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Before You Use

Thank you for choosing the Asymmetric Digital Subscriber Line (ADSL) Router. With the asymmetric technology, this device runs over standard copper phone lines. In addition, ADSL allows you to have both voice and data services in use simultaneously all over one phone line.

RTA1320ADSL2+ Router is a low-cost DSL broadband access device for home or office users. It supports ADSL2/ADSL2+ and is backward compatible to ADSL, even offers auto-negotiation capability for different flavors (G.dmt, G.lite, or T1.413 Issue 2) according to central office DSLAM's settings (Digital Subscriber Line Access Multiplexer). Also the feature-rich routing functions are seamlessly integrated to ADSL service for existing corporate or home users. Now users can enjoy various bandwidth-consuming applications via RTA1320 ADSL2+ Router.

Unpacking

Check the contents of the package against the pack contents checklist below. If any of the items is missing, contact the dealer from whom the equipment was purchased.

- ✓ ADSL Router
- ✓ Power Adapter and Cord
- ✓ RJ-11 ADSL Line Cable
- ✓ RJ-45 Ethernet Cable
- ✓ Quick Start Guide
- ✓ Driver & Utility Software CD
- ✓ USB Cable

Features

ADSL Compliance

- ☑ ANSI T1.413 Issue 2
- ☑ ITU G.992.1 Annex A (G.dmt)
- ☑ ITU G.992.2 Annex A (G.lite)
- ☑ ITU G.994.1 (G.hs)
- ☑ Support dying gasp
- ☑ Maximum Rate: 8 Mbps for downstream and 1 Mbps for upstream

ADSL2 Compliance

- ☑ ITU G.992.3 Annex A (G.dmt.bis)
- ☑ Maximum Rate: 12 Mbps for downstream and 1 Mbps for upstream

ADSL2+ Compliance

- ☑ ITU G.992.5 Annex A
- ☑ Maximum Rate: 24 Mbps for downstream and 1.2 Mbps for upstream

ATM Features

- ☑ Compliant to ATM Forum UNI 3.1 / 4.0 Permanent Virtual Circuits (PVCs)
- ☑ Support up to 8 PVCs for UBR, CBR, VBR-nrt, VBR-rt with traffic shaping
- ☑ RFC2684 LLC Encapsulation and VC Multiplexing over AAL5
- ☑ RFC2364 Point-to-Point Protocol (PPP) over AAL5
- ☑ RFC2225 Classical IP and ARP over ATM
- ☑ RFC2516 PPP over Ethernet: support Relay (Transparent Forwarding) and Client functions
- ☑ Support PPPoA or PPPoE Bridged mode (the IP address got from ISP can be passed to the user's PC and behave as the IP address of the user's PC.)
- ☑ OAM F4/F5 End-to-End/Segment Loopback Cells

Bridging Features

- ☑ Supports self-learning bridge specified in IEEE 802.1d Transparent Bridging
- ☑ Supports up to 4096 learning MAC addresses
- ☑ Transparent Bridging among 10/100 Mb Ethernet interface and USB interface
- ☑ Supports IGMP Snooping
- ☑ Supports 802.1Q VLAN packet pass-through

Routing Features

- ☑ NAT (Network Address Translation) / PAT (Port Address Translation) let multiple users on the LAN to access the internet for the cost of only one IP address.
- ☑ ALGs (Application Level Gateways): such as NetMeeting, MSN Messenger, FTP, Quick Time, mIRC, Real Player, CuSeeMe, VPN pass-through with multiple sessions, RTSP, SIP, etc.
- ☑ Port Forwarding: the users can setup multiple virtual servers (e.g., Web, FTP, Mail servers) on user's local network.
- ☑ Support DMZ
- ☑ UPnP IGD (Internet Gateway Device) with NAT traversal capability
- ☑ Support Static routes
- ☑ DNS Relay, Dynamic DNS
- ☑ DHCP Client/Relay/Server
- ☑ Time protocol can be used to get current time from network time server
- ☑ Support IGMP Proxy
- ☑ Support IP/Bridge QoS for prioritize the transmission of different traffic classes
- ☑ Support 802.1Q VLAN Tagging

Security Features

- ☑ PAP (RFC1334), CHAP (RFC1994), and MS-CHAP/MS-CHAP2 for PPP session
- ☑ Firewall support IP packets filtering based on IP address/Port number/Protocol type
- ☑ Support DoS (Deny of Services) which detect & protect a number of attacks (such as SYN/FIN/RST Flood, Smurf, WinNuke, Echo Scan, Xmas Tree Scan,

etc)

Configuration and Management

- ✎ User-friendly embedded web configuration interface with password protection
- ✎ Remote management accesses control
- ✎ Telnet session for local or remote management
- ✎ Firmware upgrades through HTTP or TFTP
- ✎ The boot loader contains very simple web page to allow the users to update the run-time firmware image.
- ✎ Configuration file backup and restore

Subscription for ADSL Service

To use the ADSL Router, you have to subscribe for ADSL service from your broadband service provider. According to the service type you subscribe, you will get various IP addresses:

Dynamic IP: If you apply for dial-up connection, you will be given an Internet account with username and password. You will get a dynamic IP by dialing up to your ISP, such as under PPPoA, PPPoE, or MER mode.

Static IP address: If you apply for full-time connectivity, you may get either one static IP address or a range of IP addresses from your ISP. The IP address varies according to different ADSL service provider, such as using IPoA or MER mode.

Notes and Cautions

Note and **Caution** in this manual are highlighted with graphics as below to indicate important information.



Note

Contains information that corresponds to a specific topic.



Caution

Represents essential steps, actions, or messages that should not be ignored.

Chapter 1: Overview

This chapter provides you the description for the LEDs and connectors on the front and rear surface of the router. Before you use/install this router, please take a look at this information first.

Physical Outlook

Front Panel

The following illustration shows the front panel of the ADSL Router:



LED Indicators

The ADSL Router is equipped with several LEDs on the front panel as described in the table below (from left to right):

Function	Color	Definition
Power	Off	Power is off.
	Solid Green	Power is on and the device operates normally.
	Solid Red	Power on self-test is in progress
		The device enters the console mode of the boot loader.
		Power on self-test is failure if the led always stays solid red.
	Flash Red	Firmware upgrades in progress
DSL	Off	No DSL signal is detected.
	Slow Flash Green	DSL line handshaking is in progress
	Fast Flash Green	DSL line training is in progress
	Solid Green	DSL line connection is up.
PPP	Off	No PPPoA or PPPoE connection
	Solid Green	At least one PPPoA or PPPoE connection is up. The users can access the Internet now.
Ethernet	Off	No Ethernet signal is detected.
	Flash Green	User data is going through Ethernet port
	Solid Green	Ethernet interface is ready to work.
USB	Off	No USB signal is detected.
	Flash Green	User data is going through USB port
	Solid Green	USB interface is ready to work.

Rear Panel

The following figure illustrates the rear panel of your ADSL Router:



Connector	Description
DSL	RJ-11 connector
USB	USB connector
Ethernet	Ethernet RJ-45 connector
	Power switch
9VAC	9VAC Power connector



Note: For use only with power supply HON-KWANG type A9100-230, Leader type A41090100.

Chapter 2: System Requirement and Installation

System Requirement

To access the ADSL Router via Ethernet, the host computer must meet the following requirements:

- ❖ Equipped with an Ethernet network interface.
- ❖ Have TCP/IP installed.
- ❖ Allow the client PC to obtain an IP address automatically or set a fixed IP address.
- ❖ With a web browser installed: Internet Explorer 5.x or later.

The ADSL Router is configured with the **default IP address of 192.168.1.1** and subnet mask of **255.255.255.0**. Considering that the DHCP server is **Enable** by default, the DHCP clients should be able to access the ADSL Router, or the host PC should be assigned an IP address first for initial configuration.

You also can manage the ADSL Router through a web browser-based manager: **ADSL ROUTER CONTROL PANEL**. The ADSL Router manager uses the HTTP protocol via a web browser to allow you to set up and manage the device.



To configure the device via web browser, at least one properly-configured PC must be connected to the network (either connected directly or through an external hub/switch to the LAN port of the device).

Choosing a place for the ADSL Router

- ❶ Place the ADSL Router close to ADSL wall outlet and power outlet for the cable to reach it easily.
- ❷ Avoid placing the device in places where people may walk on the cables. Also keep it away from direct sunlight or heat sources.
- ❸ Place the device on a flat and stable stand.

Connecting the ADSL Router

Follow the steps below to connect the related devices.

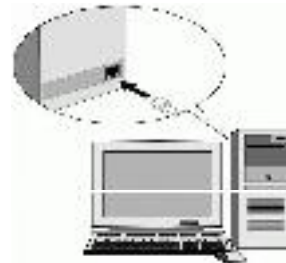
- 1 Use a RJ-11 cable (standard telephone cord) to connect the DSL port of the router to the DSL wall outlet.



- 2 Please attach one end of the Ethernet cable with RJ-45 connector to the **LAN** port of your ADSL Router.



- 3 Connect the other end of the cable to the Ethernet port of the client PC.

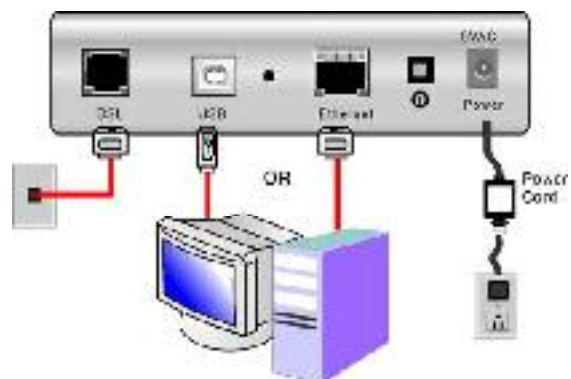


- 4 Connect the supplied power adapter to the **PWR** port of your ADSL Router, and plug the other end to a power outlet.

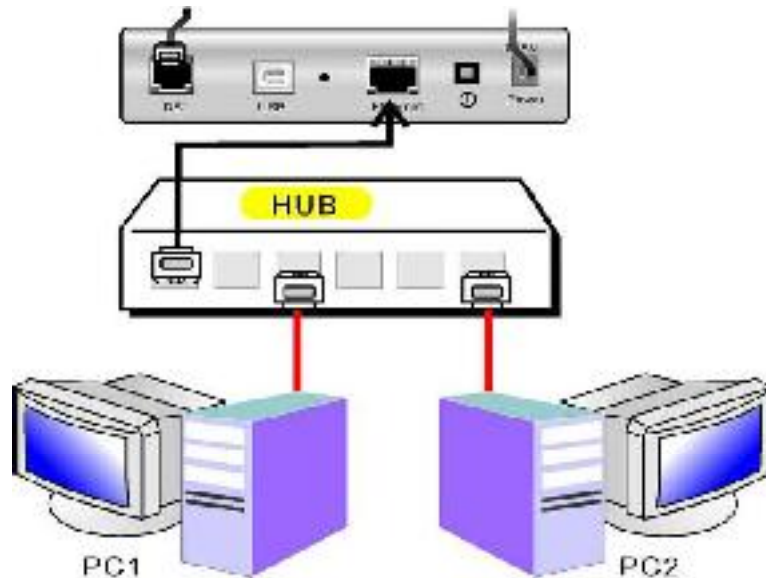


- 5 Turn on the power switch.

Here is an example for hardware connection.



When connecting through a hub, please refer to the following diagram for illustration.



USB Driver Installation

If the ADSL router is connected to a PC through the USB interface, you will be prompted for the USB drivers when plugging the USB cable to the PC. Refer to the relevant operating system to install the USB drivers.

For Windows ME

- ❶ Run the USB installation program from the CD provided in your router package.
- ❷ An **InstallShield Wizard** will appear. Please wait for a moment.
- ❸ When the welcome screen appears, click **Next** for the next step.
- ❹ When the complete window of the InstallShield Wizard appears, click **Finish**.
- ❺ Link your router and the PC with a USB cable.
- ❻ The system will detect the USB driver automatically. Then, the system will copy the proper files for this router.



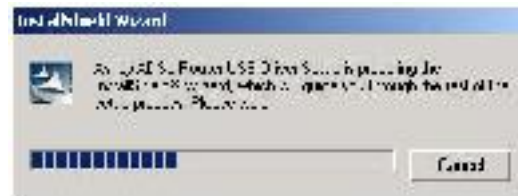
Note: If the USB device is not detected automatically, check the USB cable between the PC and the device. Besides, verify that the device is power on.

- ❼ When the file copying finished, the dialog above will close. Now the USB driver is installed properly. You can use the router.

For Windows 2000

- ❶ Run the USB installation program from the CD provided in your router package.

- 2 An **InstallShield Wizard** will appear. Please wait for a moment.



- 3 When the welcome screen appears, click **Next** for the next step.



- 4 When the complete window of the InstallShield Wizard appears, click **Finish**.



- 5 Link your router and the PC with a USB cable.

- 6 The system will detect the USB driver automatically. And then, the system will copy the proper files for this router.



Note: If the USB device is not detected automatically, check the USB cable between the PC and the device. Besides, make sure that the device is power on.

- When the file copying finished, the dialog above will close. Now the USB driver is installed properly. You can use the router.

To make sure that your router is properly installed, please do the following steps.

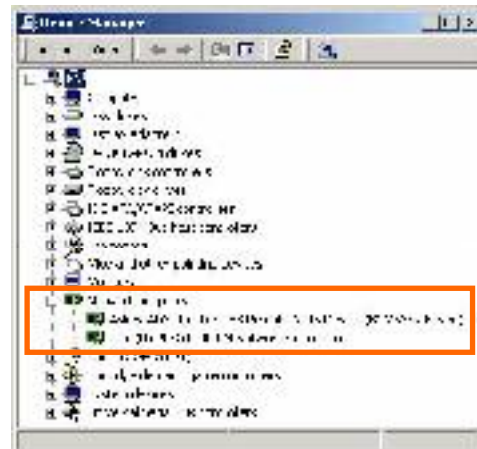
1. Right-click on **My Computer** and press **Properties**.



2. On the **Hardware** tab, click **Device Manager**.



3. Confirm that the **Askey ADSL Router USB Remote NDIS Device** is on the **Network adapters** list.

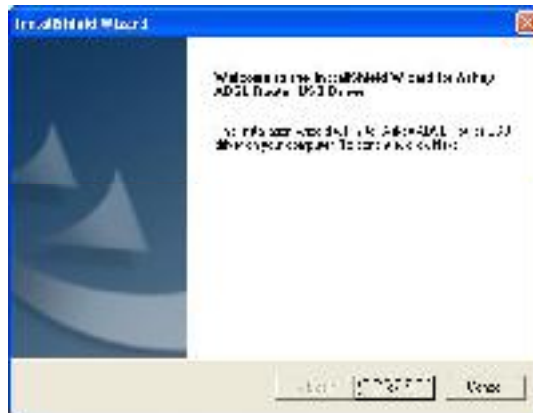


For Windows XP

- ❶ Run the USB installation program from the CD provided in your router package.
- ❷ An **InstallShield Wizard** will appear. Please wait for a moment.



- ❸ When the welcome screen appears, click **Next** for the next step.



- ❹ When the complete message of InstallShield Wizard appears, click **Finish**.



- ❺ Link your router and the PC with a USB cable.
- ❻ The system will detect the USB driver automatically.



Note: If the USB device is not detected, check the USB cable between the PC and the device. Also make sure that the device is power on.

- 7 Then the system will try to find the proper driver for your router and copy the files automatically.



- 8 After the file copying finished, a completing message will appear.



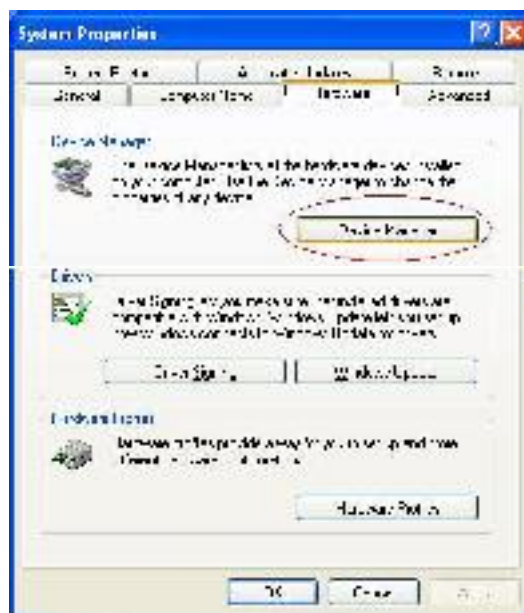
- 9 You can use the router now.

To make sure your router is properly installed, please do the following steps.

1. Right-click on **My Computer** and press **Properties**.



2. On the **Hardware** tab, click **Device Manager**.



For Windows Vista

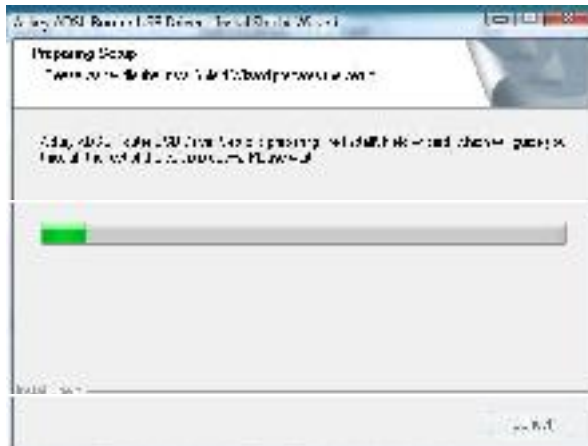
For Vista users, please press **Continue** whenever a prompted window asking for permission to continue during USB driver installation process (see the figure below for example).



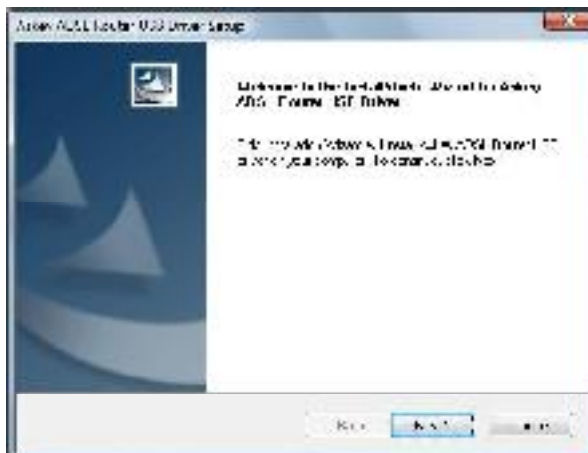
To install the USB driver before connect the router to the PC, here provides two methods.

Method One – Use the driver CD came with the product package.

- ❶ Run the USB installation program on the CD provided in your router package.
- ❷ An **InstallShield Wizard** will appear. Please wait for a moment.



- ❸ When the welcome screen appears, click **Next** for the next step.



- ❶ When the complete message of InstallShield Wizard appears, click **Finish**.



- ❷ Link your router and the PC with a USB cable.
- ❸ The system will detect the USB driver automatically.



Note: If the USB device is not detected, check the USB cable between the PC and the device. Also make sure that the device is power on.

- ❹ After the file copying finished, a completing message will appear.



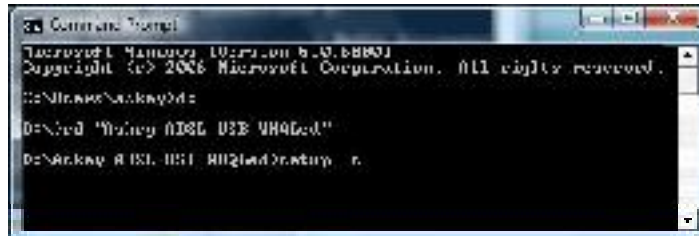
- ❺ You can use the router now.

Method Two – Run a silent installation.

- ❶ Copy the USB driver folder from the driver CD to somewhere on the PC. (In our example, the driver files are put under D:\Askey ADSL USB WHQLed.)
- ❷ Open **Start** menu, key in *cmd* in the blank and press enter. Then click **cmd**.



- ❸ When the Command Prompt screen appears, point to the driver folder on your PC, and then enter *setup -s*. Press enter to start silent installation.

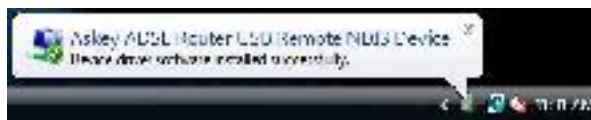


- ❹ The system will install the driver automatically. You can connect your router and the PC with a USB cable now.
- ❺ The system will detect the USB driver automatically.



Note: If the USB device is not detected, check the USB cable between the PC and the device. Also make sure that the device is power on.

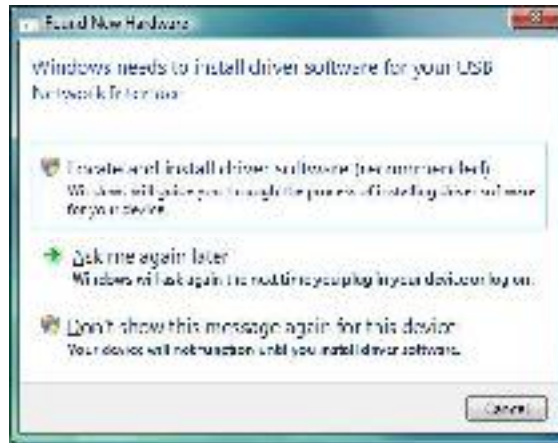
- ❻ After the file copying finished, a completing message will appear.



- ❼ You can use the router now.

If the USB driver has not been installed yet, you can also connect the router to the PC with a USB cable and wait for *Universal Plug and Play* device to detect the router, and then install the driver.

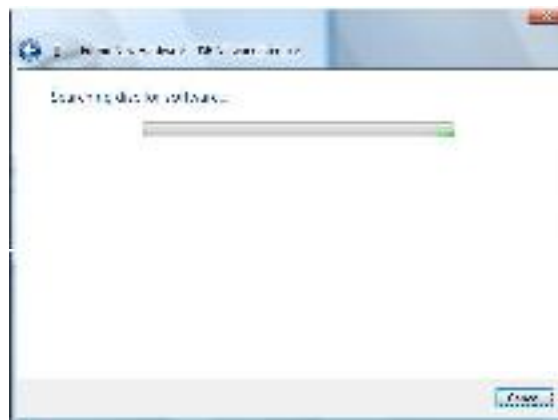
- ❶ Plug the USB cable into the USB port on the PC.
- ❷ A **Found New Hardware** window will appear. Press **Locate and install driver software (recommended)**.



- ❸ Then insert the USB driver CD provided in your router package into the PC, and press **Next**.



