Wired / Wireless

VDSL 2 Router

VC-230N / VC-230

User's Manual

Federal Communication Commission Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of 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:

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

FCC Caution

To assure continued compliance (example-use only shielded interface cables when connecting to computer or peripheral devices). Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

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

Federal Communication Commission (FCC) Radiation Exposure Statement

This equipment complies with FCC radiation exposure set forth for an uncontrolled environment. In order to avoid the possibility of exceeding the FCC radio frequency exposure limits, human proximity to the antenna shall not be less than 20 cm (8 inches) during normal operation.

CE mark Warning

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

R&TTE Compliance Statement

This equipment complies with all the requirements of DIRECTIVE 1999/5/EC OF THE EUROPEAN PARLIAMENT AND THE COUNCIL OF 9 March 1999 on radio equipment and telecommunication terminal Equipment and the mutual recognition of their conformity (R&TTE)
The R&TTE Directive repeals and replaces in the directive 98/13/EEC (Telecommunications Terminal Equipment and Satellite Earth Station Equipment) As of April 8, 2000.

WEEE Regulation

To avoid the potential effects on the environment and human health as a result of the presence of hazardous substances in electrical and electronic equipment, end users of electrical and electronic equipment should understand the meaning of the crossed-out wheeled bin symbol. Do not dispose of WEEE as unsorted municipal waste and have to collect such WEEE separately.

Safety

This equipment is designed with the utmost care for the safety of those who install and use it. However, special attention must be paid to the dangers of electric shock and static electricity when working with electrical equipment. All guidelines of this and of the computer manufacture must therefore be allowed at all times to ensure the safe use of the equipment.

Revision

User's Manual for Wired / Wireless VDSL 2 Router
Model: VC-230N / VC-230
Rev: 2.0 (Nov. 2009)
Part No. EM-VC230_230N_v2

Table of Contents

1. Introduction

The PLANET Wired / Wireless VDSL2 Router, VC-230 / VC-230N are based on several core networking technologies: IEEE 802.11b/g/n (VC-230N), Ethernet and VDSL2 (Very High Speed Digital Subscriber Line 2). This technology offers the absolute fastest data transmission speeds over existing copper telephone lines without the need for rewiring. In the following terms of **VDSL2 Router** will mean **VC-230** or **VC-230N** unless model number is specified.

The PLANET VDSL2 ROUTER can provide very high performance access to Internet, both downstream and upstream up to 100Mbps. The VDSL2 ROUTER complies with ITU-T G993.2 standard, and provide two modes for applications – Bridge and Router. With 4-port 10/100 Ethernet switch, it provide data deliver and receive in local network, so that it is the best solution for small enterprise and residence.

With built-in IEEE 802.11b/g and 802.11n wireless network capability, the VC-230N allows any computer and wireless-enabled network device connect to it without additional cabling. New 802.11n Draft 2.0 wireless capability gives you the highest speed of wireless experience ever. With a compatible wireless card installed in your PC, the files can be transferred at up to 300Mbps. The radio coverage is also doubled to offer the high speed wireless connection even in a wide space of your office or house.

There are two selectable operating modes of VDSL2 ROUTER, CO and CPE. The CO or CPE mode can be adjusted by WEB UI and users can connect two VDSL2 ROUTER for Point-to-Point Application, data transmission between two networks over existing copper telephone lines.

Via the user-friendly management interface, VDSL2 ROUTER can be managed easily by computer running standard web browsers. Furthermore, the VDSL2 ROUTER not only provides basic router's functions, such as DHCP server, Virtual Server, DMZ, QoS, and UPnP, but also provides the fully firewall functions, such as Network Address Translation (NAT), IP/Port/MAC Filtering and Content Filtering. It serves as an Internet firewall to protect your network from being accessed by outside users.

1.1 Feature

Internet Access Features

- ***Shared Internet Access:*** All users on the LAN can access the Internet through the VDSL Router using only a single external IP Address. The local (invalid) IP Addresses are hidden from external sources. This process is called NAT (Network Address Translation).
- ***Built-in VDSL2 Modem:*** The VDSL Router provides VDSL2 modem, and supports all common VDSL2 connections.
- ***Multiple WAN Connection:*** On the Internet (WAN port) connection, the VDSL Router supports Dynamic IP Address (IP Address is allocated on connection), Fixed IP Address, PPPoE, PPTP and L2TP.
- ***CO and CPE type Support:*** The VDSL Router provides the Peer-to-Peer connection. Users can select the CO and CPE mode manually.
- ***Bridge and Router Application:*** The VDSL Router supports two application modes. Currently, it comes pre-configured with routing mode. Note that, routing mode and bridging mode cannot be used simultaneously.

Advanced Internet Functions

- ***Virtual Servers:*** This feature allows Internet users to access Internet servers on your LAN. The required setup is quick and easy.
- ***Firewall:*** Supports simple firewall with NAT technology.
- ***Universal Plug and Play (UPnP):*** UPnP allows automatic discovery and configuration of the Broadband Router. UPnP is supported by Windows ME, XP, or later.
- ***Selectable VDSL2 Profiles:*** The VDSL Router supports common VDSL2 profiles (30a, 17a, 12a, 12b, 8a, 8b, 8c, 8d) for selectable. Users can choose different VDSL2 profiles based on their requirements.
- ***User Friendly Interface:*** The VDSL Router can be managed and controlled through Web UI.
- ***DMZ Support:*** The VDSL Router can translate public IP addresses to private IP address to allow unrestricted 2-way communication with Servers or individual users on the Internet. This provides the most flexibility to run programs, which could be incompatible in NAT environment.
- ***Bridge and Router Application:*** The VDSL Router supports two application modes. Currently, it comes pre-configured with routing mode. Note that, routing mode and bridging mode cannot be used simultaneously.
- ***RIP1/2 Routing:*** It supports RIPv1/2 routing protocol for routing capability.
- ***VPN Pass through Support:*** PCs with VPN (Virtual Private Networking) software are transparently supported - no configuration is required.

LAN Features

- ***4-Port Switch:*** The VDSL Router incorporates a 4-port 10/100Base-TX switching hub, making it easy to create or extend your LAN.
- ***DHCP Server Support:*** **D**ynamic **H**ost **C**onfiguration **P**rotocol provides a dynamic IP address to PCs and other devices upon request. The VDSL Router can act as a DHCP Server for devices on your local LAN.

Wireless Features(VC-230N only)

- ***Support IEEE 802.11b, g and 802.11n Wireless Stations:*** The 802.11n standard provides for backward compatibility with the 802.11b and 802.11g standard, so 802.11b, 802.11g, and 802.11n Draft 2.0 can be used simultaneously. IEEE 802.11n (Draft 2.0) wireless technology is capable of up to 300Mbps data rate.
- ***Two External Antennas with MIMO Technology:*** The VC-230N provides farther coverage, less dead spaces and higher throughput with 2T2R MIMO technology.
- ***WPS Push Button Control:*** The VC-230N supports WPS (Wi-Fi Protected Setup) to easily connect to wireless network without configuring the security.
- ***WEP Support:*** WEP (Wired Equivalent Privacy) is included. Key sizes of 64 Bit and 128 Bit are supported.
- ***WPA-PSK Support:*** WPA-PSK_TKIP and WAP-PSK_AES encryption are supported.
- ***Wireless MAC Access Control:*** The Wireless Access Control feature can check the MAC address (hardware address) of Wireless stations to ensure that only trusted Wireless Stations can access your LAN.

1.2 Package Contents

- VC-230 / VC-230N Unit x 1
- Power Adapter x 1
- Quick Installation Guide x 1
- User's Manual CD x 1
- RJ-45 cable x 1
- RJ-11cable x 1
- Antenna x 2 (VC-230N)

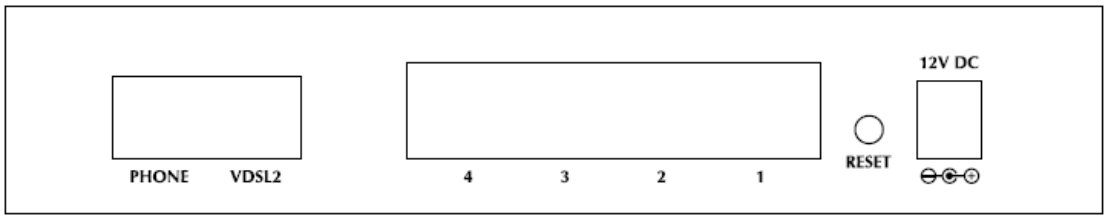
1.3 Physical Details

Front Panel of VC-230

Front Panel LED definition

LED	State	Description
PWR	ON	When the router is powered on, and in ready state.
	OFF	When the router is powered off.
DSL	Flashing	Router is trying to establish a VDSL2 connection to VDSL2 device or telecom's network.
	ON	The VDSL2 connection connected successfully.
LAN1-4	Flashing	Data is being transmitted or received via the corresponding LAN port.
	ON	The port is up.

Rear Panel of VC-230



Rear Panel Port and Button Definition

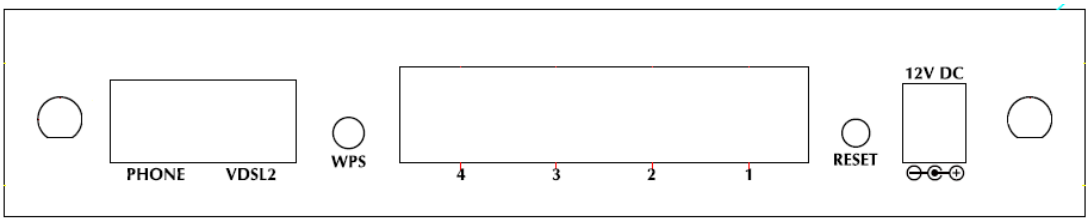
Connector	Description
POWER	Power connector with 12V DC 1 A
RESET	Press more than 3 seconds for reset to factory default setting.
LAN (1-4)	Router is successfully connected to a device through the corresponding port (1, 2, 3, or 4). If the LED light of LNK/ACT is flashing, the Router is actively sending or receiving data over that port.
PHONE	Built-in splitter for POTS connection.
VDSL2	The RJ-11 connector allows data communication between the router and the VDSL2 network through a twisted-pair phone wire

Front Panel of VC-230N

Front Panel LED definition

LED	State	Description
PWR	ON	When the router is powered on, and in ready state.
	OFF	When the router is powered off.
WPS	ON	WPS client registration is successful.
	Flashing	WPS client registration window is currently open.
	OFF	WPS is not available, or WPS is not enabled or initialized.
WLAN	ON	WLAN radio is on.
	Flashing	Data is being transmitted through WLAN.
	OFF	WLAN radio is off.
Security	ON	Enable WLAN encryption
	OFF	Disable WLAN encryption
DSL	Flashing	Router is trying to establish a VDSL2 connection to VDSL2 device or telecom's network.
	ON	The VDSL2 connection connected successfully.
LAN1-4	Flashing	Data is being transmitted or received via the corresponding LAN port.
	ON	The port is up.

Rear Panel of VC-230N



Rear Panel Port and Button Definition

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WPS	WPS on or off switch.
PHONE	Built-in splitter for POTS connection.
VDSL2	The RJ-11 connector allows data communication between the router and the VDSL2 network through a twisted-pair phone wire

2. Installation

This chapter offers information about installing your router. If you are not familiar with the hardware or software parameters presented here, please consult your service provider for the values needed.

2.1 System Requirement

1. Personal computer (PC)
2. Pentium III 266 MHz processor or higher
3. 128 MB RAM minimum
4. 20 MB of free disk space minimum
5. RJ45 Ethernet Port

2.2 Hardware Installation

Please connect the device to you computer as follow:

- Connect your telephone to the “Phone” Port via RJ-11 telephone line.
- Use another telephone cable to connect “VDSL” port of the router. And connect the other side to your CO side devices, such as VDSL 2 DSLAM, VDSL 2 Switch, or another VDSL2 ROUTER with CO mode.
- Use Ethernet cable to connect “LAN” port of the modem and “LAN” port of your computer.

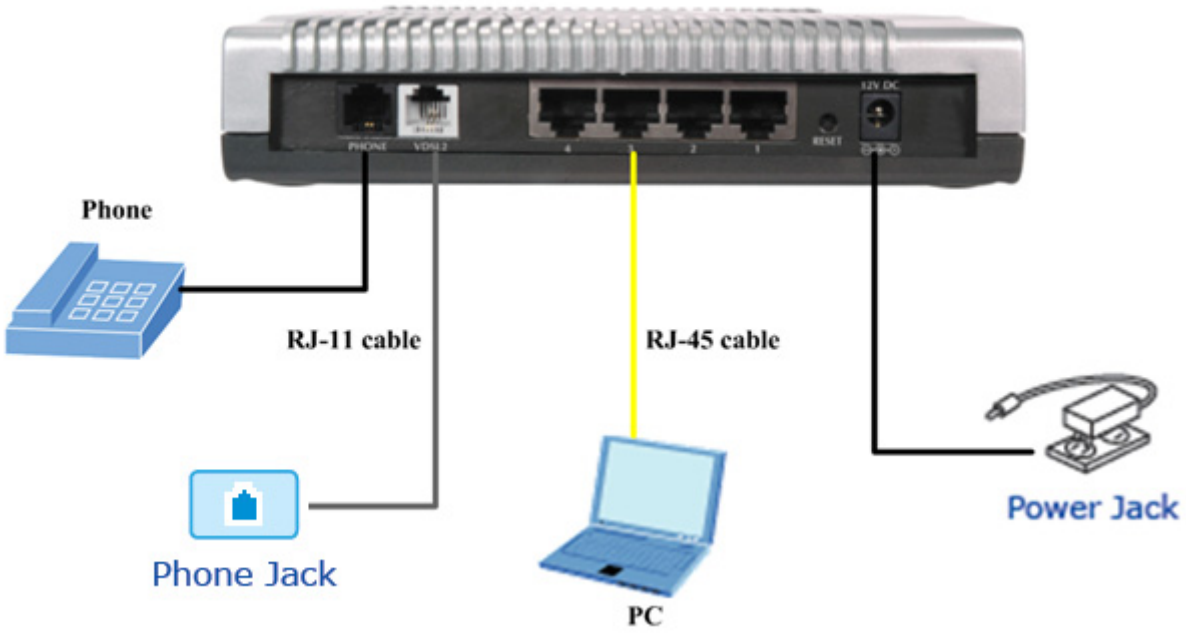


Figure 1: VC-230 connection diagram

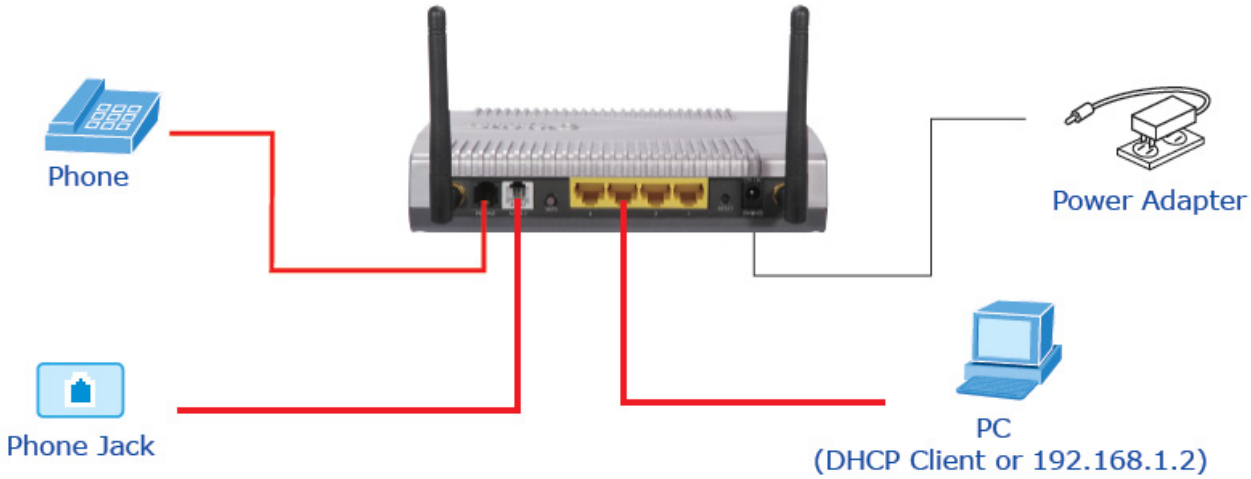


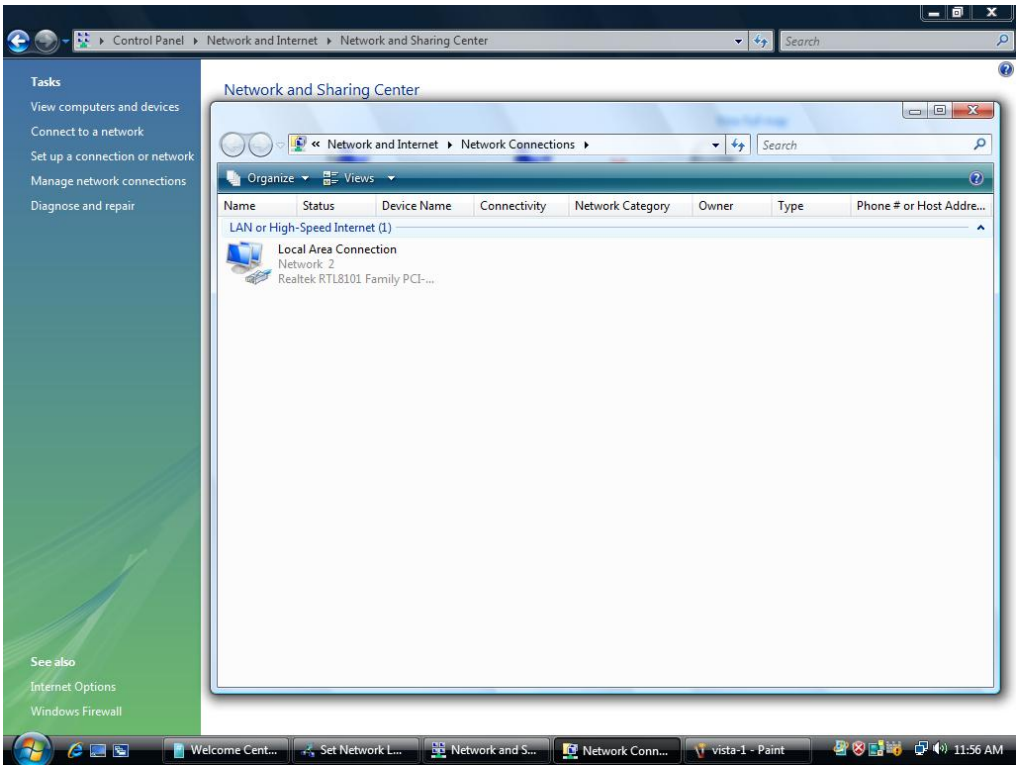
Figure 2: VC-230N connection diagram

2.3 Configuring the Network Properties

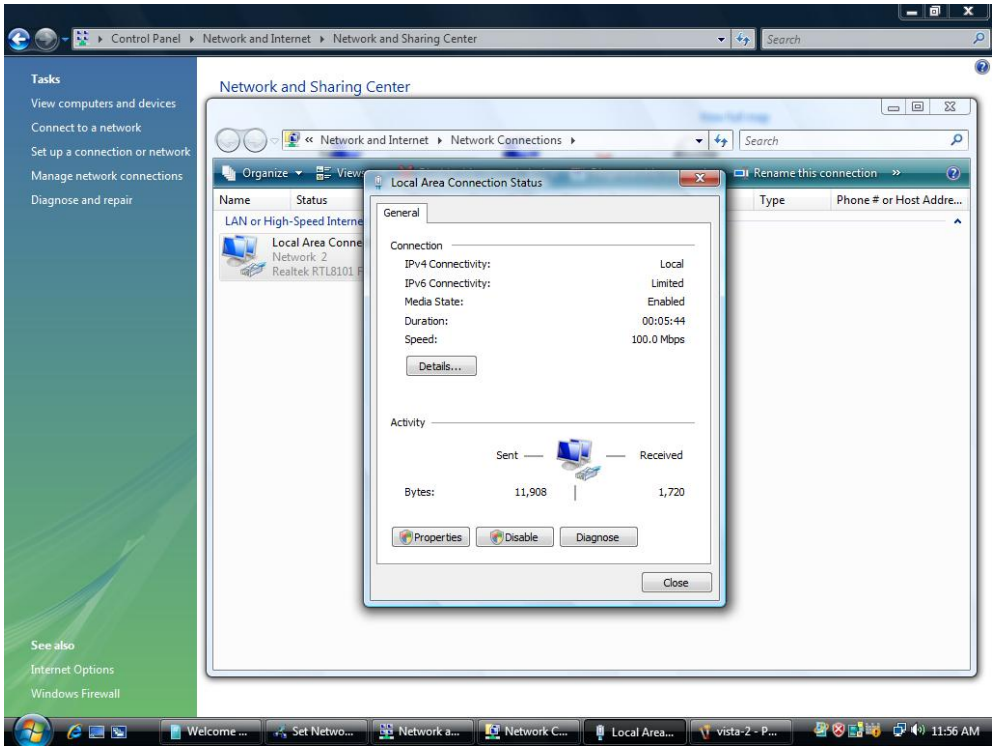
Configuring PC in Windows Vista

1. Go to **Start / Control Panel / Network and Internet / Network and Sharing Center**. Double-click on **Network Connections.**

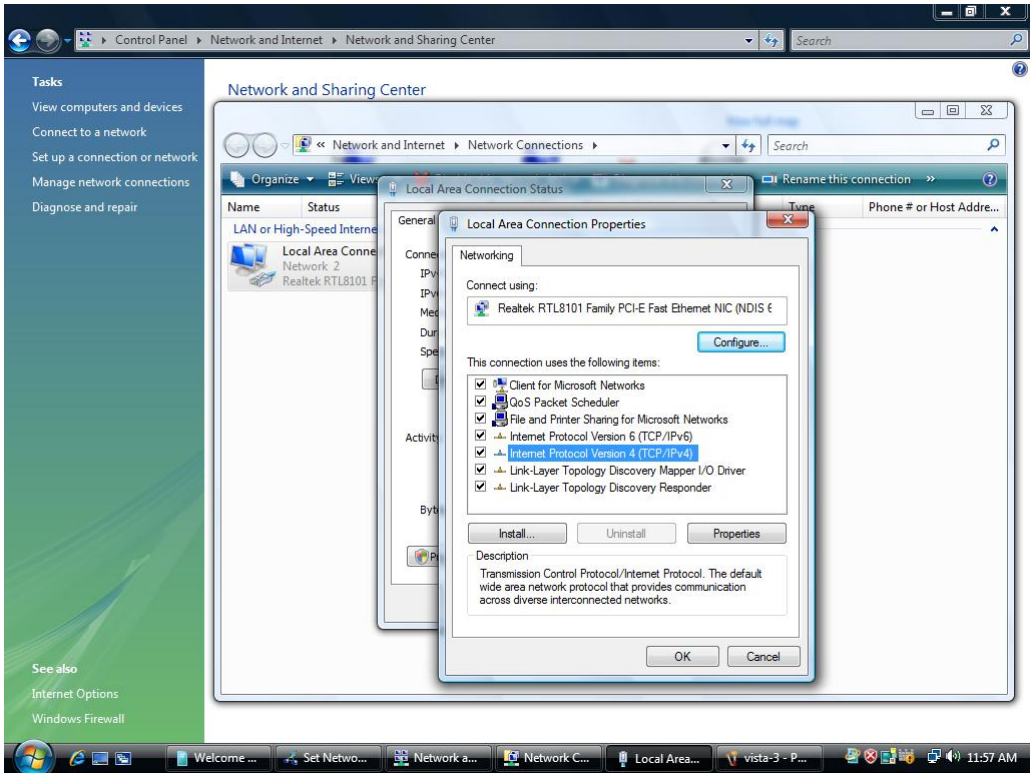
2. Double-click **Local Area Connection**.



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

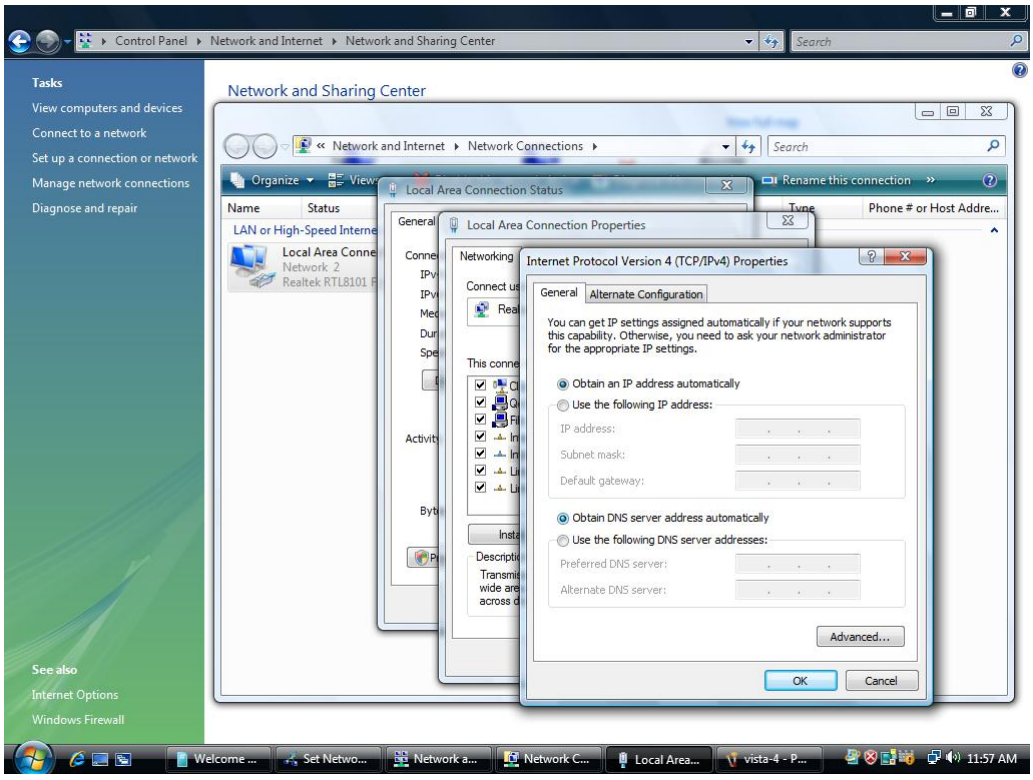


4. Select **Internet Protocol Version 4 (TCP/IPv4)** and click **Properties**.



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

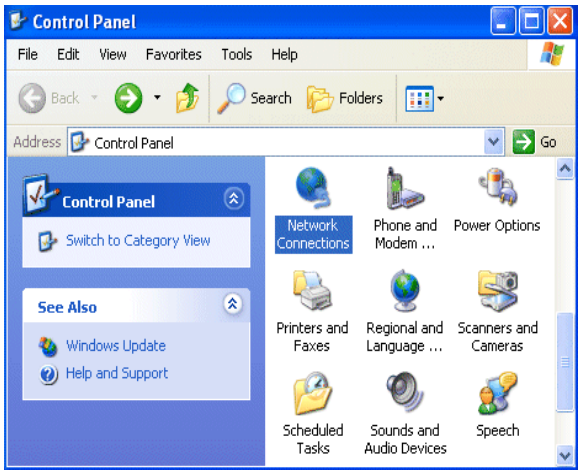
6. Click **OK** to finish the configuration.



