802.11n WLAN AP Router

User's Manual

Table of Contents

1 Introduction

Congratulations on becoming the owner of the Wireless Gateway. You will now be able to access the Internet using your high-speed xDSL/Cable modem connection.

This User Guide will show you how to connect your Wireless Gateway, and how to customize its configuration to get the most out of your new product.

Features

The list below contains the main features of the device and may be useful to users with knowledge of networking protocols. If you are not an experienced user, the chapters throughout this guide will provide you with enough information to get the most out of your device.

Features include:

- 10/100Base-T Ethernet router to provide Internet connectivity to all computers on your LAN
- Network address translation (NAT) functions to provide security for your LAN
- Network configuration through DHCP Server and DHCP Client
- Services including IP route and DNS configuration, RIP, and IP
- Supports remote software upgrades
- User-friendly configuration program accessed via a web browser

The Wireless Gateway has the internal Ethernet switch allows for a direct connection to a 10/100BASE-T Ethernet network via an RJ-45 interface, with LAN connectivity for both the Wireless Gateway and a co-located PC or other Ethernet-based device.

Device Requirements

In order to use the Wireless Gateway, you must have the following:

- One RJ-45 Broadband Internet connection via cable modem or xDSL modem
- Instructions from your ISP on what type of Internet access you will be using, and the addresses needed to set up access
- One or more computers each containing an Ethernet card (10Base-T/100Base-T network interface card (NIC))
- TCP/IP protocol for each PC
- For system configuration using the supplied
  a. web-based program: a web browser such as Internet Explorer v4 or later, or Netscape v4 or later. Note that version 4 of each browser is the minimum version

requirement – for optimum display quality, use Internet Explorer v5, or Netscape v6.1

Note

You do not need to use a hub or switch in order to connect more than one Ethernet PC to your device. Instead, you can connect up to four Ethernet PCs directly to your device using the ports labeled Ethernet on the rear panel.

Using this Document

Notational conventions

- Acronyms are defined the first time they appear in the text and also in the glossary.
- For brevity, the Wireless Gateway is referred to as "the device".
- The term *LAN* refers to a group of Ethernet-connected computers at one site.

Typographical conventions

- *Italic* text is used for items you select from menus and drop-down lists and the names of displayed web pages.
- **Bold** text is used for text strings that you type when prompted by the program, and to emphasize important points.

Special messages

This document uses the following icons to draw your attention to specific instructions or explanations.

Note

Provides clarifying or non-essential information on the current topic.

Definition

Explains terms or acronyms that may be unfamiliar to many readers. These terms are also included in the Glossary.

WARNING

Provides messages of high importance, including messages relating to personal safety or system integrity.

Getting Support

Supplied by:
Helpdesk Number:
Website:

2 Getting to know the device

Computer / System requirements

- 1. Pentium 200MHZ processor or above
- 2. Windows 98SE, Windows Me, Windows 2000, Windows XP, Windows Vista, Windows 7 and Windows 8
- 3. 64MB of RAM or above
- 4. 25MB free disk space

Package Contents

1. 11n AP Router
2. CD-ROM (Software & Manual)
3. Quick Installation Guide
4. Ethernet Cable (RJ-45)
5. Power Adapter

LED meanings & activations

Top Side

The Top Side contains lights called Light Emitting Diodes (LEDs) that indicate the status of the unit.

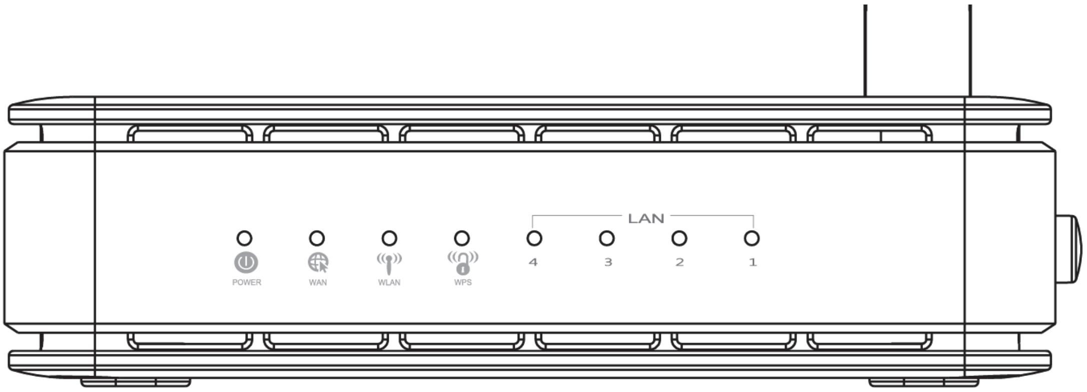
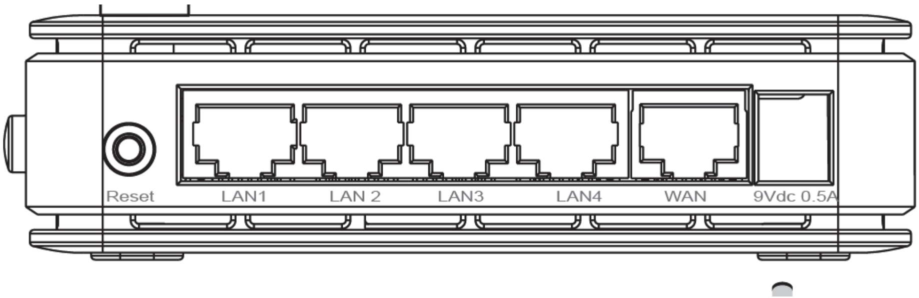


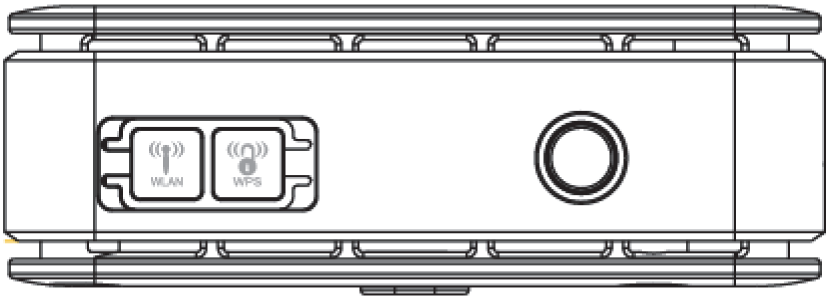
Figure 1: Top Side and LEDs

Label	Color	Function
POWER	green	On: device is powered on Off: device is powered off
WAN	green	On: WAN link established and active Off: No LAN link Blink: Valid Ethernet packet being transferred
WLAN	green	On: WLAN link established and active Blink: Valid Wireless packet being transferred
WPS	green	Off: WPS link isn't established and active Blink: Valid WPS packet being transferred
LAN	green	On: LAN link established and active Off: No LAN link Blink: Valid Ethernet packet being transferred

Rear and Left Panel and bottom Side

The rear and right panel and bottom side contains a *Restore Defaults* button, the ports for the unit's data and power connections.





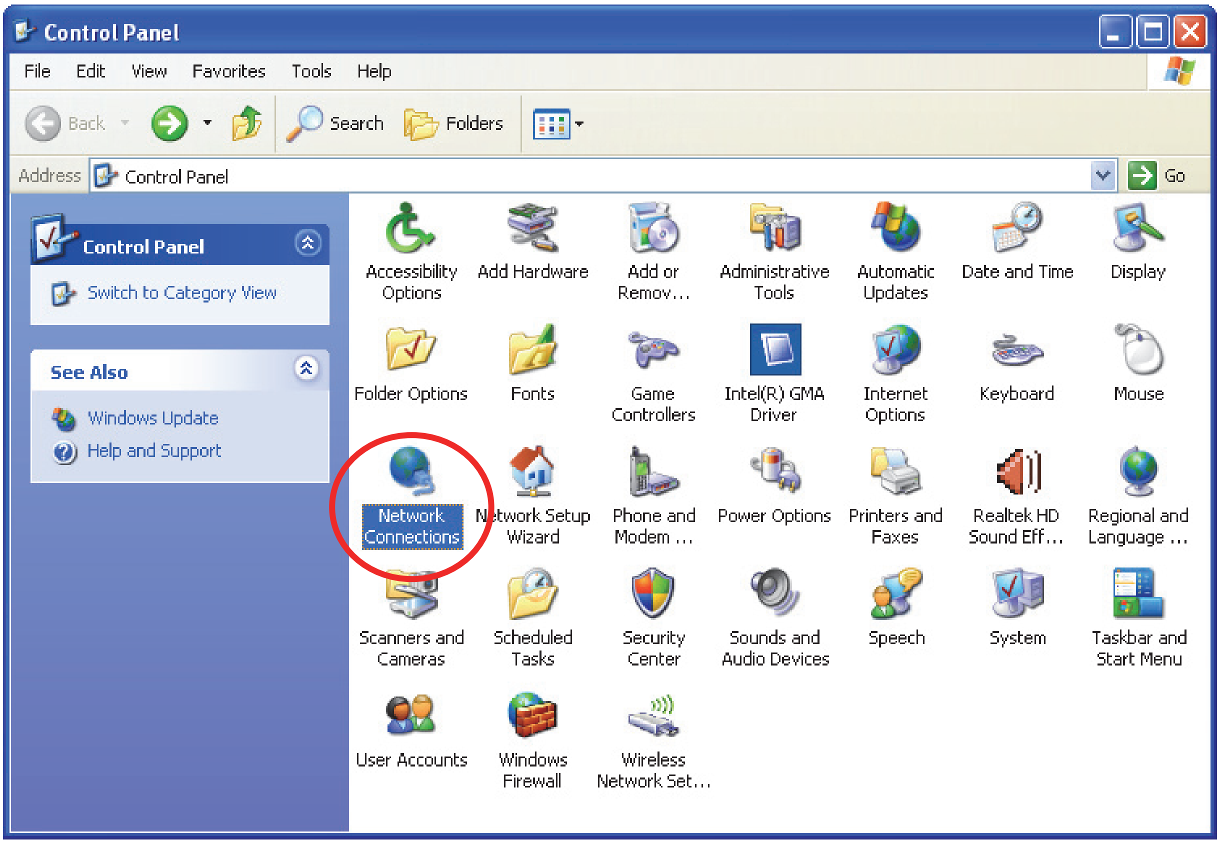
Label	Function
DC 9V	Connects to the supplied power adaptor
LAN	Connects the device via LAN Ethernet to a PC
WAN	Connects the device via WAN Ethernet to xDSL / Cable Modem
WLAN	Press this button for at least two full second to turn off/on wireless signals
WPS	WPS Press this button for 3,4,5, or 6 full seconds and the WPS LED will flash to start WPS. Now go to the wireless adapter or device and press its WPS button. Make sure to press the button within 120 seconds (2 minutes) after pressing the router's WPS button.
RESET	RESET Reset button. **RESET** the 11n AP Router to its default settings. Press this button for at least 7 full seconds to **RESET** device to its default settings.

3 Computer configurations under different OS, to obtain IP address automatically

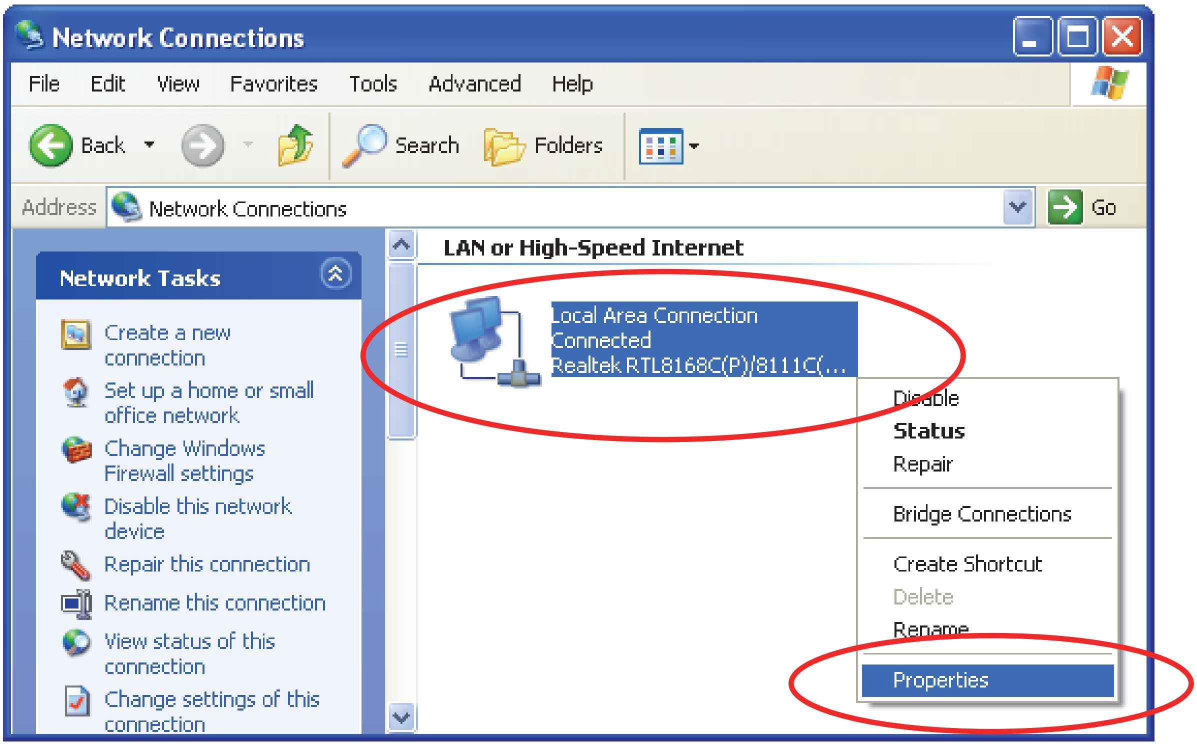
Before starting the 11n AP Router configuration, please kindly configure the PC computer as below, to have automatic IP address / DNS Server.

For Windows 98SE / ME / 2000 / XP

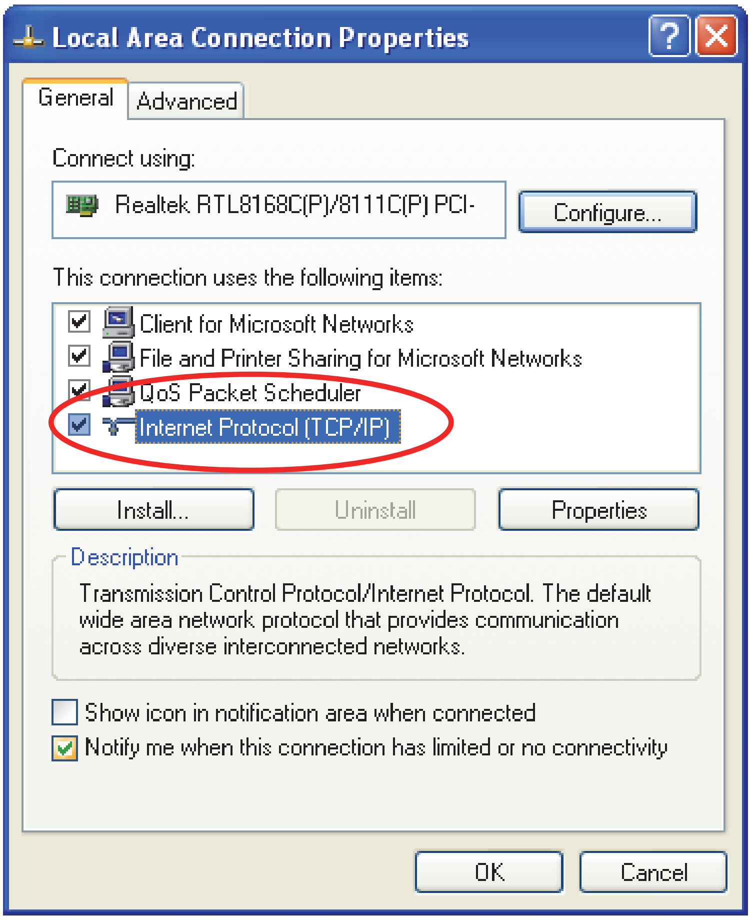
1. Click on "**Start**" -> "**Control Panel**" **(in Classic View)**. In the Control Panel, double click on "**Network Connections**" to continue.



2. Single RIGHT click on "**Local Area connection**", then click "**Properties**".


Network Connections
File Edit View Favorites Tools Advanced Help
Back
Search
Folders
Address Network Connections
Go
Network Tasks
Create a new connection
Set up a home or small office network
Change Windows Firewall settings
Disable this network device
Repair this connection
Rename this connection
View status of this connection
Change settings of this connection
LAN or High-Speed Internet
Local Area Connection
Connected
Realtek RTL8168C(P)/8111C(...
Disable
Status
Repair
Bridge Connections
Create Shortcut
Delete
Rename
Properties

3. Double click on "**Internet Protocol (TCP/IP)**".



Local Area Connection Properties

General | Advanced

Connect using:

Realtek RTL8168C(P)/8111C(P) PCI-

This connection uses the following items:

- ☑ Client for Microsoft Networks
- ☑ File and Printer Sharing for Microsoft Networks
- ☑ QoS Packet Scheduler
- ☑ Internet Protocol (TCP/IP)

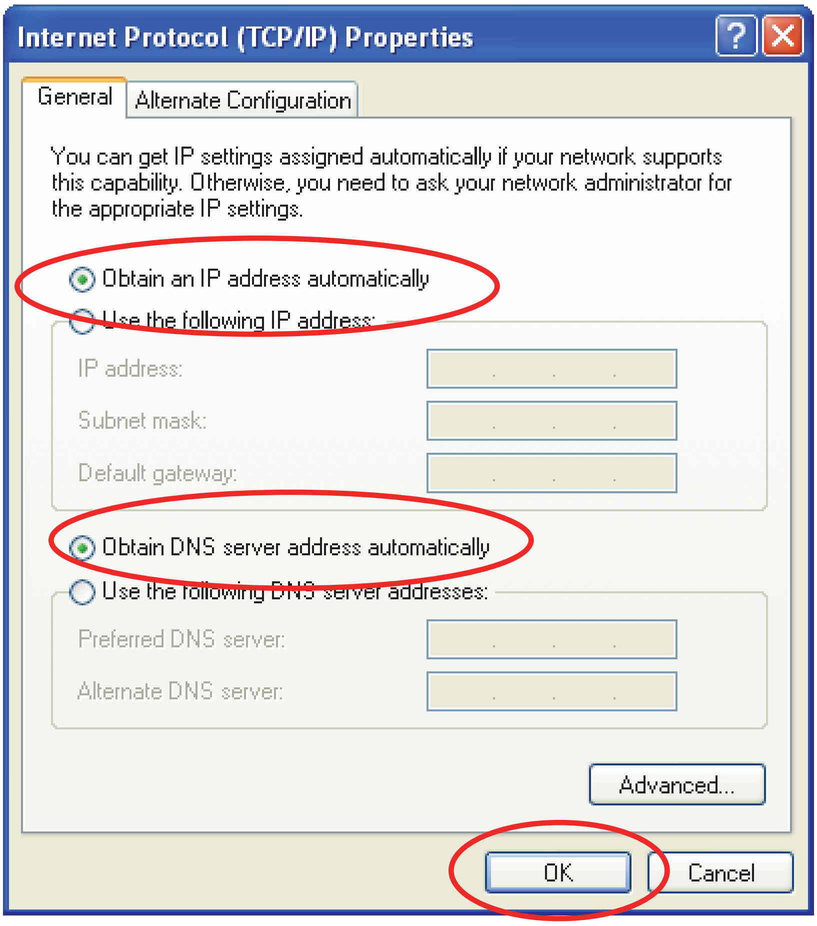
Description

Transmission Control Protocol/Internet Protocol. The default wide area network protocol that provides communication across diverse interconnected networks.

☐ Show icon in notification area when connected

☑ Notify me when this connection has limited or no connectivity

4. Check "**Obtain an IP address automatically**" and "**Obtain DNS server address automatically**" then click on "**OK**" to continue.



Internal Protocol (TCP/IP) Properties

General | Alternate Configuration

You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.

● Obtain an IP address automatically

○ Use the following IP address:

IP address: . . .

Subnet mask: . . .

Default gateway: . . .

● Obtain DNS server address automatically

○ Use the following DNS server addresses:

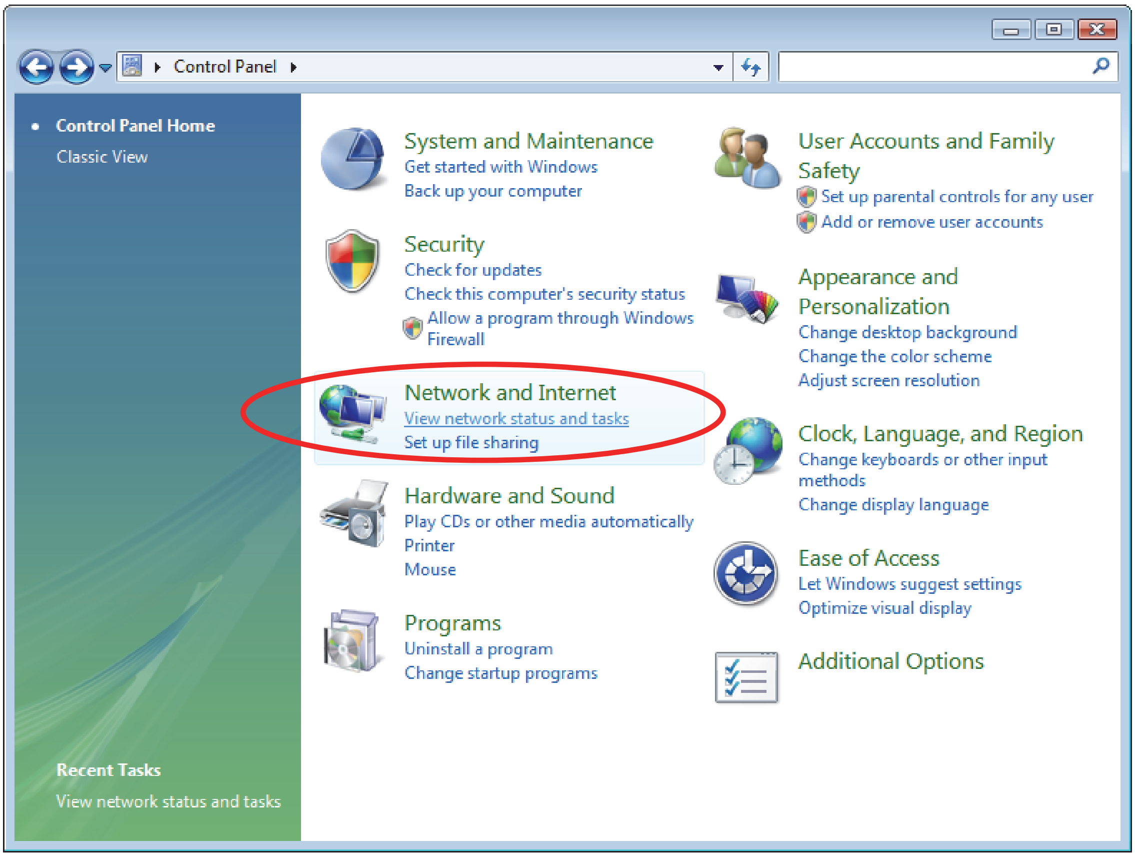
Preferred DNS server: . . .

Alternate DNS server: . . .

5. Click "**Show icon in notification area when connected**" (see screen image in 3. above) then Click on "**OK**" to complete the setup procedures.

For Windows Vista-32/64

1. Click on "**Start**" -> "**Control Panel**" -> "**View network status and tasks**".



Control Panel

- Control Panel Home

Classic View

Recent Tasks

View network status and tasks

System and Maintenance
Get started with Windows
Back up your computer

Security
Check for updates
Check this computer's security status
Allow a program through Windows Firewall

Network and Internet
View network status and tasks
Set up file sharing

Hardware and Sound
Play CDs or other media automatically
Printer
Mouse

Programs
Uninstall a program
Change startup programs

User Accounts and Family Safety
Set up parental controls for any user
Add or remove user accounts

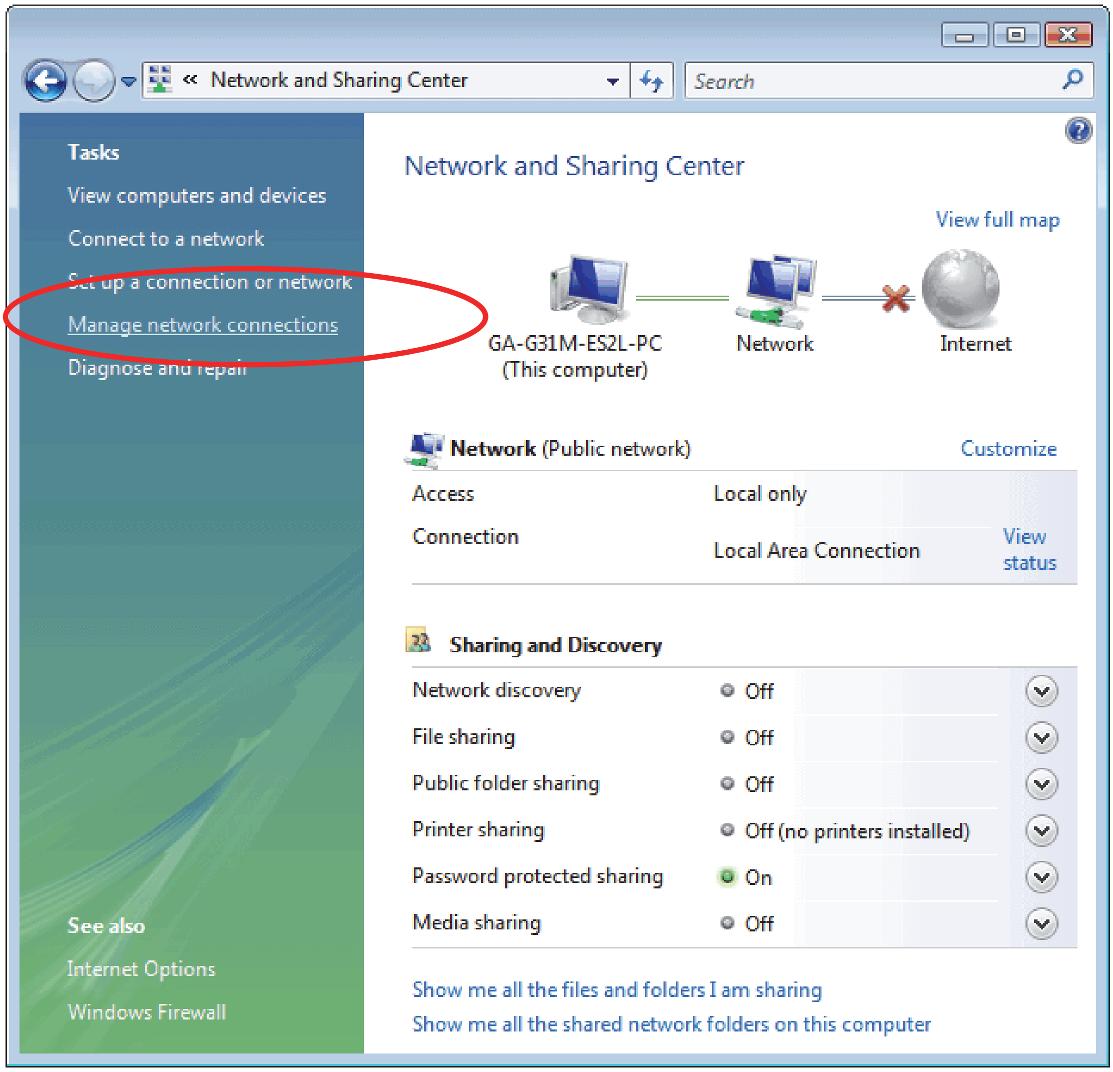
Appearance and Personalization
Change desktop background
Change the color scheme
Adjust screen resolution

Clock, Language, and Region
Change keyboards or other input methods
Change display language

Ease of Access
Let Windows suggest settings
Optimize visual display

Additional Options

2. In the Manage network connections, click on "**Manage network connections**" to continue.



« Network and Sharing Center
Search
Tasks
View computers and devices
Connect to a network
Set up a connection or network
Manage network connections
Diagnose and repair
See also
Internet Options
Windows Firewall
View full map
GA-G31M-ES2L-PC
(This computer)
Network
Internet
Customize
View status
Show me all the files and folders I am sharing
Show me all the shared network folders on this computer

Network and Sharing Center

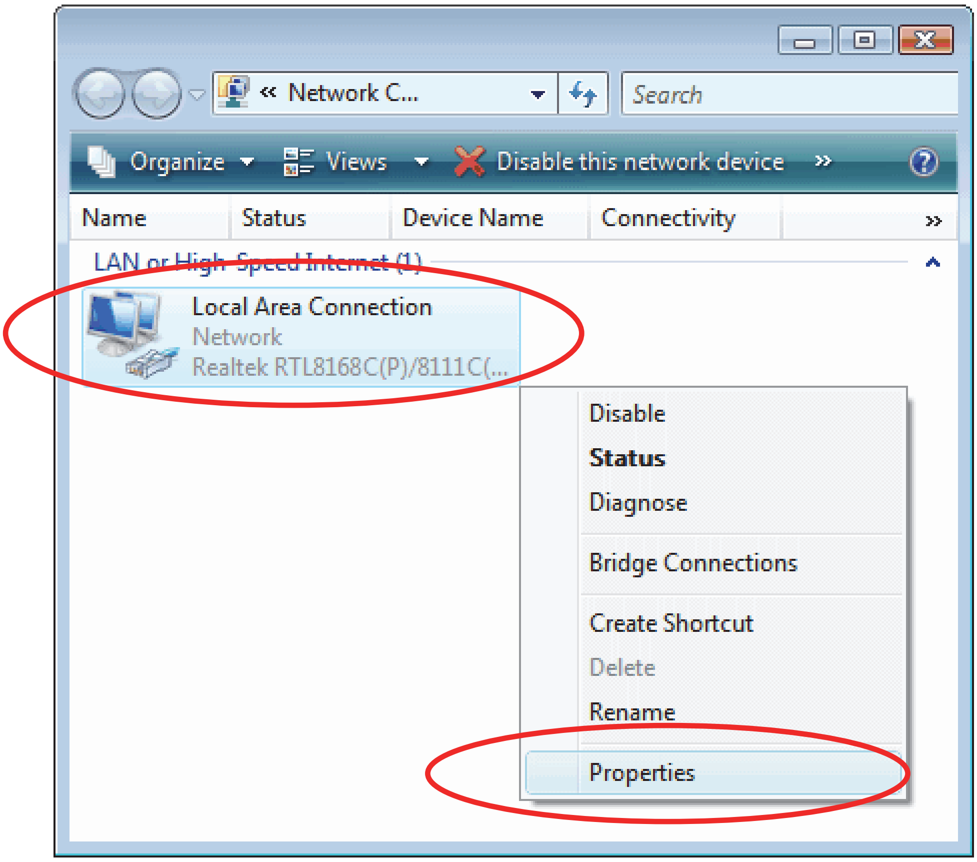
Network (Public network)

Access	Local only
Connection	Local Area Connection

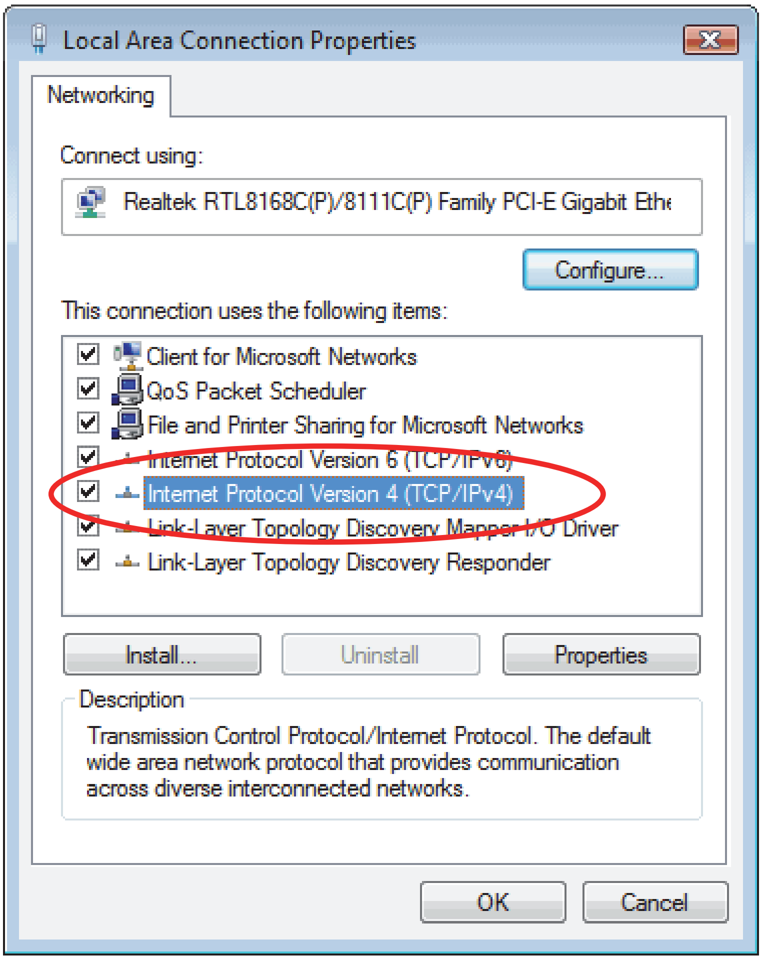
Sharing and Discovery

Network discovery	○ Off
File sharing	○ Off
Public folder sharing	○ Off
Printer sharing	○ Off (no printers installed)
Password protected sharing	● On
Media sharing	○ Off

3. Single RIGHT click on "**Local Area connection**", then click "**Properties**".



4. The screen will display the information "**User Account Control**" and click "**Continue**" to continue.
5. Double click on "**Internet Protocol Version 4 (TCP/IPv4)**".



Local Area Connection Properties

Networking

Connect using:

Realtek RTL8168C(P)/8111C(P) Family PCI-E Gigabit Ethe

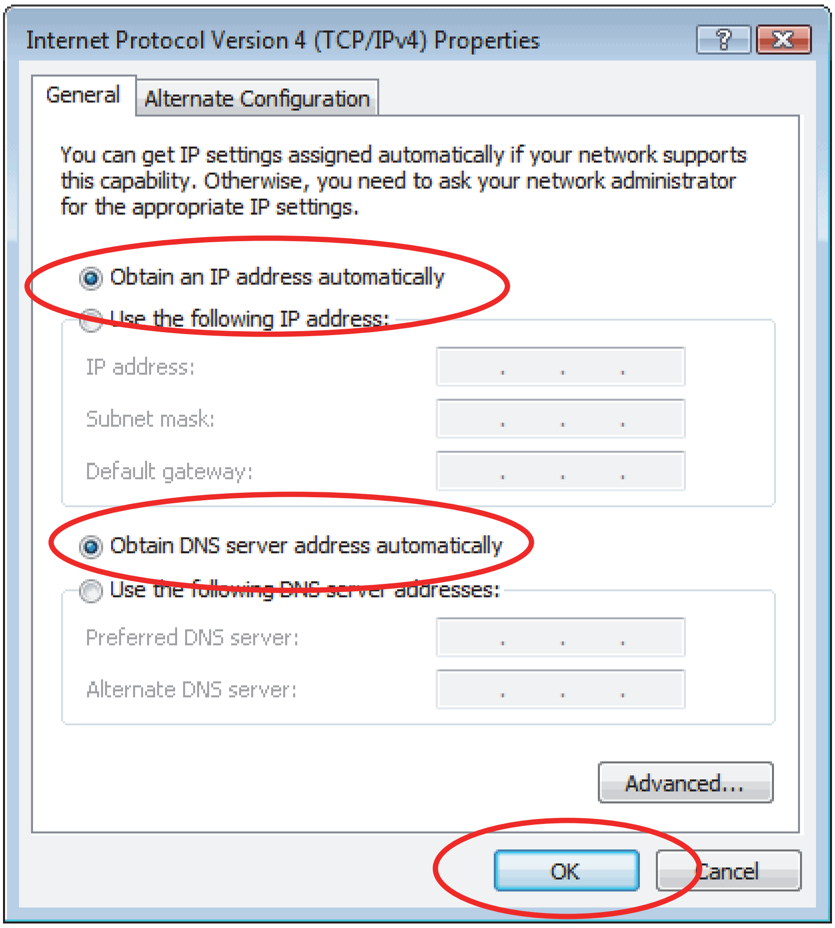
This connection uses the following items:

- ☑ Client for Microsoft Networks
- ☑ QoS Packet Scheduler
- ☑ File and Printer Sharing for Microsoft Networks
- ☑ Internet Protocol Version 6 (TCP/IPv6)
- ☑ Internet Protocol Version 4 (TCP/IPv4)
- ☑ Link-Layer Topology Discovery Mapper I/O Driver
- ☑ Link-Layer Topology Discovery Responder

Description

Transmission Control Protocol/Internet Protocol. The default wide area network protocol that provides communication across diverse interconnected networks.

6. Check "**Obtain an IP address automatically**" and "**Obtain DNS server address automatically**" then click on "**OK**" to continue.



Internet Protocol Version 4 (TCP/IPv4) Properties

You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.

● Obtain an IP address automatically

○ Use the following IP address:

IP address:

Subnet mask:

Default gateway:

● Obtain DNS server address automatically

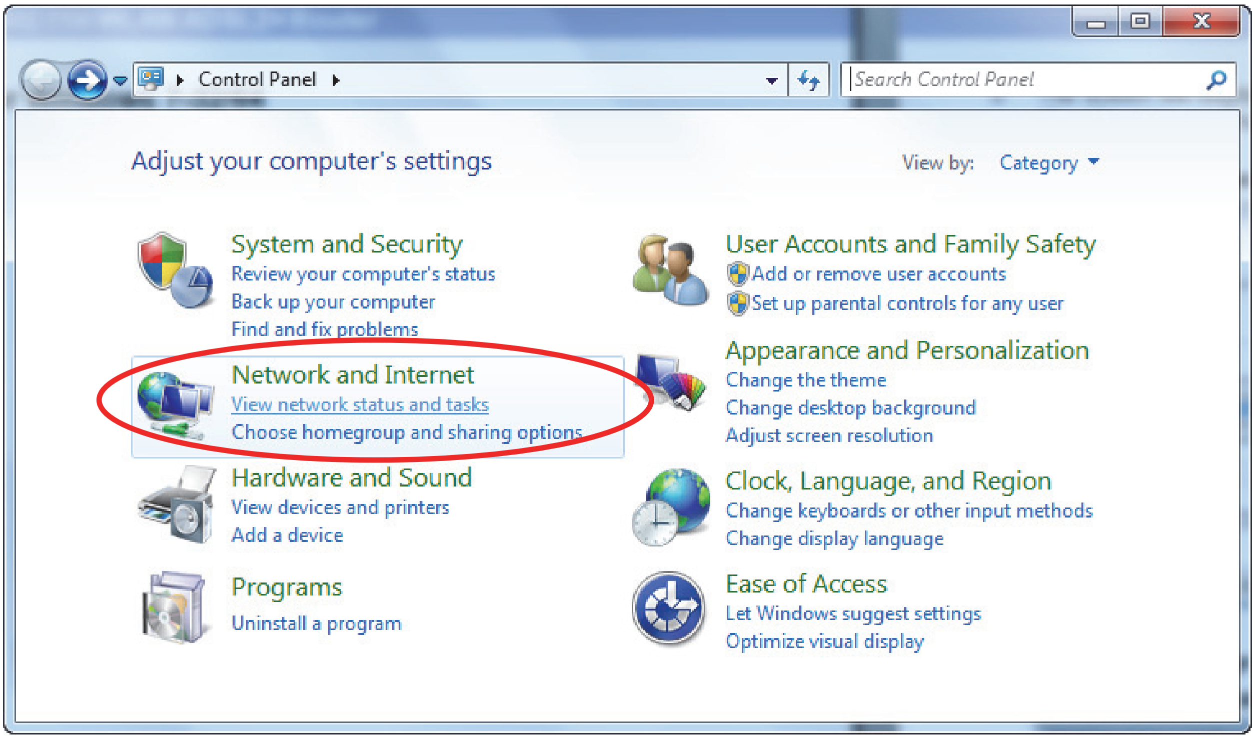
○ Use the following DNS server addresses:

Preferred DNS server:

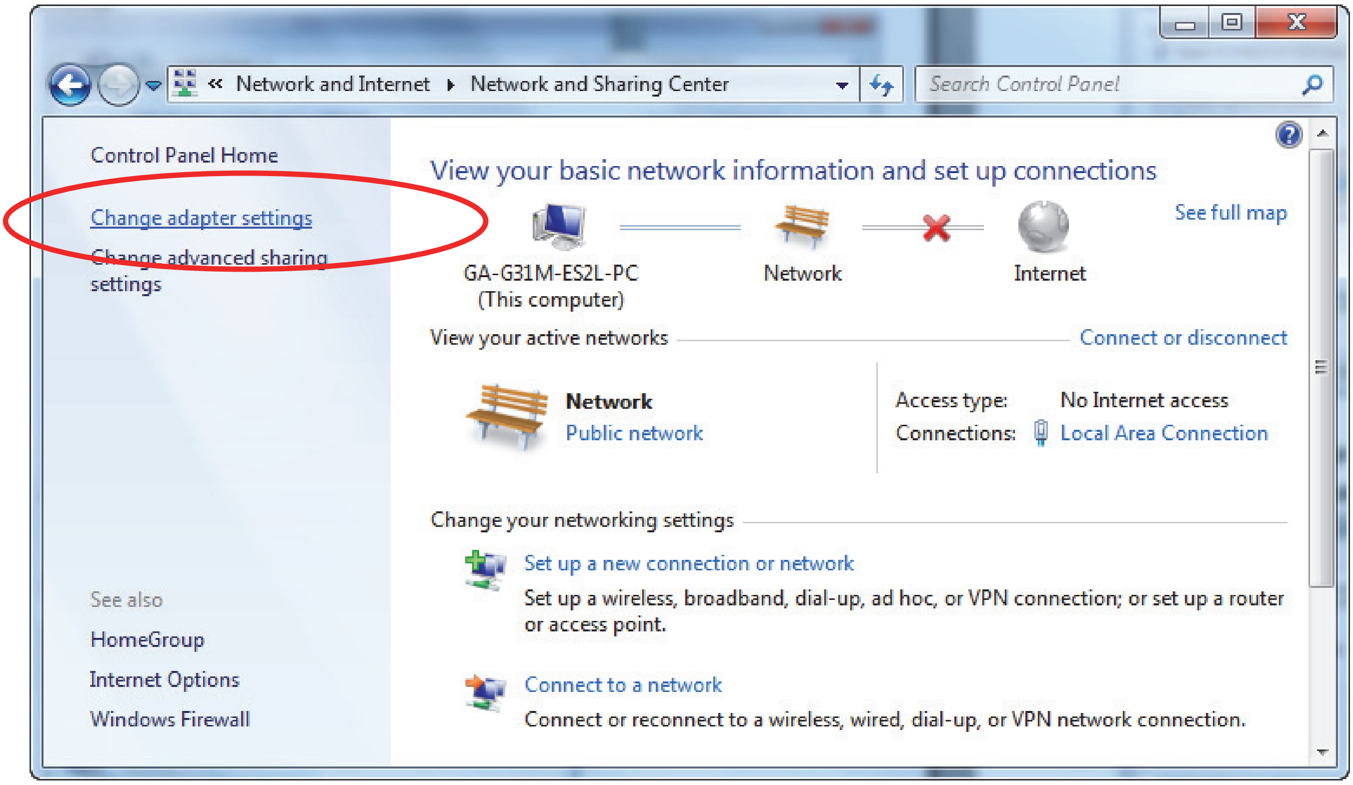
Alternate DNS server:

For Windows 7-32/64

7. Click on "**Start**" -> "**Control Panel**" **(in Category View)** -> "**View network status and tasks**".


Control Panel
Search Control Panel
Adjust your computer's settings
View by: Category
System and Security
Review your computer's status
Back up your computer
Find and fix problems
Network and Internet
View network status and tasks
Choose homegroup and sharing options
Hardware and Sound
View devices and printers
Add a device
Programs
Uninstall a program
User Accounts and Family Safety
Add or remove user accounts
Set up parental controls for any user
Appearance and Personalization
Change the theme
Change desktop background
Adjust screen resolution
Clock, Language, and Region
Change keyboards or other input methods
Change display language
Ease of Access
Let Windows suggest settings
Optimize visual display

8. In the Control Panel Home, click on "**Change adapter settings**" to continue.



« Network and Internet ▸ Network and Sharing Center

Search Control Panel

Control Panel Home

Change adapter settings

Change advanced sharing settings

See also

HomeGroup

Internet Options

Windows Firewall

View your basic network information and set up connections

View your active networks — Connect or disconnect

Network
Public network

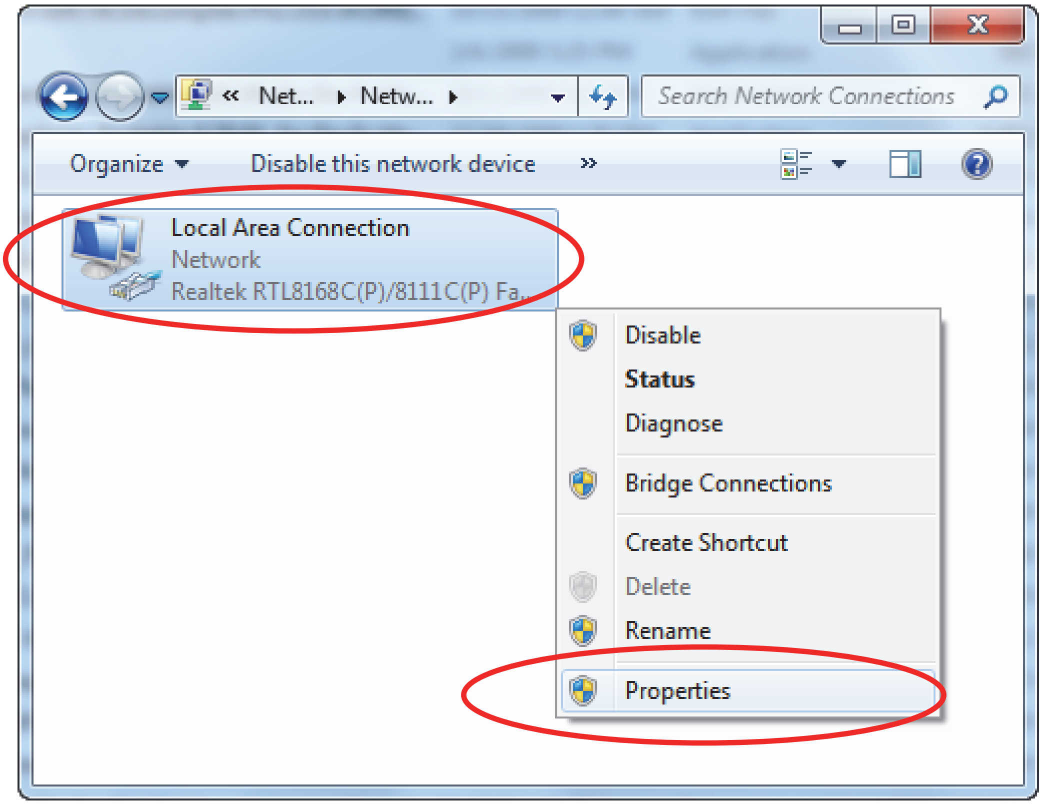
Access type: No Internet access
Connections: Local Area Connection

Change your networking settings

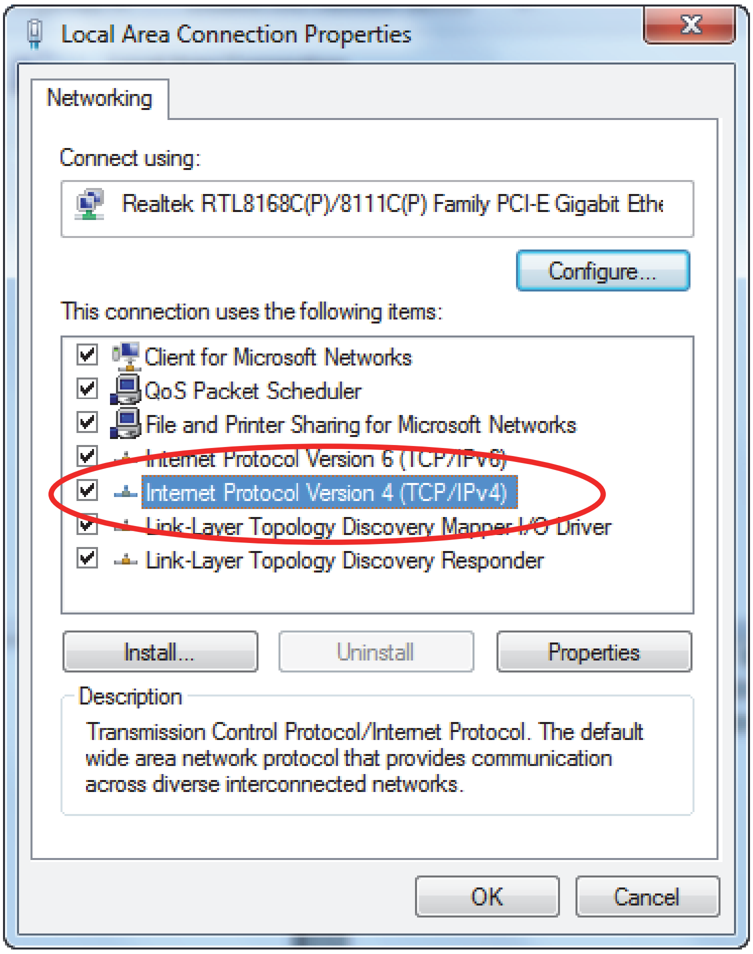
Set up a new connection or network
Set up a wireless, broadband, dial-up, ad hoc, or VPN connection; or set up a router or access point.

Connect to a network
Connect or reconnect to a wireless, wired, dial-up, or VPN network connection.