- ❹ The system will search disc for the USB driver needed and then complete the installation.



Or if you do not have a disc, but have the driver files on your PC, you can follow the steps below:

- 1 Press **I don't have the disc. Show me other options.**



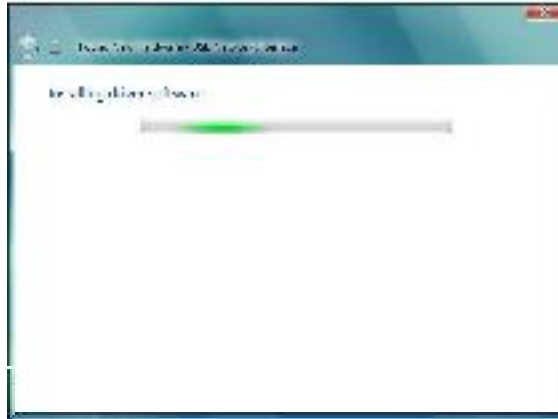
- 2 Select **Browse my computer for driver software (advanced).**



- 3 Press **Browse** to set the path for the driver file, and then press **Next**.



- ⌚ Wait while the system installing the driver.

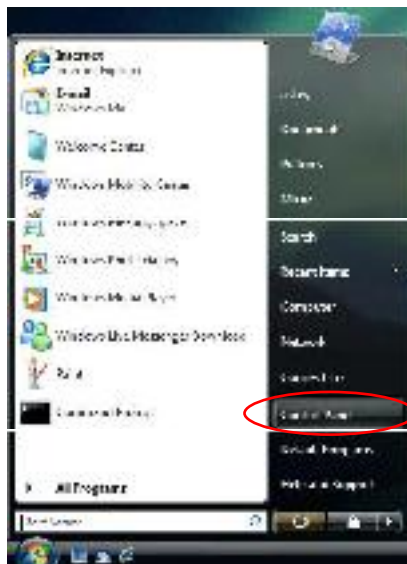


- ⌚ Now the driver software is installed successfully. Press **Close** to start using the router.



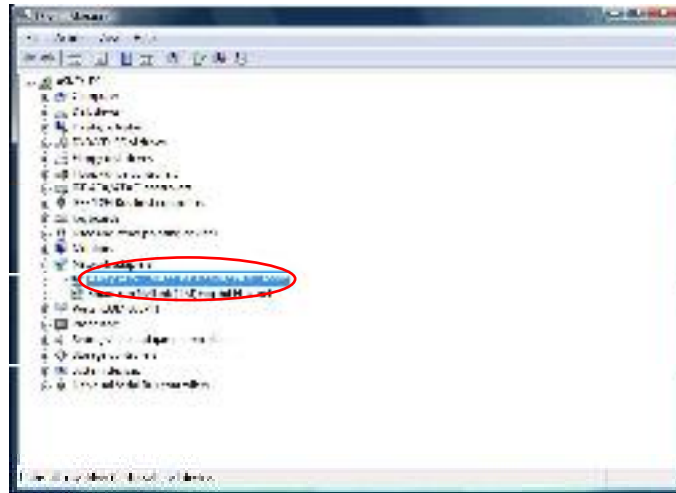
To make sure the USB driver for your router is properly installed, please do the following steps.

1. Open the Start menu and press **Control Panel**.





5. Confirm that the **Askey ADSL Router USB Remote NDIS Device** is on the **Network adapters** list.



Uninstalling the USB Driver

For Windows ME

To uninstall the USB driver, please follow the procedures below.

Method One:

- ❶ Unplug the USB cable from the USB port on your PC.
- ❷ Choose **Programs – Askey Broadband – Uninstall Askey ADSL Router USB Driver** from the **Start** menu.
- ❸ The InstallShield Wizard dialog will appear.
- ❹ A dialog appears to confirm whether you really want to remove the USB driver or not. Please click **Ok**.
- ❺ When the Maintenance Complete screen appears, the USB driver is removed successfully. Click **Finish**.

Method Two:

- ❶ Unplug the USB cable between your router and your PC. Then click **OK**.
- ❷ Choose **Settings –Control Panel** from the **Start** menu. Choose **Add/Remove Programs**.
- ❸ A dialog appears to ask you to choose the program that you want to remove. Please select **Askey ADSL Router USB Driver** and click **Change/Remove**.
- ❹ The InstallShield Wizard dialog will appear.
- ❺ When the Maintenance Complete screen appears, the USB driver is removed successfully. Click **Finish**.

For Windows 2000

To uninstall the USB driver, there are two ways to do it. Please do the following procedures.

Method One:

- ❶ To safely unplug the USB cable from the USB port on your PC:
 1. Go to the right lower corner for **Unplug and Eject Hardware** and left click on it.



2. Click the dialog for **Stop Askey ADSL Router USB Remote NDIS Device**.



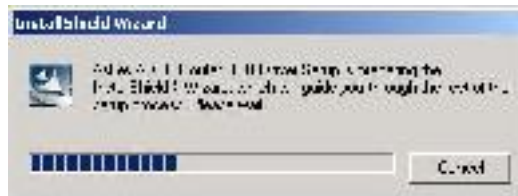
3. The Router is safely removed, click **OK** to continue.



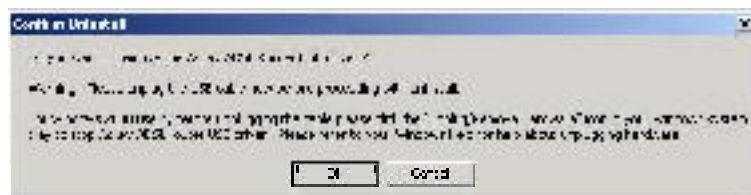
- 2 Choose **Programs – Askey Broadband – Uninstall Askey ADSL Router USB Driver** from the **Start** menu.



- 3 The InstallShield Wizard dialog will appear.



- 4 A dialog appears to confirm whether you want to remove the USB driver or not. Please click **Ok**:



- 5 When the Maintenance Complete screen appears, the USB driver is removed successfully. Click **Finish**.



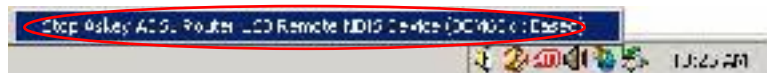
Method Two:

❶ To safely unplug the USB cable from the USB port on your PC:

1. Go to the right lower corner for **Unplug and Eject Hardware** and left click on it.



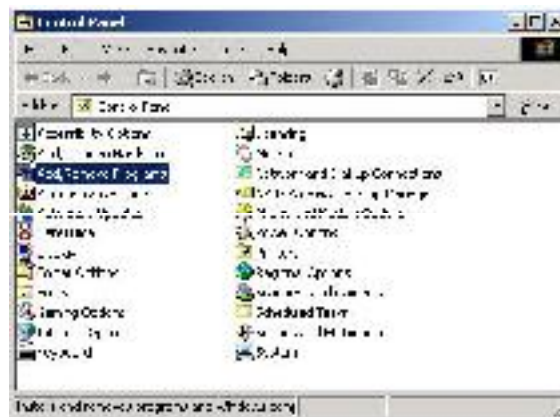
2. Click the dialog for **Stop Askey ADSL Router USB Remote NDIS Device**.



3. The Router is safely removed, click **OK** to continue.



❷ Choose **Settings – Control Panel** from the **Start** menu. Choose **Add/Remove Programs**.



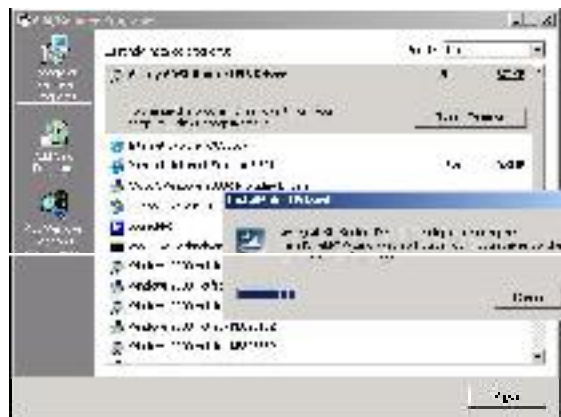
❸ A dialog appears to ask you to choose the program that you want to remove. Please select **Askey ADSL Router USB Driver** and click **Change/Remove**.



- 4 A Confirm Uninstall dialog will show up, unplug your device from the USB port and click **OK**.



- 5 The InstallShield Wizard will guide you till the USB driver is removed.



- 6 When the **Maintenance Complete** screen appears, the USB driver is removed successfully. Click **Finish**.

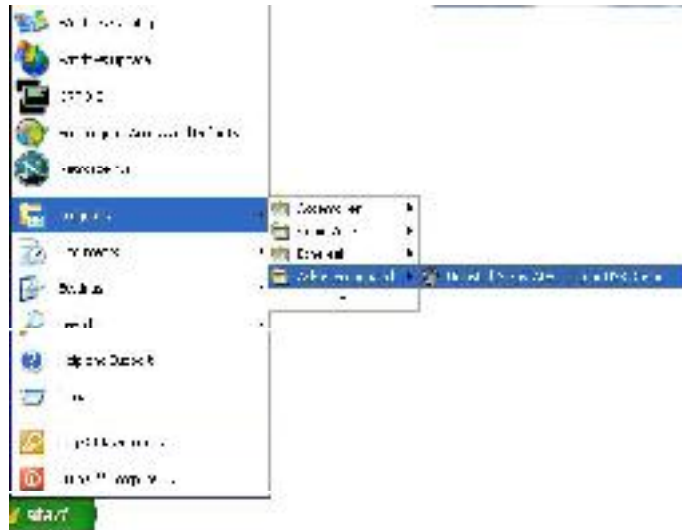


For Windows XP

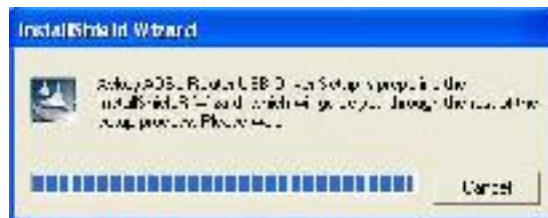
To uninstall the USB driver, there are two ways to do it. Please do as follows.

Method One:

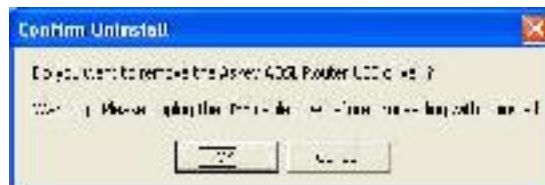
- ❶ Unplug your USB cable between your router and your PC.
- ❷ Choose **Programs – Askey Broadband – Uninstall Askey ADSL Router USB Driver** from the **Start** menu.



- ❸ The InstallShield Wizard dialog will appear.



- ❹ A dialog appears to confirm whether you want to remove the USB driver or not. Unplug the USB cable from your PC, and click **Ok**.

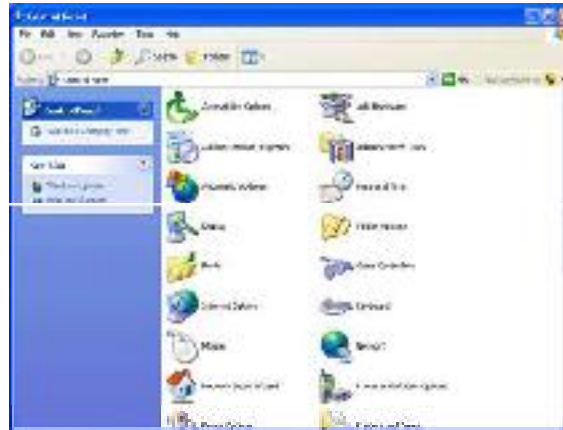


- ❺ When the Maintenance Complete screen appears, the USB driver is removed successfully. Click **Finish**.

Method Two:

- ❶ Unplug your USB cable between your router and your PC.

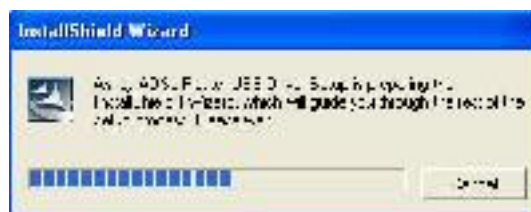
- 2 Choose **Settings – Control Panel** from the **Start** menu. Choose **Add or Remove Programs**.



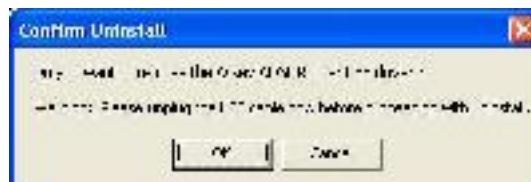
- 3 A dialog appears to ask you to choose the program that you want to remove. Please select **Askey ADSL Router USB Driver** and click **Change/Remove**.



- 4 The InstallShield Wizard dialog will appear.



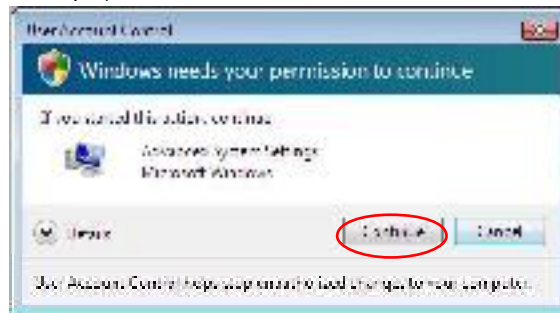
- 5 A dialog appears to confirm whether you want to remove the USB driver or not. Unplug the USB cable from your PC, and click **Ok**.



- 6 When the Maintenance Complete screen appears, the USB driver is removed successfully. Click **Finish**.

For Windows Vista

For Vista users, please press **Continue** whenever a prompted window asking for permission to continue during USB driver uninstallation process (see the figure below for example).



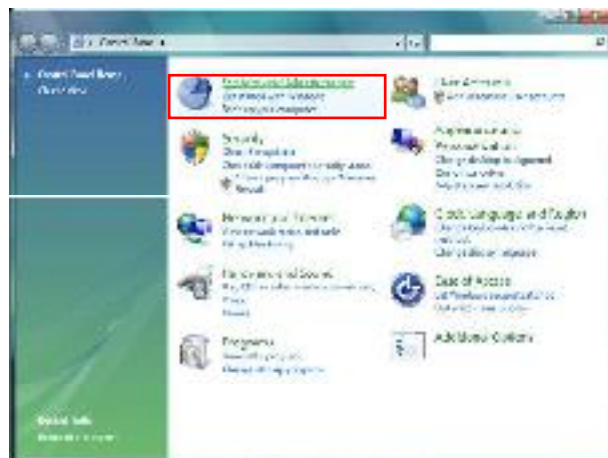
To uninstall the USB driver, there are two ways to do it. Please follow the instructions.

Method One: Remove from Device Manager.

- 1** Choose **Start** menu, and then select **Control Panel**.



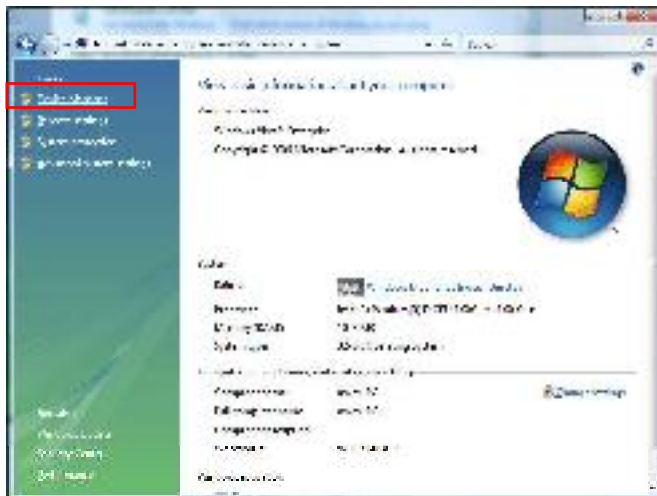
- Click **System and Maintenance**.



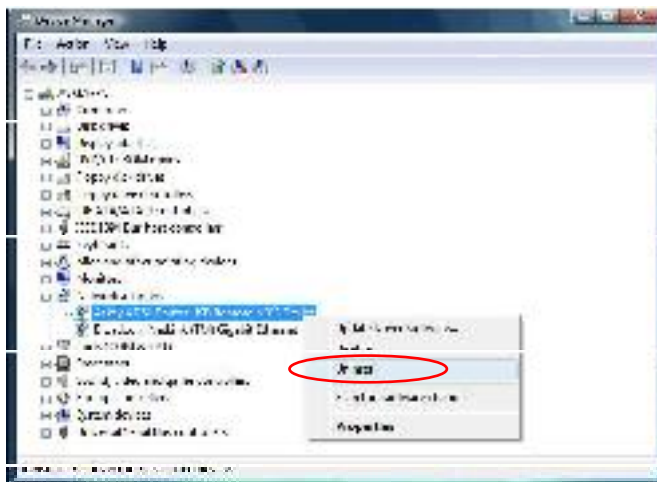
- 3 Press **System**.



- 4 Click **Device Manager**.



- 5 Right click **Askey ADSL Router USB Remote NDIS Device** on the **Network adapters** list, and press **Uninstall**.





Click **OK** when the Confirm Uninstall window appears.



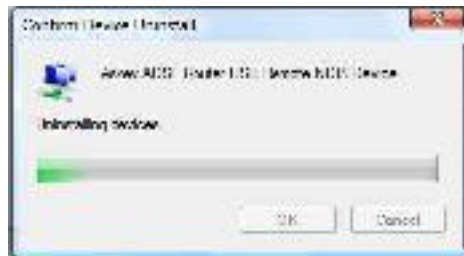
Remember to unplug the USB cable before continue the uninstallation, or you will see the reminder as follows. Unplug and press **OK**.



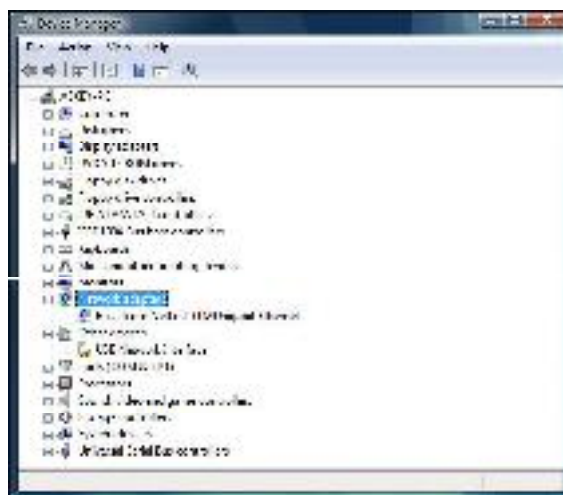
When the **Confirm Device Uninstall** screen show up, check **Delete the driver software for the device** and click **OK** to continue.



Wait while the system is uninstalling.



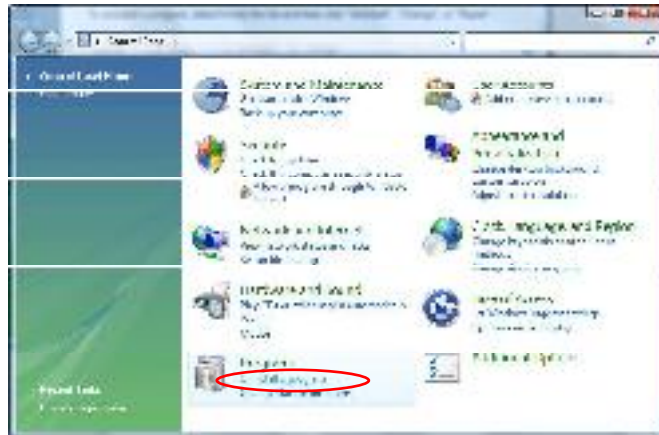
When the uninstallation is finished, the icon of this router under network adapter list will disappear.



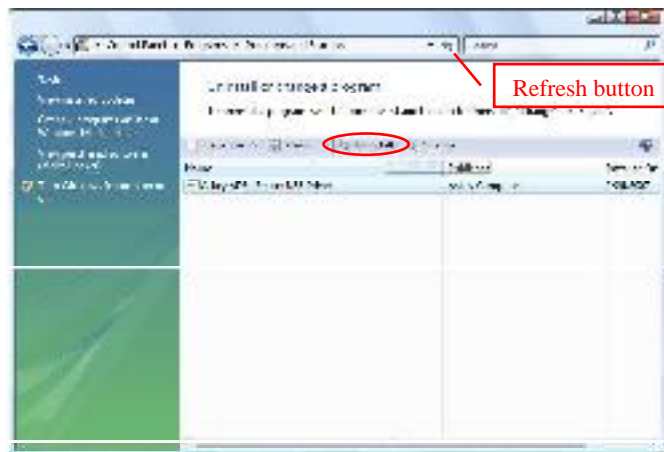
Method Two – uninstall from program list

Note: If your USB driver is installed by UPnP device, you can only use method one (via the **Device Manager**) to uninstall, because the installed driver will not be shown on the program list.

- ❶ Unplug your USB cable between your router and your PC.
- ❷ Choose **Start** menu, and open **Control Panel** folder. Click **Uninstall a program**.



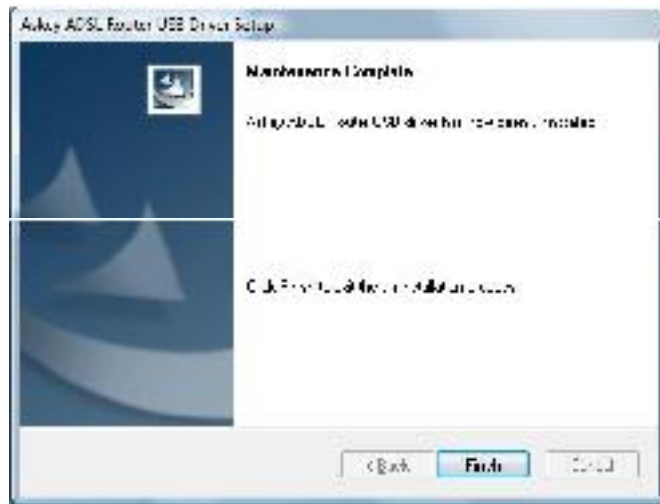
- ❸ If the driver name is not on the list, click **Refresh** button or **F5** to update the information. To remove the driver, select it, and then press **Uninstall**.



- ❹ Then the system will start to uninstall the USB driver software automatically.



- 5 When Maintenance Complete window shows up, click **Finish** to exit.



- 6 The USB driver is successfully removed now.

Setting up TCP/IP



In order to access the Internet through the ADSL Router, each host on your network must install/setup TCP/IP first. Please follow the steps below to set your network adapter.