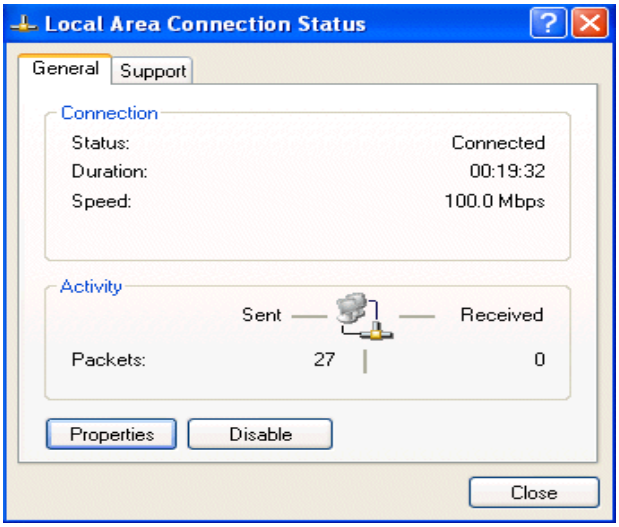
Configuring PC in Windows XP

1. Go to **Start / Control Panel (in Classic View)**. In the Control Panel, double-click on **Network Connections**

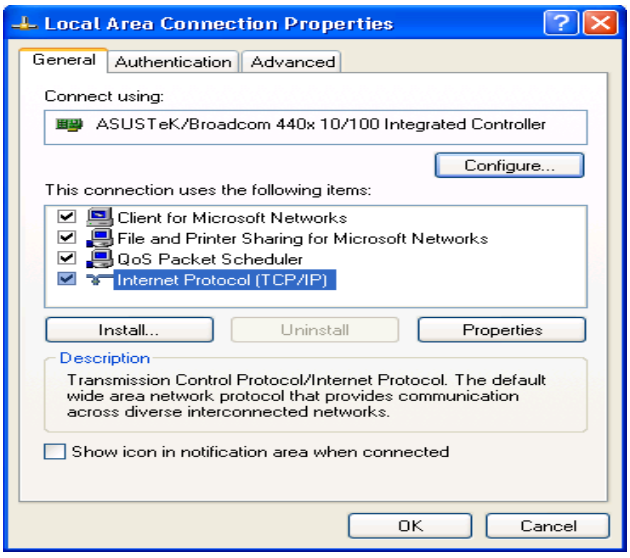
2. Double-click **Local Area Connection**.



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

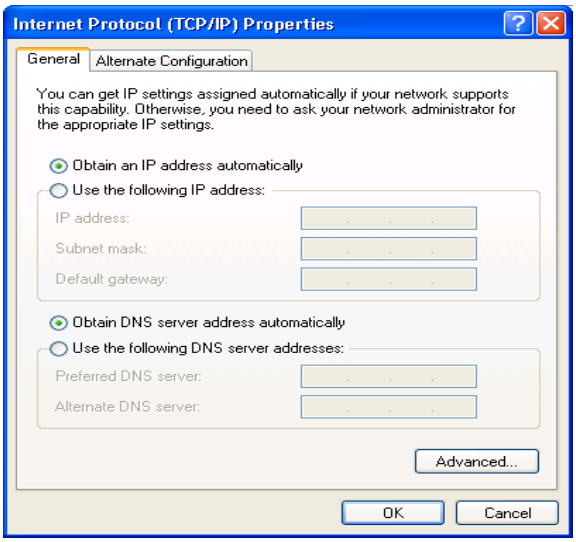


4. Select **Internet Protocol (TCP/IP)** and click **Properties**.



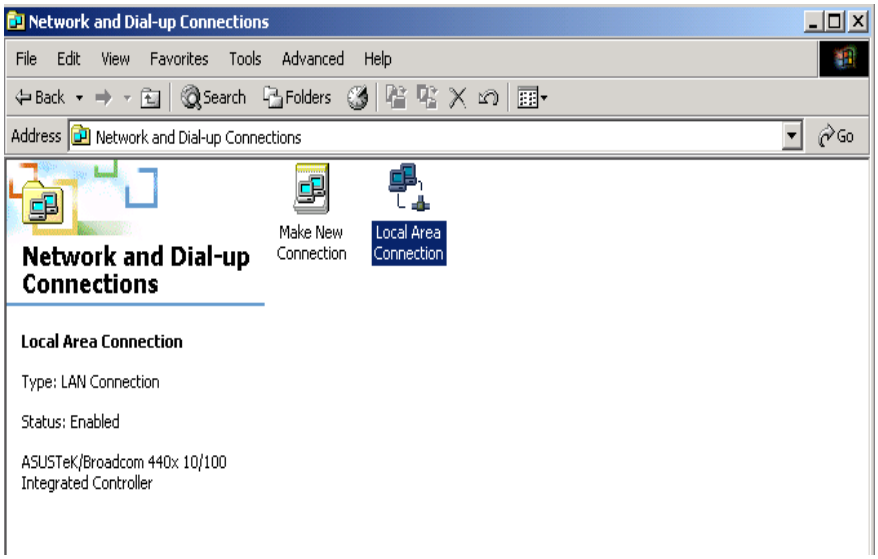
5. Select the **Obtain an IP address automatically** and the **Obtain DNS server address automatically** radio buttons.

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

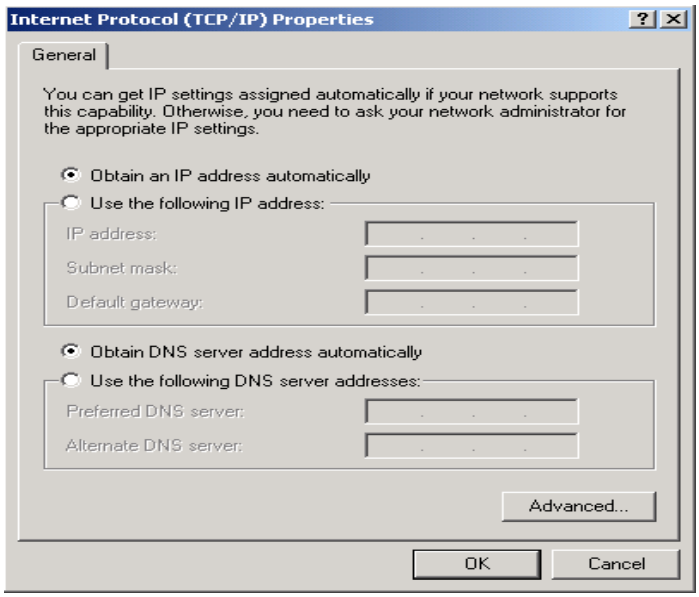


Configuring PC in Windows 2000

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

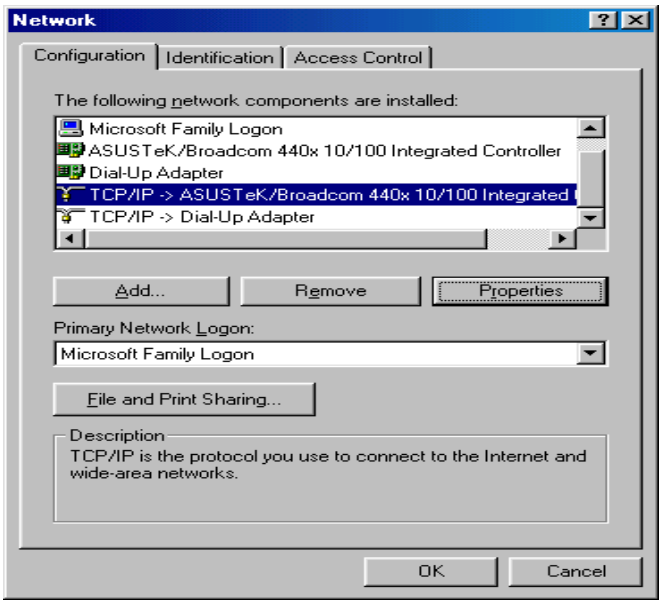


3. In the **Local Area Connection Status** window click **Properties**.
4. Select **Internet Protocol (TCP/IP)** and click **Properties**.
5. Select the **Obtain an IP address automatically** and the **Obtain DNS server address automatically** radio buttons.
6. Click **OK** to finish the configuration.

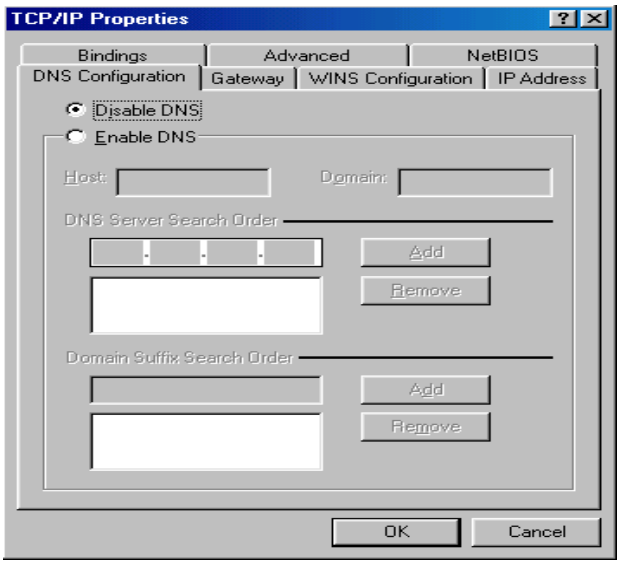


Configuring PC in Windows 98/Me

1. Go to **Start / Settings / Control Panel**. In the Control Panel, double-click on **Network** and choose the **Configuration** tab.
2. Select **TCP/IP → NE2000 Compatible**, or the name of your Network Interface Card (NIC) in your PC.

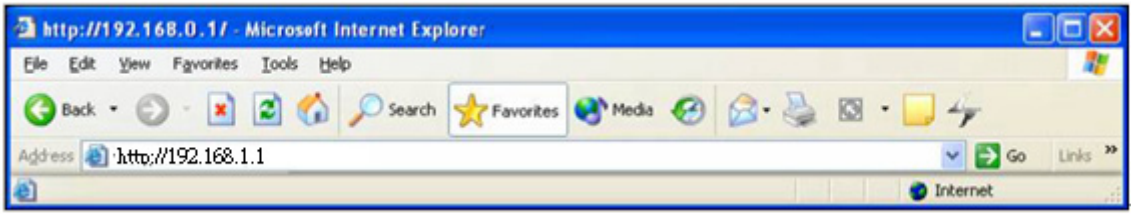


3. Select the **Obtain an IP address automatically** radio button.
4. Then select the **DNS Configuration** tab.
5. Select the **Disable DNS** radio button and click **OK** to finish the configuration.

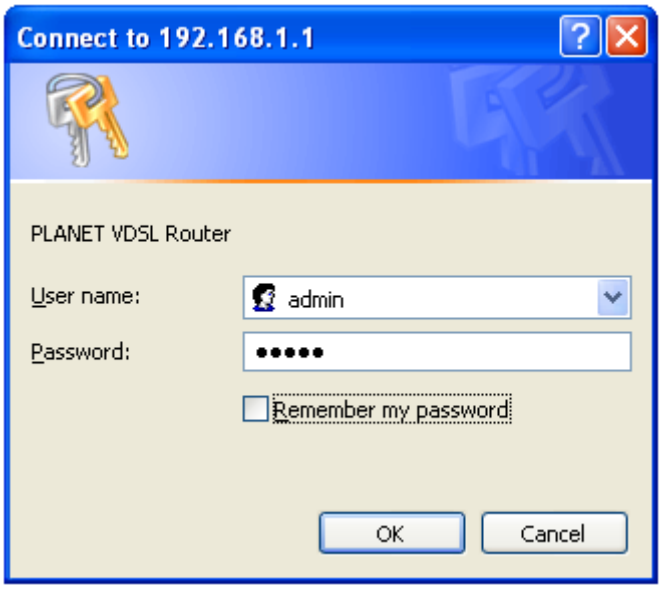


2.4 Configuring with Web Browser

It is advisable to change the administrator password to safeguard the security of your network. To configure the router, open your browser, type **"http: //192.168.1.1"** into the address bar and click **"Go"** to get to the login page.
Save this address in your Favorites for future reference.



At the User name and Password prompt, type your proper user name and password to login. The default user name / password are **"admin / admin"**. You can change these later if you wish. Click **"OK"**.

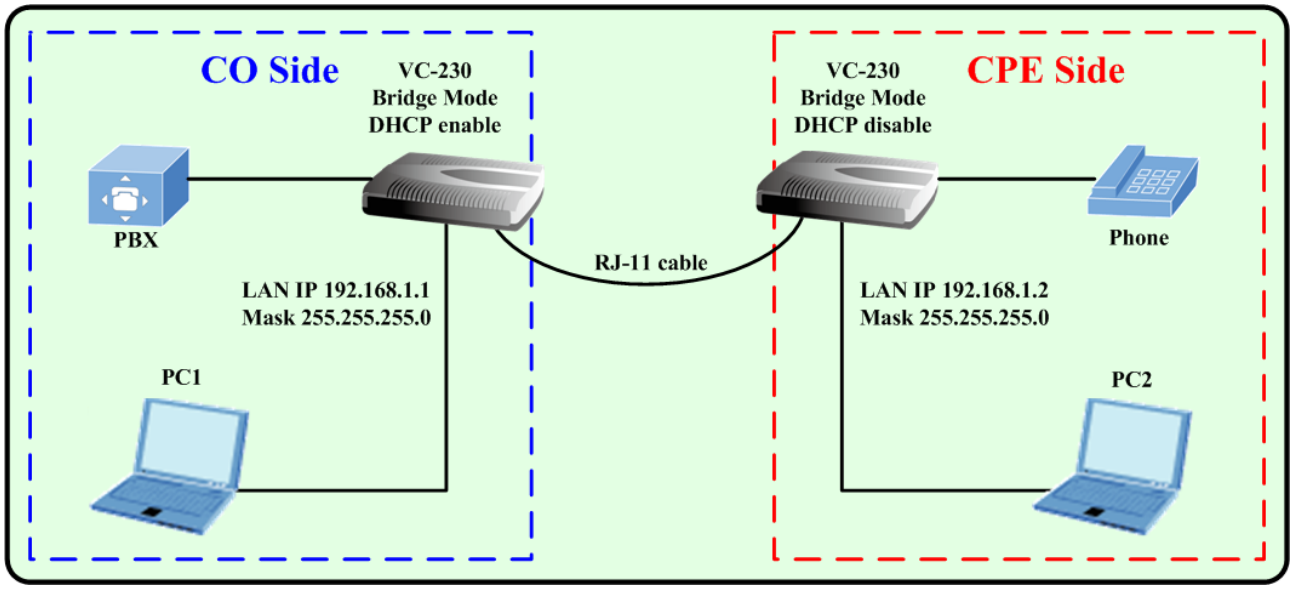


If the user name and password are correct, you will login VDSL2 ROUTER successfully and see the status page. Now you can configure the VDSL2 ROUTER for your needs.

2.5 Applications

The VDSL2 ROUTER supports two modes, users can select Router or Bridge mode for your applications. Please check as below examples for more details.

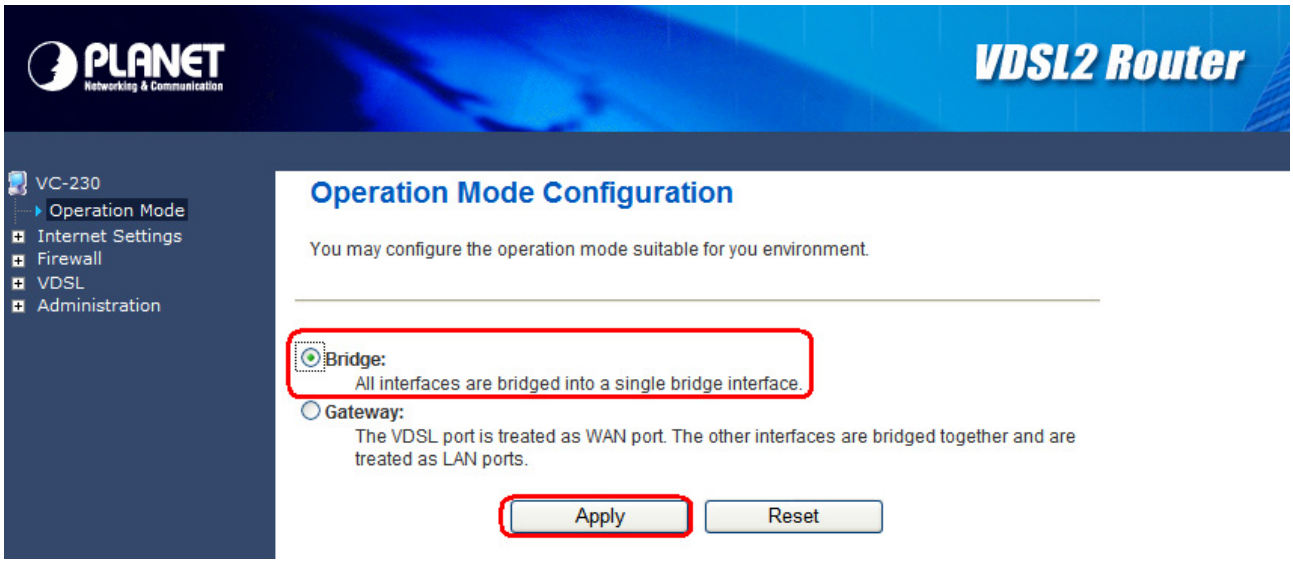
2.5.1 Bridge Mode for LAN-to-LAN connection



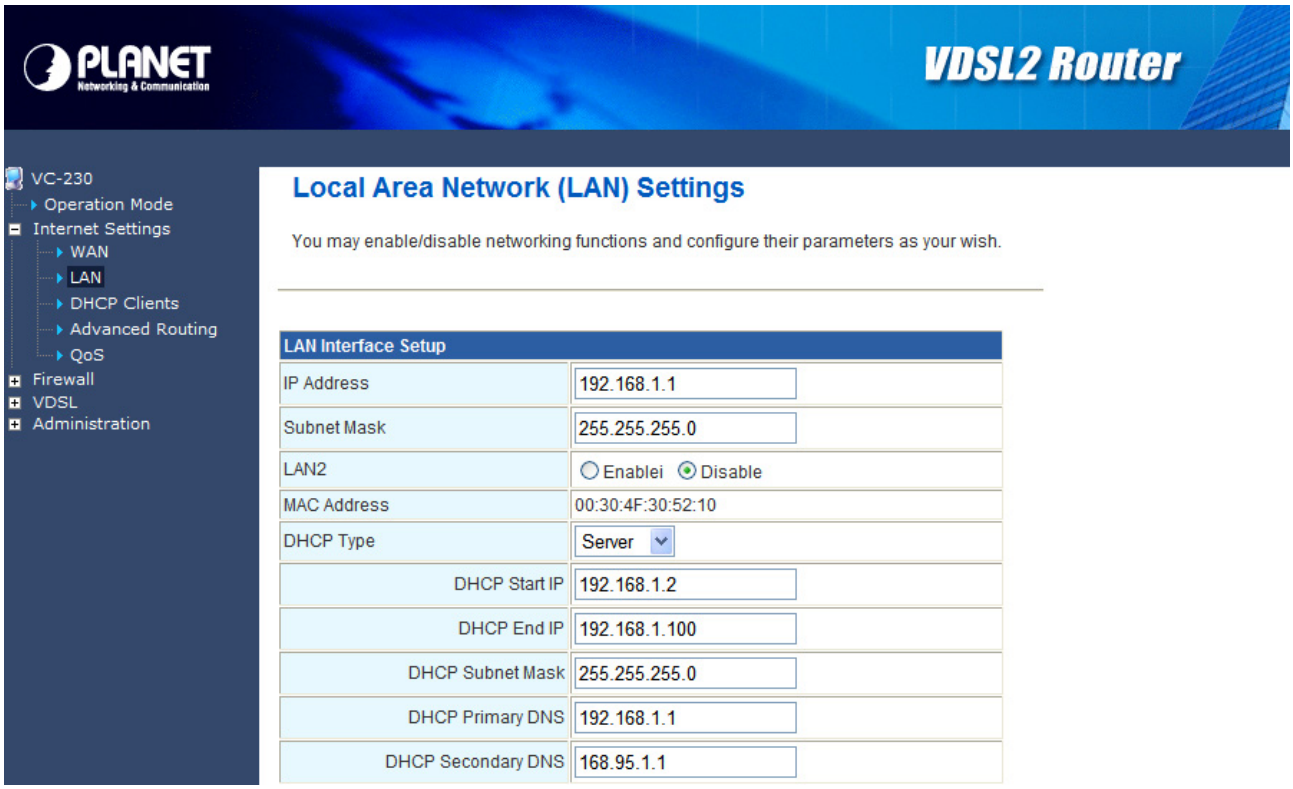
Web UI Configuration

For VDSL2 ROUTER CO side

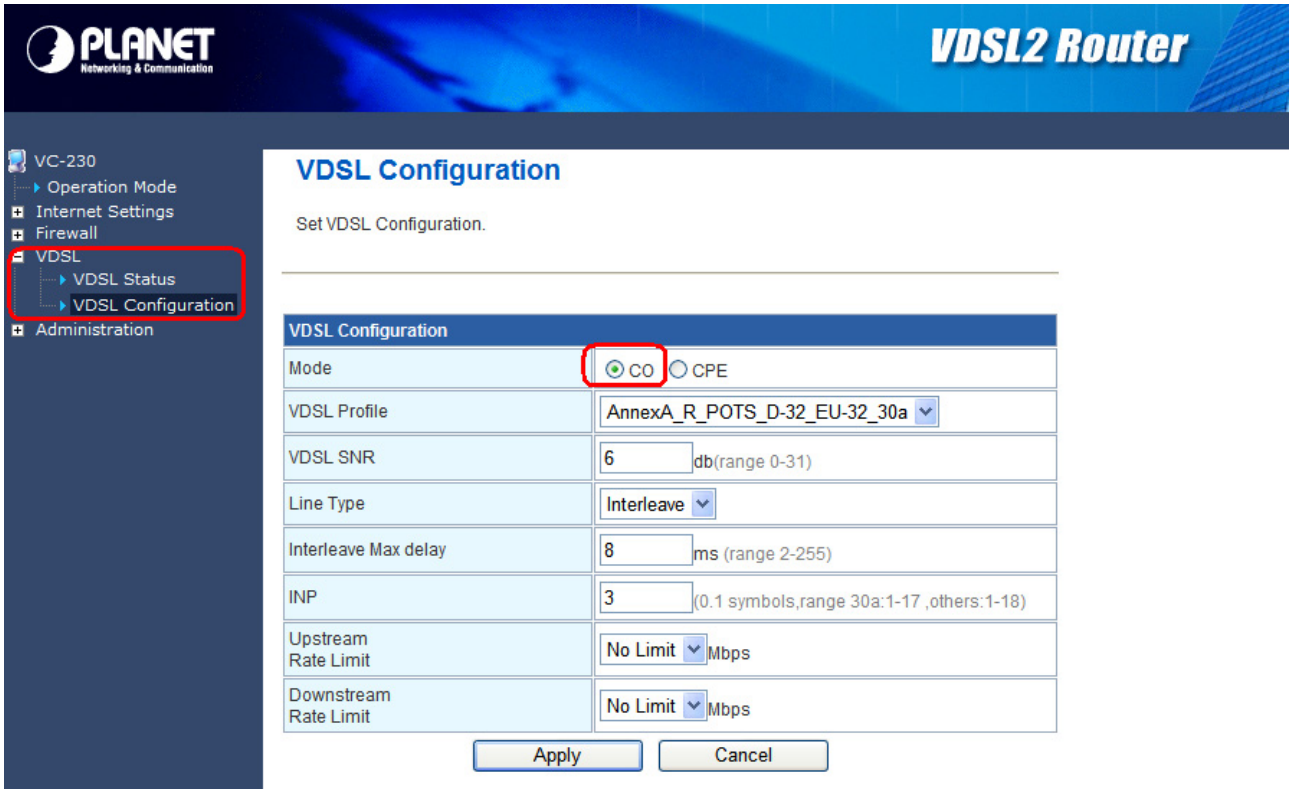
- **Step 1: Select the Bridge mode.**



■ **Step 2: Setup your LAN IP, for example, we use the 192.168.1.1 / 255.255.255.0 and enable DHCP server for VDSL2 ROUTER CO side.**

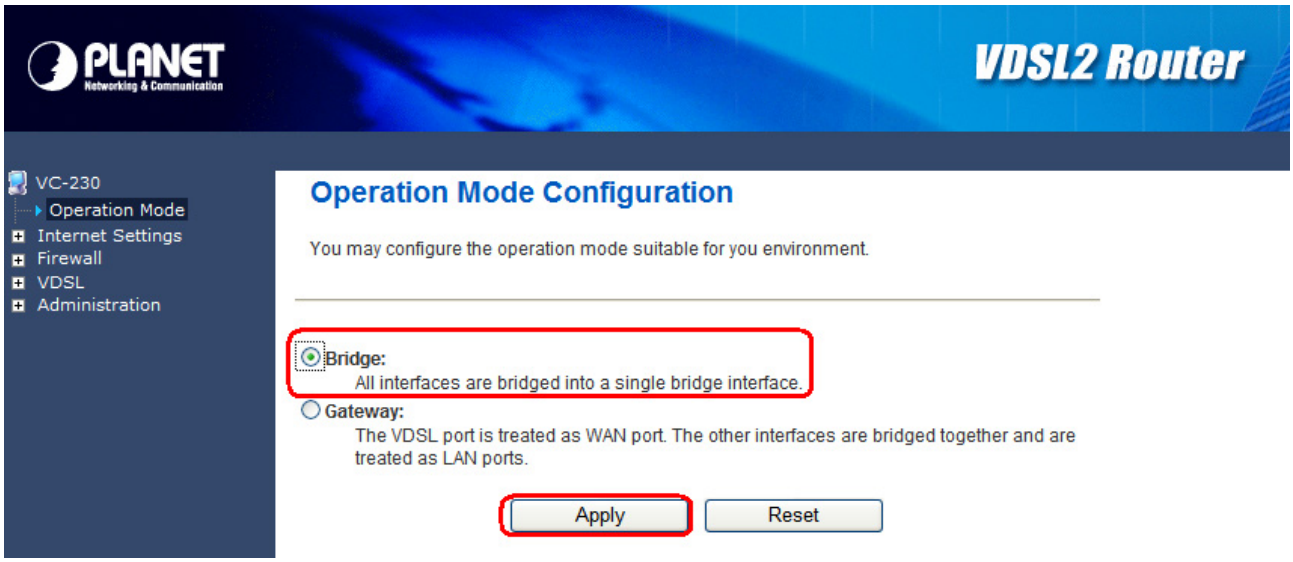


■ **Step 3: Modify your VDSL mode, default is CPE mode. Select the VDSL CO mode.**

