BiPAC 7600NX(L)

Gigabit Wireless-N (VPN) ADSL2+ Router

User Manual

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Chapter 1
Introduction the BiPAC 7600NX(L)

Introducing the BiPAC 7600NX(L)

Thank you for purchasing BiPAC 7600NX(L) Router. The BiPAC 7600NX(L) is a compact and advanced GigaConnect Multi-Service gateway(router) that offers flexible and multiple internet connection services for home, SOHO and office users to enjoy high-speed, high-level security internet connection via ADSL, and/or Ethernet WAN. With dual-WAN interfaces, the auto failover feature quickly and smoothly backs up the internet connection to ensure optimal internet connectivity. With an integrated 802.11n wireless access point and 4-point Gigabit Ethernet LAN ports, the gateway enables faster wireless speed of up to 300Mbps and LAN connection 10 times faster than regular 10/100Mbps Ethernet LAN.

Always-on Connectivity

The Auto failover feature ensures maximum connectivity and minimum interruption by quickly and smoothly connecting to a EWAN (ADSL) network in the event that your ADSL (Cable) line fails. The BiPAC 7600NX(L) will then automatically reconnect to the ADSL connection when it is restored, reducing connection costs. These features are perfect for office situations where a constant and uninterrupted connection is in need.

Maximize Bandwidth (BiPAC 7600NX only)

This device supports superfast fibre connections via dual-WAN connectivity through a Gigabit Ethernet WAN port. Using load balancing, both links can be in use all the time. Moreover, bandwidth can be manually managed in the form of a percentage and load balancing to maximize bandwidth of outbound traffic.

Wireless Mobility and Security

With an integrated 802.11n Wireless Access Point, the router delivers up to 3 times the wireless coverage of a 802.11b/g network device, so that wireless access is available everywhere in the house or office. If your network requires wider coverage, the built-in Wireless Distribution System (WDS) allows you to expand your wireless network without additional wires or cables. The BiPAC 7600NX(L) also supports the Wi-Fi Protected Setup (WPS) standard and allows users to establish a secure wireless network just by pressing a button. Multiple SSIDs allow users to access different networks through a single access point. Network managers can assign different policies and functions for each SSID, increasing the flexibility and efficiency of the network infrastructure.

Secure VPN Connections (BiPAC 7600NX only)

The BiPAC 7600NX supports comprehensive and robust IPSec、PPTP and L2TP VPN (Virtual Private Network) protocols for business users to establish private encrypted tunnels over the public Internet to secure data transmission between headquarters and branch offices. With a built-in DES/3DES VPN accelerator, the router enhances IPSec VPN performance significantly.

IPv6 supported

Internet Protocol version 6 (IPv6) is a version of the Internet Protocol that is designed to succeed IPv4. IPv6 has a vastly larger address space than IPv4. The router is already supporting IPv6, you can use it in IPv6 environment no need to change device. The dual-stack protocol implementation in an operating system is a fundamental IPv4-to-IPv6 transition technology. It implements IPv4 and IPv6 protocol stacks either independently or in a hybrid form. The hybrid form is commonly implemented in modern operating systems supporting IPv6.

Easy Sign-On (EZSO)

This special feature makes it easier for you to configure your router so that you can connect to the internet in a couple of seconds without having to logon to the router GUI for any detail configuration. This configuration method is usually auto initiated if user is to connect to the internet via 7600NX(L).

Quick Start Wizard

Support a WEB GUI page to install this device quickly. With this wizard, end users can enter the information easily which they get from their ISP, then surf the Internet immediately.

Firmware Upgradeable

Device can be upgraded to the latest firmware through the WEB based GUI.

1.2 Features of the BiPAC 7600NX(L)

- Dual-WAN ports for ADSL, and Gigabit Ethernet WAN (EWAN) for broadband connectivity
- Gigabit WAN and LAN
- Auto failover feature to ensure an always-on connectivity
- Fibre (FTTC/FTTP/FTTH) ready with high WAN throughput
- IPv6 ready (IPv4/IPv6 dual stack)
- Multiple wireless SSIDs with wireless guest access and client isolation
- IEEE 802.11 b/g/n compliant Wireless Access Point with Wi-Fi Protected Setup (WPS)
- Wi-Fi Protected Access (WPA-PSK/ WPA2-PSK) and Wired Equivalent Privacy (WEP)
- Secured IPSec VPN with powerful DES/ 3DES/ AES *(BiPAC 7600NX only)*
- PPTP VPN with Pap/ Chap/ MPPE authentication *(BiPAC 7600NX only)*
- L2TP VPN with Pap/Chap authentication *(BiPAC 7600NX only)*
- 24 VPN tunnels *(BiPAC 7600NX only)*
- SOHO Firewall Security with DoS Preventing and Packet Filtering
- Load balancing to maximize bandwidth of outband traffic *(BiPAC 7600NX only)*
- Quality of Service Control for traffic prioritization and Bandwidth management
- Universal Plug and Play (UPnP) Compliance
- Supports IPTV Application[*2]
- Two USB port for NAS(Samba)
- Ease of Use with Quick Installation Wizard and EZSO
- Ideal for SOHO, office and home users

ADSL Compliance

- Compliant with ADSL Standard

- Full-rate ANSI T1.413 Issue 2
- G.dmt (ITU G.992.1)
- G.lite (ITU G.992.2)
- G.hs (ITU G.994.1)

- Compliant with ADSL2 Standard

- G.dmt.bis (ITU G.992.3)
- ADSL2 Annex M (ITU G.992.3 Annex M)

- Compliant with ADSL2+ Standard

- G.dmt.bis plus (ITU G.992.5)
- ADSL2+ Annex M (ITU G.992.5 Annex M)

Network Protocols and Features

- IPv4 or IPv4 / IPv6 Dual Stack
- NAT, static (v4/v6) routing and RIP-1 / 2
- Dual WAN failover and failback
- Dual WAN load balance *(BiPAC 7600NX only)*
- DHCPv6
- Universal Plug and Play (UPnP) Compliant
- Dynamic Domain Name System (DDNS)
- Virtual Server and DMZ
- SNTP, DNS relay, IGMP snooping and IGMP proxy
- MLD snooping and MLD proxy for video service

Firewall

- Built-in NAT Firewall
- Stateful Packet Inspection (SPI)
- DoS attack prevention
- IP&MAC filter, URL Content Filter
- Password protection for system management
- VPN pass-through

Quality of Service Control

- Supports the DiffServ approach
- Traffic prioritization and bandwidth management based-on IPv4/IPv6 protocol, port number and address

IPTV Applications*2

- IGMP Snooping and IGMP Proxy
- MLD Snooping and MLD Proxy
- Virtual LAN (VLAN)
- Quality of Service (QoS)

Wireless LAN

- Compliant with IEEE 802.11 b/ g/ n standards
- 2.4-2.4835GHz radio band for wireless
- Up to 300Mbps wireless operation rate
- 64 / 128 bits WEP supported for encryption
- WPS (Wi-Fi Protected Setup) for easy setup
- Wireless Security with WPA-PSK / WPA2-PSK support
- Multiple wireless SSIDs with wireless guest access and client isolation
- WDS repeater function support

USB Application Server

- Storage/NAS: Samba server, FTP Server

Virtual Private Network (VPN) *(BiPAC 7600NX only)*

- 8 IPSec VPN Tunnels
- 8 PPTP VPN Tunnels (Dial-in:4, Dial-out:4)
- 8 L2TP VPN Tunnels (Dial-in:4, Dial-out:4)

Management

- Easy Sign-on (EZSO)
- Quick Installation wizard
- Web-based GUI for remote and local management (IPv4/IPv6)
- Firmware upgrades and configuration data upload and download via web-based GUI
- Supports DHCP server / client / relay
- Supports SNMP v1,v2, v3, MIB-I and MIB-II
- TR-069*1 supports remote management
- Auto failover and fallback

	1. On request for Telco / ISP projects 2. IPTV application may require subscription to IPTV services from a Telco / ISP. 3. Specifications on this datasheet are subject to change without prior notice.

1.3 Hardware Specifications

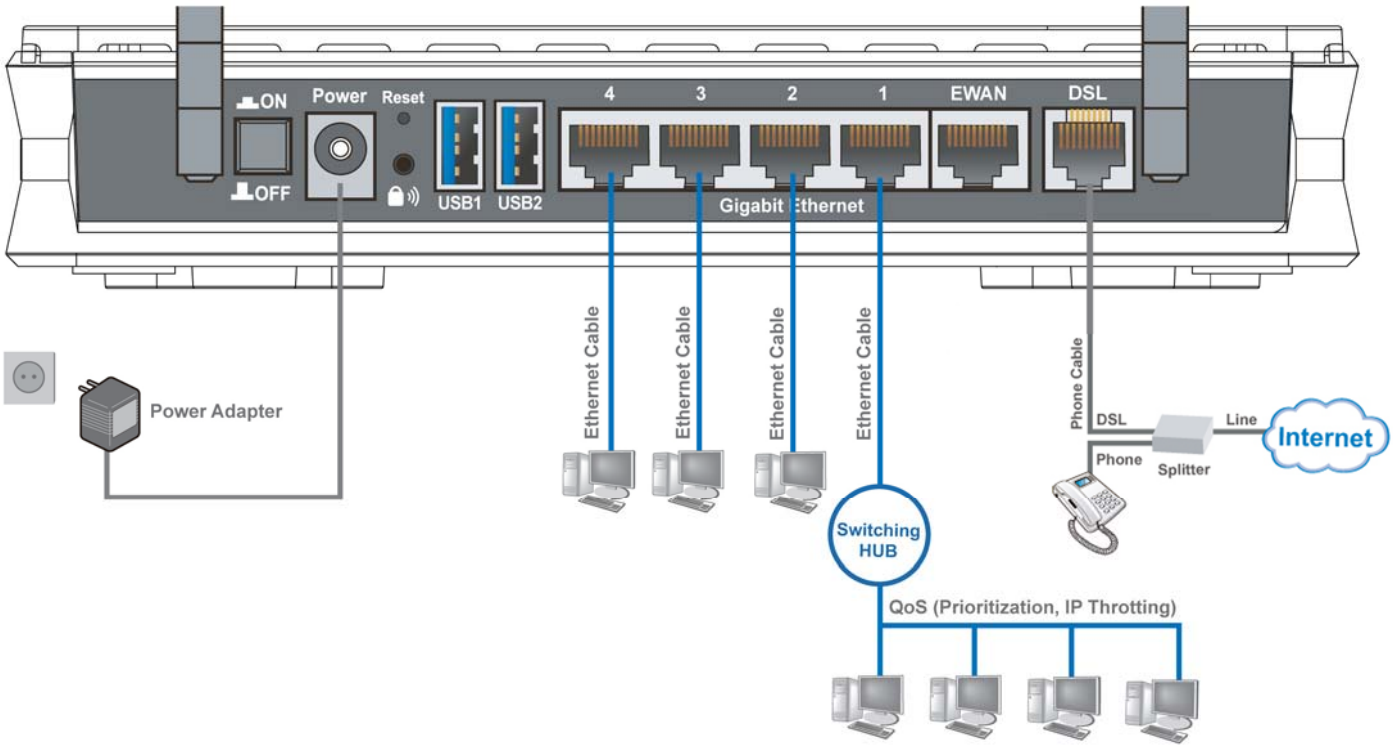
Physical Interface

- WLAN: 2 detachable antennas
- DSL: ADSL port
- USB: 2 USB 2.0 type A port for storage service
- Ethernet: 4-port 10 / 100 / 1000Mbps auto-crossover (MDI / MDI-X) Switch
- EWAN: RJ-45 Gigabit Ethernet port for connecting to ADSL/Cable/VDSL/Fibre modem for Broadband connectivity.
- Factory default reset button
- Wireless on/off and WPS push button
- Power jack
- Power switch

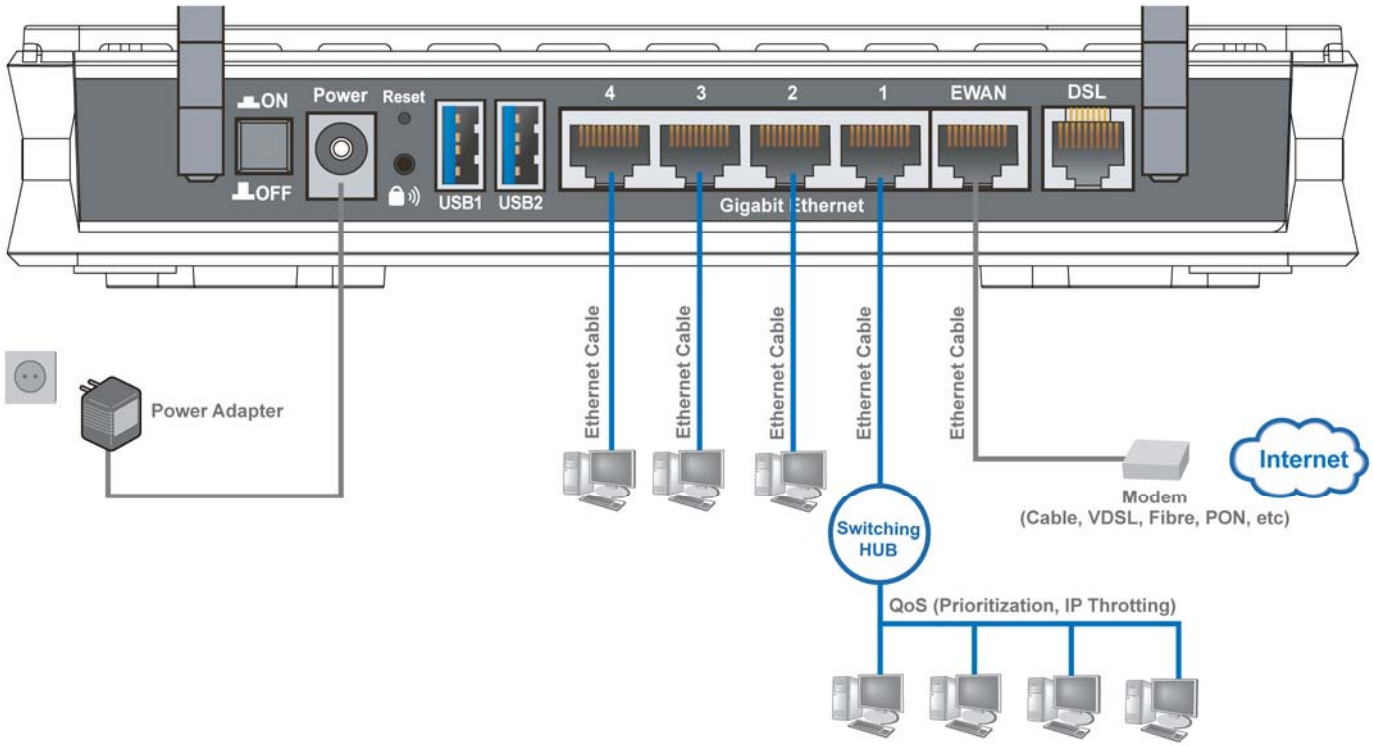
1.4 Applications for the BiPAC 7600NX(L)

BiPAC 7600NX(L) is a all-in-one router, supporting alternative ways (ADSL, EWAN) to connect to the Internet. Then users can choose one of the ways to connect to the Internet or ISP.

ADSL router mode



Broadband router mode



Chapter 2
Installing the BiPAC 7600NX(L)

2.1 Important note for using the BiPAC 7600NX(L)

Warning

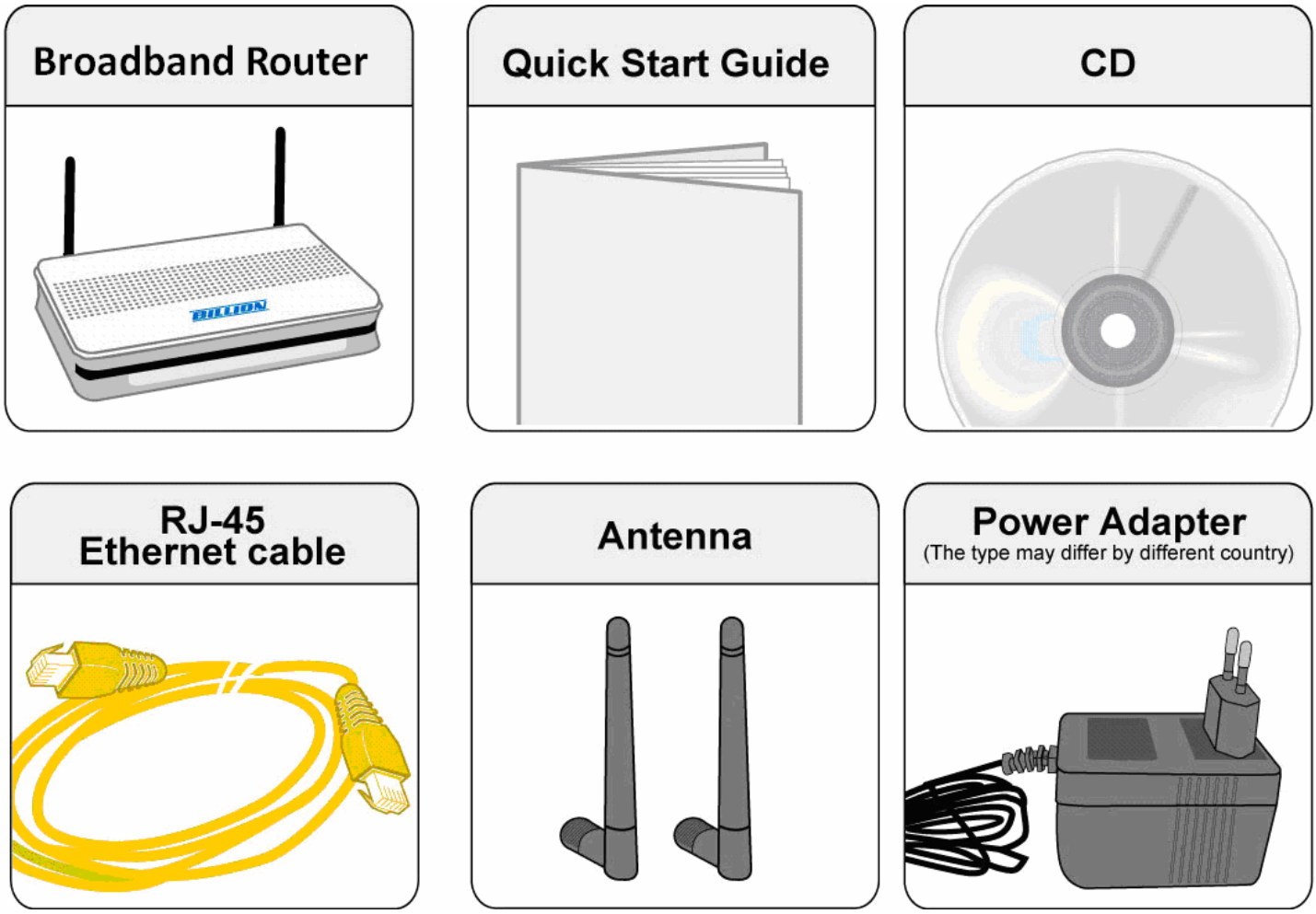
- ✓ Do not use the BiPAC 7600NX(L) in high humidity or high temperatures.
- ✓ Do not use the same power source for the BiPAC 7600NX(L) as other equipment.
- ✓ Do not open or repair the case yourself. If the BiPAC 7600NX(L) is too hot, turn off the power immediately and have it repaired at a qualified service center.
- ✓ Avoid using this product and all accessories outdoors.

Attention

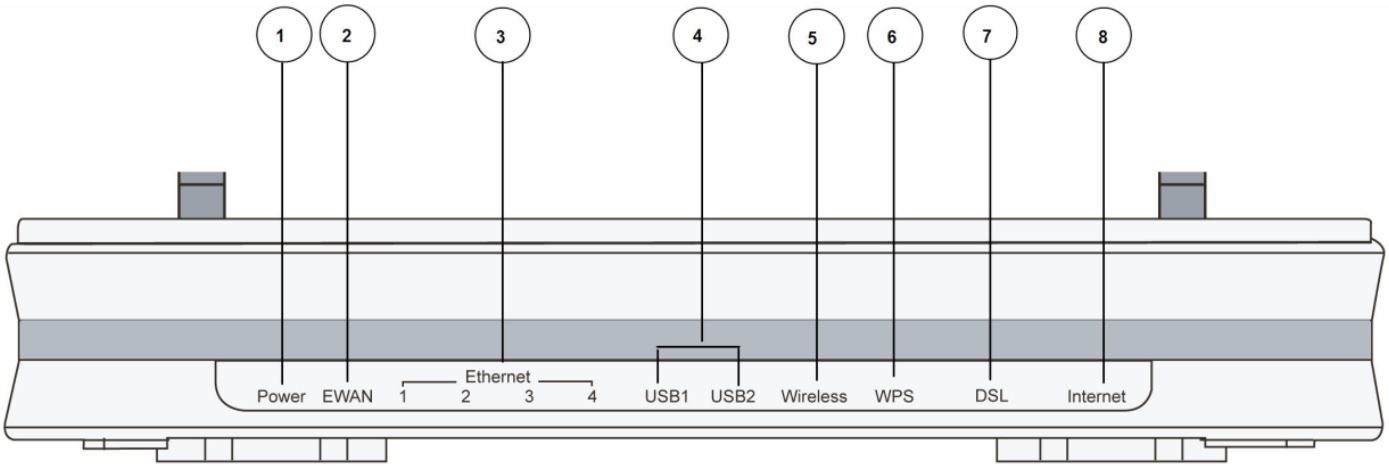
- ✓ Place the BiPAC 7600NX(L) on a stable surface.
- ✓ Only use the power adapter that comes with the package. Using a different voltage rating power adaptor may damage the router.

2.2 Package Contents

- **BiPAC 7600NX(L) Gigabit Wireless (VPN) ADSl2+ router**
- **CD containing user manual**
- **Ethernet (CAT-5 LAN) cable**
- **Power adapter**
- **Quick Start Guide**
- **Two 2dBi detachable Antennas**

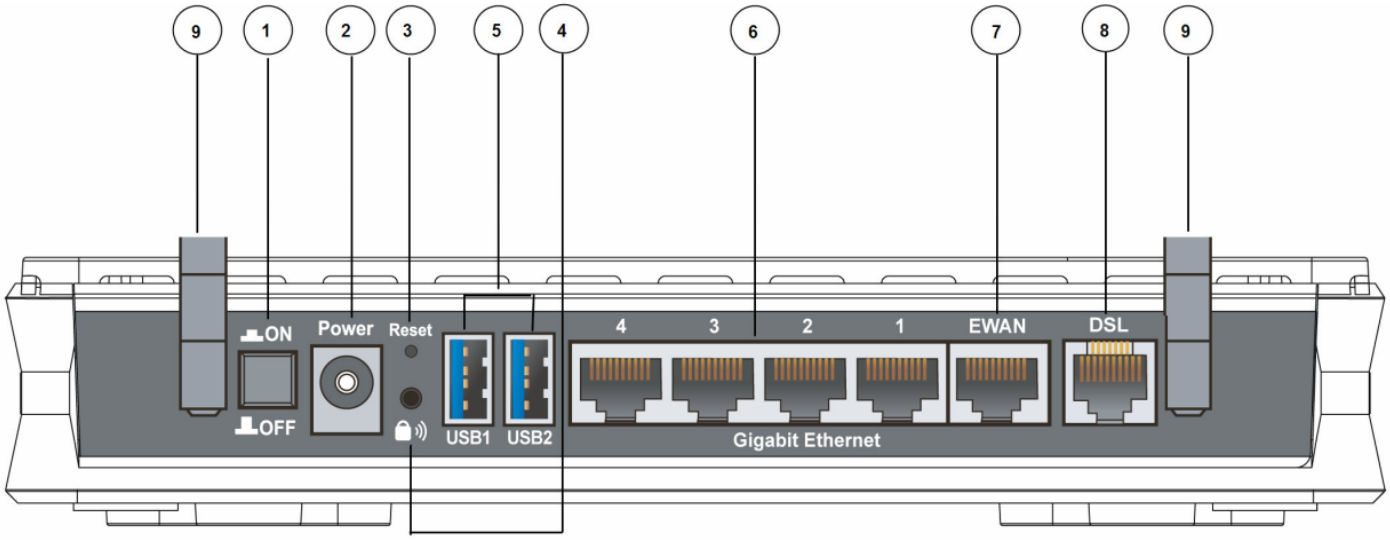


2.3 The Front LEDs



LED		Status	Meaning
1	**Power**	Red	Router powered on
		Green	System ready
2	**EWAN**	Green	Transmission speed hitting 1000Mbps
		Orange	Transmission speed hitting 10/100Mbps
		Blinking	Data being transmitted/received
3	**Ethernet Port 1-4**	Green	Transmission speed hitting 1000Mbps
		Orange	Transmission speed hitting 10/100Mbps
		Blinking	Data being transmitted/received
4	**USB1-2**	Green	Connected to a storage device
5	**Wireless**	Green	Wireless connection established
		Green blinking	Sending/receiving data
6	**WPS**	Green blinking	WPS configuration being in progress
		Lit up brightly and then goes off in 5 seconds	WPS established
		Flash for 2 mins and then goes off	WPS establishment failure
7	**DSL**	Green blinking	Waiting for ADSL synchronization
		Green	Successfully connected to an ADSL line
8	**Internet**	Red	Obtaining IP failure
		Green	Having obtained an IP address successfully
		Off	Router in bridged mode or WAN connection not present.

2.4 The Rear Ports



Port		Meaning
1	**Power**	Connect the supplied power adapter to this jack.
2	**Power Switch**	Power ON/OFF switch
3	**RESET**	After the device is powered on, press it **6 seconds or above**: to restore to factory default settings (this is used when you can not login to the router, e.g. forgot the password)
4	**WPS**	Push WPS button to trigger Wi-Fi Protected Setup function.
5	**USB**	Connect the storage device to this port.
6	**Ethernet**	Connect a UTP Ethernet cable (Cat-5 or Cat-5e) to one of the four LAN ports when connecting to a PC or an office/home network of 10Mbps or 100Mbps.
7	**EWAN**	Connect to Cable Modem, Fiber Modem or PON optic lines with your RJ-45 cable.
8	**DSL**	Connect this port to the DSL network with the RJ-11 cable (telephone) provided.
9	**Antenna**	Connect the detachable antenna to this port.

The detail instruction in Reset Button

Recovery procedures for non-working routers (e.g. after a failed firmware upgrade flash):

Power on the router, once the Power LED lit red, please press this reset button using the end of paper clip or other small pointed object immediately.

The router's emergency-reflash web interface will then be accessible via http://192.168.1.1 where you can upload a firmware image to restore the router to a functional state.

Please note that the router will only respond with its web interface at this address (**192.168.1.1**), and will not respond to ping request from your PC or other telnet operations.

Note:

Before starting recovery process, please configure the IP address of the PC as 192.168.1.100 and proceed with the following step-by-step guide.

1. Power the router off.

2. Power on the router, once the Power lights Red, press reset button immediately.

3. Internet and DSL flashes Green, router entering recovery procedure and router's IP will reset to Emergency IP address (Say 192.168.1.1)

4. Open IE and access http://192.168.1.1 to upload the firmware.

5. Internet lit Red and DSL lit off, and router starts to write firmware into flash. Please DO NOT power off the router at this step.

6. Internet lit Green when successfully upgrade firmware.

7. Power the router off and then on.

2.6 Cabling

One of the most common causes of problems is bad cabling or xDSL line(s). Make sure that all connected devices are turned on. On the front panel of the product is a bank of LEDs. Verify that the LAN Link and xDSL line LEDs are lit. If they are not, verify that you are using the proper cables.

Make sure that all other devices (e.g. telephones, fax machines, analogue modems) connected to the same telephone line as your Billion router have a line filter connected between them and the wall socket (unless you are using a Central Splitter or Central Filter installed by a qualified and licensed electrician), and that all line filters are correctly installed in a right way. If the line filter is not correctly installed and connected, it may cause problems to your XDSl connection or may result in frequent disconnections.

