D-Link®

DVG-N5402SP
VoIP Wireless Router

User’s Manual

Version 1.4

(30 March 2011)

Warranty: please contact your D-Link Authorized Reseller or the D-Link Branch Office nearest your place of purchase for information about the warranty offered on your D-Link product.

Information in this document is subject to change without notice.

FCC Warning

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 communication. 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.

CE Mark Warning

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

Warnung!

Dies ist ein Produkt der Klasse B. Im Wohnbereich kann dieses Produkt Funkstoerungen verursachen. In diesem Fall kann vom Benutzer verlangt werden, angemessene Massnahmen zu ergreifen.

Precaución!

Este es un producto de Clase B. En un entorno doméstico, puede causar interferencias de radio, en cuyo case, puede requerirse al usuario para que adopte las medidas adecuadas.

Attention!

Ceci est un produit de classe B. Dans un environnement domestique, ce produit pourrait causer des interférences radio, auquel cas l`utilisateur devrait prendre les mesures adéquates.

Attenzione!

Il presente prodotto appartiene alla classe B. Se utilizzato in ambiente domestico il prodotto può causare interferenze radio, nel cui caso è possibile che l`utente debba assumere provvedimenti adeguati.

Contents

1. Introduction

1-1 Product Overview

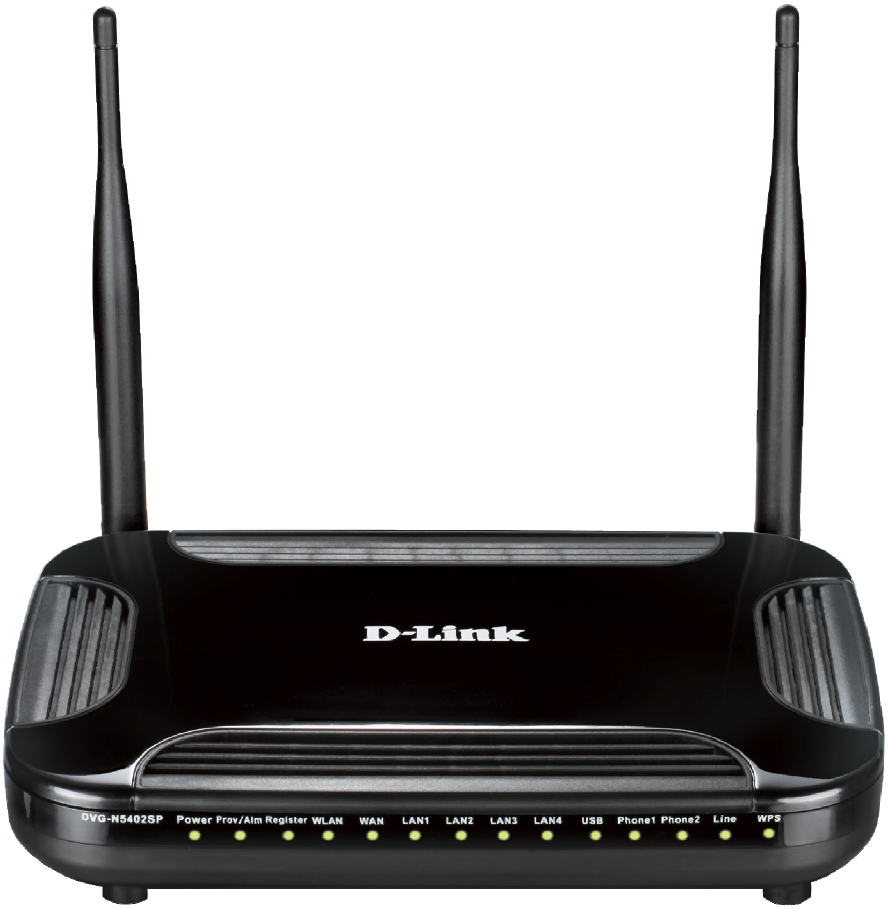
The DVG-N5402SP is designed to carry both voice and facsimile over the IP network and wirelessly share Internet access. It uses the industry standard SIP call control protocol so as to be compatible with free registration services or VoIP service providers’ systems. As a standard user agent, it is compatible with all common Soft Switches and SIP proxy servers. While running optional server software, the VoIP Router can be configured to establish a private VoIP network over the Internet without a third-party SIP Proxy Server.

The DVG-N5402SP can be seamlessly integrated into an existing network by connecting to a phone set and fax machine. With only a broadband connection such as an ADSL bridge/router, a Cable Modem or a leased-line router, the VoIP Router allows you to use voice and fax services over IP in order to reduce the cost of all long distance calls.

The DVG-N5402SP is also an 802.11b/g/n wireless access point. Allow wireless clients to connect to it and share your broadband Internet connection. A built-in 4-port switch makes it possible to connect up to 4 Ethernet-enabled computers or devices to also share your Internet connection.

1-2 Hardware Description

Front Panel



Power: A steady green light indicates a proper connection to a power source. A red light indicates the power-on self test fails or the device is malfunction.

Prov/Alm: A blinking light indicates the VoIP Router can not register with SIP Server or can not get the IP address. A blinking light also indicates the VoIP Router is attempting to connect with the Provisioning server. Once the service connects, the LED will turn off. The LED will light solid red if the self-test or boot-up fails.

Register: The Register LED will turn on and continuously working when the VoIP Router is connected to a VoIP service provider. The LED will flash if not connected to a service provider.

WLAN: A steady light indicates a wireless connection. A blinking light indicates that the VoIP Router is receiving or transmitting from or to the wireless network.

WAN: When a connection is established the LED will light up solid. The LED will blink to indicate the activity. If the LED does not light up when a cable is connected, verify the cable connections and ensure that your devices are powered on.

LAN: When a connection is established the LED will light up solid on the appropriate port. The LEDs will blink to indicate the activity. If the LED does not light up when a cable is connected, verify the cable connections and ensure that your devices are powered on.

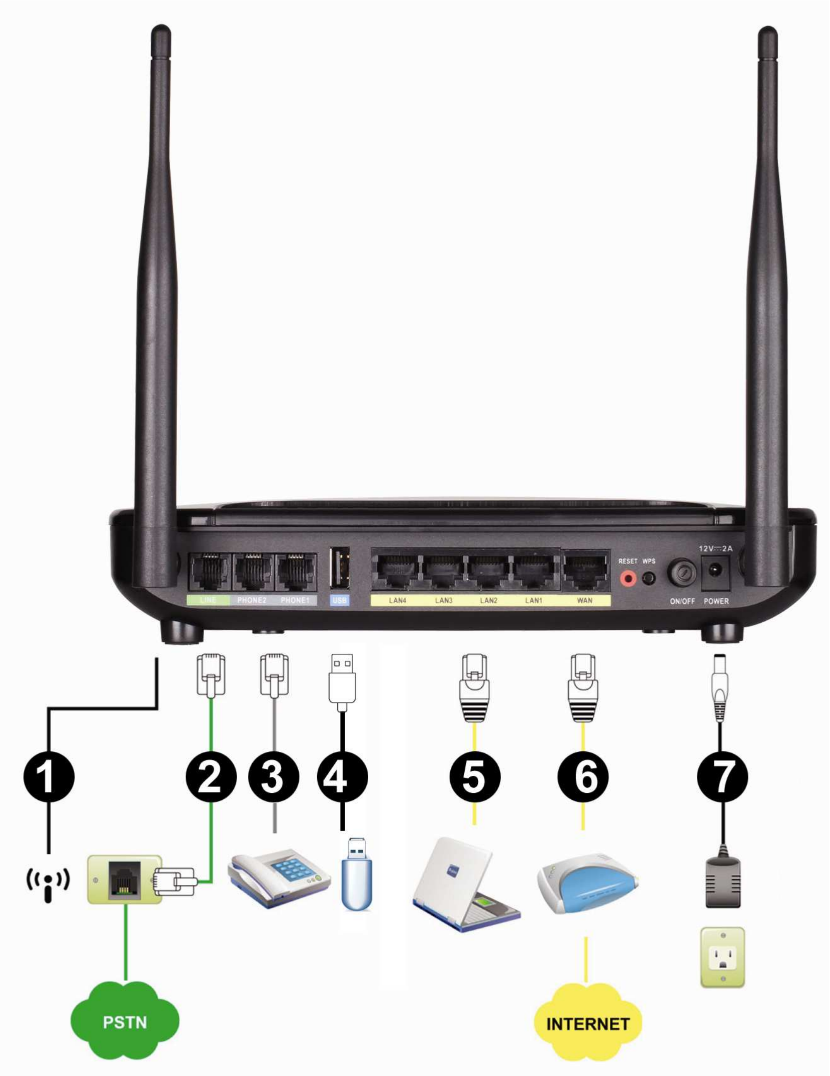
USB: When a connection is established the LED will light up solid. The LED will blink to indicate the activity. If the LED does not light up when a USB device is connected, verify the USB connection and ensure that the devices are powered on.

Phone: This LED displays the VoIP status and hook or ringing activity on the phone port that is used to connect your normal telephone(s). If a phone connected to a phone port is off the hook or in use, this LED will light solid. When a phone is ringing, the indicator will blink.

Line: Light on means the line is in use (off-hook), and vice versa.

WPS: When a WPS negotiation is established the LED will light up solid. The LED will blink to indicate the activity. If the LED does not light up when the WPS negotiation is failed or is not established.

Rear Panel



1. **Antenna:** Connect to a wireless network.
2. **LINE:** Connect to the telephone line on the wall jack through a telephone cable.
3. **PHONE2/PHONE1:** Connect to your phones through a standard telephone cable.
4. **USB:** USB host 2.0 port, for connecting to another USB device to supply some value-added application.
5. **LAN4/LAN3/LAN2/LAN1:** RJ-45 port, for connecting to the Ethernet port of a PC or the Ethernet devices through an Ethernet cable.
6. **WAN:** Connect to your ONT through an Ethernet cable.
7. **POWER:** Power adapter, for connecting to the power adapter of 12V, 2A.
8. **RESET:** Restore to factory defaults. To restore factory defaults, keep the VoIP Router powered on, push a paper clip into the hole to press the button for over 5 seconds and then release.
9. **WPS:** Button to enable or disable WPS.
10. **ON/OFF:** Power switch, power on or power off the VoIP Router.

WARNING: DO NOT (1) connect the phone ports to each other (FXS to FXS) or (2) connect any phone port directly to a PSTN line (FXS to PSTN) or to an internal PBX line (FXS to PBX extension). (3) Stacking is forbidden. Doing so may damage your VoIP Router.

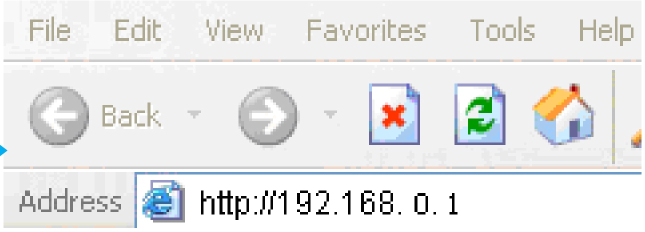
Use the Reset Button to restore factory default settings:

1. **Power on.**
2. **Press and hold the Reset button for over 5 seconds.**
3. **Release the Reset button. Factory settings are restored.**

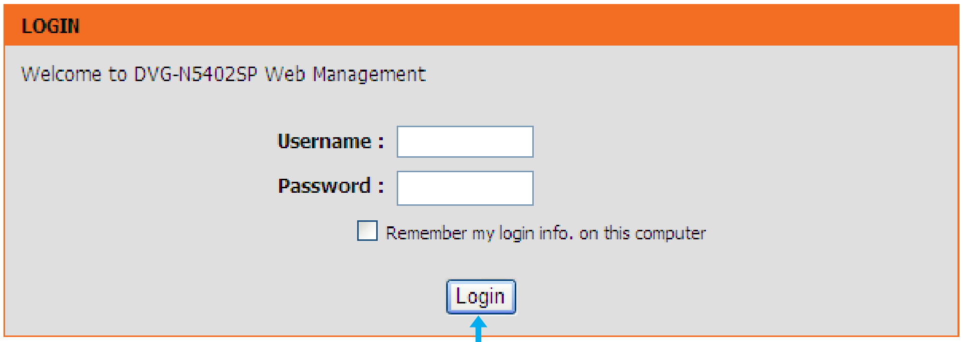
2. Getting Started

To access the Web-based configuration utility, open a Web browser such as IE (Internet Explorer) and enter the IP address of the DVG-N5402SP from LAN port.

Open your Web browser and enter **http://192.168.0.1** into the URL address bar. Click Enter.



Address http://192.168. 0. 1



LOGIN

Welcome to DVG-N5402SP Web Management

Username :

Password :

□ Remember my login info. on this computer

Click **Login** to enter Web site.

The default username and password of user account: admin/password .

3. VoIP Router Web Configuration (continued)

3-1 SETUP

3-1-1 Wireless Setup

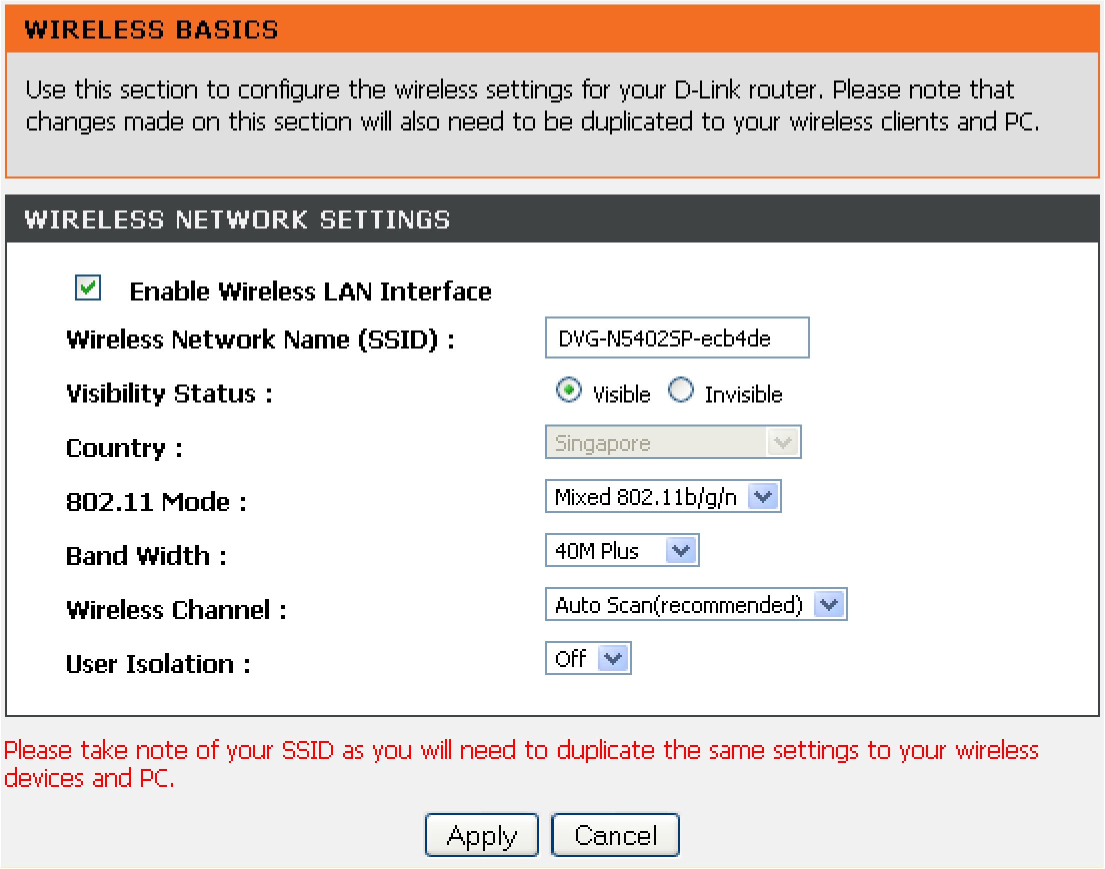
This section instructs you how to setup your wireless network on the VoIP Router device.

ⓘ Setup Hint:

1. Every device in the same wireless network must use the same SSID.
2. To avoid wireless network overlap, a specific and different channel is needed.
3. Make sure security used by every device in the same wireless network is compatible with the wireless AP.

3-1-1-1 Wireless Basic

SETUP → Wireless Setup → Wireless Basic



WIRELESS BASICS

Use this section to configure the wireless settings for your D-Link router. Please note that changes made on this section will also need to be duplicated to your wireless clients and PC.

WIRELESS NETWORK SETTINGS

☑ Enable Wireless LAN Interface

Wireless Network Name (SSID) : DVG-N5402SP-ecb4de

Visibility Status : ● Visible ○ Invisible

Country : Singapore

802.11 Mode : Mixed 802.11b/g/n

Band Width : 40M Plus

Wireless Channel : Auto Scan(recommended)

User Isolation : Off

Please take note of your SSID as you will need to duplicate the same settings to your wireless devices and PC.

Enable Wireless LAN Interface: Enable wireless basic settings on LAN interface.

Wireless Network Name (SSID): SSID is the name of your wireless network. All wireless-equipped devices share the same SSID to communicate with each other. It must be unique to identify separated wireless network. For security, you should change the default SSID to a special ID. By default the SSID will be name “DVG-N5402SP-XXXXXX” and “XXXXXX” will be the last 6 numbers of your WAN connection “TR069” MAC Address.

Visibility Status: Select the visibility status.

Visible indicates that the device broadcasts the SSID.

Invisible indicates that the device does not broadcast the SSID.

Country: Select the country where you are located from the drop-down menu.

802.11 Mode: The VoIP Router can operate in 2.4GHz ISM band with different speed of wireless connection, Select the wireless band of your network.

802.11b only - Allow all 802.11B compliant wireless devices to associate with the wireless AP.

802.11g only - Allow all 802.11G compliant wireless devices to associate with the wireless AP.

802.11n only - Allow all 802.11N compliant wireless devices to associate with the wireless AP.

Mixed 802.11b/g – Allow a mix of both 802.11B and 802.11G compliant wireless devices to associate with the wireless AP.

Mixed 802.11n/g - Allow a mix of both 802.11N and 802.11G compliant wireless devices to associate with the wireless AP.

Mixed 802.11b/g/n - Allow a mix of 802.11B, 802.11G, and 802.11N compliant wireless devices to associate with the wireless AP.

Bandwidth: Select the bandwidth from the drop-down list. You can select **20M, 40M Plus,** or **40M Minus**.