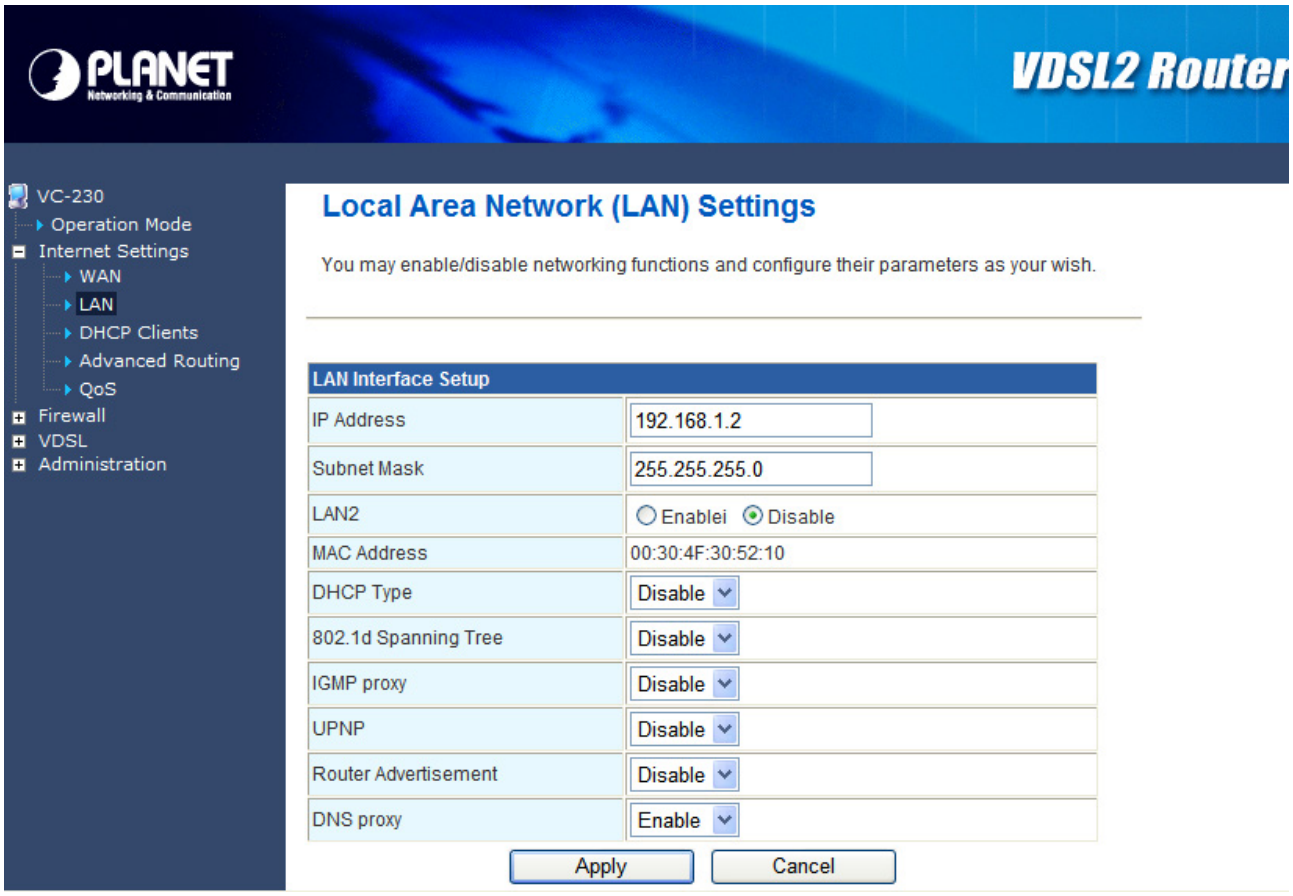


For VDSL2 ROUTER CPE side

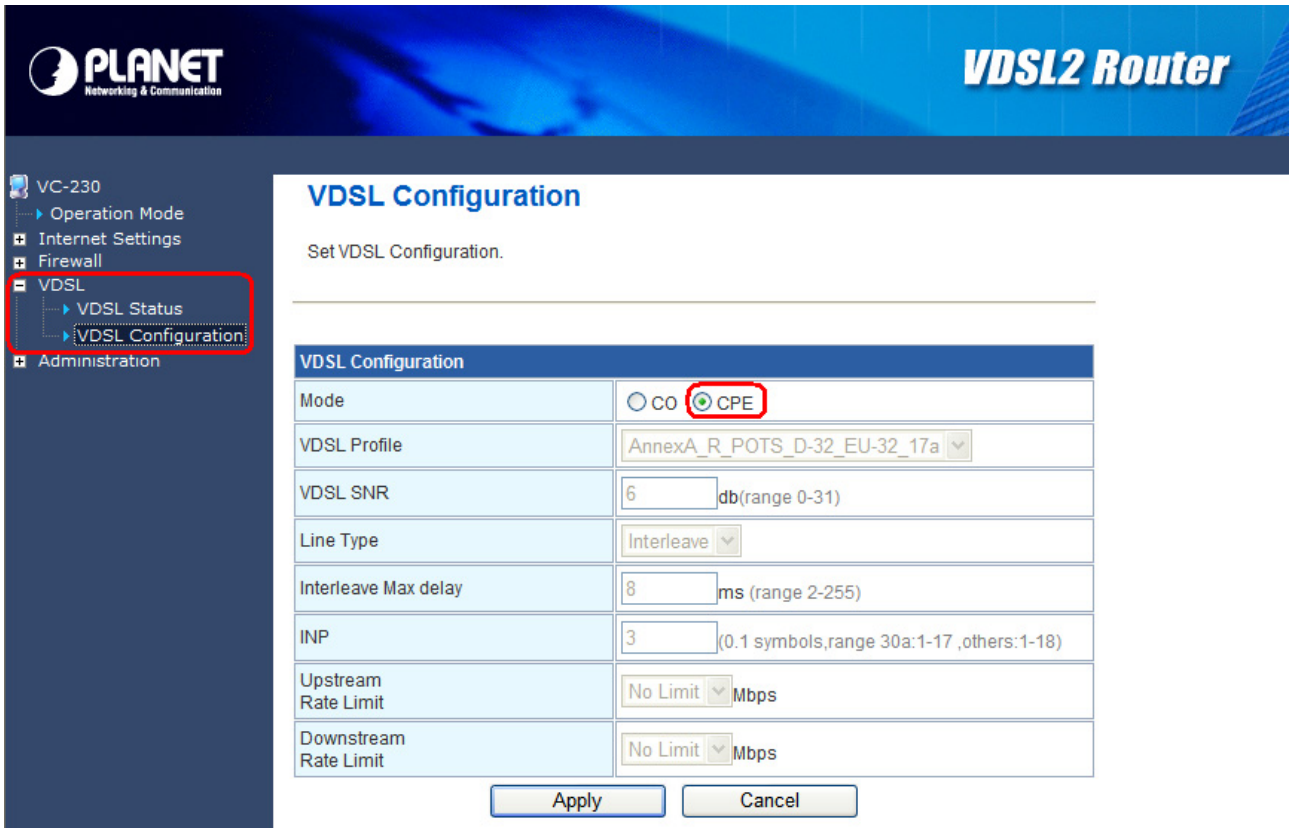
- **Step 1: Select the Bridge mode.**



- **Step 2: Setup your LAN IP, for example, we use the 192.168.1.2 / 255.255.255.0 and disable DHCP server for VDSL2 ROUTER CPE side.**

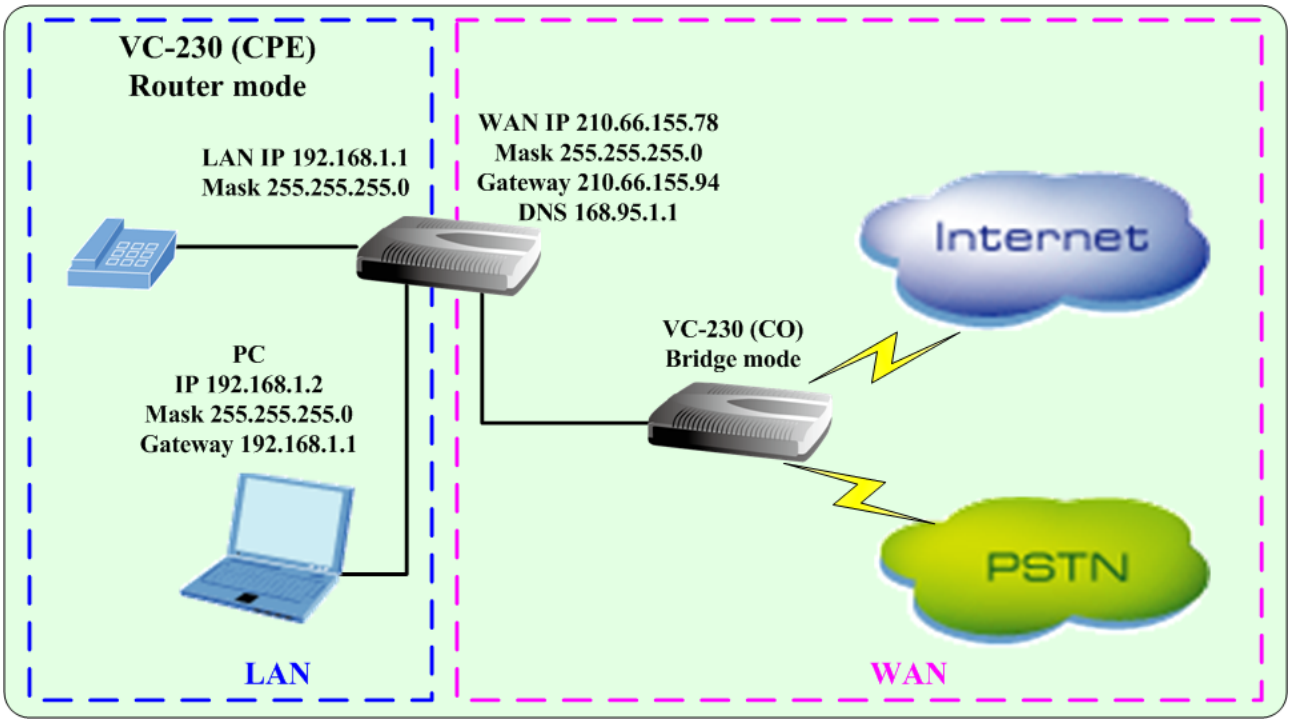


■ **Step 3: Modify your VDSL mode, default is CPE mode.**



After setting, the DSL line will try to establish the connection between two VDSL2 ROUTER. you can check the DSL LED, when the LED stop flashing and steady, the VDSL2 ROUTER will establish a connection and the PC1 and PC2 can access to each other.

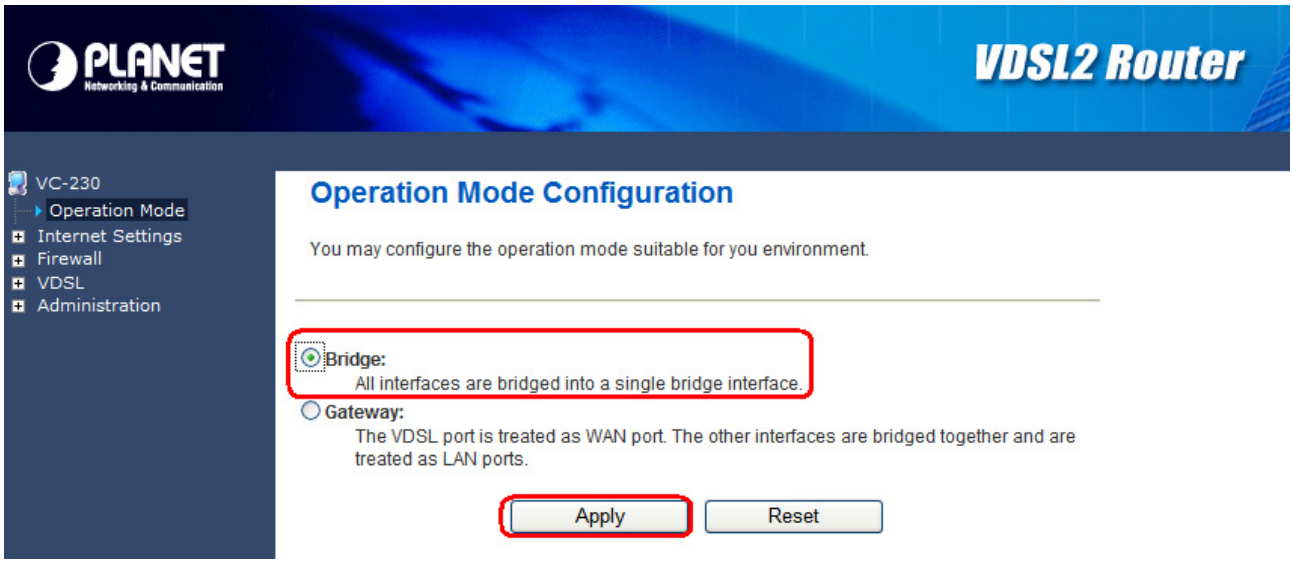
2.5.2 Router Mode for Internet connection



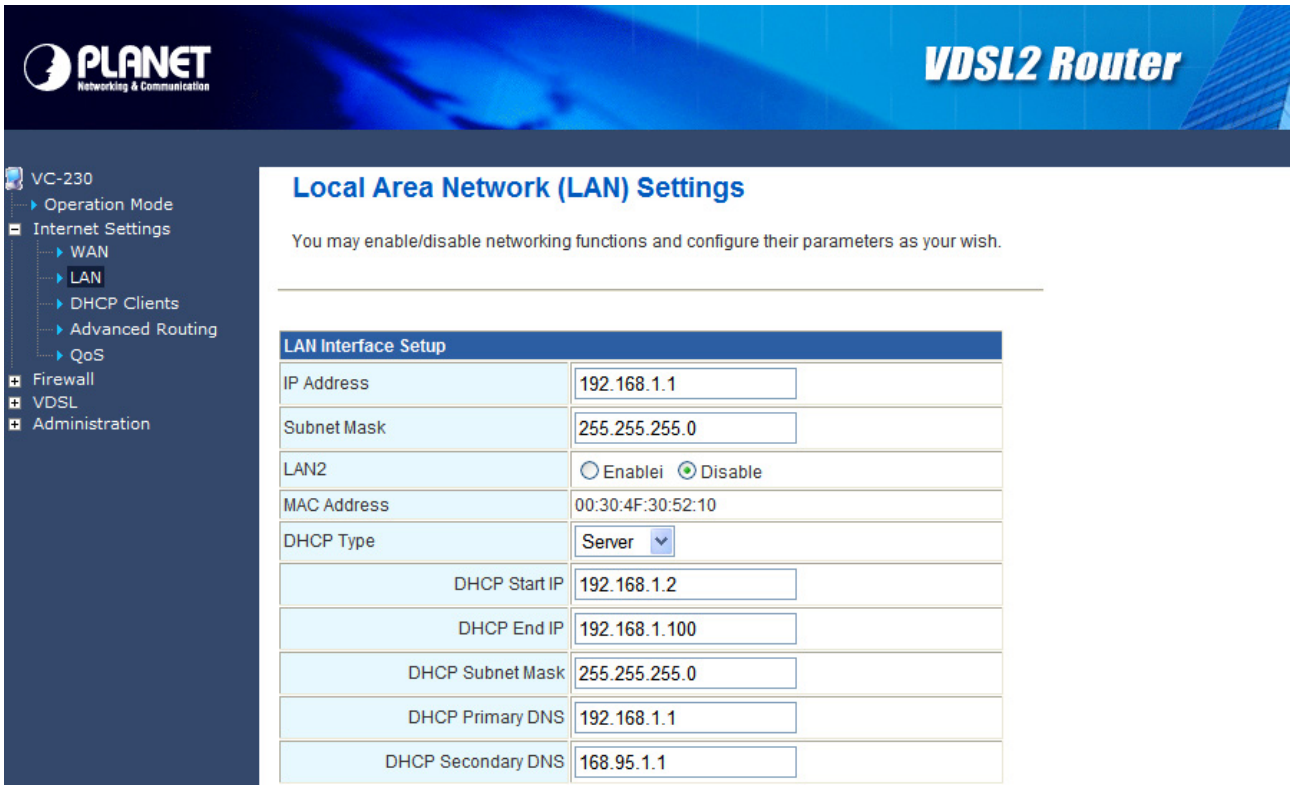
Web UI Configuration

For VDSL2 ROUTER CO side

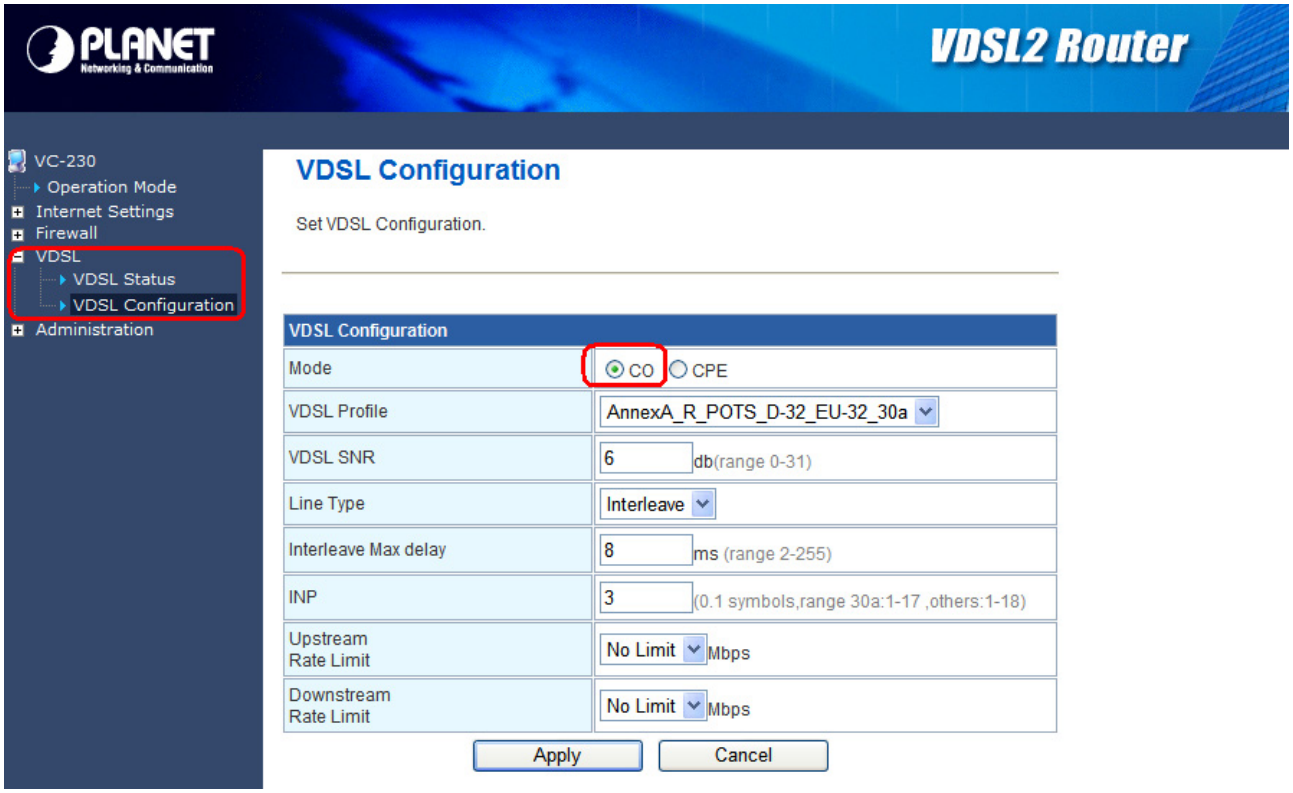
- **Step 1: Select the Bridge mode.**



■ **Step 2: Setup your LAN IP, for example, we use the 192.168.1.1 / 255.255.255.0 for VDSL2 ROUTER CO side.**

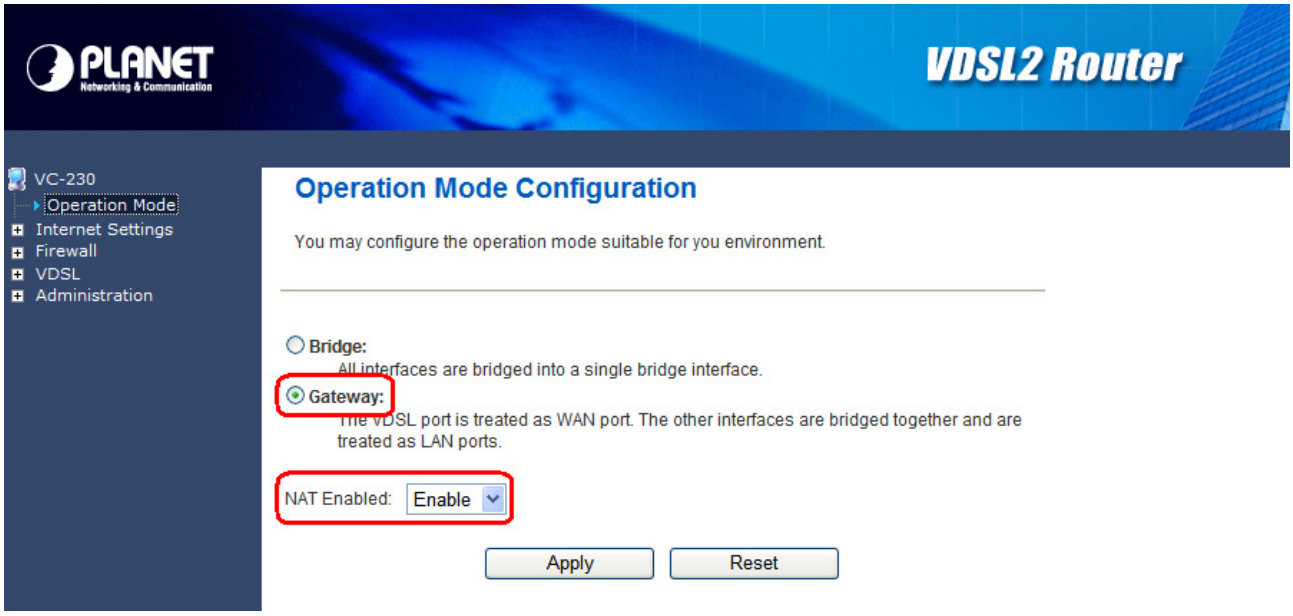


■ **Step 3: Modify your VDSL mode, default is CPE mode. Select the VDSL CO mode.**

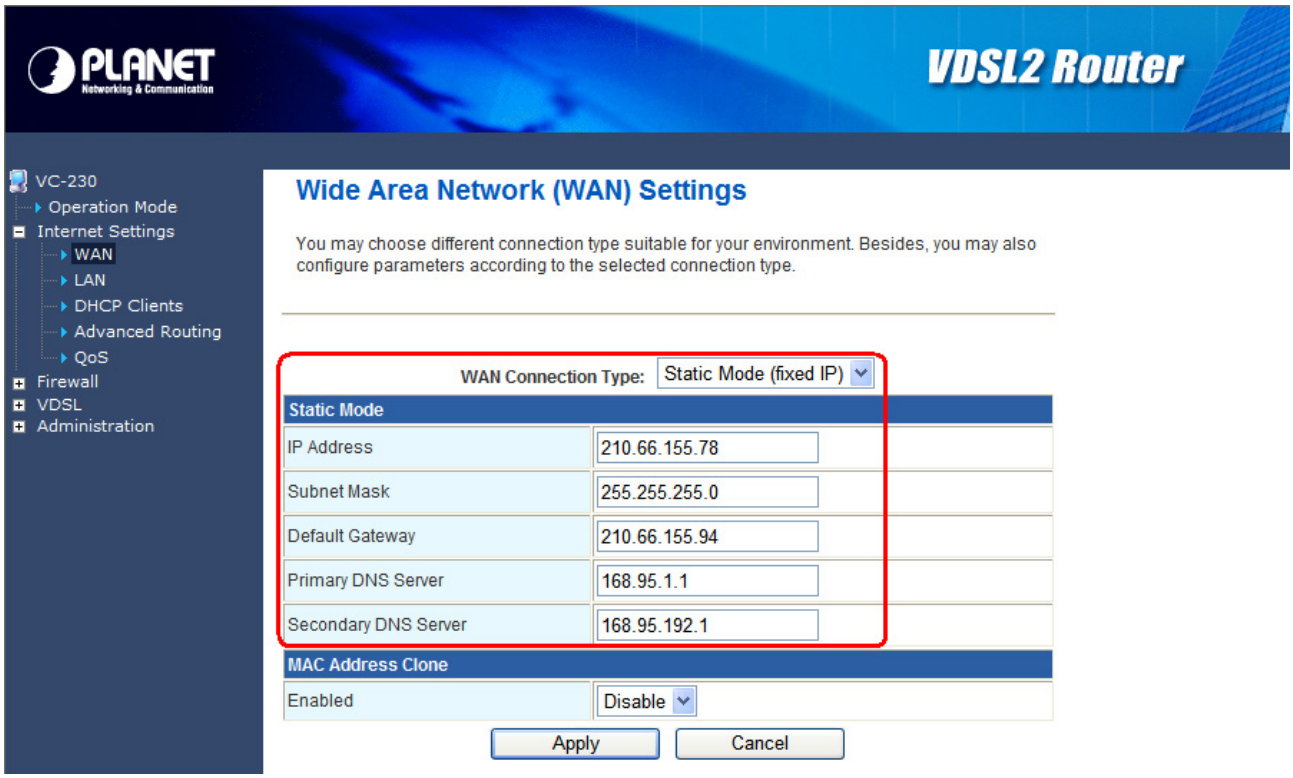


For VDSL2 ROUTER CPE side

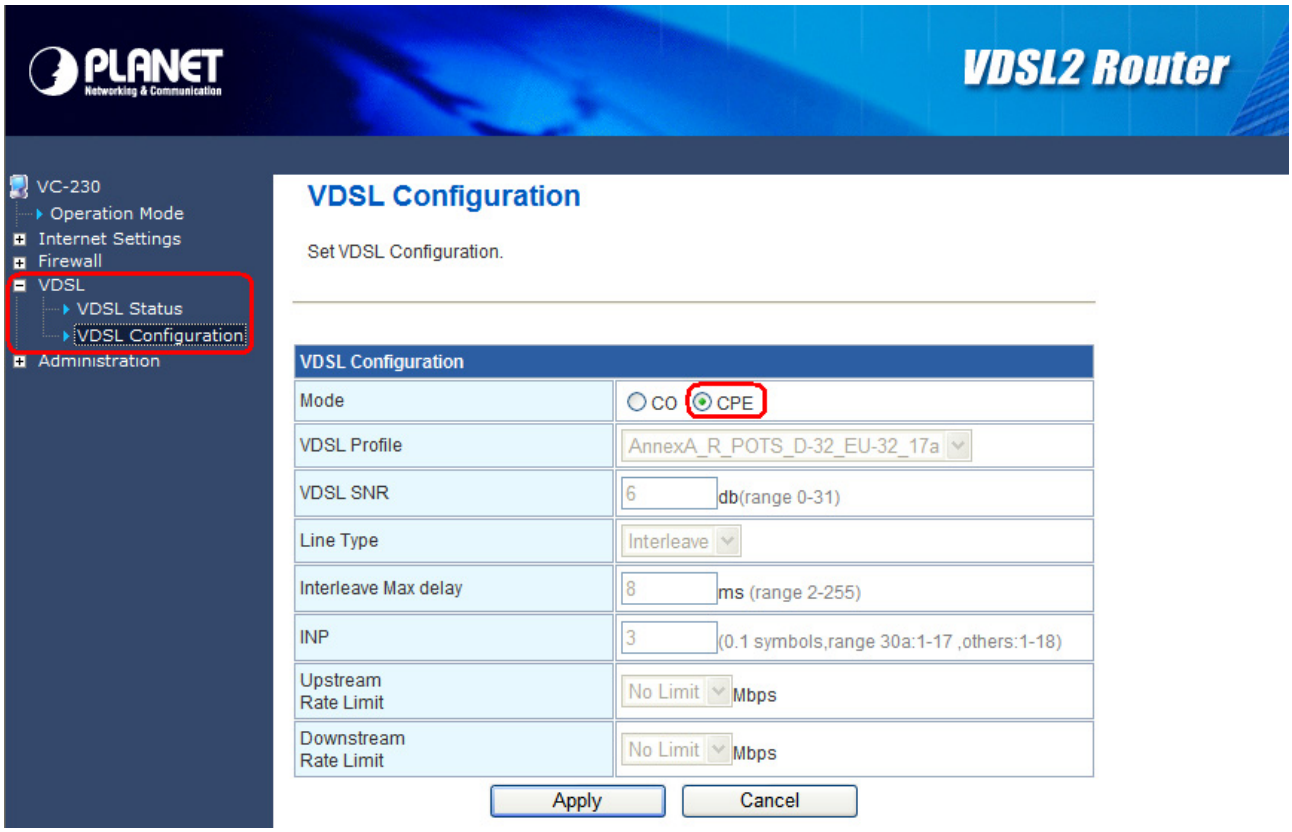
- **Step 1: Select the Router mode and enable the NAT.**