9. Single RIGHT click on "**Local Area Connection**", then click "**Properties**".



10. Double click on "**Internet Protocol Version 4 (TCP/IPv4)**".



Local Area Connection Properties

Networking

Connect using:

Realtek RTL8168C(P)/8111C(P) Family PCI-E Gigabit Ethe

Configure...

This connection uses the following items:

- ☑ Client for Microsoft Networks
- ☑ QoS Packet Scheduler
- ☑ File and Printer Sharing for Microsoft Networks
- ☑ Internet Protocol Version 6 (TCP/IPv6)
- ☑ Internet Protocol Version 4 (TCP/IPv4)
- ☑ Link-Layer Topology Discovery Mapper I/O Driver
- ☑ Link-Layer Topology Discovery Responder

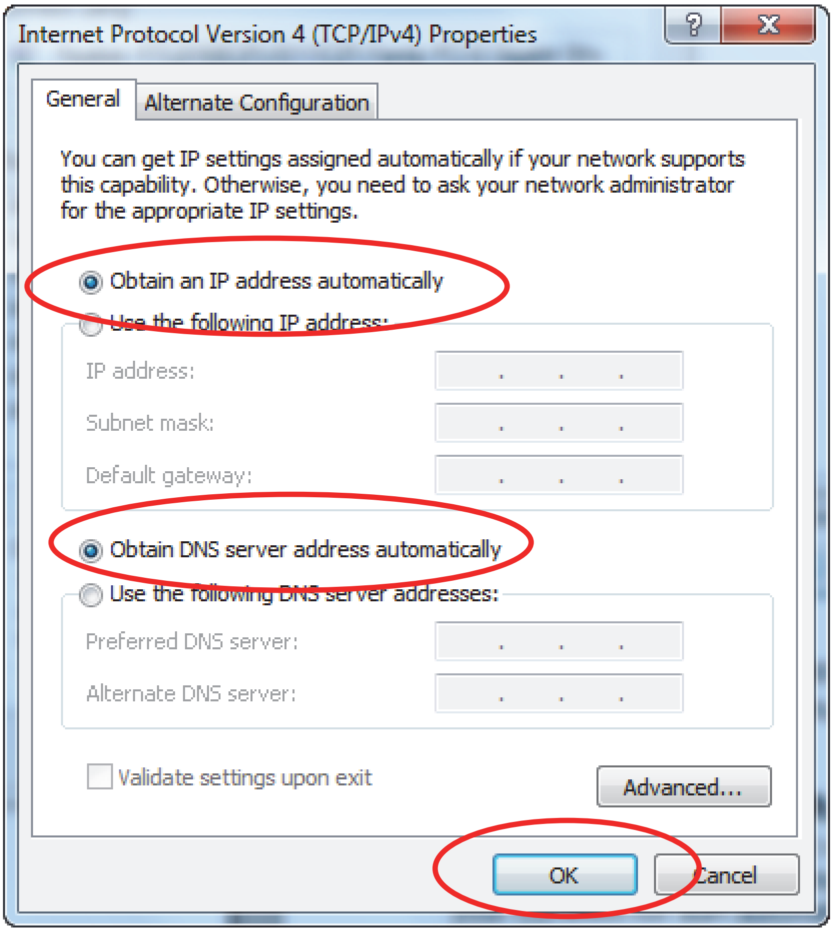
Install... Uninstall Properties

Description

Transmission Control Protocol/Internet Protocol. The default wide area network protocol that provides communication across diverse interconnected networks.

OK Cancel

11. Check "**Obtain an IP address automatically**" and "**Obtain DNS server address automatically**" then click on "**OK**" to continue.



Internet Protocol Version 4 (TCP/IPv4) Properties

General | Alternate Configuration

You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.

● Obtain an IP address automatically

○ Use the following IP address:

IP address: . . .

Subnet mask: . . .

Default gateway: . . .

● Obtain DNS server address automatically

○ Use the following DNS server addresses:

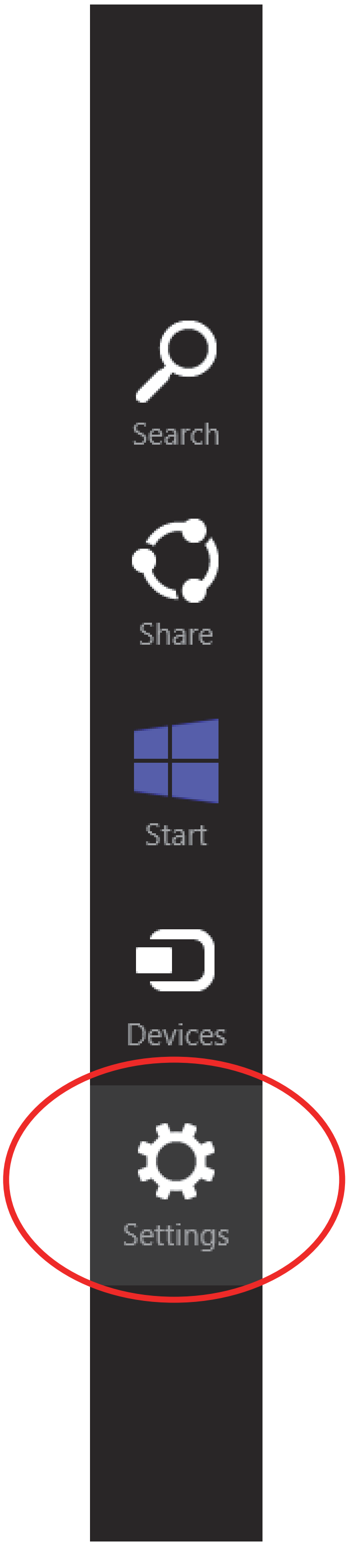
Preferred DNS server: . . .

Alternate DNS server: . . .

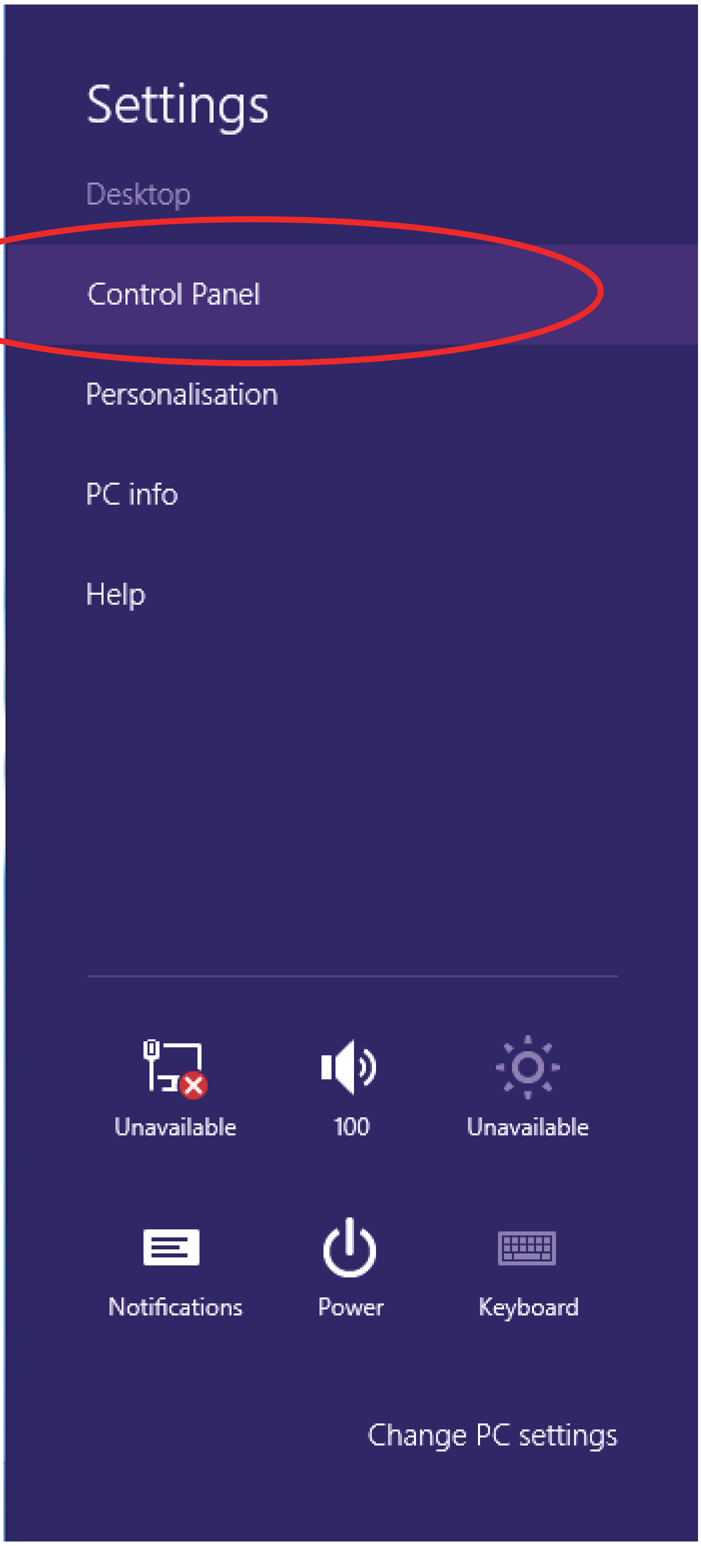
□ Validate settings upon exit

For Windows 8-32/64

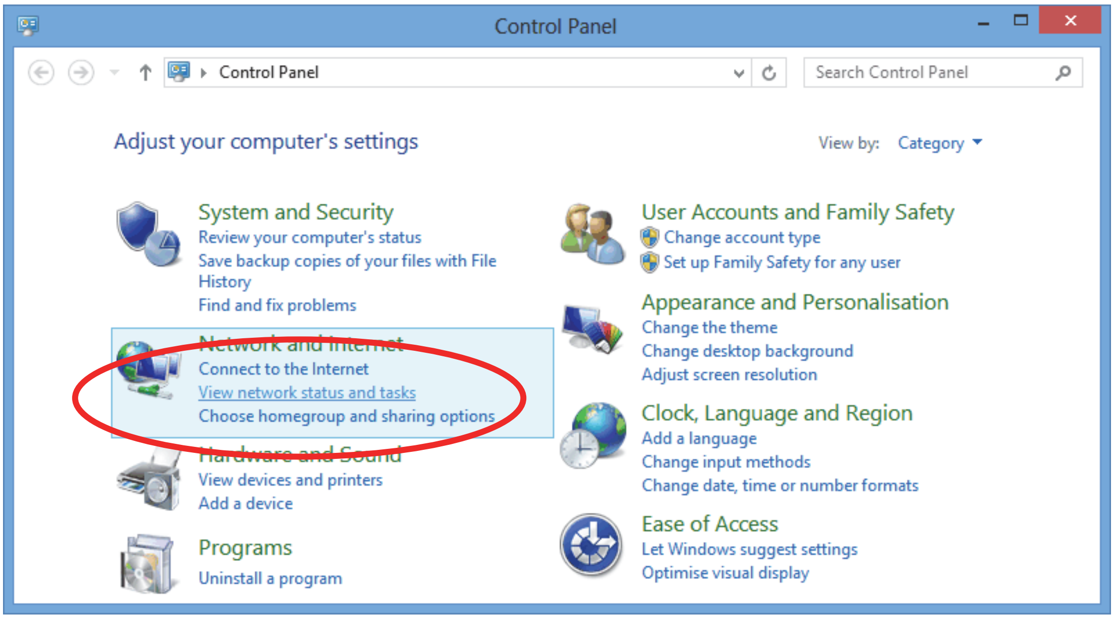
1. Move the mouse or tap to the upper right corner and click on "**Settings**".



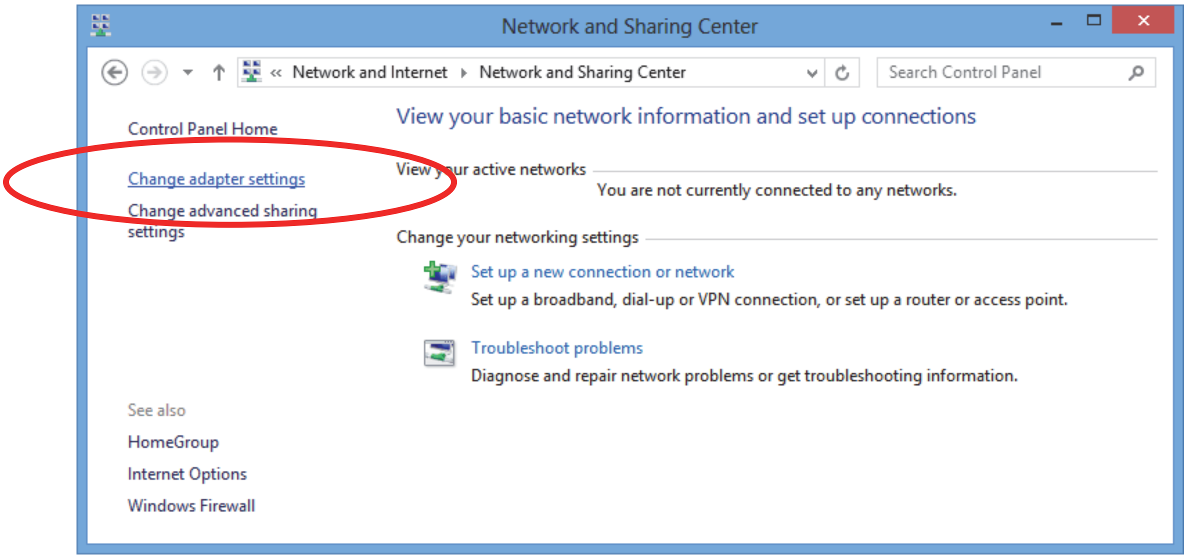
2. Click on "**Control Panel**".



3. Click on "**View network status and tasks**".


Control Panel
Control Panel
Search Control Panel
Adjust your computer's settings
View by: Category
System and Security
Review your computer's status
Save backup copies of your files with File History
Find and fix problems
Network and Internet
Connect to the Internet
View network status and tasks
Choose homegroup and sharing options
Hardware and Sound
View devices and printers
Add a device
Programs
Uninstall a program
User Accounts and Family Safety
Change account type
Set up Family Safety for any user
Appearance and Personalisation
Change the theme
Change desktop background
Adjust screen resolution
Clock, Language and Region
Add a language
Change input methods
Change date, time or number formats
Ease of Access
Let Windows suggest settings
Optimise visual display

4. In the Control Panel Home, click on "**Change adapter settings**" to continue.


Network and Sharing Center
« Network and Internet › Network and Sharing Center
Search Control Panel
Control Panel Home
Change adapter settings
Change advanced sharing settings
See also
HomeGroup
Internet Options
Windows Firewall
Set up a new connection or network
Troubleshoot problems

View your basic network information and set up connections

View your active networks

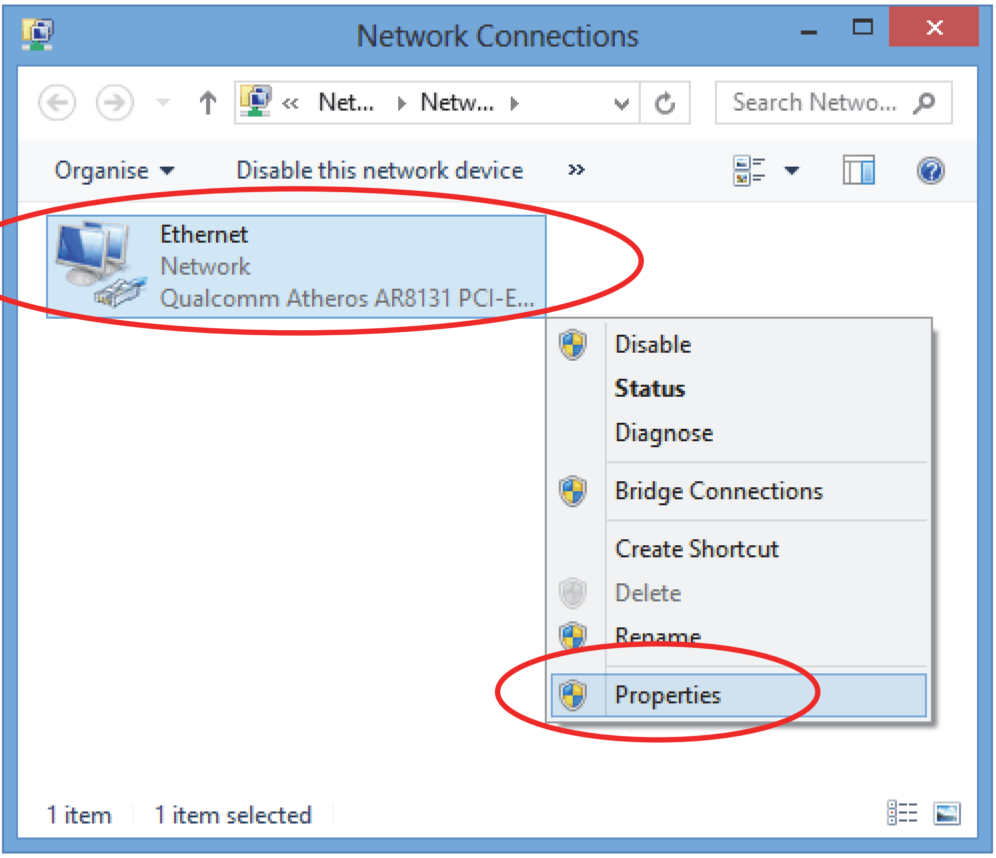
You are not currently connected to any networks.

Change your networking settings

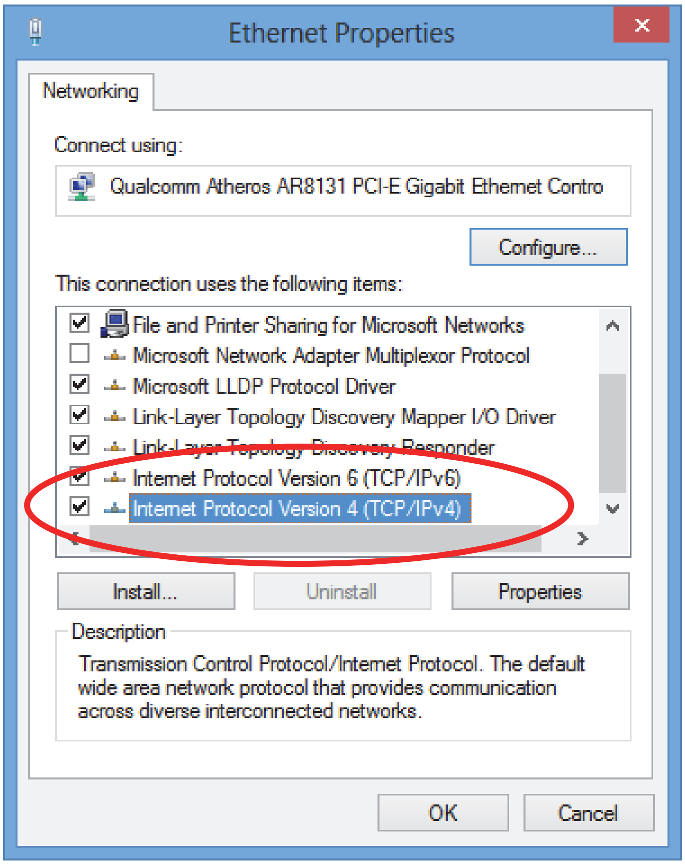
Set up a broadband, dial-up or VPN connection, or set up a router or access point.

Diagnose and repair network problems or get troubleshooting information.

5. Single RIGHT click on "**Ethernet**", then click "**Properties**".



6. Double click on "**Internet Protocol Version 4 (TCP/IPv4)**".



Connect using:

Qualcomm Atheros AR8131 PCI-E Gigabit Ethernet Contro

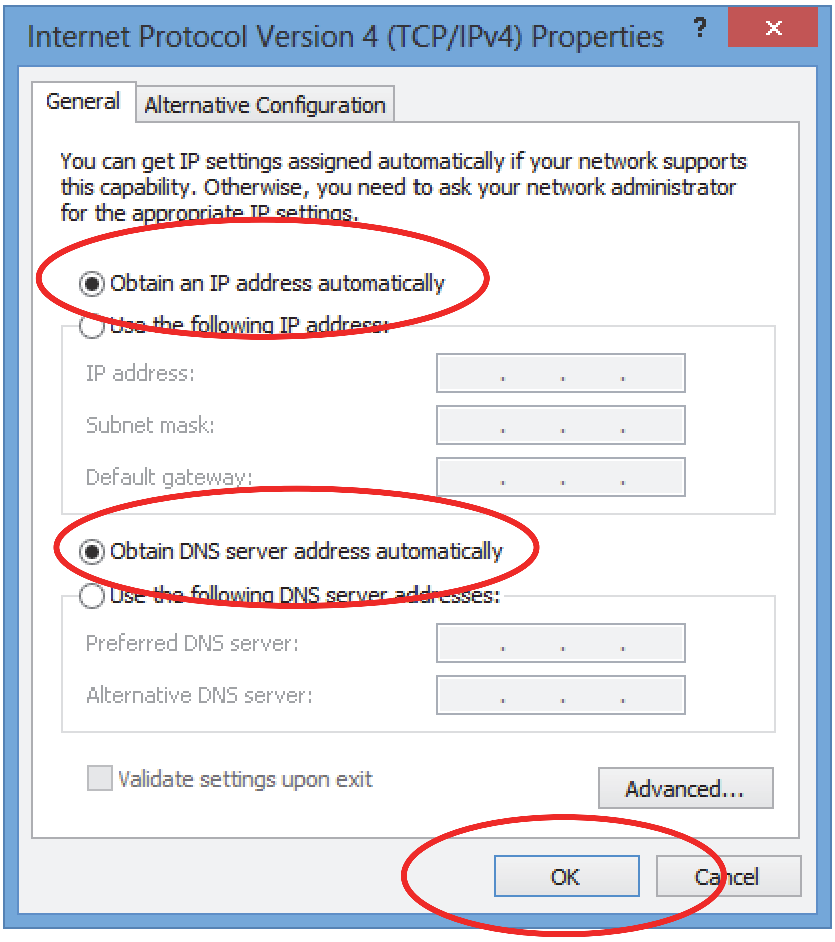
This connection uses the following items:

- ☑ File and Printer Sharing for Microsoft Networks
- ☐ Microsoft Network Adapter Multiplexor Protocol
- ☑ Microsoft LLDP Protocol Driver
- ☑ Link-Layer Topology Discovery Mapper I/O Driver
- ☑ Link-Layer Topology Discovery Responder
- ☑ Internet Protocol Version 6 (TCP/IPv6)
- ☑ Internet Protocol Version 4 (TCP/IPv4)

Description

Transmission Control Protocol/Internet Protocol. The default wide area network protocol that provides communication across diverse interconnected networks.

7. Check "**Obtain an IP address automatically**" and "**Obtain DNS server address automatically**" then click on "**OK**" to continue.



Internet Protocol Version 4 (TCP/IPv4) Properties

General | Alternative Configuration

You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.

● Obtain an IP address automatically

○ Use the following IP address:

IP address: . . .

Subnet mask: . . .

Default gateway: . . .

● Obtain DNS server address automatically

○ Use the following DNS server addresses:

Preferred DNS server: . . .

Alternative DNS server: . . .

□ Validate settings upon exit

4 Connecting your device

This chapter provides basic instructions for connecting the Wireless Gateway to a computer or LAN and to the Internet.

In addition to configuring the device, you need to configure the Internet properties of your computer(s). For more details, see the following sections:

- *Configuring Ethernet PCs*

This chapter assumes that you have already established a DSL/Cable service with your Internet service provider (ISP). These instructions provide a basic configuration that should be compatible with your home or small office network setup. Refer to the subsequent chapters for additional configuration instructions.

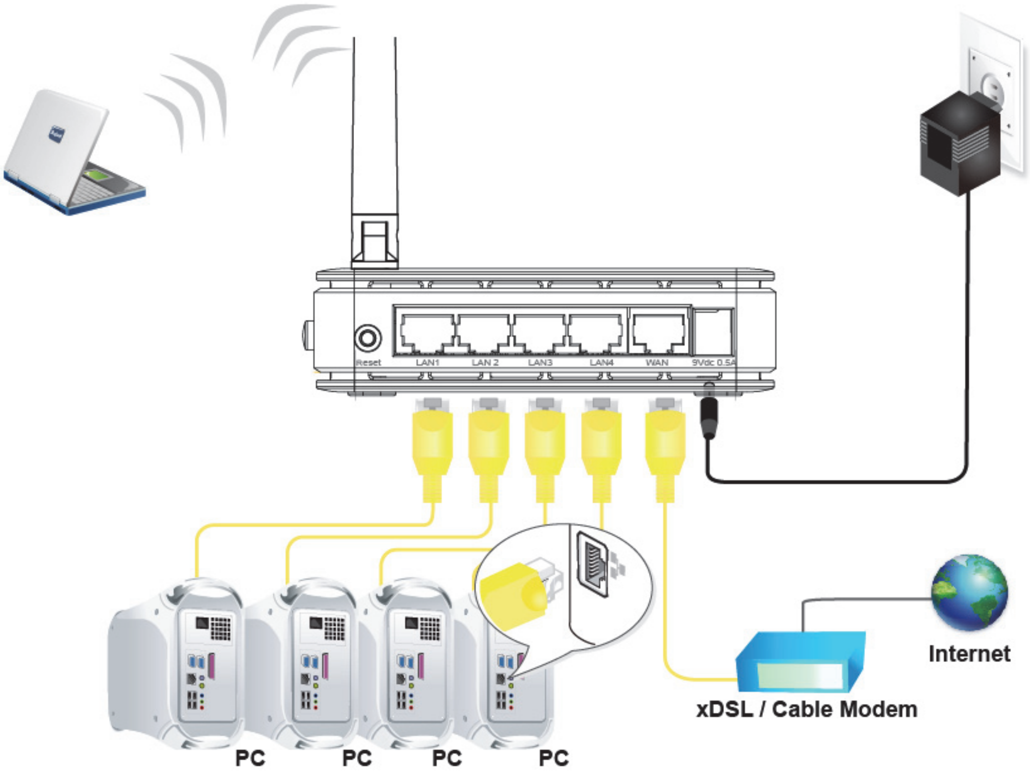
Connecting the Hardware

This section describes how to connect the device to the wall phone port, the power outlet and your computer(s) or network.

⚠ **WARNING**

Before you begin, turn the power off for all devices. *These include your computer(s), your LAN hub/switch (if applicable), and the Wireless Gateway.*

The diagram below illustrates the hardware connections. The layout of the ports on your device may vary from the layout shown. Refer to the steps that follow for specific instructions.



Step 1. Connect the Ethernet cable to WAN Port

Connect the RJ45 Ethernet cable from your xDSL/Cable Modem's Ethernet port to 11n AP Router 's WAN Port.

Step 2. Connect the Ethernet cable to LAN Port

Connect the supplied RJ45 Ethernet cable from your PC's Ethernet port to any of the 11n AP Router Router's LAN Port.

Step 3. Attach the power connector

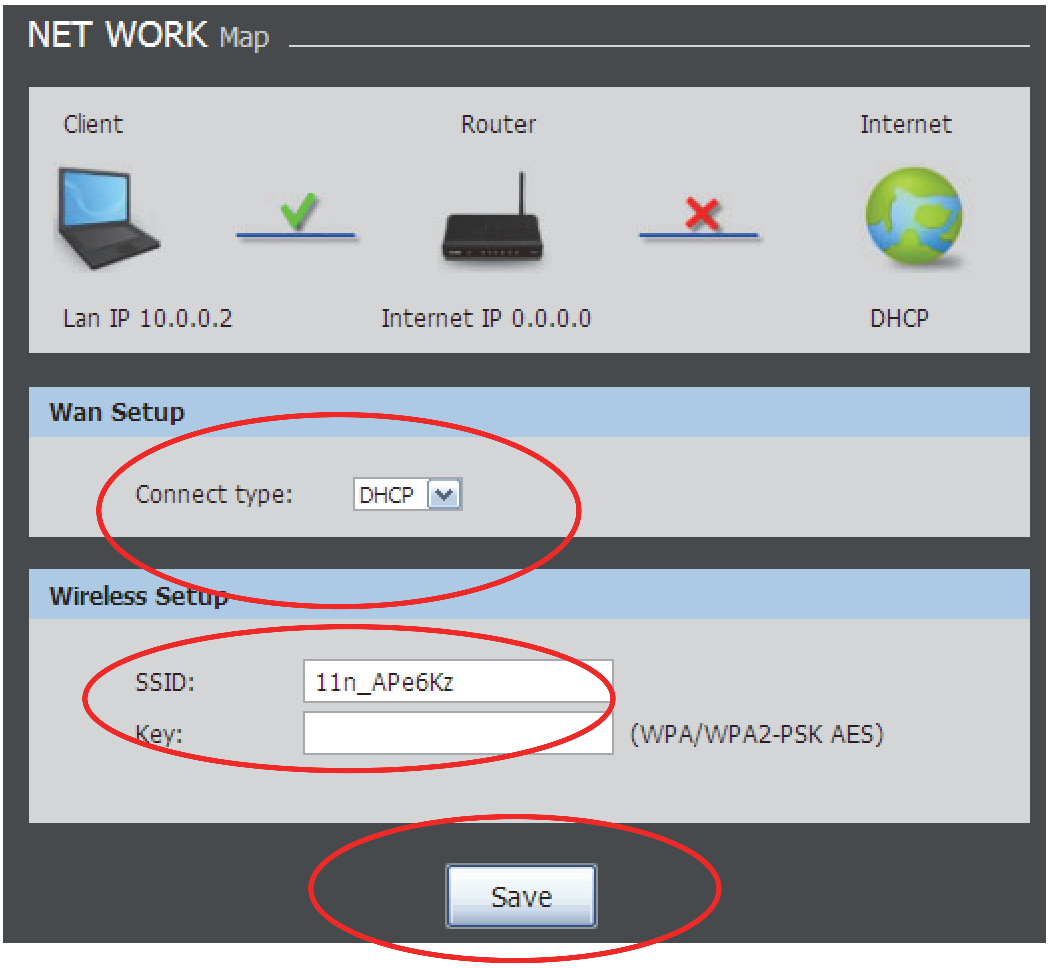
Connect the power adapter to the power inlet POWER of your 11n AP Router.

5 Advanced Configuration

Advanced Configuration with Router Mode

1. From any of the LAN computers connected to , launch your web browser, type the following URL in the web address (or location) box, and press [Enter] on your keyboard:

   http://10.0.0.2
2. Select the Connect type **DHCP**, **Static** or **PPPoE** and enter related parameters that your ISP (Internet Services Provider) or Network Administrator provided.
3. Please enter the "**SSID**" if you want to change (**the default settings SSID = 11n_APxxxx which could be found on the bottom side of the device**).
4. Please enter your own wireless password at least 8 characters for example 12345678 in the **Key** field / **Network key** field **(the Encryption type = WPA/WPA2-PSK AES)**.
5. Click on "**Save**" button.



NET WORK Map

Client — Lan IP 10.0.0.2

Router — Internet IP 0.0.0.0

Internet — DHCP

Wan Setup

Connect type: DHCP

Wireless Setup

SSID: 11n_APe6Kz

Key: (WPA/WPA2-PSK AES)

Examples

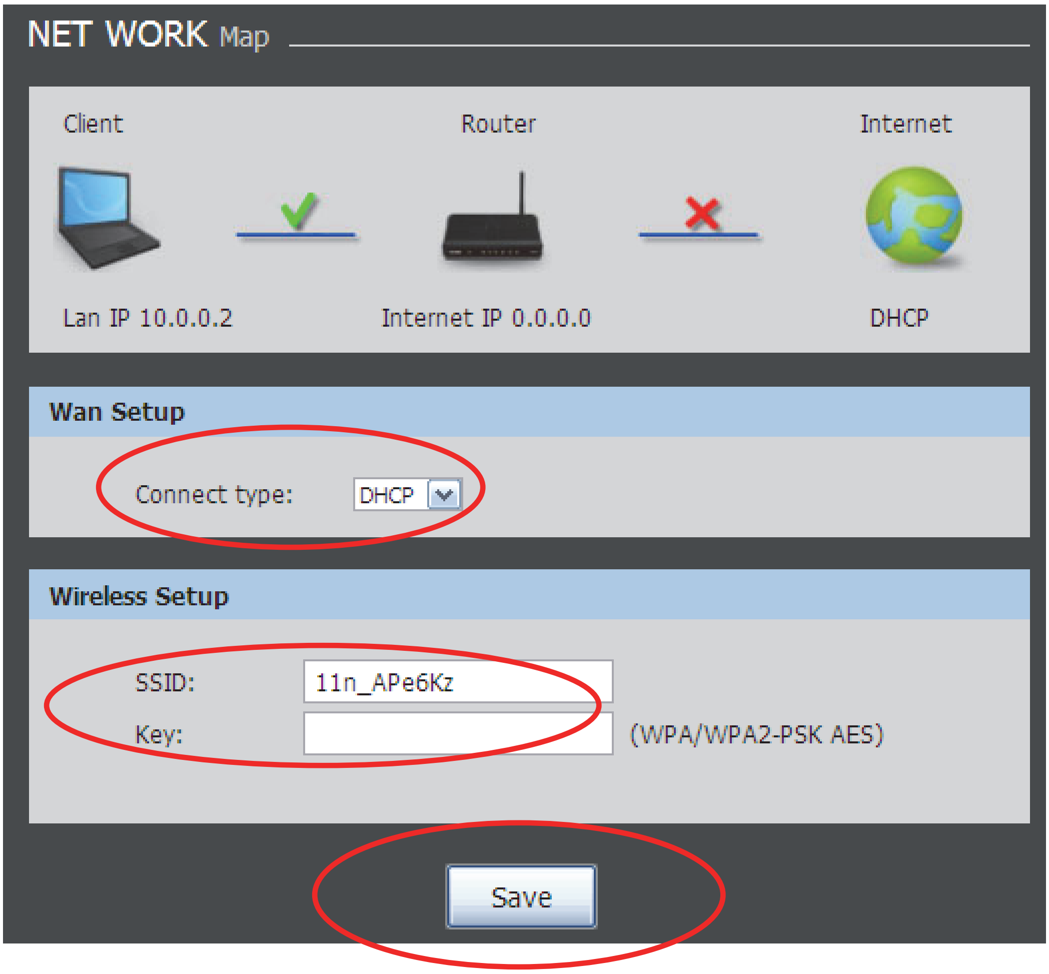
DHCP (Dynamic IP)

*Select **DHCP***

*Please enter the **SSID** if you want to change (**the default settings SSID = 11n_APxxxx which could be found on the bottom side of the device**).*

*Please enter your own wireless password at least 8 characters for example 12345678 in the **Key** field / **Network key** field **(the Encryption type = WPA/WPA2-PSK AES)**.*

*Click on **Save** button*



Lan IP 10.0.0.2

Internet IP 0.0.0.0

DHCP

Wan Setup

Connect type: DHCP

Wireless Setup

SSID: 11n_APe6Kz

Key: (WPA/WPA2-PSK AES)

PPPoE

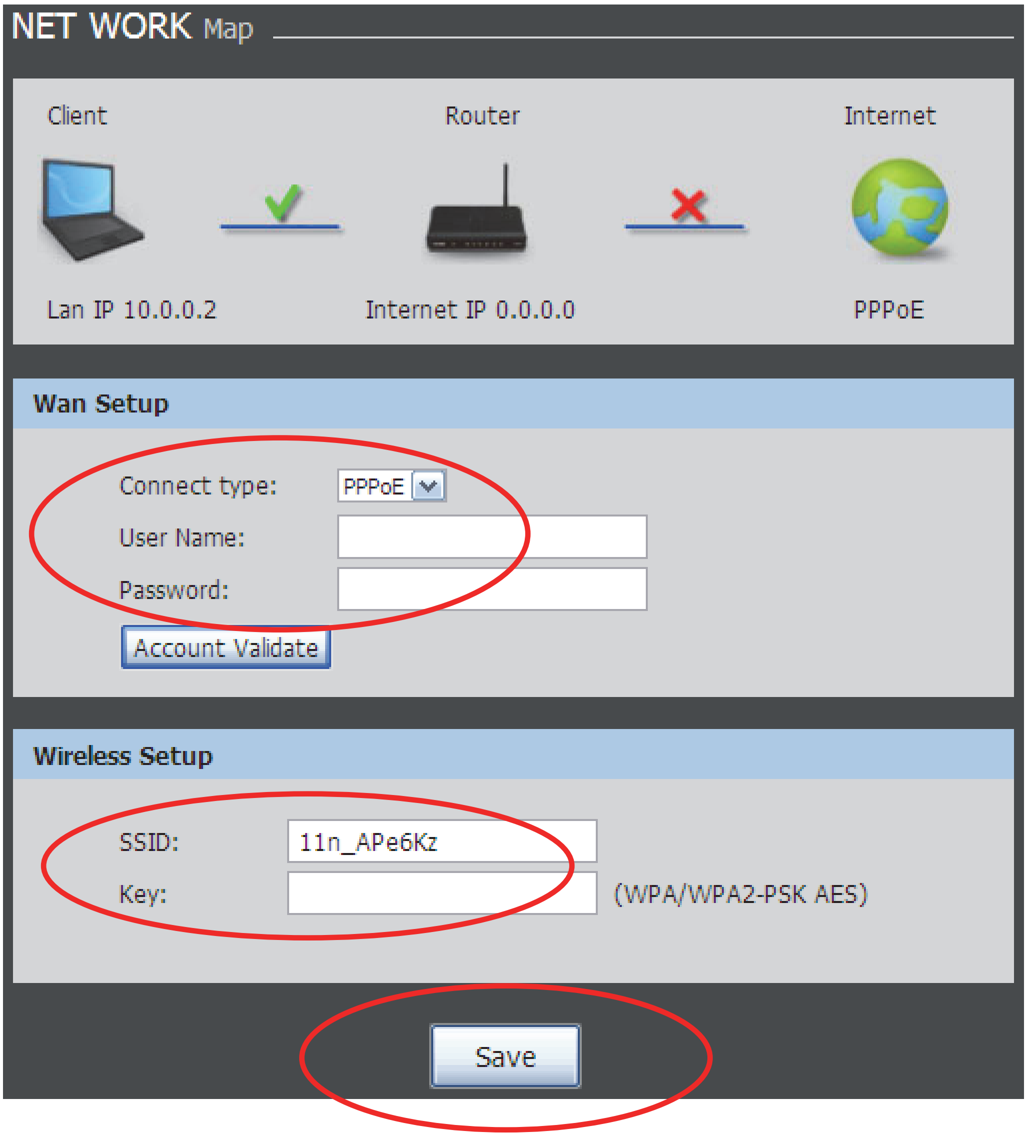
*Select **PPPoE Mode***

*Enter **Username** and **Password** offered by the ISP*

*Please enter the **SSID** if you want to change (**the default settings SSID = 11n_APxxxx which could be found on the bottom side of the device**).*

*Please enter your own wireless password at least 8 characters for example 12345678 in the **Key** field / **Network key** field **(the Encryption type = WPA/WPA2-PSK AES)**.*

*Click on **Save** button*



Connect type: PPPoE

User Name:

Password:

SSID: 11n_APe6Kz

Key: (WPA/WPA2-PSK AES)

Static IP

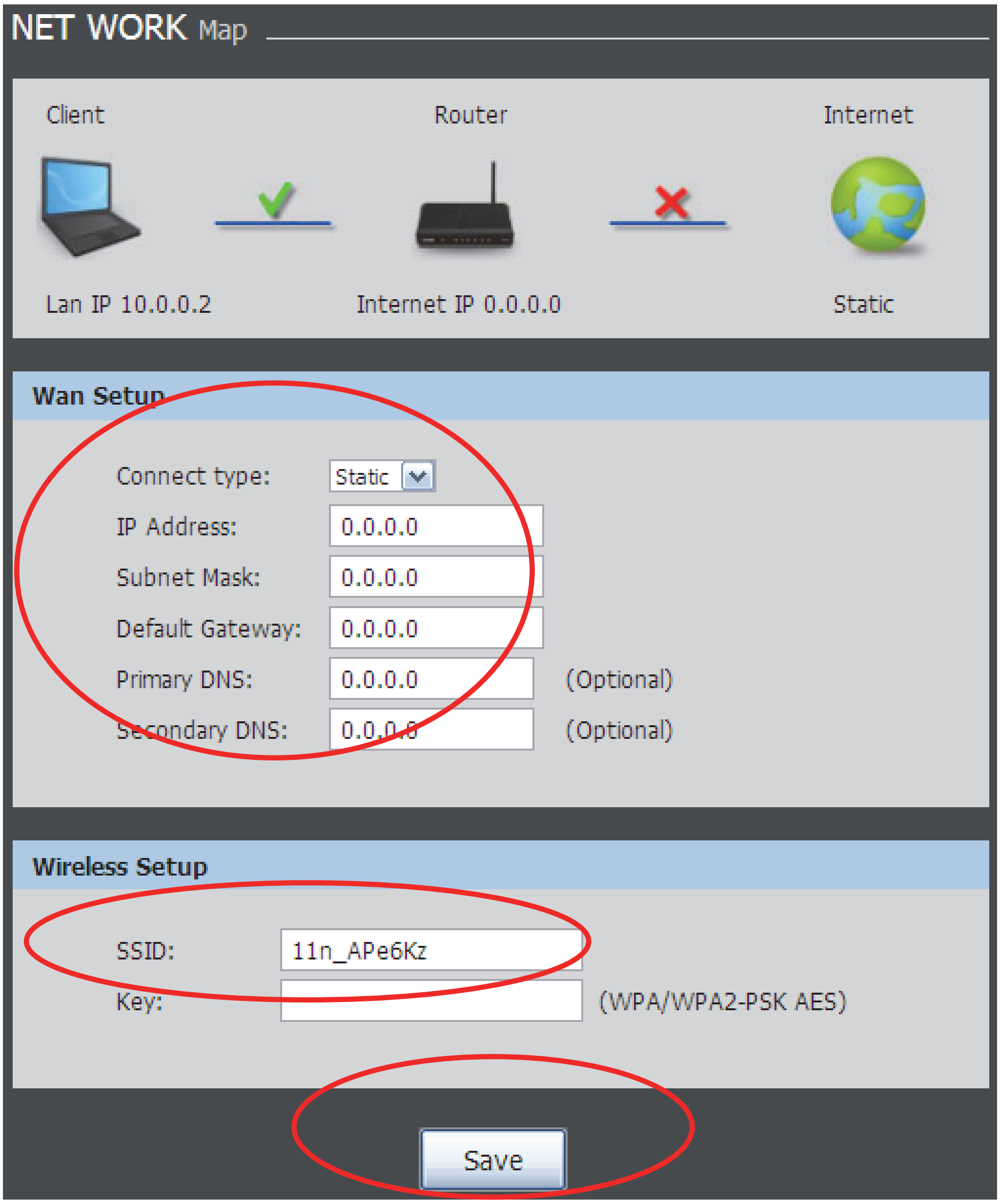
*Select **Static IP***

*Config **IP Address**, **Subnet mask**, **Default Gateway** and **DNS Server** offered by ISP (Internet Services Provider) or Network Administrator*

*Please enter the **SSID** if you want to change (**the default settings SSID = 11n_APxxxx which could be found on the bottom side of the device**).*

*Please enter your own wireless password at least 8 characters for example 12345678 in the **Key** field / **Network key** field **(the Encryption type = WPA/WPA2-PSK AES)**.*

*Click on **Save** button*



Lan IP 10.0.0.2

Internet IP 0.0.0.0

Static

Wan Setup

Connect type: Static

IP Address: 0.0.0.0

Subnet Mask: 0.0.0.0

Default Gateway: 0.0.0.0

Primary DNS: 0.0.0.0 (Optional)

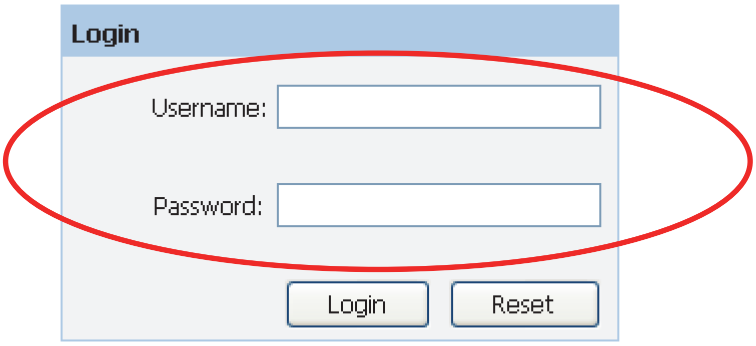
Secondary DNS: 0.0.0.0 (Optional)

Wireless Setup

SSID: 11n_APe6Kz

Key: (WPA/WPA2-PSK AES)

6. Please enter the Login User Name: **admin** and Login Password: **administrator** and then click on **Login** button.



Login

Username:

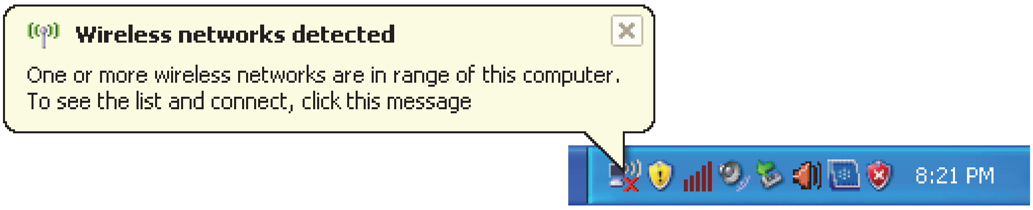
Password:

7. Now, the 11n AP Router has been configured completed, and suitable for Wireless and Internet Connections.

Wireless Connection

For easy installation it is saved to keep the settings. You can later change the wireless settings via the wireless configuration menu. (see user manual on the CD – Chapter 12).

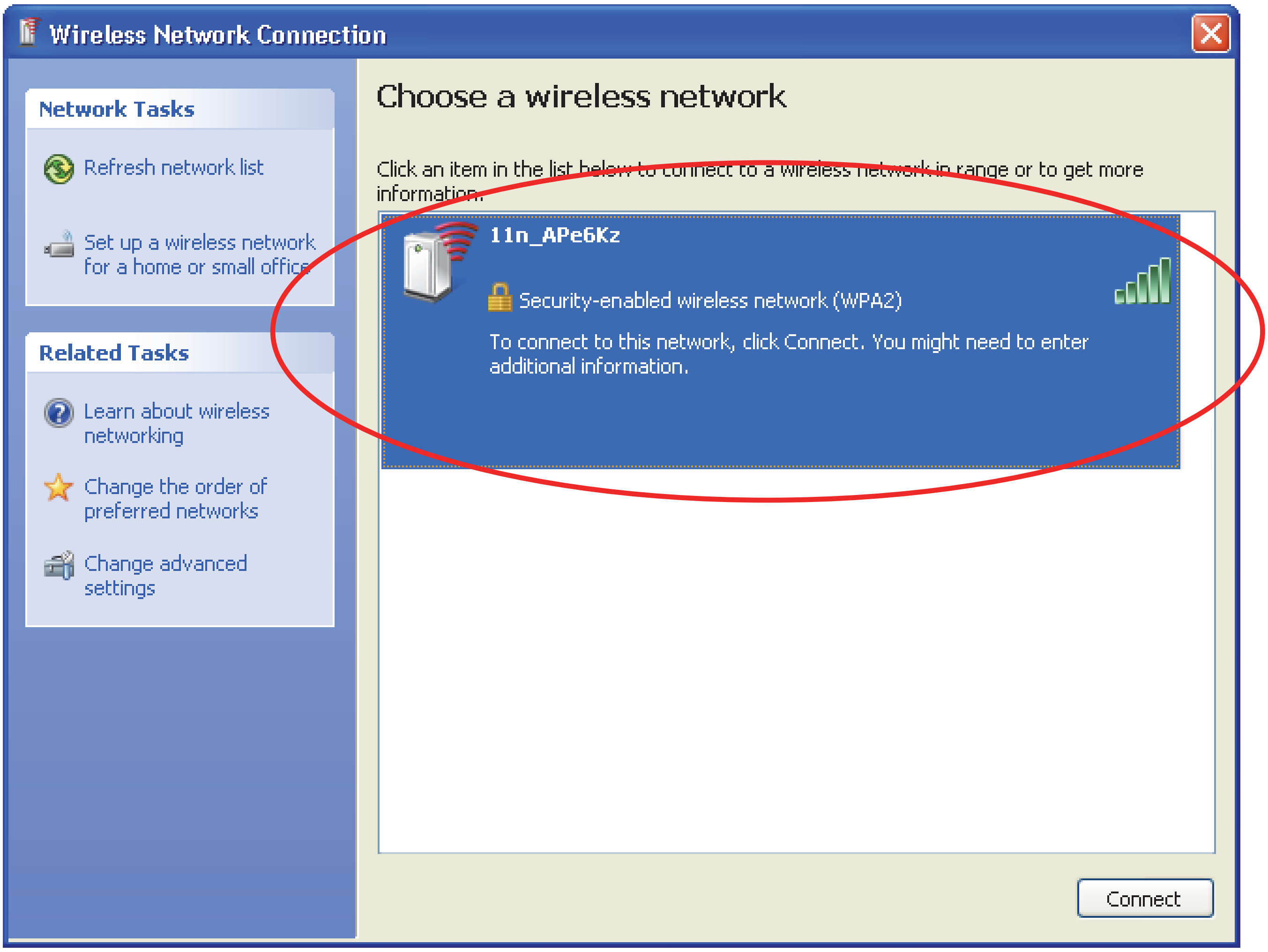
8. Double click on the wireless icon on your computer and search for the wireless network that you enter **SSID** name.



Wireless networks detected

One or more wireless networks are in range of this computer. To see the list and connect, click this message

9. Click on the wireless network that you enter **SSID** name **(the default settings SSID = 11n_APxxxx which could be found on the bottom side of the device)** to connect.


