



Leading Provider  
of 3C Total Solutions

# Zhone Bonded Channel

## User Manual *Version 1.1*

## **FCC Warning Statement**

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) this device may not cause harmful interference, and
- (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

**Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.**

## **Prohibition of Co-location**

This device and its antenna(s) must not be co-located or operating in conjunction with any other antenna or transmitter

## **Safety Information**

To maintain compliance with FCC's RF exposure guidelines, this equipment should be installed and operated with minimum distance 20cm between the radiator and your body. Use on the supplied antenna. Use on the supplied antenna. Unauthorized antenna, modification, or attachments could damage the transmitter and may violate FCC regulations.

## **Declaration of Conformity for R&TTE directive 1999/5/EC**

Essential requirements – Article 3

Protection requirements for health and safety – Article 3.1a

Testing for electric safety according to , EN50392 and EN 60950-1 has been conducted. These are considered relevant and sufficient.

Protection requirements for electromagnetic compatibility – Article 3.1b

Testing for electromagnetic compatibility according to EN 301 489-1 and EN 301 489-17 has been conducted. These are considered relevant and sufficient.

Effective use of the radio spectrum – Article 3.2

Testing for radio test suites according to EN 300 328 has been conducted. These are considered relevant and sufficient.

## **CE Mark Warning**

This is a Class B product, in a domestic environment, this product may cause radio interference, in which case the user may be required to take adequate measures.

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## General Information

The Bonded Channel features 4 LAN ports and wireless ability.

### Package Contents

The package includes one of each of the following items—

- Bonded Channel
- 12 VDC 1.5 A power adapter
- RJ-11 telephone cable
- RJ-45 Ethernet cable
- External antenna
- User Manual / Quick Guide

### Important Safety Instructions

- Place your device on a flat surface close to the cables in a location with sufficient ventilation.
- To prevent overheating, do not obstruct the ventilation openings of this equipment.
- Plug this equipment into a surge protector to reduce the risk of damage from power surges and lightning strikes.
- Operate this equipment only from an electrical outlet with the correct power source as indicated on the adapter.
- Do not open the cover of this equipment. Opening the cover will void any warranties on the equipment.
- Unplug equipment first before cleaning. A damp cloth can be used to clean the equipment. Do not use liquid / aerosol cleaners or magnetic / static cleaning devices.

## Front Panel View



LED	Mode	Definition
Internet	Solid (green)	IP is connected and no traffic detected.
	No light	Modem is in bridged mode or ADSL connection not present.
	Blinking	Connected and traffic is present.
	Red	Device attempted to connect to IP and failed.
AP	Solid	Wireless is enabled.
	No light	Wireless is disabled.
	Blinking	There is wireless traffic.
DSL2 ACT	Solid	ADSL is connected, and there is no ADSL traffic.
	No light	ADSL is not connected.
	Blinking	There is ADSL traffic.
DSL1 ACT	Solid	ADSL is connected, and there is no ADSL traffic.
	No light	ADSL is not connected.
	Blinking	There is ADSL traffic.
LAN1-LAN4	Solid	Router is connected to the LAN.
	No light	No connection to the LAN. Check if the LAN cable is connected to the router.
	Blinking	LAN traffic
Power	Solid	Router is powered on.
	No light	Router is not powered. Check if the router is plugged in and if the power switch is turned on.

## Back Panel View



Port	Description
Phone	RJ-11 cable connects to telephone (no external splitter necessary; unit has internal splitter).
Line	RJ-11 cable connects the ADSL line.
Reset / Default	<i>Restart</i> —press the button for less than 5 seconds. <i>Default settings</i> —press the button for 5 seconds or longer.
LAN1-LAN4	RJ-45 connects the unit to Ethernet devices such as a PC or a switch.
Power	Connects to the 12 VDC 1.5 A power adapter.
Antenna	Transmits wireless signals

# Installing the Router

## Connect the ADSL Line and Telephone

Connect one end of an RJ-11 cable from your ADSL connection and the other end to the LINE port of the router. Use a second RJ-11 cable to connect between a telephone and the PHONE port of the router.

## Connect the PC to the Router

Use the Ethernet cable to connect your computer directly to the router. Connect one end of the Ethernet cable to one of the 4 ports labeled LAN on the rear panel of the router and connect the other end to the Ethernet port of your computer. Attach any additional PCs to the router using RJ-45 cables to the port labeled LAN on the rear panel of the router.

## Connect the Power Adapter

Complete the process by connecting the AC power adapter to the POWER connector on the back of the device and plug the adapter into a wall outlet or power strip. Then turn on and boot up your PC and any LAN devices, such as hubs or switches, and any computers connected to them.

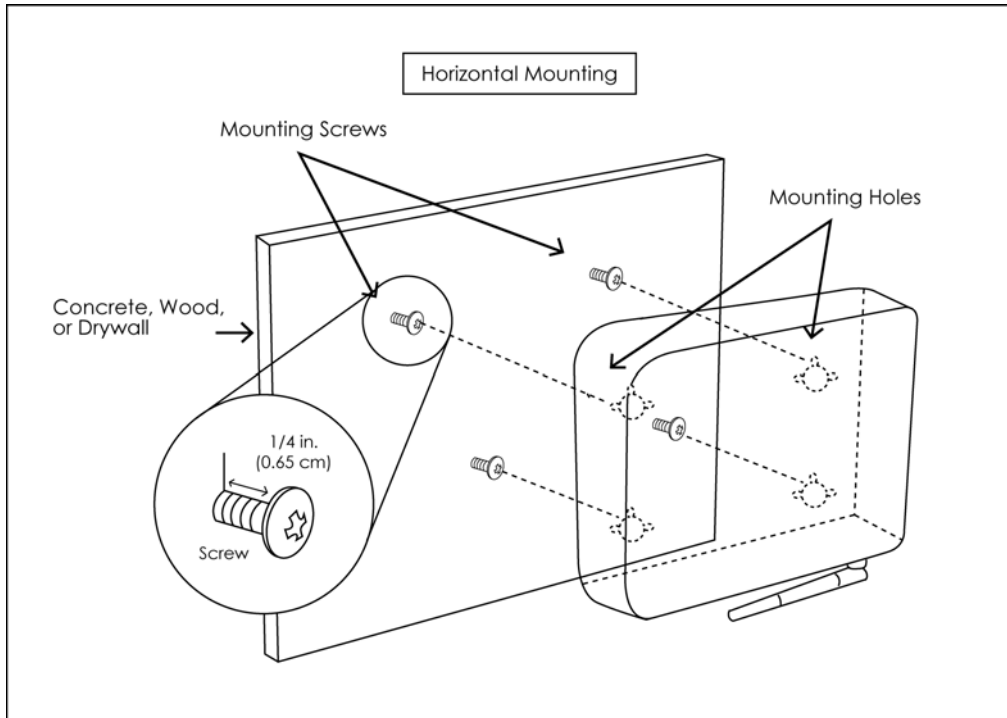


# Installation Diagram



## Mounting the Unit

The bonded channel unit can be mounted on the wall with the screws provided. Mounting can be done on wall material including concrete, wood, or drywall. Select an appropriate location free from obstructions or any possible interference. Make sure the cables can be easily attached to the router without strain. The illustration below shows how to mount the device horizontally on a wall.



# Configuring Your Computer

Prior to accessing the router through the LAN port, note the following necessary configurations—

- Your PC's TCP/IP address: **192.168.1.\_\_(** the last number is any number between 2 and 254)
- The router's default IP address: **192.168.1.1**
- Subnet mask: **255.255.255.0**

Below are the procedures for configuring your computer. Follow the instructions for the operating system that you are using.

## Windows 2000

1. In the Windows taskbar, click on the Start button and point to Settings, Control Panel, and Network and Dial-up Connections (in that order).
2. Click on Local Area Connection. When you have the Local Area Connection Status window open, click on **Properties**.
3. Listed in the window are the installed network components. If the list includes Internet Protocol (TCP/IP), then the protocol has already been enabled, and you can skip to Step 10.
4. If Internet Protocol (TCP/IP) does not appear as an installed component, then click on **Install**.
5. In the Select Network Component Type window, click on protocol and then the **Add** button.
6. Select Internet Protocol (TCP/IP) from the list and then click on **OK**.
7. If prompted to restart your computer with the new settings, click **OK**.
8. After your computer restarts, click on the Network and Dial-up Connections icon again, and right click on the Local Area Connection icon and then select **Properties**.
9. In the Local Area Connection Properties dialog box, select Internet Protocol (TCP/IP) and then click on **Properties**.
10. In the Internet Protocol (TCP/IP) Properties dialog box, click in the radio button labeled **Use the following IP address** and type 192.168.1.x (where x is any number between 2 and 254) and 255.255.255.0 in the IP address field and Subnet Mask field.