- **Step 2: Configure your WAN settings, type your WAN IP, Mask, Gateway and DNS.**

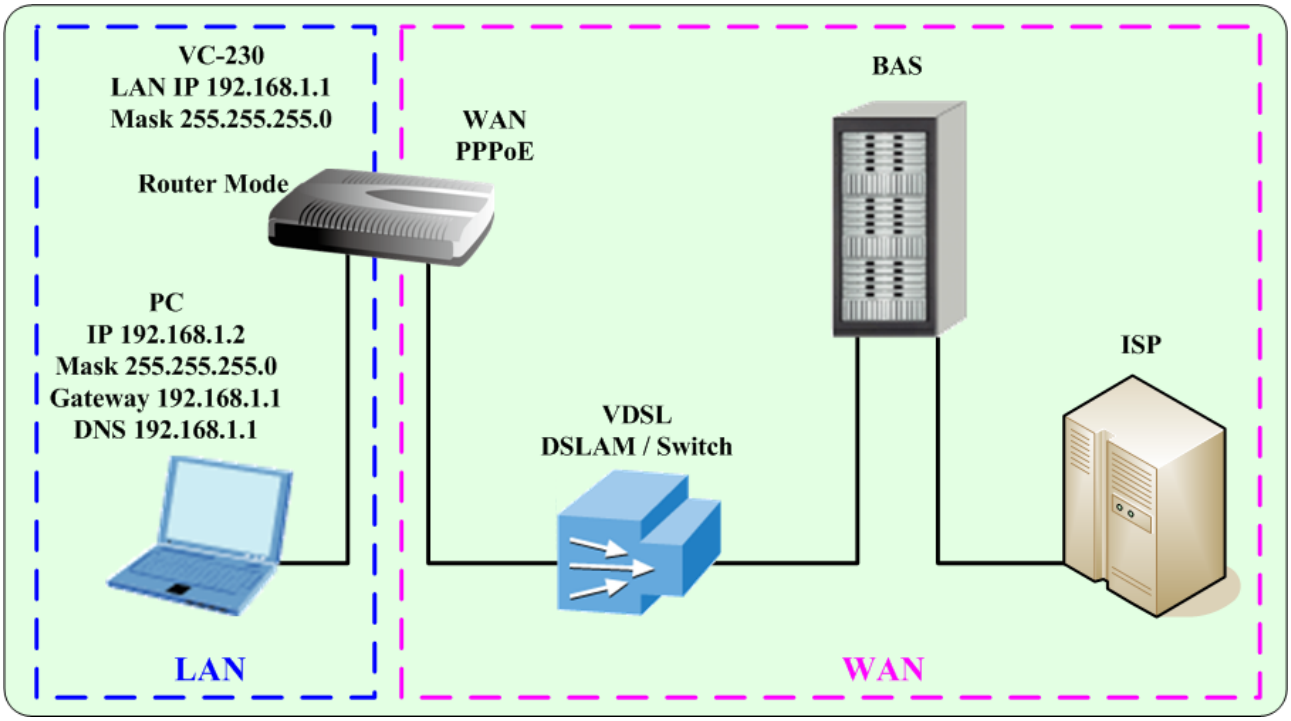


■ **Step 3: Modify your VDSL mode, default is CPE mode.**



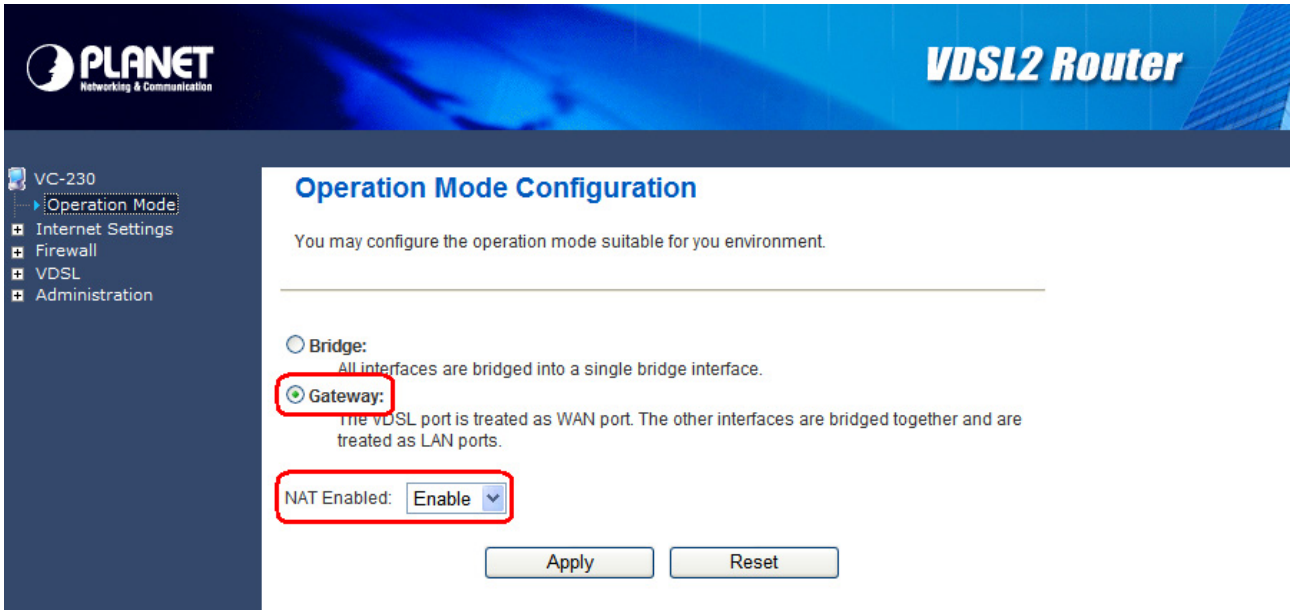
After setting, the DSL line will try to establish the connection between two VDSL2 ROUTER. You can check the DSL LED, when the LED stop flashing and steady, the VDSL2 ROUTER will establish a connection and the PC can access to Internet through VDSL connection.

2.5.3 Router Mode for PPPoE with IP Sharing

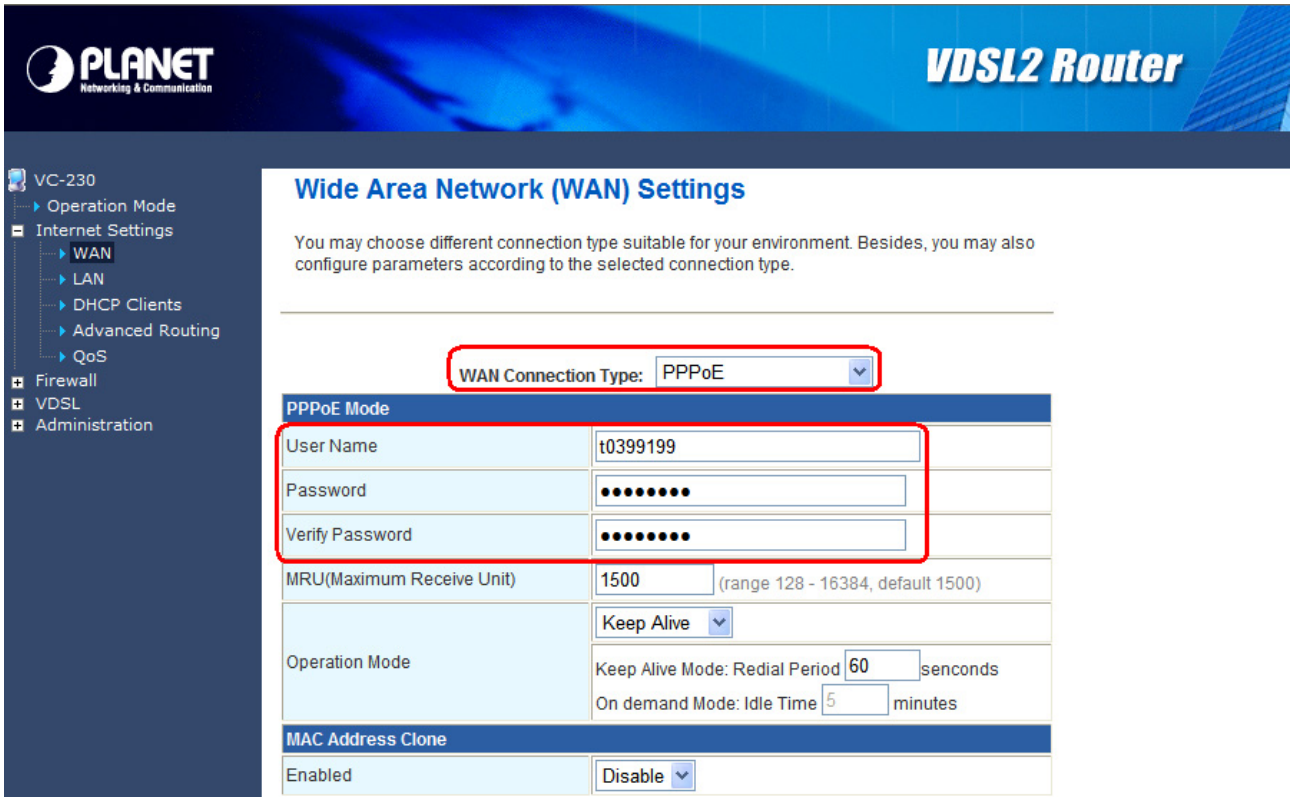


Web UI Configuration

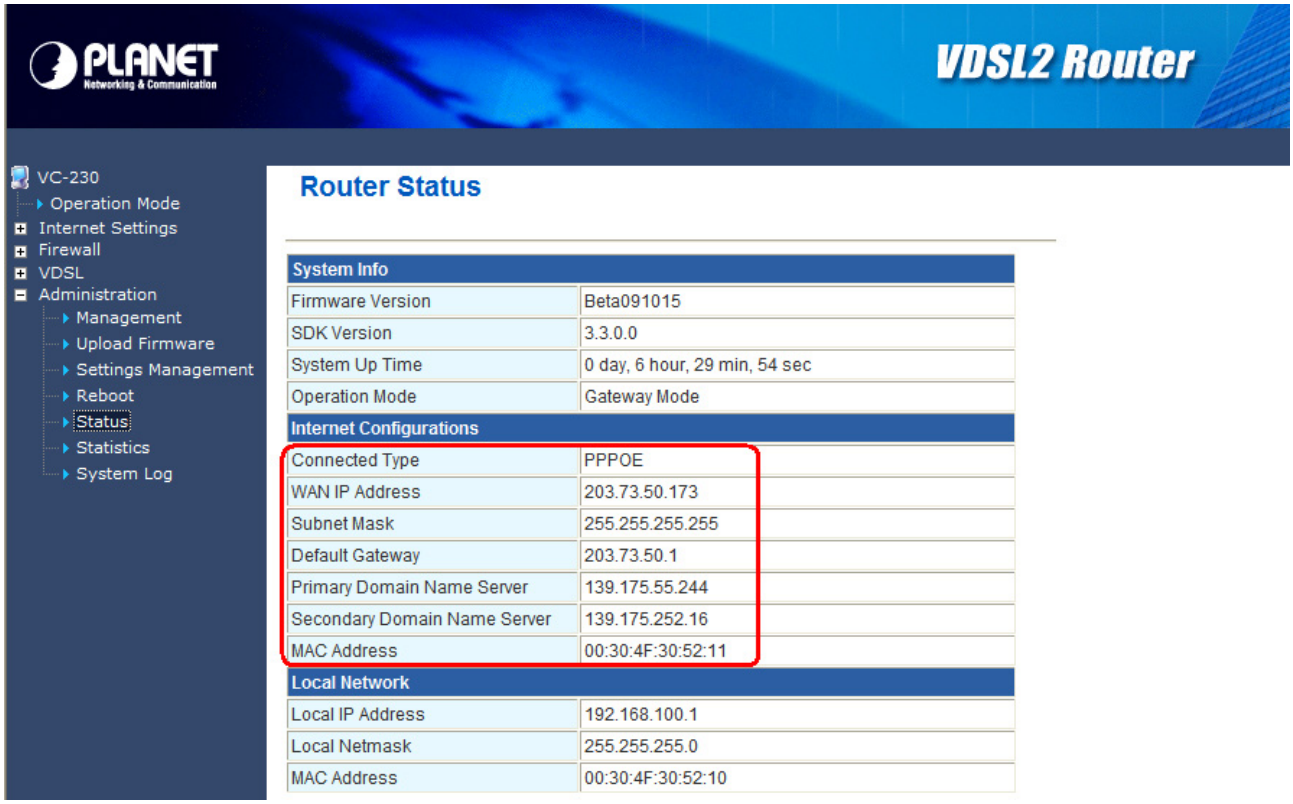
■ **Step 1: Select the Router mode and enable the NAT.**



■ **Step 2: Configure your WAN settings, select the PPPoE connection type and enter your PPPoE user name and password.**



Step 3: When the PPPoE connection is OK, the PC will access to Internet through PPPoE connection.



3. Web Configuration Management

Determine your connection settings

Before you configure the router, you need to know the connection information supplied by your service provider.

Connecting the VDSL 2 Router to your network

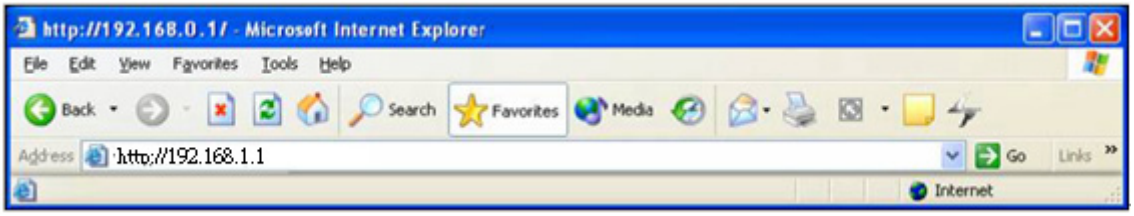
Unlike a simple hub or switch, the setup of the VDSL Router consists of more than simply plugging everything together. Because the Router acts as a DHCP server, you will have to set some values within the Router, and also configure your networked PCs to accept the IP Addresses the Router chooses to assign them.

Generally there are several different operating modes for your applications. And you can know which mode is necessary for your system from ISP. These modes are router, bridge, and PPPoE+NAT.

Configuring with Web Browser

It is advisable to change the administrator password to safeguard the security of your network. To configure the router, open your browser, type **"http: //192.168.1.1"** into the address bar and click **"Go"** to get to the login page.

Save this address in your Favorites for future reference.



At the User name prompt, type **"admin"**. And the Password prompt, type **"admin"**. You can change these later if you wish. Click **"OK"** to login the router and you can start to configure it now.

3.1 Operation Mode

The VC-230 supports two operation modes – Router and Bridge and VC-230N supports three operation modes – Router, Bridge and WISP. Currently, it comes pre-configured with routing mode.

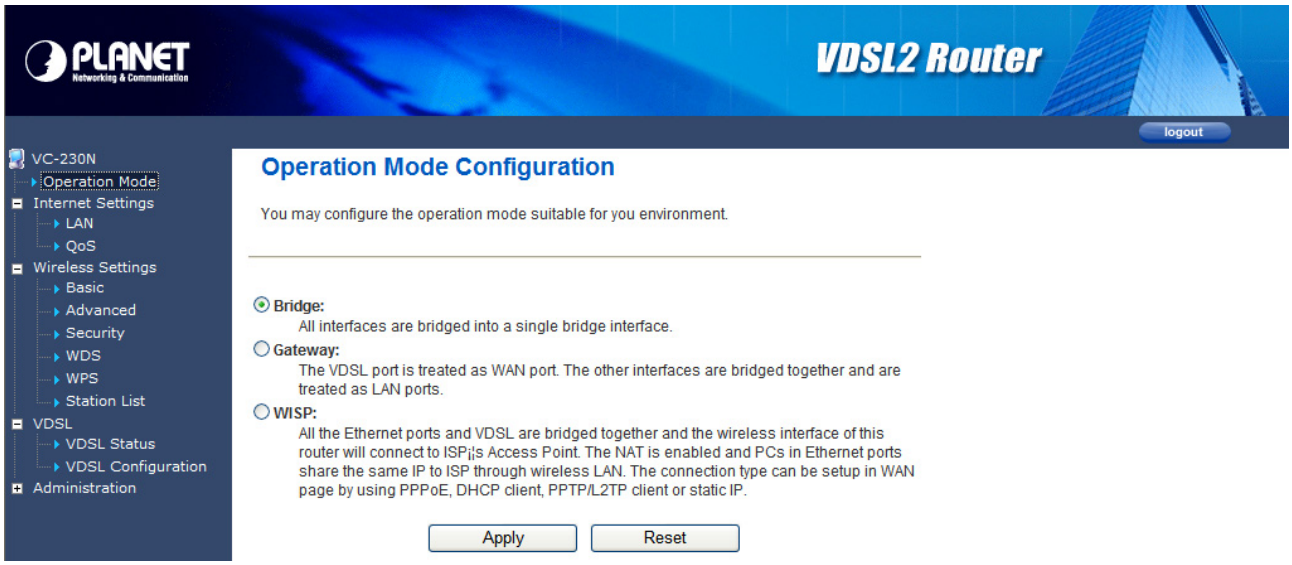
Note that, routing mode and bridging mode cannot be used simultaneously.

For **Bridge mode**, all interfaces are bridged into a single bridge interface.

For **Router mode**, the VDSL port is treated as WAN port. The other interfaces are bridged together and are treated as LAN ports.

For **WISP Mode**, all the Ethernet ports (including VDSL2) are bridged together and the wireless interface of this router will comes to WAN port for connecting to an ISP's Access Point as Internet connection. The NAT is enabled and PCs in Ethernet ports share the same IP to ISP through wireless LAN. The connection type can be setup in WAN page by using PPPoE, DHCP client, PPTP/L2TP client or static IP.

⚠	If you select **Bridge operation mode**, **WAN configuration** in Internet Settings are not available. (Firewall functions on the left page are not available, too.)

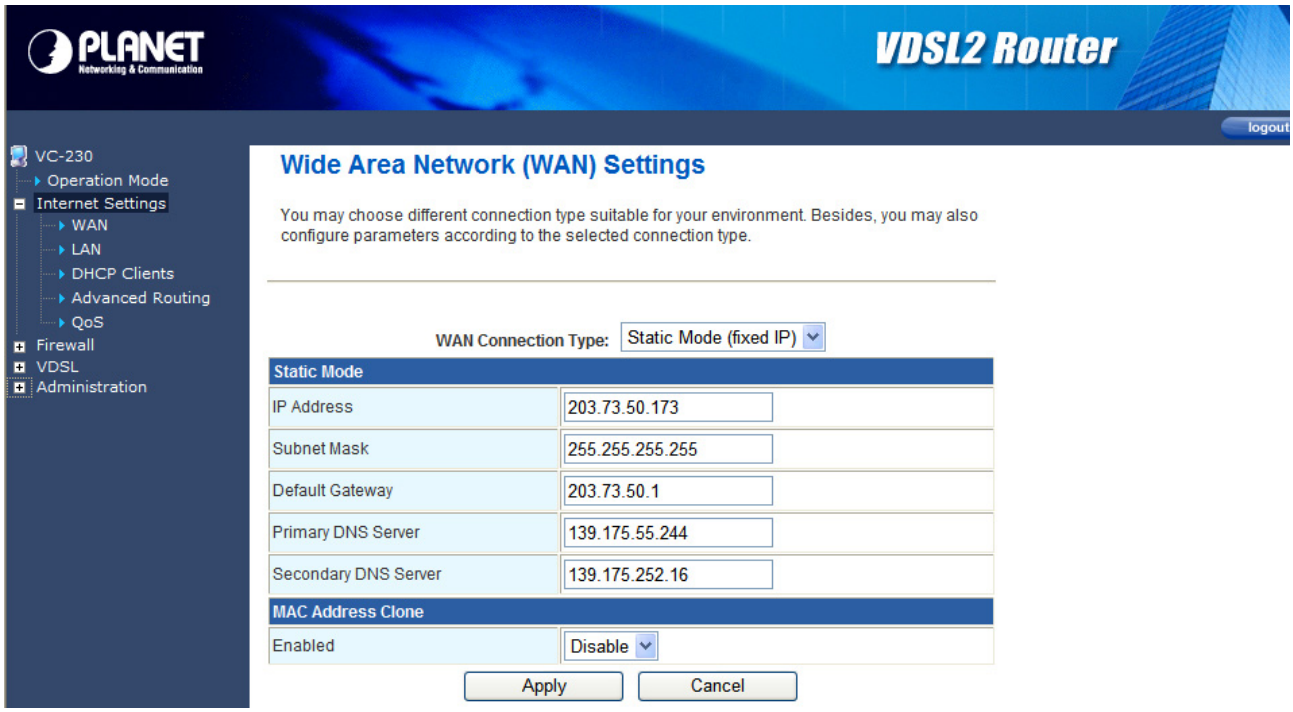


After finishing setting, click **Apply** to save the settings and make the new configuration take effect. Click **Cancel** to close without saving.

3.2 Internet Settings

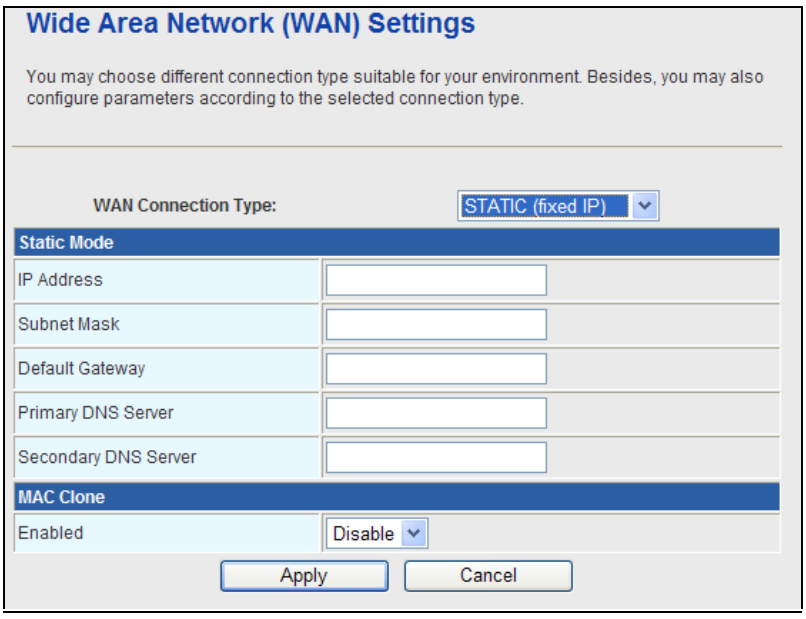
3.2.1 WAN

The WAN Settings screen allows you to specify the type of Internet connection. The WAN settings offer the following selections for the router's WAN port, STATIC (fixed IP), DHCP (Auto config), PPPoE, L2TP, and PPTP.



➢ **STATIC (FIXED IP)**

Select **STATIC (fixed IP)** in the **WAN Connection Type** drop-down list and the following page appears.



Static Mode

- **IP Address:** Enter the IP address of WAN port.
- **Subnet Mask:** Enter IP subnet mask of WAN port.
- **Default Gateway:** Enter the default gateway address of WAN port.
- **Primary DNS Server:** Primary DNS Server f of WAN port.
- **Secondary DNS Server:** Secondary DNS Server of WAN port.

