Dynalink

ADSL2+ Wireless Modem Router

User Manual

RTA1030W

U – RTA1030W

ADSL Router

User's Manual

Version 2.3

Mar. 1, 2007

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Safety and Precaution

For Installation

- ☐ Use only the type of power source indicated on the marking labels.
- ☐ Use only power adapter supplied with the product.
- ☐ Do not overload wall outlet or extension cords as this may increase the risk of electric shock or fire. If the power cord is frayed, replace it with a new one.
- ☐ Proper ventilation is necessary to prevent the product overheating. Do not block or cover the slots and openings on the device, which are intended for ventilation and proper operation. It is recommended to mount the product with a stack.
- ☐ Do not place the product near any source of heat or expose it to direct sunlight.
- ☐ Do not expose the product to moisture. Never spill any liquid on the product.
- ☐ Do not attempt to connect with any computer accessory or electronic product without instructions from qualified service personnel. This may result in risk of electronic shock or fire.
- ☐ Do not place this product on unstable stand or table.

For Using

- ☐ Power off and unplug this product from the wall outlet when it is not in use or before cleaning. Pay attention to the temperature of the power adapter. The temperature might be high.
- ☐ After powering off the product, power on the product at least 15 seconds later.
- ☐ Do not block the ventilating openings of this product.
- ☐ When the product is expected to be not in use for a period of time, unplug the power cord of the product to prevent it from the damage of storm or sudden increases in rating.

For Service

Do not attempt to disassemble or open covers of this unit by yourself. Nor should you attempt to service the product yourself, which may void the user's authority to operate it. Contact qualified service personnel under the following conditions:

- ☐ If the power cord or plug is damaged or frayed.
- ☐ If liquid has been spilled into the product.
- ☐ If the product has been exposed to rain or water.
- ☐ If the product does not operate normally when the operating instructions are followed.
- ☐ If the product has been dropped or the cabinet has been damaged.
- ☐ If the product exhibits a distinct change in performance.

Caution

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

FCC

This equipment must be installed and operated in accordance with provided instructions and a minimum 20 cm spacing must be provided between computer mounted antenna and person's body (excluding extremities of hands, wrist and feet) during wireless modes of operation.

FCC Class B Notice

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

Note:

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

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

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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.

RTA1030W Wireless ADSL2+ Router is a DSL broadband access device which allows ADSL connectivity while providing 802.11g wireless LAN capabilities 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 RTA1030W Wireless 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
- ✓ USB Cable
- ✓ Quick Start Guide
- ✓ Driver & Utility Software CD

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)
- Support dying gasp
- Maximum Rate: 12 Mbps for downstream and 1 Mbps for upstream

ADSL2+ Compliance

- ITU G.992.5 Annex A

- Support dying gasp
- Maximum Rate: 24 Mbps for downstream and 1.2 Mbps for upstream

Wireless LAN Compliance

- IEEE 802.11g and IEEE 802.11b
- Data Rate: 54, 48, 36, 24, 18, 12, 9, 6 Mbps for 802.11g; 11, 5.5, 2, 1 Mbps for 802.11b
- Modulation Technique: OFDM for 802.11g; CCK (11 Mbps, 5.5 Mbps) for 802.11b; DQPSK (2Mbps) for 802.11b; DBPSK (1 Mbps) for 802.11b
- Network Architecture: infrastructure
- Operating Frequency: 2.4 ~ 2.5 GHz
- Operating Channels: depending on local regulations. For example, 11 Channels (Northern America), 13 Channels (Europe), and 14 Channels (Japan)
- Support the selection of best quality channel automatically
- RF Output Power: 13.5+/-1.5dBm for 802.11g; 17.5+/-1.5dBm for 802.11b
- Antenna Connectors: Hardware diversity support. One external antenna and one internal antenna are provided.
- Coverage Area: 300 meters
- Support WEP (Wired Equivalent Privacy) mechanism which uses RC4 with 64-bit or 128-bit key length
- Support 802.1x and WPA/WPA2
- Support the Access Control function: only registered WLAN clients are allowed to associate to this device.
- SSID can be hidden for the security issue (Don’t broadcast SSID).
- Support the Repeater function to extend the coverage area
- Support wireless user isolation for the hotspot

ATM Features

- Compliant to ATM Forum UNI 3.1 / 4.0 Permanent Virtual Circuits (PVCs)
- Support up to 16 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, USB, and 802.11g wireless LAN
- 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
- Static routes, RFC1058 RIPv1, RFC1723 RIPv2
- 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 port mapping function which allows you to assign all data traffic transmitted among specific Internet connections and LAN ports
- 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
- Bridge packet filtering (optional)
- URL filtering (optional)
- 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/SSH session for local or remote management
- Firmware upgrades through HTTP, TFTP or FTP
- The boot loader contains very simple web page to allow the users to update the run-time firmware image.
- Configuration file backup and restore
- SNMPv1/v2 agent with MIB-II, ADSL Line MIB

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.

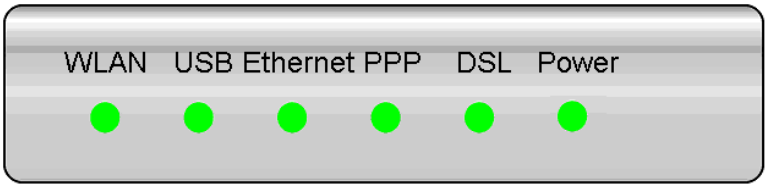
Chapter 1: Overview

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 displays the front panel of the ADSL Router:



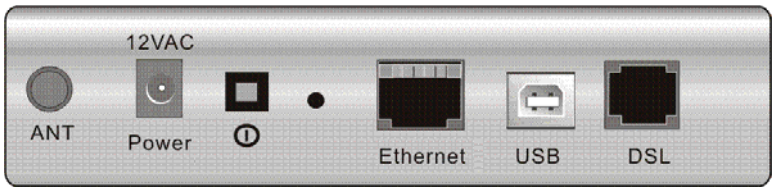
LED Indicators

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

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.
WLAN	Off	No radio signal is detected.
	Flash Green	User data is going through WLAN port
	Solid Green	WLAN interface is ready to work.

Rear Panel

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



Connector	Description
12VAC	12VAC Power connector
⏻	Power switch
Ethernet	Ethernet RJ-45 connector
USB	USB connector
DSL	RJ-11 connector

Note: For use only with power supply OEM type AA-121ABN, AA-121AD, AA-121AE; Leader type A48120100-C5, A48120100-B2, and A48120100-A3.

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).

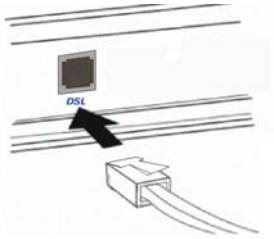
Choosing a place for the ADSL Router

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

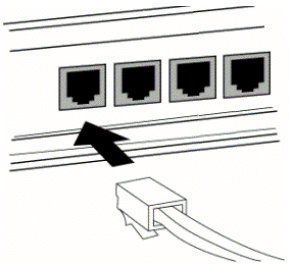
Connecting the ADSL Router

Follow the steps below to connect the related devices.

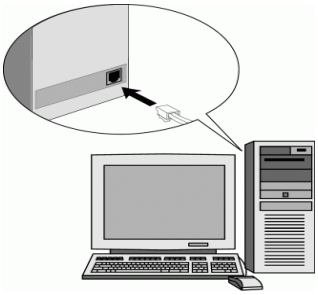
❶ Connecting the ADSL line. Connect the DSL port of the device to your ADSL wall outlet with RJ-11 cable.



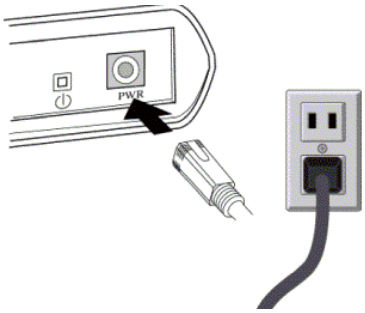
❷ Please attach one end of the Ethernet cable with RJ-45 connector to the **LAN** port of your ADSL Router.



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

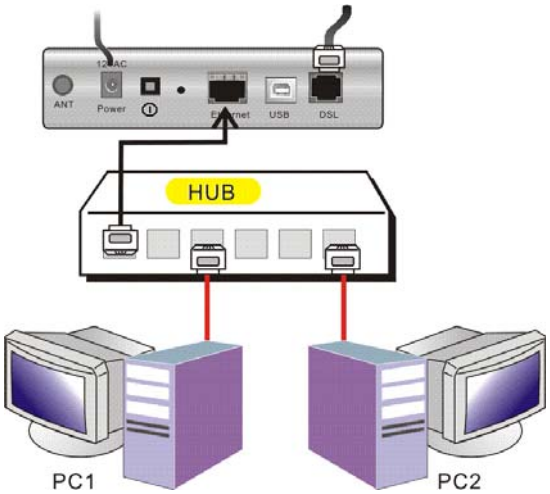


❹ Connect the supplied power adapter to the **PWR** port of your ADSL Router, and plug the other end to a power outlet.



❺ Turn on the power switch.

Here is an example for connecting the PC(s) to the router through a hub.



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.

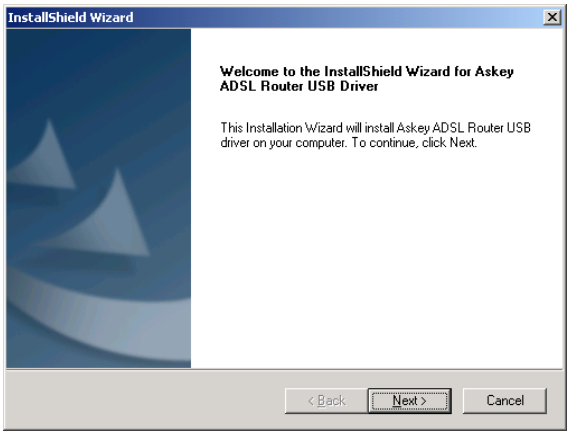
❼ When the file copying finished, the dialog above will close. Now the USB driver is installed properly. You can use the router.

For Windows 2000

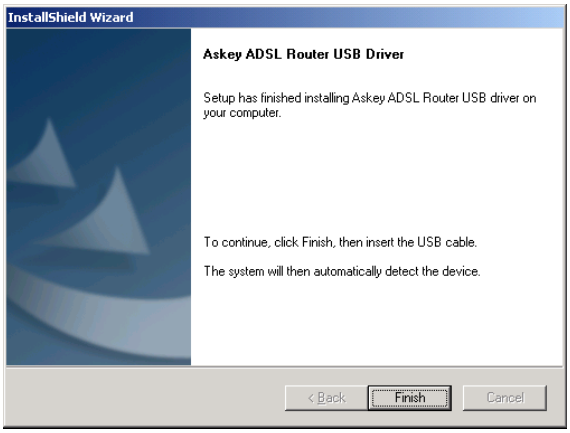
❶ Run the USB installation program from the CD provided in your router package.