Wireless Network Connection
Network Tasks
Refresh network list
Set up a wireless network for a home or small office
Related Tasks
Learn about wireless networking
Change the order of preferred networks
Change advanced settings
Connect

Choose a wireless network

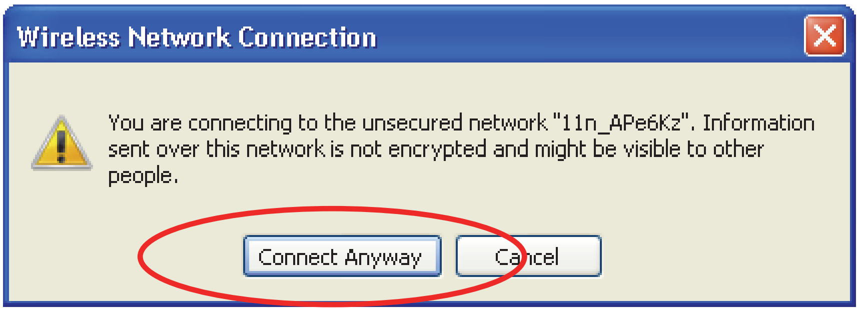
Click an item in the list below to connect to a wireless network in range or to get more information.

11n_APe6Kz

Security-enabled wireless network (WPA2)

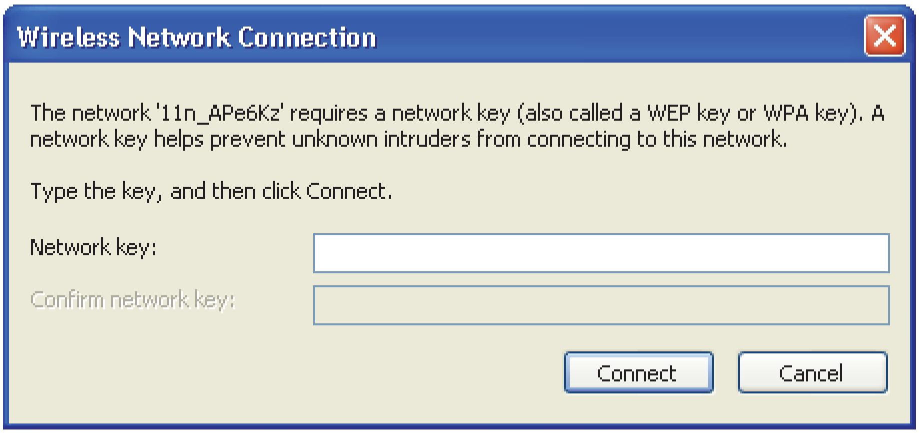
To connect to this network, click Connect. You might need to enter additional information.

10. If the wireless network isn't encrypted, click on "**Connect Anyway**" to connect.



You are connecting to the unsecured network "11n_APe6Kz". Information sent over this network is not encrypted and might be visible to other people.

11. If the wireless network is encrypted, enter your own wireless password at least 8 characters for example 12345678 in the **key** field / **Network key** field / **Confirm Network key** field **(the default settings Security Mode = None)**. You can later change this network key via the wireless configuration menu. (see user manual on the CD – Chapter 12).



Wireless Network Connection

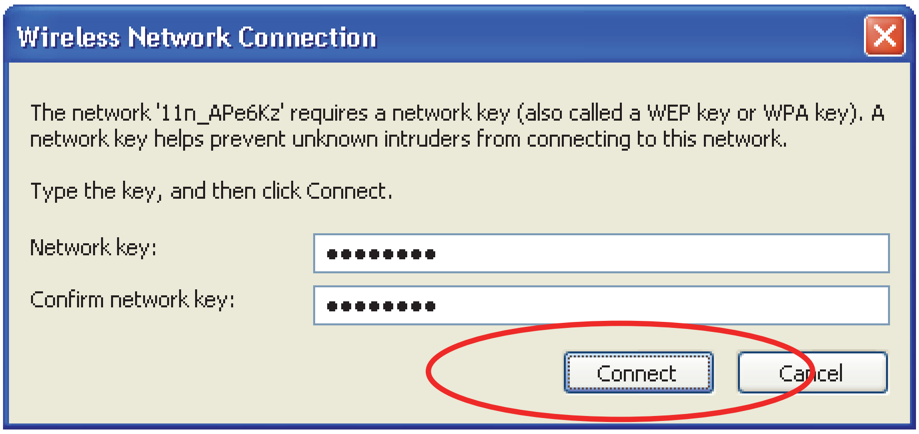
The network '11n_APe6Kz' requires a network key (also called a WEP key or WPA key). A network key helps prevent unknown intruders from connecting to this network.

Type the key, and then click Connect.

Network key:

Confirm network key:

12. Click on "Connect" or "Apply".



Wireless Network Connection

The network '11n_APe6Kz' requires a network key (also called a WEP key or WPA key). A network key helps prevent unknown intruders from connecting to this network.

Type the key, and then click Connect.

Network key: ●●●●●●●●●

Confirm network key: ●●●●●●●●●

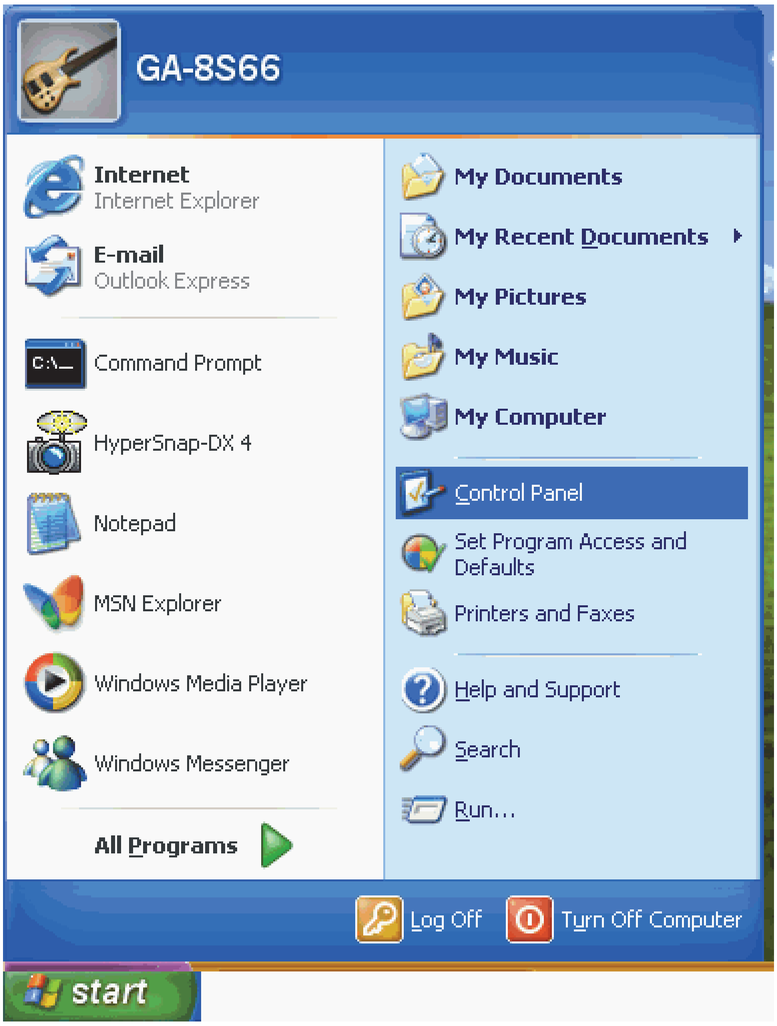
13. Now you are ready to use the Wireless Network to Internet or intranet.

6 What the Internet/WAN access of your own Network now is

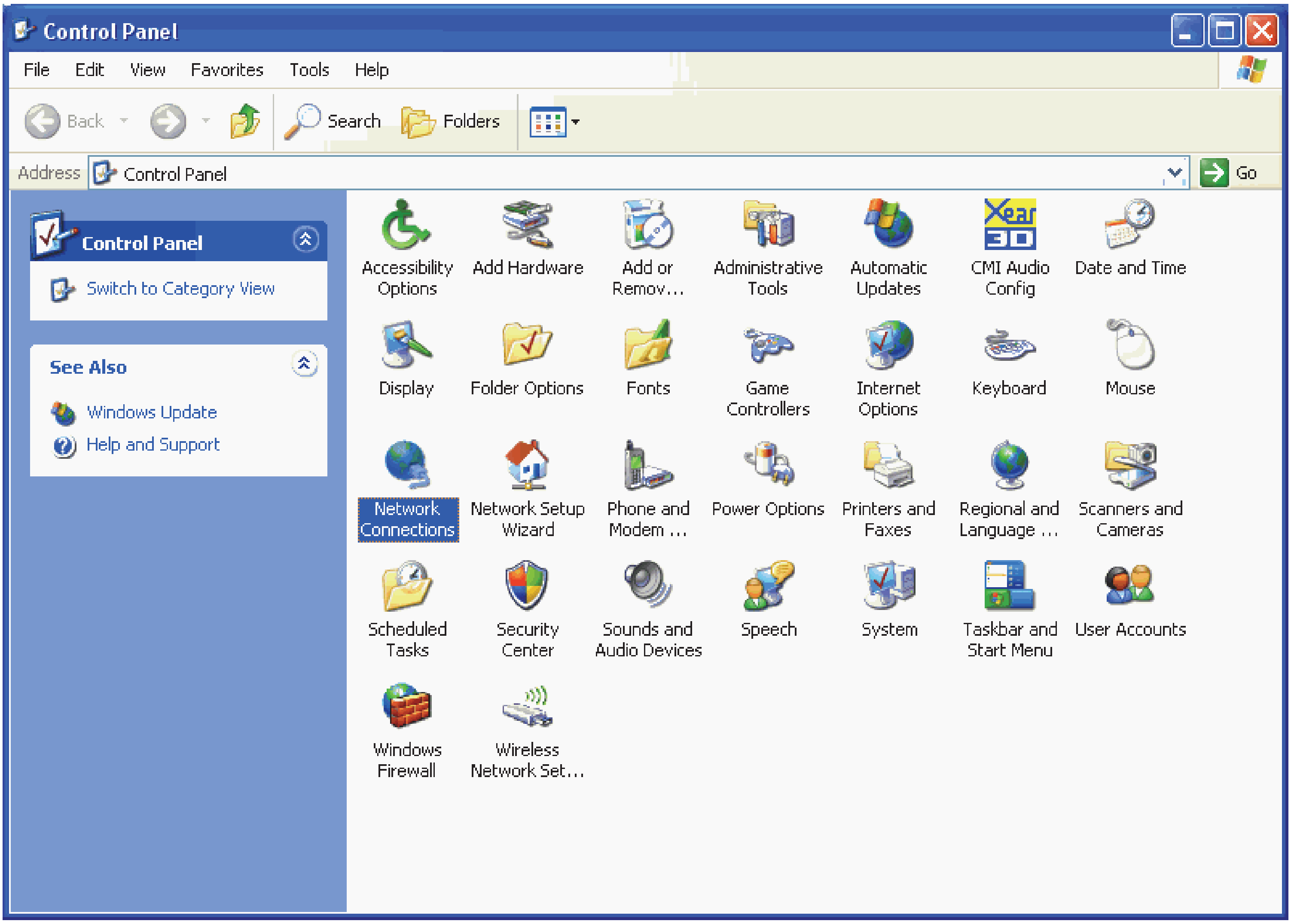
Now you could check what the Internet/WAN access of your network is to know how to configure the WAN port of Wireless Gateway.

Please follow steps below to check what the Internet/WAN access if your own Network is DHCP Client, Static IP or PPPoE Client.

1. Click Start -> Control Panel



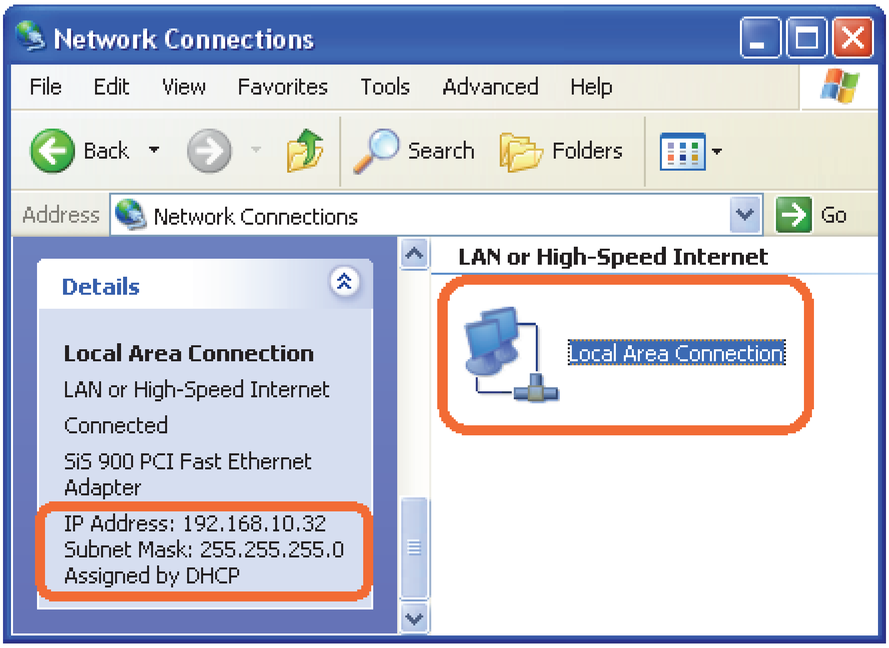
2. Double click *Network Connections*



Internet/WAN access is the DHCP client

If you cannot see any **Broadband Adapter** in the **Network Connections**, your Internet/WAN access is **DHCP Client** or **Static IP**.

3. Click **Local Area Connection** in **LAN or High-Speed Internet** and you could see string **Assigned by DHCP** in Details.

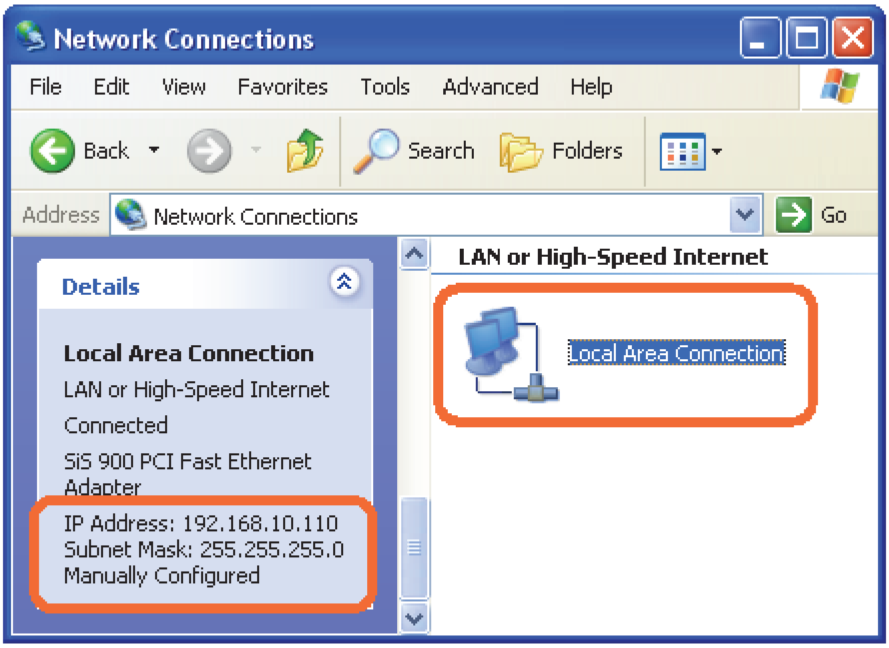


Local Area Connection
LAN or High-Speed Internet
Connected
SiS 900 PCI Fast Ethernet Adapter
IP Address: 192.168.10.32
Subnet Mask: 255.255.255.0
Assigned by DHCP

Internet/WAN access is the Static IP

If you cannot see any **Broadband Adapter** in the **Network Connections**, your Internet/WAN access is **DHCP Client** or **Static IP**.

4. Click **Local Area Connection** in **LAN or High-Speed Internet** and you could see string **Manually Configured** in Details.



Local Area Connection
LAN or High-Speed Internet
Connected
SiS 900 PCI Fast Ethernet Adapter
IP Address: 192.168.10.110
Subnet Mask: 255.255.255.0
Manually Configured

5. Right click **Local Area Connection** and click **Properties** and then you could get the IP settings in detail and write down the IP settings as follow:

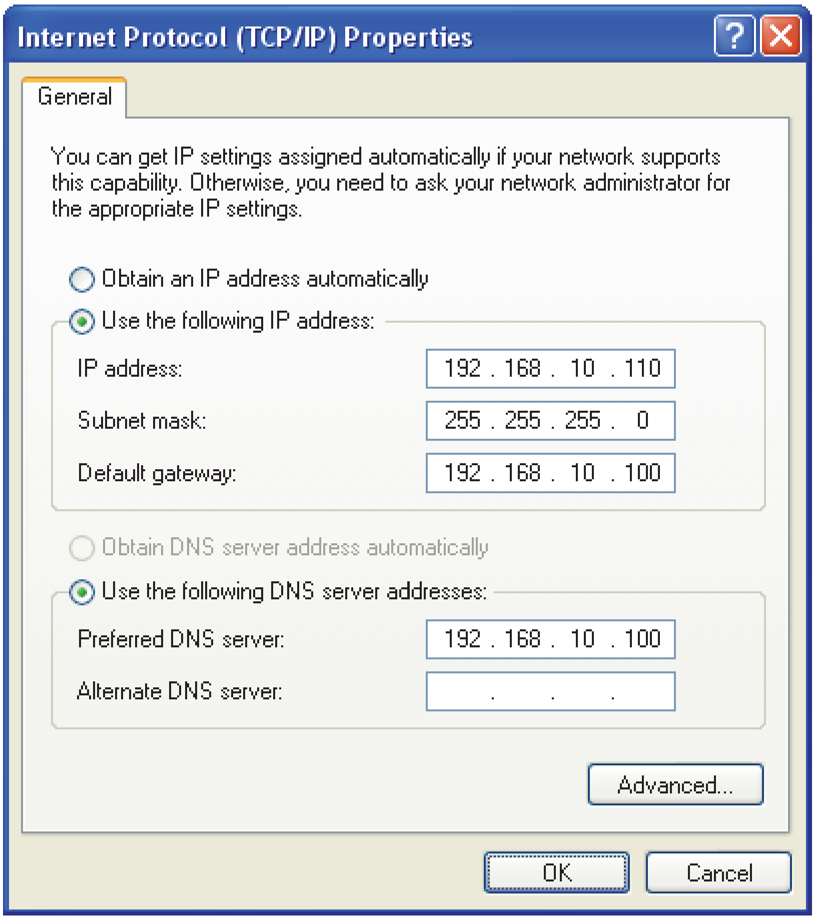
IP Address: 192.168.10.110

Subnet mask: 255.255.255.0

Default gateway: 192.168.10.100

Preferred DNS server: 192.168.10.100

Alternate DNS Server: If you have it, please also write it down.



You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.

○ Obtain an IP address automatically

● Use the following IP address:

IP address: 192 . 168 . 10 . 110

Subnet mask: 255 . 255 . 255 . 0

Default gateway: 192 . 168 . 10 . 100

○ Obtain DNS server address automatically

● Use the following DNS server addresses:

Preferred DNS server: 192 . 168 . 10 . 100

Alternate DNS server: . . .

Internet/WAN access is the PPPoE client

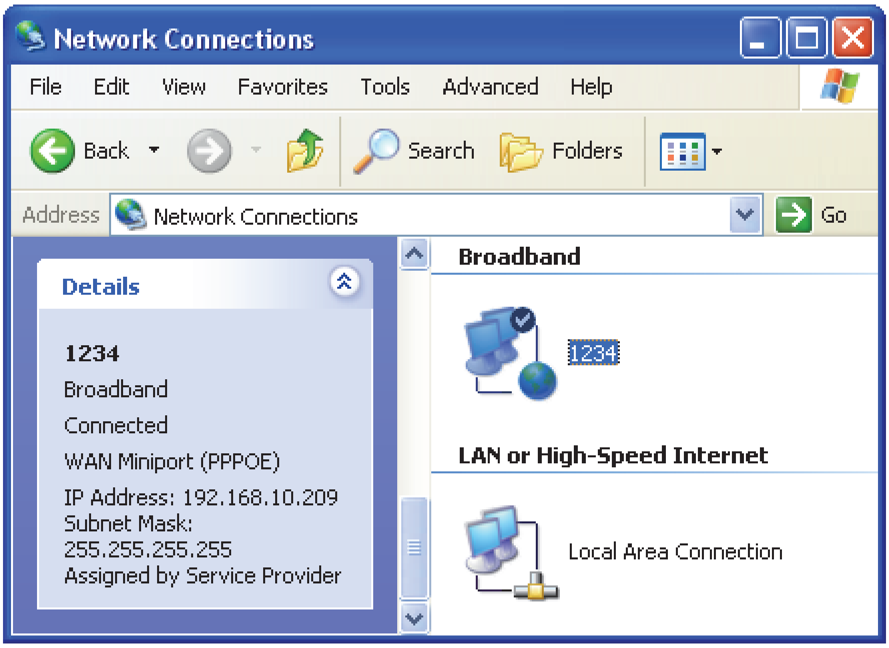
If you can see any **Broadband Adapter** in the **Network Connections**, your Internet/WAN access is **PPPoE Client**.

6. Click **Broadband Adapter** in **Broadband** and you could see string **Assigned by Service Provider** in Details.

For PPPoE configuration on Wireless Gateway, you'll need following information that you could get from your Telecom, or by your Internet Service Provider.

Username of PPPoE: 1234 for example

Password of PPPoE: 1234 for example



Details

1234
Broadband
Connected
WAN Miniport (PPPOE)
IP Address: 192.168.10.209
Subnet Mask:
255.255.255.255
Assigned by Service Provider

7 Getting Started with the Web pages

The Wireless Gateway includes a series of Web pages that provide an interface to the software installed on the device. It enables you to configure the device settings to meet the needs of your network. You can access it through your web browser from any PC connected to the device via the LAN ports.

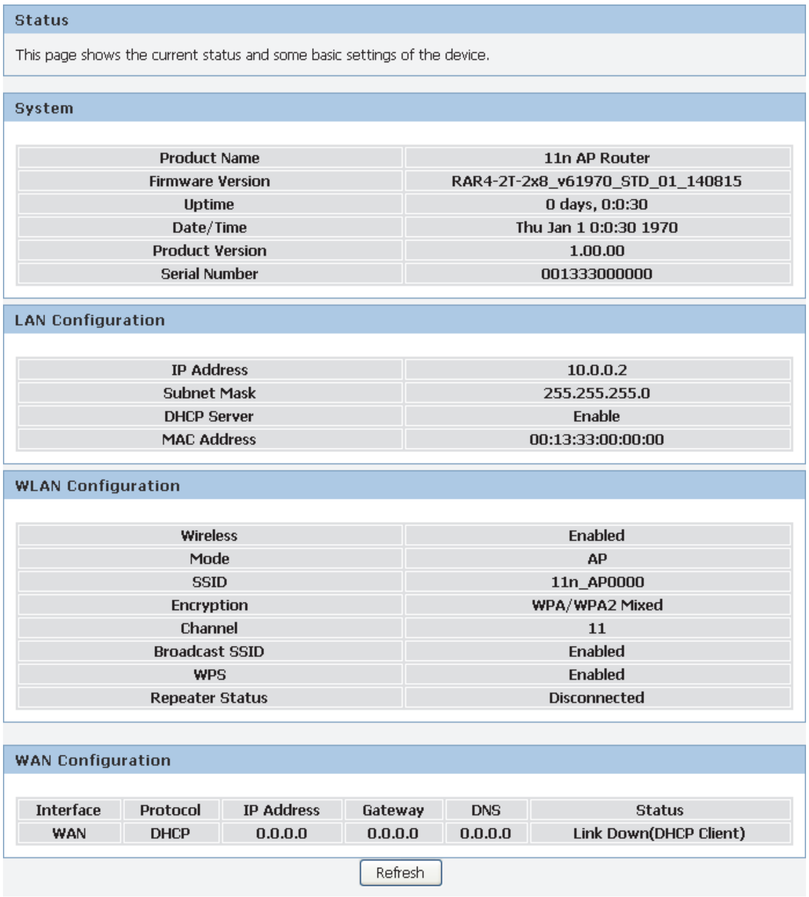
Accessing the Web pages

To access the Web pages, you need the following:

- A PC or laptop connected to the LAN port on the device.
- A web browser installed on the PC. The minimum browser version requirement is Internet Explorer v4 or Netscape v4. For the best display quality, use latest version of Internet Explorer, Netscape or Mozilla Fire fox. From any of the LAN computers, launch your web browser, type the following URL in the web address (or location) box, and press [Enter] on your keyboard:

  http://10.0.0.2

  The Status homepage for the web pages is displayed:



Status

This page shows the current status and some basic settings of the device.

System

Product Name	11n AP Router
Firmware Version	RAR4-2T-2x8_v61970_STD_01_140815
Uptime	0 days, 0:0:30
Date/Time	Thu Jan 1 0:0:30 1970
Product Version	1.00.00
Serial Number	001333000000

LAN Configuration

IP Address	10.0.0.2
Subnet Mask	255.255.255.0
DHCP Server	Enable
MAC Address	00:13:33:00:00:00

WLAN Configuration

Wireless	Enabled
Mode	AP
SSID	11n_AP0000
Encryption	WPA/WPA2 Mixed
Channel	11
Broadcast SSID	Enabled
WPS	Enabled
Repeater Status	Disconnected

WAN Configuration

Interface	Protocol	IP Address	Gateway	DNS	Status
WAN	DHCP	0.0.0.0	0.0.0.0	0.0.0.0	Link Down(DHCP Client)

Figure 2: Homepage

The first time that you click on an entry from the left-hand menu, a login box is displayed. You must enter your username and password to access the pages.

A login screen is displayed:

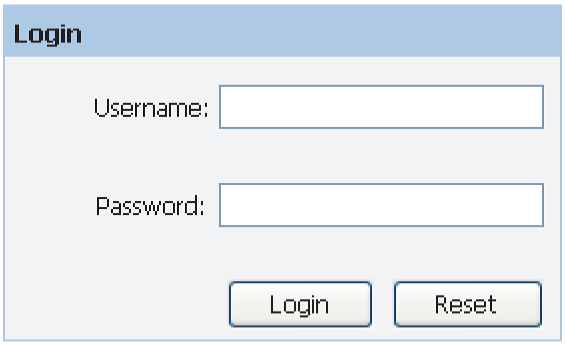


Figure 3: Login screen

1. Enter your user name and password. The first time you log into the program, use these defaults:

User Name:	**admin**
Password:	**administrator**

Note

You can change the password at any time or you can configure your device so that you do not need to enter a password. See Password.

2. Click on OK. You are now ready to configure your device.

This is the first page displayed each time you log in to the Web pages.

Note

If you receive an error message or the Welcome page is not displayed, see Troubleshooting Suggestions.

Testing your Setup

Once you have connected your hardware and configured your PCs, any computer on your LAN should be able to use the DSL /Cable connection to access the Internet.

To test the connection, turn on the device, wait for 30 seconds and then verify that the LEDs are illuminated as follows:

Table 1. LED Indicators

Label	Color	Function
POWER	green	On: device is powered on Off: device is powered off
WLAN	green	On: WLAN link established and active Blink: Valid Wireless packet being transferred
WAN	green	On: WAN link established and active Off: No LAN link Blink: Valid Ethernet packet being transferred
LAN	green	On: LAN link established and active Off: No LAN link Blink: Valid Ethernet packet being transferred

If the LEDs illuminate as expected, test your Internet connection from a LAN computer. To do this, open your web browser, and type the URL of any external website (such as http://www.yahoo.com). The LED labeled *WAN* should blink rapidly and then appear solid as the device connects to the site.

If the LEDs do not illuminate as expected, you may need to configure your Internet access settings using the information provided by your ISP. For details, see *Internet Access*. If the LEDs still do not illuminate as expected or the web page is not displayed, see *Troubleshooting Suggestions* or contact your ISP for assistance.

Default device settings

In addition to handling the xDSL / Cable modem connection to your ISP, the Wireless Gateway can provide a variety of services to your network. The device is preconfigured with default settings for use with a typical home or small office network.

The table below lists some of the most important default settings; these and other features are described fully in the subsequent chapters. If you are familiar with network configuration, review these settings to verify that they meet the needs of your network. Follow the instructions to change them if necessary. If you are unfamiliar with these settings, try using the device without modification, or contact your ISP for assistance.

WARNING

We strongly recommend that you contact your ISP prior to changing the default configuration.

Option	Default Setting	Explanation/Instructions
WAN Port IP Address	DHCP Client	This is the temporary public IP address of the WAN port on the device. It is an unnumbered interface that is replaced as soon as your ISP assigns a 'real' IP address. See *Network Settings -> WAN Interface*.
LAN Port IP Address	Assigned static IP address: 10.0.0.2 Subnet mask: 255.255.255.0	This is the IP address of the LAN port on the device. The LAN port connects the device to your Ethernet network. Typically, you will not need to change this address. See *Network Settings -> LAN Interface*.
DHCP (Dynamic Host Configuration Protocol)	DHCP server enabled with the following pool of addresses: 10.0.0.2 through 10.0.0.254	The Wireless Gateway maintains a pool of private IP addresses for dynamic assignment to your LAN computers. To use this service, you must have set up your computers to accept IP information dynamically, as described in *Configuring Ethernet PCs*.

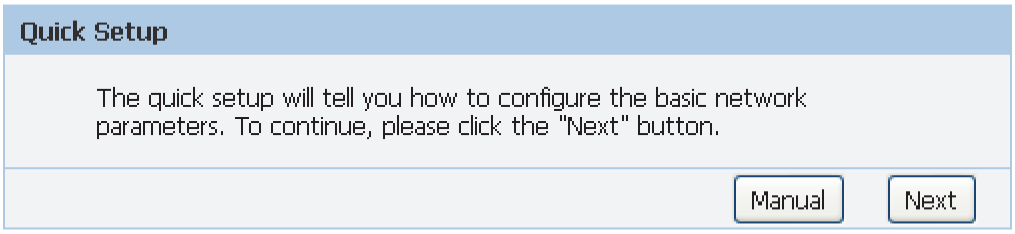
8 Quick Setup

The *Quick Setup* page displays useful information about the setup of your device, including:

- details of the device's Internet access settings
- details of the device's VoIP settings
- details of the device's Wireless settings

To display this page:

From the head menu, click on *Setup*. The following page is displayed:



Quick Setup

The quick setup will tell you how to configure the basic network parameters. To continue, please click the "Next" button.

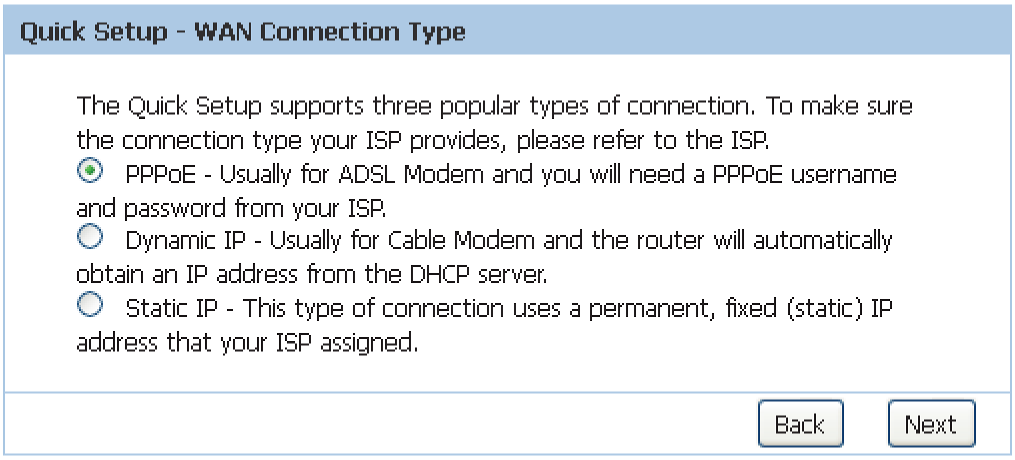
Figure 4: Quick Setup page

WAN Connection Type

This page is used to configure the parameters for Internet network which connects to the WAN port of your Access Point. Here you may change the access method to *static IP*, *Dynamic IP* or *PPPoE* by click the item value of WAN Connection Type.

To change the WAN Connection Type:

3. From the *WAN Connection Type*, select *static IP*, *Dynamic IP* or *PPPoE* setting determined by your Network Administrator or ISP.
4. Click *Next*.



Quick Setup - WAN Connection Type

The Quick Setup supports three popular types of connection. To make sure the connection type your ISP provides, please refer to the ISP.

● PPPoE - Usually for ADSL Modem and you will need a PPPoE username and password from your ISP.

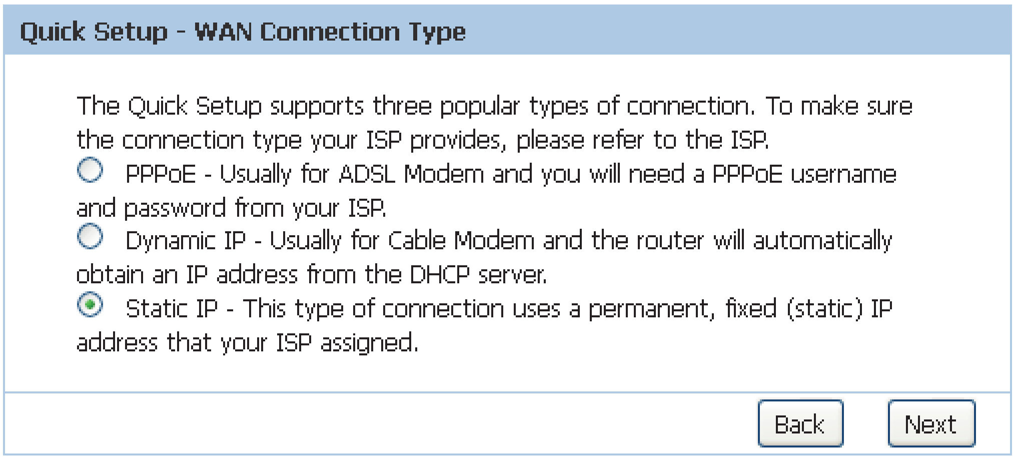
○ Dynamic IP - Usually for Cable Modem and the router will automatically obtain an IP address from the DHCP server.

○ Static IP - This type of connection uses a permanent, fixed (static) IP address that your ISP assigned.

Static IP

In this mode, the device is supposed to connect to internet via ADSL/Cable Modem. The NAT is enabled and PC in LAN/WLAN port share the same IP to ISP through WAN port. The connection type can be setup in WAN page by using static IP.

1. From the *WAN Connection Type*, select *Static IP* setting determined by your Network Administrator or ISP.
2. Click *Next*.



Quick Setup - WAN Connection Type

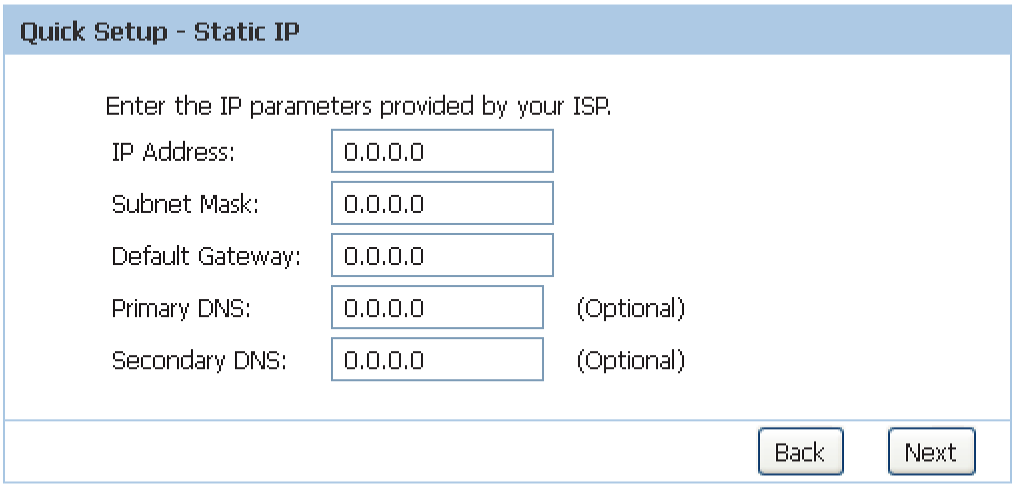
The Quick Setup supports three popular types of connection. To make sure the connection type your ISP provides, please refer to the ISP.

○ PPPoE - Usually for ADSL Modem and you will need a PPPoE username and password from your ISP.

○ Dynamic IP - Usually for Cable Modem and the router will automatically obtain an IP address from the DHCP server.

● Static IP - This type of connection uses a permanent, fixed (static) IP address that your ISP assigned.

3. Enter *IP Address* for example 172.1.1.1.
4. Enter *Subnet Mask* for example 255.255.255.0.
5. Enter *Default Gateway* for example 172.1.1.254.
6. Enter *Primary DNS* for example 172.1.1.254.
7. Click *Next*.



Quick Setup - Static IP

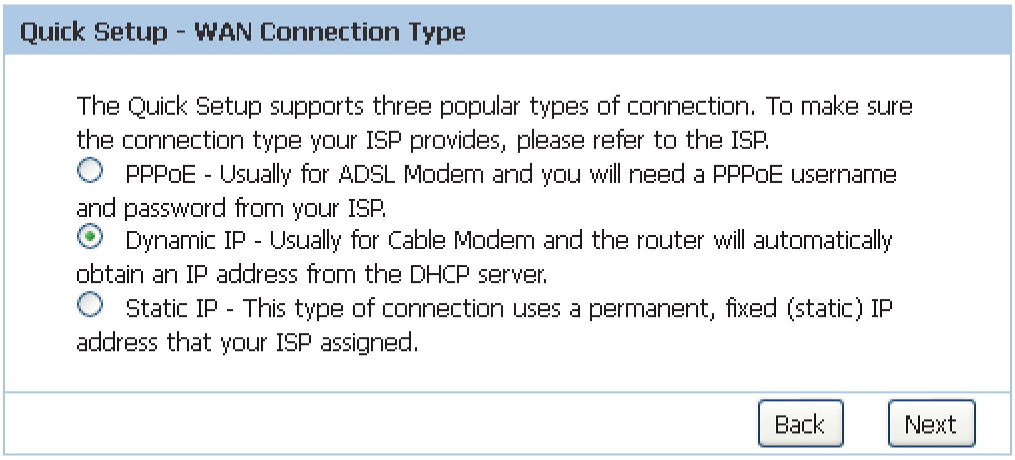
Enter the IP parameters provided by your ISP.

IP Address:	0.0.0.0	
Subnet Mask:	0.0.0.0	
Default Gateway:	0.0.0.0	
Primary DNS:	0.0.0.0	(Optional)
Secondary DNS:	0.0.0.0	(Optional)

Dynamic IP

In this mode, the device is supposed to connect to internet via ADSL/Cable Modem. The NAT is enabled and PCs in LAN/WLAN port share the same IP to ISP through WAN port. The connection type can be setup in WAN page by using Dynamic IP.

1. From the *WAN Connection Type*, select *Dynamic IP* setting determined by your Network Administrator or ISP.
2. Click *Next*.



Quick Setup - WAN Connection Type

The Quick Setup supports three popular types of connection. To make sure the connection type your ISP provides, please refer to the ISP.

○ PPPoE - Usually for ADSL Modem and you will need a PPPoE username and password from your ISP.

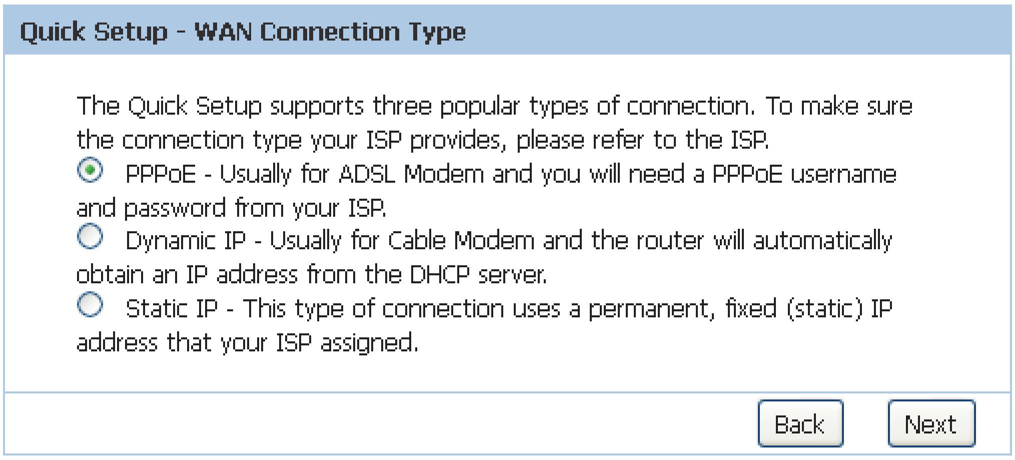
● Dynamic IP - Usually for Cable Modem and the router will automatically obtain an IP address from the DHCP server.

○ Static IP - This type of connection uses a permanent, fixed (static) IP address that your ISP assigned.

PPPoE

In this mode, the device is supposed to connect to internet via ADSL/Cable Modem. The NAT is enabled and PCs in four LAN ports share the same IP to ISP through WAN port. The connection type can be setup in WAN page by using PPPoE.

1. From the *WAN Connection Type* drop-down list, select *PPPoE* setting determined by your Network Administrator or ISP.
2. Click *Next*.



Quick Setup - WAN Connection Type

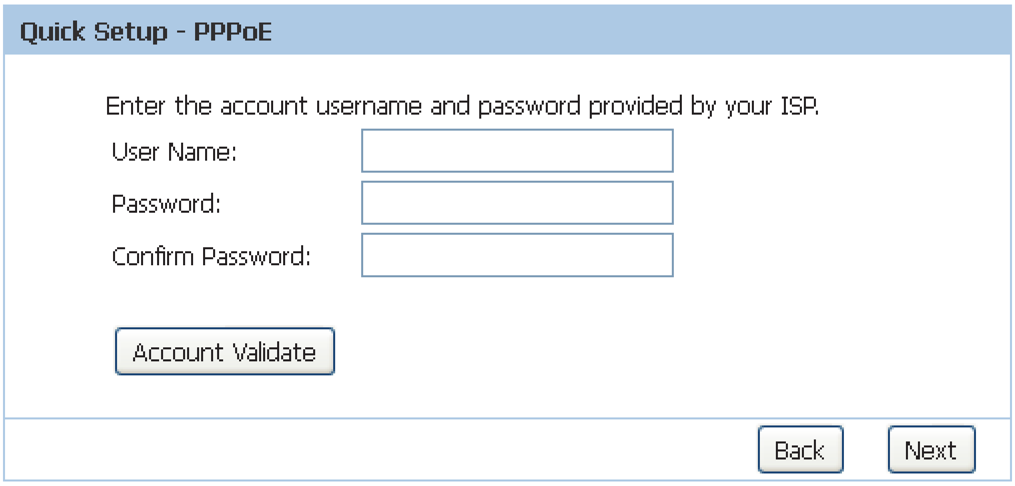
The Quick Setup supports three popular types of connection. To make sure the connection type your ISP provides, please refer to the ISP.

● PPPoE - Usually for ADSL Modem and you will need a PPPoE username and password from your ISP.

○ Dynamic IP - Usually for Cable Modem and the router will automatically obtain an IP address from the DHCP server.

○ Static IP - This type of connection uses a permanent, fixed (static) IP address that your ISP assigned.

3. Enter *User Name* for example 1234.
4. Enter *Password* for example 1234.
5. Enter *Confirm Password* for example 1234.
6. Click *Next*.



Quick Setup - PPPoE

Enter the account username and password provided by your ISP.

User Name:

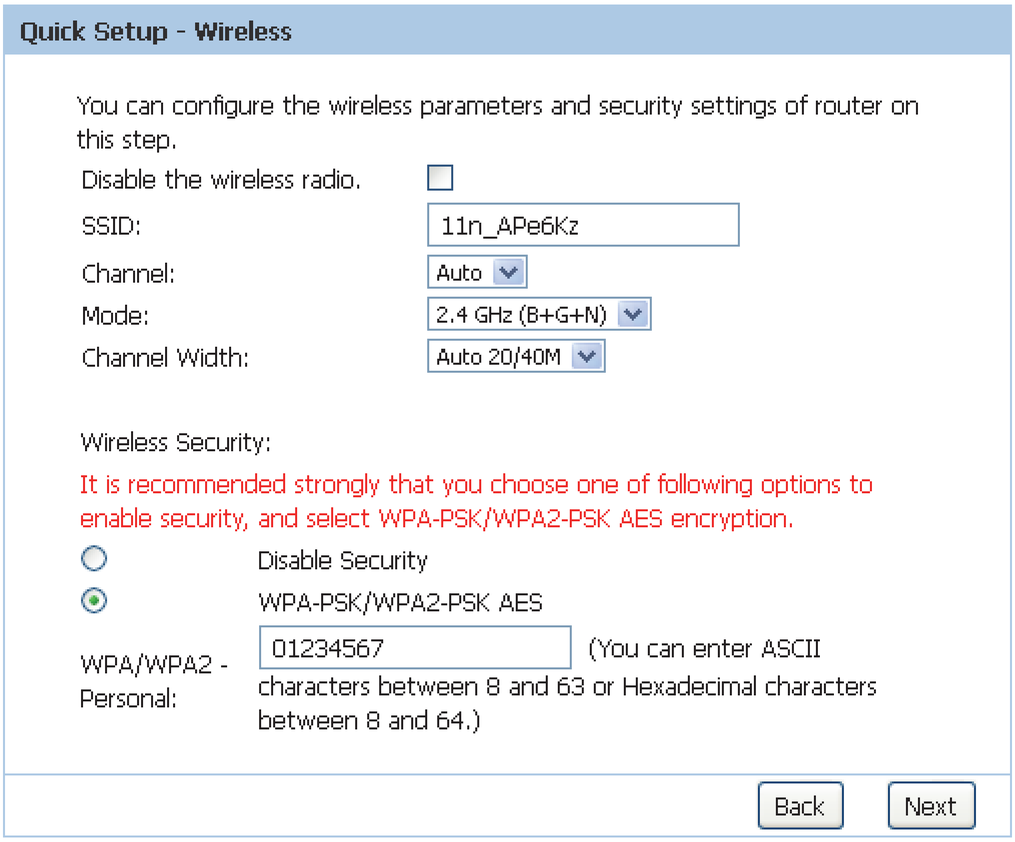
Password:

Confirm Password:

Wireless Basic Setup

This page is used to configure the parameters for wireless LAN clients which may connect to your Access Point.

7. Enter *SSID* for example 11n_AP_Router.
8. From the *Channel* drop-down list, select a Channel.
9. From the *Mode* drop-down list, select a Mode.
10. From the *Channel Width* drop-down list, select a Channel Width.
11. From the *Wireless Security*, select a *Security* and enter the key if any.
12. Click *Next*.



Quick Setup - Wireless

You can configure the wireless parameters and security settings of router on this step.

Disable the wireless radio. □

SSID: 11n_APe6Kz

Channel: Auto

Mode: 2.4 GHz (B+G+N)

Channel Width: Auto 20/40M

Wireless Security:

It is recommended strongly that you choose one of following options to enable security, and select WPA-PSK/WPA2-PSK AES encryption.

○ Disable Security

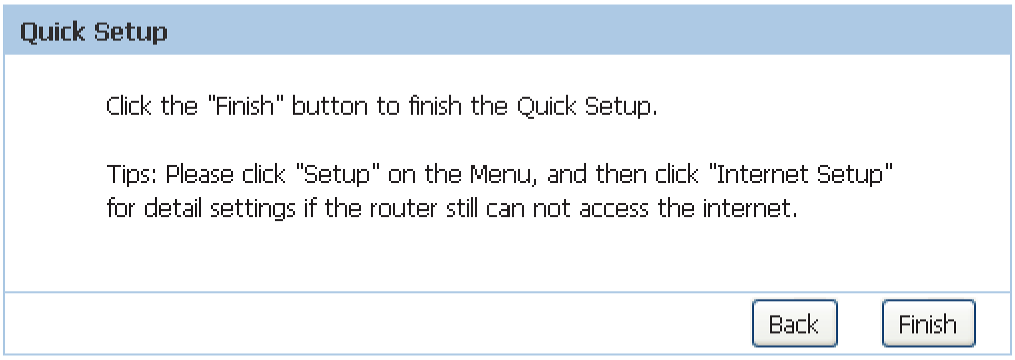
● WPA-PSK/WPA2-PSK AES

WPA/WPA2 - Personal: 01234567 (You can enter ASCII characters between 8 and 63 or Hexadecimal characters between 8 and 64.)

Finish the Quick Setup

This page is used to finish the all the settings of Quick Setup.

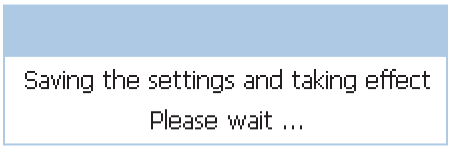
13. Click *Finish*.



Quick Setup

Click the "Finish" button to finish the Quick Setup.

Tips: Please click "Setup" on the Menu, and then click "Internet Setup" for detail settings if the router still can not access the internet.



Saving the settings and taking effect

Please wait ...

9 LAN Interface

This chapter is to configure the parameters for local area network which connects to the LAN port of your Access Point. Here you may change the setting for IP address, subnet mask, DHCP, etc...