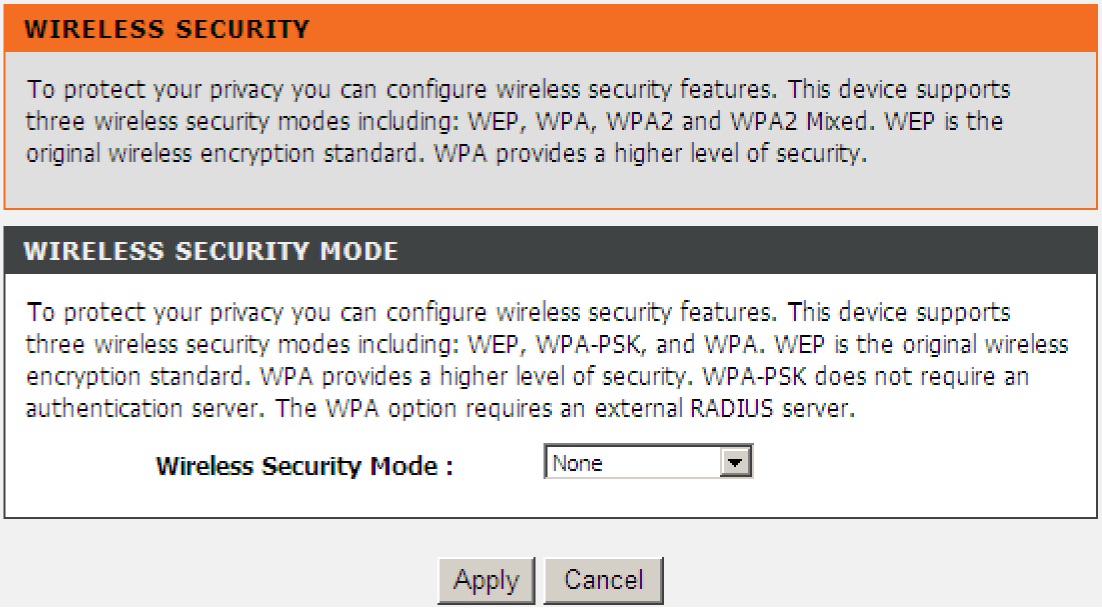
Wireless Channel: Select a clear and appropriate channel for your wireless network. A device on your wireless network must use a specific channel to transmit and receive data. If wireless network has overlap, change a different channel number.

User Isolation: The isolation among all the stations that are connected with the same VAP (Virtual Access Point). You can select **Off** or **On**.

3-1-1-2 Wireless Security

This section introduces you different ways of wireless security you can set up. It is important to enable secure algorithm to protect your data from eavesdropping by unauthorized wireless users.

SETUP → Wireless Setup → Wireless Security



WIRELESS SECURITY

To protect your privacy you can configure wireless security features. This device supports three wireless security modes including: WEP, WPA, WPA2 and WPA2 Mixed. WEP is the original wireless encryption standard. WPA provides a higher level of security.

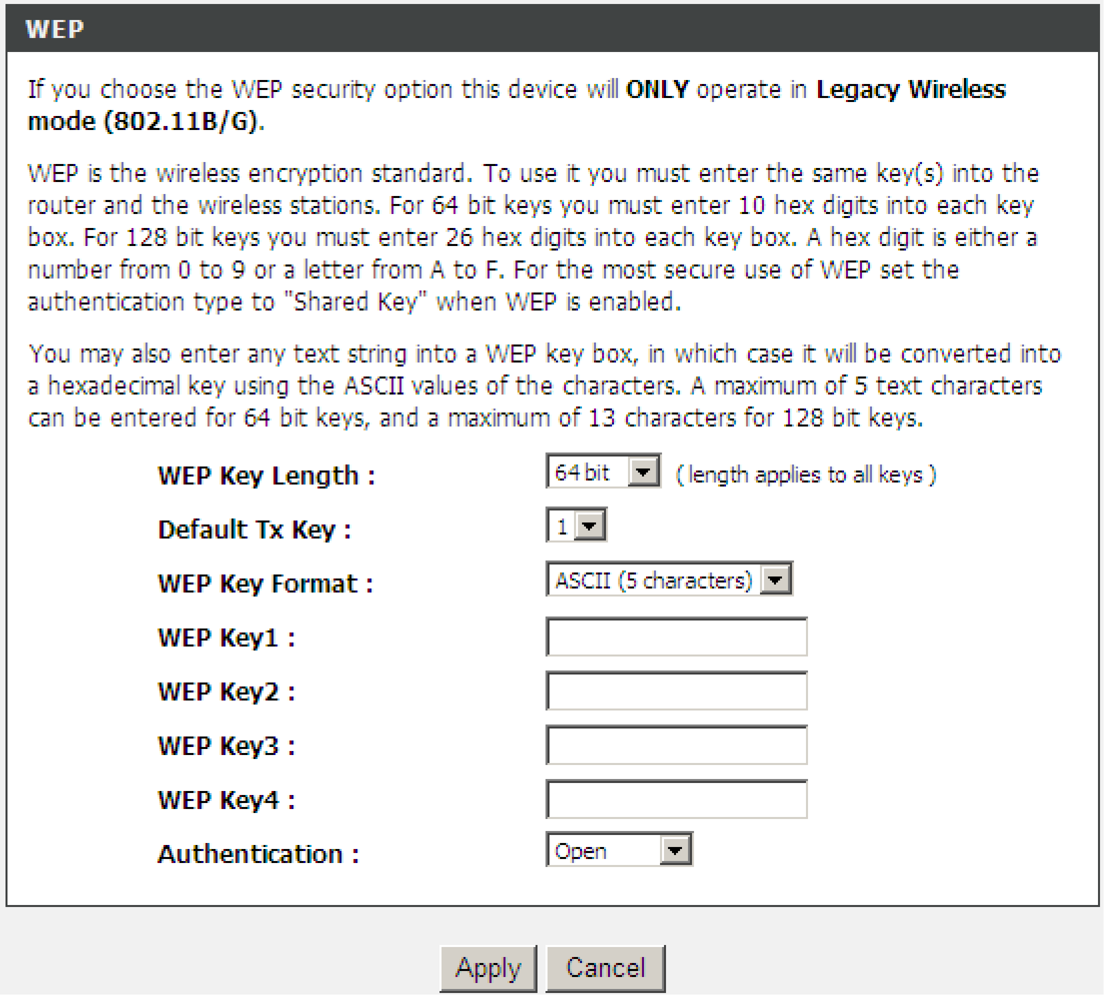
WIRELESS SECURITY MODE

To protect your privacy you can configure wireless security features. This device supports three wireless security modes including: WEP, WPA-PSK, and WPA. WEP is the original wireless encryption standard. WPA provides a higher level of security. WPA-PSK does not require an authentication server. The WPA option requires an external RADIUS server.

Wireless Security Mode : None

Wireless Security Mode: Select the encryption/authentication type: **None**, **WEP**, **WPA only**, **WPA2 only**, or **WPA/WP2 Mixed**.

SETUP → Wireless Setup → Wireless Security (WEP)



WEP

If you choose the WEP security option this device will **ONLY** operate in **Legacy Wireless mode (802.11B/G)**.

WEP is the wireless encryption standard. To use it you must enter the same key(s) into the router and the wireless stations. For 64 bit keys you must enter 10 hex digits into each key box. For 128 bit keys you must enter 26 hex digits into each key box. A hex digit is either a number from 0 to 9 or a letter from A to F. For the most secure use of WEP set the authentication type to "Shared Key" when WEP is enabled.

You may also enter any text string into a WEP key box, in which case it will be converted into a hexadecimal key using the ASCII values of the characters. A maximum of 5 text characters can be entered for 64 bit keys, and a maximum of 13 characters for 128 bit keys.

WEP Key Length :	64 bit (length applies to all keys)
Default Tx Key :	1
WEP Key Format :	ASCII (5 characters)
WEP Key1 :	
WEP Key2 :	
WEP Key3 :	
WEP Key4 :	
Authentication :	Open

WEP Key Length: Select 64-bit or 128-bit data encryption.

Default Tx Key: You can select one of the keys as active key at a time.

WEP Key Format: Select the preferred WEP Key Format according to which WEP encryption you choose. When WEP 64bits is enabled, you can select ASCII (5 characters) and Hex (10 characters). When WEP 128bits is enabled, you can select ASCII (13 characters) and Hex (26 characters).

WEP Key 1 – 4: You can manually enter key value from Key1 to Key4. Type a character sting and apply changes.

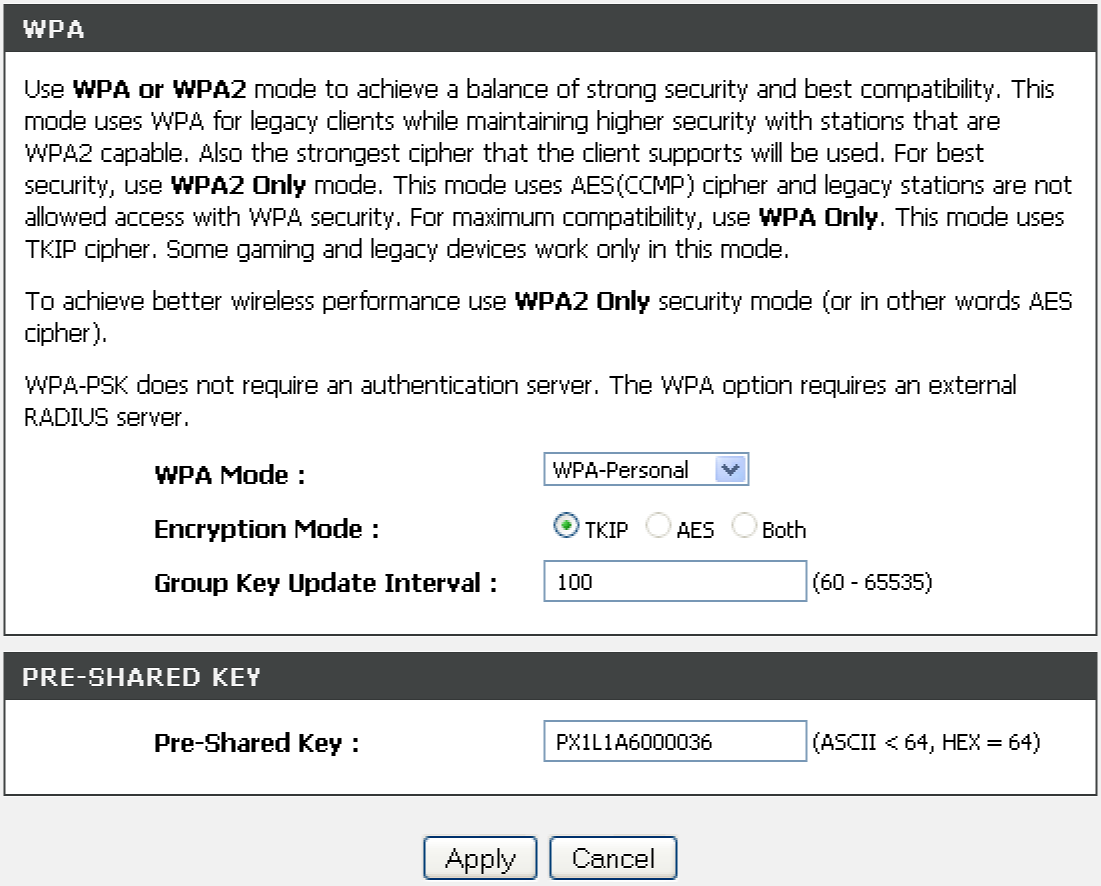
For a 64-bit WEP key - Enter 5 characters (ASCII sting) or 10 hexadecimal characters ("0-9", "A-F").

For a 128-bit WEP key - Enter 13 characters (ASCII sting) or 26 hexadecimal characters ("0-9", "A-F").

WPA Authentication Mode

The wireless network can use WPA Authentication to verify whether a wireless device is allowed to access your Access Point or not. You can choose to use Enterprise (RADIUS) method or Personal (Pre-Shared Key). The encryption mechanism used for RADIUS and WPA-PSK is the same. The difference between the two is that WPA-PSK uses a specific characters sting like password instead of a user-authentication.

SETUP → Wireless Setup → Wireless Security (WPA-PSK)



WPA

Use **WPA or WPA2** mode to achieve a balance of strong security and best compatibility. This mode uses WPA for legacy clients while maintaining higher security with stations that are WPA2 capable. Also the strongest cipher that the client supports will be used. For best security, use **WPA2 Only** mode. This mode uses AES(CCMP) cipher and legacy stations are not allowed access with WPA security. For maximum compatibility, use **WPA Only**. This mode uses TKIP cipher. Some gaming and legacy devices work only in this mode.

To achieve better wireless performance use **WPA2 Only** security mode (or in other words AES cipher).

WPA-PSK does not require an authentication server. The WPA option requires an external RADIUS server.

WPA Mode : WPA-Personal

Encryption Mode : ● TKIP ○ AES ○ Both

Group Key Update Interval : 100 (60 - 65535)

PRE-SHARED KEY

Pre-Shared Key : PX1L1A6000036 (ASCII < 64, HEX = 64)

If **WPA Security Mode** is set to **WPA** (**WPA only**, **WPA2 only**, or **WPA/WP2 Mixed**), you can set **WPA Mode** to **WPA-Personal** or **WPA-Enterprise**, select the security mode according to your wireless network.

Encryption Mode: Encryption mode is used for the configuration of WPA or WPA2 Mixed.

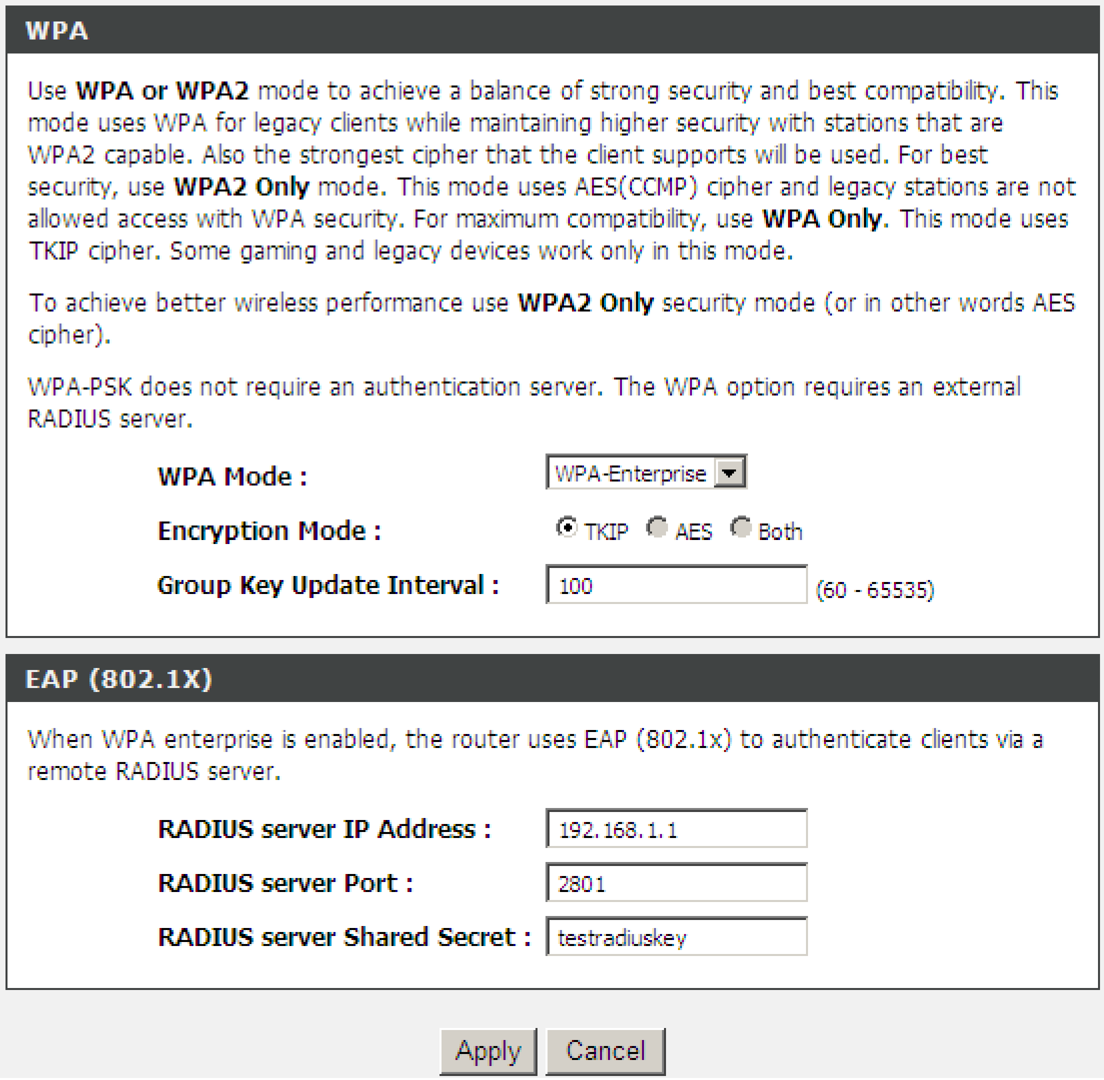
TKIP - TKIP is the security protocol used in WPA. The length of TKIP encryption is longer than WEP encryption that increases the complexity of decoding for crackers.

AES - The most powerful encryption algorithm that is commonly used in WPA.

Group Key Update Interval: Set the update interval of the group key.

Pre-Shared Key: Enter a key of 8-64 characters long in the Pre-Shared Key filed. Make sure this key is exactly the same on all other wireless stations. By default, the Pre-Shared Key will be the serial number located below your device. Use that to access your wireless network.

SETUP → Wireless Settings → Wireless Security (WPA-Enterprise)



WPA

Use **WPA or WPA2** mode to achieve a balance of strong security and best compatibility. This mode uses WPA for legacy clients while maintaining higher security with stations that are WPA2 capable. Also the strongest cipher that the client supports will be used. For best security, use **WPA2 Only** mode. This mode uses AES(CCMP) cipher and legacy stations are not allowed access with WPA security. For maximum compatibility, use **WPA Only**. This mode uses TKIP cipher. Some gaming and legacy devices work only in this mode.

To achieve better wireless performance use **WPA2 Only** security mode (or in other words AES cipher).

WPA-PSK does not require an authentication server. The WPA option requires an external RADIUS server.

WPA Mode : WPA-Enterprise

Encryption Mode : ● TKIP ○ AES ○ Both

Group Key Update Interval : 100 (60 - 65535)

EAP (802.1X)

When WPA enterprise is enabled, the router uses EAP (802.1x) to authenticate clients via a remote RADIUS server.

RADIUS server IP Address : 192.168.1.1

RADIUS server Port : 2801

RADIUS server Shared Secret : testradiuskey

If **WPA Security Mode** is set to **WPA** (**WPA only**, **WPA2 only**, or **WPA2 Mixed**), you can set **WPA Mode** to **WPA-Enterprise** (**WPA- Enterprise**, **WPA2- Enterprise**, **WPA2 Mixed- Enterprise**), select the security mode according to your wireless network.

WPA Mode: Select **WPA-Enterprise**.

WPA Cipher Suite: WPA Cipher Suite is used for the configuration of WPA or WPA2 Mixed.

TKIP - TKIP is the security protocol used in WPA. The length of TKIP encryption is longer than WEP encryption that increases the complexity of decoding for crackers.