If the TCP/IP protocol has not been installed yet, please follow the steps below for installation. In the following illustrations, we will set the PC to **get an IP address automatically** at the same time.

For Windows 98

1. Open the **Start** menu, point to **Settings** and click on **Control Panel**.



2. Double-click the **Network** icon.



- The **Network** window appears. On the **Configuration** tab, check out the list of installed network components.

Option 1: If there is **no** TCP/IP protocol, click **Add**.

Option 2: If you have TCP/IP protocol, skip to Step 6.

Your network interface card.

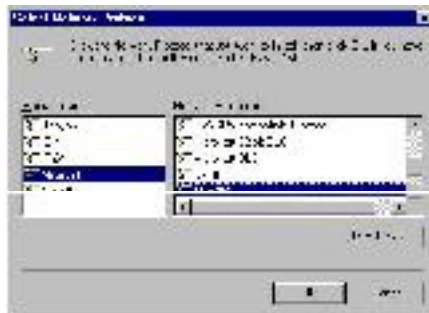
Check out if TCP/IP for your NIC is installed or not.



- Highlight **Protocol** and click **Add**.



- Highlight **Microsoft** on the left side of the window, and select **TCP/IP** on the right side. Then click **OK**.



- When returning to the **Network** window, highlight **TCP/IP** protocol for your NIC and click **Properties**.



7. On the **IP Address** tab:
Enable **Obtain an IP address automatically** and click OK.



8. When returning to the **Network** window, click **OK**



9. Wait for Windows when copying files.



10. When prompted with **System Settings Change** dialog box, click **Yes** to restart your computer.



For Windows ME

1. Open the **Start** menu, point to **Settings** and click on **Control Panel**.



2. Double-click the **Network** icon.



3. The **Network** window appears. On the **Configuration** tab, check out the list of installed network components.

Option 1: If there is **no** TCP/IP protocol, click **Add**.

Option 2: If you have TCP/IP protocol, skip to Step 6.



Your network
interface card.

Check out if TCP/IP
for your NIC is
installed or not.

4. Highlight **Protocol** and click **Add**.



5. Highlight **Microsoft** on the left side of the windows, and select **TCP/IP** on the right side. Then click **OK**.
6. While returning to **Network** window, highlight **TCP/IP** protocol for your NIC and click **Properties**.
7. On **IP Address** tab:
Enable **Obtain an IP address automatically** and click **OK**.



8. While returning to the **Network** window, click **OK**.



9. Wait for Windows when copying files.
10. When prompted with the **System Settings Change** dialog box, click **Yes** to restart your computer.



For Windows NT

1. Click **Start**, point to **Settings**, and then click **Control Panel**.



2. Double-click the **Network** icon.



3. The **Network** window appears. On the **Protocols** tab, check out the list of installed network components.

Option 1: If there is **no** TCP/IP Protocol, click **Add**.

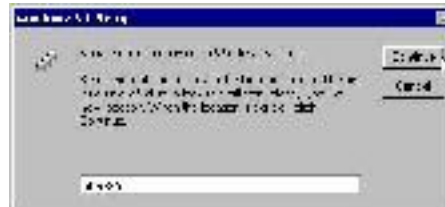
Option 2: If you have TCP/IP Protocol installed, skip to Step 7.



4. Highlight **TCP/IP Protocol** and click **OK**.



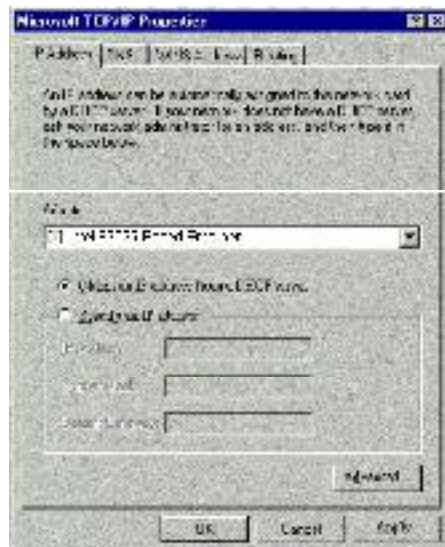
5. Insert the Windows NT CD into your CD-ROM drive and type the location of the CD. Then click **Continue**.



- When returning to the **Network** window. Open the **Protocols** tab, then select **TCP/IP Protocol** and click **Properties**.



7. Enable **Obtain an IP address from a DHCP server** and click **OK**.



8. When prompted with the message below, click **Yes** to continue.



9. When returning to **Network** window, click **Close**.



10. When prompted with **Network Settings Change** dialog box, click **Yes** to restart your computer.



For Windows 2000

1. From the **Start** menu, point to **Settings** and then click **Network and Dial-up Connections**.



2. Right-click the **Local Area Connection** icon and then click **Properties**.



3. On the **General** tab, check out the list of installed network components.
Option 1: If there is **no** TCP/IP Protocol, click **Install**.
Option 2: If you have TCP/IP Protocol, skip to Step 6.



4. Highlight **Protocol** and then click **Add**.



5. Click **Internet Protocol (TCP/IP)** and then click **OK**.



6. When returning to the **Local Area Connection Properties** window, highlight **Internet Protocol (TCP/IP)** and then click **Properties**.



7. Under the **General** tab, enable **Obtain an IP address automatically**. Then click **OK**.



For Windows XP

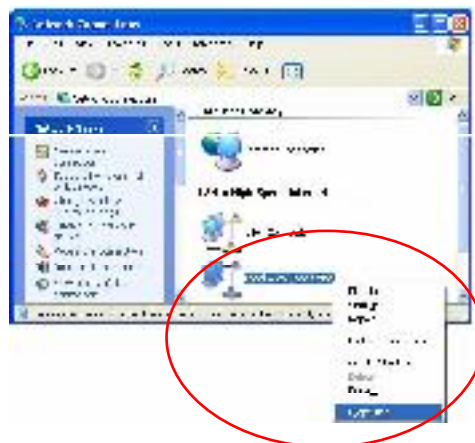
1. Open the **Start** menu, point to **Control Panel** and click it.



2. Double click the **Network Connection**.



3. Right click **Local Area Connection** and then click **Properties**.

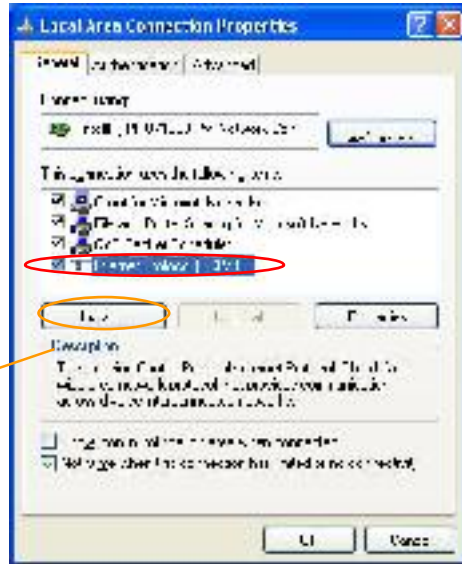


4. On the **General** tab, check out the list of installed network components.

Option 1: If there is **no** TCP/IP Protocol, click **Install**.

Option 2: If you have TCP/IP Protocol, skip to Step 7.

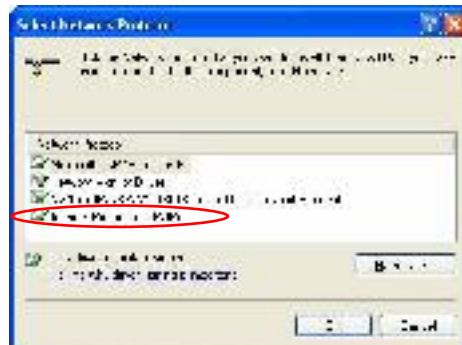
If there is **no** TCP/IP protocol installed on your PC, press **Install** to continue.



5. Highlight **Protocol** and then click **Add**.



6. Click **Internet Protocol(TCP/IP)** and then click **OK**.



7. When it returns to the **General Tab** on the **Local Area Connection Properties** window, highlight **Internet Protocol (TCP/IP)** and then click **Properties**.



8. Under the **General** tab, select **Obtain an IP address automatically**, and **Obtain DNS server address automatically**. Then click **Ok**.



For Windows Vista

1. Open the **Start** menu, point to **Control Panel** and click it.



2. Click **Network and Internet**.



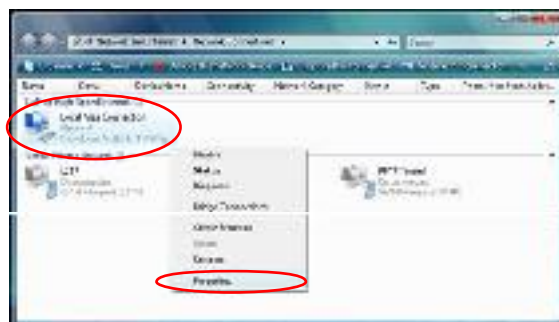
3. Select **Network and Sharing Center**.



4. Click **Manage Network Connection** on the left side.

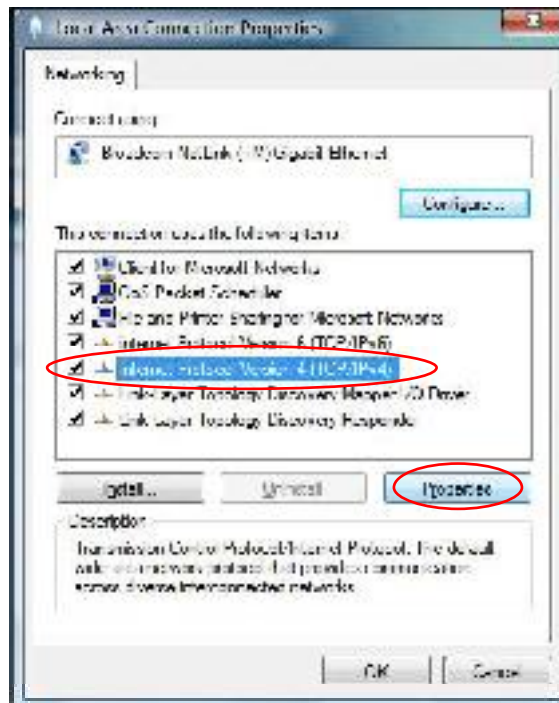


5. Right click **Local Area Connection** and select **Properties**.



6. On the **Networking** tab, you will find Internet Protocol Version 6 and Version 4. Contact your ISP to confirm which one will be used. (We take TCP/IPv4 for example here.)

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



7. Under the **General** tab, select **Obtain an IP address automatically**, and **Obtain DNS server address automatically**. Then click **Ok** to exit.



Renewing IP Address on Client PC

After the ADSL Router gets on line, there is a chance that your PC does not renew its IP address and thus causes the PC not able to access the Internet. To solve this problem, please follow the procedures below to renew PC's IP address.

For Windows 98/ME

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



2. Type **winipcfg** in the text box and click **OK**.

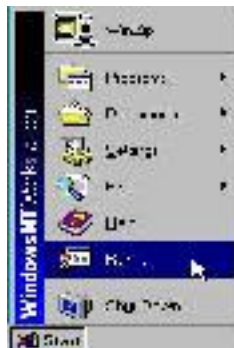


3. When the figure below appears, click **Release** to let go of the address and then click the **Renew** button to obtain a new IP address.



For Windows NT/2000/XP

1. Open the **Start** menu, and click **Run...** on this menu.



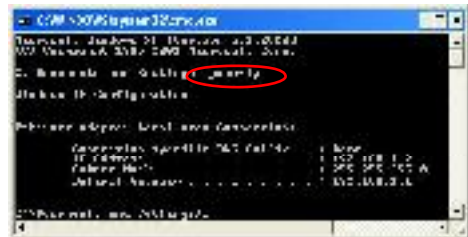
2. Type **cmd** in the text box that appears and click **OK**. Then you will see the command prompt window.



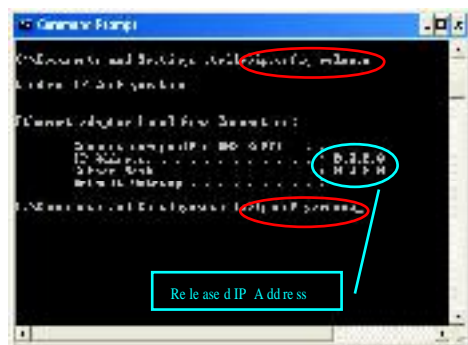
- ✦ Another way to open the command prompt:
From **Start** menu, point to **Programs**, select **Accessories**, and then click **Command Prompt**.



3. Type **ipconfig** at the command prompt window and press **Enter** to view the computer's IP information from DHCP server.



4. If the computer is holding a current IP address, type **ipconfig /release** to let go of the address, then type **ipconfig /renew** to obtain a new one.



For Windows Vista

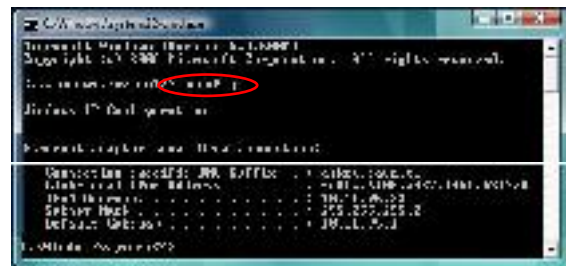
1. Open the **Start** menu, and type **cmd** in the text box then click **OK**.



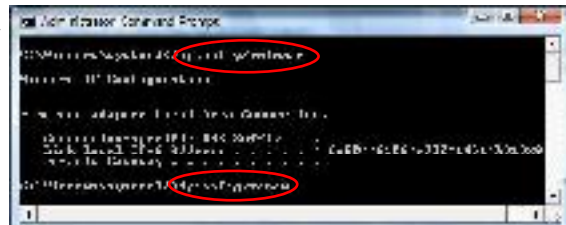
2. The command prompt window will appear.



3. Type **ipconfig** at the command window and press **Enter** to view the computer's IP information from DHCP server.



4. If the computer is holding a current IP address, type **ipconfig /release** to let go of the address, then type **ipconfig /renew** to obtain a new one.



Note:

If you cannot release the IP address successfully and see the message "**The requested operation requires elevation**," please go to the **Start** menu and right click **Command Prompt**, then set **Run as administrator**.

Press **Continue** when a dialog asking for permission to continue prompts.

After then, repeat the above instruction to release and renew the IP address.



Chapter 3: Accessing the Internet



This chapter aims to help you access the Internet in a quick and convenient way. If you need more detailed information for web configuration, please refer to the next chapter for the advanced configuration.

Before configuring the ADSL Router, you must decide whether to configure the ADSL Router as a bridge or as a router. This chapter presents some deployment examples for your reference. Each mode includes its general configure procedures. For more detailed information about web configuration, refer to "Web Configuration".

- ☐ PPP over ATM (PPPoA)
- ☐ PPPoA IP Extension
- ☐ PPP over Ethernet (PPPoE)
- ☐ PPPoE IP Extension
- ☐ Numbered IP over ATM (IPoA)
- ☐ Numbered IP over ATM (IPoA) + NAT
- ☐ Unnumbered IP over ATM (IPoA)
- ☐ Unnumbered IP over ATM (IPoA) + NAT
- ☐ Bridge Mode
- ☐ MER (Bridge Mode + NAT)

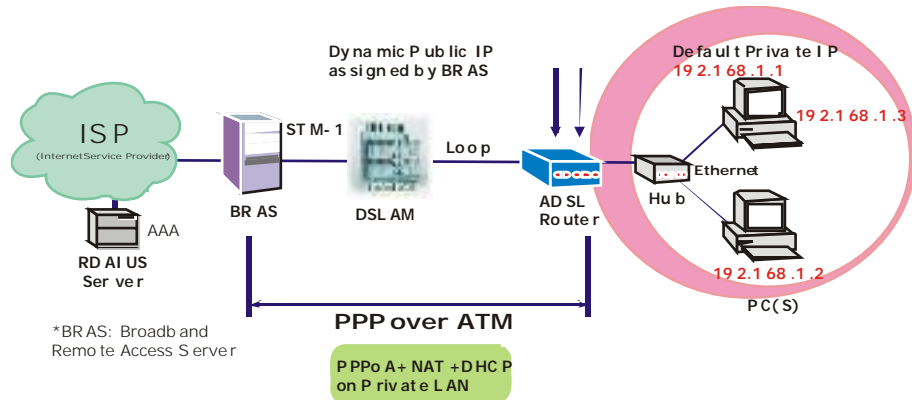
To ensure your PC accessing the Internet successfully, please check the following first.

- ☐ A network interface card is installed on your PC.
- ☐ The ADSL Router is solidly connected with your computer.
- ☐ The TCP/IP protocol has been installed and the IP address setting is to obtain IP address automatically.

After making sure that all above preparations are ready, you can open the Browser and type "**192.168.1.1**" into the URL box and start to make the web configuration for different connection modes.

This chapter is going to introduce the function of each connection mode and the basic configuring steps that you have to do. If you do not follow the configuring steps for using these connection modes, you might get some connection problems and cannot connect to the Internet well.

PPP over ATM (PPPoA) Mode



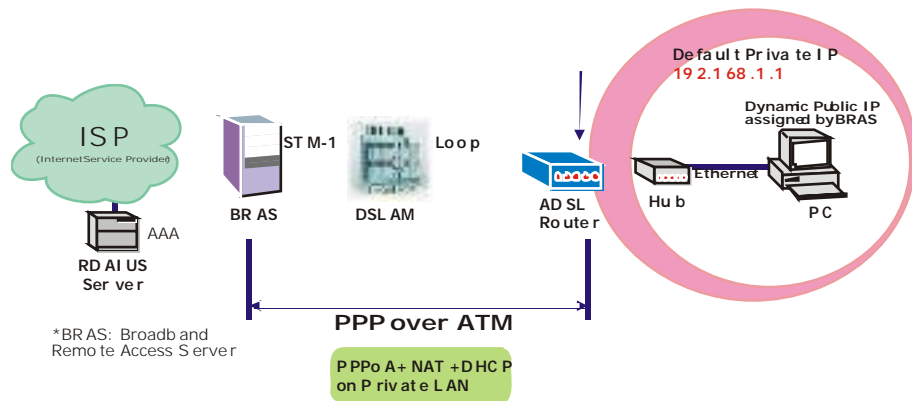
Description:

In this deployment environment, the PPPoA session is between the ADSL WAN interface and BRAS. The ADSL Router gets a public IP address from BRAS when connecting to DSLAM. The multiple client PCs will get private IP address from the DHCP server enabled on private LAN. The enabled NAT mechanism will translate the IP information for clients to access the Internet.

Configuration:

1. Start your browser and type **192.168.1.1** as the address to access ADSL web-based manager.
2. Go to **Quick Start – Quick Setup**. Uncheck **Auto Scan Internet Connection (PVC)**. Key in the **VCI** and **VPI** value, e.g.:
VPI – 0
VCI – 38
Click the **Next** button.
3. On the **Configure Internet Connection – Connection Type** page, select **PPP over ATM (PPPoA)** then click the **Next** button.
4. On the **WAN IP Settings** page, select **Obtain an IP address automatically** and check **Enable NAT** box. Click **Next**.
5. On the **PPP Username and Password** page, enter the PPP username and password that you got from your ISP. Select **Always on** or select **Dial on Demand** and key in the inactivity timeout value. (The default value is 20 minutes.) Then click **Next**.
6. On the **Configure LAN side Settings** page, key in the IP address and subnet mask for your LAN, e.g.:
Primary IP address: 192.168.1.1
Subnet Mask: 255.255.255.0
Check **DHCP Server on** box. And key in the start and end IP address, e.g.:
Start IP Address: 192.168.1.2
End IP Address: 192.168.1.254
Then enter the leased time (the default is 1 day), and click **Next**.
7. Check the network information on **This Internet Connection – Summary** page. Make sure the settings match the information provided by your ISP. Click **Finish**.

PPP over ATM (PPPoA) IP Extension Mode



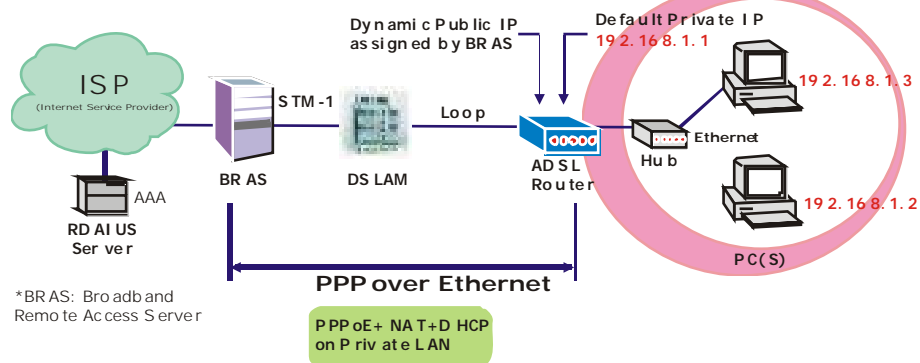
Description:

In this deployment environment, the PPPoA session is between the ADSL WAN interface and BRAS. The ADSL Router acts as a bridge and receives a public IP address from BRAS for your computer. And only the one that bears the public IP address is allowed to access the Internet. Moreover, no NAT translation will be done at this case.

Configuration:

1. Start your browser and type **192.168.1.1** in the URL box to access ADSL web-based manager.
2. Go to **Advanced – Internet – Connections**. And click **Add**.
3. Key in the **VCI** and **VPI** value, e.g.:
VPI – 0
VCI – 38
Click the **Next** button.
4. On the **Configure Internet Connection – Connection Type** page, select **PPP over ATM (PPPoA)** then click the **Next** button.
5. On the **WAN IP Settings** page, select **Obtain an IP address automatically**, check **PPP IP extension** (and **Enable NAT** would become disabled automatically) then click **Next**.
6. On the **PPP Username and Password** page, enter the PPP username and password offered by your ISP. Select **Always on**, and then click **Next**.
7. Check the network information on **This Internet Connection – Summary** page. Make sure the settings match the settings provided by the ISP. Click **Apply**.
8. Press **Finish**.

