GIGABYTE
TECHNOLOGY

AirCruiser MIMO Router

GN-BR03GM

User's Guide

November 2005 - Revision 1.0

Contents

Chapter 1
Getting To Know Your BR03GM

Overview

The GN-BR03GM AirCruiser MIMO (Multi-Input & Multi-Output) ****** router includes several devices in one box. First, there's the Wireless Router, which lets you connect Wireless-G or Wireless-B devices to the network.

There's also a built-in 4-port full-duplex 10/100 Switch to connect your wired-Ethernet devices. Connect four PCs directly, or daisy-chain out to more hubs and switches to create as big a network as you need. This router equip with powerful firewall and DoS protection, which can give the user maximum protection to prevent from damage by malicious internet user. The UPnP and MSN messenger support can provide the environment for user to surfing internet without any trouble.

This product operates in 2.4 GHz frequency bands, providing fast (up to 54 Mbps) and secure (support WPA, WPA2 and WEP) connections to 802.11 b/g networks. GN-BR03GM overcomes environment multi-path effect by MIMO feature to keep stable wireless performance.

****** MIMO (multiple-in, multiple-out) takes advantage of multiplexing to increase wireless bandwidth and range. MIMO algorithms send information out over two or more antennas and the information is received via multiple antennas as well.

Package Contents

- GN-BR03GM AirCruiser MIMO Router
- Power adapter
- Vertical Stand
- User Guide on CD-ROM
- Quick Start Guide
- SmartSetup 3 Guide
- Ethernet cable – All of the BR03GM Ethernet ports are Auto-MDIX

If there are any missing or damaged parts, please contact your local distributor or dealer immediately.

Using a power supply with a different voltage rating than the one included with the BR03GM may cause damage and void the warranty for this product.

Side Panel

The side panel of the GN-BR03GM AirCruiser MIMO Router contains all the Router's ports as well as the DC power port and initialization button.

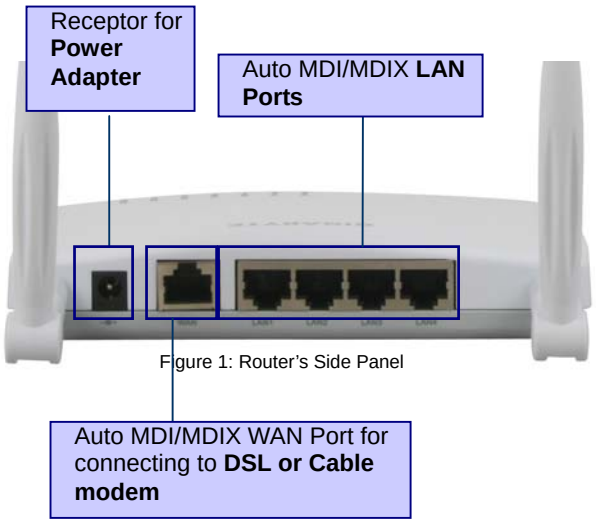


Figure 1: Router's Side Panel

Reset Button	There are two ways to reset the Router's factory defaults. Either press the Reset Button, for approximately five seconds, or restore the defaults from the Management Tools>Router Initialization screen in Router's Web-based Utility.
WAN	The WAN port is where you will connect your broadband Internet connection.
LAN1, 2, 3, 4	These ports (1, 2, 3, 4) connect the Router to PCs on your wired network and other Ethernet network devices.
Power	The Power port is where you will connect the power adapter.

LEDs

Figure 2: LED Layout

The table below describes the LED indicators on the front panel of the GN-BR03GM. All LEDs are green when lit.

LED	STATUS	DESCRIPTION
Power	Green	Power is supplied to the Router
	Off	Power is NOT supplied to the Router
WLAN	Flashing	Data is being transmitted wirelessly
WAN	On	WAN port has detected a wired link with a DSL or Cable modem.
	Flashing	Data is being transmitted / received through WAN port.
LAN	On	LAN port has detected a link with a 10/100Mbps device
	Flashing	Data is being transmitted / received through LAN port.

Key Features

- Conforms to IEEE 802.11g specification.
- Support Smart Setup I, II, III
- Support 64-bit /128-bit WEP encryption, WPA, WPA2.
- Support QoS
- Support PPPoE and PPPoE Unnumbered DSL connection
- Support up to 4 WAN configuration records
- Support DHCP client for cable/DSL connection
- Support DHCP server with static and dynamic style
- Support UPnP IGD 1.0
- Support MSN messenger and most Internet applications
- Support Firewall Filtering
- Support Virtual Server
- Support DMZ
- Support Stateful Packet Inspection (SPI)
- Support DoS Protection
- Support Stealth Mode
- VPN Packets Pass Through (Support PPTP/IPSec/L2TP Protocol)
- Log Management (Support Firewall/UPnP/WAN Connection Log)
- Easy Web Management
- Support WAN side Remote Management
- Support DNS Relay
- Dynamic DNS supported
- Web based Firmware upgrade
- Support URL Blocking
- MDI/MDIX Auto crossover detect

Chapter 2
Wireless Networking

A wireless local area network (or Wi-Fi for short) is exactly like a regular local area network (LAN), except that each computer in the wireless network uses a wireless device to connect to the network. Computers in a wireless network share the same frequency channel and SSID, which is an identification name shared by the wireless devices belonging to the same wireless network.

The Router transmits data to PCs equipped with wireless network adapters, which can roam within a certain radial range of the Router. You can arrange the Router and multiple access points to work in succession to extend the roaming range, and you can set up your wireless network to communicate with your Ethernet hardware as well. The big advantage of Wi-Fi is its simplicity. You can connect computers anywhere in your home or office without the need for wires. The computers connect to the network using radio signals, and computers can be up to 100 feet or so apart.

Wireless Network Layout

The BR03GM AirCruiser MIMO Router has been specifically designed for use with both your 802.11b and 802.11g products, and retains full backward compatibility. After you have finished setting up your GN-BR03GM AirCruiser MIMO Router, your home network will be similar to the diagram shown at the right.

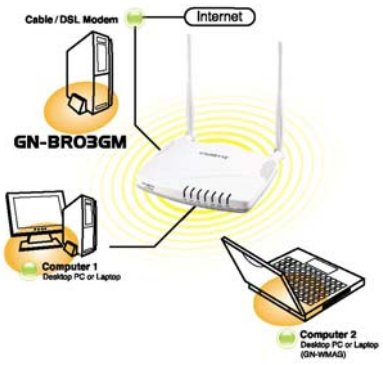


Figure 3: Typical Home Wireless Network

Chapter 3
Before You Start

What You Will Need

Internet

You will need to have an active Internet account, supplied through either ADSL or cable Modem, and your ISP user account and password information. (Your ISP can supply you with this)

Hardware Requirements

A minimum of one PC with an installed Ethernet NIC (network interface card). (If you have a DSL or Cable modem broadband connection to the Internet, you should already have this). If you wish to connect wirelessly to your BR03GM from a laptop, a wireless network PCMCIA notebook card is needed, and this manual assumes it is already properly installed.

System Requirements

The BR03GM will work with Windows, Macintosh or Linux Operating System. You just need a HTTP standard JavaScript-enabled browser, for example, Microsoft Internet Explorer or Netscape Navigator 4.0 or above.

ISP Configuration Information

Depending on the type of ISP connection you have, you may need one or more of the following configuration parameters.

- ✓ ISP User ID and Password
- ✓ ISP Domain Name Server (DNS)
- ✓ Fixed IP address or Static IP address
- ✓ Subnet Mask
- ✓ Default Gateway
- ✓ Host and Domain Names

If you are unsure of any of these settings, contact your ISP customer service.

Chapter 4
Connecting the BR03GM

Overview

You can connect to, and configure the BR03GM using either a wireless connection (via notebook PC) or using a wired connection to your desktop PC. It is HIGHLY recommended for the first time setup that configuration be done using a wired connection to your desktop PC as shown in the figure below.

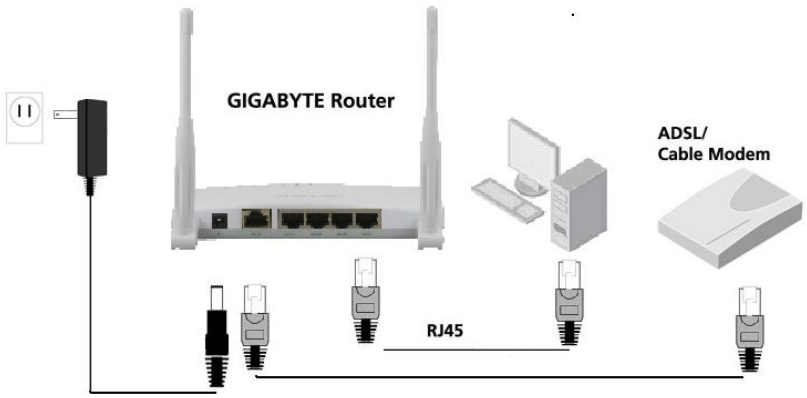


Figure 4: Wired Connection Diagram

Using a Wired Connection

It is suggested for first time setup your Router that you used the wired connection method. It is simpler, and eliminates the possibility of error due to improperly setup wireless connection.

Step 1 Turn off all the hardware devices in your network, including the ADSL/Cable modem by unplugging their power supply.

Step 2 Connect the Ethernet cable of your ADSL/Cable modem to the WAN port of the GN-BR03GM.

Step 3 Connect one end of an Ethernet cable (provided) to a LAN port in the side panel of the GN-BR03GM and the other end to the 10/100

Ethernet port of your computer. (It does not matter which LAN port you select).

Step 4 Plug the power adapter cord into the router's power jack and then plug the power adapter into a power outlet.

Step 5 Turn on your ADSL/Cable modem. After verifying all the connections, proceed to **Chapter 5 Connecting the Router to the Internet.**

Using a Wireless Connection

Step 1 Turn off all the hardware devices in your network, including the ADSL/Cable modem by unplugging their power supply.

Step 2 Connect the Ethernet cable of your ADSL/Cable modem to the WAN port of the GN-BR03GM.

Step 3 Plug the power adapter cord into the router's power jack and then plug the power adapter into a power outlet.

Step 4 Turn on your ADSL/Cable modem.

Step 5 Insert you PCMCIA notebook card, or wireless USB adapter into your notebook PC.

Step 6 If using a GIGABYTE PCMCIA notebook card, SmartSetup 3 will automatically detect your BR03GM and walk you through the setup procedure (for more details refer to your SmartSetup 3 Guide). Please refer to your vendor's users manual for connecting to the wireless network.

Step 7 When scanning for available wireless networks, your BR03GM's factory default SSID name is **GIGABYTE**. Select it using the procedures described in your particular vendor's notebook adapter users manual.

Step 8 After verifying all the connections, proceed to **Chapter 5 Connecting the Router to the Internet.**

Chapter 5
Connecting the Router to the Internet

Overview

The BR03GM AirCruiser MIMO router is configured to work “out of the box”, and the default settings generally do not require any modification. However, for initial setup, you must log into the router and key in your Internet Service Provider (ISP) settings. This only needs to be done once. Your ISP customer service desk can provide you with the all the information you will need.

This chapter includes two sets of instructions. First, by using SmartSetup to configure ISP settings in your Router, and then by using Setup Wizard to for users who wish to take more control over the ISP settings

Logging into the GN-BR03GM

SmartSetup 3 is the quickest way to securing your wireless network with WPA/WPA2-PSK, and then controlling your Wi-Fi network with its powerful and intuitive G-EZlink utility. **Please refer to your SmartSetup 3 Guide for more information.**

To login to your BR03GM follow the steps described below:

A. In the address bar of your browser, type “**192.168.1.254**” and then press the **ENTER** key.

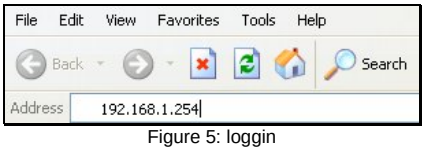


Figure 5: loggin

B. When the password page appears; use **admin** as both the default User Name and default Password. Then click the **OK** button.

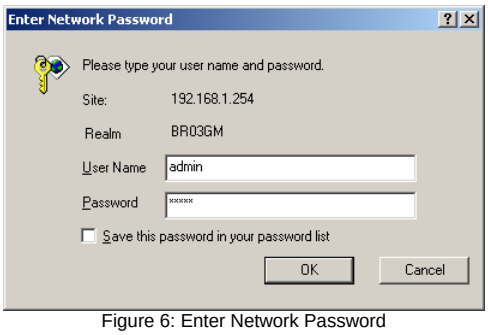


Figure 6: Enter Network Password

C. You are now connected to the Router and SmartSetup will detect your ISP type. If you do not see the menu shown below, click the Smart Setup button in the upper left of the main menu.

After SmartSetup detects your Internet connection, it will report the connection it finds. The possible options are:

- PPPoE
- Dynamic IP
- Static IP

If your connection is not detected automatically, simply press the “Smart Setup” button on the menu panel to activate it.

PPPoE Internet Connection Type
If you have a **PPPoE** type connection, the following screen shown below will appear prompting you to enter the ISP User Name and Password.

Note that you only have to enter the ISP information during initial setup only.

Dynamic IP Internet Connection Type
If you are connecting through a **Dynamic IP** address, no ISP login information is required. Just click the **OK** to allow the router to save the Dynamic IP settings and the Router will reboot, brining you to the Utility Main Page.

Static IP Internet Connection Type
If you have a **Static IP** address, the following screen show below will appear prompting you to enter your WAN IP address, WAN subnet mask, WAN gateway, and DSN information. This information is provided by your ISP.

D. After signing in to your ISP, the router will restart and the web based configuration utility will restart again automatically. You will be

presented with the GIGABYTE Wireless Router Main Page shown below.

Your BR03GM AirCruiser MIMO router is now fully installed, and you are able to wirelessly share network resources, retrieve emails, download large files, conduct a video conference, and distribute or display digital photos, videos or MP3 files.

Chapter 6
Advanced Setup

Overview

This chapter explains the Advanced Setup options available for the BR03GM. The Advanced Setup Screens offer LAN and WLAN Network Configuration, Static Routing Table, Virtual Server, Firewall Rules, and DNS Configuration. The Advanced Setup screens are available from the links on the Main menu.