AES - The most powerful encryption algorithm that is commonly used in WPA.

RADIUS Server:

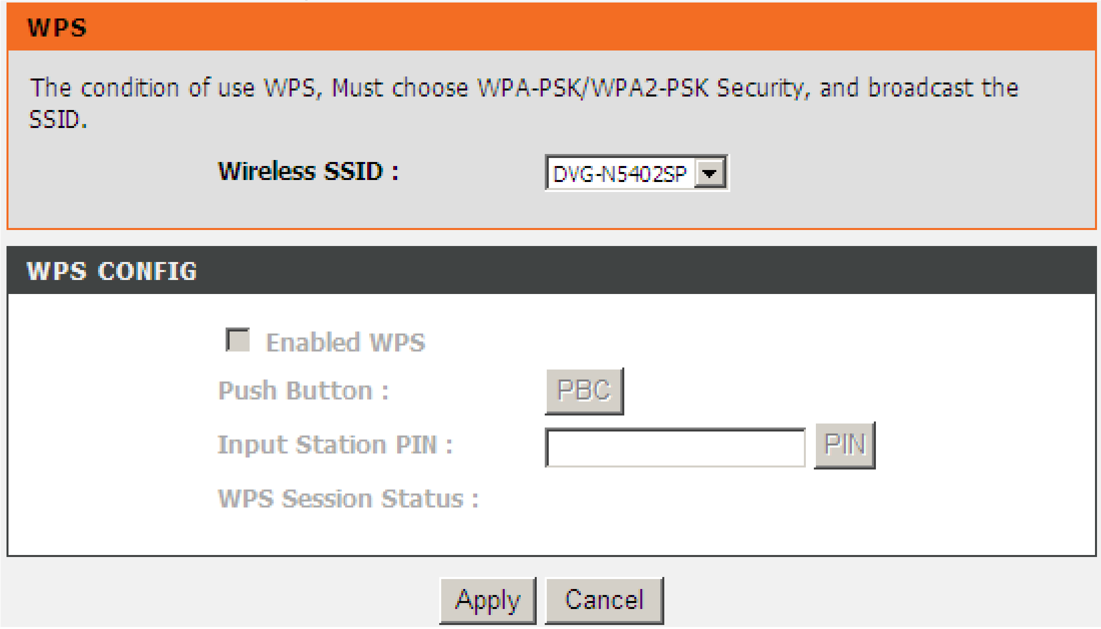
RADIUS server IP Address - Enter the IP address of the authentication RADIUS server.

RADIUS server Port - Enter the port number of the authentication RADIUS server. Keep the default value: 2801 unless the server required change to another number.

RADIUS server Shared Secret - Enter the password such as a security Key.

3-1-1-3 WPS

SETUP → Wireless Setup → WPS



WPS

The condition of use WPS, Must choose WPA-PSK/WPA2-PSK Security, and broadcast the SSID.

Wireless SSID : DVG-N5402SP

WPS CONFIG

□ Enabled WPS

Push Button :

Input Station PIN :

WPS Session Status :

Wireless SSID: Select the VAP (Virtual Access Point) of which the WPS function is enabled.

Note: There is only one VAP of which the WPS function is enabled each time. If the WPS function of the VAP has been enabled, the WPS function would be disabled before you enable the WPS function of another VAP.

Enable: Enable or disable the WPS function. The WPS function of the VoIP Router only supports the following three authentication methods: **WPA2-PSK**, **WPA2-PSK**, or **WPA2-Mixed**. If the page is in gray, you need to enable **WPA2-PSK**, **WPA2-PSK**, or **WPA2-Mixed**.

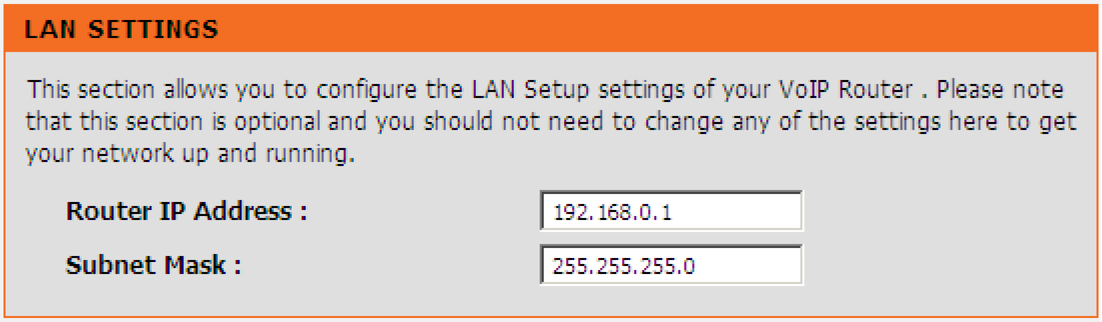
PBC Button: Click the **PBC** button to trigger WPS negotiation session through PBC.

Input Station PIN: Enter the PIN code (Personal Identification Number) of the station.

WPS Session Status: It shows the. There are four WPS negotiation status: **INPROCESS**, **ERROR**, **SUCCESS**, or **OVERLAP**.

3-1-2 LAN Setup

SETUP → LAN Setup



LAN SETTINGS

This section allows you to configure the LAN Setup settings of your VoIP Router . Please note that this section is optional and you should not need to change any of the settings here to get your network up and running.

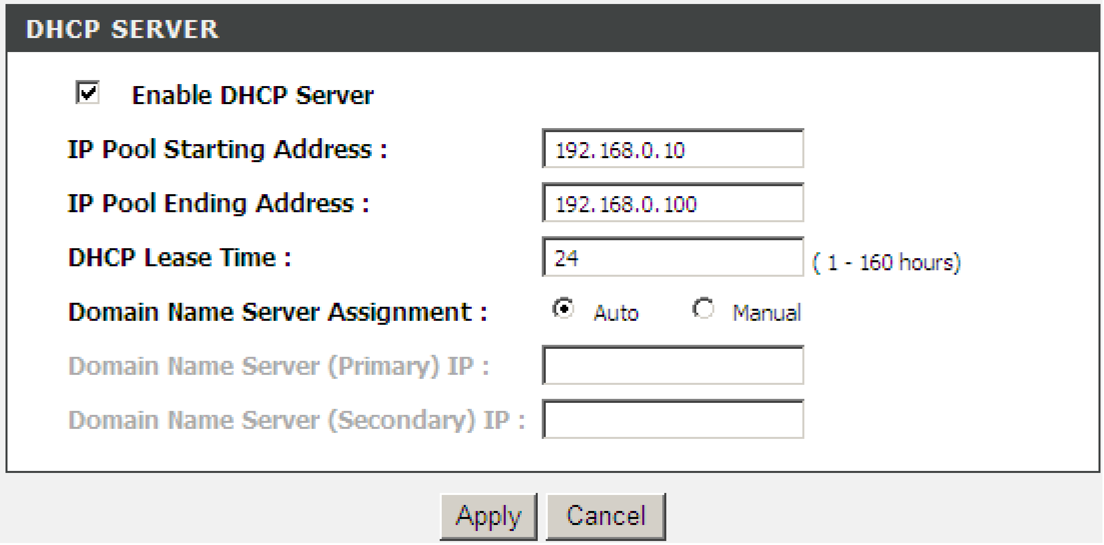
Router IP Address : 192.168.0.1

Subnet Mask : 255.255.255.0

Router IP Address: Enter the LAN IP address of the VoIP Router. It is also the default gateway for DHCP clients.

Subnet Mask: Enter the subnet mask for DHCP clients.

SETUP → LAN Setup



DHCP SERVER

☑ Enable DHCP Server

IP Pool Starting Address : 192.168.0.10

IP Pool Ending Address : 192.168.0.100

DHCP Lease Time : 24 (1 - 160 hours)

Domain Name Server Assignment : ● Auto ○ Manual

Domain Name Server (Primary) IP :

Domain Name Server (Secondary) IP :

Enable DHCP Server: This variable is to assign the IP address for the devices connected to LAN port of the VoIP Router.

IP Pool Starting Address: Enter the starting IP address for the DHCP server's IP assignment.

IP Pool Ending Address: Enter the ending IP address for the DHCP server's IP assignment.

DHCP Lease Time: Enter the length of time for the IP lease.

Domain Name Server Assignment: Select **Auto** or **Manual** to get the IP address of DNS (Domain Name Server) assigned by ISP or manually.

Domain Name Server IP: Enter the primary and secondary IP address of DNS (Domain Name Server) if Domain Name Server Assignment is **Manual**. Otherwise, the VoIP Router will not be able to access hosts using hostnames instead of IPs.

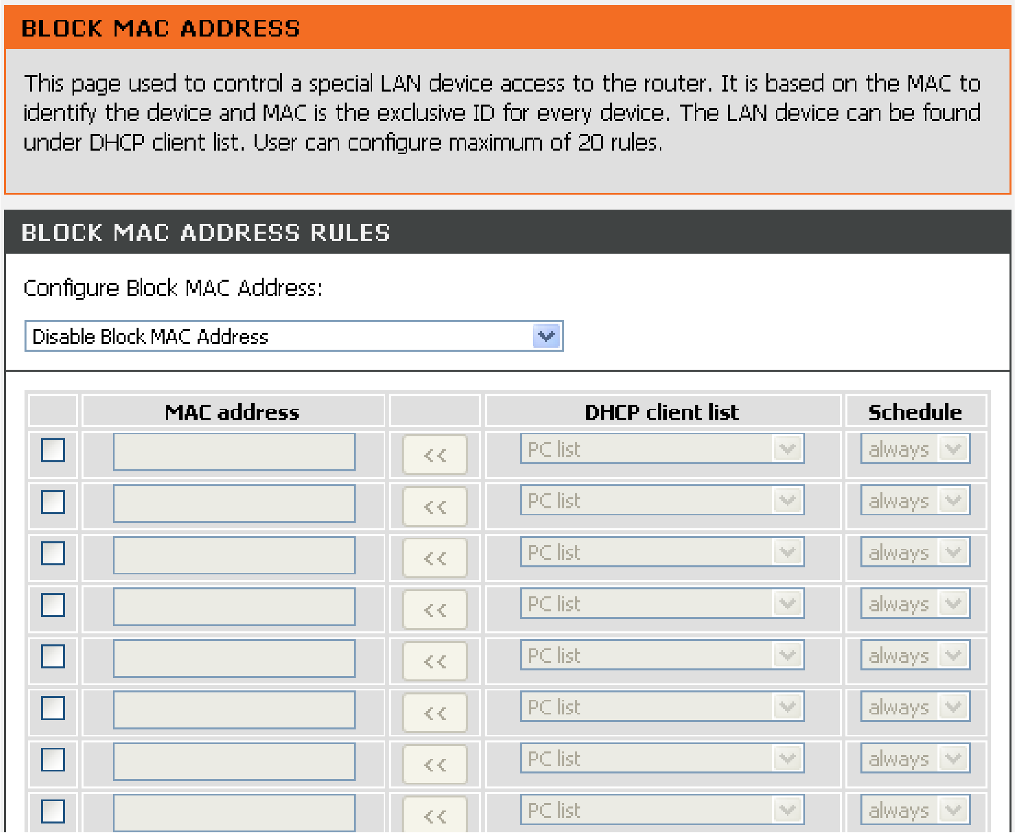
3-2 ADVANCED

3-2-1 Parental Control

3-2-1-1 MAC Filtering

Use MAC Filters to deny computers within the local area network from accessing the Internet. You can either manually add a MAC address that are connected to the VoIP Router.

ADVANCED → Parental Control → MAC Filtering



BLOCK MAC ADDRESS

This page used to control a special LAN device access to the router. It is based on the MAC to identify the device and MAC is the exclusive ID for every device. The LAN device can be found under DHCP client list. User can configure maximum of 20 rules.

BLOCK MAC ADDRESS RULES

Configure Block MAC Address:

Disable Block MAC Address

	MAC address		DHCP client list	Schedule
□		<<	PC list	always
□		<<	PC list	always
□		<<	PC list	always
□		<<	PC list	always
□		<<	PC list	always
□		<<	PC list	always
□		<<	PC list	always
□		<<	PC list	always

Configure Block MAC Address:

Disable Block MAC Address – Unable the MAC Filtering

Enable Block MAC, allow following PC to access network – MAC Address that include in the list will be able to connect to the network.

Enable Block MAC, deny following PC to access network – MAC Address that include in the list will not be able to connect to the network.

MAC Address: Enter the MAC of the computer in the LAN (Local Area Network) to be used in the MAC filtering list.

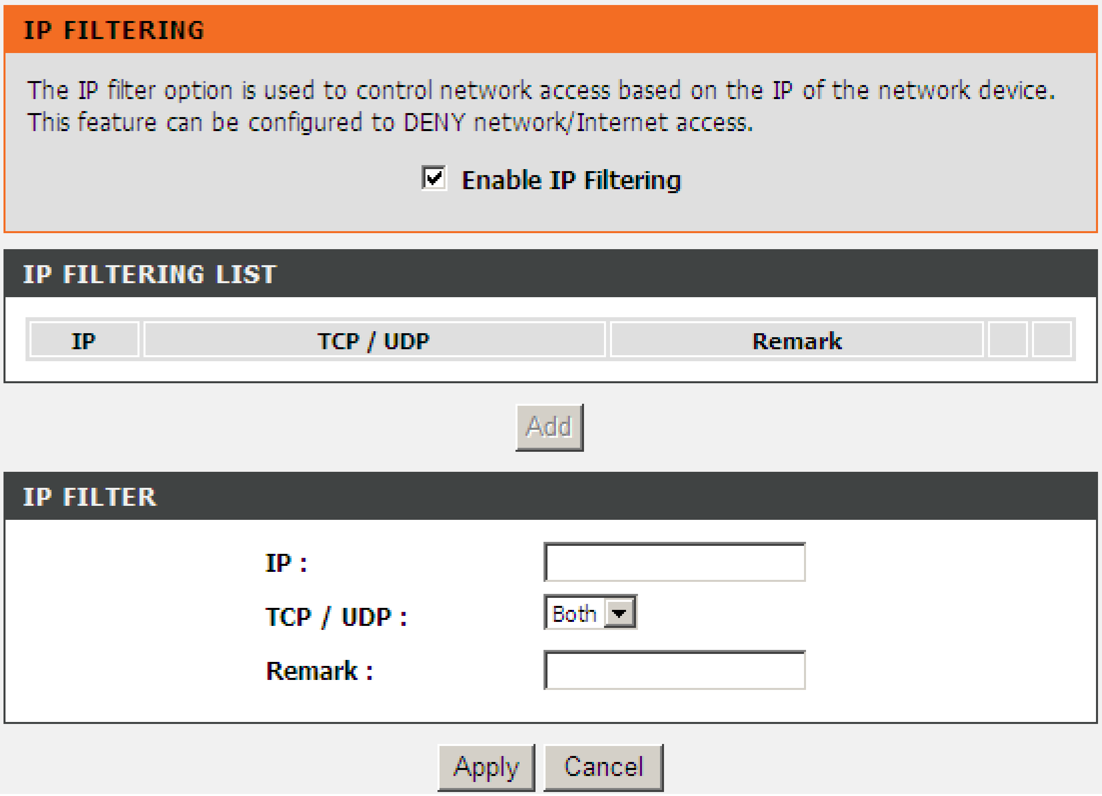
DHCP client list: Get the MAC address from computer that's listed in the LAN client list.

Schedule: Select a rule in the drop down list. Rules in the list can be configured in Advanced -> Schedules. Click the Schedules button to go to the page.

3-2-1-2 IP Filtering

Use IP Filters to deny particular LAN IP addresses from accessing the Internet. You can deny specific port numbers or all ports for a specific IP address. The screen will display well-known ports that are defined. To use them, click the edit icon. You will only need to enter the LAN IP address (es) of the computer (s) that will be denied Internet access.

ADVANCED → Parental Control → IP Filtering



IP FILTERING

The IP filter option is used to control network access based on the IP of the network device. This feature can be configured to DENY network/Internet access.

☑ Enable IP Filtering

IP FILTERING LIST

IP	TCP / UDP	Remark		

IP FILTER

IP :

TCP / UDP : Both

Remark :

Enable IP Filtering: Check the box to deny particular LAN IP addresses from accessing the Internet.

IP: Enter the IP address that you want to deny in this filed.

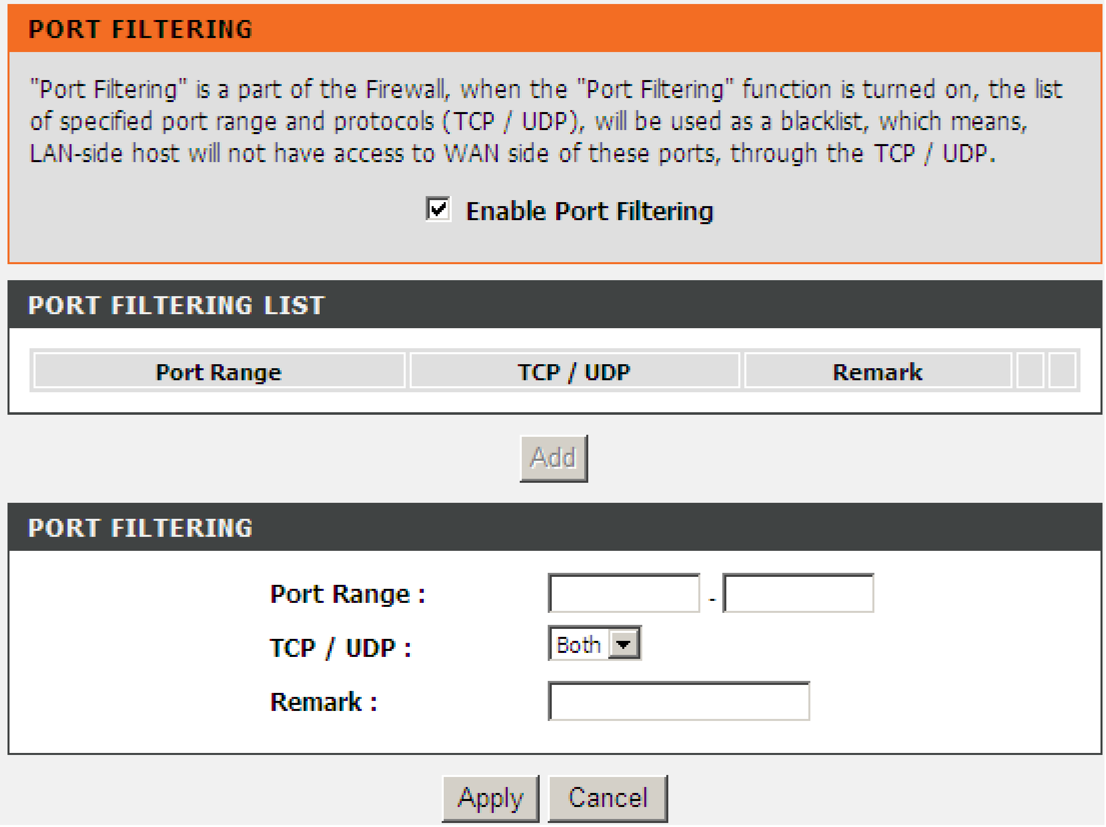
TCP/UDP: Select **TCP**, **UDP** or **Both** that will be used with the IP address that will be blocked.