Chapter 3
Basic Installation

The router can be configured with your web browser. A web browser is included as a standard application in the following operating systems: Windows 98/NT/2000/XP/Vista/Win7, Linux, Mac OS, etc. The product provides an easy and user-friendly interface for configuration.

3.1 Before Configuration

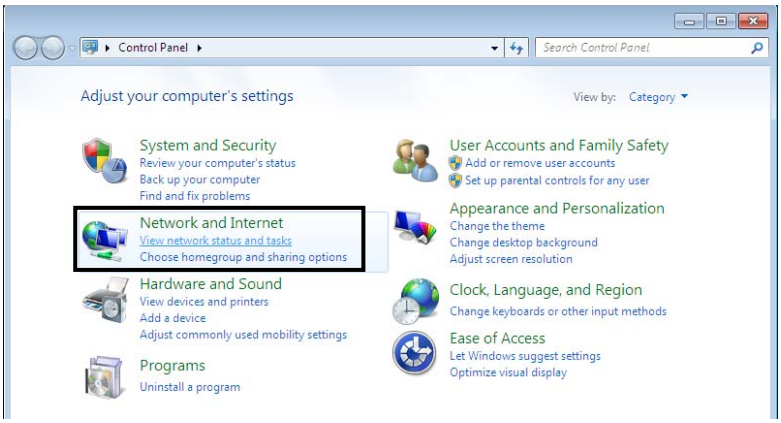
PCs must have an Ethernet interface installed properly and be connected to the router either directly or through an external repeater hub, and have TCP/IP installed and configured to obtain an IP address through a DHCP server or a fixed IP address that must be in the same subnet as the router. The default IP address of the router is **192.168.1.254** and the subnet mask is **255.255.255.0** (i.e. any attached PC must be in the same subnet, and have an IP address in the range of 192.168.1.1 to 192.168.1.253). The best and easiest way is to configure the PC to get an IP address automatically from the router using DHCP. If you encounter any problems accessing the router's web interface it may also be advisable to **uninstall** any kind of software firewall on your PCs, as they can cause problems accessing the 192.168.1.254 IP address of the router. Users should make their own decisions on how to best protect their network.

Please follow the steps below for your PC's network environment installation. First of all, please check your PC's network components. The TCP/IP protocol stack and Ethernet network adapter must be installed. If not, please refer to your Windows-related or other operating system manuals.

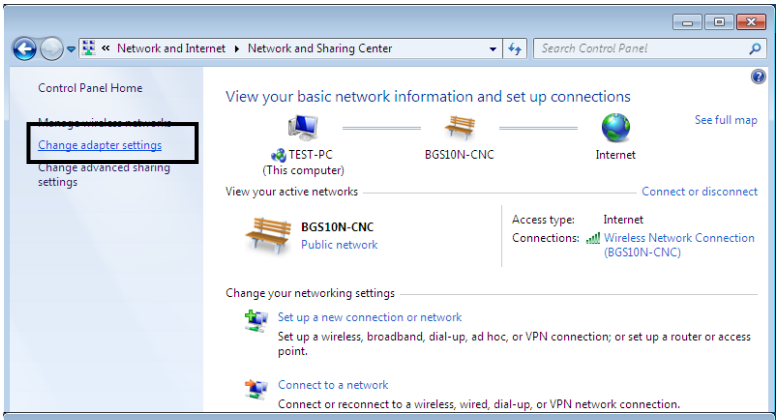
Any TCP/IP capable workstation can be used to communicate with or through the BiPAC 7600NX(L). To configure other types of workstations, please consult the manufacturer's documentation.

3.1.1 Configuring a PC in Windows 7

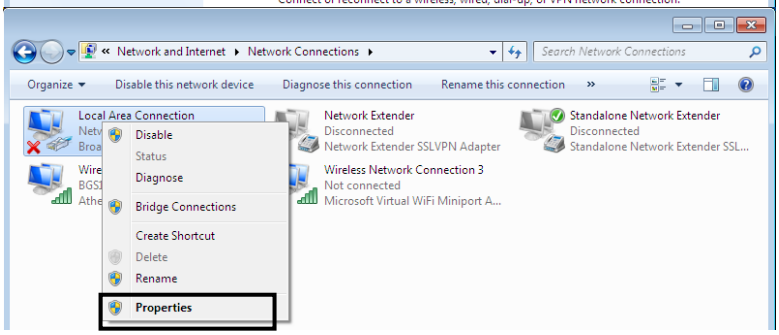
1. Go to **Start**. Click on **Control Panel**.
   Then click on **Network and Internet**.



2. When the **Network and Sharing Center** window pops up, select and click on **Change adapter settings** on the left window panel.

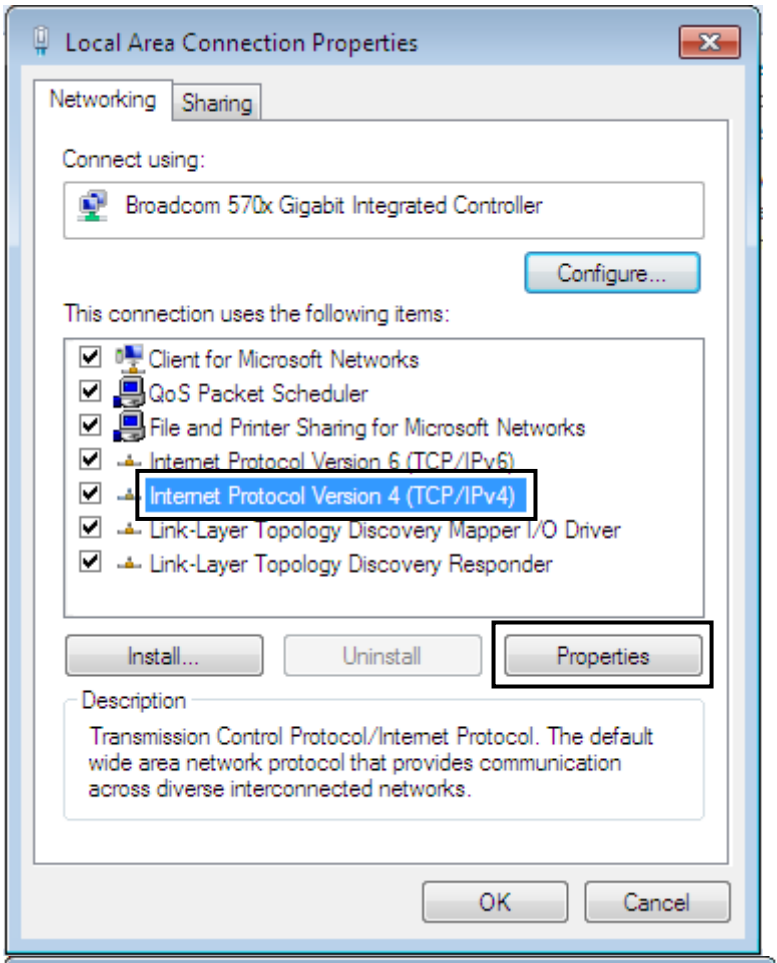


3. Select the **Local Area Connection**, and right click the icon to select **Properties**.



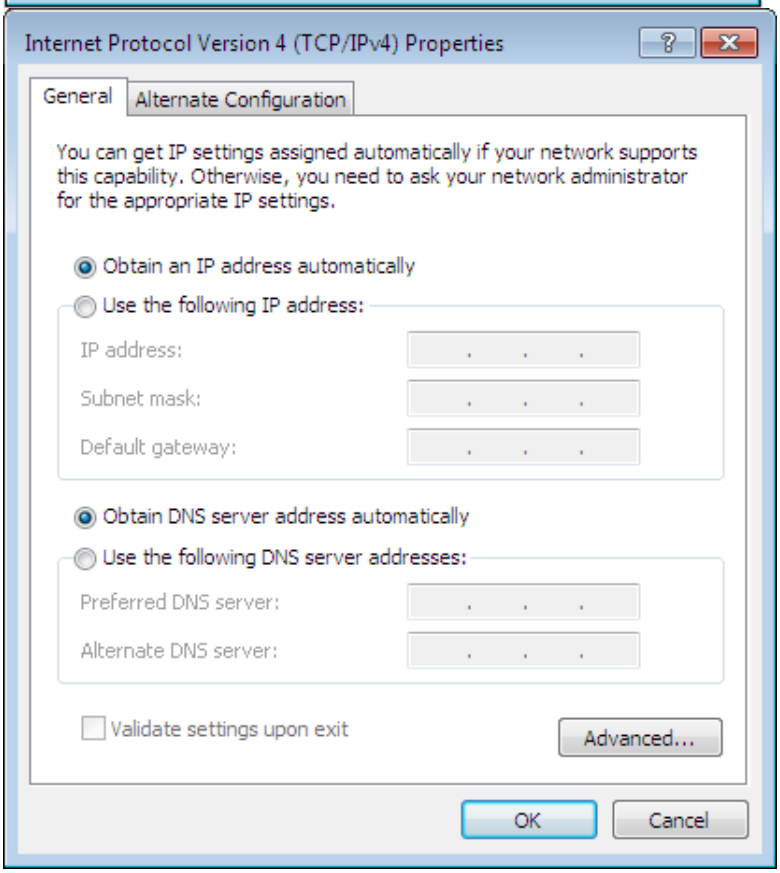
IPv4:

1) Select **Internet Protocol Version 4 (TCP/IPv4)** then click **Properties**



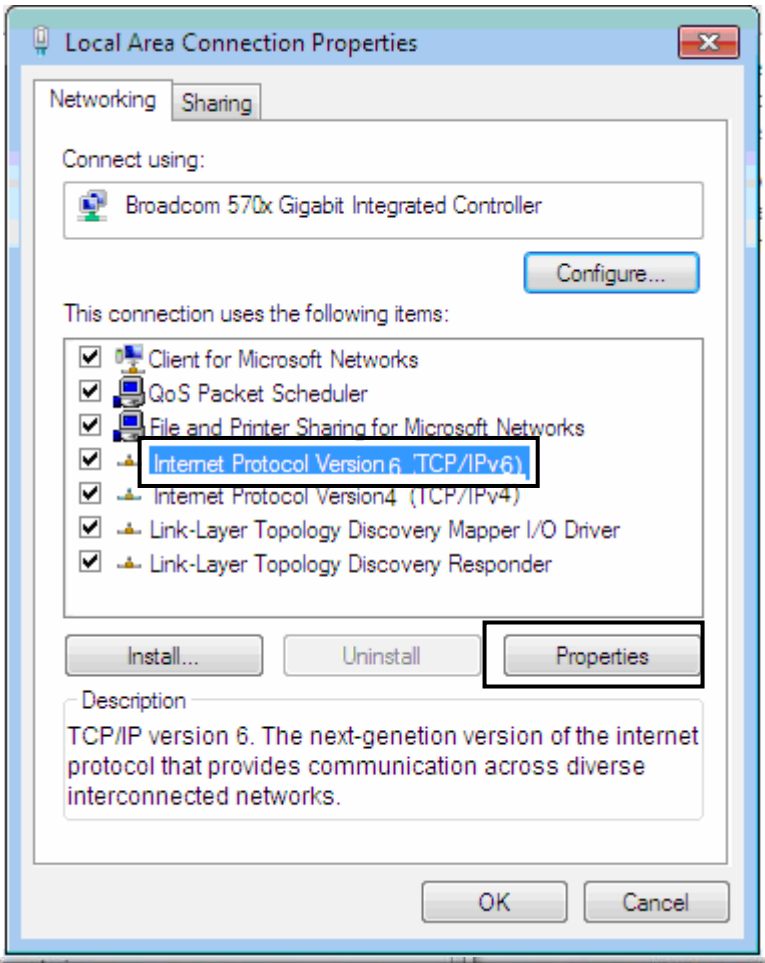
2) In the **TCP/IPv4 properties** window, select the **Obtain an IP address automatically** and **Obtain DNS Server address automatically** radio buttons. Then click **OK** to exit the setting.

3) Click **OK** again in the **Local Area Connection Properties** window to apply the new configuration.



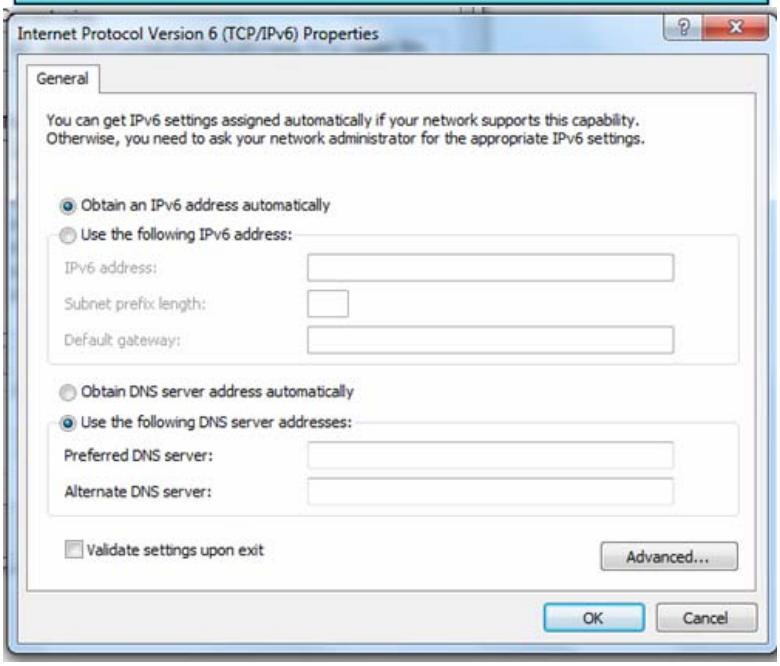
IPv6:

4. Select **Internet Protocol Version 6 (TCP/IPv6)** then click **Properties**



5. In the **TCP/IPv6 properties** window, select the **Obtain an IPv6 address automatically** and **Obtain DNS Server address automatically** radio buttons. Then click **OK** to exit the setting.

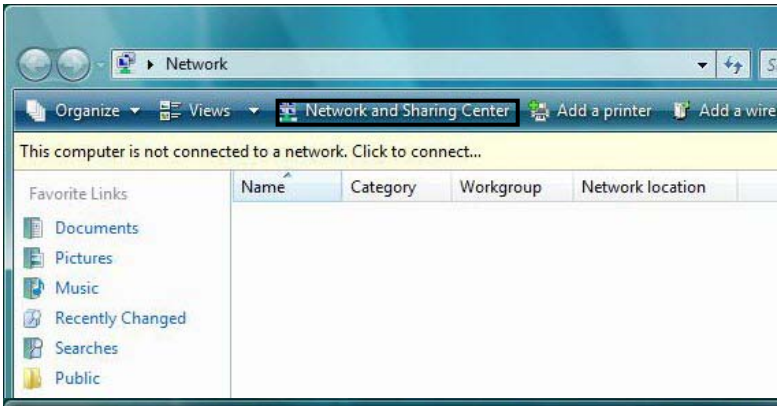
6. Click **OK** again in the **Local Area Connection Properties** window to apply the new configuration.



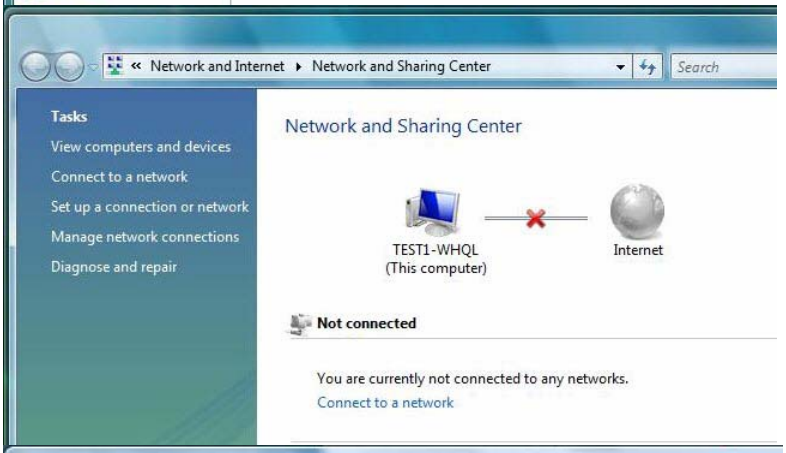
3.1.2 Configuring a PC in Windows Vista

1. Go to **Start**. Click on **Network**.

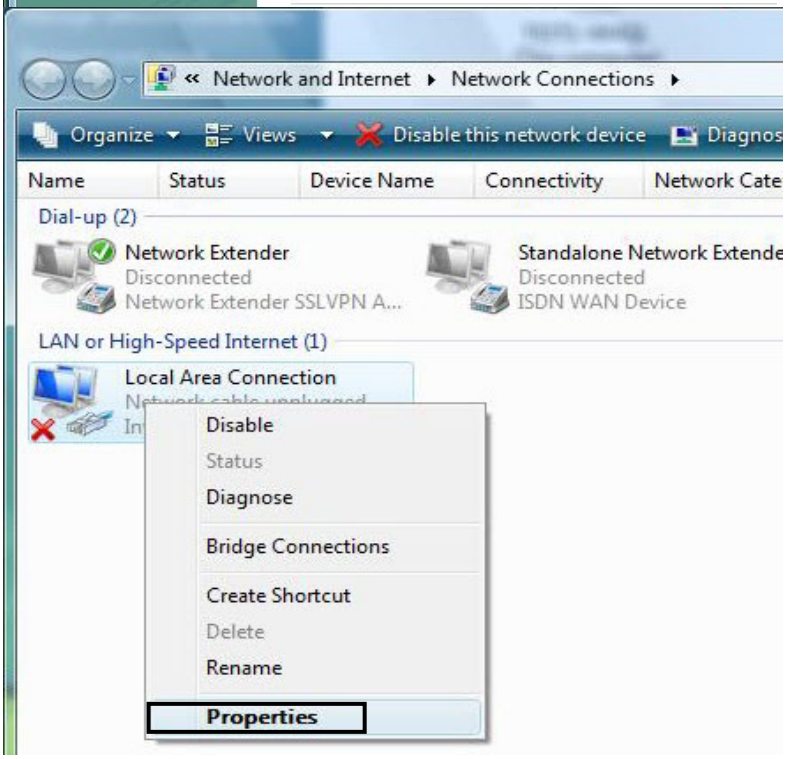
1. Then click on **Network and Sharing Center** at the top bar.



2. When the **Network and Sharing Center** window pops up, select and click on **Manage network connections** on the left window pane.

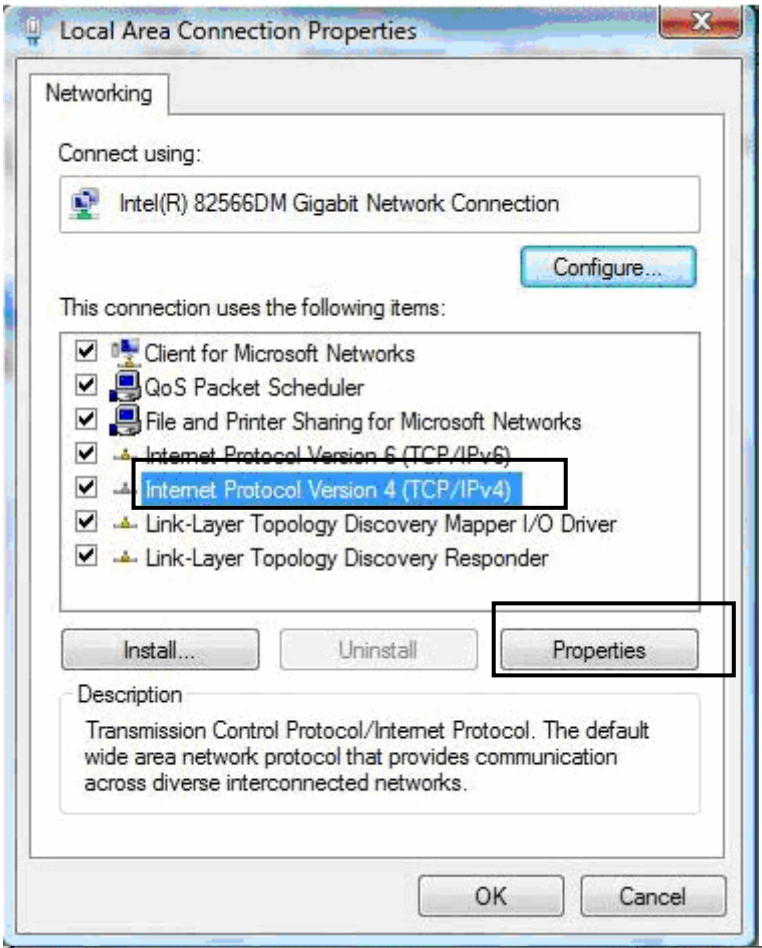


3. Select the **Local Area Connection**, and right click the icon to select **Properties**.



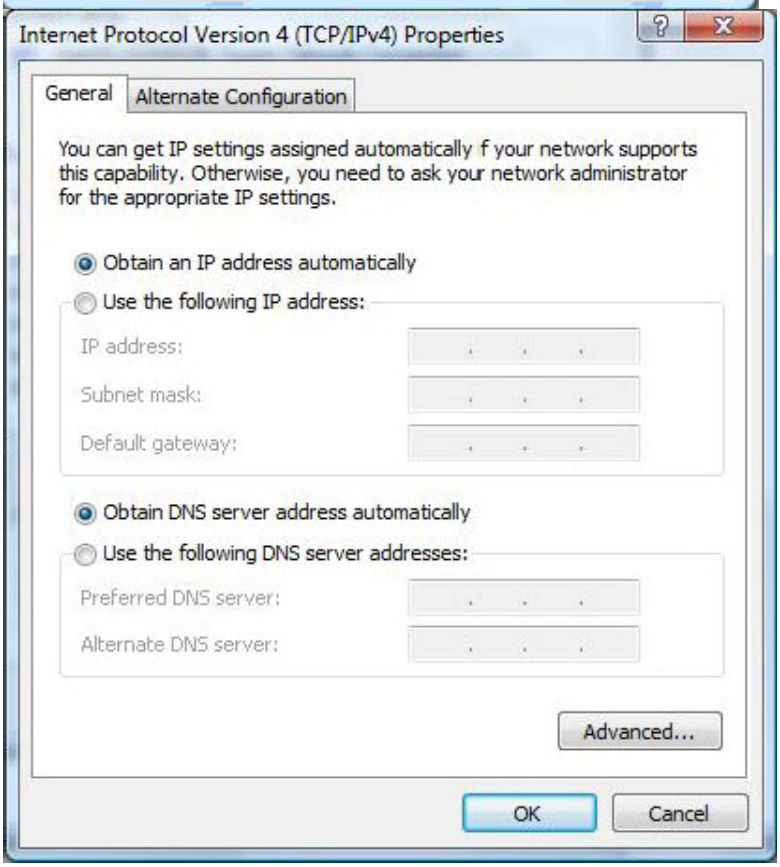
IPv4:

4. Select **Internet Protocol Version 4 (TCP/IPv4)** then click **Properties**.



5. In the **TCP/IPv4 properties** window, select the Obtain an **IP address automatically** and **Obtain DNS Server address automatically** radio buttons. Then click **OK** to exit the setting.

6. Click **OK** again in the **Local Area Connection Properties** window to apply the new configuration.

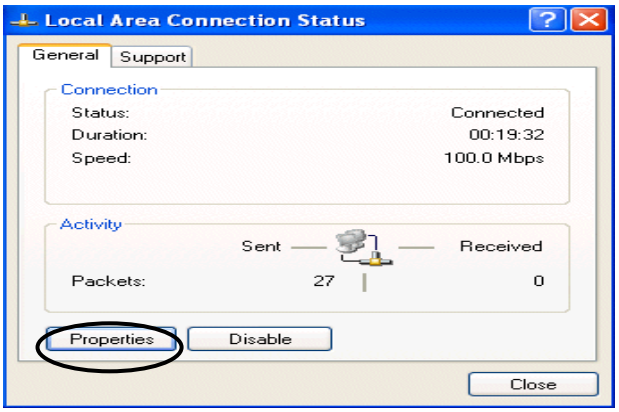


3.1.3 Configuring a PC in Windows XP

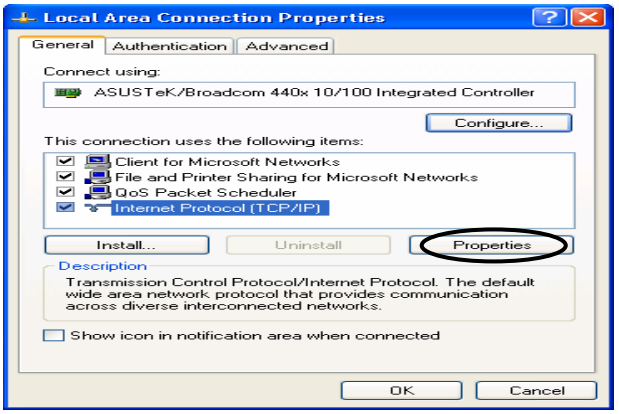
IPv4:

7. Go to **Start / Control Panel (in Classic View)**. In the Control Panel, double-click on **Network Connections**
8. Double-click **Local Area Connection**.

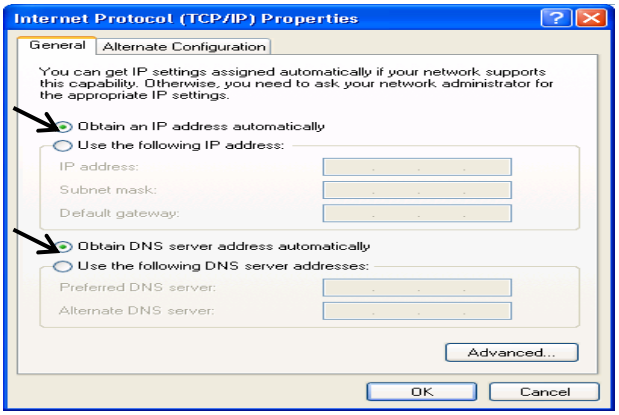
9. In the **Local Area Connection Status** window, click **Properties**.



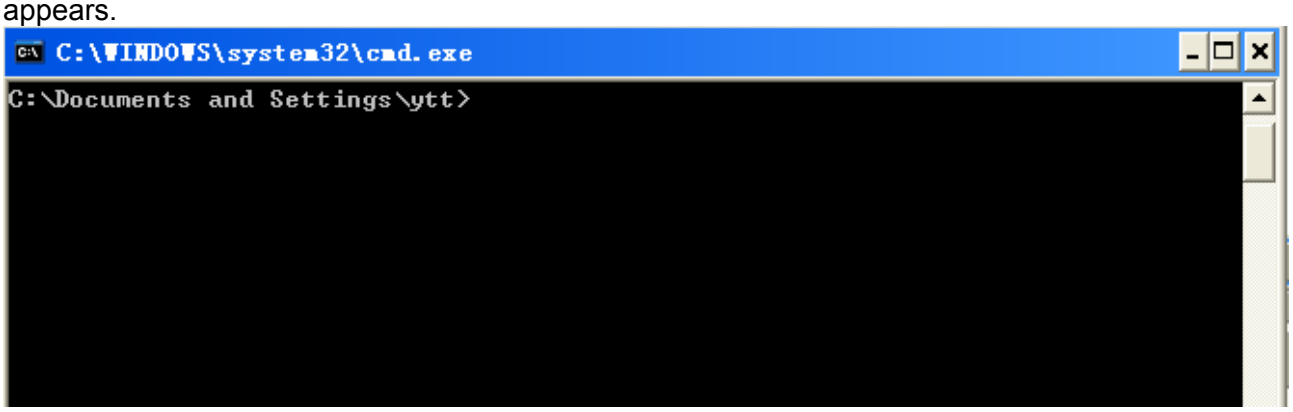
10. Select **Internet Protocol (TCP/IP)** and click **Properties**.