The Status Page

On the **Status** page the router's current connection and configuration information is displayed for the following; LAN Ethernet, WAN Ethernet, ARP Table, DHCP Lease Table, Routing Table, UPnP Port Mapping Table.

Figure 7: Status Page

LAN IP 1 Address Displays the primary IP address being used by the Local (LAN) port of the Router. The default is 192.168.1.254

LAN Netmask 1 Displays the IP Subnet Mask being used by the Local (LAN) port of the router. Default is 255.255.255.0

LAN IP 2 Address Displays the alternate IP address being used by the Local (LAN) port of the Router

LAN Netmask 2 Displays the alternate IP Subnet Mask being used by the alternate Local (LAN) port of the router.

LAN DHCP Status Identifies if the Router's built-in DHCP server is active for the LAN attached devices.

LAN DHCP Start IP The starting IP number in the range possible IP addresses issued by the DHCP server

LAN DHCP End IP The last IP number in the range possible IP addresses issued by the DHCP server

The LAN Ethernet Status Tab

On the LAN Ethernet Status the Router displays the Ethernet Status of the current LAN current connection.

Figure 8: LAN Status

MAC This field displays the MAC address used by the LAN port of the router.

MTU This specifies the maximum size of the packet permitted for Internet transmission.

Rx packets The number of data packets received by the AP.

Tx packets The number of data packets transmitted by the AP.

Rx bytes The current bandwidth (receive) on the LAN port.

Rx bytes The current bandwidth (transmit on the LAN port.

The WAN Ethernet Status button

Figure 9: WAN Status

MAC The field displays the MAC address used by the WAN port of the router.

MTU The maximum size of the packet sent from your computer to the Internet.

Rx packets The number of received packets of this port after

resetting or manually initial.

Tx packets The number of transmitted packets of this port after resetting or manually initial.

Rx bytes The current bandwidth (receive) on the WAN port.

Rx bytes The current bandwidth (transmit) on the WAN port.

The Wireless Status

Figure 10: Wireless Status

MAC The field displays the Wireless MAC address of the router.

Rx packets The number of received packets of this wireless port after resetting or manually initial.

Tx packets The number of transmitted packets of this wireless port after resetting or manually initial.

Rx bytes The current reception bandwidth on the Wireless LAN.

Rx bytes The current transmission bandwidth on the Wireless LAN.

ARP Table Tab

The **ARP Table** displays the associated MAC address and IP address pairs of your local network devices. In the example below, only the BR03GM AirCruiser MIMO Router is in the ARP Table.

Figure 11: ARP Table

DHCP Lease Table Tab

The DHCP server "leases" out address for specific times (Time To Live) to the various hosts. If a host does not use a given address for some period of time, that IP address can then be assigned to another machine. When assignments are made or changed, the DHCP server must update the information in the DNS server. The BR03GM DHCP Lease Table displays the associated

IP/MAC assignment and Time To Lease.

Figure 12: DHCP Lease Table

IP Address DHCP assigned IP address on WLAN

MAC Address MAC address of the device with the assigned IP

TTL The time to live (TTL) in seconds that a resolver will use data received from a nameserver before it will ask for the same data again.

Routing Table Tab

To determine the best path to a distant network, the BR03GM uses RIP to always select the path that has the least number of hops. Each router that data must traverse is considered to be one hop. The routing table in a router using RIP contains an entry for every known destination network. The **Routing Table** displays the GN-BR03GM RIP routing details.

Figure 13: Routing Table

Destination The IP address of the destination network address

Netmask The subnet of that destination IP address

Gateway Gateway of the destination IP address

Metric Hop count to the destination network

Interface Type of interface used

UPnP Port Mapping Table

The UPnP specification is based on TCP/IP and Internet protocols that let devices communicate with each other - UPnP technology doesn't rely on specific device drivers, using instead these standard protocols. UPnP devices can automatically configure network addressing, announce their presence on a network subnet, and permit the exchange of device and service descriptions. The **UPnP Port Mapping Table** displays the GN-BR03GM port mapping and UPnP packet request details.

No. The event number

Figure 14: UPnP Port Mapping Table

Status Current status of the UPnP port (enable/disable)

Client IP The IP address of the client utilizing the port

Protocol IP protocol (UDP/TCP)

External Port The external port mapping

Internal Port The Internal port mapping

Remote Host IP The IP of the remote host (if applicable)

Lease Time Length of time the port may be utilized for UPnP

Create Time Time the port was established for UPnP

Description UPnP process

The Network Configuration Screen

The **Network Configuration** screen consists of three areas: **LAN Configuration**, **WAN Configuration** and **WAN settings**.

The LAN Configuration Tab

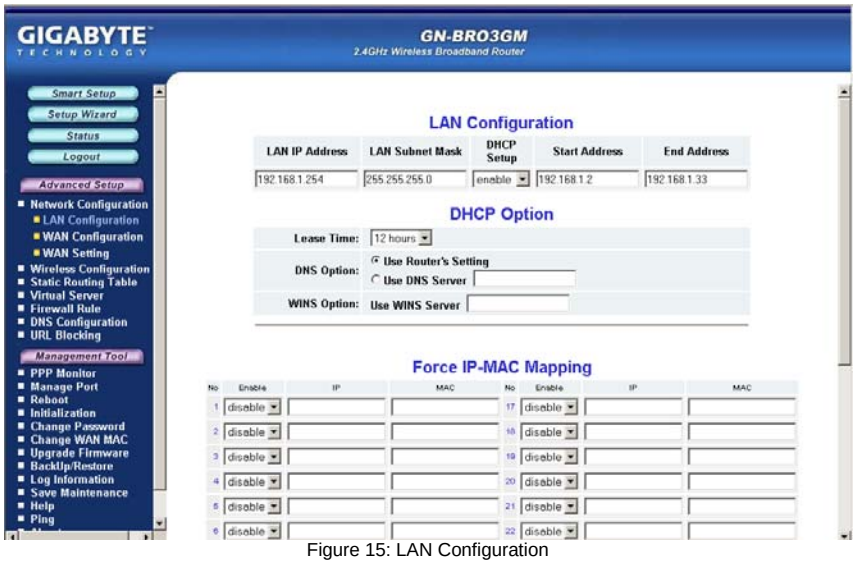


Figure 15: LAN Configuration

LAN Configuration
Allows you to modify the LAN parameters, and if you want to enable DHCP automatic IP address assignments, you can enable it here, and specify a Start and End address for the IP range.

DHCP Option
The DHCP server "leases" out address for specific times (Time To Live) to the various hosts. If a host does not use a given address for some period of time, that IP address can then be assigned to another machine. When assignments are made or changed, the DHCP server must update the information in the DNS server. The AirCruiser G DHCP Lease Table displays the associated IP/MAC assignment and Time To Lease.

Force IP-MAC Mapping
Allows you to manually assign a specific IP address to a specific network device (MAC address) on the network. This will be updated in the ARP table automatically.

The WAN Configuration Tab

Figure 16: WAN Configuration

The BR03GM has many advanced WAN configuration features. As a special redundant feature, you can configure up to 4 WAN connections and each may have its own connection type (PPPoE, PPPoE Unnumber, Dynamic IP address, Static IP address) and other properties. The device can automatically attempt to connect to these in order if your primary connection fails.

Click the **Edit** button to the right of the ISP that you wish to modify. A screen will appear allowing you to change the Internet connection type. (see below) Click the **Next** button to continue with modifications.

Figure 17: WAN Type Select

Depending on the WAN type you select, the corresponding WAN setup screen will appear next.

WAN Configuration Tab – Dynamic IP Address

Figure 18: Dynamic IP Address

Your Internet Service Provider will supply you with the following account information you will need:

- ISP Name
- Host Name
- Gateway
- DNS1 and DS2 Address
- DNS Domain Name

Enter the information provided by your ISP in the spaces provided.

MTU (Maximum Transmission Unit)
The largest packet unit is sent from your computer to the network. Any message larger than MTU will be divided into smaller packets before being sent. You should keep the default setting (1500). Setting MTU size is largely a process of trial-and-error: If you suspect your MTU setting is causing a connection problem, start with the maximum value of 1500, and then reduce the size down to 1400 until the problem goes away.

NAT Setup
The Network Address Translation (NAT) is a standard that allows multiple computers on a private network to share a single IP address.
Universal Plug and Play (UPnP) is a technology based on Internet standards and technologies, such as TCP/IP, HTTP, and XML, that allows devices on a network to automatically connect with other devices.

UPnP Delete Time
Select the duration that UPnP will be active. Since allowing this may present a security risk, the default setting is 0.

If the WAN IP address and LAN IP address obtained from DHCP server are from the same subnet, the LAN IP address will *automatically* change to another subnet and reboot the router.

WAN Configuration Tab – PPPoE

Figure 19: PPPoE

Your Internet Service Provider will supply you with the following account information you will need:

- ISP Name
- User ID/Password
- Service Name
- AC Name
- DNS1 and DNS2 Address
- DNS Domain Name

Enter the information provided by your ISP in the fields provided.

Authentication Type
Select one of the following authentication settings: Auto, CHAP or PAP. The default setting is “Auto” (automatic authentication).

Challenge Handshake Authentication Protocol (CHAP) is the most common authentication method using PPP dialup method. With CHAP, the server will send a challenging signal to a remote Router, which will send back an encryption key.

Password Authentication Protocol (PAP) is a simple PPP authentication protocol allowing a Router to send a simple user ID and password to another Router for authentication. PAP has been defined in RFC1334.

Connection

Automatic When the GN-BR03GM is powered on, it automatically establishes a connection with the network. If the link becomes disconnected for any reason, the GN-BR03GM will re-connect automatically.

Manual When you click “connection”, the system will establish a connection to the network. If the link becomes disconnected for any reason, the GN-BR03GM will **not** re-connect automatically.

Dial on Demand

Enable When there is no Internet activity for a period, the WAN connection will automatically end. If a browser is launched again, the GN-BR03GM will automatically connect to Internet.

Disable When there is no Internet activity for a period, the WAN connection will automatically end. If a browser is launched again, the GN-BR03GM will **not** automatically connect to Internet.

WAN Configuration Tab – Static IP Address

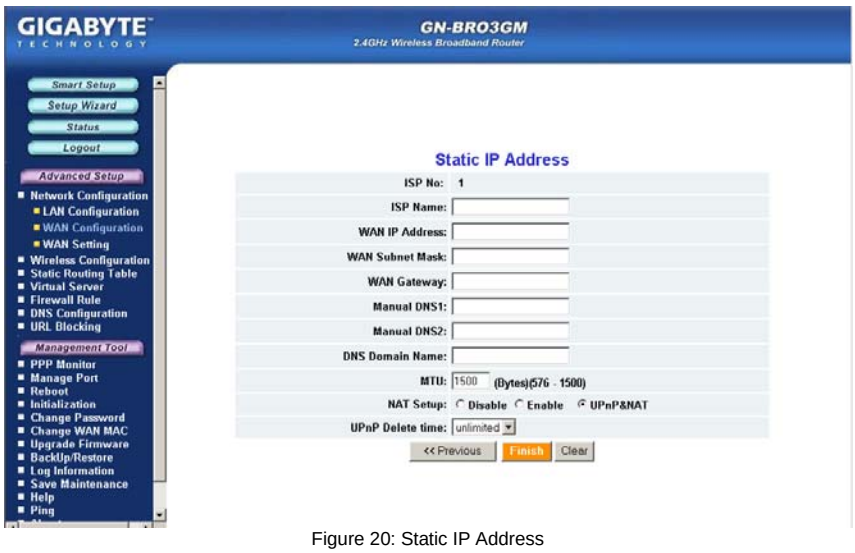


Figure 20: Static IP Address

Your Internet Service Provider will supply you with the following account information you will need:

- ISP Name
- WAN IP Address
- WAN Subnet Mask
- WAN Gateway

- DNS1 and DNS2
- DNS Domain Name

This information is all provided by your ISP. In the event that your ISP has assigned you several Static IP addresses, you will only need to one.

WAN Configuration Tab - PPPoE Unnumber

PPPoE Unnumbered is a PPPoE service provided by some ISPs. The BR03GM supports services that provide multiple global IP addresses. When using PPPoE Unnumbered, you can have up to 16 Global IP address depending upon your ISP's service policy. Among these Global IP addresses, one is used as Router's WAN IP address and the others can be used by the downstream clients of the Router.

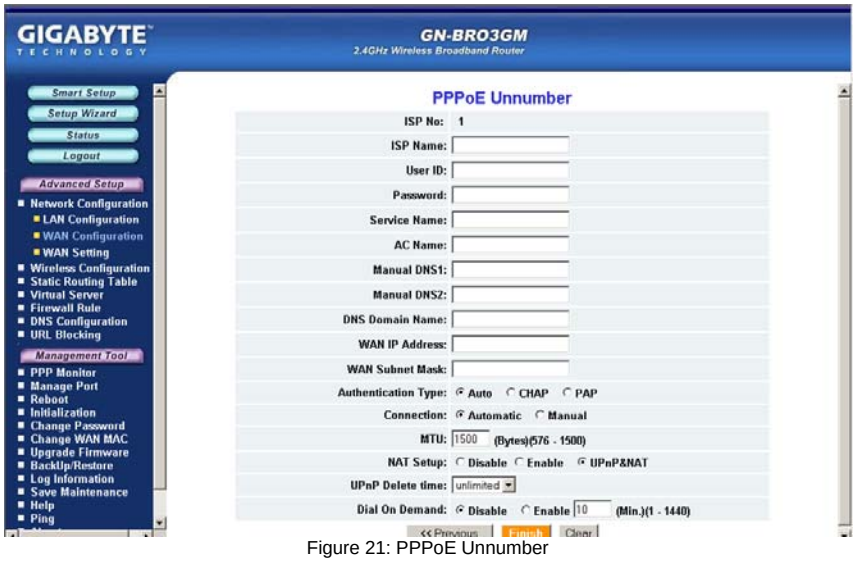


Figure 21: PPPoE Unnumber

Your Internet Service Provider will supply you with the following account information you will need:

- ISP Name
- User ID/Password
- Service Name
- AC Name
- DNS1 and DNS2
- DNS Domain Name
- WAN IP Address

- WAN Subnet Mask

Enter the information provided by your ISP for each of your Global IP's, then click next to proceed to enter additional IP's.