Remark: Enter comments.

3-2-1-3 Port Filtering

Port filtering enables you to control all data that can be transmitted over routers. When the port used at the source end is within the defined scope, it will be filtered without transmission.

ADVANCED → Parental Control → Port Filtering



PORT FILTERING

"Port Filtering" is a part of the Firewall, when the "Port Filtering" function is turned on, the list of specified port range and protocols (TCP / UDP), will be used as a blacklist, which means, LAN-side host will not have access to WAN side of these ports, through the TCP / UDP.

☑ Enable Port Filtering

PORT FILTERING LIST

Port Range	TCP / UDP	Remark		

PORT FILTERING

Port Range :	-
TCP / UDP :	Both
Remark :	

Enable Port Filtering: This variable is to restrict certain types of data packets by port.

Port Range: Enter the port range that will be denied access to the Internet.

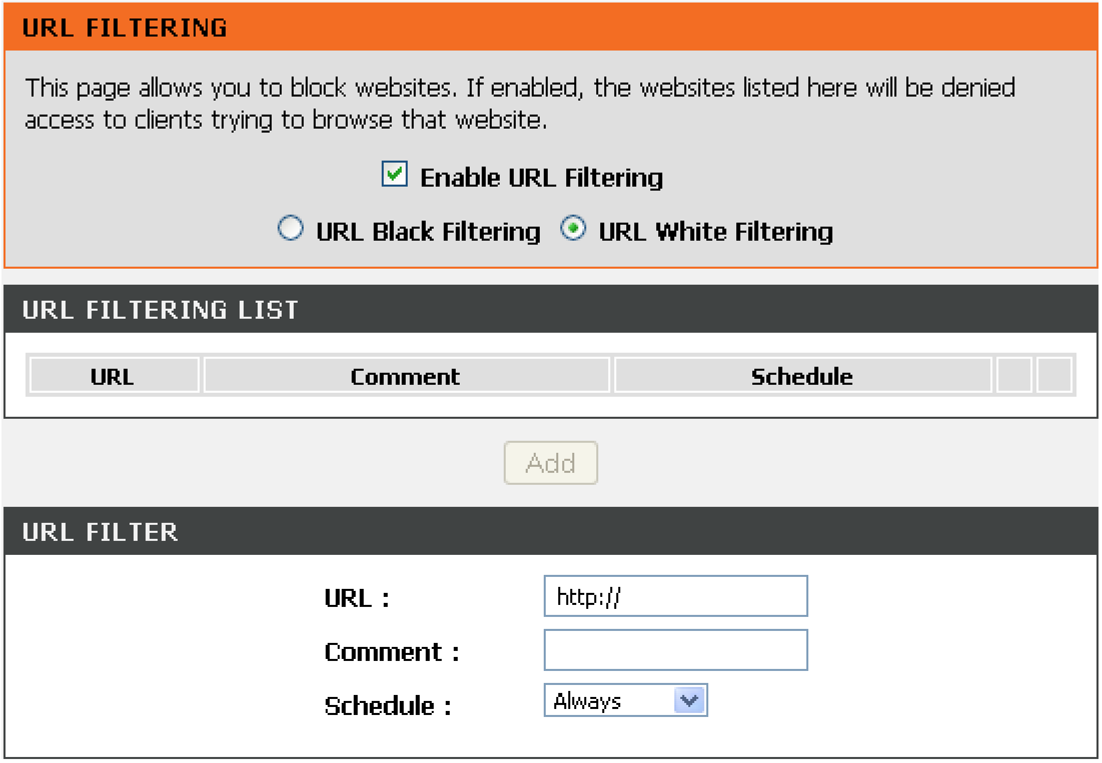
TCP/UDP: Select **TCP**, **UDP** or **Both** that will be used with the port that will be blocked.

Remark: Enter comments.

3-2-1-4 URL Filtering

URL Filtering is used to block websites (for example, www.yahoo.com).

ADVANCED → Parental Control → URL Filtering



URL FILTERING

This page allows you to block websites. If enabled, the websites listed here will be denied access to clients trying to browse that website.

☑ Enable URL Filtering

○ URL Black Filtering ● URL White Filtering

URL FILTERING LIST

URL	Comment	Schedule		

URL FILTER

URL :	http://
Comment :	
Schedule :	Always

Enable URL Filtering: Enable or disable the URL function.

URL Black Filtering: Users unable to access the website that are listed in the URL Filtering List.

URL White Filtering: Users can only access the website that are listed in the URL Filtering List.

URL: URL (Uniform Resource Locator) is a mark method for describing the Websites on the Internet and other resource locations.

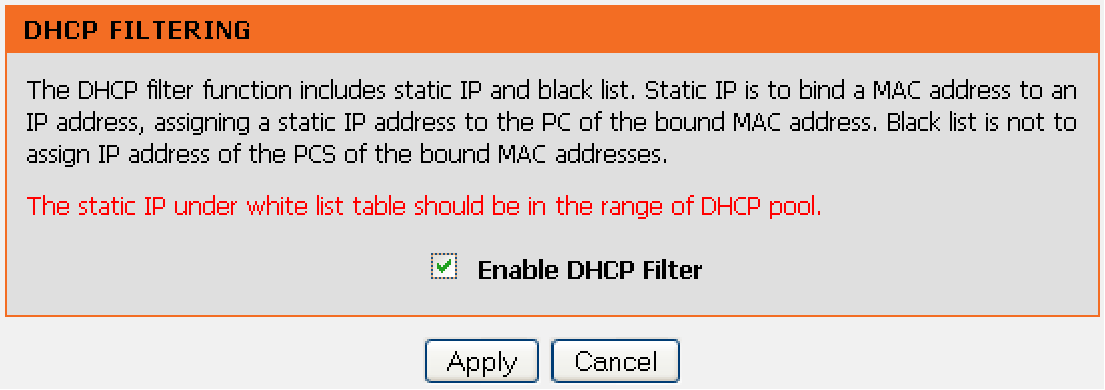
Comment: Enter the comments.

Schedule: Select a rule in the drop down list. Rules in the list can be configured in Advanced -> Schedules. Click the Schedules button to go to the page.

3-2-1-5 DHCP Filtering

DHCP Filtering is used to control network access based on the IP address of the network device. It is used to deny network or Internet access.

ADVANCED → Parental Control → DHCP Filtering



DHCP FILTERING

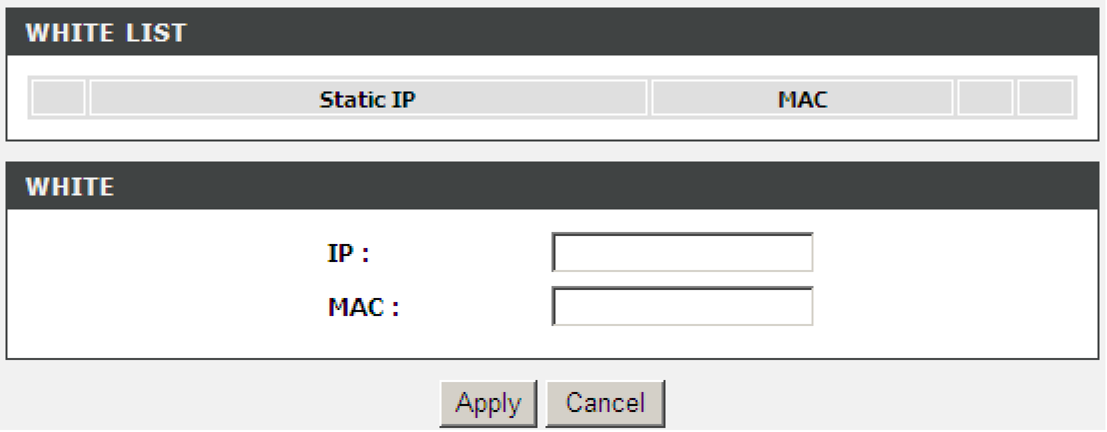
The DHCP filter function includes static IP and black list. Static IP is to bind a MAC address to an IP address, assigning a static IP address to the PC of the bound MAC address. Black list is not to assign IP address of the PCS of the bound MAC addresses.

The static IP under white list table should be in the range of DHCP pool.

☑ Enable DHCP Filter

Enable DHCP Filter: Enable or disable the DHCP filtering function.

ADVANCED → Firewall and DMZ → DHCP Filtering



WHITE LIST

	Static IP	MAC		

WHITE

IP :

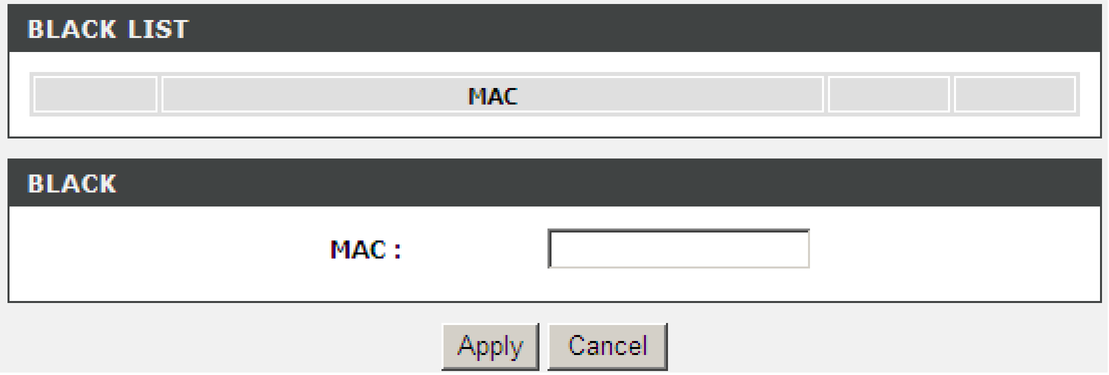
MAC :

WHITE LIST: Bind the static IP address with the specified MAC address. If the MAC address of the device on the LAN consists with the specified MAC address, the VoIP Router assigns the binding IP address.

IP: Enter the binding IP address.

MAC: Enter the binding MAC address.

ADVANCED → Firewall and DMZ → DHCP Filtering



BLACK LIST: If the MAC address of the device on the LAN, the VoIP Router does not assign the IP address.

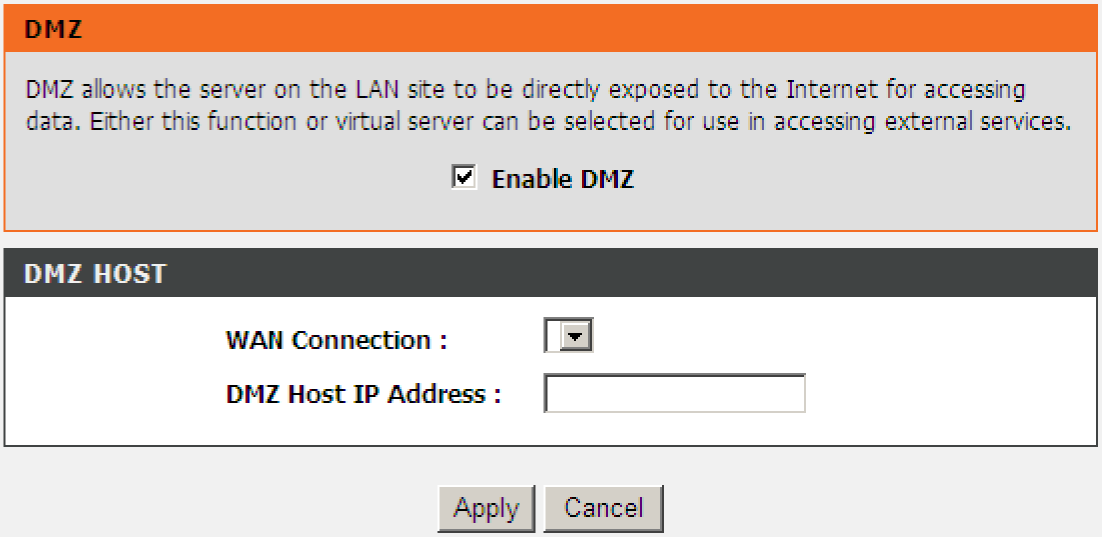
MAC: Enter the MAC address of the device on the LAN.

3-2-2 Firewall and DMZ

3-2-2-1 DMZ

DMZ (Demilitarized Zone) allows the server on the LAN site to be directly exposed to the Internet for accessing data and to forward all incoming ports to the DMZ Host. Adding a client to the DMZ may expose that computer to a variety of security risks; so only use this option as a last resort.

ADVANCED → Firewall and DMZ → DMZ



DMZ allows the server on the LAN site to be directly exposed to the Internet for accessing data. Either this function or virtual server can be selected for use in accessing external services.

☑ Enable DMZ

Enable DMZ: Check the box to enable DMZ feature.

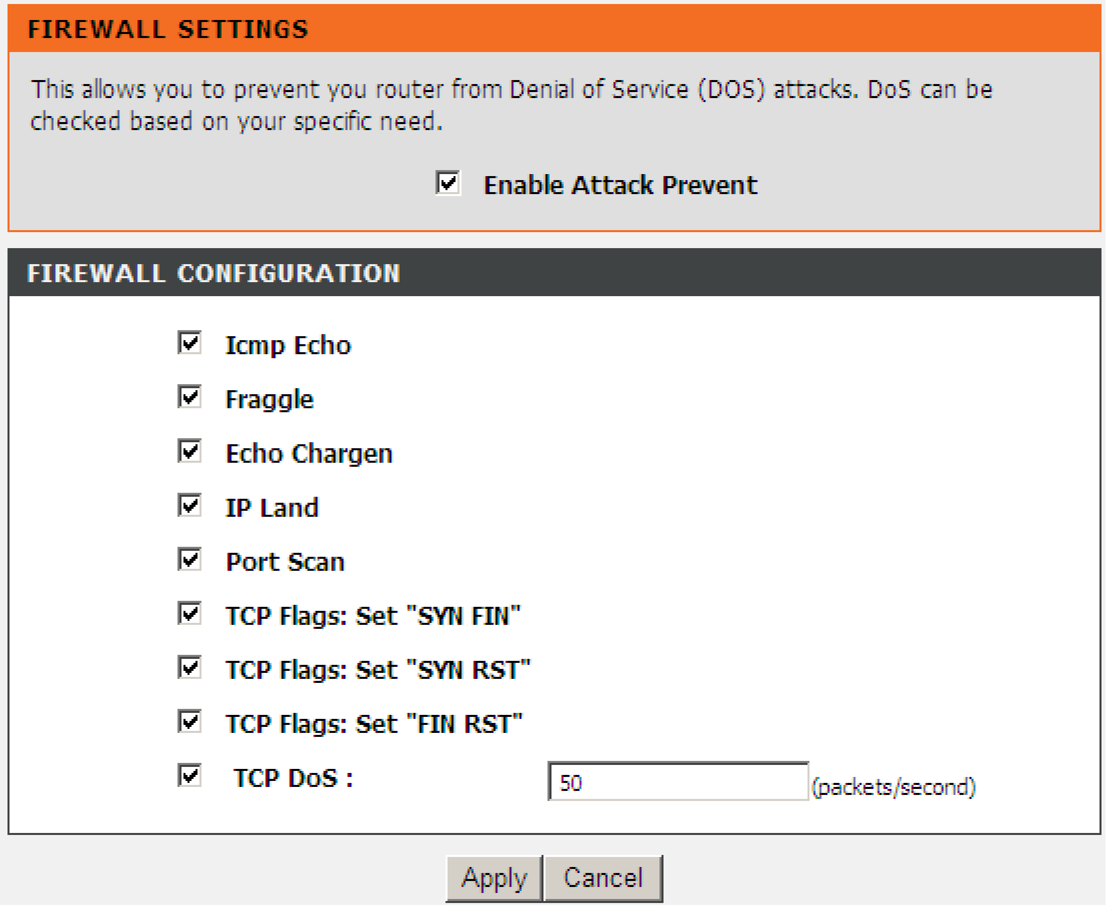
WAN Connection: Select the WAN port that enables DMZ from the drop-down list. Users can access the DMZ host that is provided by this WAN connection through Internet access.

DMZ Host IP Address: Enter the IP address of that computer as a DMZ Host with unrestricted Internet access.

Note: Either this function or virtual server can be selected for use in accessing external services.

3-2-2-2 Dos Protection

ADVANCED → Firewall and DMZ → Dos Protection



FIREWALL SETTINGS

This allows you to prevent you router from Denial of Service (DOS) attacks. DoS can be checked based on your specific need.

☑ Enable Attack Prevent

FIREWALL CONFIGURATION

☑ Icmp Echo

☑ Fraggle

☑ Echo Chargen

☑ IP Land

☑ Port Scan

☑ TCP Flags: Set "SYN FIN"

☑ TCP Flags: Set "SYN RST"

☑ TCP Flags: Set "FIN RST"

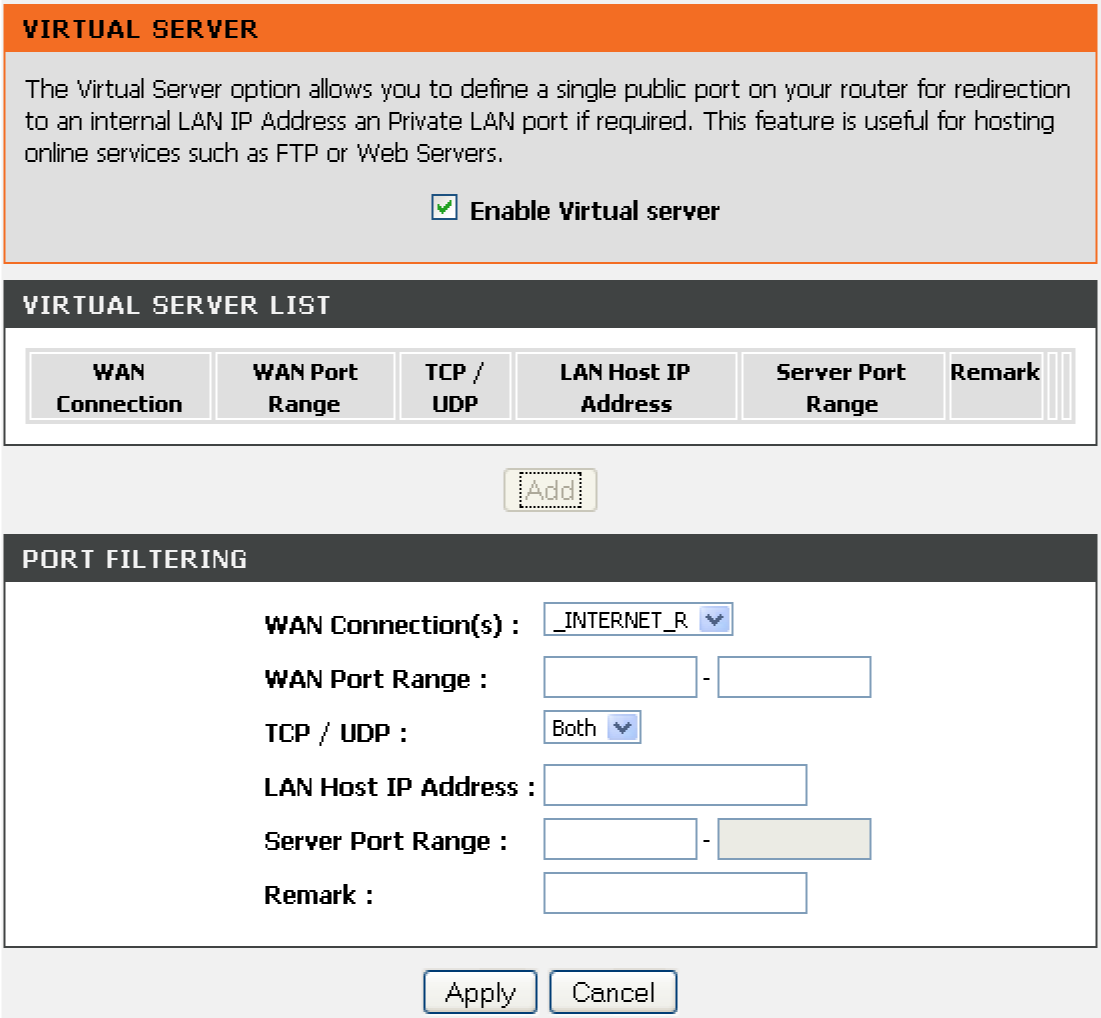
☑ TCP DoS : 50 (packets/second)

Enable Attack Prevent: Check the box to prevent DoS attacks from WAN or LAN. There are various types of DoS attacking. Leave settings in this field to the default if you are not familiar with it.