11. Click on **OK** twice to save your changes and then close the **Control Panel**.

## Windows XP

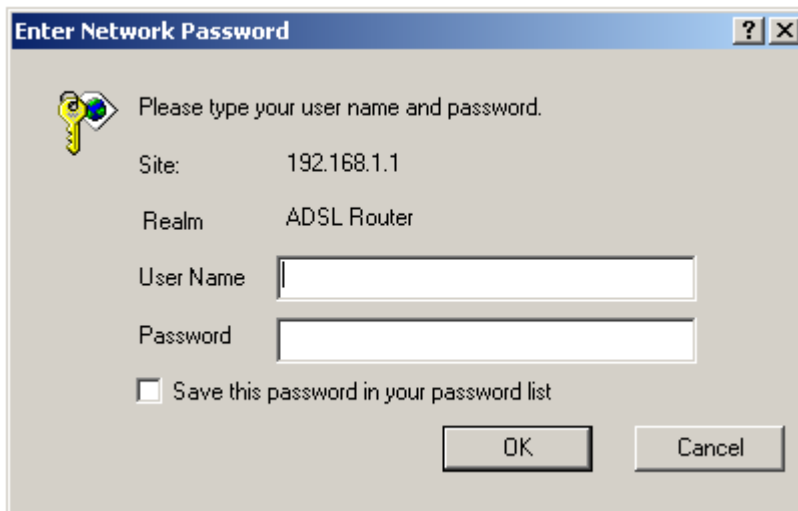
1. In the Windows taskbar, click on the Start button and point to Settings and then click Network Connections.
2. In the Network Connections window, right click on the Local Area Connection icon and click on properties.
3. Listed in the Local Area Connection window are the installed network components. Make sure the box for Internet Protocol (TCP/IP) is checked and then click on **Properties**.
4. In the Internet Protocol (TCP/IP) Properties dialog box, click in the radio button labeled **Use the following IP address** and type 192.168.1.x (where x is any number between 2 and 254) and 255.255.255.0 in the IP address field and Subnet Mask field.
5. Click on **OK** twice to save your changes and then close the **Control Panel**.

## Log in to the Router

This section explains how to log in to your router using the following steps—

1. Launch your web browser.
2. Enter the URL <http://192.168.1.1> in the address bar and click on **Enter**.

A login screen like the one below will be displayed after you connect to the user interface.



3. Enter your user name and password, and then click on **OK** to display the user interface.



**NOTE:** There are two default user name and password combinations—

Username	Password	Access to (in interface)
admin	admin	All sections
user	user	All sections except <i>Advanced</i> and <i>Wireless</i>

*The admin / admin combination can perform all functions. The user / user name and password combination can display device status, but cannot change or save configurations. Passwords can be changed at any time.*

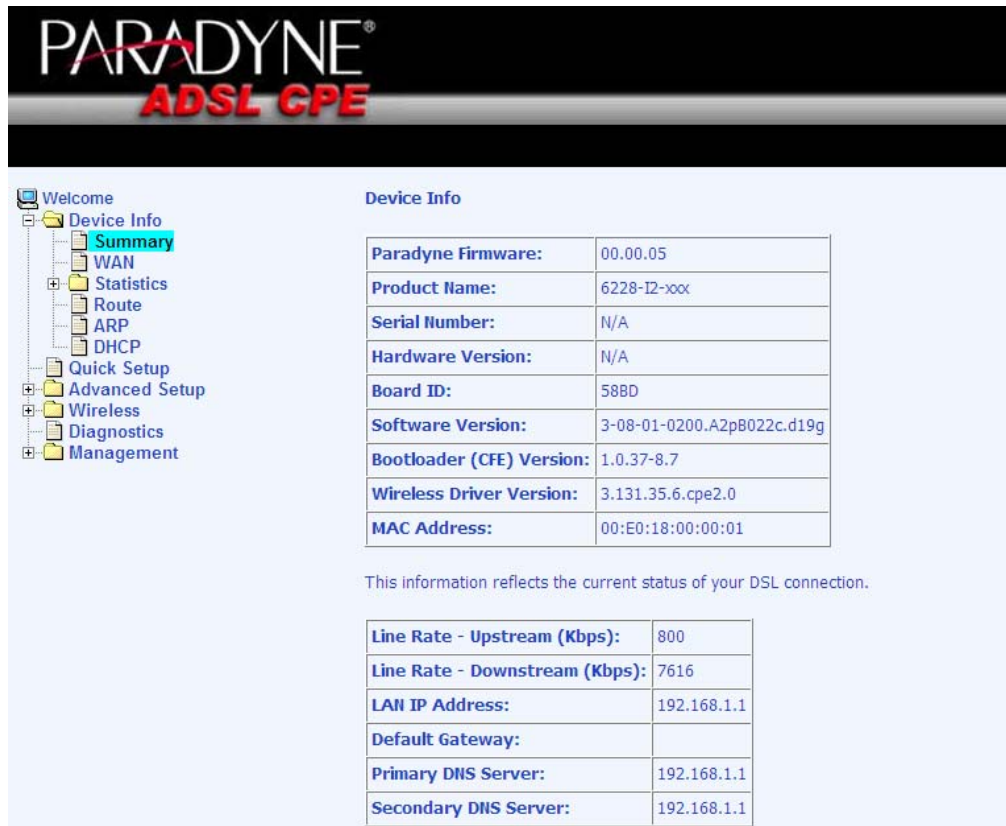
## Device Info

This section describes the system information that can be accessed using the menu items under Device Info. In addition to general device information, the following items can also be seen—WAN, Statistics, Route, ARP and DHCP.

### Summary

To access information on the device and connection status, click on *Summary* under *Device Info*. It shows the following information about the CPE—

- Board ID
- Software Version
- Bootloader (CFE) Version
- Wireless Driver Version
- MAC Address
- Upstream / Downstream Line Rate (in Kbps)
- LAN IP Address
- Default Gateway
- Primary DNS Server IP Address
- Secondary DNS Server IP Address



**PARADYNE<sup>®</sup>**  
**ADSL CPE**

Welcome

- Device Info
  - Summary**
  - WAN
  - Statistics
  - Route
  - ARP
  - DHCP
- Quick Setup
- Advanced Setup
- Wireless
- Diagnostics
- Management

**Device Info**

Paradyne Firmware:	00.00.05
Product Name:	6228-I2-xxx
Serial Number:	N/A
Hardware Version:	N/A
Board ID:	588D
Software Version:	3-08-01-0200.A2p8022c.d19g
Bootloader (CFE) Version:	1.0.37-8.7
Wireless Driver Version:	3.131.35.6.cpe2.0
MAC Address:	00:E0:18:00:00:01

This information reflects the current status of your DSL connection.

Line Rate - Upstream (Kbps):	800
Line Rate - Downstream (Kbps):	7616
LAN IP Address:	192.168.1.1
Default Gateway:	
Primary DNS Server:	192.168.1.1
Secondary DNS Server:	192.168.1.1

## WAN

To access WAN Information click on the *WAN* item located under *Device Info*. The following information about each WAN connection is provided—

- VPI/VCI
- Connection ID
- Category
- Service Name
- Interface Name
- Protocol
- IGMP (Internet Group Management Protocol)
- QoS (Quality of Service)
- State
- Status
- IP Address

Note that this screen will be like the one below before a WAN connection is set up.

The screenshot shows the Paradyne ADSL CPE web interface. The left sidebar contains a navigation tree with 'Device Info' expanded to 'WAN'. The main content area is titled 'WAN Info' and contains an empty table with the following columns: VPI/VCI, Con. ID, Category, Service Name, Interface Name, Protocol, IGMP, QoS, State, Status, and IP Address.

The following screen shows a WAN connection that has been created.

The screenshot shows the Paradyne ADSL CPE web interface with a single WAN connection listed in the table. The table has the following data row:

VPI/VCI	Con. ID	Category	Service Name	Interface Name	Protocol	IGMP	QoS	State	Status	IP Address
0/35	1	UBR	br_0_35	nas_0_35	Bridge	N/A	Disabled	Enabled	Up	

## STATISTICS

### LAN Statistics

To access LAN statistics click on the *LAN* item under *Statistics*. Information is given for each interface (Ethernet Bonding, Ethernet (Port 1-4) and Wireless). For both received and transmitted data, the following information is provided—

- Bytes
- Packets
- Errors
- Drops

To renew the data, click on the **Reset Statistics** button below the table.



