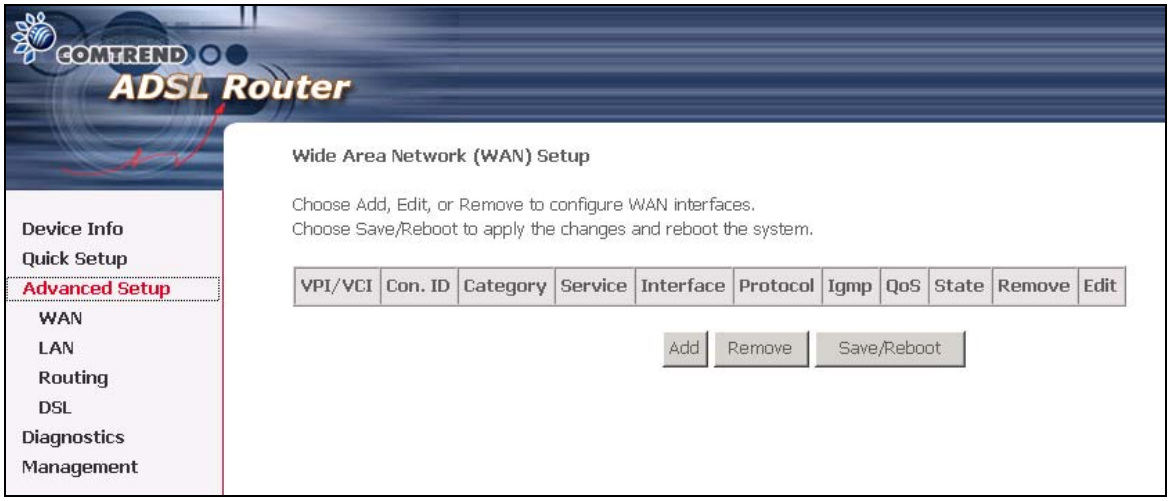
Chapter 6 Advanced Setup

This chapter explains: WAN, LAN, Routing and DSL.



VPI/VCI	ATM VPI (0-255) / VCI (32-65535)
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
Firewall	Shows if the Firewall enabled or disabled
Nat	Shows if the Network Address Translation(NAT) is enabled or disabled.
QoS	Shows enable or disable IGMP QoS
State	Shows enable or disable WAN connection

6.1 WAN

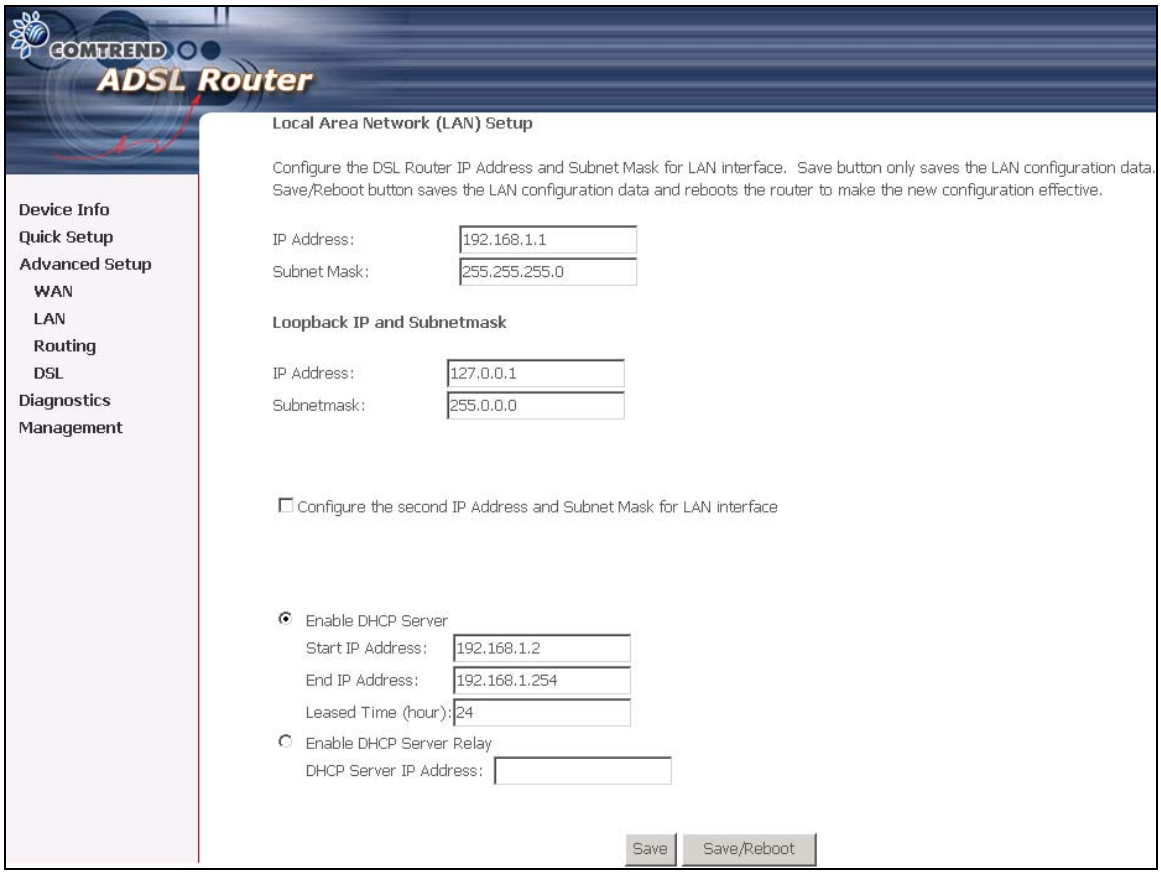


For further information on WAN please reference section: 5.1, Page 29.

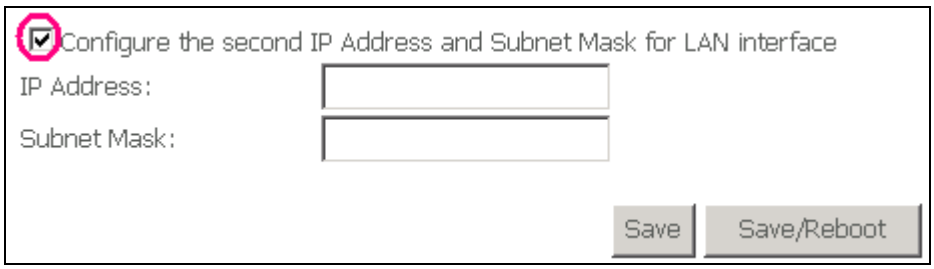
6.2 LAN

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



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



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

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

6.3 NAT

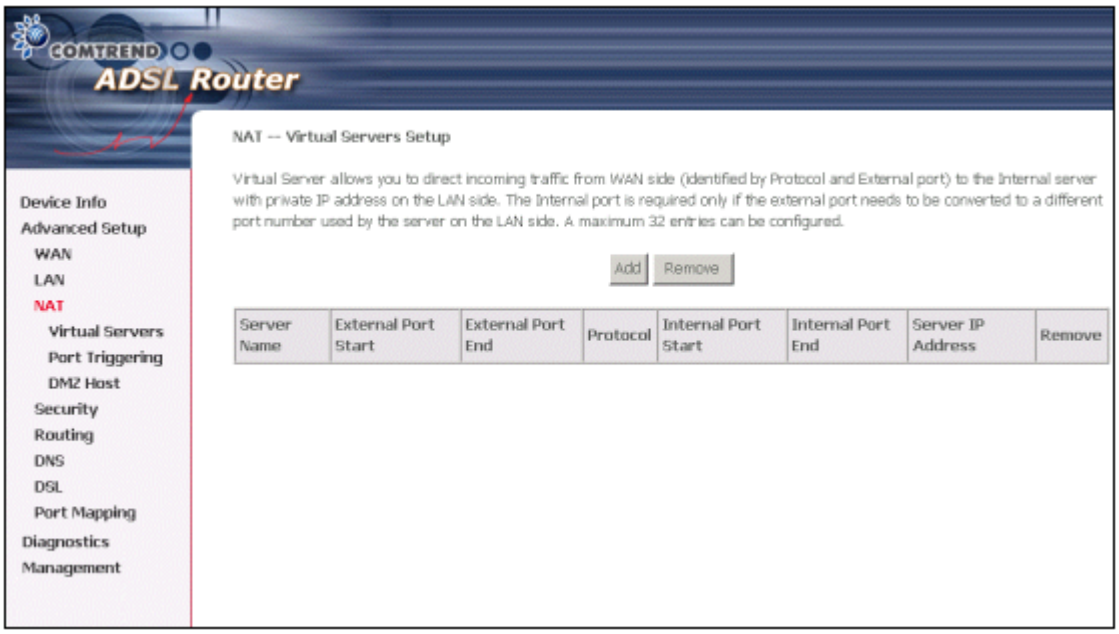
Note: This option is not available for bridge mode.

To display the NAT function, you need to enable the NAT feature in the WAN Setup.

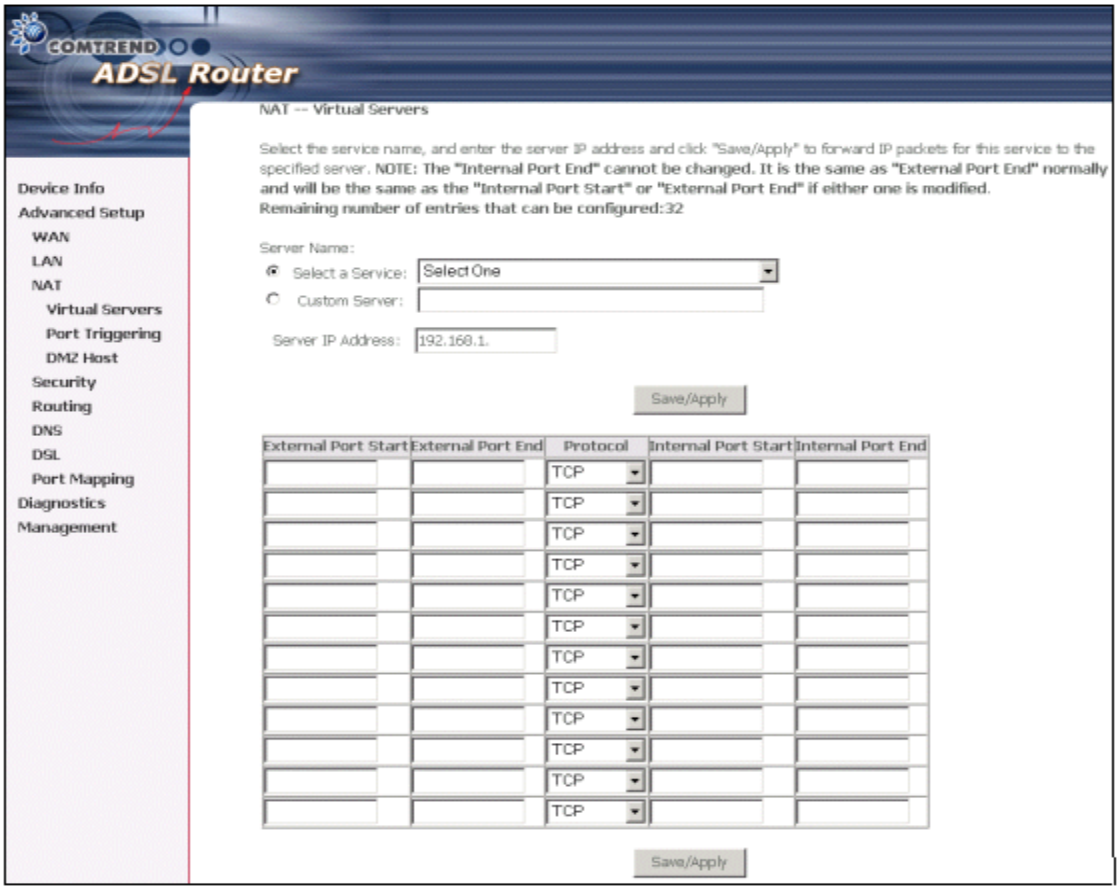
6.3.1 Virtual Servers

Note: This option is not available for Bridge mode.