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

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

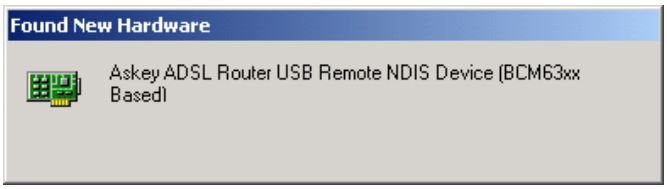


❹ When the complete window of the InstallShield Wizard appears, click **Finish**.



❺ Link your router and the PC with a USB cable.

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

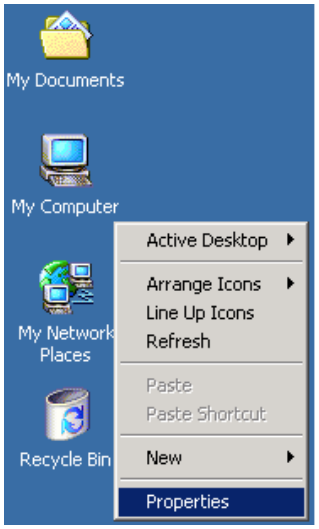


Note: If the USB device is not detected automatically, check the USB cable between the PC and the device. Besides, make sure that the device is power on.

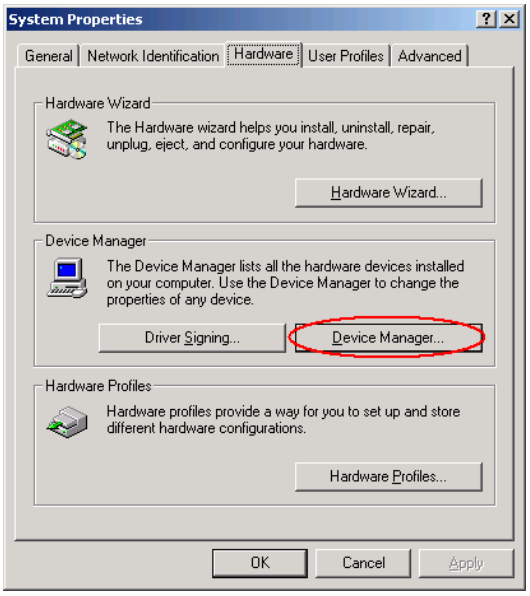
❼ When the file copying finished, the dialog above will close. Now the USB driver is installed properly. You can use the router.

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

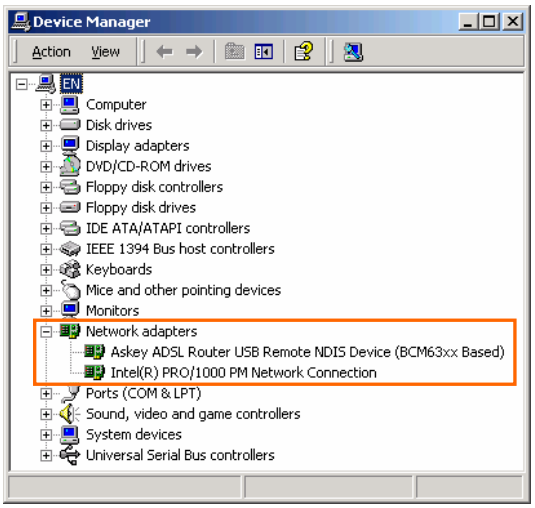
1. Right-click on **My Computer** and press **Properties**.



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



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

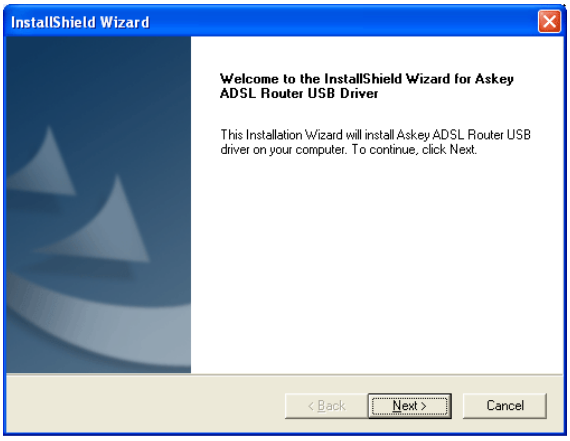


For Windows XP

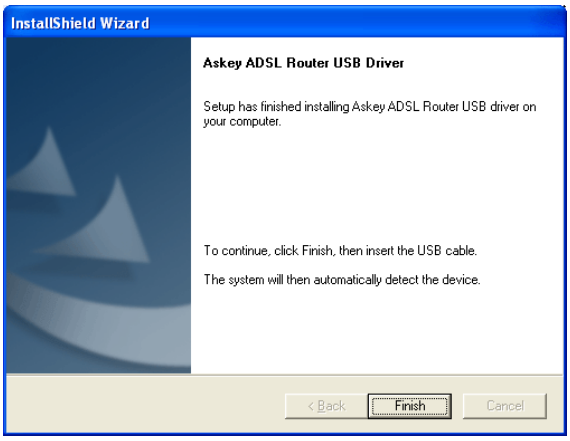
❶ Run the USB installation program from the CD provided in your router package.

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

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

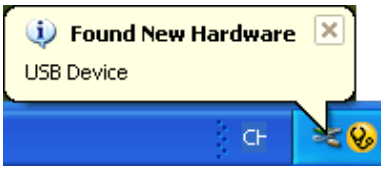


❹ When the complete message of InstallShield Wizard appears, click **Finish**.



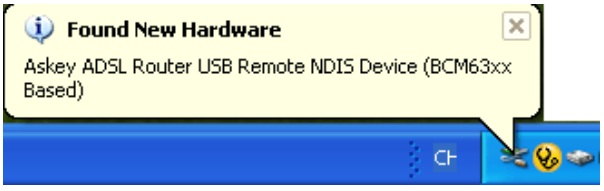
❺ Link your router and the PC with a USB cable.

❻ The system will detect the USB driver automatically.

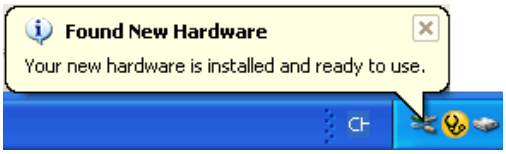


Note: If the USB device is not detected, check the USB cable between the PC and the device. Also make sure that the device is power on.

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



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

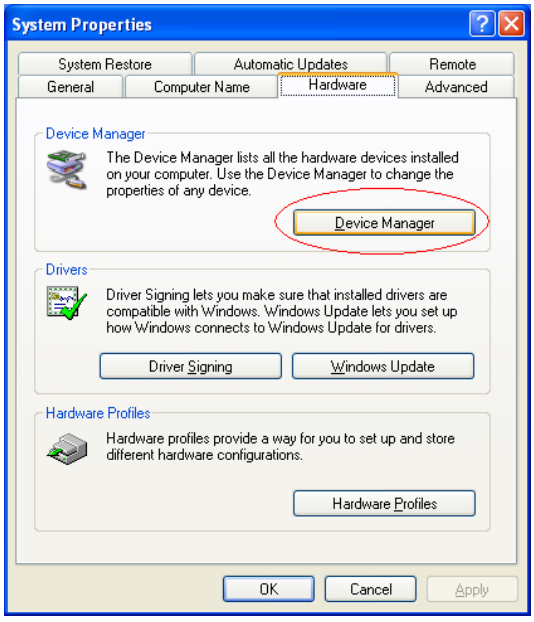


❾ You can use the wireless router now.

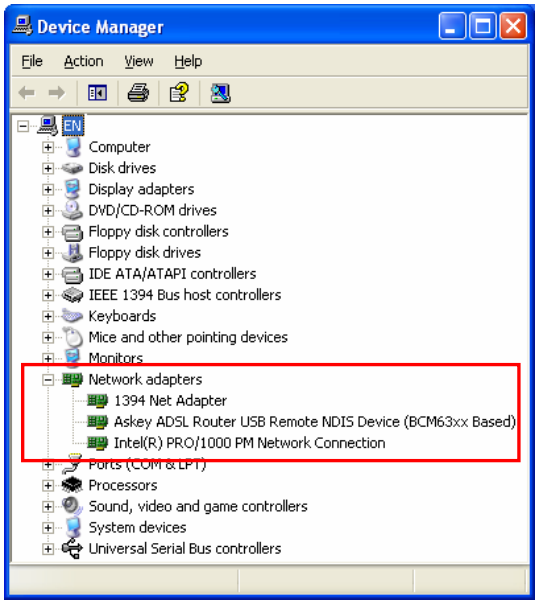
To make sure your router is properly installed, please do the following steps.

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

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

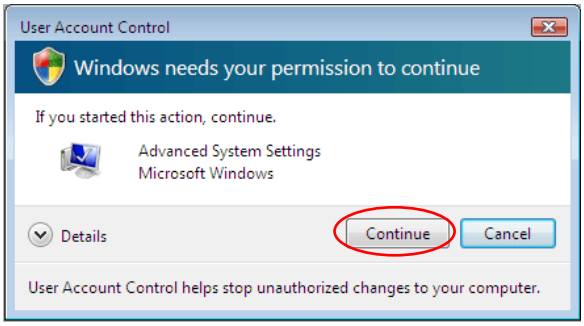


3. Confirm that the **Askey ADSL Router USB Remote NDIS Device** is on the **Network adapters** list.



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).

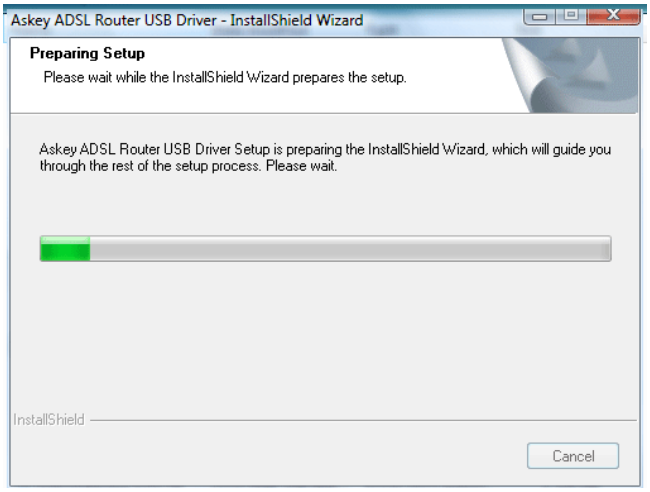


To install the USB driver before connect the router to the PC, here provides two methods.