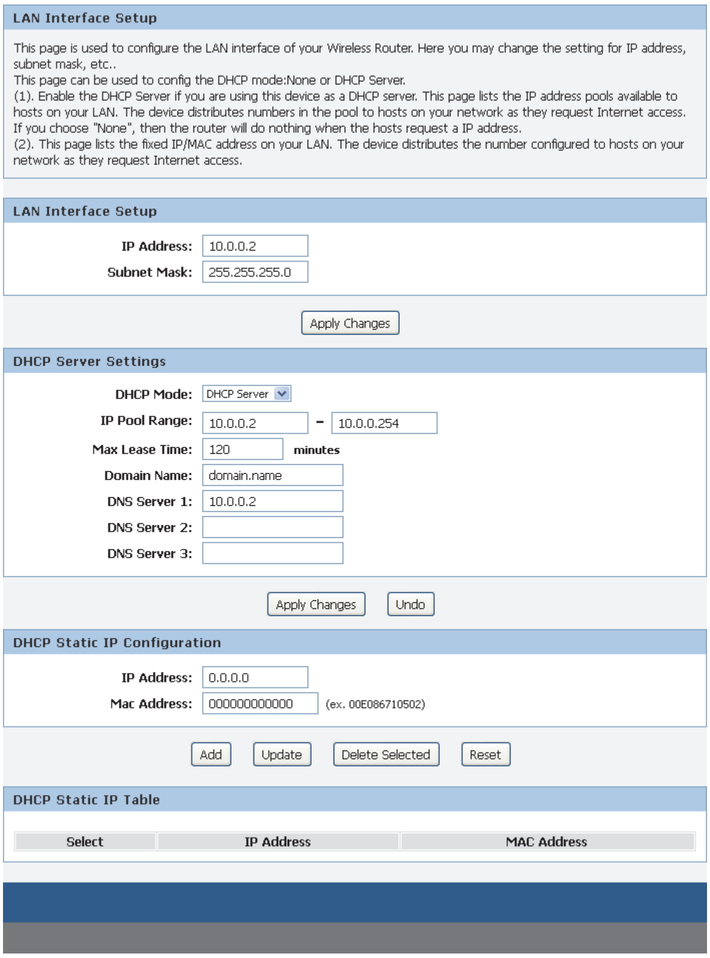
Note

> *You should only change the addressing details if your ISP asks you to, or if you are familiar with network configuration. In most cases, you will not need to make any changes to this configuration.*

LAN Interface Setup

To check the configuration of LAN Interface:

1. From the *Setup* menu, click on *Local Network*. The following page is displayed:



LAN Interface Setup

This page is used to configure the LAN interface of your Wireless Router. Here you may change the setting for IP address, subnet mask, etc..
This page can be used to config the DHCP mode:None or DHCP Server.
(1). Enable the DHCP Server if you are using this device as a DHCP server. This page lists the IP address pools available to hosts on your LAN. The device distributes numbers in the pool to hosts on your network as they request Internet access.
If you choose "None", then the router will do nothing when the hosts request a IP address.
(2). This page lists the fixed IP/MAC address on your LAN. The device distributes the number configured to hosts on your network as they request Internet access.

LAN Interface Setup

IP Address:	10.0.0.2
Subnet Mask:	255.255.255.0

DHCP Server Settings

DHCP Mode:	DHCP Server
IP Pool Range:	10.0.0.2 – 10.0.0.254
Max Lease Time:	120 minutes
Domain Name:	domain.name
DNS Server 1:	10.0.0.2
DNS Server 2:	
DNS Server 3:	

DHCP Static IP Configuration

IP Address:	0.0.0.0
Mac Address:	000000000000 (ex. 00E086710502)

DHCP Static IP Table

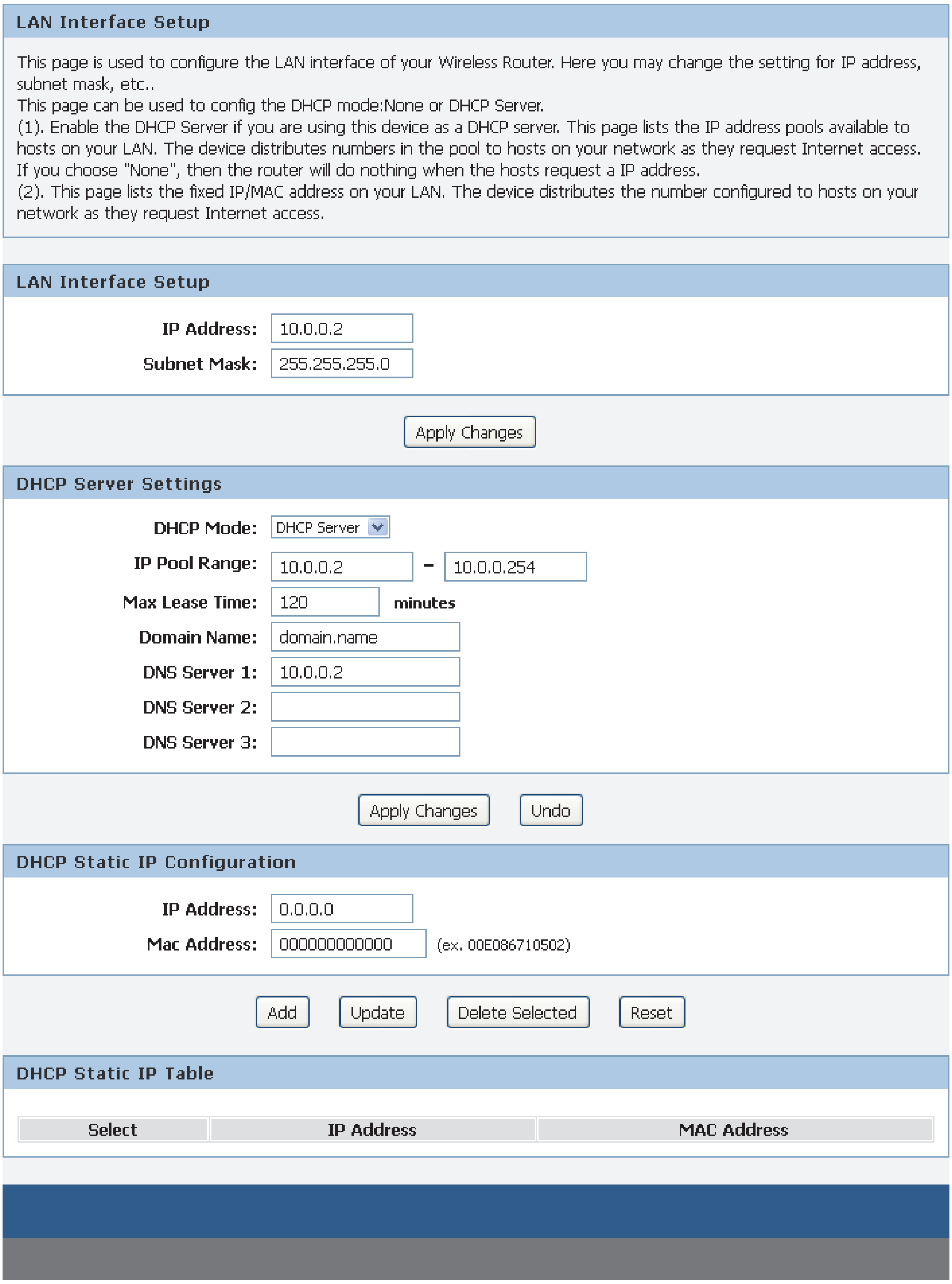
Select	IP Address	MAC Address

Field	Description
IP Address	**The IP address of your router on the local area network. Your local area network settings are based on the address assigned here.**
Subnet Mask	**The subnet mask of your router on the local area network.**
DHCP Mode	**Once your router is properly configured and DHCP Server is enabled, the DHCP Server will manage the IP addresses and other network configuration information for computers and other devices connected to your Local Area Network. There is no need for you to do this yourself.** **The computers (and other devices) connected to your LAN also need to have their TCP/IP configuration set to "DHCP" or "Obtain an IP address automatically".**
IP Pool Range	**These two IP values (from and to) define a range of IP addresses that the DHCP Server uses when assigning addresses to computers and devices on your Local Area Network. Any addresses that are outside of this range are not managed by the DHCP Server; these could, therefore, be used for manually configured devices or devices that cannot use DHCP to obtain network address details automatically.** **Your router, by default, has a static IP address of 192.168.0.1. This means that addresses 192.168.0.2 to 192.168.0.254 can be made available for allocation by the DHCP Server.**
Max Lease Time	**The amount of time that a computer may have an IP address before it is required to renew the lease. The lease functions just as a lease on an apartment would. The initial lease designates the amount of time before the lease expires. If the tenant wishes to retain the address when the lease is expired then a new lease is established. If the lease expires and the address is no longer needed then another tenant may use the address.**
Domain Name	**Domain name for the dhcp server scope.**
DNS Servers	**DNS Server address for the dhcp server scope.**
IP Address	**The IP address to be configured for your computer or device on the local area network.For example, 192.168.0.2.**
Mac Address	**The mac address of your computer or device on the local area network.**

Changing the LAN IP address and subnet mask

To Change the configuration of LAN Interface:

1. From the *Setup* menu, click on *Local Network*. The following page is displayed:



LAN Interface Setup

This page is used to configure the LAN interface of your Wireless Router. Here you may change the setting for IP address, subnet mask, etc..
This page can be used to config the DHCP mode:None or DHCP Server.
(1). Enable the DHCP Server if you are using this device as a DHCP server. This page lists the IP address pools available to hosts on your LAN. The device distributes numbers in the pool to hosts on your network as they request Internet access. If you choose "None", then the router will do nothing when the hosts request a IP address.
(2). This page lists the fixed IP/MAC address on your LAN. The device distributes the number configured to hosts on your network as they request Internet access.

LAN Interface Setup

IP Address: 10.0.0.2
Subnet Mask: 255.255.255.0

DHCP Server Settings

DHCP Mode: DHCP Server
IP Pool Range: 10.0.0.2 - 10.0.0.254
Max Lease Time: 120 minutes
Domain Name: domain.name
DNS Server 1: 10.0.0.2
DNS Server 2:
DNS Server 3:

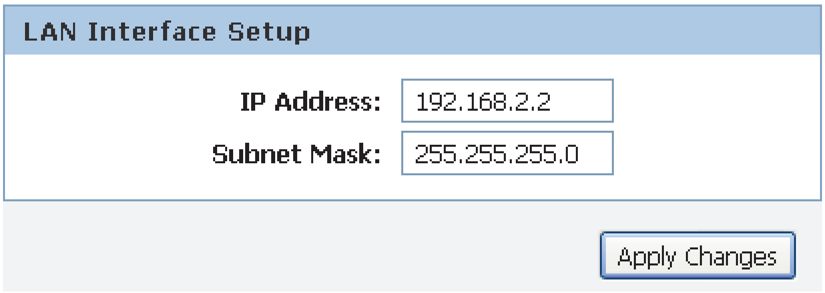
DHCP Static IP Configuration

IP Address: 0.0.0.0
Mac Address: 000000000000 (ex. 00E086710502)

DHCP Static IP Table

Select	IP Address	MAC Address

2. Change the *IP Address and Subnet Mask*.
3. Click *Apply Changes*.

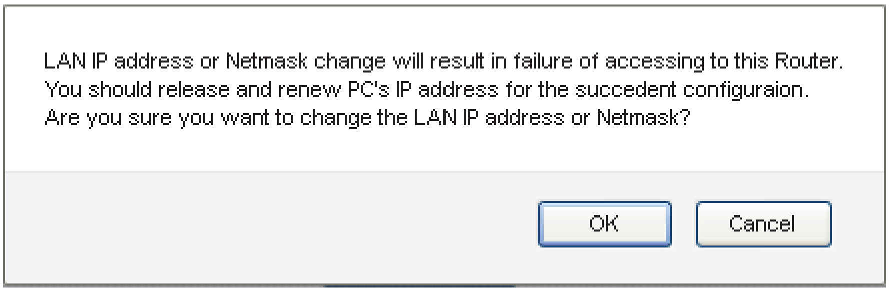


LAN Interface Setup

IP Address: 192.168.2.2

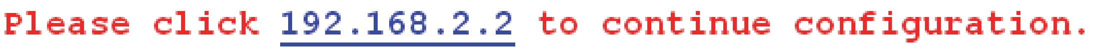
Subnet Mask: 255.255.255.0

4. Click *OK*.



LAN IP address or Netmask change will result in failure of accessing to this Router.
You should release and renew PC's IP address for the succedent configuraion.
Are you sure you want to change the LAN IP address or Netmask?

5. Type IP Address and *Change default LAN port IP address*.
6. Click in the *IP Address and Subnet Mask* box and type a new IP Address and Subnet Mask.
7. Change the *default DHCP Client Range*.
8. Click *Apply Changes*.



Please click 192.168.2.2 to continue configuration.

You may also need to renew your DHCP lease:

Windows 95/98

a. Select **Run...** from the **Start** menu.

b. Enter **winipcfg** and click **OK**.

c. Select your ethernet adaptor from the pull-down menu

d. Click **Release All** and then **Renew All**.

e. **Exit** the winipcfg dialog.

Windows NT/Windows 2000/Windows XP

a. Bring up a command window.

b. Type **ipconfig /release** in the command window.

c. Type **ipconfig /renew**.

d. Type **exit** to close the command window.

Linux

a. Bring up a shell.

b. Type **pump -r** to release the lease.

c. Type **pump** to renew the lease.

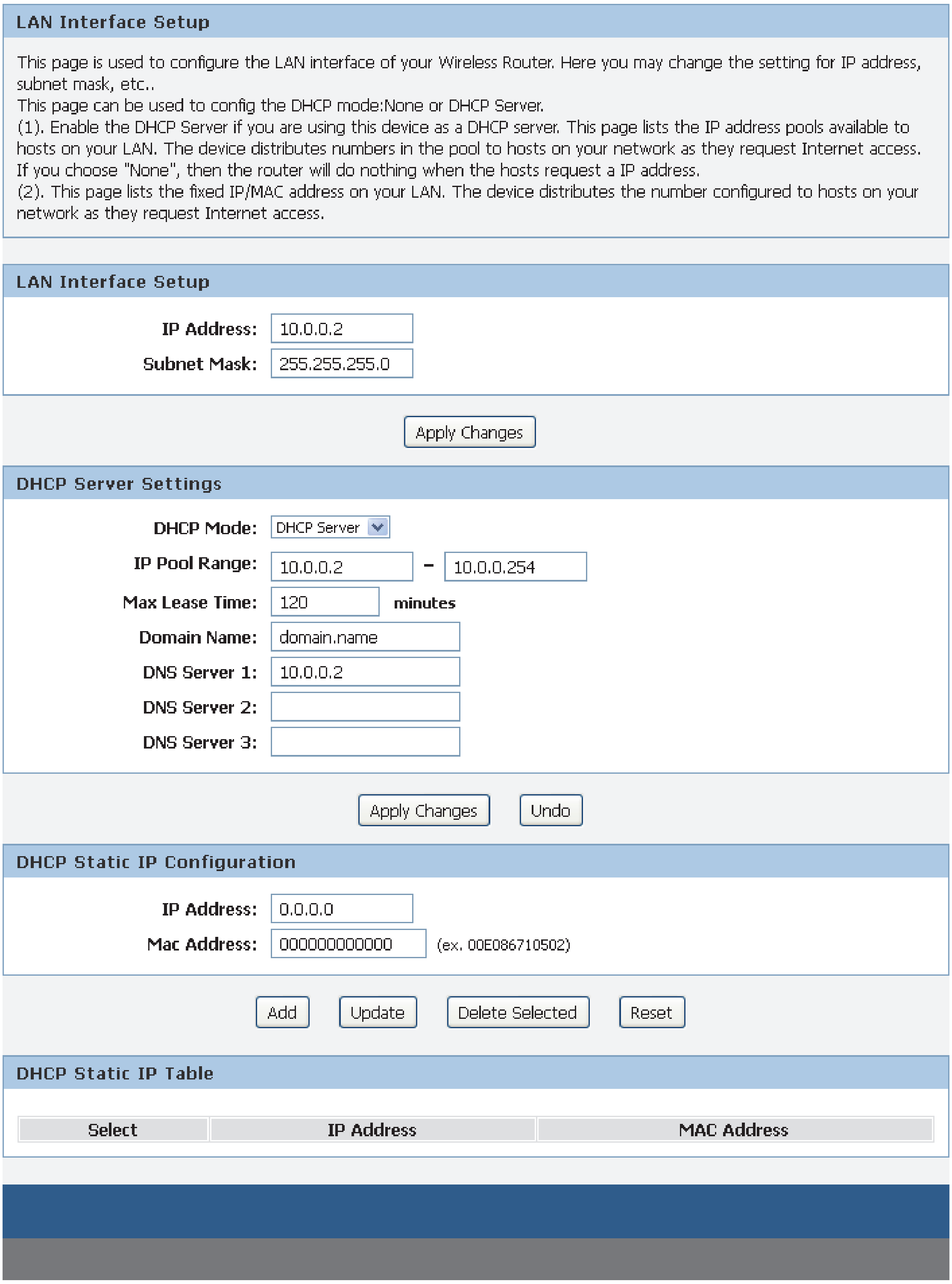
Note

If you change the LAN IP address of the device while connected through your Web browser, you will be disconnected. You must open a new connection by entering your new LAN IP address as the URL.

DHCP Static IP Configuration

If you need to assign static ip for your computer or device on the local area network, configure static ip with the mac address.:

1. From the *Setup* menu, click on *Local Network*. The following page is displayed:



LAN Interface Setup

This page is used to configure the LAN interface of your Wireless Router. Here you may change the setting for IP address, subnet mask, etc..
This page can be used to config the DHCP mode:None or DHCP Server.
(1). Enable the DHCP Server if you are using this device as a DHCP server. This page lists the IP address pools available to hosts on your LAN. The device distributes numbers in the pool to hosts on your network as they request Internet access. If you choose "None", then the router will do nothing when the hosts request a IP address.
(2). This page lists the fixed IP/MAC address on your LAN. The device distributes the number configured to hosts on your network as they request Internet access.

LAN Interface Setup

IP Address: 10.0.0.2
Subnet Mask: 255.255.255.0

DHCP Server Settings

DHCP Mode: DHCP Server
IP Pool Range: 10.0.0.2 – 10.0.0.254
Max Lease Time: 120 minutes
Domain Name: domain.name
DNS Server 1: 10.0.0.2
DNS Server 2:
DNS Server 3:

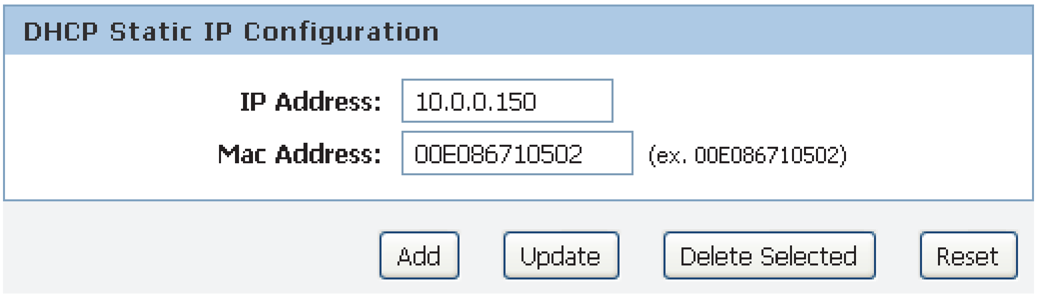
DHCP Static IP Configuration

IP Address: 0.0.0.0
Mac Address: 000000000000 (ex. 00E086710502)

DHCP Static IP Table

Select	IP Address	MAC Address

2. Enter the *IP Address*.
3. Enter the *Mac Address*.
4. Click *Add*.

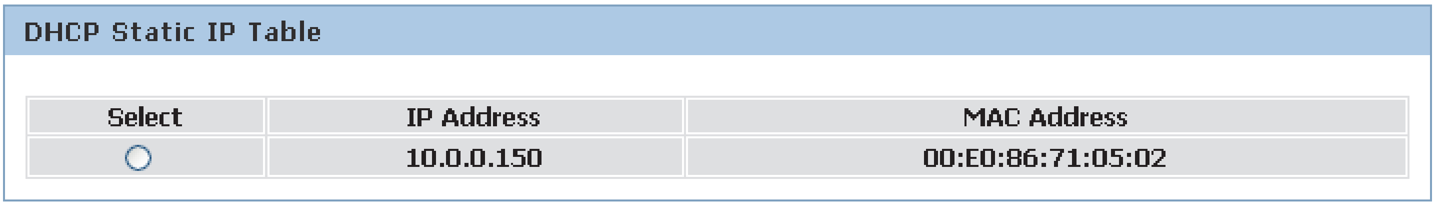


DHCP Static IP Configuration

IP Address: 10.0.0.150

Mac Address: 00E086710502 (ex. 00E086710502)

5. The DHCP Static IP Configuration that you created has been added in the *DHCP Static IP Table*.



DHCP Static IP Table

Select	IP Address	MAC Address
○	10.0.0.150	00:E0:86:71:05:02

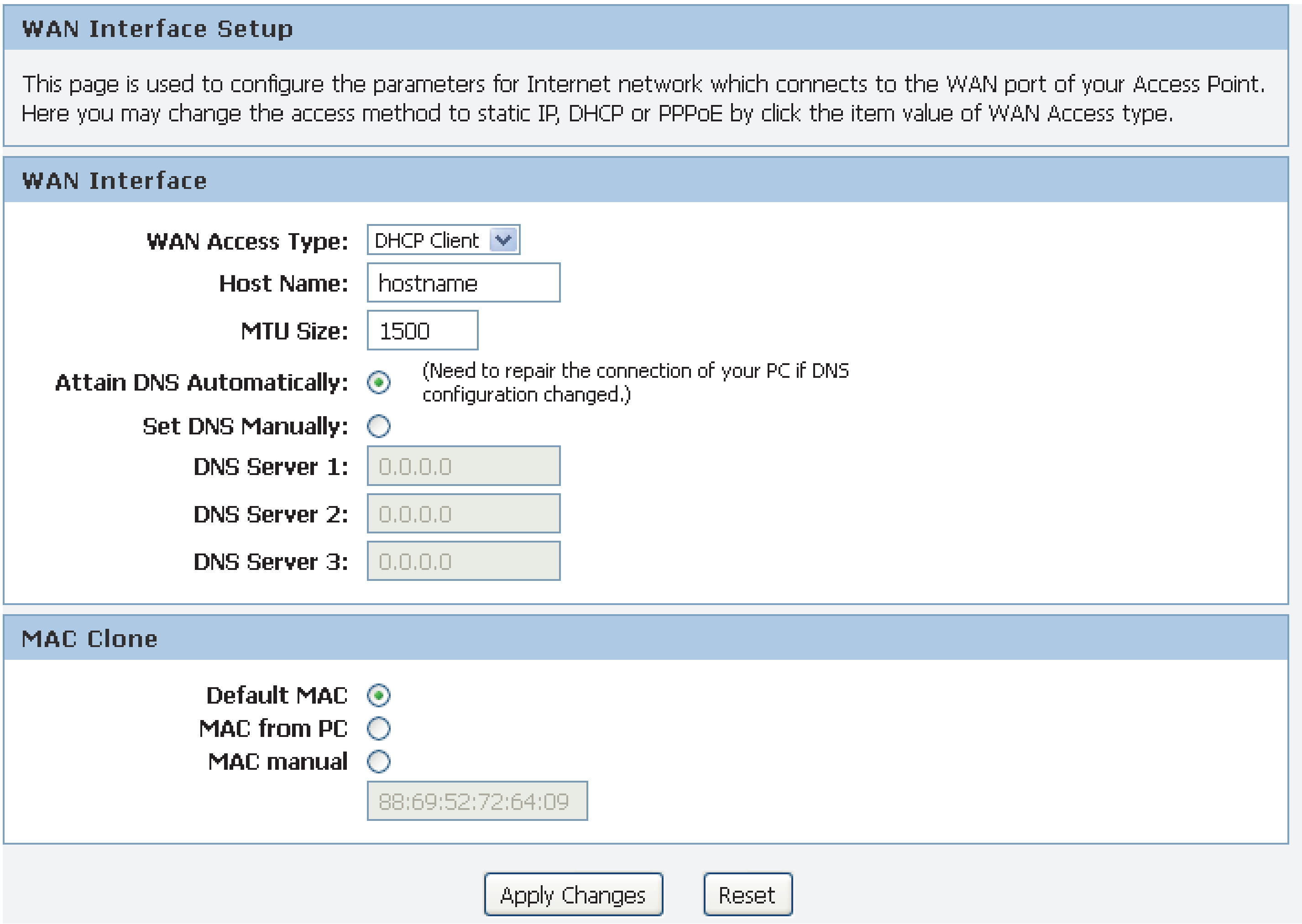
10 Internet Setup

This chapter describes how to configure the way that your device connects to the Internet. Your ISP determines what type of Internet access you should use and provides you with any information that you need in order to configure the Internet access to your device.

Wireless Gateway supports 3 methods of obtaining the WAN IP address:

Option	Description
Static IP	**Choose this option if you are a leased line user with a fixed IP address.**
DHCP Client	**Choose this option if you are connected to the Internet through a Cable modem line.**
PPPoE	**Choose this option if you are connected to the Internet through a DSL line**

1. From the *Setup* menu, click on *Internet Setup*. The following page is displayed:



WAN Interface Setup

This page is used to configure the parameters for Internet network which connects to the WAN port of your Access Point. Here you may change the access method to static IP, DHCP or PPPoE by click the item value of WAN Access type.

WAN Interface

WAN Access Type:	DHCP Client
Host Name:	hostname
MTU Size:	1500
Attain DNS Automatically:	● (Need to repair the connection of your PC if DNS configuration changed.)
Set DNS Manually:	○
DNS Server 1:	0.0.0.0
DNS Server 2:	0.0.0.0
DNS Server 3:	0.0.0.0

MAC Clone

Default MAC	●
MAC from PC	○
MAC manual	○
	88:69:52:72:64:09

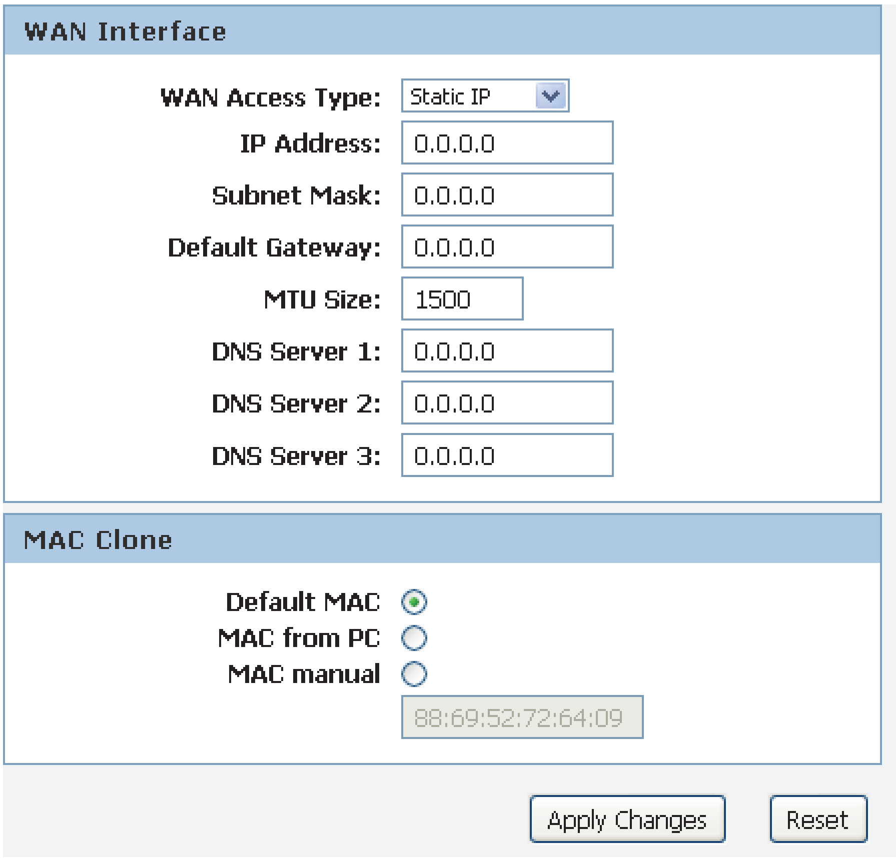
Option		Description
WAN Access Type	**Static IP**	**Choose this option if you are a leased line user with a fixed IP address.**
	DHCP Client	**Choose this option if you are connected to the Internet through a Cable modem line.**
	PPPoE	**Choose this option if you are connected to the Internet through a DSL line**
Host Name		**The name of the DHCP host**
IP Address		**Check with your ISP provider**
Subnet Mask		**Check with your ISP provider**
Default Gateway		**Check with your ISP provider**
User Name		**User name for PPPoE registration recognized by the Internet service provider**
Password		**Password for PPPoE registration recognized by the Internet service provider**
Service Name		**Service Name for PPPoE registration recognized by the Internet service provider**
Connection Type	**Continuous**	**The connection is always on**
	Connect on Demand	**Enter the minutes after which the session must be disconnected, if no activity takes place**
	Manual	**Manually connect**
Idle Time		**Enter the minutes after which the session must be disconnected**
MTU Size		**Specify the network MTU rate**
Attain DNS Automatically		**Obtain DNS server address automatically**
DNS 1 (Primary DNS Server)		**Check with your ISP provider**
DNS 2 (Secondary DNS Server)		**Check with your ISP provider**
DNS 3 (Third DNS Server)		**Check with your ISP provider**
MAC Clone		**Clone MAC lets the device identify itself as another computer or device**

Configuring Static IP connection

If you are a leased line user with a fixed IP address, enter in the IP address, subnet mask, gateway address, and DNS (domain name server) address(es) provided to you by your ISP.

If your ISP wants you to connect to the Internet using Static IP, follow the instructions below.

1. From the *Setup* menu, click on *Internet Setup*. The following page is displayed:
2. From the *WAN Access Type* drop-down list, select *Static IP* setting.
3. Enter *WAN IP Address, WAN Subnet Mask, Default Gateway* and *DNS* which was given by Telecom or by your Internet Service Provider (ISP).
4. Click *Apply Changes*.



WAN Interface

WAN Access Type:	Static IP
IP Address:	0.0.0.0
Subnet Mask:	0.0.0.0
Default Gateway:	0.0.0.0
MTU Size:	1500
DNS Server 1:	0.0.0.0
DNS Server 2:	0.0.0.0
DNS Server 3:	0.0.0.0

MAC Clone

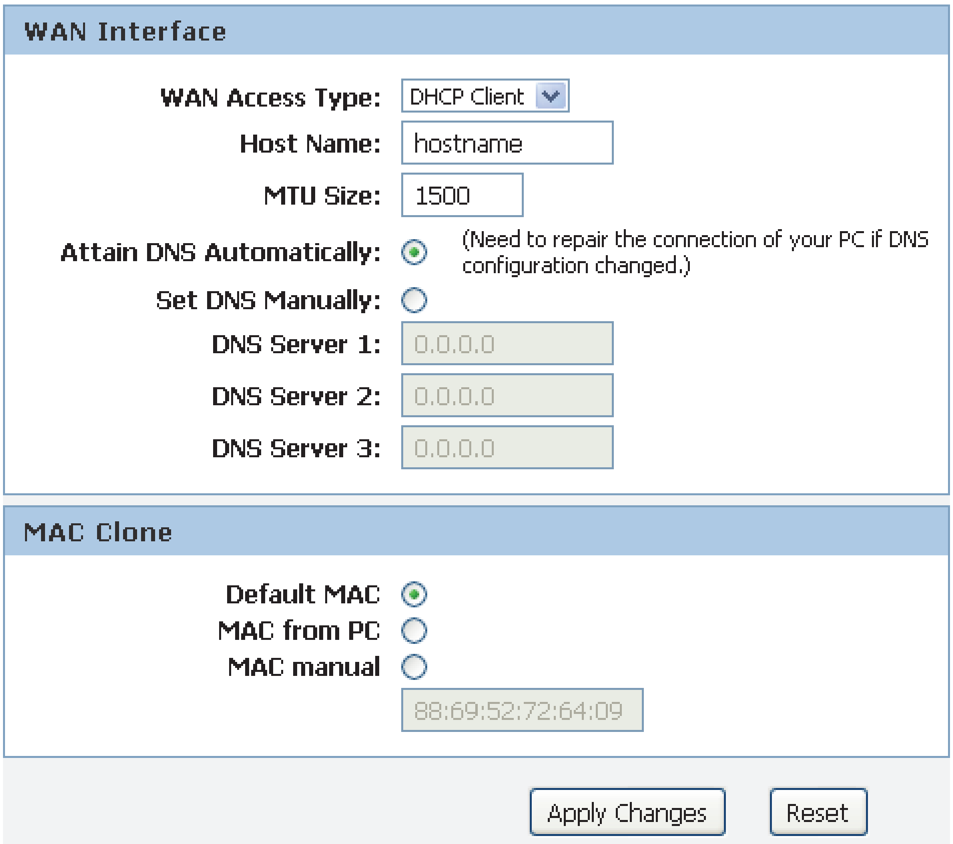
Default MAC ●
MAC from PC ○
MAC manual ○
88:69:52:72:64:09

Configuring DHCP Client connection

Dynamic Host Configuration Protocol (DHCP), Dynamic IP (Get WAN IP Address automatically). If you are connected to the Internet through a Cable modem line, then a dynamic IP will be assigned.

If your ISP wants you to connect to the Internet using DHCP Client, follow the instructions below.

1. From the *Setup* menu, click on *Internet Setup*. The following page is displayed:
2. From the *WAN Access Type* drop-down list, select *DHCP Client* setting.
3. Click *Apply Changes*.



WAN Interface

WAN Access Type: DHCP Client

Host Name: hostname

MTU Size: 1500

Attain DNS Automatically: ● (Need to repair the connection of your PC if DNS configuration changed.)

Set DNS Manually: ○

DNS Server 1: 0.0.0.0

DNS Server 2: 0.0.0.0

DNS Server 3: 0.0.0.0

MAC Clone

Default MAC ●

MAC from PC ○

MAC manual ○

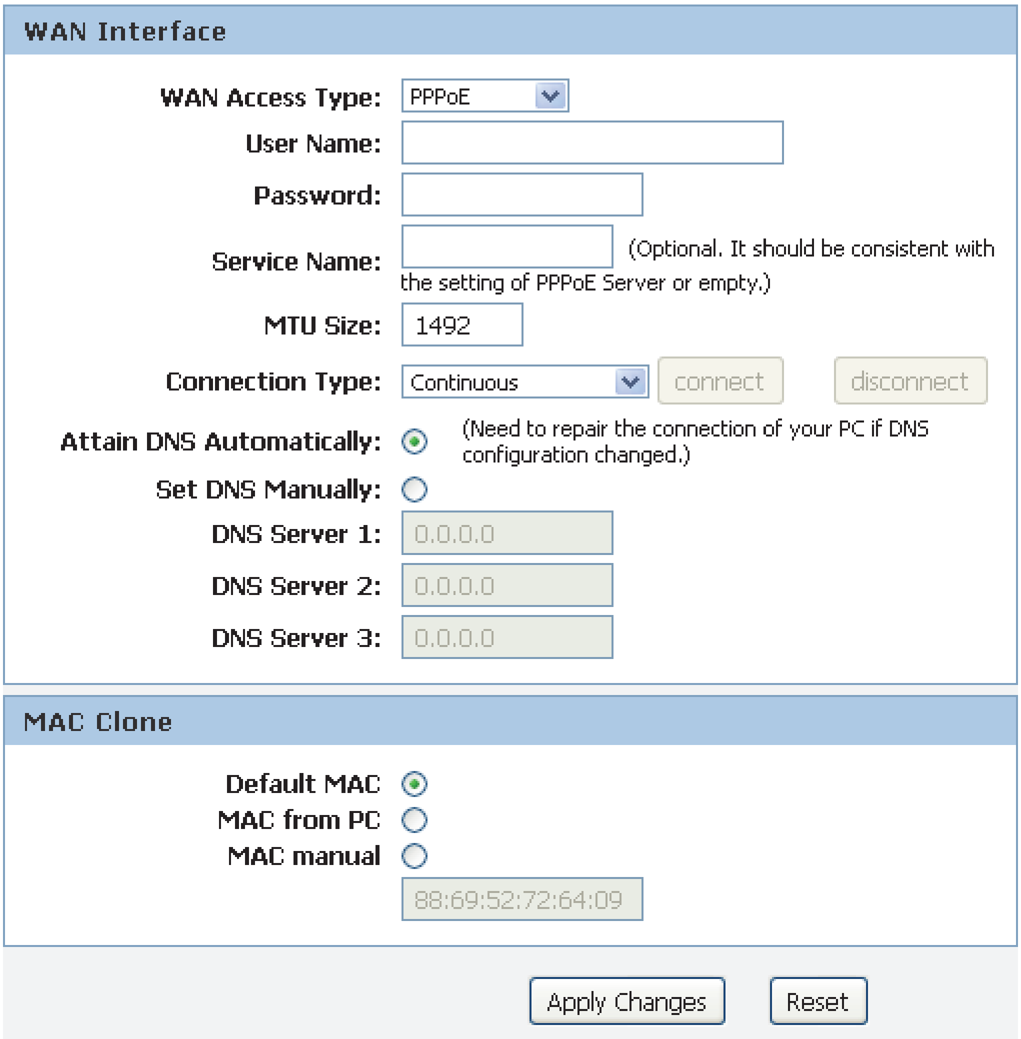
88:69:52:72:64:09

Configuring PPPoE connection

If your ISP's Internet service uses PPPoE you need to set up a PPP login account. The first time that you login to the Internet, your ISP will ask you to enter a username and password so they can check that you are a legitimate, registered Internet service user. Your device stores these authentication details, so you will not have to enter this username and password every time you login.

If your ISP wants you to connect to the Internet using PPP, follow the instructions below.

1. From the *Setup* menu, click on *Internet Setup*. The following page is displayed:
2. From the *WAN Access Type* drop-down list, select *PPPoE* setting.
3. Enter *User Name/Password* provided by your ISP. Type them in the relevant boxes.
4. Click *Apply Changes*.



WAN Interface

WAN Access Type: PPPoE
User Name:
Password:
Service Name: (Optional. It should be consistent with the setting of PPPoE Server or empty.)
MTU Size: 1492
Connection Type: Continuous

Attain DNS Automatically: ● (Need to repair the connection of your PC if DNS configuration changed.)
Set DNS Manually: ○
DNS Server 1: 0.0.0.0
DNS Server 2: 0.0.0.0
DNS Server 3: 0.0.0.0

MAC Clone

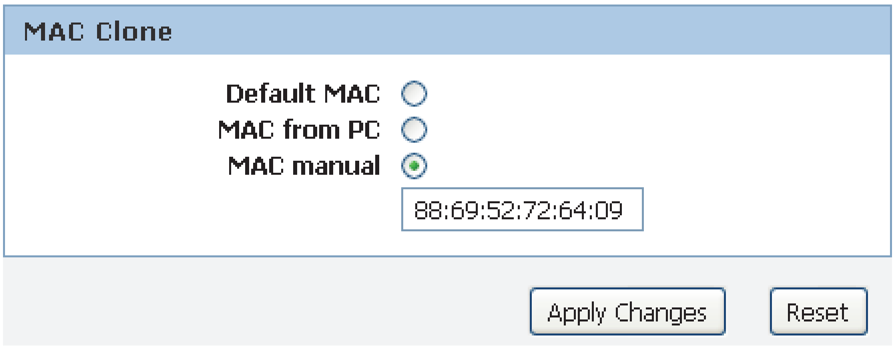
Default MAC ●
MAC from PC ○
MAC manual ○
88:69:52:72:64:09

Clone MAC Address

Some particularly ISPs do not want you to have a home network and have a DSL/Cable modem that allows only 1 MAC to talk on the internet. If you change network cards, you have to call them up to change the MAC. The Wireless Gateway can it's MAC to computer's one that was originally set up for such an ISP.

This page allows you to enable or disable *Clone MAC Address* option.

1. From the *Setup* menu, click on *Internet Setup*. The following page is displayed:
2. Click *MAC manual* ratio.
3. Enter the MAC for example 88:69:52:72:64:09 that you want to be instead of in the *Clone MAC Address* field.
4. Click *Apply Changes*.



MAC Clone

Default MAC ○
MAC from PC ○
MAC manual ●
88:69:52:72:64:09

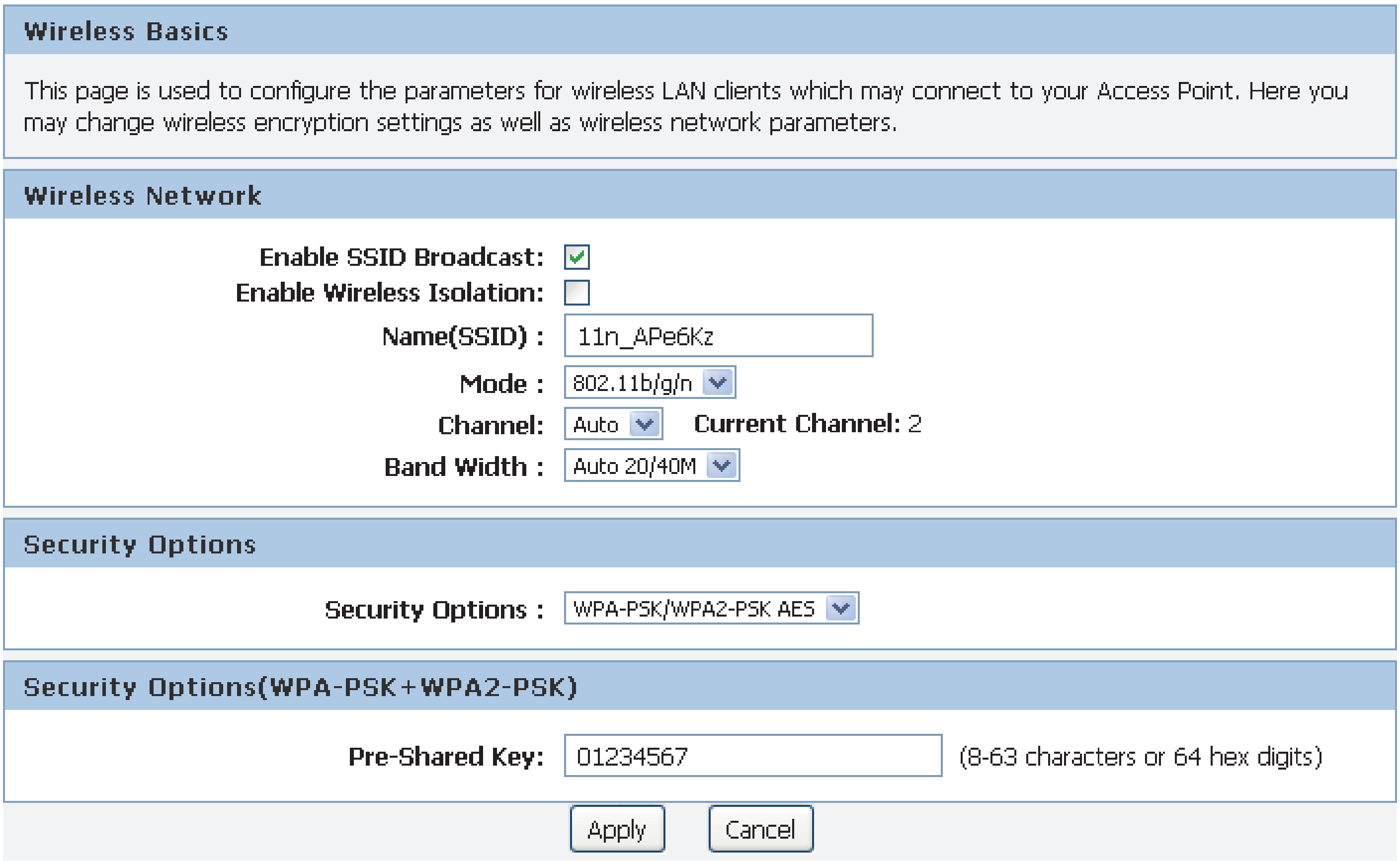
11 IPv6

Use this section to configure your IPv6 Connection type. If you are unsure of your connection method, please contact your Internet Service Provider.

Wireless Basics

The *Wireless Network* page allows you to configure the Wireless features of your device. To access the *Wireless Basics* page:

From the *Setup* menu, click on *IPv6*. The following page is displayed:



Wireless Basics

This page is used to configure the parameters for wireless LAN clients which may connect to your Access Point. Here you may change wireless encryption settings as well as wireless network parameters.

Wireless Network

Enable SSID Broadcast: ☑
Enable Wireless Isolation: □
Name(SSID) : 11n_APe6Kz
Mode : 802.11b/g/n
Channel: Auto Current Channel: 2
Band Width : Auto 20/40M

Security Options

Security Options : WPA-PSK/WPA2-PSK AES

Security Options(WPA-PSK+WPA2-PSK)

Pre-Shared Key: 01234567 (8-63 characters or 64 hex digits)

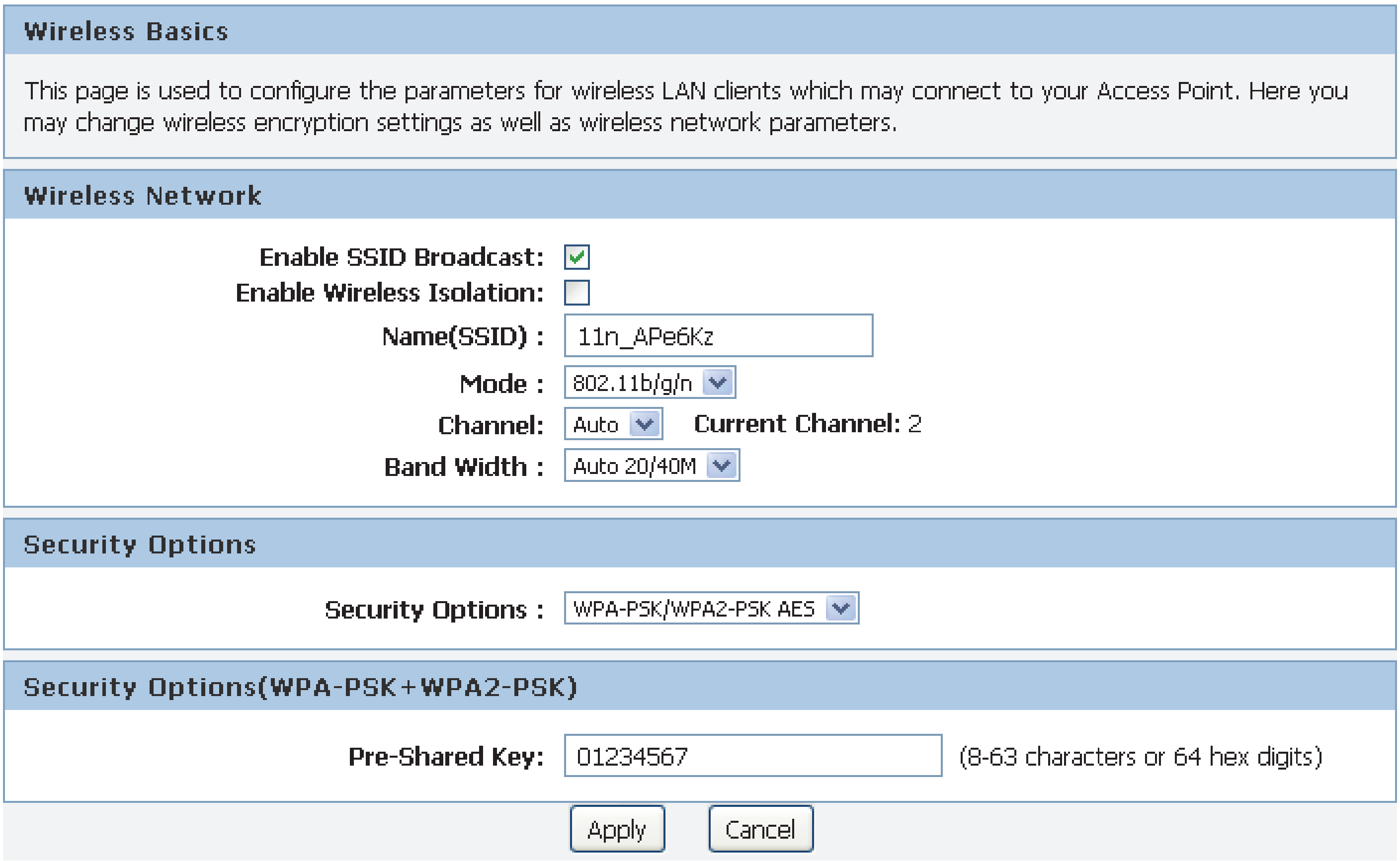
12 Wireless Network

This chapter assumes that you have already set up your Wireless PCs and installed a compatible Wireless card on your device. See *Configuring Wireless PCs*.

Wireless Basics

The *Wireless Network* page allows you to configure the Wireless features of your device. To access the *Wireless Basics* page:

From the *Wireless* menu, click on *Wireless Basics*. The following page is displayed:



Wireless Basics

This page is used to configure the parameters for wireless LAN clients which may connect to your Access Point. Here you may change wireless encryption settings as well as wireless network parameters.