PPP over Ethernet (PPPoE) Mode



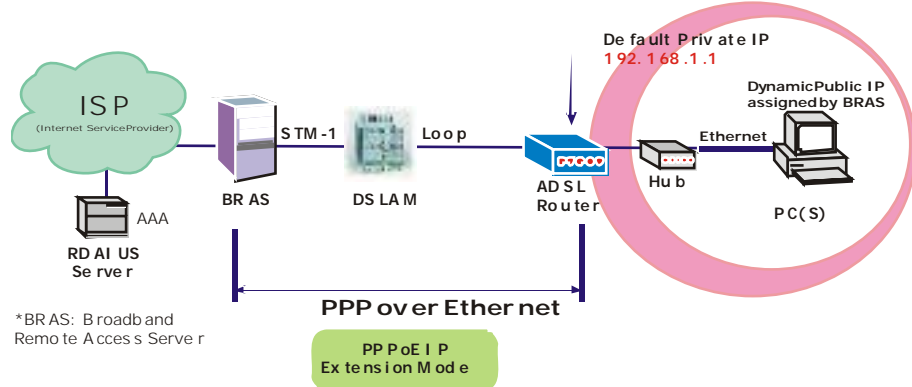
Description:

In this deployment environment, the PPPoE session is between the ADSLWAN interface and BRAS. The ADSL Router gets a public IP address from BRAS when connecting to DSLAM. The multiple client PCs will get private IP address from the DHCP server enabled on private LAN. The enabled NAT mechanism will translate the IP information for clients to access the Internet.

Configuration:

1. Start your browser and type **192.168.1.1** in the URL box to access ADSL web-based manager.
2. Go to **Quick Start – Quick Setup**. Uncheck **Auto Scan Internet Connection (PVC)**. Key in the **VCI** and **VPI** value, e.g.:
VPI – 0
VCI – 39
Click the **Next** button.
3. On the **Configure Internet Connection – Connection Type** page, select **PPP over Ethernet (PPPoE)** then click the **Next** button.
4. On the **WAN IP Settings** page, select **Obtain an IP address automatically** and check **Enable NAT** box. Click **Next**.
5. On the **PPP Username and Password** page, enter the PPP username and password that you got from your ISP. Select **Always on** or select **Dial on Demand** and key in the inactivity timeout value. (The default value is 20 minutes.) Then click **Next**.
6. On the **Configure LAN side Settings** page, key in the IP address and subnet mask for your LAN, e.g.:
Primary IP address: 192.168.1.1
Subnet Mask: 255.255.255.0
Check **DHCP Server on** box. And key in the start and end IP address, e.g.:
Start IP Address: 192.168.1.2
End IP Address: 192.168.1.254
Then enter the leased time (the default is 1 day), and click **Next**.
7. Check the network information on **This Internet Connection -- Summary** page. Make sure the settings match the information provided by your ISP. Click **Finish**.

PPP over Ethernet (PPPoE) IP Extension Mode



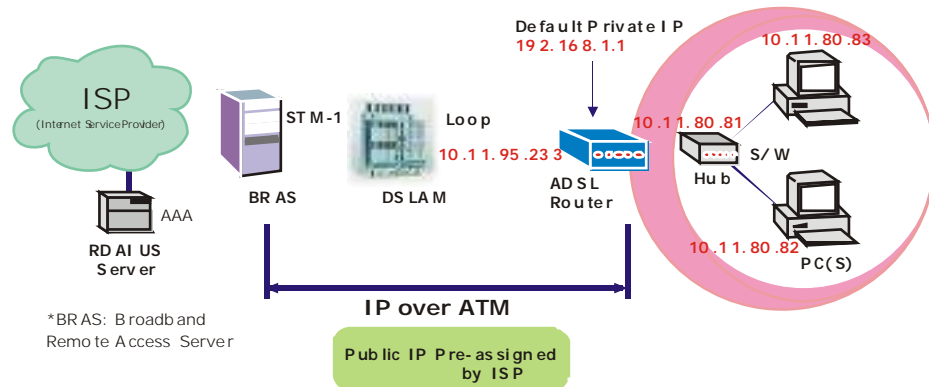
Description:

In this deployment environment, the PPPoE session is between the ADSL WAN interface and BRAS. The ADSL Router acts as a bridge and gets a public IP address from BRAS for your computer. And only the one that got the public IP address is allowed to access into Internet. The real IP that you got is acquired from ISP. Moreover, no NAT translation will be done at this case.

Configuration:

1. Start your browser and type **192.168.1.1** in the URL box to access ADSL web-based manager.
2. Go to **Advanced – Internet – Connections**. And click **Add**.
3. Key in the **VCI** and **VPI** value, e.g.:
VPI – 0
VCI – 39
Click the **Next** button.
4. On the **Configure Internet Connection – Connection Type** page, select **PPP over Ethernet (PPPoE)** then click the **Next** button.
5. On the **WAN IP Settings** page, select **Obtain an IP address automatically**, check **PPP IP extension** (and **Enable NAT** would become disabled automatically) then click **Next**.
6. On the **PPP Username and Password** page, enter the PPP username and password offered by your ISP. Select **Always on**, and then click **Next**.
7. Check the network information on **This Internet Connection -- Summary** page. Make sure the settings match the settings provided by the ISP. Click **Apply**.
8. Press **Finish**.

Numbered IP over ATM (IPoA)



Description:

If you apply for multiple IP addresses from your ISP, you can assign these public IP addresses to the ADSL Router and public server, e.g., Web or FTP server. Typically the first IP is network address, the second is used as router IP address and the last one is for subnet broadcasting. Other remaining IP addresses can be assigned to PCs on the LAN.

The following example uses the LAN IP address ranging from 10.11.80.81 to 10.11.80.86 and the subnet mask for LAN is 255.255.255.248. The WAN IP address is 10.11.95.233, and the subnet mask for WAN is 255.255.255.248.

Configuration:

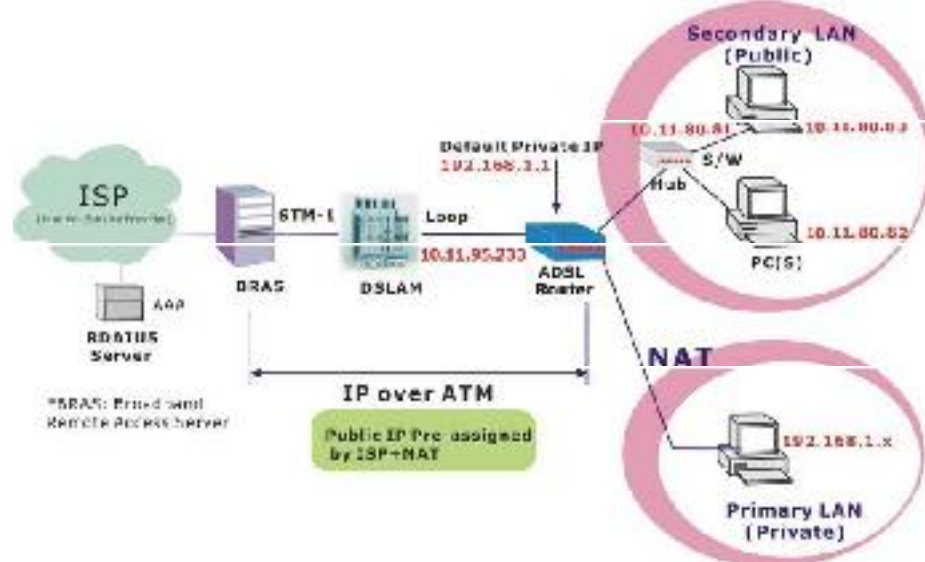
1. Start your browser and type **192.168.1.1** in the URL box to access ADSL web-based manager.
2. Go to **Quick Start – Quick Setup**. Uncheck **Auto Scan Internet Connection (PVC)**. Key in the **VCI** and **VPI** value, e.g.:
VPI – 0
VCI – 32
Click the **Next** button.
3. On the **Configure Internet Connection – Connection Type** page, select **IP over ATM (IPoA)** then click **Next**.
4. On the **WAN IP Settings** page, select **Use the following IP address** and **Use the following DNS Server Address**, then key in the information that your ISP offered, e.g.:
WAN IP Address: 10.11.95.233
WAN Subnet Mask: 255.255.255.248
Primary DNS server: 168.95.1.1
Secondary DNS server: 168.95.192.1
Uncheck **Enable NAT** and click **Next**.
5. On the **Configure LAN side Settings** page, key in the information for your LAN, e.g.,
Primary IP Address: 192.168.1.1
Subnet mask: 255.255.255.0
Start IP Address: 192.168.1.2
End IP Address: 192.168.1.254
6. Check **Configure the second IP Address and Subnet Mask for LAN Interface** and enter the information needed.
Secondary IP Address: 10.11.80.81

Subnet mask: 255.255.255.248

Click **Next**.

7. Check the network information on the **Summary** page. Make sure the settings match the settings provided by your ISP. Click **Finish**.
8. Refer to the TCP/IP properties, specify an IP Address, and fill in other information needed, e.g.:
IP Address: 10.11.80.82
Subnet Mask: 255.255.255.248
Gateway: 10.11.80.81
Preferred DNS server: 168.95.1.1
9. Now the router is well-configured. You can access the Internet.

Numbered IP over ATM (IPoA)+NAT



Description:

In this deployment environment, we make up a private IP network of 192.168.1.1. NAT function is enabled (on ADSL Router or use another NAT box connected to hub) to support multiple clients to access the Router and some public servers (WWW, FTP).

If you apply for multiple IP addresses from your ISP, you can assign these public IP addresses to the ADSL Router and public server, e.g., Web or FTP server. Typically the first IP is network address, the second is used as router IP address and the last one is subnet broadcasting. Other remaining IP addresses can be assigned to PCs on the LAN.

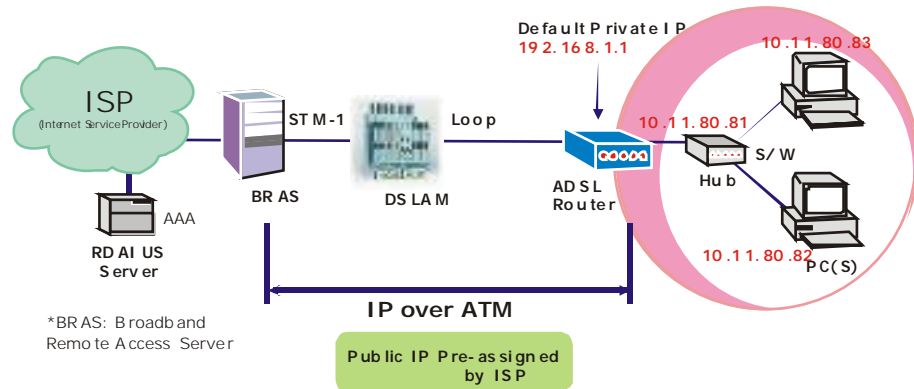
The following example uses the IP address ranging from 10.11.80.81 to 10.11.80.86 and the subnet mask is 255.255.255.248.

Configuration:

1. Start your browser and type **192.168.1.1** in the URL box to access ADSL web-based manager.
2. Go to **Quick Start – Quick Setup**. Uncheck **Auto Scan Internet Connection (PVC)**. Key in the VCI and VPI value, e.g.:
VPI – 0
VCI – 32
Click the **Next** button.
3. On the **Configure Internet Connection – Connection Type** page, select **IP over ATM (IPoA)** then click **Next**.
4. On the **WAN IP Settings** page, select **Use the following IP address** and **Use the following DNS Server Address**, then key in the information that your ISP offered, e.g.:
WAN IP Address: 10.11.80.81
WAN Subnet Mask: 255.255.255.248
Primary DNS server: 168.95.1.1
Secondary DNS server: 168.95.192.1
5. Check the **Enable NAT** box. And click **Next**.

6. On the **Configure LAN side Settings** page, key in the information for your LAN, e.g.,
Primary IP Address: *192.168.1.1*
Subnet mask: *255.255.255.0*
Start IP Address: *192.168.1.2*
End IP Address: *192.168.1.254*
7. Check the network information. Make sure the settings match the settings provided by ISP. Click **Finish**.
8. Now the router is well configured. You can access into Internet.

Unnumbered IP over ATM (IPoA)



Description:

If you apply for multiple IP addresses from your ISP, you can assign these public IP addresses to the ADSL Router and public server, e.g., Web or FTP server. Typically the first IP is network address, the second is used as router IP address and the last one is subnet broadcasting. Other remaining IP addresses can be assigned to PCs on the LAN.

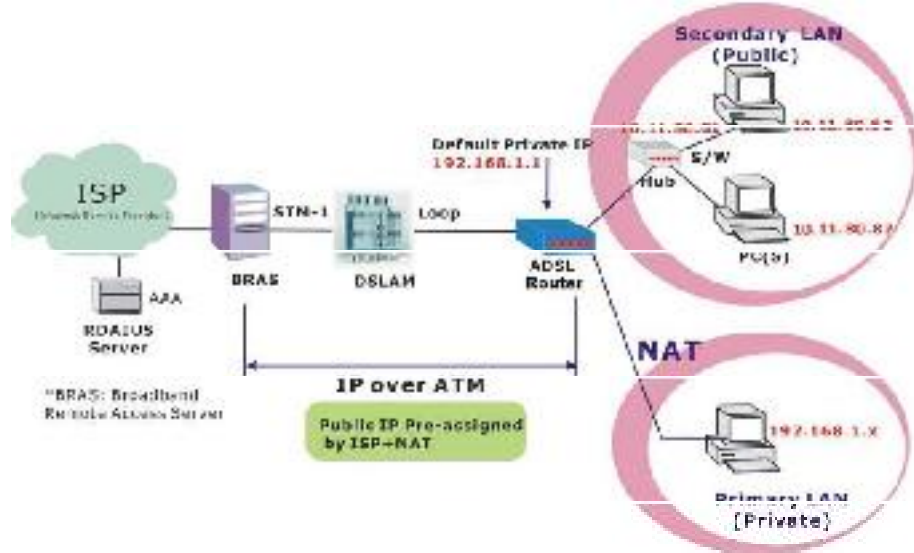
The following example uses the IP address ranging from 10.11.80.81 to 10.11.80.86 and the subnet mask is 255.255.255.248. In such circumstance, we do not assign any WAN IP.

Configuration:

1. Start your browser and type **192.168.1.1** in the URL box to access ADSL web-based manager.
2. Go to **Quick Start – Quick Setup**. Uncheck **Auto Scan Internet Connection (PVC)**. Key in the **VCI** and **VPI** value, e.g.:
VPI – 0
VCI – 32
Click the **Next** button.
3. On the **Configure Internet Connection – Connection Type** page, select **IP over ATM (IPoA)** then click **Next**.
4. On the **WAN IP Settings** page, select **None** for WAN IP address settings. Then, select **Use the following DNS Server Address** and key in the information that your ISP offered, e.g.:
Primary DNS server: 168.95.1.1
Secondary DNS server: 168.95.192.1
Uncheck **Enable NAT** and click **Next**.
5. On the **Configure LAN side Settings** page, key in the information for your LAN, e.g.,
Primary IP Address: 192.168.1.1
Subnet mask: 255.255.255.0
Start IP Address: 192.168.1.2
End IP Address: 192.168.1.254
6. Check **Configure the second IP Address and Subnet Mask for LAN Interface** and enter the information needed, e.g.,
Secondary IP Address: 10.11.80.81
Subnet mask: 255.255.255.248
Check **DHCP Server Off** and click **Next**.

7. Check the network information on the **Summary** page. Make sure the settings match the settings provided by your ISP. Click **Finish**.
8. Refer to the TCP/IP properties, specify an IP Address, and fill in other information needed, e.g.:
IP Address: *10.11.80.82*
Subnet Mask: *255.255.255.248*
Gateway: *10.11.80.81*
Preferred DNS server: *168.95.1.1*
9. Now the router is well-configured. You can access the Internet.

Unnumbered IP over ATM (IPoA)+NAT



Description:

If you apply for multiple IP addresses from your ISP, you can assign these public IP addresses to the ADSL router and public server, e.g., Web or FTP server. Typically the first IP is network address, the second is used as router IP address and the last one is subnet broadcasting. Other remaining IP addresses can be assigned to PCs on the LAN.

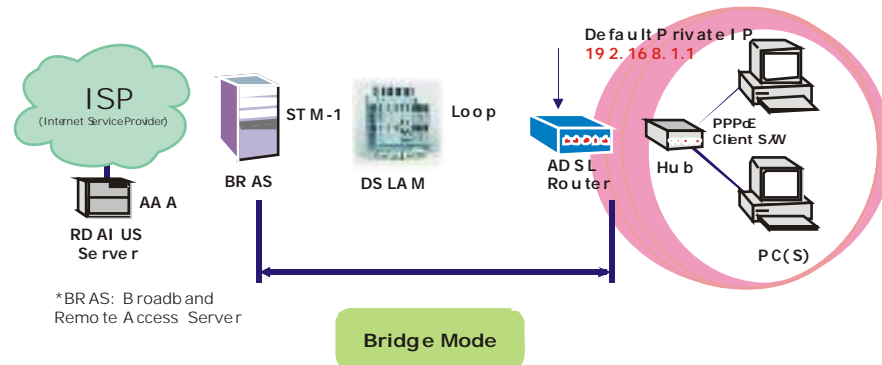
The following example uses the IP address ranging from 10.11.80.81 to 10.11.80.86 and the subnet mask is 255.255.255.248. In such circumstance, we enable NAT function but not assign any WAN IP.

Configuration:

1. Start your browser and type **192.168.1.1** in the URL box to access ADSL web-based manager.
2. Go to **Quick Start – Quick Setup**. Uncheck **Auto Scan Internet Connection (PVC)**. Key in the **VCI** and **VPI** value, e.g.:
VPI – 0
VCI – 32
Click the **Next** button.
3. On the **Configure Internet Connection – Connection Type** page, select **IP over ATM (IPoA)** then click **Next**.
4. On the **WAN IP Settings** page, select **None** for WAN IP address settings. Then, select **Use the following DNS Server Address** and key in the information that your ISP offered, e.g.:
Primary DNS server: 168.95.1.1
Secondary DNS server: 168.95.192.1
5. Check the **Enable NAT** box. And click **Next**.
6. On the **Configure LAN side Settings** page, key in the information for your LAN, e.g.,
Primary IP Address: 192.168.1.1
Subnet mask: 255.255.255.0
Start IP Address: 192.168.1.2
End IP Address: 192.168.1.254

7. Check **Configure the second IP Address and Subnet Mask for LAN Interface** and enter the information needed, e.g.,
Secondary IP Address: *10.11.80.81*
Subnet mask: *255.255.255.248*
Click **Next**.
8. Check the network information on the **Summary** page. Make sure the contents match the settings provided by your ISP. Click **Finish**.
9. Now the router is well-configured. You can access the Internet.

Bridge Mode



Description:

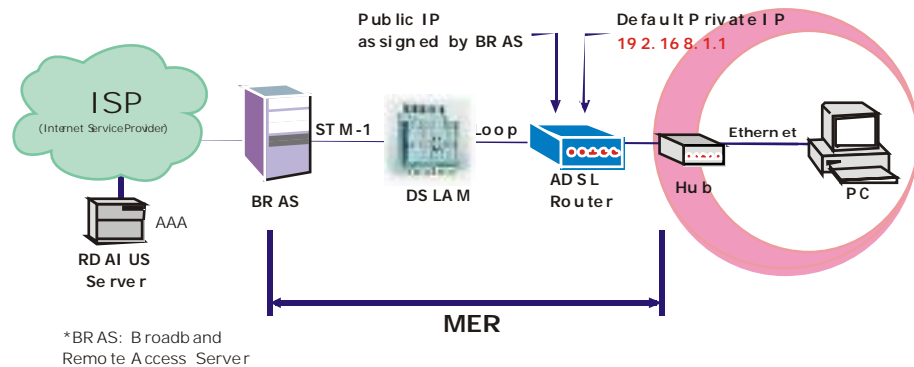
In this example, the ADSL Router acts as a bridge which bridging the PC IP addresses from LAN to WAN. The PC IP address can be a static public address that is pre-assigned by the ISP or a dynamic public address that is assigned by the ISP DHCP server, or an IP address received from PPPoE software.

Therefore, it does not require a public IP address. It only has a default private IP address (192.168.1.1) for management purpose.

Configuration:

1. Choose a client PC and set the IP as 192.168.1.x (x is between 2 and 254) and the gateway as 192.168.1.1.
2. Start your browser and type **192.168.1.1** in the URL box to access ADSL web-based manager.
3. Go to **Quick Start – Quick Setup**. Uncheck **Auto Scan Internet Connection (PVC)**. Key in the **VCI** and **VPI** value, e.g.,
VPI – 0
VCI – 35
 Then click the **Next** button.
4. On the **Configure Internet Connection – Connection Type** page, select **Bridging** then click the **Next** button.
5. On the **WAN IP Settings** page, select **None** for WAN IP address settings.
6. On the **Configure LAN side Settings** page, enter the IP address and subnet mask for your LAN, e.g.:
Primary IP address: 192.168.1.1
Subnet Mask: 255.255.255.0
 Choose **DHCP Server Off** and click **Next**.
7. Check the network information on the **Summary** page. Make sure the contents match the settings provided by your ISP. Click **Finish**.
8. Refer to the TCP/IP properties, specify an IP Address, and fill in other information needed, e.g.:
IP Address: 10.11.86.81
Subnet Mask: 255.255.255.248
Gateway: 10.11.86.1
Preferred DNS server: 168.95.1.1
9. Click **OK**. Now the router is well-configured. You can access to the Internet.

MER

**Description:**

In this deployment environment, we make up a private IP network of 192.168.1.1. NAT function is enabled to support multiple clients to access to Internet.

In this example, the ADSL Router acts as a NAT device which translates a private IP address into a public address. Therefore multiple users can share with one public IP address to access the Internet through this router. The public address can be a static public address that is pre-assigned by ISP or a dynamic public address that is assigned by the ISP DHCP server.

Configuration:

1. Start your browser and type **192.168.1.1** in the URL box to access ADSL web-based manager.
2. Go to **Quick Start – Quick Setup**. Uncheck **Auto Scan Internet Connection (PVC)**. Key in the **VCI** and **VPI** value, e.g.,
VPI – 0
VCI – 37
 Then click the **Next** button.
4. On the **Configure Internet Connection – Connection Type** page, select **Bridging** and then click the **Next** button.
5. On the **WAN IP Settings** page, select **Obtain an IP address automatically**; then, select **Obtain DNS server address automatically**.
6. Check **Enable NAT**. Then click **Next**.
7. On the **Configure LAN side Settings** page, key in the IP address and subnet mask for your LAN. Check **DHCP Server On** box, and enter the start and end points, e.g.:
Primary IP address: 192.168.1.1
Subnet Mask: 255.255.255.0
Start IP Address: 192.168.1.2
End IP Address: 192.168.1.254
 Then key in the leased time that you want. And click **Next**
8. Check the network information on the **Summary** page. Make sure the contents match the settings provided by your ISP. Click **Finish**.
9. Now the router is well-configured. You can access the Internet.

Chapter 4: Web Configuration



Some users might want to set specific configuration for the router such as firewall, data transmission rate..., and so on. This chapter will provide you advanced information of the web pages for the router for your reference.