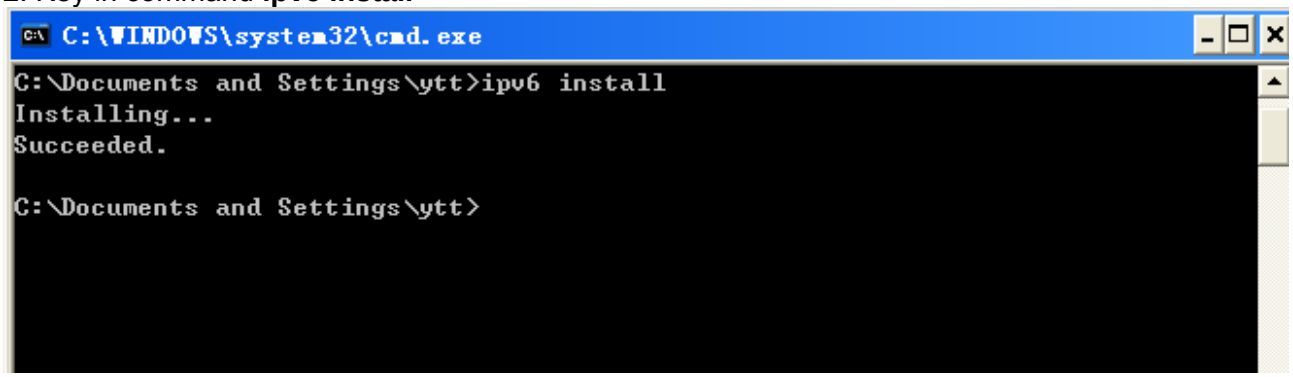
11. Select the **Obtain an IP address automatically** and the **Obtain DNS server address automatically** radio buttons.
12. Click **OK** to finish the configuration.



IPv6:
IPv6 is supported by Windows XP, but you should install it first.
Act as shown below:
1. On the desktop, Click Start > Run, type cmd, then press Enter key in the keyboard, the following screen appears.



2. Key in command **ipv6 install**

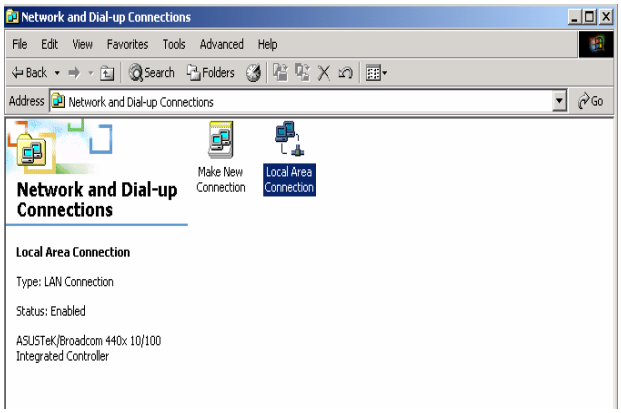


Configuration is OK now, you can test whether it works ok.

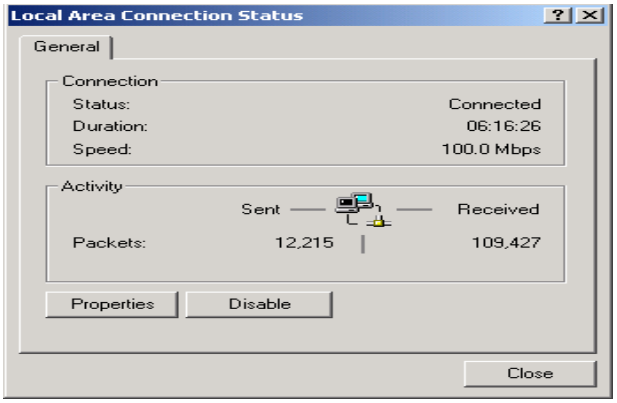
3.1.3 Configuring PC in Windows 2000

1. Go to **Start / Settings / Control Panel**. In the Control Panel, double-click on **Network and Dial-up Connections**.

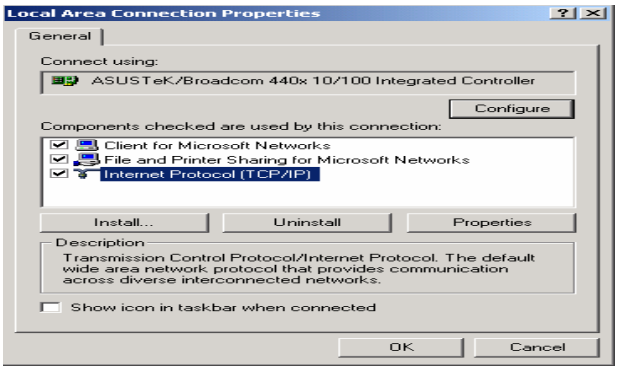
2. Double-click **Local Area Connection**.



3. In the **Local Area Connection Status** window click **Properties**.

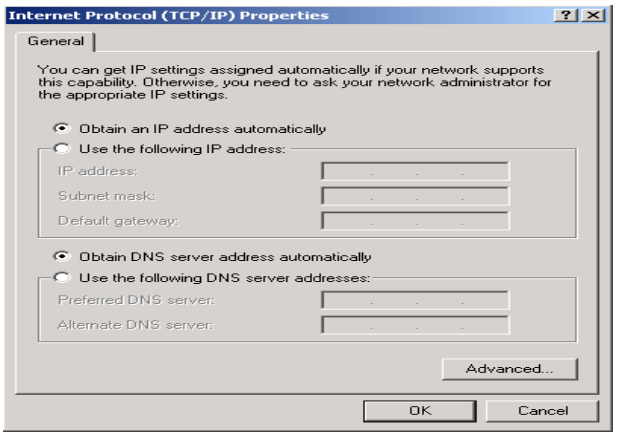


4. Select **Internet Protocol (TCP/IP)** and click **Properties**.



5. Select the **Obtain an IP address automatically** and the **Obtain DNS server address automatically** radio buttons.

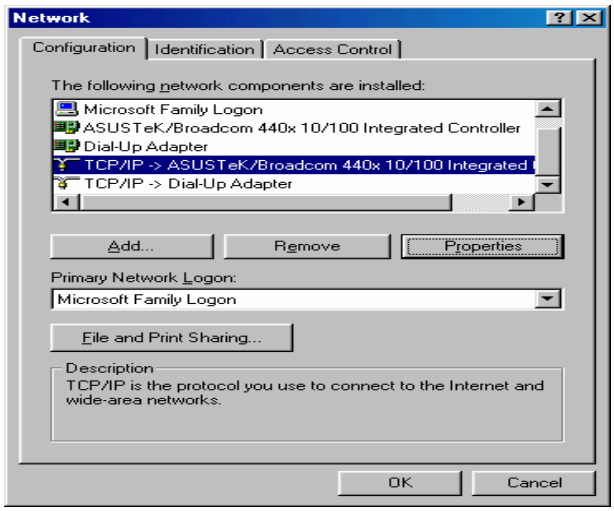
6. Click **OK** to finish the configuration.



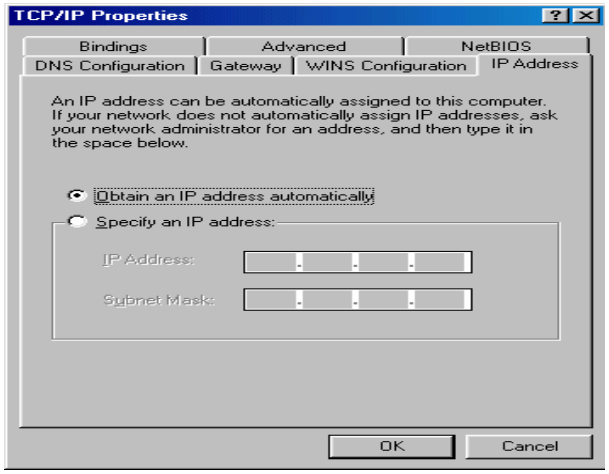
3.1.4 Configuring PC in Windows 98/Me

1. Go to **Start / Settings / Control Panel**. In the Control Panel, double-click on **Network** and choose the **Configuration** tab.

2. Select **TCP/IP ->NE2000 Compatible**, or the name of your Network Interface Card (NIC) in your PC.

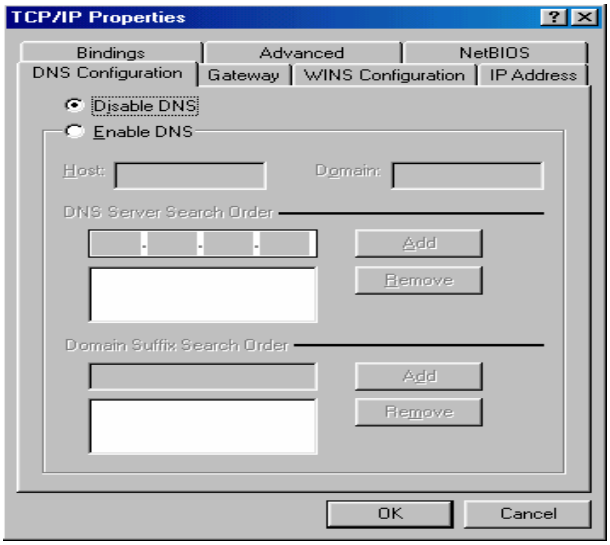


3. Select the **Obtain an IP address automatically** radio button.



4. Then select the **DNS Configuration** tab.

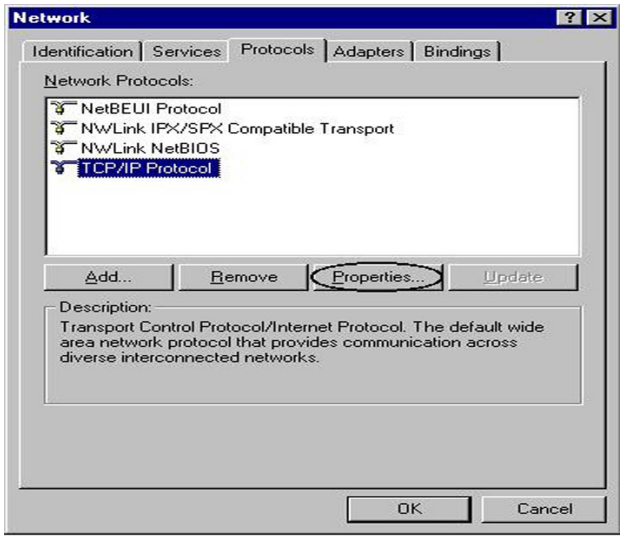
5. Select the **Disable DNS** radio button and click **OK** to finish the configuration.



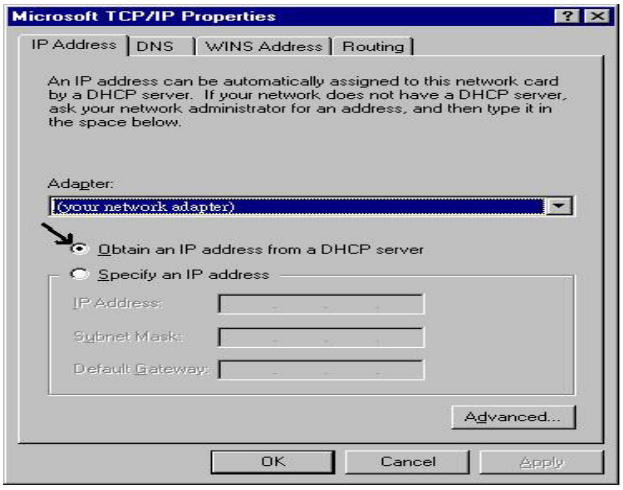
3.1.5 Configuring PC in Windows NT4.0

1. Go to **Start / Settings / Control Panel**. In the Control Panel, double-click on **Network** and choose the **Protocols** tab.

2. Select **TCP/IP Protocol** and click **Properties**.



3. Select the **Obtain an IP address from a DHCP server** radio button and click **OK**.



3.2 Factory Default Settings

Before configuring your router, you need to know the following default settings.

Web Interface:

- Username: admin
- Password: admin

LAN Device IP Settings:

- IP Address: 192.168.1.254
- Subnet Mask: 255.255.255.0

ISP setting in WAN site:

- PPPoE

DHCP server:

- DHCP server is enabled.
- Start IP Address: 192.168.1.100
- IP pool counts: 20

3.2.1 Username and Password

The default username and password are “**admin**” and “**admin**” respectively.

Attention

If you ever forget the password to log in, you may press the **RESET** button up to **6** seconds to restore the factory default settings.

3.3 LAN and WAN Port Addresses

The parameters of LAN and WAN ports are pre-set in the factory. The default values are shown below.

IPv4:

LAN Port		WAN Port
IP address	192.168.1.254	The PPPoE function is *enabled* to automatically get the WAN port configuration from the ISP.
Subnet Mask	255.255.255.0	
DHCP server function	Enabled	
IP addresses for distribution to PCs	20 IP addresses continuing from 192.168.1.100 through 192.168.1.119	

3.4 Information from your ISP

Before configuring this device, you have to check with your ISP (Internet Service Provider) what kind of service is provided such as **ADSL** (Dynamic IP Address, Static IP Address, PPPoE, PPPoA, Bridge Mode), **EWAN** ((Dynamic IP address, Static IP address, PPPoE, Bridge Mode).

Gather the information as illustrated in the following table and keep it for reference.

ADSL:

PPPoE	VPI/VCI, VC-based/LLC-based multiplexing, Username, Password, Service Name, and Domain Name System (DNS) IP address (it can be automatically assigned by your ISP when you connect or be set manually).	
PPPoA	VPI/VCI, VC-based/LLC-based multiplexing, Username, Password, and Domain Name System (DNS) IP address (it can be automatically assigned by your ISP when you connect or be set manually).	
Dynamic IP Address	RFC1483 Bridged IP	VPI/ VCI, LLC-based/ VC-based multiplexing, and Domain Name System (DNS) IP address (it can be automatically assigned by your ISP when you connect or be set manually).
	RFC1483 Routed IP	VPI/ VCI, LLC-based/ VC-based multiplexing, and Domain Name System (DNS) IP address (it can be automatically assigned by your ISP when you connect or be set manually).
Static IP Address	RFC1483 Bridged IP	VPI/ VCI, LLC-based/ VC-based multiplexing, Static IP Address, IP Subnet Mask, Gateway IP Address, and Domain Name System (DNS) IP address.
	RFC1483 Routed IP	VPI/ VCI, LLC-based/ VC-based multiplexing, Static IP Address, IP Subnet Mask, Gateway IP Address, and Domain Name System (DNS) IP address.
Bridge Mode	1483 Bridged Only	VPI/ VCI, LLC-based/ VC-based multiplexing.

EWAN:

PPPoE	Username, Password, Service Name, and Domain Name System (DNS) IP address (it can be automatically assigned by your ISP when you connect or be set manually).
Dynamic IP Address	Domain Name System (DNS) IP address (it can be automatically assigned by your ISP when you connect or be set manually).
Static IP Address	Static IP Address, IP Subnet Mask, Gateway IP Address, and Domain Name System (DNS) IP address.
Bridge Mode	Pure bridge.

Chapter 4
Easy Sign-On (EZSO)

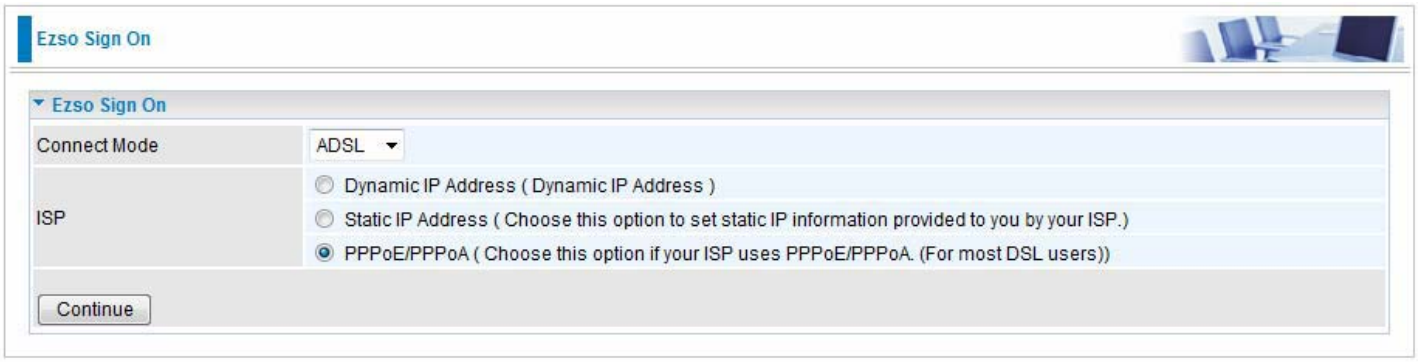
4.1 Easy Sign-On (EZSO)

This EZSO feature makes it easier for you to configure your router so that you can connect to the internet in a couple of seconds without having to logon to the router's GUI for any detail configuration. This configuration method is usually auto initiated if user is to connect to the internet via 7600NX(L).

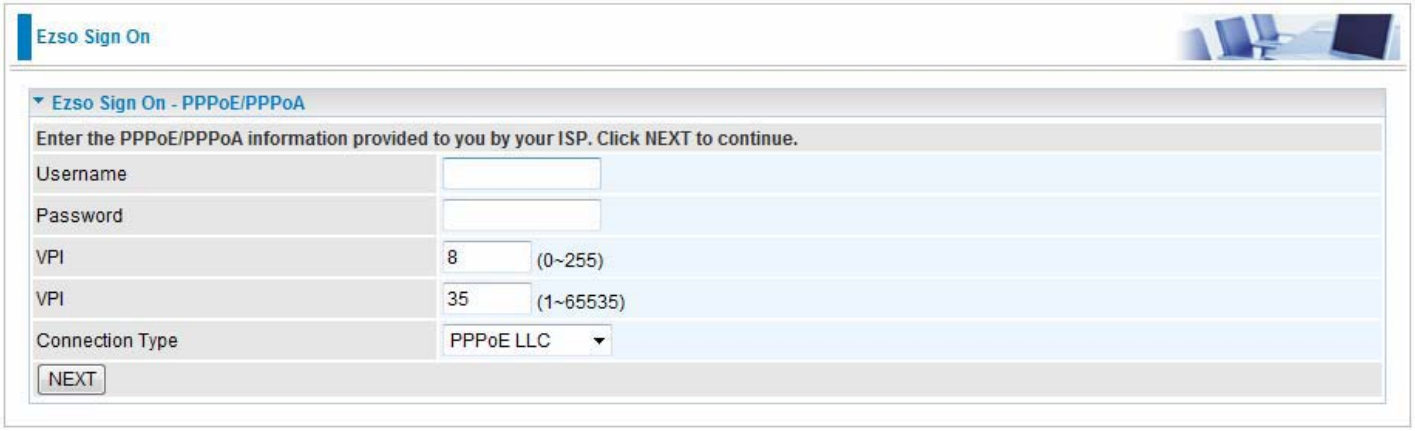
When user try to access any internet access via 7600NX(L) (usually the first users of the router), router would take you to the EZSO configuration page without logon to the router's GUI.

➢ ADSL

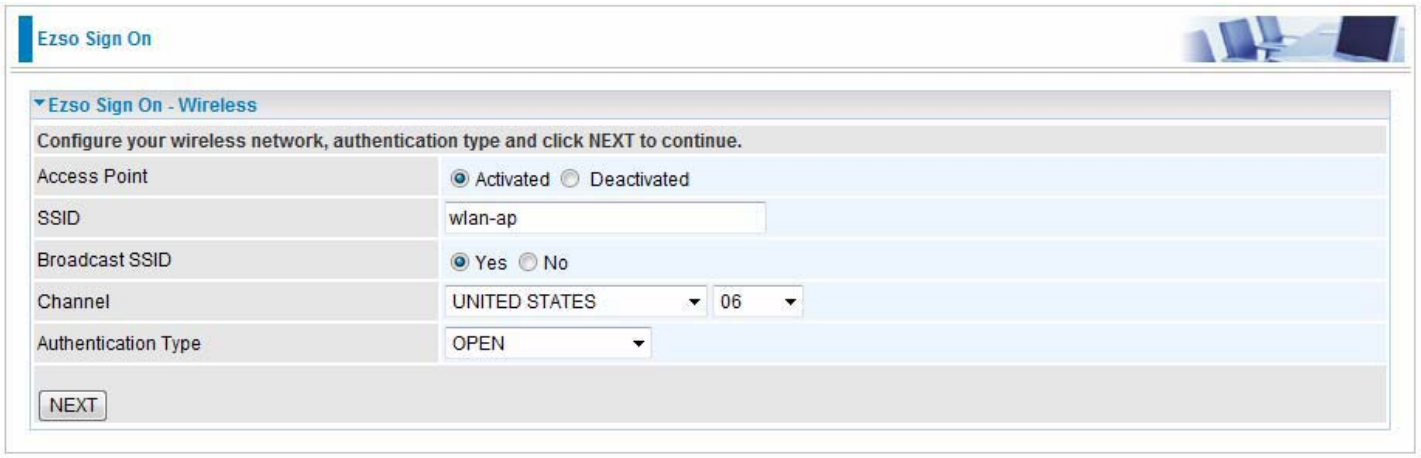
Step 1: Choose the **ADSL** connection mode. Press **Continue** to move on.



Step 2: Type the ADSL account, VCI/VPI from your ISP. Press **NEXT** to continue.



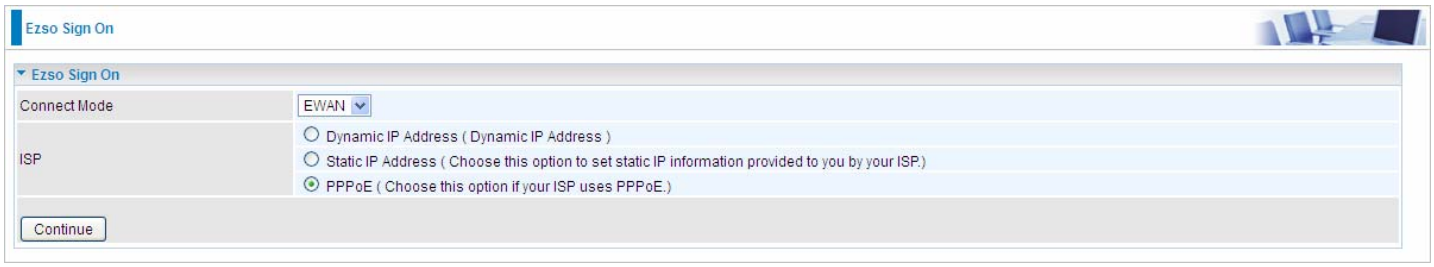
Step 3: Configure your wireless network. Press **NEXT** to continue.



Step 4: EZSO finished. (The default configuration is base on IPv4/IPv6)

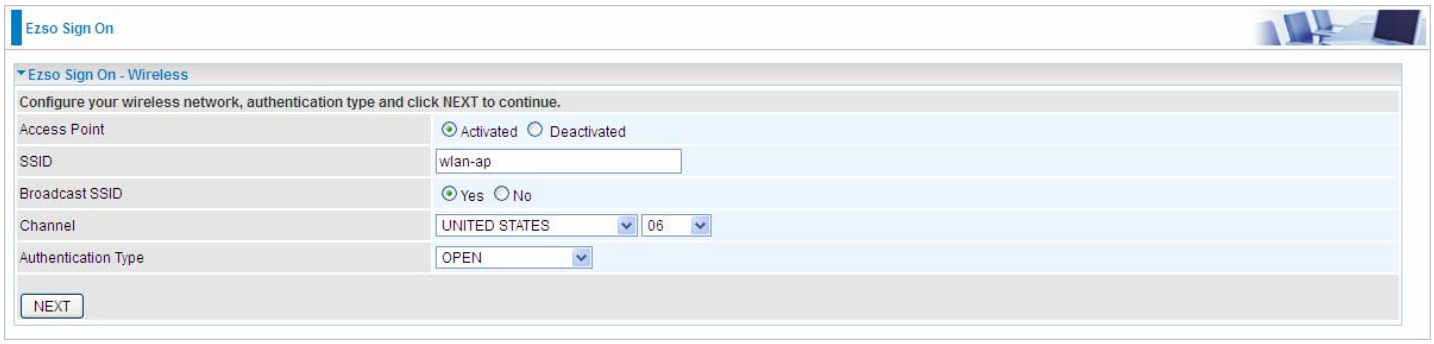
➢ EWAN

Step 1: Choose the **EWAN** connection mode. Press **Continue** to move on.

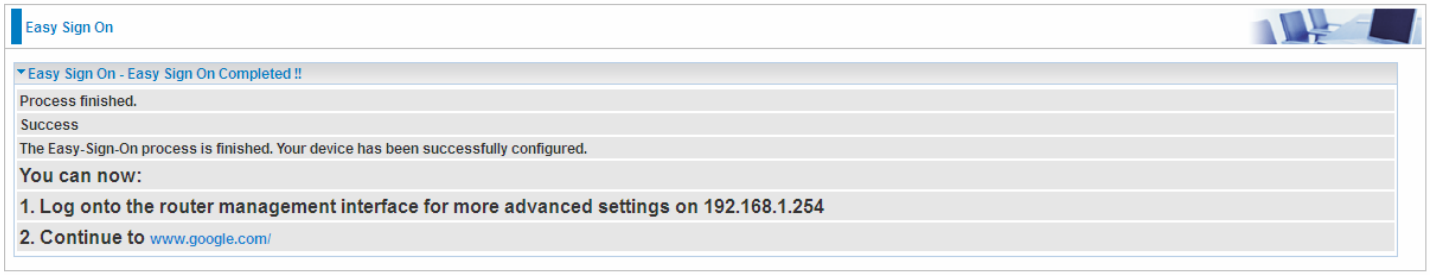


Step 2: Enter the PPPoE account provided by your ISP. Press **NEXT** to continue.

Step 3: Configure your wireless network. Press **NEXT** to continue.



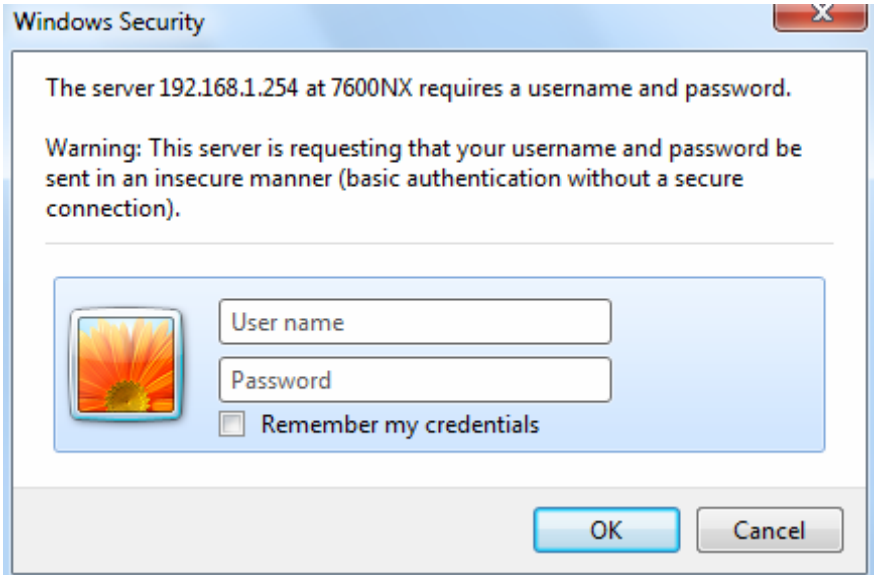
Step 4: EZSO finished. (The default configuration is base on IPv4/IPv6)



Chapter 5
Configuration

5.1 Configuring 7600NX(L) with your Web Browser

Open your web browser, enter the IP address of your router, which by default is **192.168.1.254**, and click "**OK**", a user name and password window prompt will appear. The default username and password are **"admin"** and **"admin".**



Congratulation! You are now successfully logged on to the BiPAC 7600NX(L)!