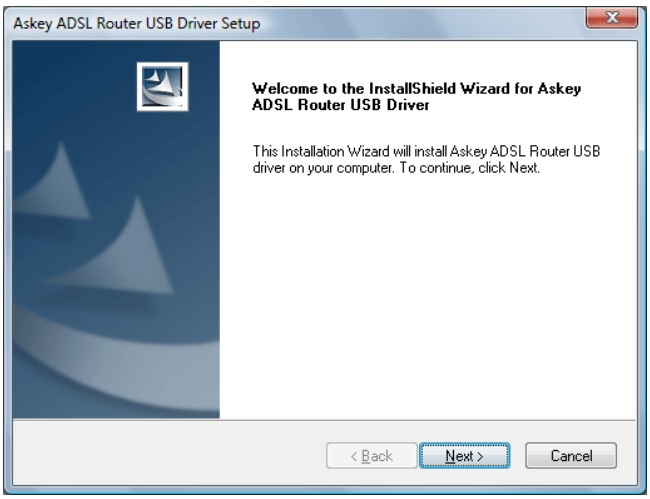
Method One – Use the driver CD came with the product package.

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

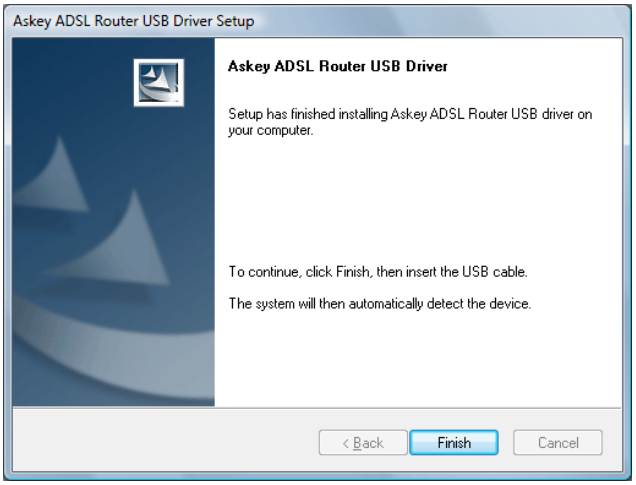
❷ An **InstallShield Wizard** will appear. Please wait for a moment.



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

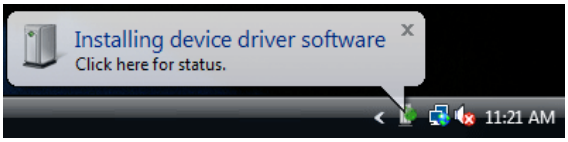


❹ When the complete message of InstallShield Wizard appears, click **Finish**.



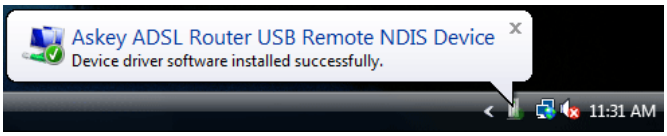
❺ Link your router and the PC with a USB cable.

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.

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

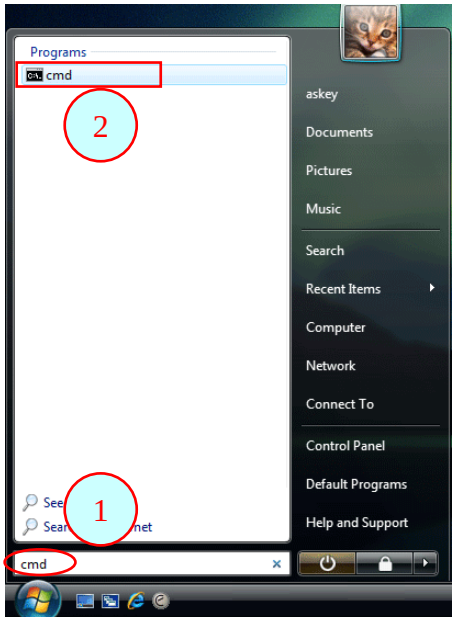


❽ You can use the router now.

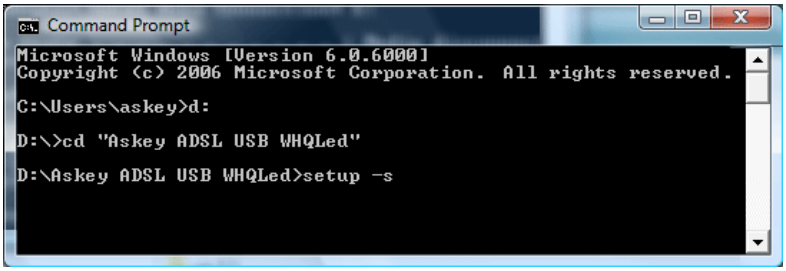
Method Two – Run a silent installation.

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.**

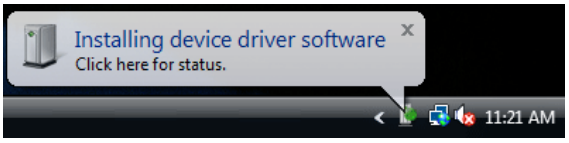


❸ When the Command Prompt screen appears, point to the driver folder on your PC, and then enter *setup -s*. Press enter to start silent installation.



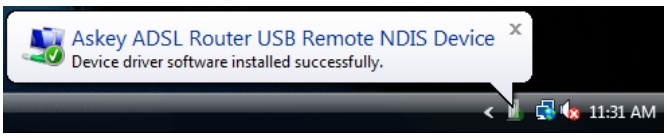
❹ The system will install the driver automatically. You can connect your router and the PC with a USB cable now.

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.

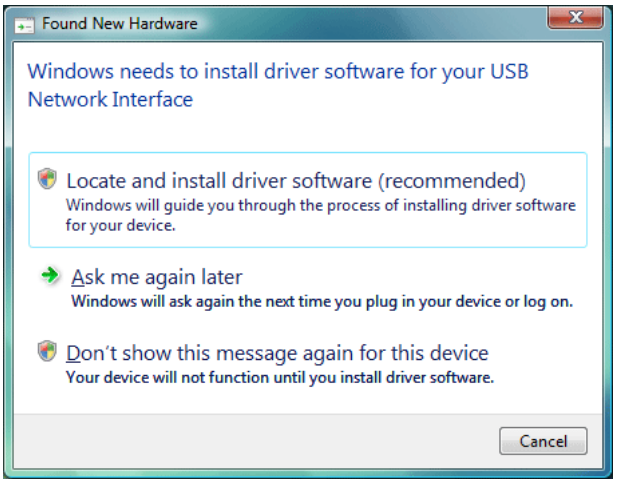


❼ You can use the router now.

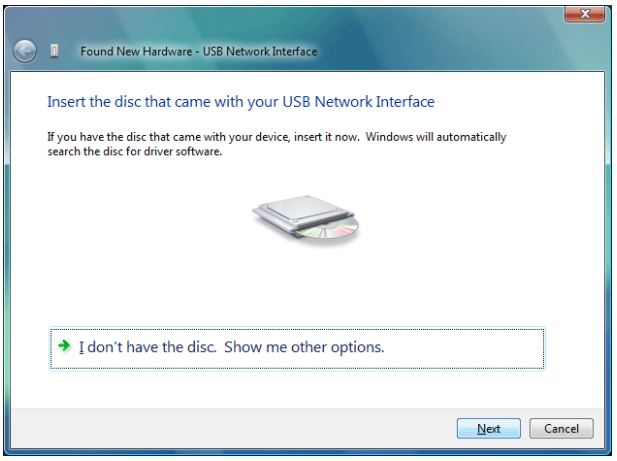
If the USB driver has not been installed yet, you can also connect the router to the PC with a USB cable and wait for *Universal Plug and Play* device to detect the router, and then install the driver.

❶ Plug the USB cable into the USB port on the PC.

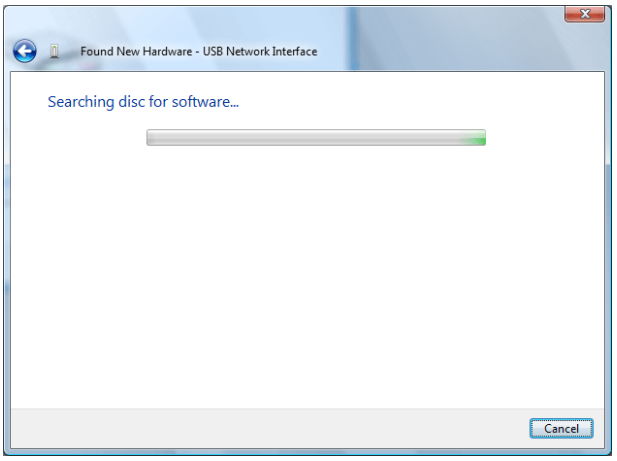
❷ A **Found New Hardware** window will appear. Press **Locate and install driver software (recommended)**.



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

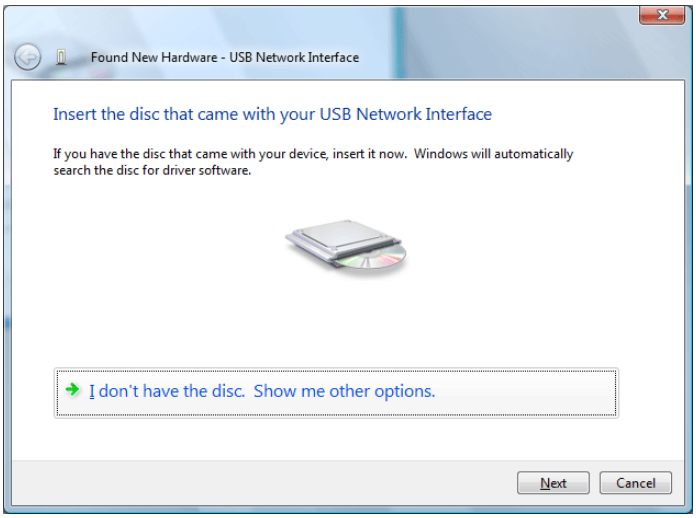


❹ The system will search disc for the USB driver needed and then complete the installation.