Wireless Network

Enable SSID Broadcast: ☑

Enable Wireless Isolation: □

Name(SSID) : 11n_APe6Kz

Mode : 802.11b/g/n

Channel: Auto   Current Channel: 2

Band Width : Auto 20/40M

Security Options

Security Options : WPA-PSK/WPA2-PSK AES

Security Options(WPA-PSK+WPA2-PSK)

Pre-Shared Key: 01234567 (8-63 characters or 64 hex digits)

Figure 5: Wireless Network page

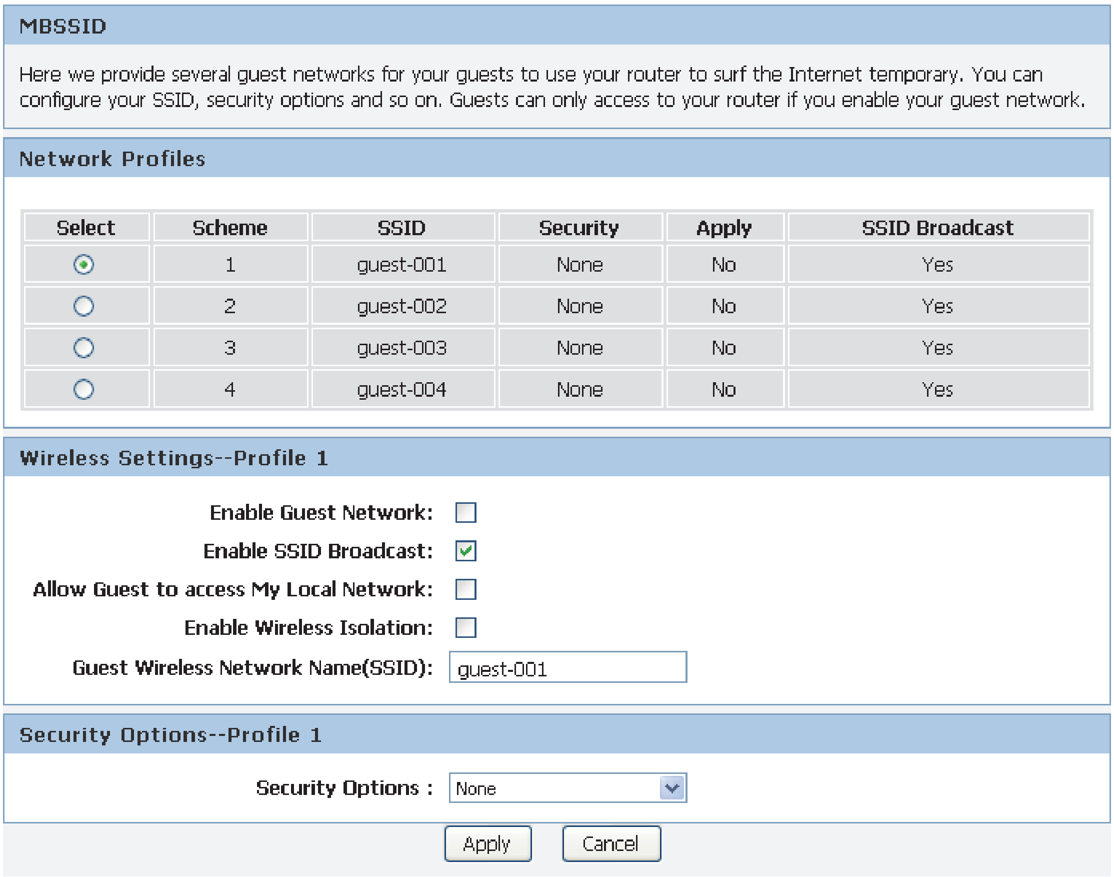
Field	Description
Enable SSID Broadcast	**Broadcast or Hide SSID to your Network.** **Default: Enabled**
Enable Wireless Isolation	**Isolate your Network.** **Default: Disabled**
SSID	**Specify the network name.** **Each Wireless LAN network uses a unique Network Name to identify the network. This name is called the Service Set Identifier (SSID). When you set up your wireless adapter, you specify the SSID. If you want to connect to an existing network, you must use the name for that network. If you are setting up your own network you can make up your own name and use it on each computer. The name can be up to 20 characters long and contain letters and numbers.**
Mode	**Specify the WLAN Mode to 802.11b mode, 802.11g mode, 802.11b/g mode, 802.11n mode, 802.11n/g mode or 802.11b/g/n mode**
Channel	**Choose a Channel from the pull-down menu.**
Band Width	**Choose a Band Width from the pull-down menu.**
Max Transmission Rate	**Select the Max Transmission Rate from the drop-down list**
Security Options	**Configure the Encryption to None, WEP, WPA-PSK[TKIP] , WPA2-PSK[AES] or WPA-PSK/WPA2-PSK AES**
Security Encryption(WEP)	**Authentication Type: Automatic or Shared Keys** **Encryption Strength: 64 bits or 128 bits**
Security Encryption(WEP) Key	**Select and configure Key 1, Key 2, Key 3 or Key 4**
Security Options(WPA-PSK)	**Enter the Pre-Shared Key**
Security Options(WPA2-PSK)	**Enter the Pre-Shared Key**
Security Options(WPA-PSK+WPA2-PSK)	**Enter the Pre-Shared Key**

Wireless Multiple BSSID Settings

Here we provide several guest networks for your guests to use your router to surf the Internet temporary. You can configure your SSID, security options and so on. Guests can only access to your router if you enable your guest network.

To access the *MBSSID Settings* page:

From the *WLAN* menu, click on *MBSSID*. The following page is displayed:



MBSSID

Here we provide several guest networks for your guests to use your router to surf the Internet temporary. You can configure your SSID, security options and so on. Guests can only access to your router if you enable your guest network.

Network Profiles

Select	Scheme	SSID	Security	Apply	SSID Broadcast
●	1	guest-001	None	No	Yes
○	2	guest-002	None	No	Yes
○	3	guest-003	None	No	Yes
○	4	guest-004	None	No	Yes

Wireless Settings--Profile 1

Enable Guest Network: □

Enable SSID Broadcast: ☑

Allow Guest to access My Local Network: □

Enable Wireless Isolation: □

Guest Wireless Network Name(SSID): guest-001

Security Options--Profile 1

Security Options : None

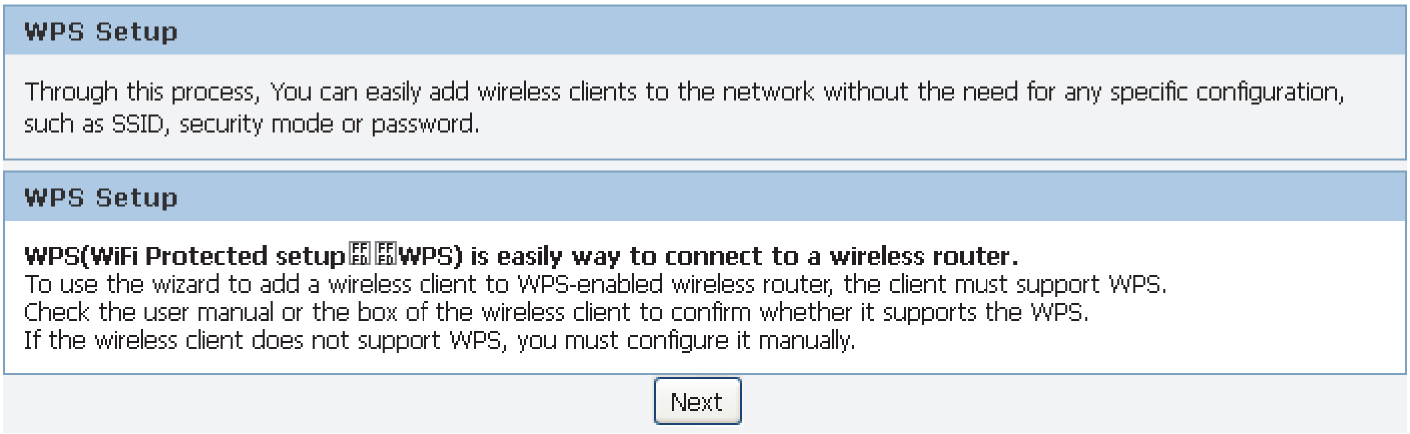
Field	Description
Network Profiles	**You can click radio button of each profile to check detail info or change settings of each profile. The table is a brief summary of how many profiles you can create, it provides profile number, SSID of this profile, Security type of this profile, this guest wireless network is Enabled or Not, and the SSID will be displayed or not.**
Enable Guest Network	**If this check box is checked, then this guest network is enabled. You and your visitors can connect to your network via the SSID of this profile.**
Enable SSID Broadcast	**If Enabled, the Wireless Access Point will broadcast its name (SSID) to all Wireless Stations. Stations which have no SSID (or a null value) can then adopt the correct SSID for connections to this Access Point.**
Allow Guest to access My Local Network	**If Unchecked, any user connects to this SSID can only access internet, but can not access gateway's management UI, such as Web Server, Telnet, etc. . All clients in this SSID are not allowed to access clients of other SSIDs and Ethernet network.**

	If Checked, any user who connects to this SSID can access not only internet but also local networks of this wireless router like users in primary SSID.
Enable Wireless Isolation	**If checked, the wireless client under this SSID can`t access other wireless clients under the same SSID.** **If unchecked, the wireless client under this SSID can access other wireless clients under the same SSID.**
Guest Wireless Network Name(SSID)	**Enter a value of up to 32 alphanumeric characters. The same Name (SSID) must be assigned to all wireless devices in your network. The default SSID is SSID_N, N is profile number, but we strongly recommend that you change your network`s Name (SSID) to a different value. This value is also case-sensitive. For example, SSID is not the same as SSId.**
Security Options	**None - no data encryption** **WEP - Wired Equivalent Privacy, use WEP 64- or 128-bit data encryption** **Note: Wi-Fi Protected Setup function is disabled when the security setting is WEP with Shared-Key authentication** **WPA-PSK [TKIP] - Wi-Fi Protected Access with Pre-Shared Key, use WPA-PSK standard encryption with TKIP encryption type** **WPA2-PSK [AES] - Wi-Fi Protected Access version 2 with Pre-Shared Key, use WPA2-PSK standard encryption with the AES encryption type** **WPA-PSK [AES] + WPA2-PSK [AES] - Allow clients using either WPA-PSK [AES] or WPA2-PSK [AES]** **To achieve the best performance with 11N wireless adapters under robust security network, we recommends that you change your network`s security option to WPA2-PSK.**

WPS Setup

Through this process, You can easily add wireless clients to the network without the need for any specific configuration, such as SSID, security mode or password.

From the *Wireless* menu, click on WPS. The following page is displayed:



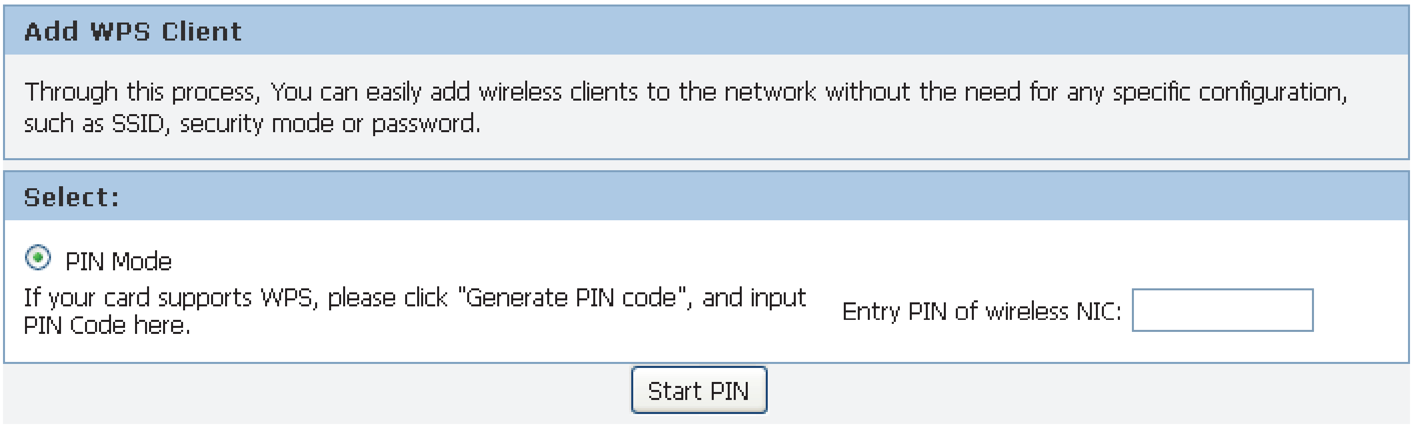
WPS Setup

Through this process, You can easily add wireless clients to the network without the need for any specific configuration, such as SSID, security mode or password.

WPS Setup

WPS(WiFi Protected setup□□WPS) is easily way to connect to a wireless router.
To use the wizard to add a wireless client to WPS-enabled wireless router, the client must support WPS.
Check the user manual or the box of the wireless client to confirm whether it supports the WPS.
If the wireless client does not support WPS, you must configure it manually.

You can add wireless client by PIN mode. If you use PIN mode, you should input client PIN code. Meanwhile you should start client WPS process. You can find client PIN code on client manager.



Add WPS Client

Through this process, You can easily add wireless clients to the network without the need for any specific configuration, such as SSID, security mode or password.

Select:

● PIN Mode

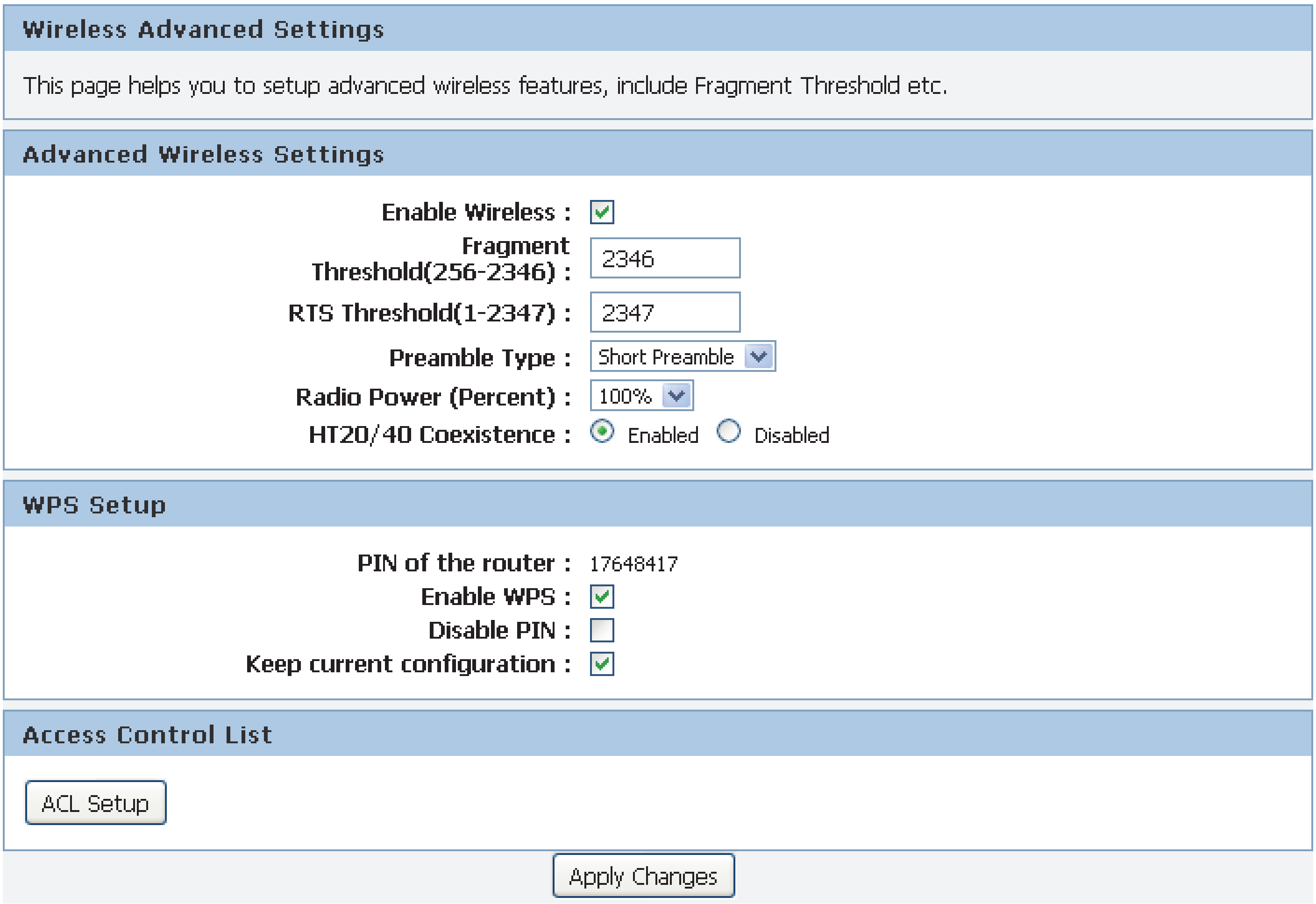
If your card supports WPS, please click "Generate PIN code", and input PIN Code here.

Entry PIN of wireless NIC:

Wireless Advanced Settings

This page helps you to setup advanced wireless features, include Fragment Threshold etc.

From the *Wireless* menu, click on *Wireless Advanced*. The following page is displayed:



Wireless Advanced Settings

This page helps you to setup advanced wireless features, include Fragment Threshold etc.

Advanced Wireless Settings

Enable Wireless : ☑

Fragment Threshold(256-2346) : 2346

RTS Threshold(1-2347) : 2347

Preamble Type : Short Preamble

Radio Power (Percent) : 100%

HT20/40 Coexistence : ● Enabled ○ Disabled

WPS Setup

PIN of the router : 17648417

Enable WPS : ☑

Disable PIN : □

Keep current configuration : ☑

Access Control List

Field	Description
Fragment Threshold	**When transmitting a packet over a network medium, sometimes the packet is broken into several segments, if the size of packet exceeds that allowed by the network medium.** **The Fragmentation Threshold defines the number of bytes used for the fragmentation boundary for directed messages.**
RTS Threshold	**RTS stands for "Request to Send". This parameter controls what size data packet the low level RF protocol issues to an RTS packet. The default is 2347.**
Preamble Type	**This is the length of the CRC (Cyclic Redundancy Check) block for communication between the router and wireless clients. High network traffic areas should select Short preamble type.**
Radio Power (Percent)	**TX Power measurement.**
HT20/40	**Disable or Enable 20/40MHz Coexist**

Coexistence	
Enable WPS	**Disable or Enable WPS**
Disable PIN	**Disable or Enable PIN**
Keep current configuration	**Disable or Enable current configuration**

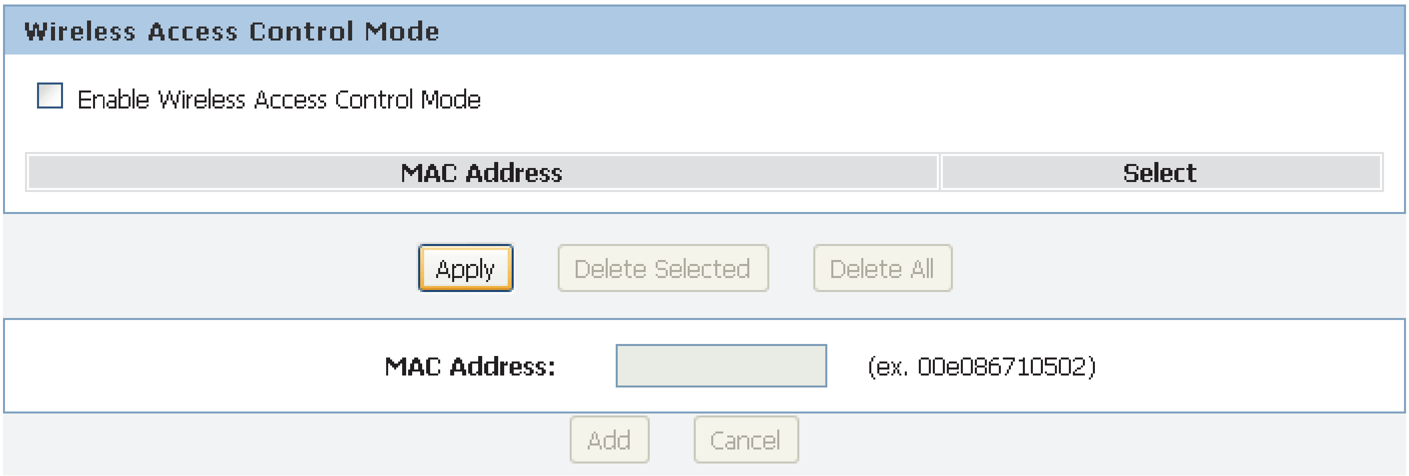
Wireless Access Control Mode

For security reason, using MAC ACL's (MAC Address Access List) creates another level of difficulty to hacking a network. A MAC ACL is created and distributed to AP so that only authorized NIC's can connect to the network. While MAC address spoofing is a proven means to hacking a network this can be used in conjunction with additional security measures to increase the level of complexity of the network security decreasing the chance of a breach.

MAC addresses can be add/delete/edit from the ACL list depending on the MAC Access Policy.

If you choose 'Allowed Listed', only those clients whose wireless MAC addresses are in the access control list will be able to connect to your Access Point. When 'Deny Listed' is selected, these wireless clients on the list will not be able to connect the Access Point. To access the *Wireless Network Access Control* page:

From the *Wireless* menu, click on *Access Control* and then click on *ACL Setup* button. The following page is displayed:



Wireless Access Control Mode

□ Enable Wireless Access Control Mode

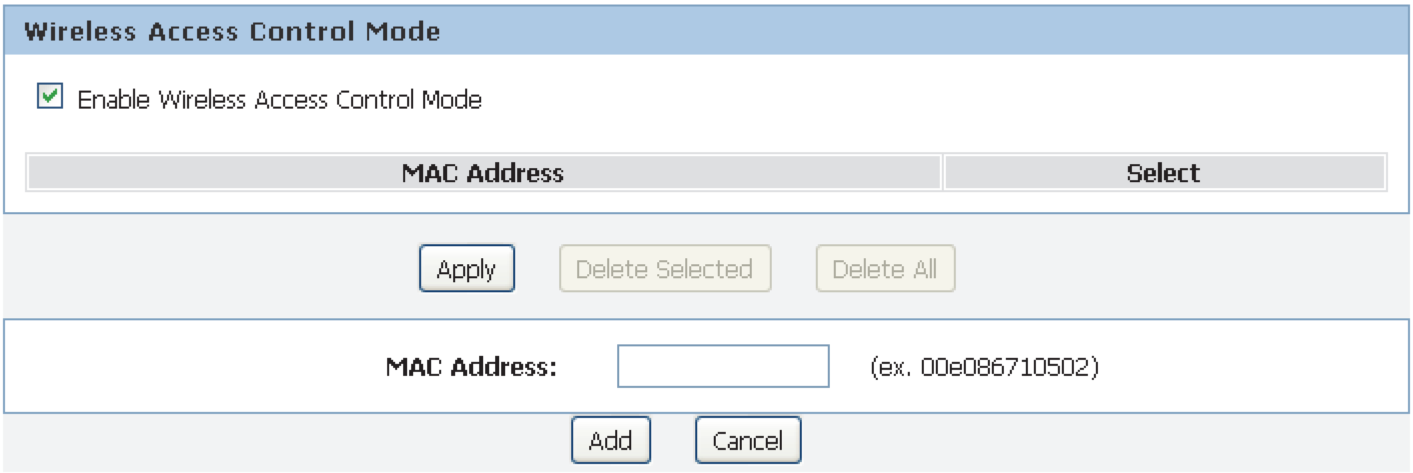
MAC Address	Select

MAC Address: (ex. 00e086710502)

Allow Listed

If you Enable Wireless Access Control Mode, only those clients whose wireless MAC addresses are in the access control list will be able to connect to your Access Point.

1. Enable Wireless Access Control Mode.
2. Click *Apply* button.



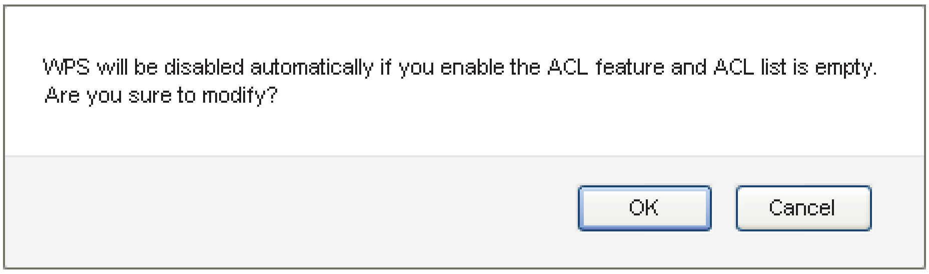
Wireless Access Control Mode

☑ Enable Wireless Access Control Mode

MAC Address	Select

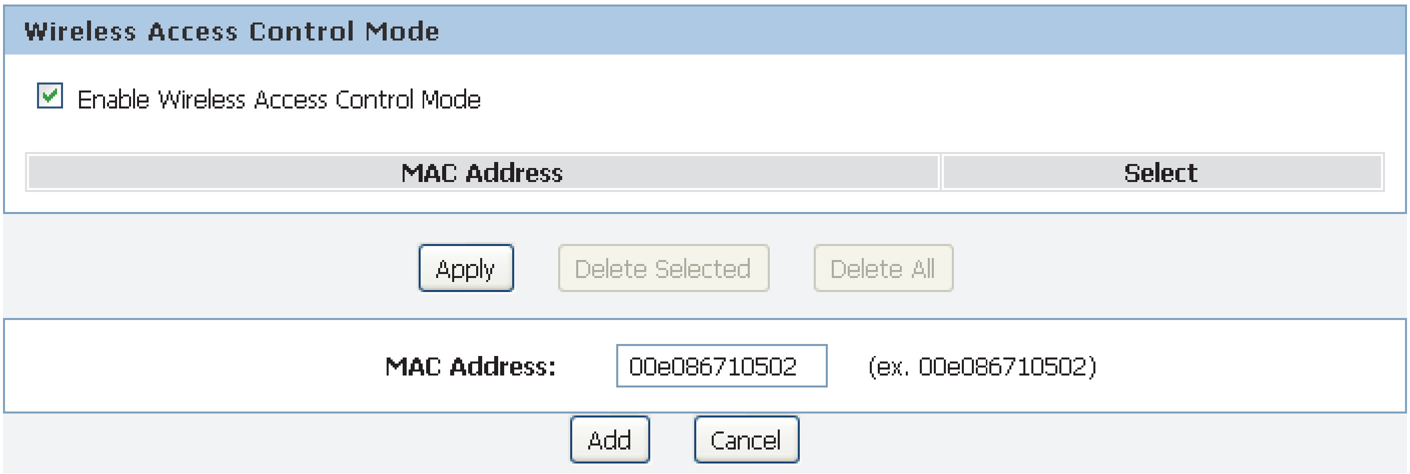
MAC Address: (ex. 00e086710502)

3. Click *OK* button.



WPS will be disabled automatically if you enable the ACL feature and ACL list is empty. Are you sure to modify?

4. Enter the *MAC Address*.
5. Click *Add* button.



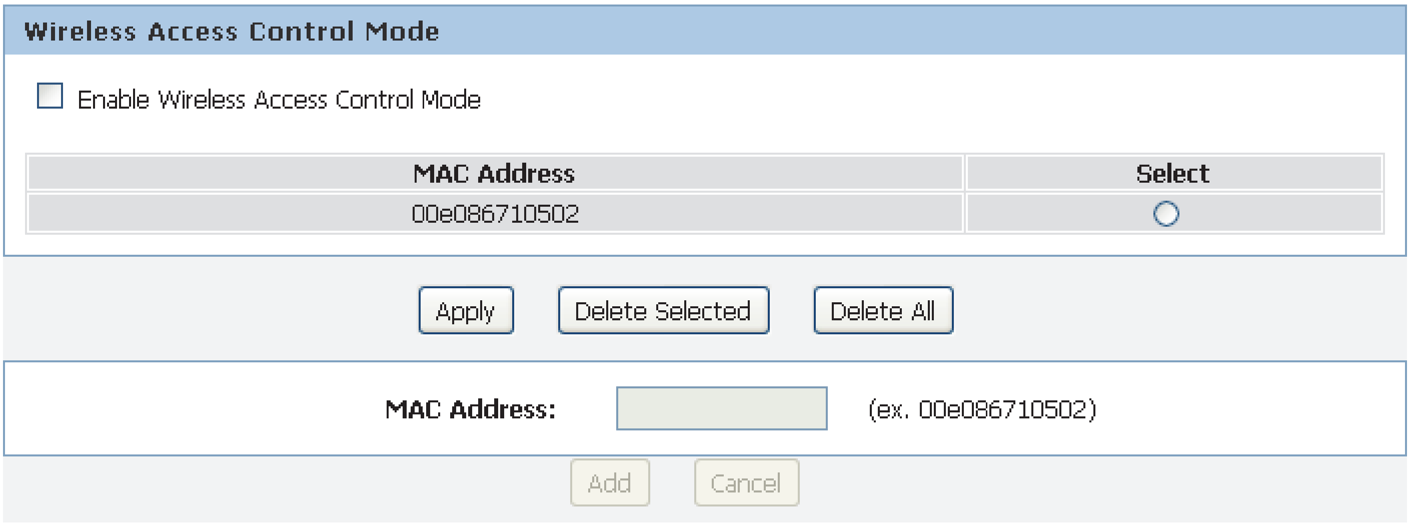
Wireless Access Control Mode

☑ Enable Wireless Access Control Mode

MAC Address	Select

MAC Address: 00e086710502 (ex. 00e086710502)

6. The MAC Address that you created has been added in the *Access Control List*.



Wireless Access Control Mode

□ Enable Wireless Access Control Mode

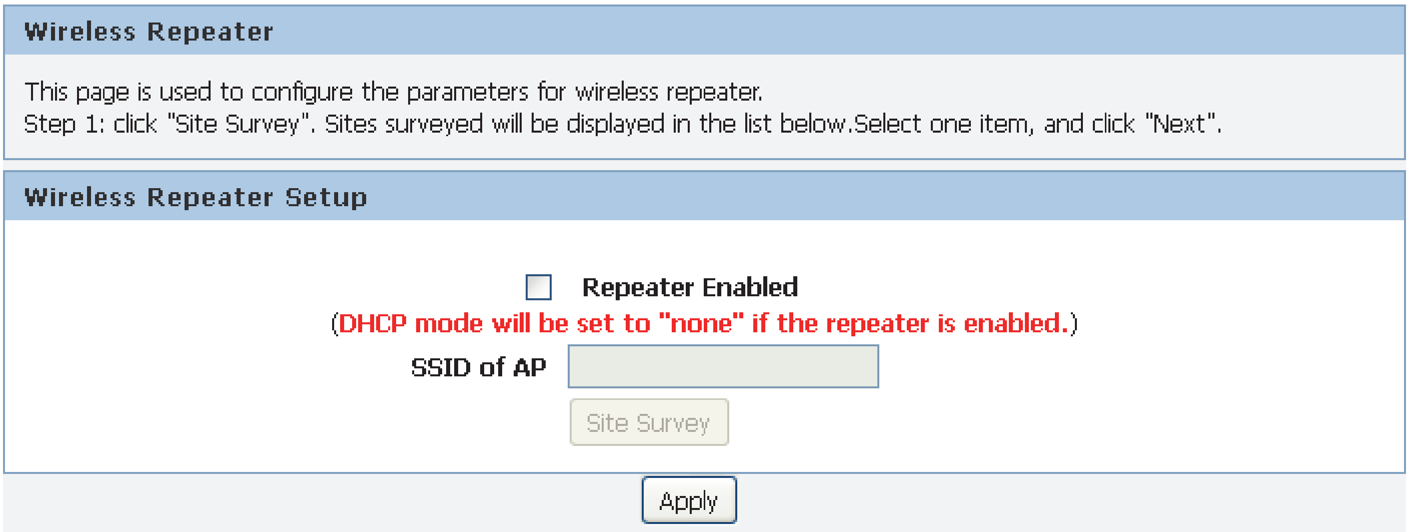
MAC Address	Select
00e086710502	○

MAC Address: (ex. 00e086710502)

Wireless Repeater

This page provides tool to scan the wireless network. If any Access Point or IBSS is found, you could choose to connect it manually. To access the *Wireless Repeater settings* page:

From the *Wireless* menu, click on *Wireless Repeater*. The following page is displayed:



Wireless Repeater

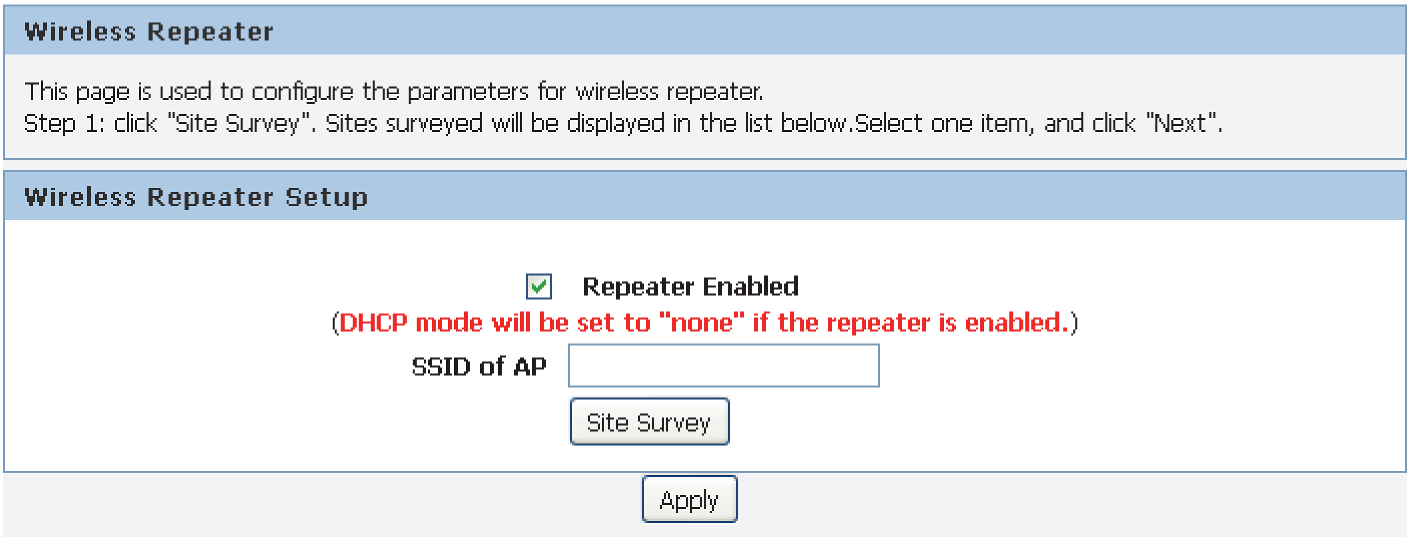
This page is used to configure the parameters for wireless repeater.
Step 1: click "Site Survey". Sites surveyed will be displayed in the list below.Select one item, and click "Next".

Wireless Repeater Setup

□ Repeater Enabled
(DHCP mode will be set to "none" if the repeater is enabled.)

SSID of AP

1. Enable Repeater Enabled.
2. Click *Site Survey* button.



Wireless Repeater

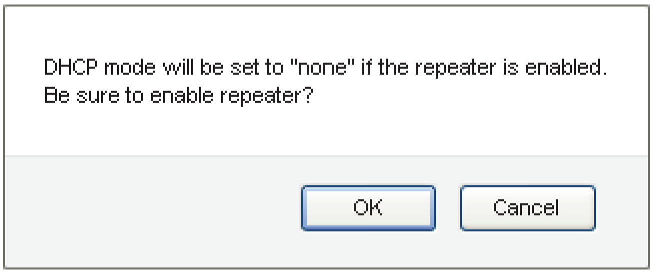
This page is used to configure the parameters for wireless repeater.
Step 1: click "Site Survey". Sites surveyed will be displayed in the list below.Select one item, and click "Next".

Wireless Repeater Setup

☑ Repeater Enabled
(DHCP mode will be set to "none" if the repeater is enabled.)

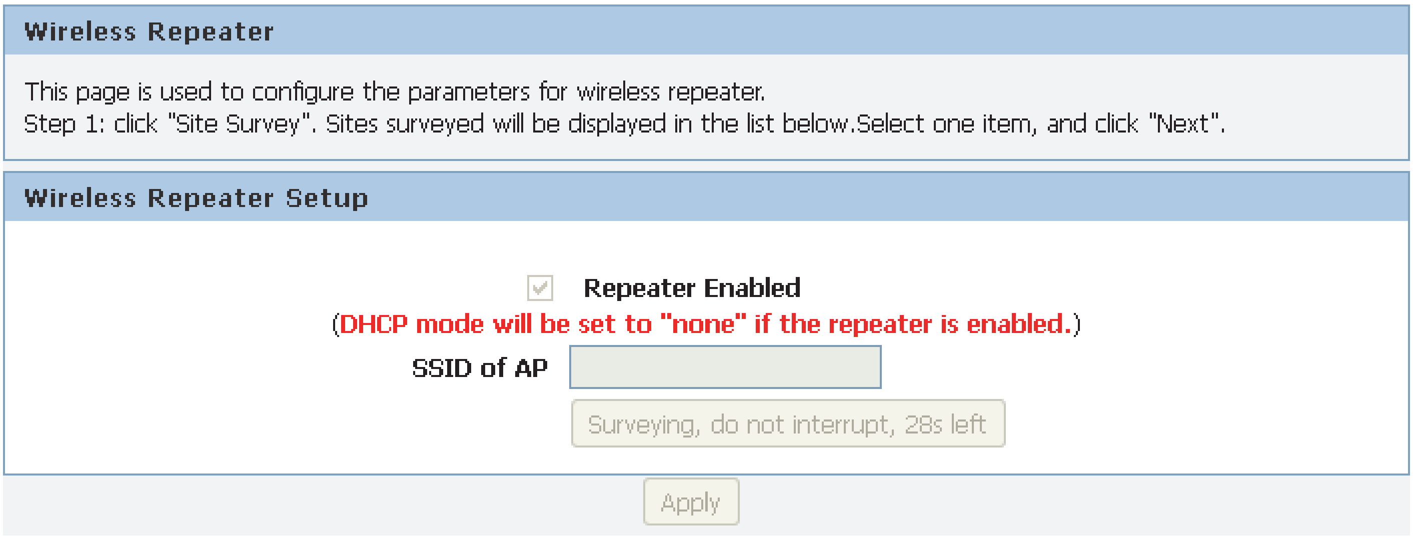
SSID of AP

3. Click *OK* button.



DHCP mode will be set to "none" if the repeater is enabled.
Be sure to enable repeater?

4. Surveying, do not interrupt, 30s left.



Wireless Repeater

This page is used to configure the parameters for wireless repeater.
Step 1: click "Site Survey". Sites surveyed will be displayed in the list below.Select one item, and click "Next".

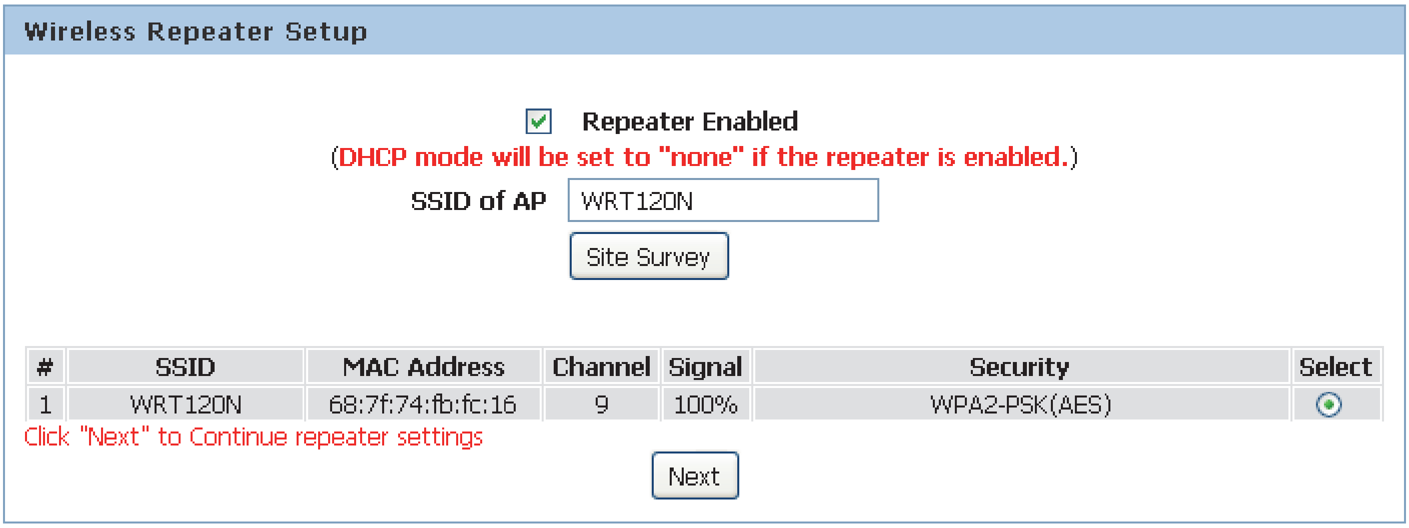
Wireless Repeater Setup

☑ Repeater Enabled

(DHCP mode will be set to "none" if the repeater is enabled.)

SSID of AP

5. Now you could see the APs that scanned by the Wireless Gateway were listed below.
6. Click on the ratio of AP's SSID under the item *Select* that you want the Wireless Gateway to connect to.
7. Click *Next* button.



Wireless Repeater Setup

☑ Repeater Enabled

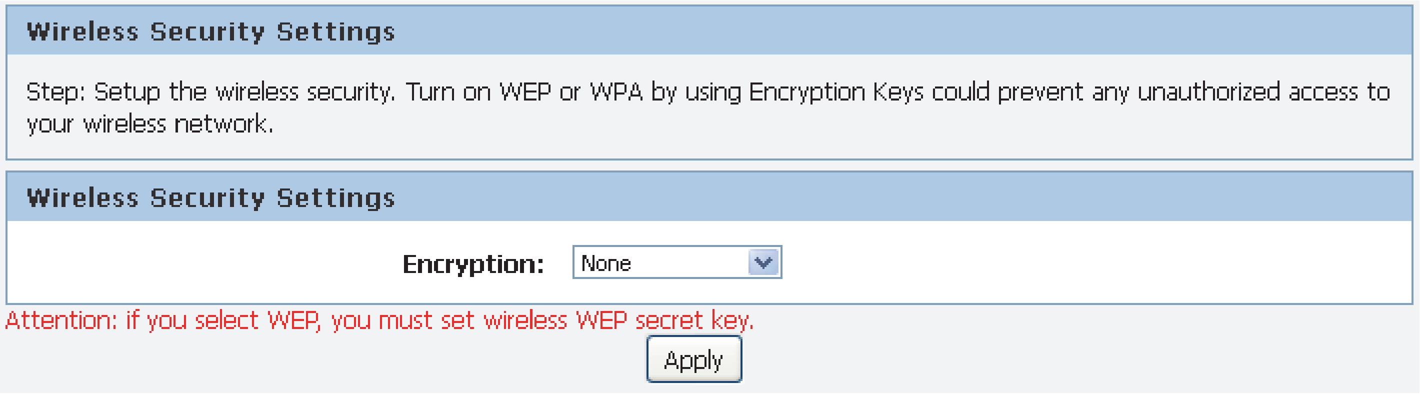
(DHCP mode will be set to "none" if the repeater is enabled.)

SSID of AP: WRT120N

#	SSID	MAC Address	Channel	Signal	Security	Select
1	WRT120N	68:7f:74:fb:fc:16	9	100%	WPA2-PSK(AES)	●

Click "Next" to Continue repeater settings

8. Setup Wireless Security Settings.
9. Click *Apply* button.



Wireless Security Settings

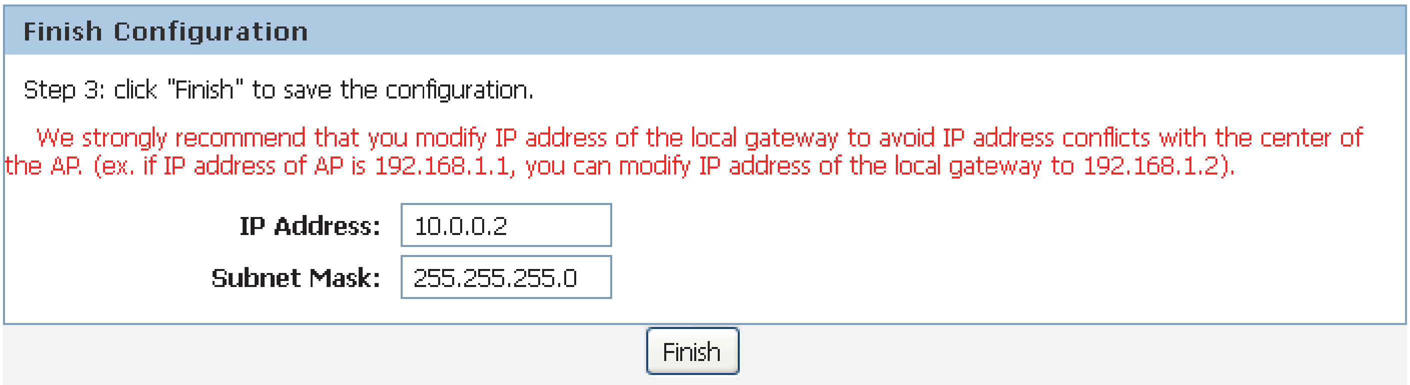
Step: Setup the wireless security. Turn on WEP or WPA by using Encryption Keys could prevent any unauthorized access to your wireless network.

Wireless Security Settings

Encryption: None

Attention: if you select WEP, you must set wireless WEP secret key.

10. We strongly recommend that you modify IP address of the local gateway to avoid IP address conflicts with the center of the AP. (ex. if IP address of AP is 192.168.1.1, you can modify IP address of the local gateway to 192.168.1.2).
11. Click *Finish* button.



Finish Configuration

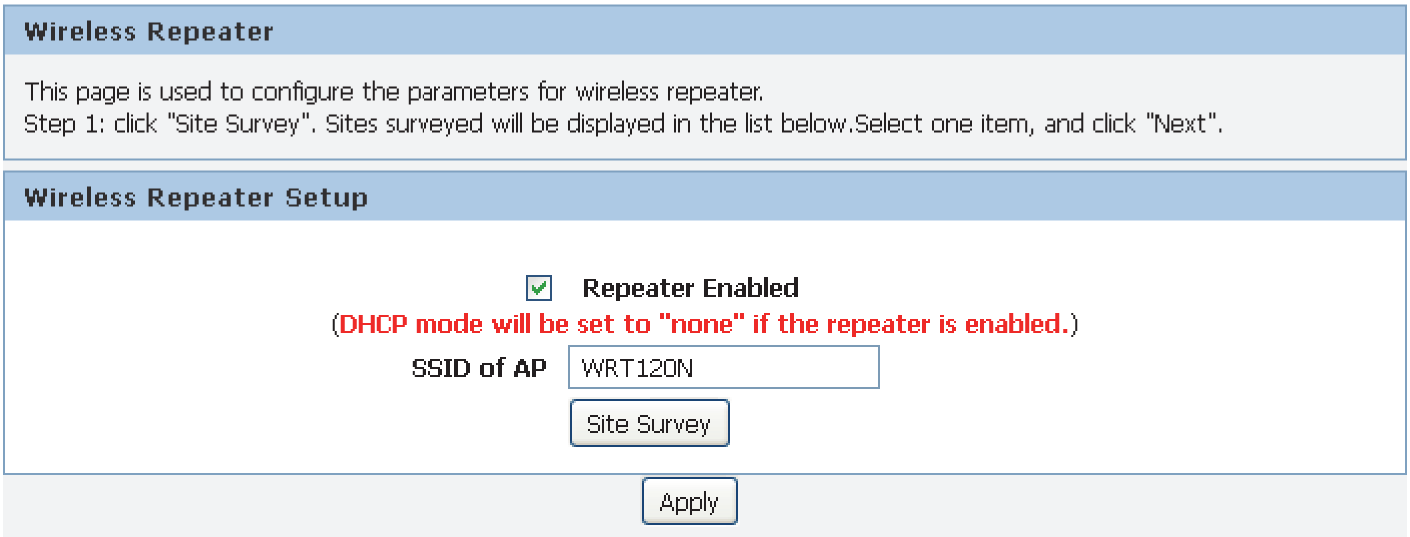
Step 3: click "Finish" to save the configuration.

We strongly recommend that you modify IP address of the local gateway to avoid IP address conflicts with the center of the AP. (ex. if IP address of AP is 192.168.1.1, you can modify IP address of the local gateway to 192.168.1.2).

IP Address: 10.0.0.2

Subnet Mask: 255.255.255.0

12. Click *Apply* button.



Wireless Repeater

This page is used to configure the parameters for wireless repeater.
Step 1: click "Site Survey". Sites surveyed will be displayed in the list below.Select one item, and click "Next".

Wireless Repeater Setup

☑ Repeater Enabled

(DHCP mode will be set to "none" if the repeater is enabled.)

SSID of AP: WRT120N

13 Access Control List Configuration

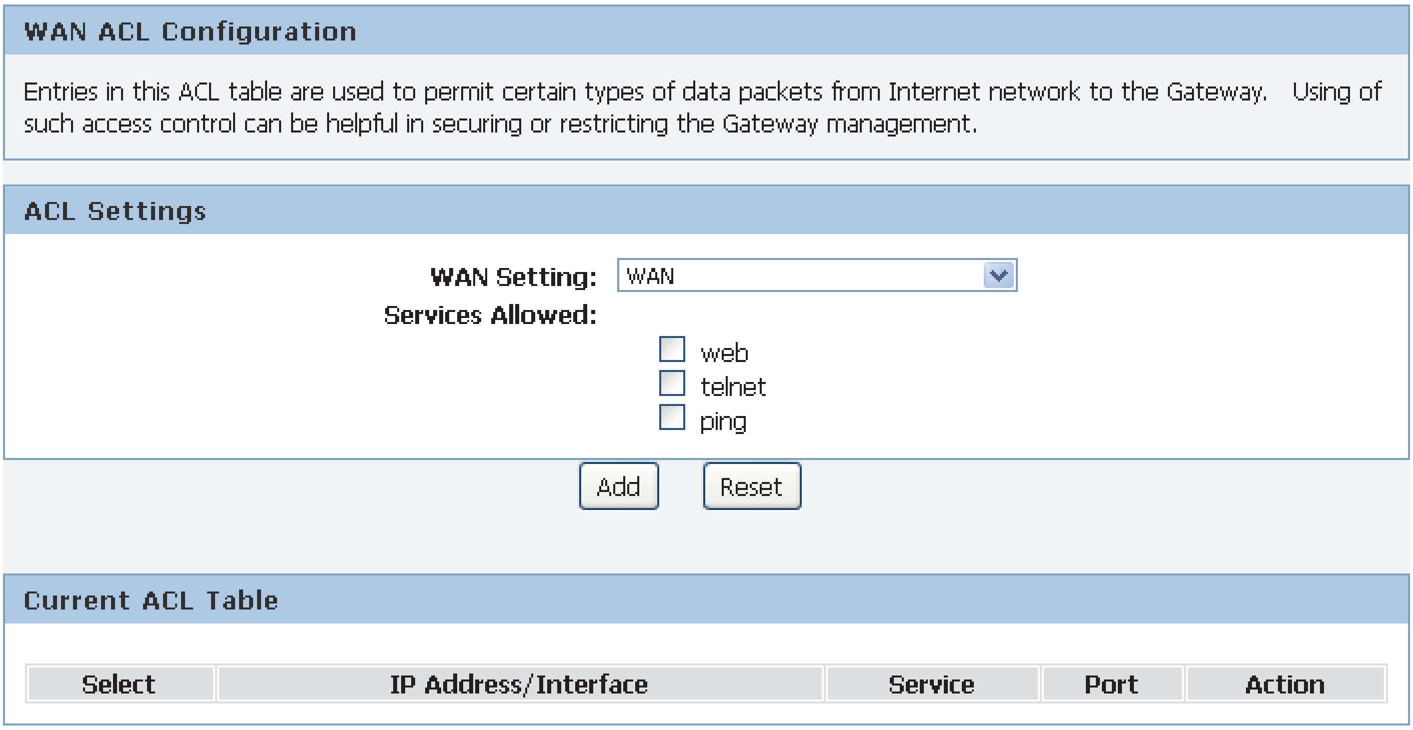
You can specify which services are accessable form WAN side.