The WAN Settings Tab - WAN Multi-Session Select

The WAN Multi-Session Select Tab displays the settings of the **Main Session** and **Backup Session**.

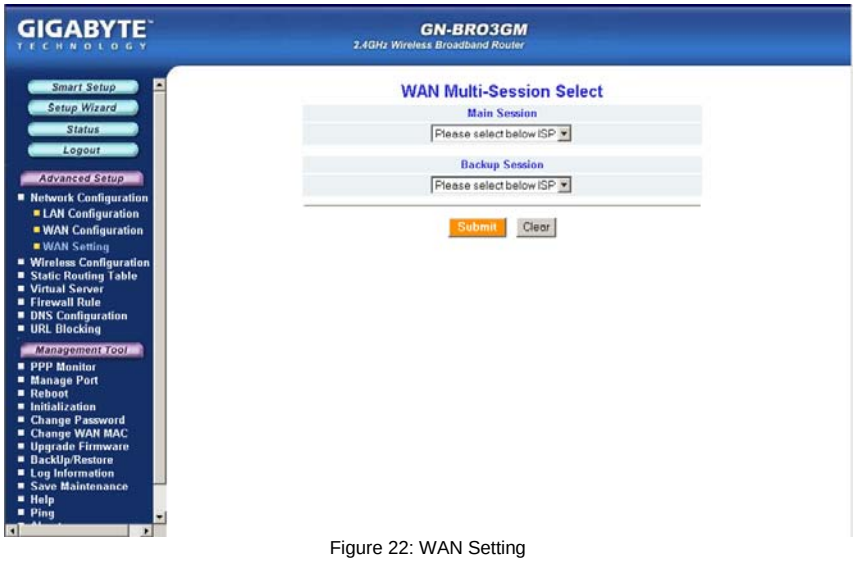


Figure 22: WAN Setting

Select a WAN connection type for the Main Session from the drop-down menu and select Backup Session type. The Backup Session will become active if the Main Session fails to establish a connection to the Internet.

In the event that neither the Main Session nor the Backup Session can successfully establish a connection with your ISP, the following process will apply:

Automatic: Main -> Backup, Main -> Backup (repeat) Attempts to establish connection is repeated until successful.

Manual: Main -> Backup (Backup Session attempts only once)

The Backup Session can have a specific LAN type connection assigned.

The Wireless Configuration Screen

The **Wireless Configuration** screen allows you to configure the Router's WLAN function.

The 802.11g Tab

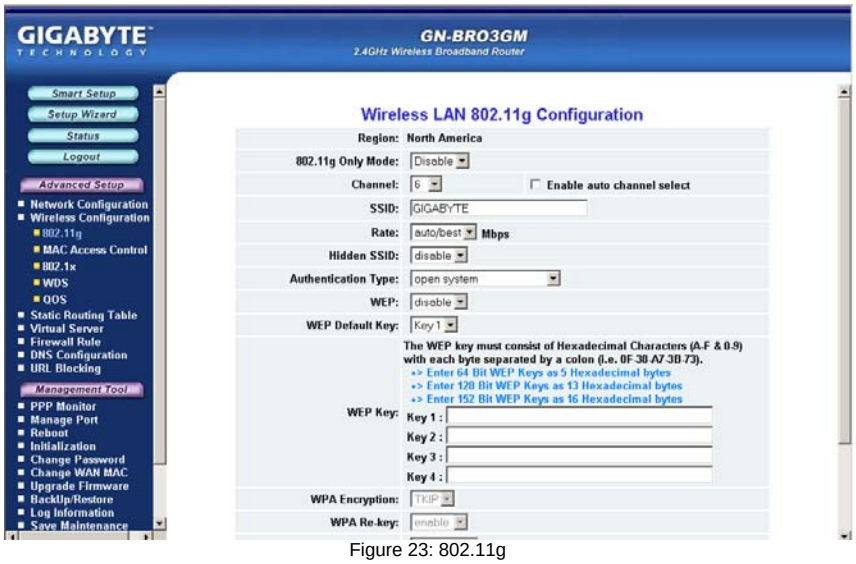


Figure 23: 802.11g

Region
Indicates the geographical region you are in. Verify that the region indicated is correct. If not, please contact your local distributor or dealer immediately.

RF Type
Select the radio frequency (RF) standard or 'wireless mode' from the drop-down list. 802.11g Mixed: Supports both11b and 11g simultaneously, also working with devices from different vendors.

802.11g Only Mode
The mixture of both 11b and 11g traffic on your wireless network results in the former reducing the performance of the latter. For this reason, the BR03GM 802.11g Only Mode allows you to restrict all traffic to 11g (54Mbps) traffic only. Keep in mind, however that enabling this feature comes at the expense of eliminating all 11b based traffic will be received or transmitted by the BR03GM. Enable will restrict all traffic to 802.11g traffic, while disable will allow a mixture of both 11b and 11g. The default setting is disable.

Channel
The channel may be manually changed (if there are other wireless networks

operating in your area) by selecting a channel from the drop-down list.

SSID
The SSID (Service Set Identifier) is the name of your wireless network. The SSID is up to 32 ASCII characters in length and case sensitive (i.e. Letters in upper case “A~Z” and lower case “a~z” are unique). The default SSID is “GIGABYTE”. To change the SSID, type in the SSID you want to use in the SSID field and click Submit. If you make a change to the SSID, any wireless devices on your network must also be reconfigured to connect to the new network name.

Rate
Select a wireless data transmission rate from the drop- down list. The default setting auto/best automatically detects and sets the optimum transmission rate.

Hidden SSID
For security purposes, you may choose to hide your network’s SSID by selecting enable from the drop-down list. This will prevent computers scanning for the presence of wireless networks to detect your network name. The default setting is disable.

Authentication Type

Select an authentication type from the drop-down list. The default setting is Open System.

Open System: The sender and the receiver do NOT share a secret key. Each party generates its own key-pair and asks the receiver to accept a randomly generated key. Once accepted, this key will only be used for a short period of time. Afterwards, a new key will be generated and agreed upon.

Shared Key: Authentication is based upon a secret key shared by both the sender and the receiver. If Shared Key is selected, you cannot choose the WEP disable option.

WPA Pre-shared key:, The WPA Pre-shared Key authentication standard uses a password or “ key” between 8 and 32 characters. This encryption key is changed after every dialog box using the Temporary Key Integrity Protocol (TKIP), which allows users to change keys based on dialog box and automatically synchronize keys between devices on the network. The TKIP encryption algorithm is stricter than the one used by WEP but is based on the same standard.

WPA: The 802.1x authentication protocol, allows users to authenticate wireless network access through a RADIUS Server and is a required by WPA standard. If no RADIUS Server exists in your network environment, you still can use WPA through the use of WPA Pre-shared Key.

WEP Key
The GN-BR03GM supports two WEP standards: 64-bit and 128-bit. The 64-bits

encryption uses 40 bits as a secret key, (user-defined) and the remaining 24 bits are reserved. The 128-bits encryption uses 104 bits as a secret key, (user-defined) and the remaining 24 bits are reserved.

WPA Re-key
Enabling the requirement for WPA rekeying of a Passphrase for increased security. Default is disable.

WPA Re-key Timer
Specify time (in minutes) for expiration of the current WPA Key.

WPA PSK Passphrase
The Passphrase must be between 8 and 64 characters.

WPA PSK Re-key
A user without a RADIUS server, may specify generating a new WPA PSK key more frequently than each time he connects to the network.

WPA PSK Re-key Timer
Specify time (in minutes) for expiration of the current WPA PSK key

The MAC Access Control Tab

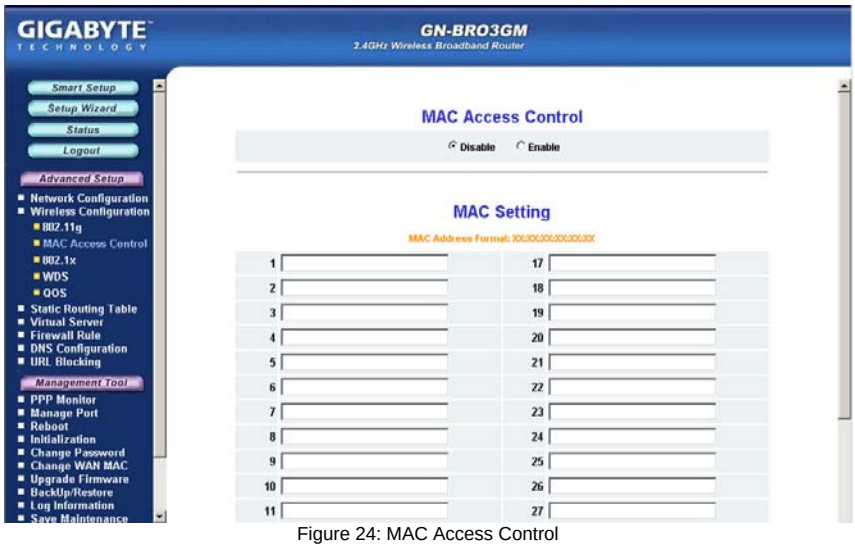


Figure 24: MAC Access Control

The **MAC Access Control** screen allows you to specify the Media Access Controller (MAC) address of up to 32 devices on your network. Only those devices listed in the table will have access to transmit data through the

GN-BR03GM. In this way, even if someone manages to obtain all the information necessary to connect to your network, if their MAC address is not permitted, they still cannot connect. Keep in mind, however that MAC addresses can be spoofed, so it is not a panacea but rather another component of your existing security process. Enable the feature, then key in the MAC addresses to be allowed. Enter the MAC in the form separated by colon. The default setting is **Disable**.

The Radius Server Configuration Tab

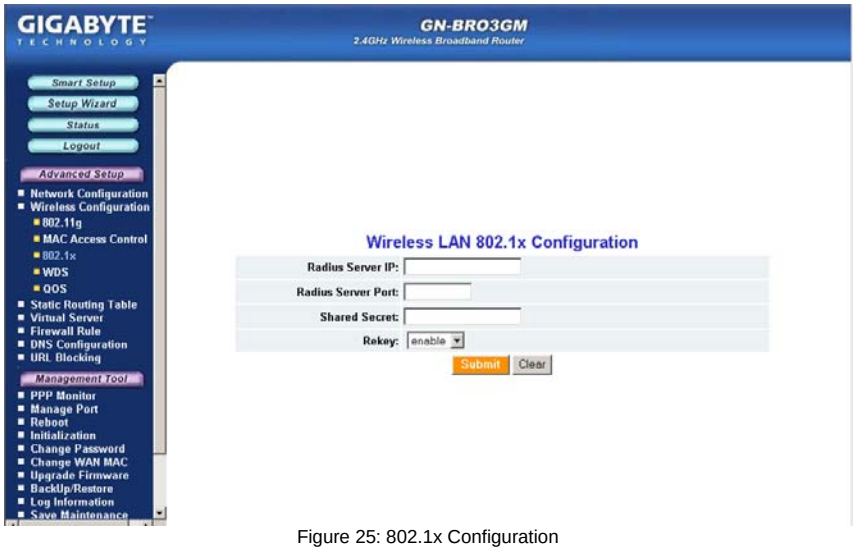


Figure 25: 802.1x Configuration

Your BR03GM supports 802.1x and RADIUS Server authentication. RADIUS provides a centralized, server-based authentication of client access to the network.

RADIUS Server IP Assign an IP address for the RADIUS Server.

RADIUS Server Port Enter a value within the range 1~65536 for the port.

Shared Secret Enter a password up to 256 characters (uppercase “A~Z”, lowercase “a~z” or numeric “0~9”) in length.

The WDS Tab

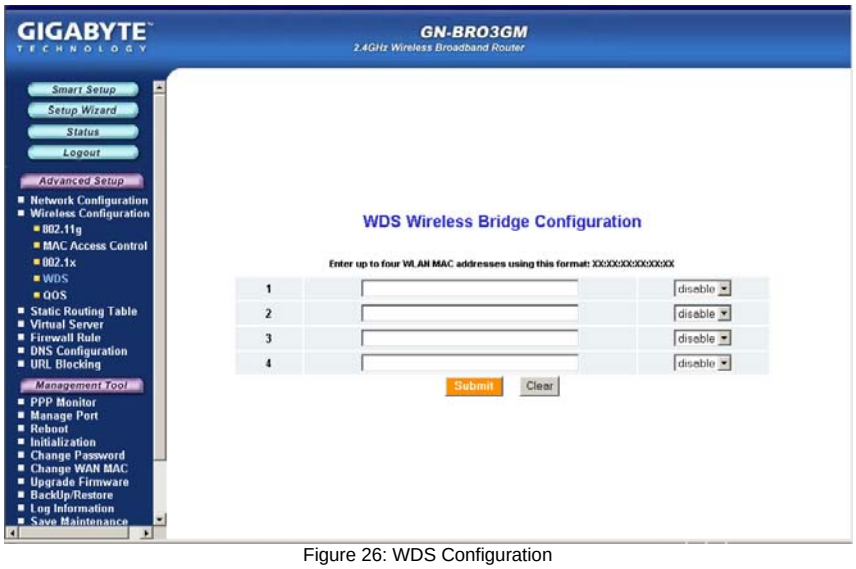


Figure 26: WDS Configuration

Wireless Distribution System (WDS) technology enables several access points to increase the coverage of a wireless network. Although enterprises or home users can reduce most wiring problems by using access points that support WDS, they still need cables to connect external ISP.

To use WDS, please make sure:

- ✓ All routers/AP's participating in the WDS must use the same RF Channel
- ✓ DHCP (if used) must only be enabled on the bridge Router and **not** on the node AP's.