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.



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



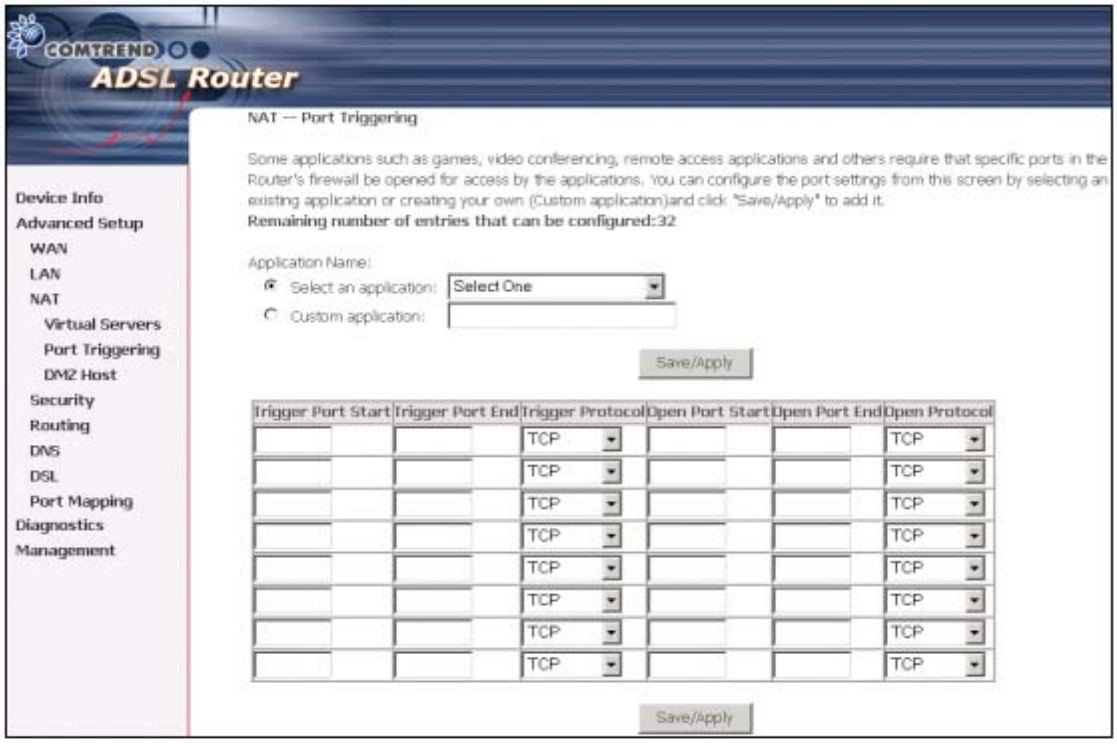
Select a Service Or Custom Server	User should select the service from the list. Or User can enter the name of their choice.
Server IP Address	Enter the IP address for the server.
External Port Start	Enter the starting external port number (when you select Custom Server). When a service is selected the 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

Note: This option is not available for Bridge mode.

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.

To add a Trigger Port, simply click the Add button. The following will be displayed.



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

Note: This option is not available for Bridge mode.

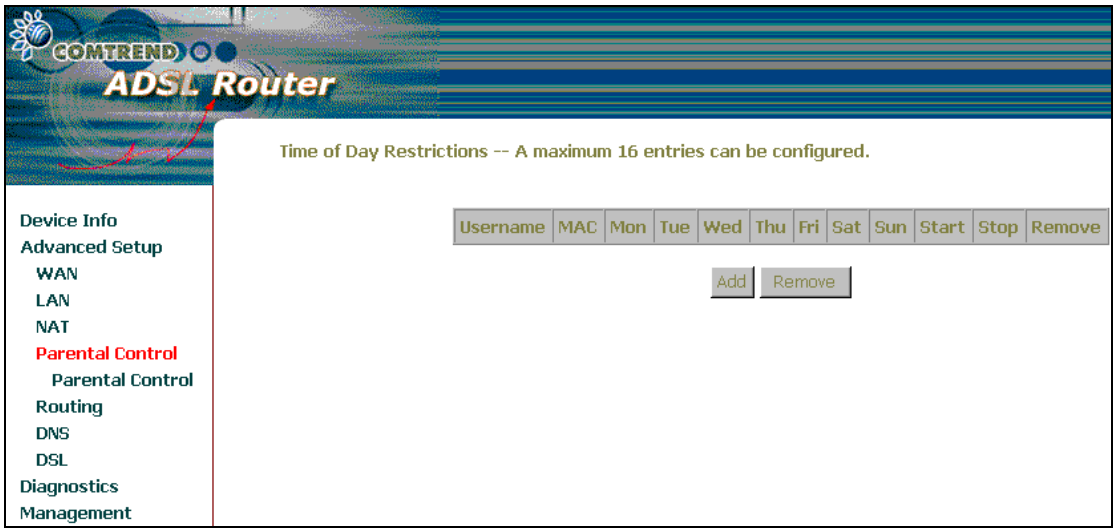
The DSL router will forward IP packets from the WAN that do not belong to any of the applications configured in the Virtual Servers table to the DMZ host computer.

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.

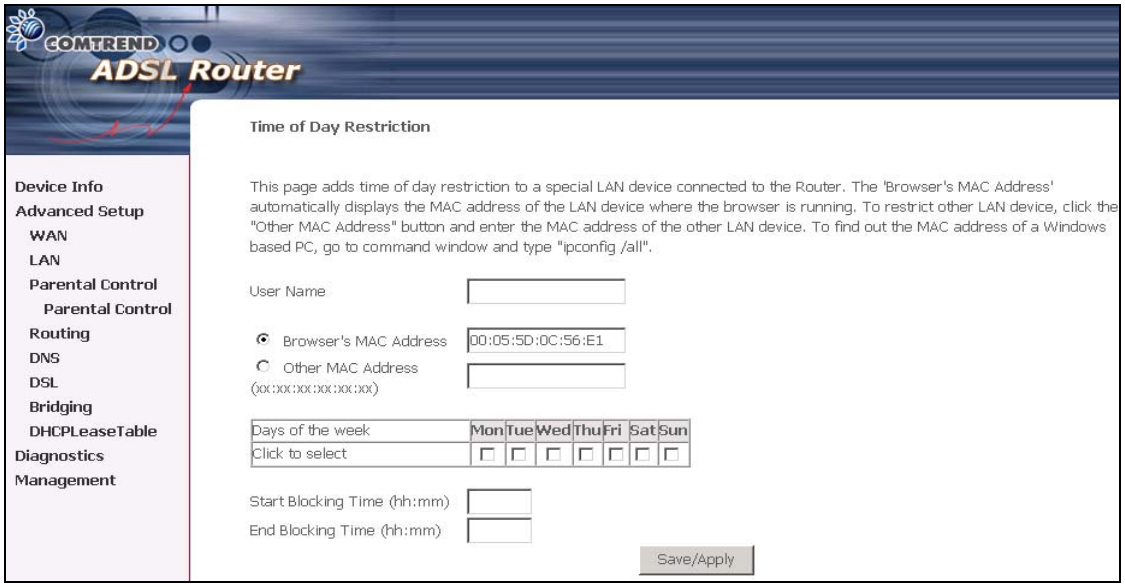
6.4 Security

6.4.1 Parental Control

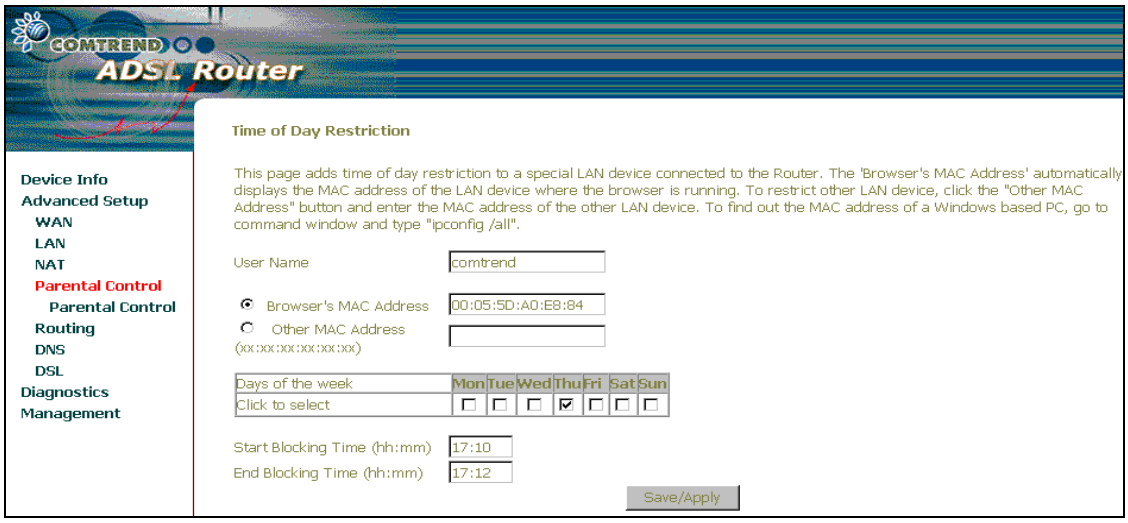
Click on Parental Control in the menu bar.



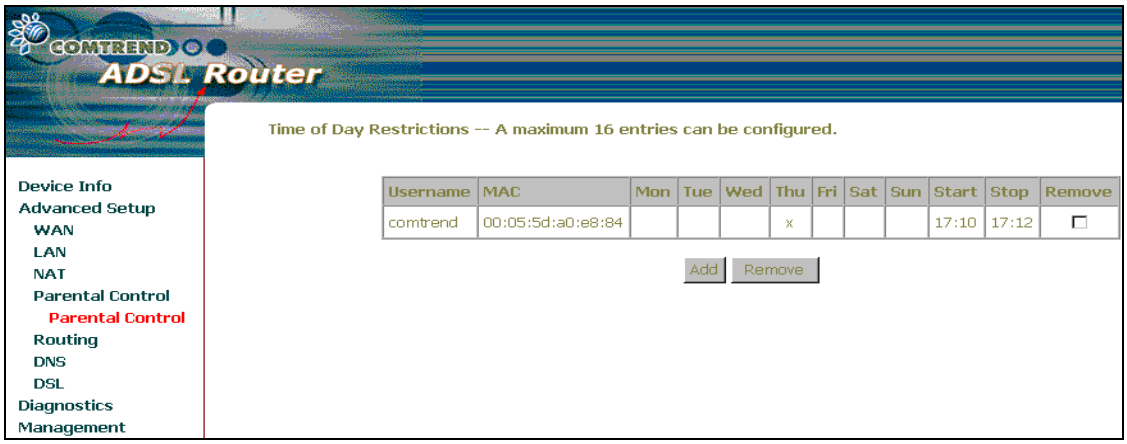
Then click Add.The following screen will be displayed.