3-2-2-3 Virtual Server

Enable users on Internet to access the WWW, FTP and other services from your NAT. It is also known as port forwarding. When remote users are accessing Web or FTP servers through WAN IP address, it will be routed to the server with LAN IP address.

ADVANCED → Firewall and DMZ → Virtual Server



VIRTUAL SERVER

The Virtual Server option allows you to define a single public port on your router for redirection to an internal LAN IP Address an Private LAN port if required. This feature is useful for hosting online services such as FTP or Web Servers.

☑ Enable Virtual server

VIRTUAL SERVER LIST

WAN Connection	WAN Port Range	TCP / UDP	LAN Host IP Address	Server Port Range	Remark

PORT FILTERING

WAN Connection(s) :	_INTERNET_R
WAN Port Range :	-
TCP / UDP :	Both
LAN Host IP Address :	
Server Port Range :	-
Remark :	

WAN Connection (s): Select the WAN interface for the Internet connection. Users can access the virtual server through the WAN connection.

WAN Port Range: Enter the port range for the WAN side.

TCP/UDP: Select the communication protocols used by the server, **TCP**, **UDP** or **Both**.

LAN Host IP Address: Enter the IP address of the device that provides various services.

Server Port Range: Enter comments.

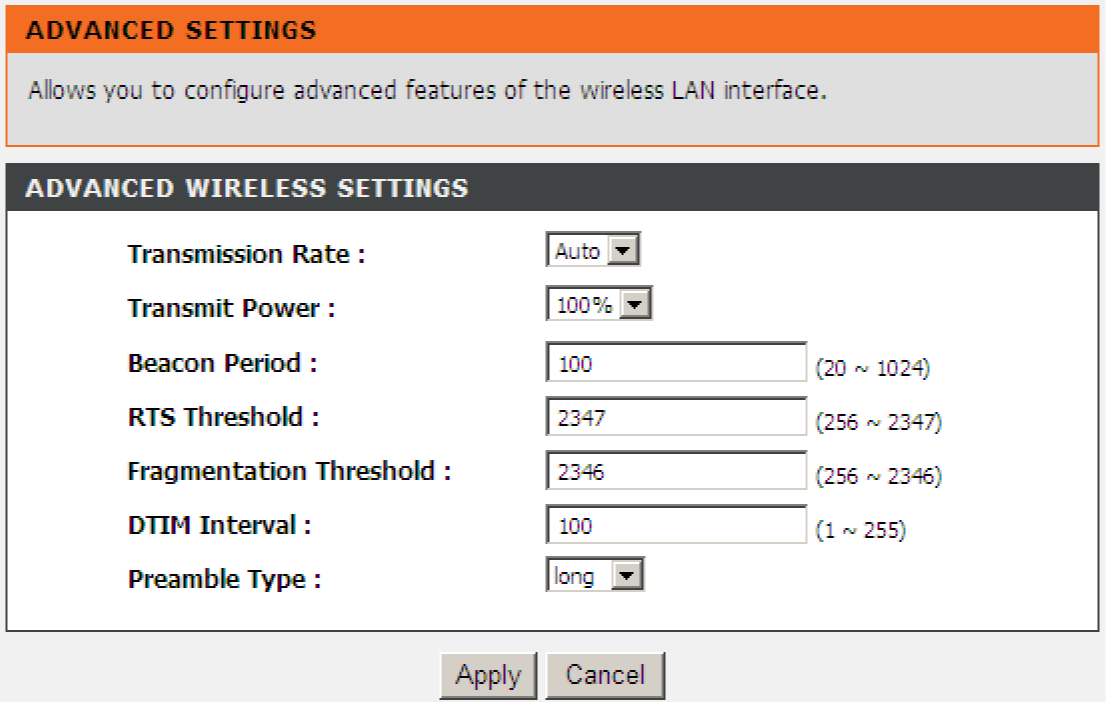
Remark: Enter comments.

3-2-3 Advanced Wireless

3-2-3-1 Advanced

This section introduces advanced configuration of the wireless access point. If you are not familiar with the following functions, keep the default parameters. In some cases, incorrect settings may reduce wireless performance.

ADVANCED → Advanced Wireless → Advanced



ADVANCED SETTINGS

Allows you to configure advanced features of the wireless LAN interface.

ADVANCED WIRELESS SETTINGS

Transmission Rate :	Auto	
Transmit Power :	100%	
Beacon Period :	100	(20 ~ 1024)
RTS Threshold :	2347	(256 ~ 2347)
Fragmentation Threshold :	2346	(256 ~ 2346)
DTIM Interval :	100	(1 ~ 255)
Preamble Type :	long	

Transmission Rate: You can select it from the drop-down list. Auto rate changes automatically to get better throughput depending on the range and environment of the wireless network.

Transmit Power: You can adjust the percentage of power 100, 80, 60, 40, 20 of your VoIP Router to change the coverage of wireless network. Keep the default value, 100% to reach full range.

Beacon Period: It indicates the frequency interval of target beacon transmission time which can be found in a packet body. The VoIP Router transmits the beacon packet to help a wireless client to identify the existence of nearby AP (Access Point). If the beacon intervals are too long, it would be hard to access the network. If the beacon intervals are too short, the resources would be wasted. The default value is **100.**

RTS Threshold: It is a mechanism to implement in collision avoidance. In a large wireless network, two stations do not hear each other but can hear wireless access point. When the two send data to AP (Access Point) at the same time, it may result in data collision and a loss of messages for both wireless stations. In most case, it is recommended to keep the default value:2347.

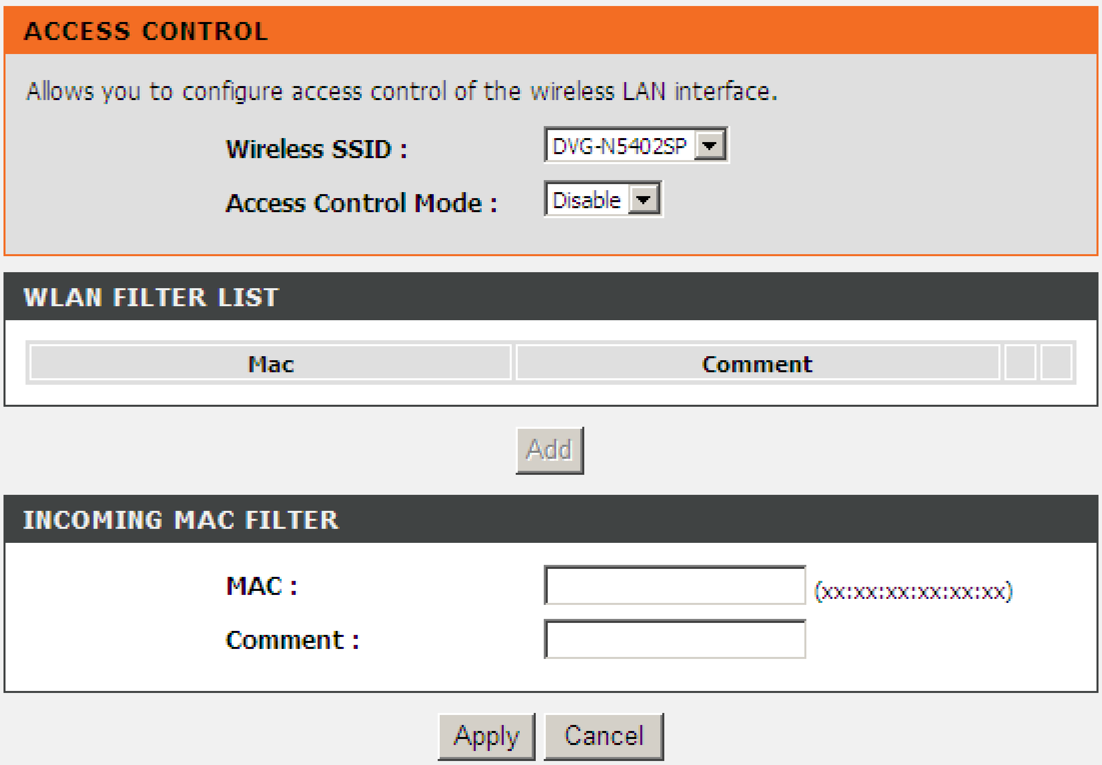
Fragmentation Threshold: A packet can be fragmented into small units to pass over a network medium that can not support the original packet size. If you encounter a busy network, a lower value of fragment threshold could improve performance. If the traffic flows are not very busy, a higher fragment threshold provides good network performance. In most case, it is recommended to keep the default value: 2346.

Preamble Type: It defines the length of the preamble which sends out with a packet format. Specify an appropriate preamble type for your network. If you do not know which one to select, it is recommended to keep the default setting.

3-2-3-2 Access Control

The Access Control setting provides a service that you can control different access rights for different wireless clients connected to your VoIP Router. The local and remote stations are limited to access the Internet through your AP (Access Point) using MAC address of wireless client. Choose the appropriate Access Control Services from the option of Access Control Mode.

ADVANCED → Advanced Wireless → Access Control



ACCESS CONTROL

Allows you to configure access control of the wireless LAN interface.

Wireless SSID : DVG-N5402SP

Access Control Mode : Disable

WLAN FILTER LIST

Mac	Comment

INCOMING MAC FILTER

MAC : (xx:xx:xx:xx:xx:xx)

Comment :

Access Control Mode:

Disable: The VoIP Router does not response to any access rules. You are not allowed to modify the configuration in this page.

Allow: If you select **Allow**, only those wireless clients whose MAC addresses are in the WLAN FILTER LIST are allowed to connect to your AP (Access Point).

Deny: If you select **Deny**, only those wireless clients whose MAC addresses are in the WLAN FILTER LIST are restricted and denied to connect to your AP (Access Point).

MAC: Specify the MAC address for permitting or blocking the access to your AP (Access Point).

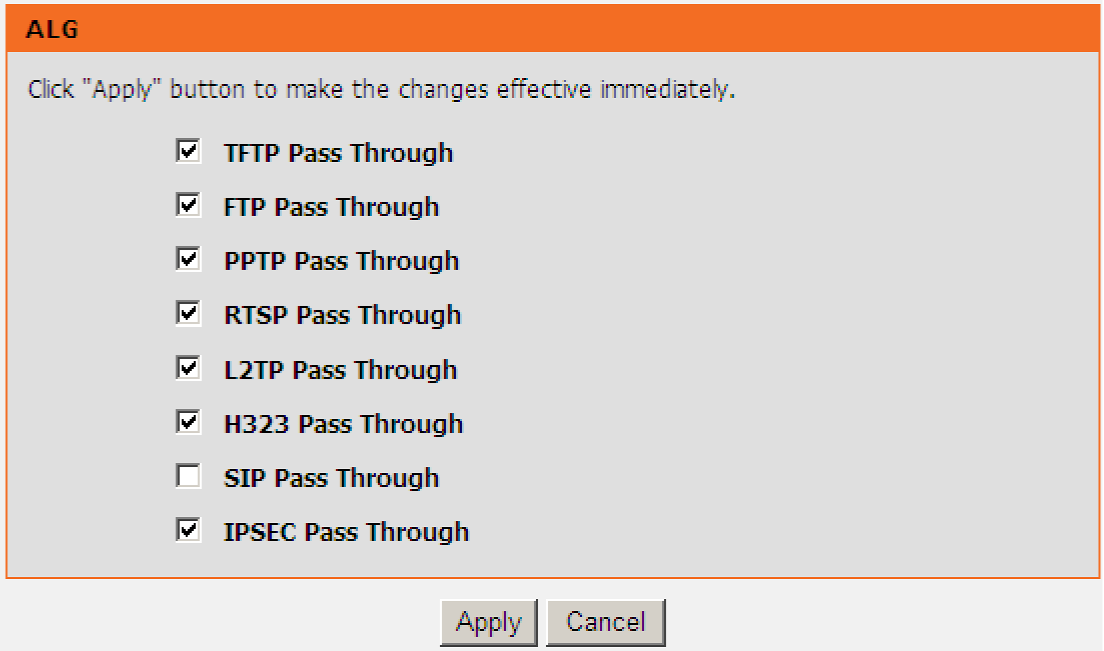
Comment: Enter the comments.

3-2-4 Advanced Network

3-2-4-1 ALG

ALG (Application Layer Gateway) is also named the third generation firewall. When the user on the trusted network wants to connect to the untrusted network (Internet), the application will be guided to the proxy server of the firewall. The proxy server disguises the actual server on the Internet. It can estimate the request, and decides the permission or deny of the request according to the rule in a suit of unit network service.

ADVANCED → Advanced Network → ALG



ALG

Click "Apply" button to make the changes effective immediately.

☑ TFTP Pass Through

☑ FTP Pass Through

☑ PPTP Pass Through

☑ RTSP Pass Through

☑ L2TP Pass Through

☑ H323 Pass Through

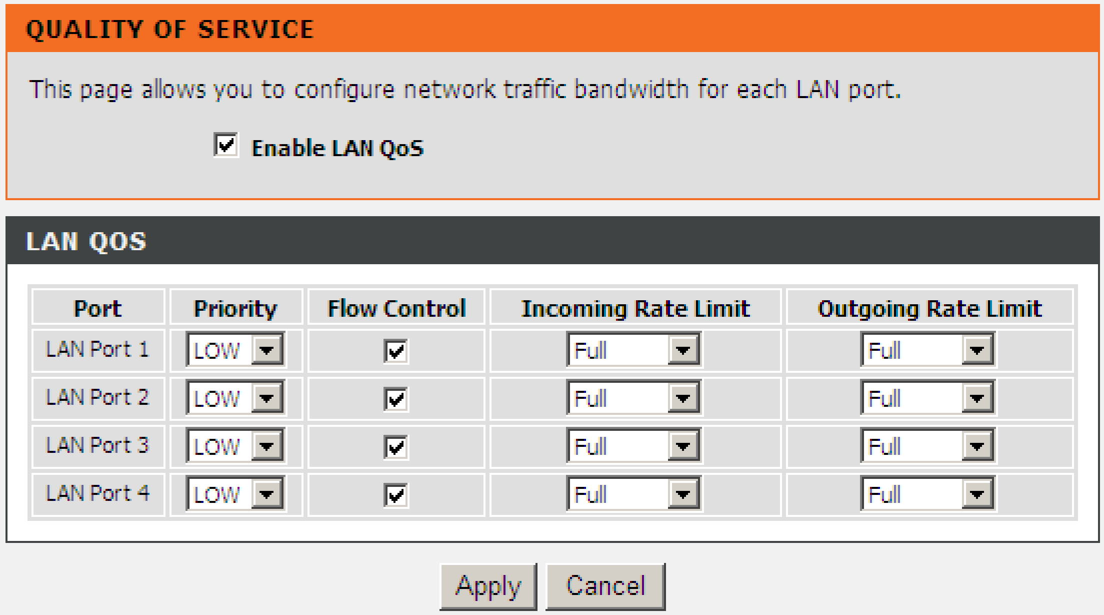
□ SIP Pass Through

☑ IPSEC Pass Through

3-2-4-2 QoS

LAN QoS

ADVANCED → Advanced Network → QoS



QUALITY OF SERVICE

This page allows you to configure network traffic bandwidth for each LAN port.

☑ Enable LAN QoS

LAN QOS

Port	Priority	Flow Control	Incoming Rate Limit	Outgoing Rate Limit
LAN Port 1	LOW	☑	Full	Full
LAN Port 2	LOW	☑	Full	Full
LAN Port 3	LOW	☑	Full	Full
LAN Port 4	LOW	☑	Full	Full

Enable LAN QoS: Check the box to enable LAN QoS by Hardware.

Priority: Use the drop-down menu to select **Low** or **HIGH** for the VoIP Router to deliver the packets from LAN interface when the packets arrive at the same time.

Flow Control: Check the box to limit incoming and outgoing rate.