At the configuration homepage, the left navigation pane where bookmarks are provided links you directly to the desired setup page, including:

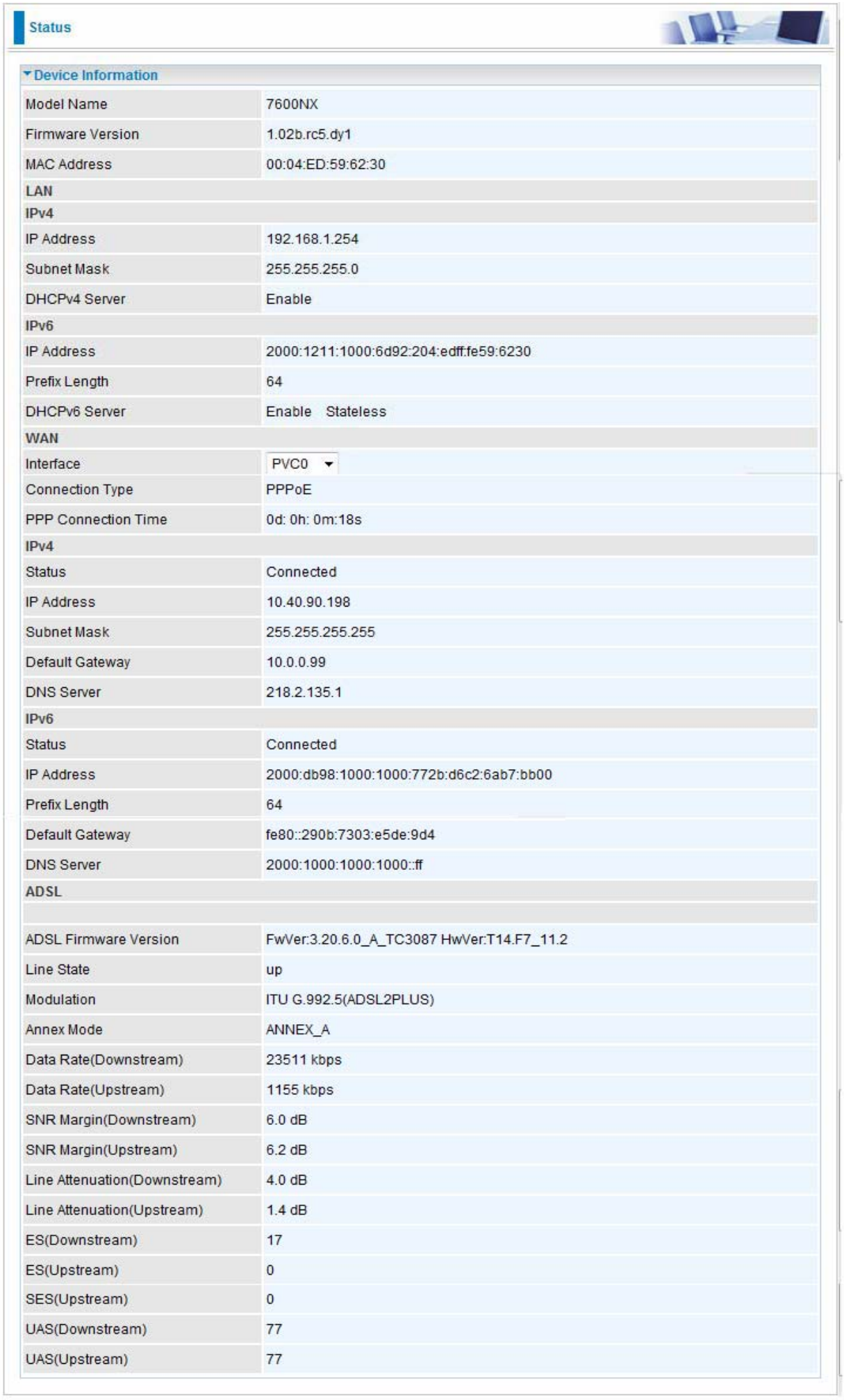
- **Status**(Device Info, System Log, Statistics, DHCP Table, IPSec Status *(7600NX only)*, PPTP Status *(7600NX only)*, Disk Status, L2TP Status *(7600NX only)*)
- **Quick Start** (Wizard Setup)
- **Configuration** (Interface Setup, Dual WAN, Advanced Setup, Access Management, Maintenance)
- **Language**

Please see the relevant sections of this manual for detailed instructions on how to configure your Billion router.

5.2 Status

In this section,you can check the router working status, including **Device Info**, **System Log**, **Statistics**, **DHCP Table**, **IPSEC Status** *(7600NX only)*, **PPTP Status** *(7600NX only)*, **Disk Status**, and **L2TP Status** *(7600NX only)*.

5.2.1 Device Info



Status

Device Information

Model Name	7600NX
Firmware Version	1.02b.rc5.dy1
MAC Address	00:04:ED:59:62:30
LAN	
IPv4	
IP Address	192.168.1.254
Subnet Mask	255.255.255.0
DHCPv4 Server	Enable
IPv6	
IP Address	2000:1211:1000:6d92:204:edff:fe59:6230
Prefix Length	64
DHCPv6 Server	Enable Stateless
WAN	
Interface	PVC0
Connection Type	PPPoE
PPP Connection Time	0d: 0h: 0m:18s
IPv4	
Status	Connected
IP Address	10.40.90.198
Subnet Mask	255.255.255.255
Default Gateway	10.0.0.99
DNS Server	218.2.135.1
IPv6	
Status	Connected
IP Address	2000:db98:1000:1000:772b:d6c2:6ab7:bb00
Prefix Length	64
Default Gateway	fe80::290b:7303:e5de:9d4
DNS Server	2000:1000:1000:1000::ff
ADSL	
ADSL Firmware Version	FwVer:3.20.6.0_A_TC3087 HwVer:T14.F7_11.2
Line State	up
Modulation	ITU G.992.5(ADSL2PLUS)
Annex Mode	ANNEX_A
Data Rate(Downstream)	23511 kbps
Data Rate(Upstream)	1155 kbps
SNR Margin(Downstream)	6.0 dB
SNR Margin(Upstream)	6.2 dB
Line Attenuation(Downstream)	4.0 dB
Line Attenuation(Upstream)	1.4 dB
ES(Downstream)	17
ES(Upstream)	0
SES(Upstream)	0
UAS(Downstream)	77
UAS(Upstream)	77

Device Information

Firmware Version: This is the Firmware version

MAC Address: This is the MAC Address

Model Name: Show model name of the router

LAN

➢ **IPv4:**

IP Address: LAN port IPv4 address.

Sub Net Mask: LAN port IP subnet mask.

DHCP Server: LAN port DHCP role - Enabled, Relay or disabled

➢ **IPv6:**

IP Address: LAN port IPv6 address.

Prefix Length: The prefix length

DHCP Server: The DHCP status.

WAN

Interface: The now used connection method, PVC0-PVC7, EWAN.

Connection Type: The protocol selected.

PPPoE connection Time: The time totaled since it has been successfully connected.

➢ **IPv4:**

Status: the connection status, Not connected or Connected.

IP Address: WAN port IP address.

Subnet Mask: WAN port IP subnet mask.

Default Gateway: The IP address of the default gateway.

DNS Server: WAN port DHCP role - Enabled, Relay or disabled

➢ **IPv6:**

Status: the IPv6 connection status.

IP Address: WAN port IPv6 address.

Prefix Length: The prefix length..

Default Gateway: The IP address of the default gateway.

DNS Server: DNS information.

ADSL

ADSL Firmware Version: This is the DSL firmware version associated with your router

Line State: This is the status of your ADSL link, up or down.

Modulation: This field displays the ADSL modulation status for G.dmt or T1.413.

Annex Mode: To show the router's type, e.g. Annex A, Annex B

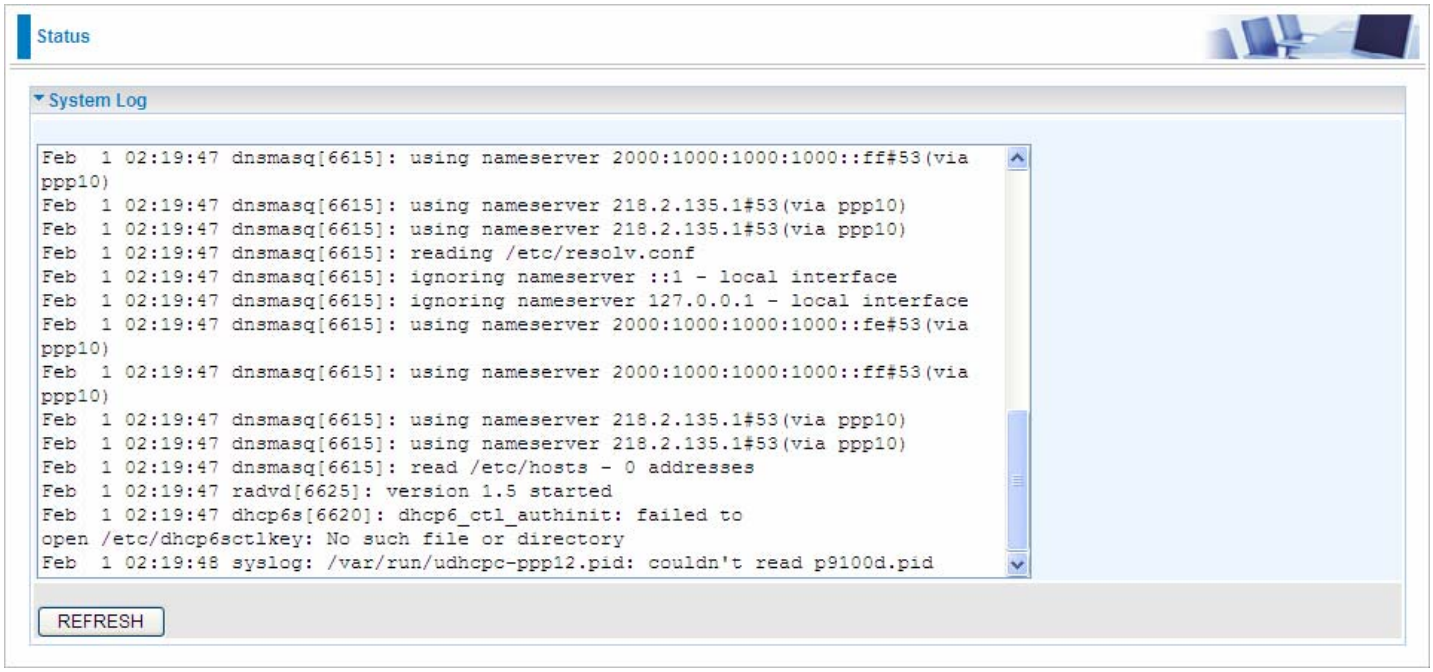
SNR Margin: To show the router's SNR margin for Downstream/Upstream

Line Attenuation: To show the router's for Downstream/Upstream

Data Rate: To show the router’s data rate for Downstream/Upstream

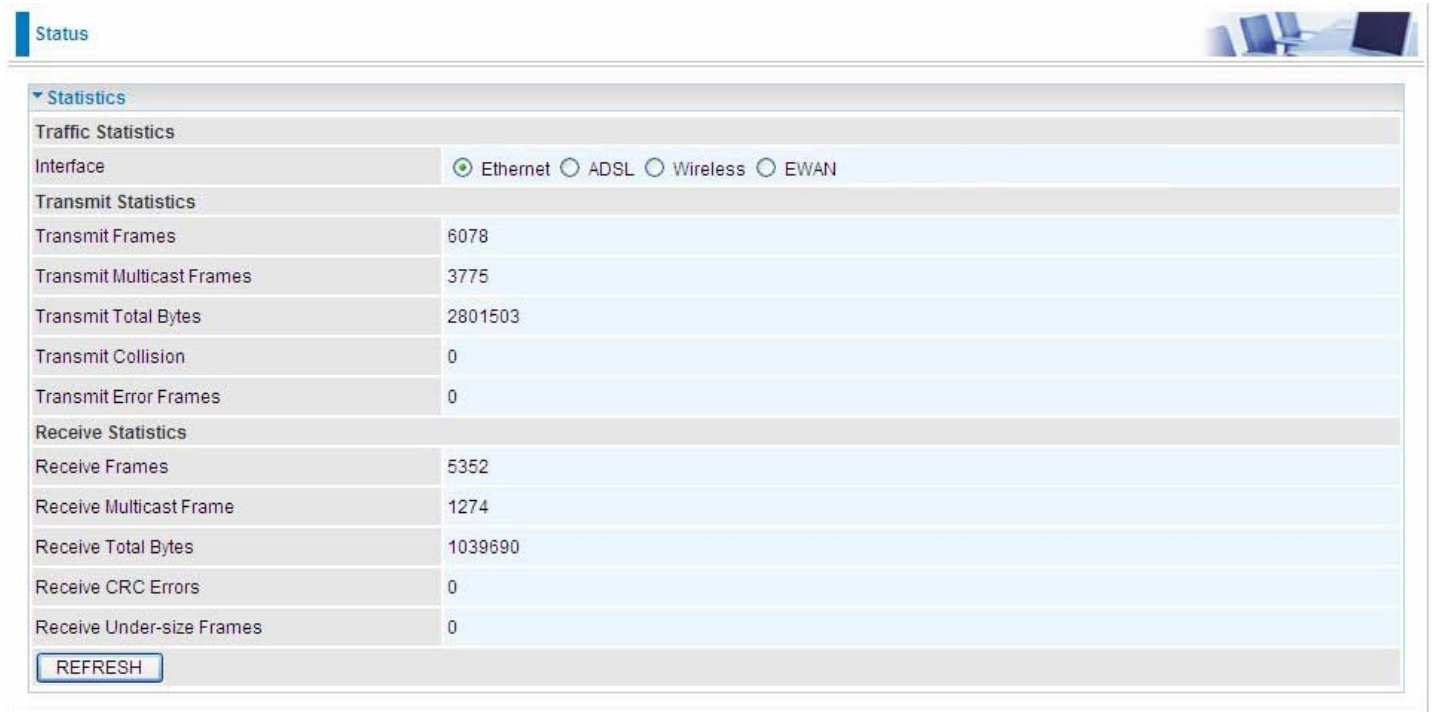
5.2.2 System Log

In system log, users can check the operations to the router and track the glitches to the router when occurred.



5.2.3 Statistics

➢ **Ethernet**



Interface: This field displays the type of port

Transmit Frames: This field displays the number of frames transmitted until the latest second.

Transmit Multicast Frames: This field displays the number of multicast frames transmitted until the latest second.

Transmit total Bytes: This field displays the number of bytes transmitted until the latest second.

Transmit Collision: This is the number of collisions on this port.

Transmit Error Frames: This field displays the number of error packets on this port.

Receive Frames: This field displays the number of frames received until the latest second.

Receive Multicast Frames: This field displays the number of multicast frames received until the latest second.

Receive total Bytes: This field displays the number of bytes received until the latest second.

Receive CRC Errors: This field displays the number of error packets on this port.

Receive Under-size Frames: This field displays the number of under-size frames received until the latest second.

REFRESH: Press this button to refresh the statistics.

➢ ADSL

Transmit total PDUs: This field displays the number of total PDU transmitted until the latest second.

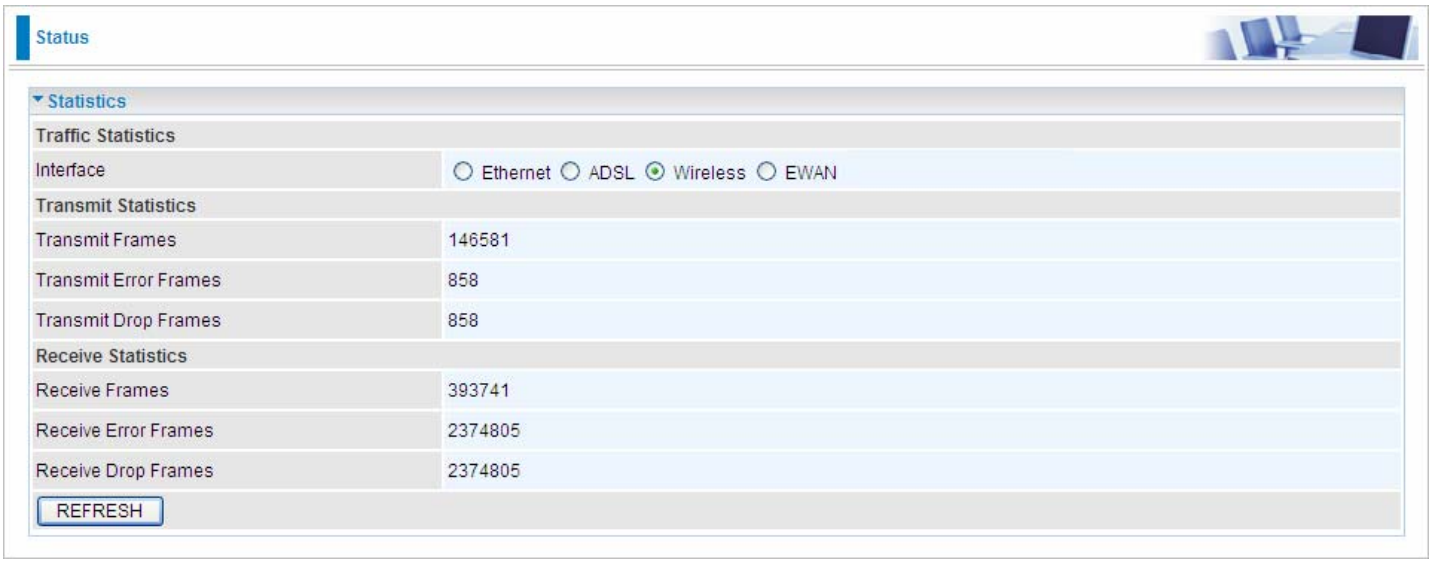
Transmit total Error Counts: This field displays the number of total error transmitted until the latest second.

Receive total PDUs: This field displays the number of total PDU received until the latest second.

Receive total Error Counts: This field displays the number of total error received until the latest second.

REFRESH: Press this button to refresh the statistics.

➢ Wireless



Tx Frames Count: This field displays the number of frames transmitted until the latest second.

Tx Errors Count: This field displays the number of errors frames transmitted until the latest second.

Tx Drops Count: This field displays the number of drops frames transmitted until the latest second.

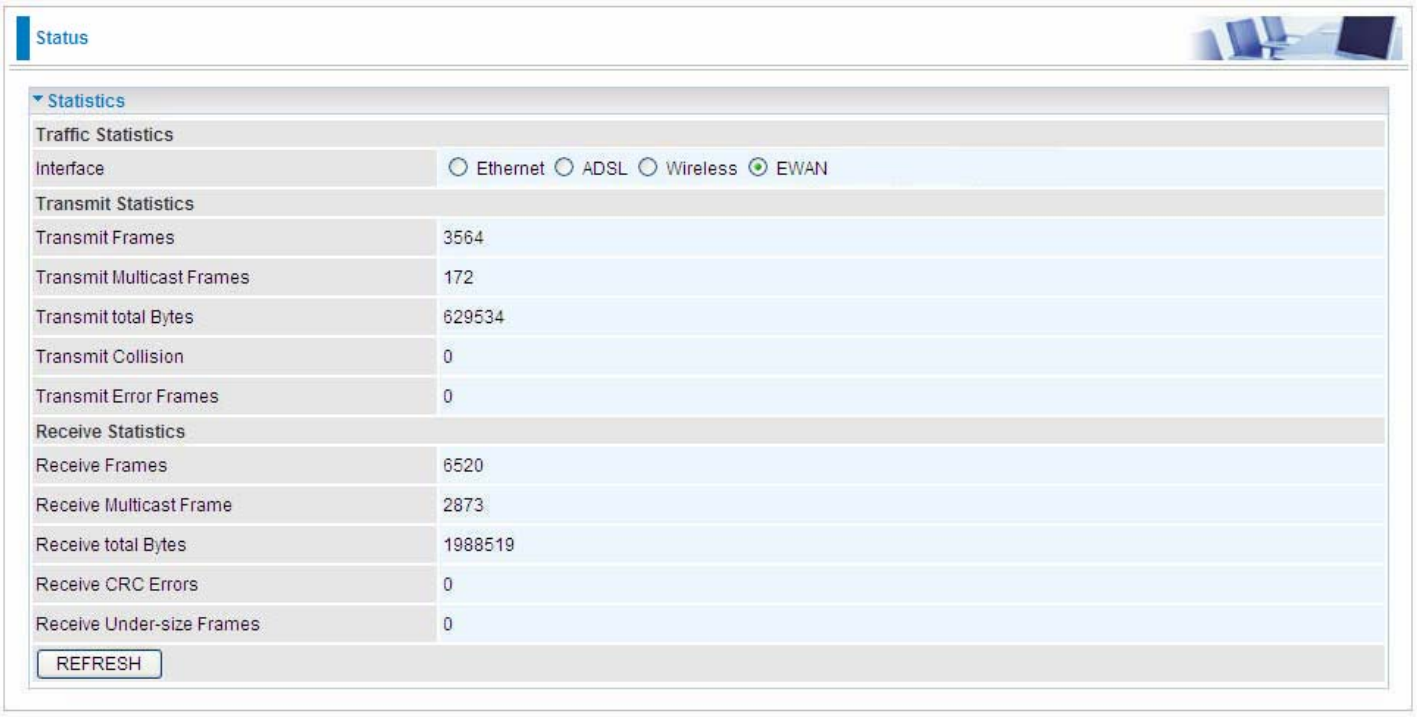
Rx Frames Count: This field displays the number of frames received until the latest second.

Rx Errors Count: This field displays the number of errors frames received until the latest second.

Rx Drops Count: This field displays the number of drops frames received until the latest second.

REFRESH: Press this button to refresh the statistics.

➢ EWAN



Transmit Frames: This field displays the total number of frames transmitted until the latest second.

Transmit Multicast Frames: This field displays the total number of multicast frames transmitted till the latest second.

Transmit total Bytes: This field displays the total number of bytes transmitted until the latest second.

Transmit Collision: This is the number of collisions on this port.

Transmit Error Frames: This field displays the number of error packets on this port.

Receive Frames: This field displays the number of frames received until the latest second.

Receive Multicast Frames: This field displays the number of multicast frames received until the latest second.

Receive total Bytes: This field displays the number of bytes received until the latest second.

Receive CRC Errors: This field displays the number of error packets on this port.

Receive Under-size Frames: This field displays the number of under-size frames received until the latest second.

REFRESH: Press this button to refresh the statistics.

5.2.4 DHCP Table

DHCP table displays the devices connected to the router with clare information.

#: The index identifying the connected devices.

HostName: Show the hostname of the PC.

IP: The IP allocated to the device.

MAC Address: The MAC of the connected device.

Expire Time: The total remaining interval since the IP assignment to the PC.

5.2.5 IPSEC Status *(7600NX only)*

#: The IPSec entry index number.

Connection Name: User-defined IPSEC VPN connection name.

Remote Gateway: The IP of the remote gateway.

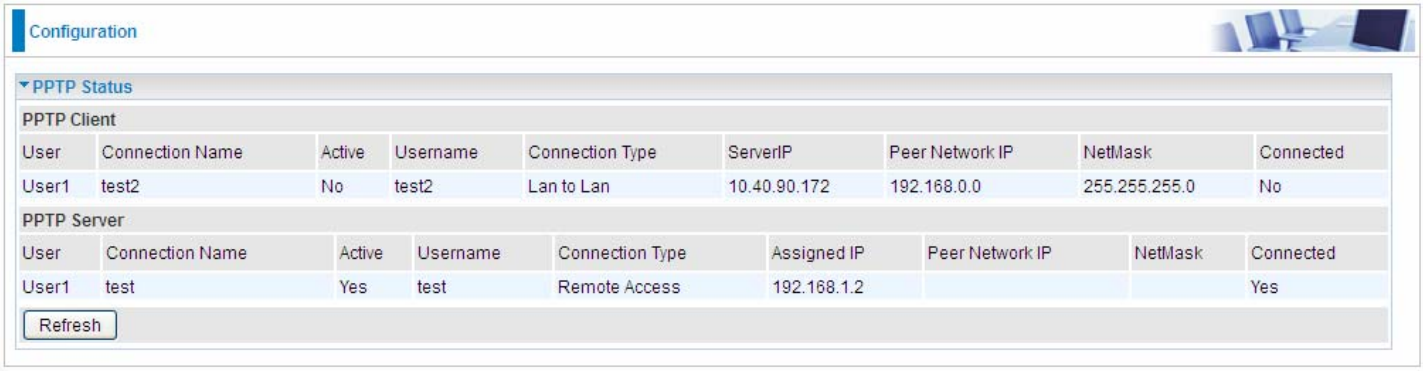
Local Address: The IP and netmask of local IPSEC gateway.

Remote address: The IP and netmask of remote IPSEC gateway.

Connected: Show the connecting status.

Action: Connection or Drop the connection.

5.2.6 PPTP Status *(7600NX only)*



PPTP Client

User: Four users(sessions) for client sessions. Here shows the using user.

Connection Name: Show user-defined PPTP VPN connection name.

Active: Show if the tunnel is active for connection.

Connection Type: Remote Access or LAN to LAN.

Server IP: Show the IP of VPN Server.

Peer Network IP: Display the remote network and subnet mask in LAN to LAN PPTP connection.

NetmasK: Show the netmask of peer network.

Connected: Show the connecting status.

PPTP Server

User: Four users (sessions) for server sessions. Here shows the using user.

Connection Name: Show user-defined PPTP VPN connection name.

Active: Show if the tunnel is active for connection.

Connection Type: Remote Access or LAN to LAN.

Assigned IP: Show the IP assigned to the client.

Peer Network IP: Display the remote network and subnet mask in LAN to LAN PPTP connection.

NetmasK: Show the netmask of peer network.

Connected: Show the connecting status.

Refresh: Click this button to refresh the connection status.

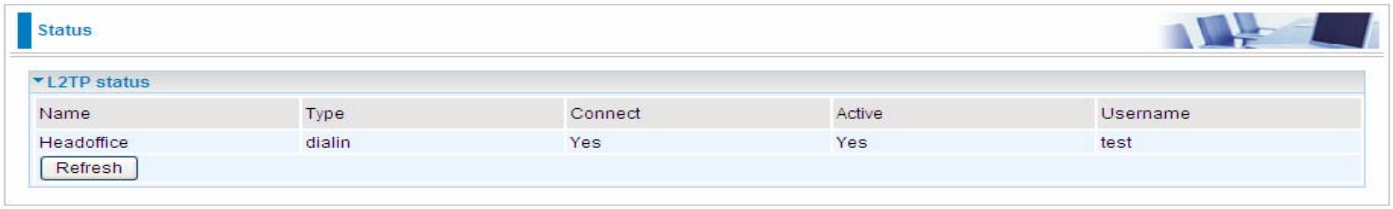
5.2.7 Disk Status

Partition: Display the NAS partition.

Disk Space(KB): Display the total storage space of the NAS in KB unit.

Free Space(KB): Display the available space in KB unit.

5.2.8 L2TP Status*(7600NX only)*



Name: Display the user-defined L2TP connection name.

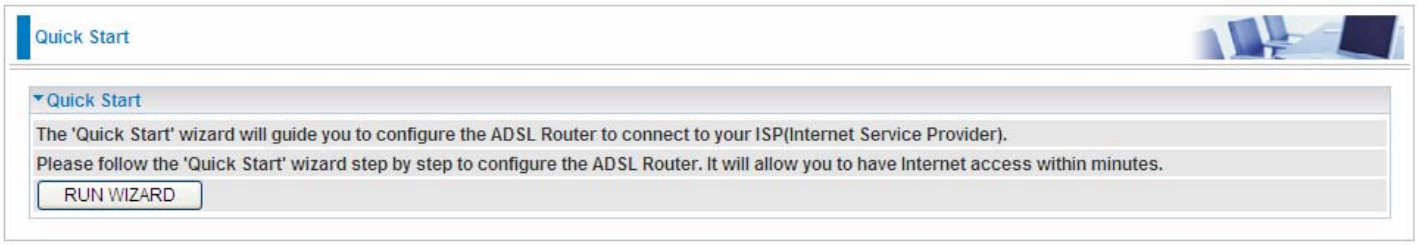
Type: The VPN mode: dialin or dialout.