MAC Clone

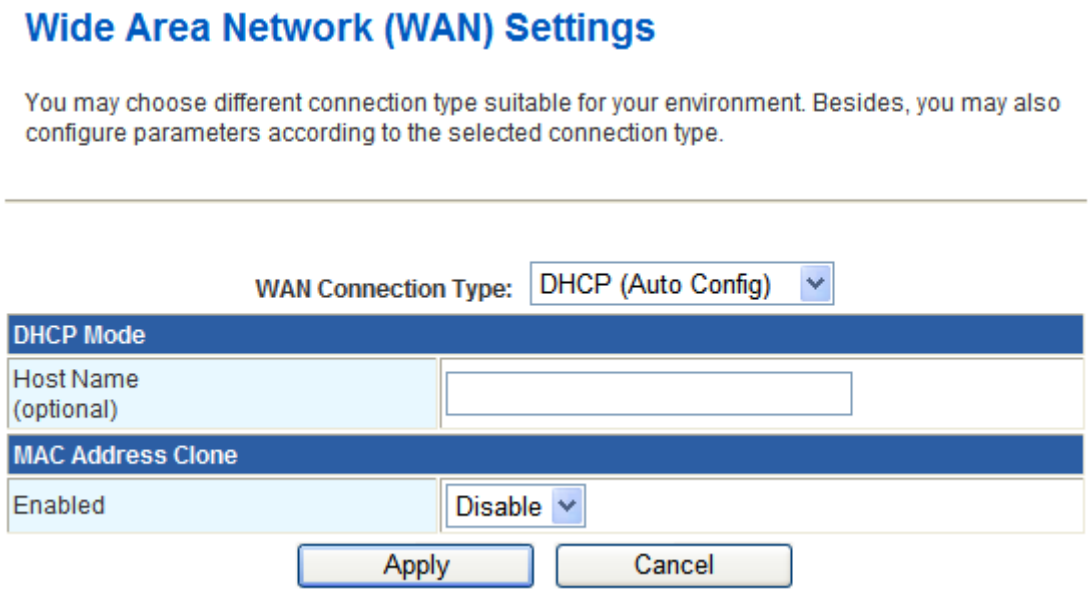
MAC Clone provides WAN to connect to a MAC address.

- **Enabled:** Enable or disable MAC clone.

After finishing setting, click **Apply** to save the settings and make the new configuration take effect.
Click **Cancel** to close without saving.

➢ DHCP (AUTO CONFIG)

Select **DHCP (Auto config)** in the **WAN Connection Type** drop-down list and the following page appears. If the WAN connection type is set to **DHCP**, the device automatically obtains the IP address, gateway and DNS address from the DHCP server on WAN interface.



MAC Clone

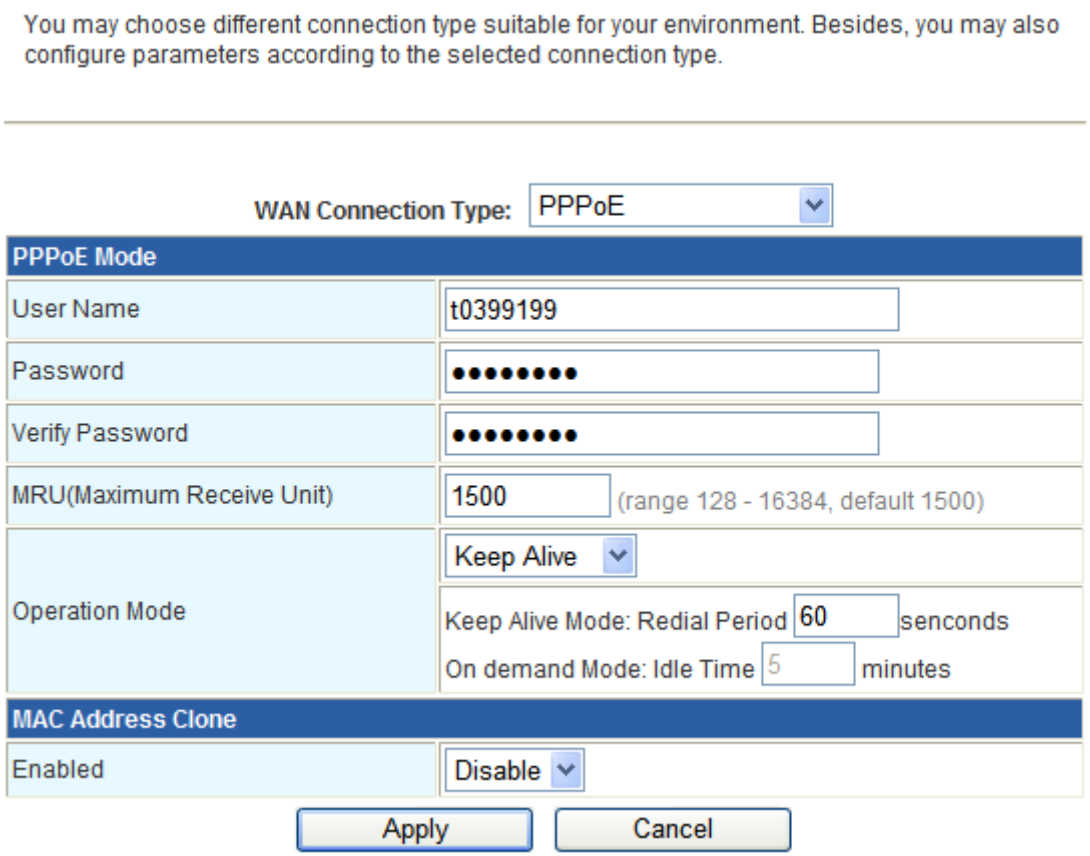
MAC Clone provides WAN to connect to a MAC address.

- **Enabled:** Enable or disable MAC clone.

After finishing setting, click **Apply** to save the settings and make the new configuration take effect.
Click **Cancel** to close without saving.

➢ PPPOE

Select **PPPoE (ADSL)** in the **WAN Connection Type** drop-down list and the following page appears. If the WAN connection type is set to **PPPoE**, you can configure the following parameters to PPPoE dial up.



PPPoE Mode

- **User Name:** User name of PPPoE account
- **Password:** Password of PPPoE account
- **Verify Password:** Enter the password of PPPoE account again.
- **Operation Mode:** It provides two types of operation modes.
  - **Keep Alive** means keeping on-line mode. You can set the redial period in the field. When the redial period expires, Router will execute dial-up again to keep online.
  - **On Demand** means executing dial-up on demand. Within the preset idle time, if Router does not detect the flow of the user continuously, Router automatically stops the PPPOE connection. Once it detects the flow (e.g., accessing a webpage), the router restarts the PPPOE dial-up.

MAC Clone

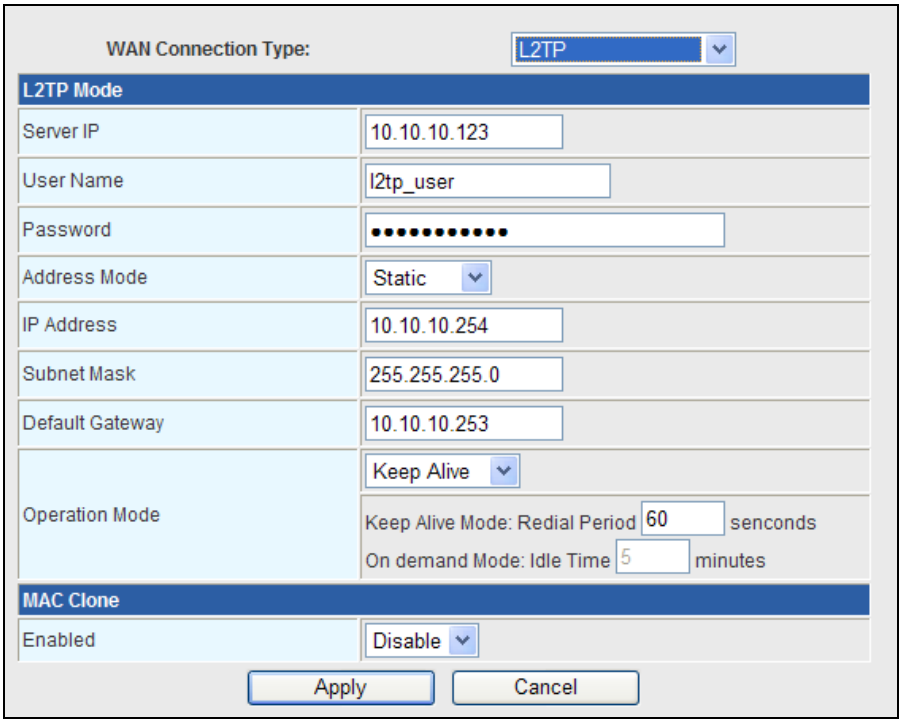
- **Enabled:** Enable or disable.

After finishing setting, click **Apply** to save the settings and make the new configuration take effect.
Click **Cancel** to close without saving.

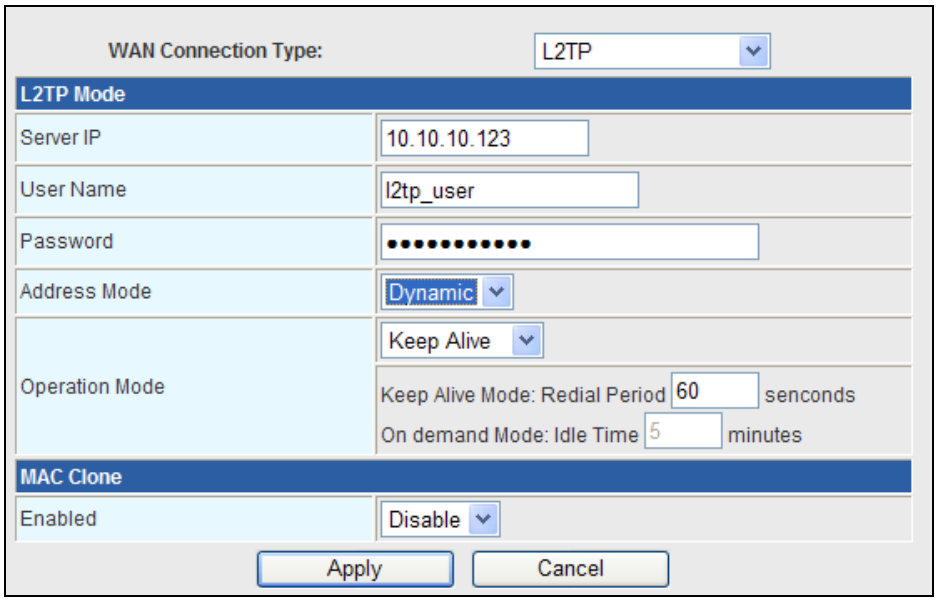
➢ L2TP

Select **L2TP** in the **WAN Connection Type** drop-down list and the following page appears. There are two address modes: **Static** and **Dynamic**.

1. If you select **Static** in the **Address Mode** field, the page shown in the following figure appears.



2. If you select **Dynamic** in the **Address Mode** field, the page shown in the following figure appears.



L2TP Mode

- **Server IP:** Address of L2TP server.
- **User Name:** The user name of L2TP account.
- **Password:** The password of L2TP account.
- **IP Address:** IP address of WAN port.
- **Subnet Mask:** Subnet mask of WAN port.
- **Default Gateway:** The default gate way of WAN port.
- **Operation Mode:** It provides two types of operation modes.
  - **Keep Alive** means keeping on-line mode. You can set the redial period in the field. When the redial period expires, Router will execute dial-up again to keep online.
  - **On Demand** means executing dial-up on demand. Within the preset idle time, if Router does not detect the flow of the user continuously, Router automatically stops the PPPOE connection. Once it detects the flow (e.g., accessing a webpage), the router restarts the PPPOE dial-up.

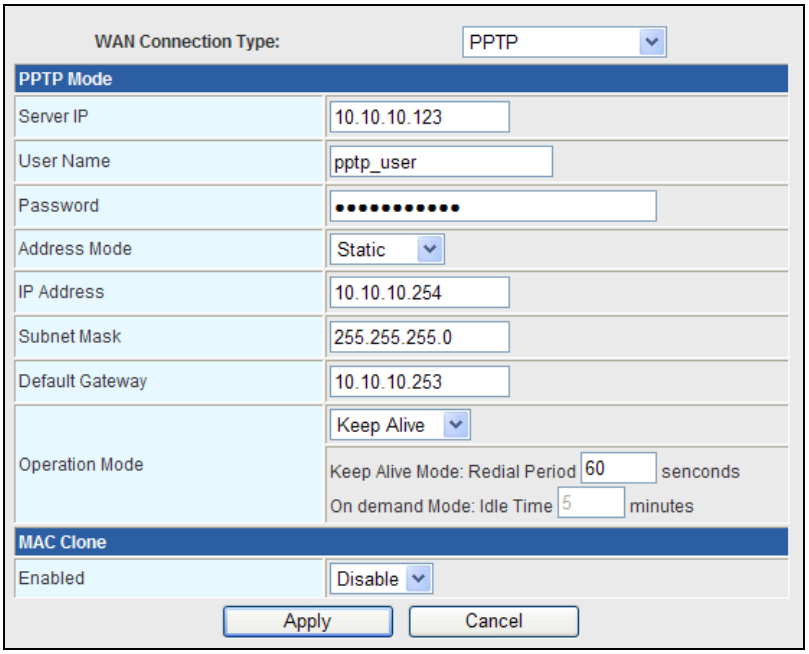
MAC Clone

- **Enabled:** Enable or disable.

After finishing setting, click **Apply** to save the settings and make the new configuration take effect.
Click **Cancel** to close without saving.

➢ PPTP

Select **PPTP** in the **WAN Connection Type** drop-down list and the following page appears. There are two address modes: **Static** and **Dynamic**.



PPTP Mode

- **Server IP:** Address of PPTP server.
- **User Name:** The user name of PPTP account.
- **Password:** The password of PPTP account.
- **IP Address:** IP address of WAN port.
- **Subnet Mask:** Subnet mask of WAN port.
- **Default Gateway:** The default gate way of WAN port.
- **Operation Mode:** It provides two types of operation modes.
  - **Keep Alive** means keeping on-line mode. You can set the redial period in the field. When the redial period expires, Router will execute dial-up again to keep online.
  - **On Demand** means executing dial-up on demand. Within the preset idle time, if Router does not detect the flow of the user continuously, Router automatically stops the PPPOE connection. Once it detects the flow (e.g., accessing a webpage), the router restarts the PPPOE dial-up.

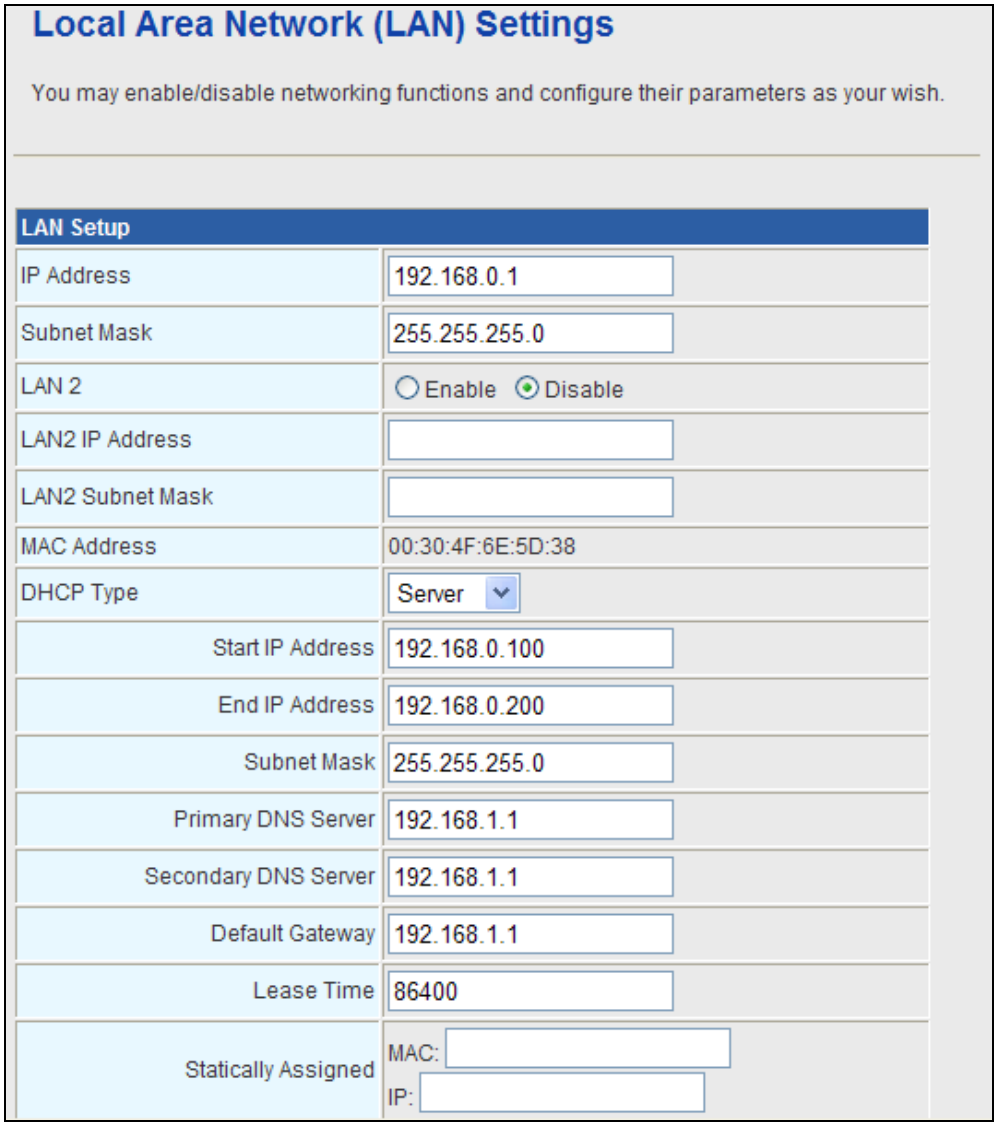
MAC Clone

- **Enabled:** Enable or disable.

After finishing setting, click **Apply** to save the settings and make the new configuration take effect.
Click **Cancel** to close without saving.

3.2.2 LAN

This page allows you may enable or disable networking functions and configure their parameters according to your practice.



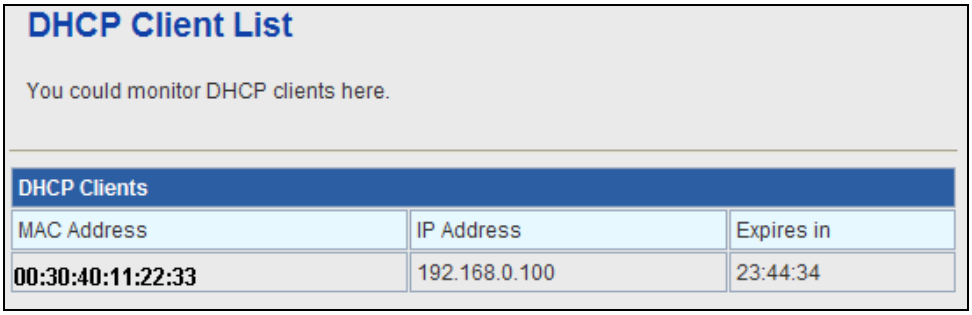
- **IP Address:** Enter the IP address of LAN port.
- **Subnet mask:** Enter the subnet mask of LAN port.
- **LAN2:** The second IP switch of LAN port. You can enable or disable this function.
- **LAN2 IP Address:** The second IP address of LAN port.
- **LAN2 Subnet Mask:** The second IP Subnet Mask of LAN port.
- **MAC Address:** MAC address of LAN port (Read-only).
- **DHCP Type:** You can select **Server** or **Disable**. If you select Disable, the DHCP service of LAN port is disabled. After selecting Server, you can set the following items.
- **Start IP Address:** The first IP address that DHCP server assigns.
- **End IP Address:** The last IP address that DHCP server assigns.
- **Subnet Mask:** The subnet mask of dynamic IP.

- **Primary DNS Server:** The primary DNS server address.
- **Secondary DNS Server:** The secondary DNS Server address.
- **Default Gateway:** The default gateway that DHCP server assigns.
- **Lease Time:** Lease time of the IP address.
- **Statically Assigned:** Assign IP to the assigned MAC address. Enter the assigned MAC address and IP in the corresponding fields.
- **802.1d Spanning Tree:** Spanning Tree Protocol. You can select Enable or Disable.
- **IGMP Proxy:** You can select Enable or Disable.
- **UPNP:** Universal Plug and Play (UPNP).You can select Enable or Disable.
- **Router Advertisement:** You can select Enable or Disable.
- **DNS Proxy:** You can select Enable or Disable.

After finishing setting, click **Apply** to save the settings and make the new configuration take effect.
Click **Cancel** to close without saving.

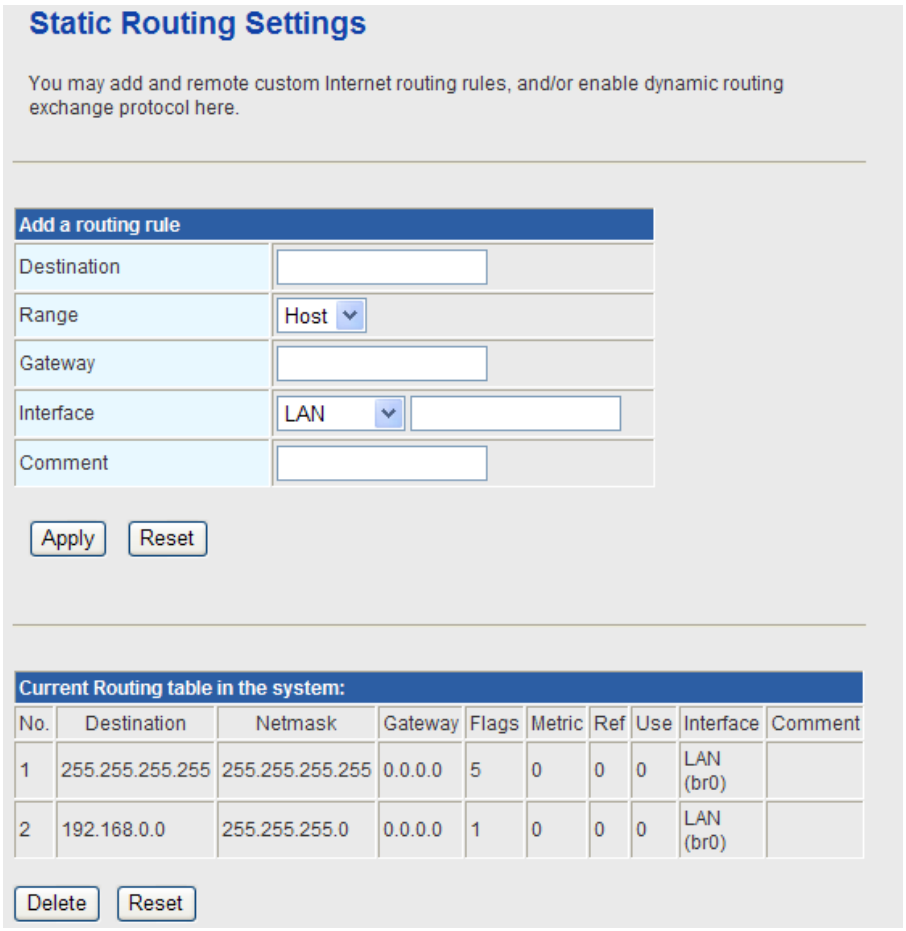
3.2.3 DHCP clients

You can view the information about DHCP clients in the page.



3.2.4 Advanced Routing

You can add or delete routing rules, enable or disable dynamic routing protocol in the page.



Add a routing rule

- **Destination:** Enter the legal destination IP address.
- **Range:** Destination IP address is a host address or the network address.
- **Gateway:** Enter the specific gateway.
- **Interface:** The interface for this route. You can select LAN, WAN and Custom.
- **Comment:** Add the description of this route.

After finishing the setting above, click **Apply** to make the new routing rule take effect. Otherwise, click **Reset** to cancel the new routing rule.

Current Routing table in the system

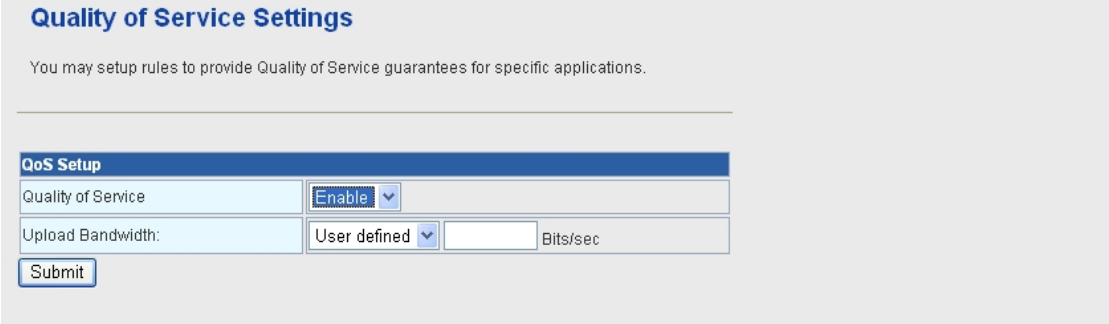
You can delete or reset the routing rules.

Dynamic Routing Settings

You can enable or disable the **RIP**.
After finishing the setting above, click **Apply** to make the new routing rule take effect. Otherwise, click **Reset** to cancel the new routing rule.

3.2.5 QoS

You may set up rules to provide Quality of Service (QoS) guarantee for some specific applications. In the page, you can enable or disable Quality of Service. After enabling QoS, you can set upload bandwidth and download bandwidth.