Example: Suppose Router1 is connected to the DSL modem, and uses DHCP to dish out IP's to your WLAN. To use Router1 to bridge to a remote AP, key in AP's Wireless MAC Address in Router1's WDS configuration list and select "enable" then press Submit. In AP's LAN settings, disable DHCP and assure the AP uses the same RF Channel as the Router1. You should now be able to connect to Router1 through AP.

Note that bridging between different vendors wireless gear is not guaranteed. Your GN-BR03GM may only create a WDS environment with other Gigabyte Routers or GIGABYTE Access Points.

The Qos Tab

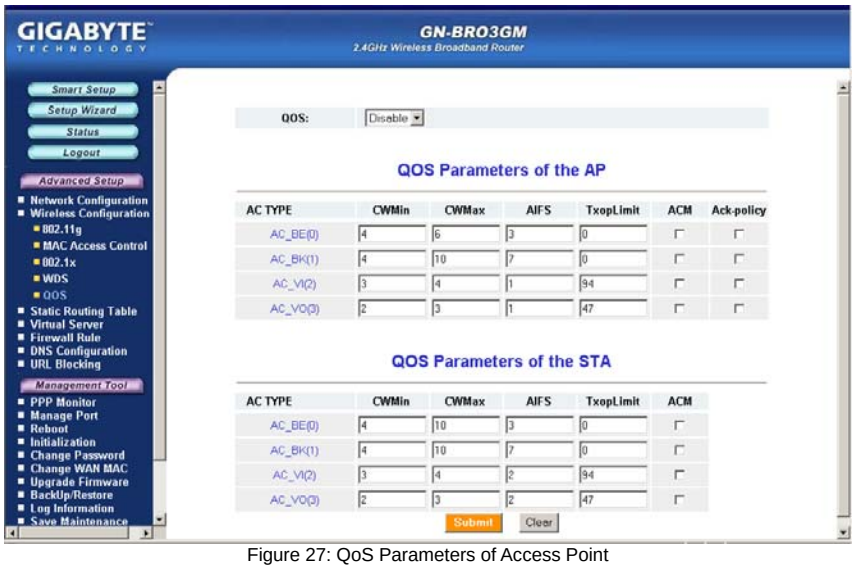


Figure 27: QoS Parameters of Access Point

Quality of Service. Required to support wireless multimedia applications and advanced traffic management. QoS enables Wi-Fi access points to prioritize traffic and optimize the way shared network resources are allocated among different applications.

WIth this feature, users can set the data frame transmission priority for Audio, Video, Background information and Best-Effort to achieve the best performance from your applications. **Warning:** The GN-BR03GM doesn't support VLAN Tag packet format and only support IPV4 DSCP (Differentiated Services Codepoint).

AC TYPE	Access Categories (VI,VO,BE and BK)
CWMin	Minimum of Contention Window
CWMax	Maximum of Contention Window
AIFS	Arbitration Inter Frame Spacing
TxopLimit	Limit time of Transmission Opportunity
ACM	Admission Control Mandatory
Ack-policy	Acknowledgment Policy (Normal ACK or No Ack)

The Static Routing Table Screen

The **Static Routing Table** displays the GN-BR03GM routing settings. To add or modify, enter a value into the field and click the **Submit** button.

Figure 28: Static Routing Table

Destination IP
Enter the Destination IP address that will be assigned to a specific network or host.

Netmask
Enter the netmask associated with the Destination IP.

Gateway
Enter an IP address that will be assigned to the interface connecting to subnets.

Metric
The “Metric” value is a number between 1and 15 that represents the number of Routers between your network and the destination. Generally, setting the Metric value as either 2 or 3 is sufficient for most applications. If this is a direct connection, please set the value to 1. The default setting is 1.

The Virtual Server Screen

The **Virtual Server** screen allows you to manage the virtual server settings of the GN-BR03GM. There are two virtual server options: 1. The router has only one IP address or, 2. The router has multiple IP addresses (8 or 16 in most instances). If you have only one IP address click on the **PPPoE/DHCP/Static** tab. If you have multiple IP addresses, click on the **PPPoE Unnumber** tab. The DMZ Support tab allows you to enable a Demilitarized Zone (Zone) on your network.

The DMZ Setting Tab

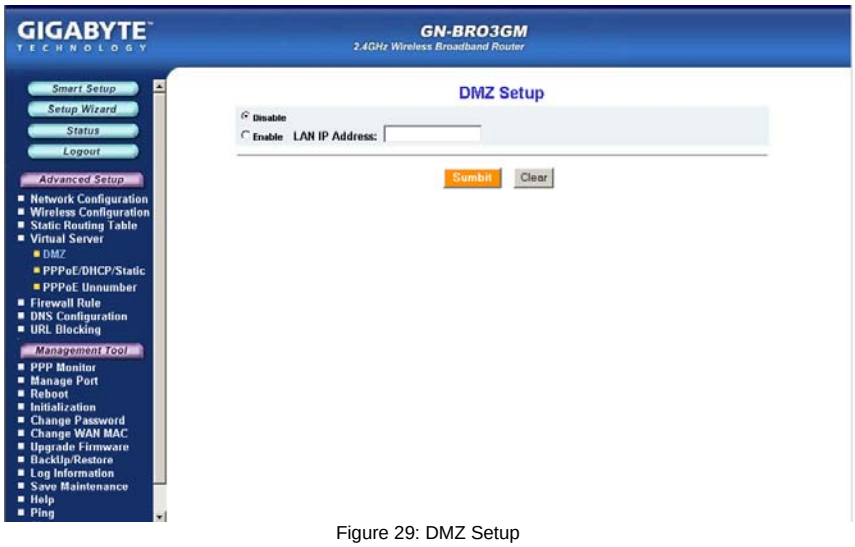


Figure 29: DMZ Setup

With a firewall setup, it sometimes necessary to place some clients (e.g. Internet games, video conferencing, or VPN connections) outside of the firewall while leaving the others protected. You can do this using a Demilitarized Zone. The DMZ feature allows you to specify the IP address of the computer that will be placed outside the firewall of your network. Enter the IP Address of your computer (e.g. 192.168.1.2) into the LAN IP Address field and click the **Submit** button.

	Note: DMZ servers pose a security risk. A computer designated as the default DMZ server loses much of the protection of the firewall, and is exposed to exploits from the Internet. If compromised, the DMZ server can be used to attack your network.

The Virtual Server PPPoE/DHCP/Static Configuration Tab

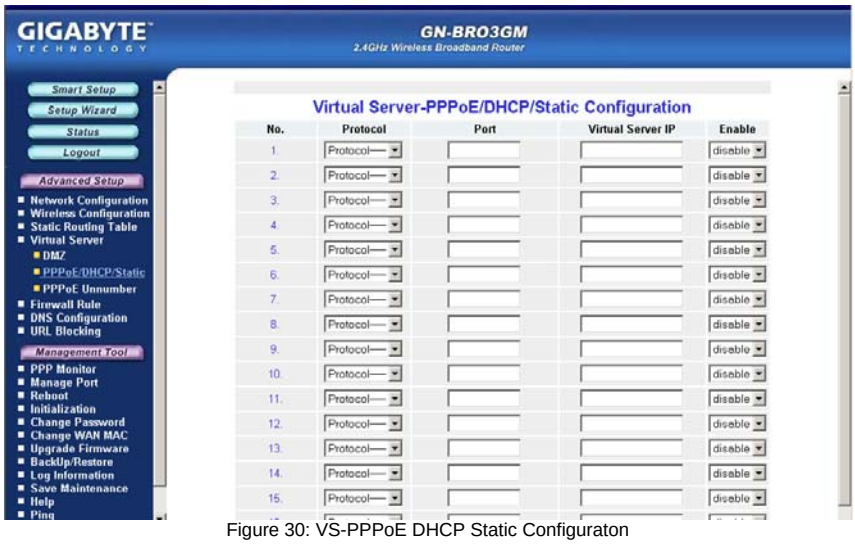


Figure 30: VS-PPPoE DHCP Static Configuraton

The BR03GM is configurable to behave as a Virtual Server, allowing remote computers on the WAN (Internet) side of the network to be automatically redirected to local server(s) on the LAN (your private network) side of the network.

Protocol The protocol used for the virtual service

Port The port number of the service used by the PC on the LAN side.

Virtual Server IP The server computer in the LAN that will be providing the virtual services

For example, if you have an FTP server on the LAN side you wanted Internet users to access, suppose the PC has a local IP address of 192.168.1.1, you would use the following virtual server settings:

- Protocol: TCP
- Port: 21 (FTP uses port 21)
- Virtual Server IP: 192.168.1.1
- Enable: enable

The PPPoE Unnumber Tab

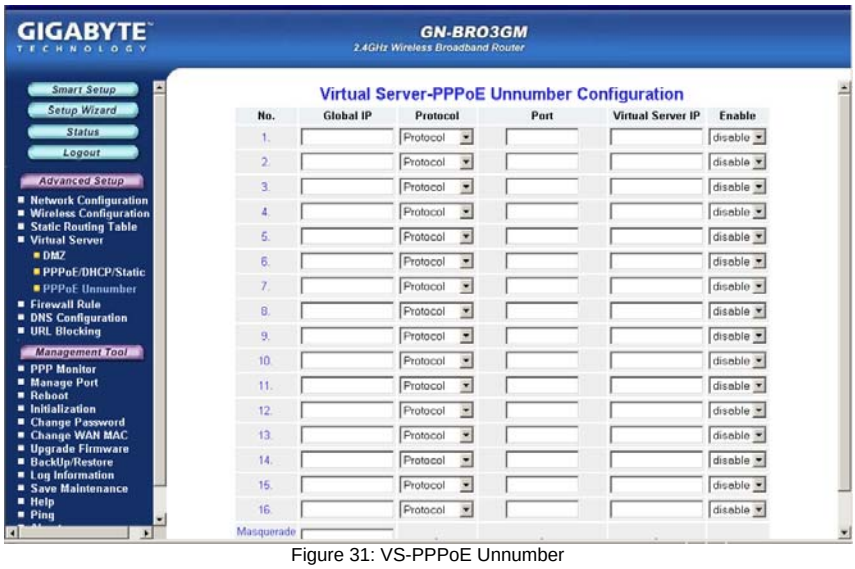


Figure 31: VS-PPPoE Unnumber

Advanced feature of the BR03GM is that it supports services that offer multiple global IP addresses, with each IP address requires its own setting. This feature is normally only found on enterprise class routers. The BR03GM has an IP allocation scheme capable of directly assigning global IP to LAN clients.

You can only take advantage of this feature if your ISP service packages will provide you with a range of valid "Global IP". (For example **61.222.10.1** ~ **61.222.10.7)** These seven addresses can be individually configured.

Global IP An IP within the range of IP's assigned to you by your ISP

Protocol The protocol used for the Unnumbered service

Port The port number of the service used by the LAN side

Virtual Server IP The computer on the LAN that will be providing the Unnumbered virtual services

Example: Taking the IP address of 192.168.1.1 of a PC connected to the BR03GM for example would use the following settings:

- Global IP: 61.222.10.2
- Protocol: TCP
- Port: 21

- Virtual Server IP: 192.168.1.1
- Enable: enable

The Global IP 61.222.10.2 is now directly assigned to the FTP server at the IP address 192.168.1.1 located within the BR03GM's LAN.

The Firewall Rule Screen

The Firewall Rule screen displays your network security settings. Use this screen to create network security policies to prevent unauthorized access to your network.

The Security Configuration Tab

Select security configuration options from this page including **Security One-Touch Setting**, **Stealth Mode** and **Unlawful Computer Access Detection**. You can select with one click a 'High" "Medium" or "Low (off)" level of Security. You can fine tune your security level settings with the One-touch Settings section. Just check /uncheck the boxes to include/remove that particular setting.

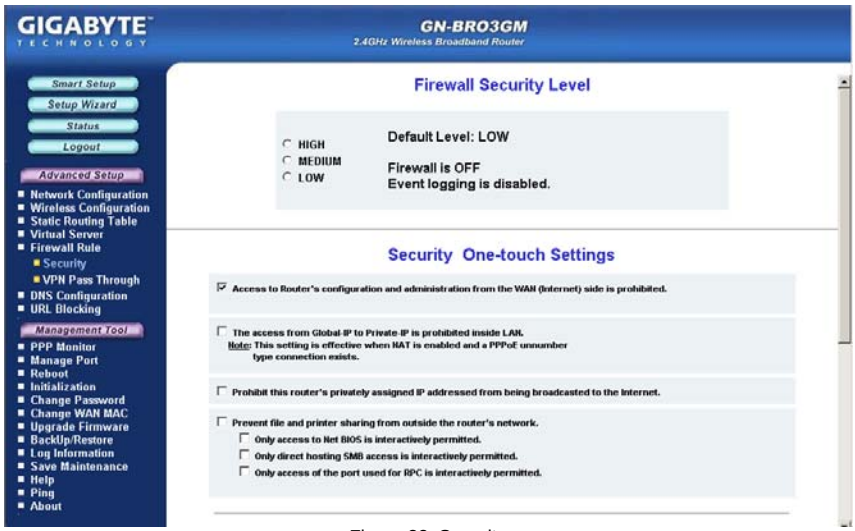


Figure 32: Security

The VPN Pass Through Tab

Figure 33: VPN Pass Through

A Virtual Private Network (VPN) is a type of secured private network connection, built upon publicly-accessible infrastructure such as the Internet. They usually provide connectivity to various devices behind a gateway or firewall.

The GN-BR03GM supports Internet-industry standard technologies to provide open and interoperable VPN solutions, including Internet Protocol Security (IPSec), Layer 2 Tunneling Protocol (L2TP) and Point-to-Point Tunneling Protocol (PPTP).

PPTP Pass Through setting
Point-to-Point Tunneling Protocol (PPTP) allows you to establish a connection to an enterprise network. To allow PPTP tunnels to pass through the Router, click Enable and key in the Router's IP address.

IPSec Pass Through setting
IP Security (IPSec) provides authentication and encryption. Since it is mainly a Layer 3 technology, it can secure all data on the network. To allow IPSec tunnels to pass through the Router, click Enable and key in the Router's IP address.