Connect: The connecting status.

Active: Show if the L2TP tunnel is active for connection.

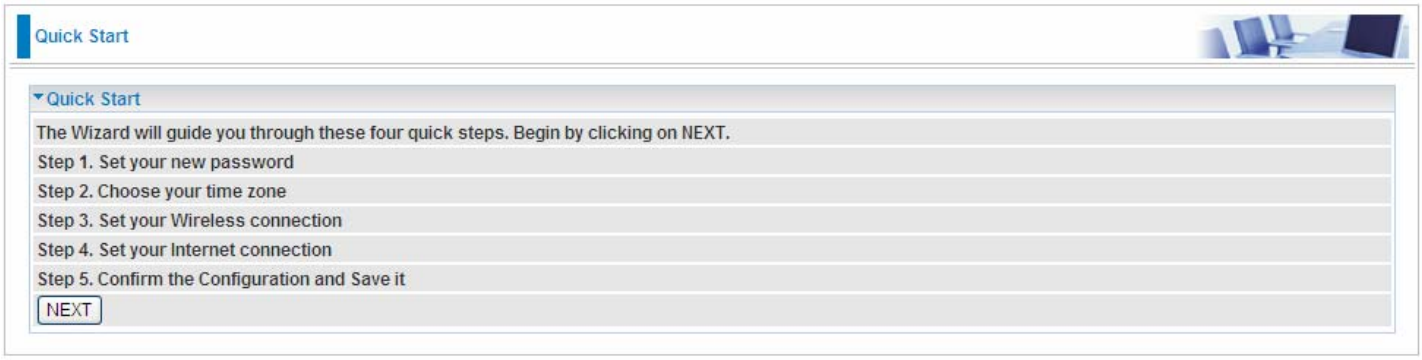
Username: The user assigned to client (dialout use) or the user set for client to connect in (dialin use).

5.3 Quick Start



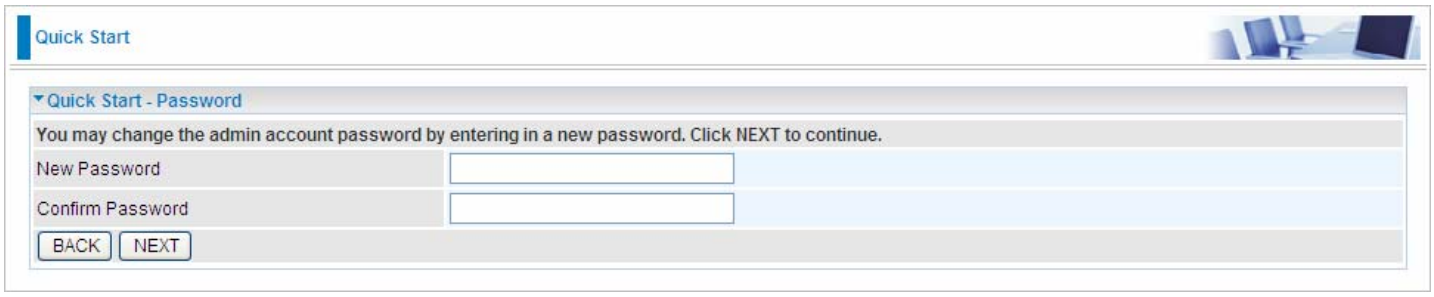
For detailed instructions on configuring WAN settings, see the **Interface Setup** section of this manual.

The Quick Start Wizard is a useful and easy utility to help setup the device to quickly connect to your ISP (Internet Service Provider) with only a few steps required. It will guide you step by step to configure the password, time zone, and WAN settings of your device. The Quick Start Wizard is a helpful guide for first time users to the device.

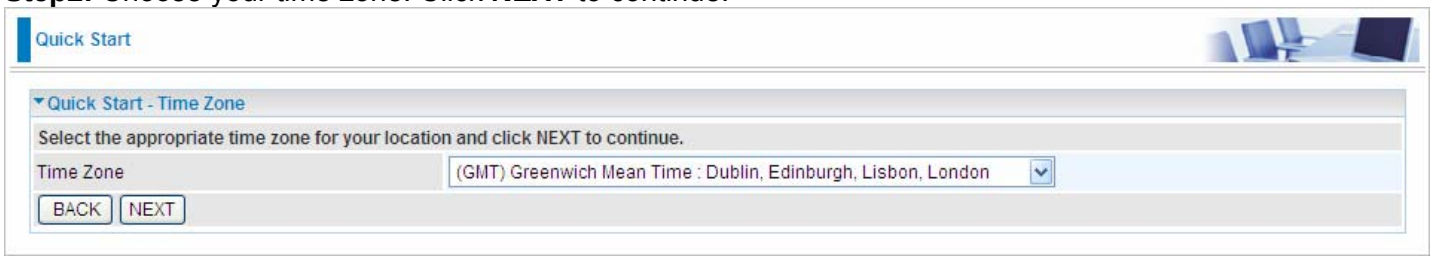


Click **NEXT** to enter step 1.

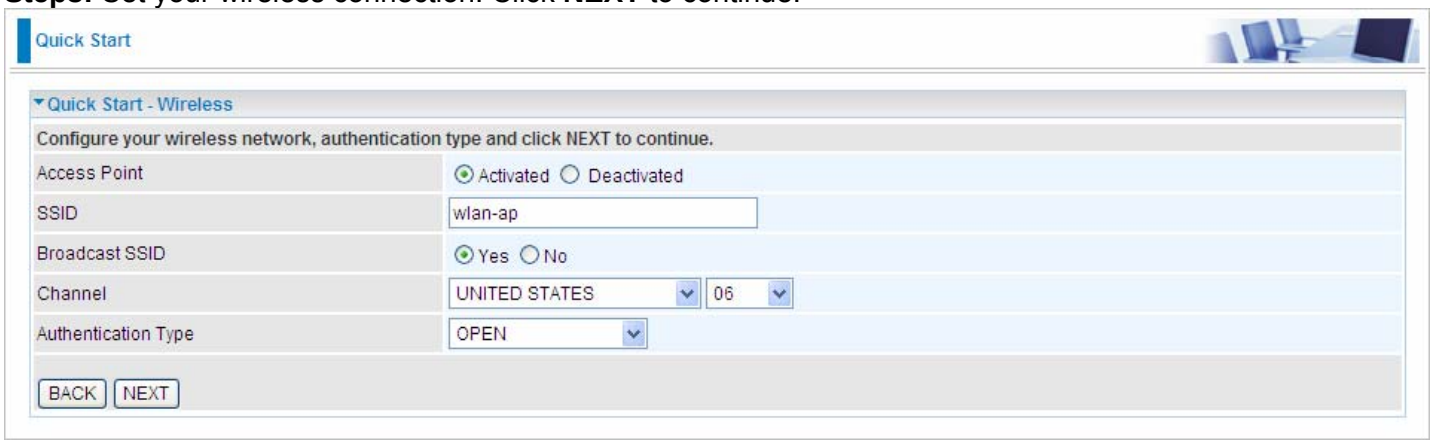
Step1. Set new password of the “admin” account. The password was used to manage the web access. The default is “admin”. Once changed, please remember carefully. Click **NEXT** to continue.



Step2: Choose your time zone. Click **NEXT** to continue.



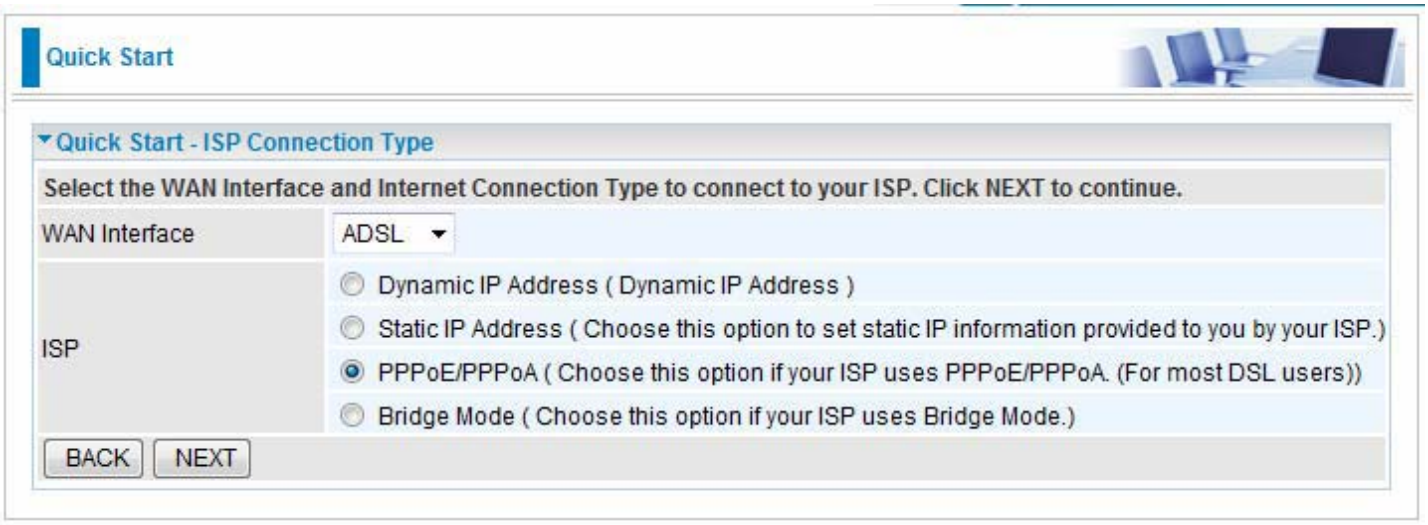
Step3: Set your wireless connection. Click **NEXT** to continue.



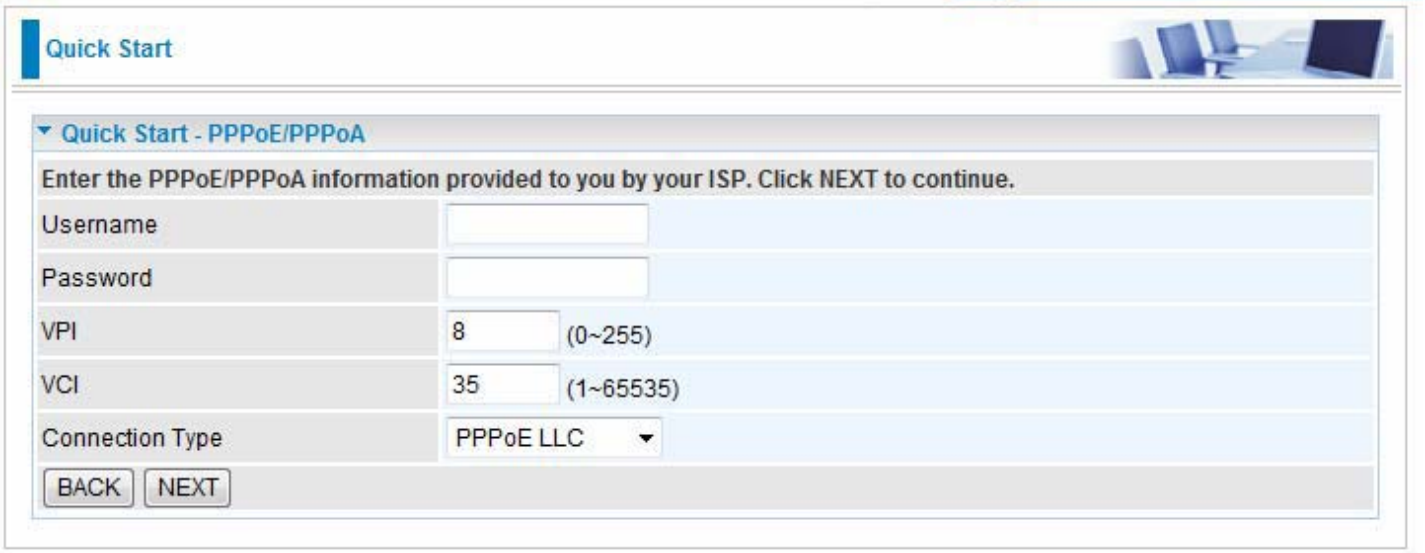
Step4: Set your Internet connection

WAN Transfer Modes: ADSL, or EWAN.

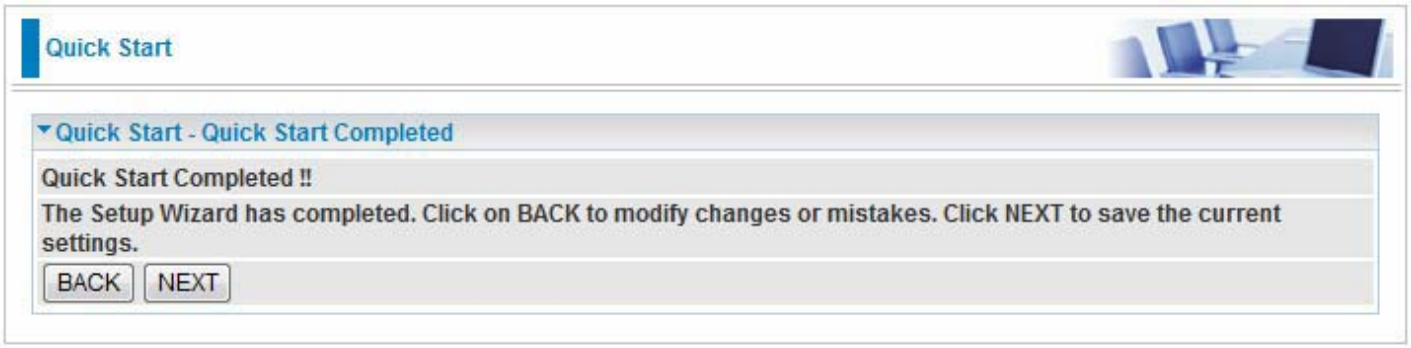
➢ **ADSL**



1) Enter the PPPoE/PPPoA account / VPI,VCI information provided to you by your ISP. Click **NEXT** to continue.



2).The Setup Wizard has completed. Click on BACK to modify changes or mistakes. Click **NEXT** to save the current settings.



3). Quick Start Completed!

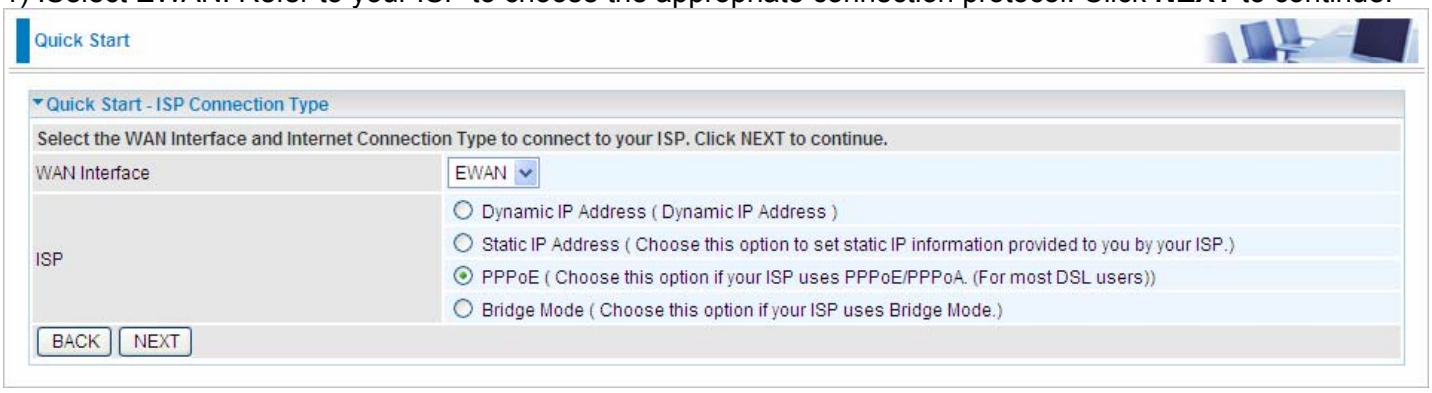
Note:

Please make sure the ADSL have synchronized, users can go to **Status** > **Device Info** to check instant information. If the ADSL have synchronized, you can see information like shown in the following screenshot.

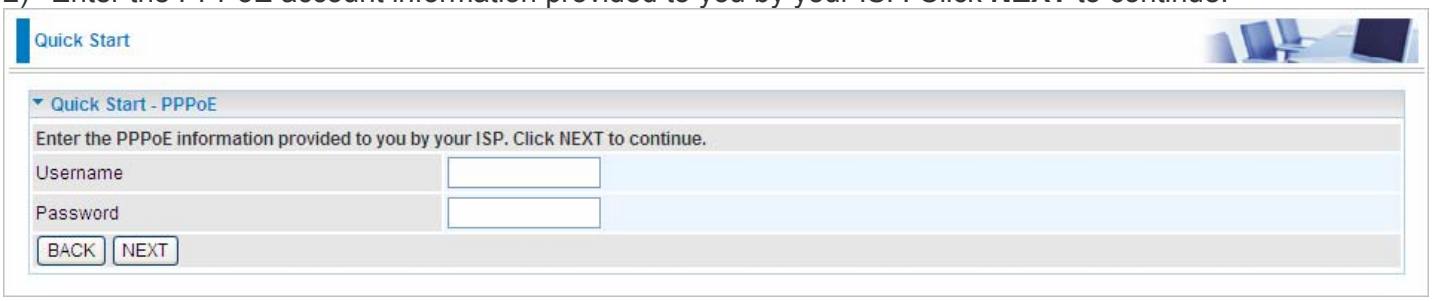
ADSL	
ADSL Firmware Version	FwVer:3.20.6.0_A_TC3087 HwVer:T14.F7_11.2
Line State	up
Modulation	ITU G.992.5(ADSL2PLUS)
Annex Mode	ANNEX_A
Data Rate(Downstream)	23511 kbps
Data Rate(Upstream)	1155 kbps
SNR Margin(Downstream)	6.0 dB
SNR Margin(Upstream)	6.2 dB
Line Attenuation(Downstream)	4.0 dB
Line Attenuation(Upstream)	1.4 dB
ES(Downstream)	17
ES(Upstream)	0
SES(Downstream)	12
SES(Upstream)	0
UAS(Downstream)	77
UAS(Upstream)	77

➢ EWAN

1) .Select EWAN. Refer to your ISP to choose the appropriate connection protocol. Click **NEXT** to continue.



2) Enter the PPPoE account information provided to you by your ISP. Click **NEXT** to continue.

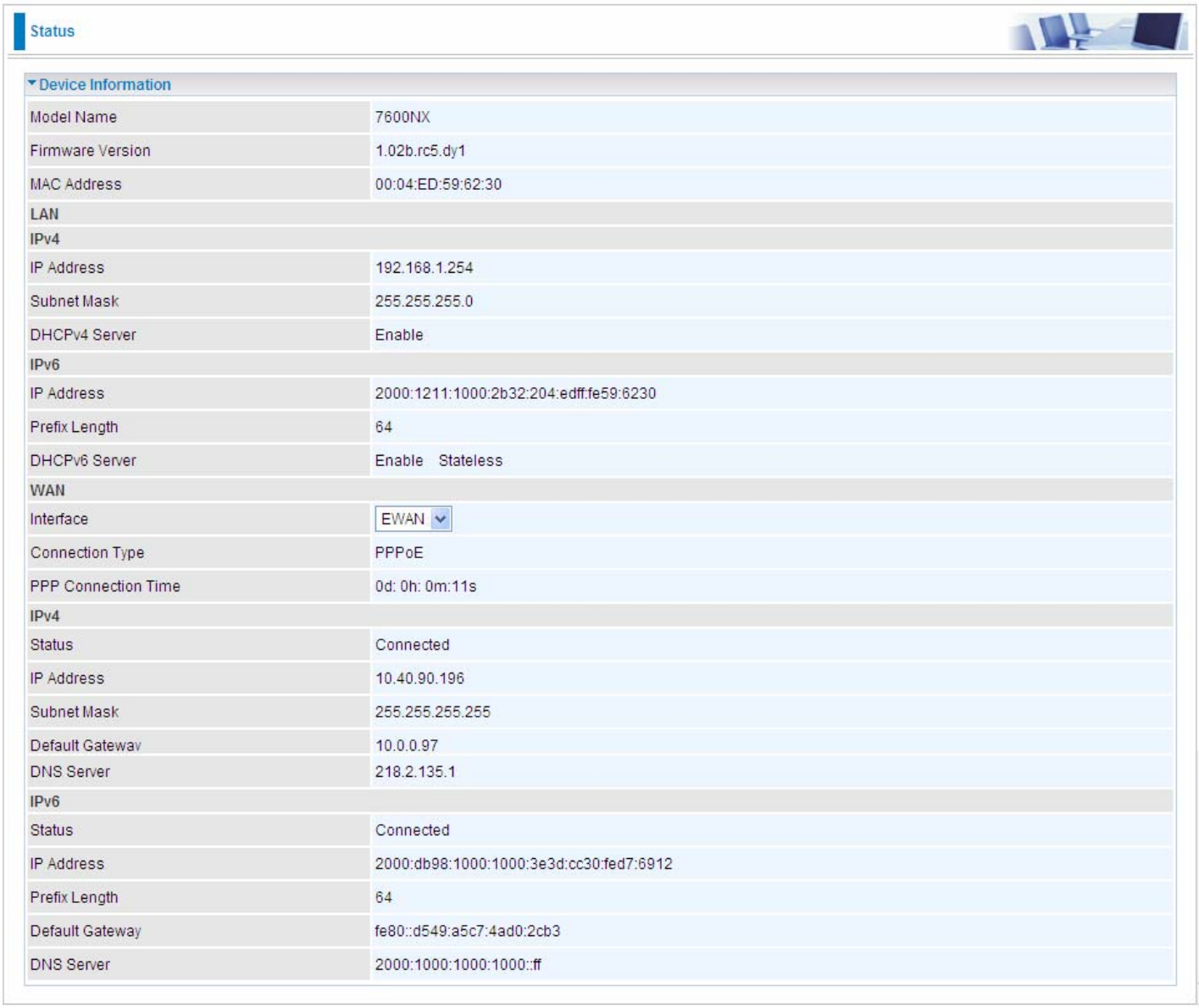


2).The Setup Wizard has completed. Click on BACK to modify changes or mistakes. Click **NEXT** to save the current settings.

3). Quick Start Completed!

Switch to **Status > Devic Info** to view the status.

If configuration is completed, users can change to **Status > Device Info** for information.



Status

Device Information

Model Name	7600NX
Firmware Version	1.02b.rc5.dy1
MAC Address	00:04:ED:59:62:30
LAN	
IPv4	
IP Address	192.168.1.254
Subnet Mask	255.255.255.0
DHCPv4 Server	Enable
IPv6	
IP Address	2000:1211:1000:2b32:204:edff:fe59:6230
Prefix Length	64
DHCPv6 Server	Enable Stateless
WAN	
Interface	EWAN
Connection Type	PPPoE
PPP Connection Time	0d: 0h: 0m:11s
IPv4	
Status	Connected
IP Address	10.40.90.196
Subnet Mask	255.255.255.255
Default Gatewav	10.0.0.97
DNS Server	218.2.135.1
IPv6	
Status	Connected
IP Address	2000:db98:1000:1000:3e3d:cc30:fed7:6912
Prefix Length	64
Default Gateway	fe80::d549:a5c7:4ad0:2cb3
DNS Server	2000:1000:1000:1000::ff

5.4 Configuration

Click this item to access the following sub-items that configure the router: **Interface Setup**, **Advanced Setup**, **Access Management**, **and Maintenance**.

First, let us take a look at the **Interface Setup**. There are three items contained in this section, namely, **Internet**, **LAN**, and **Wireless**.
Each is described in the following scenario.

5.4.1 Interface Setup

5.4.1.1 Internet

➢ **ADSL**

Configuration

Internet

WAN Interface	ADSL
ATM PVC	
Virtual Circuit	PVC 0 PVCs Summary
Status	Activated Deactivated
VPI	8 (range: 0~255)
VCI	35 (range: 32~65535)
QoS	
ATM QoS	ubr
PCR	0 cells/second
SCR	0 cells/second
MBS	0 cells
IPv4/IPv6	
IP Version	IPv4 IPv4/IPv6 IPv6
ISP Connection Type	
ISP	Dynamic IP Address Static IP Address PPPoE/PPPoA Bridge Mode
802.1q Options	
802.1q	Activated Deactivated
VLAN ID	0 (range: 0~4095)
PPPoE/PPPoA	
Connection Type	PPPoE LLC
Username	
Password	
Bridge Interface for PPPoE	Activated Deactivated
Connection Setting	
Connection	Always On (Recommended) Connect Manually
TCP MSS Option	TCP MSS 0 bytes(0 means use default)
IP Options	
IP Common Options	
Default Route	Yes No
Support IPTV Profile	Enable Disable
IPv4 Options	
Get IP Address	Static Dynamic
Static IP Address	0.0.0.0
IP Subnet Mask	0.0.0.0
Gateway	0.0.0.0
NAT	Enable
Dynamic Route	RIP1 Direction None
TCP MTU Option	TCP MTU 0 bytes(0 means use default:1492)
IGMP Proxy	Enable Disable
IPv6 Options	
IPv6 Address	/
Obtain IPv6 DNS	Enable Disable
Primary DNS	
Secondary DNS	
MLD Proxy	Enable Disable

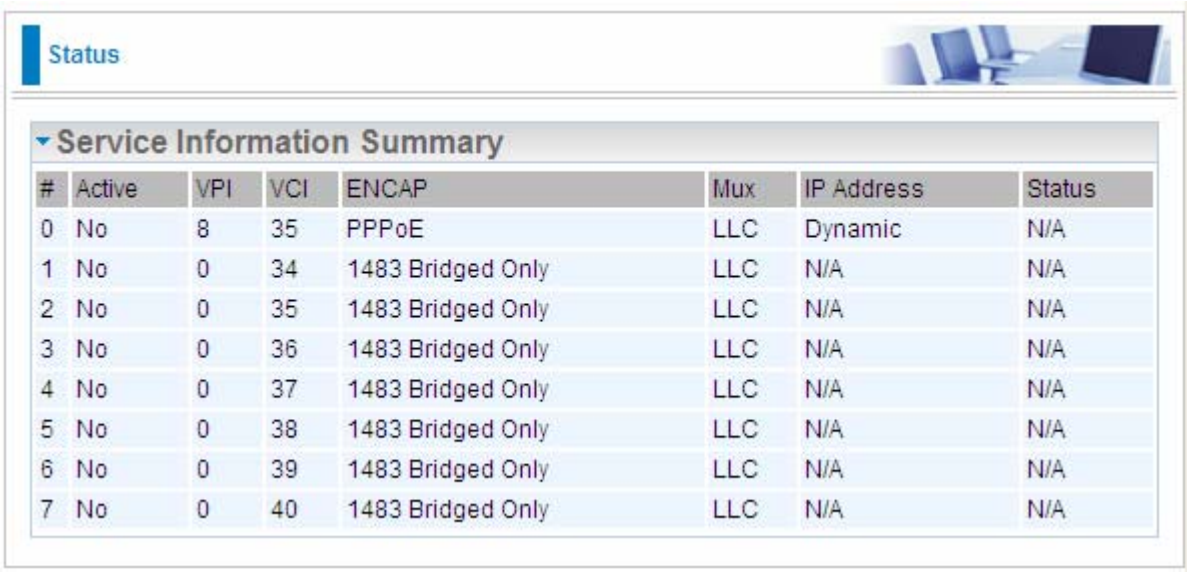
SAVE

ATM PVC

ATM settings are used to connect to your ADSL service. Your ISP provides VPI, VCI settings to you (VPI, VCI pair is used to set a PVC). In this Device, you can totally setup 8 PVCs on different encapsulations, if you apply 8 different virtual circuits from your ISP. You need to activate the PVC to take effect. For PVCs management, you can use ATM QoS to setup each PVC traffic line's priority.

Virtual Circuit: VPI (Virtual Path Identifier) and VCI (Virtual Channel Identifier) define a virtual circuit. VPI, VCI paire is used to set a PVC

PVC Summary: show the information for each PVC where users can check status of each PVC.



