Load Balancing Router

User's Guide

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Document Version: 1.4

1: Introduction

Congratulations on the purchase of your new Load Balancer. The Load Balancer provides ***Shared Broadband Internet Access*** for all LAN users.

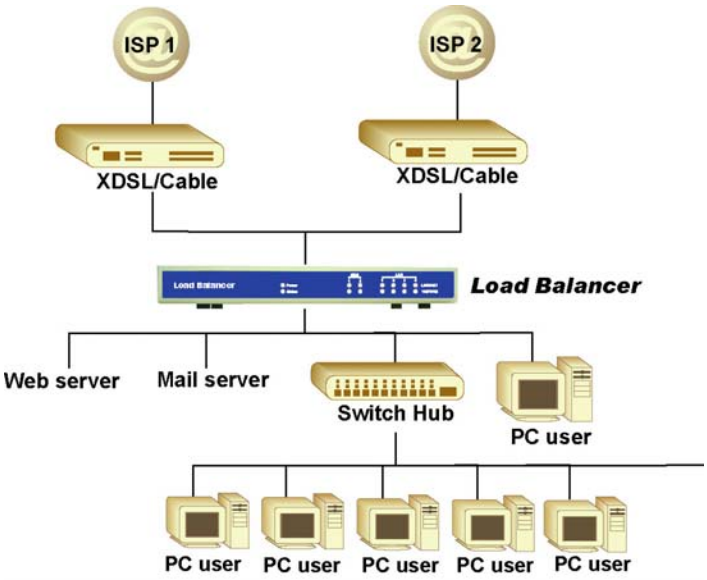


Figure 1-1: Load Balancer

Internet Features

- ***Shared Broadband Internet Access***

  All LAN users can access the Internet through the Load Balancer, by sharing one (1) or two (2) Broadband modems and connections.

- ***High-Performance Dual Modem Support***

  The Load Balancer has two (2) WAN ports, allowing connection of two (2) Broadband modems. **This gives twice the bandwidth of a single modem**.
  Flexible configuration allows each port to use a different type of modem and connection method. Also, you can determine how the Internet traffic is shared between the 2 modems.

- ***Supports all common Connection Methods***

  All popular DSL and Cable Modems and connection methods are supported, including Fixed IP, Dynamic IP, PPPoE, and PPTP.

- ***PPPoE Session Management***

  Multiple PPPoE sessions are supported and you can choose to “map” sessions to individual PCs if desired.

- ***Multiple IP Address Support***

  If your ISP allocates you multiple IP addresses, these are also supported and you can “map” IP addresses to individual PCs if desired.

- ***Special Applications***

  This feature allows you to use some non-standard applications, where the port number used for the response is different to the port number used by the sender.

- ***Virtual Servers***

  This feature allows Internet users to access Internet servers on your LAN. For standard servers such as Web, FTP or E-Mail servers, only the IP address of the server PC is required. You can also define you own Server types if required.

- ***Multiple DMZ***

  A "DMZ" PC will receive incoming connection requests, which would otherwise be blocked. For each IP address allocated by your ISP, a separate "DMZ" PC can be specified. So if your ISP has given you multiple IP addresses, you can have multiple “DMZ” PCs. Each “DMZ” PC has unrestricted 2-way Internet access, providing the ability to run programs that are otherwise incompatible with NAT routers like the Load Balancer.

- ***Access Filter***

  The network Administrator can use the Access Filter to gain fine control over the Internet access and applications available to LAN users. Five (5) user groups are available, and each group can have different access rights.

- ***Block URL***

  Use this feature to block access to undesirable Web sites by LAN users. You can even have different settings for different groups of PCs.

- ***Session Limit***

  With Session Limit feature, if the numbers of new sessions for system exceed the maximum in the sampling time, any new session in the system will be drop.

- ***System Filter Exception***

  With firewall exception, the packets will not be processed by firewall or NAT module, but be processed directly by system protocol stack.

Other Features

- ***4-Port Switching Hub***

  The Load Balancer incorporates a 4-port 10 /100BaseT switching hub, making it easy to create or extend your LAN.

- ***DHCP Server Support***

  Dynamic **H**ost **C**onfiguration **P**rotocol provides a dynamic IP address to PCs and other devices upon request. The Load Balancer can act as a **DHCP Server** for devices on your local LAN.

- ***Multi Segment LAN Support***

  LANs containing one or more segments are supported, via The Load Balancer's built-in static routing table.

- ***ARP proxy***

  The ARP proxy feature allows you to assign an external (Internet) IP address to The Load Balancer's LAN port. This allows Servers on your LAN to have external (Internet) IP addresses.

- ***Easy Setup***

  Use your favorite WEB browser for configuration.

- ***Remote Management***

  The Load Balancer can be managed from any PC on your LAN. And, if the Internet connection exists, it can also (optionally) be configured via the Internet.

- ***Password - protected Configuration***

  Optional password protection is provided to prevent unauthorized users from modifying the configuration data and settings.

- ***HTTP Firmware Upgrade and backup***

  The web management feature allows you to use HTTP upgrade new firmware and backup system configuration from local or even from remote site. As long as you enable “Remote upgrade” and “Remote web-based setup” from Advanced feature web page.

- ***Email Alert***

  It will send a warning email to the system administrator, if one of the WAN ports was disconnected when both WAN ports are enabled.

- ***Syslog***

  It can generate real time system information on the web page or a particular machine. It is useful to monitor the device.

- ***QoS Configuration.***

  This function will make some specified packets with higher priority for pass-through. Especially you use real-time applications like Internet phone, video conference,. etc.

- ***UPnP***

  To “Enable” UpnP (Universal Plug & Play), the load balancer will become one of the network devices. It is useful to discovery and control network devices, such as Internet gateway.

Package Contents

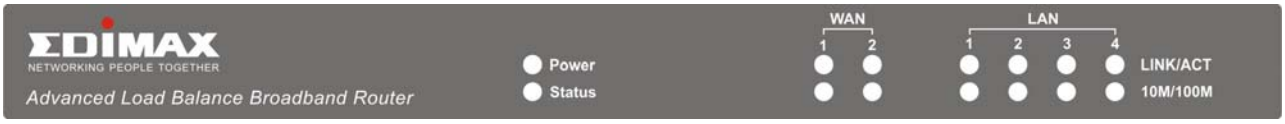
The following items should be included:

- The Load Balancer Unit
- Power Adapter
- Quick Installation Guide
- CD-ROM containing the on-line manual.

If any of the above items are damaged or missing, please contact your dealer immediately.

Physical Details

Front Panel



Operation of the Front Panel LEDs is as follows:

LAN	
LINK/ACT	ON – Physical connection or data in/out.
	OFF – No physical connection.
10M/100M	ON – The corresponding LAN port is using 100BaseT.
	OFF – 10BaseT connection on the corresponding LAN port or no connection.
WAN	
LINK/ACT	ON – Physical connection to the Broadband modem on WAN port 1/2 established.
	OFF – No physical connection on WAN port 1/2.
10M/100M	ON – Physical connection using 100BaseT on WAN port 1/2 established.
	OFF – 10BaseT connection or no connection on WAN port 1/2.
System	
Power	OFF – No power.
	ON – Normal Operation
Status	OFF – Normal operation.
	ON – Firmware not loaded or Hardware error.
	Blinking – Data in/out

Also, some Status and Error conditions are indicated by combinations of LEDs, as shown below

LED Action	Condition
WAN1 LINK/ACT & 10M/100M LEDs flash alternatively.	Firmware Download in progress.
WAN1 LINK/ACT & 10M/100M LEDs flash concurrently.	MAC address not assigned.
WAN1 LINK/ACT & 10M/100M LEDs solid On	SDRAM error
WAN2 LINK/ACT & 10M/100M LEDs solid On	Timer/Interrupt error
LAN1 LINK/ACT & 10M/100M LEDs solid On	LAN/WAN error

Rear Panel

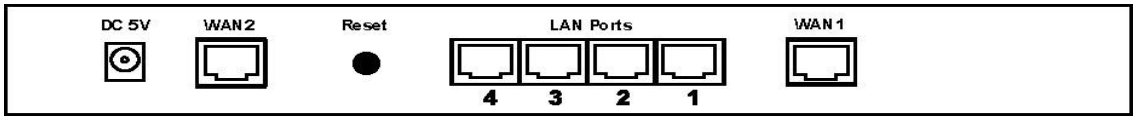


Figure 1-2: Rear Panel

DC 5V	Connect the supplied power adapter here.
WAN 2	Connect the 2nd Broadband Modem here, if available.
Reset Button	When pressed and released, The Load Balancer will reboot (restart) within 1 second. It resets to default over 3 seconds.
LAN Ports	Connect the PCs to these ports. Both 10BaseT and 100BaseT connections can be used simultaneously. **Note:** Any port will automatically operate as an "Uplink" port if required. Just use a normal LAN cable to connect to a normal port on another hub.
WAN 1	Connect the primary Broadband Modem here.

Default Settings

When The Load Balancer has finished booting, all configuration settings will be set to the factory defaults, including:

- *IP Address* set to its default value of 192.168.1.1, with a *Network Mask* of 255.255.255.0
- *DHCP Server* is enabled
- *User Name: admin*
- Password cleared (no password)

TFTP Download

This setting should be used only if your Load Balancer is unusable, and you wish to restore it by downloading new firmware. Follow this procedure:

1. Power On The Load Balancer.
2. Use the supplied Windows utility or a TFTP client program applies the new firmware. If using the supplied Windows TFTP program, the screen will look like the following example.

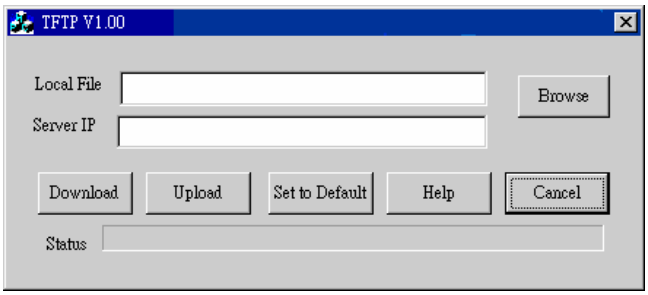


Figure 1-3: Windows TFTP utility

- Enter the name of the firmware upgrade file on your PC, or click the "Browse" button to locate the file.
- Enter the LAN IP address of The Load Balancer in the "Server IP" field.
- Click "Download" to send the file to The Load Balancer.

3. When downloading is finished. It should then work normally, using the default settings.

Note:

The supplied Windows TFTP utility also allows you to perform three (3) other operations:

- Save the current configuration settings to your PC (use the "Upload" button).
- Restore a previously-saved configuration file to The Load Balancer (use the "Download" button).
- Set The Load Balancer to its default values (use the "Set to Default" button).

2: Basic Setup

Overview

Basic Setup of your Load Balancer involves the following steps:

1. Attach The Load Balancer to one (1) PC, and configure it for your LAN.
2. Install your Load Balancer in your LAN, and connect the Broadband Modem or Modems.
3. Configure your Load Balancer for Internet Access.
4. Configure PCs on your LAN to use The Load Balancer.

Requirements

- One (1) or two (2) DSL or Cable modems, each with an Internet Access account with an ISP.
- Network cables. Use standard 10/100BaseT network (UTP) cables with RJ45 connectors
- TCP/IP network protocol must be installed on all PCs.

Procedure

1: Configuring The Load Balancer for your LAN

1. Use a standard LAN cable to connect your PC to any Hub port on The Load Balancer.
2. Connect the power adapter and power up The Load Balancer. Only use the power adapter provided; using a different one may cause hardware damage.
3. Start your PC. If your PC is already running, restart it. It will then obtain an IP address from The Load Balancer.
4. Start your WEB browser.
5. In the *Address* or *Location* box enter:

   `HTTP://192.168.1.1`

6. You will be prompted for the User Name and password, as shown below.

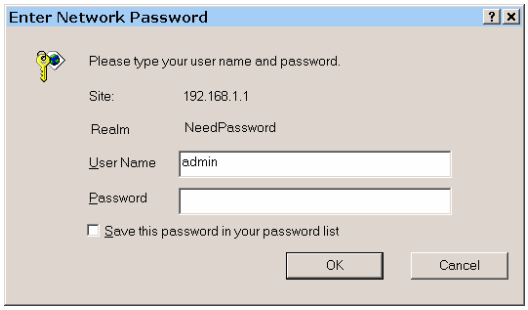


Figure 2-1: Password Dialog

7. Enter *admin* for the "User Name" and leave the "Password" blank.
   - The "User Name" is always *admin*

- You can and should set a password, using the following ***Admin Password*** screen.

No Response ?

- Is your PC using a Fixed IP address ?

  If so, you must configure your PC to use an IP address within the range 192.168.1.2 to 192.168.1.254, with a *Network Mask* of 255.255.255.0. See *Appendix B – Windows TCP/IP Setup* for details.

- Check that The Load Balancer is properly installed, LAN connection is OK, and it is powered ON.

8. After the login, you will then see the ***Admin Password*** screen, as shown below. Assign a password by entering it in the "Password" and "Verify Fields.

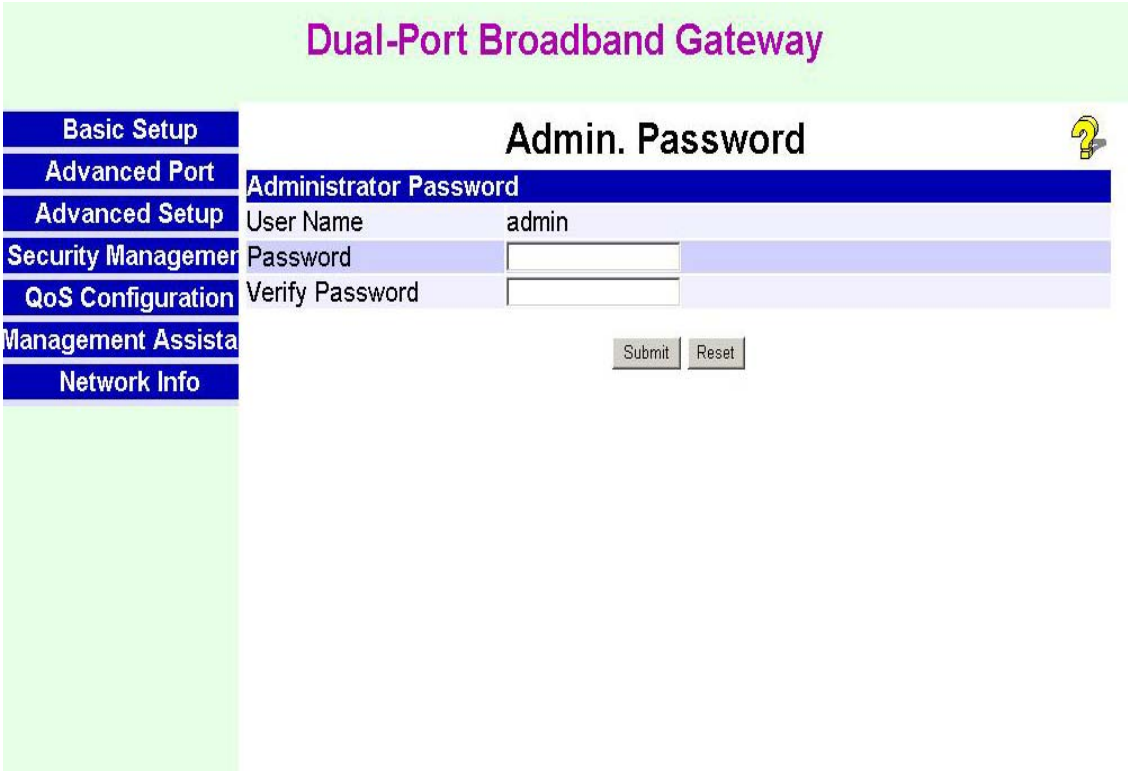


Figure 2-2: Home Screen (Admin Password)

9. Select ***LAN & DHCP*** from the menu. You will see a screen like the example below.

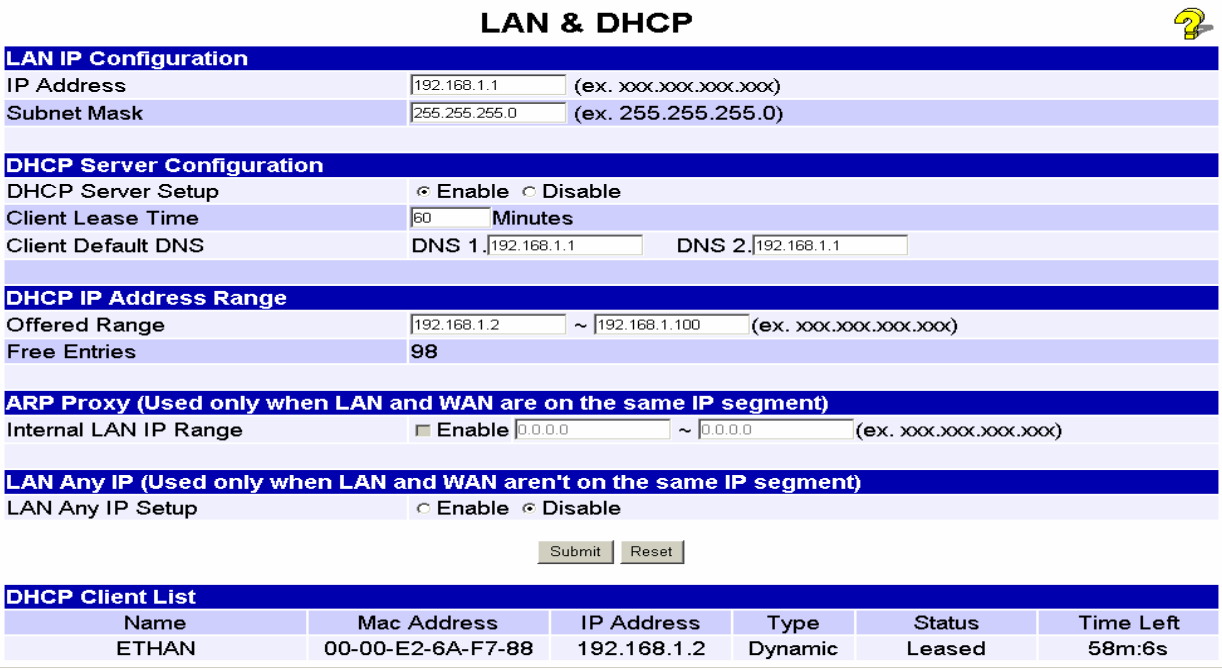


Figure 2-3: LAN & DHCP

10. Ensure these settings are suitable for your LAN:
    - The default settings are suitable for many situations.
    - See the following table for details of each setting.
11. Save your data, then go to *Step 2, Installing The Load Balancer in your LAN*.

Settings – LAN & DHCP

IP Address	IP address for The Load Balancer, as seen from the local LAN. Use the default value unless the address is already in use or your LAN is using a different IP address range. In the latter case, enter an unused IP Address from within the range used by your LAN.
Subnet Mask	The default value 255.255.255.0 is standard for small (class "C") networks. For other networks, use the Subnet Mask for the LAN segment to which The Load Balancer is attached (the same value as the PCs on that LAN segment).
DHCP Server Configuration	• **DHCP Server Setup** - If **Enabled**, The Load Balancer will allocate IP Addresses to PCs (DHCP clients) on your LAN when they start up. The default and recommended value is "Enable". (Windows systems, by default, act as DHCP clients. This setting is called *Obtain an IP address automatically*.)

	• **DHCP Server Setup** - If you are already using a DHCP Server, the DHCP Server setting must be **Disabled**, and the existing DHCP server must be set to provide the IP address of The Load Balancer as the *Default Gateway*. • **Client Lease Time** – It is a finite period of time for a DHCP server lease an IP address to a client.. • **Client Default DNS** – An IP address of the default DNS server for the client requesting DHCP service.
DHCP IP Address Range	• **Offered Range** fields set the values used by the DHCP server when allocating IP Addresses to DHCP clients. This range also determines the number of DHCP clients supported. • **Free Entries** indicates how many DHCP entries are not currently allocated, and still available.
ARP Proxy	Enable this ONLY if the LAN port has an IP address in the same address range as the WAN port(s). This means that all PCs using this Gateway must have valid fixed external (Internet) IP addresses. If enabled, enter the IP address range used on your LAN.
LAN Any IP Setup	By default is disabled. If you enable “LAN Any IP”, that means no matter what static IP address hold on the client (your PC). The client has do not need to change the IP address, even though it has different IP segment than LAN segment. It still can access Internet through NAT.
DHCP Client List	This table shows the IP addresses which have been allocated by the DHCP Server function. For each address which has been allocated, the following information is shown. • **Name** – The "hostname" of the PC. In some cases, this may not be known. • **MAC Address** – The physical address (network adapter address) of the PC. • **IP Address** – The IP address allocated to this PC. • **Type** – Indicates IP address to be dynamic or static. • **Status** – If *Dynamic*, the IP address was allocated by this DHCP Server. If *Sniffed*, the IP address was detected by examining the LAN, rather than allocated by the DHCP Server. In this case, the *Name* is usually not known. • **Time Left** – The time expired since which IP address is leased.