The screenshot displays the Paradyne ADSL CPE web interface. At the top, the Paradyne logo and 'ADSL CPE' are visible. The left sidebar contains a navigation tree with 'Statistics' expanded to show 'LAN' selected. The main content area is titled 'Statistics -- LAN' and features a table with the following data:

Interface	Received				Transmitted			
	Bytes	Pkts	Errs	Drops	Bytes	Pkts	Errs	Drops
Ethernet Bonding	497180	7765	0	0	1517392	8913	0	0
Ethernet LAN1(1-4)	657220	5148	0	0	1814521	5151	0	0
Wireless	7121	44	0	0	21247	181	186	0

Below the table is a 'Reset Statistics' button.

### WAN Statistics

To access WAN statistics click on the *WAN* item under *Statistics*. WAN statistics, like the LAN statistics are listed by each connection with received and transmitted data packet information.





Welcome

- Device Info
  - Summary
  - WAN
  - Statistics
    - LAN
    - WAN
    - ATM
    - ADSL
  - Route
  - ARP
  - DHCP
- Quick Setup
- Advanced Setup
- Wireless
- Diagnostics
- Management


**WAN Statistics**

Service	VPI/VCI	Protocol	Interface	Received				Transmitted			
				Bytes	Pkts	Errs	Drops	Bytes	Pkts	Errs	Drops
br_0_35	0/35	Bridge	nas_0_35	0	0	0	0	23665	200	0	0

Reset Statistics

## ATM Statistics

To access ATM statistics click on the *ATM* item under *Statistics*. ATM statistics are organized into three areas— ATM Interface Statistics, AAL5 Interface Statistics, and AAL5 VCC Statistics. To view renewed values, click on the Reset Statistics button.



Welcome

- Device Info
  - Summary
  - WAN
  - Statistics
    - LAN
    - WAN
    - ATM
    - ADSL
  - Route
  - ARP
  - DHCP
- Quick Setup
- Advanced Setup
- Wireless
- Diagnostics
- Management

**Statistics -- ATM**

**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
0/35	2147988600	0	0	0	0

Reset Statistics

## ADSL Statistics

To view ADSL statistics click on the *ADSL* item under *Statistics*. Information contained in this screen is useful for troubleshooting and diagnostics of connection problems. Click on the **Reset Statistics** button to view renewed values.



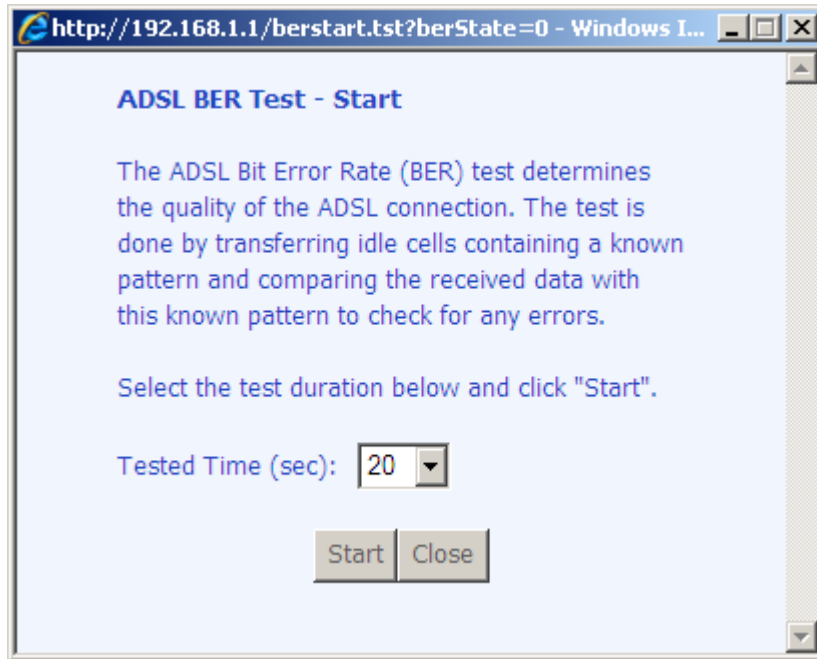
The screenshot displays the PARADYNE ADSL CPE web interface. On the left is a navigation tree with categories like Device Info, Summary, WAN, Statistics, Route, Quick Setup, Advanced Setup, Wireless, Diagnostics, and Management. The main area is titled 'Statistics -- ADSL' and contains a table of performance metrics. At the bottom, there are two buttons: 'ADSL BER Test' and 'Reset Statistics'.

	Downstream	Upstream
Mode:	G.DMT	
Type:	Interleave	
Line Coding:	Trellis Off	
Status:		
Link Power State:	L0	
	Downstream	Upstream
SNR Margin (dB):	0.0	0.0
Attenuation (dB):	0.0	0.0
Output Power (dBm):	13.0	0.0
Attainable Rate (Kbps):	0	0
Rate (Kbps):	7616	800
K (number of bytes in DMT frame):	0	0
R (number of check bytes in RS code word):	0	0
S (RS code word size in DMT frame):	0	0
D (interleaver depth):	0	0
Delay (msec):	0	0
Super Frames:	0	0
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:	0	0
Data Cells:	0	0
Bit Errors:	0	0
Total ES:	0	0
Total SES:	0	0
Total UAS:	2608	0

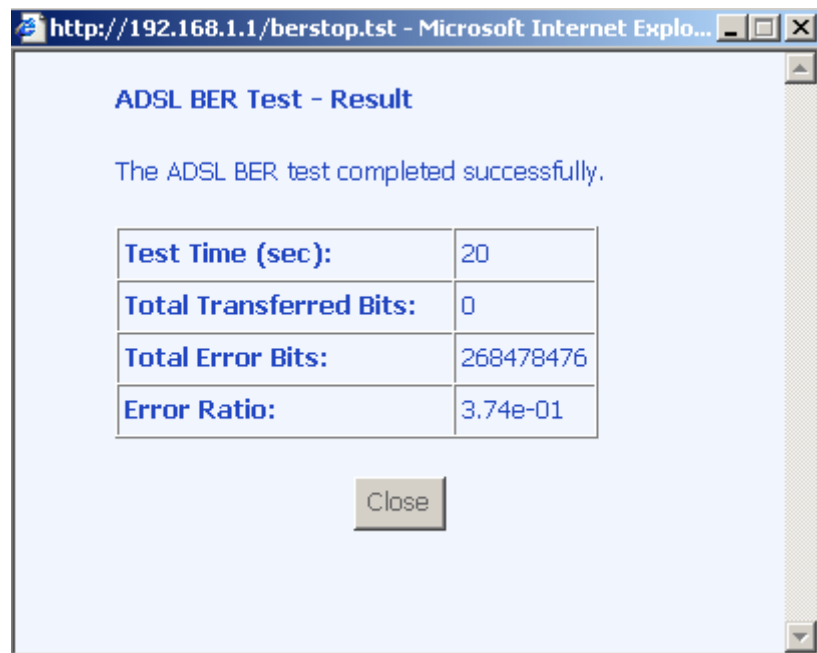
## ADSL BER Test

A Bit Error Rate Test (BER Test) is a test that reflects the ratio of error bits to the total number transmitted.

If you click on the **ADSL BER Test** button at the bottom of the ADSL Statistics page, the following pop-up screen will appear allowing you to set the tested time and to begin the test.



Below is an ADSL BER Test result screen displaying information about the test including the error bits and ratio.



## Route

To access the routing information, click on the *Route* item under *Device Info*. The following are the routing information provided—

- Destination
- Gateway
- Subnet Mask
- Flag
- Metric
- Service
- Interface



The screenshot displays the Paradyne ADSL CPE web interface. The top banner features the Paradyne logo and 'ADSL CPE'. On the left, a navigation tree shows 'Device Info' expanded to 'Route'. The main content area is titled 'Device Info -- Route' and includes a legend for flags: U - up, I - reject, G - gateway, H - host, R - reinstate, D - dynamic (redirect), M - modified (redirect). Below the legend is a table with the following data:

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

## ARP (Address Resolution Protocol)

To access ARP status click on the *ARP* item under *Device Info*. The information provided shows the IP address that is mapped to the hardware IP address.