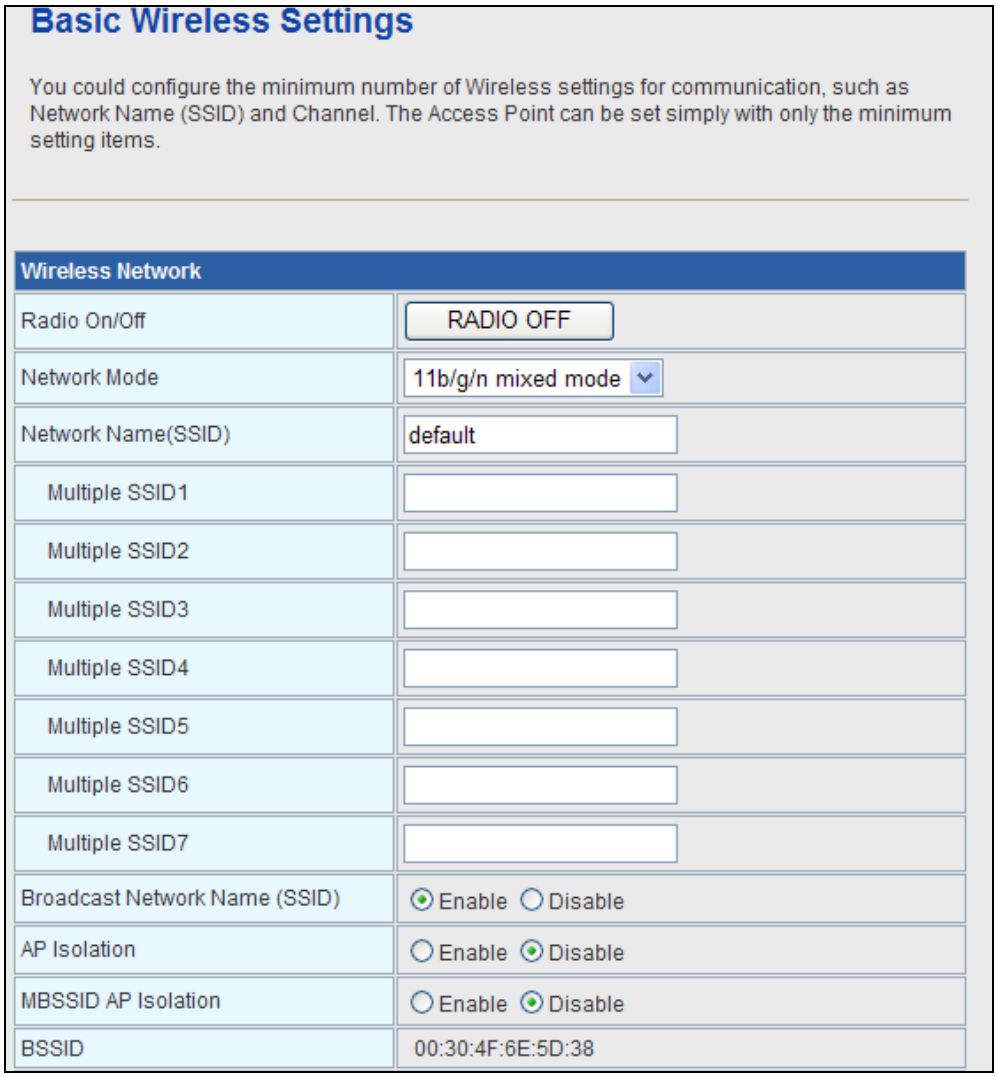
- **Upload Bandwidth:** You can select the proper bandwidth in the drop-down list. The value is from **64K** to **60M**. You can also set the bandwidth by selecting **User defined** and enter the proper bandwidth in the field.
- **Download Bandwidth:** You can select the proper bandwidth in the drop-down list. The value is from **64K** to **60M**. You can also set the bandwidth by select **User defined** and enter the proper bandwidth in the field.

After finishing the setting above, click **Submit** to save the new configuration.

3.3 Wireless Setting (For VC-230N only)

3.3.1 Basic

You can configure the minimum number of wireless settings for communication, such as network name (SSID) and channel.

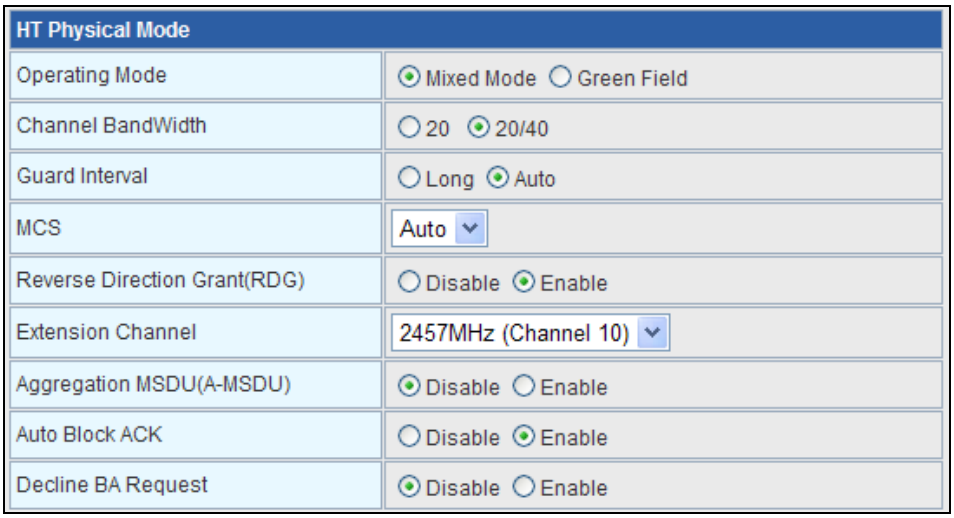


Wireless Network

- **Radio On/Off:** Enable or disable the wireless LAN.
- **Network Mode:** There are 6 modes: 11b only, 11g only,11b/g mixed mode, and 11b/g/n mixed mode.
- **Network Name (SSID):** The service set identification (SSID) is a unique name to identify the router in the wireless LAN. Wireless stations associating to the router must have the same SSID. Enter a descriptive name. Its length is up to 32 characters.
- **Multiple SSID 1/2/3/4/5/6/7:** There are 7 multiple SSIDs. Enter their descriptive names that you want to use.
- **Broadcast Network Name (SSID):** Select **Enable** to allow the SSID broadcast on the network, so that the STA can find it. Otherwise, the STA can not find it.

- **AP Isolation:** Enable or disable AP Isolation. When many clients connect to the same access point, they can access each other. If you want to disable the access between clients which connect the same access point, you can enable this function.
- **MBSSID AP Isolation:** Enable or disable MBSSID AP Isolation.
- **BSSID:** Basic Service Set Identifier. This is the assigned MAC address of the station in the access point. This unique identifier is in Hex format and can only be edited when Multi BSSID is enabled in the previous screen.
- **Frequency (Channel):** A channel is the radio frequency used by wireless device. Channels available depend on your geographical area. You may have a choice of channels (for your region) and you should use a different channel from an adjacent AP to reduce the interference. The Interference and degrading performance occurs when radio signals from different APs overlap.

HT Physical Mode

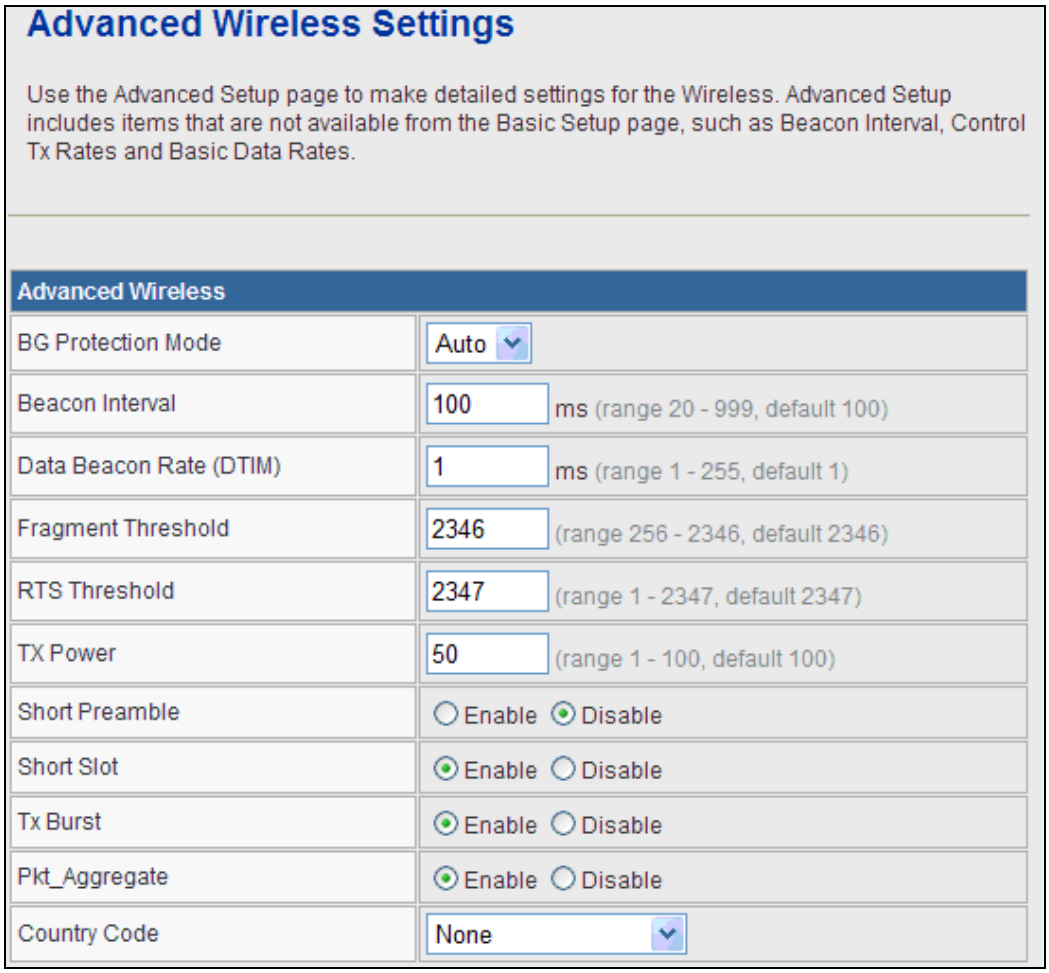


HT Physical Mode

- **Operation Mode:** Select Mixed Mode or Green Field.
- **Channel Bandwidth:** Select 20 or 20/40.
- **Guard Interval:** Select Long or Auto.
- **MCS:** Select the proper value between 0 and15 or 32. Auto is the default value.
- **Reverse Direction Grant (RDG):** Select Disable or Enable.
- **Extension Channel:** Select the proper extension channel in the drop-down list.
- **Aggregation MSDU (A-MSDU):** Select Disable or Enable.
- **Auto Block ACK:** Select Disable or Enable.
- **Decline BA Request:** Select Disable or Enable.

3.3.2 Advanced

This page makes more detailed settings for the AP. **Advanced Wireless Settings** page includes items that are not available in the **Basic Wireless Settings** page, such as basic data rates, beacon interval, and data beacon rate.

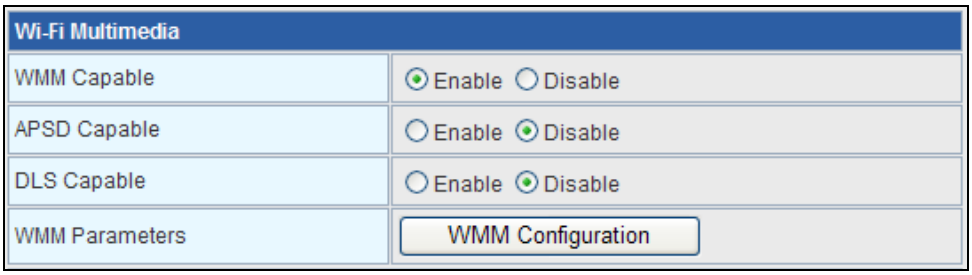


Advanced Wireless

- **BG Protection Mode:** It provides 3 options, including Auto, On, and Off. The default BG protection mode is **Auto**.
- **Beacon Interval:** The interval time range is between 20ms and 999ms for each beacon transmission. The default value is 100ms.
- **Date Beacon Rate (DTM):** The DTM range is between 1 ms and 255 ms. The default value is 1ms.
- **Fragment Threshold:** This is the maximum data fragment size (between 256 bytes and 2346 bytes) that can be sent in the wireless network before the router fragments the packet into smaller data frames. The default value is 2346.
- **RTS Threshold:** Request to send (RTS) is designed to prevent collisions due to hidden node. A RTS defines the biggest size data frame you can send before a RTS handshake invoked. The RTS threshold value is between 1 and 2347. The default value is 2347.

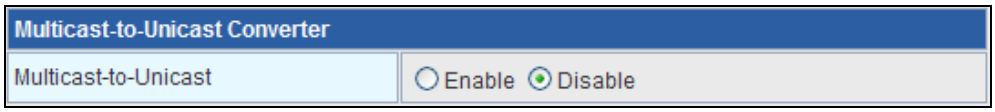
  If the RTS threshold value is greater than the fragment threshold value, the RTS handshake does not occur. Because the data frames are fragmented before they reach the RTS size.
- **Tx Power:** The Tx Power range is between 1 and 100. The default value is 100.
- **Short Preamble:** Select Disable or Enable.

- **Short Slot:** Select Disable or Enable.
- **Tx Burst:** Select Disable or Enable.
- **Pkt_Aggregate:** Select Disable or Enable.
- **Country Code:** Select the region which area you are. It provides six regions in the drop-down list.



Wi-Fi Multimedia

- **WMM Capable:** Enable or disable WMM.
- **APSD Capable:** Enable or disable APSD.
- **WMM Parameter:** Click WMM Configuration button to pop up WMM Parameters of Access Point page. You can configure WMM parameters in the page.



Multicast-to-Unicast Converter

Multicast-to-Unicast Converter: Enable or disable Multicast-to-Unicast Converter.

After finishing the settings above, click **Apply** to save the settings and make the new configuration take effect. Click **Cancel** to close without saving.

3.3.3 Security

Choose **Wireless Settings>Security** and the following page appears. It allows you to modify the settings to prevent the unauthorized accesses.

Select SSID

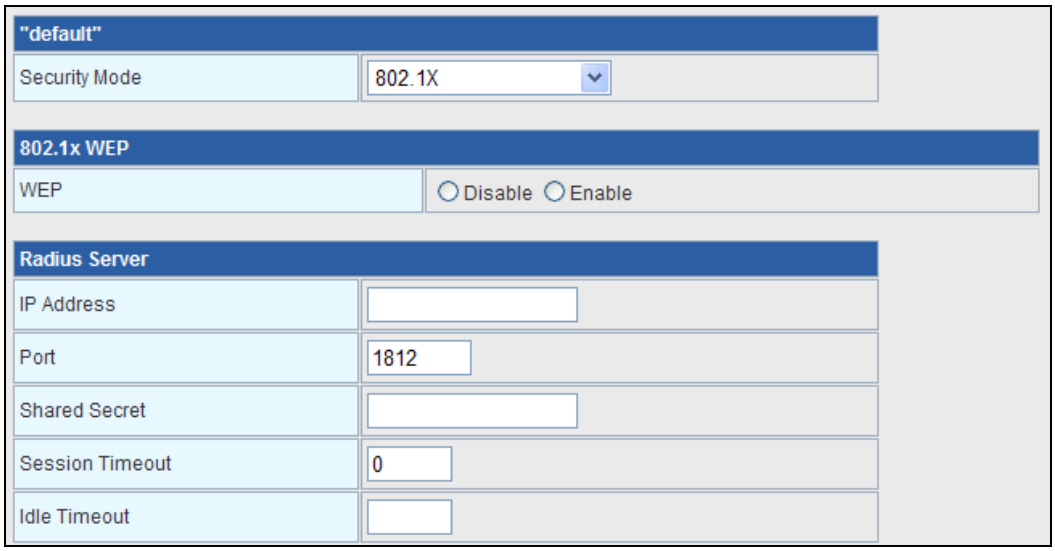
SSID choice: Select SSID in the drop-down list**.**

Security

Security Mode: There are 11 options, including **Disable, OPEN, SHARED, WEPAUTO, WPA, WPA-PSK, WPA2, WPA2-PSK, WPAPSKWPA2PSK, WPA1WPA2,** and **802.1X**.

[EXAMPLE]

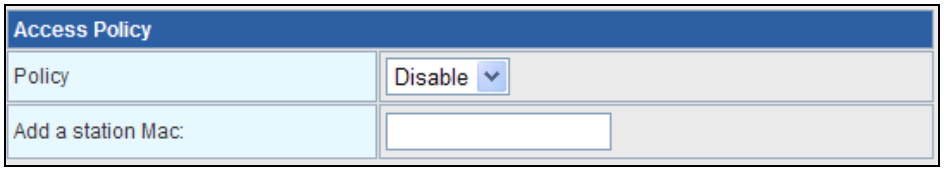
Take 802.1x for example. Select 802.1x in the **Security Mode** down-list. The page shown in the following page appears.



- **WEP:** Disable or enable WEP.

Radius Server

- **IP Address:** Enter the IP address of Radius Server.
- **Port:** The default port of the RADIUS server for authentication is 1812. You need not change this value unless your network administrator instructs you to do so with additional information.
- **Shared Secret:** Enter a password as the key to be shared between the external authentication server and the access point. The key is not send over the network. This key must be the same on the external authentication server and your router.
- **Session Timeout:** Set the time interval for session. Enter the proper value in the field.
- **Idle Timeout:** Set the idle time interval. Enter the proper value in the field.



Access Policy

- **Policy:** There are three options, including Disable, Allow, and Reject. You can choose Disable, Allow or Reject. Select Allow, only the clients whose MAC address is listed can access the router. Select Reject, the clients whose MAC address is listed are denied to access the router.
- **Add a station MAC:** If you want to add a station MAC, enter the MAC address of the wireless station that are allowed or denied access to your router in this address field.

After finishing the settings above, click **Apply** to save the settings and make the new configuration take effect. Click **Cancel** to close without saving.

3.3.4 WDS

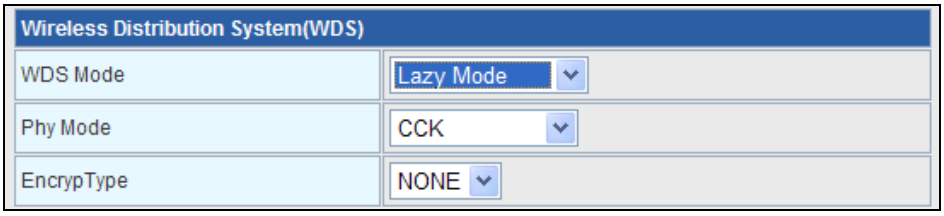
Wireless Distribution System (WDS)

WDS Mode: There are four options, including **Disable**, **Lazy Mode**, **Bridge Mode**, and **Repeater Mode**.

➢ **Disable**

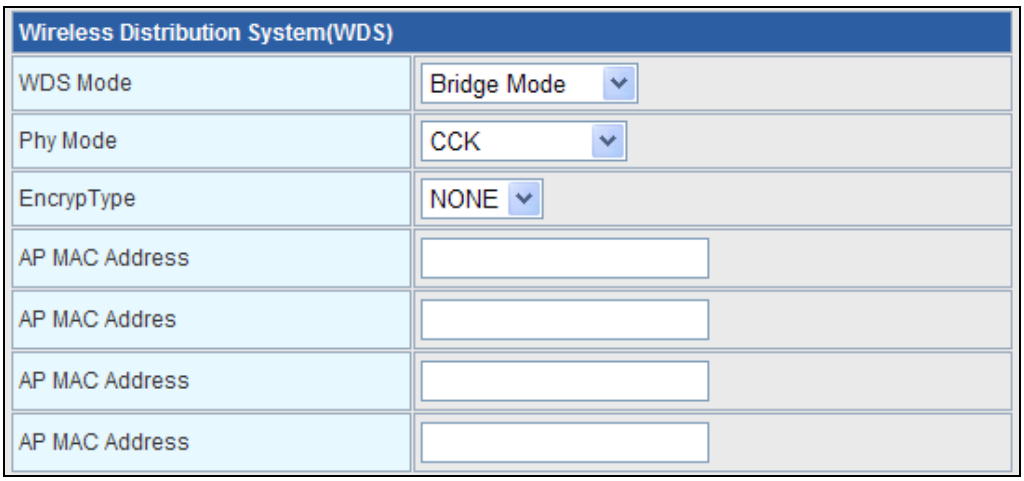
Select Disable to disable the WDS mode.

➢ **Lazy Mode**



- **WDS Mode:** Select Lazy Mode. The VC-230N WDS Lazy mode is allowed the other VC-230N WDS bridge / repeater mode link automatically.
- **Phy Mode:** It provides 4 options, including **CCK**, **OFDM**, **HTMIX**, and **GREENFIELD**.
- **Encryp Type:** It provides 4 options, including **None, WEP, TKIP,** and **AES**.

➢ **Bridge Mode/ Repeater Mode**



- **WDS Mode:** Select **Bridge** Mode or **Repeater** Mode.
- **Phy Mode:** It provides 4 options, including CCK, OFDM, HTMIX, and GREENFIELD.
- **Encryp Type:** It provides 4 options, including **None, WEP, TKIP**, and **AES**.
- **AP MAC Address:** It provides 4 AP MAC Address. Enter the MAC address of the other APs.

WDS (Wireless Distribution System) allows access points to communicate with one another wirelessly in a standardized way. It can also simplify the network infrastructure by reducing the amount of cabling required. Basically the access points will act as a client and an access point at the same time.
WDS is incompatible with WPA. Both features cannot be used at the same time. A WDS link is bi-directional, so the AP must know the MAC address of the other AP, and the other AP must have a WDS link back to the AP.

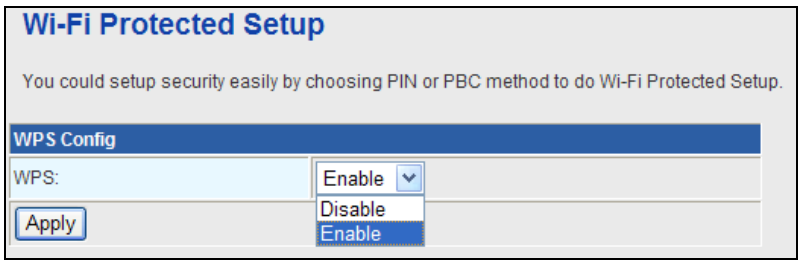
Dynamically assigned and rotated encryption key are not supported in a WDS connection. This means that WPA and other dynamic key assignment technologies may not be used. Only Static WEP keys may be used in a WDS connection, including any STAs that are associated with a WDS repeating AP.
Enter the MAC address of the other APs that you want to link to and click enable.
Supports up to 4 point to multipoint WDS links, check Enable WDS and then enable on the MAC addresses.

Example of a WDS topology:

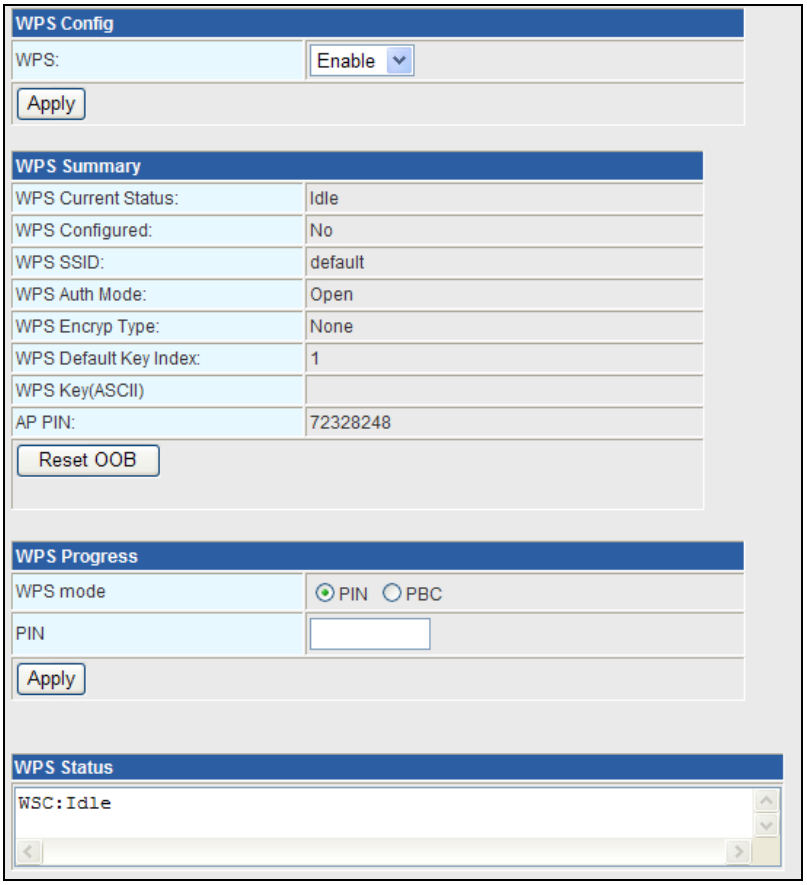
AP1 <-- WDS --> Master AP (our AP) <-- WDS --> AP3<-- WDS --> AP4

3.3.5 WPS

You can enable or disable the WPS function in this page.



Select **Enable** in the WPS drop-down list. Click **Apply** and the following page appear.



WPS Summary

It displays the WPS information, such as WPS Current Status, WPS Configured, and WPS SSID.
Reset OOB: Reset to out of box (OoB) configuration

WPS Progress

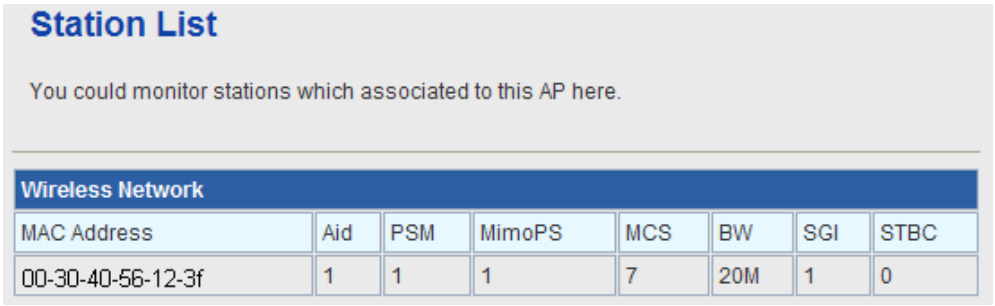
- **WPS mode:** There are two way for you to enable WPS function: **PIN, PBC**. You can use a push button configuration (PBC) on the Wi-Fi router. If there is no button, enter a 4- or 8-digit PIN code. Each STA supporting WPS comes with a hard-coded PIN code.
- **PIN:** If you select PIN mode, you need enter the PIN number in the field.

WPS Status

It displays the information about WPS status.

3.3.6 Station List

Through this page, you can easily identify the connected wireless stations. It automatically observes the ID of connected wireless station (if specified), MAC address, SSID, and current status.