Entries in this ACL table are used to permit certain types of data packets from your local network or Internet network to the Gateway.

Using of such access control can be helpful in securing or restricting the Gateway management.

Access Control List Config

1. From the *Advanced* menu, click on *Access Control List*. The following page is displayed:



WAN ACL Configuration

Entries in this ACL table are used to permit certain types of data packets from Internet network to the Gateway. Using of such access control can be helpful in securing or restricting the Gateway management.

ACL Settings

WAN Setting: WAN

Services Allowed:

□ web
□ telnet
□ ping

Current ACL Table

Select	IP Address/Interface	Service	Port	Action

Figure 6: ACL Configuration page

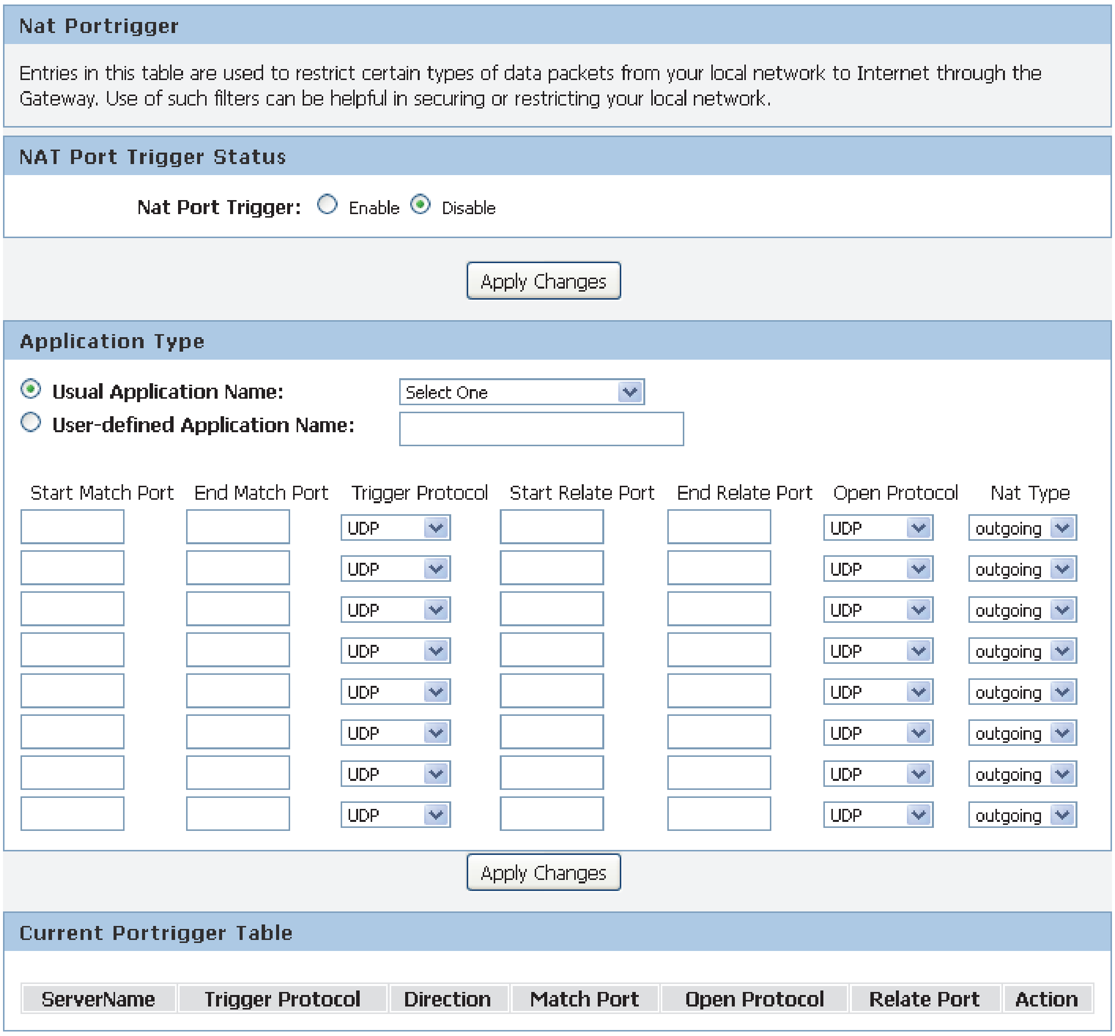
14 Port Triggering

Port Triggering is a special form of Port Forwarding in which it requires an outgoing connection before allowing incoming connections on a single or multiple port. Port Triggering is mostly used when your computer is behind a NAT router.

For example, if a gaming application sends outgoing data on ports 5000-6000 but receives the incoming data on port 111, typically behind a NAT router the router simply drops the data because it does not know which computer it should send requests to. But with port triggering you can tell the router to allow incoming data on port 111 when an outgoing data sends it through ports 5000-6000. It gives more flexibility than static port forwarding because you don't need to set it up for a specific computer.

Port Triggering Config

2. From the *Advanced* menu, click on *Port Triggering*. The following page is displayed:



Nat Portrigger

Entries in this table are used to restrict certain types of data packets from your local network to Internet through the Gateway. Use of such filters can be helpful in securing or restricting your local network.

NAT Port Trigger Status

Nat Port Trigger: ○ Enable ● Disable

Application Type

● **Usual Application Name:** Select One

○ **User-defined Application Name:**

Start Match Port	End Match Port	Trigger Protocol	Start Relate Port	End Relate Port	Open Protocol	Nat Type
		UDP			UDP	outgoing
		UDP			UDP	outgoing
		UDP			UDP	outgoing
		UDP			UDP	outgoing
		UDP			UDP	outgoing
		UDP			UDP	outgoing
		UDP			UDP	outgoing
		UDP			UDP	outgoing

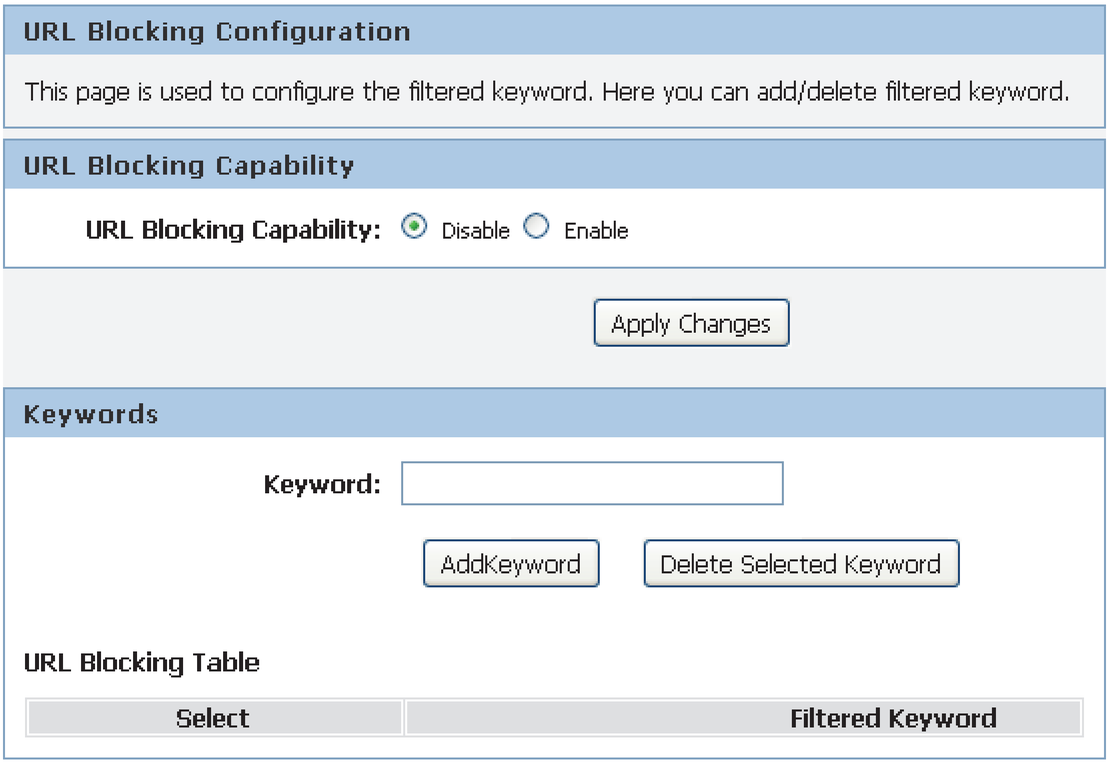
Current Portrigger Table

ServerName	Trigger Protocol	Direction	Match Port	Open Protocol	Relate Port	Action

15 URL Blocking

URL Blocking is used to deny LAN users from accessing the internet. Block those URLs which contain keywords listed below.

1. From the *Advanced -> URL Blocking* menu. The following page is displayed:



URL Blocking Configuration

This page is used to configure the filtered keyword. Here you can add/delete filtered keyword.

URL Blocking Capability

URL Blocking Capability: ● Disable ○ Enable

Keywords

Keyword:

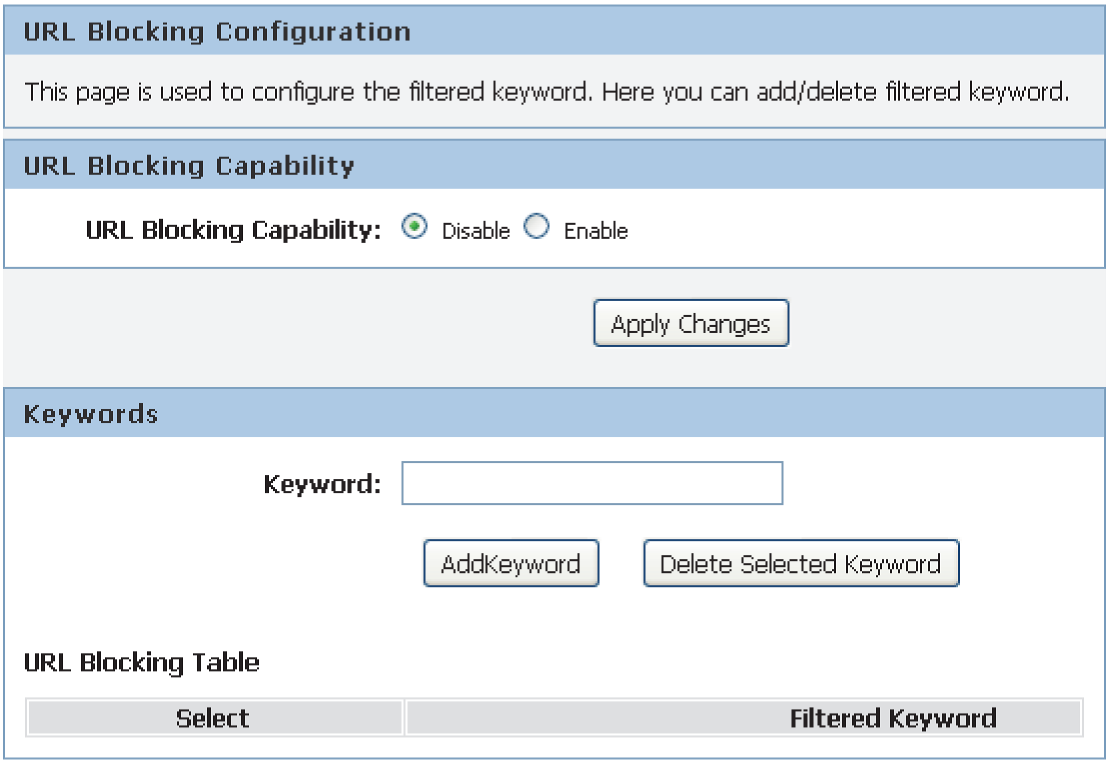
URL Blocking Table

Select	Filtered Keyword

URL Blocking for specified URL Address

Please follow example below to deny LAN users from accessing the Internet.

2. From the *Advanced -> URL Blocking* menu. The following page is displayed:



URL Blocking Configuration

This page is used to configure the filtered keyword. Here you can add/delete filtered keyword.

URL Blocking Capability

URL Blocking Capability: ● Disable ○ Enable

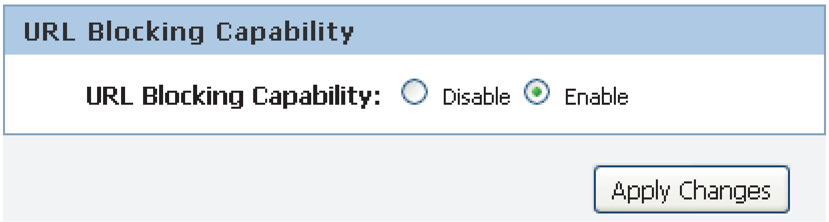
Keywords

Keyword:

URL Blocking Table

Select	Filtered Keyword

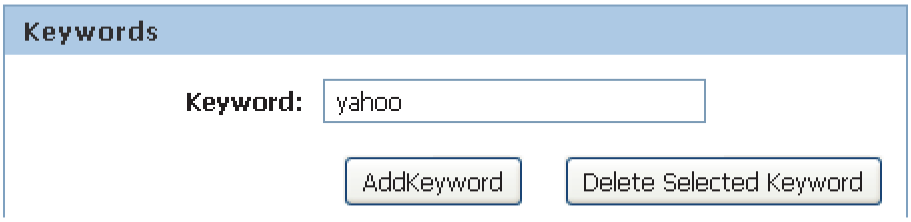
3. Enable URL Blocking Capability.
4. Click *Apply Changes*.



URL Blocking Capability

URL Blocking Capability: ○ Disable ● Enable

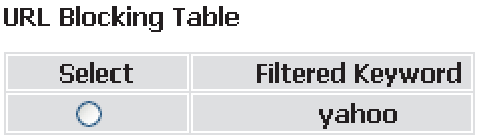
5. Enter the URL Address that you want to be denied for LAN user.
6. Click *AddKeyword*.



Keywords

Keyword: yahoo

7. Now the URL Filter that you created has been added and listed in the *Current Filter Table*.
8. Now the URL Address in the *Current Filter Table* cannot be visited.



URL Blocking Table

Select	Filtered Keyword
○	yahoo

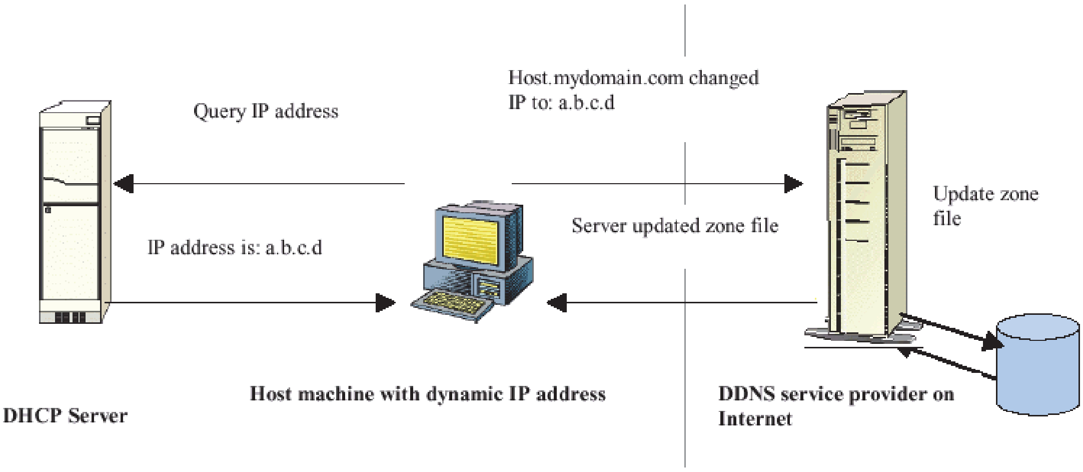
16 Dynamic DNS

When you want your internal server to be accessed by using DNS name rather than using the dynamic IP address, you can use the DDNS service. The DDNS server allows to alias a dynamic IP address to a static hostname.

This chapter provides you an overview of the Dynamic DNS feature of the modem and configuration details related to it.

Overview

If some host has a dynamic IP address that keeps changing frequently, it is difficult to keep updating the IP record that is associated with the domain name of this host in the zone files. This will result in non-accessibility of this host on the Internet. Dynamic DNS service allows to keep mapping of a dynamic IP address of such host to a static hostname. Dynamic DNS services are provided by many websites. The host needs to register with some website and get a domain name. When the IP address of the host changes, it just needs to send a message to the website that's providing dynamic DNS service to this host. For this to work, an automated update client needs to be implemented. These update clients send update messages to the servers whenever there is some change in the IP address of that host. Then, the server updates the entries for that host and replies back with some return code.



Above Figure explains one such scenario in which a host gets a dynamic IP address for itself from a DHCP server. As the host has registered with one of the dynamic DNS service providers on the Internet, it sends an update message to the service provider with host name and changed IP address. The service provider updates the new IP address of the host in the zone files that have entry for that host name and replies back with some return code. The return code communicates the success or failure of the update message. This process is repeated every time the host's IP address changes.

If the dynamic DNS service provider is notified of the same IP address again and again, then it considers it an abuse and might block the host name. To avoid this scenario, the IP address that was successfully updated to the ISP is stored on the unit. Whenever we receive an IP address change notification, the new IP address is compared with the IP address that was stored on the last update. If they differ, then only an update request is sent. However, when the system comes up there is no way of knowing what was the IP address on last successful update before the system went down. You need to give the command "system config save" periodically to save this IP address on Flash.

Registering With Dynamic DNS Service Provider

Currently, Wireless Gateway supports two Dynamic DNS service providers, www.tzo.com and www.dyndns.com. To use their Dynamic DNS service, you first need to visit the Web site of a service provider and register. While registering, you need to provide your username, password, and hostname as mandatory parameters. A service provider may also prompt you to fill some optional parameters.

Configuring IP Interfaces

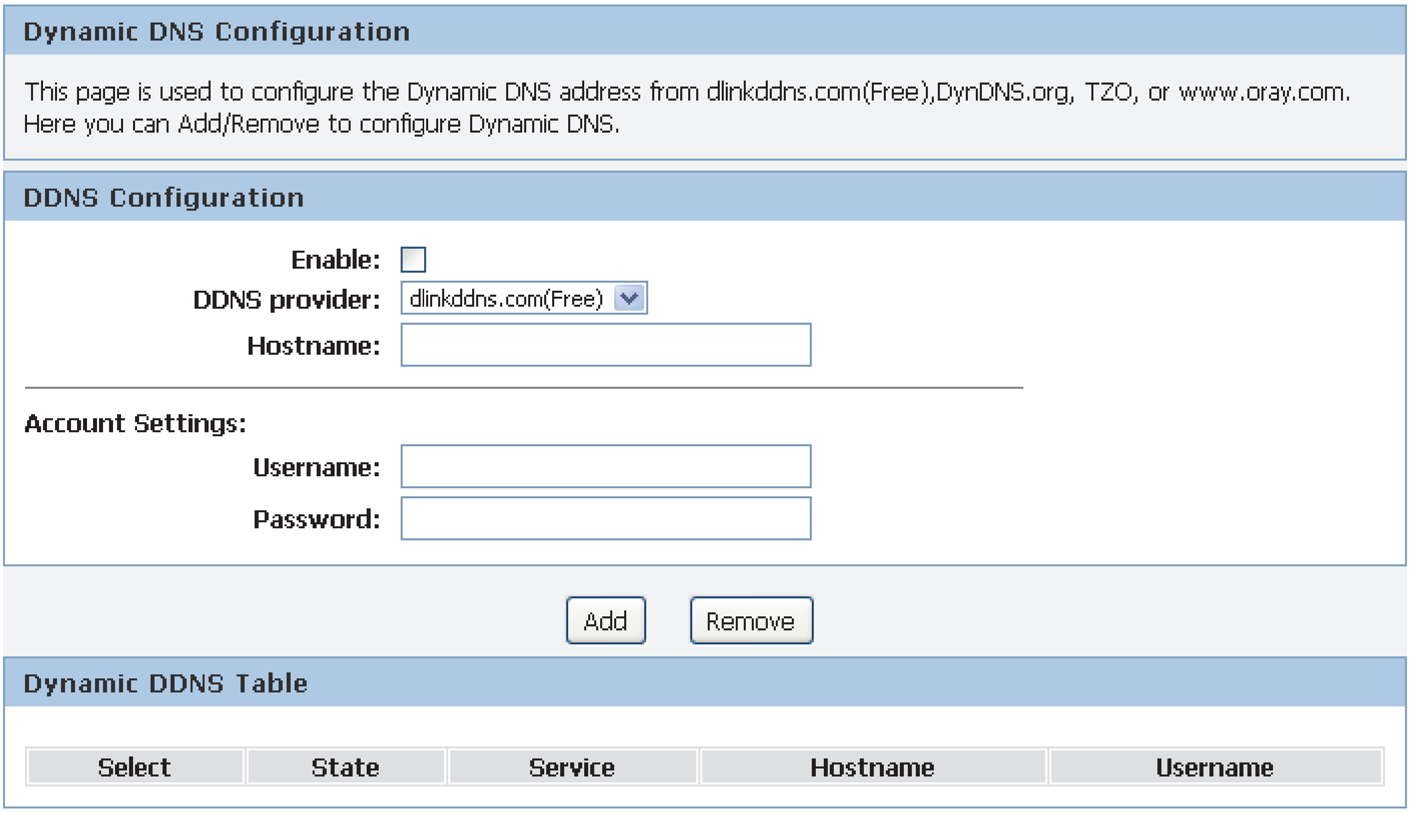
You need to create a Dynamic DNS interface per IP interface and can only create one Dynamic DNS interface service on one IP interface. For more information on creating IP interfaces, refer to section Creating IP interfaces.

Note

www.dyndns.org provides three kinds of services - Dynamic DNS, Custom DNS and Static DNS. You can create different domains in these systems. Custom DNS service is a full DNS solution for newly purchased domains or domains you already own. A web-based interface provides complete control over resource records and your entire domain, including support for dynamic IPs and automated updates. Static DNS service points a DNS hostname in some domain owned by dyndns.org to the user's ISP-assigned static or pseudo-static IP address.

DynDNS service points a fixed hostname in some domain owned by dyndns.org to the user's ISP-assigned dynamic IP address. This allows more frequent update of IP addresses, than allowed by Static DNS.

1. From the *Advanced -> Dynamic DNS* menu. The following page is displayed:



Dynamic DNS Configuration

This page is used to configure the Dynamic DNS address from dlinkddns.com(Free),DynDNS.org, TZO, or www.oray.com. Here you can Add/Remove to configure Dynamic DNS.

DDNS Configuration

Enable:	□
DDNS provider:	dlinkddns.com(Free)
Hostname:	

Account Settings:

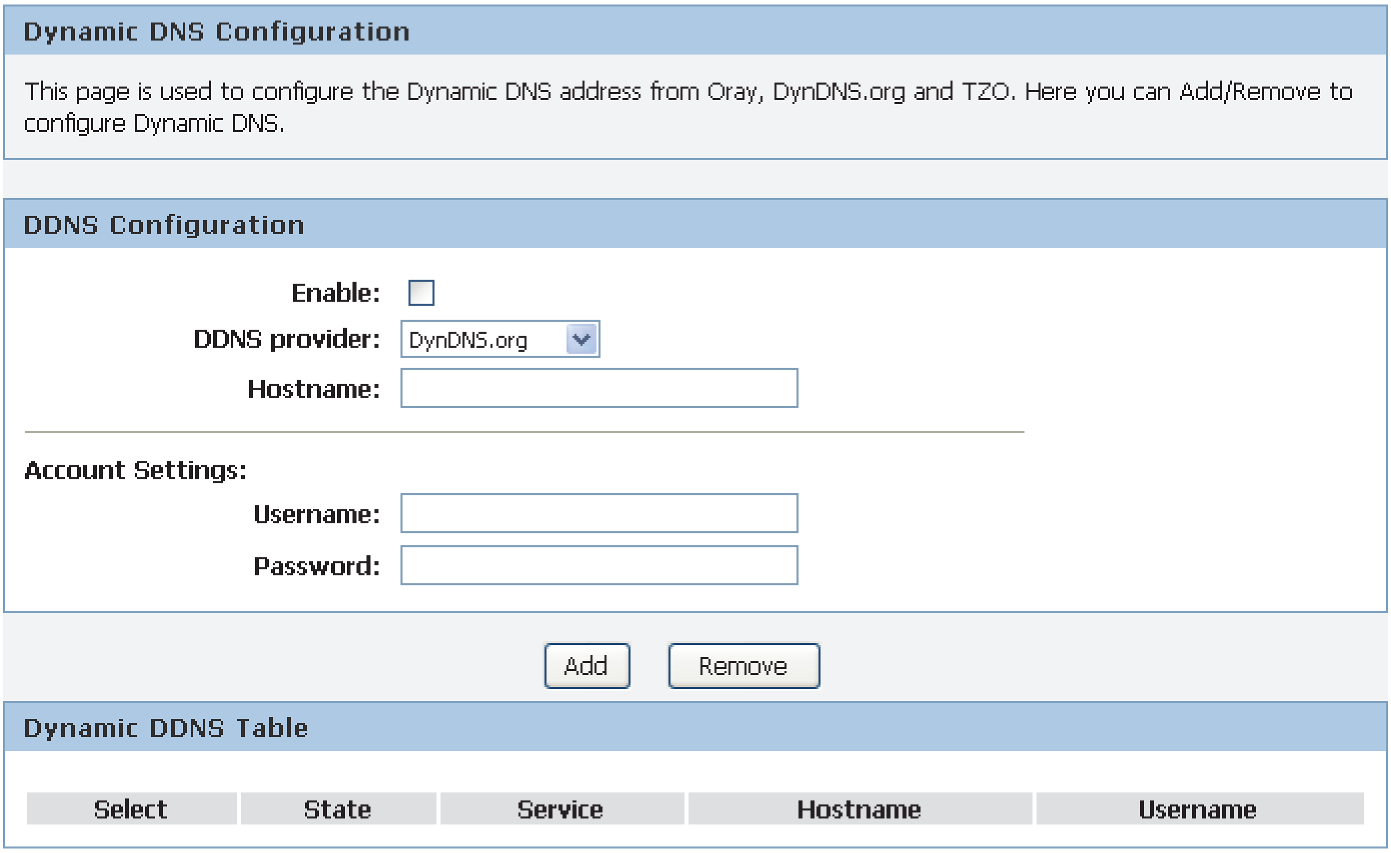
Username:	
Password:	

Dynamic DDNS Table

Select	State	Service	Hostname	Username

Configure DynDNS

2. From the *Advanced -> Dynamic DNS* menu. The following page is displayed:



Dynamic DNS Configuration

This page is used to configure the Dynamic DNS address from Oray, DynDNS.org and TZO. Here you can Add/Remove to configure Dynamic DNS.

DDNS Configuration

Enable: □

DDNS provider: DynDNS.org

Hostname:

Account Settings:

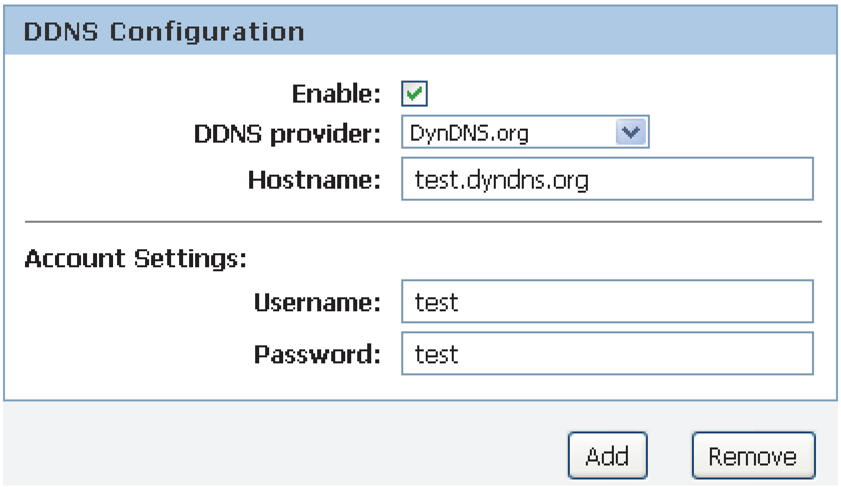
Username:

Password:

Dynamic DDNS Table

Select	State	Service	Hostname	Username

3. *Enable DDNS*
4. Select the DynDNS.org from the *Service Provider* drop-down list.
5. Type your own unique *User Name*, *Password* and *Domain Name* which you applied from www.dyndns.com in the relevant boxes. They can be any combination of letters or numbers with a maximum of 20 characters.
6. Click *Add*.



DDNS Configuration

Enable: ☑

DDNS provider: DynDNS.org

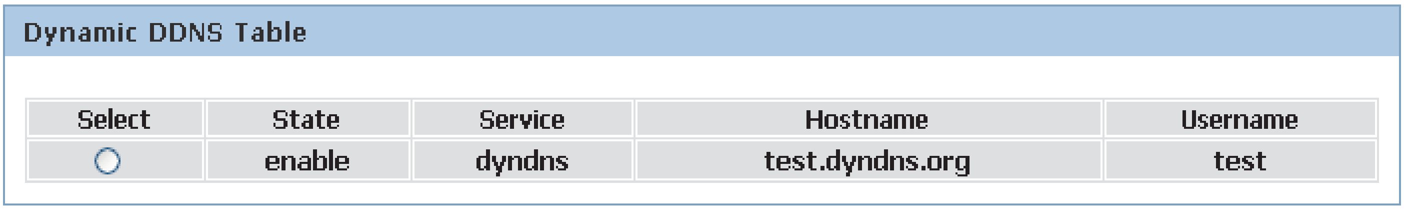
Hostname: test.dyndns.org

Account Settings:

Username: test

Password: test

7. Now the Dynamic DNS that you created has been added and listed in the *Dynamic DDNS Table*.

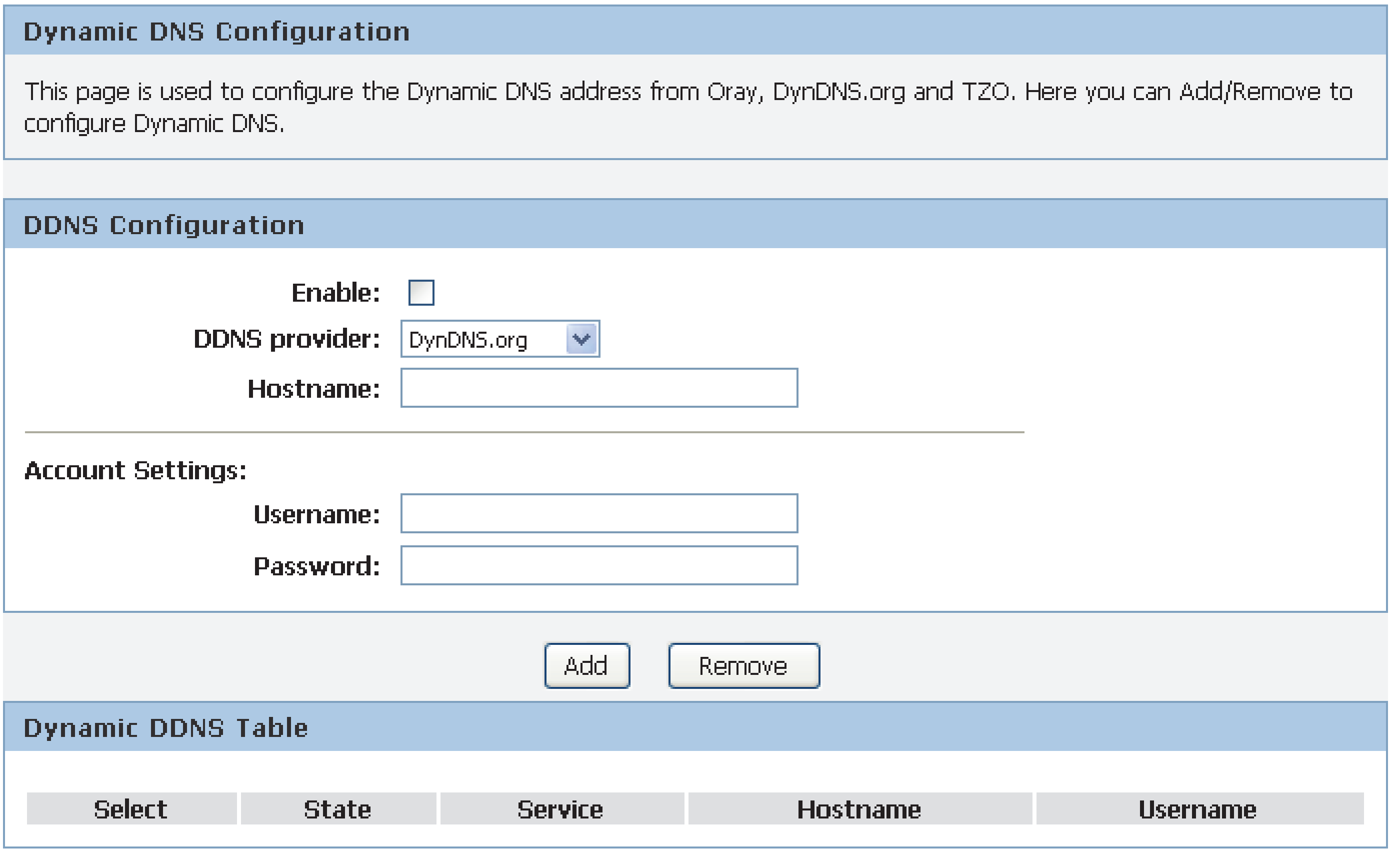


Dynamic DDNS Table

Select	State	Service	Hostname	Username
○	enable	dyndns	test.dyndns.org	test

Configure TZO

1. From the *Advanced -> Dynamic DNS* menu. The following page is displayed:



Dynamic DNS Configuration

This page is used to configure the Dynamic DNS address from Oray, DynDNS.org and TZO. Here you can Add/Remove to configure Dynamic DNS.

DDNS Configuration

Enable: □

DDNS provider: DynDNS.org

Hostname:

Account Settings:

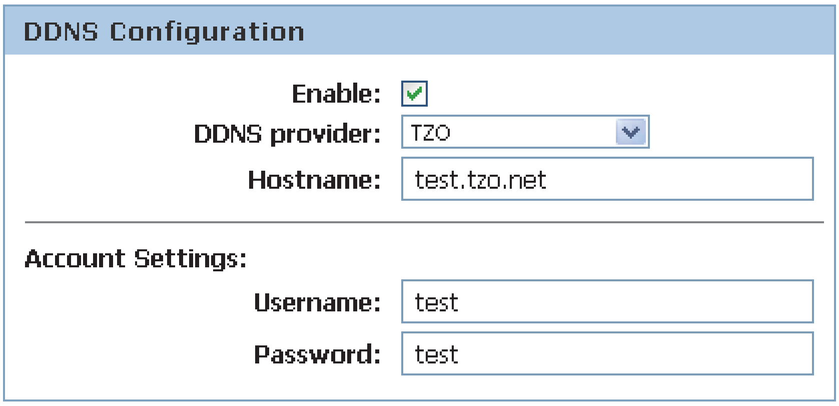
Username:

Password:

Dynamic DDNS Table

Select	State	Service	Hostname	Username

2. *Enable DDNS*
3. Select the TZO from the *Service Provider* drop-down list.
4. Type your own unique *Email*, *Key* and *Domain Name* which you applied from http://www.tzo.com/MainPageWebClient/clientsignup.html in the relevant boxes. They can be any combination of letters or numbers with a maximum of 20 characters.
5. Click *Add*.



DDNS Configuration

Enable: ☑

DDNS provider: TZO

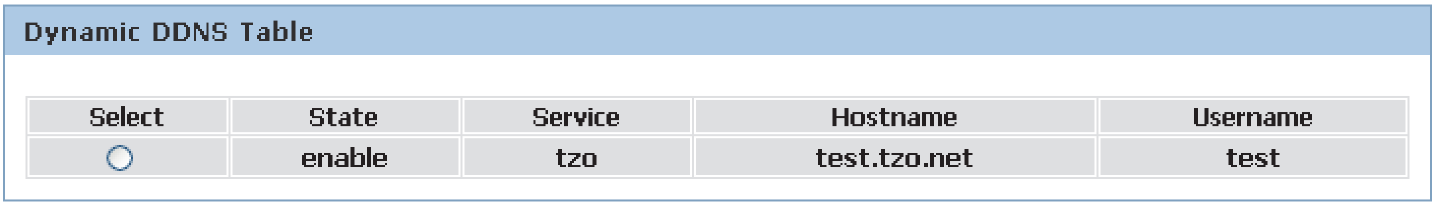
Hostname: test.tzo.net

Account Settings:

Username: test

Password: test

6. Now the Dynamic DNS that you created has been added and listed in the *Dynamic DDNS Table*.



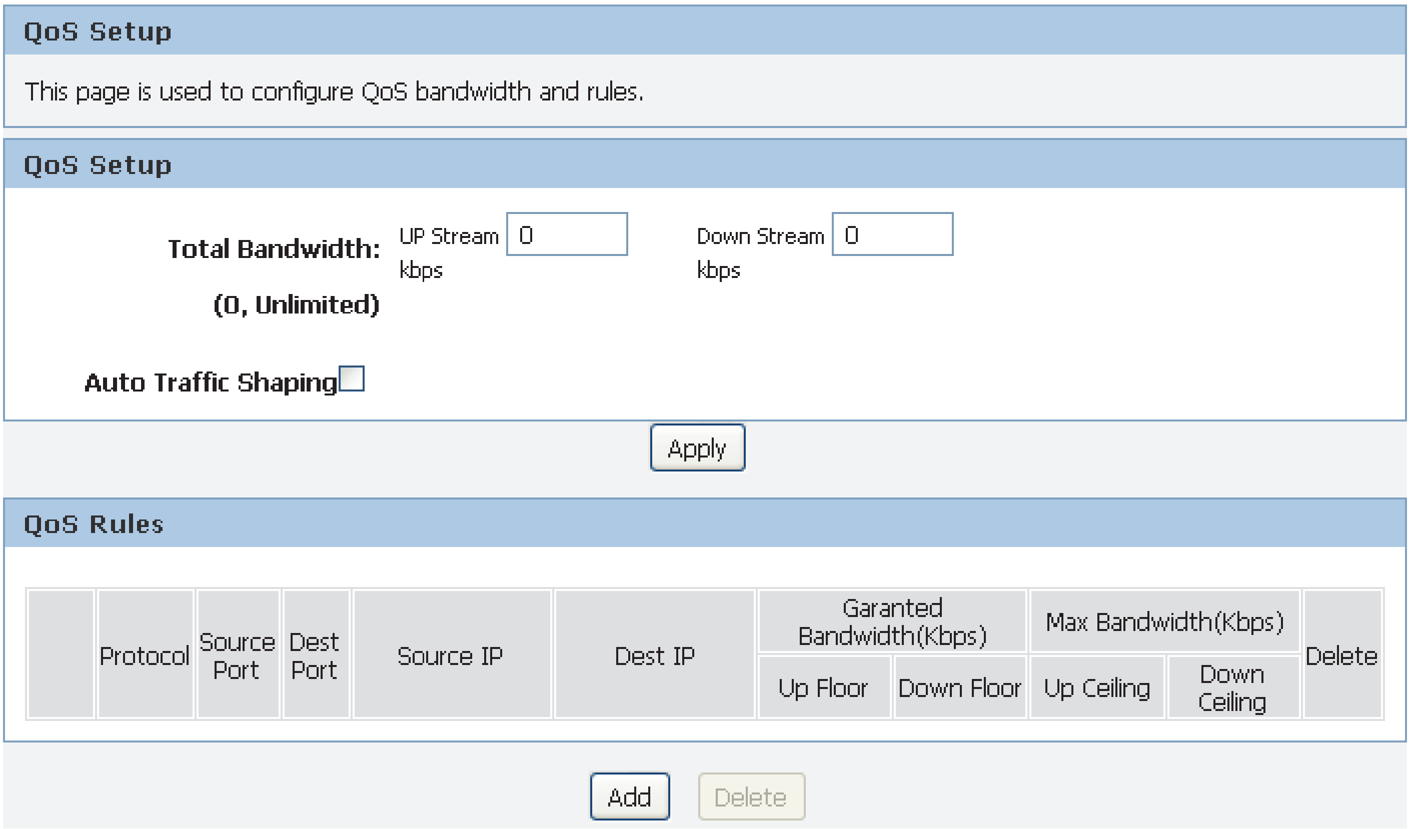
Dynamic DDNS Table

Select	State	Service	Hostname	Username
○	enable	tzo	test.tzo.net	test

17 QoS

QoS is a pro-active measures to adjust the output rate of flow. The role is to limit the outflow of a network traffic of a connection with sudden, so that such packets to send out a uniform rate. You can add traffic shaping rules.

1. From the *Advanced -> QoS Setup* menu. The following page is displayed:



QoS Setup

This page is used to configure QoS bandwidth and rules.

QoS Setup

Total Bandwidth: UP Stream 0 kbps Down Stream 0 kbps

(0, Unlimited)

Auto Traffic Shaping □

Apply

QoS Rules

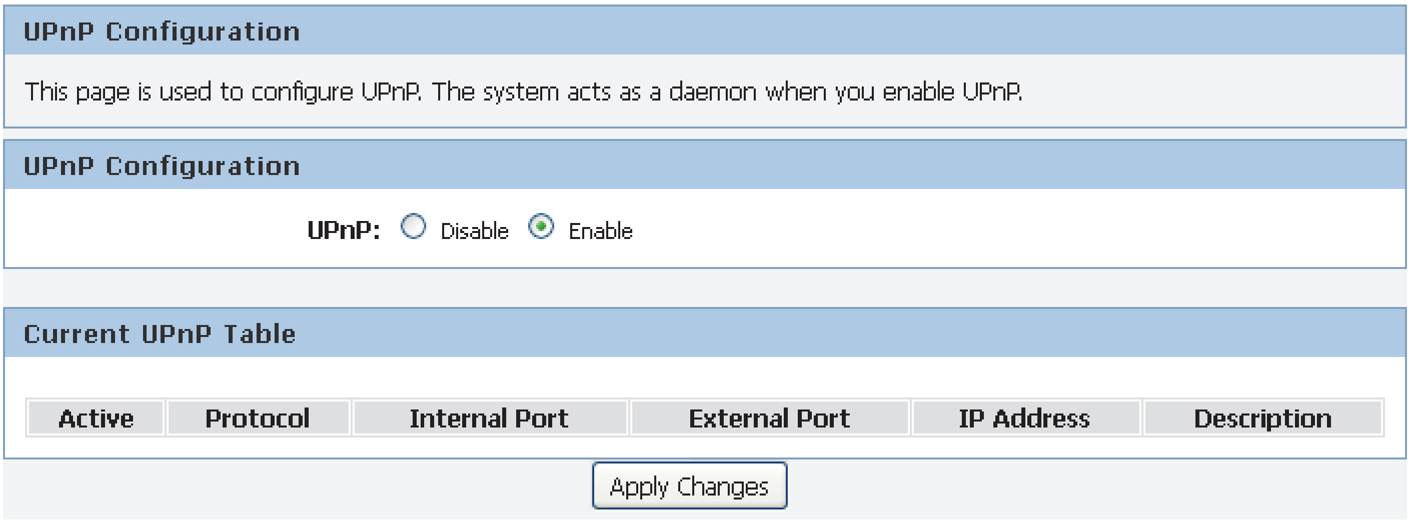
	Protocol	Source Port	Dest Port	Source IP	Dest IP	Garanted Bandwidth(Kbps)		Max Bandwidth(Kbps)		Delete
						Up Floor	Down Floor	Up Ceiling	Down Ceiling	

Add Delete

18 UPnP

UPnP is short for Universal Plug and Play, which is a networking architecture that provides compatibility among networking equipment, software, and peripherals. This router has optional UPnP capability, and can work with other UPnP devices and software.

1. From the *Advanced -> UPnP* menu. The following page is displayed:



UPnP Configuration

This page is used to configure UPnP. The system acts as a daemon when you enable UPnP.

UPnP Configuration

UPnP: ○ Disable ● Enable

Current UPnP Table

Active	Protocol	Internal Port	External Port	IP Address	Description

19 Virtual Server

Your device has built in advanced Security features that protect your network by blocking unwanted traffic from the Internet.

If you simply want to connect from your local network to the Internet, you do not need to make any changes to the default Security configuration. You only need to edit the configuration if you wish to do one or both of the following:

- allow Internet users to browse the user pages on your local network (for example, by providing an FTP or HTTP server)
- play certain games which require accessibility from the Internet

This chapter describes how to configure Security to suit the needs of your network.

By default, the IP addresses of your LAN PCs are hidden from the Internet. All data sent from your LAN PCs to a PC on the Internet appears to come from the IP address of your device.

In this way, details about your LAN PCs remain private. This security feature is called *Port Forwarding*.

Configuring Virtual Server

Certain network games, chat or file sharing software do not work with your default Port Forwarding setting. Your device knows the port, protocol and trigger information needed to allow access to the common applications listed below, but by default, access to them is disabled.

Application	TCP port number	UDP port number	Trigger required?
E-mail	110, 25	N/A	false
News	119	N/A	false
MSN Messenger	1863	N/A	false
Yahoo! Instant Messenger	5050 5055 5100	N/A	false
AOL Instant Messenger	5190	N/A	false
Internet Relay Chat (IRC)	194	194	false
Netmeeting (h323)	1720	N/A	true
	N/A	1719	true
	1731 522	N/A	false
Real Audio	544 7070	544 6770	false
Ping	N/A (ICMP)	N/A (ICMP)	false
Web connections (HTTP, HTTPS)	80, 443	N/A	false
DialPad	51210	N/A	true

Application	TCP port number	UDP port number	Trigger required?
	N/A	51200 51201	true
FTP	21	N/A	false
Telnet	23	N/A	false
Secure shell (SSH)	22	N/A	false
Windows Media Services	1755	1755	false
Gnutella	6346	N/A	false
Kazaa	1214	N/A	false
Windows Terminal Server	3389	N/A	false
DNS	N/A	53	false
PPTP	1723	1723	false
Internet Key Exchange	N/A	500	false
LDAP	389	N/A	false
GRE	N/A (GRE)	N/A (GRE)	false
Databeam (T.120)	1503	N/A	false

You can enable access to a common application from a specific PC on your network.

If you want to allow access to an application that is **not** included on the above list of common applications, you can create and enable a *custom* application.

Configuring custom applications

If you want to enable access to an application that does not appear on your device's default list of common applications you can create a custom application.

In order to create a custom application, you must know:

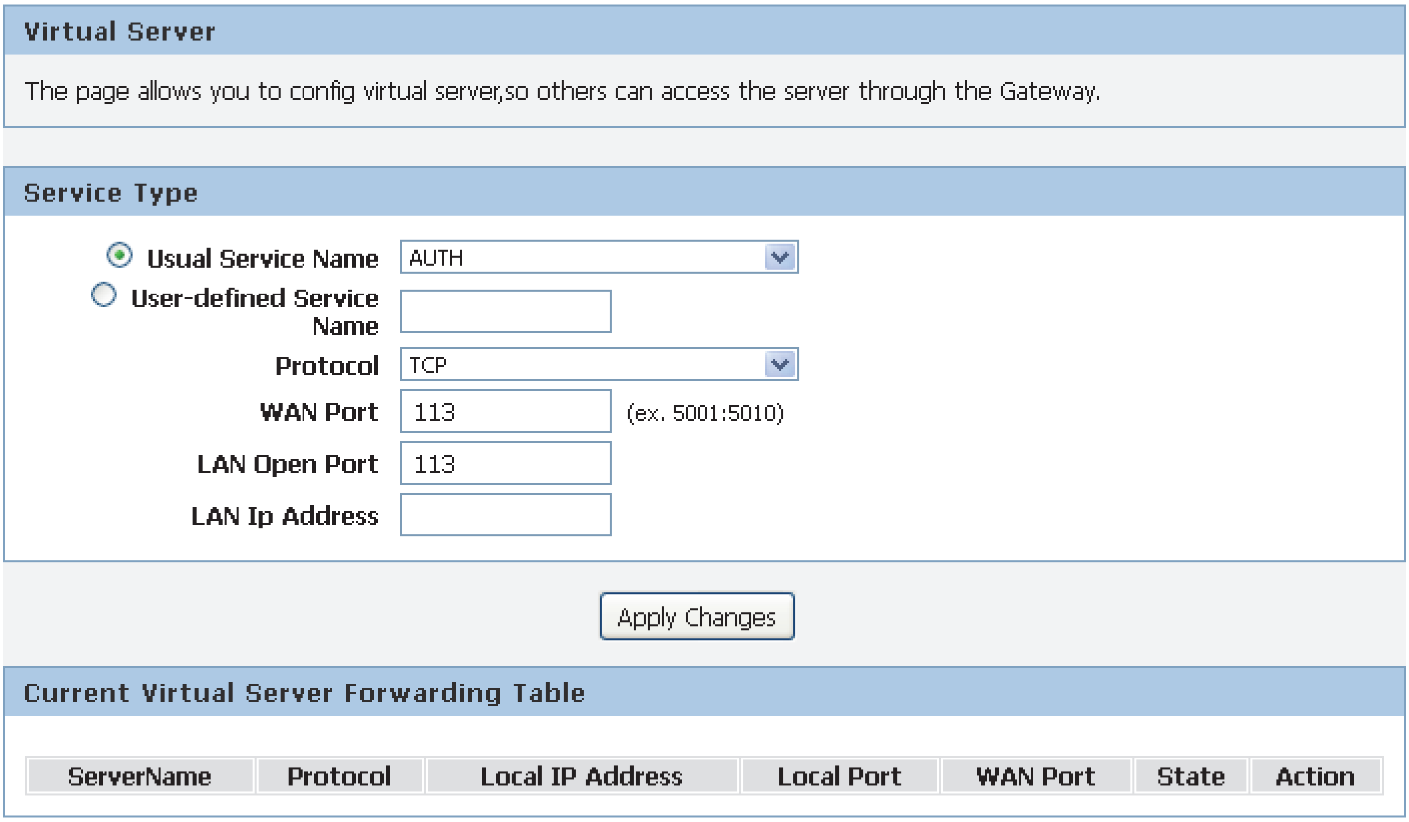
1. the protocol used by the application (e.g., TCP, UDP and so on)
2. the primary port or range of ports used by the application
3. whether the application requires a trigger, and if so, the secondary port or range of ports used by the application
4. the address translation type used by the trigger

Your application provider or games manufacturer should provide you with these details.