Using Web-Based Manager

After properly configuring your host PC, please proceed as follows:



1. Start your web browser and type **192.168.1.1**, the private IP address of the ADSL Router, in the URL field.
2. After connecting to the device, you will be prompted to enter username and password. By default, both the username and the password are **admin**. An example under Windows XP is shown as the left figure.

If you login successfully, the main page will appear. From now on, the ADSL Router acts as a web server sending HTML pages/forms on your request. You can fill in these pages/forms and apply them to the ADSL Router.

Outline of Web Manager

To configure the web page, please use **admin** as the username and the password. The main screen will be shown as below.



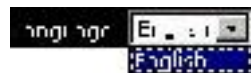
- Title:** The title of this management interface.
- Main Menu:** Including Quick Start, Status, Advanced, and Management.
- Main Window:** The current workspace of the web manager, containing configuration or status information.
- Current Version:** Here provides the version info for firmware and ADSL2+.

To Have the New Settings Take Effect

After selecting or adjusting the settings according to your needs, your customizations will be saved to the flash memory before you restart the router. And only after rebooting the router, your customizations may take effect.

Language

On the top to the right of this web page, it provides a drop-down menu for you to choose a proper language. (Nonetheless, we only offer English at present.)



Quick Start

The pages under the Quick Start menu provide user a quick way to set up the router. If you do not know much about the router, you can use the Quick Start pages to adjust basic settings to activate your router.

Connect to Internet

This is a quick way to connect to the Internet by using PPPoE interface, please click **Connect to Internet** to open the web page.

Enter the user name and password (that you get from the ISP) for your ADSL router and click **Connect**.

The system will connect automatically, and then you can access the Internet.



Quick Setup

The quick setup wizard will guide you to configure the ADSL router through some specific steps. Yet different connection interface will lead to different setting pages. Refer to the following pages for detailed information.

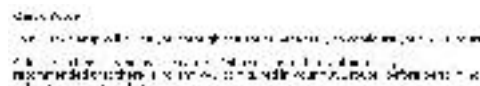


Auto Scan Internet Connection (PVC):

The default setting is checked, shown as the figure. If there is no any PVC configured in your ADSL router, you can check this item so that it may start to scan internet connection automatically. Otherwise, please leave this item unchecked.

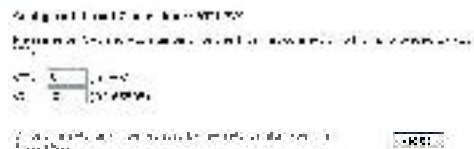


After unchecking the Auto Scan item, you will have to enter VPI and VCI value to configure a new ATM PVC.



VPI (Virtual Path Identifier):

Identifies the virtual path between endpoints in an ATM network. The valid range is from 0 to 255. To enter the setting, please refer to the setting that the ISP offered.



VCI (Virtual Channel Identifier):

Identifies the virtual channel endpoints in an ATM network. The valid range is from 32 to 65535 (1 to 31 is reserved for well-known protocols). To enter the setting, please refer to the setting that the ISP gave you.

After entering the VPI/VCI value, please click **Next** for the following step.

Connection Type

The system provides several protocols for you to choose. Your ISP will offer you the most suitable settings of the protocol. Before you set this page, please refer to the protocol that your ISP offered.

After clicking on the **Next** button from the VPI/VCI web page, the following screen will appear. Please choose the connection type and encapsulation mode that you want to use and click **Next** for next page.

For instance, PPP over Ethernet (PPPoE) is selected in this demonstrative figure.



PPP over ATM/ PPP over Ethernet

If the connection type you choose is **PPP over ATM** or **PPP over Ethernet**, please refer to the following information.

According to the ISP's configuration on the server, you can choose PPPoE or PPPoA modes.

Choose **PPPoA** or **PPPoE** and click **Next**.



On this screen, you have to make the settings for WAN IP. To get the IP address automatically, click the **Obtain an IP address automatically** radio button. Or click **Use the following IP address** button and enter the IP address for WAN interface.



Check **Enable NAT** if you need.

MTU:

It means the maximum size of the packet that transmitted in the network. The packet of the data greater than the value set here will be divided into several packets for transmitting.

The default setting for PPPoE is 1492; while for PPPoA is 1500.

Click **Next** for the next procedure.

PPP Username & PPP Password:

Key in the username and password that you received from your ISP.

Always On:

Select this item to make the connection active all the time.

Dial on Demand:

Select this item to make a connection automatically while in demand. Enter the timeout to cut off the network connection if there is no activity for this router.

Manually Connect:

Select this item to make a connection by pressing the **Connect** hyperlink on the **Advanced Setup – Internet – Connections** web page.

On the **Configure LAN side Settings** page, you have to fill in the data requested.

Primary IP Address & Subnet Mask:

Key in the information that offered by your ISP for the LAN connection.

Configure the secondary IP Address and Subnet Mask:

Check this box to set up a secondary IP Address to connect to your router if they are not included in the range that DHCP server accepts. See the next figure for the secondary IP address and subnet mask.

Secondary IP Address & Subnet Mask:

Key in the second IP address and the subnet mask received from the ISP for your LAN connection.

MTU: (refer to the WAN section)

The default **MTU** value for **LAN side Settings** is 1500. You may modify it if necessary.

DHCP Server On:

Check this item if DHCP service is needed on the LAN side. The router will assign IP address and gateway address for each of your PCs.

Start IP Address & End IP Address:

Enter the information needed.

Lease Time:

Key in the duration for the leased time. The default is 1 day.

DHCP Server Off:

Check this item if DHCP service is not needed on the LAN.



On this web page, the primary IP address and subnet mask will be shown on it. You can modify them if needed.



Key in all the necessary settings and click **Next** for the coming page.

You can check the contents on the **Summary** page.

If you find anything incorrect, click **Back** to modify the settings.

If everything is OK, click **Finish** to accept these settings.

Now, the system will reboot to activate the new settings that you have set in this section.

Please wait for 2 minutes before restarting the router.

[illegible][illegible]

IP over ATM

If the type you have to choose is IP over ATM, please refer to the following information.

IPoA is an alternative of LAN emulation. It allows TCP/IP network to access ATM network and uses ATM quality of service's features.

Choose **IPoA** and click **Next**.



None:

If it is not necessary to set the WAN IP address, please click this button.

Obtain an IP address automatically:
Click this button to allow the system to get an IP address automatically.

WAN IP Address & WAN Subnet Mask:

If you choose **Use the following IP address**, you have to enter the IP address and subnet mask information that you received from the ISP for the WAN interface.



Obtain DNS server address automatically:

Only when you select **Obtain an IP address automatically** that this option is available. You may click this button to allow the system to get DNS server address automatically.

Use the following DNS server addresses:

Select this item to set the DNS server addresses manually, type the information provided by your ISP in the following **Primary DNS** and **Secondary DNS server** entries, e.g., **168.95.1.1** and **168.95.192.1**.

Click **Enable NAT** if necessary.

On the **Configure LAN side Settings** page, you have to fill in the data requested.

After setting up the WAN IP and DNS server information, click **Next** to open the following page.

Primary IP Address & Subnet Mask:

Key in the information that offered by your ISP for the LAN connection, e.g., **192.168.1.1** for the primary IP address and **255.255.255.0** for the subnet mask.

MTU:

(Please refer to the PPPoA/ PPPoE section.) The default **MTU** setting here is 1500. You may modify it if necessary.



Configure the secondary IP Address and Subnet Mask for LAN interface:

Check this box to set up a secondary IP Address to connect to your router if they are not included in the range that DHCP server accepts. You have to key in the information received from your ISP for the LAN connection, e.g., the secondary IP is *10.11.80.81* and the mask is *255.255.255.248* in the example illustrated in the figure.

DHCP Server On:

Check this item if DHCP service is needed on the LAN side. The router will assign IP address and gateway address for each of your PCs.

Start IP Address & End IP Address:

Enter the information needed.

Lease Time:

Key in the duration for the time. The default is 1 day.

DHCP Server Off:

Check this item if DHCP service is not needed on the LAN.

You can check the settings on the **Summary** page.

If you find anything incorrect, click **Back** to modify the settings.

If everything is OK, click **Finish** to accept these settings.

And the following page will appear.

Now, the system will reboot to activate the new settings that you have set in this section.

Please wait for 2 minutes before restarting the router.

Key in all the necessary settings.
Click **Next** for the coming page.

Bridging

If the mode you choose is **Bridging** (or **MER**), please refer to the following information.

The bridging mode can configure your router to send and receive packets between LAN and WAN interfaces. The WAN interface is ATM PVC; the LAN interface can be Ethernet, USB, or Wireless.

Choose **Bridging** and click **Next**.

None:

If it is not necessary to set the WAN IP address, please click this button. In our example, we select this item.

Obtain an IP address automatically:

Click this button to allow the system to get an IP address automatically.

WAN IP Address, WAN Subnet Mask, and Default Gateway: When choosing **Use the following IP address**, you have to key in the IP address, the subnet mask, and the default gateway provided by your ISP for the WAN interface.

While you choose to obtain the IP address automatically or use specific IP address, you have to decide whether to select **Obtain DNS server address automatically** or **Use the following DNS server address** and enter the information provided by you ISP.

You may check **Enable NAT** if you want.

Press **Next** to continue.

Primary IP Address & Subnet Mask:

Key in the IP address and the subnet mask that provided by your ISP for LAN interface. The primary IP address and subnet mask for our example are *192.168.1.1* and *255.255.255.0*, respectively.

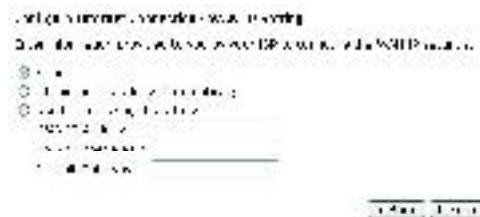
MTU: Please refer to PPPoA/ PPPoE.

DHCP Server On:

Check this item if DHCP service is needed on the LAN. The router will assign IP address and gateway address for each of your PCs.

DHCP Server Off:

Check this item if DHCP service is not needed on the LAN. We choose this item in our example.



The default setting is none, shown as the figure above. While selecting **Obtain an IP address automatically** or **Use the following IP address**, the DNS setting appears, shown as the figure below.



You can check the settings on the **Summary** page now.

If you find anything incorrect, click **Back** to modify the settings.

If everything is OK, click **Finish** to accept these settings.

And the following page will appear.

Now, the system will reboot to activate the new settings that you have done in this section.

Please wait for 2 minutes before restarting the router.



Status

Overview

This page displays the current status for the ADSL connection, including system up time, ADSL speed, and the information about LAN IP address, default gateway, DNS server, firmware version, boot loader version, ADSL driver version, Ethernet MAC address, and memory size. The system status will be different according to the settings that you configured in the web pages.

Device Information

This information reflects the current status of your ADSL router.

System Up Time	11:11:04:00
ADSL Speed (DS/US)	70.0/88.0 kbps
LAN IP Address	192.168.1.1
Default Gateway	192.168.1.254
Primary DNS server	192.168.1.1
Secondary DNS server	192.168.1.2
Firmware Version	1.0.0
Boot Loader Version	1.0.0.0.0.0
ADSL Driver Version	ADSL2.0.1.0.0
Ethernet MAC Address	00:0C:29:5A:00:00
IPv4 MAC Address	00:0C:29:5A:00:00
Memory Size	48M Flash / 128M RAM

ADSL Line

This page shows all information for ADSL.

For knowing the quality of the ADSL connection, please click **ADSL BER Test** button to have advanced information.

Click [More Information](#) hyperlink to show more detailed information about ADSL Line Status.

ADSL Line Status

ADSL Line Status: The status of the ADSL line.

Line Status	Line Type	Line Status	Line Type
ADSL Line	ADSL Line	ADSL Line	ADSL Line
ADSL Line	ADSL Line	ADSL Line	ADSL Line

ADSL Line	ADSL Line	ADSL Line
ADSL Line	ADSL Line	ADSL Line
ADSL Line	ADSL Line	ADSL Line
ADSL Line	ADSL Line	ADSL Line
ADSL Line	ADSL Line	ADSL Line
ADSL Line	ADSL Line	ADSL Line

ADSL BER Test

This test determines the quality of the ADSL connection. It is done by transferring idle cells containing a known pattern and comparing the received data with this known pattern to check for errors.

After selecting the test duration time and click **Start**, the following dialog appears to tell you the test is running. You can stop the test by pressing **Stop** or close this dialog window by clicking **Close**.

When the test is over, the result will be shown on the following dialog window for your reference. Click **Close** to close this window.



Internet Connection

This page displays the connection information for your router, such as the PVC name, VPI/VCI value, service category, protocol, invoking NAT and QoS or not, IP address, linking status, and so on.

Internet Connection

Table 4-1 Internet Connection

Interface	PVC Name	VPI/VCI	Service Category	Protocol	NAT	QoS	IP Address	Linking Status
eth0	eth0	8	1	PPPoE	Y	Y	192.168.1.1	Up

Traffic Statistics

This table shows the records of data going through the LAN and WAN interface. For each interface, cumulative totals are displayed for **Received** and **Transmitted**.

You may click **Reset** to reset the amount.

Traffic Statistics

Table 4-2 Traffic Statistics

Interface	Type	Received		Transmitted	
		Packets	Bytes	Packets	Bytes
eth0	eth0	1	1	1	1
eth1	eth1	1	1	1	1

Reset

DHCP Table

This table shows all DHCP clients who get their IP addresses from your ADSL Router. For each DHCP client, it shows the **Host Name**, **MAC Address**, **IP Address** and the **Lease Time**.

DHCP Table

Table 4-3 DHCP Table

Host Name	MAC Address	IP Address	Lease Time
eth0	00:10:00:00:00:00	192.168.1.1	10:00:00:00

Routing Table

This table shows the routing rules that your router uses.

Routing Table

Table 4-4 Routing Table

Destination	Gateway	Next Hop	Interface	Metric
0.0.0.0/0	192.168.1.1	192.168.1.1	eth0	1
192.168.1.0/24	192.168.1.1	192.168.1.1	eth0	1

ARP Table

This table shows the IP address record for IP-to-Physical translation in your router.

ARP Table

Table 4-5 ARP Table

IP Address	Physical Address	Interface	Type
192.168.1.1	00:10:00:00:00:00	eth0	Static

Advanced Setup

Local Network – IP Address

This page is the same as you can see on the **Configure LAN side Settings** page while running the **Quick Setup**. It allows you to set IP Address and Subnet Mask values for LAN interface.

Primary IP Address:

Key in the first IP address that you received from your ISP for the LAN connection.

Subnet Mask:

Key in the subnet mask that you received from your ISP for the LAN connection.

Host Name:

List the host name of this device.

Domain Name:

List the name of the domain.

Configure the secondary IP Address and Subnet Mask:

Check this box to enter another set of IP Address and Subnet Mask to connect to your router if they are not included in the range that DHCP server accepts.

After checking this box, the secondary IP address and subnet mask entries will show up, as shown in the right figure.

Secondary IP Address & Subnet Mask: Enter the information provided by your ISP for your LAN connection.

MTU:

It means the maximum size of the packet that transmitted in the network. The packet of the data greater than the number set here will be divided into several packets for transmitting. The default value for LAN setting is 1500.

Apply:

Click this button to activate the settings listed above.



Local Network – DHCP Server

This allows you to set DHCP server on LAN interface.

DHCP Server On:

Check this item if DHCP service is needed on the LAN. The router will assign IP address and gateway address for each of your PCs.

You have to key in **Start IP Address**, **End IP Address**, and **Lease Time**.

The default lease time is 1day.

Relay On:

Click this button to have a relay setting. And type the Server IP in the IP field.

When the DHCP server is served by another device rather than the router itself, you can relay to that specific server and enter the IP address of it, as 10.11.95.2 in our example.

Server and Relay Off:

Check this item if DHCP service isn't needed on the LAN.

Apply:

Click this button to activate the settings listed above.

You can reserve one specific IP address for a certain PC for particular purpose. Simply add a mapping entry of MAC address & IP address for that PC by pressing the **Reserved IP Address List** button. The window as the one shown in the right column will appear.

Click the **Add** button to open another dialog window, shown as the right one. On **PC's MAC Address** and **Assigned IP Address** boxes, please type the correct information according to your need and click **Apply**.

The information added will be shown on the window right away, as the right figure illustrates. That is, the specified address will be reserved and not be assigned by DHCP for other computer(s).

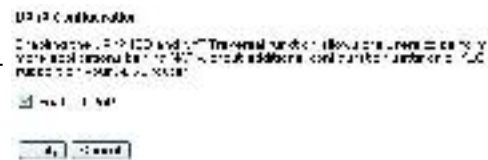
You may click **Add** button to add another set or click **Close** to exit.



Local Network – UPnP

The UPnP is only available for Windows XP. If you are not a Windows XP user, you may ignore this page.

Enabling the UPnP IGD and NAT traversal function allows the users to perform more applications behind NAT without additional configuration settings or ALG support on your ADSL Router.



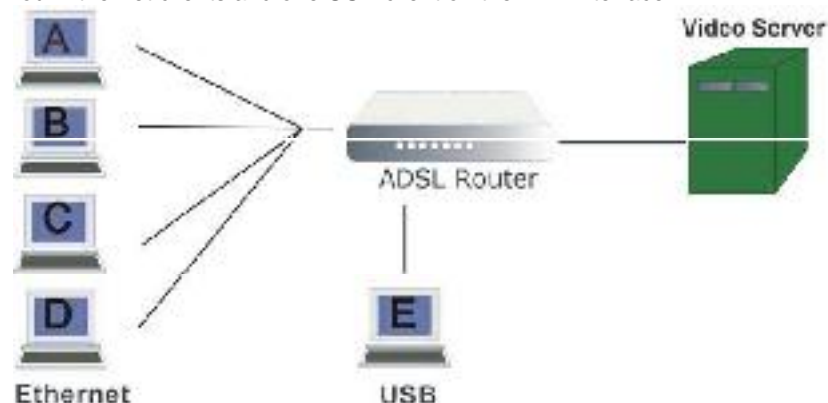
You can enable the UPnP function through this web page by checking **Enable UPnP** and press **Apply**.

Local Network – IGMP Snooping

Traditionally, IP packets are transmitted in one of either two ways - Unicast (1 sender to 1 recipient) or Broadcast (1 sender to everyone on the network). Multicast delivers IP packets to just a group of hosts on the network.

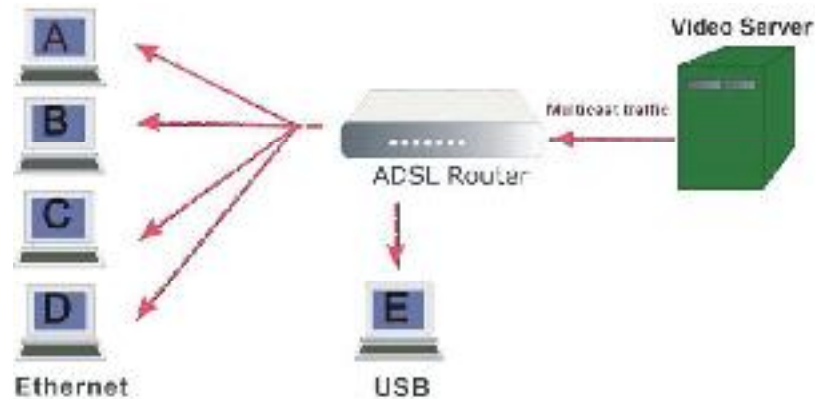
Without IGMP snooping, multicast traffic is treated in the same manner as broadcast traffic, that is, it is forwarded to all ports. With IGMP snooping, multicast traffic of a group is only forwarded to ports that have members of that group. IGMP snooping generates no additional network traffic, allowing you to significantly reduce multicast traffic passing through your switch.

The figure below shows a simple network connected via the ADSL router. There are four Ethernet clients and one USB client on the LAN interface.

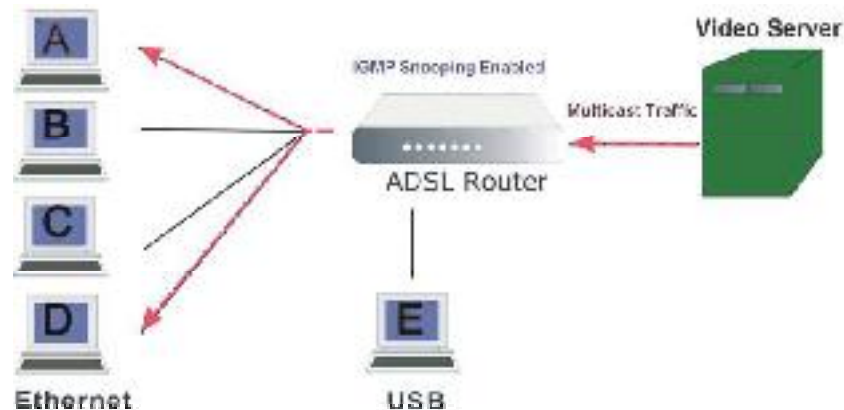


Now suppose the video server is the multicast transmitter and host A and D are multicast receivers. If we do not turn on the IGMP snooping function, the router will

forward the multicast traffic to all hosts connecting to this router and consequently block and interrupt the traffic of the other users who do not want to receive the multicast service, shown as the following figure.



When IGMP snooping is invoked, it makes the system aware to establish the best path for multicast service to save LAN bandwidth. Refer the figure below, just as desired, only host A and D will actually receive multicast traffic when IGMP snooping is enabled.



While IGMP snooping is enabled, the IGMP packets will be monitored, the membership information will be recorded and processed, and the multicast traffic will only be forwarded to those LAN interfaces, such as Ethernet and USB, which are bonded to the subscribed multicast groups. Thus it helps to save the bandwidth and helps the devices to perform more effectively.

Check **Enable IGMP Snooping** and click **Apply** to invoke this function.

When IGMP Snooping is enabled, you can check the box below to filter out multicast packets which will be sent to your local network if no user plays multimedia movies.

If the PVC you're using is NAT enabled, remember to turn on the IGMP Proxy at the same time. Please refer to **Internet – IGMP Proxy** for more information.





Note that the IGMP proxy must be enabled first. If the IGMP Snooping function is not available as shown in the following figure, you have to enable the IGMP Proxy first.



Internet – Connections

To set WAN settings for each service, please open **Advanced – Internet**. This page allows you to edit, to remove, or to add WAN settings.

If you click the [Connect](#) hyperlink under the **PVC Name** item, the system will connect to WAN automatically. If the WAN connection is OK, you can check the detailed information directly.