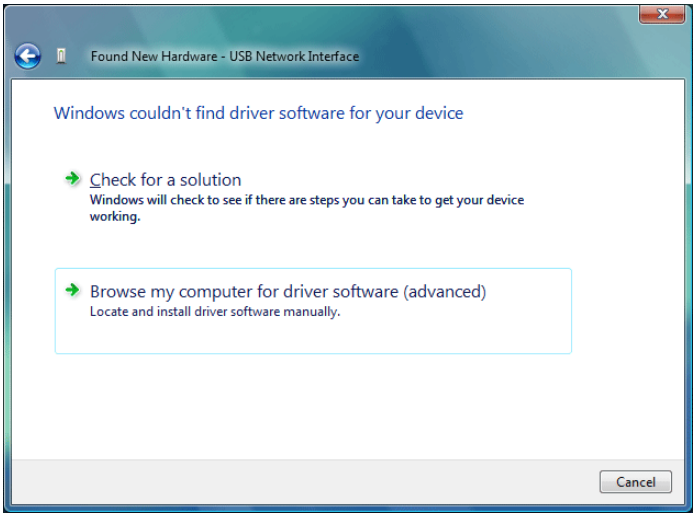


Or if you do not have a disc, but have the driver files on your PC, you can follow the steps below:

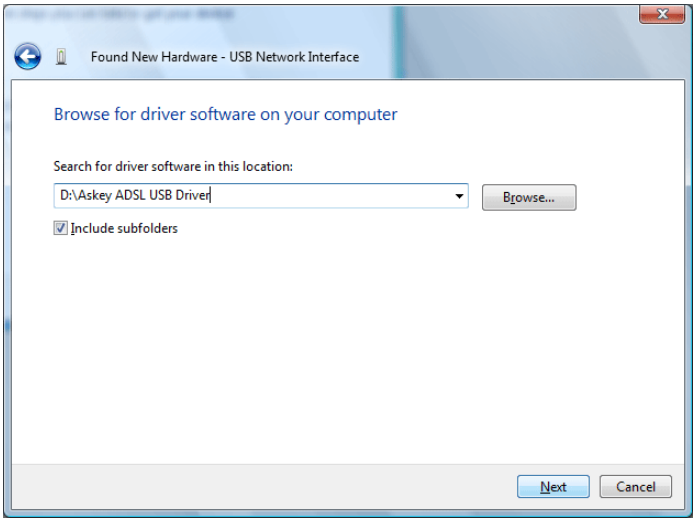
❸ Press **I don't have the disc. Show me other options**.



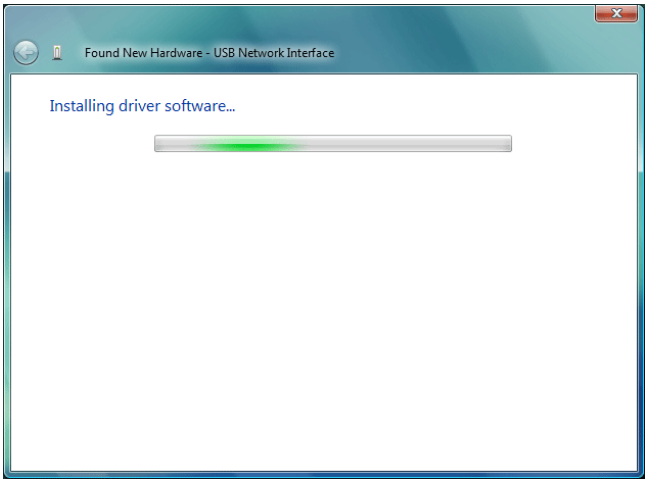
❹ Select **Browse my computer for driver software (advanced)**.



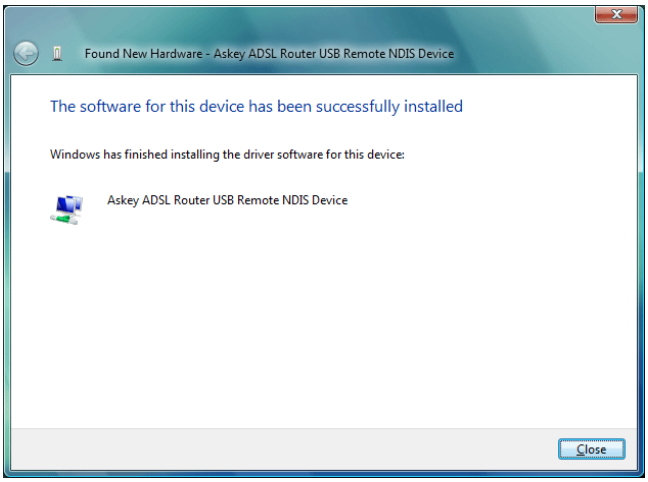
❺ Press **Browse** to set the path for the driver file, and then press **Next**.



❻ Wait while the system installing the driver.

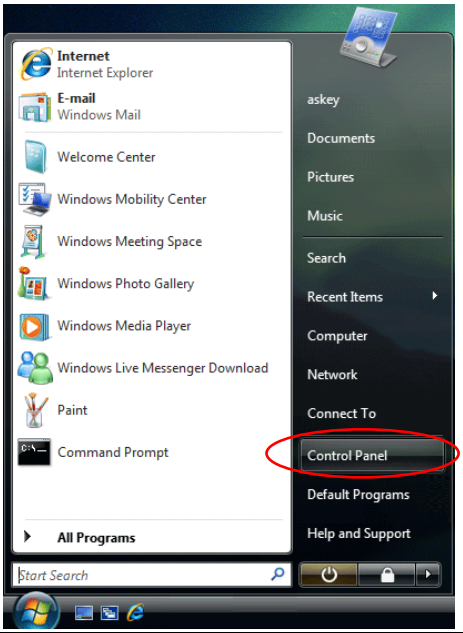


❼ Now the driver software is installed successfully. Press **Close** to start using the router.

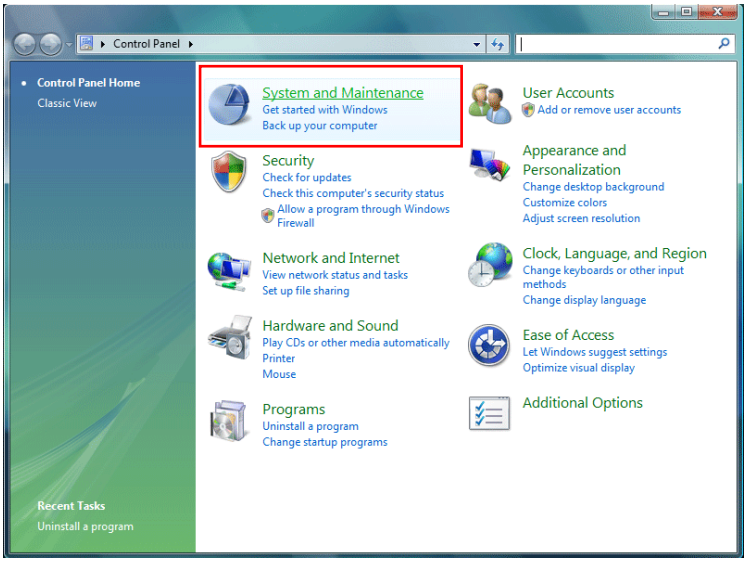


To make sure the USB driver for your router is properly installed, please do the following steps.

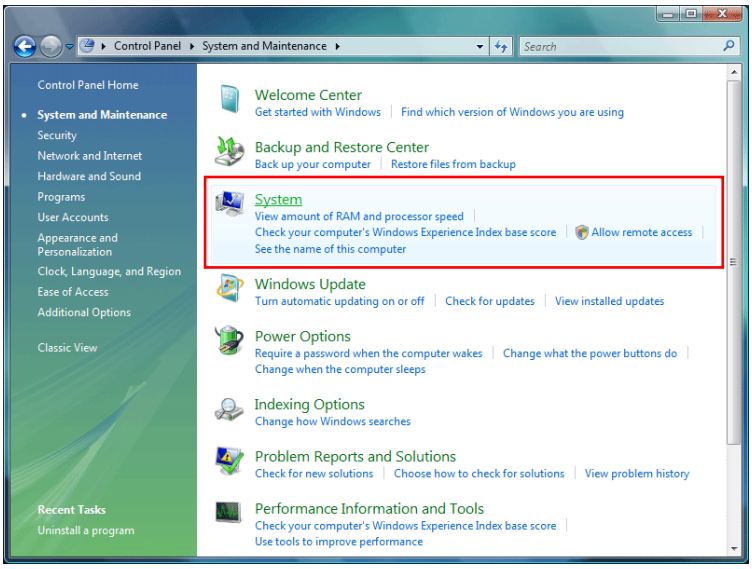
1. Open the Start menu and press **Control Panel**.



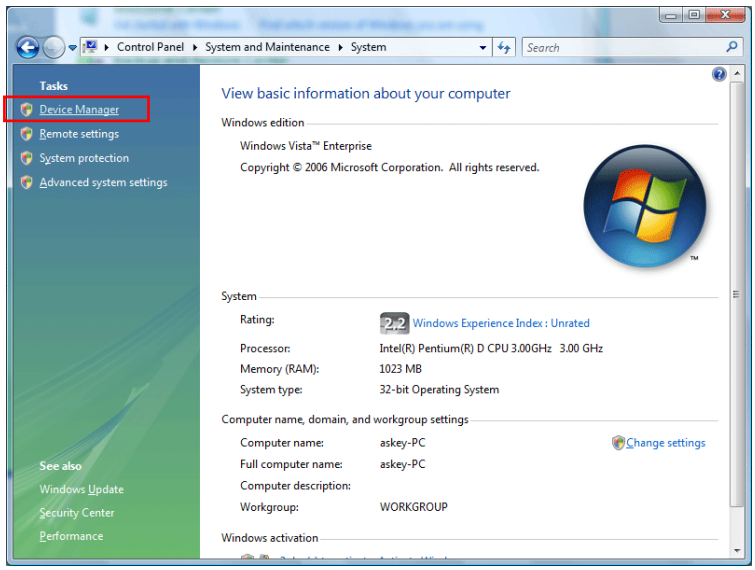
2. On the **Control Panel** folder, click **System and Maintenance**.