2. Installing The Load Balancer in your LAN

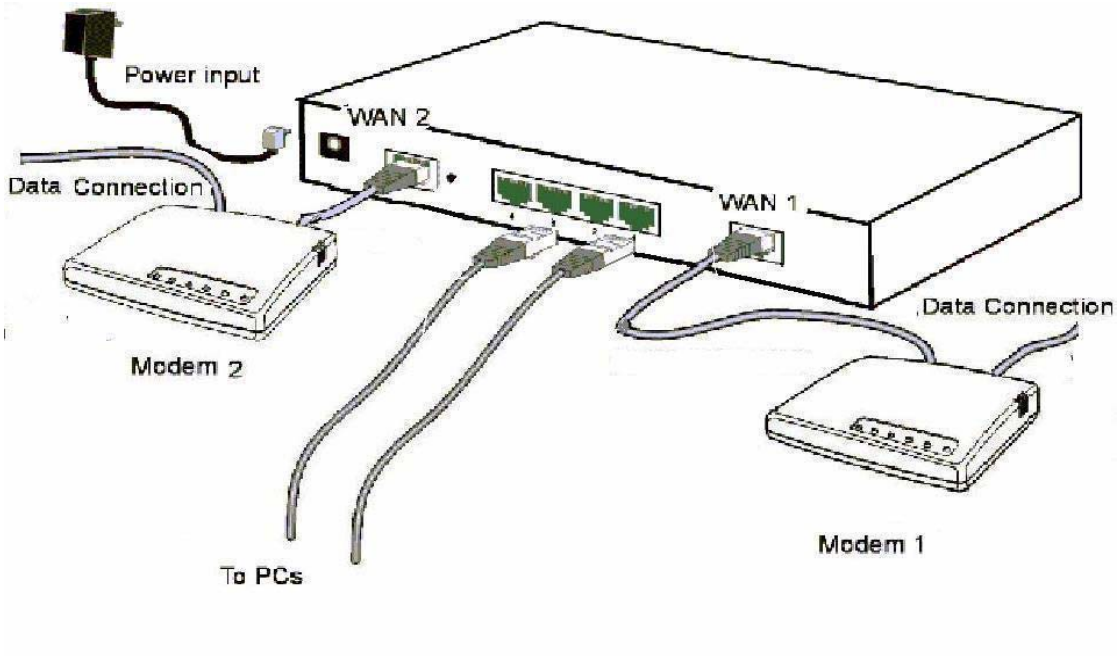


Figure 2-4: Installation Diagram

1. Ensure The Load Balancer and the DSL/Cable modem are powered OFF.
   Leave the modem or modems connected to their data line.
2. Connect the Broadband modem or modems to The Load Balancer.
   - If using only one (1) Broadband modem, connect it to the "WAN 1" port.
   - Use the cable supplied with your DSL/Cable modem. If no cable was supplied, use a standard cable.
3. Use standard LAN cables to connect PCs to the Switching Hub ports on The Load Balancer.
   - Both 10BaseT and 100BaseT connections can be used simultaneously.
   - If you need to connect The Load Balancer to another Hub, just use a standard LAN cable to connect any port on The Load Balancer to a standard port on another hub. Any LAN port on The Load Balancer will automatically act as an "Uplink" port when required.
4. Power Up
   - Power on the Cable or DSL modem or modems.
   - Connect the supplied power adapter to The Load Balancer and power up.
5. Check the LEDs
   - The ***Power*** LED should be ON.
   - The ***WAN – Link*** LED should be ON, if the corresponding WAN port is connected to a broadband modem.
   - The ***Error*** LED will flash during start up, but will then turn Off. If it stays On, there is an error condition.

- For each PC connected to the LAN ports, the corresponding ***LAN*** LED (either ***10*** or ***100***) should be ON.

3. Configuring The Load Balancer for Internet Access

Select *Primary Setup* from the menu, to see a screen like the example below.

- Configure WAN 1 and/or WAN 2 as required.
- For any of the following situations, refer to ***Chapter 3: Advanced Port Setup*** for any further configuration, which may be required.
  - Using both ports
  - Multiple IP addresses on either port
  - Multiple PPPoE sessions
  - PPTP connection method

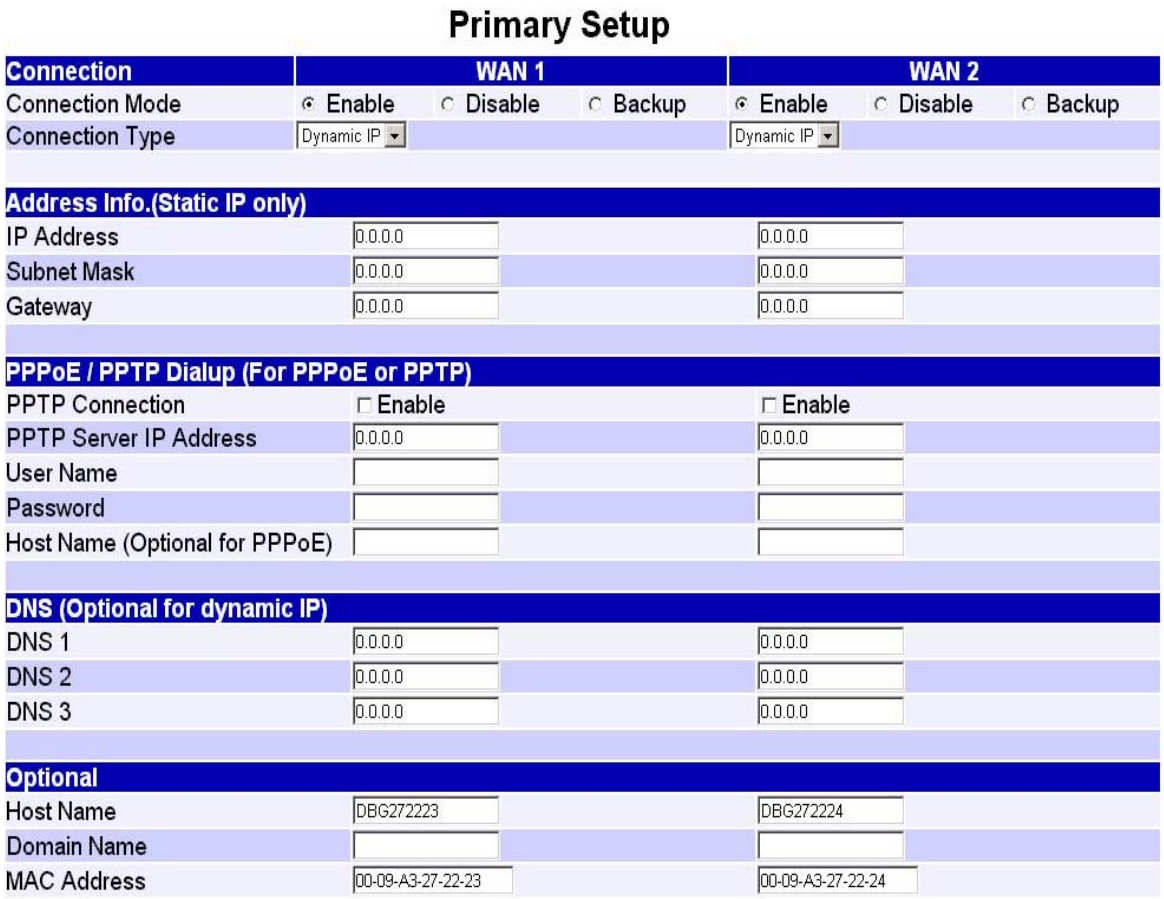


Figure 2-5: Primary Setup Screen

Settings – Primary Setup

Connection Mode	Select the appropriate setting: • **Enable** – Select this if you have connected a broadband modem to this port. • **Disable** – Select this if there is no broadband modem connected to this port. • **Backup** – Use this if you have a broadband modem on each port, and wish to normally use only one. Select *Enable* for the primary port, and *Backup* for the secondary port. The *Backup* port will only be used if the primary port fails.
Connection Type	Check the data supplied by your ISP, and select the appropriate option. • **Static IP** – Select this if your ISP has provided a Fixed or Static IP address. Then enter the data into the *Address Info* fields. • **Dynamic IP** – Select this if your ISP provides an IP address automatically, when you connect. You can ignore the *Address Info* fields. • **PPPoE** – Select this if your ISP uses this method. (Usually, your ISP will provide some PPPoE software. This software is no longer required, and should not be used.) If this method is selected, you must complete the *PPPoE dialup* fields. **Note:** If using the PPTP connection method, select *Static IP* or *Dynamic IP*, as appropriate, according to the IP address method used by your ISP.
Address Info	This is for *Static IP* users only. Enter the address information provided by your ISP. If your ISP provided multiple IP address, you can use the ***Multi-DMZ*** screen to assign the additional IP addresses.
PPPoE / PPTP Dialup	This is for *PPPoE* and *PPTP* users only. • Enter the *Username* and *Password* provided by your ISP. • If using PPTP, enable the *PPTP Connection* checkbox, and enter the IP address of the PPTP server. • Host name (Optional For PPPoE),This field is used by a Host to uniquely associate an access concentrator to a particular Host request. **Note:** There are additional PPPoE/PPTP options on the ***Port Options*** screen. To use multiple PPPoE sessions on either port, configure the ***Advanced PPPoE*** screen.
DNS	If using a *Fixed IP* address, you MUST enter at least 1 DNS address. If using *Dynamic IP* or *PPPoE*, DNS information is optional.

Optional	• **Host name** – This is required by some ISPs. If your ISP provided a Host Name, enter it here. Otherwise, you can use the default value. • **Domain name** – This is required by some ISPs. If your ISP provided a Domain Name, enter it here. Otherwise, you can use the default value. • **MAC address** – Some ISP's record your MAC address (also called "Physical address" or "Network Adapter address"). If so, you can enter the MAC address expected by your ISP in this field. Otherwise, this should be left at the default value.

Setup of The Load Balancer is now complete. PCs on your LAN must now be configured. See the following section for details.

4: Configure PCs on your LAN

Overview

For each PC, the following may need to be configured:

- TCP/IP network settings
- Internet Access configuration

TCP/IP Settings

If using the default Load Balancer settings, and the default Windows 95/98/ME/2000/XP TCP/IP settings, no changes need to be made. Just start (or restart) your PC.

- By default, The Load Balancer will act as a DHCP Server, automatically providing a suitable IP Address (and related information) to each PC when the PC boots.
- For all non-Server versions of Windows, the default TCP/IP setting is to act as a DHCP client. In Windows, this is called *Obtain an IP address automatically*.
  Just start (or restart) your PC, and it will obtain an IP address from The Load Balancer.
- If using fixed IP addresses on your LAN, or you wish to check your TCP/IP settings, refer to ***Appendix B – Windows TCP/IP Setup***.

Internet Access

To configure your PCs to use The Load Balancer for Internet access, follow this procedure:

For Windows 9x/2000

1. Select *Start Menu - Settings - Control Panel - Internet Options*.
2. Select the *Connection* tab, and click the *Setup* button.
3. Select "I want to set up my Internet connection manually, or I want to connect through a local area network (LAN)" and click *Next*.
4. Select "I connect through a local area network (LAN)" and click "*Next*".
5. Ensure all of the boxes on the following *Local area network Internet Configuration* screen are **unchecked**.
6. Check the "No" option when prompted "Do you want to set up an Internet mail account now?".
7. Click *Finish* to close the Internet Connection Wizard.
   Setup is now completed.

For Windows XP

1. Select Start Menu - Control Panel - Network and Internet Connections.
2. Select *Set up or change your Internet Connection*.
3. Select the *Connection* tab, and click the *Setup* button.
4. Cancel the pop-up "Location Information" screen.
5. Click *Next* on the "New Connection Wizard" screen.
6. Select "Connect to the Internet" and click "*Next*".

7. Select "Set up my connection manually" and click “*Next*”.
8. Check "Connect using a broadband connection that is always on" and click *Next*.
9. Click *Finish* to close the New Connection Wizard.
   Setup is now completed.

Accessing AOL

To access AOL (America On Line) through The Load Balancer, the *AOL for Windows* software must be configured to use TCP/IP network access, rather than a dial-up connection. The configuration process is as follows:

- Start the *AOL for Windows* communication software. Ensure that it is Version 2.5, 3.0 or later. This procedure will not work with earlier versions.
- Click the *Setup* button.
- Select *Create Location*, and change the location name from "New Locality" to "Load Balancer".
- Click *Edit Location*. Select *TCP/IP* for the *Network* field. (Leave the *Phone Number* blank.)
- Click *Save*, then *OK*.
  Configuration is now complete.
- Before clicking "Sign On", always ensure that you are using the "Load Balancer" location.

Macintosh Clients

From your Macintosh, you can access the Internet via The Load Balancer. The procedure is as follows.

1. Open the TCP/IP Control Panel.
2. Select *Ethernet* from the *Connect via* pop-up menu.
3. Select *Using DHCP Server* from the *Configure* pop-up menu. The DHCP Client ID field can be left blank.
4. Close the TCP/IP panel, saving your settings.

Note:

If using manually assigned IP addresses instead of DHCP, the required changes are:

- Set the *Router Address* field to The Load Balancer’s IP Address.
- Ensure your *DNS* settings are correct.

Linux Clients

To access the Internet via The Load Balancer, it is only necessary to set The Load Balancer as the "Gateway", and ensure your *Name Server* settings are correct.

Ensure you are logged in as "root" before attempting any changes.

Fixed IP Address

By default, most Unix installations use a fixed IP Address. If you wish to continue using a fixed IP Address, make the following changes to your configuration.

- Set your *Default Gateway* to the IP Address of The Load Balancer.
- Ensure your *DNS* (Name server) settings are correct.

To act as a DHCP Client (recommended)

The procedure below may vary according to your version of Linux and X -windows shell.

1. Start your X Windows client.
2. Select *Control Panel - Network*
3. Select the "Interface" entry for your Network card. Normally, this will be called "eth0".
4. Click the *Edit* button, set the "protocol" to "DHCP", and save this data.
5. To apply your changes

   Use the "Deactivate" and "Activate" buttons, if available.

   OR, restart your system.

3: Advanced Port Setup

Overview

- ***Port Options*** contains some options, which can be set on either or both WAN ports. For most situations, the default values are satisfactory.
- ***Load Balance*** screen is only functional if you are using both WAN ports. It allows you to determine the proportion of WAN traffic sent through each port.
- ***Advanced PPPoE*** setup is required if you wish to use multiple sessions on one or both of the WAN ports. It can also be used to manually connect or disconnect a PPPoE session. Otherwise, this screen can be ignored.
- ***Advanced PPTP*** setup is required if using the PPTP connection method.

Port Options

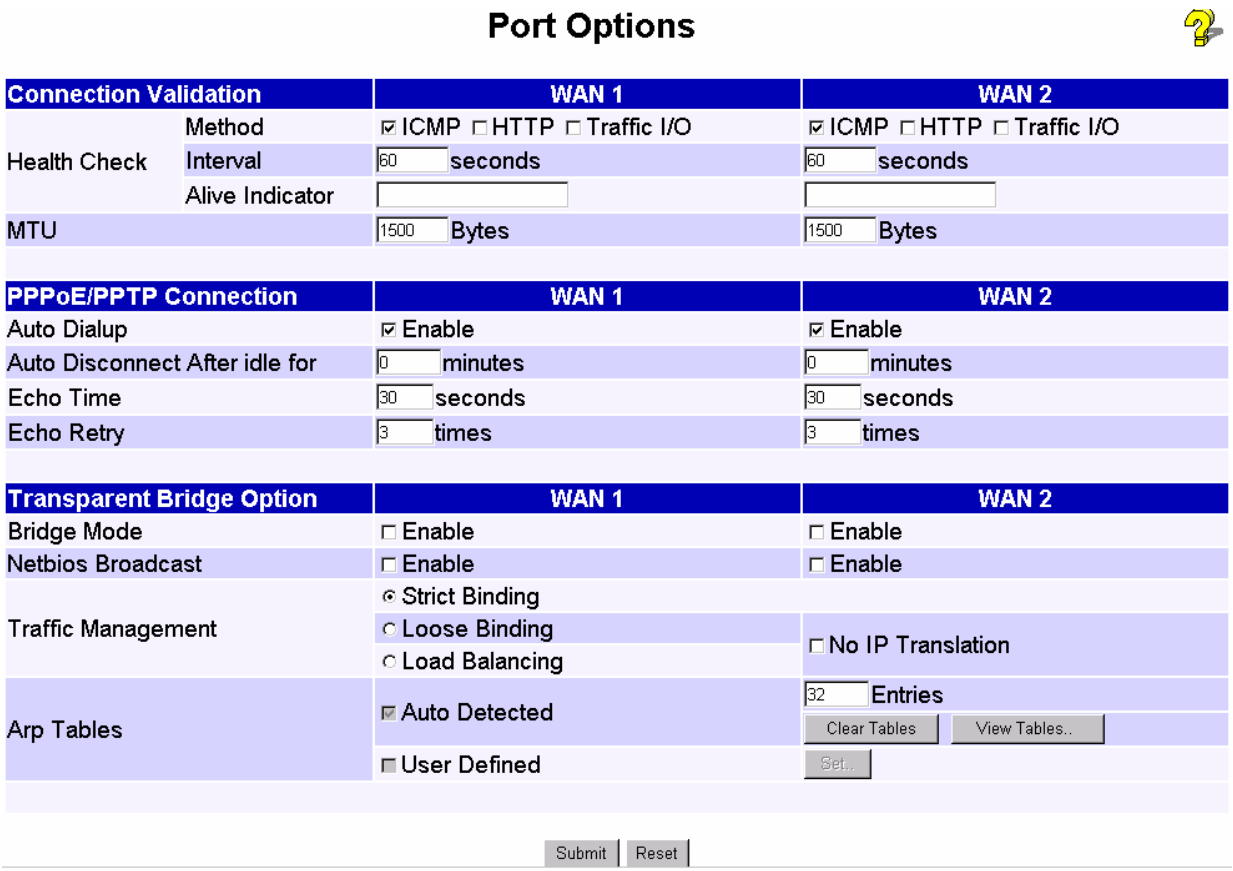


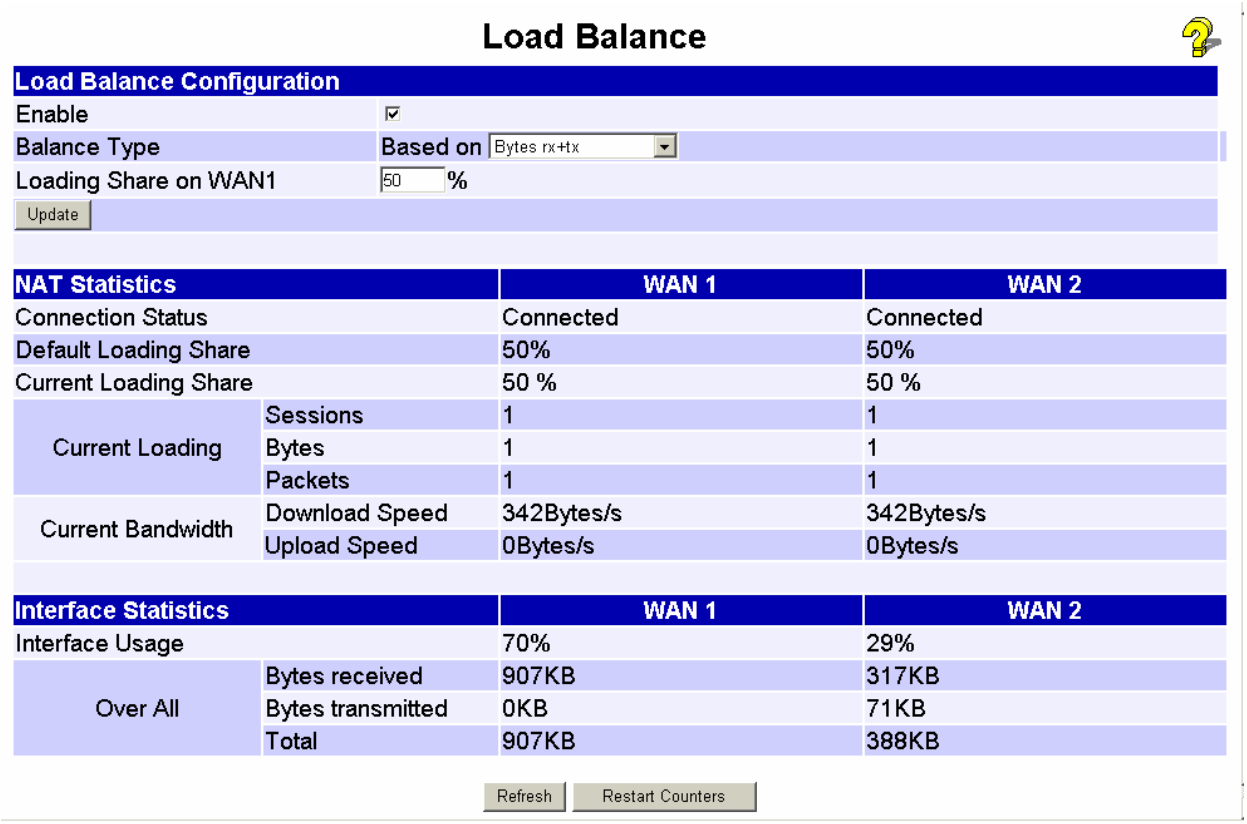
Figure 3-1: Port Options

Settings – Port Options

Connection Validation	• **Health Check** – Disable will not do Alive Indicator Check. By default health check is enable. Health checking is performing an ICMP echo request and HTTP packets to the specific destination that could be either: 1. Name or IP Address user specified in the "Alive Indicator" input box or gateway of WAN interface if "Alive Indicator" input box is left blank. • **Alive Indicator** – This is the IP address used to check if the WAN connection is operating. The Load Balancer will contact this system to check if the WAN connection is working. Change this address if you wish. Default is the gateway IP. **Note**: This is not used for PPPoE connections. • **MTU** – The Maximum Transmission Unit for the Ethernet data. It is used to determining the packet size to be used on the WAN interface. Normally, this does not need to be changed, but if your ISP advises you to use a particular MTU, enter it here.
PPPoE / PPTP Connection Options	• **Auto Dialup** – If set to *Enable* a connection will be established whenever outgoing WAN traffic is detected. If not Enabled, you must establish a connection manually. • **Auto Disconnect** – This determines when an idle connection will be terminated. Enter the required time period. • **Echo Time** – This determines how often an Echo request is sent to the PPPoE server. The Echo request is used to determine if the connection is still valid. Normally, there is no need to change the default value. • **Echo Retry** – The number of time the Echo request will be sent, if there is no response to the first request. Normally, there is no need to change the default value.
Transparent Bridge Option	• **Bridge Mode** – If set to Enable, this WAN port doesn't use NAT & Load Balance function when LAN/WAN IP have the real IP addresses on the same network segment. • **NetBIOS Broadcast** – This will allow you access files through Microsoft network neighborhood. If you enable the NetBIOS Broadcast. • **Traffic Management** –**Strict Binding:** traffic from bridge hosts(eg. transparent to wan1) can only go thru that specified wan(eg. wan1) interface. **Loose Binding:** traffic from bridge hosts(eg. transparent to wan1) can go thru alternative wan(eg. wan2) interface when bind interface (eg. wan1) is down, it's acting like a fail over mechanism for transparent bridge mode. **Load Balancing:** Traffic from bridge hosts(eg. transparent to wan1) can go thru either wan(eg. wan1 or wan2) interface based on loading mechanism specified in the load balance section, it's acting like a load balancing mechanism for transparent bridge mode. • **ARP Table –** ARP table is used by the device to determine the bridge hosts' location (eg, inside/outside wan and which wan) its' size can be adjusted if needed.