Input your User Name. Select the day of the week and the time that you want the restriction in place (as shown below).



Then click Save/Apply. The following screen will be displayed.



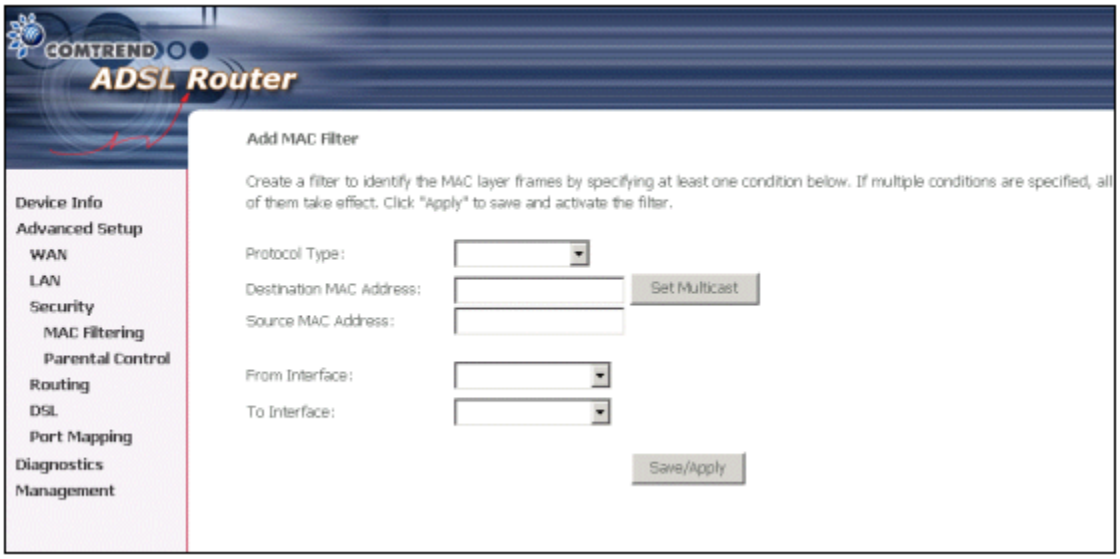
6.4.2 MAC Filtering

Mac Filtering is only available for Bridged mode.

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 setting up the MAC filtering policy and the MAC filtering rules. MAC Filtering is only effective on ATM PVCs configured in Bridge mode.

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 FORWARD; you change by clicking the **Change Policy** button.

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 **Apply** to save and activate the filter.



Option	Description
Protocol type	PPPoE, IPv4, IPv6, AppleTalk, IPX, NetBEUI, IGMP
Destination MAC Address	Define the destination MAC address
Source MAC Address	Define the source MAC address

Set Multicast	Click this button, it will automatically set the multicast MAC address.
From Interface	Select the incoming packet interface
To Interface	Select the outgoing packet interface

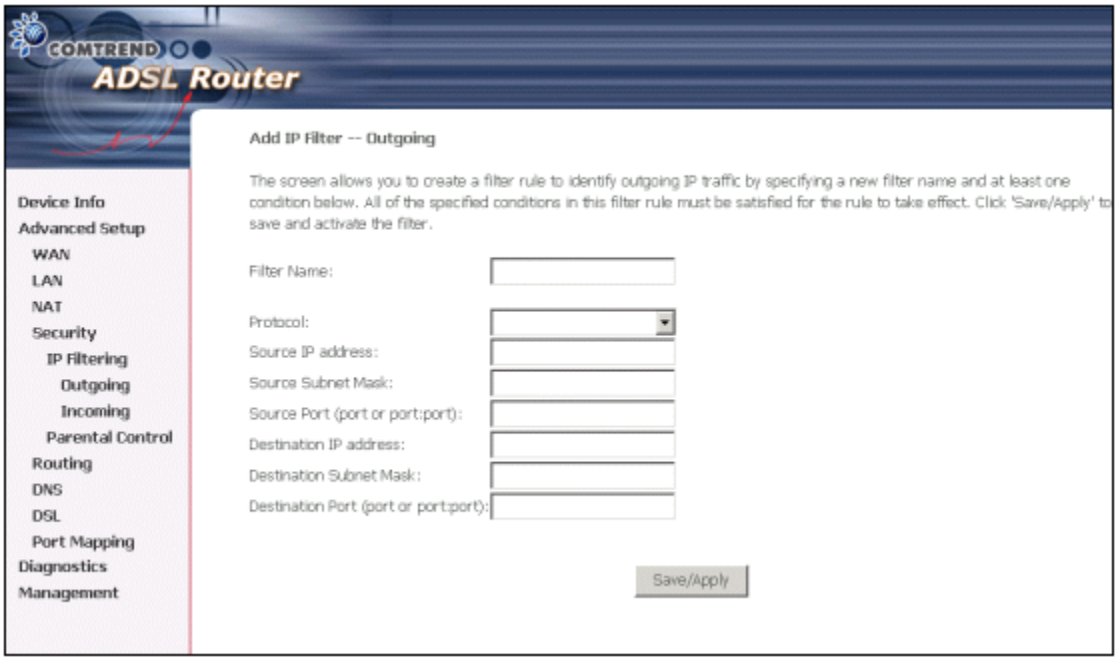
6.4.3 IP Filtering

This option is only available for PPPoE and PPPoA.

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

To add a filtering rule, simply click the Add button. The following screen will be displayed.



Filter Name	Type a name for the filter rule.
Protocol	User can select from: 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

To add a filtering rule, simply click the Add button. The following screen will be displayed.

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

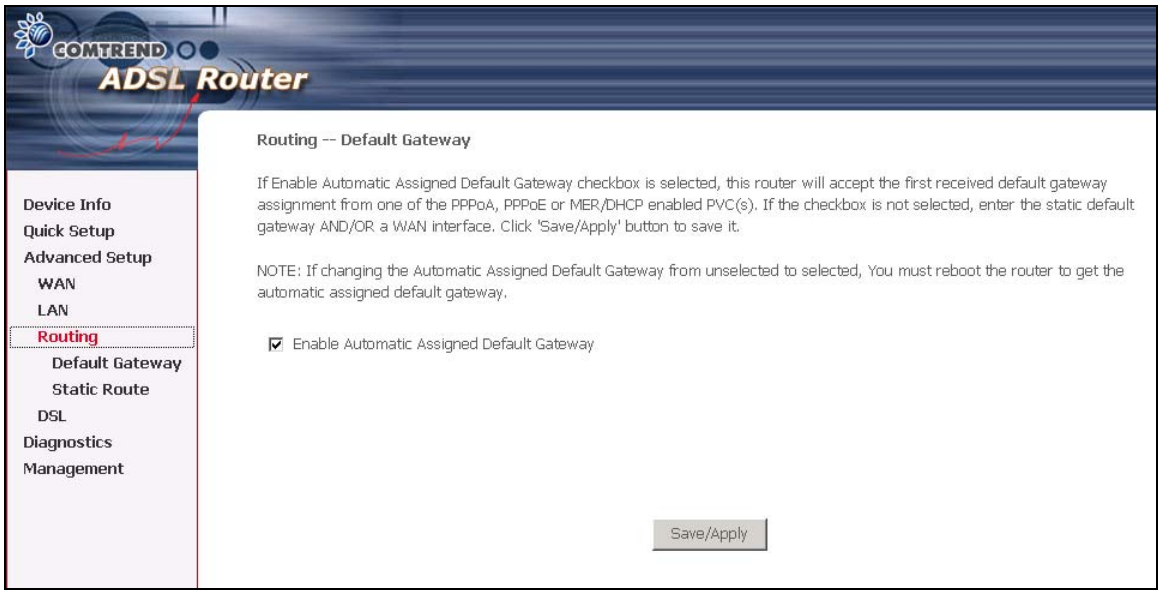
6.5 Routing

The Routing dialog box allows you to configure Default gateway, Static Route and RIP.

6.5.1 Default Gateway

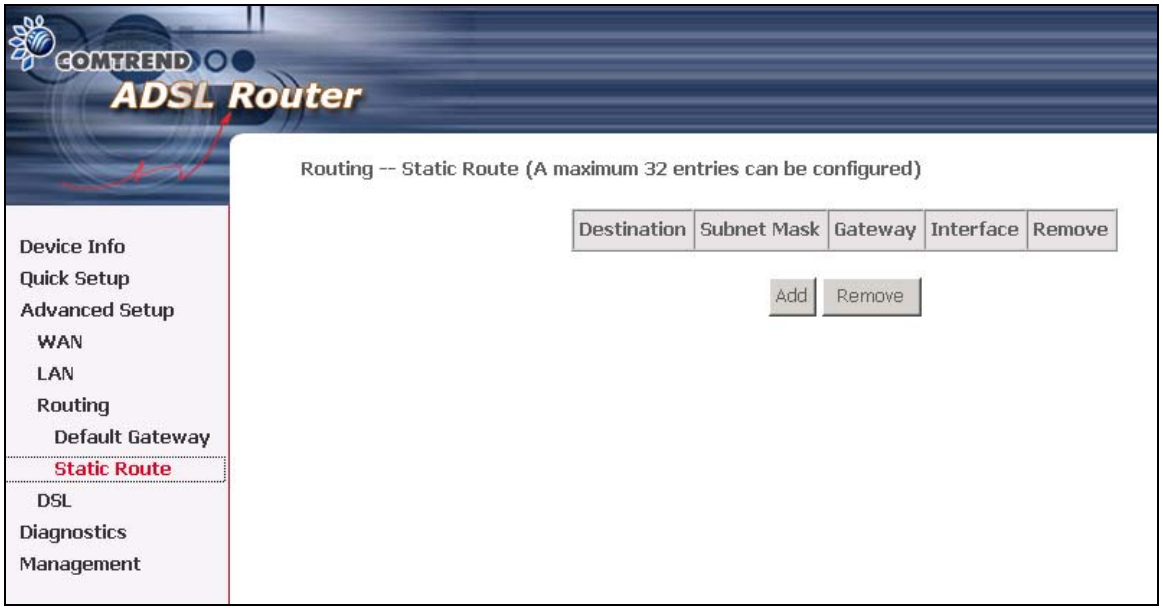
If '**Enable Automatic Assigned Default Gateway'** checkbox is selected, this router will accept the first received default gateway assignment from one of the PPPoA, PPPoE or MER/DHCP enabled PVC(s). If the checkbox is not selected, enter the static default gateway AND/OR a WAN interface. Click 'Save/Apply'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