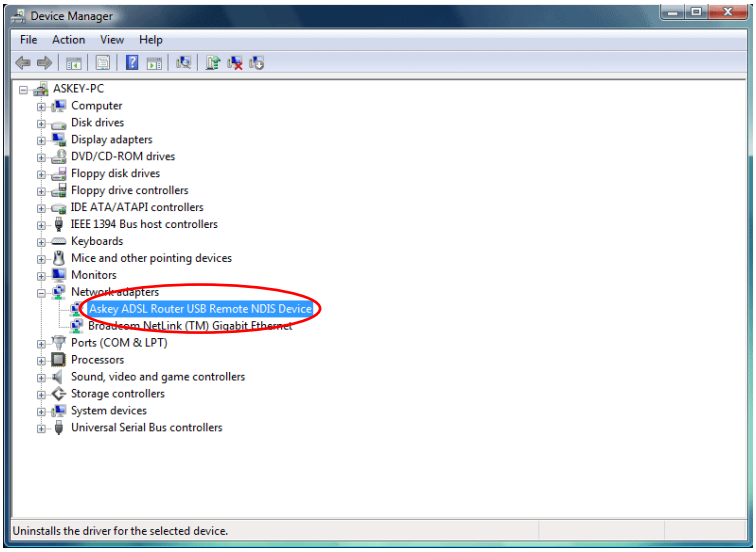
3. Press **System**.



4. Click **Device Manager**.



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.**

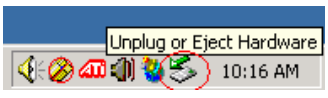
For Windows 2000

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:

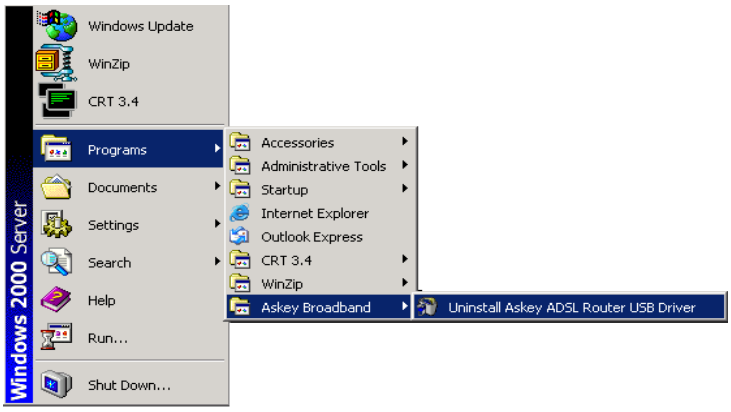
1. Go to the right lower corner for **Unplug and Eject Hardware** and left click on it.



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

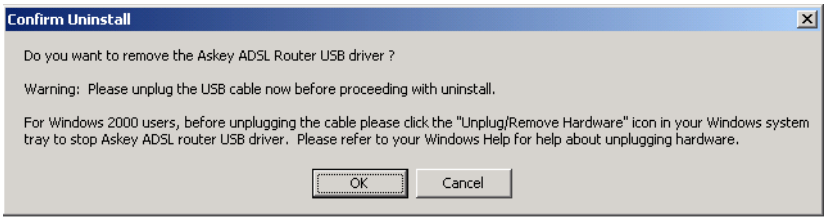
3. The Router is safely removed, click **OK** to continue.

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

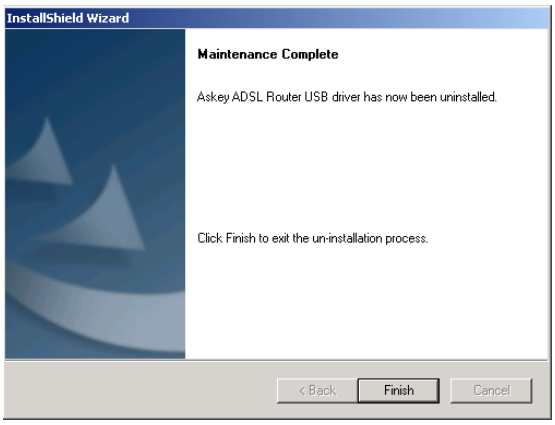


❸ The InstallShield Wizard dialog will appear.

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



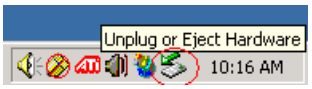
❺ When the Maintenance Complete screen appears, the USB driver is removed successfully. Click **Finish.**



Method Two:

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

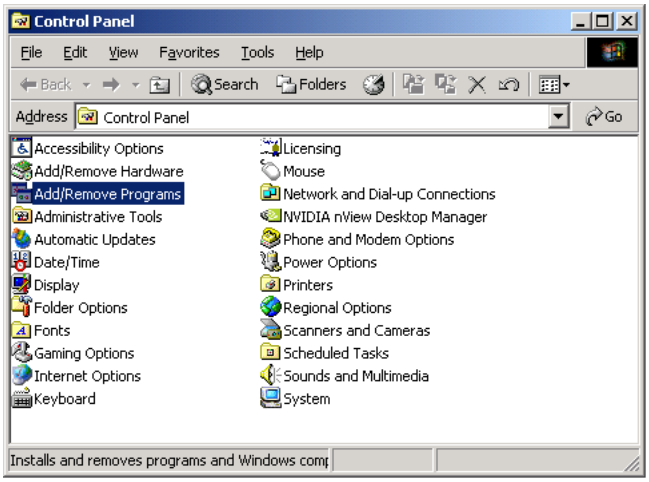
1. Go to the right lower corner for **Unplug and Eject Hardware** and left click on it.



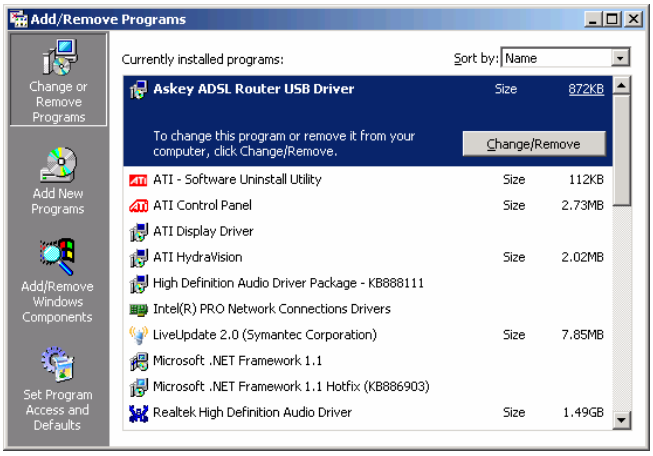
2. Click the dialog for **Stop Askey ADSL Router USB Remote NDIS Device**.

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

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

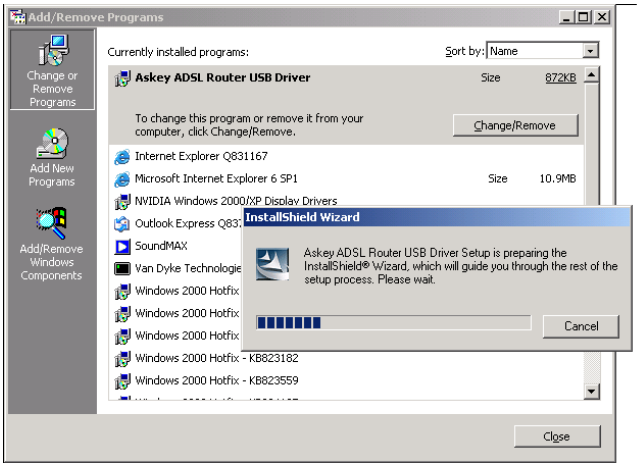


❸ A dialog appears to ask you to choose the program that you want to remove. Please select **Askey ADSL Router USB Driver** and click **Change/Remove**.

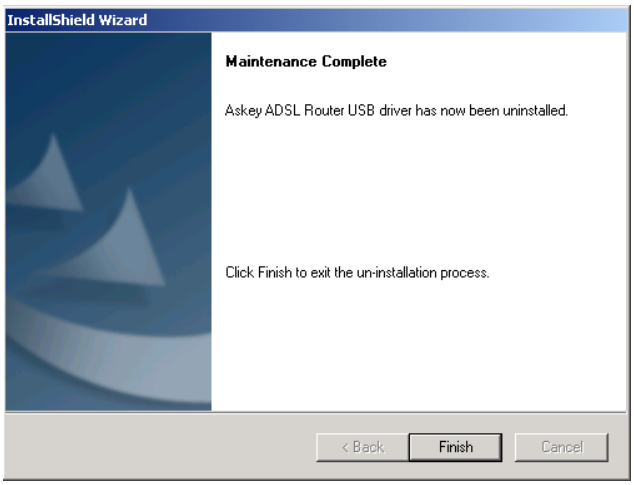


❹ A Confirm Uninstall dialog will show up, unplug your device from the USB port and click **OK**.

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



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



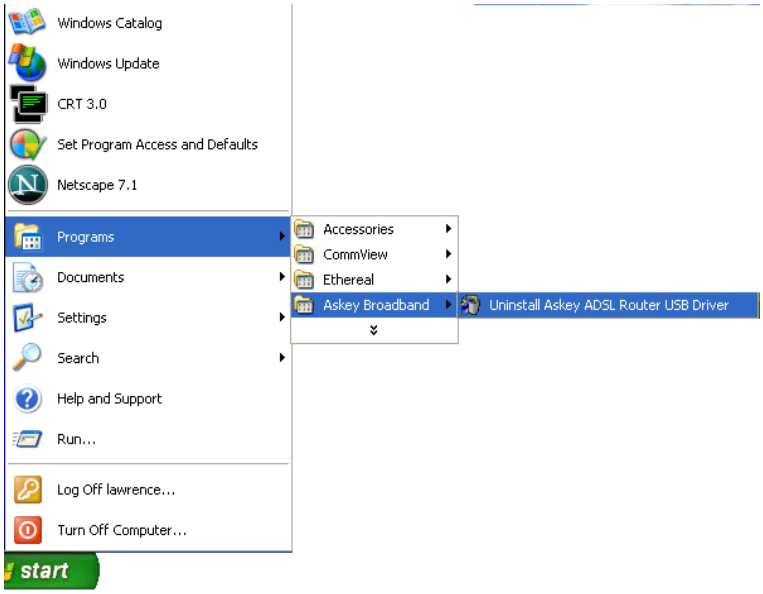
For Windows XP

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

Method One:

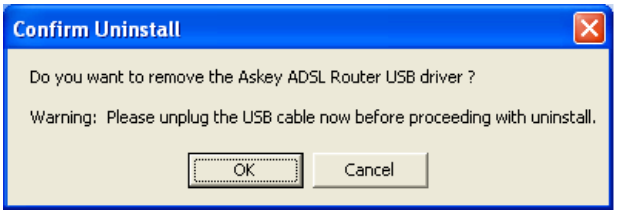
❶ Unplug your USB cable between your router and your PC.