Load Balance

This screen is only operational if using Internet connections on both WAN ports.



Load Balance

Load Balance Configuration	
Enable	☑
Balance Type	Based on Bytes rx+tx
Loading Share on WAN1	50 %
Update	

NAT Statistics		WAN 1	WAN 2
Connection Status		Connected	Connected
Default Loading Share		50%	50%
Current Loading Share		50 %	50 %
Current Loading	Sessions	1	1
	Bytes	1	1
	Packets	1	1
Current Bandwidth	Download Speed	342Bytes/s	342Bytes/s
	Upload Speed	0Bytes/s	0Bytes/s

Interface Statistics		WAN 1	WAN 2
Interface Usage		70%	29%
Over All	Bytes received	907KB	317KB
	Bytes transmitted	0KB	71KB
	Total	907KB	388KB

Refresh | Restart Counters

Figure 3-2: Load Balance

These settings are only functional if using both WAN ports. If using both WAN ports, these settings determine the proportion of traffic sent over each port.

Settings – Load Balance

Load Balance Configuration	• **Enable** – Use this to enable your Load Balance settings. Unless this is checked, the other settings on this screen have no effect.
	• **Balance Type** – Select the desired option:
	  • Bytes rx+tx – Traffic is measured by Bytes.
	  • Packets rx+tx – Traffic is measured by Packets.
	  • Sessions established – Traffic is measured by Sessions.
	  • IP Address – Traffic is measured by IP address.
	• **Loading Share on WAN 1** – Enter the percentage (%) of traffic to be sent over WAN 1. If one WAN port connection has greater bandwidth than the other, the one with the greater bandwidth should be given a higher percentage of traffic than the other.
	Click the "Update" button to save your changes.

NAT Statistics	This section displays the current data about WAN 1 and WAN 2. You can use this information to help you "fine-tune" the settings above.
Interface Statistics	This section displays cumulative statistics. Use the "Restart Counters" button to restart these counters when required.
Buttons	• **Update** – Save the settings on this screen. • **Refresh** – Update the data on screen. • **Restart Counters** – Restart the counters used in the "Interface Statistics" section.

Advanced PPPoE

The screen is required in order to use multiple PPPoE sessions on the same WAN port.

It can also be used to manually connect or disconnect a PPPoE session.

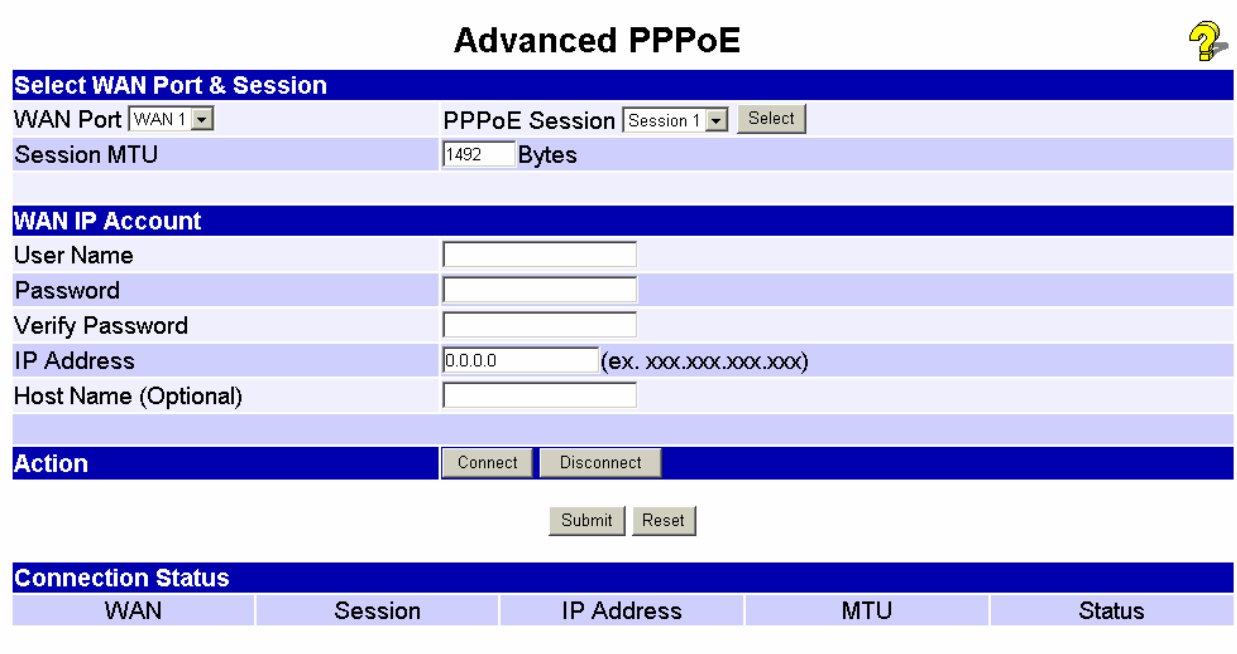


Figure 4: Advanced PPPoE

Settings – Advanced PPPoE

WAN Port **PPPoE Session**	Select the desired Port and Session, then click the "Select" button. The data for the selected Port/Session will then be displayed in the *WAN IP Account* section.
Session MTU	The Maximum Transfer Unit for PPPoE packet data. Leave it as default, unless the ISP offers different PPPoE packets data size.
WAN IP Account	• **User Name** – Enter the PPPoE user name assigned by your ISP. • **Password** – Enter the PPPoE password assigned by your ISP. • **Verify Password** – Re-enter the PPPoE password assigned by your ISP. • **IP Address** – If you have a fixed IP address, enter if here. Otherwise, this field should be left at 0.0.0.0. • **Host Name** – This field is used by a Host to uniquely associate an access concentrator to a particular Host request.
Action	Use the "Connect" and "Disconnect" buttons to establish or terminate a connection on this session, if required.
Connection Status	This displays the current connection status for each session.

Advanced PPTP

This screen is only useful if using the PPTP connection method.

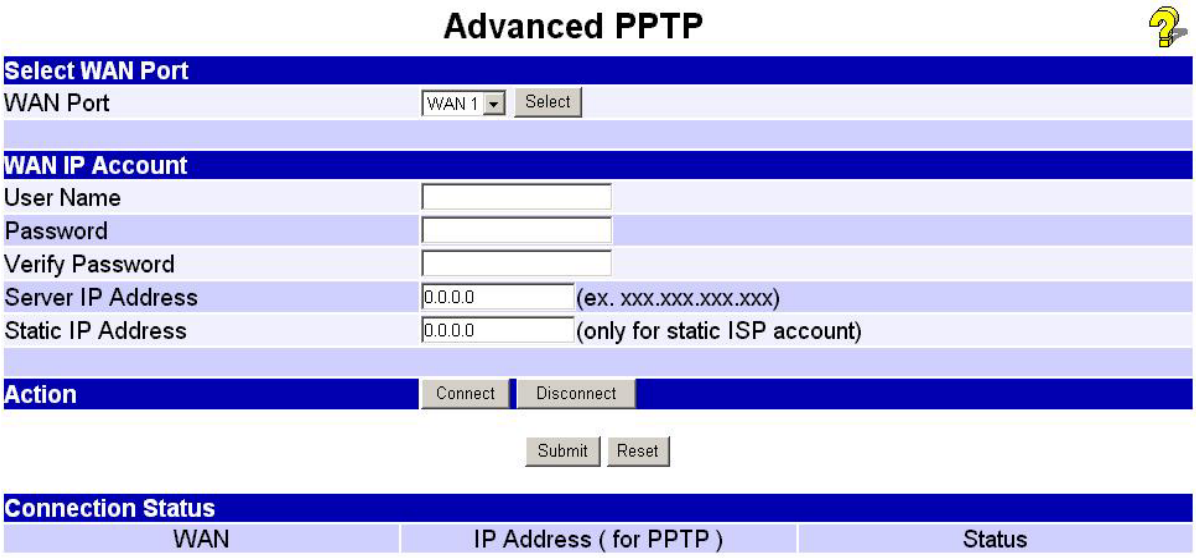


Figure 5: Advanced PPTP

Settings – Advanced PPTP

WAN Port	Select the desired Port, then click the "Select" button. The data for the selected Port will then be displayed in the *WAN IP Account* section.
WAN IP Account	• **User Name** – The PPTP user name (login name) assigned by your ISP. • **Password** – The PPTP password associated with the *User Name* above. This is assigned by your ISP, and used to login to the PPTP Server. • **Verify Password** – Re-enter the PPTP password assigned by your ISP. • **Server IP Address** – Enter the IP address of the PPTP Server, as provided by your ISP. • **Static IP Address** – If you have a fixed IP address, enter if here. Otherwise, this field should be left at 0.0.0.0.
Action	Use the "Connect" and "Disconnect" buttons to establish or terminate a connection on this session, if required.
Connection Status	This displays the current connection status.

4: Advanced Configuration

Overview

The following advanced features are provided.

- Host IP Setup
- Virtual Servers
- Custom Virtual Server
- Special Applications
- Dynamic DNS
- Multi DMZ
- Advanced Features
- UPnP

This chapter contains details of the configuration and use of each of these features.

Host IP Setup

This feature is used in the following situations:

- You have Multi-Session PPPoE, and wish to bind each session to a particular PC on your LAN.
- You wish to use the ***Access Filter*** feature. This requires that each PC be identified by using the ***Host IP Setup*** screen.
- You wish to have different ***Block URL*** settings for different PCs. This requires that each PC be identified by using the ***Host IP Setup*** screen. (You do not have to use the Host IP feature to apply the same ***Block URL*** settings to all PCs.)
- You wish to reserve a particular (LAN) IP address for a particular PC on your LAN. This allows the PC to use DHCP (Windows calls this "Obtain an IP address automatically") while gaining the benefits of a fixed IP address. The PC's IP address will never change, so it can be provided to other people and applications.

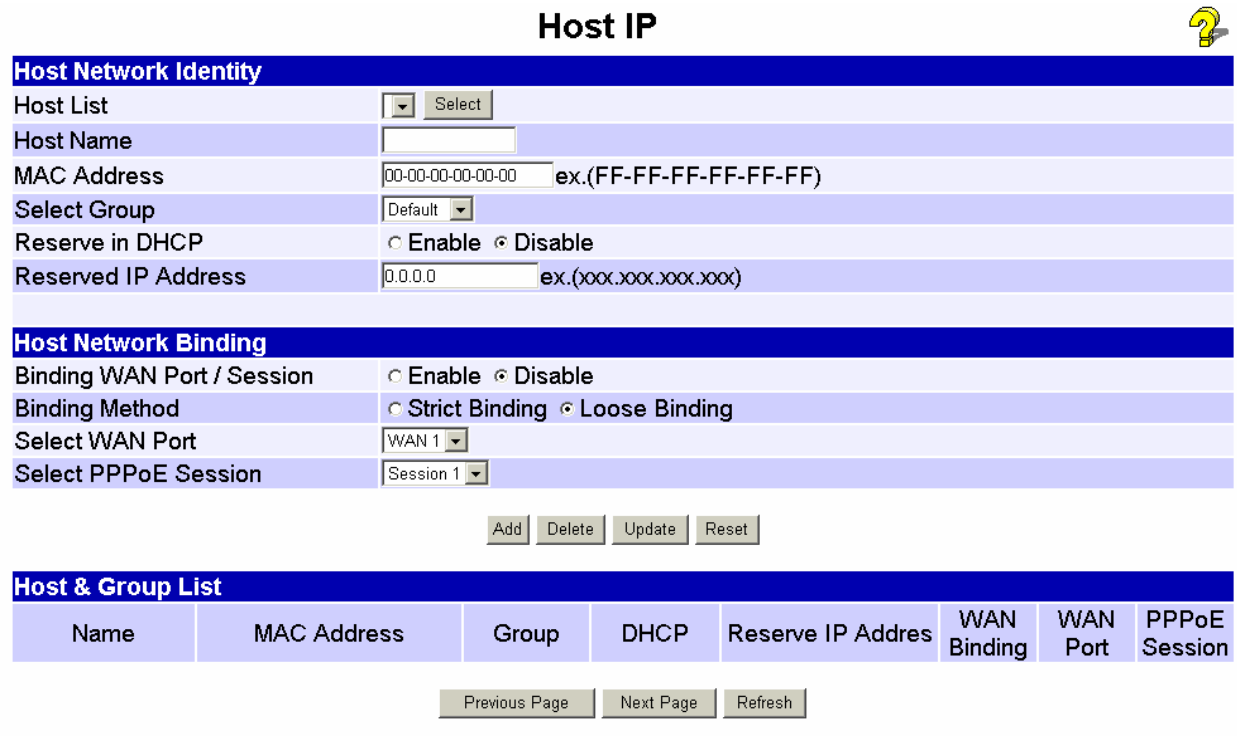


Figure 4-1: Host IP Setup

Settings – Host IP Setup

Host Network Identity	This section identifies each Host (PC) • **Host List** – When adding a new Host, ignore this list. To edit an existing entry, select it from the list, and click the "Select" button. The data fields will then be updated with data for the selected entry. • **Host name** – Enter a suitable name. Generally, you should use the "Hostname" (computer name) defined on the Host itself. • **MAC Address** – Also called *Physical Address* or *Network Adapter Address*. Enter the MAC address of this host. • **Select Group** – Select the group you wish to put this host into. • **Reserve in DHCP** – Select *Enable* to reserve a particular (LAN) IP address for a particular PC on your LAN. This allows the PC to use DHCP (Windows calls this "obtain an IP address automatically") while having an IP address which never changes. • **Reserved IP** – Enter the IP address you wish to reserve, if the setting above is *Enable*. Otherwise, ignore this field.

Host Network Binding	• **Bind WAN port/Session** – Select *Enable* if you wish to associate this PC with a particular PPPoE Session. All traffic for that PC will then use the selected PPPoE port and session. • **Binding Method** – Suppose your PC is bound to WAN1 port, now you are selecting “Strict Binding”. If WAN1 port is disconnected, your packets cannot go out through WAN2 port, if WAN2 port is still alive. If you are selecting “Loose Binding” then when WAN1 port is disconnected, your packets will automatically go to WAN2, if WAN2 is alive. • **Select WAN Port/Select PPPoE session** – If the setting above is *Enable*, select the desired Port and Session. Otherwise, ignore these settings. **Note**: Multiple PPPoE sessions are defined on the ***Advanced PPPoE*** screen.
Buttons	• **Add** – Use this to add a new entry to the database, using the data shown on screen. • **Delete** – Click this to delete the selected entry. • **Update** – Use this to update the selected entry, after making the desired changes. • **Reset** – Reverse any changes you have made since loading the data from The Load Balancer.
Host & Group List	This table shows the current bindings.

Virtual Servers

This feature allows you to make Servers on your LAN accessible to Internet users. Normally, Internet users would not be able to access a server on your LAN because:

- Your Server's IP address is only valid on your LAN, not on the Internet.
- Attempts to connect to devices on your LAN are blocked by the firewall in The Load Balancer.

The "Virtual Server" feature solves these problems and allows Internet users to connect to your servers, as illustrated below.

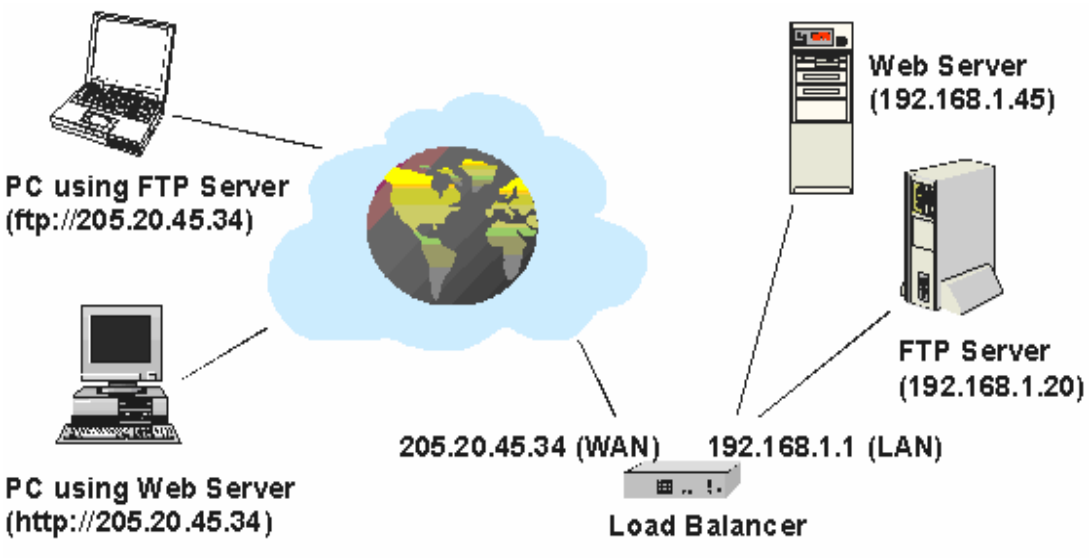


Figure 4-2: Virtual Servers

Note that, in this illustration, both Internet users are connecting to the same IP Address, but using different protocols.