Device Info -- ARP

IP Address	Flags	HW Address	Device
192.168.1.4	Complete	00:07:40:FD:1C:F9	br0

Navigation menu: Welcome, Device Info (Summary, WAN, Statistics, LAN, WAN, ATM, ADSL, Route, ARP, DHCP), Quick Setup, Advanced Setup, Wireless, Diagnostics, Management.

## DHCP (Dynamic Host Configuration Protocol)

To access the DHCP lease information click on *DHCP* under *Device Info*. Devices that have been issued IP addresses by DHCP will be listed on this screen by its hostname, MAC address and IP address along with the expiration of the IP address.



Device Info -- DHCP Leases

Hostname	MAC Address	IP Address	Expires In
Test-NB	00:13:02:13:61:EF	192.168.1.2	23 hours, 35 minutes, 53 seconds

Navigation menu: Welcome, Device Info (Summary, WAN, Statistics, Route, ARP, DHCP), Quick Setup, Advanced Setup, Wireless, Diagnostics, Management.

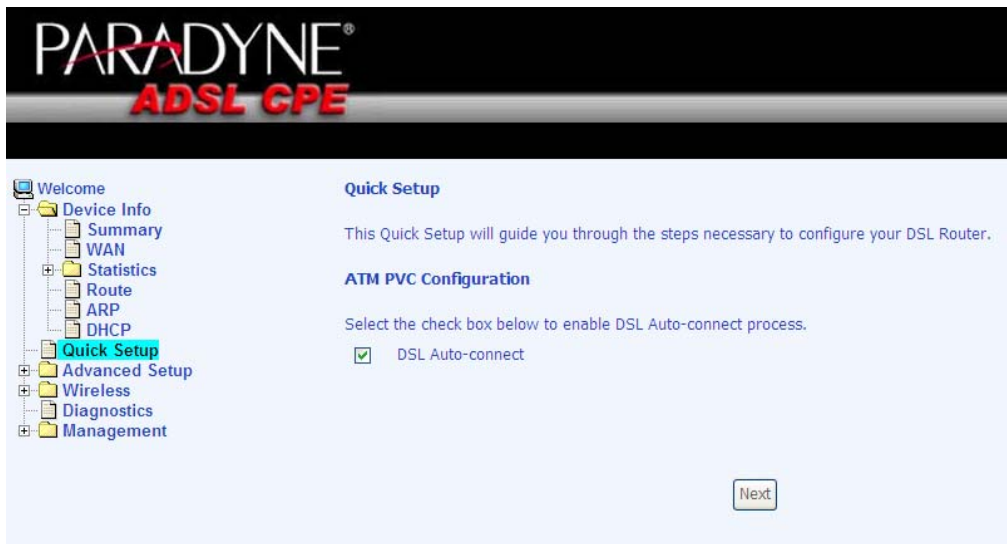
# Quick Setup

This section will explain how to quickly configure the router for the main purpose of connecting to the Internet. If you need to configure any advanced functions, then those can be performed in the advanced section.

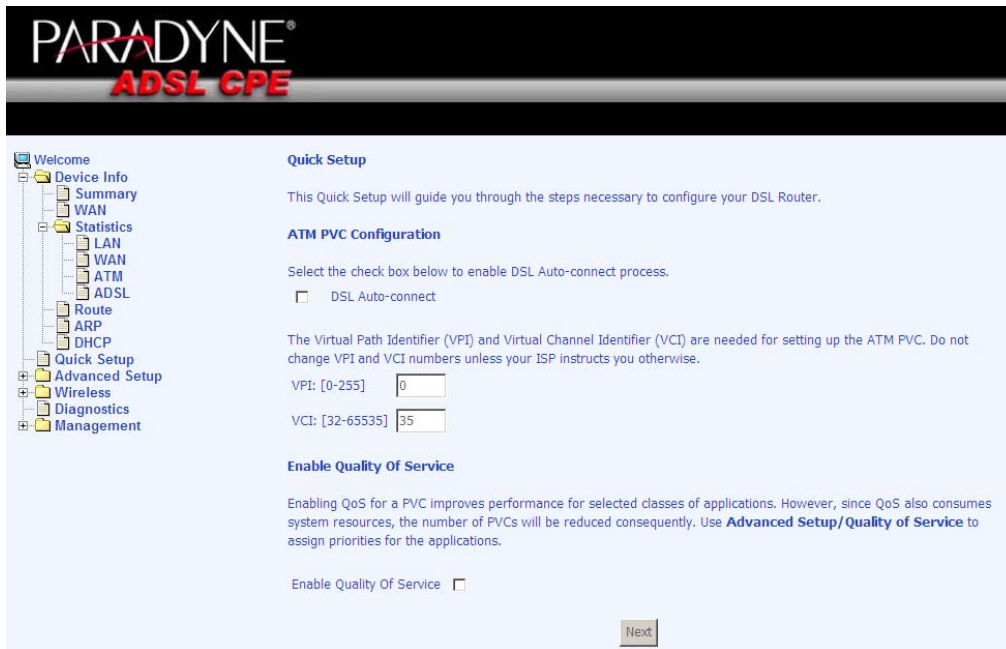
## ATM PVC Configuration

To enable the auto-connect process, click on the box labeled DSL Auto-connect, a process that will automatically detect the first usable PVC and automatically detect PPPoE, PPPoA, and Bridge Protocol (with DHCP Server available). To continue, click on the Next button.

**Note:** The following example will be a PPPoA example where the VPI / VCI numbers have not been used. Note that the same numbers can be used only once.



VPI and VCI numbers can be entered manually if you do not want to use DSL Auto-connect. Quality of service can also be enabled on this screen.



Additionally, if you do not use DSL Auto-connect, then you will need to select the connection type and encapsulation mode from a list as shown below.



The next screen to appear will depend on the connection type that was selected in the previous screen.

The screenshot shows the Paradyne ADSL CPE configuration interface. On the left is a navigation tree with categories: Welcome, Device Info, Quick Setup, Advanced Setup (containing WAN, LAN, NAT, Firewall, Quality of Service, Routing, DNS, ADSL, and Port Mapping), Wireless, Diagnostics, and Management. The main content area is titled "PPP Username and Password". It includes a descriptive paragraph: "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." Below this are three input fields: "PPP Username:", "PPP Password:", and "Authentication Method:" (set to "AUTO"). There are four unchecked checkboxes: "Dial on demand (with idle timeout timer)", "PPP IP extension", "Keep Alive", and "Use Static IP Address". There are two radio button options for the default gateway: "Obtain default gateway automatically." (selected) and "Use the following default gateway:". Under the second option, there are two sub-options: "Use IP Address:" (with an empty text box) and "Use WAN interface:" (with a dropdown menu showing "ppp0a\_0\_35\_1/ppp\_0\_35\_1"). At the bottom right are "Back" and "Next" buttons.

In the next screen, decide whether or not NAT, firewall, IGMP multicast, and WAN service should be enabled.

The screenshot shows the Paradyne ADSL CPE configuration interface for "Network Address Translation Settings". The navigation tree on the left is similar to the previous screen but highlights "Advanced Setup" and "Wireless". The main content area is titled "Network Address Translation Settings" and includes a descriptive paragraph: "Network Address Translation (NAT) allows you to share one Wide Area Network (WAN) IP address for multiple computers on your Local Area Network (LAN)." Below this are two checked checkboxes: "Enable NAT" and "Enable Firewall". There is a section titled "Enable IGMP Multicast, and WAN Service" with two checkboxes: "Enable IGMP Multicast" (unchecked) and "Enable WAN Service" (checked). Below these is a "Service Name:" label followed by a text box containing "ppp0a\_0\_35\_1". At the bottom right are "Back" and "Next" buttons.



The following is the Device Setup screen where you enter the IP address / subnet mask as well as enable or disable DHCP server. If you have a second IP address and subnet mask for the LAN interface, click on the checkbox.

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**ADSL CPE**

Welcome  
+ Device Info  
+ Quick Setup  
+ Advanced Setup  
+ Wireless  
+ Diagnostics  
+ Management

**Device Setup**

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

IP Address:

Subnet Mask:

Disable DHCP Server

Enable DHCP Server

Start IP Address:

End IP Address:

Leased Time (hour):

Configure the second IP Address and Subnet Mask for LAN interface

Configure the second IP Address and Subnet Mask for LAN interface

IP Address:

Subnet Mask:

Back Next

The last screen under the Quick Start section allows you to set up the wireless feature on the router.