You can add new PVC(s) by clicking the **Add** button, edit the settings for the present PVC by clicking  in the **Edit** column, or delete the existing PVC by pressing  icon.

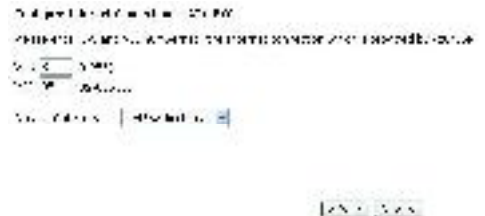


Adding a New One

To add a new WAN connection, please click the **Add** button. The following screen appears.

VPI (Virtual Path Identifier):

Identifies the virtual path between endpoints in an ATM network. The valid range is from 0 to 255. Please refer to the value that your ISP provides.



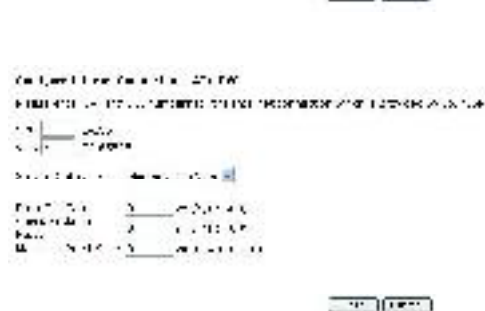
VCI (Virtual Channel Identifier):

Identifies the virtual channel endpoints in an ATM network. The valid range is from 32 to 65535 (1 to 31 is reserved for well-known protocols). Please refer to the value that your ISP provides.



Service Category:

It decides the size and rate for the packets of the data in different service type. There are five categories provided here for your selection, shown as the drop-down menu in the right column.



If you select **UBR with PCR** or **CBR**, you have to offer the value for the peak cell rate.

If you choose **Non Realtime VBR**, or **Realtime VBR**, you have to key in the value for the peak cell rate, sustainable cell rate, and maximum burst size.

As you can see from the right figure, the range for **Peak Cell Rate** is from 1 to 2500; the value for **Sustainable Cell Rate** ranges from 1 to 2499 and must be smaller than Peak Cell Rate; and the range for **Maximum Burst Size** is from 1 to 1000000.

After pressing **Next**, you will see the web page listed as the right one. Choose the protocol that you would like to use. (Here is the example for choosing **PPPoA**.)

Please refer to **Quick Setup** for more information if you don't know how to set the configuration.

You can check **Enable QoS** to improve performance for selected applications. More detailed information for QoS will be introduced in later instruction.

If you choose **PPPoE** or **Bridging**, you will see the option for **802.1Q VLAN Tagging**.

802.1Q VLAN Tagging:

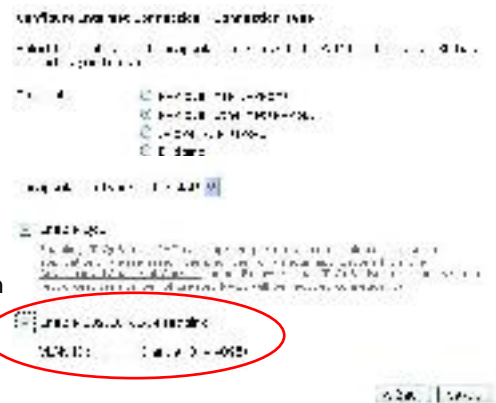
802.1Q-compliant switch ports can be configured to transmit tagged or untagged frames. A tag field containing VLAN (and/or 802.1p priority) information can be inserted into an Ethernet frame. If a port has an 802.1Q-compliant device attached (such as another switch), these tagged frames can carry VLAN membership information between switches, thus letting a VLAN span multiple switches. However, it is important for network administrators to ensure ports with non-802.1Q-compliant devices attached are configured to transmit untagged frames. Many NICs for PCs and printers are not 802.1Q-compliant. If they receive a tagged frame, they will not understand the VLAN tag and will drop the frame. Also, the maximum legal Ethernet frame size for tagged frames was increased in 802.1Q (and its companion, 802.3ac) from 1,518 to 1,522 bytes.

After checking **Enable 802.1Q VLAN Tagging**, you will have to enter a **VLAN ID**, as shown in the figure.

VLAN ID:

The VLAN Identifier is a 12 bit field. It uniquely identifies the VLAN to which the frame belongs to and can have a value between 0 and 4095.

Click **Next** to continue.



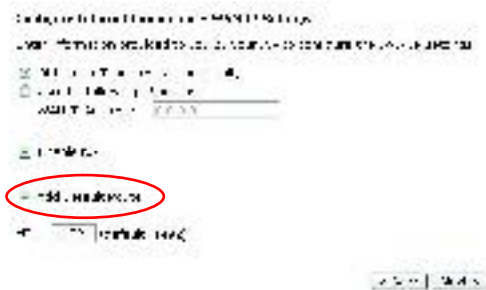
Notice that **802.1Q VLAN Tagging** function can only be invoked under **PPPoE** and **Bridging** Mode; the system will not provide this option while setting **PPPoA** or **IPoA** mode.

The **WAN IP settings** page will differ slightly according to the protocol that you choose. The graphic is the one that you will see if you choose the **PPPoE** mode in the previous step. You can select **Enable NAT** or change the **MTU** value according to your needs.

Add Default Route:

Check this item to add a default route.

The next figure following the WAN IP Settings in the PPPoE mode is shown at the right. You may refer to the **Quick Setup** for further information.

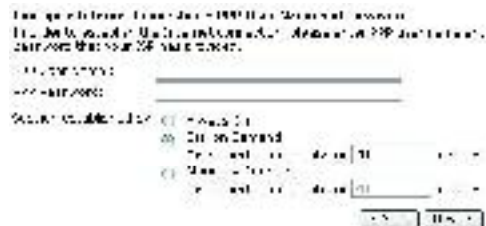


If you choose **IP over ATM** from the **Connection Type** web page, you will get a web page as the figure.

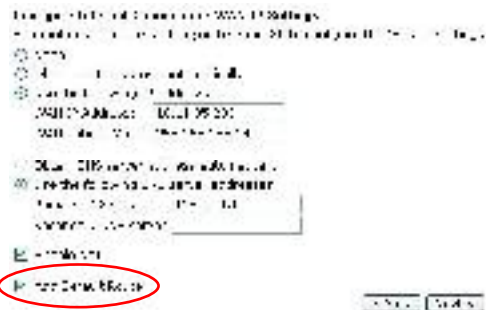
You may refer to **Quick Start – Connection Type – IPoA** section for more information.

Add Default Route:

Check this item to add a default IPoA route.

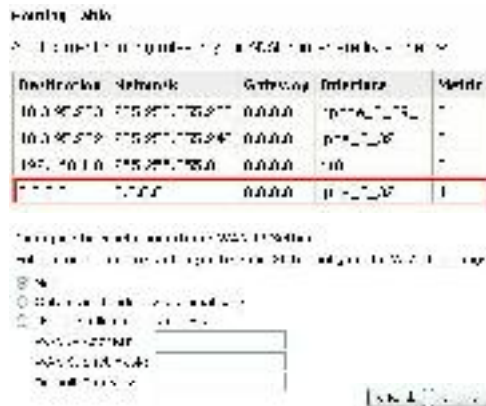


For example, after rebooting your router, the default route will be shown on the **Routing Table** under **Status** menu, you may check it.



If you choose **Bridging** from the **Connection Type** web page, you will get a web page as the figure listed at the right side.

Please refer to **Quick Setup** for more information.



After configuring the WAN IP Setting page, press Next, and then you will see the Summary page.

Check the information displayed here.

Enable this Internet Connection: Check the box to enable this internet connection or uncheck it to disable this setting. You may change this setting by press the Modify icon on the Advanced – Internet Connection Configuration page and click Next until the summary page is displayed.



Internet – DNS Server

If **Enable Automatic Assigned DNS** checkbox is selected, this router will accept the **first** received DNS assignment from one of the PPPoA, PPPoE or MER/DHCP enabled PVC(s) during the connection establishment. If the checkbox is not selected, it is necessary for you to enter the primary and optional secondary DNS server IP addresses. Finish your setting and click the **Apply** button to save it and invoke it.

Enable Automatic Assigned DNS:
Check this box to enable this function, or uncheck this box to disable it.

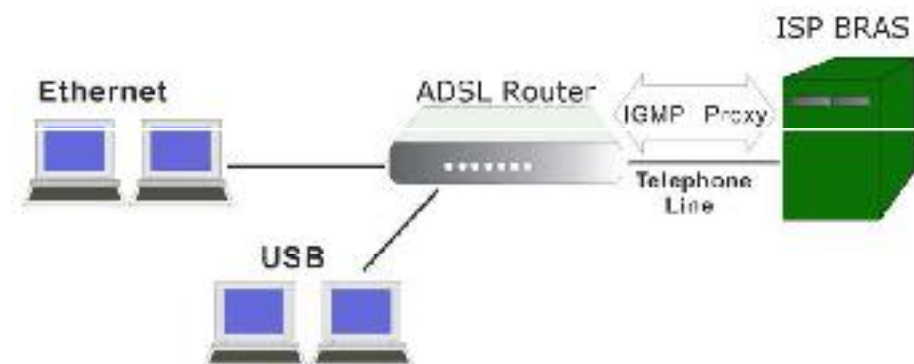
Primary DNS server & Secondary DNS server:
Key in your primary and secondary DNS server addresses received from the ISP.

If you are satisfied with the settings, click **Apply**.



Internet – IGMP Proxy

The Internet Group Management Protocol (IGMP) is an Internet protocol that provides a way for an Internet computer to report its multicast group membership to adjacent routers.



The hosts interact with the system through the exchange of IGMP messages. When you want to configure IGMP proxy, the system will interact with other routers through the exchange of IGMP messages. However, when acting as the proxy, the system performs the host portion of the IGMP task as follows:

- When being queried, the system will send membership reports to the group.
- When one of the hosts joins a multicast address group which none of other hosts belongs to, the system will send unsolicited membership reports to that group.
- When the last host in a particular multicast group leaves the group, the system will send a leave group membership report to the router's group.

Internet Connection:

This table displays the Internet connection(s) created in this router.

IGMP Proxy Enabled:

Check this box to enable this function or uncheck this box to disable this function.

After finish the settings, click **Apply**.



Internet – ADSL

Enable ADSL Port:

Check this box to enable this function. It simply invokes the line mode that you choose here for the router.

Select the support of line modes:

There are several selections, and you may select them according to the line modes supported by your ISP and your needs.



Capability Enabled:

Two items are provided here for you to choose.

Bitswap:

It is a mandatory receiver initiated feature to maintain the operating conditions of the modem during changing environment conditions. It reallocates the data bits and power among the allowed carriers without modification of the higher layer control parameters in the ATU. After a bit swapping reconfiguration, the total data rate and the data rate on each latency path is unchanged. Check this box to enable the function. If not, uncheck this box to close the function.

Seamless Rate Adaptation:

It enables the ADSL2/ ADSL2+ Router to change the data rate of the connection while in operation without any service interruption or bit errors. Check this box to enable the function. If not, uncheck this box to close the function.

IP Routing – Static Route

The table shows all static route status and allows you to add or remove static routes. A static IP routing is a manually defined path, which determines the data transmitting route. If your local network is composed of multiple subnets, you may want to specify a routing path to the routing table.

Destination Network Address:

Display the IP address that the data packets are to be sent.

Netmask, Gateway, WAN Interface:

Display the subnet mask, gateway, and WAN interface information that the transmitting data will pass through.

Delete:

Allow you to remove selected route settings.



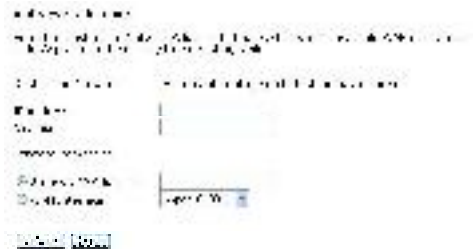
This page shows all the routing table of data packets going through your ADSL Router.

Adding a New One

To add a static route, please click **Add**. Type the destination network address, subnet mask and gateway that you received from the ISP and click **Apply**.

IP Address:

The destination IP address and netmask of the network indicates where data packets are to be sent. You may specify an IP, type 0.0.0.0, or leave it blank.



Gateway IP Address:


Click this button to forward packets to the specific gateway. Key in the gateway IP address that you want to use.

WAN Interface:

Click this button to forward packets to a specific WAN interface. Choose one from the drop-down menu.

For example, type *192.168.1.1* in the field of the gateway IP address and leave the destination network blank. Click **Apply** to view the routing result.

Remove Static Route

If you don't want the static route that you created, please click the  icon in the **Delete** column from the table.

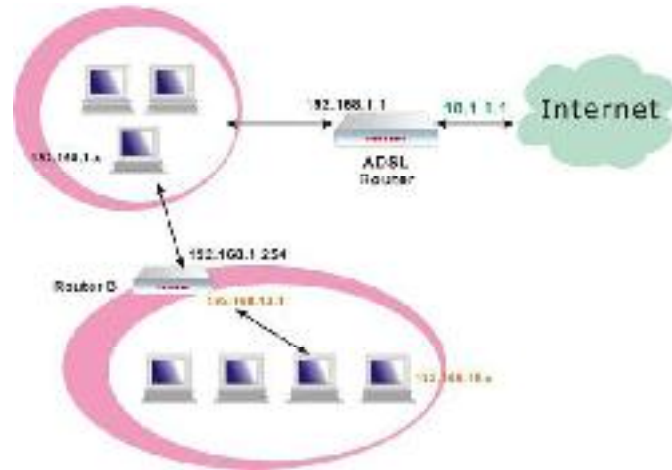


A dialog window will appear to confirm your action. Click **OK** to remove the static route, or click **Cancel** to keep the setting.



Example – Static Route

Here provides you an example of Static Route.



For the LAN shown above, if the PC in the subnet of 192.168.1.x wants to access the PC in the subnet of 192.168.10.x, we can set a static route in the ADSL router, in which the destination is the PC in the subnet 192.168.10.x and the gateway is router B. The setting would be as follows:

Destination: 192.168.10.0

Netmask: 255.255.255.0 (Standard Class C)

Gateway: 192.168.1.254 (Router B)

IP Routing – Dynamic Routing

Routing Information Protocol (RIP) is utilized by means of exchanging routing information between routers. It helps the routers to determine optimal routes. This page allows you to enable/disable this function.

RIP Version:

It incorporates the RIP information when receiving and broadcasting the RIP packets. From the drop down menu, select a RIP version to be accepted, **1**, **2** or **both**.

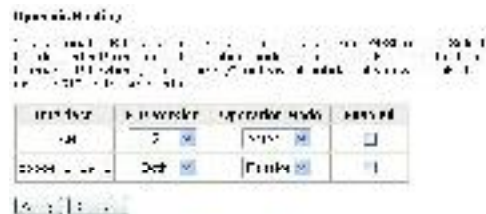
Operation:

There are two modes for you to choose, Active and Passive. Select **Active** for transmitting and receiving data, or select **Passive** for receiving data only.

Enabled:

Check **Enabled** to enable the RIP function on different interface. Otherwise, disable this function.

Click **Apply** to invoke the settings set here.



Virtual Server – Port Forwarding

The Router implements NAT to make your entire local network appear as a single machine to the Internet. The typical situation is that you have local servers for different services and you want to make them publicly accessible. With NAT applied, it will translate the internal IP addresses of these servers to a single IP address that is unique on the Internet. NAT function not only eliminates the need for multiple public IP addresses but also provides a measure of security for your LAN.

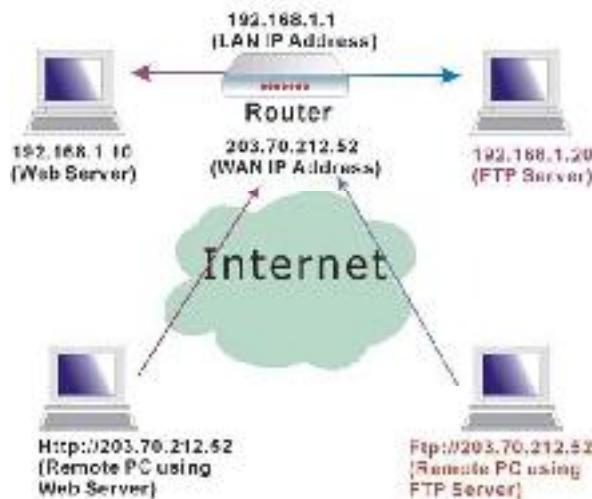
When the router receives an incoming IP packet requesting for accessing your local server, the router will recognize the service type according to the port number in this packet (e.g., port 80 indicates HTTP service and port 21 indicates FTP service). By specifying the port number, the router knows which service should be forwarded to the local IP address that you specified.

After setting the virtual server, you should modify the filter rule about the port and service information which you set on the virtual server. Because the firewall protects the router by filter rule, you should update the filter rule after you set up the virtual server.

Virtual Server function allows you to make servers on your LAN accessible to Internet users. Normally, Internet users would not be able to access a server on your LAN because:

- Your server does not have a valid external IP Address.
- Attempts to connect to devices on your LAN are blocked by the firewall in this device.

The Virtual Server feature solves these problems and allows Internet users to connect to your servers, as illustrated below:



IP Address seen by Internet Users

Once configured, anyone on the Internet can connect to your Virtual Servers.

Please note that, in the above picture, both Internet users are connecting to the same IP address, but using different protocols, such as *Http://203.70.212.52* and *Ftp://203.70.212.52*.

To Internet users, all virtual servers on your LAN have the same IP Address. This IP Address is allocated by your ISP. This address should be static, rather than dynamic, to make it easier for Internet users to connect to your Servers. However, you can use Dynamic DNS feature to allow users to connect to your virtual servers by using a URL, instead of an IP address.

IP addresses can be automatically redirected to local servers configured with private IP addresses. In other words, depending on the requested service (TCP/UDP port number), the router redirects the external service request to the appropriate server (located at another internal IP address).

Add New Port Forwarding

To set a virtual server, please open the **Virtual Server** item from the **Advanced** setup menu.

To add a new Port Forwarding, please click **Add** from the **Port Forwarding** web page.

Pre-defined:

Choose one of the service types from the first drop-down list, such as Audio/Video, Games, and so on. In the second drop-down list, choose the name of the application that you want to use with the type that you select in the first list.

For example, if you choose *Audio/Video* in the first field, the corresponding contents of the second field would be like the drop-down list shown as the following figure.



User defined:

Type a new service name for building a customized service for specific purpose.

There are three lines that you can enter settings into on this page. If you need more lines, just apply the settings and then add a new port forwarding rule.



From Internet Host IP Address:

Select the initial place for port forwarding. If you choose **SINGLE**, a box will appear for you to fill in the IP address for the specific host. And, if you choose **SUBNET**, the boxes for IP address and Netmask will appear for you to fill in the IP address and subnet mask for the specific subnet.



Forward to Internal Host IP Address:

Key in the address for the host used as the destination that information will be forwarded to.

For example, select the predefined application name *Audio/Video – Media Player 7*, set from *ALL* internet host IP addresses, and forward to *192.168.1.200*. Click **Apply**. Be sure to reboot your router for these changes to take effect.

The result will be displayed as the following figure.

If you do not want the server that you created, check the **Delete** box of that application and click the **Delete** button to discard it.

Or if you want to add another one, click **Add** to add a new one.

Virtual Server – Port Triggering

When the router detects outbound traffic on a specific port, it will set up the port forwarding rules temporarily on the port ranges that you specify to allow inbound traffic. It is supposed to increase the support for Internet gaming, video conferencing, and Internet telephony due to the applications require multiple connection.

To add a new port triggering rule, click **Add** to open this web page. Then choose an application name from the **Pre-defined** list box.

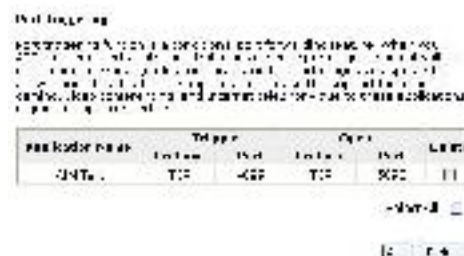
The system provides 9 items for you to choose.

Or define by yourself by typing the name into the field of **User defined**.

Click **Apply** to complete the setting.

If you select *AIM Talk* the result page will be like the demo figure in the right column.

You may delete the application by checking the delete box and pressing **Delete**.



Virtual Server – DMZ Host

In computer networks, a DMZ (demilitarized zone) is a computer host or small network inserted as a "neutral zone" between a company's private network and the outside public network. It prevents outside users from getting direct access to a server that has company data. A DMZ is an optional and more secure approach to a firewall and effectively acts as a proxy server as well.

To dose the function of DMZ Host, please click **Discarded**.

To activate a DMZ host, please click **Forwarded to the DMZ host** radio button, and enter the IP Address of DMZ host.

Click **Apply**.

DMZ Host

Enable this feature to allow a computer connected with Internet to access the private network. For example, you can enable this feature to forward the Internet traffic to a computer connected with Internet.

If you enable this feature from the Internet, you will be able to access the private network through the Internet.

☒ Forwarded

☐ Forwarded to the DMZ host

IP Address of DMZ Host:

Apply **Discard**

Once this feature is enabled, you must specify an IP address. It allows unrestricted 2-way communication between the specified IP address and other Internet users or Servers.

- └ This allows almost any application to be used on the specified IP address.
- └ The specified IP address will receive all "Unknown" connections and data.
- └ The DMZ feature only works when the NAT function is enabled.

Virtual Server – Dynamic DNS

The Dynamic DNS (Domain Name System) combines both functions of DNS and DHCP to map a dynamic IP to a fixed domain name. This page allows you to access the virtual servers with a domain name and password.

Dynamic DNS:

Select **Enable** to enable DDNS; select **Disabled** to disable this function.

Dynamic DNS Provider:

Choose a provider (*DynDNS.org*, *TZO.com*, *ChangeIP.com*, or *No-IP.com*) from the drop-down list.

Internet Connection:

Select the interface from the drop-down list that you want to use for connecting the Internet.

User Name:

Type the user name that you registered with the provider.

Password:

Type the password that you registered with the provider.

HostName.DomainName:

Key in the domain name that you registered. You can use letters and dash for naming, yet other characters are not allowed to use for preventing from making troubles.

Status:

It displays current status.

Dynamic DNS Configuration

The page allows you to enable or disable the Dynamic DNS function. If you enable this function, you can access the private network through the Internet.

☒ Enabled ☐ Disabled

Dynamic DNS Provider:

Internet Connection:

User Name:

Password:

HostName.DomainName:

Apply **Discard**

Virtual Server – Static DNS

This page allows you to configure DNS mapping between Domain name and IP address for your local hosts. In case you want to access the local servers with domain names from the local network, you can configure the mapping information on the page.