Connecting to the Virtual Servers

Once configured, anyone on the Internet can connect to your Virtual Servers. They must use The Load Balancer's Internet IP Address (the IP Address allocated by your ISP).
e.g.

```
http://205.20.45.34
ftp://205.20.45.34
```

- To Internet users, all virtual Servers on your LAN have the same IP Address. This IP Address is allocated by your ISP.
- This address should be static, rather than dynamic, to make it easier for Internet users to connect to your Servers. However, you can use the *Dynamic DNS* feature (explained later in this chapter) to allow users to connect to your Virtual Servers using a URL, instead of an IP Address.
  e.g.

  ```
  HTTP://my_domain_name.dyndns.org
  FTP://my_domain_name.dyndns.org
  ```

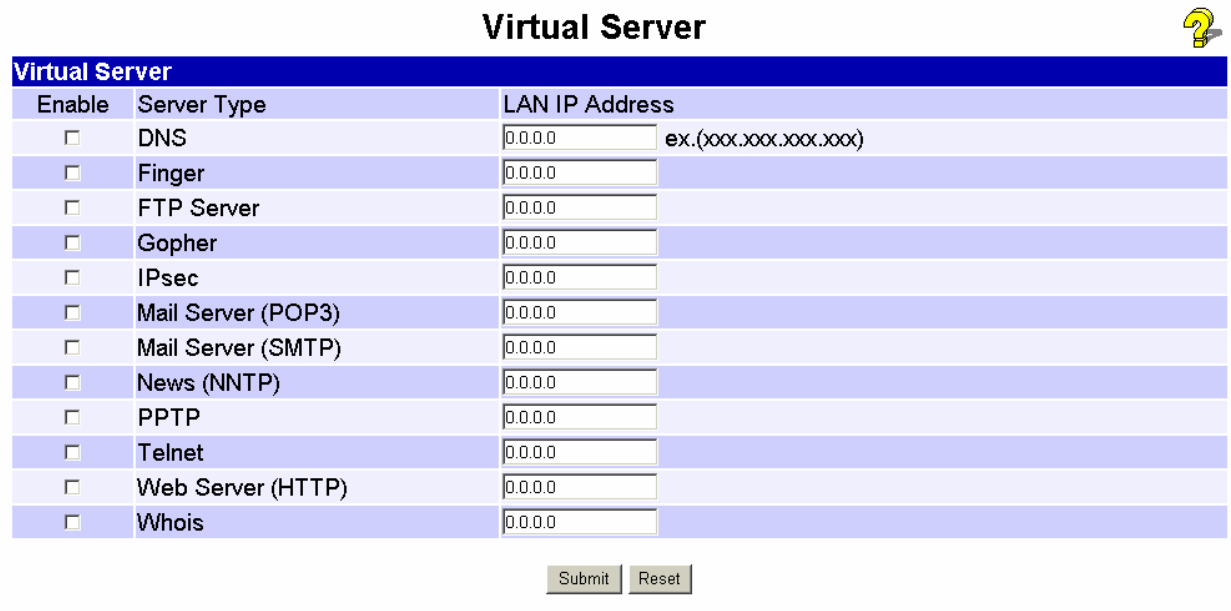


Figure 4-3: Virtual Server

Settings – Virtual Server

Enable	Use this to Enable or Disable each Virtual server as required.
Server Type	Select the desired Server type. If the type of Server you wish to use is not listed, use the ***Custom Virtual Server*** screen to define your own type.
LAN IP Address	Enter the IP address of the PC on your LAN which is running the required Server software. Each PC should have a fixed IP address, or have a reserved IP address. (See the ***Host IP*** section earlier in this chapter for details on reserving an IP address.)

Custom Virtual Servers

This screen allows you to define your own Server types, for situations when the desired Server type is not listed on the ***Virtual Servers*** screen.

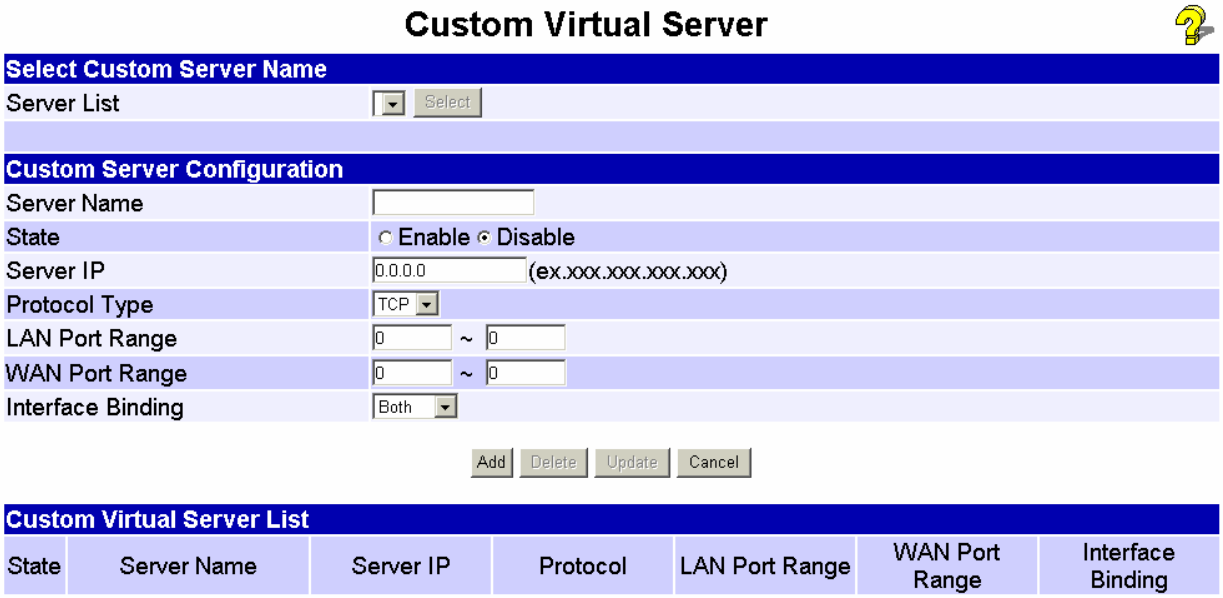


Figure 4-4: Custom Virtual Servers

Settings – Custom Virtual Servers

Select Custom Server Name	**Server List** If creating a new entry, ignore this list. To edit an existing entry, select it, and then click the "Select" button. The screen will update with data for the selected entry.
Custom Server Configuration	This data defines the Custom Virtual Server: • **Server Name** – Enter a suitable name for this server. • **State** – Use this to Enable or Disable the server as required. • **Server IP** – Enter the IP address of the PC on you LAN which is running the required Server software. Each PC should have a fixed IP address, or have a reserved IP address. (See the ***Host IP*** section earlier in this Chapter for details on reserving an IP address.) Each PC must be running the appropriate Server software.

	• **Protocol Type** – Select the network protocol used by this sever type. • **LAN Port Range** – Enter the range of port number used for outgoing traffic from this Server. If only a single port is required, enter it in both fields. • **WAN Port Range** - – Enter the range of port number used for incoming traffic to this Server. If only a single port is required, enter it in both fields • **Interface Binding** – This selection allows the severs binding WAN1 port or WAN2 port, or even both WAN1 and WAN2 ports together.
Buttons	• **Add** – Create a new Special Application entry. • **Delete** – Delete the selected entry. • **Update** – Save any changes you have made to the current entry. • **Cancel** – Cancel any changes you have made since the last save operation.
Custom Virtual Server List	This table shows details of all Custom Virtual Servers which have been defined.

Special Applications

If you use Internet applications which have non-standard connections or port numbers, you may find that they do not function correctly because they are blocked by the firewall in The Load Balancer. In this case, you can define the application as a "Special Application" in order to make it work.

Note that the terms "Incoming" and "Outgoing" on this screen refer to traffic from the client (PC) viewpoint

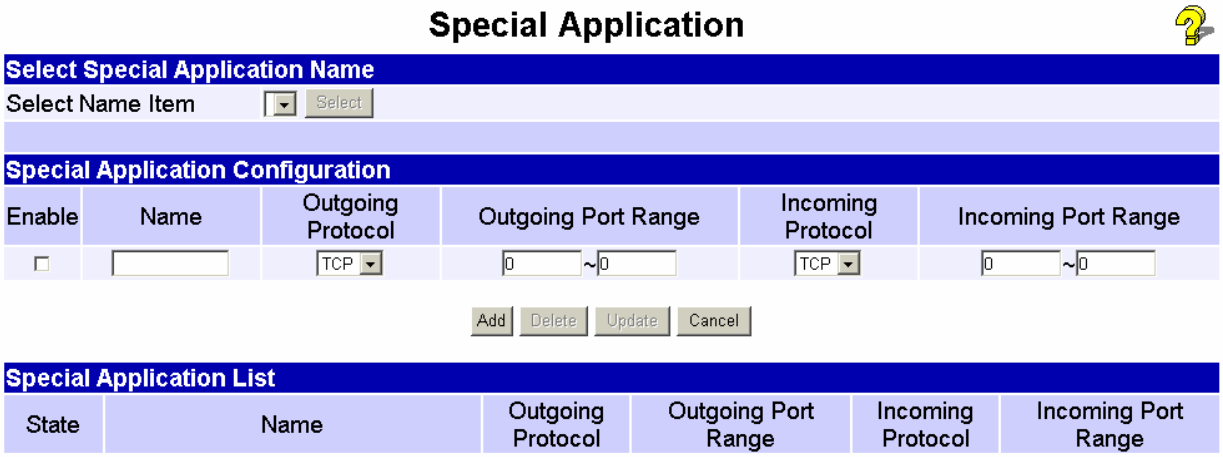


Figure 4-5: Special Applications

Settings – Special Applications

Select Special Application Name	
Select Name Item	This lists any special applications, which are currently defined. • If adding a new Special Application, ignore this list. Just enter your data in the *Special Application Configuration* section, and click the "Add" button. • To edit an existing entry, select it from this list, and click the "Select" button. The data for the selected application will then be displayed in the *Special Application Configuration* section. Make any required changes, and then click the "Update" button.
Special Application Configuration	
Enable	Use this to Enable or Disable this Special Application as required.
Name	Enter a descriptive name to identify this Special Application.
Outgoing Protocol	Select the protocol used by this application, when sending data to the remote server or PC.

Outgoing Port Range	Enter the beginning and end of the range of port numbers used by the application server, for data you send. If the application uses a single port number, enter it in both fields.
Incoming Protocol	Select the protocol used by this application, when receiving data from the remote server or PC.
Incoming Port Range	Enter the beginning and end of the range of port numbers used by the application server, for data you receive. If the application uses a single port number, enter it in both fields.
Buttons	• **Add** – Create a new Special Application entry. • **Delete** – Delete the selected entry. • **Update** – Save any changes you have made to the current entry. • **Cancel** – Cancel any changes you have made since the last save operation.
Special Application List	This shows details of all Special Applications which are currently defined.

Using a Special Application on your PC

- Once the *Special Applications* screen is configured correctly, you can use the application on your PC normally. Remember that only one (1) PC can use each Special application at any time.
- Also, when 1 PC is finished using a particular Special Application, there may need to be a "Time-out" period before another PC can use the same Special Application.
- If an application still cannot function correctly, try using the "DMZ" feature, if possible.

Dynamic DNS

Dynamic DNS is very useful when combined with the *Virtual Server* feature. It allows Internet users to connect to your Virtual Servers using a URL, rather than an IP Address.

This also solves the problem of having a dynamic IP address. With a dynamic IP address, your IP address may change whenever you connect to your ISP, which makes it difficult to connect to you.

You must register for the Dynamic DNS service. The Load Balancer supports 2 types of service providers:

- Standard client, available at http://www.dyndns.org
  Other sites may offer the same service, but can not be guaranteed to work.
- TZO at http://www.tzo.com
- 3322 is available in China at http://www.3322.org

To use the Dynamic DNS feature

1. Register for the service from your preferred service provider.
2. Follow the service provider's procedure to have a Domain Name (Host name) allocated to you.
3. Configure the ***Dynamic DNS*** screen, as described below.
4. The Load Balancer will then automatically update your IP Address recorded by the Dynamic DNS service provider.
5. From the Internet, users will now be able to connect to your Virtual Servers (or DMZ PC) using your Domain name.

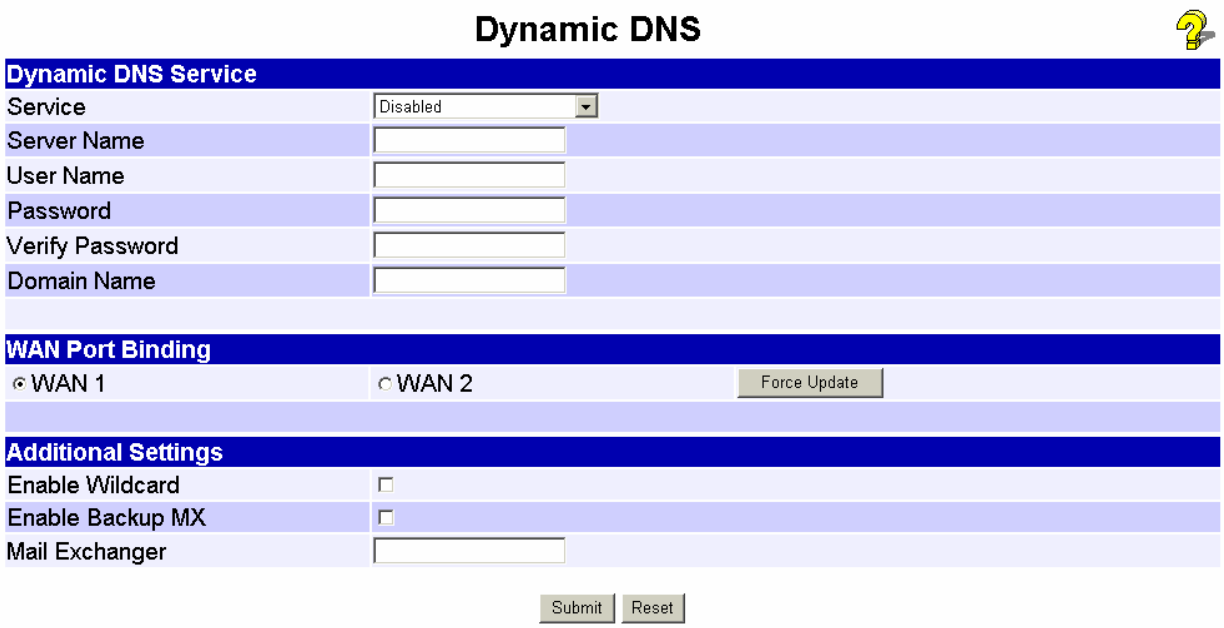


Figure 4-6: Dynamic DNS

Settings – Dynamic DNS

Dynamic DNS Service	Use this to Enable/Disable the Dynamic DNS feature, and select the required service provider. • **Disable** – Dynamic DNS is not used. • **TZO** – Select this to use the TZO service (www.tzo.com). You must configure the *TZO* section of this screen. • **Standard Client** – Select this to use the standard service (from www.dyndns.org or other provider). You must configure the *Standard Client* section of this screen. • **3322(in China)** – This is available in China. It is similar to “Standard client” • **User Defined DDNS Server** – This is the user define DDNS server. If the DDNS other than TZO, dyndns.org and 3322.
WAN Port Binding	• Select the WAN port on which the Dynamic DNS is used. • The "Force Update" button will update your record on the Dynamic DNS Server immediately.
Additional Standard Client or 3322 Settings	These options are available if using the standard client. • **Enable Wildcard** – If selected, traffic sent to sub-domains (of your Domain name) will also be forwarded to you. • **Enable backup MX** – If enabled, you must enter the *Mail Exchanger* address below. • **Mail Exchanger** – If the setting above is enabled, enter the address of the backup Mail Exchanger.

Multi DMZ

This feature allows each WAN port IP address to be associated with one (1) computer on your LAN. All outgoing traffic from that PC will be associated with that WAN port IP address. Any traffic sent to that IP address will be forwarded to the specified PC, allowing unrestricted 2-way communication between the "DMZ PC" and other Internet users or Servers.

Note:

The "DMZ PC" is effectively outside the Firewall, making it more vulnerable to attacks. For this reason, you should only enable the DMZ feature when required

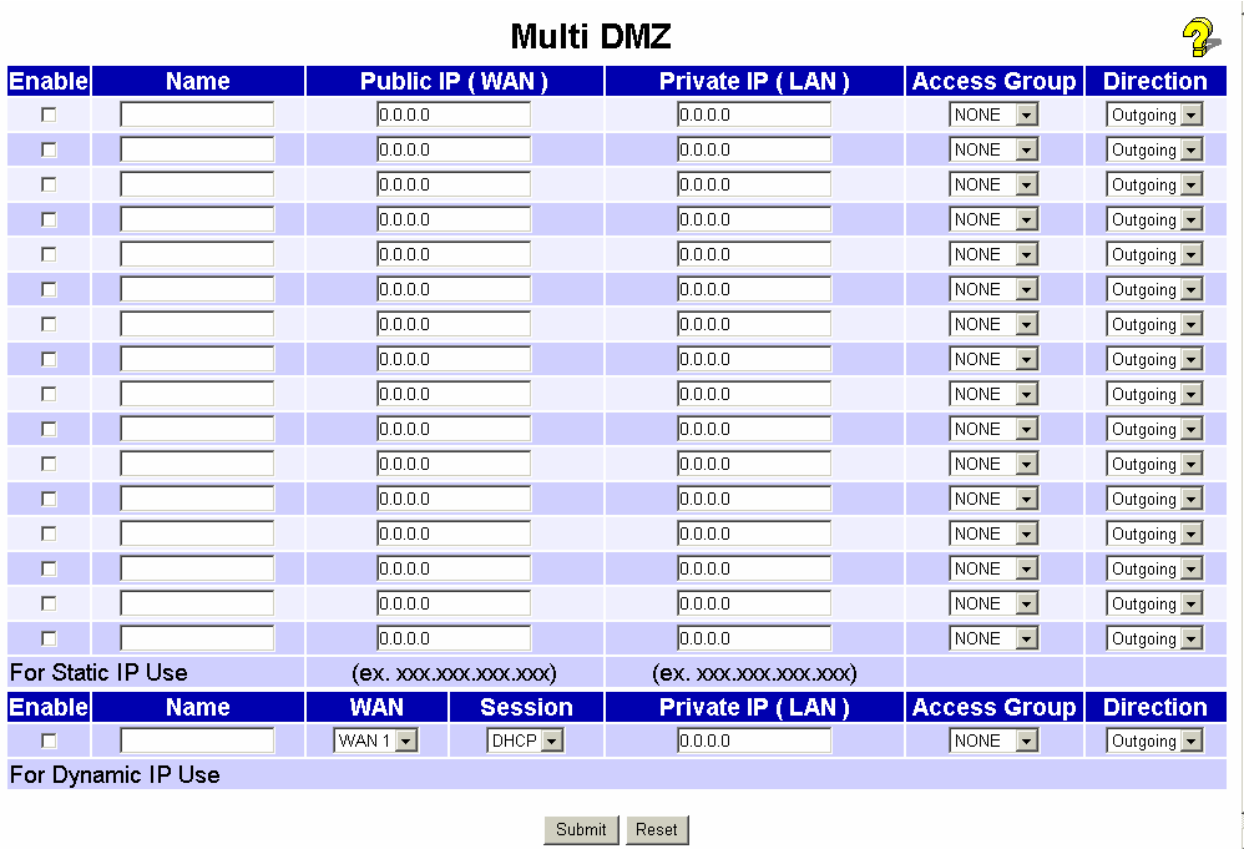


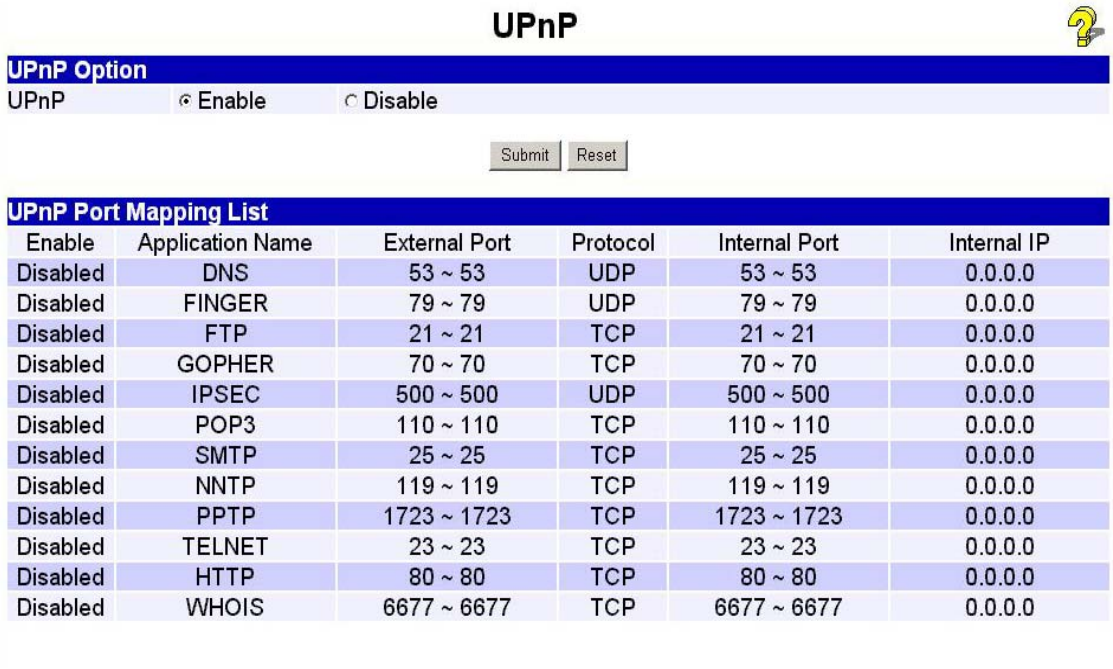
Figure 4-7: Multi DMZ

Settings – Multi DMZ

Enable	Use this to enable or disable the DMZ setting, as required.
Name	Enter a name to assist you to remember this setting. This name has no effect on the operation.
For Static IP	
Public IP address	Enter the WAN port (Internet) IP address you wish to associate to a PC. This IP address must have been allocated to you by your ISP.
Private IP Address (LAN)	Enter the IP address of the PC you wish to associate with this WAN port IP address. This IP address should be fixed, or reserved. (See the ***Host IP*** section for details on reserving an IP address.)
For Dynamic IP	
WAN	Select the desired WAN port.
Session	• Select "DHCP" if the IP address on this WAN port is dynamically assigned. You can only select assign one (1) Private (LAN) IP address to each port. • If using multi-session PPPoE, select the desired PPPoE session. These sessions are defined on the ***Advanced PPPoE*** screen. You can assign one (1) one (1) Private (LAN) IP address to each PPPoE session.
Private IP Address (LAN)	Enter the IP address of the PC you wish to associate with this WAN port IP address. This IP address should be fixed, or reserved. (See the ***Host IP*** section for details on reserving an IP address.)
Access Group	You can decide the users to have the authority of using DMZ, by define the groups.
Direction	For DMZ, you can allow inbound, outbound only, or both inbound and outbound both.