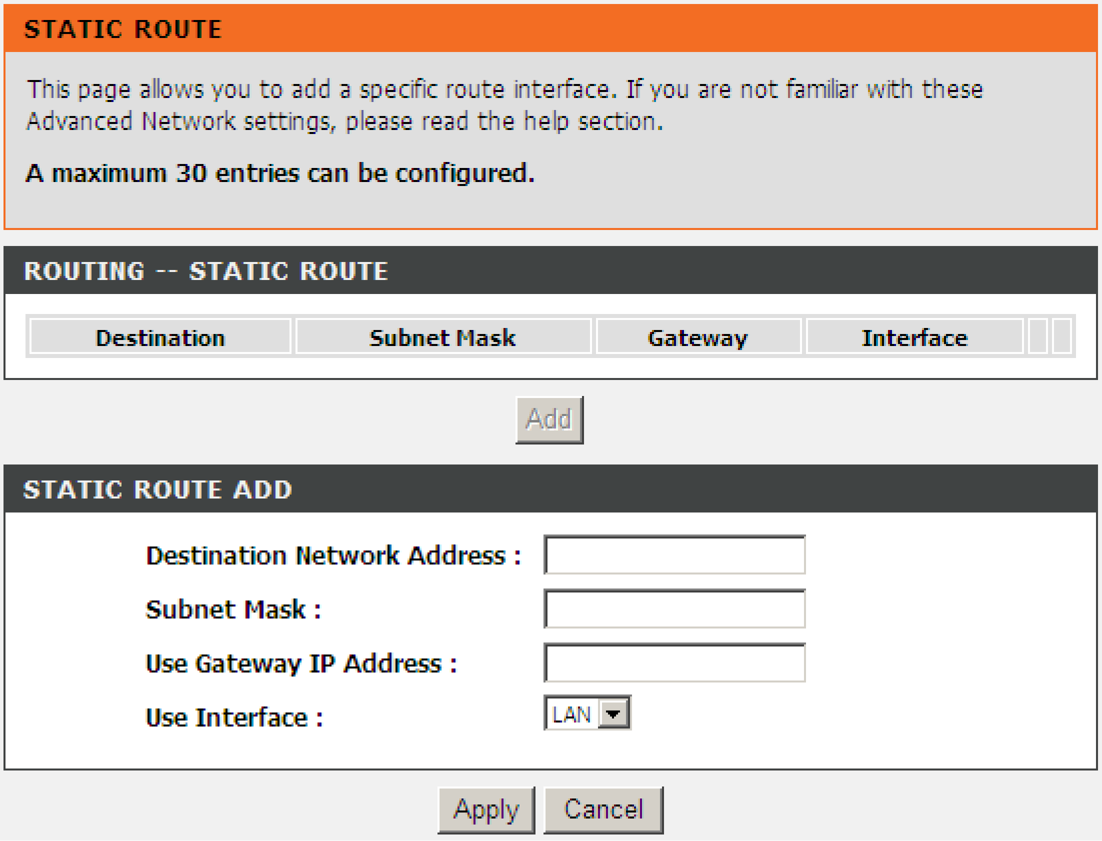
Incoming Rate Limit: Select the proper rate limit for the specific LAN port from the drop-down menu. The flow is from LAN to WAN, and the rate limit can not exceed the real upstream bandwidth.

Outgoing Rate Limit: Select the proper rate limit for the specific LAN port from the drop-down menu. The flow is from WAN to LAN, and the rate limit can not exceed the real downstream bandwidth.

3-2-4-3 Static Routing

Build static routes within an internal network. These routes will not apply to the Internet.

ADVANCED → Advanced Network → Static Routing



STATIC ROUTE

This page allows you to add a specific route interface. If you are not familiar with these Advanced Network settings, please read the help section.

A maximum 30 entries can be configured.

ROUTING -- STATIC ROUTE

Destination	Subnet Mask	Gateway	Interface

STATIC ROUTE ADD

Destination Network Address :	
Subnet Mask :	
Use Gateway IP Address :	
Use Interface :	LAN

Destination Network Address: The destination IP address of the router.

Subnet Mask: The subnet mask of the destination IP address.

Use Gateway IP Address: The gateway IP address of the router.

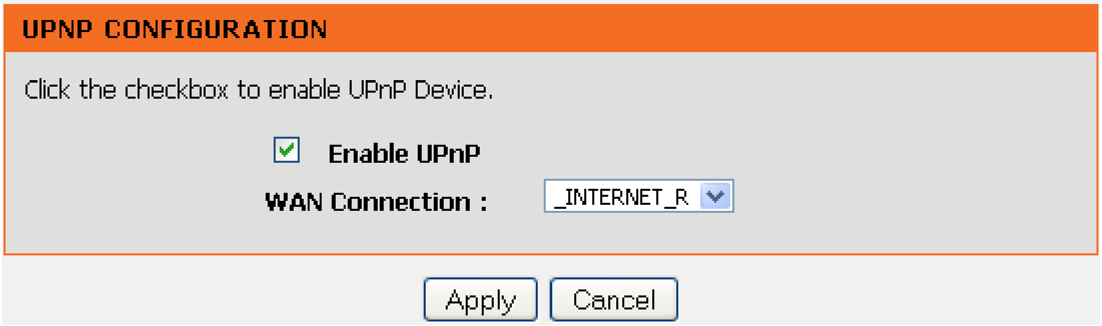
Use Interface: The interface name of the router output port.

You can only choose **Use Gateway IP Address** or **Use Interface**.

Click **Apply** to save the settings.

3-2-4-4 UPNP

ADVANCED → Advanced Network → UPNP



UPNP CONFIGURATION

Click the checkbox to enable UPnP Device.

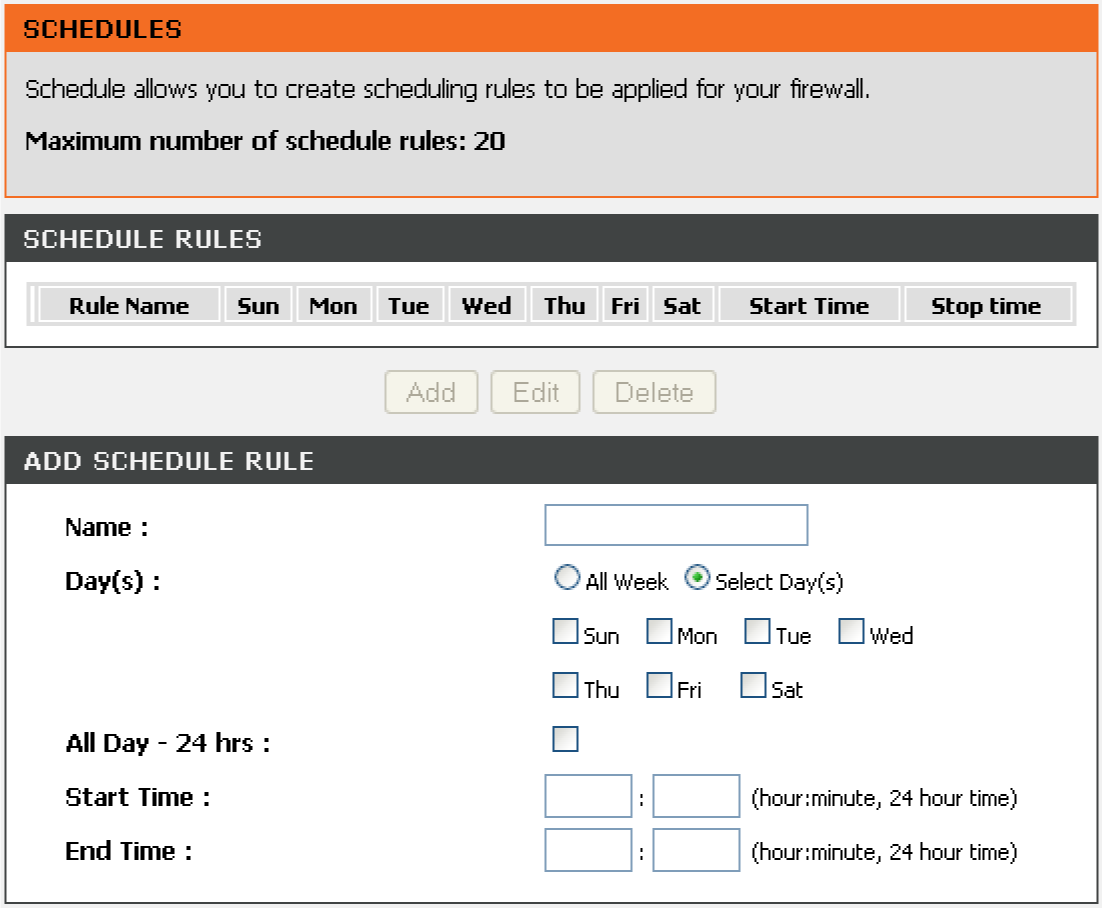
☑ Enable UPnP

WAN Connection : _INTERNET_R

Enable UPNP: Check the box to enable the IP traffic of the VOIP Router to pass through an Internet sharing device.

3-2-5 Schedule

To access the Schedules window, click the schedules button in the Advanced directory.



SCHEDULES

Schedule allows you to create scheduling rules to be applied for your firewall.

Maximum number of schedule rules: 20

SCHEDULE RULES

Rule Name	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Start Time	Stop time

ADD SCHEDULE RULE

Name :	
Day(s) :	○ All Week ● Select Day(s)
	□ Sun □ Mon □ Tue □ Wed
	□ Thu □ Fri □ Sat
All Day - 24 hrs :	□
Start Time :	: (hour:minute, 24 hour time)
End Time :	: (hour:minute, 24 hour time)

You can add schedules in this page and then apply them to Parental Control.

Name: Enter a Name for the schedule.

Day(s): Use the radio buttons to click the desired Day(s), either All Week or Select Day(s) (in which case you must tick the checkboxes for the desired individual days of the week),

All Day – 24 hrs: Tick to apply the rules for whole day.

Start Time: Start time in hour and minute (24 Hour Time)

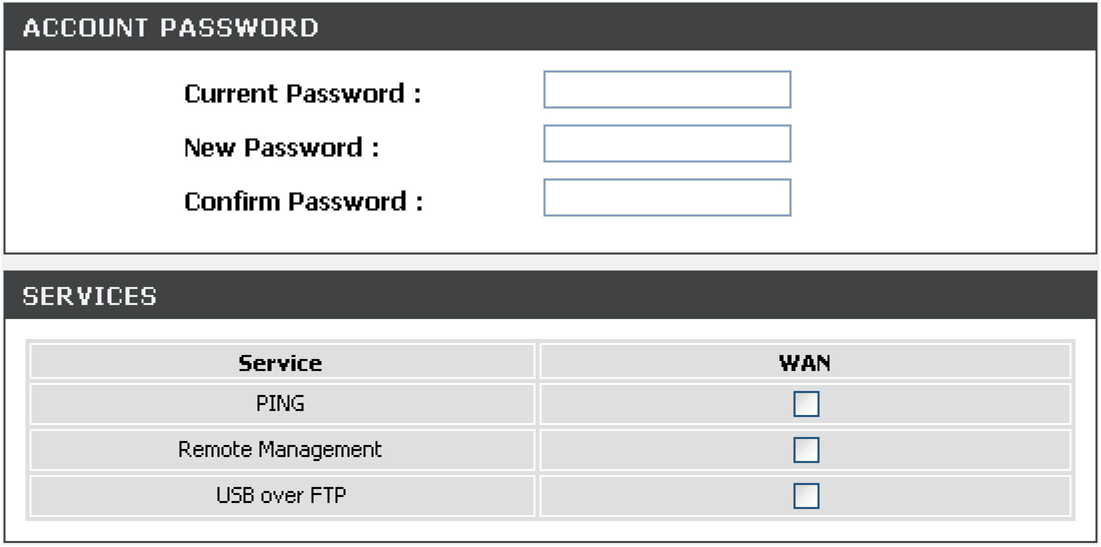
End Time: End Time in hour and minute (24 Hour Time)

Click Apply to see the entry in the Schedule Rule table. To remove an entry in the table, select the entry, and click the Delete button. To modify an entry in the table, select the entry, click the Edit button, make the desired changes, and then click the Apply button.

3-3 MAINTENANCE

3-3-1 Device Management

MAINTENANCE → Device Management



ACCOUNT PASSWORD

Current Password :	
New Password :	
Confirm Password :	

SERVICES

Service	WAN
PING	□
Remote Management	□
USB over FTP	□

Note: Logging in as **user**, you can only access to some specific settings of the VoIP Router.

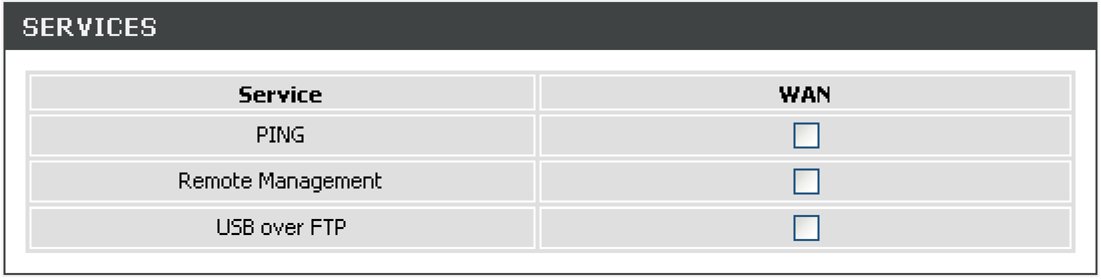
Current Password: Enter the password for accessing the VoIP Router.

New Password: Modify the password for accessing the VoIP Router.

It is highly recommended that you modify the password for securing your VoIP Router.

Confirm Password: Enter the modified password again.

MAINTENANCE → Device Management



SERVICES

Service	WAN
PING	□
Remote Management	□
USB over FTP	□

You can manage the router through the following function with the selected WAN connection.

PING: When you select the check box, you can ping the router with the WAN connection.

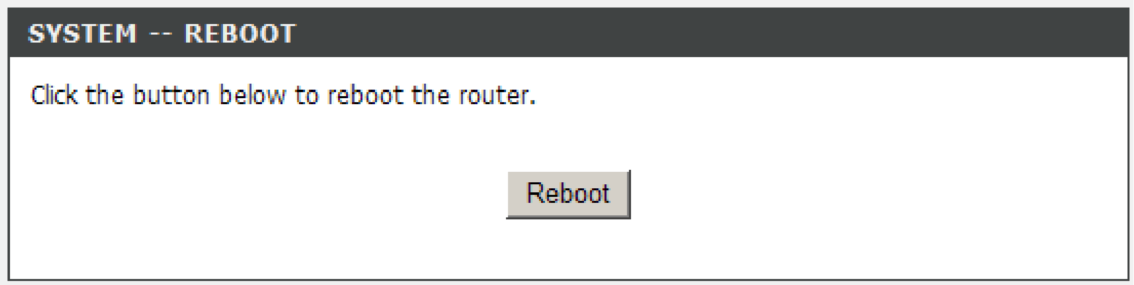
WWW: When you select the check box, you can access the Web server of the router to manage the router.

USB over FTP: When you select the check box, you can access your external storage through the internet side by acting the router as a FTP Server.

3-3-2 Backup and Restore

Reboot

MAINTENANCE → Backup and Restore →Reboot



SYSTEM -- REBOOT

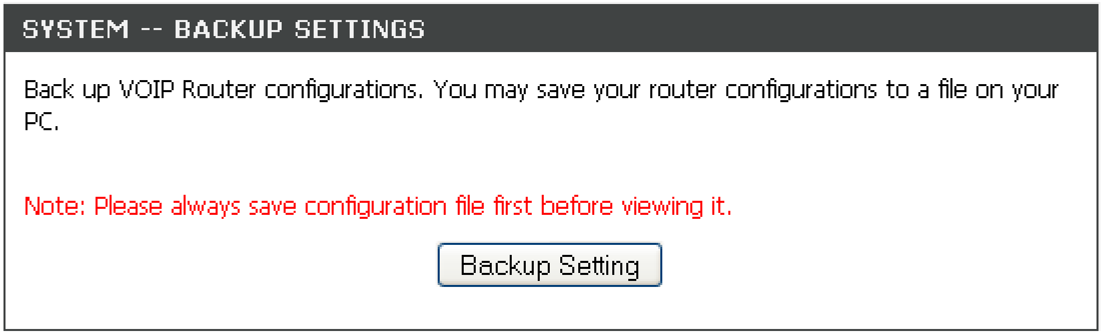
Click the button below to reboot the router.

Reboot: Click the **Reboot** button to reboot the system.

Backup Setting

The current system settings can be saved as a file onto the local hard drive.

MAINTENANCE → Backup and Restore → Backup Setting



SYSTEM -- BACKUP SETTINGS

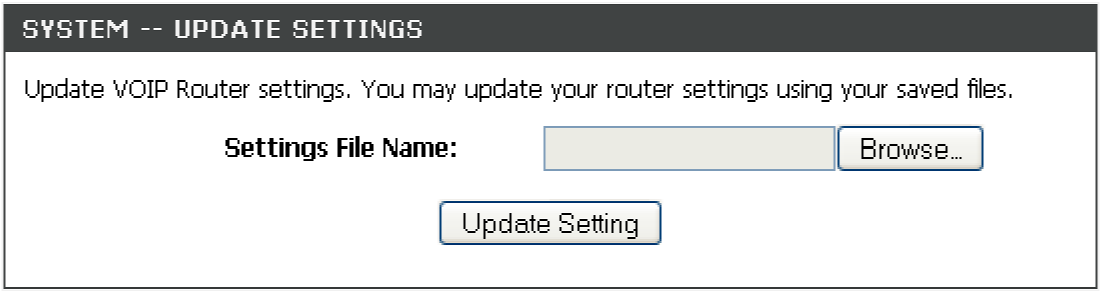
Back up VOIP Router configurations. You may save your router configurations to a file on your PC.

Note: Please always save configuration file first before viewing it.

Backup Setting: Click the Backup Settings button to save all current settings to a file on your PC.

Update Setting

MAINTENANCE → Backup and Restore → Update Setting



SYSTEM -- UPDATE SETTINGS

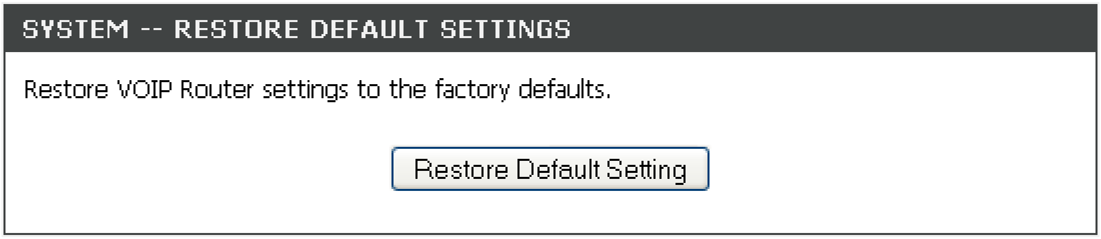
Update VOIP Router settings. You may update your router settings using your saved files.

Settings File Name:

To restore the system settings file, click the Browse button to search the local hard drive for the file to be used. Once you locate the file, click the Upload Setting button to overwrite the current settings with the settings saved to the file.