HostName.DomainName

Key in the domain name that you registered at the provider. You can use letters and dash for naming, yet other characters are not allowed to use for preventing from making troubles.

IP Address

Key in the IP address for the domain name to map.

Click **Apply** to upload your setting.

NAT ALG Configuration

The need for IP address translation arises when a network's internal IP addresses cannot be used outside the network either for security reasons or because they are invalid for use outside the network. Use of NAT (Network Address Translation) devices allows local hosts on such private networks to transparently access the external global Internet and enables access to selective local hosts from the outside.

ALG (Application Level Gateway) is a security component that augments a firewall or NAT employed in a computer network. ALG allows legitimate application data to pass through the security checks of the firewall that would have otherwise restricted the traffic for not meeting its filter criteria. ALG application specific translation agents allow an application on a host in one address realm to connect to its counterpart running on a host in different realm transparently. An ALG may interact with NAT to set up state, use NAT state information, modify application specific payload and perform whatever else is necessary to get the application running across disparate address realms.

Enable VPN ALG:

VPN ALG allows two or more simultaneous VPN connections through this router. Check the box to invoke this function.

Enable SIP ALG:

SIP ALG allows two or more simultaneous VoIP phone calls made by VoIP clients through this router. The default setting for SIP ALG is enabled.

Transparent use of SIP-based devices in a NAT scenario requires that modifications be made to the SIP messages. These modifications are performed by the ALG.

A SIP ALG provides functionality to allow VoIP traffic to pass both from the private to public and public to private side of the firewall when using Network Address Translation (NAT). The SIP-ALG inspects and modifies SIP traffic to allow SIP traffic to pass through the firewall so that person-to-person SIP sessions may be established.

Click **Apply** to upload your setting.

Firewall

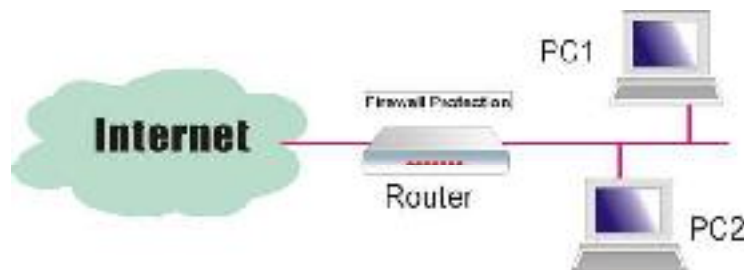
The firewall is a kind of software that interrupts the data between the Internet and your computer. It is the TCP/IP equivalent of a security gate at the entrance to your company. All data must pass through it, and the firewall (functions as a security guard) will allow only authorized data to be passed into the LAN.

What the firewall can do? It can:

- deny or permit any packet from passing through explicitly
- distinguish between various interfaces and match on the following fields:
 - ◆ source and destination IP address
 - ◆ port

To keep track of the performance of IP Filter, a logging device is used. The device supports logging of the TCP/UDP and IP packet headers and the first 129 bytes of the packet (including headers) whenever a packet is successfully **passed** through or **blocked**, and whenever a packet matches a rule being setup for suspicious packets.

An example for firewall setup:



This picture shows the most common and easiest way to employ the firewall. Basically, you can install a packet-filtering router at the Internet gateway and then configure the filter rule in the router to block or filter protocols and addresses. The systems behind the router usually have a direct access to the Internet; however some dangerous services such as NIS and NFS are usually blocked.

For the security of your router, set the firewall is an important issue.

Firewall – Bridge Filtering

The bridge filtering mechanism provides a way for the users to define rules to allow/deny packets through the bridge based on source MAC address and/or destination MAC address. When bridge filtering is enabled, each packet is examined against the each defined filter rules sequentially, and when a matched is determined, the packets will be blocked.

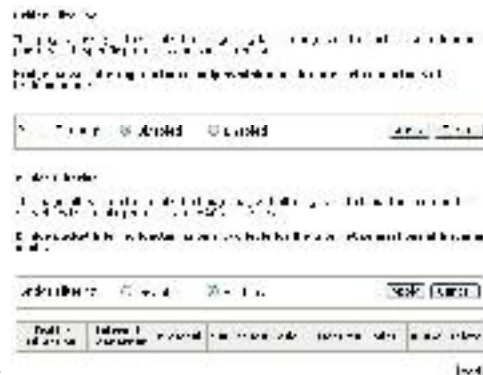
This page allows you to define the bridge packet filtering rules to block those redundant packets with specific protocols and MAC addresses.

Choose **Disabled** to disable the bridge filtering function. Click **Enabled** to monitor and block redundant packets.

To initiate the Bridge Filtering rules, select the **Enabled** radio button and click **Apply**.

Click **Add** to configure a new bridge filtering rule.

Note that the **Add** option is available only when there is a bridge mode PVC on this device.



Select traffic direction from the drop down menu, and check the network interface which you want this rule to apply on. Then, choose a protocol and define the source or destination MAC address which you want to control.

There are three options for traffic direction: **Outbound** means from local network to Internet; **Inbound** means from Internet to local network; **Bi-direction** includes both directions.

The protocols that you can choose is listed as the right figure shows. Select one proper protocol for this bridge filtering rule.

For example, if we choose Outbound, check br_0_35, select PPPoE as protocol, and enter 00:90:96:01:2A:C3 into the Source MAC Address field, then after clicking Apply, we will see the result as shown in the right.

You can use **Add** or **Delete** button to maintain the bridge filtering rules.



Firewall – IP Filtering

This page allows you to specify the IP packet filtering rules to prevent the services accessed from the Internet hosts or limit the Internet access for local hosts.

Choose **Disabled** to disable the firewall function. Click **Enabled** to invoke the settings that you set in this web page.

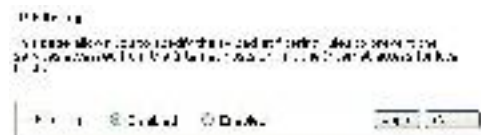
To initiate the IP Filtering, please select the **Enabled** radio button and click **Apply**. The web page will be shown as the right picture.

Select the direction to filter packets:

Inbound means the data is transferred from outside onto your computer.

Outbound means the data is transferred from your computer onto outside through Internet. Please choose **Outbound traffic** or **Inbound traffic** as the direction for filtering packets.

Then, to add a new IP Filtering rule, click **Add**.



This page provides some settings for you to adjust for adding a new outbound IP Filtering.

Allow Traffic:

Choose **No** to stop the data transmission, **Yes** to permit the data pass through.

Protocol:

Here provides several default policies for security levels for you to choose. If you don't want to use the predefined setting, you can use **User Defined** to set a customized protocol according to the necessity.

When you choose **User Defined** setting, you have to enter a port number in the "as" field.

Source/Destination IP address:

To specify IP address to allow or deny data transmission, please pull down the drop-down menu to choose a proper one.

The setting **All** means that all the IP addressed in the network are allowed or denied to pass through in Internet. If you choose **Single** or **Subnet**, you will have to key in the specific IP address (and Netmask for subnet) as the start/end point to let the router identify for granting or denying passing through.

Port Range:

The port range is from 0 to 65535. Please key in the start point and end point for the IP Filtering.

After finish the settings, click **Apply**.



Here provides an example shown in the right column. Select **TCP** as the **Protocol** type, and make the **Source and Destination IP address** to include **All**, then type **0** and **65535** as the **start and end port**.

Add New Outbound IP Filtering Rule

Add New Outbound IP Filtering Rule

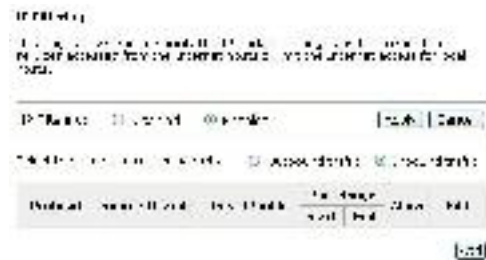
Add New Outbound IP Filtering Rule

Add New Outbound IP Filtering Rule

A new IP filtering setting for Outbound traffic is created in the web page. To edit the setting, please click  to get into the editing page. To delete the setting, click  to erase it. To set another IP filtering, click **Add** again.



To add a new Inbound IP Filtering, click **Inbound traffic** in the item of **Select the direction to filter packets** on the **IP Filtering** page. Use the same way to add a new one as stated above.



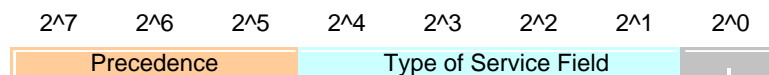
Quality of Service

QoS (Quality of Service) is an industry-wide initiative to provide preferential treatment to certain subsets of data, enabling that data to traverse the Internet or intranet with higher quality transmission service.

There have been two generations of quality of service architectures in the Internet. The interpretation of the *Type of Service Octet* in the Internet Protocol header varies between these two generations.

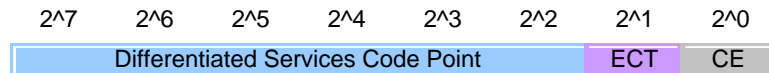
The First generation: Precedence and type of service bits

The refined definition of the initial *Type of Service Octet* looks like this:



The Second generation: Differentiated services code point

The *Differentiated Service Code Point* is a selector for router's per-hop behaviors (PHB). As a selector, there is no implication that a numerically greater DSCP implies a better network service. RFC2474 redefined the *Type of Service Octet* to be:



The fields *ECT* and *CE* are nothing to do with quality of service. They are spare bits in the IP header used by Explicit Congestion Notification. As can be seen, the *DSCP* totally overlaps the old *Precedence* field. So if values of *DSCP* are carefully chosen then backward compatibility can be achieved. This leads to the notions of "class", each class being the group of DSCP with the same *Precedence* value. Values within a class would offer similar network services but with slight differences. Classes were initially defined as:

DSCP	Precedence	Purpose
0	0	Best effort
8	1	Class 1
16	2	Class 2
24	3	Class 3
32	4	Class 4
40	5	Express forwarding
48	6	Control
56	7	Control

Now, DSCP is what we are using for the QoS configuration on this device.

Among the classes you will see on the webpage, the **BE** (*Best Effort*) class possesses no guaranteed rates; the **CS** (*Class Selector*) values enable backward compatibility with the older IP-Precedence scheme ranges 0~7; the **EF** (*Expedited Forwarding*) class is a low-loss, low-latency, low-jitter, assured-bandwidth, end-to-end service; **AF** (*Assured Forwarding*) provides for the delivery of IP packets in four independently forwarded AF classes, AF1x through AF4x. Within each AF class, an IP packet can be assigned one of three different levels of drop precedence. This class is used when a service (application) requires a high probability of packets being forwarded, so long as the aggregate traffic from each site does not exceed the subscribed information rate (profile). Each of the four AF classes allocates a certain amount of forwarding resources, such as buffer space and bandwidth in each network node. When congestion occurs, the drop precedence of a packet determines the relative importance of the packet within the AF class.

You can start to configure the Bridge QoS/IP QoS rules on the **Quality of Service** webpage for your router.

Quality of Service – Bridge QoS

To classify the upstream traffic by assigning the transmission priority for different users' data, please use Bridge QoS to prioritize the data transmission.

The Bridge QoS allows you to set the settings based on layer two bridge packets.

Traffic Class Name:

Key in a name as the traffic class for identification.

802.1p Priority:

Each incoming packet will be mapped to a specific priority level, so that these levels may be acted on individually to deliver traffic differentiation. Please choose the number (from 0 to 7, low to high priority) for the 802.1p Priority.

Traffic Priority:

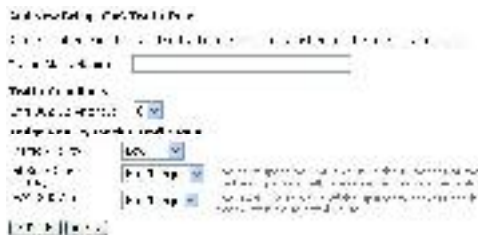
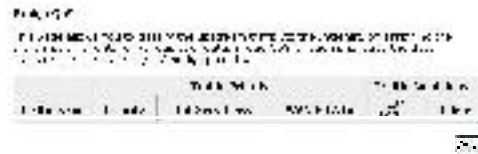
There are three options – *Low*, *Medium*, and *High* that you can choose. The router will arrange the precedence for the traffic according to the traffic priority setting here.

As for the settings for the DSCP value and the WAN 802.1p value of the upstream packets, they will be seen on the WAN side.

DiffServ Class (DSCP):

DiffServ is a computer networking architecture that specifies a simple, scalable and coarse-grained mechanism for classifying, managing network traffic and providing QoS (quality of service) guarantees on modern IP networks. DiffServ can, for example, be used to provide low-latency, guaranteed service to critical network traffic such as voice or video while providing simple best-effort traffic guarantees to non-critical services such as web traffic or file transfers.

The higher position the item appears, the smaller DSCP value it is (i.e., *BE* is the lowest while *CS7* is the highest). The corresponding DSCP value in the IP header of the upstream packets will be overwritten by the selected value. The default setting is *No change*.



WAN 802.1p:

If 802.1p is enabled on Internet connection, WAN 802.1p value of the upstream packets can be overwritten by the selected value. You may select a priority from the drop-down menu.

If you set the **LAN 802.1p Priority 0** as the **traffic condition**, choose **Low traffic priority** for this rule, set **DSCP** as BE, and **WAN 802.1p** as **no change**, after clicking **Apply**, you will get the result as the figure in the right column.

Thus when the users' data matches the traffic condition, the transmission will get a low traffic priority.

You may check the **Delete** box and press **Delete** to discard it, or click **Add** to create more.

**Quality of Service – IP QoS**

To classify the upstream traffic by assigning the transmission priority of the data for different users, please use IP QoS to prioritize the data transmission.

The IP QoS allows you to set the settings based on layer three IP packets.

To add a new IP QoS setting, press **Add** in the page of **Quality of Service – IP QoS**, a page same as the right side will appear.

Traffic Class Name:

Type a name as the traffic class for identification.

LAN Ports which traffic come from:

The IP QoS rules will be applied on the LAN ports you checked here. The default setting includes all ports.

Source MAC Address& MAC Mask/ Destination MAC Address& MAC Mask:

Key in the specific MAC Address or MAC Mask of the devices which you want the QoS rule to be applied to, or simply leave it blank to include all.

Protocol:

Choose a proper interface for this function. If you don't know how to select, simply use the default one.



Source IP/ Subnet Mask/ Port:

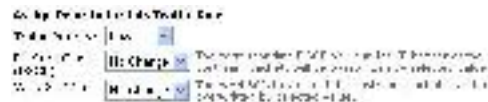
Key in the **source IP address** (ex.: 192.168.1.0) and **subnet mask** (ex.: 255.255.255.0) for the application (ex.: FTP, HTTP, and so on) that you want to invoke the QoS traffic rule. You may simply enter the **source port**, ranging from 0 to 65535, as the traffic condition.

**Destination IP/ Subnet Mask/ Port:**

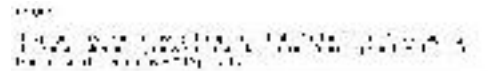
Enter the **destination IP address** (ex.: 168.95.1.88) and **subnet mask** (ex.: 255.255.255.0) for the application that you want to invoke the QoS traffic rule. Or simply enter the **destination port** for the traffic condition; it ranges from 1 to 65535.

Traffic Priority/ DiffServ Class (DSCP)/ WAN 802.1p:

Please refer to the Bridge QoS section.



After finishing the settings, click **Apply**, the new QoS setting will be shown as the example.

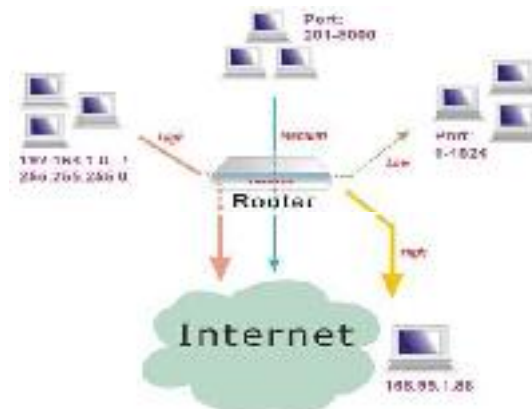


According to the example, we set four rules for IP QoS. In traffic A, we set the **destination port** as 1-1024, and the traffic priority is *low*; in traffic B, the **source port** is from 201 to 8000, and the priority is *medium*; in traffic C, when the **source IP** is 192.168.1.0, subnet mask is 255.255.255.0, the traffic priority is *high*; in traffic D, when the traffic is heading to 168.95.1.88, the priority is *high*.

Rule	Source IP	Subnet Mask	Source Port	Dest. IP	Dest. Port	Priority	Apply
A	192.168.1.0	255.255.255.0	1-1024			Low	Apply
B			201-8000			Medium	Apply
C	192.168.1.0	255.255.255.0				High	Apply
D				168.95.1.88		High	Apply

To delete the rules you set, simply click the check button below **Delete** item and click **Delete** button.

According to our example, the IP QoS configuration can be illustrated by the following figure in the next page.



While there are many PCs getting online, the PCs using *port 201-8000* to access the internet will have **medium** traffic priority, the PCs carrying 192.168.1.x/255.255.255.0 as IP address will have **high** traffic priority. In addition, PCs heading to *port 1-1024* will have a **low** priority, while the PCs accessing 168.95.1.88 will have a **high** priority.

Port Mapping

This page allows you to configure various *port mapping groups* which contains specific Internet connections and LAN ports. The user data will be only transmitted and received among the interfaces in the group.

Normally, this function only needed when more than two PVCs are available, for example, if we have two PVCs, one uses PPPoE and the other uses Bridge mode, we may want to group certain connection to a specific port, especially when some devices may consume higher bandwidth.

In our illustration, the two PVCs we have are *pppoe_0_39_1* and *br_0_35*.

Click **Add** to create a new group.

Group Name:

Give a unique name here. The word length must not be over the length of the field. In our example, *bridge*.



Available Interfaces:

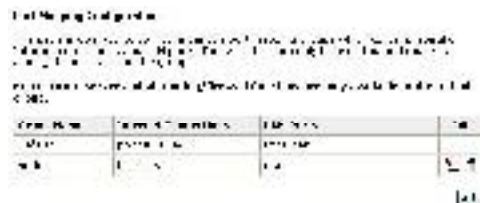
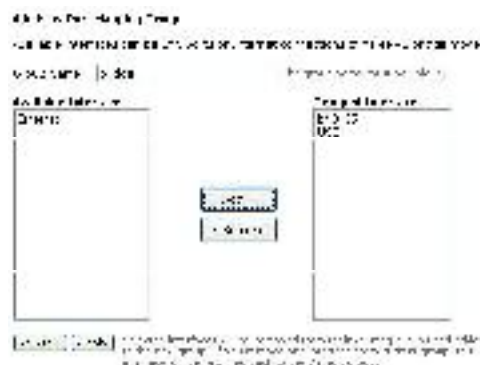
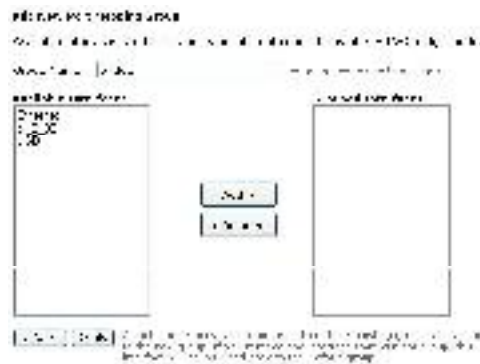
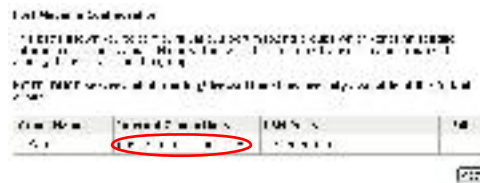
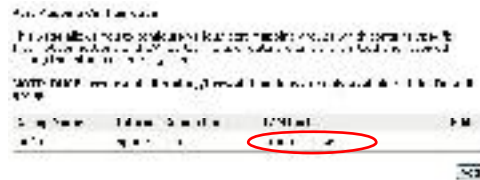
The available interfaces (such as Ethernet and USB) will be displayed in the left side box. When you choose it and click **Add**, it will be transferred into the **Grouped Interfaces** at the right side box. Yet, if you want to remove the interface from the current group, it will be returned back to the Default group (left side box) after you click Remove.

Now we are going to map the Ethernet port with the bridge mode PVC. Click *br_0_35* and press **Add** button, then press *USB* and click **Add** again. The two items are moved to the right box now.

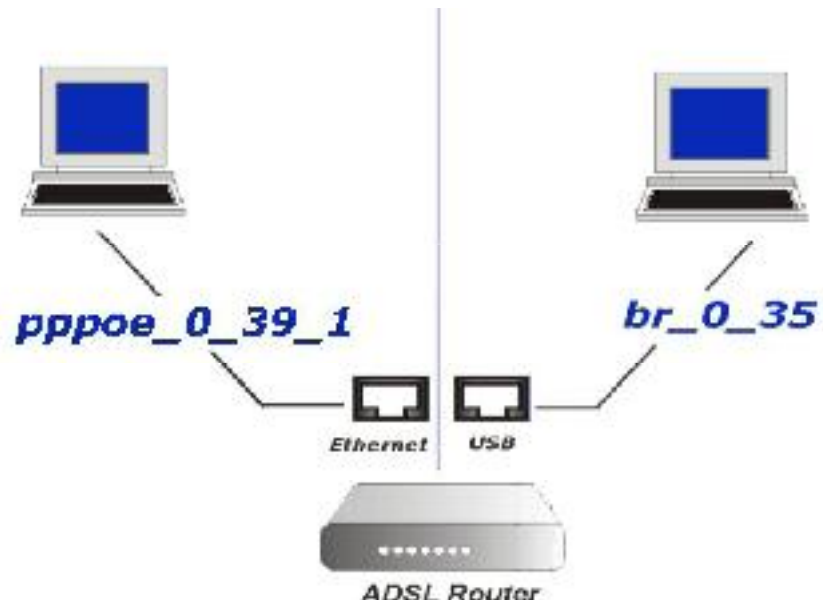
After finish the settings, click **Apply**.

As you can see, we have a default group, in which PPPoE mode will be applied through Ethernet port and we have another group named *bridge*, in which bridge mode will be applied when connecting to the USB port.

You may click  to edit the created group, press  to delete it, or click **Add** to create another group.



The following relationship figure illustrates the port mapping configuration.



Under this configuration, any PC that connect to *Ethernet port* will connect to the internet through the bridge mode PVC **pppoe_0_39_1**, while the device using *USB* will access the internet by the PPPoE connection **br_0_35**.