UPnP

With UPNP (Universal Plug & Play) function, it can easily setup and configure an entire network, enable discovery and control of networked devices and services.



UPnP

UPnP Option

UPnP ◉ Enable ○ Disable

Submit Reset

UPnP Port Mapping List

Enable	Application Name	External Port	Protocol	Internal Port	Internal IP
Disabled	DNS	53 ~ 53	UDP	53 ~ 53	0.0.0.0
Disabled	FINGER	79 ~ 79	UDP	79 ~ 79	0.0.0.0
Disabled	FTP	21 ~ 21	TCP	21 ~ 21	0.0.0.0
Disabled	GOPHER	70 ~ 70	TCP	70 ~ 70	0.0.0.0
Disabled	IPSEC	500 ~ 500	UDP	500 ~ 500	0.0.0.0
Disabled	POP3	110 ~ 110	TCP	110 ~ 110	0.0.0.0
Disabled	SMTP	25 ~ 25	TCP	25 ~ 25	0.0.0.0
Disabled	NNTP	119 ~ 119	TCP	119 ~ 119	0.0.0.0
Disabled	PPTP	1723 ~ 1723	TCP	1723 ~ 1723	0.0.0.0
Disabled	TELNET	23 ~ 23	TCP	23 ~ 23	0.0.0.0
Disabled	HTTP	80 ~ 80	TCP	80 ~ 80	0.0.0.0
Disabled	WHOIS	6677 ~ 6677	TCP	6677 ~ 6677	0.0.0.0

Figure 4-8: UPnP

Settings – UPnP

UPnP Option	If you Enable UPnP, then this two wan router will become one of the entire local network. You can find out there is an icon show up on network neighborhood on the window XP OS. Every time you add a new network device with port mapping, The new network device will appear on the mapping list.

NAT

NAT (Network Address Translation) is the technology which allows one (1) WAN (Internet) IP address to be used by many LAN users.

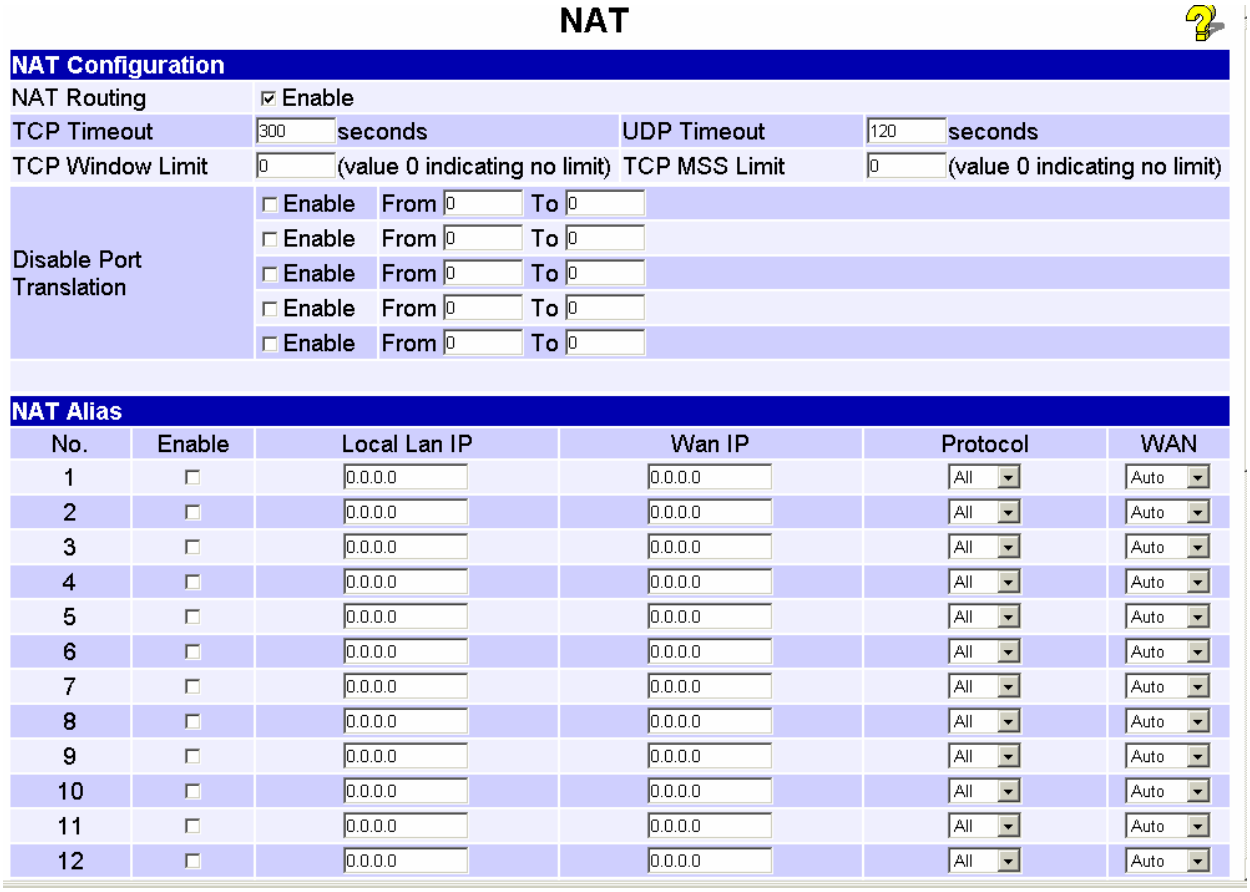


Figure 4-9: NAT

Settings – NAT

NAT Configuration	• **NAT Routing** – You can enable or disable NAT through the check box. If you disable NAT checkbox, it will act as a bridge or Static Router. Most features will be unavailable. • **TCP Timeout** – Enter the desired value to use on both WAN ports. The default is 300. • **UDP Timeout** – Enter the desired value to use on both WAN ports. The default is 120. • **TCP Window Limit** – Enter the desired value to use on both WAN ports. The default is 0 (no limit). • **TCP MSS Limit** – Enter the required MSS (Maximum Segment Size) to use on both WAN ports. The default is 0 (no limit)., • **Disable Port Translation** –If some packets whose port number cannot be translated for special applications, you must input value in port range for **"**Disable Port Translation"
NAT Alias	• For each alias entry, the Wan IP acts as an alias IP of the host with Local Lan IP to internet via the specified WAN port for the specified Protocol packets

Advanced Features

This screen allows you to change some advanced settings:

- **Remote Access Configuration** – This feature allows you to manage The Load Balancer via the Internet. You can restrict access to a specified IP address or address range.
- **External Filters Configuration** – These settings determine whether or not The Load Balancer should respond to ICMP (ping) requests received from the WAN port.
- **Interface Binding** – Use these to ensure that certain traffic is sent by a particular WAN port, and thereby a particular ISP account. These settings are only useful if using both WAN ports.

Protocol & Port Binding – This allows you binding WAN1 or WAN2 ports by selecting TCP/UDP protocol.

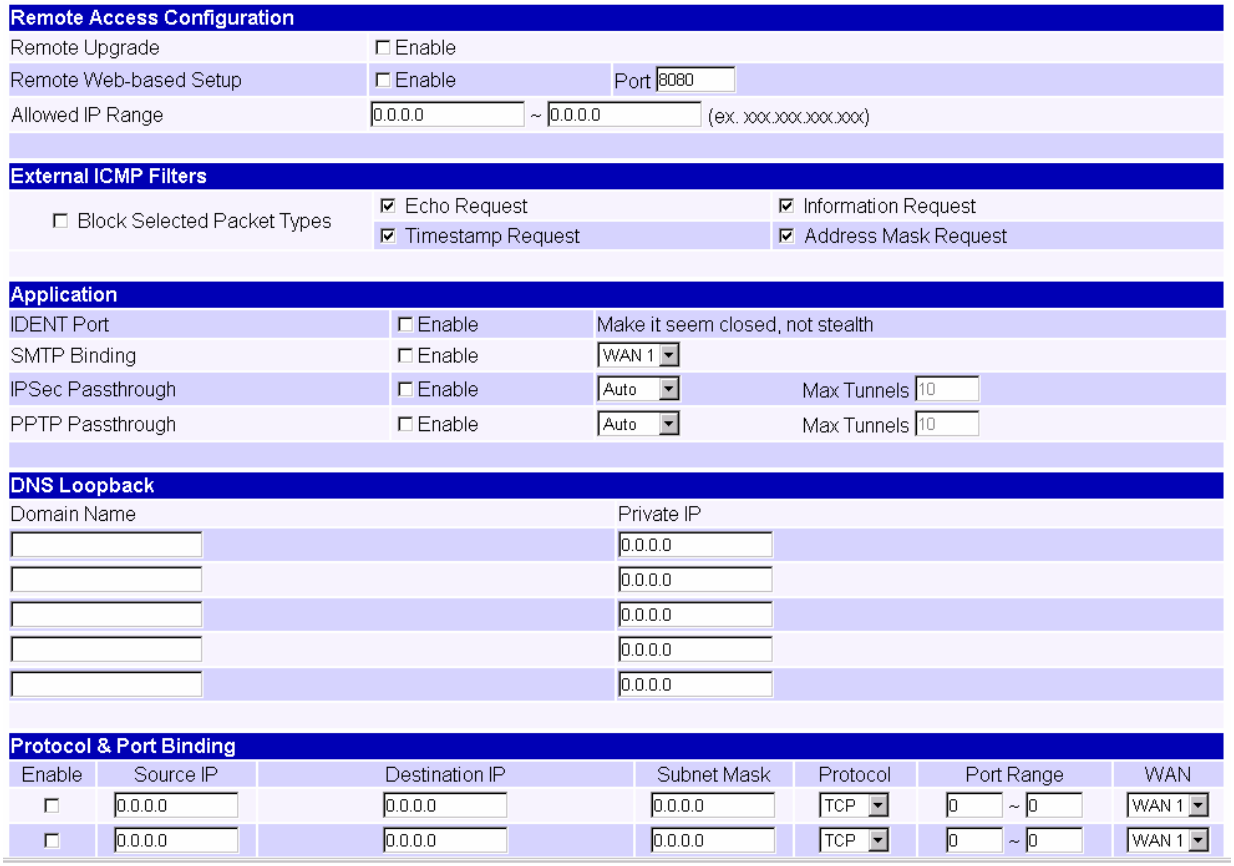


Figure 4-10: Advanced Features

Settings – Advanced Features

Remote Access Configuration	• **Remote Upgrade** – If enabled, you can use the supplied Windows program to remotely upgrade the Firmware. If not enabled, upgrades must be performed by a PC on the LAN.
	• **Remote Web-based setup** - – If enabled, access to the Web-based interface is available via the Internet. (See below for details.) If not enabled, access is only available to PCs on the LAN.
	• **Port** – The port number used when connecting remotely. See below for details.
	• **Allowed IP range** – Remote access is only available to the IP addresses entered here.
	  • Leaving these fields blank will allow access by all PCs.
	  • These addresses must be Internet IP addresses, not addresses on the local LAN.
	  • To specify a single address, enter it in both fields.
	• **IDENT Port** – Port 113 is associated with the Internet's (Identification / Authentication) service. When a client program in your computer contacts a remote server for services such as POP, IMAP, SMTP, that remote server sends back a query to the "Ident" server running in many systems listening for these queries on port 113. This means that port 113 is often probed by attackers as a rich source of your personal information. By default it is “Disable”.

External Filters Configuration	These settings determine whether or not The Load Balancer should respond to ICMP (ping) requests received from the WAN port. • **Block Selected packet types** – This acts as "master" switch. If checked, the selected packet types are blocked. Otherwise, they are accepted. • **Echo Request, Timestamp Request, …** Select the packet types you wish to block, using the checkboxes.
DNS Loopback	When you have some servers on LAN and their domain names have already registered on public DNS. To avoid DNS loopback problem, please enter the following fields. • **Domain Name** – Enter the domain name specified by you for local host/server. • **Private IP** – Enter the private IP address of your local host/server.

Interface Binding	**SMTP (Simple Mail Transport Protocol) Binding** Unless you are using E-mail accounts from different ISPs on each port, you can ignore these settings. Some ISPs configure their E-mail Servers so they will not accept E-mail from IP addresses not allocated by themselves. If you are using accounts from different ISPs, sending E-mail over the wrong port may result in non-acceptance of the mail. In this case, you can use these settings to correct the problem. • **Enable** - If enabled, the port you specify below will be used for all outgoing SMTP traffic. If not enabled, either port will be used. • **WAN 1 / WAN 2** – Select the desired port.
Protocol & Port Binding	**Protocol and Port Binding** Use these settings if you wish to ensure that particular traffic is sent by a particular WAN port, and thereby a particular ISP account. • **Enable** - Enable or disable each item as required. • **Source IP** - IP address of source which packets are sent from. • **Destination IP** – IP address of destination which packets are sent to. • **Subnet Mask** – With subnet mask other than 255.255.255.255, you can make a IP sub-network as your destination. • **Protocol** - Select the protocol used by the traffic you wish to configure. • **Port Range** - Enter the beginning and end of the port range used by the traffic you wish to configure. If only a single port is used, enter the port number in both fields. • **WAN** - Select the port you wish this traffic to use.

Using Remote Web-based Setup

To connect to The Load Balancer from a remote PC via the Internet:

1. Ensure that both your PC and The Load Balancer are connected to the Internet.
2. Start your Web Browser.
3. In the "Address" bar, enter "HTTP://" followed by the Internet IP Address of The Load Balancer. If the port number is not 80, the port number is also required. (After the IP Address, enter ":" followed by the port number.)
   e.g.

   `HTTP://123.123.123.123:8080`

   - This example assumes the WAN IP Address is 123.123.123.123, and the port number is 8080.
   - If using the ***Dynamic DNS*** feature, you can connect using the domain name allocated to you.
     e.g.
     `HTTP://my_domain_name.dyndns.org:8080`

5: Security Management

Overview

- ***URL Filter*** It can block specific or browse only certain website by configure IP address, URL or Key words
- ***Access filter*** You can block all Internet access or select block well-known port or block user define ports by groups.
- ***Session Limit*** It can eliminate users access Internet, and send email alert to the administrator. If the device detect new sessions that is exceed the maximum sampling time.
- ***Firewall Exception*** It can eliminate users access Internet, and send email alert to the administrator. If the device detect new sessions that is exceed the maximum sampling time.

URL Filter

This feature allows you to block access to undesirable Web sites. You can block by URL, IP address, or Keyword. You can also have different blocking settings for different groups of PCs.

- In operation, every URL is searched to see if it matches or contains any of the URL or keywords entered here. Then, after a DNS lookup determines the IP address of the requested site, the site's IP address is checked against IP address entries on this screen.
- Note that a single IP address may host many Web sites. Entering the IP address on this screen will block all Web sites hosted on that IP address.

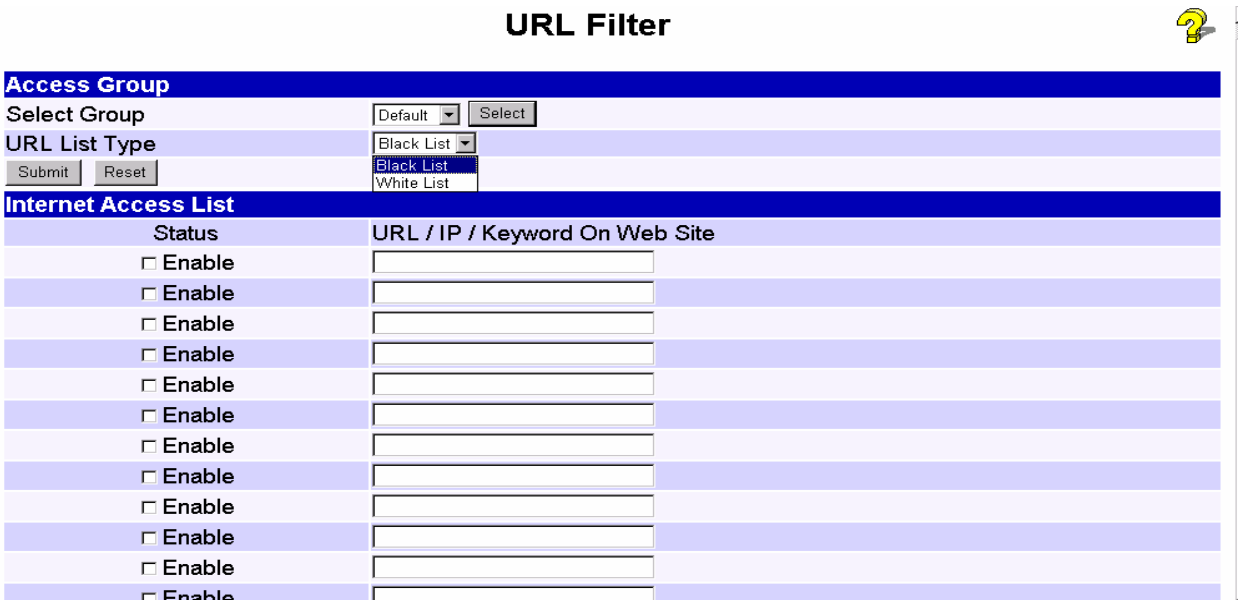


Figure 5-1: URL Filter

Settings – URL Filter

Access Group	This allows you have different blocking rules for different Groups of PCs. • All PCs (users) are in the *Default* Group unless moved to another group on the ***Host IP*** screen. • If you want the same restrictions to apply to everyone, select *Default* for the Group. In this case, there is no need to enter any Hosts on the ***Host IP*** screen. • If you wish to apply different restrictions on different Groups, select the desired Group, and click the "Select" button. The screen will update with data for the selected Group. • URL List Type – **Black List**: If you select Black List, It will block the URL that you keep it on Access Item. **White List:** If you are select White List type, it will block the entire URL except you keep it on the Access Item. • Submit Button – Button to submit Black List or White List.
Block Internet Access	• **Enable/Disable** – Use this to Enable or Disable each setting, as required. • **Block URL/IP/Keyword** – Enter the URL, IP address or keyword you wish to block.

Access Filter

The network Administrator can use the Access Filter to gain fine control over the Internet access and applications available to LAN users.

- Five (5) user groups are available, and each group can have different access rights.
- All PCs (users) are in the *Default* group, unless assigned to another group on the ***Host IP*** screen.