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.**

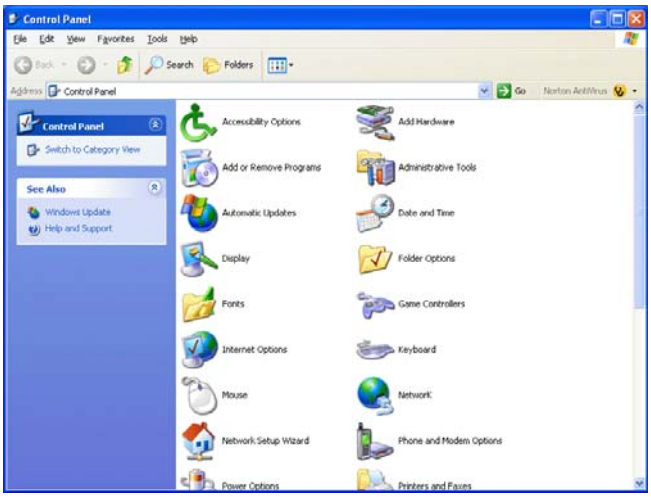


❺ When the Maintenance Complete screen appears, the USB driver is removed successfully. Click **Finish.**

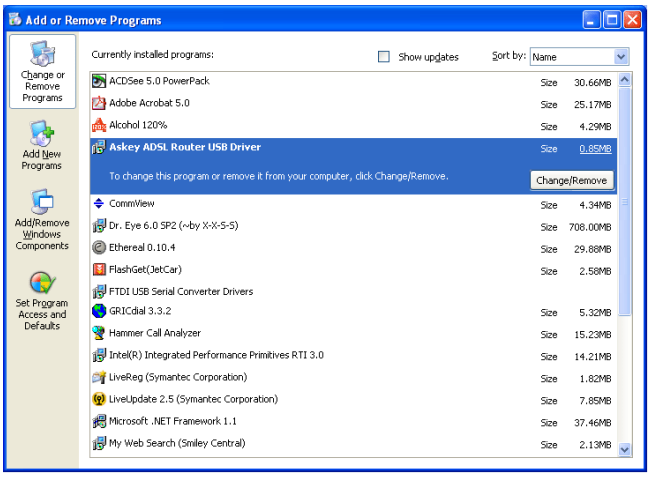
Method Two:

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

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

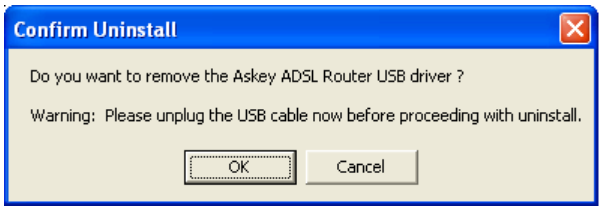


❸ A dialog appears to ask you to choose the program that you want to remove. Please select **Askey ADSL Router USB Driver** and click **Change/Remove**.



❹ The InstallShield Wizard dialog will appear.

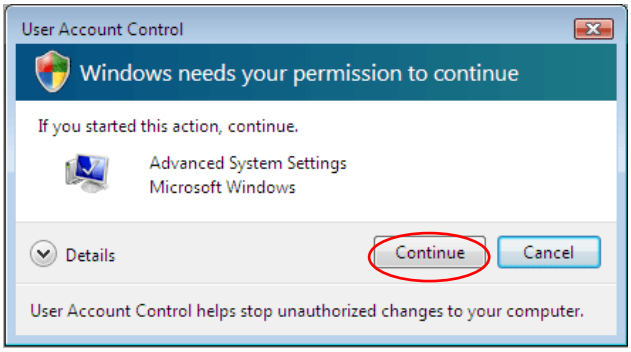
❺ A dialog appears to confirm whether you want to remove the USB driver or not. Unplug the USB cable from your PC, and click **Ok**.



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

For Windows Vista

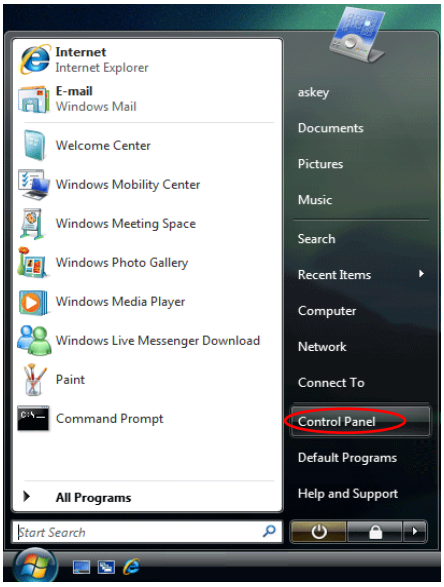
For Vista users, please press **Continue** whenever a prompted window asking for permission to continue during USB driver uninstallation process (see the figure below for example).



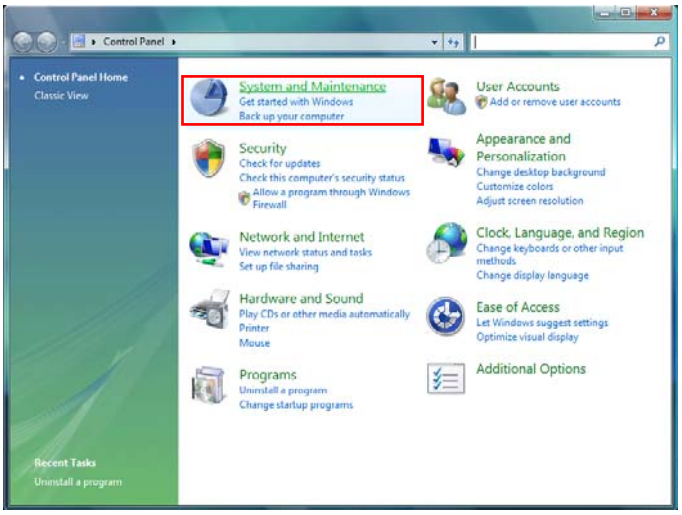
To uninstall the USB driver, there are two ways to do it. Please follow the instructions.

Method One: Remove from Device Manager.

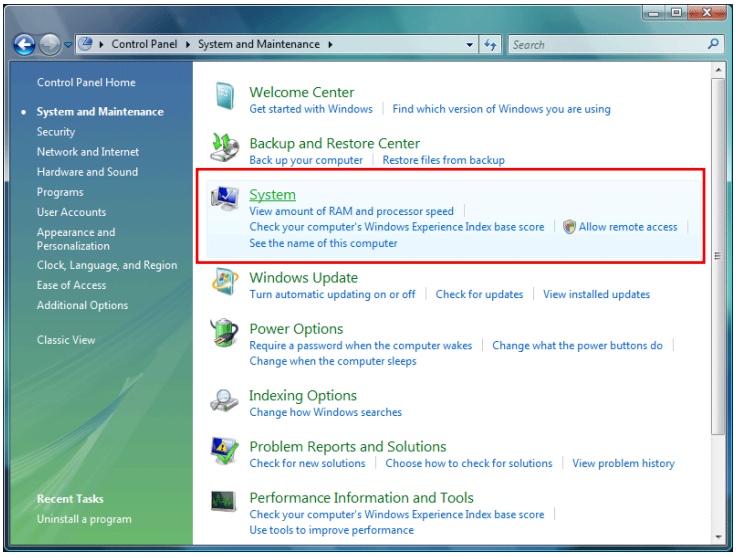
❶ Choose **Start** menu, and then select **Control Panel**.



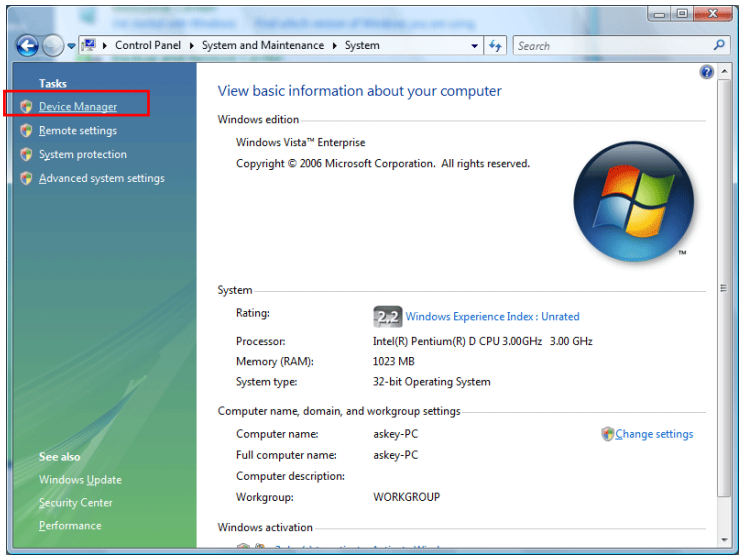
❷ Click **System and Maintenance**.



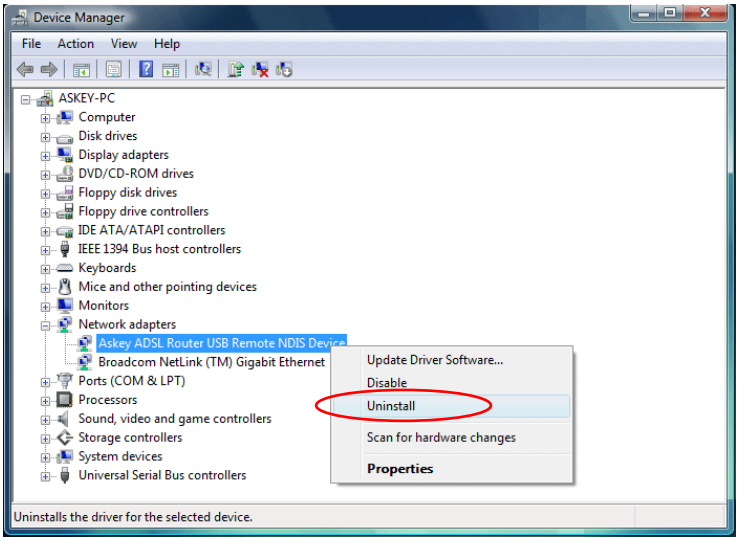
❸ Press **System**.



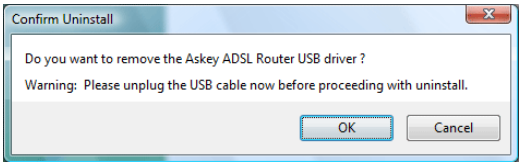
❹ Click **Device Manager**.



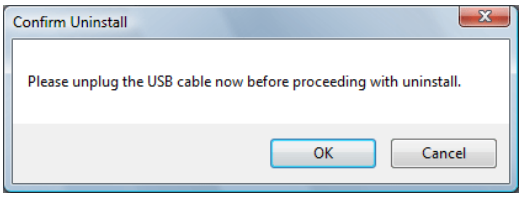
❺ Right click **Askey ADSL Router USB Remote NDIS Device** on the **Network adapters** list, and press Uninstall.