#	Active	VPI	VCI	ENCAP	Mux	IP Address	Status
0	No	8	35	PPPoE	LLC	Dynamic	N/A
1	No	0	34	1483 Bridged Only	LLC	N/A	N/A
2	No	0	35	1483 Bridged Only	LLC	N/A	N/A
3	No	0	36	1483 Bridged Only	LLC	N/A	N/A
4	No	0	37	1483 Bridged Only	LLC	N/A	N/A
5	No	0	38	1483 Bridged Only	LLC	N/A	N/A
6	No	0	39	1483 Bridged Only	LLC	N/A	N/A
7	No	0	40	1483 Bridged Only	LLC	N/A	N/A

Status: Select whether to enable the service.

VPI: The valid range for the VPI is 0 to 255. Enter the VPI assigned to you. This field may already be configured.

VCI: The valid range for the VCI is 1 to 65535. Enter the VCI assigned to you. This field may already be configured.

QoS

ATM QoS: Select the Quality of Service types for this Virtual Circuit. The ATM QoS types include **CBR** (Constant Bit Rate), **VBR** (Variable Bit Rate) and **UBR** (Unspecified Bit Rate). These QoS types are all controlled by the parameters specified below, including PCR, SCR and MBS.

Select CBR to specify fixed (always-on) bandwidth for voice or data traffic. Select UBR for applications that are non-time sensitive, such as e-mail. Select VBR for burst traffic and bandwidth sharing with other applications.

PCR: Divide the DSL line rate (bps) by 424 (the size of an ATM cell) to find the Peak Cell Rate (PCR). This is the maximum rate at which the sender can send cells.

SCR: The Sustain Cell Rate (SCR) sets the average cell rate (long-term) that can be transmitted.

MBS: Maximum Burst Size (MBS) refers to the maximum number of cells that can be sent at the peak rate. Type the MBS, which is less than 65535

IPv4/IPv6

IP version: choose ***IPv4***, ***IPv4/IPv6***, ***IPv6*** based on users' environment.

Here we take IPv4/IPv6 for example, when you just choose IPv4 or IPv6, you can just get information from the following listed parameters.

ISP Connection Type:

ISP: Select the encapsulation type your ISP uses.

- **Dynamic IP Address:** Select this option if your ISP provides you an IP address automatically. This option is typically used for Cable services. Please enter the Dynamic IP information accordingly.

- ***Static IP Address*:** Select this option to set static IP information. You will need to enter in the Connection type, IP address, subnet mask, and gateway address, provided to you by your ISP. Each IP address entered in the fields must be in the appropriate IP form, which is four IP octets separated by a dot (xx.xx.xx.xx). The Router will not accept the IP address if it is not in this format.
- ***PPPoE/PPPoA:*** Select this option if your ISP requires you to use a PPPoE/PPPoA connection. This option is typically used for DSL users.
- ***Bridge:*** Select this mode if you want to use this device as an OSI layer 2 device like a modem.

802.1q Options

802.1q: Enter the user name exactly as your ISP assigned.

VLAN ID: It is a parameter to specify the VLAN which the frame belongs. Enter the VLAN ID identification, tagged: 0-4095.

PPPoE/PPPoA

Connection Type: Select the encapsulation mode, PPPoE LLC, PPPoE VC-Mux, PPPoA LLC, PPPoA VC-Mux by your ISP.

Username: Enter the user name exactly as your ISP assigned.

Password: Enter the password associated with the user name above.

Bridge Interface for PPPoE: When Activated, the device will gain WAN IP from your ISP with the PPPoE account. But if your PC is connected to the router working as a DHCP client, in this mode, the device acts as a NAT router; while if you dial up with the account within your PC, the device will then work as a bridge forwarding the PPPoE information to the PPPoE server and send the response to your PC, thus your PC gets a WAN IP working in the internet.

Conenction Setting

Connection:

- **Always On:** Click on **Always On** to establish a PPPoE/PPPoA session during start up and to automatically re-establish the PPPoE/PPPoA session when disconnected by the ISP.
- **Connect Manually:** Select Connect Manually when you don't want the connection up all the time.

TCP MSS Option: Enter the TCP Maximum Segment Size (MSS).

IP Options

Default Router: Select Yes to use this interface as the default route interface.

Support IPTV Profile: Select whether to enable to support IPTV profile.

IPv4 Options:

Get IP Address: Choose Static or Dynamic

Static IP address: If Static is selected in the above field, please enter the specific IP address you get from ISP and the following IP subnet mask and gateway address.

IP Subnet Mask: Enter the subnet mask.

Gateway: Enter the specific gateway IP address you get from ISP.

NAT: select Enable if you use this router to hold a group of PCs to get access to the internet.

Dynamic Route:

RIP Version: (Routing Information protocol) Select this option to specify the RIP version, including RIP-1, RIP-2 and RIP-2.

RIP Direction: Select this option to specify the RIP direction.

- **None** is for disabling the RIP function.

- **Both** means the router will periodically send routing information and accept routing information then incorporate into routing table.
- **IN only** means the router will only accept but will not send RIP packet.
- **OUT only** means the router will only send but will not accept RIP packet.

TCP MTU Option: Maximum Transmission Unit, the maximum is 1500.

IGMP Proxy: IGMP (Internet Group Multicast Protocol) is a network-layer protocol used to establish membership in a Multicast group. Choose whether enable IGMP proxy.

IPv6 options (only when choose IPv4/IPv6 or just IPv6 in IP version field above):

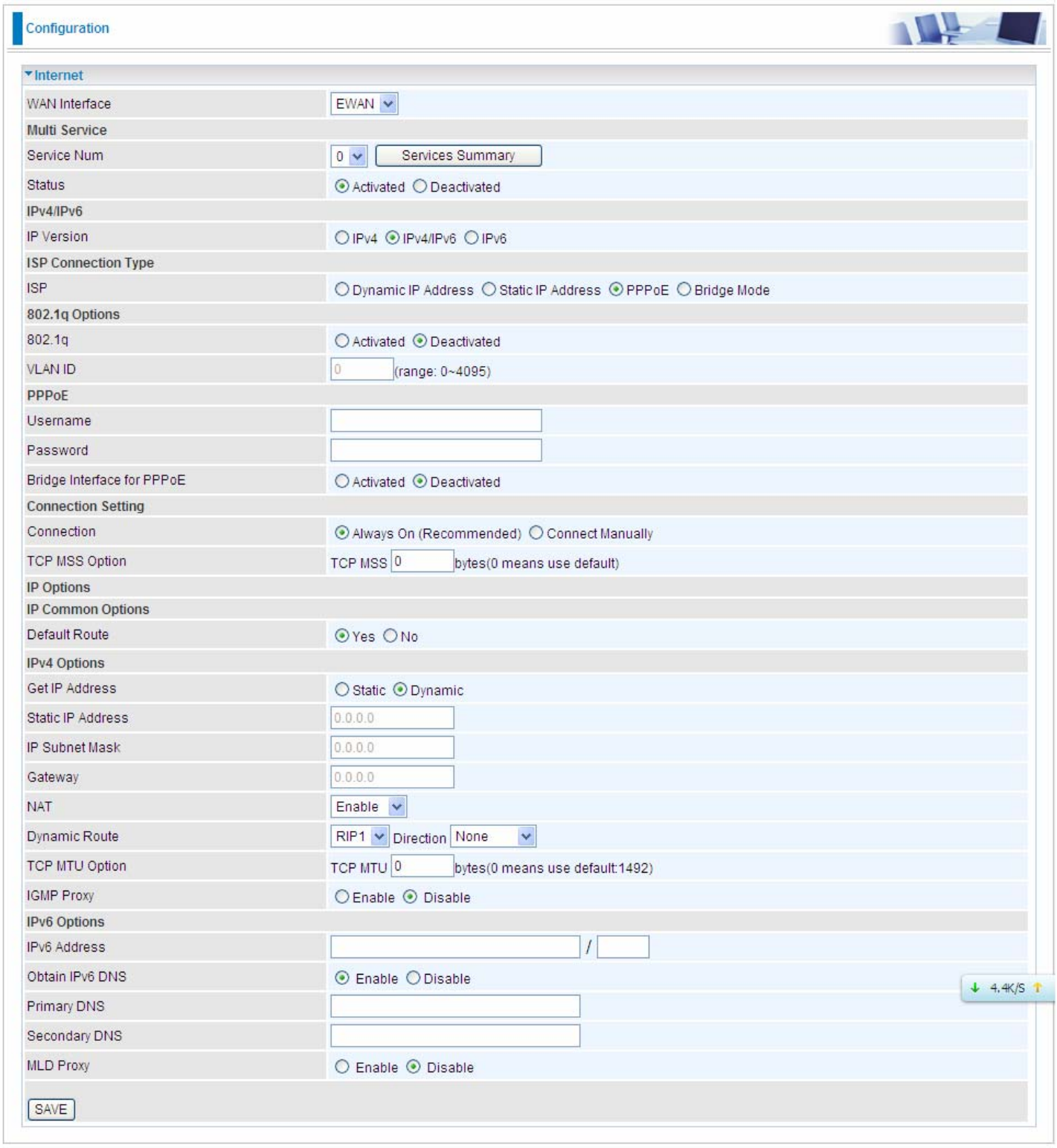
IPv6 Address: Type the WAN IPv6 address from your ISP.

Obtain IPv6 DNS: Choose if you want to obtain DNS automatically.

Primary/Secondary: If you choose Disable in the Obtain IPv6 DNS field, please type the exactly primary and secondary DNS.

MLD Proxy: MLD (Multicast Listener Discovery Protocol) is to IPv6 just as IGMP to IPv4, it is a Multicast Management protocol for IPv6 multicast packets.

➢ EWAN

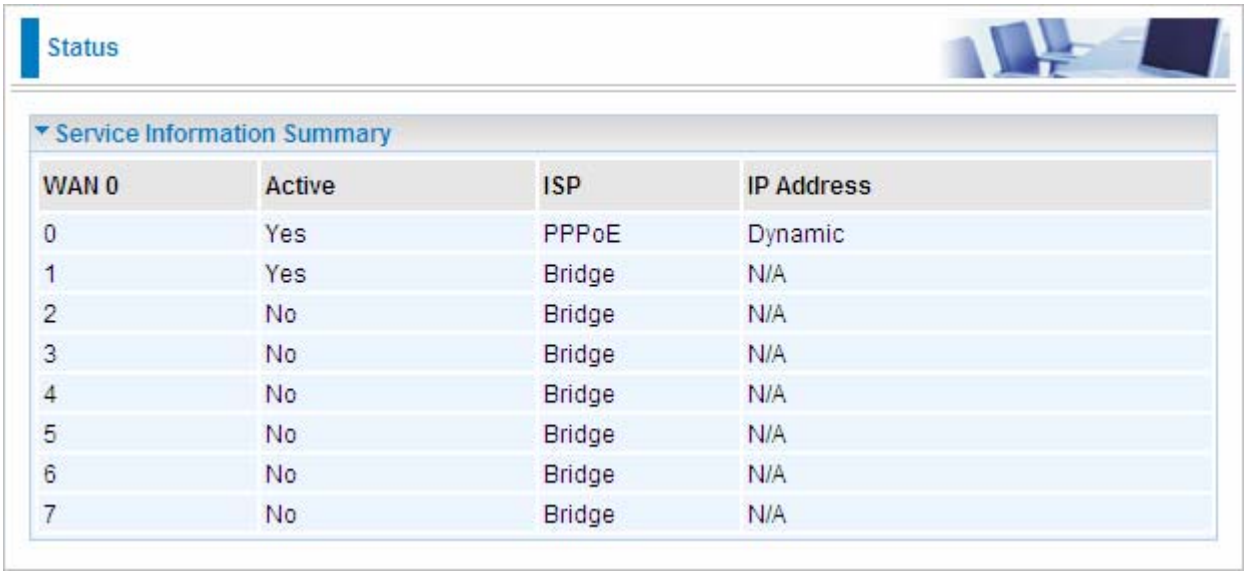


(7600NXL)

Multi Service *(7600NXL only)*

Service Num: The index to mark the EWAN interface of different ISP type, ranging from 0-7.

Service Summary: The diagram for view of service information.



WAN 0	Active	ISP	IP Address
0	Yes	PPPoE	Dynamic
1	Yes	Bridge	N/A
2	No	Bridge	N/A
3	No	Bridge	N/A
4	No	Bridge	N/A
5	No	Bridge	N/A
6	No	Bridge	N/A
7	No	Bridge	N/A

Status: Select whether to enable the service.

IPv4/IPv6

IP version: choose ***IPv4***, ***IPv4/IPv6***, ***IPv6*** based on users' environment.

Here we take IPv4/IPv6 for example, when you just choose IPv4 or IPv6, you can just get information from the following listed parameters.

ISP Connection Type:

ISP: Select the encapsulation type your ISP uses.

- **Dynamic IP:** Select this option if your ISP provides you an IP address automatically. This option is typically used for Cable services. Please enter the Dynamic IP information accordingly.
- ***Static IP*:** Select this option to set static IP information. You will need to enter in the Connection type, IP address, subnet mask, and gateway address, provided to you by your ISP. Each IP address entered in the fields must be in the appropriate IP form, which is four IP octets separated by a dot (xx.xx.xx.xx). The Router will not accept the IP address if it is not in this format.
- ***PPPoE:*** Select this option if your ISP requires you to use a PPPoE connection.
- ***Bridge:*** Select this mode if you want to use this device as an OSI layer 2 device like a switch.

802.1q Options

802.1q: Enter the user name exactly as your ISP assigned.

VLAN ID: It is a parameter to specify the VLAN which the frame belongs. Enter the VLAN ID identification, tagged: 0-4095.

PPPoE

Username: Enter the user name exactly as your ISP assigned.

Password: Enter the password associated with the user name above.

Bridge Interface for PPPoE: When "Activated", the device will gain WAN IP from your ISP with the PPPoE account. But if your PC is connected to the router working as a DHCP client, in this mode, the device acts as a NAT router; while if you dial up with the account within your PC, the device will then work as a bridge forwarding the PPPoE information to the PPPoE server and send the response to your PC, thus your PC gets a WAN IP

working in the internet.

Connection Setting

Connection:

- **Always On:** Click on **Always On** to establish a PPPoE session during start up and to automatically re-establish the PPPoE session when disconnected by the ISP.
- **Connect Manually:** Select Connect Manually when you don't want the connection up all the time.

TCP MSS Option: Enter the TCP Maximum Segment Size (MSS).

IP Options

Default Route: Select **Yes** to use this interface as default route interface.

IPv4 options:

Get IP Address: Choose Static or Dynamic

Static IP Address: If Static is selected in the above field, please enter the specific IP address you get from ISP and the following IP subnet mask and gateway address.

IP Subnet Mask: The default is 0.0.0.0. User can change it to other such as 255.255.255.0.Type the subnet mask assigned to you by your ISP (if given).

Gateway: Enter the specific gateway IP address you get from ISP.

NAT: Select Enable if you use this router to hold a group of PCs to get access to the internet.

Dynamic Route:

RIP Version: (Routing Information protocol) Select this option to specify the RIP version, including RIP-1, RIP-2.

RIP Direction: Select this option to specify the RIP direction.

- **None** is for disabling the RIP function.
- **Both** means the router will periodically send routing information and accept routing information then incorporate into routing table.
- **IN only** means the router will only accept but will not send RIP packet.
- **OUT only** means the router will only send but will not accept RIP packet.

TCP MTU Option: Maximum Transmission Unit, the maximum is 1500.

IGMP Proxy: IGMP (Internet Group Multicast Protocol) is a network-layer protocol used to establish membership in a Multicast group. Choose whether enable IGMP proxy.

IPv6 options (only when choose IPv4/IPv6 or just IPv6 in IP version field above):

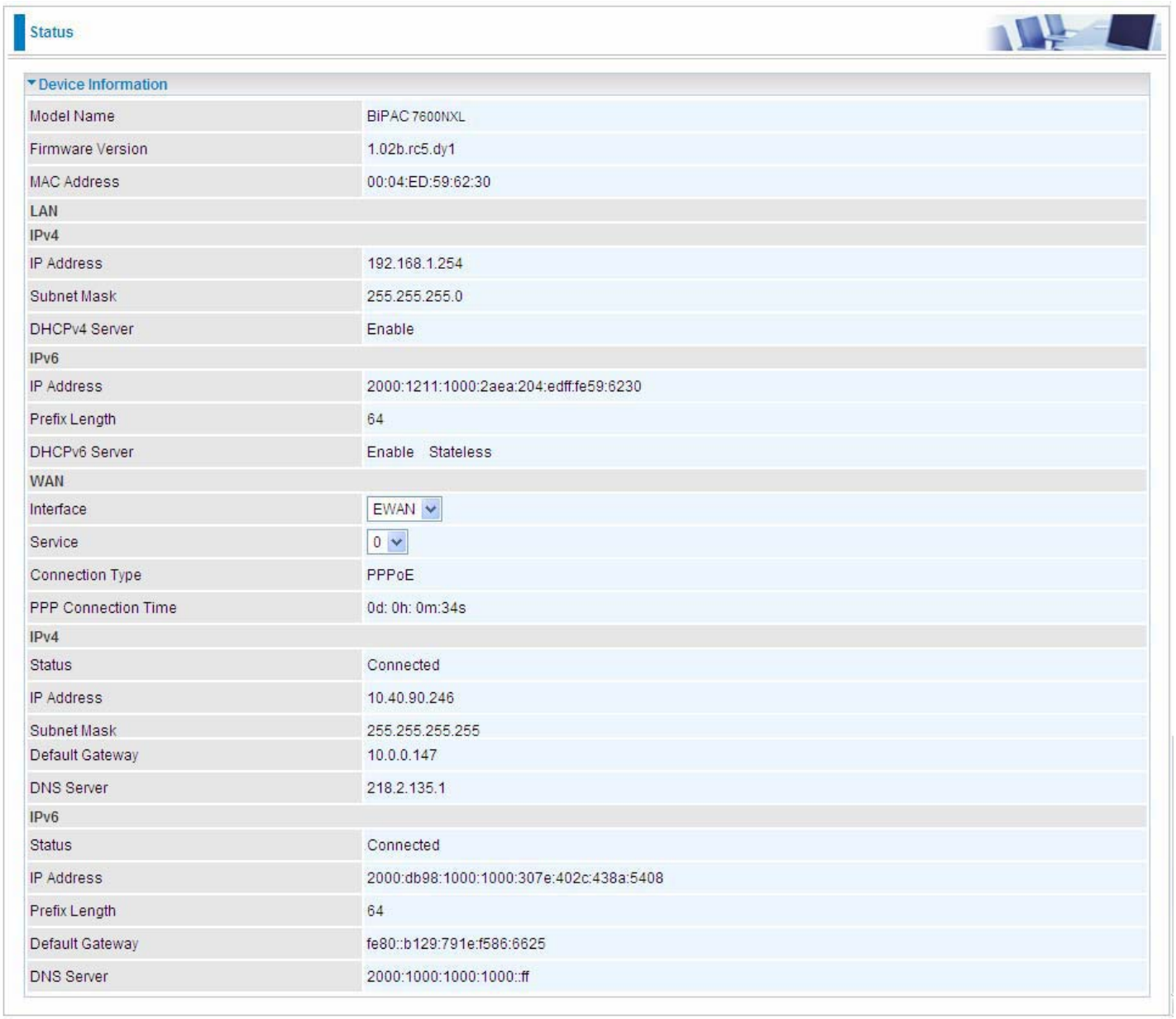
IPv6 Address: Type the WAN IPv6 address from your ISP.

Obtain IPv6 DNS: Choose if you want to obtain DNS automatically.

Primary/Secondary: if you choose Disable in the Obtain IPv6 DNS field, please type the exactly primary and secondary DNS.

MLD Proxy: MLD (Multicast Listener Discovery Protocol) is to IPv6 just as IGMP to IPv4. It is a Multicast Management protocol for IPv6 multicast packets.

When router's Internet configuration is finished successfully, you can go to status to get the connection information.



Status

Device Information

Model Name	BiPAC 7600NXL
Firmware Version	1.02b.rc5.dy1
MAC Address	00:04:ED:59:62:30
LAN	
IPv4	
IP Address	192.168.1.254
Subnet Mask	255.255.255.0
DHCPv4 Server	Enable
IPv6	
IP Address	2000:1211:1000:2aea:204:edff:fe59:6230
Prefix Length	64
DHCPv6 Server	Enable Stateless
WAN	
Interface	EWAN
Service	0
Connection Type	PPPoE
PPP Connection Time	0d: 0h: 0m:34s
IPv4	
Status	Connected
IP Address	10.40.90.246
Subnet Mask	255.255.255.255
Default Gateway	10.0.0.147
DNS Server	218.2.135.1
IPv6	
Status	Connected
IP Address	2000:db98:1000:1000:307e:402c:438a:5408
Prefix Length	64
Default Gateway	fe80::b129:791e:f586:6625
DNS Server	2000:1000:1000:1000::ff

(7600NXL)

5.4.1.2 LAN

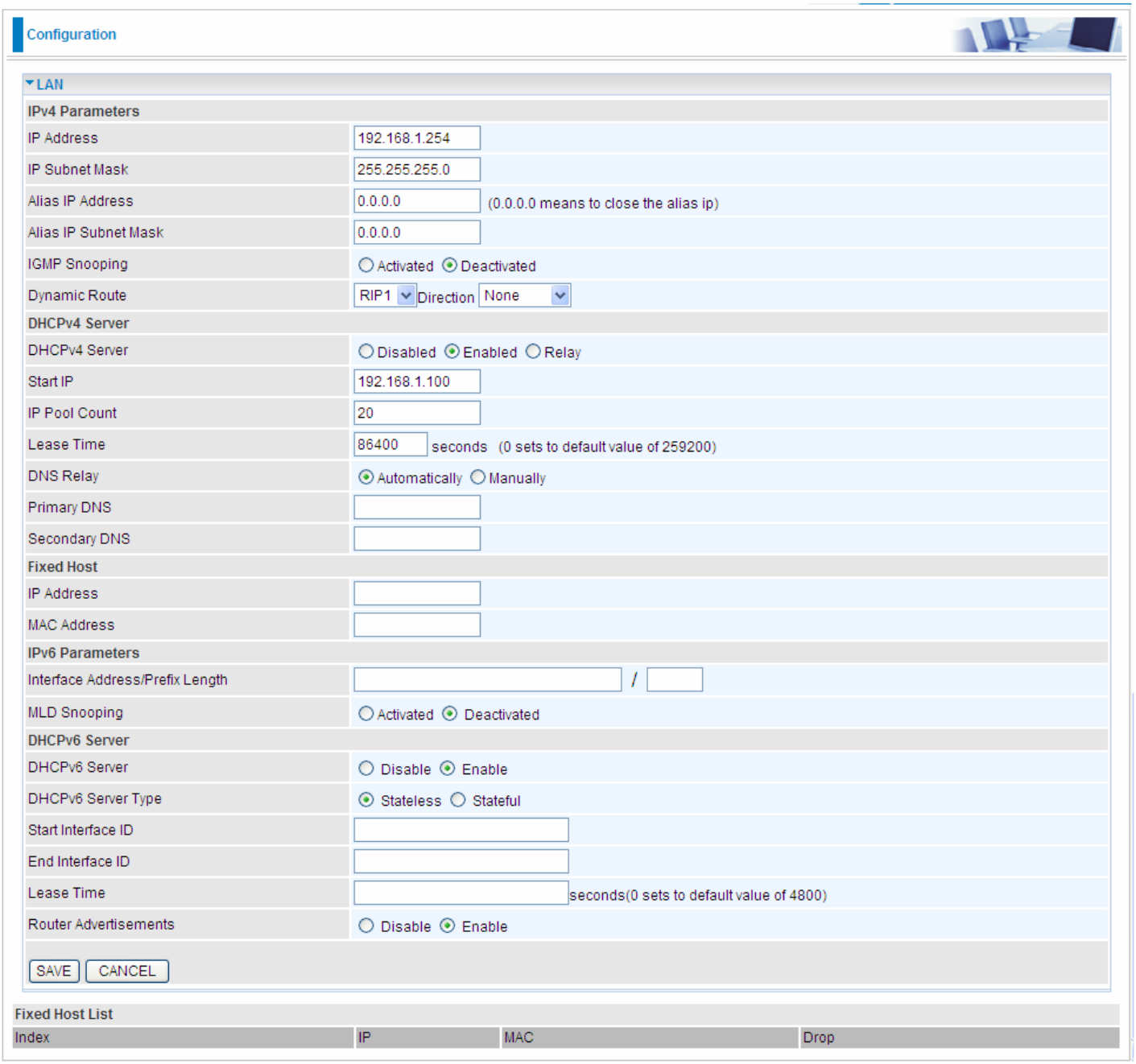
A Local Area Network (LAN) is a shared communication system to which many computers are attached and is limited to the immediate area, usually the same building or floor of a building.

IPv6

The IPv6 address composes of two parts, thus, the prefix and the interface ID.

There are two ways to dynamically configure IPv6 address on hosts. One is statefull configuration, for example using DHCPv6 (which resembles its counterpart DHCP in IPv4.) In the stateful autoconfiguration model, hosts obtain interface addresses and/or configuration information and parameters from a DHCPv6 server. The Server maintains a database that keeps track of which addresses have been assigned to which hosts.

The second way is stateless configuration. Stateless auto-configuration requires no manual configuration of hosts, minimal (if any) configuration of routers, and no additional servers. The stateless mechanism allows a host to generate its own addresses using a combination of locally available information (MAC address) and information (prefix) advertised by routers. Routers advertise prefixes that identify the subnet(s) associated with a link, while hosts generate an "interface identifier" that uniquely identifies an interface on a subnet. An address is formed by combining the two. When using stateless configuration, you needn't configure anything on the client.



IPv4 Parameters

IP Address: Enter the IP address of Router in dotted decimal notation, for example, 192.168.1.254 (factory default).

IP Subnet Mask: The default is 255.255.255.0. User can change it to other such as 255.255.255.128.

Alias IP Address: This is for local networks virtual IP interface. Specify an IP address on this virtual interface.

Alias IP Subnet Mask: Specify a subnet mask on this virtual interface.

IGMP Snooping: Select **Activated** to enable IGMP Snooping function, Without IGMP snooping, multicast traffic is treated in the same manner as broadcast traffic - that is, it is forwarded to all ports. With IGMP snooping, multicast traffic of a group is only forwarded to ports that have members of that group.

Dynamic Route: Select the RIP version from RIP1 or RIP2B.

DHCPv4 Server

DHCP (Dynamic Host Configuration Protocol) allows individual clients to obtain TCP/IP configuration at start-up from a server.

DHCPv4 Server	
DHCPv4 Server	○ Disabled ◉ Enabled ○ Relay
Start IP	192.168.1.100
IP Pool Count	20
Lease Time	86400 seconds (0 sets to default value of 259200)
DNS Relay	◉ Automatically ○ Manually
Primary DNS	
Secondary DNS	

DHCPv4 Server: If set to **Enabled**, your BiPAC 7600NX(L) can assign IP addresses, default gateway and DNS servers to the DHCP client.

- If set to **Disabled**, the DHCP server will be disabled.
- If set to **Relay**, the BiPAC 7600NX(L) acts as a surrogate DHCP server and relays DHCP requests and responses between the remote server and the clients. Enter the IP address of the actual, remote DHCP server in the Remote DHCP Server field in this case.
- When DHCP is used, the following items need to be set.

Start IP: This field specifies the first of the contiguous addresses in the IP address pool.

IP Pool Count: This field specifies the count of the IP address pool.

Lease Time: The current lease time of client.

DNS Relay Select Automatically obtained or Manually set (if selected. Please set the exactly information). If you set Static IP in the ISP Connection Type field, then select Manually here and set the specific DNS information.

Primary DNS Server: Enter the IP addresses of the DNS servers. The DNS servers are passed to the DHCP clients along with the IP address and the subnet mask.

Secondary DNS Server: Enter the IP addresses of the DNS servers. The DNS servers are passed to the DHCP clients along with the IP address and the subnet mask.