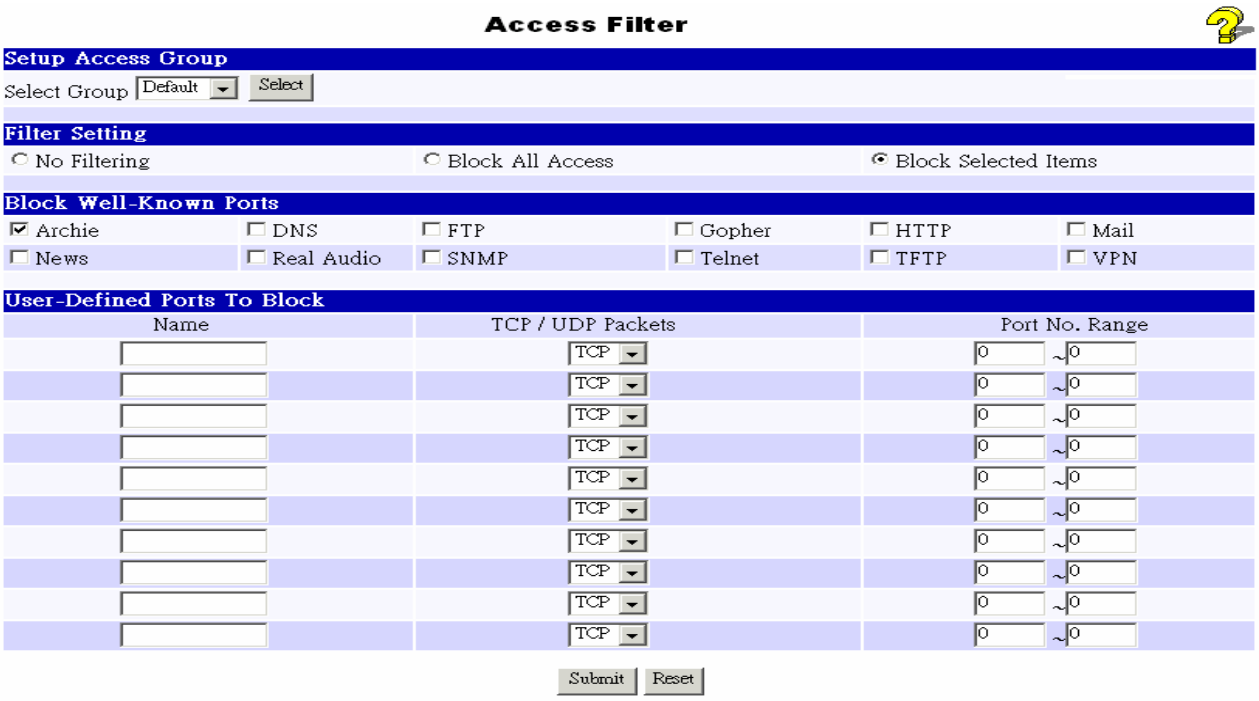


Figure 5-2: Access Filter

Settings – Access Filter

Setup Access Group	This allows you have different access rights for different Groups of PCs. • If you want the same restrictions to apply to everyone, select *Default* for the Group. In this case, there is no need to enter any Hosts on the ***Host IP*** screen. • If you wish to apply different restrictions on different Groups, select the desired Group, and click the "Select" button. The screen will update with data for the selected Group.
Filter Setting	Select the desired option for this Group: • **No filtering** – Nothing is blocked, Internet access is not restricted. • **Block All Access** – Everything is blocked, Internet access is not available. • **Block selected items** – Items selected on this screen are blocked. You can block well known services by using the checkboxes, or define your own filters.

Block Well-known ports	Select the services you wish to block. The current group will not be able to use any services which are checked.
User-defined Ports to Block	This section is optional. It allows you to define your own filters if required. For each filter, the following information is required. • **Name** – Enter a meaningful name for this filter. • **TPC/UDP Packets** – Select either TCP or UDP, depending on which protocol is used by the service you wish to block. • **Port No. Range** – Enter the range of port numbers used by the service you wish to block. If only a single port is required, enter it in both fields.

Session Limit

This new feature allows to drop the new sessions from both WAN and LAN side. If the new sessions number are exceed the maximum sessions in a sampling time.

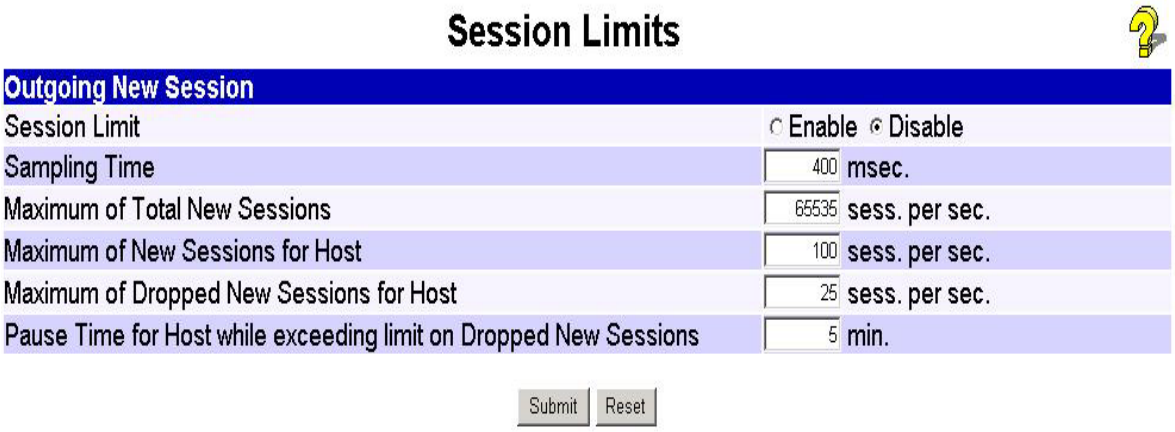


Figure 5-3: Session Limit

Session Limit

Sampling Time	The period to count the new session. Only those new sessions occurred in the most recently sampling time were be count for limit checking.(Default is 400 mil-sec)
Maximum of Total New session	If the number of new sessions for system exceed the maximum in the Sampling Time. Any new sessions in the system will be dropped. (Default: 65535 session/sec)
Maximum of New Sessions for Host	If the number of new sessions for the host exceeds the maximum in the sampling time. Any new session of the host will be dropped. (Default: session/sec)
Maximum of Dropped New Sessions for Host	If the number of dropped new sessions for the host exceeds the Maximum in the sampling time, any new session of the host will be dropped for the pause time.
Pause Time	Within the pause time, no new session of the suspended host could be served by system.(Default is 5 minutes)

System Filter Exception

System Filter Exception Rules: The rules with which any received packets is complied, the packets will not processed by Firewall or NAT module, but to be processed directly by system protocol stack.

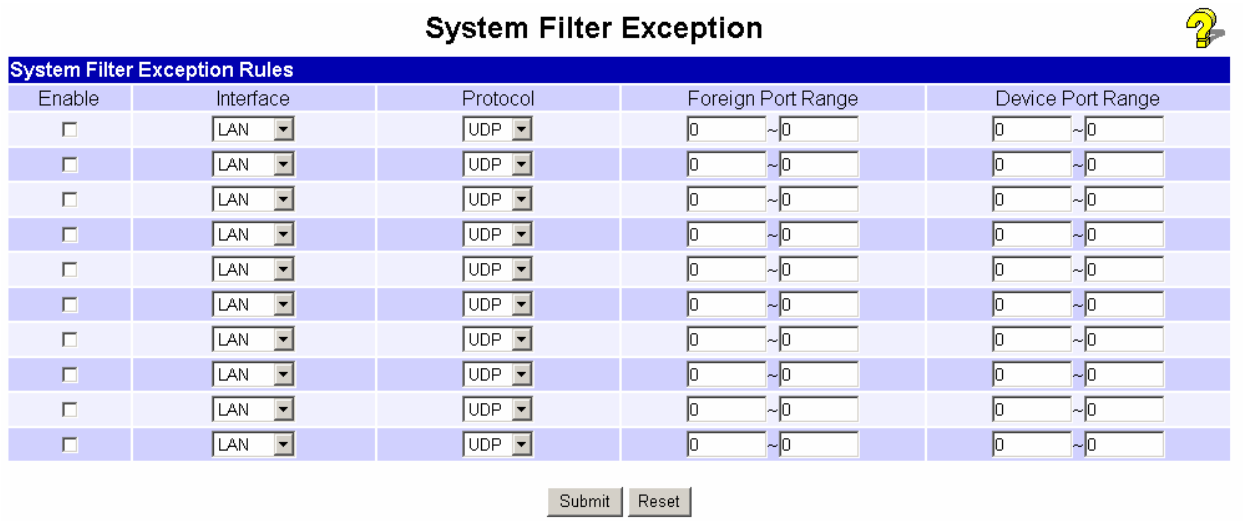


Figure 5-4: System Filter Exception

Firewall Exception

Enable	The check box can allow you enable or disable firewall exception.
Interface	You can select LAN, WAN1, WAN2 or ALL interfaces to be process by the system protocol stack. If you enable check box.
Protocol	There are six protocols (UDP/TCP/ICMP/GRE/ESP/AH) to choose to let packets directly process by the system protocol stack.
Foreign Port Range	Select foreign port number range directly process by system protocol stack. If enable check box.
Device Port Range	Select device port number range directly process by system protocol stack. If enable check box.

6: QoS Configuration

Overview

The Load Balancer provides QoS, which supports the high quality of network service. Because it will classify outgoing packets based on some policies defined by users, make some real-time applications to get better response or performance.

QoS Setup

The following web page management are guiding you how to setup QoS and make QoS work.

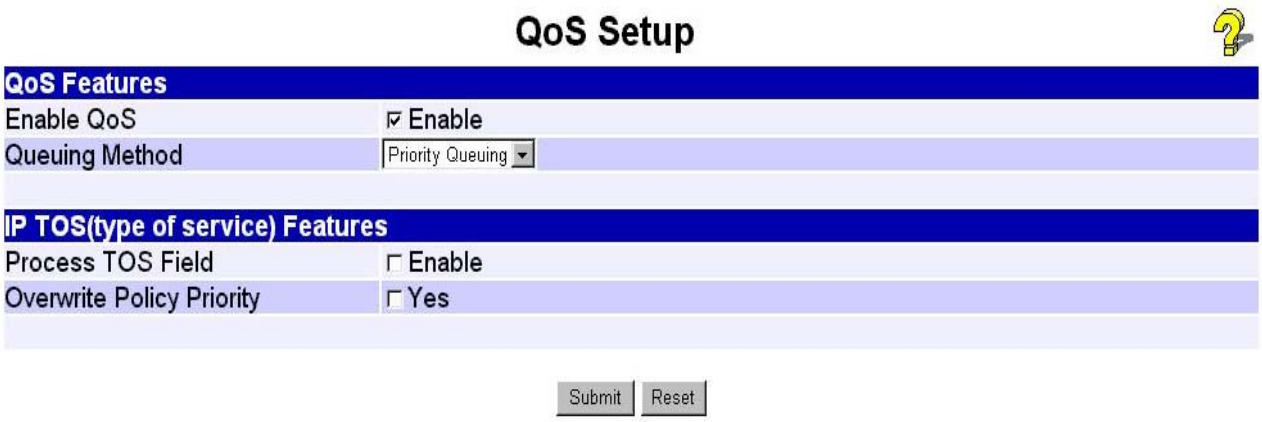


Figure 6-1:QoS Setup

Data – QoS Setup.

QoS Feature	• **Enable QoS** – This will allow users enable QoS function. • **Queuing Method** – The methods that how you manage your queue." Priority queuing". It is one of the first queuing variations to be wildly implemented.
IP TOS (Type of Service) Feature	• **Process TOS Field** –An 8 bits field in the IP packet header designed to contain values indicating how each packet should be handled in the network. If you choose "enable" then it will enable this function to process IP Type of Service field. • **Overwrite policy priority** – Choose "yes" to set the priority of TOS field in IP packet overwrite the priority defined in policy configuration

Policy Configuration

When you use QoS, you must define some policies to make some packets to have higher priority to pass through.

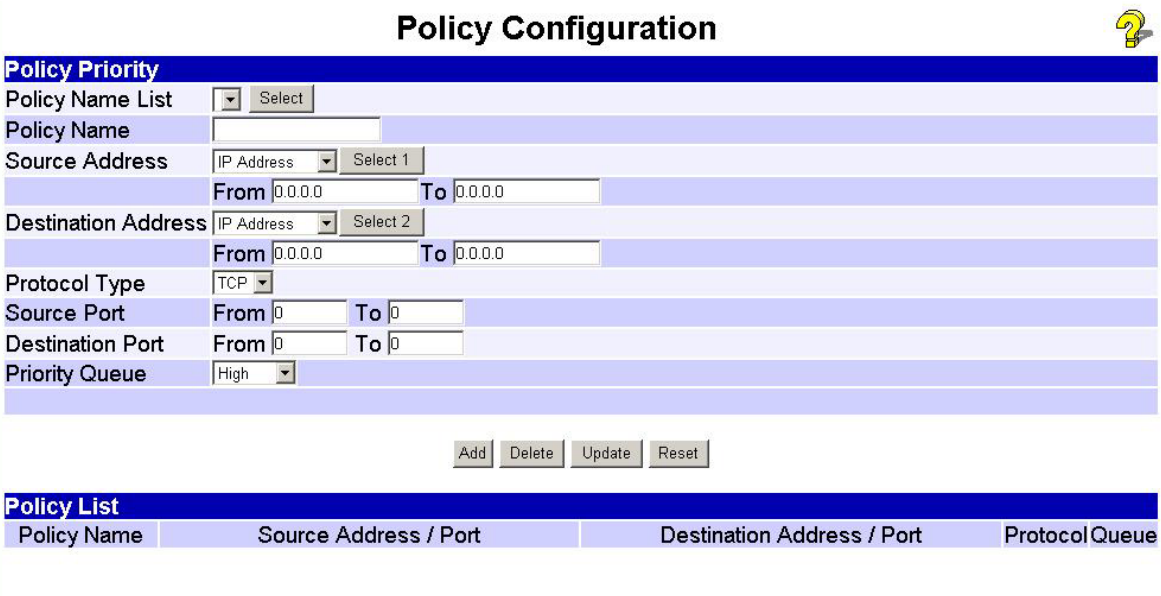


Figure 6-2: Policy Configuration

Data – Policy Configuration.

Network Admission Policy	This section identifies each policy • **Policy Name List** – When adding a new Policy, ignore this list. To edit an existing entry, select it from the list, and click the "Select" button. The data fields will then be updated with data for the selected entry. • **Policy Name** – Enter a suitable name. Generally, you should use the "Policy Name" for the network traffic. • **Source Address** – Define the source address of packets here. It has two types like IP address or MAC address. If you select IP address, you can define IP address range, otherwise define up to four MAC addresses. • **Destination Address** – Define the destination address of packets here. The explanation is as the same as above. • **Protocol Type** – The field defines traffic packet type, i.e. IP,TCP and UDP. • **Source Port** – Define the source port of packets here. • **Destination Port** – Define the destination port of packets here. • **Priority Queue** – It defines a packet if it meets all conditions defined above, it will be serviced with some priority level.

7: Management Assistant

Overview

The following advanced features are provided.

- SNMP
- Email Alert
- SNMP
- Syslog
- Upgrade Firmware

This chapter contains details of the configuration and use of each of these features.

SNMP

This section is only useful if you have SNMP (Simple Network Management Protocol) software on your PC. If you have SNMP software, you can use a standard MIB II file with The Load Balancer.

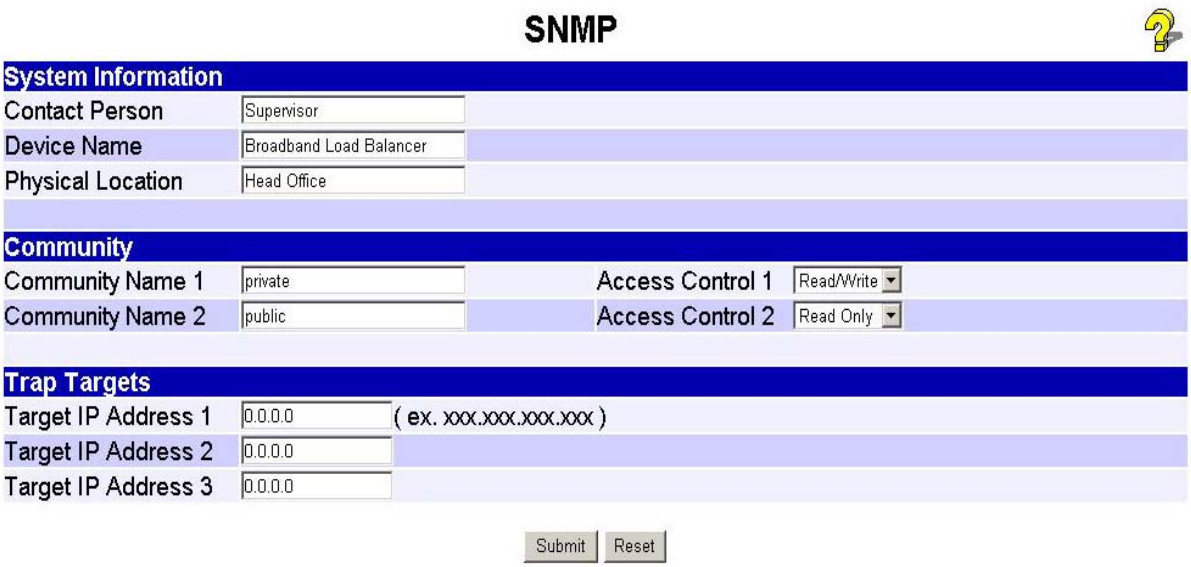


Figure 7-1: SNMP

Settings – SNMP

System Information	• **Contact Person** – The name of the person responsible for this device. • **Device name** – The name of The Load Balancer. • **Physical Location** – The location of The Load Balancer.
Trap Targets	Enter the IP address of any targets (PCs running SNMP software) to which you want traps to be sent. All traps are level 1.

Email Alert

This feature will send an warning Email, inform system administrator that one of the WAN ports was disconnected.

Email Alert – You can choose to enable or disable it to send a warning email.

Email Sender Address – It is an email address which will send the warning email.

Email (SMTP) Server Address – It is an email server address the warning email will be sent to.

Email Recipient Address – It is an email address of system administrator the email will be sent to.

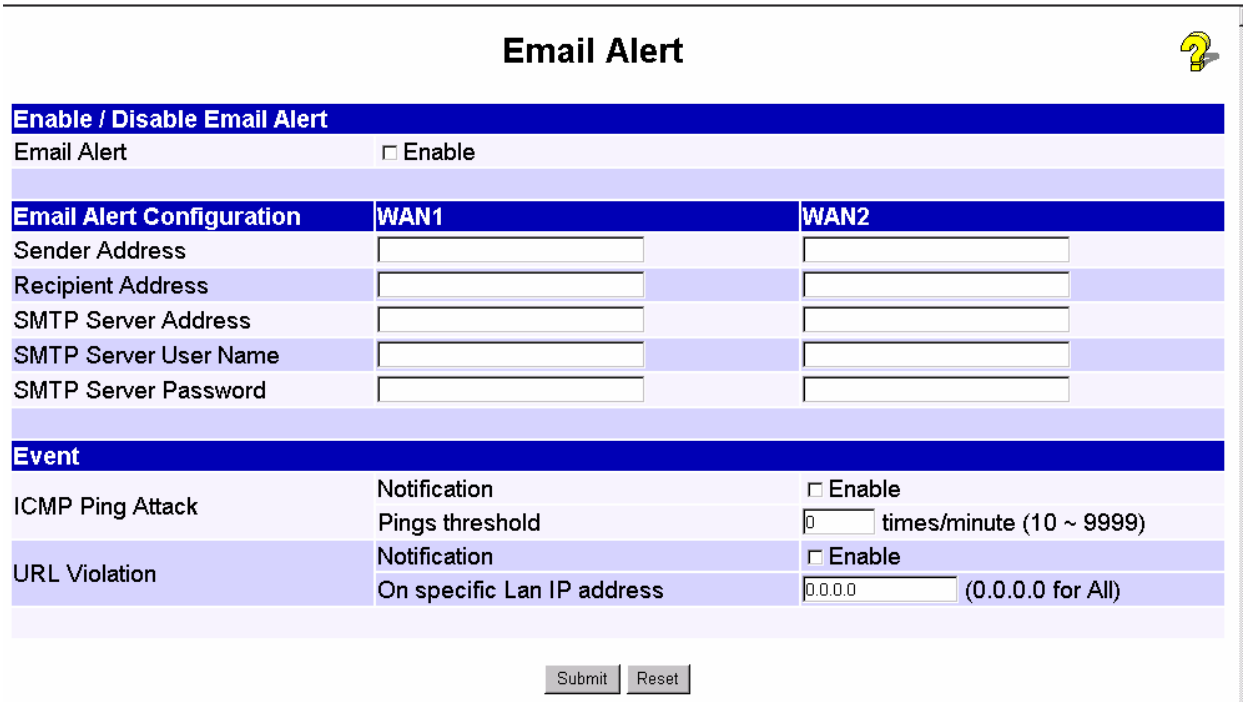


Figure 7-2: Email Alert

Settings – Email Alert

Enable/Disable Email Alert	• **Enable** – This will enable email alert to send a warning email when WAN port was disconnected.
Email Alert Configuration	• **Sender Address** – It is an email address that sends a warning email to a recipient. • **Recipient Address** –It is an email address a warning email will be sent to. Usually it is system administrator email address. For example: admin@mail.domain.com • **SMTP Server Address -** It is an email sever address,a warning email will be sent to. If you are enabled email alert. For example: mail.domain.com. • **SMTP server user name –** This is the user name of email sender for authentication (optional). • **SMTPserver password -** This is the user password
Event	**ICMP Ping Attack –** This feature is useful to prevent ICMP attack from WAN or LAN. It will drop the packets if the ping times are excessive the threshold value. It will send email to the administrator, if email is enabled. **URL Violation –** If toy enable this function, it will send an email to a administrator who is (are) violation the URL filter.

Syslog

This feature can send real time system information on the web page or to the specified PC.

Syslog Configuration – Syslog Configuration allow you where to send system information to other machine or not. There are up to three machines you can choose to send your system log.

Message Status– Messages send only keep when “keep send message” checked. Currently we keep last 100 messages in the RAM area, they will clear when reboot or power off.