L2TP Pass Through setting
Layer 2 Tunneling Protocol (L2TP) is an extension of the Point-to-Point Tunneling Protocol and is also used to establish virtual private networks. To allow L2TP tunnels to pass through the Router, click Enable, and key in the Router's IP address.

The DNS Configuration Screen

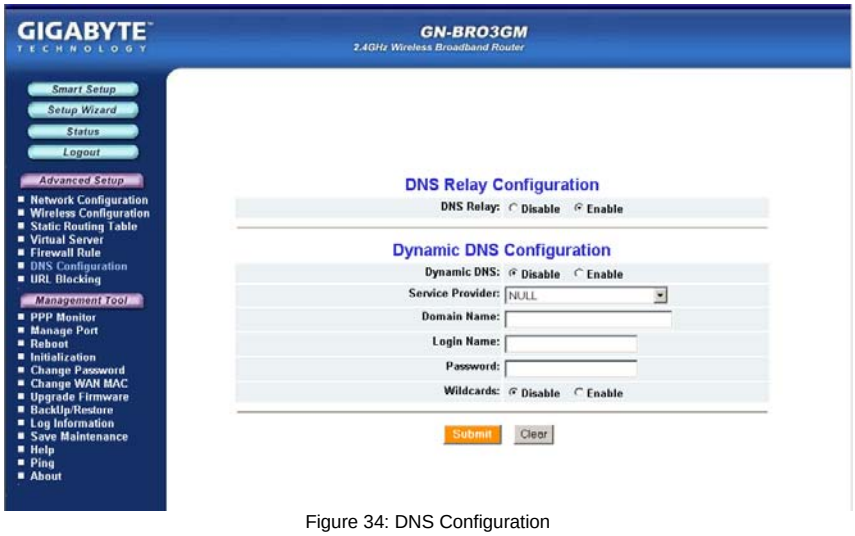


Figure 34: DNS Configuration

DNS Relay
DNS Relay will set your PC's DNS entries to point to the Router's Gateway address, which will then forward DNS queries to the DNS server used by the Router. This is needed when using DHCP to assign IP address to the PC's in you LAN. The default value of DNS relay is **Enable**.

Dynamic DNS
The GN-BR03GM offers a **Dynamic Domain Name Server** (DDNS) service that allows you to assign a fixed host and domain name to a dynamic Internet IP address. This gives Internet users the ability to connect with a virtual sever using a FQDN, rather than with an IP address. Before using this feature, you must first register an account with the dynamic DNS service. (http://www.dyndns.org)

Service Provider From this pull down menu, enter the DDNS service with which you have membership.

Domain Name This is the DDNS URL assigned by the DDNS service.

Login Name Enter the User Name for your DDNS account.

Password Enter the Password for your DDNS account.

Wildcards If your dynamic DNS provider allows using wildcards in resolving your URL, you may select Enable to activate this function.

The URL Blocking Configuration Screen

The URL Blocking Configuration screen allows you to restrict access based upon specific web addresses and/or keywords.

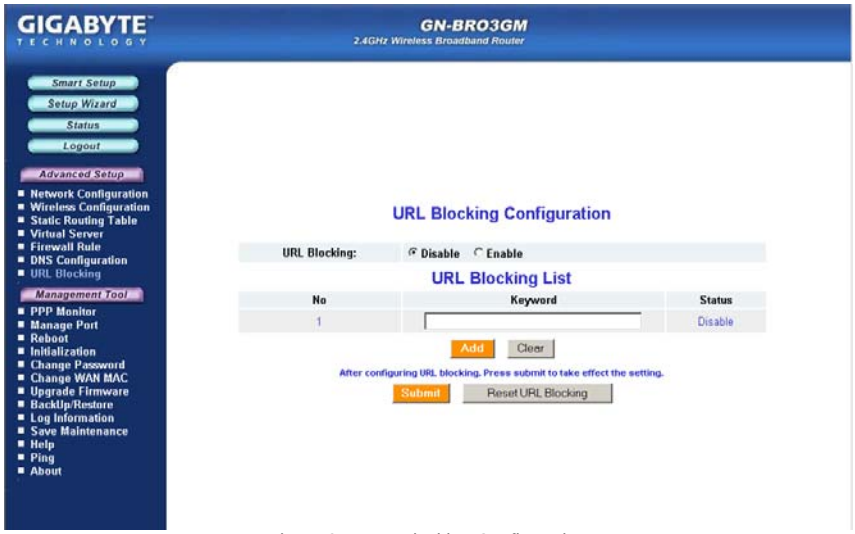


Figure 35: URL Blocking Configuration

To activate the **URL Blocking** feature:

Disable/Enable Select the **Enable** option to enable.

Monitor Port Select port 80 to monitor the World Wide Web

Keyword Enter the keyword or domain in the Keyword field that you wish to block.

All URL's with those keywords in the DOMAIN name will now be blocked.

Chapter 7
Using Management Tools

Overview

Management Tool Screens offer management of the Router itself, such as Firmware Updates, Initialization, and Password administration etc.
The instructions in this chapter will help you how to use the management tools of the web-based utility to effectively manage your GN-BR03GM AirCruiser MIMO router.

The PPP Monitor Screen

The **PPP Monitor** screen displays the WAN (Internet) connection status. Click the **Disconnect** button to end your current session. Click the **Connect** button to re-connect to the ISP.

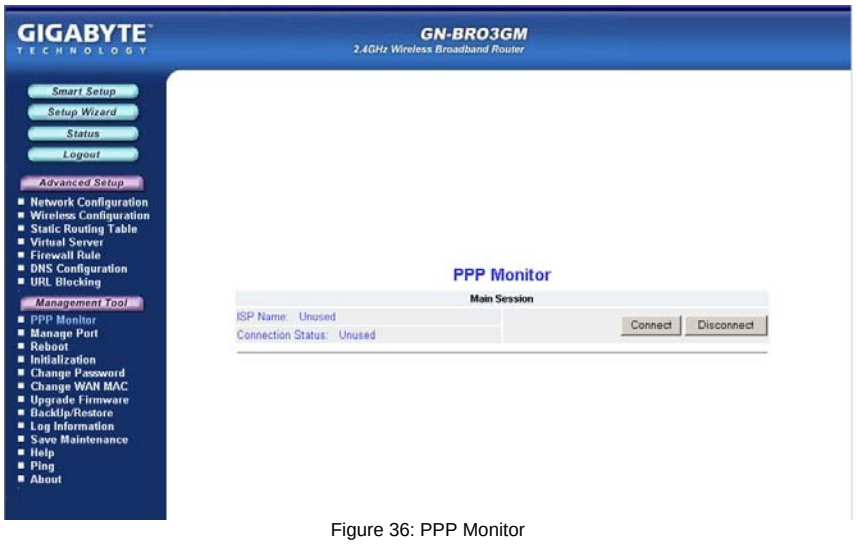


Figure 36: PPP Monitor

Manage Port Configuration Screen

The **Manage Port Configuration screen** allows you to change the port on which the Router's configuration utility runs. The default is Port 80 but users can change this to any port they wish (like 8080, 8000 or else port). In this case, to access the Router configuration utility, you would type http://192.168.1.254:8080

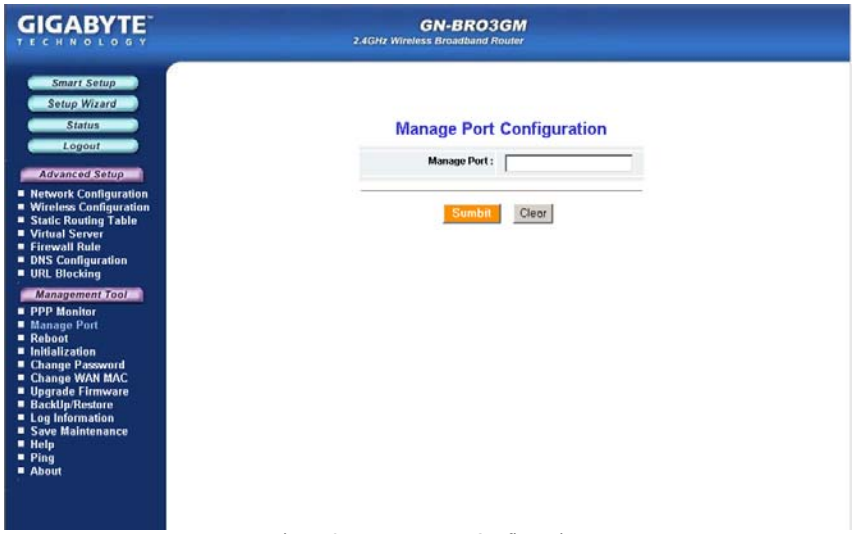


Figure 37: Manage Port Configuration

The Reboot Screen

The Reboot screen allows you to reboot the GN-BR03GM. You are also automatically brought to this screen after you confirm OK to any change of Router settings.

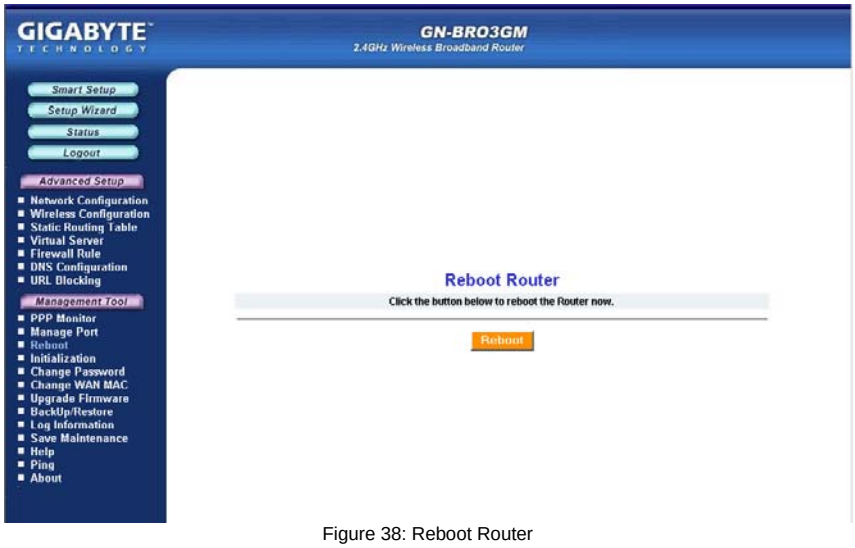


Figure 38: Reboot Router

The Initialization Screen

The **Initialization** screen allows you to reset the GN-BR03GM back to its original factory settings. To initialize the router, use the tip of a pencil or a paperclip to press and hold the **init** button for 5 seconds. (The init button is located on the side of the unit, next to the AC power input).

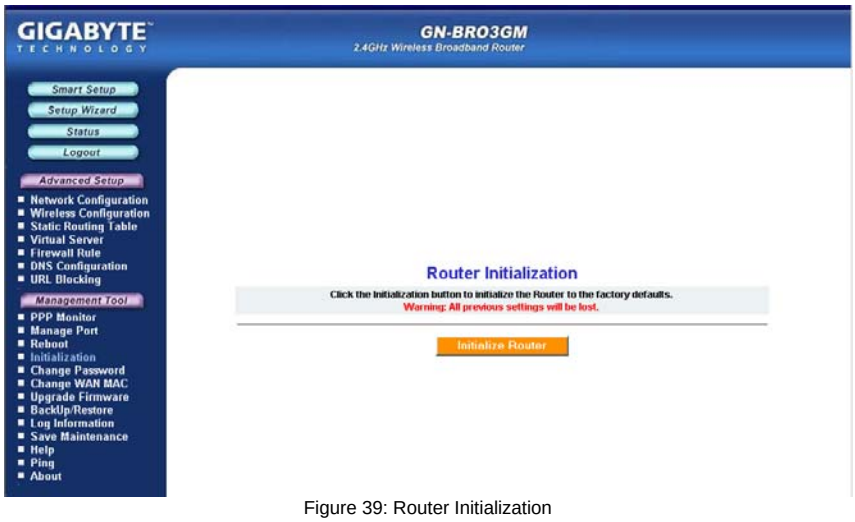


Figure 39: Router Initialization

The Change Password Screen

The **Change Password** screen allows the administrator to create a new password for the GN-BR03GM. To change an existing password, enter your account and new password and after re-typing the password to confirm, click the **Submit** button.

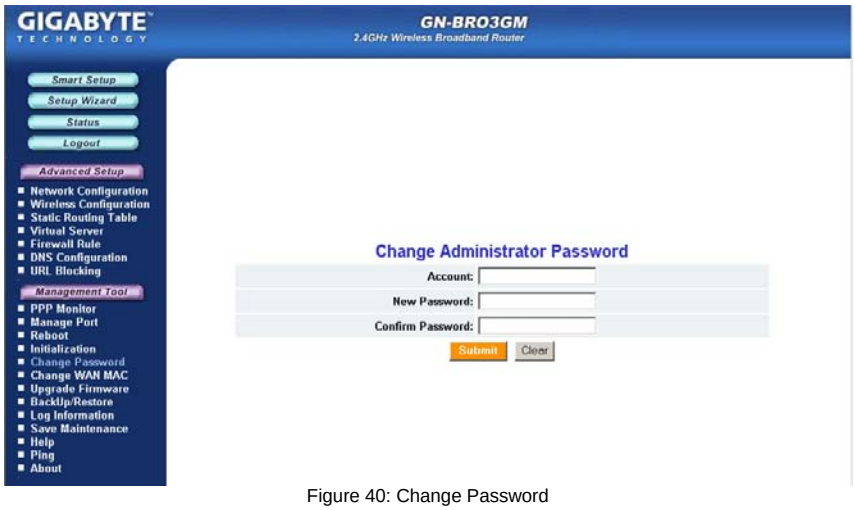


Figure 40: Change Password

The Change WAN MAC Screen

The **Change WAN MAC** screen allows you to assign a new MAC address. If your ISP requires MAC address authentication, chose the **Assign WAN MAC** option and enter the ISP authorized MAC address in the **New WAN MAC Address** field and click the **Submit** button. If you want to restore the factory default MAC address, choose the **Restore Default WAN MAC** option and click the **Submit** button.