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**ADSL CPE**

Welcome  
+ Device Info  
+ Quick Setup  
+ Advanced Setup  
+ Wireless  
+ Diagnostics  
+ Management

**Wireless -- Setup**

Enable Wireless

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

SSID:

Back Next

When you click on Next, the summary screen shows the settings made under WAN setup.

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**ADSL CPE**

Welcome

- Device Info
- Quick Setup
- Advanced Setup
- Wireless
- Diagnostics
- Management

### WAN Setup - Summary

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

<b>VPI / VCI:</b>	0 / 35
<b>Connection Type:</b>	PPPoA
<b>Service Name:</b>	pppoa_0_35_1
<b>Service Category:</b>	UBR
<b>IP Address:</b>	Automatically Assigned
<b>Service State:</b>	Enabled
<b>NAT:</b>	Enabled
<b>Firewall:</b>	Enabled
<b>IGMP Multicast:</b>	Disabled
<b>Quality Of Service:</b>	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.

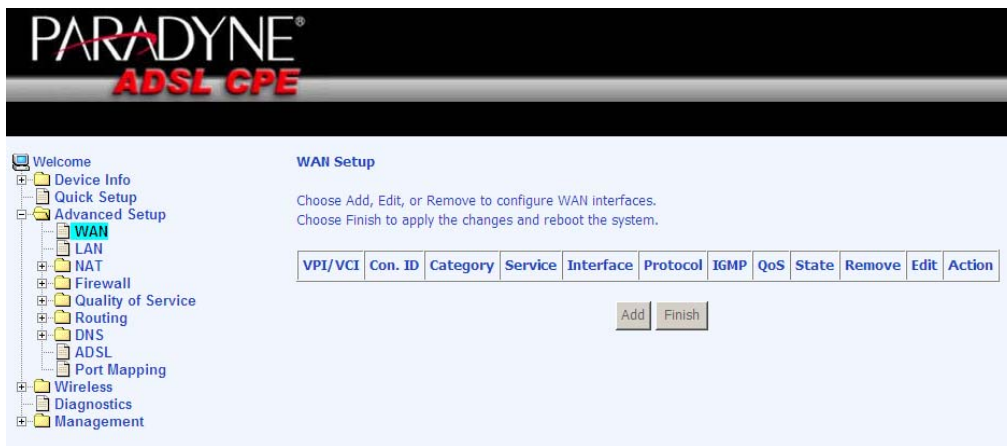
[Back](#) [Save/Reboot](#)

# Advanced Setup

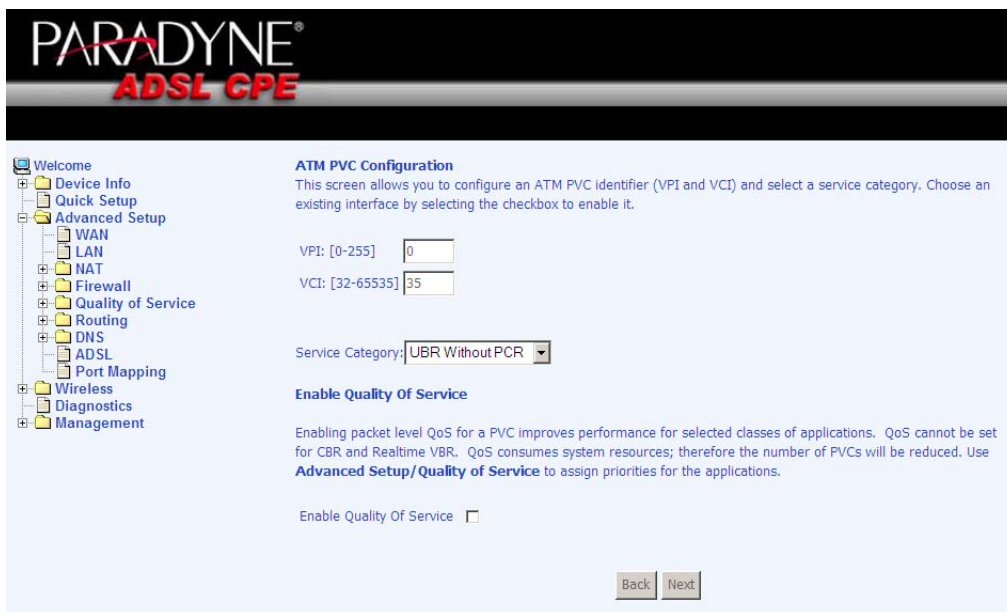
This section of the user manual explains the advanced configurations of the CPE. The topics under Advanced Setup are *WAN*, *LAN*, *NAT*, *security*, *routing*, *DNS*, and *DSL*.

## WAN

Configure the WAN settings according to the instructions given by your ISP. Each existing WAN connection will be listed in the table with the options to edit or remove them as well as to add new WAN connections. Remember to click on the **Save / Reboot** button after any changes made.



Click on the **Add** button if you want to add a new rule for the WAN interface. The ATM PVC Configuration screen appears.



The ATM PVC Configuration screen allows you to configure an ATM PVC identifier (VPI and VCI) and select a service category. Verify the following values with your ISP before you change them.

- **VPI:** Virtual Path Identifier. The valid range is 0 to 255.
- **VCI:** Virtual Channel Identifier. The valid range is 32 to 65535.
- **Service Category:** Five classes of traffic are listed—
  - UBR Without PCR
  - UBR With PCR
  - CBR
  - Non Realtime VBR
  - Realtime VBR

Enabling QoS for a PVC improves performance for selected classes of applications. However, since QoS also consumes system resources, the number of PVCs is reduced. If you want to enable QoS service, click on the **Enable Quality Of Service** check box.

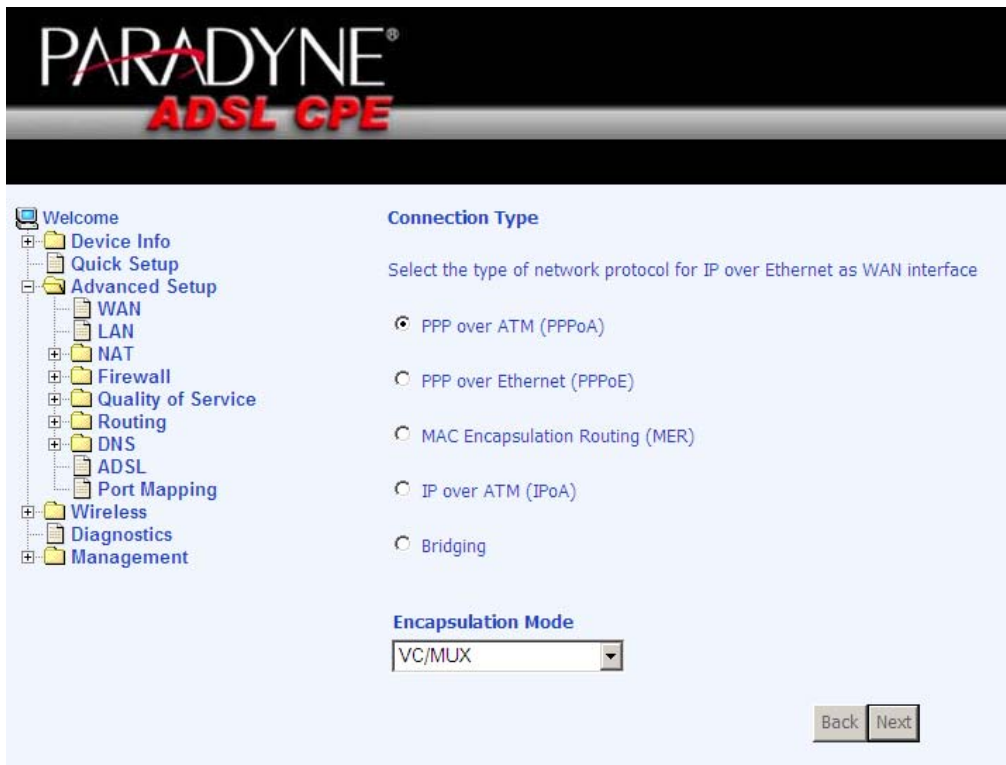
### Connection Type

This screen shows the below types of network protocols and encapsulation modes—

- PPP over ATM (PPPoA)
- PPP over Ethernet (PPPoE)
- MAC Encapsulation Routing (MER)
- IP over ATM (IpoA)
- Bridging

Select the mode that your ISP has instructed you to use and click on **Next**.