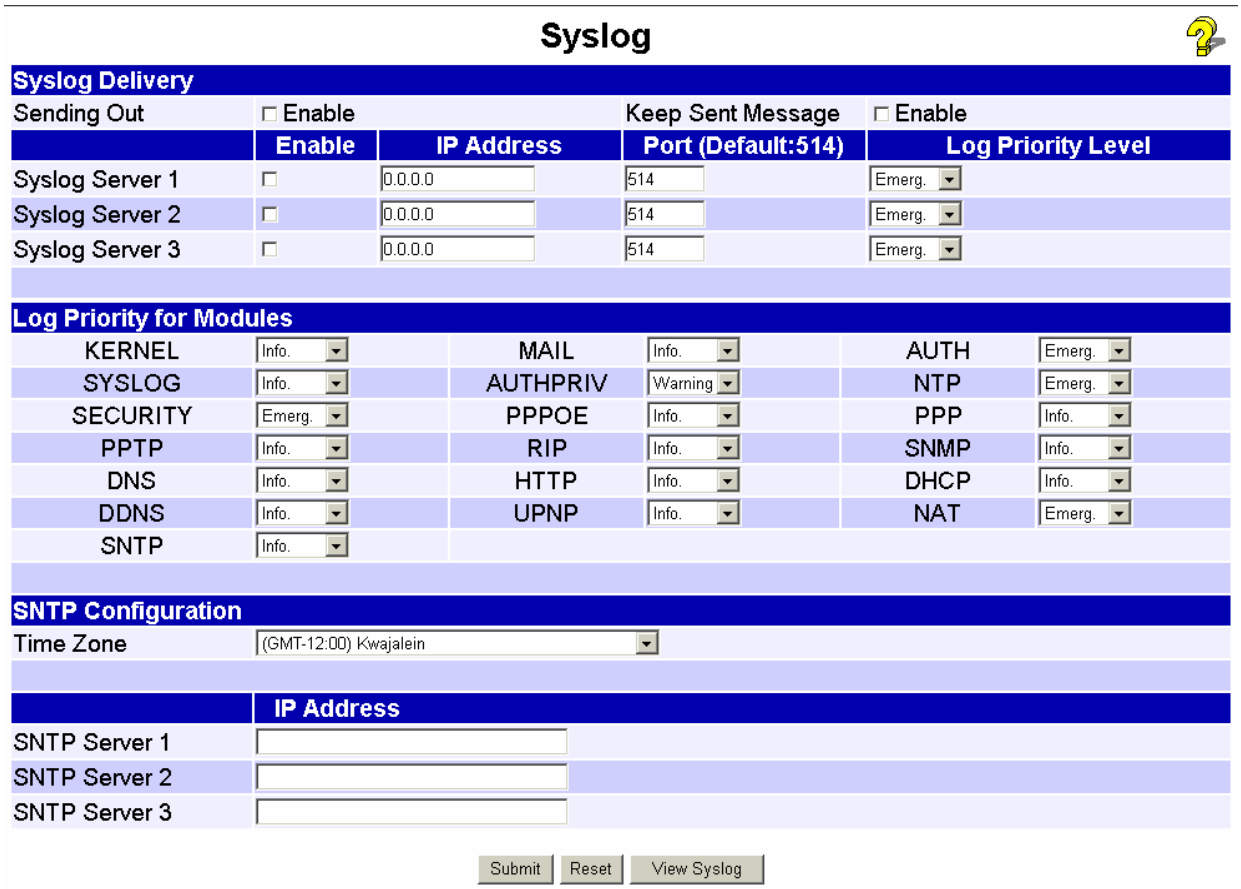


Figure 7-3:Syslog

Syslog Configuration

Syslog Global	• **Enable** – Set to “enable”, if you want to send system log messages to other machine.
Keep Sent Messages	• **Enable** – Checked this, if you want to keep sent messages, otherwise the sent messages will be deleted.
Syslog Server	• **IP address:** Up to 3 syslog servers can be used. • **Enable:** You can enable or disable each server temporarily. • **Port:** If your syslog server does not use the default port, you can change it. • **Log Priority Level:** The syslog messages are divided into 8 levels, from Emergency to Debug level. The lower level, the less messages will be generated. Emergency is the lowest priority level, and Debug is the highest one.

Admin Password Screen

The password screen allows you to assign a password to The Load Balancer.

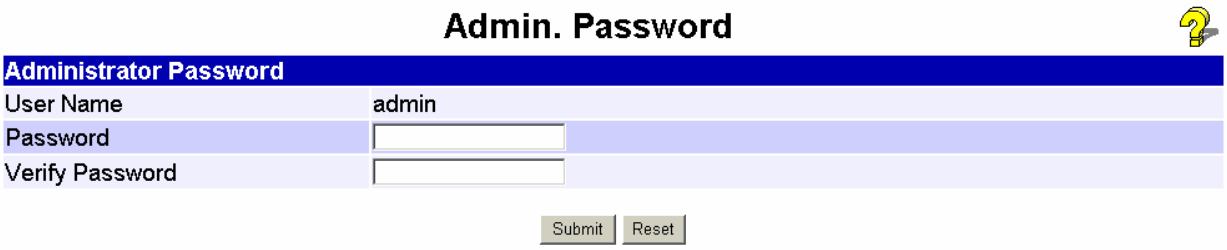


Figure 7-4: Admin Password Screen

Enter the desired password, re-enter it in the *Verify Password* field, then save it.

When you connect to The Load Balancer with your Browser, you will be prompted for the password when you connect, as shown below.

Figure 7-5: Password Dialog

- Enter "Admin" for the *User Name*.
- Enter the password for The Load Balancer, as set on the *Admin Password* screen above.

Upgrade Firmware

This Upgrade Firmware Screen allows you to upgrade firmware or backup system configuration by using HTTP upgrade.

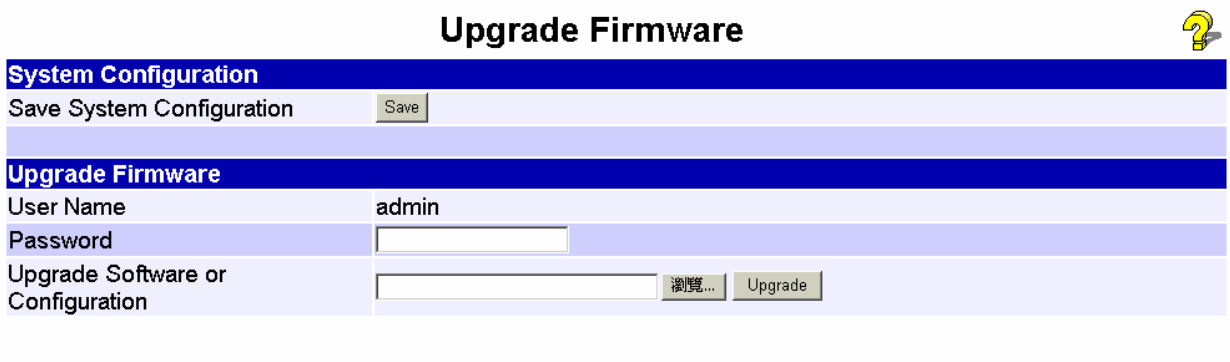


Figure 7-6: Firmware Upgrade Screen

- You can backup your system configuration by press “save” button of Save System Configuration. It will save the system configuration for you. (Notice: You have to refresh the browser after you saved the system configuration file)
- You also can do firmware upgrade by input the correct password and the file name of your firmware. Remember do not Reset or Restart the device while update new firmware, because it may cause system to crash.

8: Advanced LAN Configuration

Overview

These screens and settings are provided to deal with non-standard situations, or to provide additional options for advanced users.

Existing DHCP Server

If your LAN already has a DHCP Server, and you wish to continue using it, the following configuration is required.

- The DHCP Server function in The Load Balancer must be **disabled**. This setting is on the ***LAN & DHCP*** screen.
- Your DHCP Server must be configured to provide The Load Balancer's LAN IP address as the "Default Gateway".
- Your DHCP Server must provide correct DNS addresses to the PCs.

Routing

This section is only relevant if your LAN has other Routers or Gateways.

- If you don't have other Routers or Gateways on your LAN, you can ignore the ***Static Routing*** page completely.
- If your LAN has other Gateways and Routers, you must configure the Static Routing screen as described below. You also need to configure the other Routers.

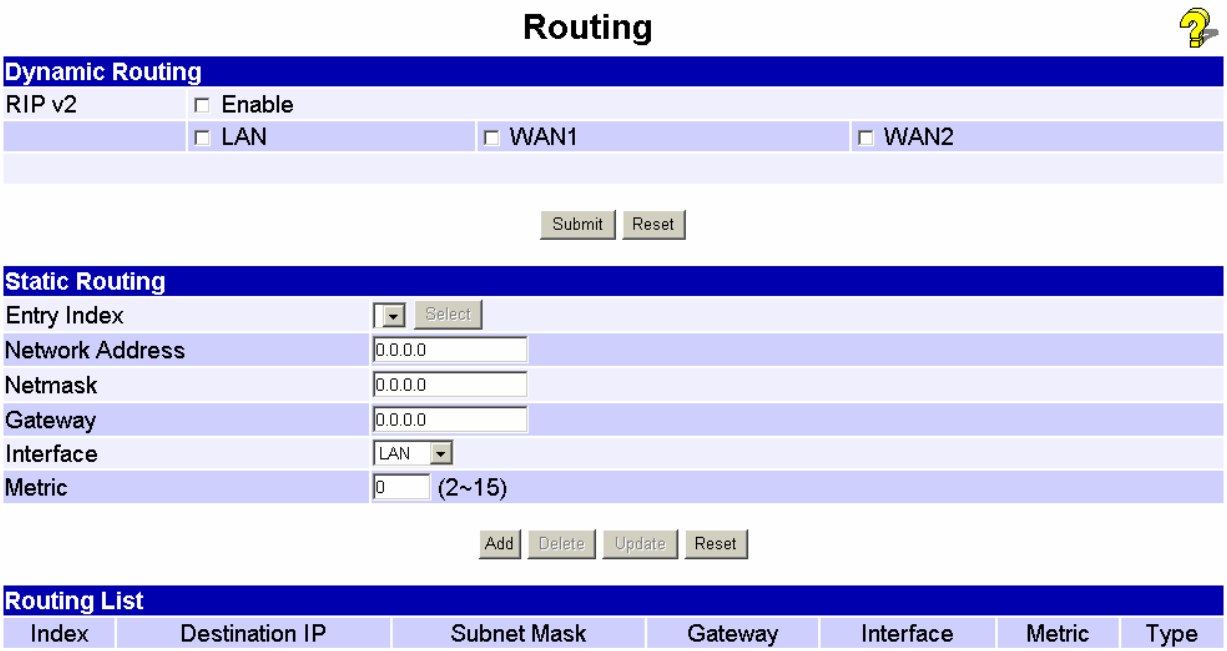


Figure 8-1: Routing

Note:

If there is an entry or entries in the Routing table with an Index of zero (0), these are System entries. You cannot modify or delete these entries.

Settings – Routing

Dynamic Routing	• **RIP v2** – This acts as “master” switch. If enabled, the selected WAN or LAN will run RIPv1/v2, otherwise they don’t have RIP function. • **LAN, WAN1, WAN2** – If enabled, any WAN or LAN can execute RIP function.
Entry Index	• • If adding a new entry, ignore this field. • To edit an existing entry, select it from the list, and click the "Select" button. The screen will then update with the data for the selected entry. • If the Index is 0, this is a System entry that you can neither delete nor modify.
Network Address	The network address of the remote LAN segment. For standard class "C" LANs, the network address is the first 3 fields of the Destination IP Address. The 4th (last) field can be left at 0.
Netmask	The Network Mask for the remote LAN segment. For class "C" networks, the default mask is 255.255.255.0

Gateway	The IP Address of the Gateway or Router that The Load Balancer must use to communicate with the destination above. (NOT the router attached to the remote segment.)
Interface	Select the correct interface, usually "LAN". The "WAN" interface is only available if NAT (Network Address Translation) is disabled.
Metric	The number of "hops" (routers) to pass through to reach the remote LAN segment. The shortest path will be used.

Configuring Other Routers on your LAN

All traffic for devices not on the local LAN must be forwarded to The Load Balancer, so that they can be forwarded to the Internet. This is done by configuring other Routers to use The Load Balancer as the *Default Route* or *Default Gateway*, as illustrated by the example below.

Static Routing - Example

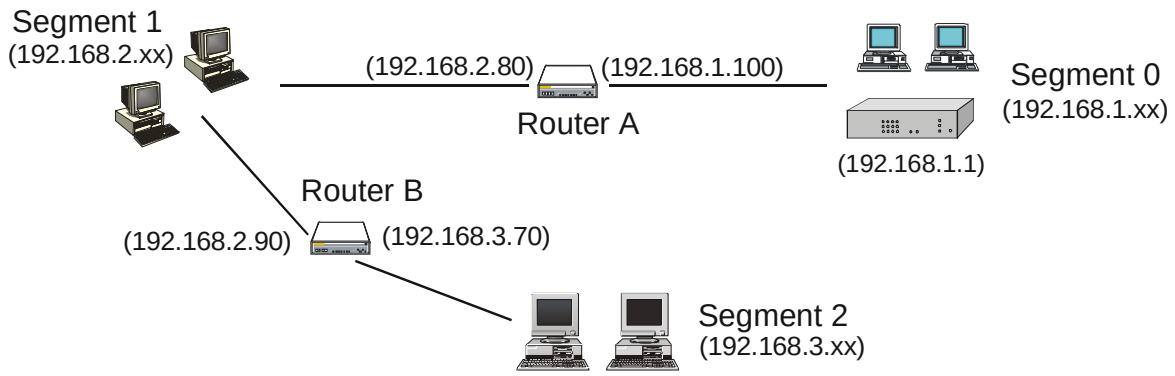


Figure 8-2: Routing Example

For The Load Balancer Gateway's Routing Table

For the LAN shown above, with 2 routers and 3 LAN segments, The Load Balancer requires 2 entries as follows.

Entry 1 (Segment 1)	
Destination IP Address	192.168.2.0
Network Mask	255.255.255.0

Gateway IP Address	192.168.1.100
Interface	LAN
Metric	2
Entry 2 (Segment 2)	
Destination IP Address	192.168.3.0
Network Mask	255.255.255.0 (Standard Class C)
Gateway IP Address	192.168.1.100
Interface	LAN
Metric	3

For Router A's Default Route

Destination IP Address	0.0.0.0
Network Mask	0.0.0.0
Gateway IP Address	192.168.1.1
Metric	2

For Router B's Default Route

Destination IP Address	0.0.0.0
Network Mask	0.0.0.0
Gateway IP Address	192.168.2.80
Interface	LAN
Metric	3

9: Operation and Status

Operation

Once both The Load Balancer and the PCs are configured, operation is automatic.

However, there are some situations where additional Internet configuration may be required:

Refer to *Chapter 4 - Advanced Features* for further details.

System Status

Use the ***System Status*** link on the main menu to view this screen.

System Status

WAN Information	WAN 1	WAN 2
Connection Status	Connected	Connected
Connection Type	DHCP Force Renew	DHCP Force Renew
IP Address	192.168.9.9	192.168.9.8
Subnet Mask	255.255.255.0	255.255.255.0
Gateway	192.168.9.1	192.168.9.1
DNS IP Address	192.168.9.1	192.168.9.1
MAC Address	00-0E-DB-00-3B-67	00-0E-DB-00-3B-69

LAN Information	
IP Address	192.168.1.1
Subnet Mask	255.255.255.0
MAC Address	00-0E-DB-00-3B-68
DHCP Server	Enabled

Device Information	
Firmware Version	Ver 2.1 Rel 22 Built Date: Sep 27 2004
NAT	Enabled
Load Balance	Enabled
Virtual Server	Disabled
Special Application	Disabled
Multi DMZ	Disabled
Block URL	Disabled
Hardware ID	01112004200001000000000002009

Figure 9-1: System Status

Data – System Status

WAN Information	• **Connection Status** – Current status – either "Connected" or "Not connected". • **Connection Type** – The type of connection used – DHCP, Fixed IP, PPPoE, or PPTP. • **"Force Renew"** button– Only available if using a dynamic IP address (DHCP). Clicking this button will perform a DHCP "Renew" transaction with the ISP's DHCP server. This will extend the period for which the current WAN IP address is allocated to you. • **IP Address** – The IP address of The Load Balancer, as seen from the Internet. This IP Address is allocated by the ISP (Internet Service Provider) • **Subnet Mask** – The Network Mask (Subnet Mask) for the IP Address above. • **Domain Name IP Address** – The address of the current DNS (Domain Name Server. • **MAC Address** – The MAC (physical) address of The Load Balancer, as seen from the Internet.
LAN Information	• **IP Address** – The LAN IP Address of The Load Balancer. • **Subnet Mask** – The Network Mask (Subnet Mask) for the IP Address above. • **MAC Address** – The MAC (physical) address of The Load Balancer, as seen from the local LAN. • **DHCP Server** – The status of the DHCP Server function - either "Enabled" or "Disabled".
Device Information	• **Firmware Version** – Version of the Firmware currently installed. • **NAT** – Status of the *NAT* feature – either “Enable” or “Disable”. • **Load Balance** – Status of the *Load Balance* feature – either “Enable” or “Disable”. • **Virtual Server** – Status of the *Virtual Server* feature – either "Enabled" or "Disabled". • **Special Applications** – Status of the *Special Applications* feature – either "Enabled" or "Disabled". • **DMZ** – Status of the *DMZ* feature – either "Enabled" or "Disabled". • **Block URL** – Status of the *Block URL* feature – either “Enable” or “Disable”. • **Hardware ID** – The manufacturers ID for this particular device.
Device Statistics	• **System UpTime** – The time since the system of a device was last reinitialized. • **CPU Usage** – The current usage percentage of CPU. • **Memory Usage** – The current usage percentage of Memory (Heap & Queue).

Buttons	• **Refresh** – Update the data on screen. • **Restart** – Restart (reboot) The Load Balancer. • **Restore Factory Defaults** – This will delete all existing settings, and restore the factory default settings. See below for details.

Restore Factory Defaults

When the "Restore Factory Defaults" button on the ***Status*** screen above is clicked, the following screen is displayed.

Figure 9-2: Restore Factory Defaults

If the "Restore Default Value" button on this screen is clicked:

- ALL of your settings will be erased.
- The default IP address, password and ALL other settings will be restored to the factory default values.
- The DCHP server function will be enabled.

These changes may mean that the current connection is invalid, and you will have to re-connect to The Load Balancer using its default IP address (192.168.1.1).

WAN Status

Use the ***WAN Status*** link on the main menu to view this screen.

WAN Status

NAT Statistics		WAN 1	WAN 2
Connection Status		Connected	Connected
Default Loading Share		50%	50%
Current Loading Share		50 %	50 %
Current Loading	Sessions	1	1
	Bytes	1	1
	Packets	1	1
Current Bandwidth	Download Speed	244 Bytes/s	244 Bytes/s
	Upload Speed	0 Bytes/s	0 Bytes/s

Interface Statistics		WAN 1	WAN 2
Interface Usage		56%	43%
Over All	Bytes received	1033 KB	1211 KB
	Bytes transmitted	694 KB	94 KB
	Total	1727 KB	1305 KB

Check NAT Detail | Refresh | Restart Counters

Figure 9-3: WAN Status

Data – System Status

NAT Statistics	This section displays data for each WAN port. • **Connection status** – This will display either *Connected* or *Not Connected*. • **Default Loading Share** - The default traffic loading between the WAN ports. • **Current Loading Share** – The current traffic loading between the WAN ports. • **Current Loading** – The number of sessions, Bytes and Packets currently being processed on each port. • **Current Bandwidth** – The current Download and Upload speeds on each WAN port. • "Check NAT Detail" will display the ***NAT Status*** screen, described below.
Interface Statistics	This section displays cumulative statistics. Use the "Restart Counter" button to restart these counters when required.

NAT Status

This screen is displayed when you click the "Check NAT Detail" button on the ***WAN Status*** screen.