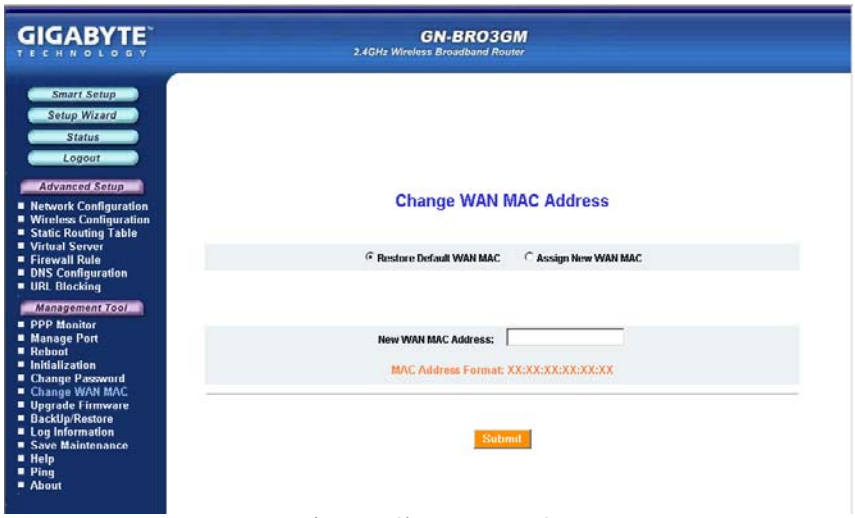


Figure 41: Change WAN MAC

The Upgrade Firmware Screen

The Upgrade Firmware screen allows you to update the current GN-BR03GM firmware to the latest version directly from the GIGABYTE website. Click the Browse button to locate the firmware file which you just downloaded from the GIGABYTE website, and then click **Upgrade**. Warning: Assure you are installing the correct firmware version.

Figure 42: Upgrade Firmware

The Backup / Restore Screen

The **Backup / Restore** screen allows you to save the current configuration settings of the GN-BR03GM as a temp file onto your computer. To revert the GN-BR03GM to back to a previously saved configuration settings, click the **Browse** to locate the saved configuration file. Then, click the **Restore** button.

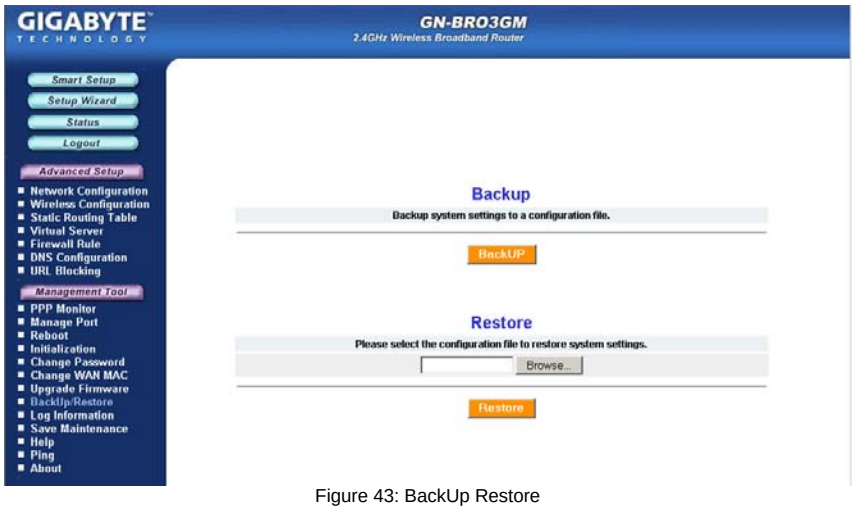


Figure 43: BackUp Restore

The Log Information Screen

The GN-BR03GM has advanced firewall features, and can effectively prevent intruders and unwanted attacks on your network, while keeping logs of all such attempts including all legitimate WAN connections and UPnP logs. Click on **Firewall Log**, **WAN Connection** or **UPnP Log** to view the list.

The Firewall Log Tab

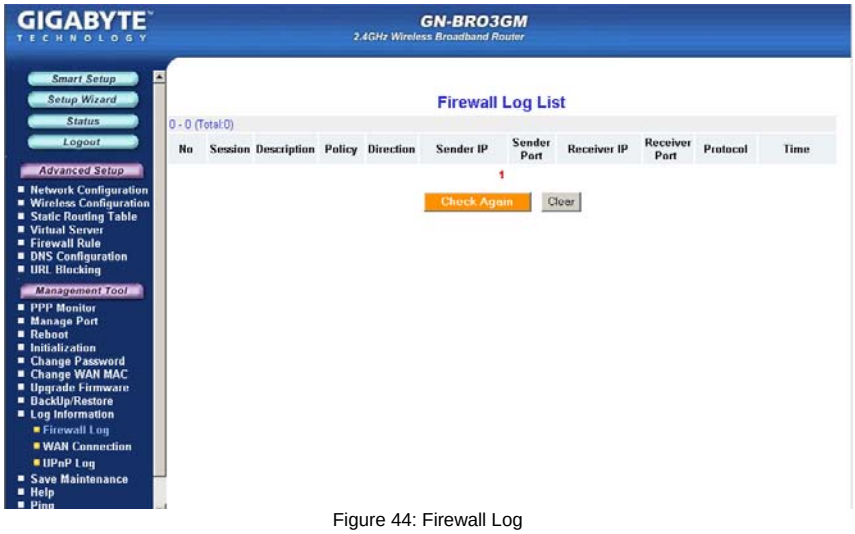


Figure 44: Firewall Log

The WAN Connection Tab
In the WAN connection Log, all logins are chronologically ordered, with indications of connection type and event type.

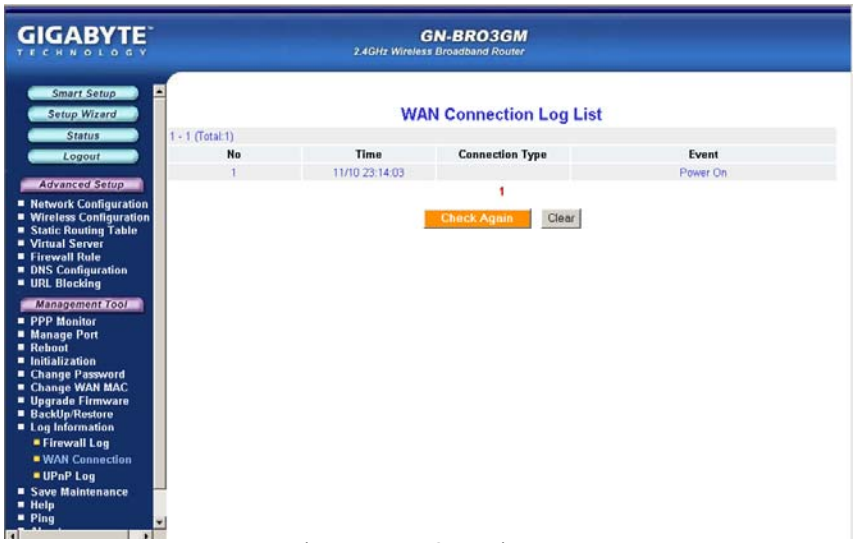


Figure 45: WAN Connection Log

The UPnP Log Tab
The Universal Plug and Play log screen records and displays UPnP packets reaching your BR03GM. It logs details such as Source IP, time of connection, connection status, external port and protocol for LAN port(s) that are UPnP enabled. To refresh the list, press “Check Again”.

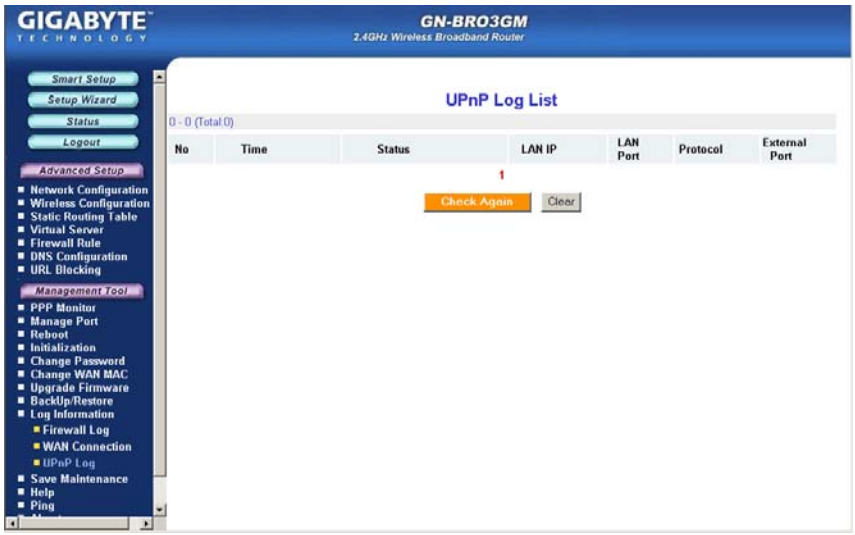


Figure 46: UPnP Log

The Save Maintenance Screen

The Save Maintenance screen allows you to save logs and status information as a file which can then be sent to the Technical Support team at GIGABYTE.

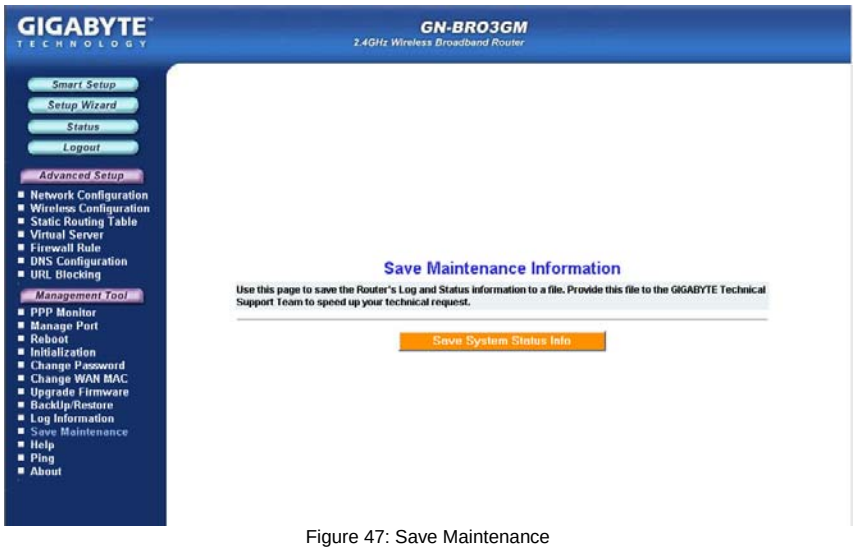


Figure 47: Save Maintenance

The Ping Screen

'Pinging' involves sending a packet of data to a site and recording how long it takes for the site to acknowledge receipt. This is useful if you think that a web site might be slow or unavailable. Type the IP Address and click the Ping to start.

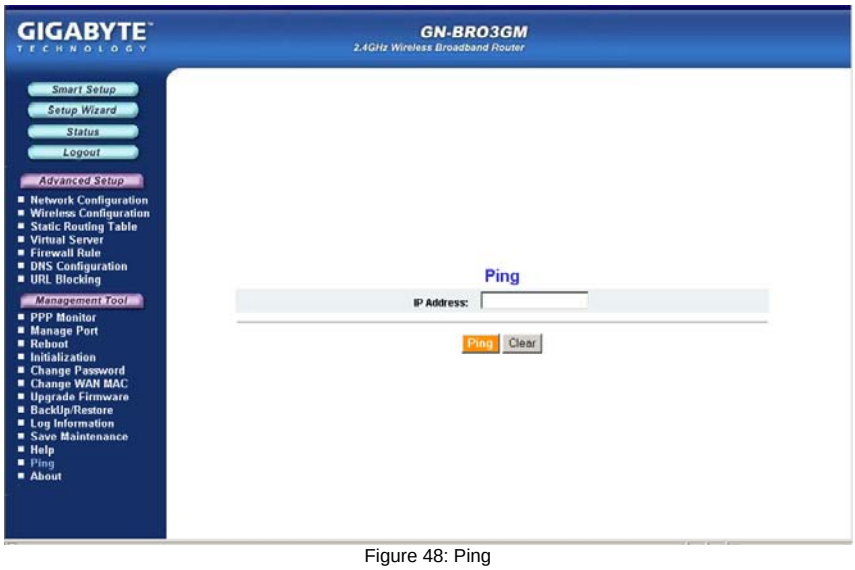


Figure 48: Ping

The Help Screen

The **Help** screen is where you can access online guide to assist in configuring the GN-BR03GM.

Figure 49: Help

The About Screen

The **About** screen displays the Router model name and firmware version.

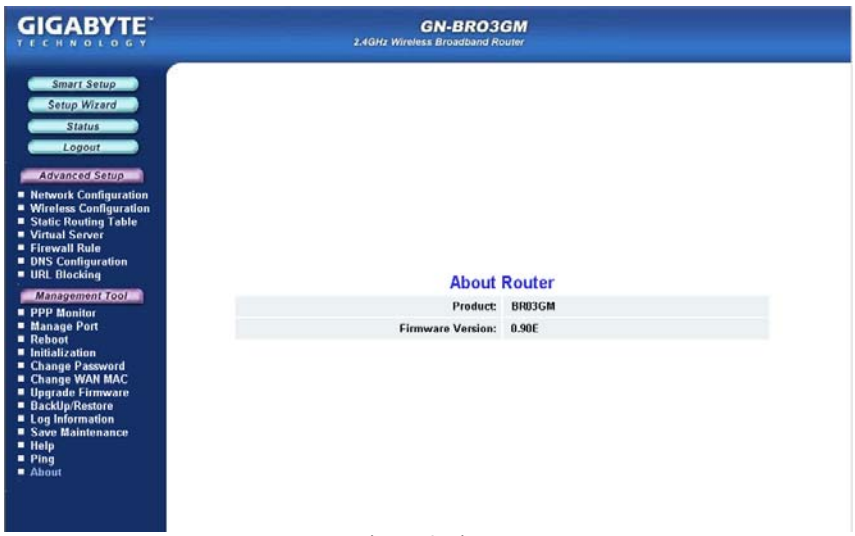


Figure 50: About

Appendix A
FAQ

This section provides solutions to common problems that may occur during installation, configuration or use of the GN-BR03GM.