Fixed Host

In this field, users can map the specific IP (must in the DHCP IP pool) for some specific MAC, and this information can be listed in the following table.

Fixed Host	
IP Address	
MAC Address	

IP Address: Enter the specific IP. For example: 192.168.1.110.

MAC Address: Enter the responding MAC. For example: 00:0A:F7:45:6D:ED

When added, you can see the ones listed as showed below:

Fixed Host Litsing			
Index	IP	MAC	Drop
1	192.168.1.102	23:24:5B:4B:22:33	

IPv6 parameters

IPv6 Parameters	
Interface Address/Prefix Length	/
MLD Snooping	Activated Deactivated
DHCPv6 Server	
DHCPv6 Server	Disable Enable
DHCPv6 Server Type	Stateless Stateful
Start Interface ID	
End Interface ID	
Lease Time	seconds(0 sets to default value of 4800)
Router Advertisements	Disable Enable

Interface Address / Prefix Length: enter the static LAN IPv6 address, we suggest leave the field empty because when setted wrong, it will result in LAN devices not being able to access other IPv6 device through internet. Router will take the same WAN's prefix to LAN side if the field is empty.

MLD Snooping: Similar to IGMP Snooping, but applicable for IPv6.

DHCPv6 Server

DHCPv6 Server: Check whether to enable DHCPv6 server.

DHCPv6 Server Type: Select Stateless or Stateful. When DHCPv6 is enabled, this parameter is available.

- **Stateless:** If selected, the PCs in LAN are configured through RA mode, thus, the PCs in LAN are configured through RA mode, to obtain the prefix message and generate an address using a combination of locally available information (MAC address) and information (prefix) advertised by routers, but they can obtain such information like DNS from DHCPv6 Server.
- **Stateful:** If selected, the PCs in LAN will be configured like in IPv4 mode, thus obtain addresses and DNS information from DHCPv6 server.

Start interface ID: enter the start interface ID. The IPv6 address composed of two parts, thus, the prefix and the interface ID. Interface is like the Host ID compared to IPv4.

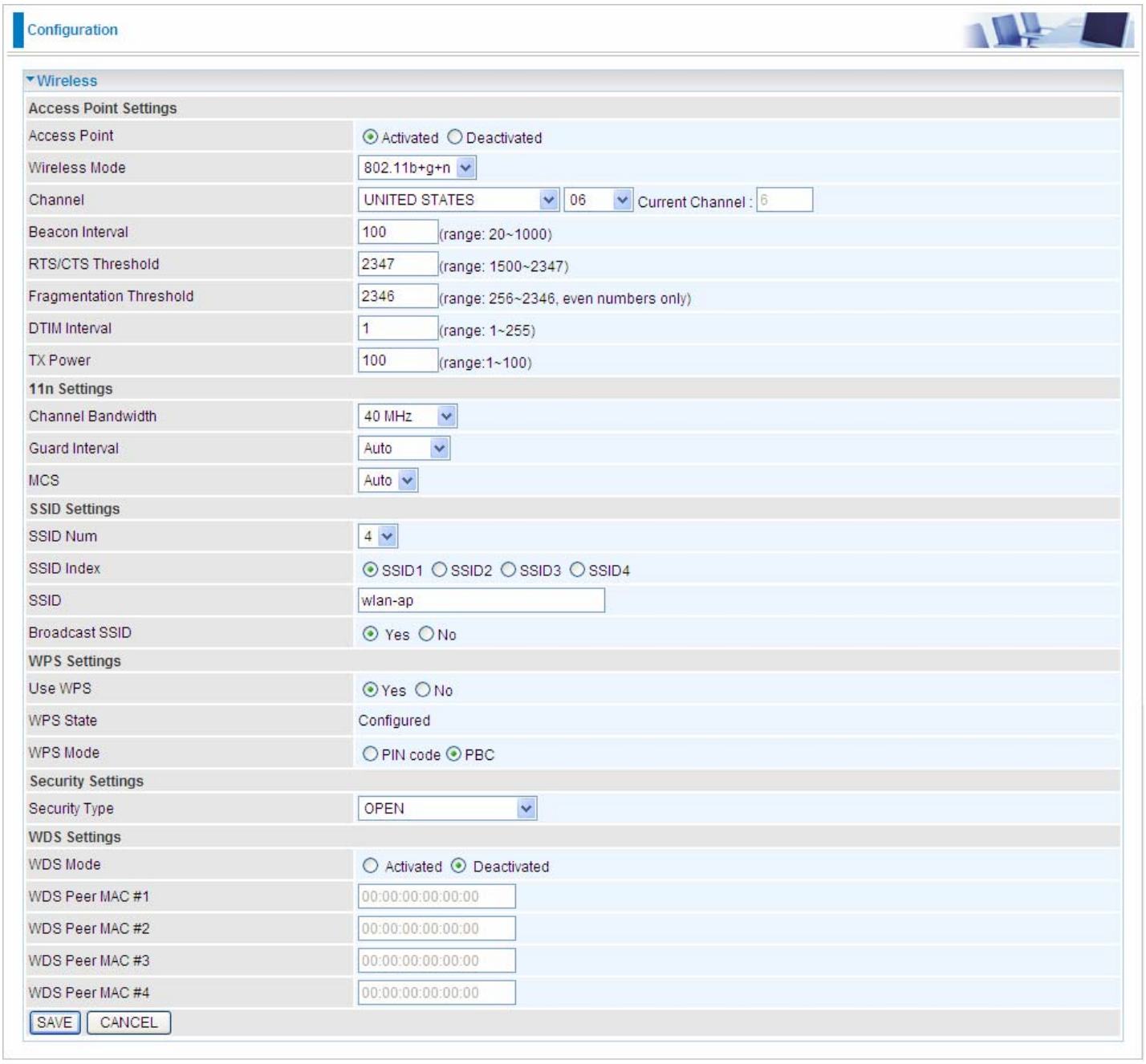
End interface ID: enter the end interface ID.

Leased Time (hour): the leased time, similar to leased time in DHCPv4, is a time limit assigned to clients, when expires, the assigned ID will be recycled and reassigned.

Issue Router Advertisement: Check whether to enable issue Router Advertisement feature. It is to send Router Advertisement messages periodically. Router will multicast the v6 Prefix information (similar to v4 network number 192.168.1.0) to all LAN devices if the field is enabled. **We suggest enabling this field.**

5.4.1.3 Wireless

This section introduces the wireless LAN and some basic configurations. Wireless LANs can be as complex as a number of computers with wireless LAN cards communicating through access points which bridge network traffic to the wired LAN.



(By default, 4 SSIDs are in use. But to simplify the illustration, we only enable 1 SSID.)

Access Point Settings

Access Point: Default setting is set to **Activated**. If you want to close the wireless interface, select **Deactivated.**

Channel ID: The range of radio frequencies used by IEEE 802.11b/g/n wireless devices is called a channel. There are Regulation Domains and Channel ID in this field. The Channel ID will be different based on Regulation Domains. Select a channel from the drop-down list box.

Beacon interval: The Beacon Interval value indicates the frequency interval of the beacon. Enter a value between 20 and 1000. A beacon is a packet broadcast by the Router to synchronize the wireless network.

RTS/CTS Threshold: The RTS (Request To Send) threshold (number of bytes) for enabling RTS/CTS handshake. Data with its frame size larger than this value will perform the RTS/CTS handshake. Enter a value between 1500 and 2347.

Fragmentation Threshold: The threshold (number of bytes) for the fragmentation boundary for directed messages. It is the maximum data fragment size that can be sent. Enter a value between 256 and 2346, even number only.

DTIM: This value, between 1 and 255, indicates the interval of the Delivery Traffic Indication Message (DTIM).

TX Power: The transmission power of the antennas, ranging from 1-100, the higher the more powerful of the transmission performance.

Wireless Mode: The default setting is **802.11b+g+n** (Mixed mode). If you do not know or have both 11g and 11b devices in your network, then keep the default in **mixed mode**. From the drop-down manual, you can select **802.11g** if you have only 11g card. If you have only 11b card, then select **802.11b** and if you only have 802.11n then select **802.11n**.

11n Settings

Channel Bandwidth: Select either **20 MHz** or **20/40 MHz** for the channel bandwidth. The wider the Channel bandwidth the better the performance will be.

Guard Interval: Select either **400nsec** or **800nsec** for the guard interval. The guard interval is here to ensure that data transmission do not interfere with each other. It also prevents propagation delays, echoing and reflections. The shorter the Guard Interval, the better the performance will be. We recommend users to select Auto.

MCS: There are options **0~15** and **AUTO** to select for the **Modulation and Coding Scheme**. We recommend users selecting **AUTO**.

SSID Settings

SSID Index: Select how many SSIDs you want to lay out. A total of 4 is in list. By default 4 SSIDs are in use.

SSID: The SSID is the unique name of a wireless access point (AP) to be distinguished from another. For security propose, change the default **wlan-ap** to a unique ID name to the AP which is already built-in to the router's wireless interface. Make sure your wireless clients have exactly the SSID as the device, in order to get connected to your network.

Broadcast SSID: Select **Yes** to make the SSID visible so a station can obtain the SSID through passive scanning. Select **No** to hide the SSID in so a station cannot obtain the SSID through passive scanning.

WPS Settings

WPS (Wi-Fi Protected Setup) feature is a standard protocol created by Wi-Fi Alliance. This feature greatly simplifies the steps needed to create a Wi-Fi networks for a residential or an office setting. WPS supports 2 types of configuration methods which are commonly known among consumers: **PIN Method** & **PBC Method**.

WPS State: Display whether the WPS is **configured** or **unconfigured**.

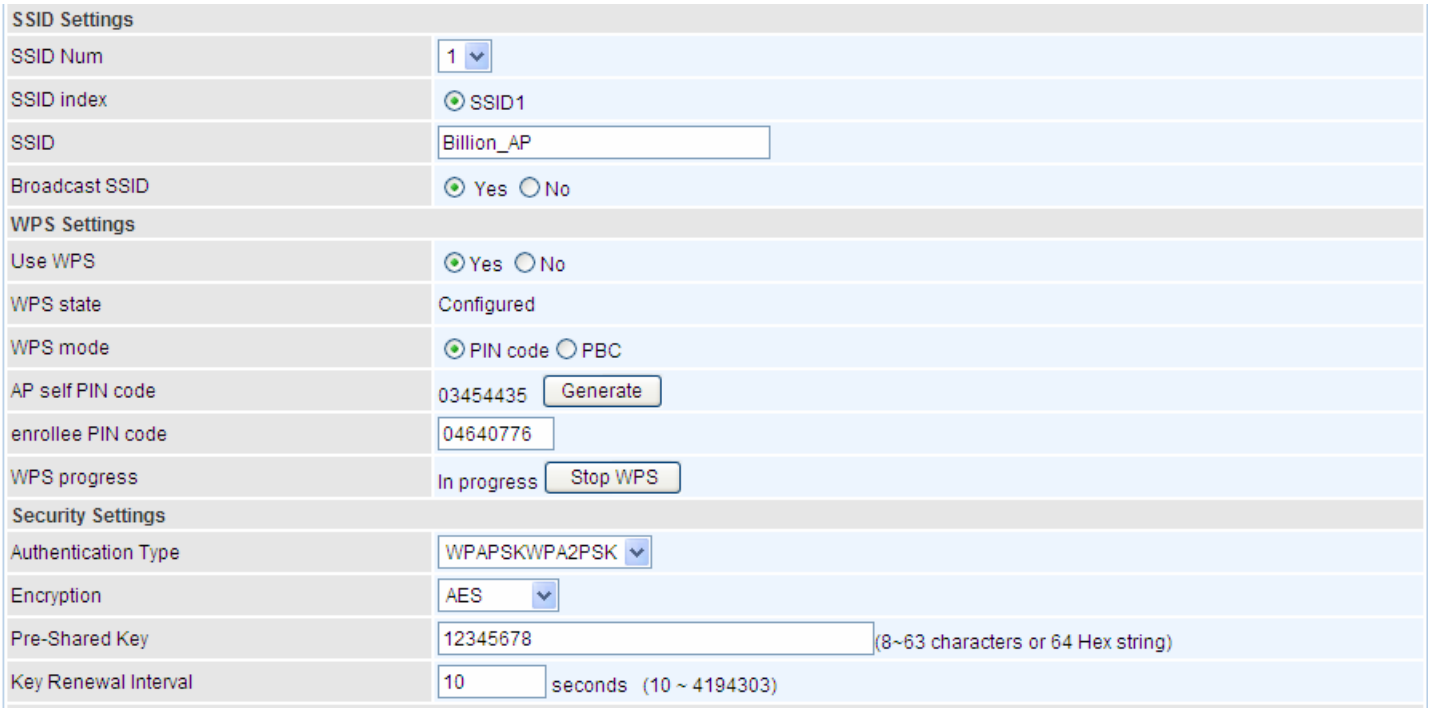
WPS Mode: Select the mode which to start WPS, choose between **PIN Code** and **PBC** (Push Button). Selecting **Pin Code** mode will require you to know the enrollee PIN code.

To future understand the two modes of configuration; please refer to the following **Wi-Fi Protected Setup.**

Wi-Fi Protected Setup

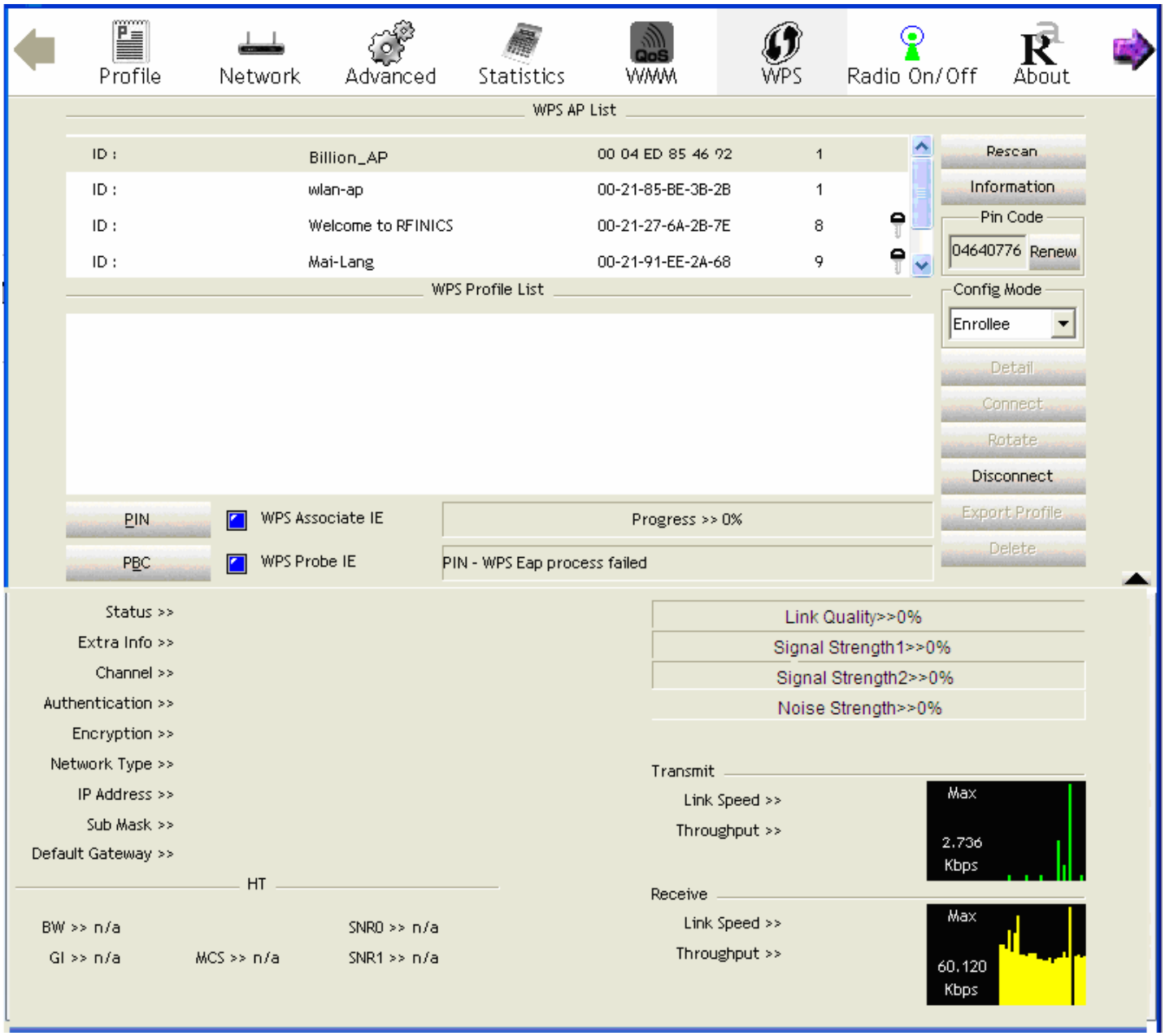
PIN Method: Configure AP as Registrar

1. Jot down the client's Pin (eg. 04640776).

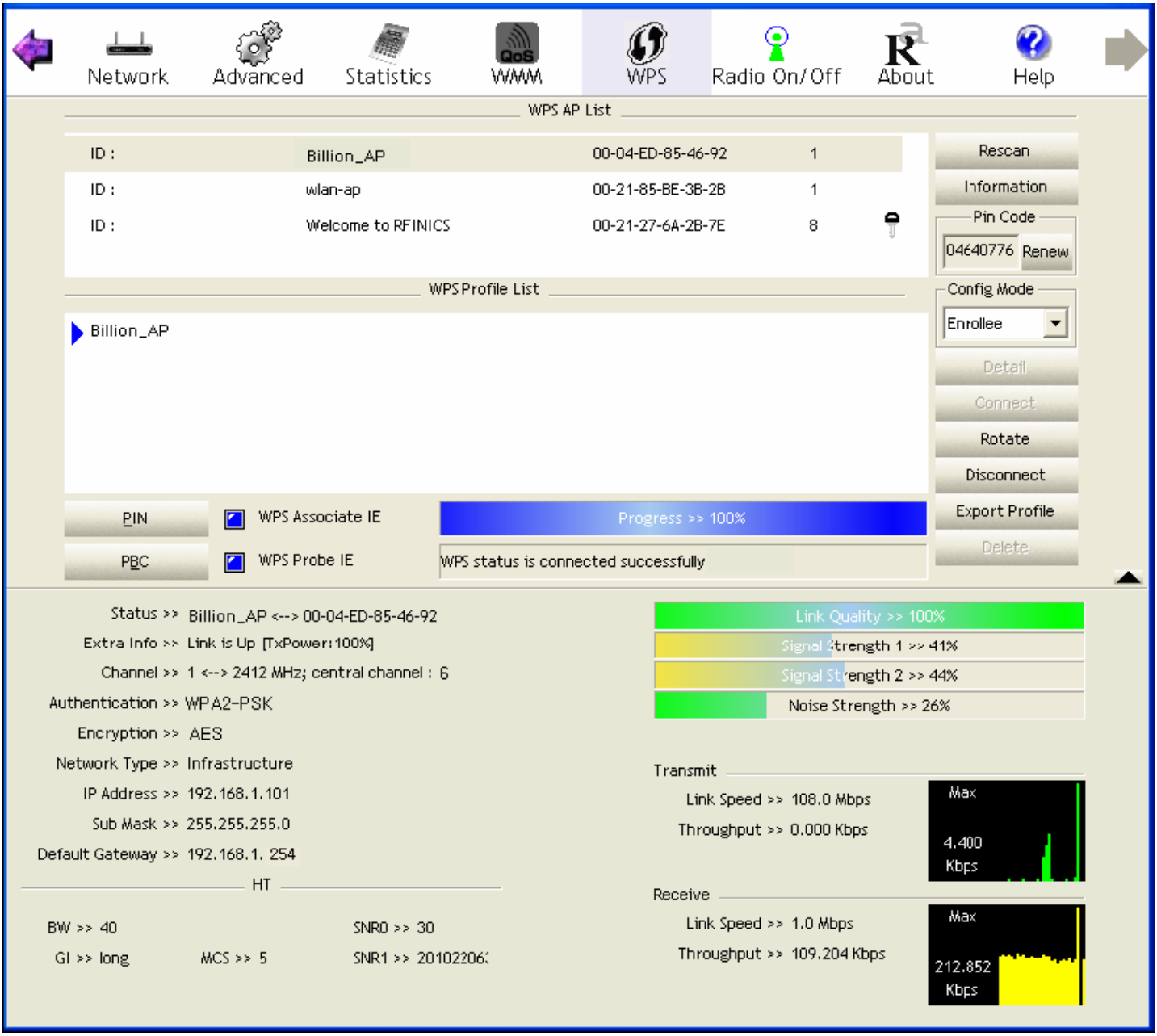


2. Enter the Enrollee(Client) PIN code and then press Start WPS.

3. Launch the wireless client's WPS utility (eg. Ralink Utility). Set the Config Mode as Enrollee, press the WPS button on the top bar, select the AP (eg. Billion_AP) from the WPS AP List column. Then press the PIN button located on the middle left of the page to run the scan.

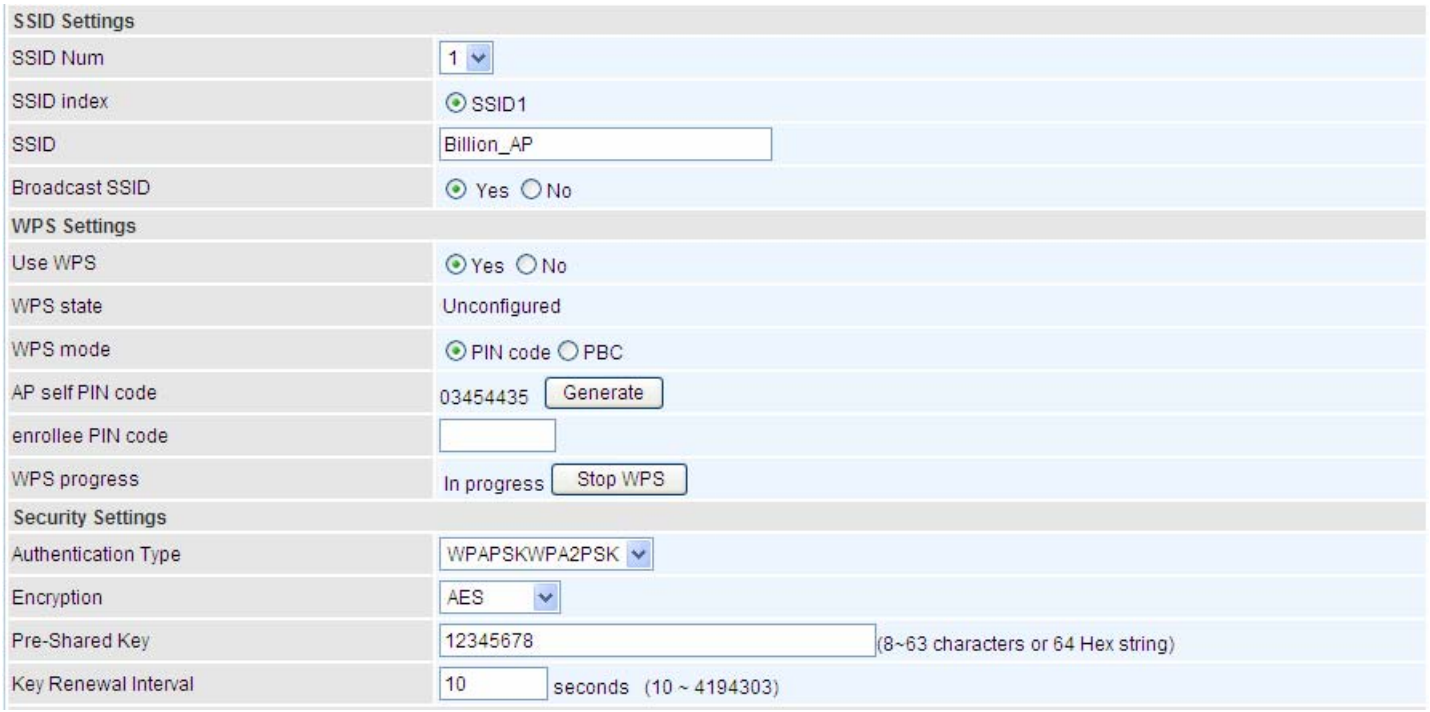


4. The client's SSID and security setting will now be configured to match the SSID and security setting of the registrar (router).