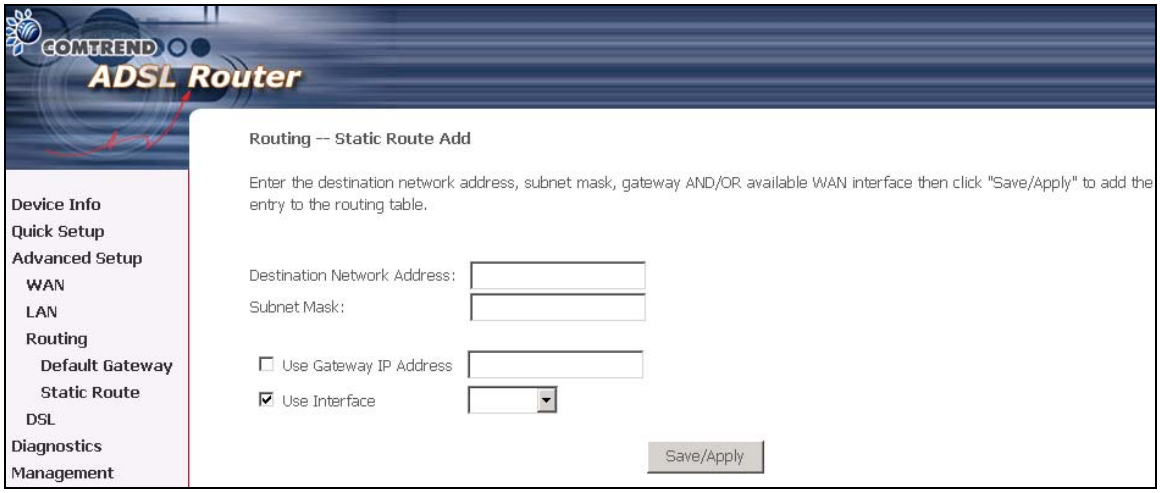


6.5.2 Static Route

Choose **Static Route** to display the Static Route screen. The Static Route screen lists the configured static routes, and allows configuring static routes. Choose **Add** or **Remove** to configure the static routes.



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.



6.6 DNS

6.6.1 DNS Server

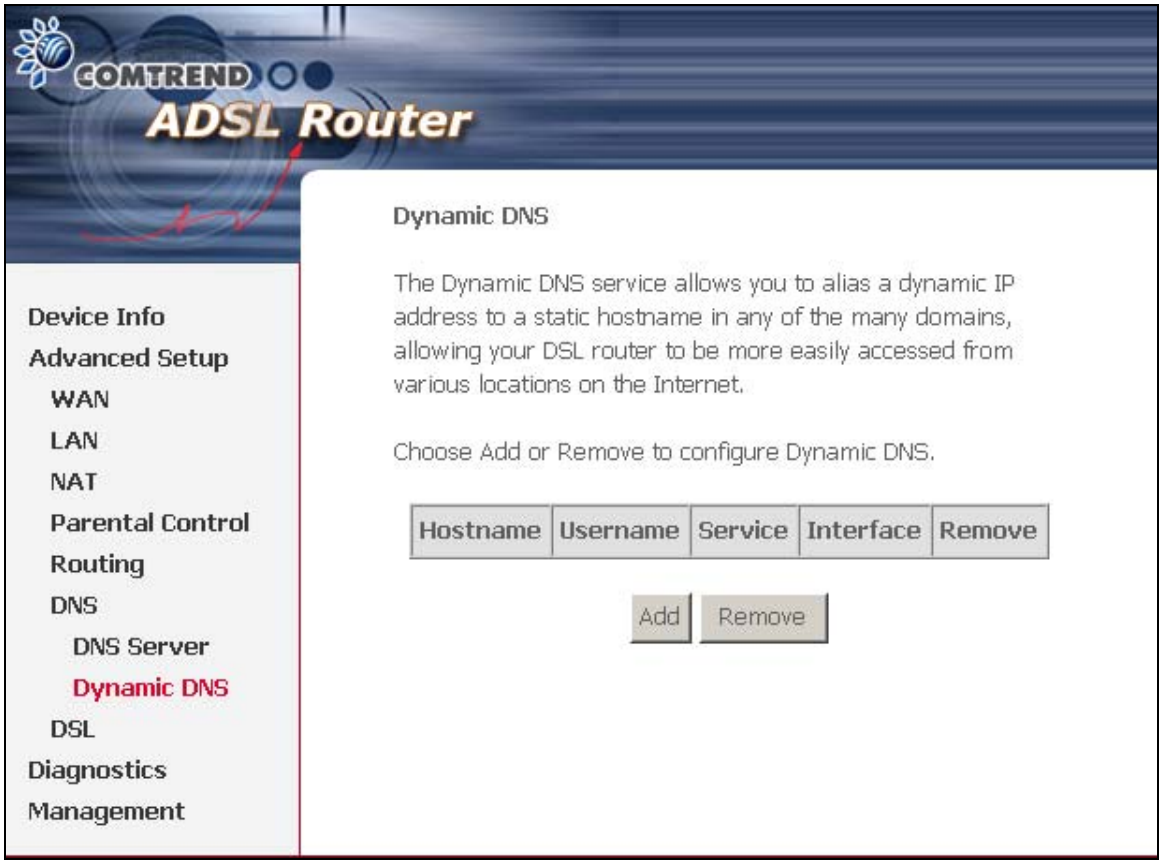
If 'Enable Automatic Assigned DNS' checkbox is selected, this router will accept the first received DNS assignment from one of the PPPoA, PPPoE or MER/DHCP enabled PVC(s) during the connection establishment. If the checkbox is not selected, enter the primary and optional secondary DNS server IP addresses.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

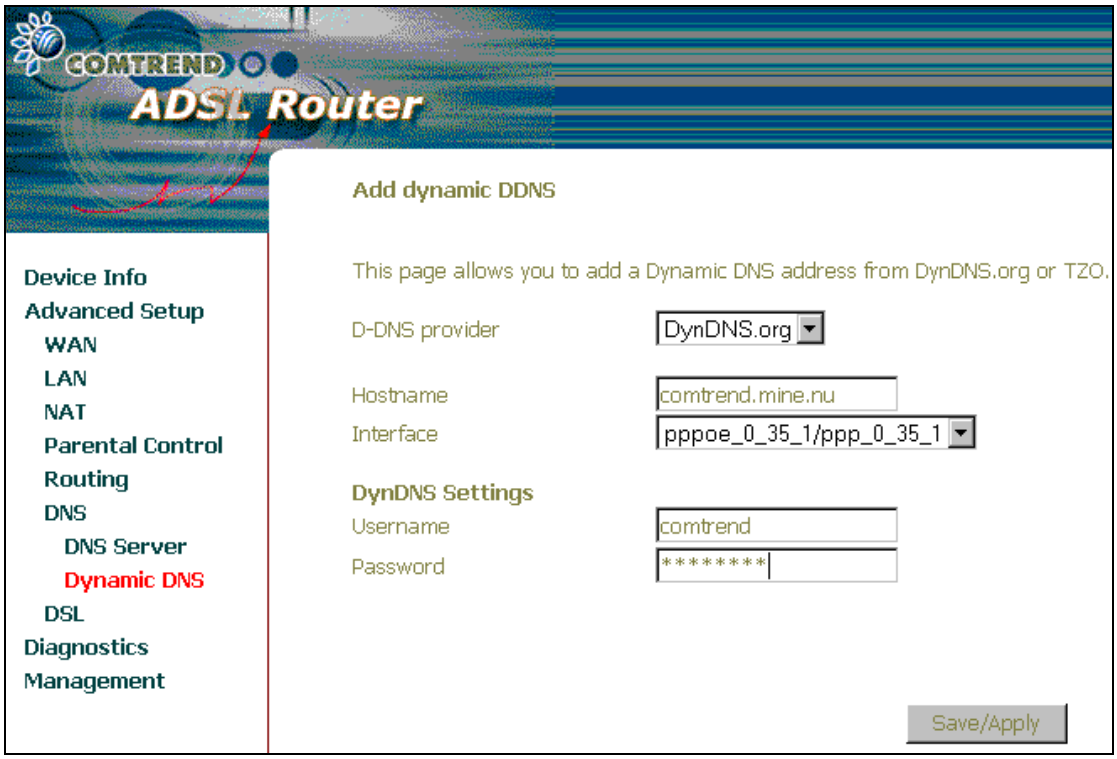
6.6.2 Dynamic DNS

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

For this option to be available (displayed on your screen), you need to have set up a WAN PPPoE or PPPoA interface. This can be done at www.dyndns.org . Here you will register your host name, username and password.

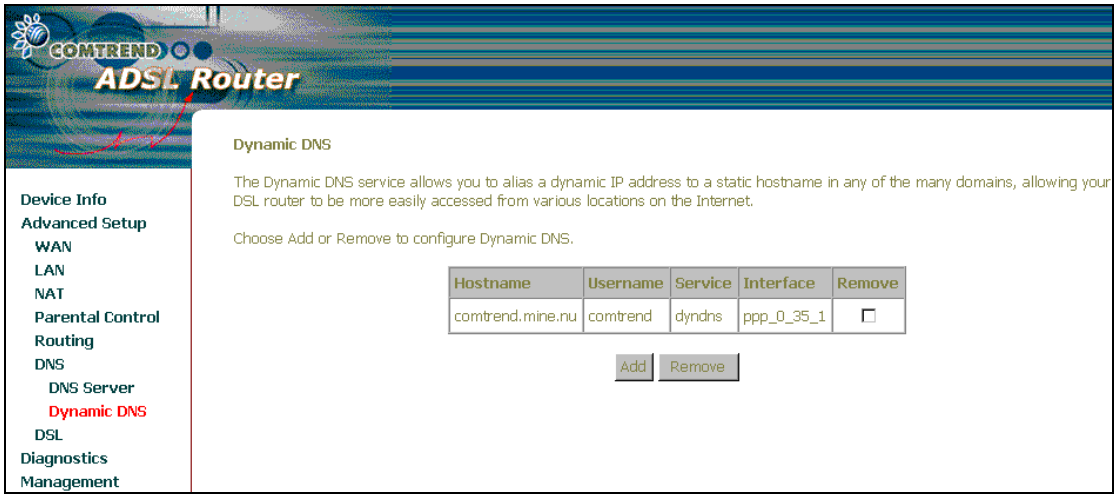
Click on the Dynamic DNS button. The following screen will be displayed.