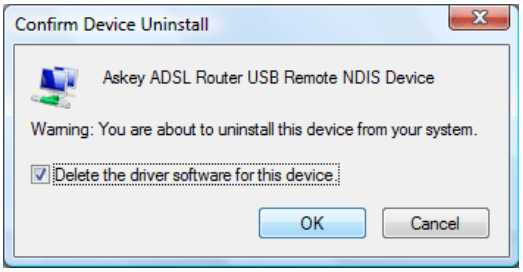
❻ Click **OK** when the Confirm Uninstall window appears.



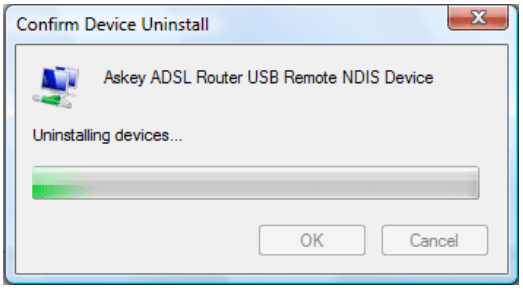
Remember to unplug the USB cable before continue the uninstallation, or you will see the reminder as follows. Unplug and press **OK**.



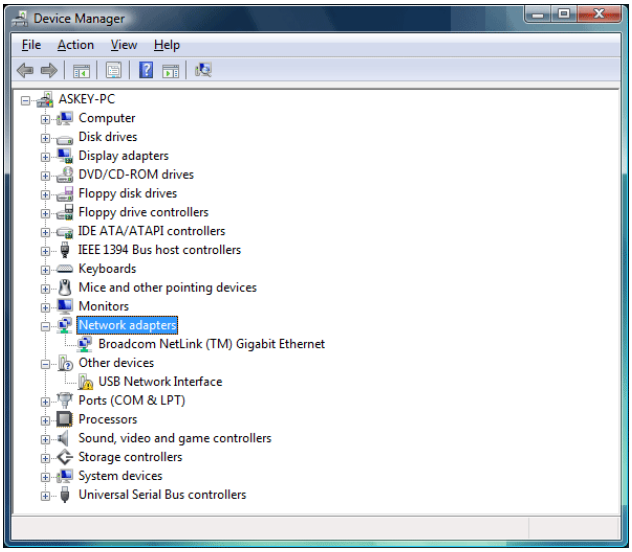
❼ When the **Confirm Device Uninstall** screen show up, check **Delete the driver software for the device** and click **OK** to continue.



❽ Wait while the system is uninstalling.



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

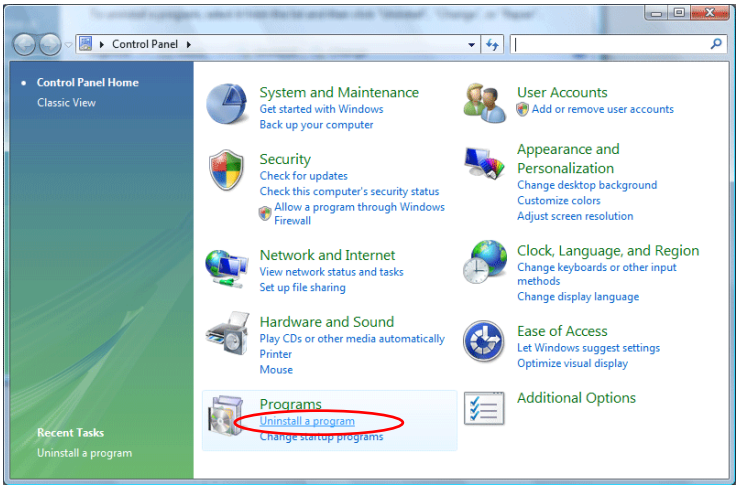


Method Two – uninstall from program list

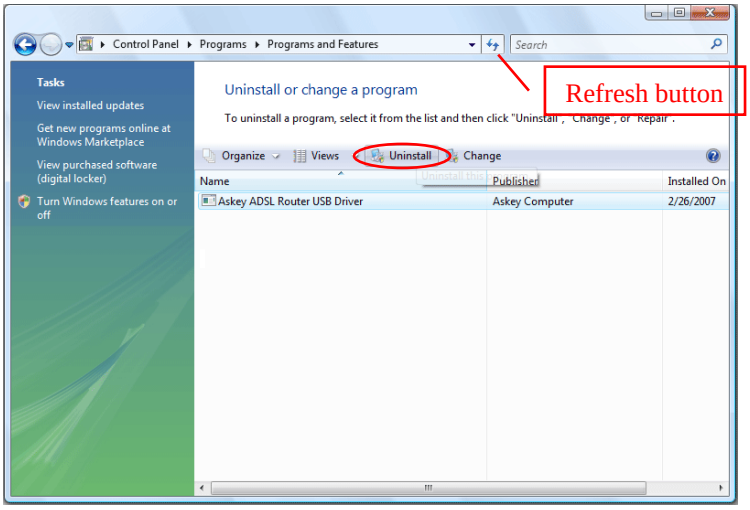
Note: If your USB driver is installed by UPnP device, you can only use method one (via the **Device Manager**) to uninstall, because the installed driver will not be shown on the program list.

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

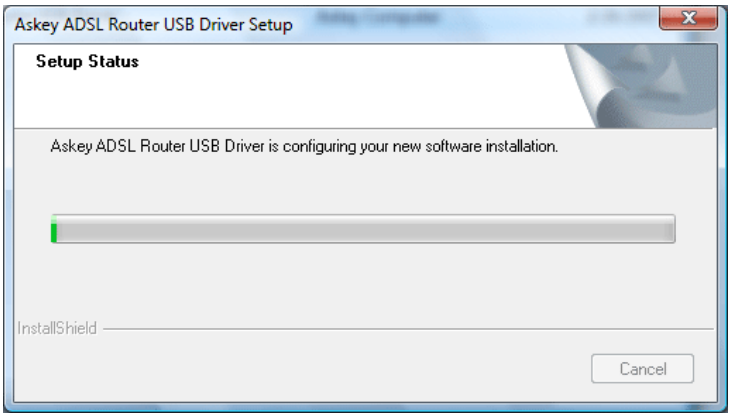
❷ Choose **Start** menu, and open **Control Panel** folder. Click **Uninstall a program**.



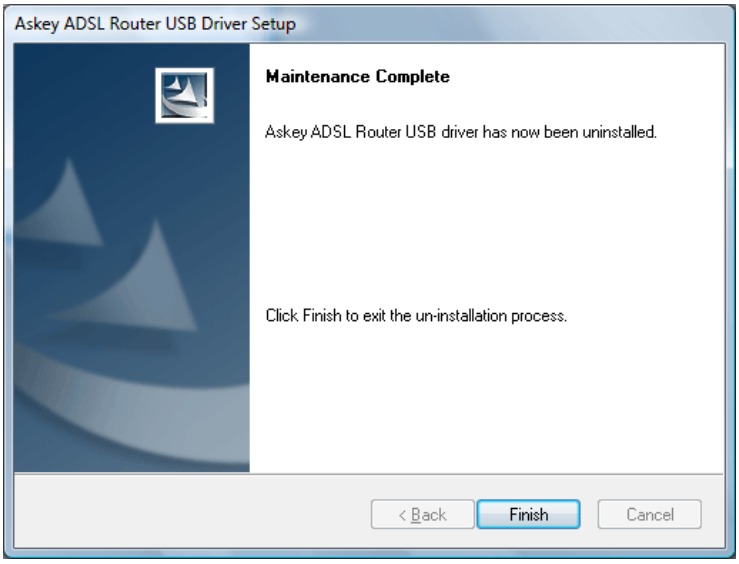
❸ If the driver name is not on the list, click **Refresh** button or **F5** to update the information. To remove the driver, select it, and then press **Uninstall**.



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



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



❻ 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

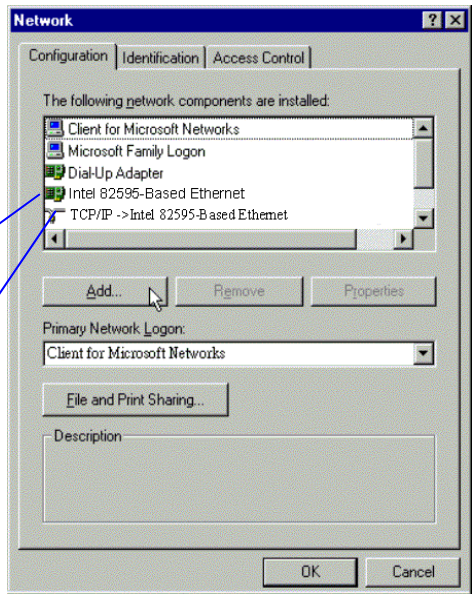
1. Open the **Start** menu, point to **Settings** and click on **Control Panel**.

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

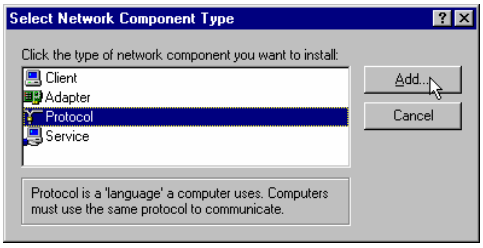
3. The **Network** window appears. On the **Configuration** tab, check out the list of installed network components.

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

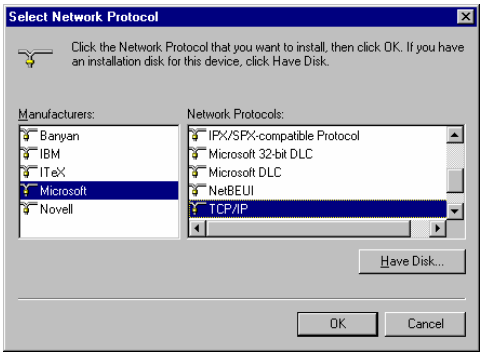
   Option 2: If you have TCP/IP protocol, skip to Step 6.



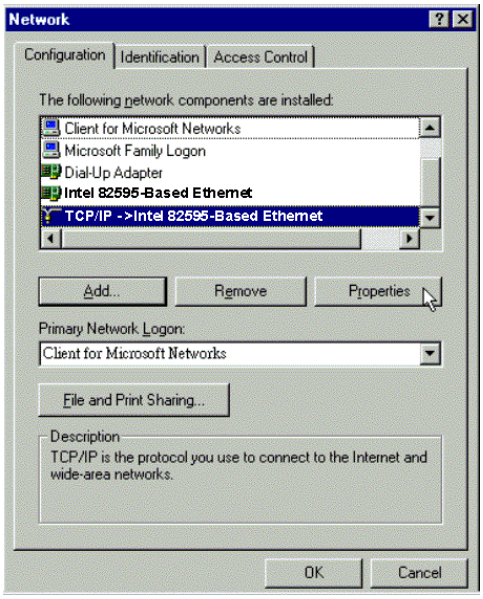
4. Highlight **Protocol** and click **Add**.