Also available is the option to enable 802.1q, a standard to allow multiple bridged networks to transparently share the same physical network link without leakage of information between networks (i.e. "trunking"). Click on the checkbox if you wish to enable this function.



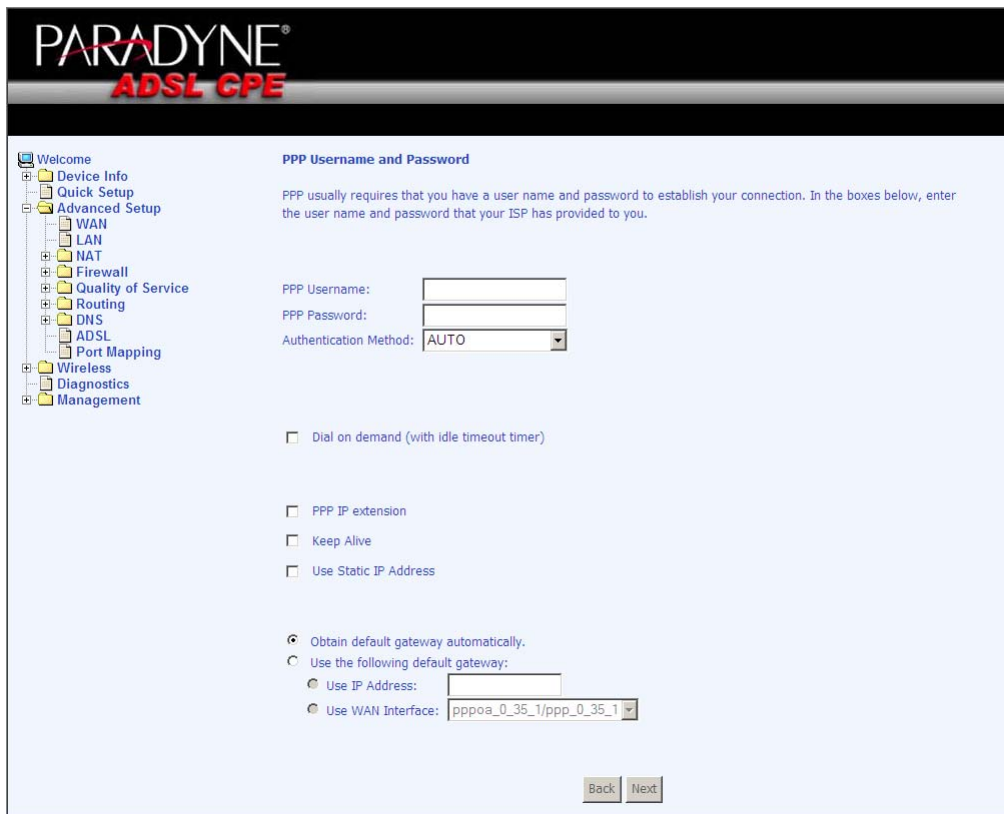
If you selected a PPP connection, then the next screen shows the PPP Username and Password section. The PPP username and password will have already been entered. For this example, the PPPoA Service Name “Test” has been chosen.

Select an **authentication method** from the following choices— auto, PAP, CHAP, and MSCHAP.

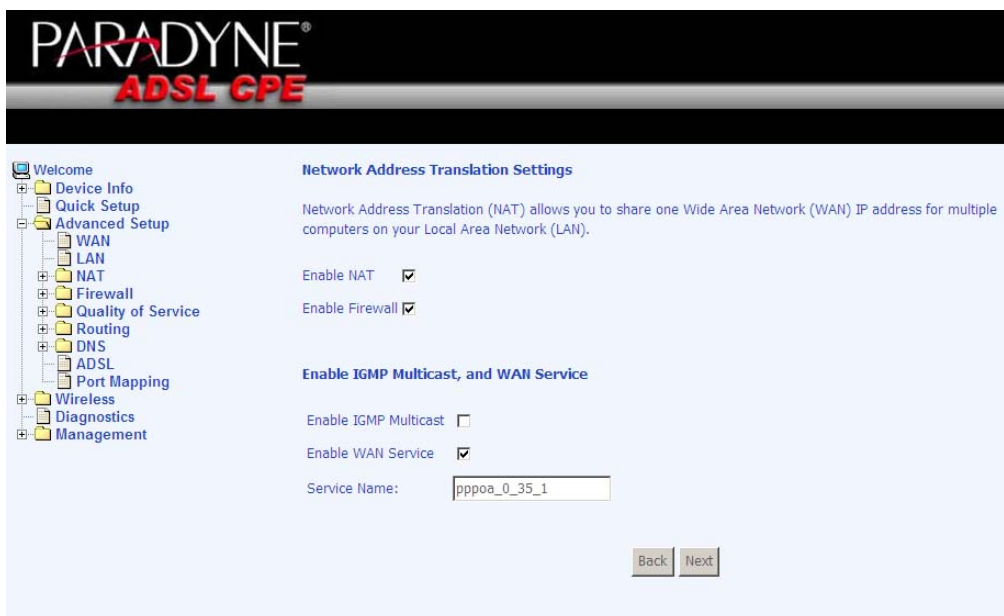
**Dial on demand:** If you select this box, then an additional **Inactivity Timeout** box will appear for you to enter the time in minutes.

PPP IP extension is a special feature deployed by some service providers. Do not select this item unless specifically required by your service provider.

Click on the **Next** button when you finish to continue.



The next screen allows you to configure NAT settings as well as enable IGMP multicast and WAN service.



Bridge Example:

To set up a bridge connection, from the following Connection Type Screen, select bridging as the connection type and select the preferred encapsulation mode and then click on Next.



The next screen will be to select whether or not to enable bridge service and to enter the service name. To finish the bridge connection setup, click on **Next** and the summary of the connection will be displayed.



When the settings are complete, the next screen shows a **WAN Setup - Summary** screen displaying the WAN configurations made. Below is the bridge connection WAN Setup Summary page. Click on the **Save** button when the settings are correct.

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**WAN Setup - Summary**

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

VPI / VCI:	0 / 35
Connection Type:	Bridge
Service Name:	pppoa_0_35_1
Service Category:	UBR
IP Address:	Not Applicable
Service State:	Enabled
NAT:	Disabled
Firewall:	Disabled
IGMP Multicast:	Not Applicable
Quality Of Service:	Disabled

Click "Save" to save these settings. Click "Back" to make any modifications.  
NOTE: You need to reboot to activate this WAN interface and further configure services over this interface.

Back Save

The below screen will appear showing the WAN settings that you made. When satisfied with the settings, and no changes are necessary, click on the **Finish** button. To remove any settings, click on the **Remove** button.

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**WAN Setup**

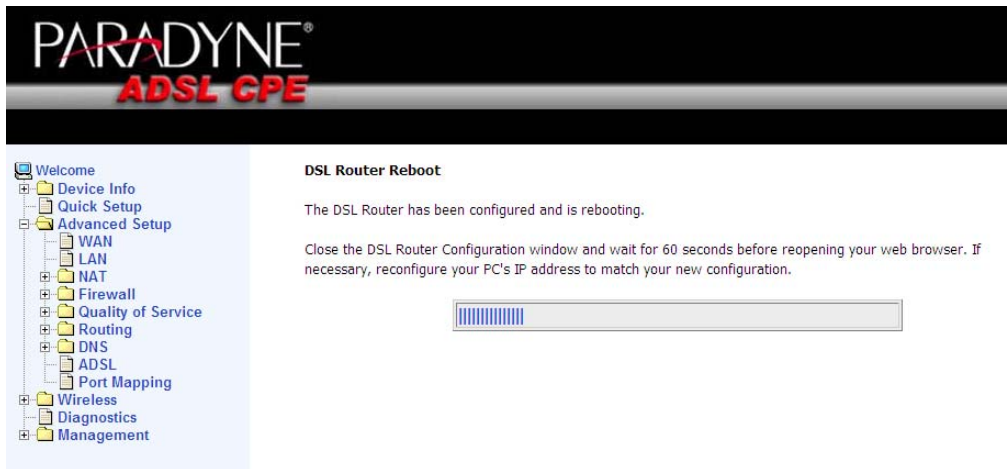
Choose Add, Edit, or Remove to configure WAN interfaces.  
Choose Finish to apply the changes and reboot the system.