Virtual Server for FTP

In this example configuration, a custom application called *FTP Server* using TCP port 21 is created.

5. From the *Advanced -> Virtual Server* menu. The following page is displayed:



Virtual Server

The page allows you to config virtual server,so others can access the server through the Gateway.

Service Type

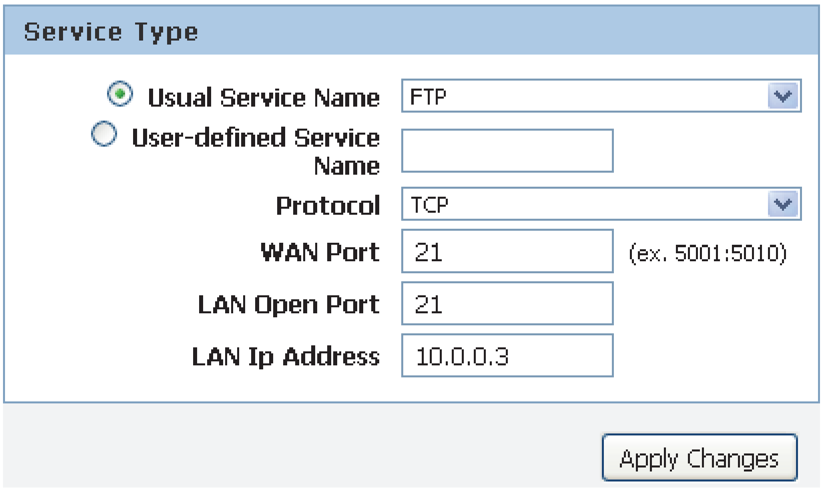
● Usual Service Name	AUTH
○ User-defined Service Name	
Protocol	TCP
WAN Port	113 (ex. 5001:5010)
LAN Open Port	113
LAN Ip Address	

Apply Changes

Current Virtual Server Forwarding Table

ServerName	Protocol	Local IP Address	Local Port	WAN Port	State	Action

6. Select *FTP* from the *Usual Service Name* drop-down list.
7. Select *TCP* from the *Protocol* drop-down list.
8. Type the Local IP Address for your FTP Server.
9. Click *Apply Changes*



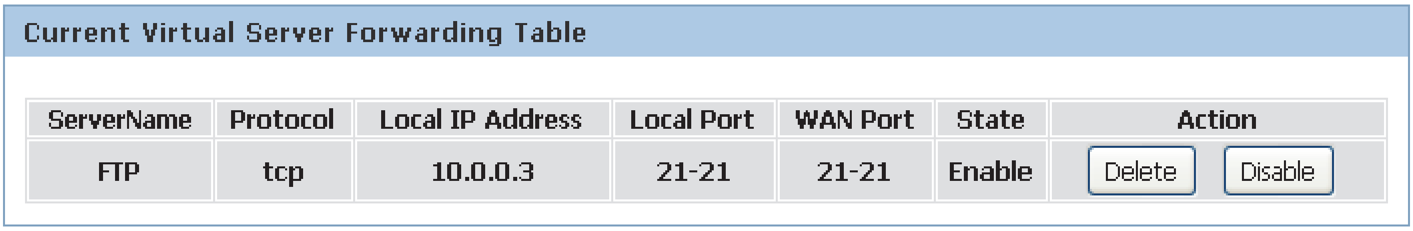
Service Type

● Usual Service Name	FTP
○ User-defined Service Name	
Protocol	TCP
WAN Port	21 (ex. 5001:5010)
LAN Open Port	21
LAN Ip Address	10.0.0.3

Fields on the first setting block	Description
Usual Service Name	The usual Service is listed here.
User-defined Service Name	To define the Service Name manually.
Protocol	There are 2 options available: TCP, UDP.
WAN Port	The destination port number that is made open for this application on the WAN-side
LAN Open Port	The destination port number that is made open for this application on the LAN-side.
LAN Ip Address	IP address of your local server that will be accessed by Internet.

Function Button	Description
Apply Changes	Click to change the setting of default actions to the configuration.
Delete	Delete the selected port forwarding rules from the forwarding table. You can click the checkbox at the **Select** column to select the forwarding rule.
Disable	Disable forwarding rules from the forwarding table.

10. Configure Virtual Server setting successfully!



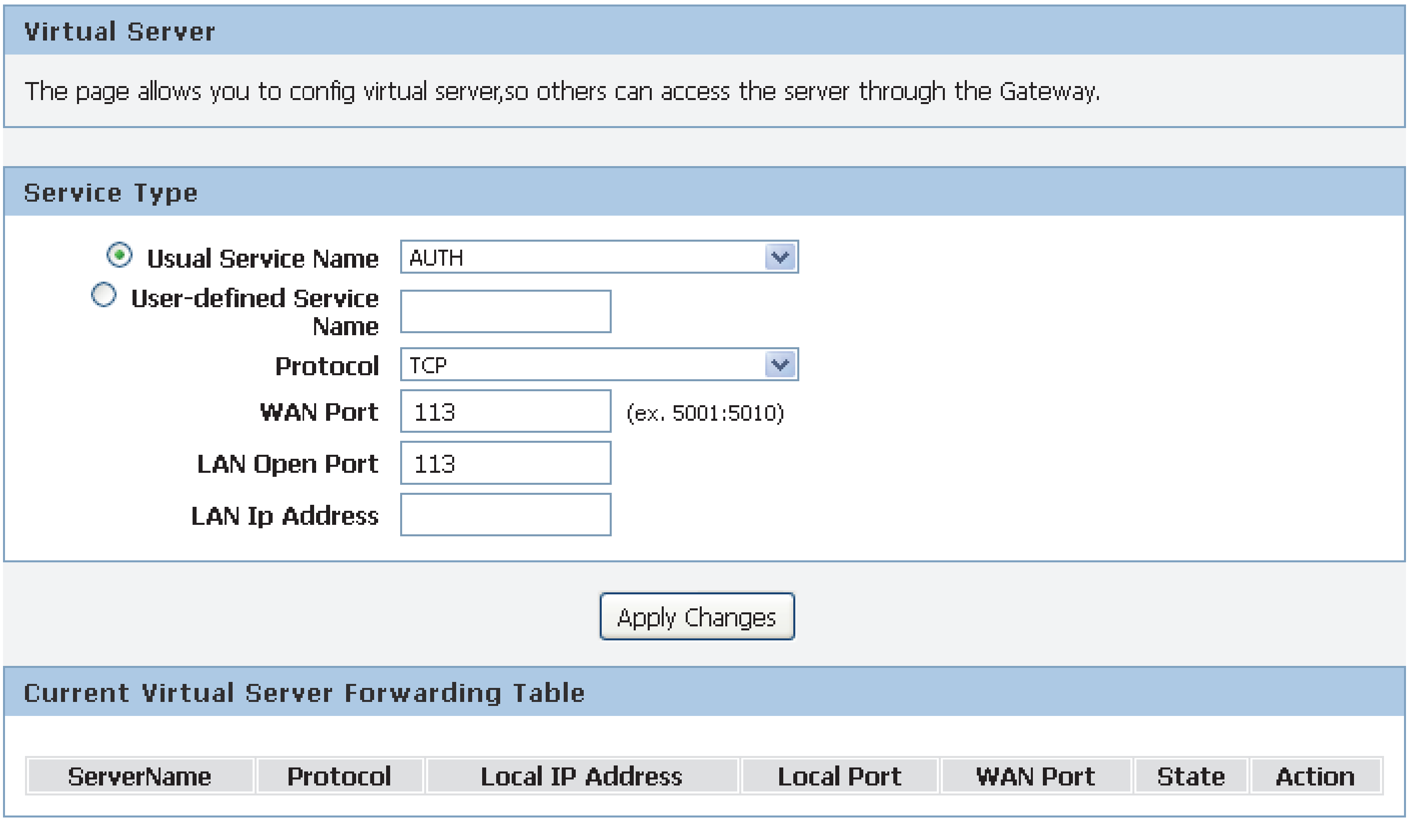
Current Virtual Server Forwarding Table

ServerName	Protocol	Local IP Address	Local Port	WAN Port	State	Action
FTP	tcp	10.0.0.3	21-21	21-21	Enable	Delete Disable

Port Forwarding for HTTP

In this example configuration, a custom application called *HTTP Server* using TCP port 80 is created.

1. From the *Advanced -> Virtual Server* menu. The following page is displayed:



Virtual Server

The page allows you to config virtual server,so others can access the server through the Gateway.

Service Type

● Usual Service Name: AUTH

○ User-defined Service Name:

Protocol: TCP

WAN Port: 113 (ex. 5001:5010)

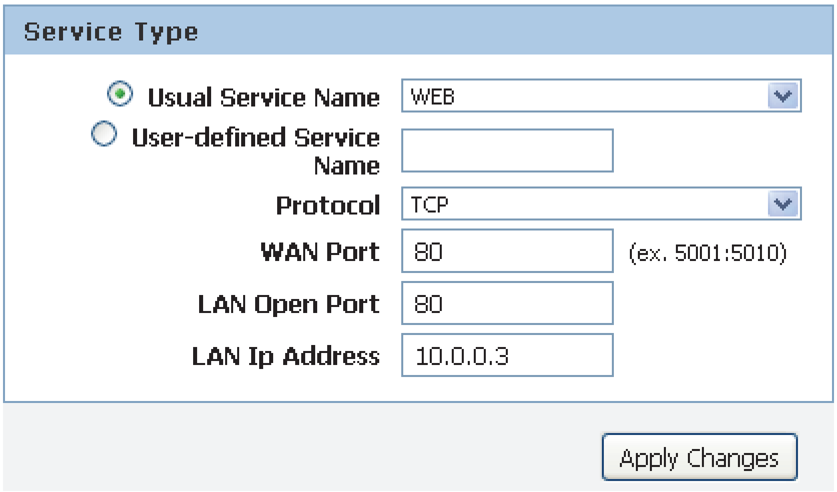
LAN Open Port: 113

LAN Ip Address:

Current Virtual Server Forwarding Table

ServerName	Protocol	Local IP Address	Local Port	WAN Port	State	Action

2. Select *WEB* from the *Usual Service Name* drop-down list.
3. Select *TCP* from the *Protocol* drop-down list.
4. Type the Local IP Address for your HTTP Server.
5. Click *Apply Changes*



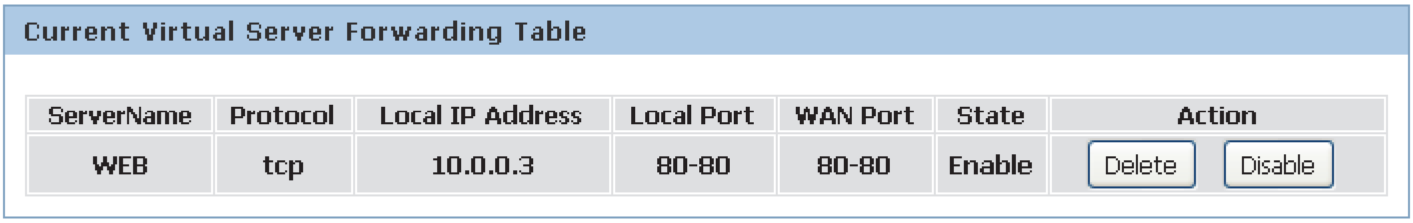
Service Type

● Usual Service Name: WEB
○ User-defined Service Name:
Protocol: TCP
WAN Port: 80 (ex. 5001:5010)
LAN Open Port: 80
LAN Ip Address: 10.0.0.3

Fields on the first setting block	Description
Usual Service Name	The usual Service is listed here.
User-defined Service Name	To define the Service Name manually.
Protocol	There are 2 options available: TCP, UDP.
WAN Port	The destination port number that is made open for this application on the WAN-side
LAN Open Port	The destination port number that is made open for this application on the LAN-side.
LAN Ip Address	IP address of your local server that will be accessed by Internet.

Function Button	Description
Apply Changes	Click to change the setting of default actions to the configuration.
Delete	Delete the selected port forwarding rules from the forwarding table. You can click the checkbox at the **Select** column to select the forwarding rule.
Disable	Disable forwarding rules from the forwarding table.

6. Configure Virtual Server setting successfully!

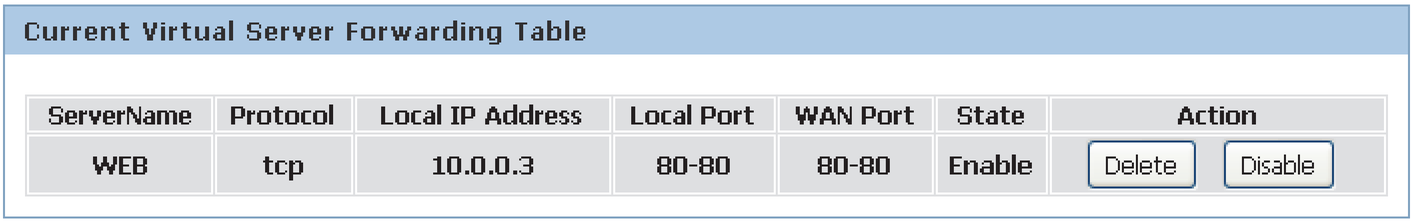


Current Virtual Server Forwarding Table

ServerName	Protocol	Local IP Address	Local Port	WAN Port	State	Action
WEB	tcp	10.0.0.3	80-80	80-80	Enable	Delete Disable

Deleting custom applications

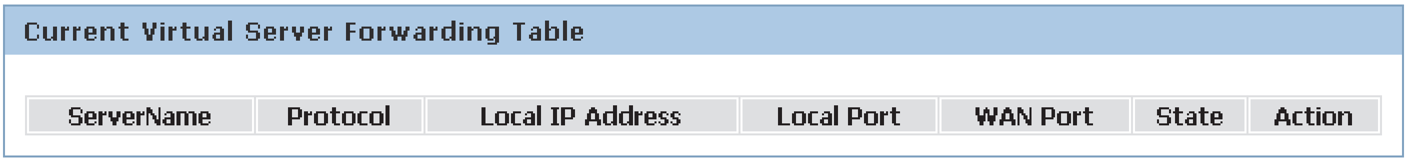
1. From the *Advanced -> Virtual Server* menu. The following page is displayed:
2. Click *Delete*.



Current Virtual Server Forwarding Table

ServerName	Protocol	Local IP Address	Local Port	WAN Port	State	Action
WEB	tcp	10.0.0.3	80-80	80-80	Enable	Delete Disable

3. The Port Forwarding setting has been deleted completely.



Current Virtual Server Forwarding Table

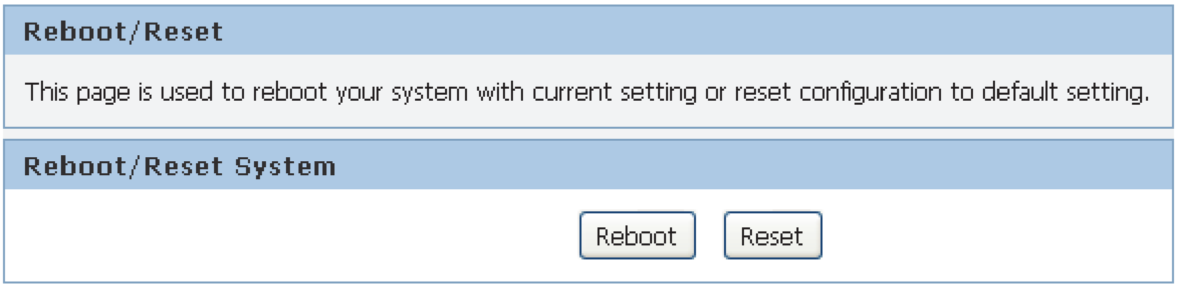
ServerName	Protocol	Local IP Address	Local Port	WAN Port	State	Action

20 Reboot/Reset

Restarts the router with current setting or default setting.

Reboot/Reset

1. From the *Maintenance* -> *Reboot* menu. The following page is displayed:



Reboot/Reset

This page is used to reboot your system with current setting or reset configuration to default setting.

Reboot/Reset System

Fields on the first setting block	Description
Reboot	Restarts the router for the settings to take effect.
Reset	Restarts the router with factory default setting.

21 Firmware Upgrade

About firmware versions

Firmware is a software program. It is stored as read-only memory on your device.

Your device can check whether there are later firmware versions available. If there is a later version, you can download it via the Internet and install it on your device.

Note

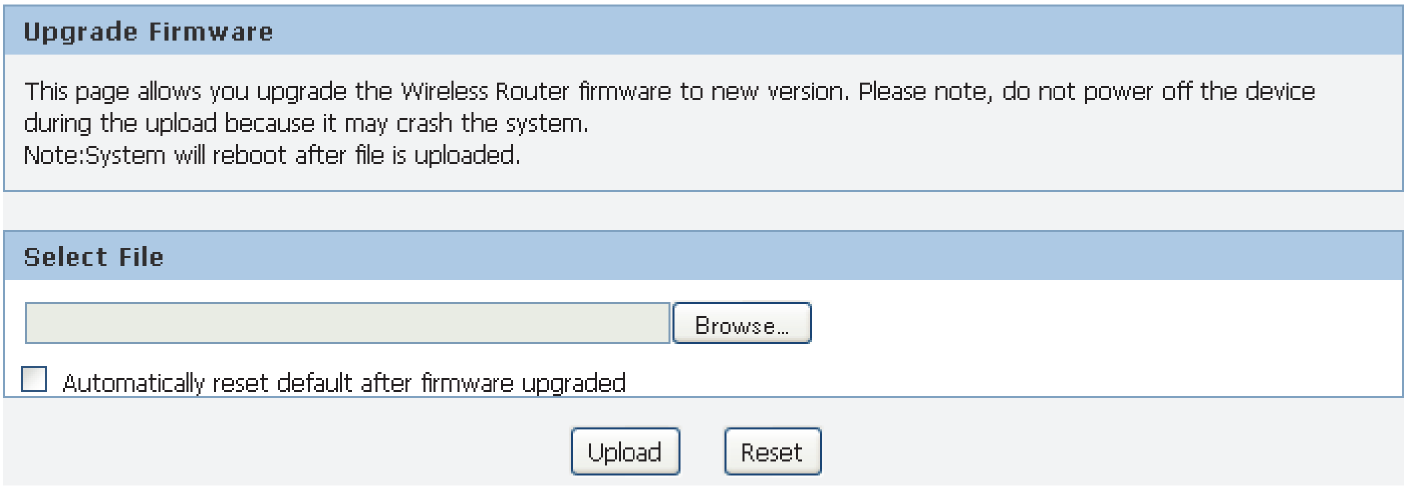
If there is a firmware update available you are strongly advised to install it on your device to ensure that you take full advantage of any new feature developments.

Manually updating firmware

You can manually download the latest firmware version from provider's website to your PC's file directory.

Once you have downloaded the latest firmware version to your PC, you can manually select and install it as follows:

1. From the *Maintenance -> Firmware Upgrade* menu. The following page is displayed:
2. Click on the *Browse…* button.
3. Once you have selected the file to be installed, click *Open*. The file's directory path is displayed in the *New Firmware Image:* text box.
4. Click *Automatically reset default after firmware upgraded*.
5. Click *Upload*.



Upgrade Firmware

This page allows you upgrade the Wireless Router firmware to new version. Please note, do not power off the device during the upload because it may crash the system.
Note:System will reboot after file is uploaded.

Select File

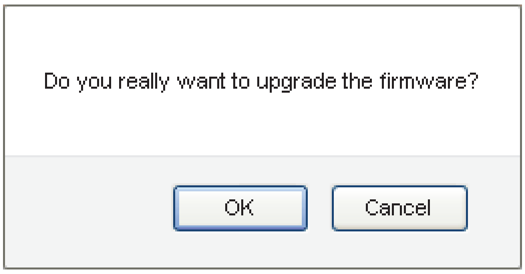
□ Automatically reset default after firmware upgraded

Figure 7: Manual Update Installation section

(Note that if you are using certain browsers (such as *Opera 7*) the *Browse* button is labeled *Choose*.)

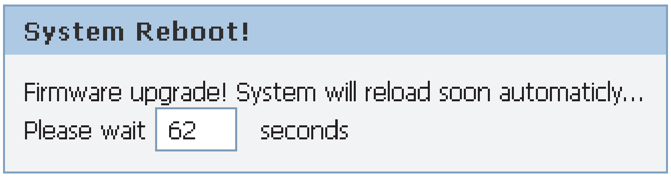
Use the *Choose file* box to navigate to the relevant directory where the firmware version is saved.

6. Click *OK*.



Do you really want to upgrade the firmware?

7. The device checks that the selected file contains an updated version of firmware. A status screen pops up, please wait for a while…….
8. The device checks that the selected file contains an updated version of firmware. A status screen pops up, please wait for a while…….



System Reboot!

Firmware upgrade! System will reload soon automaticly...

Please wait 62 seconds

22 Backup/Restore Settings

This page allows you save current settings to a file or reload the settings from the file which was saved previously.

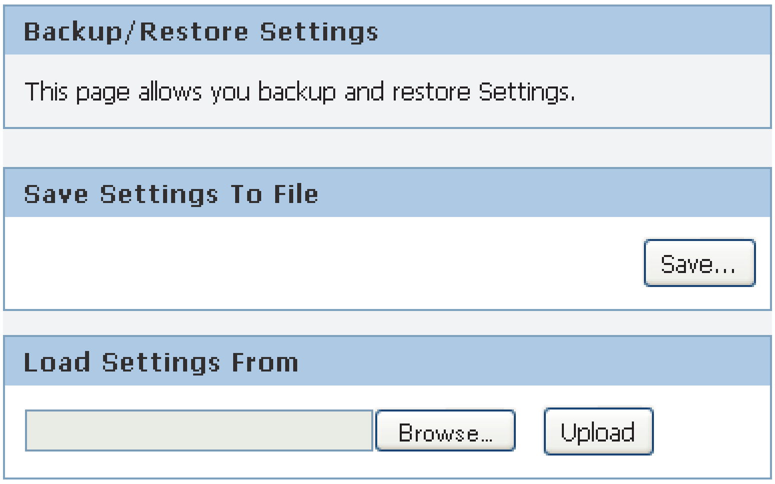
Besides, you could reset the current configuration to factory default.

If you do make changes to the default configuration but then wish to revert back to the original factory configuration, you can do so by resetting the device to factory defaults.

Save Settings to File

It allows you save current settings to a file.

1. From the *Maintenance -> Backup/Restore* menu. The following page is displayed:


Backup/Restore Settings

This page allows you backup and restore Settings.

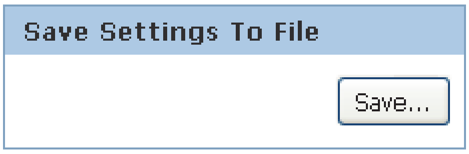
Save Settings To File

Load Settings From

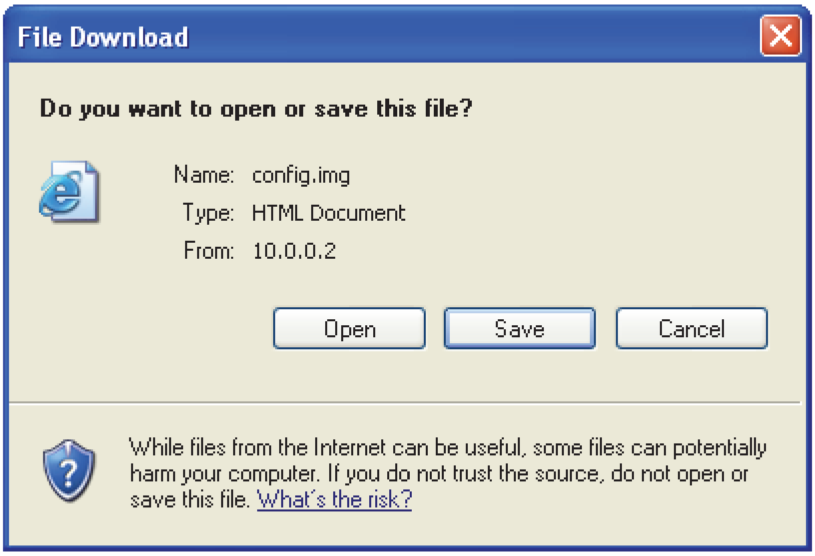
Figure 8: Reset to Defaults page

Option	Description
Save Settings to File	**Save the Settings to a File**
Load Settings from File	**Load Settings from a File**

2. Click on *Save….*


Save Settings To File

3. If you are happy with this, click *Save* and then browse to where the file to be saved. Or click *Cancel* to cancel it.



File Download

Do you want to open or save this file?

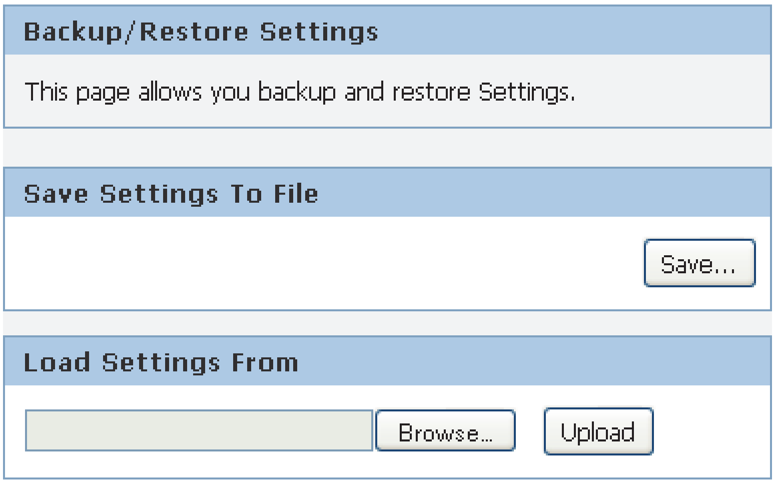
Name: config.img
Type: HTML Document
From: 10.0.0.2

While files from the Internet can be useful, some files can potentially harm your computer. If you do not trust the source, do not open or save this file. What's the risk?

Load Settings from File

It allows you to reload the settings from the file which was saved previously.

4. From the *Maintenance -> Backup/Restore* menu. The following page is displayed:



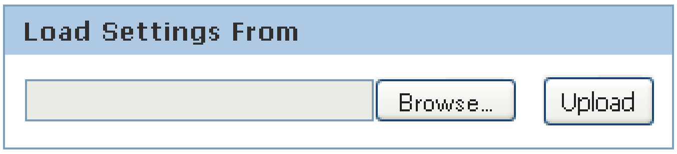
Backup/Restore Settings

This page allows you backup and restore Settings.

Save Settings To File

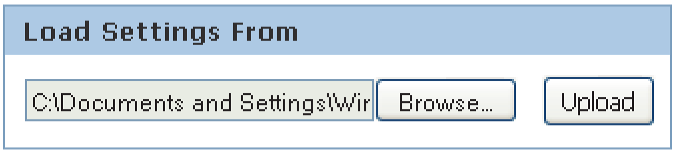
Load Settings From

5. Click on *Browse….*to browse to where the config.img is.



Load Settings From

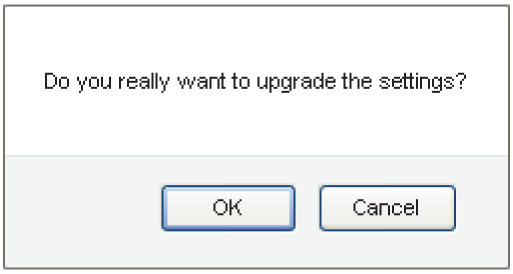
6. If you are happy with this, click *Upload* to start to load settings from file.



Load Settings From

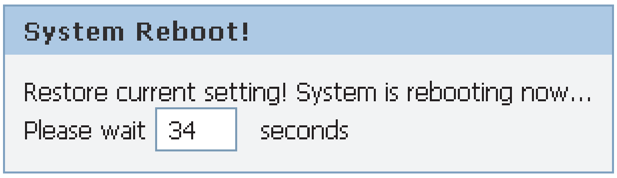
C:\Documents and Settings\Wir

7. If you are happy with this, click *Upload* to start to load settings from file.



Do you really want to upgrade the settings?

8. please wait for a while…….



System Reboot!

Restore current setting! System is rebooting now...

Please wait 34 seconds

23 Password

You can restrict access to your device's web pages using password protection. With password protection enabled, users must enter a username and password before gaining access to the web pages.

By default, password protection is enabled on your device, and the username and password set are as follows:

Username: **admin**

Password: **administrator**

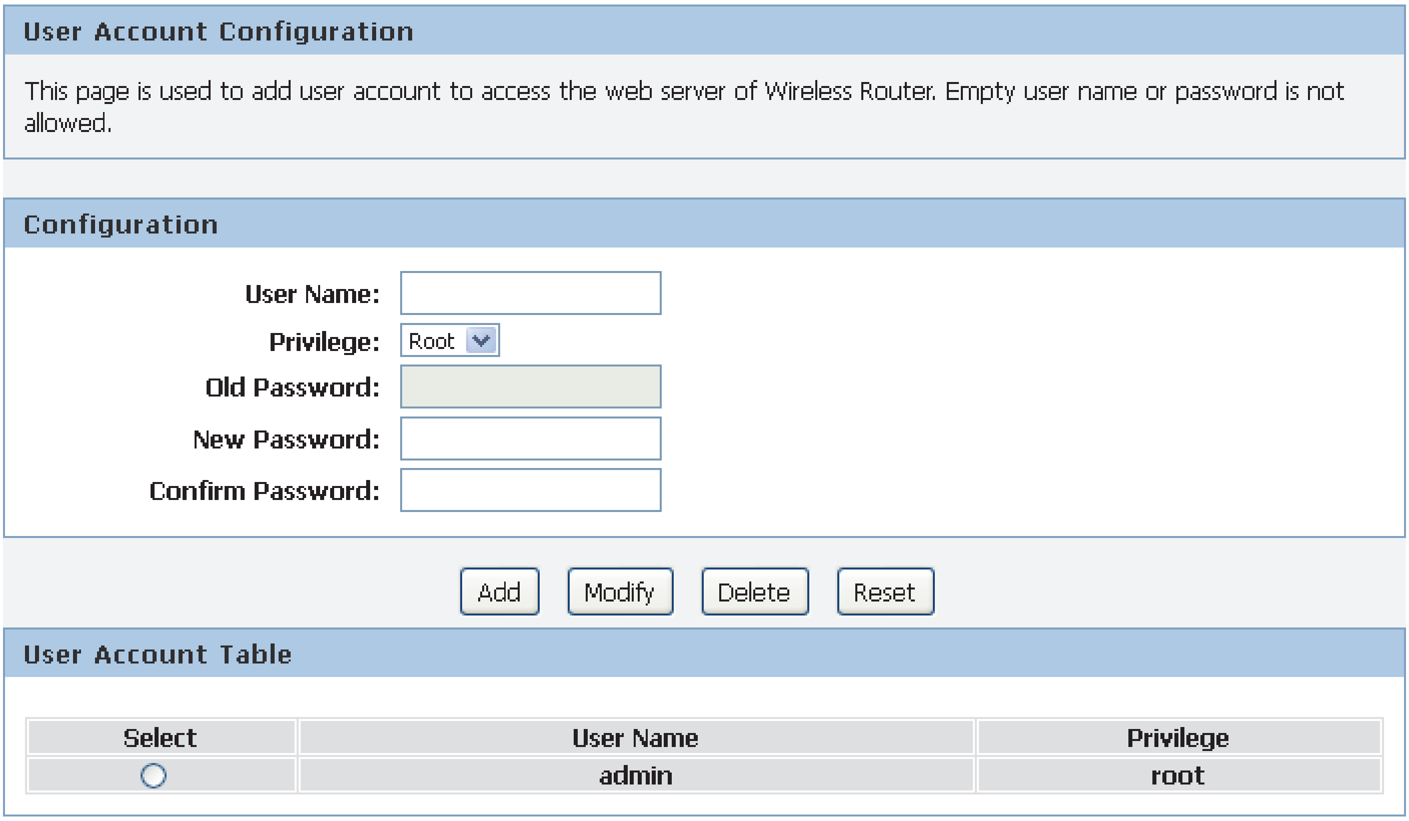
Setting your username and password

Note

> *Non-authorized users may try to access your system by guessing your username and password. We recommend that you change the default username and password to your own unique settings.*

To change the default password:

1. From the *Maintenance -> Password* menu. The following page is displayed:



User Account Configuration

This page is used to add user account to access the web server of Wireless Router. Empty user name or password is not allowed.

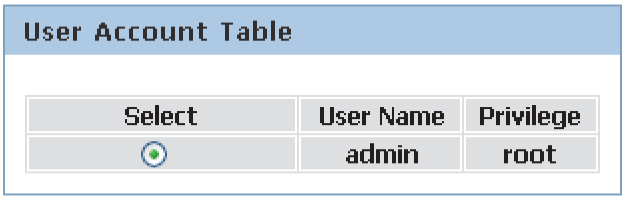
Configuration

User Name:	
Privilege:	Root
Old Password:	
New Password:	
Confirm Password:	

User Account Table

Select	User Name	Privilege
○	admin	root

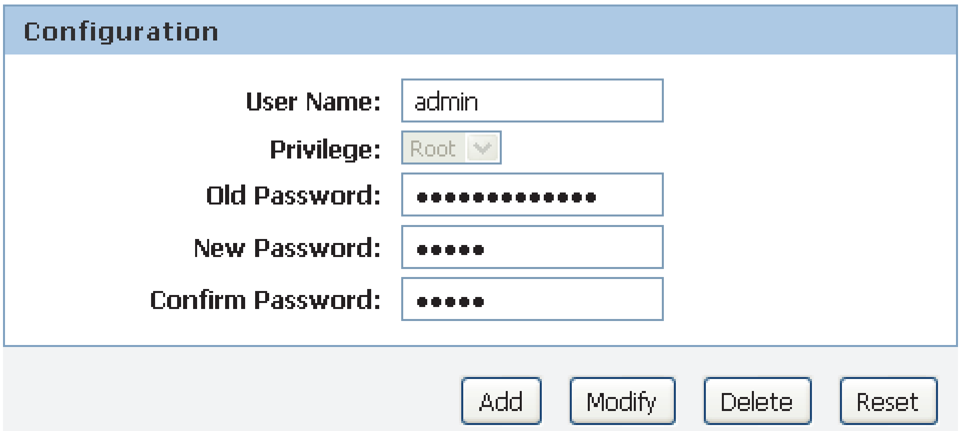
2. This page displays the current username and password settings. Change your own unique password in the relevant boxes. They can be any combination of letters or numbers with a maximum of 30 characters. The default setting uses ***admin*** for the username and **administrator** for password.
3. If you are happy with these settings, click ***Modify***. You will see following page that the new user has been displayed on the Currently Defined Users. You need to login to the web pages using your new username and new password.
4. Click on the ratio of admin from User Account Table.



User Account Table

Select	User Name	Privilege
◉	admin	root

5. Enter the Old Password.
6. Enter the New Password.
7. Enter the Confirm Password.
8. Click on *Modify*.



Configuration

User Name: admin

Privilege: Root

Old Password: ●●●●●●●●●●●●●

New Password: ●●●●●

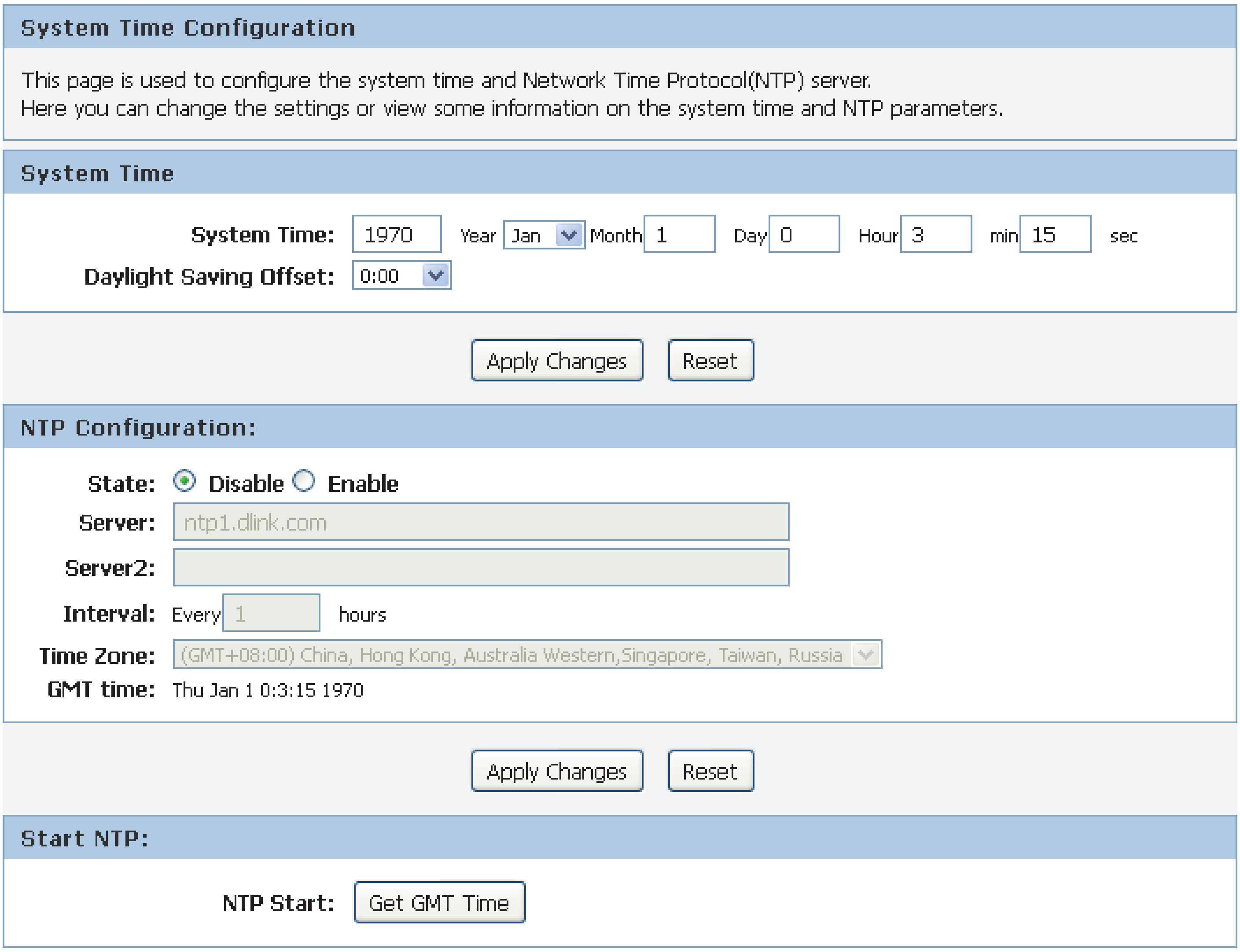
Confirm Password: ●●●●●

24 Time and Date

Certain systems may not have a date or time mechanism or may be using inaccurate time/day information. the Simple Network Time Protocol feature provides a way to synchronize the device's own time of day setting with a remote time server as described in RFC 2030 (SNTP) and RFC 1305 (NTP).

Time and Date Configuration settings

1. From the *Maintenance -> Time and Date* menu. The following page is displayed:



System Time Configuration

This page is used to configure the system time and Network Time Protocol(NTP) server.
Here you can change the settings or view some information on the system time and NTP parameters.

System Time

System Time: 1970 Year Jan Month 1 Day 0 Hour 3 min 15 sec

Daylight Saving Offset: 0:00

NTP Configuration:

State: ● Disable ○ Enable

Server: ntp1.dlink.com

Server2:

Interval: Every 1 hours

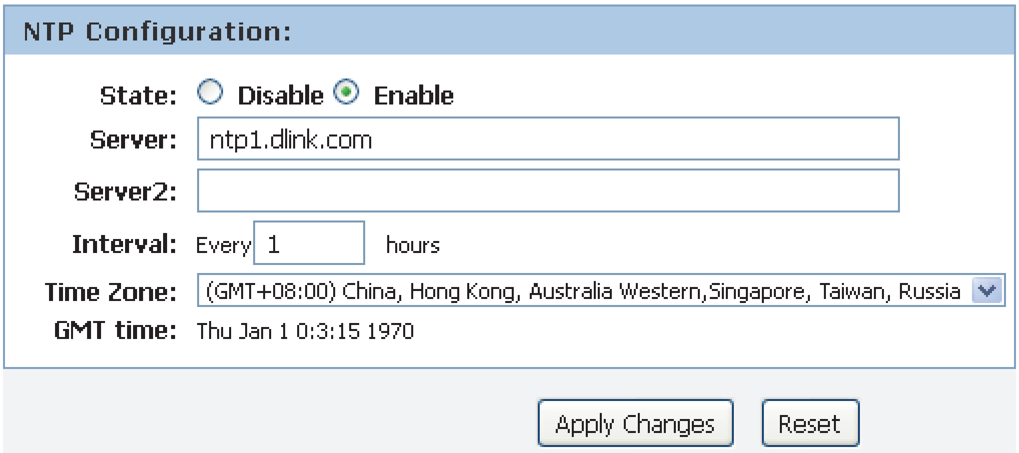
Time Zone: (GMT+08:00) China, Hong Kong, Australia Western,Singapore, Taiwan, Russia

GMT time: Thu Jan 1 0:3:15 1970

Start NTP:

NTP Start: Get GMT Time

2. Check the option *State*.
3. Configure the Server.
4. From the *Time Zone* drop-down list, select *Your Own Time Zone*.
5. Click *Apply Changes*.



NTP Configuration:

State: ○ Disable ● Enable

Server: ntp1.dlink.com

Server2:

Interval: Every 1 hours

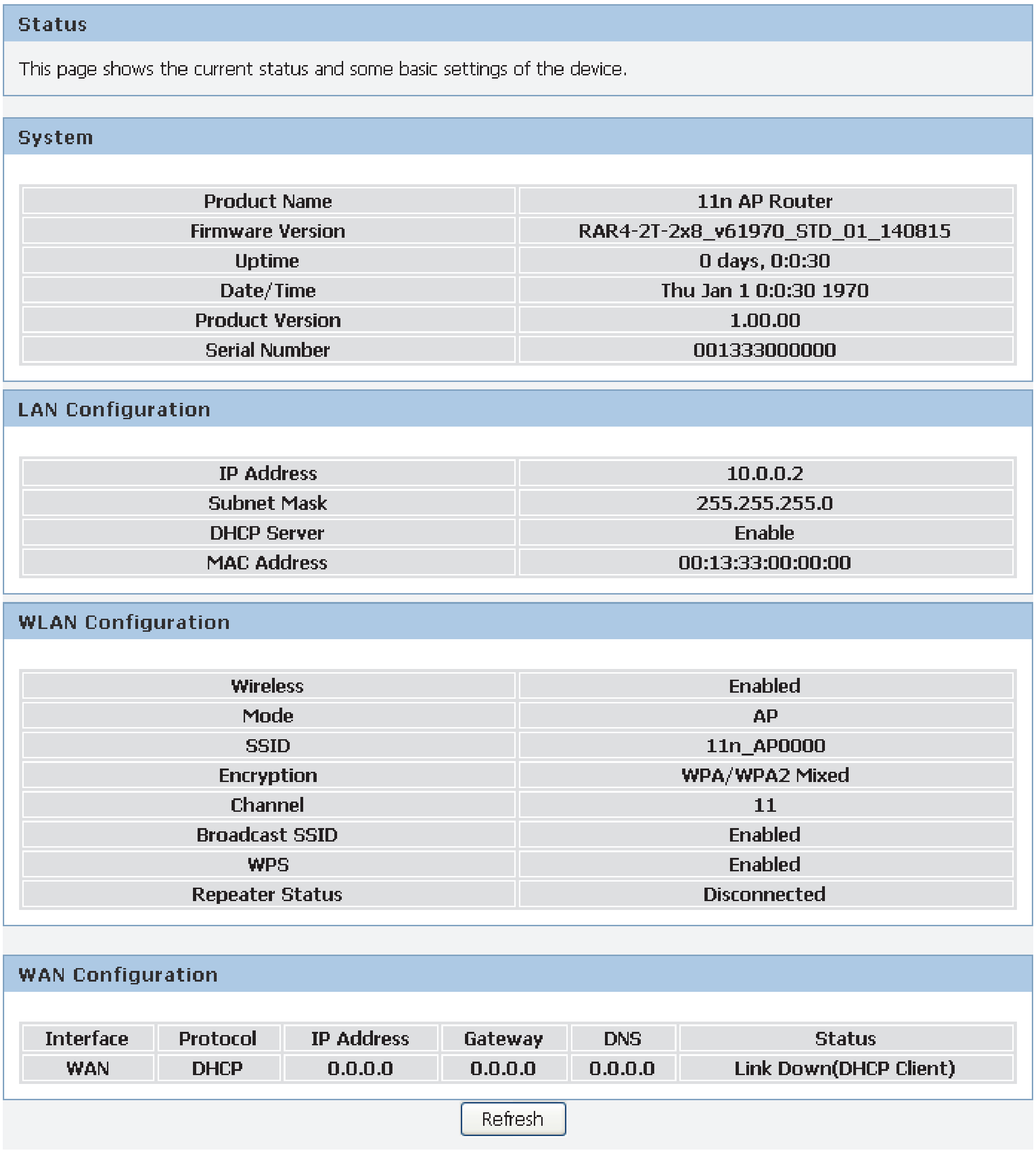
Time Zone: (GMT+08:00) China, Hong Kong, Australia Western,Singapore, Taiwan, Russia

GMT time: Thu Jan 1 0:3:15 1970

25 Status

This page displays the current information for the device. It will display the LAN, WAN, and system firmware information. This page will display different information, according to WAN setting (Static IP, DHCP, or PPPoE).

1. From the *Status -> Device Info* menu. The following page is displayed:



Status

This page shows the current status and some basic settings of the device.

System

Product Name	11n AP Router
Firmware Version	RAR4-2T-2x8_v61970_STD_01_140815
Uptime	0 days, 0:0:30
Date/Time	Thu Jan 1 0:0:30 1970
Product Version	1.00.00
Serial Number	001333000000

LAN Configuration

IP Address	10.0.0.2
Subnet Mask	255.255.255.0
DHCP Server	Enable
MAC Address	00:13:33:00:00:00

WLAN Configuration

Wireless	Enabled
Mode	AP
SSID	11n_AP0000
Encryption	WPA/WPA2 Mixed
Channel	11
Broadcast SSID	Enabled
WPS	Enabled
Repeater Status	Disconnected

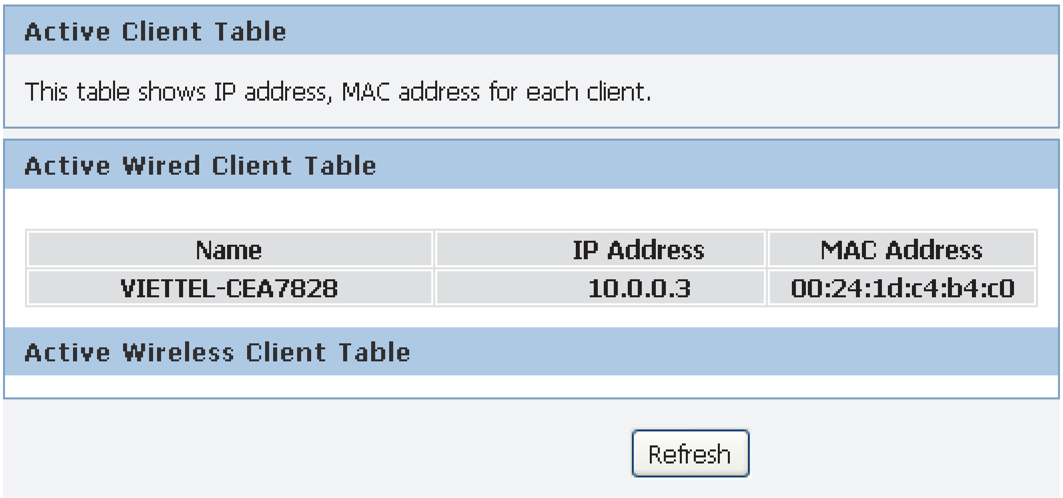
WAN Configuration

Interface	Protocol	IP Address	Gateway	DNS	Status
WAN	DHCP	0.0.0.0	0.0.0.0	0.0.0.0	Link Down(DHCP Client)

26 Active Client Table

This page shows the computers, identified by the name and MAC address that have acquired IP addresses by the DHCP server with the time that the lease for the IP address is up

1. From the *Status -> Active Client Table* menu. The following page is displayed:



Active Client Table

This table shows IP address, MAC address for each client.