Restore Default Setting

MAINTENANCE → Backup and Restore → Restore Default Setting



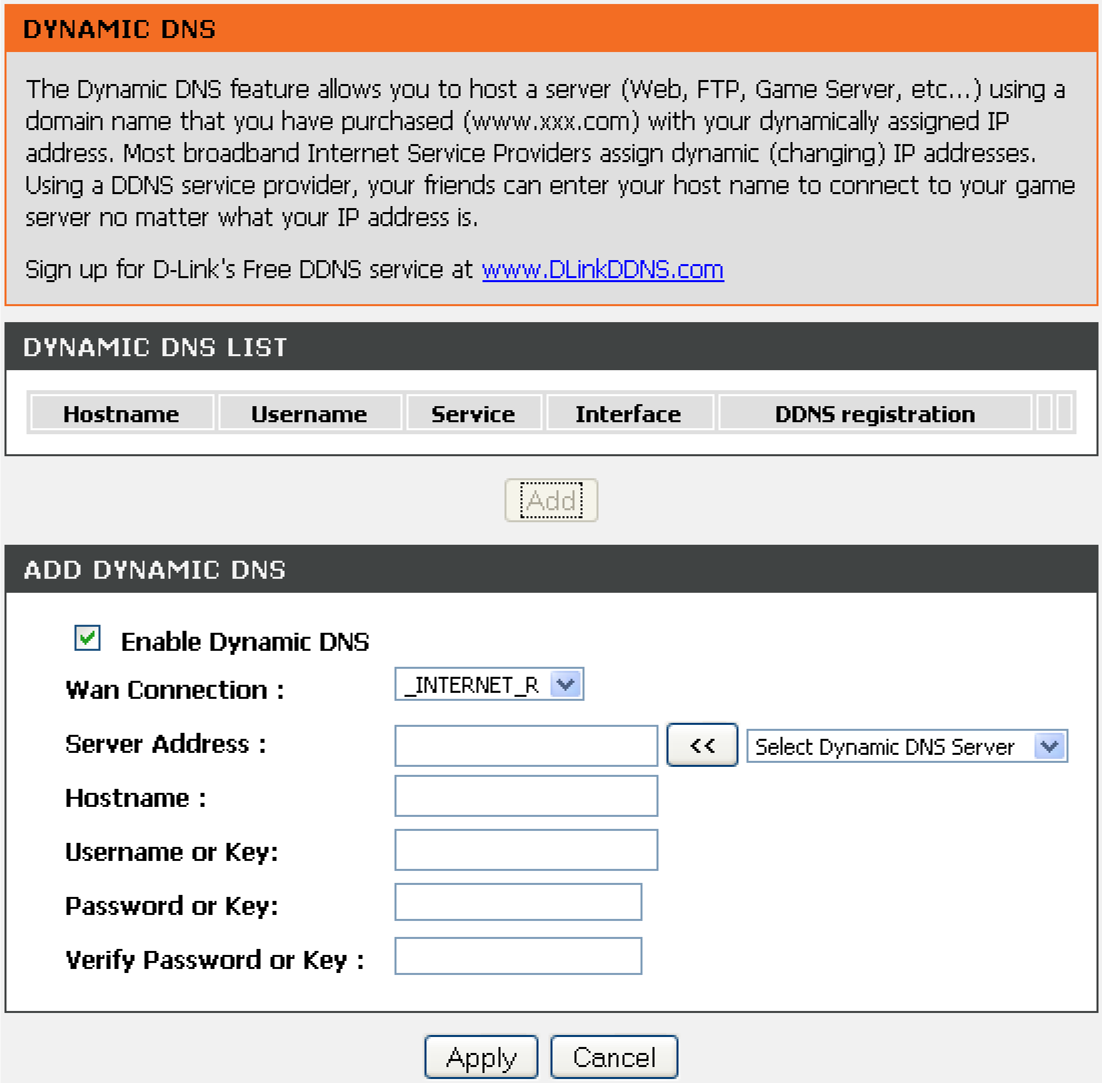
SYSTEM -- RESTORE DEFAULT SETTINGS

Restore VOIP Router settings to the factory defaults.

Click Restore Default Setting to reset the settings of the VoIP Router to the factory default settings.

3-3-3 Dynamic DNS

ADVANCED → Dynamic DNS



DYNAMIC DNS

The Dynamic DNS feature allows you to host a server (Web, FTP, Game Server, etc...) using a domain name that you have purchased (www.xxx.com) with your dynamically assigned IP address. Most broadband Internet Service Providers assign dynamic (changing) IP addresses. Using a DDNS service provider, your friends can enter your host name to connect to your game server no matter what your IP address is.

Sign up for D-Link's Free DDNS service at www.DLinkDDNS.com

DYNAMIC DNS LIST

Hostname	Username	Service	Interface	DDNS registration

ADD DYNAMIC DNS

☑ Enable Dynamic DNS

Wan Connection :	_INTERNET_R
Server Address :	Select Dynamic DNS Server
Hostname :	
Username or Key:	
Password or Key:	
Verify Password or Key :	

Enable Dynamic DNS: Check the box to enable DDNS (Dynamic Domain Name Server) function. It is only necessary when the VoIP Router is set up behind an Internet sharing device that uses a dynamic IP address and does not support DDNS.

Wan Connection: Select the WAN connection that you want to configure DDNS.

Server Address: Select a DDNS service from the drop-down menu.

Hostname: Enter the URL of the system (or NAT) – applied from domain name registration providers (e.g. www.dyndns.org).

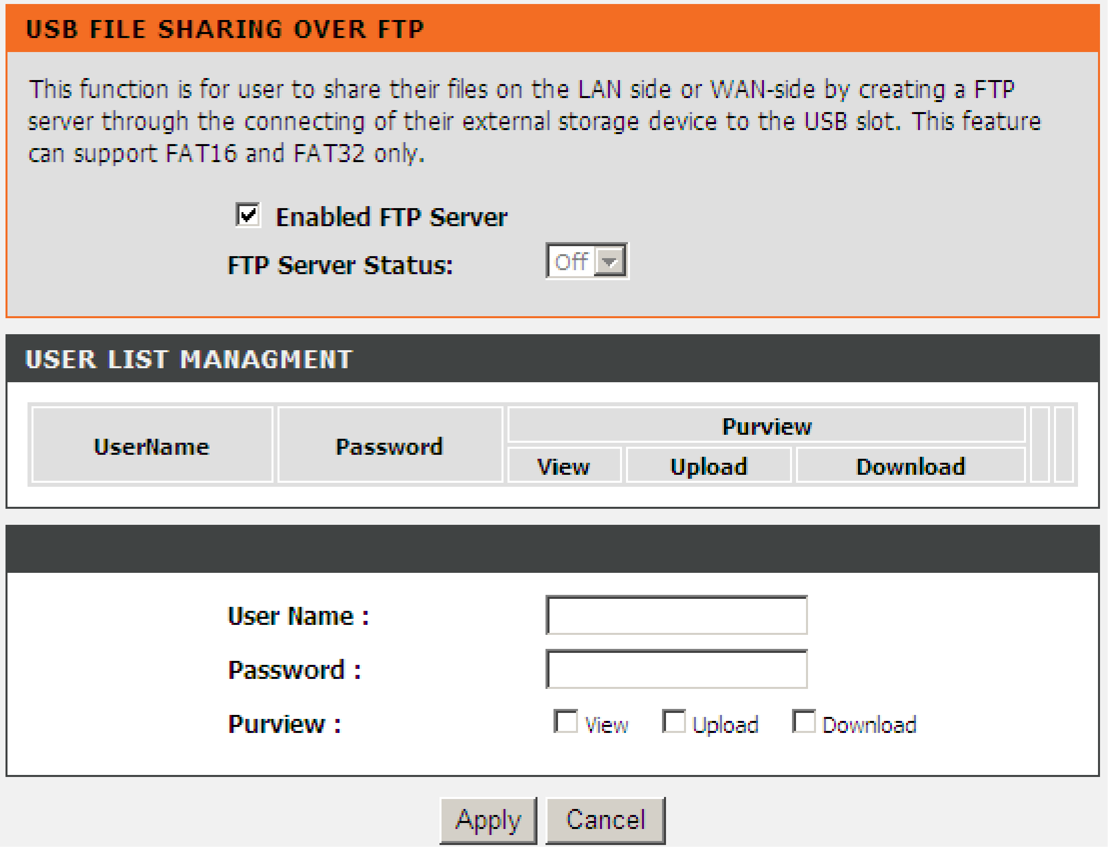
Username or Key: Enter the user name for logging into the DDNS server.

Password or Key: Enter the password for logging into the DDNS server.

Verify Password or Key: Enter the password again for confirmation.

3-3-4 USB File Sharing over FTP

MAINTENANCE → USB File Sharing over FTP



USB FILE SHARING OVER FTP

This function is for user to share their files on the LAN side or WAN-side by creating a FTP server through the connecting of their external storage device to the USB slot. This feature can support FAT16 and FAT32 only.

☑ Enabled FTP Server

FTP Server Status: Off

USER LIST MANAGMENT

UserName	Password	Purview		
		View	Upload	Download

User Name :

Password :

Purview : □ View □ Upload □ Download

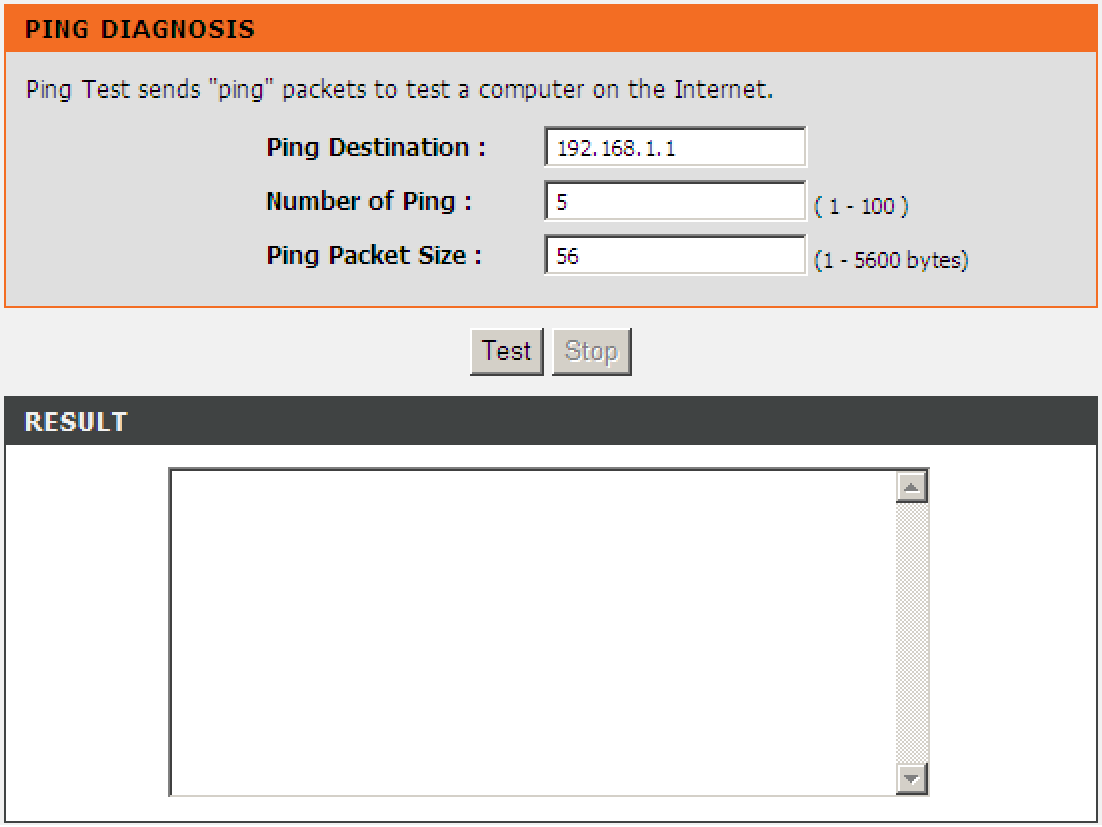
Enabled FTP Server: Select the check box to enable the FTP server.
FTP Server Status: The current status of FTP server.
User Name: Enter the user name that accesses the FTP server.
Password: Enter the password that accesses the FTP server.
Purview: You can select **View**, **Upload**, **Download** for the user.

3-3-5 Diagnostics

3-3-5-1 Ping

In this page, you can use ping to verify whether a remote peer is reachable.

MAINTENANCE → Diagnostics → Ping



PING DIAGNOSIS

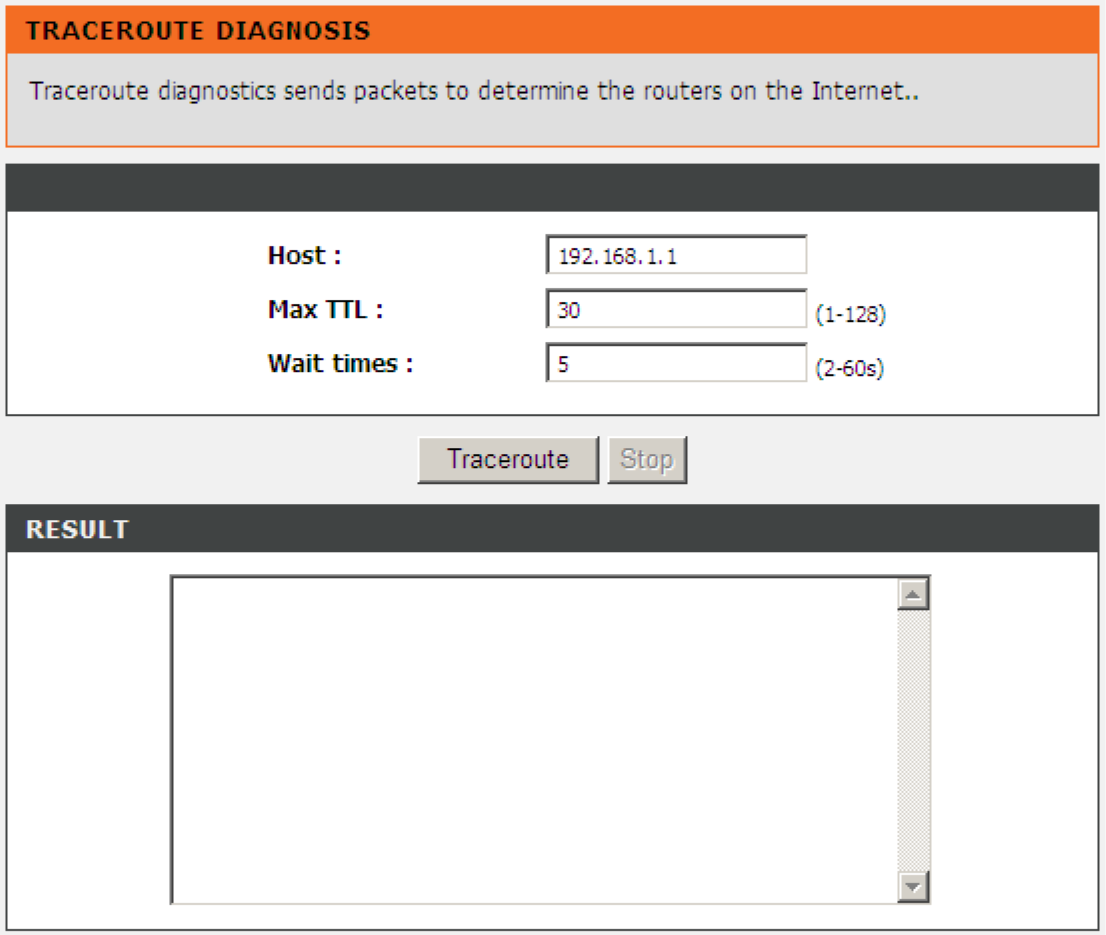
Ping Test sends "ping" packets to test a computer on the Internet.

Ping Destination :	192.168.1.1	
Number of Ping :	5	(1 - 100)
Ping Packet Size :	56	(1 - 5600 bytes)

Ping Destination: Enter the IP address or domain name for ping.
Number of Ping: Enter the number of ping. Its range is in 1 to 100.
Ping Packet Size: Set the packet size for ping. Its range is in 1 to 5600.

3-3-5-2 Traceroute

MAINTENANCE → Diagnostics → Traceroute



TRACEROUTE DIAGNOSIS

Traceroute diagnostics sends packets to determine the routers on the Internet..

Host : 192.168.1.1

Max TTL : 30 (1-128)

Wait times : 5 (2-60s)

Host: Enter the IP address or domain name for testing.

Max TTL: Set the survival time of the data packets during testing. Its range is in 1 to 128.

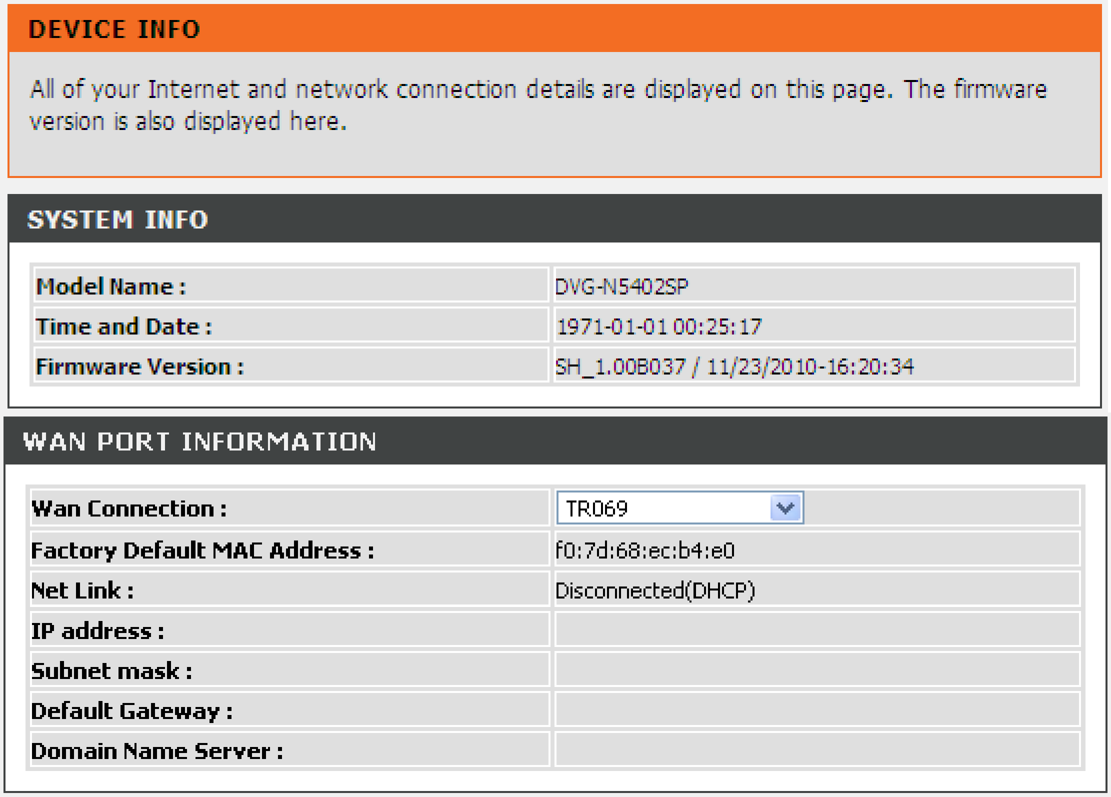
Wait times: Set the waiting time during testing. Its range is in 2 to 60.

3-4 STATUS

3-4-1 Device Info

STATUS → Device Info

For WAN Port Information, it shows IP address, subnet mask, default gateway and Domain name server. If you use PPPoE to obtain IP, you will know if the IP is obtained through this method. If IP address, subnet mask, default gateway is blank, it means that the VoIP Router does not obtain IP.