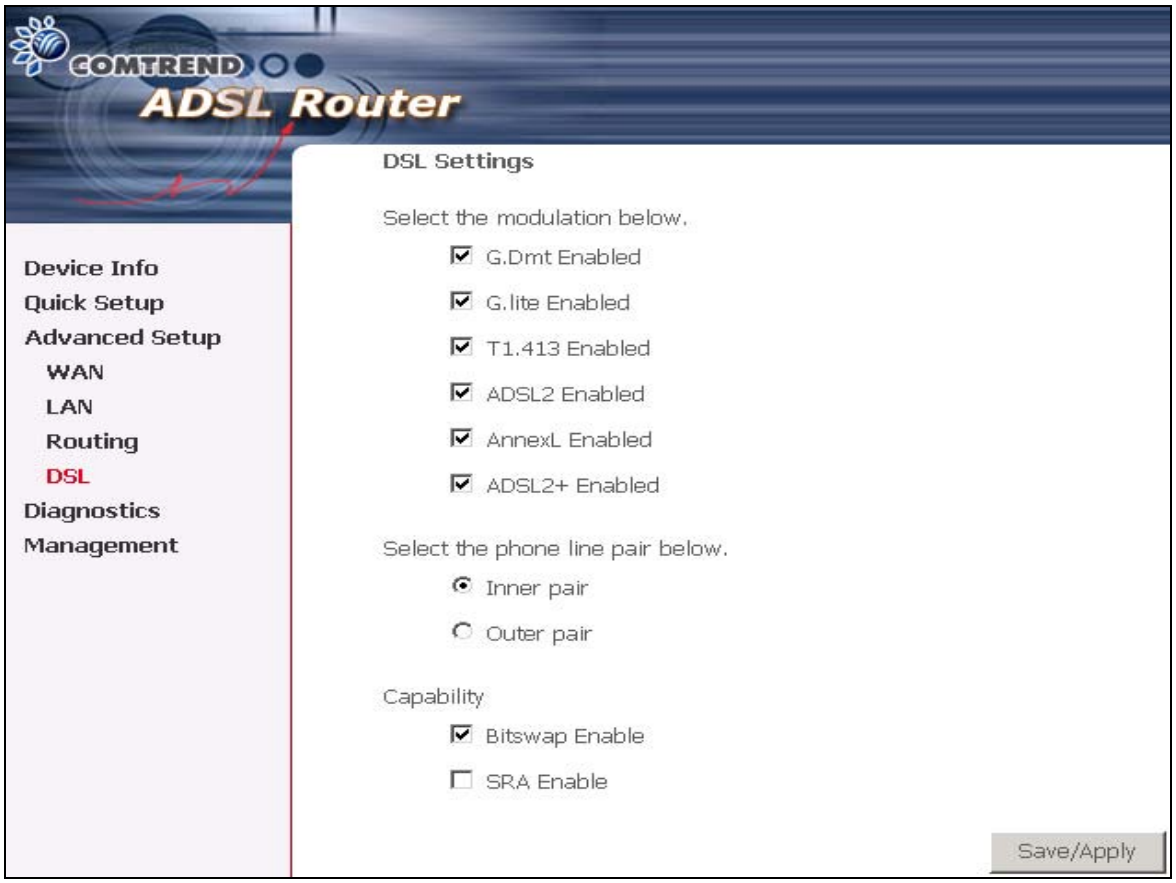
D-DNS provider	Select a dynamic DNS provider from the list
Hostname	Enter the name for the dynamic DNS server.
Interface	Select the interface from the list
Username	Enter the username for the dynamic DNS server.
Password	Enter the password for the dynamic DNS server.

To add a dynamic DDNS, select your D-Dns provider. Then input Hostname, Username and Password. Click Save/Apply. The following screen will be displayed.



6.7 DSL

To access the DSL settings, First click On **Advanced Setup** and then click on **DSL**. The DSL Settings dialog box allows you to select an appropriate modulation mode.



Option	Description
G.dmt/G.lite	Sets G.Dmt/G.lite if you want the system to use either G.Dmt or G.lite mode.
T1.413	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	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 bitswaping function
SRA Enable	Allows seamless rate adaptation

Chapter 7 Diagnostics

The Diagnostics menu provides feedback on the connection status of the CT-5071 and the ADSL link. 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	Description
Ethernet Connection	**Pass:** indicates that the Ethernet interface from your computer is connected to the LAN port of your DSL 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 DSL Router does not detect the Ethernet interface on your computer.
ADSL Synchronization	**Pass:** Indicates that the DSL modem has detected a DSL signal from the telephone company. A solid WAN LED on the router also indicates the detection of a DSL signal from the telephone company. **Fail:** indicates that the DSL modem does not detect a signal from the telephone company's DSL network. The WAN LED will continue to flash green.

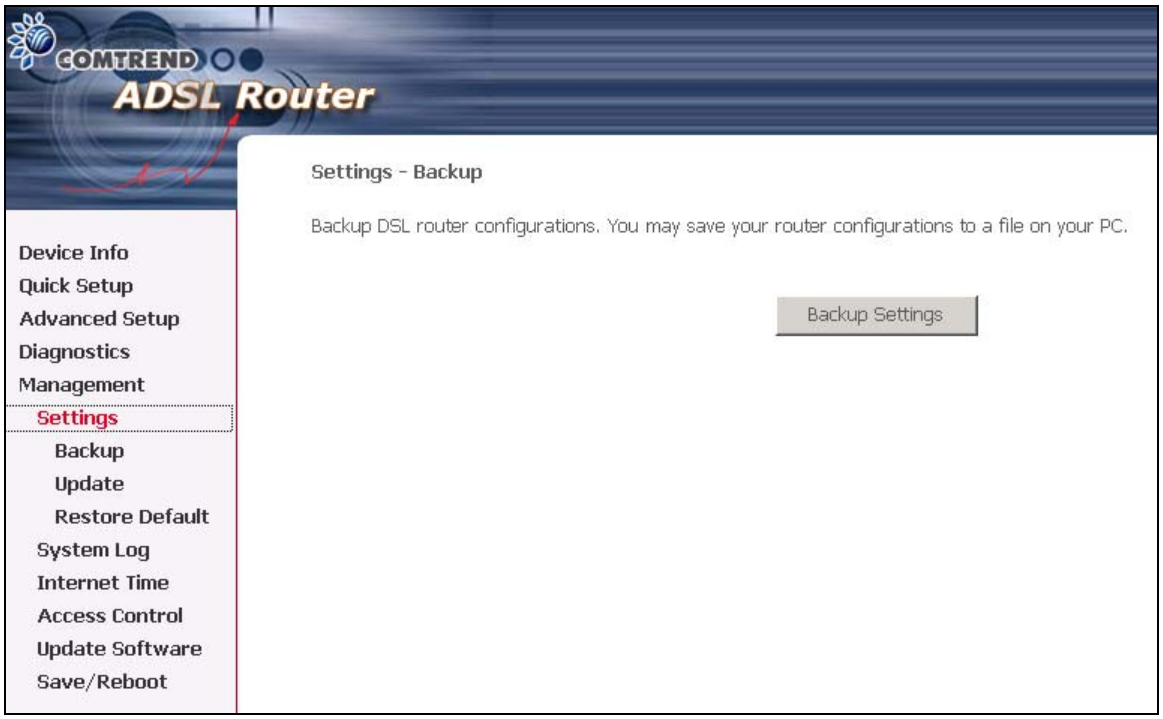
Chapter 8 Management

The Management section of the CT-5071 supports the following maintenance functions and processes:

- System log
- Update software
- Restore Settings
- Local Access
- User Access
- Remote Access

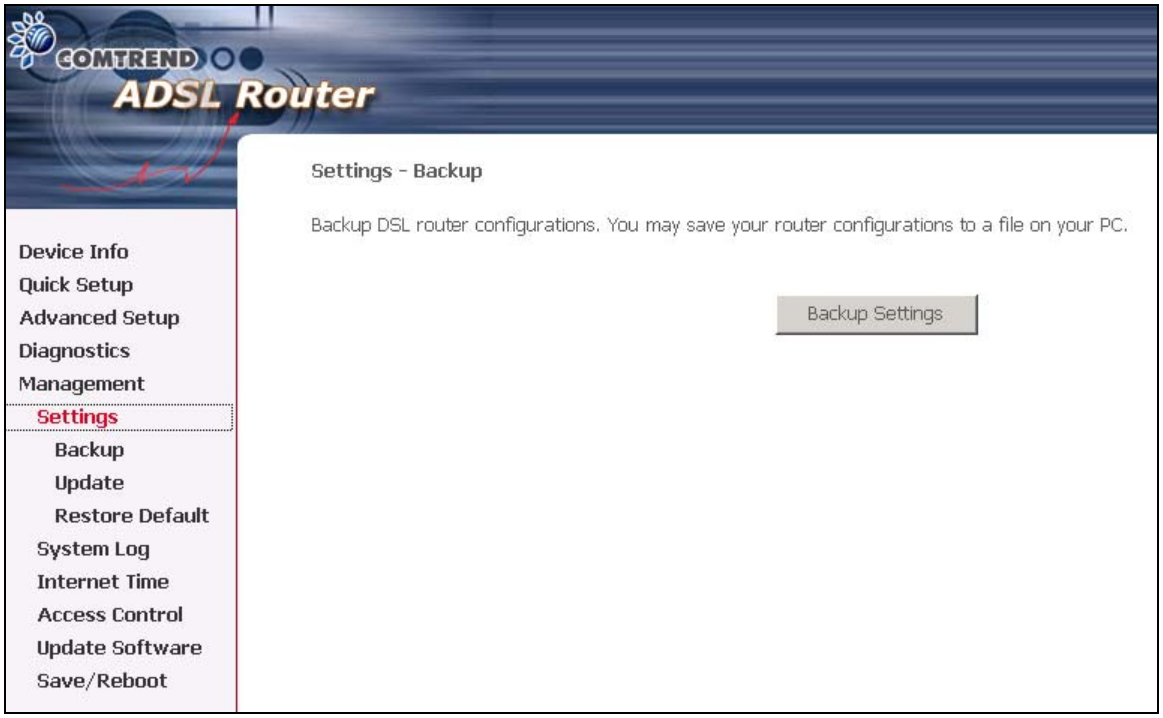
8.1 Settings

The Settings option allows you to back up your settings to a file, retrieve the setting file, and restore the settings.