Active Wired Client Table

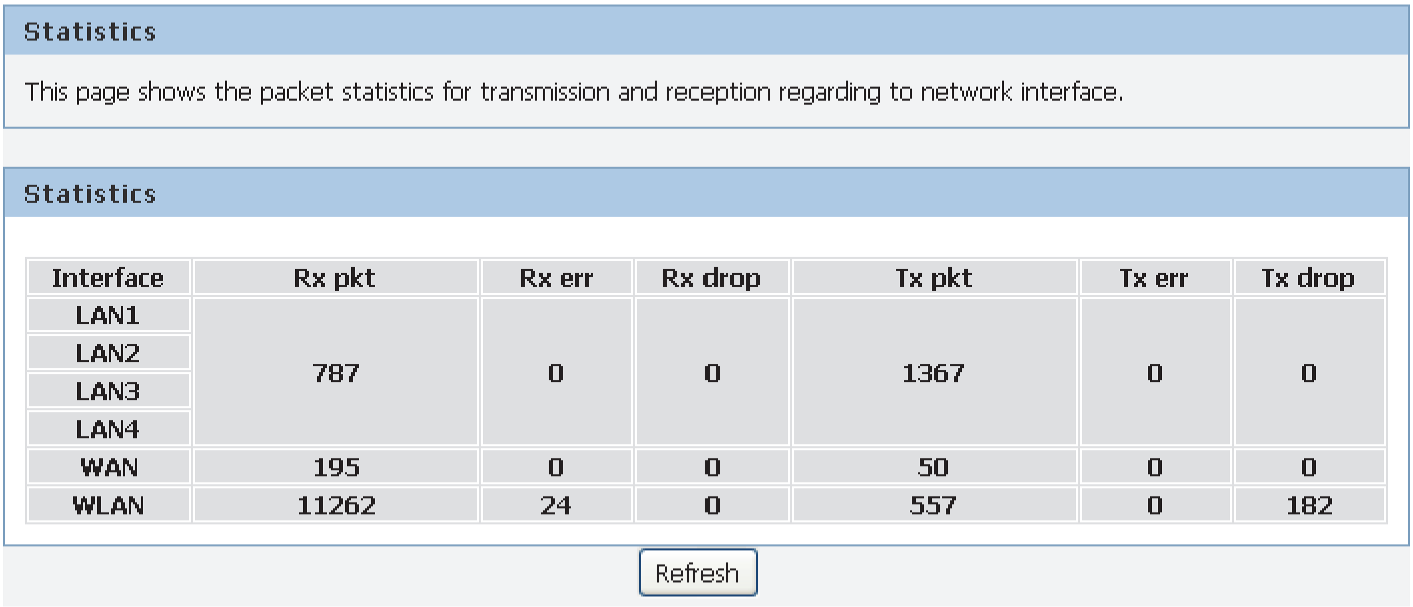
Name	IP Address	MAC Address
VIETTEL-CEA7828	10.0.0.3	00:24:1d:c4:b4:c0

Active Wireless Client Table

27 Statistics

This page shows the packet statistics for transmission and reception regarding to network interface.

1. From the *Status* -> *Statistics* menu. The following page is displayed:



Statistics

This page shows the packet statistics for transmission and reception regarding to network interface.

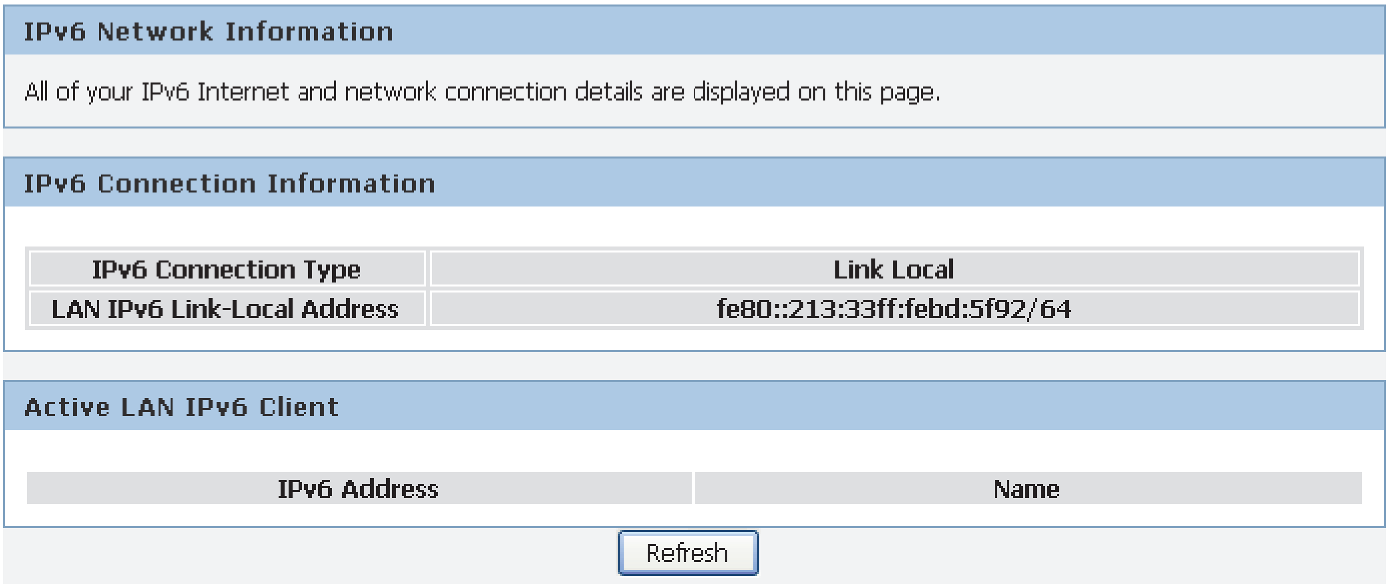
Statistics

Interface	Rx pkt	Rx err	Rx drop	Tx pkt	Tx err	Tx drop
LAN1 LAN2 LAN3 LAN4	787	0	0	1367	0	0
WAN	195	0	0	50	0	0
WLAN	11262	24	0	557	0	182

28 IPV6

All of your IPv6 Internet and network connection details are displayed on this page.

2. From the *Status* -> *IPv6* menu. The following page is displayed:



IPv6 Network Information

All of your IPv6 Internet and network connection details are displayed on this page.

IPv6 Connection Information

IPv6 Connection Type	Link Local
LAN IPv6 Link-Local Address	fe80::213:33ff:febd:5f92/64

Active LAN IPv6 Client

IPv6 Address	Name

A Configuring your Computers

This appendix provides instructions for configuring the Internet settings on your computers to work with the Wireless Gateway.

Configuring Ethernet PCs

Before you begin

By default, the Wireless Gateway automatically assigns the required Internet settings to your PCs. You need to configure the PCs to accept this information when it is assigned.

> **Note** In some cases, you may want to assign Internet information manually to some or all of your computers rather than allow the Wireless Gateway to do so. See *Assigning static Internet information to your PCs* for instructions.

- If you have connected your LAN PCs via Ethernet to the Wireless Gateway, follow the instructions that correspond to the operating system installed on your PC:
  - Windows® XP PCs
  - Windows 2000 PCs
  - Windows Me PCs
  - Windows 95, 98 PCs
  - Windows NT 4.0 workstations

Windows® XP PCs

1. In the Windows task bar, click the *Start* button, and then click *Control Panel*.
2. Double-click the Network Connections icon.
3. In the *LAN or High-Speed Internet* window, right-click on the icon corresponding to your network interface card (NIC) and select *Properties*. (Often, this icon is labeled *Local Area Connection*).

   The *Local Area Connection* dialog box is displayed with a list of currently installed network items.
4. Ensure that the check box to the left of the item labeled *Internet Protocol TCP/IP* is checked and click *Properties*.
5. In the *Internet Protocol (TCP/IP) Properties* dialog box, click the radio button labeled *Obtain an IP address automatically*. Also click the radio button labeled *Obtain DNS server address automatically*.
6. Click *OK* twice to confirm your changes, and then close the Control Panel.

Windows 2000 PCs

First, check for the IP protocol and, if necessary, install it:

1. In the Windows task bar, click the *Start* button, point to *Settings*, and then click *Control Panel*.
2. Double-click the Network and Dial-up Connections icon.

3. In the *Network and Dial-up Connections* window, right-click the Local Area Connection icon, and then select *Properties*.

   The *Local Area Connection Properties* dialog box is displayed with a list of currently installed network components. If the list includes Internet Protocol (TCP/IP), then the protocol has already been enabled. Skip to step 10.

4. If Internet Protocol (TCP/IP) does not display as an installed component, click *Install…*
5. In the *Select Network Component* Type dialog box, select *Protocol*, and then click *Add…*
6. Select *Internet Protocol (TCP/IP)* in the Network Protocols list, and then click *OK*.

   You may be prompted to install files from your Windows 2000 installation CD or other media. Follow the instructions to install the files.

7. If prompted, click *OK* to restart your computer with the new settings.

Next, configure the PCs to accept IP information assigned by the Wireless Gateway:

8. In the *Control Panel*, double-click the Network and Dial-up Connections icon.
9. In the *Network and Dial-up Connections* window, right-click the Local Area Connection icon, and then select *Properties*.
10. In the Local Area Connection Properties dialog box, select *Internet Protocol (TCP/IP),* and then click *Properties*.
11. In the *Internet Protocol (TCP/IP) Properties* dialog box, click the radio button labeled *Obtain an IP address automatically.* Also click the radio button labeled *Obtain DNS server address automatically*.
12. Click *OK* twice to confirm and save your changes, and then close the Control Panel.

Windows Me PCs

1. In the Windows task bar, click the *Start* button, point to *Settings*, and then click *Control Panel*.
2. Double-click the Network and Dial-up Connections icon.
3. In the *Network and Dial-up Connections* window, right-click the Network icon, and then select *Properties*.

   The *Network Properties* dialog box displays with a list of currently installed network components. If the list includes Internet Protocol (TCP/IP), then the protocol has already been enabled. Skip to step 11.

4. If Internet Protocol (TCP/IP) does not display as an installed component, click *Add…*
5. In the *Select Network Component Type* dialog box, select *Protocol*, and then click *Add…*
6. Select *Microsoft* in the Manufacturers box.
7. Select *Internet Protocol (TCP/IP)* in the Network Protocols list, and then click *OK*.

   You may be prompted to install files from your Windows Me installation CD or other media. Follow the instructions to install the files.

8. If prompted, click *OK* to restart your computer with the new settings.

Next, configure the PCs to accept IP information assigned by the Wireless Gateway:

9. In the *Control Panel*, double-click the Network and Dial-up Connections icon.
10. In *Network and Dial-up Connections window*, right-click the Network icon, and then select *Properties*.
11. In the *Network Properties* dialog box, select *TCP/IP*, and then click *Properties*.
12. In the TCP/IP Settings dialog box, click the radio button labeled **Server** *assigned IP address*. Also click the radio button labeled *Server assigned name server address*.
13. Click *OK* twice to confirm and save your changes, and then close the *Control Panel*.

Windows 95, 98 PCs

First, check for the IP protocol and, if necessary, install it:

1. In the Windows task bar, click the *Start* button, point to *Settings*, and then click *Control Panel*.
2. Double-click the Network icon.

   The *Network* dialog box displays with a list of currently installed network components. If the list includes TCP/IP, and then the protocol has already been enabled. Skip to step 9.

3. If TCP/IP does not display as an installed component, click *Add…*

   The *Select Network Component Type* dialog box displays.

4. Select *Protocol*, and then click *Add…*

   The Select Network Protocol dialog box displays.

5. Click on *Microsoft* in the Manufacturers list box, and then click *TCP/IP* in the Network Protocols list box.
6. Click *OK* to return to the Network dialog box, and then click *OK* again.

   You may be prompted to install files from your Windows 95/98 installation CD. Follow the instructions to install the files.
7. Click *OK* to restart the PC and complete the TCP/IP installation.

Next, configure the PCs to accept IP information assigned by the Wireless Gateway:

8. Open the Control Panel window, and then click the Network icon.
9. Select the network component labeled TCP/IP, and then click *Properties*.

   If you have multiple TCP/IP listings, select the listing associated with your network card or adapter.
10. In the TCP/IP Properties dialog box, click the IP Address tab.
11. Click the radio button labeled *Obtain an IP address automatically*.
12. Click the DNS Configuration tab, and then click the radio button labeled *Obtain an IP address automatically*.
13. Click *OK* twice to confirm and save your changes.

    You will be prompted to restart Windows.
14. Click *Yes*.

Windows NT 4.0 workstations

First, check for the IP protocol and, if necessary, install it:

1. In the Windows NT task bar, click the *Start* button, point to *Settings*, and then click *Control Panel*.
2. In the Control Panel window, double click the Network icon.
3. In the *Network dialog* box, click the *Protocols* tab.

   The *Protocols* tab displays a list of currently installed network protocols. If the list includes TCP/IP, then the protocol has already been enabled. Skip to step 9.
4. If TCP/IP does not display as an installed component, click *Add…*
5. In the *Select Network Protocol* dialog box, select *TCP/IP*, and then click *OK*.

   You may be prompted to install files from your Windows NT installation CD or other media. Follow the instructions to install the files.

   After all files are installed, a window displays to inform you that a TCP/IP service called DHCP can be set up to dynamically assign IP information.
6. Click *Yes* to continue, and then click *OK* if prompted to restart your computer.

Next, configure the PCs to accept IP information assigned by the Wireless Gateway:

7. Open the Control Panel window, and then double-click the Network icon.
8. In the *Network* dialog box, click the *Protocols* tab.
9. In the *Protocols* tab, select *TCP/IP*, and then click *Properties*.
10. In the *Microsoft TCP/IP Properties* dialog box, click the radio button labeled *Obtain an IP address from a DHCP server.*
11. Click *OK* twice to confirm and save your changes, and then close the Control Panel.

Assigning static Internet information to your PCs

If you are a typical user, you will not need to assign static Internet information to your LAN PCs because your ISP automatically assigns this information for you.

In some cases however, you may want to assign Internet information to some or all of your PCs directly (often called "statically"), rather than allowing the Wireless Gateway to assign it. This option may be desirable (but not required) if:

- You have obtained one or more public IP addresses that you want to always associate with specific computers (for example, if you are using a computer as a public web server).
- You maintain different subnets on your LAN (subnets are described in Appendix B).

Before you begin, you must have the following information available:

- The IP address and subnet mask of each PC
- The IP address of the default gateway for your LAN. In most cases, this is the address assigned to the LAN port on the Wireless Gateway. By default, the LAN port is assigned the IP address *10.0.0.2*. (You can change this number or another number can be assigned by your ISP. See *Addressing* for more information.)
- The IP address of your ISP's Domain Name System (DNS) server.

On each PC to which you want to assign static information, follow the instructions relating only to checking for and/or installing the IP protocol. Once it is installed, continue to follow the instructions for displaying each of the Internet Protocol (TCP/IP) properties. Instead of enabling dynamic assignment of the IP addresses for the computer, DNS server and default gateway, click the radio buttons that enable you to enter the information manually.

Note

Your PCs must have IP addresses that place them in the same subnet as the Wireless Gateway's LAN port. If you manually assign IP information to all your LAN PCs, you can follow the instructions in Addressing to change the LAN port IP address accordingly.

B IP Addresses, Network Masks, and Subnets

IP Addresses

Note

This section refers only to IP addresses for IPv4 (version 4 of the Internet Protocol). IPv6 addresses are not covered.

This section assumes basic knowledge of binary numbers, bits, and bytes.

IP addresses, the Internet's version of telephone numbers, are used to identify individual nodes (computers or devices) on the Internet. Every IP address contains four numbers, each from 0 to 255 and separated by dots (periods), e.g. 20.56.0.211. These numbers are called, from left to right, field1, field2, field3, and field4.

This style of writing IP addresses as decimal numbers separated by dots is called *dotted decimal notation*. The IP address 20.56.0.211 is read "twenty dot fifty-six dot zero dot two-eleven."

Structure of an IP address

IP addresses have a hierarchical design similar to that of telephone numbers. For example, a 7-digit telephone number starts with a 3-digit prefix that identifies a group of thousands of telephone lines, and ends with four digits that identify one specific line in that group.

Similarly, IP addresses contain two kinds of information:

- *Network ID*
  Identifies a particular network within the Internet or intranet
- *Host ID*
  Identifies a particular computer or device on the network

The first part of every IP address contains the network ID, and the rest of the address contains the host ID. The length of the network ID depends on the network's *class* (see following section). The table below shows the structure of an IP address.

	Field1	**Field2**	**Field3**	**Field4**
Class A	Network ID	Host ID		
Class B	Network ID		Host ID	
Class C	Network ID			Host ID

Here are some examples of valid IP addresses:

Class A: 10.30.6.125 (network = 10, host = 30.6.125)
Class B: 129.88.16.49 (network = 129.88, host = 16.49)
Class C: 192.60.201.11 (network = 192.60.201, host = 11)

Network classes

The three commonly used network classes are A, B, and C. (There is also a class D but it has a special use beyond the scope of this discussion.) These classes have different uses and characteristics.

Class A networks are the Internet's largest networks, each with room for over 16 million hosts. Up to 126 of these huge networks can exist, for a total of over 2 billion hosts. Because of their huge size, these networks are used for WANs and by organizations at the infrastructure level of the Internet, such as your ISP.

Class B networks are smaller but still quite large, each able to hold over 65,000 hosts. There can be up to 16,384 class B networks in existence. A class B network might be appropriate for a large organization such as a business or government agency.

Class C networks are the smallest, only able to hold 254 hosts at most, but the total possible number of class C networks exceeds 2 million (2,097,152 to be exact). LANs connected to the Internet are usually class C networks.

Some important notes regarding IP addresses:

- The class can be determined easily from field1:

field1 = 1-126:	Class A
field1 = 128-191:	Class B
field1 = 192-223:	Class C

  (field1 values not shown are reserved for special uses)
- A host ID can have any value except all fields set to 0 or all fields set to 255, as those values are reserved for special uses.

Subnet masks

Definition
mask

A mask *looks like a regular IP address, but contains a pattern of bits that tells what parts of an IP address are the network ID and what parts are the host ID: bits set to 1 mean "this bit is part of the network ID" and bits set to 0 mean "this bit is part of the host ID."*

Subnet masks are used to define *subnets* (what you get after dividing a network into smaller pieces). A subnet's network ID is created by "borrowing" one or more bits from the host ID portion of the address. The subnet mask identifies these host ID bits.

For example, consider a class C network 192.168.1. To split this into two subnets, you would use the subnet mask:

255.255.255.128

It's easier to see what's happening if we write this in binary:

11111111. 11111111. 11111111.10000000

As with any class C address, all of the bits in field1 through field3 are part of the network ID, but note how the mask specifies that the first bit in field4 is also included. Since this extra bit has only two values (0 and 1), this means there are two subnets. Each subnet uses the remaining 7 bits in field4 for its host IDs, which range from 1 to 126 hosts (instead of the usual 0 to 255 for a class C address).

Similarly, to split a class C network into four subnets, the mask is:

255.255.255.192 or 11111111. 11111111. 11111111.11000000

The two extra bits in field4 can have four values (00, 01, 10, 11), so there are four subnets. Each subnet uses the remaining six bits in field4 for its host IDs, ranging from 1 to 62.

Note

Sometimes a subnet mask does not specify any additional network ID bits, and thus no subnets. Such a mask is called a default subnet mask*. These masks are:*

Class A:	*255.0.0.0*
Class B:	*255.255.0.0*
Class C:	*255.255.255.0*

These are called default *because they are used when a network is initially configured, at which time it has no subnets.*

C UPnP Control Point Software on Windows ME/XP

This appendix provides instructions for configuring the UPnP on your computers to work with the Wireless Gateway.

UPnP is an architecture for pervasive peer-to-peer network connectivity of intelligent appliances, Wireless devices, and PCs of all form factors. It is designed to bring easy-to-use, flexible, standards-based connectivity to ad-hoc or unmanaged networks whether in the home, in a small business, public spaces, or attached to the Internet. UPnP is a distributed, open networking architecture that leverages TCP/IP and the Web technologies to enable seamless proximity networking in addition to control and data transfer among networked devices in the home, office, and public spaces.

UPnP is more than just a simple extension of the plug and play peripheral model. It is designed to support zero-configuration, "invisible" networking, and automatic discovery for a breadth of device categories from a wide range of vendors. This means a device can dynamically join a network, obtain an IP address, convey its capabilities, and learn about the presence and capabilities of other devices. DHCP and DNS servers are optional and are used only if available on the network. Finally, a device can leave a network smoothly and automatically without leaving any unwanted state behind.

UPnP Control Point Software on Windows ME

To install the control point software on Windows ME:

1. In the Control Panel, select "Add/Remove Programs".

2. In the "Add/Remove Programs Properties" dialog box, select the "Windows Setup" tab. In the "Components" list, double click on the "Communications" entry.

3. In the "Communications" dialog box, scroll down the "Components" list to display the UPnP entry. Select the entry, click "OK".

4. Click "OK" to finish the "Add/Remove Programs" dialog.

5. Reboot your system.

Once you have installed the UPnP software and you have rebooted (and your network includes the IGD system), you should be able to see the IGD controlled device on your network.

UPnP Control Point Software on Windows XP with Firewall

On Windows XP versions earlier than SP2, Firewall support is provided by the Windows XP Internet Connection Firewall. You cannot use the Windows XP Internet Connection Firewall support on a system that you intend to use as a UPnP control point. If this feature is enabled, although the control point system may display controlled devices in the list of network devices, the control point system cannot participate in UPnP communication. (This restriction also applies to controlled devices running on Windows XP systems earlier than SP2.)

On Windows XP SP2 and later, Firewall support is provided by Windows Firewall. Unlike earlier versions, Windows XP SP2 can be used on a system that you intend to use as a UPnP control point.

To turn off the Firewall capability on any version of Windows XP, follow the steps below:

1. In the Control Panel, select "Network and Internet Connections".

2. In the "Network and Internet Connections" dialog box, select "Network Connections".

3. In the "Network Connections" dialog box, right-click on the local area connection entry for your network; this will display a menu. Select the "Properties" menu entry.

4. In the "Local Area Connection Properties" dialog box, select the "Advanced" tab. Disable the Internet Connection Firewall by de-selecting the entry with the following label:

"Protect my computer and network by limiting or preventing access to the computer from the Internet".

5. Click "OK".

SSDP requirements

You must have SSDP Discovery Service enabled on your Windows XP system to use the UPnP Control point software.

SSDP Discovery Service is enabled on a default installation of Windows XP. To check if it is enabled on your system, look in Control Panel > Administrative Tools > Services).

Installation procedure

To install the Control point software on Windows XP, follow the steps below:

1. In the Control Panel, select "Add/Remove Programs".

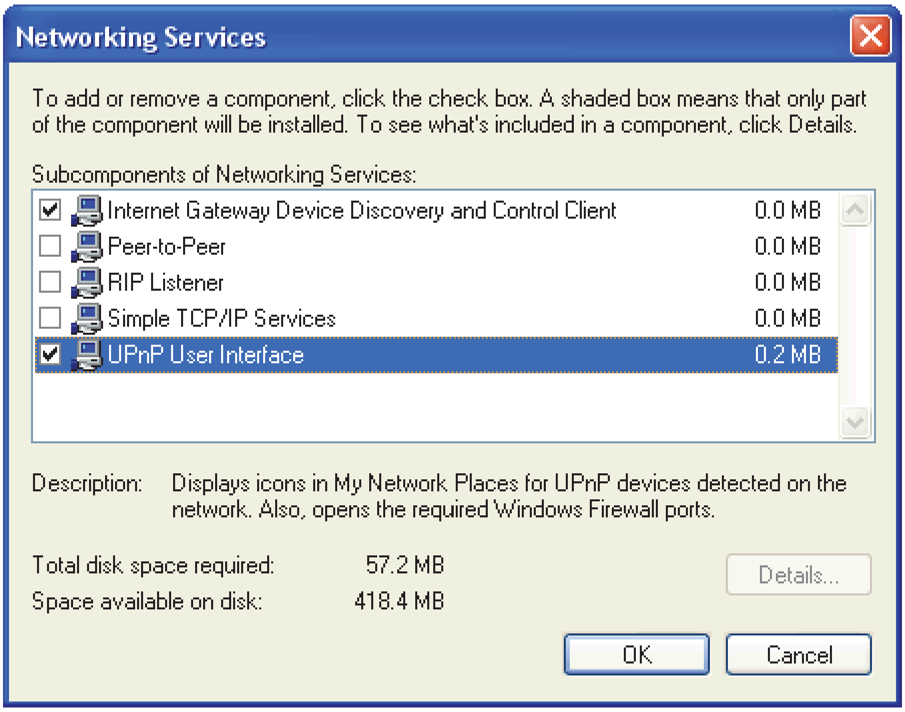
2. In the "Add or Remove Programs" dialog box, click the "Add / Remove Windows Components" button.

3. In the "Windows Component Wizard" dialog box, scroll down the list to display the "Networking Services" entry. Highlight (select) the entry, and click on the "Details" button.

4. The "Networking Services" window is displayed.

The subcomponents shown in the Networking Services window will be different depending on if you are using Windows XP, Windows XP (SP1), or Windows XP (SP2).

If you are using Windows XP SP2, the Networking Services window will display the following list of sub-components:



Networking Services

To add or remove a component, click the check box. A shaded box means that only part of the component will be installed. To see what's included in a component, click Details.

Subcomponents of Networking Services:

☑	Internet Gateway Device Discovery and Control Client	0.0 MB
□	Peer-to-Peer	0.0 MB
□	RIP Listener	0.0 MB
□	Simple TCP/IP Services	0.0 MB
☑	UPnP User Interface	0.2 MB

Description: Displays icons in My Network Places for UPnP devices detected on the network. Also, opens the required Windows Firewall ports.

Total disk space required: 57.2 MB

Space available on disk: 418.4 MB

5. Select the following entries from the "Networking Services" window and then click "OK":

If you are using **Windows XP**, select:

• "Universal Plug and Play".

If you are using **Windows XP SP1**, select:

• "Internet Gateway Device discovery and Control Client".

• "Universal Plug and Play".

If you are using **Windows XP SP2**, select:

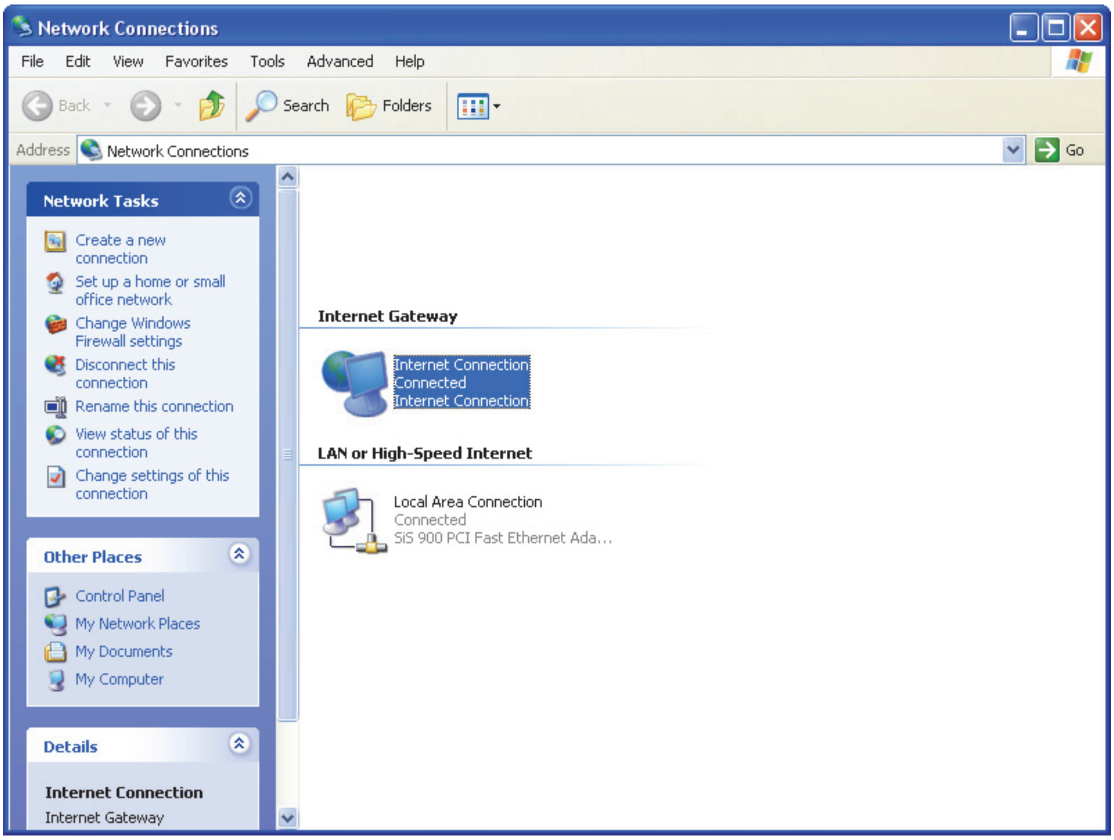
• "Internet Gateway Device discovery and Control Client".

• "UPnP User Interface".

6. Reboot your system.

Once you have installed the UPnP software and you have rebooted (and your network includes the IGD system), you should be able to see the IGD controlled device on your network.

For example, from the Network Connections window you should see the Internet Gateway Device:



Network Connections
File Edit View Favorites Tools Advanced Help
Back Search Folders
Address Network Connections Go
Network Tasks
Create a new connection
Set up a home or small office network
Change Windows Firewall settings
Disconnect this connection
Rename this connection
View status of this connection
Change settings of this connection
Other Places
Control Panel
My Network Places
My Documents
My Computer
Details

Internet Connection
Internet Gateway

Internet Gateway

Internet Connection
Connected
Internet Connection

LAN or High-Speed Internet

Local Area Connection
Connected
SiS 900 PCI Fast Ethernet Ada...

D Troubleshooting

This appendix suggests solutions for problems you may encounter in installing or using the Wireless Gateway, and provides instructions for using several IP utilities to diagnose problems.

Contact Customer Support if these suggestions do not resolve the problem.

Troubleshooting Suggestions

Problem	Troubleshooting Suggestion
LEDs	
Power LED does not illuminate after product is turned on.	Verify that you are using the power cable provided with the device and that it is securely connected to the Wireless Gateway and a wall socket/power strip.
LINK LAN LED does not illuminate after Ethernet cable is attached.	Verify that the Ethernet cable is securely connected to your LAN hub or PC and to the Wireless Gateway. Make sure the PC and/or hub is turned on. Verify that your cable is sufficient for your network requirements. A 100 Mbit/sec network (10BaseTx) should use cables labeled CAT 5. A 10Mbit/sec network may tolerate lower quality cables.
Internet Access	
My PC cannot access the Internet	Use the ping utility (discussed in the following section) to check whether your PC can communicate with the device's LAN IP address (by default 10.0.0.2). If it cannot, check the Ethernet cabling. If you statically assigned a private IP address to the computer, (not a registered public address), verify the following: • Check that the gateway IP address on the computer is your public IP address (see Current Status for instructions on viewing the IP information.) If it is not, correct the address or configure the PC to receive IP information automatically. • Verify with your ISP that the DNS server specified for the PC is valid. Correct the address or configure the PC to receive this information automatically.
My LAN PCs cannot display web pages on the Internet.	Verify that the DNS server IP address specified on the PCs is correct for your ISP, as discussed in the item above. If you specified that the DNS server be assigned dynamically from a server, then verify with your ISP that the address configured on the Wireless Gateway is correct, then You can use the ping utility, to test connectivity with your ISP's DNS server.
Web pages	

Problem	Troubleshooting Suggestion
I forgot/lost my user ID or password.	If you have not changed the password from the default, try using "admin" the user ID and "administrator" as password. Otherwise, you can reset the device to the default configuration by pressing the Reset Default button on the Rare panel of the device (see *Rare Panel*). Then, type the default User ID and password shown above. **WARNING:** Resetting the device removes any custom settings and returns all settings to their default values.
I cannot access the web pages from my browser.	Use the ping utility, discussed in the following section, to check whether your PC can communicate with the device's LAN IP address (by default 10.0.0.2). If it cannot, check the Ethernet cabling. Verify that you are using Internet Explorer or Netscape Navigator v4.0 or later. Verify that the PC's IP address is defined as being on the same subnet as the IP address assigned to the LAN port on the Wireless Gateway.
My changes to the web pages are not being retained.	Be sure to use the *Confirm Changes/Apply* function after any changes.

Diagnosing Problem using IP Utilities

ping

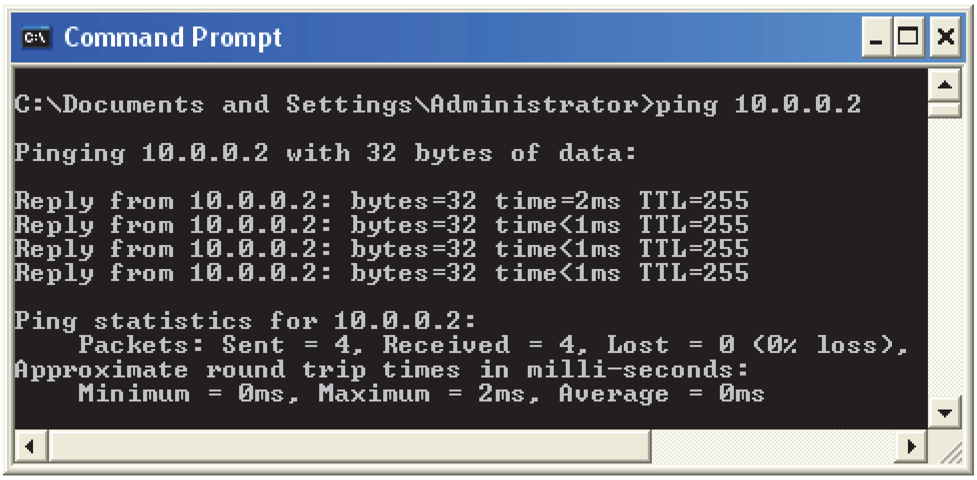
Ping is a command you can use to check whether your PC can recognize other computers on your network and the Internet. A ping command sends a message to the computer you specify. If the computer receives the message, it sends messages in reply. To use it, you must know the IP address of the computer with which you are trying to communicate.

On Windows-based computers, you can execute a ping command from the Start menu. Click the *Start* button, and then click *Run*. In the *Open* text box, type a statement such as the following:

ping 10.0.0.2

Click *OK*. You can substitute any private IP address on your LAN or a public IP address for an Internet site, if known.

If the target computer receives the message, a *Command Prompt* window is displayed:



```
C:\Documents and Settings\Administrator>ping 10.0.0.2

Pinging 10.0.0.2 with 32 bytes of data:

Reply from 10.0.0.2: bytes=32 time=2ms TTL=255
Reply from 10.0.0.2: bytes=32 time<1ms TTL=255
Reply from 10.0.0.2: bytes=32 time<1ms TTL=255
Reply from 10.0.0.2: bytes=32 time<1ms TTL=255

Ping statistics for 10.0.0.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 2ms, Average = 0ms
```

Figure 9: Using the ping Utility

If the target computer cannot be located, you will receive the message *Request timed out*.

Using the ping command, you can test whether the path to the Wireless Gateway is working (using the preconfigured default LAN IP address 10.0.0.2) or another address you assigned.

You can also test whether access to the Internet is working by typing an external address, such as that for *www.yahoo.com* (216.115.108.243). If you do not know the IP address of a particular Internet location, you can use the *nslookup* command, as explained in the following section.

From most other IP-enabled operating systems, you can execute the same command at a command prompt or through a system administration utility.

nslookup

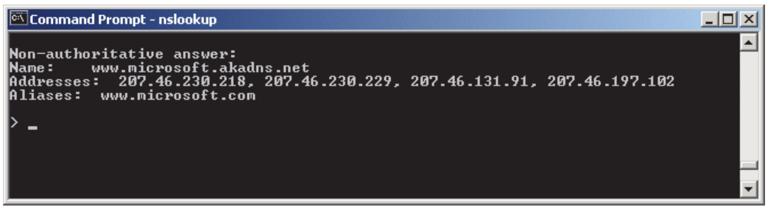
You can use the nslookup command to determine the IP address associated with an Internet site name. You specify the common name, and the nslookup command looks up the name in on your DNS server (usually located with your ISP). If that name is not an entry in your ISP's DNS table, the request is then referred to another higher-level server, and so on, until the entry is found. The server then returns the associated IP address.

On Windows-based computers, you can execute the nslookup command from the *Start* menu. Click the *Start* button, and then click *Run*. In the *Open* text box, type the following:

Nslookup

Click *OK*. A Command Prompt window displays with a bracket prompt (>). At the prompt, type the name of the Internet address that you are interested in, such as *www.microsoft.com*.

The window will display the associate IP address, if known, as shown below:



```
Non-authoritative answer:
Name:    www.microsoft.akadns.net
Addresses:  207.46.230.218, 207.46.230.229, 207.46.131.91, 207.46.197.102
Aliases:  www.microsoft.com

> _
```

Figure 10:   Using the nslookup Utility

There may be several addresses associated with an Internet name. This is common for web sites that receive heavy traffic; they use multiple, redundant servers to carry the same information.

To exit from the nslookup utility, type **exit** and press **[Enter]** at the command prompt.

E Glossary

10BASE-T A designation for the type of wiring used by Ethernet networks with a data rate of 10 Mbps. Also known as Category 3 (CAT 3) wiring. See *data rate, Ethernet*.

100BASE-T A designation for the type of wiring used by Ethernet networks with a data rate of 100 Mbps. Also known as Category 5 (CAT 5) wiring. See *data rate, Ethernet*.

ADSL Asymmetric Digital Subscriber Line
The most commonly deployed "flavor" of DSL for home users is asymmetrical DSL. The term asymmetrical refers to its unequal data rates for downloading and uploading (the download rate is higher than the upload rate). The asymmetrical rates benefit home users because they typically download much more data from the Internet than they upload.

analog An analog signal is a signal that has had its frequency modified in some way, such as by amplifying its strength or varying its frequency, in order to add information to the signal. The voice component in DSL is an analog signal. See *digital*.

ATM Asynchronous Transfer Mode
A standard for high-speed transmission of data, text, voice, and video, widely used within the Internet. ATM data rates range from 45 Mbps to 2.5 Gbps. See *data rate*.

authenticate To verify a user's identity, such as by prompting for a password.

binary The "base two" system of numbers, that uses only two digits, 0 and 1, to represent all numbers. In binary, the number 1 is written as 1, 2 as 10, 3 as 11, 4 as 100, etc. Although expressed as decimal numbers for convenience, IP addresses in actual use are binary numbers; e.g., the IP address 209.191.4.240 is 11010001.10111111.00000100.11110000 in binary. See *bit, IP address, network mask*.

bit Short for "binary digit," a bit is a number that can have two values, 0 or 1. See *binary*.

bps bits per second

bridging Passing data from your network to your ISP and vice versa using the hardware addresses of the devices at each location. Bridging contrasts with routing, which can add more intelligence to data transfers by using network addresses instead. The Wireless Gateway can perform both routing and bridging. Typically, when both functions are enabled, the device routes IP data and bridges all other types of data. See *routing*.

broadband A telecommunications technology that can send different types of data over the same medium. DSL is a broadband technology.

broadcast To send data to all computers on a network.

DHCP Dynamic Host Configuration Protocol
DHCP automates address assignment and management.

When a computer connects to the LAN, DHCP assigns it an IP address from a shared pool of IP addresses; after a specified time limit, DHCP returns the address to the pool.

DHCP relay
Dynamic Host Configuration Protocol relay
A DHCP relay is a computer that forwards DHCP data between computers that request IP addresses and the DHCP server that assigns the addresses. Each of the Wireless Gateway's interfaces can be configured as a DHCP relay. See *DHCP*.

DHCP server
Dynamic Host Configuration Protocol server
A DHCP server is a computer that is responsible for assigning IP addresses to the computers on a LAN. See *DHCP*.

digital
Of data, having a form based on discrete values expressed as binary numbers (0's and 1's). The data component in DSL is a digital signal. See *analog*.

DNS
Domain Name System
The DNS maps domain names into IP addresses. DNS information is distributed hierarchically throughout the Internet among computers called DNS servers. For example, *www.yahoo.com* is the domain name associated with IP address 216.115.108.243. When you start to access a web site, a DNS server looks up the requested domain name to find its corresponding IP address. If the DNS server cannot find the IP address, it communicates with higher-level DNS servers to determine the IP address. See *domain name.*

domain name
A domain name is a user-friendly name used in place of its associated IP address. Domain names must be unique; their assignment is controlled by the Internet Corporation for Assigned Names and Numbers (ICANN). Domain names are a key element of URLs, which identify a specific file at a web site. See *DNS.*

download
To transfer data in the downstream direction, i.e., from the Internet to the user.

DSL
Digital Subscriber Line
A technology that allows both digital data and analog voice signals to travel over existing copper telephone lines.

encryption keys
See *network keys*

Ethernet
The most commonly installed computer network technology, usually using twisted pair wiring. Ethernet data rates are 10 Mbps and 100 Mbps. *See also 10BASE-T, 100BASE-T, twisted pair*.

FTP
File Transfer Protocol
A program used to transfer files between computers connected to the Internet. Common uses include uploading new or updated files to a web server, and downloading files from a web server.

Gbps
Abbreviation of Gigabits per second, or one billion bits per second. Internet data rates are often expressed in Gbps.

host
A device (usually a computer) connected to a network.

HTTP
Hyper-Text Transfer Protocol
HTTP is the main protocol used to transfer data from web

sites so that it can be displayed by web browsers. See *web browser, web site*.

Hub

A hub is a place of convergence where data arrives from one or more directions and is forwarded out in one or more directions. It connects an Ethernet bridge/router to a group of PCs on a LAN and allows communication to pass between the networked devices.

ICMP

Internet Control Message Protocol
An Internet protocol used to report errors and other network-related information. The ping command makes use of ICMP.

IEEE

The Institute of Electrical and Electronics Engineers is a technical professional society that fosters the development of standards that often become national and international standards.

Internet

The global collection of interconnected networks used for both private and business communications.

intranet

A private, company-internal network that looks like part of the Internet (users access information using web browsers), but is accessible only by employees.

IP

See TCP/IP.

IP address

Internet Protocol address
The address of a host (computer) on the Internet, consisting of four numbers, each from 0 to 255, separated by periods, e.g., 209.191.4.240. An IP address consists of a *network ID* that identifies the particular network the host belongs to, and a *host ID* uniquely identifying the host itself on that network. A network mask is used to define the network ID and the host ID. Because IP addresses are difficult to remember, they usually have an associated domain name that can be specified instead. See *domain name, network mask*.

ISP

Internet Service Provider
A company that provides Internet access to its customers, usually for a fee.

LAN

Local Area Network
A network limited to a small geographic area, such as a home or small office.

LED

Light Emitting Diode
An electronic light-emitting device. The indicator lights on the front of the Wireless Gateway are LEDs.

MAC address

Media Access Control address
The permanent hardware address of a device, assigned by its manufacturer. MAC addresses are expressed as six pairs of hex characters, with each pair separated by colons. For example; *NN:NN:NN:NN:NN:NN*.

mask

See network mask.

Mbps

Abbreviation for Megabits per second, or one million bits per second. Network data rates are often expressed in Mbps.

NAT

Network Address Translation
A service performed by many routers that translates your network's publicly known IP address into a *private* IP address for each computer on your LAN. Only your router and your LAN know these addresses; the outside world sees only the public IP address when talking to a computer on your LAN.

network

A group of computers that are connected together, allowing them to communicate with each other and share resources, such as software, files, etc. A network can be small, such as a *LAN*, or very large, such as the *Internet*.

network mask

A network mask is a sequence of bits applied to an IP address to select the network ID while ignoring the host ID. Bits set to 1 mean "select this bit" while bits set to 0 mean "ignore this bit." For example, if the network mask 255.255.255.0 is applied to the IP address 100.10.50.1, the network ID is 100.10.50, and the host ID is 1. See *binary, IP address, subnet*.

NIC

Network Interface Card
An adapter card that plugs into your computer and provides the physical interface to your network cabling. For Ethernet NICs this is typically an RJ-45 connector. See *Ethernet, RJ-45*.

packet

Data transmitted on a network consists of units called packets. Each packet contains a payload (the data), plus overhead information such as where it came from (source address) and where it should go (destination address).

ping

Packet Internet (or Inter-Network) Groper
A program used to verify whether the host associated with an IP address is online. It can also be used to reveal the IP address for a given domain name.

port

A physical access point to a device such as a computer or router, through which data flows into and out of the device.

PPP

Point-to-Point Protocol
A protocol for serial data transmission that is used to carry IP (and other protocol) data between your ISP and your computer. The WAN interface on the Wireless Gateway uses two forms of PPP called PPPoA and PPPoE. See *PPPoA, PPPoE*.

PPPoA

Point-to-Point Protocol over ATM
One of the two types of PPP interfaces you can define for a Virtual Circuit (VC), the other type being PPPoE. You can define only one PPPoA interface per VC.

PPPoE

Point-to-Point Protocol over Ethernet
One of the two types of PPP interfaces you can define for a Virtual Circuit (VC), the other type being PPPoA. You can define one or more PPPoE interfaces per VC.

protocol

A set of rules governing the transmission of data. In order for a data transmission to work, both ends of the connection have to follow the rules of the protocol.

remote

In a physically separate location. For example, an employee away on travel who logs in to the company's intranet is a remote user.

RIP

Routing Information Protocol
The original TCP/IP routing protocol. There are two versions of RIP: version I and version II.

RJ-11

Registered Jack Standard-11
The standard plug used to connect telephones, fax machines, modems, etc. to a telephone port. It is a 6-pin connector usually containing four wires.

RJ-45

Registered Jack Standard-45
The 8-pin plug used in transmitting data over phone lines. Ethernet cabling usually uses this type of connector.

routing

Forwarding data between your network and the Internet on the most efficient route, based on the data's destination IP address and current network conditions. A device that performs routing is called a router.

SDNS

Secondary Domain Name System (server)
A DNS server that can be used if the primary DSN server is not available. *See DNS*.

subnet

A subnet is a portion of a network. The subnet is distinguished from the larger network by a *subnet mask* that selects some of the computers of the network and excludes all others. The subnet's computers remain physically connected to the rest of the parent network, but they are treated as though they were on a separate network. See *network mask*.

subnet mask

A mask that defines a subnet. See *network mask*.

TCP

See *TCP/IP*.

TCP/IP

Transmission Control Protocol/Internet Protocol
The basic protocols used on the Internet. TCP is responsible for dividing data up into packets for delivery and reassembling them at the destination, while IP is responsible for delivering the packets from source to destination. When TCP and IP are bundled with higher-level applications such as HTTP, FTP, Telnet, etc., TCP/IP refers to this whole suite of protocols.

Telnet

An interactive, character-based program used to access a remote computer. While HTTP (the web protocol) and FTP only allow you to download files from a remote computer, Telnet allows you to log into and use a computer from a remote location.

TFTP

Trivial File Transfer Protocol
A protocol for file transfers, TFTP is easier to use than File Transfer Protocol (FTP) but not as capable or secure.

TKIP

Temporal Key Integrity Protocol (TKIP) provides WPA with a data encryption function. It ensures that a unique master key is generated for each packet, supports message integrity and sequencing rules and supports re-keying mechanisms.

triggers

Triggers are used to deal with application protocols that create separate sessions. Some applications, such as NetMeeting, open secondary connections during normal operations, for example, a connection to a server is established using one port, but data transfers are performed on a separate connection. A trigger tells the device to expect these secondary sessions and how to handle them.

Once you set a trigger, the embedded IP address of each incoming packet is replaced by the correct host address so that NAT can translate packets to the correct destination. You can specify whether you want to carry out address replacement, and if so, whether to replace addresses on TCP packets only, UDP packets only, or both.

twisted pair

The ordinary copper telephone wiring used by telephone companies. It contains one or more wire pairs twisted together to reduce inductance and noise. Each telephone line uses one pair. In homes, it is most often installed with two pairs. For Ethernet LANs, a higher grade called Category 3 (CAT 3) is used for 10BASE-T networks, and an even higher grade called Category 5 (CAT 5) is used for 100BASE-T networks. See *10BASE-T, 100BASE-T, Ethernet*.

unnumbered interfaces

An unnumbered interface is an IP interface that does not have a local subnet associated with it. Instead, it uses a *router-id* that serves as the source and destination address of packets sent to and from the router. Unlike the IP address of a normal interface, the router-id of an unnumbered interface is allowed to be the same as the IP address of another interface. For example, the WAN unnumbered interface of your device uses the same IP address of the LAN interface (10.0.0.2).

The unnumbered interface is temporary – PPP or DHCP will assign a 'real' IP address automatically.

upstream The direction of data transmission from the user to the Internet.

VC Virtual Circuit
A connection from your DSL router to your ISP.

VCI Virtual Circuit Identifier
Together with the Virtual Path Identifier (VPI), the VCI uniquely identifies a VC. Your ISP will tell you the VCI for each VC they provide. See *VC*.

VPI Virtual Path Identifier
Together with the Virtual Circuit Identifier (VCI), the VPI uniquely identifies a VC. Your ISP will tell you the VPI for each VC they provide. See *VC*.

WAN Wide Area Network
Any network spread over a large geographical area, such as a country or continent. With respect to the Wireless Gateway, WAN refers to the Internet.

Web browser A software program that uses Hyper-Text Transfer Protocol (HTTP) to download information from (and upload to) web sites, and displays the information, which may consist of text, graphic images, audio, or video, to the user. Web browsers use Hyper-Text Transfer Protocol (HTTP). Popular web browsers include Netscape Navigator and Microsoft Internet Explorer. See *HTTP, web site, WWW*.

Web page A web site file typically containing text, graphics and hyperlinks (cross-references) to the other pages on that web site, as well as to pages on other web sites. When a user accesses a web site, the first page that is displayed is called the *home page*. See *hyperlink, web site*.

Web site A computer on the Internet that distributes information to (and gets information from) remote users through web browsers. A web site typically consists of web pages that contain text, graphics, and hyperlinks. See *hyperlink, web page*.

WWW World Wide Web

Also called *(the) Web.* Collective term for all web sites anywhere in the world that can be accessed via the Internet.

Warning

Notice:
Any changes or modifications not expressly approved by the party responsible for compliance could void your authority to operate the equipment.

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

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

Notice:
1. This Transmitter must not be colocated or operating in conjunction with any other antenna or transmitter.

2. This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. Thisequipment should be installed and operated with a minimum distance of 20 centimeters between the radiator and your body.

Label Requirement: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.