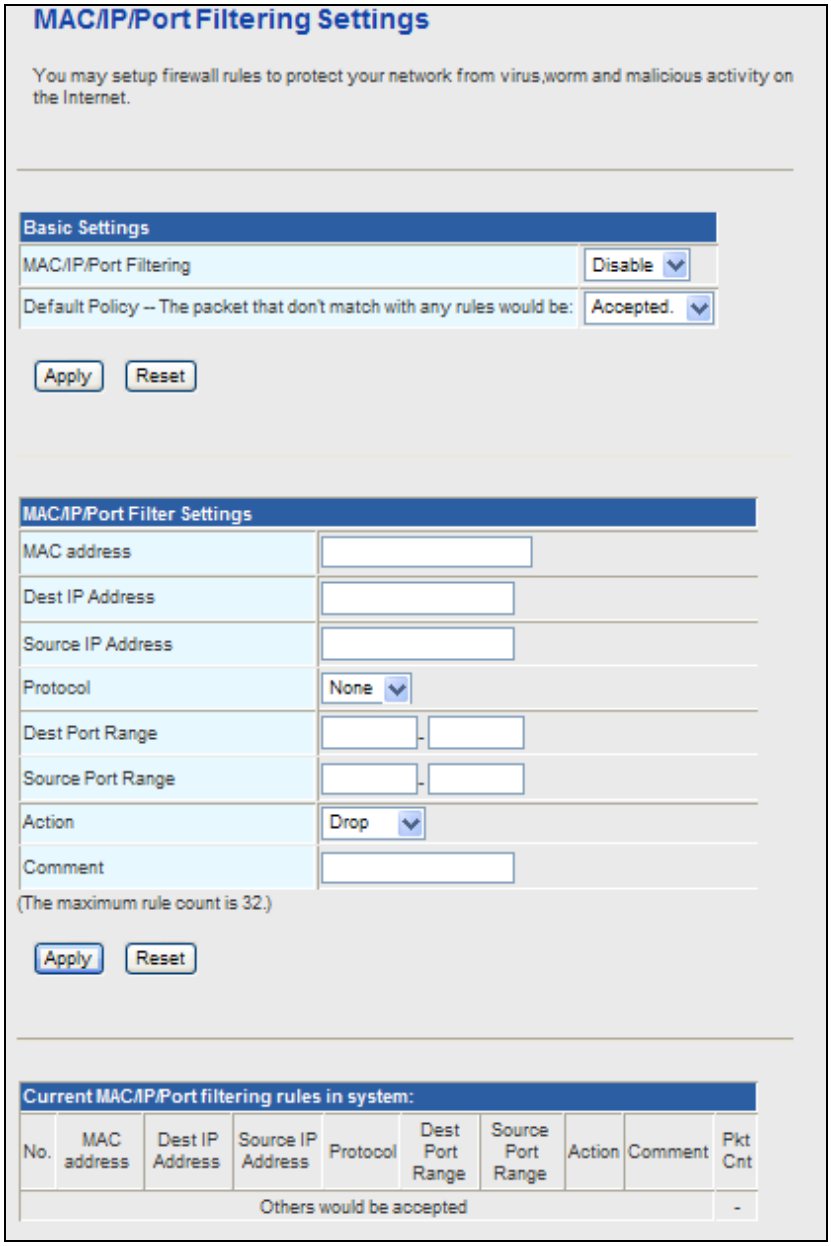
3.4 Firewall

The VDSL Router provides the fully firewall functions, such as IP/Port/MAC Filtering, Port Forwarding, DMZ, SPI Firewall and Content Filtering. It serves as an Internet firewall to protect your network from being accessed by outside users.

3.4.1 MAC/IP/Port Filtering

Use the MAC/IP/Port filters to deny / allow particular LAN IP addresses from accessing the Internet. You can deny / allow specific port numbers or all ports for a specific IP address.

You may set up firewall rules to protect your network from malicious activity on the Internet. It is also convenient for you to delete these settings.



Basic Settings

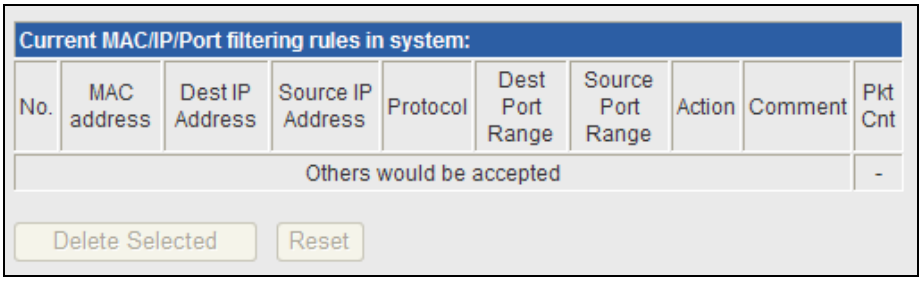
- **MAC/IP/Port Filtering:** Enable or disable the MAC/IP/Port filtering function.
- **Default Policy:** The Packet that does not match any rules would be dropped or accepted.

MAC/IP/Port Filter Settings

- **MAC Address:** Enter the MAC address that matches the source address of the packet (optional).
- **Dest IP Address:** Enter the IP address that matches the destination address of the packet (optional).
- **Source IP Address:** Enter the IP address that matches the source address of the packet (optional).
- **Protocol:** There are 4 options, including none, TCP, UDP and ICMP.
- **Dest Port Range:** After setting a valid protocol, you may enter the UPD or TCP destination port range.
- **Source Port Range:** After setting a valid protocol, you may enter the UPD or TCP source port range.
- **Action:** Select **Drop** or **Accept** in the drop down list.
- **Comment:** Add description for this rule.

Click **Apply** to make the configuration take effect. Click **Reset** to cancel the new configuration.

⚠	The maximal rule number you can add is 32.



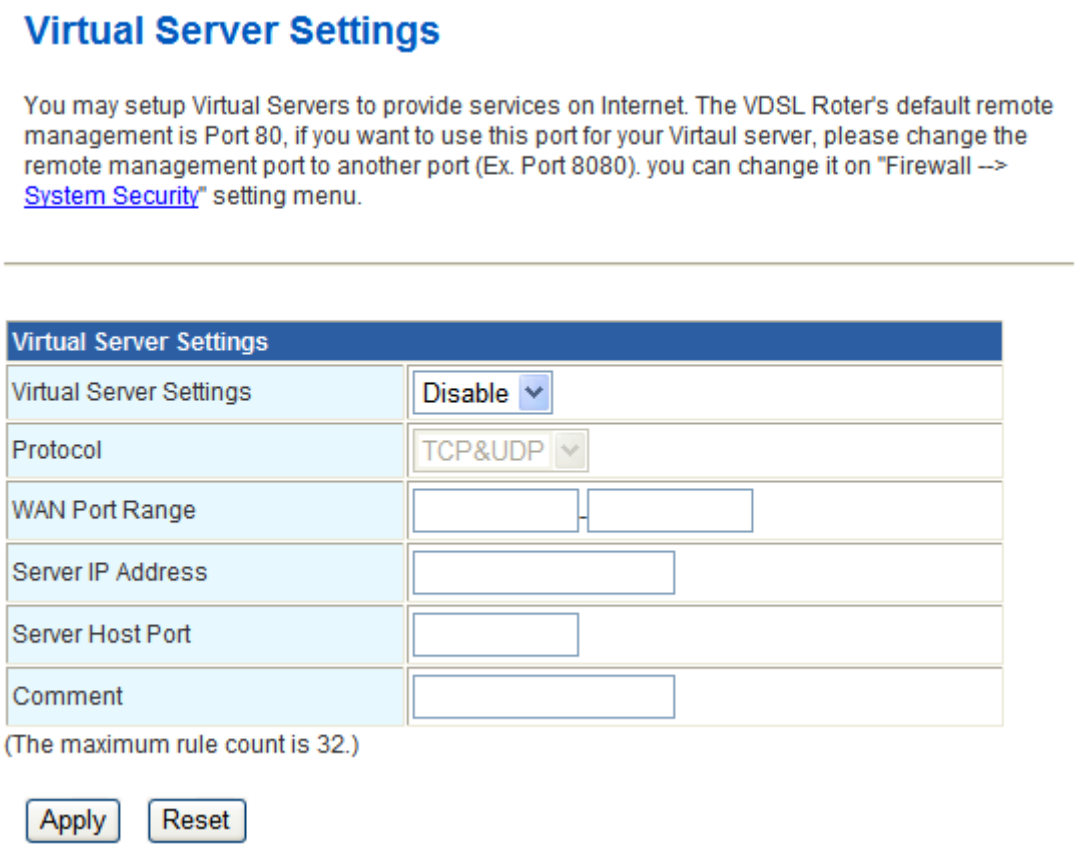
Current MAC/IP/Port filtering rules in system

If you want to delete some rules in the table above, select the rules, and then click **Delete Selected**. Otherwise, click **Reset**.

3.4.2 Port Forwarding (Virtual Server)

The Virtual Server is the server or server(s) behind NAT (on the LAN), for example, Web server or FTP server, that you can make visible to the outside world even though NAT makes your whole inside network appear as a single machine to the outside world.

This page allows you to set virtual server to provide services on the Internet.



Virtual Server Settings

- **Virtual Server Settings:** Enable or disable this function. After selecting **Enable**, you can set the following parameters.
- **Protocol:** There are 3 options, including none, TCP& UDP, TCP, and UDP.
- **WAN Port Range:** You can setup your port range for your WAN side.
- **Server IP Address:** Enter the virtual server IP address in internal network.
- **Server Host Port:** Set the port range of your virtual server.
- **Comment:** Add description for this rule.

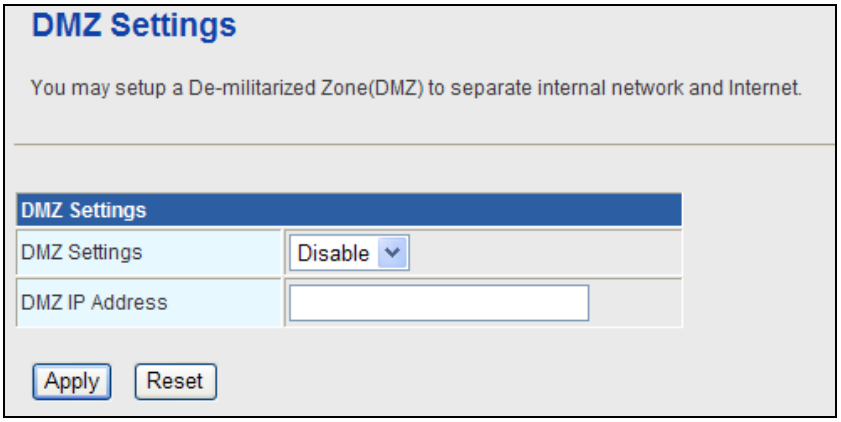
⚠	The maximal rule number you can add is 32.

Click **Apply** to make the configuration take effect. Click **Reset** to cancel the new configuration.

3.4.3 DMZ

DMZ (Demilitarized Zone) allows a single computer on your LAN to expose ALL of its ports to the Internet. Enter the IP address of that computer as a DMZ (Demilitarized Zone) host with unrestricted Internet access. When doing this, the DMZ host is no longer behind the firewall.

This page allows you to set a De-militarized Zone (DMZ) to separate internal network and Internet.

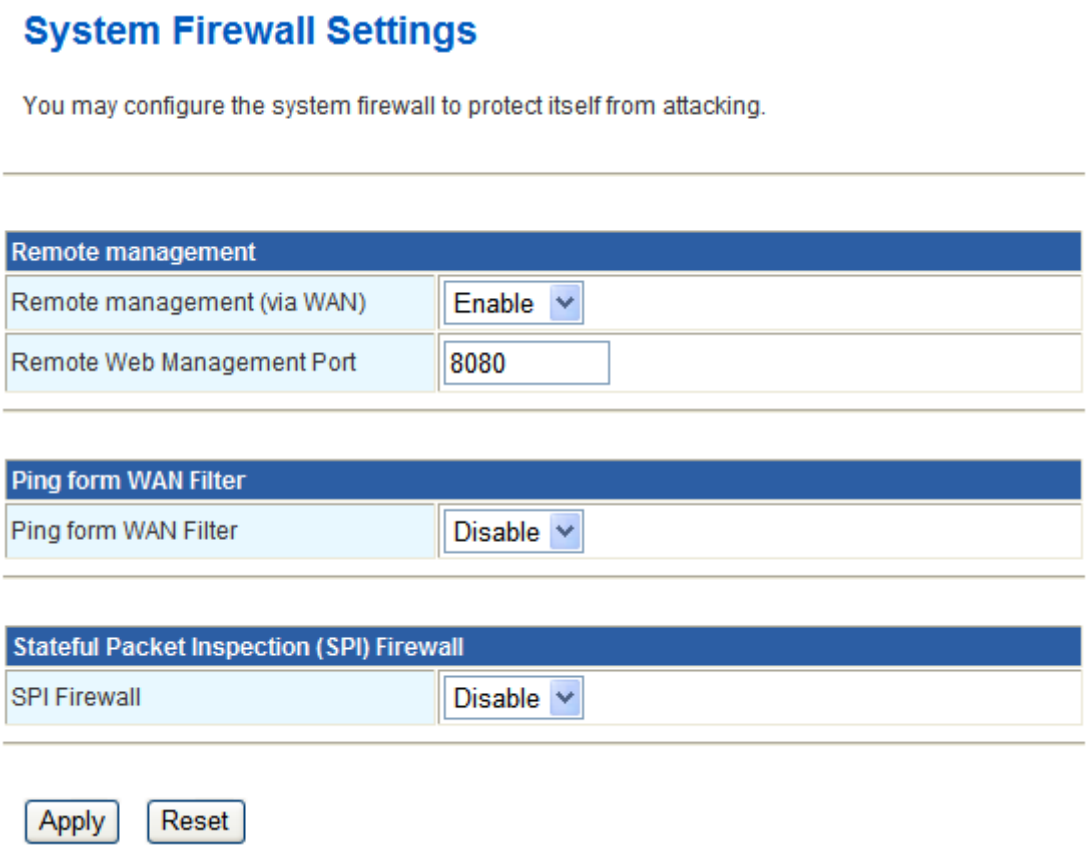


- **DMZ Settings:** Enable or disable this function. After selecting Enable, you can set the DMZ IP address.
- **DMZ IP Address:** Enter the DMZ host IP address.

Click **Apply** to make the configuration take effect. Click **Reset** to cancel the new configuration.

3.4.4 System Security Settings

Choose **Firewall > System Security** and the following page appears. This page allows you to configure the system firewall to protect Router from attacking.



Remote Management

Remote management (via WAN): Deny or allow remote management through web.
Remote management Port: The default remote management port is 80, you can change the remote management port for your needs. Ex. 8080.

Ping from WAN Filter

Ping from WAN Filter: You may select enable or disable to determine whether to filter the ping package which comes from the external network.

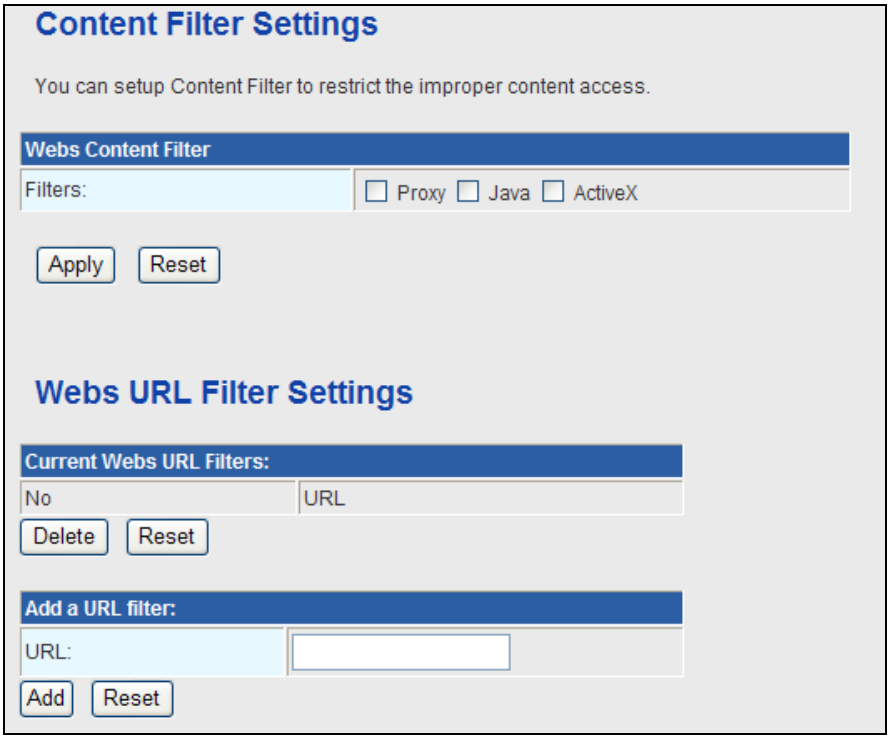
Stateful Packet Inspection (SPI)

SPI Firewall: You may disable or enable the SPI firewall.
Click **Apply** to make the configuration take effect. Click **Reset** to cancel the new configuration.

3.4.5 Content Filtering

This page is used to configure the Blocked FQDN (Such as tw.yahoo.com) and filtered keyword. Here you can add / delete FQDN and filtered keyword.

Choose **Firewall > Content Filtering** and the following page appears. You can set content filter to restrict the improper content access.



Webs Content Filters: If you want to block some applications as Proxy, Java and ActiveX of web pages please select the check box and click “Apply”.

Current Webs URL Filters: If you want to delete some filters in the table above, select the rules, and then click **Delete**. Otherwise, click **Reset**.

Add a URL filter

URL: Enter the FQDN and click “Add” to apply this URL filter rule.
Click **Add** to add a URL filter. Otherwise, click **Reset** to cancel the URL filter.

3.5 VDSL

VDSL2 (Very High-Bit-Rate Digital Subscriber Line 2), G.993.2 is the newest and most advanced standard of xDSL broadband wire line communications. Designed to support the wide deployment of Triple Play services such as voice, data, high definition television (HDTV) and interactive gaming, VDSL2 enable operators and carrier to gradually, flexibly, and cost efficiently upgrade exiting xDSL-infrastructure.

The PLANET VDSL Router can provide very high performance access to Internet, both downstream and upstream up to 100Mbps. The VDSL Router complies with ITU-T G993.2 standard, and supports two selectable operating modes of VDSL2, CO and CPE mode. The CO or CPE mode can be adjusted by WEB UI and users can connect two VC-230 / VC-230N for Point-to-Point Application, data transmission between two networks over existing copper telephone lines.

3.5.1 VDSL Status

Users can check the VDSL Line status in this page, it includes Line status, Date Rate, SNR, Delay and Impulse Noise Protection.

VDSL			
Link Status	Showtime		
Firmware Version	010100		
Mode	CPE		
Basic Status	**Upstream**	**Downstream**	**Unit**
Line Rate	9496	54536	Kb/s
Actual Data Rate	7628	48124	Kb/s
SNR	64	69	0.1dB
Advance Status	**Upstream**	**Downstream**	**Unit**
Actual delay	8	8	ms
Actual INP	20	20	0.1 symbols
15M CV	0	0	counter
1Day CV	0	0	counter
15M FEC	703	1146	counter
1Day FEC	469830	13205047	counter
Previous Data Rate	6936	48602	Kbps

3.5.2 VDSL Configuration

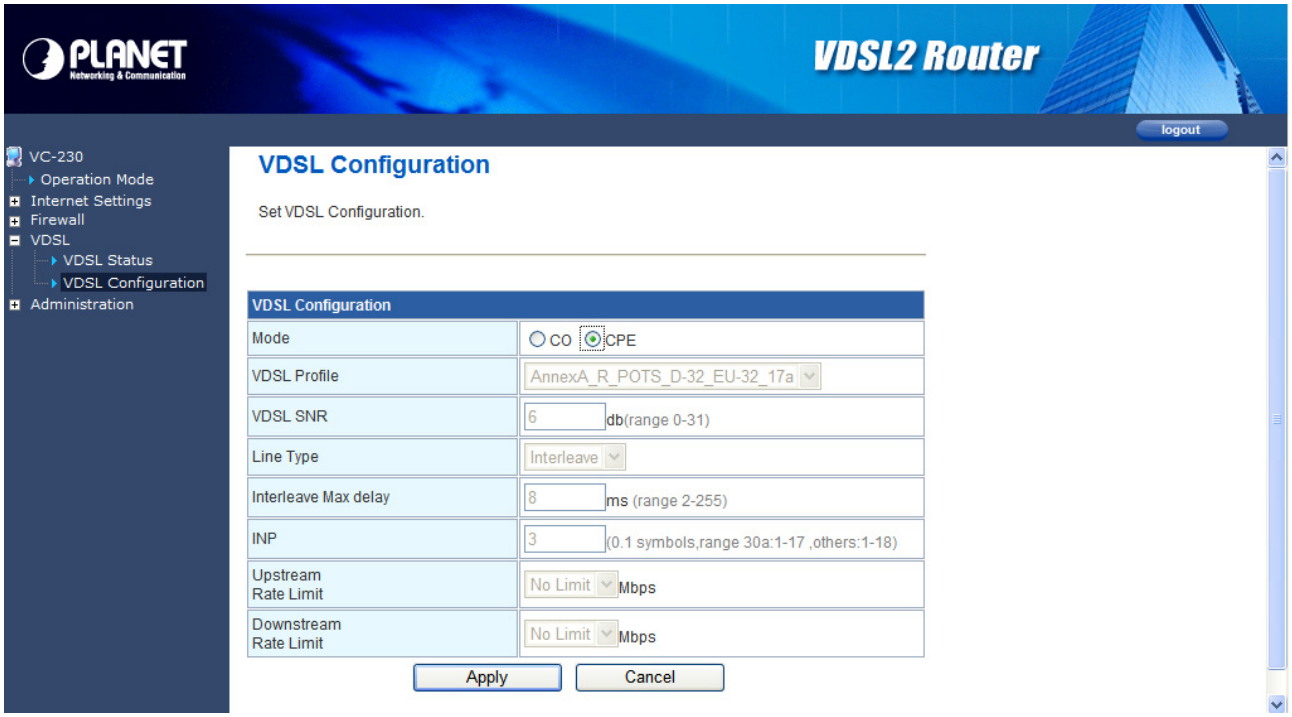
The VDSL Router provides two VDSL operation modes for applications. Users can select the CO and CPE mode manually.

For CPE mode, the router works as a VDSL client device, the VDSL connection is based on the CO side; users don't need to configure any VDSL settings on this mode.

For CO mode, the router works as a VDSL CO device such as VDSL DSLAM or Switch, you can configure the VDSL basic parameters for your VDSL connection.

CPE Mode

The VDSL Router default is CPE mode, in this mode, all VDSL parameters will be blocked and users don't need to configure it. Just connect to CO device for VDSL connection.

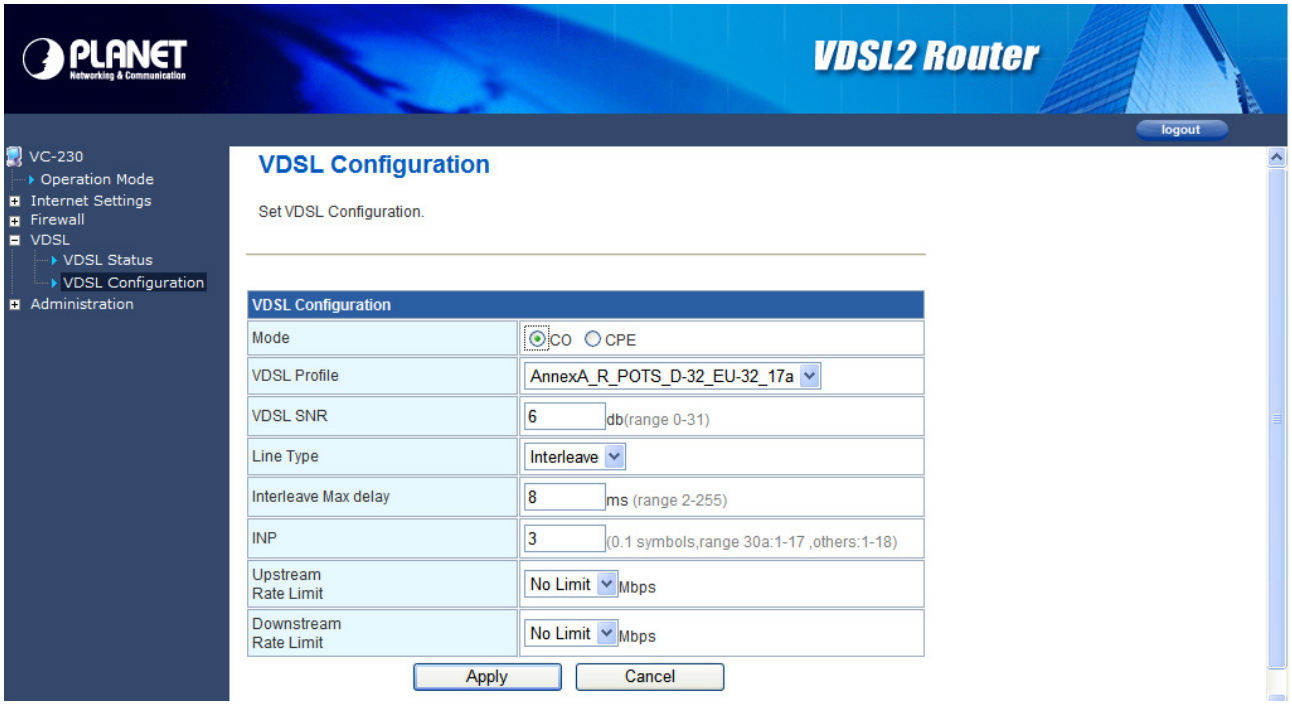


CO Mode

If you want to configure the VDSL Router as a CO device for Peer-to-Peer connection, please select CO mode and you can select proper settings for your VDSL connection.

Default CO parameters:

- **VDSL Profile: AnnexA_R_POTS_D-32_EU-32_30a**
- **VDSL SNR: 6 dB**
- **Line Type: Interleave**
- **Interleave Max. Delay: 8 ms**
- **INP : 3**
- **Upstream / Downstream Rate Limit : No Limit**



VDSL Profile

The VDSL Router provides most common VDSL2 profiles for user; it supports the 30a, 17a, 12a, 12b, 8a, 8b, 8c and 8d. You can select the proper profile for your real environment. Different profiles provide different connection status of data rate and distance; please refer to **Appendix A** for more information.

The VDSL Router supports below profiles.

1. AnnexA_R_POTS_D-64_EU-64_30a
2. AnnexA_R_POTS_D-32_EU-32_30a
3. AnnexA_R_POTS_D-64_EU-64_17a
4. AnnexA_R_POTS_D-32_EU-32_17a
5. AnnexA_R_POTS_D-32_EU-32_12b
6. AnnexA_R_POTS_D-32_EU-32_12a
7. AnnexA_R_POTS_D-32_EU-32_8a
8. AnnexA_R_POTS_D-32_EU-32_8b

9. AnnexA_R_POTS_D-32_EU-32_8c
10. AnnexA_R_POTS_D-32_EU-32_8d
11. AnnexB_997_997E17-M2x-A
12. AnnexB_997_997E30-M2x-NUS0
13. AnnexB_998_998E17-M2x-NUS0
14. AnnexB_998_998E30-M2x-NUS0
15. AnnexC_POTS_25-138_b
16. AnnexC_POTS_25-276_b
17. AnnexC_TCM-ISDN

VDSL SNR

In analog and digital communications, Signal-to-Noise Ratio, often written SNR, is a measure of signal strength relative to background noise. The ratio is usually measured in decibels (dB).