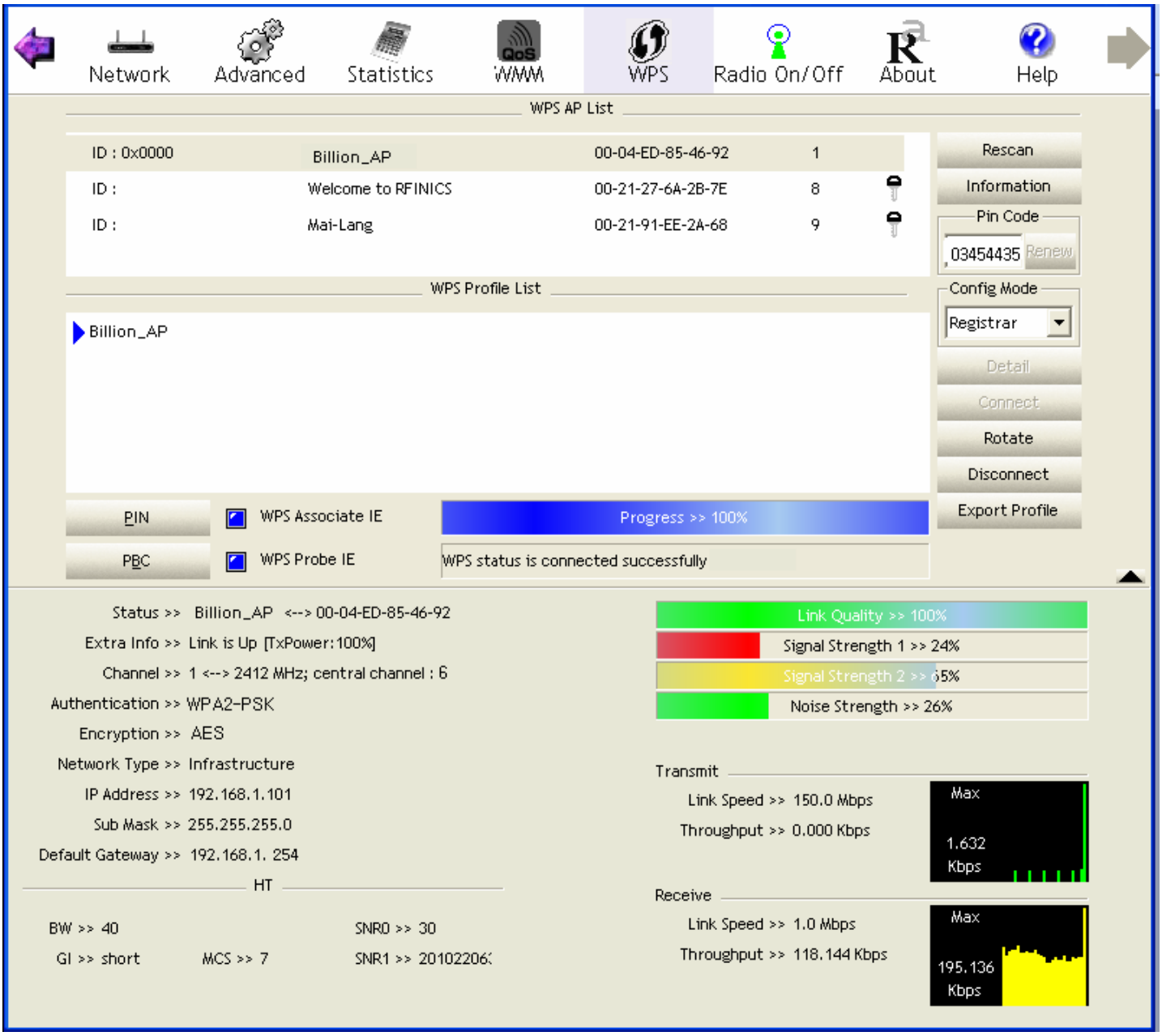


PIN Method: Configure AP as Enrollee

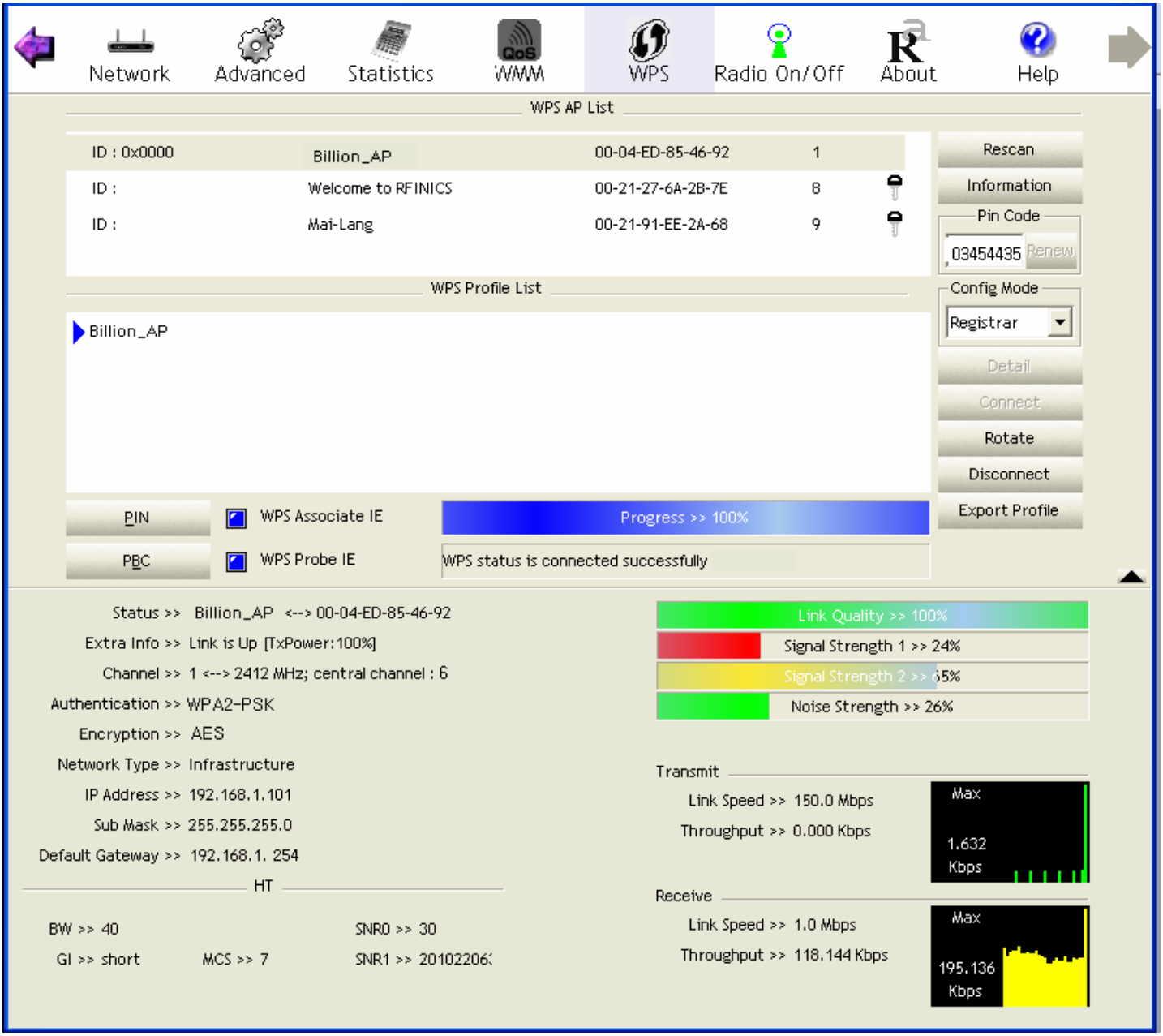
1. Jot down the WPS PIN (eg. 03454435).Press Start WPS.



2. Launch the wireless client's WPS utility (eg. Ralink Utility). Set the Config Mode as Registrar. Enter the PIN number in the PIN Code column then choose the correct AP (eg. Billion_AP) from the WPS AP List before pressing the PIN button to run the scan.



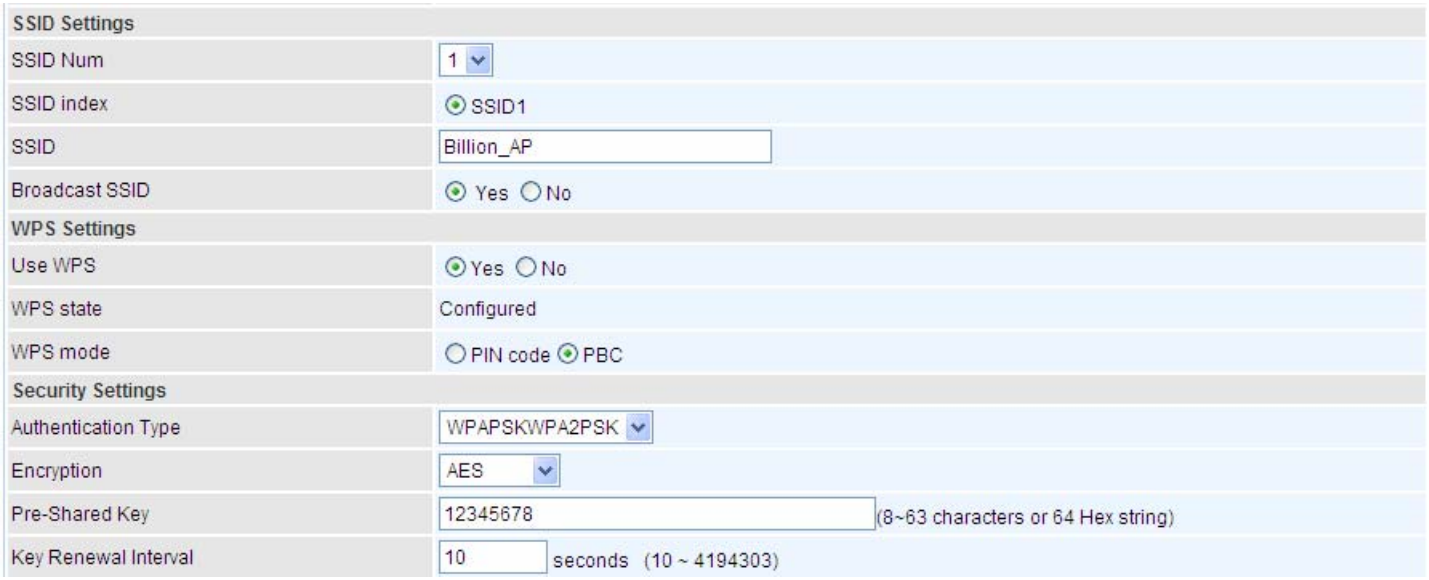
3. The router's (AP's) SSID and security setting will now be configured to match the SSID and security setting of the registrar (client).



4. Now to make sure that the setup is correctly done, cross check to see if the SSID and the security setting of the registrar setting match with the parameters found on both Wireless Configuration and Wireless Security Configuration page.

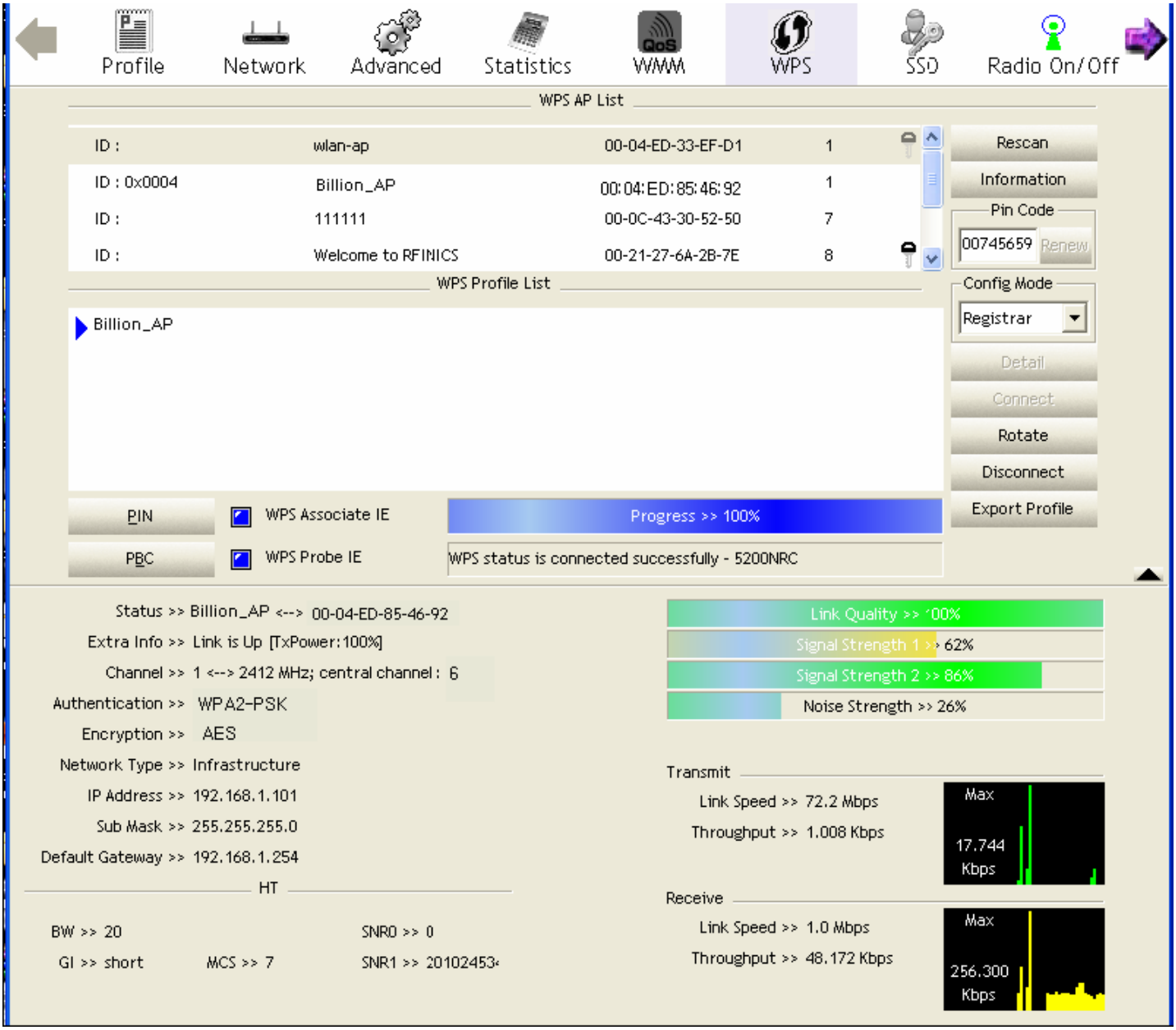
PBC Method:

1. Press the PBC radio button, Then Start WPS.



2. Launch the wireless client's WPS Utility (eg. Ralink Utility). Set the Config Mode as Enrollee. Then press the WPS button and choose the correct AP (eg. Billion_AP) from the WPS AP List section before pressing the PBC button to run the scan.

3. When the PBC button is pushed, a wireless communication will be established between your router and the PC. The client's SSID and security setting will now be configured to match the SSID and security setting of the router.



Security Settings

Authentication Type: You can disable or enable wireless security for protecting wireless network. The default type of wireless security is OPEN and to allow all wireless stations to communicate with the access points without any data encryption.
To prevent unauthorized wireless stations from accessing data transmitted over the network, the router offers secure data encryption, known as WEP and WPA.
There are five alternatives to select from: WEP-64Bits, WEP-128Bits, WPA-PSK, WPA2-PSK, WPA/WPA2-PSK.
If you require high security for transmissions, please select WPA-PSK, WPA2-PSK or WPA/WPA2-PSK.

➢ WEP

Security Settings	
Authentication Type	WEP-64Bits
WEP AuthType	Both
WEP 64-bits	For each key, please enter either (1) 5 characters, or (2) 10 characters ranging from 0~9, a, b, c, d, e, f.
WEP 128-bits	For each key, please enter either (1) 13 characters, or (2) 26 characters ranging from 0~9, a, b, c, d, e, f.
Key #1	
Key #2	
Key #3	
Key #4	

WEP AuthType: WEP authentication method, there are two methods of authentication used, Open System authentication (OPENWEB) and Share Key authentication (SHAREDWEB). We suggest you select OPENWEB.

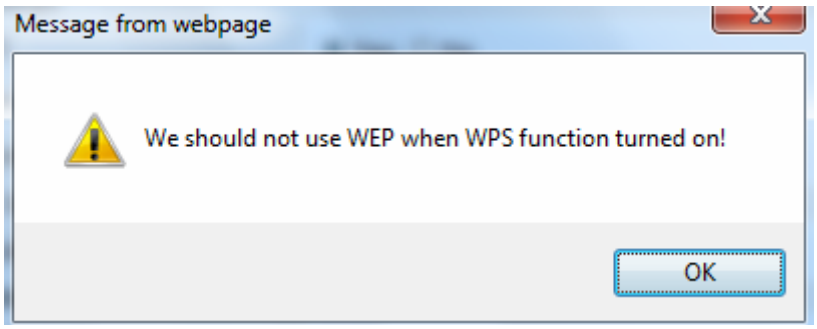
Key 1 to Key 4: Enter the key to encrypt wireless data. To allow encrypted data transmission, the WEP Encryption Key values on all wireless stations must be the same as the router. There are four keys for your selection. The input format is in HEX style, 5 and 13 HEX codes are required for 64-bitWEP and 128-bitWEP respectively.

If you chose **WEP-64Bbits**, then enter any 5 ASCII characters or 10 hexadecimal characters ("0-9", "A-F").

If you chose **WEP-128Bits**, then enter 13 ASCII characters or 26 hexadecimal characters ("0-9", "A-F").

You must configure all four keys, but only one key can be activated at any one time. The default key is key 1.

Note: When you enable **WPS** function, this **WEP** function will be invalid. And if you select one of **WEP-64Bits/ WEP-128Bits,** the following prompt box will appear to notice you.



➢ **WPA-PSK & WPA2-PSK**

Security Settings	
Authentication Type	WPAPSK
Encryption	TKIP
Pre-Shared Key	(8~63 characters or 64 Hex string)
Key Renewal Interval	10 seconds (10 ~ 4194303)

Encryption: TKIP (Temporal Key Integrity Protocol) or AES (Advanced Encryption System) utilizes a stronger encryption method and incorporates Message Integrity Code (MIC) to provide protection against hackers.

Pre-Shared key: The key for network authentication. The input format should be 8-63 ASKII characters or 64 hexadecimal characters

Key Renewal Interval: The time interval for changing the security key automatically between wireless client and AP.

WDS Settings

WDS (Wireless distributed system) is a wireless access point mode that enables wireless link and communication with other access point. It is easy to be installed, just define the peer's MAC of the connected AP.

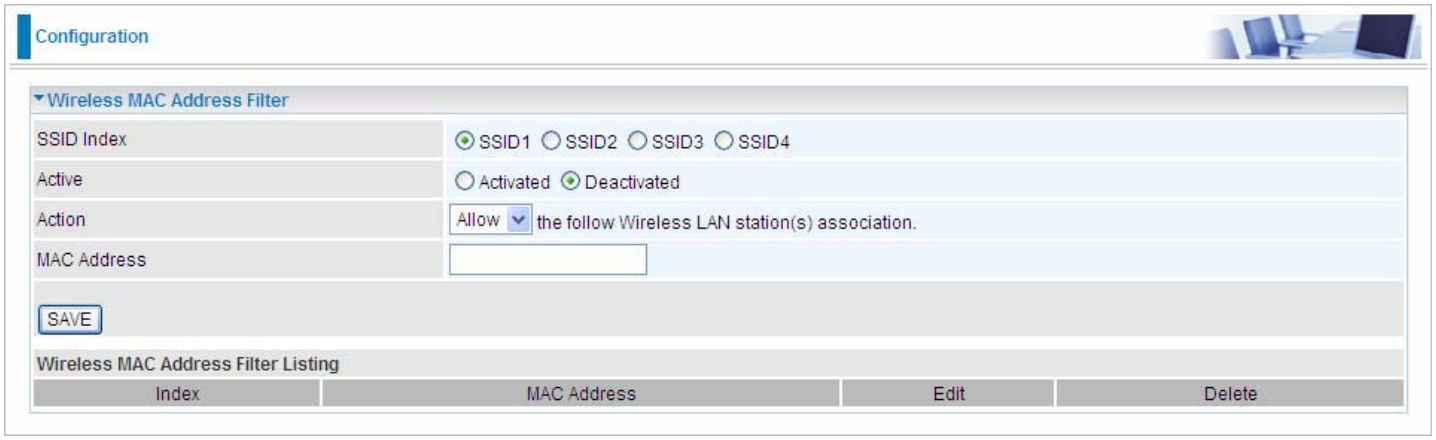
WDS Mode: select Activated to enable WDS feature and Deactivated to disable this feature.

MAC Address: Enter the AP MAC addresses (in XX:XX:XX:XX:XX:XX format) of the peer connected AP.

WDS Settings	
WDS Mode	Activated Deactivated
WDS Peer MAC #1	00:00:00:00:00:00
WDS Peer MAC #2	00:00:00:00:00:00
WDS Peer MAC #3	00:00:00:00:00:00
WDS Peer MAC #4	00:00:00:00:00:00

Wireless MAC Address Filter

The MAC filter screen allows you to configure the router to give exclusive access to up to 8 devices (Allow Association) or exclude up to 8 devices from accessing the router (Deny Association). Every Ethernet device has a unique MAC (Media Access Control) address. The MAC address is assigned at the factory and consists of six pairs of hexadecimal characters, for example, 00:AA:BB:00:00:02. You need to know the MAC address of the devices to configure this screen.



SSID Index: Select the targeted SSID you want the MAC filter rules to apply to.

Active: Select **Activated** to enable MAC address filtering.

Action: Define the filter action for the list of MAC addresses in the MAC address filter table.

Select **Deny** to block access to the AP, MAC addresses not listed will be allowed to access the router. Select **Allow** to permit access to the router, MAC addresses not listed will be denied access to the router.

MAC Address: Enter the MAC addresses (in XX:XX:XX:XX:XX:XX format) of the wireless station that are allowed or denied access to the specified in these address fields.

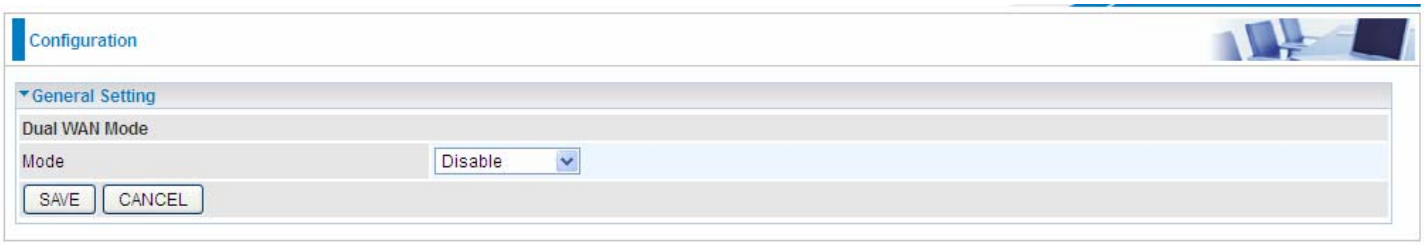
5.5 Dual WAN

Dual WAN is specially designed to offer users failover/fallback or Load Balance feature.

Auto failover/failback is to ensure an always-on internet connection. Users can set a WAN1 (main WAN) and WAN 2 (backup WAN), and when WAN1 fails, it will switch to WAN2, and when WAN1 restores, it will switch to WAN1 again.

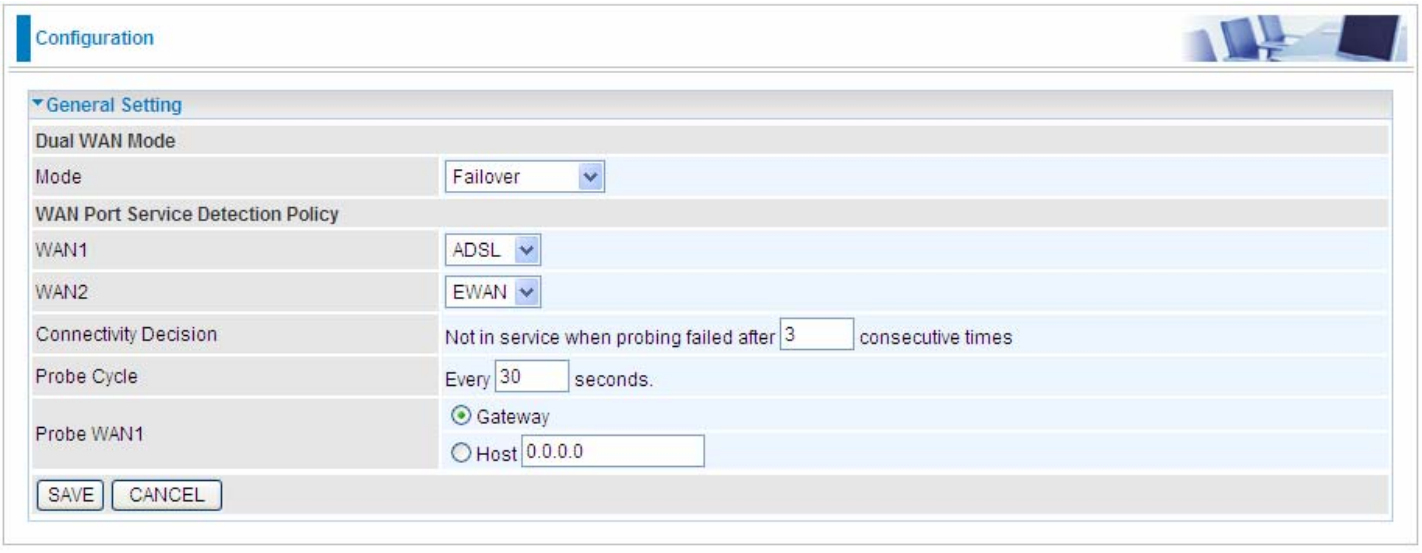
Load balance provides optimal bandwidth sharing for multiple PCs on your network, or allows maximum reliability with network redundancy. Load balance supported by BiPAC 7600NX(L) balance network bandwidth for network traffic through two WAN connections, ideal for small-to-medium business that requires increased bandwidth, network scalability, and resilience for mission-critical network and internet applications.

5.5.1 General Setting



Select **Failover** to enable the failover/failback feature or **Load Balance** to make the router work in load balance mode.

➢ **Failover**



WAN Port Service Detection Policy

WAN1: Select “ADSL”, or “EWAN” for WAN1 (The main WAN).

WAN2: Select the “EWAN” for WAN2 as backup port if you select “ADSL” as WAN1.

Connectivity Decision: Set how many times of probing failure to switch to backup port.

Probe Cycle: Set the time duration for the **Probe Cycle** to determine when the router will switch to the backup connection (backup port) once the main connection (main port) fails. For example, when set to 30 seconds, the

probe will be conducted every 30 seconds.

Note:

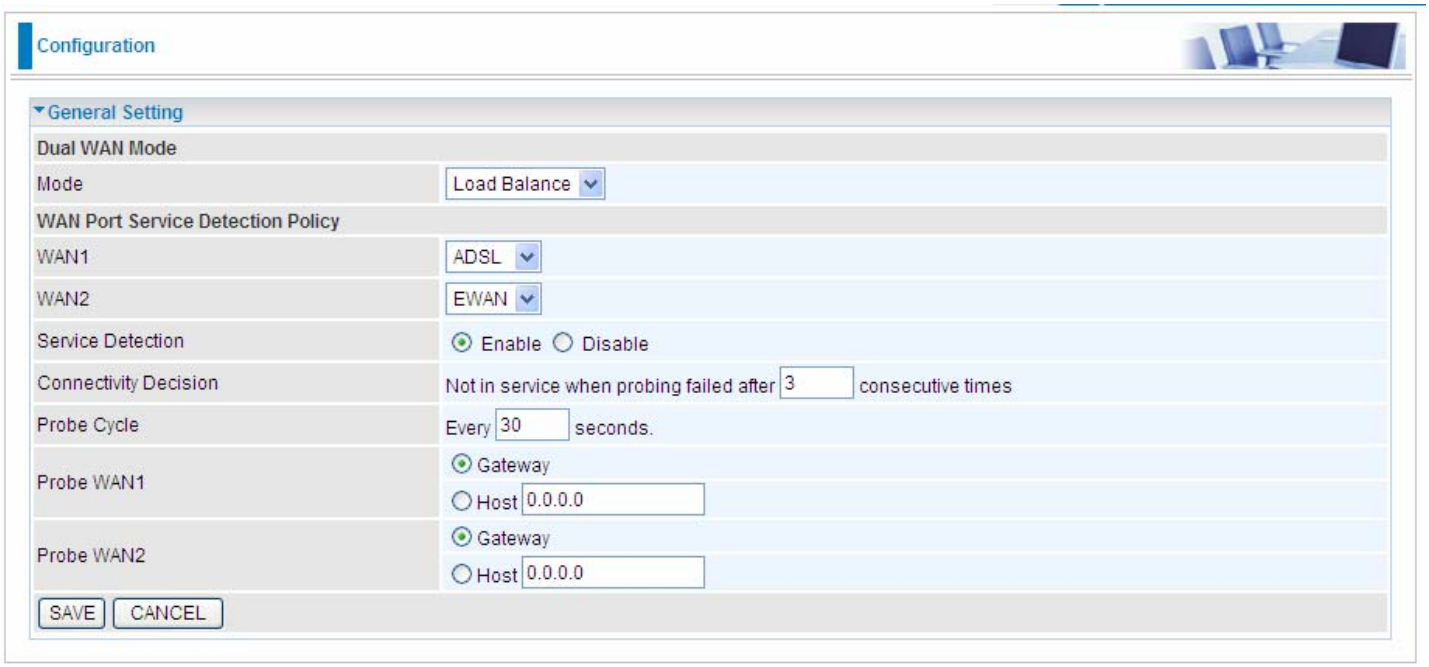
1) The time set is for each probe cycle, but the decision to change to the backup port is determined by **Probe Cycle** multiplied by **connection Decision amount** (e.g. From the image above it will be 30 seconds multiplied by 3 consecutive fails, the router will determine failover to WAN2 (backup port)).

2).The failback setting follow the same decision policy as the failover. For example, according to settings above in the screenshot, the connection probe will be carried out every 30 seconds, and 3 consecutive times of probe success is found, the router will determine failback to WAN1 (main WAN).

Probe WAN 1: Choose the probe policy, to probe gateway or host (users decide themselves)

- **Gateway:** It will send ping packets to gateway of Wan1 interface and wait for response from it in every "Probe Cycle" to check the connectivity of the gateway of WAN1 interface.
- **Host:** It will send ping packets to specific host and wait for response in every "Probe Cycle". The host must be an IP address.

➢ Load Balance *(7600NX only)*



WAN Port Service Detection Policy

WAN1: Select "ADSL", or "EWAN" for WAN1 (The main WAN).

WAN2: Select the "EWAN" for WAN2 as backup port if you select "ADSL" as WAN1.

Connectivity Decision: Set how many times of probing failure to switch to backup port.

Probe Cycle: Set the time duration for the **Probe Cycle** to determine when the router will switch to the backup connection (backup port) once the main connection (main port) fails. For example, when set to 30 seconds, the probe will be conducted every 30 seconds.

Note:

1) The time set is for each probe cycle, but the decision to change to the backup port is determined by **Probe Cycle** multiplied by **connection Decision amount** (e.g. From the image above it will be 30 seconds multiplied