VPI/VCI	Con. ID	Category	Service	Interface	Protocol	IGMP	QoS	State	Remove	Edit	Action
0/35	1	UBR	pppoa_0_35_1	nas_0_35	Bridge	N/A	Disabled	Enabled	<input type="checkbox"/>	Edit	
2/38	1	UBR	pppoa_2_38_1	ppp_2_38_1	PPPoA	Disabled	Disabled	Enabled	<input type="checkbox"/>	Edit	Up

Add Remove Finish



After selecting the **Finish** button, the below screen will appear. At this point, the router will reboot to save the changes made.



## LAN Local Area Network (LAN) Setup

You can configure the DSL Router IP address and Subnet Mask for the LAN interface to correspond your LAN's IP Subnet. Enter the following items—

- IP Address
- Subnet Mask
- Enable UpnP
- Disable / Enable DHCP Server
- Start / End IP Address
- Leased Time in hours
- Configure the second IP address and Subnet Mask for LAN interface

The **Save** button only saves the LAN configuration data, but does not apply the configurations. Select the **Save/Reboot** button to save the LAN configuration data and reboot the router and apply the new configurations.

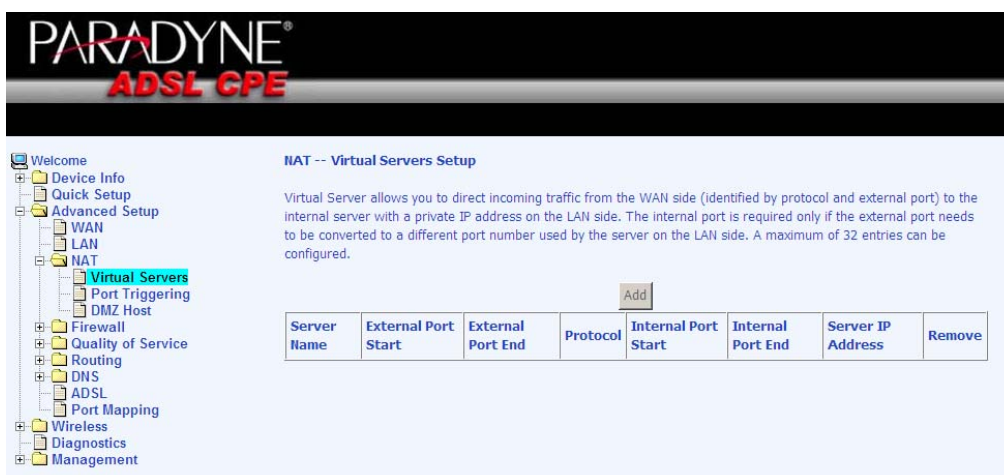


## NAT

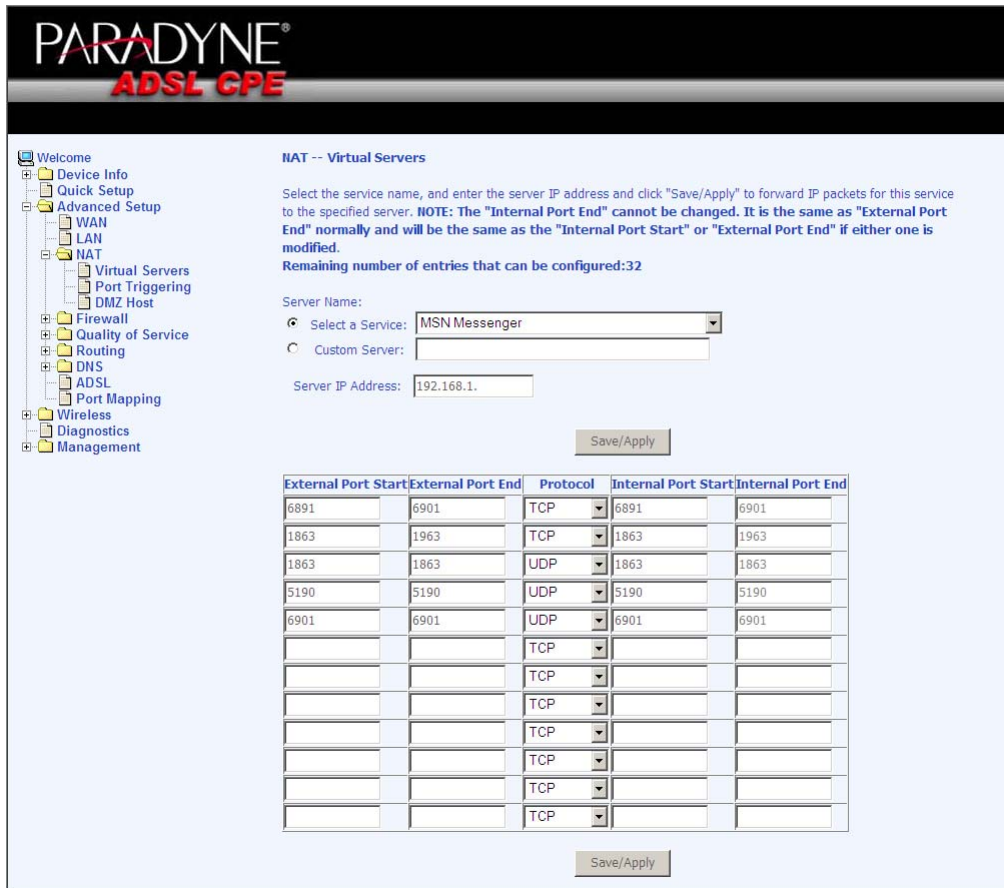
Enable NAT (Network Address Translation) to configure the Virtual Server, Port Triggering, and DMZ Host.

### Virtual Servers

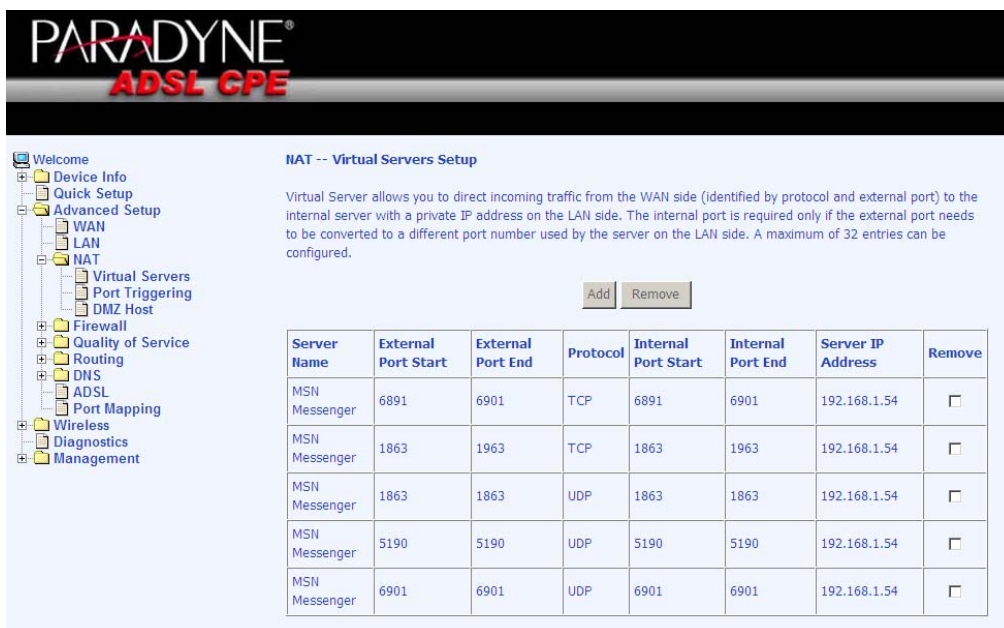
A virtual server allows you to direct incoming traffic from the WAN side to a specific IP address on the LAN side. To set up a virtual server, click on the Add button.



Select the virtual server from the drop-down list and complete the server IP address, then click on the Save / Apply button.



The following screen appears after you save your selection. To add additional virtual servers, click on the **Add** button. If you need to remove any of the server names, select the check box and click on the **Remove** button.



## Port Triggering

Click on the Add button to add Port Triggering to your Internet application.

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**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 of 32 entries can be configured.

Add Remove

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

The below screen appears when you click on Add allowing you to select the application that you want to set the port settings for. After a selection has been made, click on the Save / Apply button.