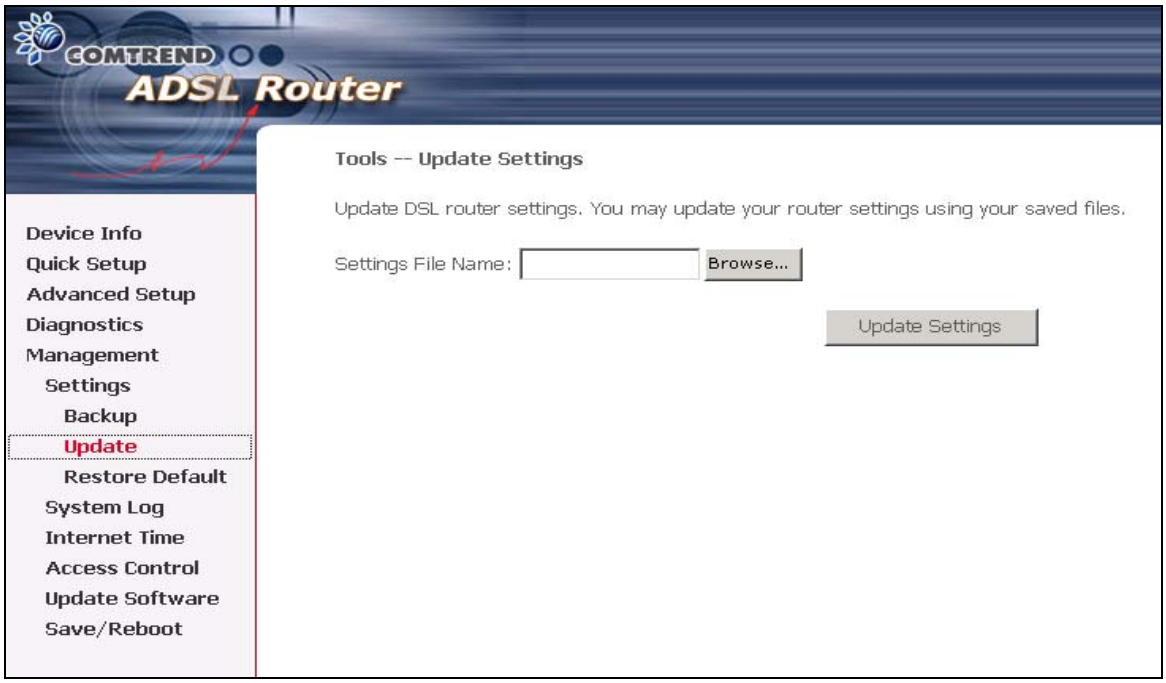
8.1.1 Configuration Backup

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



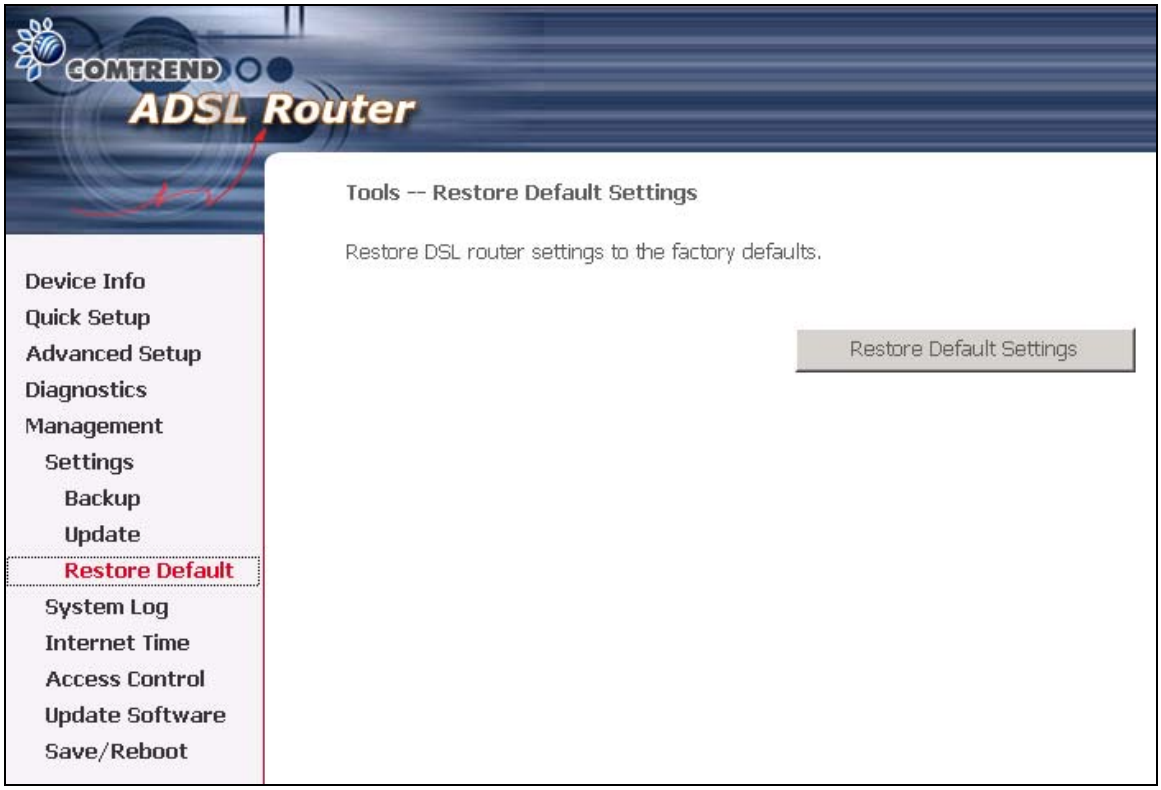
8.1.2 Configuration Restoration

The Update option under Management>Settings update your router settings using your saved files.



8.1.3 Restore Default

Clicking the Restore Default Configuration option in the Restore Settings screen can restore the original factory installed settings.



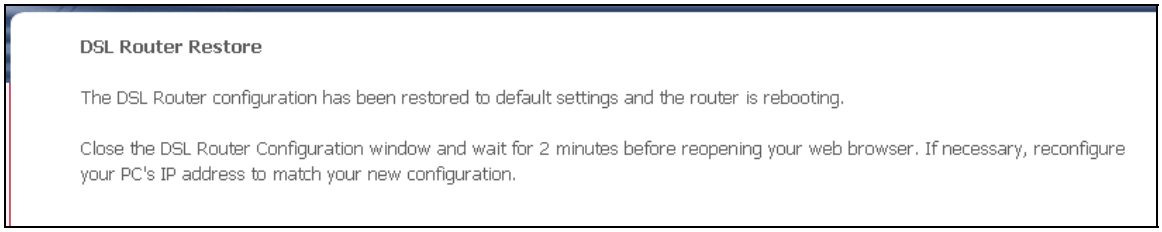
NOTE: This entry has the same effect as the hardware reset-to-default button. The CT-5071 board hardware and the boot loader support the **reset to default** button. If the reset button is continuously pushed for more than 5 seconds until the power indicator blinks, the boot loader will erase the entire configuration data saved on the flash memory.

NOTE: 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 CT-5071.

Default settings
The CT-5071 default settings are

- LAN port IP= 192.168.1.1, subnet mask = 255.255.255.0
- Local user name: root
- Password: 12345

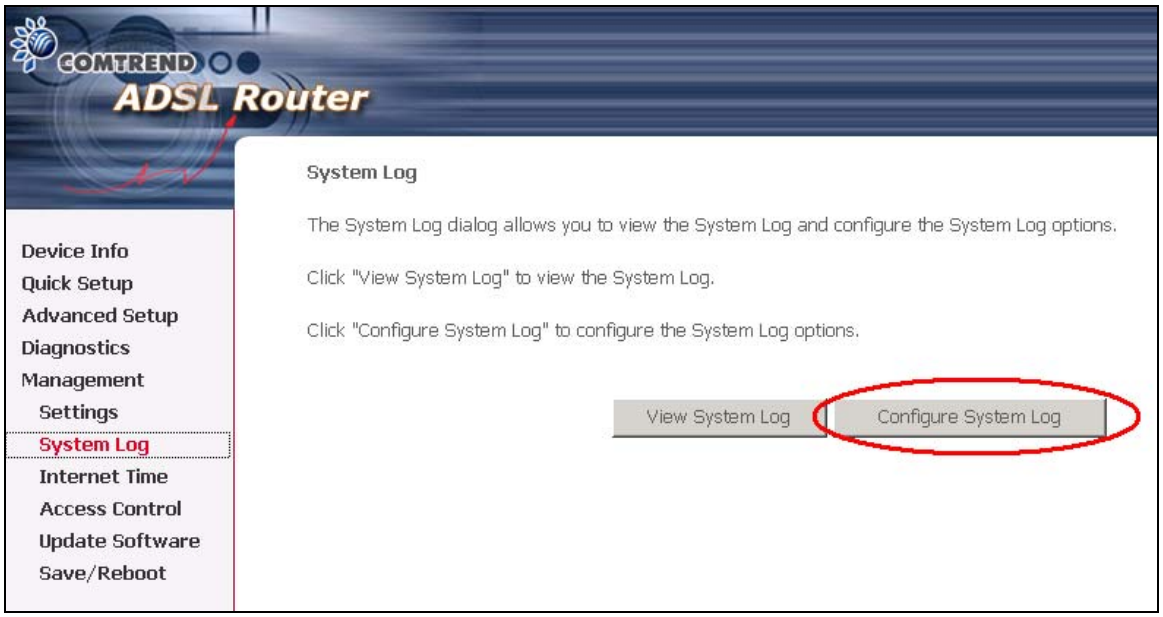
After the Restore Default Configuration button is selected, the following screen appears. Close the DSL Router Configuration window and wait for 2 minutes before reopening your web browser. If necessary, reconfigure your PC's IP address to match your new configuration.



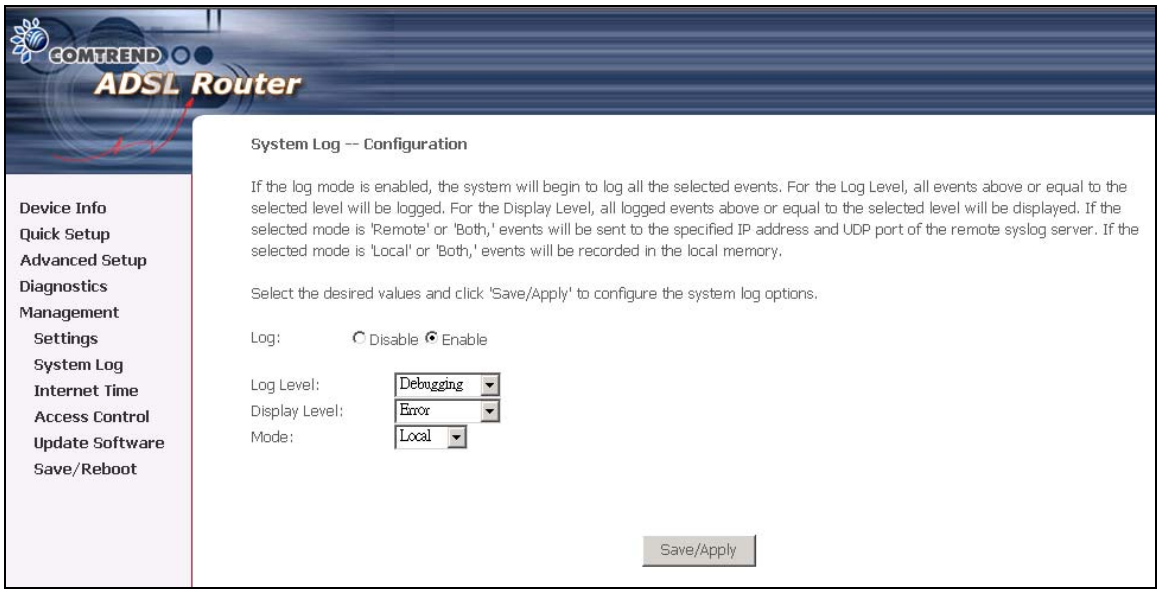
8.2 System Log

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.