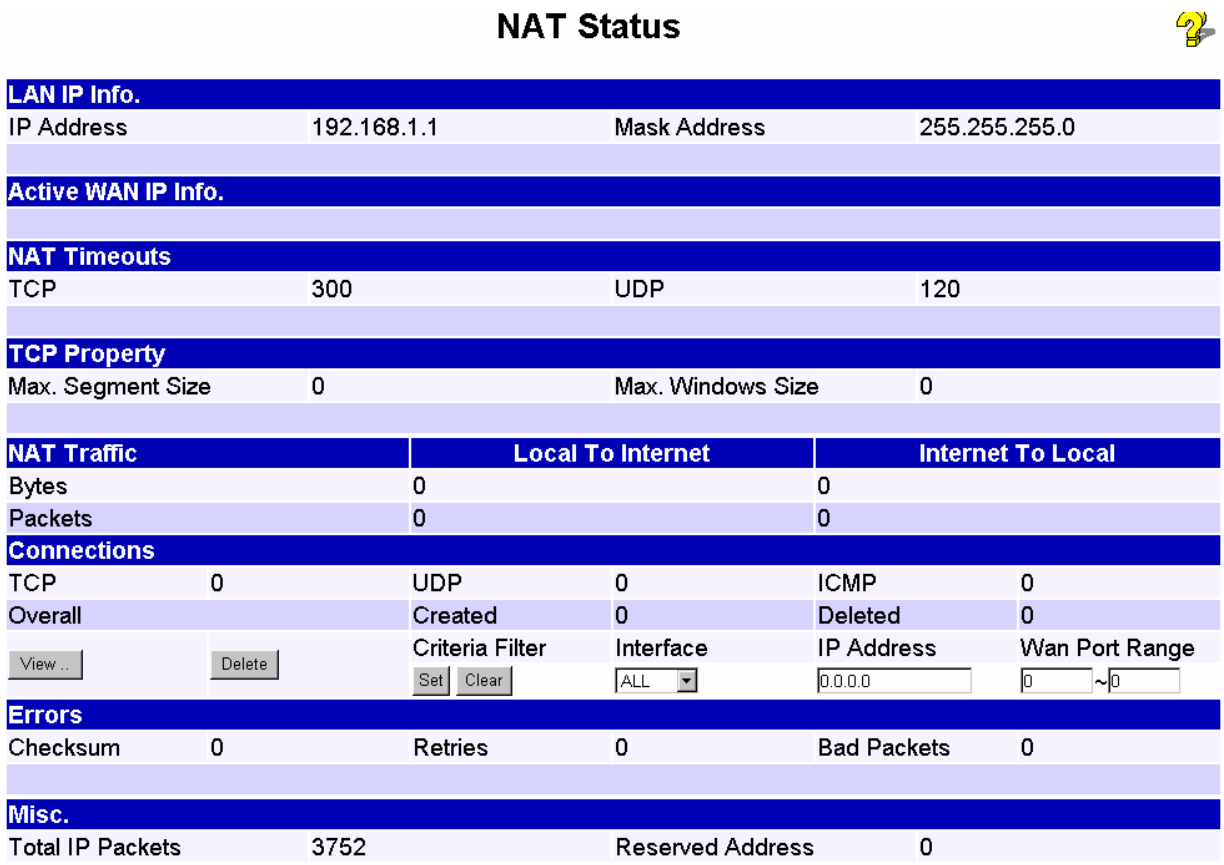


Figure 9-4: NAT Status

Data – NAT Status

LAN IP Info	• **IP Address** – The LAN IP Address of The Load Balancer. • **Mask Address** – The Network Mask (Subnet Mask) for the IP Address above.
Active WAN IP Info	There is one (1) row for each active connection. For each connection, the following data is shown. • **IP Address** – The WAN (Internet) IP Address of The Load Balancer. • **Mask Address** – The Network Mask (Subnet Mask) for the IP Address above
NAT Timeouts	This displays the current timeout values for TCP and UDP connections.

TCP Prosperity	This displays the MSS (Maximum Segment Size) and Maximum Windows size for TCP packets.
NAT Traffic	This section displays statistics for both outgoing (LAN to Internet) and Incoming (Internet to Local) traffic.
NAT Connections	This displays the current number of active connections. For further details, click the "View Connection" list button.
Errors	Statistics are displayed for Checksum errors, number of retries, and number of bad packets.
Misc.	This displays the total IP packets and reserved address.

Appendix A

Specifications

Model	BR-6624
Dimensions	245mm (W) x 137mm (D) x 30mm (H)
Operating Temperature	0° C to 40° C
Storage Temperature	-10° C to 70° C
Network Protocol:	TCP/IP
Network Interface:	6 Ethernet: 4 * 10/100BaseT (RJ45) auto-Switching Hub ports for LAN devices 2 * 10/100BaseT (RJ45) for WAN
LEDs	8 LAN 4 WAN 1 Status 1 Power
External Power Adapter	5 V 1.5A DC

FCC 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.

(2) This device must accept any interference received, including interference that may cause undesired operation.

CE Marking Warning

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

Appendix B

Windows TCP/IP Setup

Overview

TCP/IP Settings

If using the default Load Balancer settings, and the default Windows 95/98/ME/2000 TCP/IP settings, no changes need to be made.

- By default, The Load Balancer will act as a DHCP Server, automatically providing a suitable IP Address (and related information) to each PC when the PC boots.
- For all non-Server versions of Windows, the default TCP/IP setting is to act as a DHCP client.
- If you wish to check your TCP/IP settings, the procedure is described in the following sections.
- If your LAN has a Router, the LAN Administrator must re-configure the Router itself.

Checking TCP/IP Settings - Windows 9x/ME:

1. Select *Control Panel - Network*. You should see a screen like the following:

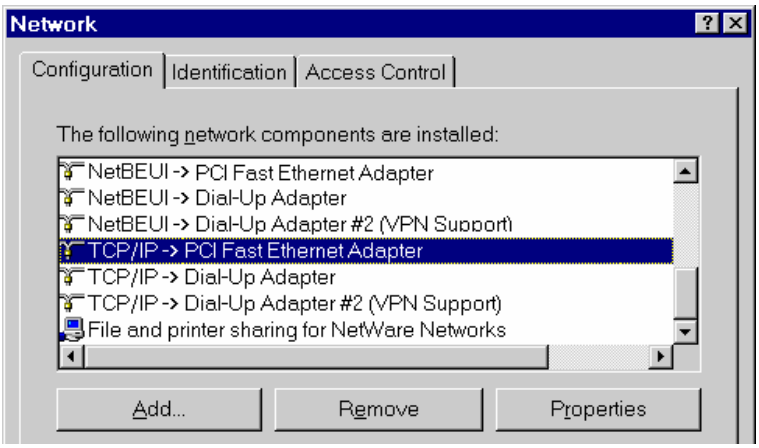


Figure B-1: Network Configuration

2. Select the *TCP/IP* protocol for your network card.
3. Click on the *Properties* button. You should then see a screen like the following.

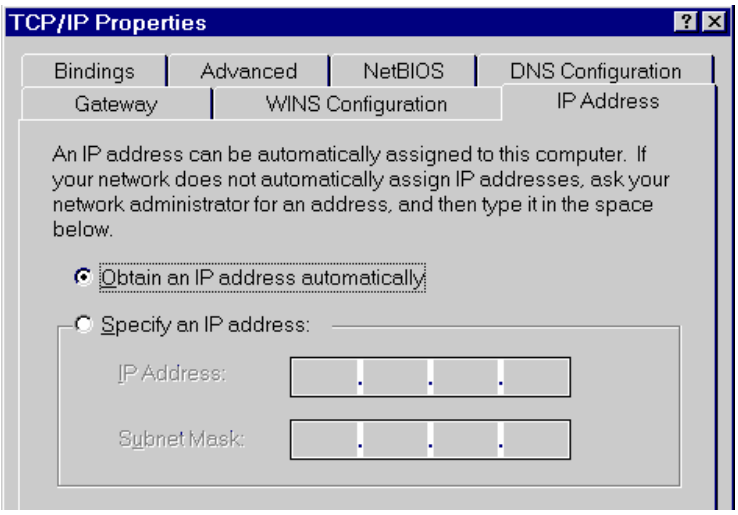


Figure B-2: IP Address (Win 95)

Ensure your TCP/IP settings are correct, as follows:

Using DHCP

To use DHCP, select the radio button *Obtain an IP Address automatically*. This is the default Windows settings.

Restart your PC to ensure it obtains an IP Address from The Load Balancer.

Using "Specify an IP Address"

If your PC is already configured, check with your network administrator before making the following changes:

- If the *DNS Server* fields are empty, select *Use the following DNS server addresses*, and enter the DNS address or addresses provided by your ISP, then click *OK*.
- On the *Gateway* tab, enter The Load Balancer's IP address in the *New Gateway* field and click *Add*, as shown below. (Your LAN administrator can advise you of the IP Address they assigned to The Load Balancer.)

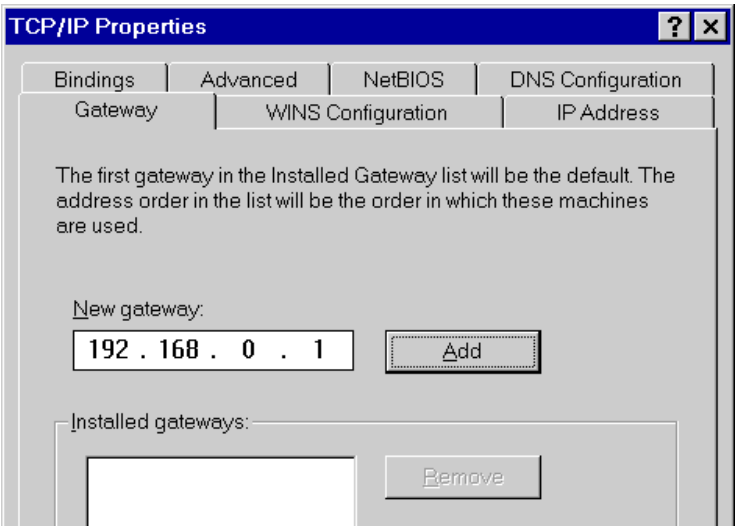


Figure B-3: Gateway Tab (Win 95/98)

- On the *DNS Configuration* tab, ensure *Enable DNS* is selected. If the *DNS Server Search Order* list is empty, enter the DNS address provided by your ISP in the fields beside the *Add* button, then click *Add*.

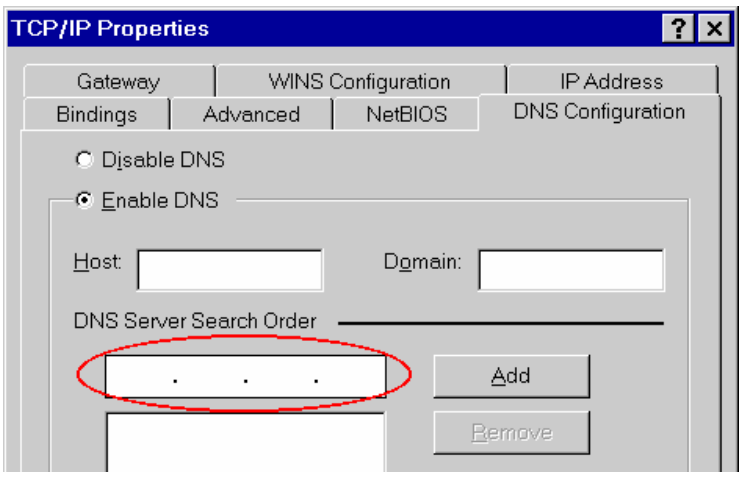


Figure B-4: DNS Tab (Win 95/98)

Checking TCP/IP Settings - Windows 2000:

1. Select *Control Panel - Network and Dial-up Connection*.
2. Right click the *Local Area Connection* icon and select *Properties*. You should see a screen like the following:

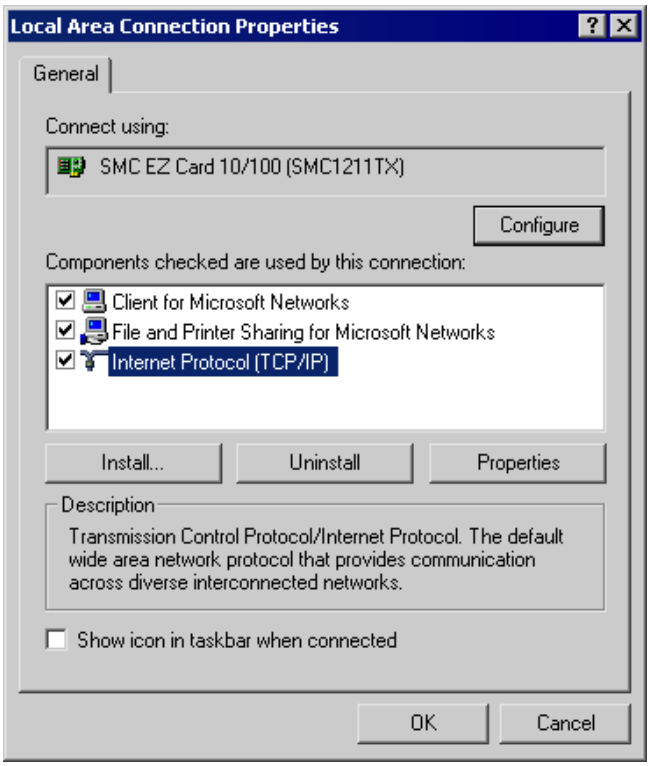


Figure B-5: Network Configuration (Win 2000)

3. Select the *TCP/IP* protocol for your network card.
4. Click on the *Properties* button. You should then see a screen like the following.

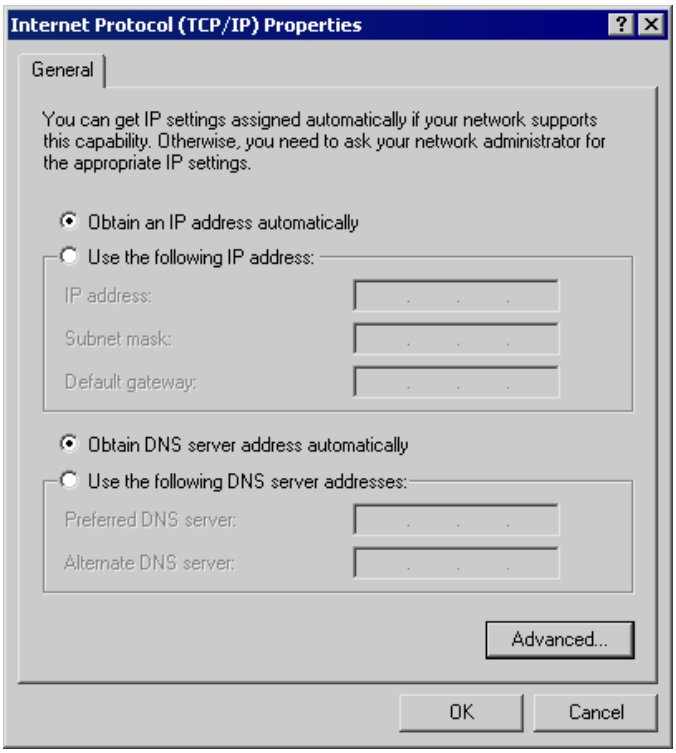


Figure B-6: TCP/IP Properties (Win 2000)

5. Ensure your TCP/IP settings are correct:

Using DHCP

To use DHCP, select the radio button *Obtain an IP Address automatically*. This is the default Windows settings.

Restart your PC to ensure it obtains an IP Address from The Load Balancer.

Using a fixed IP Address ("Use the following IP Address")

If your PC is already configured, check with your network administrator before making the following changes:

- Enter The Load Balancer's IP address in the *Default gateway* field and click *OK*. (Your LAN administrator can advise you of the IP Address they assigned to The Load Balancer.)
- If the *DNS Server* fields are empty, select *Use the following DNS server addresses*, and enter the DNS address or addresses provided by your ISP, then click *OK*.

Checking TCP/IP Settings - Windows XP:

1. Select Control Panel - Network Connection.
2. Right click the *Local Area Connection* and choose *Properties*. You should see a screen like the following:

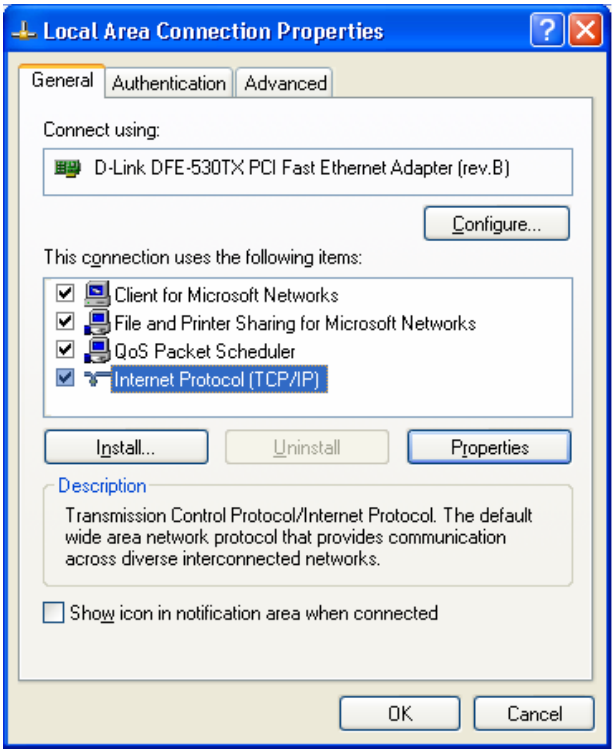


Figure B-7: Network Configuration (Windows XP)

3. Select the *TCP/IP* protocol for your network card.
4. Click on the *Properties* button. You should then see a screen like the following.

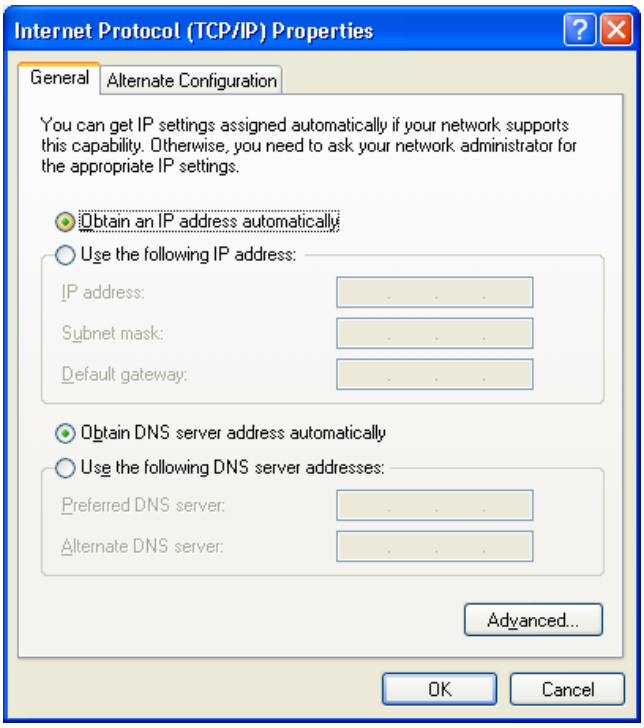


Figure B-8: TCP/IP Properties (Windows XP)

5. Ensure your TCP/IP settings are correct.

Using DHCP

To use DHCP, select the radio button *obtain an IP Address automatically*. This is the default Windows settings.

Restart your PC to ensure it obtains an IP Address from The Load Balancer.

Using a fixed IP Address ("Use the following IP Address")

If your PC is already configured, check with your network administrator before making the following changes.

- Enter The Load Balancer's IP address in the *Default gateway* field and click *OK*. (Your LAN administrator can advise you of the IP Address they assigned to The Load Balancer.)
- If the *DNS Server* fields are empty, select *Use the following DNS server addresses*, and enter the DNS address or addresses provided by your ISP, then click *OK*.

Appendix C

Troubleshooting

Overview

This chapter covers some common problems that may be encountered while using The Load Balancer and some possible solutions to them. If you follow the suggested steps and The Load Balancer still does not function properly, contact your dealer for further advice.

General Problems

Problem 1:	**Can't connect to The Load Balancer to configure it.**
Solution 1:	Check the following: • The Load Balancer is properly installed, LAN connections are OK, and it is powered ON. • Ensure that your PC and The Load Balancer are on the same network segment. (If you don't have a router, this must be the case.) • If your PC is set to "Obtain an IP Address automatically" (DHCP client), restart it. • If your PC uses a Fixed (Static) IP address, ensure that it is using an IP Address within the range 192.168.1.2 to 192.168.1.254 and thus compatible with The Load Balancer's default IP Address of 192.168.1.1. Also, the Network Mask should be set to 255.255.255.0 to match The Load Balancer. In Windows, you can check these settings by using *Control Panel-Network* to check the *Properties* for the TCP/IP protocol.

Internet Access

Problem 1:	**When I enter a URL or IP address I get a time out error.**
Solution 1:	A number of things could be causing this. Try the following troubleshooting steps. • Check if other PCs work. If they do, ensure that your PCs IP settings are correct. If using a Fixed (Static) IP Address, check the Network Mask, Default gateway and DNS as well as the IP Address. • If the PCs are configured correctly, but still not working, check The Load Balancer. Ensure that it is connected and ON. Connect to it and check its settings. (If you can't connect to it, check the LAN and power connections.) • If The Load Balancer is configured correctly, check your Internet connection (DSL/Cable modem etc) to see that it is working correctly.
Problem 2:	**Some applications do not run properly when using The Load Balancer.**

Solution 2:	The Load Balancer processes the data passing through it, so it is not transparent. Use the *Special Applications* feature to allow the use of Internet applications which do not function correctly. If this does solve the problem you can use the *DMZ* function. This should work with most applications, but: • It is a security risk, since the firewall is disabled for the *DMZ* PC. • Only one (1) PC can use this feature.