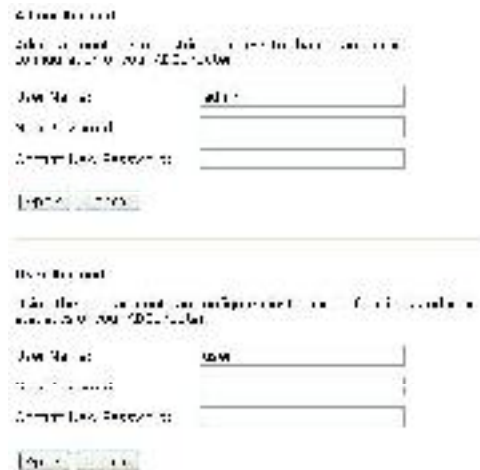
Management Accounts

This page allows you to **CHANGE** the user name and password for accessing your ADSL Router.

For the **Admin Account**, the default setting for both username and password are **admin**. If you want to change the username and the password, please modify the **User Name** and **New Password**, and then retype the new password in the **Confirm** field for confirmation. Then click **Apply**.

To create a user account, you may setup a username and password under **User Account** on the same page.

Note that the new user can merely access the **Quick Start** and **Status** page.



Management Control – From Remote

There are six interfaces for the remote access. Please choose from them if you want to enable the remote access control.

Select the Internet Connect:

Select one connection item from the drop-down list to enable the function.

Web Browser:

Check this box if you want to have remote control through HTTP. The default port number is 8080. Modify the port whenever you want.

Telnet:

Check this box if you want to have remote control through telnet.

FTP:

Choose this box if you want to have remote control through FTP.

TFTP:

Choose this box if you want to have remote control through TFTP.

Secure Shell (SSH):

Choose this box if you want to have remote control through SSH.

Ping:

Choose this box if you want to have remote control through ping command under DOS prompt.



Authorized Host IP Address List:

Decide whether all internet hosts can access your router or only authorized internet hosts can access. Click **Apply** to save your setting.

**Management Control – From Local**

You can allow local access to your router via the checked interfaces.

Authorized Host IP Address List:

Refer to Remote Management Control.

Click **Apply** to activate your settings or click **Cancel** to retain the original settings.

**TR-069 Client Configuration**

TR-069 is a CPE WAN Management Protocol (CWMP) intended for communication between Customer Premise Equipment (CPE) and an Auto-Configuration Server (ACS). It defines a mechanism that encompasses secure auto configuration of a CPE, and also incorporates other CPE management functions into an integrated framework.

Using TR-069 the CPE can get in contact with the ACS and establish the configuration automatically. Accordingly other service functions can be provided. TR-069 is the current standard for activation of CPE in the range of DSL broadband market.



Compliant with DSL's Forum's TR-069 Remote Management Specification, the ADSL Router is highly manageable with the default ACS for auto-configuration, dynamic service provisioning, firmware updates, status and performance monitoring, and diagnostics to a collection of ADSL routers. By these provision value-added services, the ADSL Router with TR-069 helps DSL service provider reduce operation effort as well as enhance customer satisfaction.

Normally, users do not have to modify the settings here. If you do not know how to set up, you can just accept the factory default settings on this page or contact your ISP.

Connect to ACS:

Choose to connect to ACS with or without SSL (Secure Socket Layer) protocol according to your ISP.

If the ACS URL starts with **http://**, choose *without* SSL mode; if it begins with **https://**, select *with* SSL.

ACS URL Address:

Key in the Auto-Configuration Server URL Address provided by the ISP, e.g.,

<http://10.11.95.124:8082/askey/ACSServer> without SSL or <https://10.11.95.124:8443/askey/ACSServer> with SSL.

ACS User Name/ ACS Password:

When connecting to ACS, this device must have correct user name and password for authentication. Key in the information provided by the ISP.

When the content of ACS URL Address, User Name, and Password match the ACS authorization, the router will send an online report to ACS.

Connection Request User**Name/Password:**

If the ACS wants to communicate with the device, it will have to offer the matching Connection Request User Name and Password. When the device sends the report to ACS for the first time, it will contain information for this.

Periodic Transmission of Inform Request:

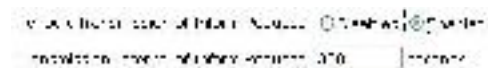
If this function is enabled, the CPE will frequently report to ACS the status after a period of time set here. The default setting is **300** seconds, and the ISP can modify the value. Generally, users do not have to change the settings here.

If this function is disabled, the CPE will only report once when the connection between ACS and the device has been set up.

Identify the Validation of Certificate from ACS

When using SSL protocol to connect to ACS, a trusted CA and synchronic time setting with the server are used to identify the validation of the Certificate sent from ACS.

When choosing **with SSL** for **Connect to ACS**, you will see a paragraph appear on the bottom of the window (as shown in the right column).



Press **Trusted CA Certificates** to Import Certificate obtained from your ISP, a window (as shown in the figure) will be prompted for you to import certificate.

Note: The certificate may have been imported in this device already, please check with your ISP.



To synchronize your time with the server, go to **Management->Internet Time** to adjust the setting. Configure to set time by **Time Server**, and make sure the time zone is the same as the server's.

(Please refer to the next section for detailed information about Internet Time.)

Internet Time

The clock of the router must synchronize with global Internet time. The time you set in the screen will be adapted to system log.

Update Now:

Click this button to refresh the current time.

Set Time by (Time Server/ Manual):

The default setting is **Manual**. Select this one, and set the start time by typing the date and the time manually to help the router perform tasks.

If you select **Time Server**, the system will set time via time server automatically.

Primary Time Server/ Secondary Time Server:

You may select the preferred time server from the drop-down list. The time will be adjusted by the time server.

Time Zone:

Choose the time zone of your location.

Apply:

Save the data on the screen and apply the data after restarting the router.

Cancel:

Discard the new configuration and reserve the original settings.

The screenshot shows the 'Internet Time' configuration page. It includes a title bar, a 'Update Now' button, and a section for setting the time. The 'Set Time by' dropdown is set to 'Manual'. Below it, there are fields for 'Date' and 'Time'. The 'Primary Time Server' and 'Secondary Time Server' dropdowns are set to 'Time Server'. The 'Time Zone' dropdown is set to 'UTC+08:00, Taipei'. At the bottom, there are 'Apply' and 'Cancel' buttons.

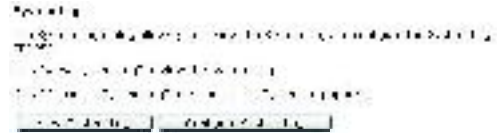
System Log

As shown on the web page, you can view the system log and configure system log whenever you want.

To view the system log, you must configure system log first. Press **Configure System Log** to start.

Configuring System Log

You can **enable** or **disable** the log function, and choose **log level**, **display level** and proper **mode** as you like. Then click **Apply** to invoke the settings or press **Cancel** to discard them.



There are 8 types of **log level** and **display level** for you to choose.

Log Level:

This function enables you to decide how detailed the messages will be stored. Set a proper level according to your needs. The default Log Level is **Debugging**.



The **Debugging** Level logs all messages to the file, while the **Emergency** Level logs fatal messages only. The lower the item is, the more detailed information it provides; i.e., *debugging* level stores the most detailed information.

Owing to the limitation of the storage on the ADSL router, the former information will be erased and replaced by the latest message automatically when the buffer is overflowed.

Display Level:

For the convenience of the users, the display level can function as a filter. It decides the level for the messages to exhibit when the user wants to view the logs on the local side. For example, for a programmer or engineer, he/she may want to know about *debugging* or *informational* level message; for general users, they may only need or want to learn about *error*, *critical*, *alert*, or *emergency* messages only. The default Display Level is **Error**.



Therefore, when the log level is "Debugging" and the display level is "Error", the CPE logs the most detailed message but shows error level data only.

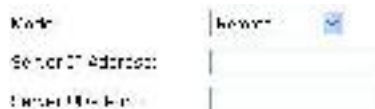
Mode:

You can choose where to store the logs; the options include **Local**, **Remote** and **Both**. *Local* means the CPE, i.e., the ADSL Router. *Remote* means the log server you specified to forward the log information to. The default mode is **Local**.

If you choose **Remote** or **Both**, you have to specify the **Server IP Address** and **UDP Port**, and all the events will be sent to the specified UDP port of the specified log server.

Note:

Display Level only filters for the *local* side. All the messages will be displayed on the remote Log Server.

**Example**

Suppose we are going to record the system logs on both the ADSL Router and the Server bearing IP address 10.11.95.2, the procedures below illustrate the situation:

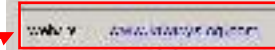
System Log Configuration

1. Choose **Enabled** Log.
2. Select *Debugging* as the **Log Level**, and *Error* as the **Display Level**. (Or select other level according to your needs.)
3. Set the **Mode** as *Both*, key in the **Server IP Address** as 10.11.95.2, and leave the **Server UDP Port** as the default value 514.
4. Press **Apply** to invoke the settings.



To view the system log on the Log Server (10.11.95.2), a log viewing tool must be installed.

- Download the tool from the
Kiwi Enterprises website.



- [illegible]

For example, message 1 shows *alert* level information which is a kernel process containing detailed intrusion information; message 2 displays *notice* level information which is an IGMP process exhibiting that the IGMP function had been started.

For viewing the system log on local side, click the **View System Log** button on the webpage for system log configuration.

[illegible]

For example, message 3 shows *critical* level information which is a *pppd* (PPP daemon) process showing that a valid IP address had been received from server, and connection is up; message 4 is a kernel process belonging to *critical* level information which reveals that the Ethernet 0 link is up.

Note that the earlier messages may be automatically replaced by the updated information when the buffer is overflowed on the router.

Backup Config

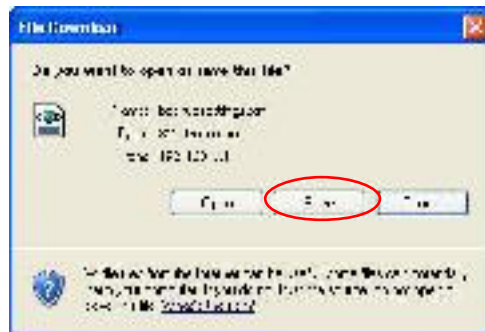
To backup your settings of the router into your computer, you can use **Backup Config** web page to save the settings.



Click **Backup** button and the warning window will be prompted. Click **OK** to continue the backup procedure.



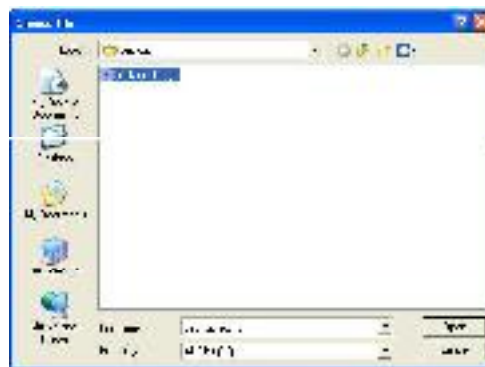
The system will ask your command about the next procedure. Click **Save** to backup.



You may change the file name and choose a place to save the backup file.



And when you want to restore the settings in the future, simply open **Backup Config** web page and use **Browse** button to locate the file.



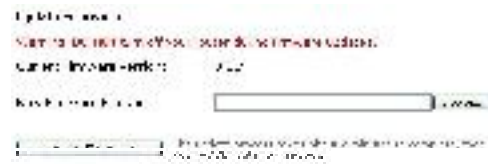
After opening the backup file, click **Restore**.



Update Firmware

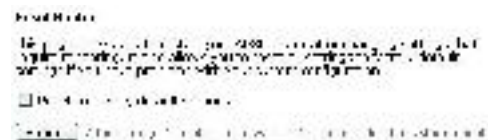
If you have to or want to update the firmware for this router, you can open the **Update Firmware** web page and choose the correct file by pressing **Browse**. Then click the **Update Firmware** button. The system will execute the update procedure automatically. When it is finished, the system will tell you the update is successfully.

Note: Router must not turn off during firmware updates.



Reset Router

To make the settings that you set for this router take effect, please open the **Reset Router** web page and click the **Reboot** button to invoke all settings.



You can restore your web pages with default settings. Simply check **Reset to factory default settings** and click **Reboot**.

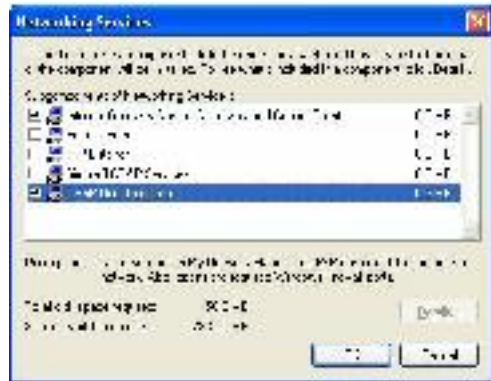
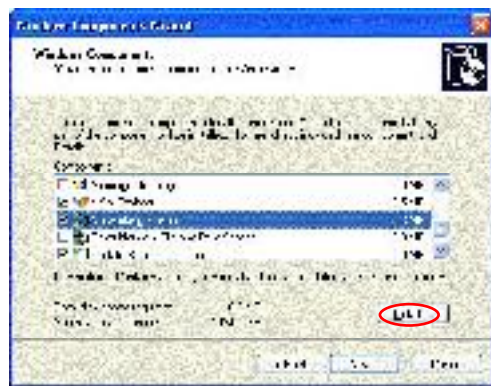
UPnP for XP

Universal plug and play (UPnP) is architecture for pervasive peer to peer network connectivity of intelligent appliances and PCs of all form factors. It is designed to bring easy-to-use, flexible, standards-based connectivity to ad-hoc or unmanaged networks whether in the home, in a small business, public spaces, or attached to the Internet.

Only **Windows XP** supports UPnP function.

Please follow the steps below for installing UPnP components.

1. Click on the **Start** menu, point to **Settings** and click on **Control Panel**.
2. Select **Add or Remove Programs** > **Add/Remove Windows Components** to open **Windows Components Wizard** dialog box.
3. Select **Networking Services** and click **Details**. Click the **UPNP User Interface** check box.
4. Click **OK**. The system will install UPnP components automatically.



5. After finishing the installation, go to **My Network Places**. You will find an icon (e.g., ADSL2+ Router) for UPnP function.



6. Double click on the icon, and the ADSL router will open another web page via the port for UPnP function. The IE address will be directed to the management main webpage as shown in the graphic.
7. Now, the NAT traversal function has already been provided. The ADSL router will create a new virtual server automatically when the router detects that some internet applications is running on the PC.



Chapter 5: Troubleshooting

If the suggested solutions in this section do not resolve your issue, contact your system administrator or Internet service provider.

Problems with LAN

PCs on the LAN cannot get IP addresses from the ADSL Router.

The chances are that the interface used as DHCP server is modified and the client PCs do not renew IP addresses.

If your DHCP server is enabled on Private IP Address previously and you modify the interface to Public IP Address, the client PCs should renew IP addresses.

The PC on the LAN cannot access the Web page of the ADSL Router.

Check that your PC is on the same subnet with the ADSL Router.

Problems with WAN

You cannot access the Internet.

- ❑ Check the physical connection between the ADSL Router and the LAN.
If the LAN LED on the front panel is off or keeps blinking, there may be problem on the cable connecting to the ADSL Router.
At the DOS prompt, ping the IP address of the ADSL Router, e.g., ping 192.168.1.1. If the following response occurs:
`Reply from 192.168.1.1: bytes=32 time=100ms TTL=253`
Then the connection between the ADSL Router and the network is OK.
If you get a failed ping with the response of:
`Request timed out`
Then the connection is fail. Check the cable between the ADSL Router and the network.
- ❑ Check the DNS setting of the ADSL Router.
At the DOS prompt, ping the IP address of the DNS provided by your ISP. For example, if your DNS IP is 168.95.1.1, then ping 168.95.1.1. If the following response occurs:
`Reply from 168.95.1.1: bytes=32 time=100ms TTL=253`
Then the connection to the DNS is OK.
If you get a failed ping with the response of:
`Request timed out`
Then the DNS is not reachable. Check your DNS setting on the ADSL Router.

Problems with Upgrading

The following lists the error messages that you may see during upgrading and the action to take.

- ❑ **Error message:** All the ADSL LEDs light up and cannot light off as usual.
Possible cause: When users are executing firmware upgrade or saving settings to the router, the power for the router is lost for some unknown reasons, the normal web page for the router might be damaged. After power on your router, the LEDs might not work normally.



Action: Setup your PC with a static IP address, such as 192.168.1.2, and then access the router's web page by entering <http://192.168.1.1>. Then update the firmware again.

- ❑ **Error Message:** Image uploading failed. The selected file contains an illegal image.
Possible cause: The firmware file format is invalid.
Action: Check to see whether the file format is correct; otherwise download a firmware file with correct format.
- ❑ **Error Message:** Image uploading failed. The system is out of memory.
Possible cause: It may be caused by the lack of memory.
Action: Reboot your ADSL Router and perform the upgrade task again.
- ❑ **Error Message:** Image uploading failed. No image file was selected.
Possible cause: You did not select a file correctly.
Action: Download a compatible firmware from the web.

Chapter 6: Glossary

ARP (Address Resolution Protocol)

ARP is a TCP/IP protocol for mapping an IP address to a physical machine address that is recognized in the local network, such as an Ethernet address.

A host wishing to obtain a physical address broadcasts an ARP request onto the TCP/IP network. The host on the network that has the IP address in the request then replies with its physical hardware address.

Inverse ARP (In-ARP), on the other hand, is used by a host to discover its IP address. In this case, the host broadcasts its physical address and a RARP server replies with the host's IP address.

DHCP (Dynamic Host Configuration Protocol)

When operates as a DHCP server, the ADSL Router assign IP addresses to the client PCs on the LAN. The client PCs "leases" these Private IP addresses for a user-defined amount of time. After the lease time expires, the private IP address is made available for assigning to other network devices.

The DHCP IP address can be a single, fixed public IP address, an ISP assigned public IP address, or a private IP address.

If you enable DHCP server on a private IP address, a public IP address will have to be assigned to the NAT IP address, and NAT has to be enabled so that the DHCP IP address can be translated into a public IP address. By this, the client PCs are able to access the Internet.

LAN (Local Area Network) & WAN (Wide Area Network)

A LAN is a computer network limited to the immediate area, usually the same building or floor of a building. A WAN, on the other hand, is an outside connection to another network or the Internet.

The Ethernet side of the ADSL Router is called the LAN port. It is a twisted-pair Ethernet 10Base-T interface. A hub can be connected to the LAN port. More than one computers, such as server or printer, can be connected through this hub to the ADSL Router and composes a LAN.

The DSL port of the ADSL Router composes the WAN interface, which supports PPP or RFC 1483 connecting to another remote DSL device.

NAT (Network Address Translation) IP Address

NAT is an Internet standard that translates a private IP within one network to a public IP address, either a static or dynamic one. NAT provides a type of firewall by hiding internal IP addresses. It also enables a company to use more internal IP addresses.

If the IP addresses given by your ISP are not enough for each PC on the LAN and the ADSL Router, you need to use NAT. With NAT, you make up a private IP network for the LAN and assign an IP address from that network to each PC. One of some public addresses is configured and mapped to a private workstation address when accesses are made through the gateway to a public network.

For example, the ADSL Router is assigned with the public IP address of 168.111.2.1. With NAT enabled, it creates a Virtual LAN. Each PC on the Virtual LAN is assigned with a private IP address with default value of 192.168.2.2 to 192.168.2.254. These PCs are not accessible by the outside world but they can communicate with the outside world through the public IP 168.111.2.1.

Private IP Address

Private IP addresses are also LAN IP addresses, but are considered "illegal" IP addresses to the Internet. They are private to an enterprise while still permitting full network layer connectivity between all hosts inside an enterprise as well as all public hosts of different enterprises.

The ADSL Router uses private IP addresses by assigning them to the LAN that cannot be directly accessed by the Internet or remote server. To access the Internet, private network should have an agent to translate the private IP address to public IP address.

Public IP Address

Public IP addresses are LAN IP addresses that can be considered "legal" for the Internet, because they can be recognized and accessed by any device on the other side of the DSL connection. In most cases they are allocated by your ISP.

If you are given a range of fixed IP addresses, then one can be assigned to the router and the others to network devices on the LAN, such as computer workstations, ftp servers, and web servers.

PVC (Permanent Virtual Circuit)

A PVC is a logical point-to-point circuit between customer sites. PVCs are low-delay circuits because routing decisions do not need to be made along the way. Permanent means that the circuit is preprogrammed by the carrier as a path through the network. It does not need to be set up or turned down for each session.

UDP (User Datagram Protocol)

UDP is a connectionless transport service that dispenses with the reliability services provided by TCP. UDP gives applications a direct interface with IP and the ability to address a particular application process running on a host via a port number without setting up a connection session.

Virtual Server

You can designate virtual servers, e.g., a FTP, web, telnet or mail server, on your local network and make them accessible to the outside world. A virtual server means that it is not a dedicated server -- that is, the entire computer is not dedicated to running on the public network but in the private network.

VPI (Virtual Path Identifier) & VCI (Virtual Channel Identifier)

A VPI is a 8-bit field while VCI is a 16-bit field in the ATM cell header. A VPI identifies a link formed by a virtual path and a VCI identifies a channel within a virtual path. In this way, the cells belonging to the same connection can be distinguished. A unique and separate VPI/VCI identifier is assigned in advance to indicate which type of cell is following, unassigned cells, physical layer OAM cells, metasingaling channel or a generic broadcast signaling channel. Your ISP should supply you with the values.

Appendix: Specifications

Interface	<ul style="list-style-type: none"> ■ One RJ-11 port for ADSL connection ■ Four RJ-45 ports for IEEE 802.3/802.3u 10/100 Base-T auto-sensing and auto-crossover Ethernet connection ■ One USB port compliant to USB 1.1 ■ One hidden reset button for restoration of factory default settings
Regulatory Approvals and Compliance	EMC: FCC part 15 Class B, CE Telecom: FCC part 68 Safety: UL, CB, LVD
Power Requirement and Operation	Power Adaptor: Input 120±10 or 230±10 VAC; Output 9 VAC, 1A
Environment Requirement	Power Consumption: less than 10 Watt Ambient Temperature: 0 to 40°C (32 to 96°F) Relative Humidity: 20% to 90% (non-condensing)
Physical	PCB: 80 mm (L) x 105 mm (W) x 20 mm (H) Housing: 125 mm (L) x 90 mm (W) x 35 mm (H) Weight: 58g