In digital communications, the SNR will probably cause a reduction in data speed because of frequent errors that require the source (transmitting) computer or terminal to resend some packets of data. SNR measures the quality of a transmission channel over a network channel. The greater the ratio, the easier it is to identify and subsequently isolate and eliminate the source of noise.

Generally speaking, the higher SNR value gets better line quality, but lower performance.

You can set your SNR is this field, default is 6.

Line Type

You can select the VDSL line type, there are three types for selection – Interleave, fast and No Limit. Default is Interleave type for VDSL CO mode.

- **Fast mode:** guarantees a minimum end to end latency less than 1 ms.
- **Interleaved mode:** provides impulse noises protection for any impulse noise with a duration less than 250 us. Interleaved mode has a maximum end to end latency of 10m sec.

Rate Limit

You can limit your Max. Data Rate for Upstream and Downstream, select the data rate which you want for Upstream and Downstream.

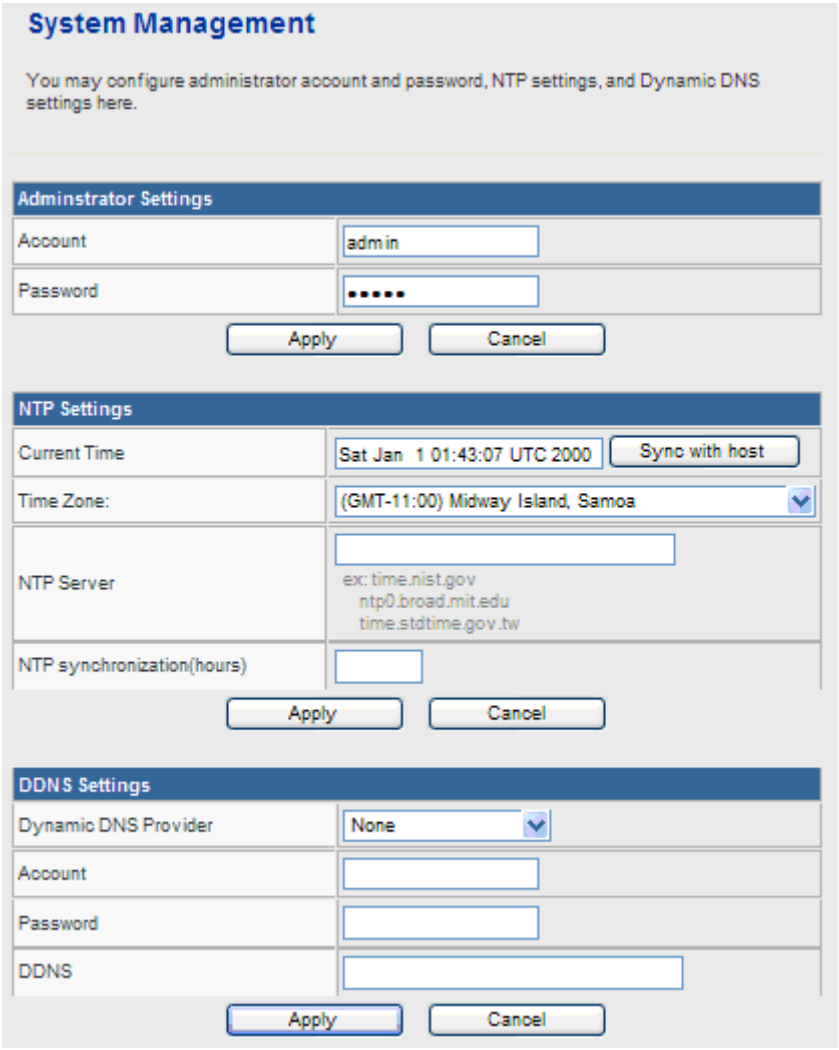
- **Upstream Rate Limit:** The value of outbound traffic limitation in Mbps, from the VDSL2 CO to the CPE. Default is **No Limit.** The range between 1Mbps to 100Mbps.
- **Downstream Rate Limit:** The value of inbound traffic limitation in Mbps, from the VDSL2 CPE to the CO. Default is **No Limit.** The range between 1Mbps to 100Mbps.

3.6 Administration

You can configure admin management in this part. It includes Management, Update Firmware, Setting management, Reboot, Status, Statistics and System Log.

3.6.1 Management

Choose **Administration > Management,** and the following page appears. You may configure administrator account and password, NTP settings, and dynamic DNS settings in the page.



Administrator Settings

- **Account:** Enter the username of the administrator in the field.
- **Password:** Enter the password of the administrator in the field.

NTP Settings

- **Current Time:** Display the current date and time. Click **Sync with host**, the current time is synchronized by your PC which is connected to Router.

- **Time Zone:** Select the proper time zone in the drop-down list.
- **NTP Server:** Enter the IP address or domain name of NTP server.
- **NTP Synchronization (hours):** Enter the time interval for synchronization.

DDNS Settings

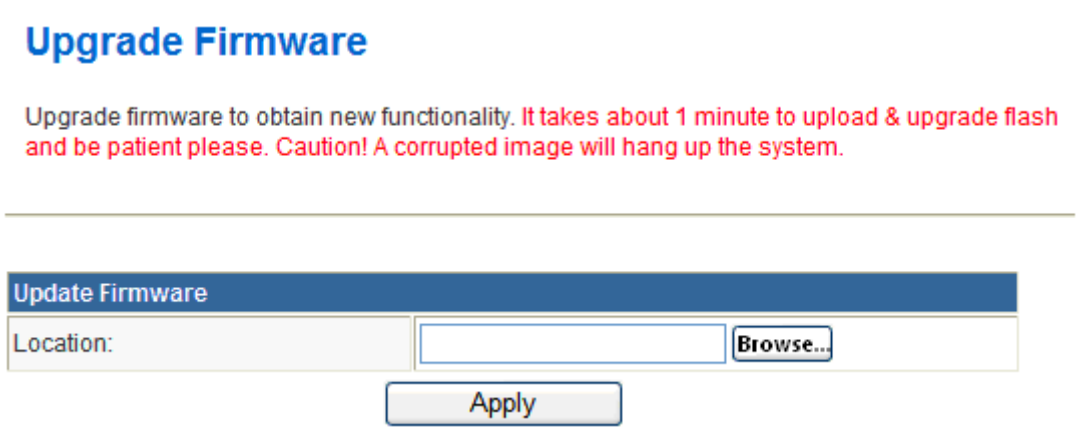
- **Dynamic DNS Provider:** Select the proper dynamic DNS provider in the drop-down list. After selecting a dynamic DNS provider, you are allowed to set the following parameters.
- **Account:** Enter the username of DDNS provider in the field.
- **Password:** Enter the password of DDNS provider in the field.
- **DDNS:** Enter the domain name of your device.

Click **Apply** to make the configuration take effect. Click **Cancel** to cancel the new configuration.

3.6.2 Upload Firmware

Choose **Administration > Upload Firmware** and the following page appears. In this page, you may upgrade the correct new version firmware to obtain new functionality. It takes about 1 minute to upload upgrade flash.

⚠	If the firmware is uploaded in an improper way, the system would core dump.

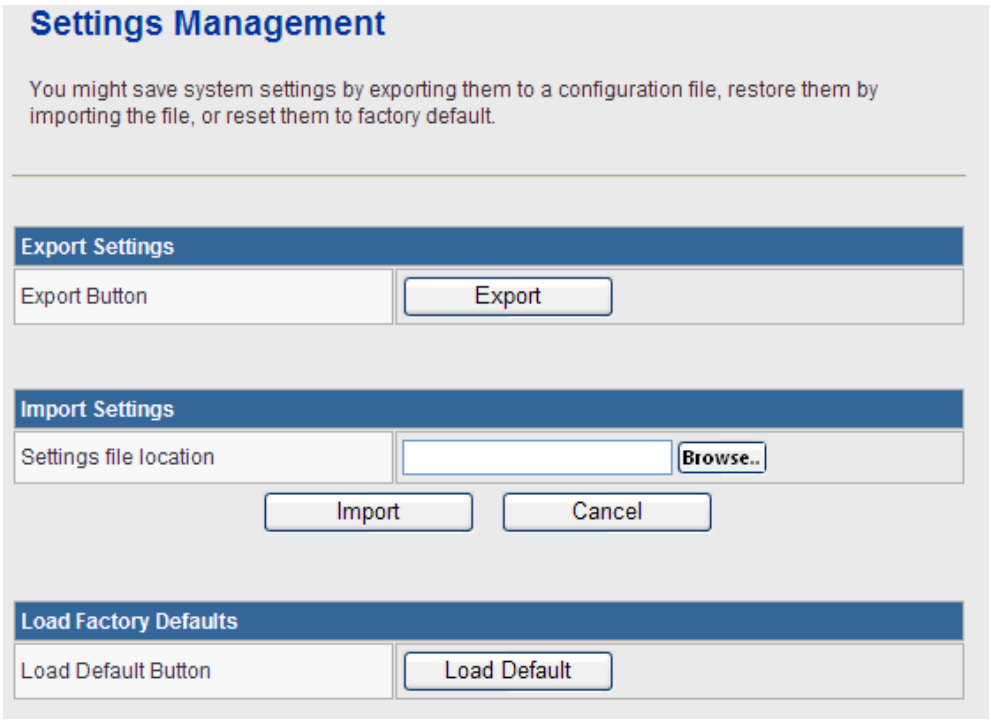


Update Firmware

Location: Click **Browse** to select the firmware file, and click **Apply** to upgrade the firmware.

3.6.3 Setting Management

Choose **Administration > Settings Management** and the following page appears. You may save system settings by exporting them to a configuration file, restore them by importing the file, or reset them to the factory default.



Export Settings

Export Button: Click the **Export** to export the settings.

Import Settings

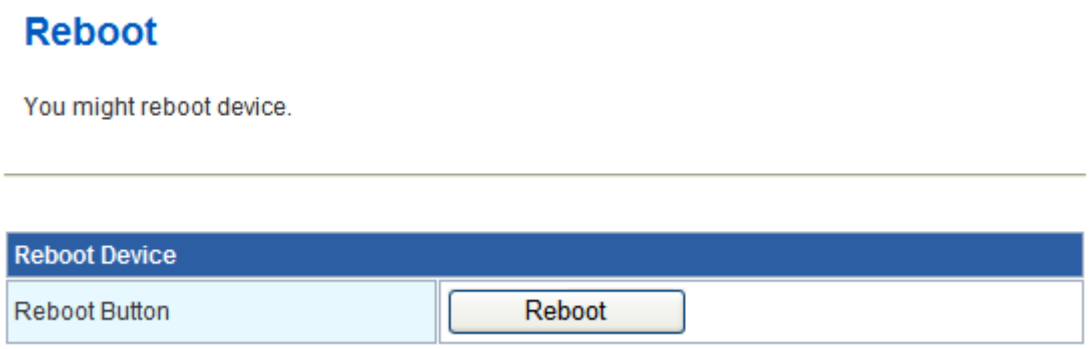
Settings file location: Click **Browse** to select the configuration file, and then click **Import** to upload the configuration file. Click **Cancel** to cancel the uploading operation.

Load Factory Defaults

Load Default Button: Click **Load Default** to make Router return to the default settings.

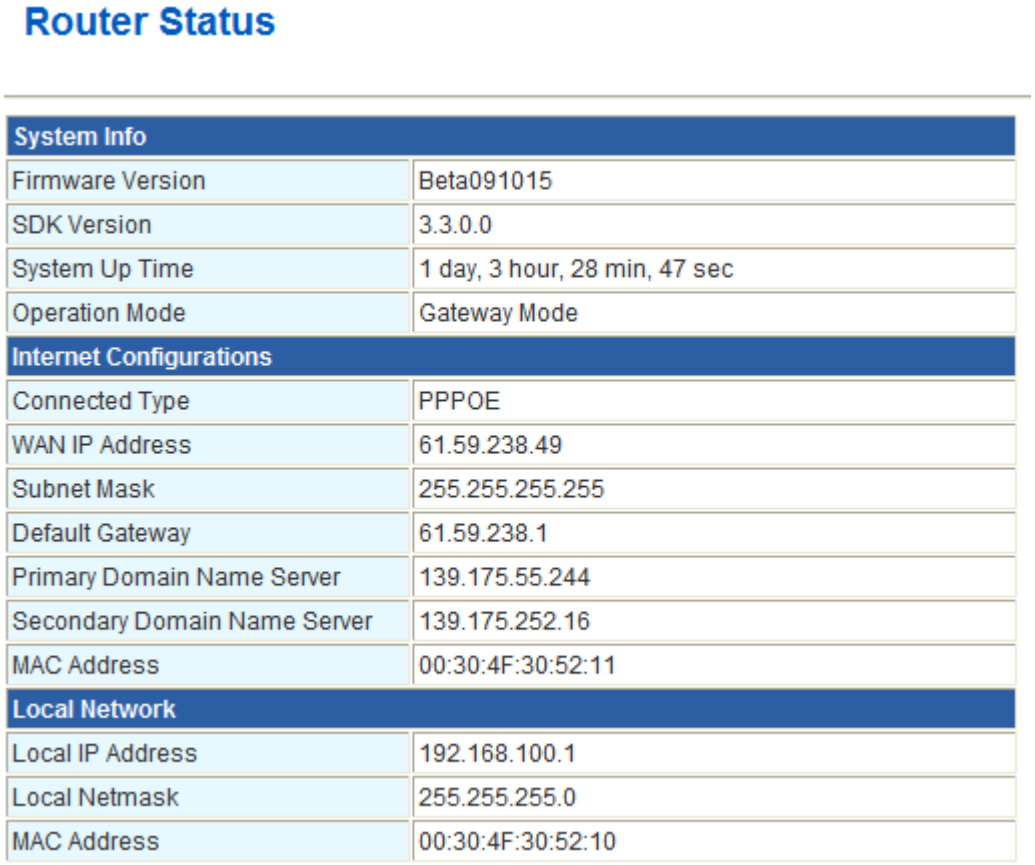
3.6.4 Reboot

The **Reboot** screen allows you to restart your router with its current settings. Click the "Reboot" button and the device will restart.



3.6.5 Status

Choose **Administration > Status** and the following page appears. It displays the information about Router status, including system information, Internet configurations, and local network.

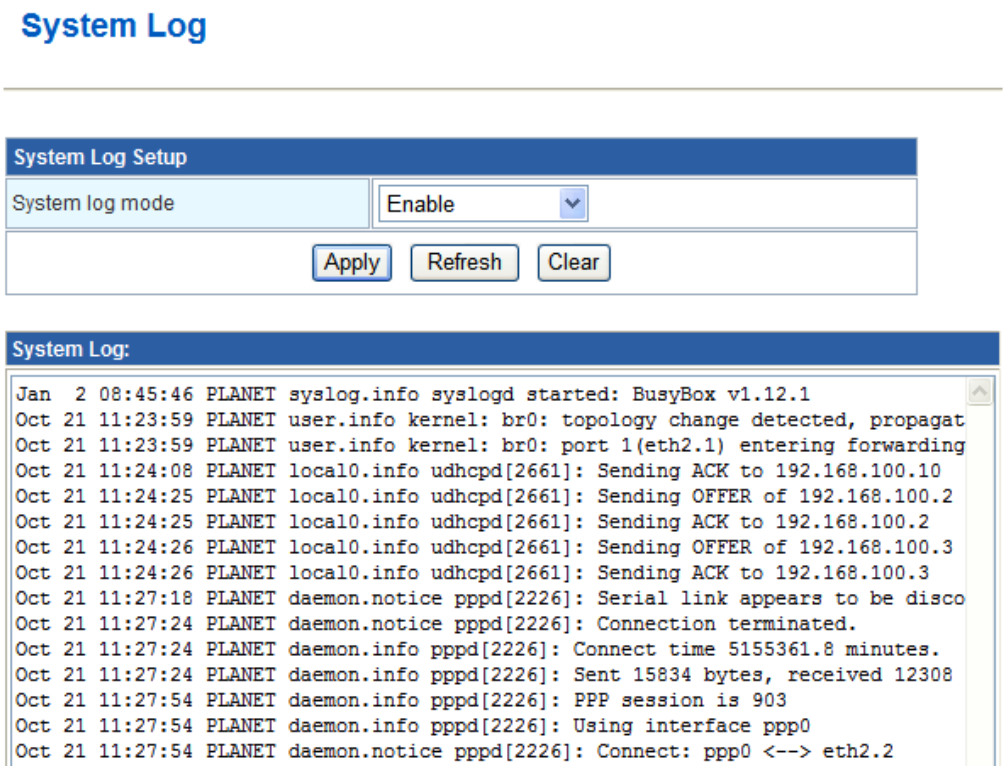


3.6.6 Statistics

You can see the Statistic information in this screen. It includes the Traffic for all interfaces.

3.6.7 System Log

The system log dialog allows you to view the system log and click the “Refresh” button to fresh the system event logs. Choose **Administration > System Log** and the following page appears. You are allowed to view and disable / enable the system log in this page.



Click **Refresh** to refresh the log. Click **Clear** to clear the log.

Appendix A: Performance of VDSL Router Profiles

Below table is a performance table for profile and line distance, this data is just for reference. The actual data rate will vary on the quality of the telephone line and environment factors.

For better performance, we suggest using the AWG-26 or above cable for your connection, and the best line distance is about 1km.

(Data rate: Mbps)

Profile / Distance		200m	400m	800m	1000m
AnnexA_EU-32_30a	**Up**	100	50	5	
	Down	100	100	60	
AnnexA_ EU-32_17a	**Up**	55	45	20	7
	Down	100	100	55	50
AnnexA_EU-32_12a	**Up**	55	45	20	7
	Down	80	70	60	50
AnnexA_EU-32_12b	**Up**	55	45	20	7
	Down	80	70	60	50
AnnexA_EU-32_8a	**Up**	15	13	9	6
	Down	80	72	60	50
AnnexA_EU-32_8b	**Up**	15	13	9	6
	Down	80	72	60	50
AnnexA_EU-32_8c	**Up**	15	14	10	7.5
	Down	80	72	60	50
AnnexA_EU-32_8d	**Up**	15	13	9	6
	Down	80	72	60	50

The real data rate and distance are based on your real environment, this is just for reference.

Appendix B: Glossary

Address mask

A bit mask select bits from an Internet address for subnet addressing. The mask is 32 bits long and selects the network portion of the Internet address
and one or more bits of the local portion. Sometimes it called subnet mask.

VDSL

VDSL2 (Very High-Bit-Rate Digital Subscriber Line 2), G.993.2 is the newest and most advanced standard of xDSL broadband wire line communications.

ADSL

Asymmetric digital subscriber line

AAL5

ATM Adaptation Layer - This layer maps higher layer user data into ATM cells, making the data suitable for transport through the ATM network.

ATM

Asynchronous Transfer Mode - A cell-based data transfer technique in which channel demand determines packet allocation. ATM offers fast packet technology,
real time, and demand led switching for efficient use of network resources.

AWG

American Wire Gauge - The measurement of thickness of a wire

Bridge

A device connects two or more physical networks and forward packets between them. Bridges can usually be made to filter packets, that is, to forward only certain traffic. Related devices are repeaters which simply forward electrical signals from one cable to the other and full-fledged routers which make routing decisions based on several criteria.

Broadband

Characteristic of any network multiplexes independent network carriers onto a single cable. Broadband technology allows several networks to coexist on one single cable; traffic from one network does not interfere with traffic from another. Broadcast a packet delivery system where a copy of a given packet is given to all hosts attached to the network. Example: Ethernet.

CO
Central Office. Refers to equipment located at a Telco or service provider's office.

CPE
Customer Premises Equipment located in a user's premises

DHCP (Dynamic Host Configuration Protocol)
DHCP is software that automatically assigns IP addresses to client stations logging onto a TCP/IP network. DHCP eliminates having to manually assign permanent IP addresses to every device on your network. DHCP software typically runs in servers and is also found in network devices such as Routers.

DMT
Discrete Multi-Tone frequency signal modulation

Downstream rate
The line rate for return messages or data transfers from the network machine to the user's premises machine.

DSLAM
Digital Subscriber Line Access Multiplex

Dynamic IP Addresses
A dynamic IP address is an IP address that is automatically assigned to a client station (computer, printer, etc.) in a TCP/IP network. Dynamic IP addresses are typically assigned by a DHCP server, which can be a computer on the network or another piece of hardware, such as the Router. A dynamic IP address
may change every time your computer connects to the network.

Encapsulation
The technique layer protocols in which a layer adds header information to the protocol data unit (PDU) from the layer above. As an example, in Internet terminology, a packet would contain a header from the physical layer, followed by a header from the network layer (IP), followed by a header from the transport
layer (TCP), and followed by the application protocol data.

Ethernet
One of the most common local area network (LAN) wiring schemes, Ethernet has a transmission rate of 10 Mbps.

FTP
File Transfer Protocol. The Internet protocol (and program) transfer files between hosts.

Hop count
A measure of distance between two points on the Internet. It is equivalent to the number of gateways that separate the source and destination.

HTML
Hypertext Markup Language - The page-coding language for the World Wide Web.

HTML browser
A browser used to traverse the Internet, such as Netscape or Microsoft Internet Explorer.

http
Hypertext Transfer Protocol - The protocol carry world-wide-web (www) traffic between a www browser computer and the www server being accessed.

ICMP
Internet Control Message Protocol - The protocol handle errors and control messages at the IP layer. ICMP is actually part of the IP protocol.

Internet address
An IP address is assigned in blocks of numbers to user organizations accessing the Internet. These addresses are established by the United States Department of Defense's Network Information Center. Duplicate addresses can cause major problems on the network, but the NIC trusts organizations to use individual addresses responsibly. Each address is a 32-bit address in the form of x.x.x.x where x is an eight- bit number from 0 to 255. There are three classes: A, B and C, depending on how many computers on the site are likely to be connected.

Internet Protocol (IP)
The network layer protocol for the Internet protocol suite

IP address
The 32-bit address assigned to hosts that want to participate in a TCP/IP Internet.

ISP
Internet service provider - A company allows home and corporate users to connect to the Internet.

MAC
Media Access Control Layer - A sub-layer of the Data Link Layer (Layer 2) of the ISO OSI Model responsible for media control.

MIB
Management Information Base - A collection of objects can be accessed via a network management protocol, such as SNMP and CMIP (Common Management Information Protocol).

NAT
Network Address Translation - A proposal for IP address reuse, where the local IP address is mapped to a globally unique address.

NVT
Network Virtual Terminal

PAP
Password Authentication Protocol

PORT
The abstraction used in Internet transport protocols to distinguish among multiple simultaneous connections to a single destination host.

POTS
Plain Old Telephone Service - This is the term describe basic telephone service.

PPP
Point-to-Point-Protocol - The successor to SLIP, PPP provides router-to-router and host-to-network connections over both synchronous and asynchronous circuits.

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

Remote server
A network computer allows a user to log on to the network from a distant location.

RFC
Request for Comments - Refers to documents published by the Internet Engineering Task Force (IETF) proposing standard protocols and procedures for the Internet. RFC can be found at www.ietf.org.

Route
The path that network traffic takes from its source to its destination. The route a datagram may follow can include many gateways and many physical networks.
In the Internet, each datagram is routed separately.

Router
A system is responsible for making decisions about which of several paths network (or Internet) traffic will follow. To do this, it uses a routing protocol to gain information about the network and algorithms to choose the best route based on several criteria known as "routing metrics".

Routing Table
Information stored within a router that contains network path and status information. It is used to select the most appropriate route to forward information along.

Routing Information Protocol
Routers periodically exchange information with one another so that they can determine minimum distance paths between sources and destinations.

SNMP
Simple Network Management Protocol - The network management protocol of choice for TCP/IP-based Internet.

SOCKET
(1) The Berkeley UNIX mechanism for creating a virtual connection between processes.
(2) IBM term for software interfaces that allow two UNIX application programs to talk via TCP/IP protocols.

Spanning-Tree Bridge Protocol (STP)
Spanning-Tree Bridge Protocol (STP) - Part of an IEEE standard. A mechanism for detecting and preventing loops from occurring in a multi-bridged environment.
When three or more LAN's segments are connected via bridges, a loop can occur. Because of a bridge forwards all packets that are not recognized as being local,
some packets can circulate for long periods of time, eventually degrading system performance. This algorithm ensures only one path connects any pair of stations, selecting

one bridge as the 'root' bridge, with the highest priority one as identifier, from which all paths should radiate.

Spoofing
A method of fooling network end stations into believing that keep alive signals have come from and returned to the host. Polls are received and returned locally at
either end

Static IP Address
A static IP address is an IP address permanently assigned to computer in a TCP/IP network. Static IP addresses are usually assigned to networked devices that are consistently accessed by multiple users, such as Server PCs, or printers. If you are using your Router to share your cable or DSL Internet connection, contact your ISP to see if they have assigned your home a static IP address. You will need that address during your Router's configuration.

Subnet
For routing purposes, IP networks can be divided into logical subnets by using a subnet mask. Values below those of the mask are valid addresses on the subnet.

TCP
Transmission Control Protocol - The major transport protocol in the Internet suite of protocols provides reliable, connection-oriented full-duplex streams.

TFTP
Trivial File Transfer Protocol. A simple file transfer protocol (a simplified version of FTP) that is often boot diskless workstations and other network devices such as routers over a network (typically a LAN).
Telnet
The virtual terminal protocol in the Internet suite of protocols - Allows users of one host to log into a remote host and act as normal terminal users of that host.

Transparent bridging
The intelligence necessary to make relaying decisions exists in the bridge itself and is thus transparent to the communicating workstations. It involves frame forwarding, learning workstation addresses, and ensuring no topology loops exist (in conjunction with the Spanning-Tree algorithm).

UDP
User Datagram Protocol - A connectionless transport protocol that runs on top of TCP/IP's IP. UDP, like TCP, uses IP for delivery; however, unlike TCP, UDP provides for exchange of datagram without acknowledgments or guaranteed delivery. Best suited for small, independent requests, such as requesting a MIB value from an SNMP agent, in which first setting up a connection would take more time than sending the data.

UNI signaling
User Network Interface signaling for ATM communications.

Virtual Connection (VC)
A link that seems and behaves like a dedicated point-to-point line or a system that delivers packets in sequence, as happens on an actual point-to-point network. In reality, the data is delivered across a network via the most appropriate route. The sending and receiving devices do not have to be aware of the options and the route is chosen only when a message is sent. There is no pre-arrangement, so each virtual connection exists only for the duration of that one transmission.

WAN
Wide area network - A data communications network that spans any distance and is usually provided by a public carrier (such as a telephone company or service provider).