Q: What is the default IP address for the BR03GM?
A: 192.168.1.254

Q: I can't remember the password or IP address of the router.
A: You can resolve this by pressing the "**Init**" button on the side of the router. You can also reset the Router from the Web Utility <Initialization Page>. The Router will reboot and all settings (including the default password) will be restored to their default values.

Q: What is the default username and password for the BR03GM?
A: Username is "admin" and password is "admin".

Q: Why do I have to setup ISP information into my Router?
A: ISPs require a special login protocol, in which you must enter a login name and password in order to access the Internet. In order to share the Internet connection among several computers, you must configure it with the TCP/IP information that your one PC would normally use.

Q: Where in the network do I connect the router?
A: In a typical environment, the GN-BR03GM is installed directly onto the ADSL/Cable Modem. Plug the RJ45 Ethernet cable of the ADSL or Cable Modem into the WAN port of the Router.

Q: Why should I use the GN-BR03GM to work as a DHCP server?
A: Using the BR03GM Router as a DHCP server By default, the router will function as a DHCP (Dynamic Host Configuration Protocol) server, allowing it to assign IP, DNS server, and default gateway addresses to all computers connected to the router's LAN. The assigned default gateway address is the LAN address of the router. IP addresses will be assigned to the attached PCs from a pool of addresses specified in this menu. Each pool address is tested before it is assigned to avoid duplicate addresses on the LAN. DCHP helps prevent IP conflicts.

Q: What is the IEEE 802.11g standard?
A: The IEEE 802.11g standard specifies data rates of up to 54 Mbps in the 2.45-GHz band. It uses Orthogonal Frequency Division Multiplexing (OFDM), which is provided by this standard and is compatible with 802.11b standard offering speeds of about 11 Mbps. This standard uses Complementary Code Keying (CCK) modulation. Both 11g and 11b can operate at a range of up to 300 feet.

Q: When using BR03GM in Australia, you will use PPPoA protocol. How to set up your configuration in BR03GM?

A: Suggestion 1, Using Static IP.
Suggestion 2, Using DHCP client to get IP from ADSL/ Cable modem.

Appendix B
Using Setup Wizard

In addition to Smart Setup, your BR03GM Router's ISP settings may be configured manually using Setup Wizard. Press the Setup Wizard menu button to proceed. You will be presented with the screen shown below. Please choose your Internet connection (WAN) type from the list and follow the steps for instructions

PPPoE: **Most common type for typical home users. If your broadband ISP service PPPoE, please select this item, click the** Next **button and then** go to Step 3 **of this section**

Dynamic IP Address:
If your broadband ISP service is an 'always-on connection', but you do not have a static IP, please select this item, click the Next **button and then** go to Step 7 **of this section.**

Static IP Address:
Common for Enterprise Internet connections. If your broadband ISP service is a 'fixed-connection' and your IP never changes, please select this item, click

the Next **button and then** go to Step 11 **of this section.**

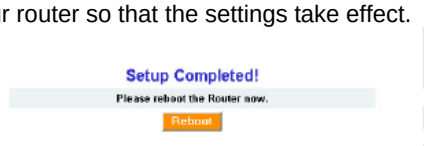
PPPoE Unnumber:

Common in Japan and some European Countries. If you use PPPoE Unnumber, please select this item, click the Next **button and then** go to Step 15 **of this section.**

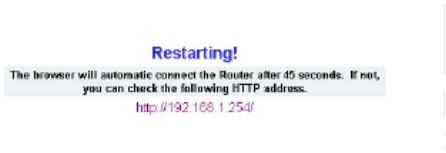
Connection Type - PPPoE

On the **PPPoE** screen, enter your User Name and Password as provided by your ISP. Click the **Finish** button to continue with setup.

The **Setup Completed** screen appears. Click the **Reboot** button to restart your router so that the settings take effect.



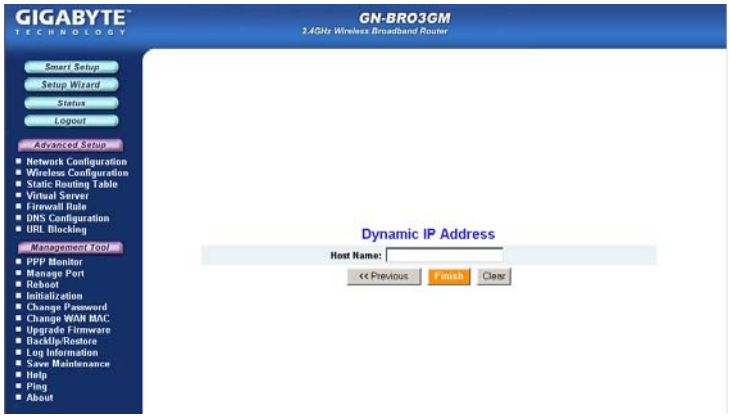
While the router is rebooting, the Router Restarting Screen will display the time remaining. Please be patient and let the router restart itself.



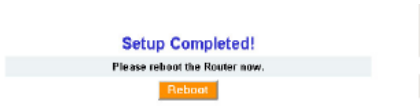
Once your router has successfully rebooted, it will load Router Welcome Screen. **Setup is complete.**

Connection Type - Dynamic IP Address

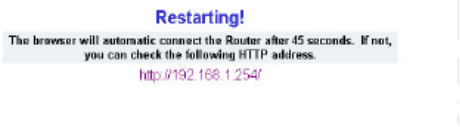
If you have selected **Dynamic IP Address** ISP Type, the Dynamic IP Address Screen will display, prompting you for the ISP information. Enter it and click the **Finish** button to continue with router setup.



The **Setup Completed** appears. Click the **Reboot** button to restart your router so that the settings take effect



While the router is rebooting, the **Router Restarting** screen will display the time remaining.



Once your router has successfully rebooted, it will load Router Welcome Screen. **Setup is complete.**

Connection Type - Static IP Address

On the **Static IP Address** screen, type in the information provided by your ISP, and then click the **Finish** button to continue with router setup.

If your ISP has assigned you several IP addresses, please enter only one.

A screen with the message **Setup Completed** appears. Click the **Reboot** button to restart your router so that the settings take effect

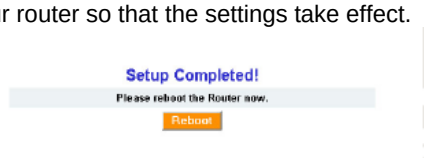
While the router is rebooting, the **Router Restarting** screen will display the time remaining.

Once your router has successfully rebooted, it will load Router Welcome Screen. **Setup is complete.**

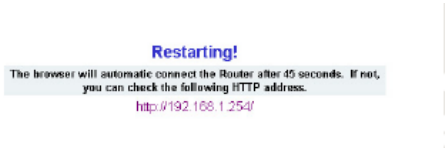
Connection Type – PPPoE Unnumber

On the **PPPoE Unnumber** screen, type in the information provided by your ISP, and then click the **Finish** button to continue with router setup.

The **Setup Completed** screen appears. Click the **Reboot** button to restart your router so that the settings take effect.



While the router is rebooting, the Router Restarting Screen will display the time remaining. Please be patient and let the router restart itself.



Once your router has successfully rebooted, it will load Router Welcome Screen. **Setup is complete.**

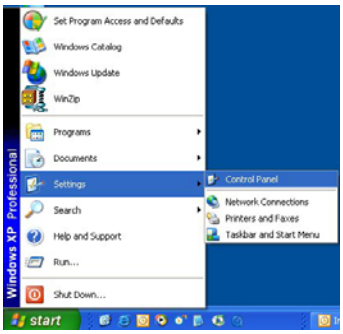
Appendix C
Configuring TCP/IP Settings

Computers access the Internet using a protocol called TCP/IP (Transmission Control Protocol/ Internet Protocol). Each computer on your network must have TCP/IP installed and selected as its networking protocol. If a Network Interface Card (NIC) is already installed in your PC, then TCP/ IP is probably already installed as well. Please follow the steps in this chapter to assure the correct TCP/IP settings. For advanced users who know the TCP/IP settings are already correct, you may skip this section and proceed directly to **Chapter 6 Advanced Setup**.

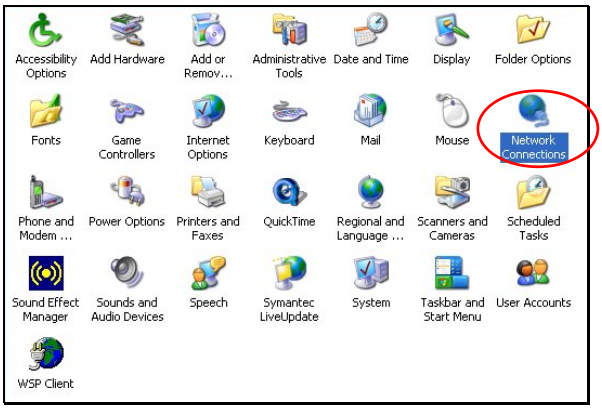
Enabling DHCP to Automatically Configure TCP/IP Settings

Each PC using accessing the wireless router must be assigned specific information about itself and resources that are available on its network. The simplest way to configure this is to allow the PC to automatically assign the IP by using a DHCP server. Follow the steps below to allow windows to automatically assign IP numbers for you.

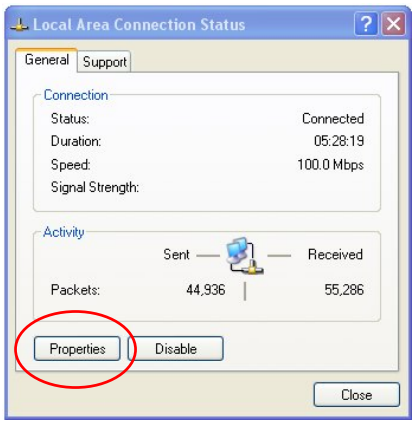
Step 1 Click the **Start** button. Select **Settings** and then click the **Control Panel** icon.



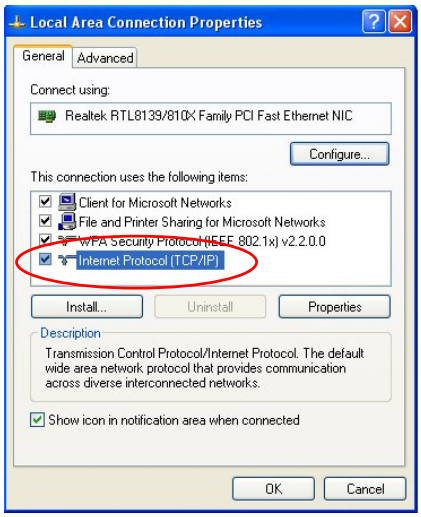
Step 2 Double-click the **Network and Dial-up Connection** icon.



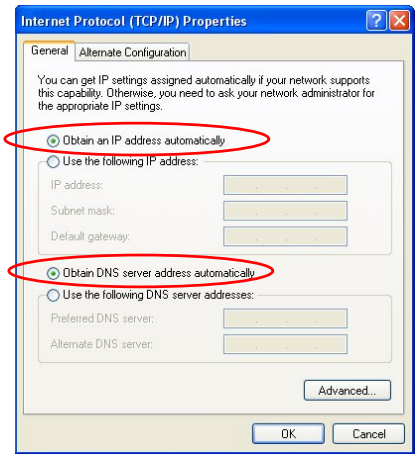
Step 3 Double-click the **Local Area Connection** icon, and then click the **Properties** button.



Step 4 The **Local Area Connection Properties** window will appear. For the applicable Ethernet / wireless adapter, make sure that there is a check in the **Internet Protocol (TCP/IP)** checkbox, then double-click on "**Internet Protocol (TCP/IP)**"



Step 5 Select both the **Obtain IP address automatically** and **Obtain DNS server address automatically**, options and then click **OK**. Continue clicking on the **OK** button to complete the PC configuration.



Windows will now automatically assign IP numbers to computers connecting to your GN-BR03GM.

Appendix D
Troubleshooting

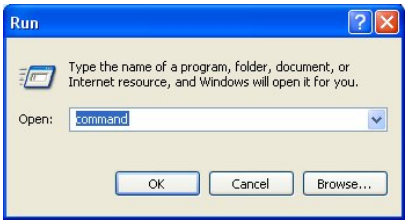
Problem 1: **Cannot connect to the Router's Web-based Utility.**

Response:

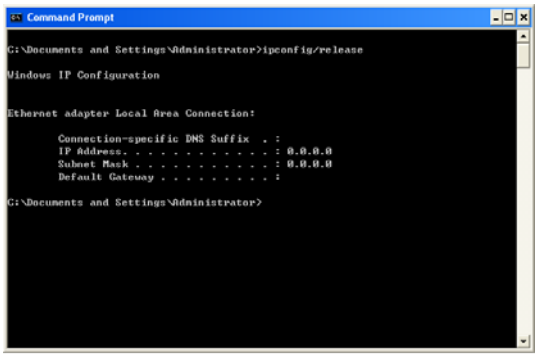
- Make sure that your Router uses DHCP, and make sure your PC's IP address is on the same subnet as the router.
- Check to see if your web browser is automatically detecting LAN settings.
- Try closing all web browsers and trying again.

Make sure that your Router uses DHCP, and make sure your PC's IP address is on the same subnet as the router.

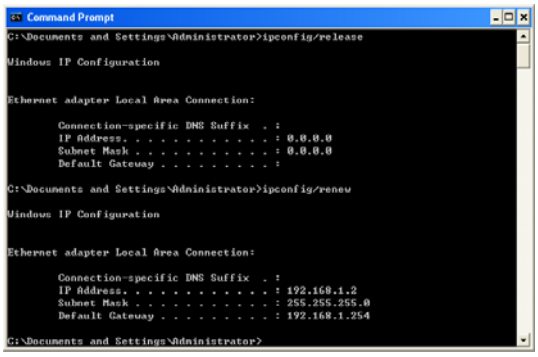
Step 1 Click the **Start** button. Select **Run**, then type "command". Press OK.