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

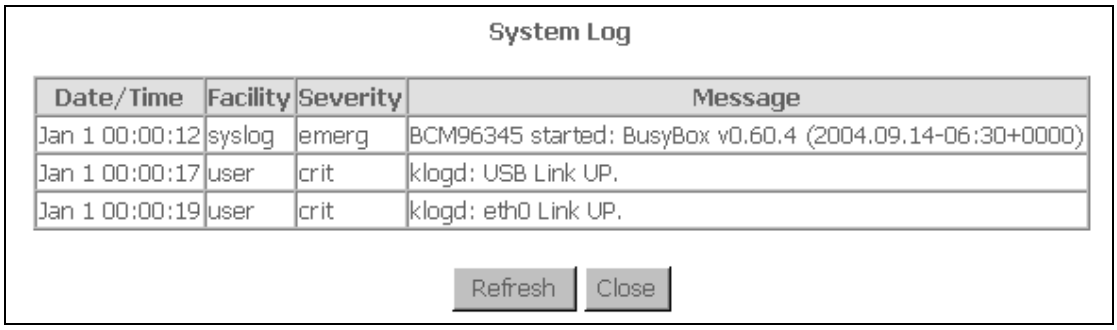


2. Select from the desired Log options described in the following table, and then click **Save/Apply**.



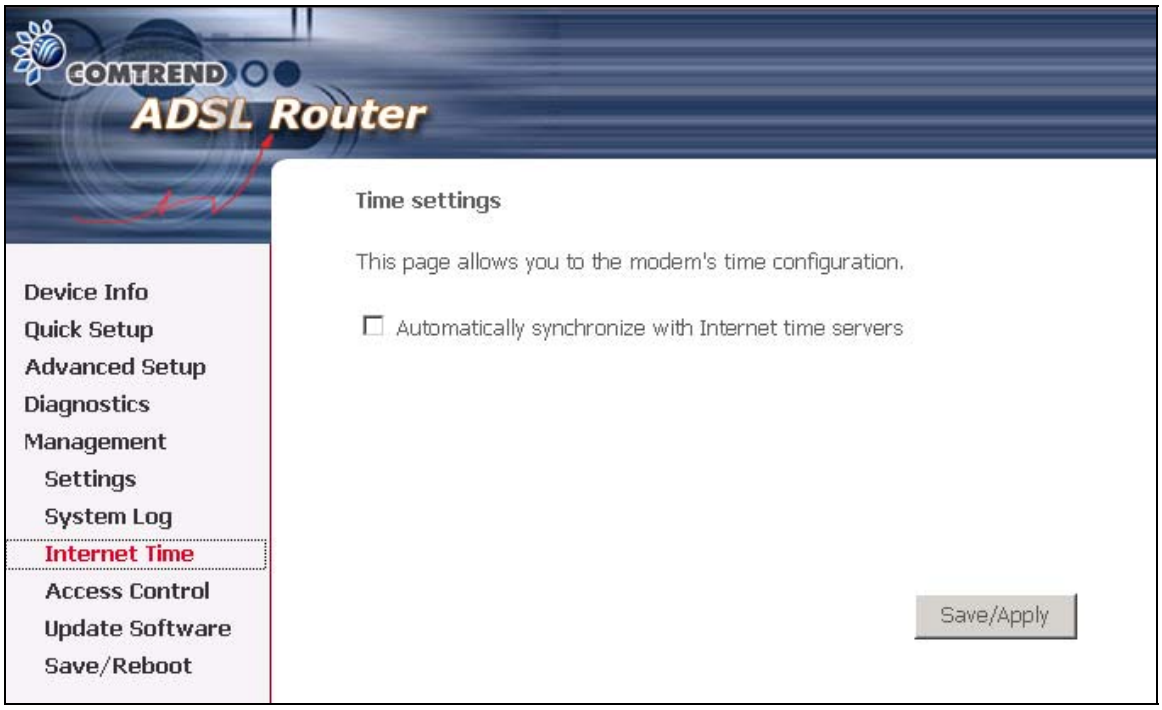
Option	Description
Log	Indicates whether the system is currently recording events. The user can enable or disable event logging. By default, it is disabled. To enable it, tick Enable and then Apply button.
Log level	Allows you to configure the event level and filter out unwanted events below this level. The events ranging from the highest critical level "Emergency" down to this configured level will be recorded to the log buffer on the CT-5071 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 ● 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.

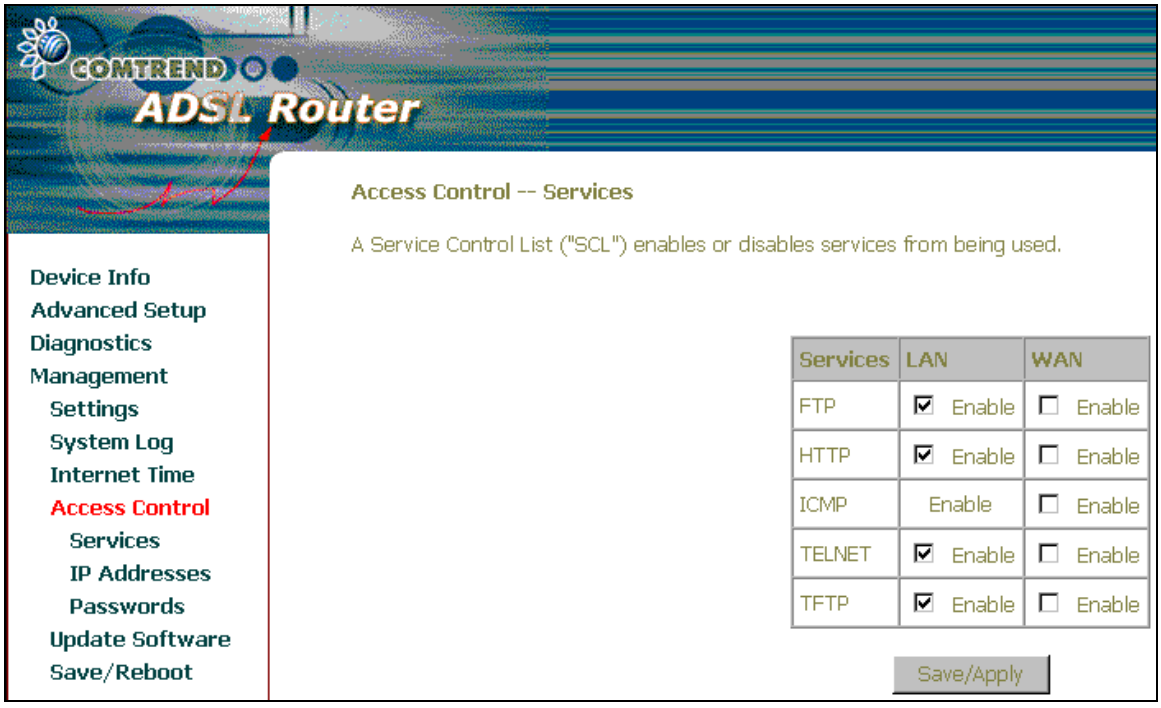
3. Click **View System Log**. The results are displayed as follows.



8.3 Internet Time

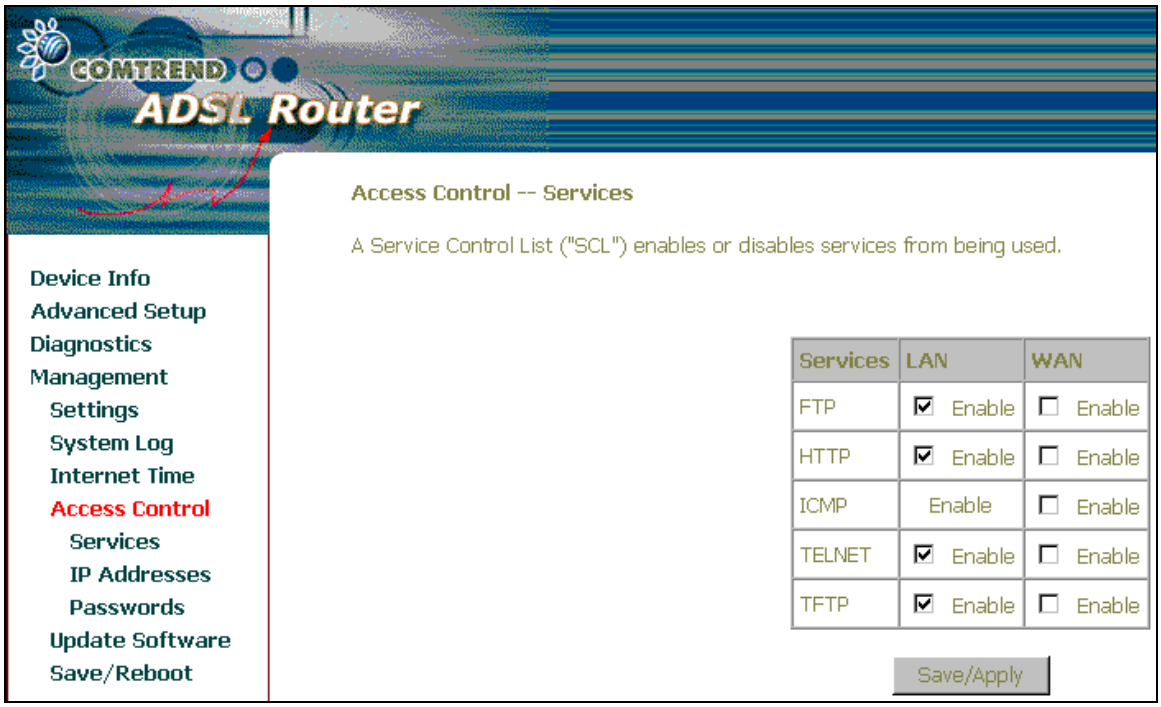
The Internet Time option under Management menu bar configures the Modem's time. To automatically synchronize with Internet timeservers, tick the corresponding box displayed on the screen. Then click **Save/Apply**.





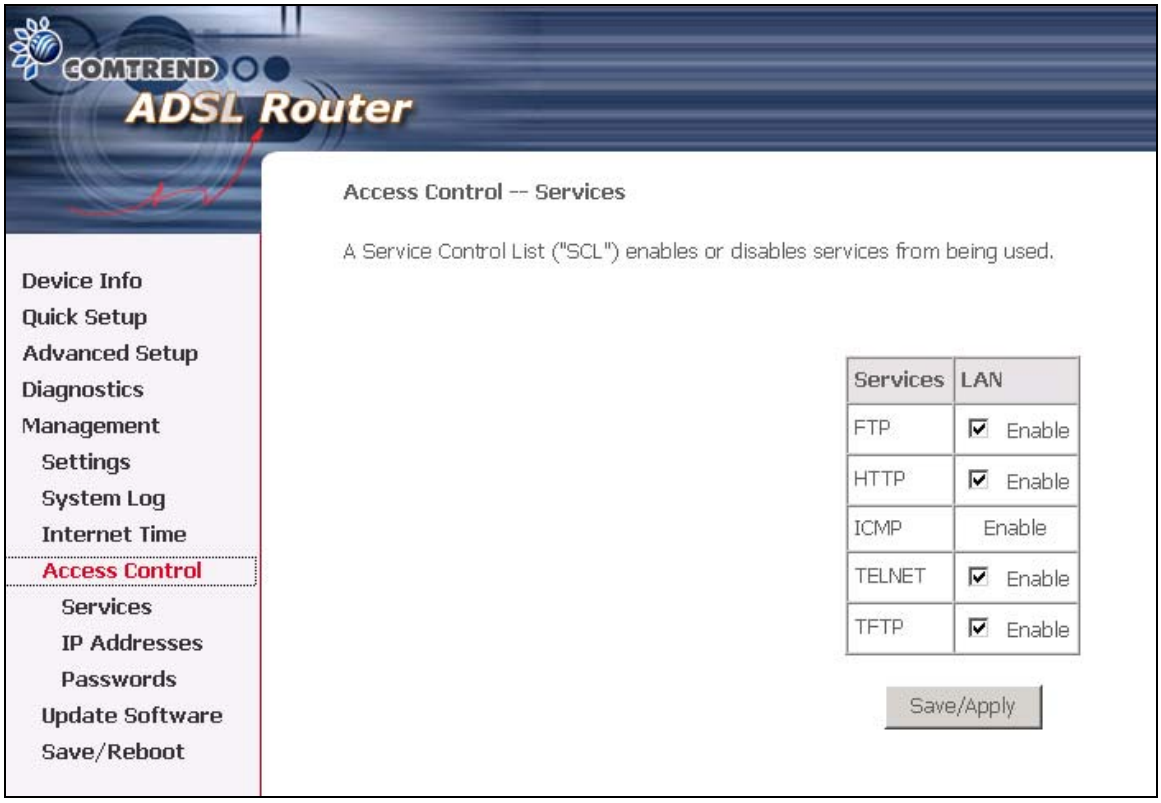
8.4 Access Control

The Access Control option under Management menu bar configures the access-related parameters, including three parts: Services, IP Address, and Passwords.