DEVICE INFO

All of your Internet and network connection details are displayed on this page. The firmware version is also displayed here.

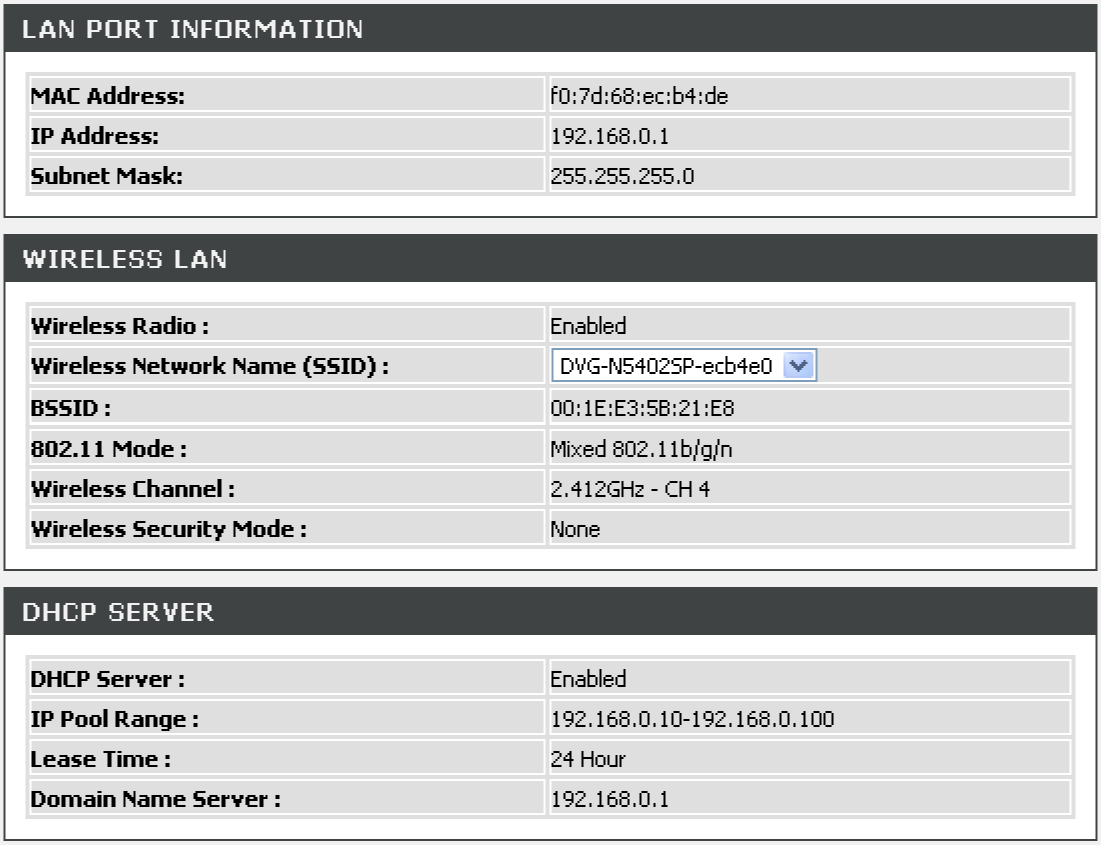
SYSTEM INFO

Model Name :	DVG-N5402SP
Time and Date :	1971-01-01 00:25:17
Firmware Version :	SH_1.00B037 / 11/23/2010-16:20:34

WAN PORT INFORMATION

Wan Connection :	TR069
Factory Default MAC Address :	f0:7d:68:ec:b4:e0
Net Link :	Disconnected(DHCP)
IP address :	
Subnet mask :	
Default Gateway :	
Domain Name Server :	

For LAN Port Information, it shows LAN port IP, subnet mask, and the MAC address.



LAN PORT INFORMATION

MAC Address:	f0:7d:68:ec:b4:de
IP Address:	192.168.0.1
Subnet Mask:	255.255.255.0

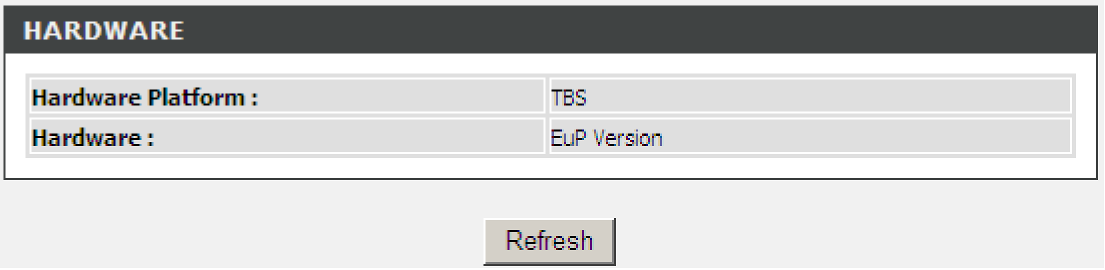
WIRELESS LAN

Wireless Radio :	Enabled
Wireless Network Name (SSID) :	DVG-N5402SP-ecb4e0
BSSID :	00:1E:E3:5B:21:E8
802.11 Mode :	Mixed 802.11b/g/n
Wireless Channel :	2.412GHz - CH 4
Wireless Security Mode :	None

DHCP SERVER

DHCP Server :	Enabled
IP Pool Range :	192.168.0.10-192.168.0.100
Lease Time :	24 Hour
Domain Name Server :	192.168.0.1

For Hardware, it shows the hardware platform and driver version.

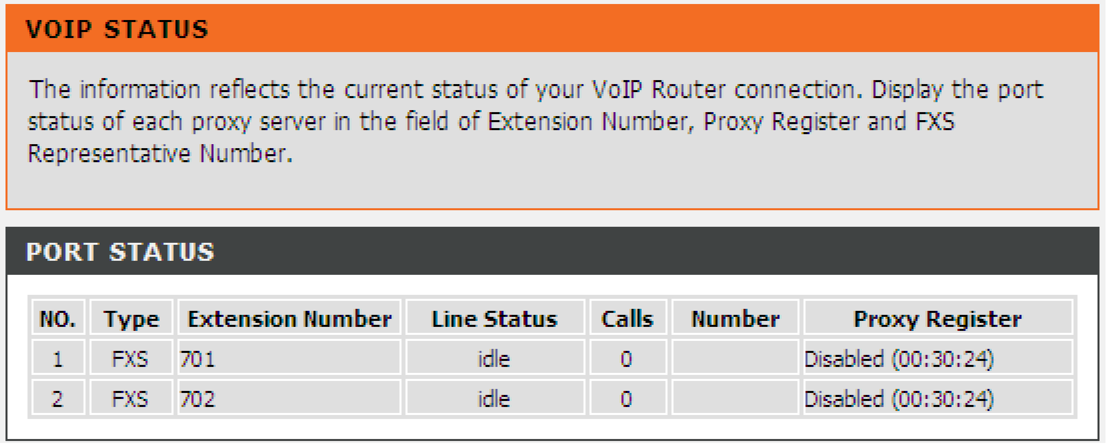


HARDWARE

Hardware Platform :	TBS
Hardware :	EuP Version

3-4-2 VoIP Status

STATUS → VoIP Status



VOIP STATUS

The information reflects the current status of your VoIP Router connection. Display the port status of each proxy server in the field of Extension Number, Proxy Register and FXS Representative Number.

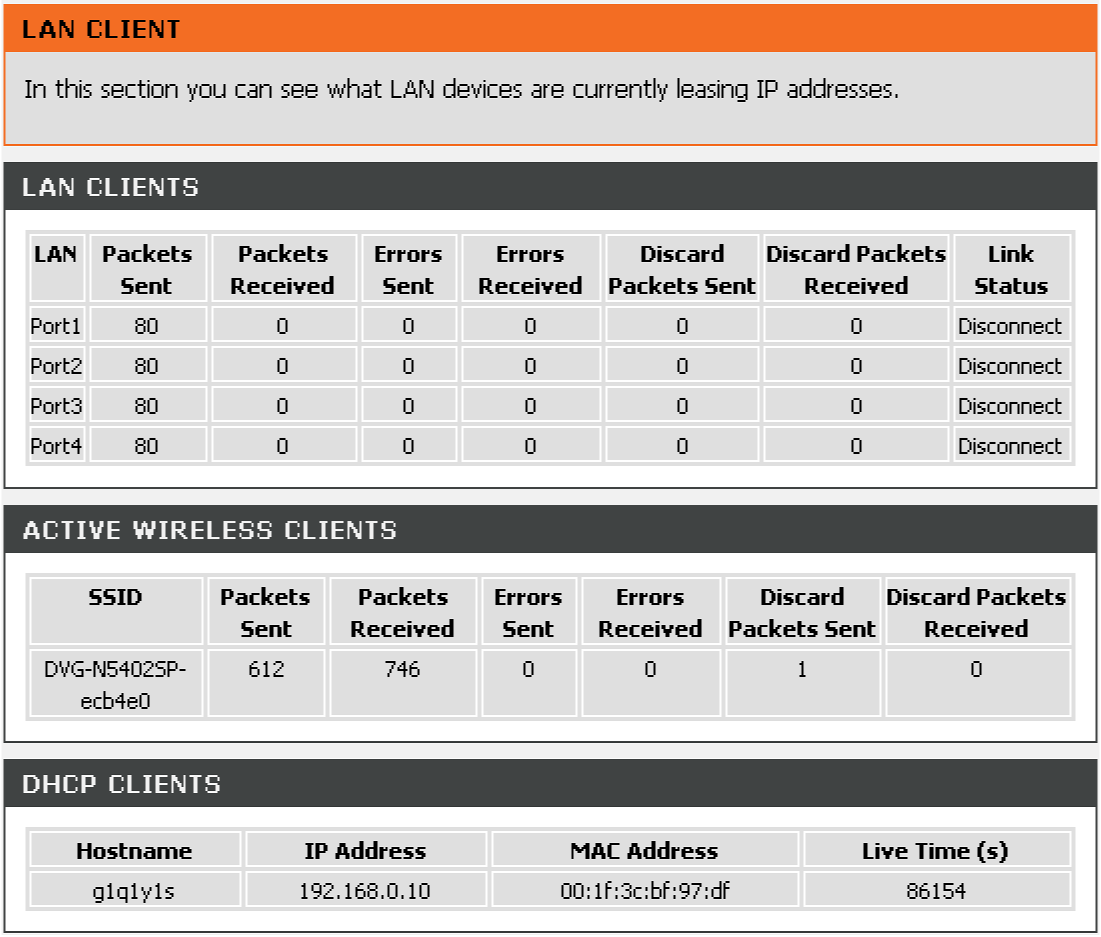
PORT STATUS

NO.	Type	Extension Number	Line Status	Calls	Number	Proxy Register
1	FXS	701	idle	0		Disabled (00:30:24)
2	FXS	702	idle	0		Disabled (00:30:24)

For Port Status, it includes if each port registers to Proxy successfully, the last dialed number, how many calls each port has made since the VoIP Router is start, etc.

3-4-3 LAN Client

STATUS → LAN Client



LAN CLIENT

In this section you can see what LAN devices are currently leasing IP addresses.

LAN CLIENTS

LAN	Packets Sent	Packets Received	Errors Sent	Errors Received	Discard Packets Sent	Discard Packets Received	Link Status
Port1	80	0	0	0	0	0	Disconnect
Port2	80	0	0	0	0	0	Disconnect
Port3	80	0	0	0	0	0	Disconnect
Port4	80	0	0	0	0	0	Disconnect

ACTIVE WIRELESS CLIENTS

SSID	Packets Sent	Packets Received	Errors Sent	Errors Received	Discard Packets Sent	Discard Packets Received
DVG-N5402SP-ecb4e0	612	746	0	0	1	0

DHCP CLIENTS

Hostname	IP Address	MAC Address	Live Time (s)
g1q1y1s	192.168.0.10	00:1f:3c:bf:97:df	86154

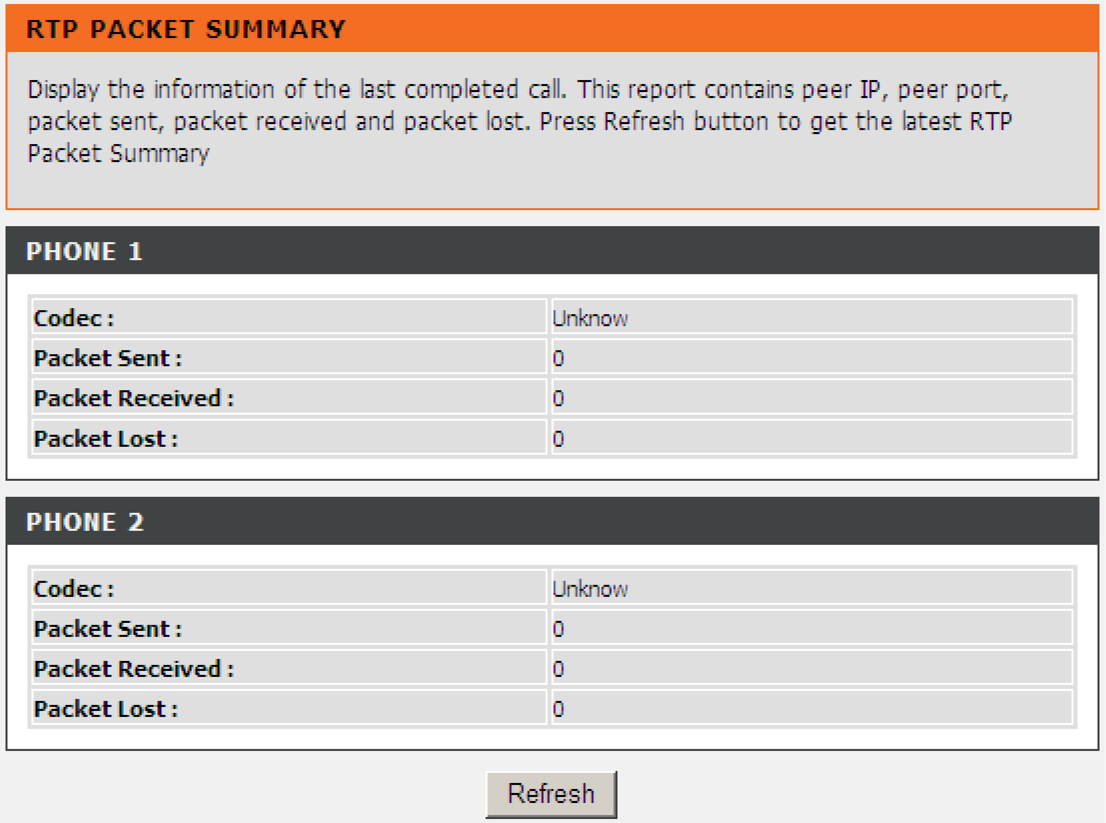
The **LAN CLIENTS** table displayed the local LAN information.

The **ACTIVE WIRELESS CLIENTS** table displayed the identification and transmission status of active wireless clients on wireless LAN interface.

The **DHCP CLIENTS** table displayed LAN device that has already been assigned an address from DVG-N5402SP. You can check if the DHCP client has obtain an IP address.

3-4-4 Statistics

STATUS → Statistics



RTP PACKET SUMMARY

Display the information of the last completed call. This report contains peer IP, peer port, packet sent, packet received and packet lost. Press Refresh button to get the latest RTP Packet Summary

PHONE 1

Codec :	Unknow
Packet Sent :	0
Packet Received :	0
Packet Lost :	0

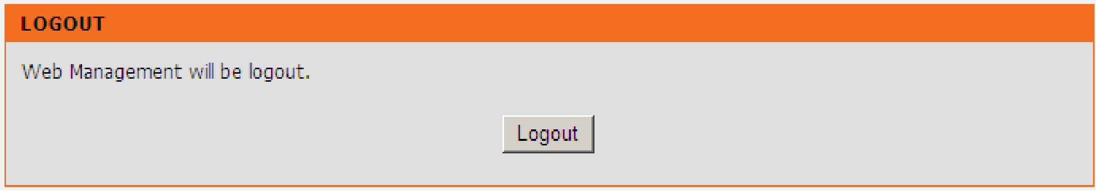
PHONE 2

Codec :	Unknow
Packet Sent :	0
Packet Received :	0
Packet Lost :	0

It displays the information of the last call made. Press **Refresh** button to get the latest RTP Packet Summary.

3-4-5 Logout

STATUS → Logout


LOGOUT

Web Management will be logout.

If setting or parameter has been changed, remember to save the changes before you logout the configuration menu.

Appendix

Product Features

WAN

- One 10/100/1000Mbps auto-negotiation, auto-crossover RJ-45 Ethernet port
- Support Static IP, DHCP, PPPoE, PPTP, L2TP, 3G USB Adapter, and Bridge.
- QoS: IP TOS (Type of Services) and DiffServ (Differentiated Services) for both SIP signaling and RTP
- NAT Traversal : Port Forwarding, STUN and Outbound Proxy
- NTP: (Network Time Protocol RFC 1305), Accepts up to 3 Time Server
- Time Zone Support
- MAC Address Clone
- RTP Packet Summary : packet sent, packet received, packet loss for voice quality analysis

LAN

- Four 10/100/1000Mbps auto-negotiation, auto-crossover RJ 45 Ethernet ports
- Support router and bridge mode (NAT mode and Non-NAT mode)
- DHCP server

Voice Features

- SIP (RFC3261) compatible
- Voice codecs : G.711 a /ulaw, G.726, G.729A, G.723.1, G722, iLBC
- CNG (Comfort Noise Generation)
- VAD (Voice Activity Detection)
- G.165/G.168 echo cancellation
- Adjustable Jitter Buffer and programmable Gain Control
- In-Band DTMF, Out-Of-Band DTMF relay (RFC2833, SIP INFO)
- Multiple SIP Proxy server entries with failover mechanism
- Polarity reversal generation (FXS)
- T.30 (G.III) / Real time T.38 / Secured T.38 FAX relay
- DTMF, FSK (Bellcore & ETSI) Caller ID generation.
- Support Caller ID Restriction (CLIR)
- Digit Map for dial plan
- Speed Dial
- Local phone book for peer-to-peer calling
- E.164 Numbering & ENUM support
- Hot-Line, Warm-Line support
- Single Number / Account (reprehensive number) for multiple ports
- Call features:
  - Call Hold, Call Waiting, Call Pickup
  - Call Forward - Unconditional, Busy, No Answer
  - Call Transfer - Unattended, Attended
  - Three Way Calling (Media Server required)
- Analogue interface
  - Connector : RJ-11
  - Signaling protocol : Loop Start

Configuration & Maintenance

- Configuration methods:
  - Web

  - IVR
  - Telnet
- Status reports:
  - Port status
  - Registration status
  - Ping tests
  - Hardware / software information
- Firmware Upgrade through LOCAL, TFTP, FTP, HTTP, HTTPS server
- Configuration Backup/Restore
- Reset button (with restore factory default function)