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**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: QuickTime 4 Client

Custom application:

Save/Apply

Trigger Port	Start	Trigger Port	End	Trigger Protocol	Open Port	Start	Open Port	End	Open Protocol
554		554		TCP	6970		32000		UDP
554		554		TCP	6970		7000		TCP/UDP
				TCP					TCP
				TCP					TCP
				TCP					TCP
				TCP					TCP
				TCP					TCP
				TCP					TCP

Save/Apply

The below screen appears after you save your selections. You will be able to add or remove selections made, by clicking on the Add and Remove buttons.

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**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 of 32 entries can be configured.

Add Remove

Application	Trigger	Open		Remove			
		Protocol	Port Range		Protocol	Port Range	
		Start	End	Start	End		
QuickTime 4 Cli	TCP	554	554	UDP	6970	32000	<input type="checkbox"/>
QuickTime 4 Cli	TCP	554	554	TCP/UDP	6970	7000	<input type="checkbox"/>

## DMZ Host

You can define the IP address of the DMZ Host on this screen. Enter the IP address and click on **Save / Apply**.

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**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:

Save/Apply

# Firewall

## IP Filtering—Outgoing

The outgoing filter will block the LAN traffic from entering the WAN side. Click on the **Add** button to create filters.



The below screen will appear when you click on **Add**. Input the filter name, source information (from the LAN side), and destination information (from the WAN side). Then click on **Save / Apply**.

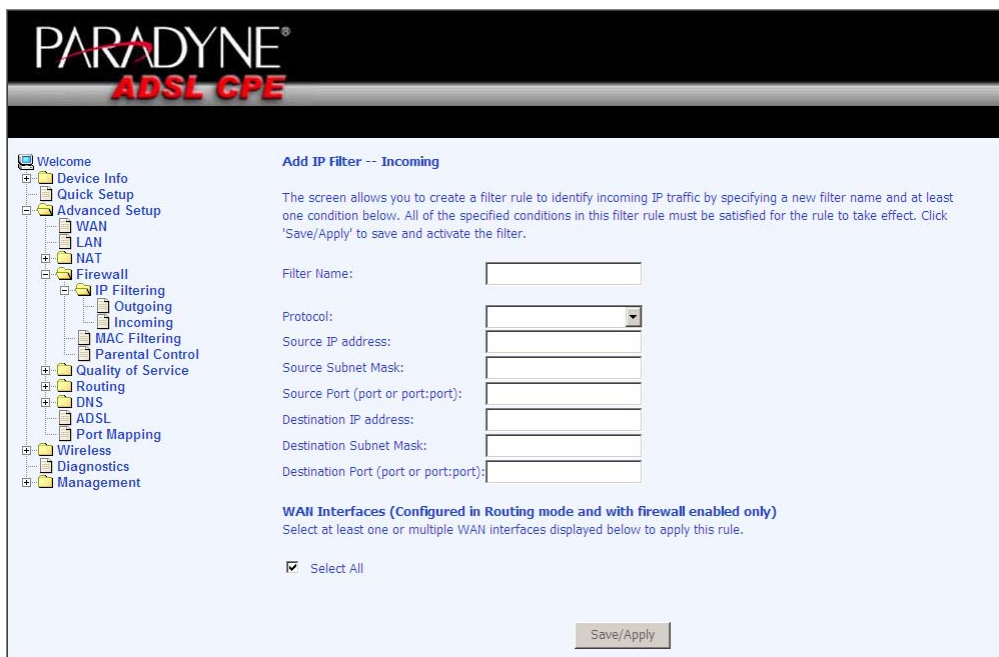


## IP Filtering—Incoming

Incoming filter filters the WAN traffic to the LAN side. Click on the Add button to add incoming filter settings.

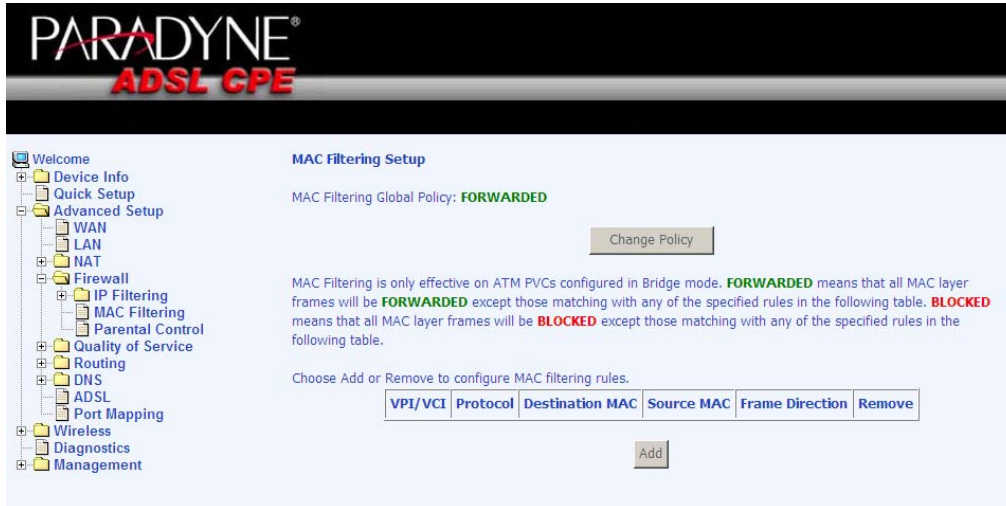


Enter a filter name, information about the source address (from the WAN side), and information about the destination address (to the LAN side). Select the protocol and WAN interface, and then click on Save/Apply to add the setting.



## MAC Filtering

MAC filtering can forward or block traffic by MAC address. You can change the policy or add settings to the MAC filtering table using the MAC Filtering Setup screen.



If you click on Change Policy, a confirmation dialog allows you to verify your change.



If you want to add a setting to the MAC filtering table, enter the Source and Destination MAC address, and select protocol type, frame direction, and WAN interface. Then click on Save / Apply to save it.





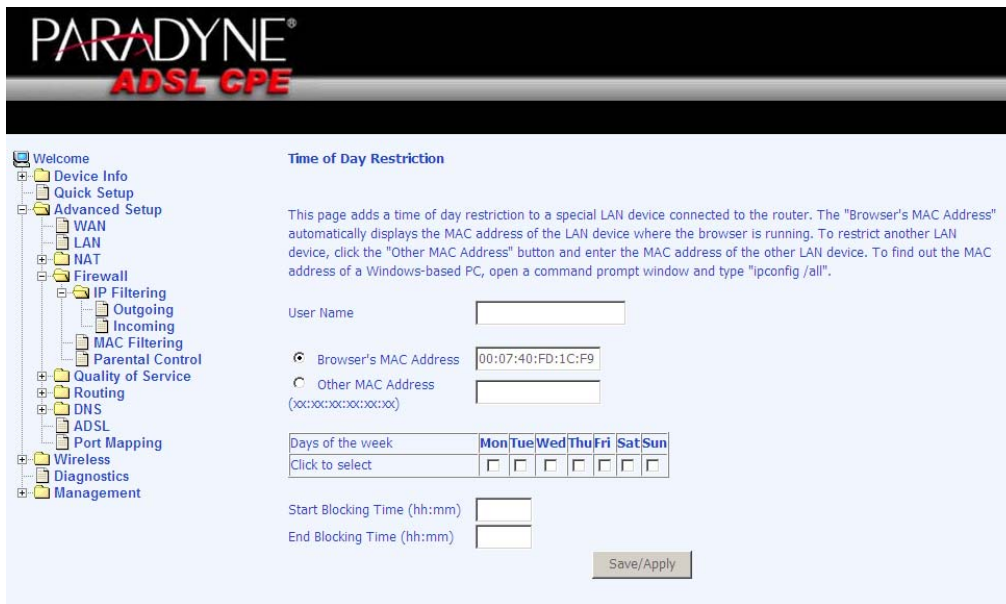
After you save the settings, a screen showing the settings will appear. On this screen you will be able to view and delete MAC filtering rules.

## Parental Control

In a home setting, parents can also restrict the day of the week certain computers can access the router. Click on **Add** to set up the restrictions.



After you click on **Add**, you will see the below screen. You will be able to enter the MAC address of the PC that you wish to place on a time of day restriction. Click on **Save / Apply** to save the settings and to continue.



## Quality of Service

This QoS screen allows you to enable QoS and configure outgoing IP packet traffic management using DSCP (Differentiated Services Code Point) marks. Any outgoing packets without any classification rules will be marked with the DSCP mark that is selected.