8.4.1 Services

The Services option limits or opens the access services over the LAN or WAN. These services are provided FTP, HTTP, ICMP, , SSH (Security Socket Share), TELNET, and TFTP. Enable the service by checking the item in the corresponding checkbox, and then click **Save/Apply**.

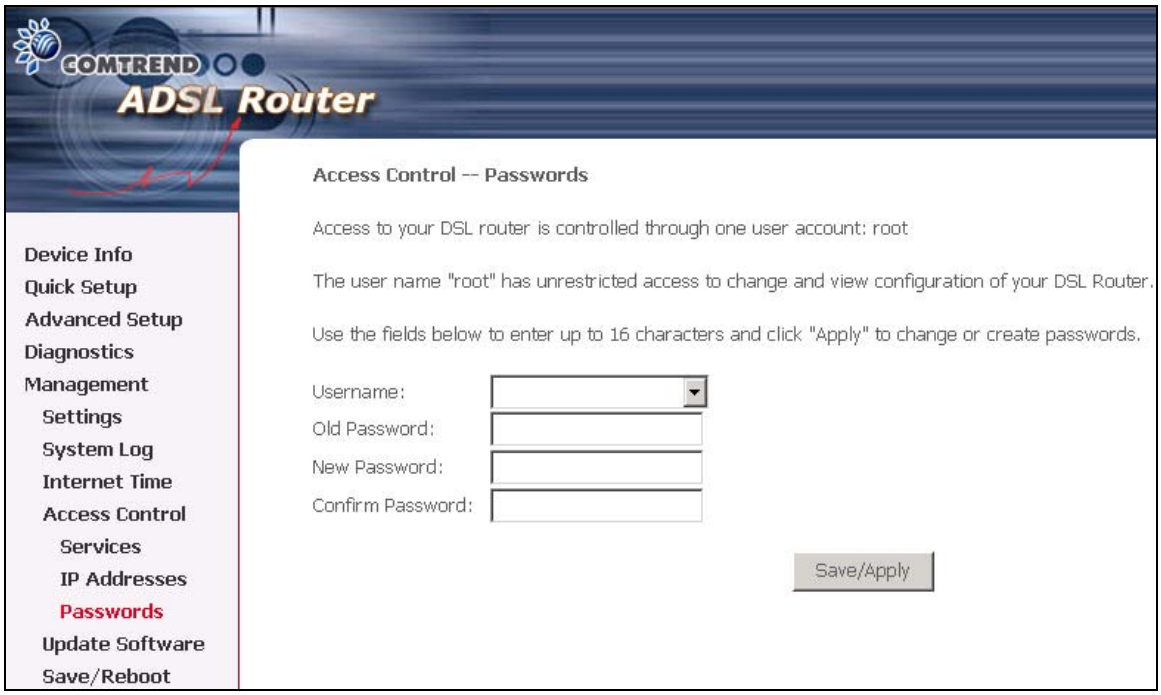


8.4.2 Access IP Addresses

The IP Addresses option limits the access by IP address. If the Access Control Mode is enabled, only the allowed IP addresses can access the router. Before you enable 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 managing the DSL Router.

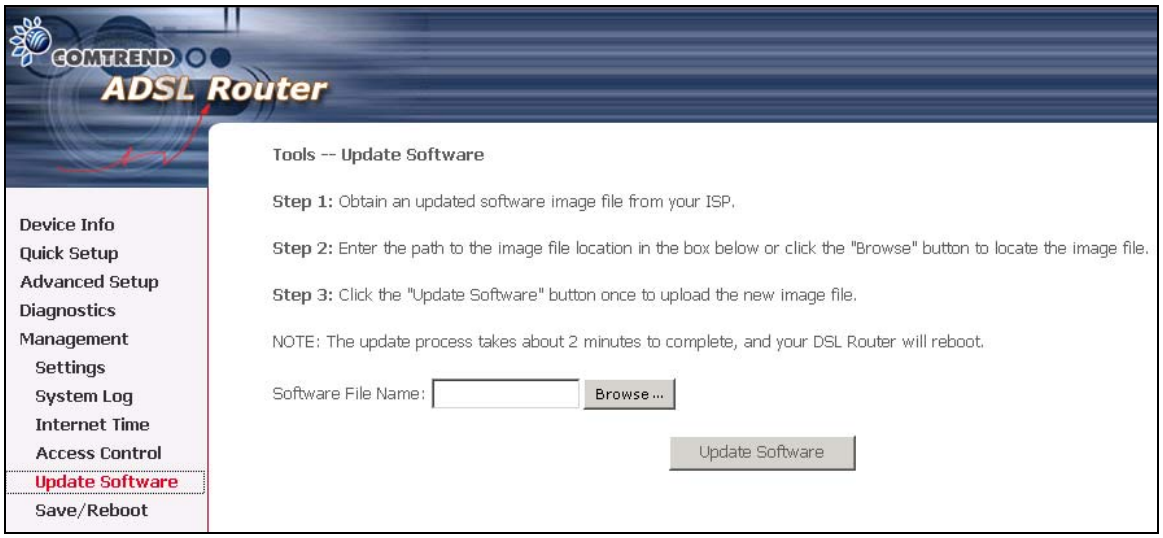
8.4.3 Password Change

To change the current password, do the following. Select Username – root. Enter Old Password and New Password. Then enter the new password again in the Confirm Password box to verify the new password. Then, click Save/Apply button.



8.5 Update software

The Update Software screen allows you to obtain an updated software image file from your ISP. Manual software upgrades from a locally stored file can be performed using the following screen.



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

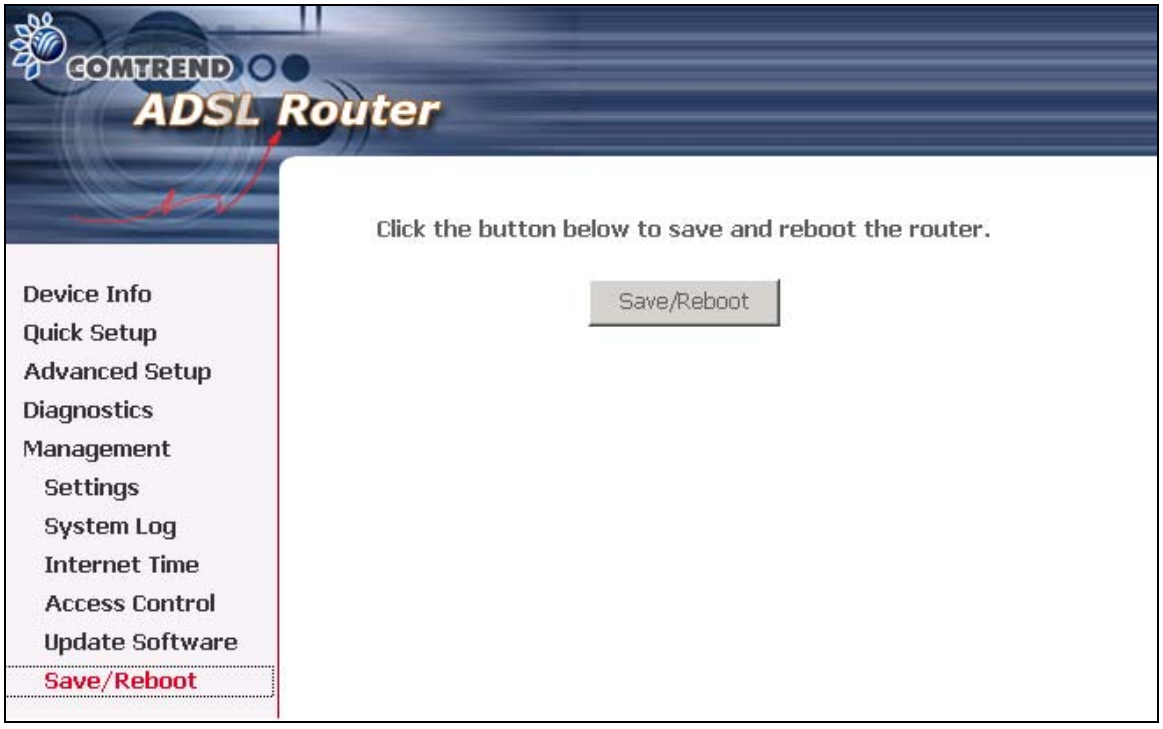
Step 2: Enter the path to the image file location in the box below or click the **Browse** button to locate the image file.

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.

8.6 Save and Reboot

The Save/Reboot option saves the configurations and reboots the router. 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.



Appendix A: Pin Assignments

Line port (RJ11)

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

Pin Assignments of the RJ11 Port

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

Pin assignments of the LAN Port

Appendix B: Specifications

Rear Panel
RJ-11 X1 for ADSL, Reset Button X 1, Power Jack X 1, Power switch X 1

ADSL
Standard ANSI T1.413 Issue 2, ITU-T G.992.1, G.992.2 , G.992.3, G.994.1
G.992.5 (ADSL2+) Downstream : 24 Mbps Upstream : 1.3 Mbps
G.992.3 (ADSL2) Downstream : 12 Mbps Upstream : 1.3 Mbps
G.DMT data rate Downstream: 11 Mbps Upstream: 1 Mbps
G.lite data rate Downstream: 1.5 Mbps Upstream: 512 Kbps
Auto-negotiation rate adaptation

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

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

Management
Telnet, Web-based management, Configuration backup and restoration
Software upgrade via HTTP, TFTP server, or FTP server

Bridge Functions
Transparent bridging and learning IEEE 802.1d
Spanning Tree Algorithm

Routing Functions
Static route, RIP, and RIPv2, NAT/PAT, DHCP Server/DHCP Relay, DNS Proxy, ARP
IGMP Proxy

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

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

Power Supply
External power adapter 110 Vac or 220 Vac

Environment Condition

Operating temperature	0 ~ 50 degrees Celsius
Relative humidity	5 ~ 90% (non-condensing)

Dimensions

92mm (W) x 34mm (H) x 114mm (D)

Certifications

FCC Part 15 class B, FCC Part 68, CE

Note: Specifications are subject to change without notice