Step 2 At the command prompt, type "**ipconfig /release**" and press the **ENTER** key.



Step 3 At the next command prompt, type "**ipconfig /renew**" and press the **ENTER** key.

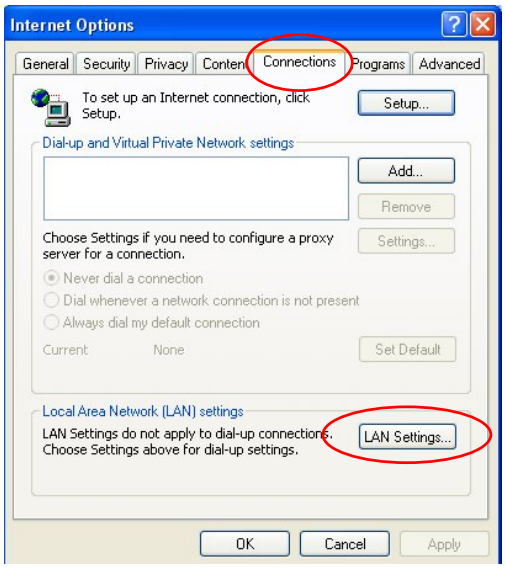


The default gateway represents the IP address of your GN-BR03GM, that is: 192.168.1.254. All computers accessing this Router MUST be in the same subnet (192.168.1.x, where x is anything between 1 and 253)
In the above example, the BR03GM gateway shown above is 192.168.1.254, and the PC's IP address is 192.168.1.2

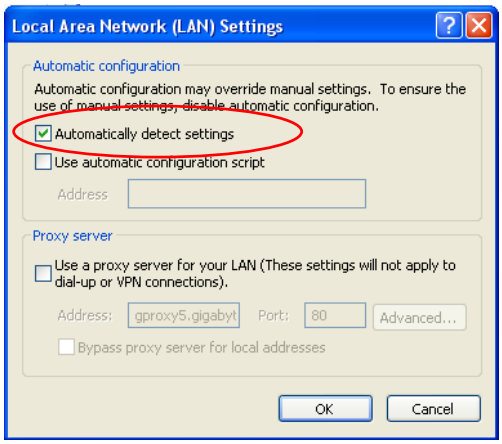
Check to see if your web browser is automatically detecting LAN settings

Step 1 Open **Internet Explorer.** From the menu select **Tools** and then click **Internet Options**.

Step 2 From the **Internet Options** window, click the **Connections** tab, and then click the **LAN Settings** button (see figure below).



Step 3 Now verify that none of the checkboxes have been ticked, and click on the **OK** button. Now you will be able to login to the Router and configure or change network settings.



Problem 2: **I can't connect to the Internet**

Response :

- Check that the power cord is connected properly, and the router's power LED is lit green.
- Verify that all the TCP/IP configuration settings are correct. (Problem 1 above)
- Check that your ADSL/Cable Modem is operating normally, and/or you have ISP service available.
- Check that all network cabling is properly connected.

Appendix E
Glossary

802.11e
An IEEE standard that adds Quality of Service (QoS) features and multimedia support to the existing 802.11b, 802.11g, and 802.11a wireless networks.

ADSL
Asymmetric digital subscriber line (ADSL) is a new modem technology that converts existing twisted-pair telephone lines into access paths for high-speed communication of various sorts.

Auto-MDI/MDIX
On a network hub or switch, an auto-MDI/MDIX port automatically senses if it needs to act as a MDI or MDIX port. The auto- MDI/MDIX capability eliminates the need for crossover cables.

Auto-negotiate
To automatically determine the correct setting. The term is often used with communications and networking

DHCP
The Dynamic Host Configuration Protocol (DHCP) is an Internet protocol for automating the configuration of computers that use TCP/IP. DHCP can be used to automatically assign IP addresses, to deliver TCP/IP stack configuration parameters such as the subnet mask and default router, and to provide other configuration information such as the addresses for printer, time and news servers.

DMZ
In computer networks, a DMZ (demilitarized zone) is a computer host or small network inserted as a "neutral zone" between a company's private network and the outside public network. It prevents outside users from getting direct access to a server that stores company data. Typically, the DMZ contains devices accessible to Internet traffic, such as Web (HTTP) servers, FTP servers, SMTP (e-mail) servers and DNS servers.

DNS
The Domain Name System (DNS) is a distributed Internet directory service. DNS is used mostly to translate between domain names and IP addresses, and to control Internet email delivery. Most Internet services rely on DNS to work. If DNS fails, web sites cannot be located and email delivery service will be suspended.

Dynamic IP Address
An IP address is automatically assigned to a user’s AP in a TCP/IP network typically by a DHCP server.

Firewall
A system designed to prevent unauthorized access to or from a private network. Firewalls can be implemented in both hardware and software, or a combination of both. Firewalls are frequently used to prevent unauthorized Internet users from accessing private networks connected to the Internet, especially intranets. All messages entering or leaving the intranet pass through the firewall, which examines each message and blocks those that do not meet the specified security criteria.

Gateway
A device, usually a Router, that connects hosts on a local network to other networks.

IP Address
Every PC on the Internet has a unique identifying number, called an IP Address. A typical IP address looks like this: 216.27.61.137

IPSec
IPSec stands for IP Security. It provides authentication and encryption over the Internet. It functions at Layer 3 and thus secures everything on the network. It has become a standard protocol used for virtual private networks (VPNs).

MAC Address
On a local area network (LAN) or other network, the MAC (Media Access Control) address is your computer's unique hardware number. Usually written as: 01:23:45:67:89:ab

MTU
The size in bytes of the largest packet that can be sent or received.

NAT
A technique by which several hosts share a single IP address for accessing to the Internet.

Ping (Packet Internet Groper)
A utility to determine whether a specific IP address is accessible. It works by sending a packet to the specified address and waiting for a reply. PING is used primarily to troubleshoot Internet connections.

SSID
SSID is the name representing the Router in WLAN.

PPPoE
Point-to-Point over Ethernet is a protocol for connecting remote hosts to the Internet over an always-on connection by simulating a dial-up connection.

QoS
Quality of Service. Required to support wireless multimedia applications and

advanced traffic management. QoS enables Wi-Fi access points to prioritize traffic and optimize the way shared network resources are allocated among different applications. Without QoS, all applications running on different devices have equal opportunity to transmit data frames. That works well for data traffic from applications such as web browsers, file transfers, or e-mail but it is inadequate for multimedia applications. Voice over Internet Protocol (VoIP), video streaming, and interactive gaming are highly sensitive to latency increases and throughput reductions and require QoS. QoS extensions for 802.11 networks will be addressed in the upcoming IEEE 802.11e standard.

Router
A device that forwards data packets along networks. A router is connected to at least two networks, commonly two LANs or WANs or a LAN and its ISP network. Routers are located at gateways, the places where two or more networks connect.

Subnet Mask
A mask used to determine which subnet an IP address belongs to. An IP address has two components, the network address and the host address. Subnetting enables the network administrator to further divide the host part of the address into two or more subnets.

TCP/IP
TCP/IP (Transmission Control Protocol/Internet Protocol), the suite of communications protocols used to connect hosts on the Internet.

VPN
Virtual private networks are secured private network connections, built on top of publicly accessible infrastructure, such as the Internet or the public telephone network. VPNs typically employ some combination of encryption, digital certificates, strong user authentication and access control to provide security to the traffic they carry. They usually provide connectivity to many machines behind a gateway or firewall.

WAN
Wide Area Network, a communication network that covers a relatively broad geographic area, consisting of two or more LANs. Broadband communication over the WAN is often through public networks such as the ADSL or Cable systems, or through leased lines or satellites. To simplify it, please image network as a WAN.

WEP
WEP (Wired Equivalent Privacy) is a data privacy mechanism based on a 64/128-bit shared key algorithm, as described in the IEEE 802.11 standard.

WMM™
Wi-Fi Multimedia. A group of features for wireless networks that improve the user experience for audio, video and voice applications. WMM is based on a subset of the IEEE 802.11e WLAN QoS draft standard. WMM adds prioritized

capabilities to Wi-Fi networks and optimizes their performance when multiple concurring applications, each with different latency and throughput requirements, compete for network resources. By using WMM, end-user satisfaction is maintained in a wider variety of environments and traffic conditions. WMM makes it possible for home network users and enterprise network managers to decide which data streams are most important and assign them a higher traffic priority.

Appendix F
Specifications

System	
CPU & Wireless	Realtek RTL8651B with Ralink RT2661(MAC) & RT2529 (RF)
Standards	IEEE 802.3 (10BaseT), IEEE 802.3u (100BaseTX), IEEE 802.11b/g (Wireless)
Operating Range	Wireless - Open space: 100 – 300m; Indoor: 30 - 100m
Power Consumption	1200mA @ Transmitting, 1150mA @ Receiving
RF – 802.11b	
Frequency Band	2412 ~ 2484 MHz (subject to local regulation)
Modulation Technology	DSSS (Direct Sequence Spread Spectrum)
Modulation Techniques	DBPSK, DQPSK, CCK
Data Rates	11, 5.5, 2, 1 Mbps, auto fallback
Peak Output power	20 dBm @ Nominal Temp Range
Receive Sensitivity	-85 dBm @ 11 Mbps date rate at nominal temperature
Antenna	2 external dipole antennas, 1 internal printed antenna
RF – 802.11g (backward compatible to 802.11b)	
Frequency Band	2412 ~ 2484 MHz (subject to local regulation)
Modulation Technology	OFDM and DSSS
Modulation Techniques	64QAM, 16QAM, QPSK, BPSK, DBPSK, DQPSK, CCK
Data Rates	54, 48, 36, 24, 18, 12, 11, 9, 6, 5.5, 2, 1 Mbps, auto fallback
Peak Output power	20 dBm @ Nominal Temp Range
Receive Sensitivity	-68 dBm @ 54 Mbps date rate at nominal temperature
Antenna	2 external dipole antennas, 1 internal printed antenna

Regulatory and Environmental Compliance	
EMC certification	FCC part 15 (USA)
	CE (Europe)
Temperature Range	Operating: 0 ~ 40 degree C, Storage: -20 ~ 65 degree C
Humidity	10% ~ 85% Non-condensing
Software	
Roaming	Yes
Security	64/128 bit WEP; WPA-PSK, WPA, WPA2-PSK, WPA2, WPA-Auto, WPA-PSK-Auto
Management Utility	WEB Configuration for network link
Mechanical	
Packaging	Generic, Gigabyte, private labeling optional
LED indicator	Power/Status LED x 1 Wireless LED x 1 LAN Port LED x 4 WAN Port LED x 1
Gross Weight	270 ± 1g
Dimension	161 mm * 138 mm * 28 mm ± 0.5mm

Appendix G
Warranty

Limited Warranty Statement (1-Year Warranty)

Thank you for purchasing the GIGABYTE Product. This limited warranty statement will provide you one year warranty starting from the purchase date. Of which if any defect is occurred due to accidents or any man-made factors, or any unauthorized torn-off or damage to GIGABYTE's sticker on the product, GIGABYTE Technology will not provide after-sale services, such as:

- Products are damaged due to any violation of instructions on user manual.
- Hardware is damaged due to inappropriate assembling.
- Products are damaged due to the use of illegal accessory.
- Products are damaged due to parts disassembling without authorization.
- Products are damaged due to exceeding environment limits.
- Products are damaged due to unexpected external force.
- Products are damaged due to nature disasters.
- Products are copies or illegally smuggled goods.

Appendix H
Regulatory Information

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

FCC Statement: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

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

FCC Caution: To assure continued compliance, any changes or modifications not expressly approved by the party responsible for compliance could void the user authority to operate this equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

IMPORTANT NOTE:
FCC Radiation Exposure Statement:
This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body. The antenna(s) used for this transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Europe - Declaration of Conformity

CE	This device is a 2.4 GHz low power RF device intended for home and office use in EU and EFTA member states. In some EU / EFTA member states some restrictions may apply. Please contact local spectrum management authorities for further details before putting this device into operation.

GIGA-BYTE Technology, Inc. declares that the product: **AirCruiser MIMO Router Model Number: GN-BR03GM** is in conformity with and in accordance with the European Directive of EMC, 89/336 EEC for the following sections:

EN 61000-3-2, EN 61000-3-3, EN 55024, and EN 55022 Disturbances and Immunities

GIGA-BYTE Technology, Inc. also declares the conformity of above mentioned product with the actual required safety standards in accordance with LVD Directive 73/23 EEC:

EN 60950 Safety

In accordance with R&TTE Directive 1995/5/EC, Part 17: Requirements for Operation in the European Community, GIGA-BYTE Technology, Inc declares the conformity of the above mentioned products for:

EN 300 328-2 V1.2.1, ETSI EN 300 328-1：V1.3.1, EN 301 489-1, and EN 301 489-17 Technical Requirements for Radio Equipment

Countries of Operation and Conditions of Use in the European Community
The user should run the configuration utility program provided with this product to check the current channel of operation and confirm that the device is operating in conformance with the spectrum usage rules for European Community countries as described in this section. European standards dictate a maximum radiated transmit power of 100mW EIRP and a frequency range of 2.400 - 2.4835 Ghz.

Appendix I
General Public License

Licensing Information

This product includes copyrighted software license owned by third-party under terms of the GNU General Public License. Texts of the GPL are included with every CD shopped with our product. All future firmware updates will also be accompanied with their related source code on our website.

Please refer to the following GNU General Public License for further details of this License.

Specially, the parts of this product listed below are subject to the GNU General Public License.
1. The Linux operating system kernel
2. The iptables packet filter and NAT software
3. The busybox swiss army knife of embedded linux
4. The udhcpd DHCP client/server implementation
5. The rp-pppoe PPPoE client implementation
6. The pppd PPP daemon implementation
7. The ez-ipupdate ddns implementation

The Copyright for All listed Software packages are owned by their respective authors, please refer to the source code via our website for further details.

Availability of Source Code

Gigabyte Tech. has provided the full Source Code of the GPL Licensed Software on our website. All future firmware updates will also be accompanied with their related source code.

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