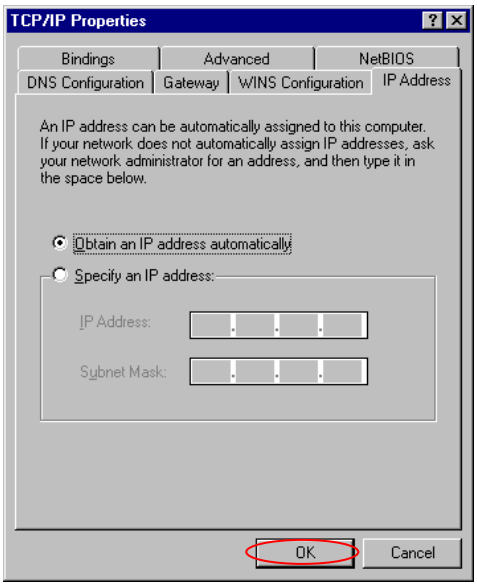
5. Highlight **Microsoft** on the left side of the window, and select **TCP/IP** on the right side. Then click **OK.**



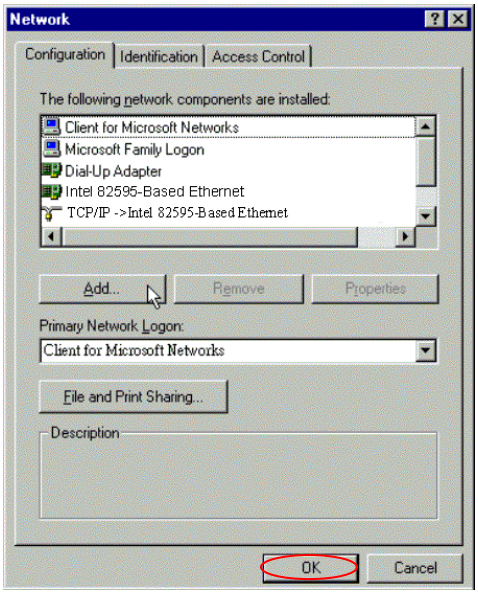
6. When returning to the **Network** window, highlight **TCP/IP** protocol for your NIC and click **Properties**.



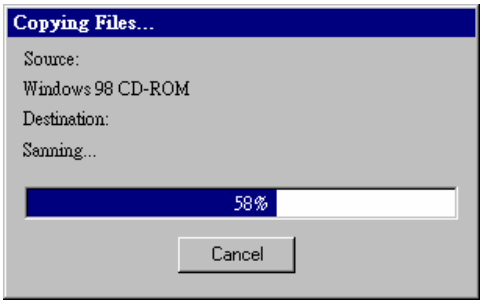
7. On the **IP Address** tab: Enable **Obtain an IP address automatically** and click OK.



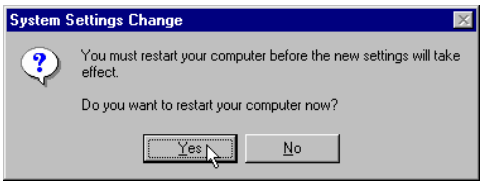
8. When returning to the **Network** window, click **OK**



9. Wait for Windows when copying files.

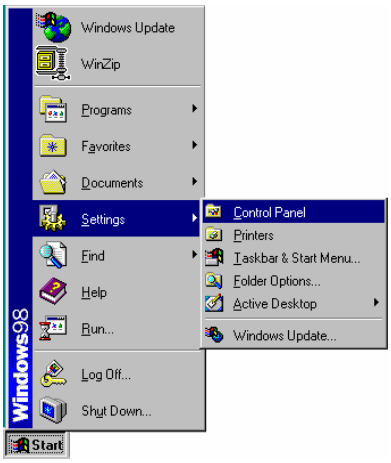


10. When prompted with **System Settings Change** dialog box, click **Yes** to restart your computer.



For Windows ME

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



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

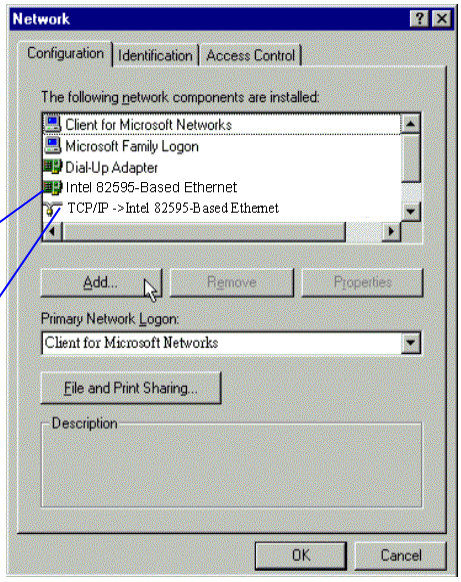
3. The **Network** window appears. On the **Configuration** tab, check out the list of installed network components.

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

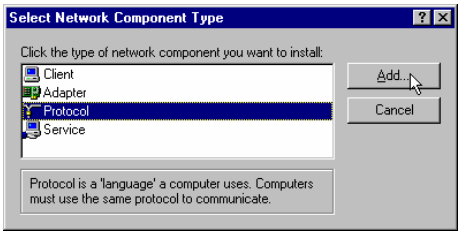
   Option 2: If you have TCP/IP protocol, skip to Step 6.

Your network interface card.

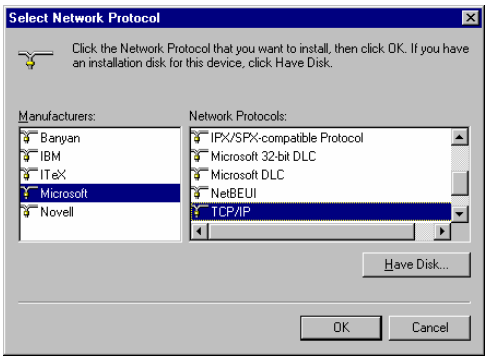
Check out if TCP/IP for your NIC is installed or not.



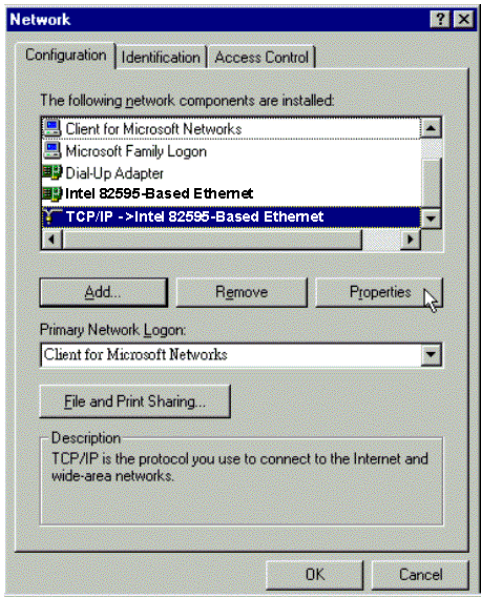
4. Highlight **Protocol** and click **Add**.



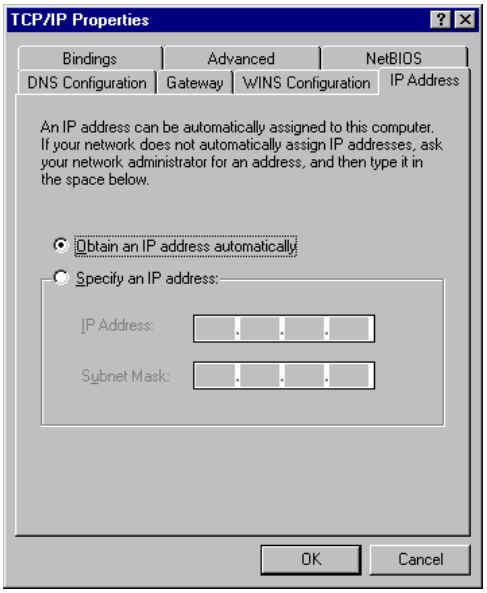
5. Highlight **Microsoft** on the left side of the windows, and select **TCP/IP** on the right side. Then click **OK**.



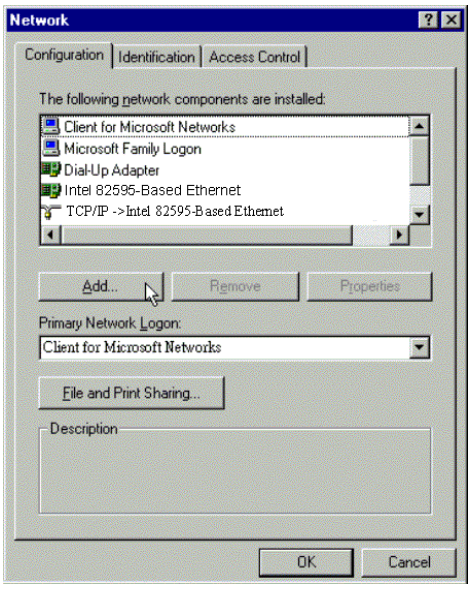
6. While returning to **Network** window, highlight **TCP/IP** protocol for your NIC and click **Properties**.



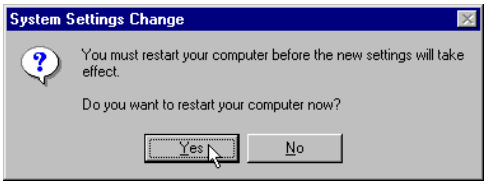
7. On **IP Address** tab:
Enable **Obtain an IP address automatically** and click OK.



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



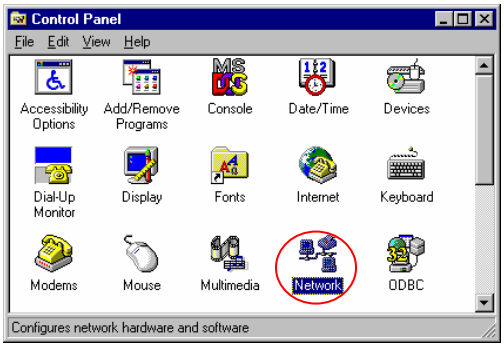
9. Wait for Windows when copying files.
10. When prompted with the **System Settings Change** dialog box, click **Yes** to restart your computer.



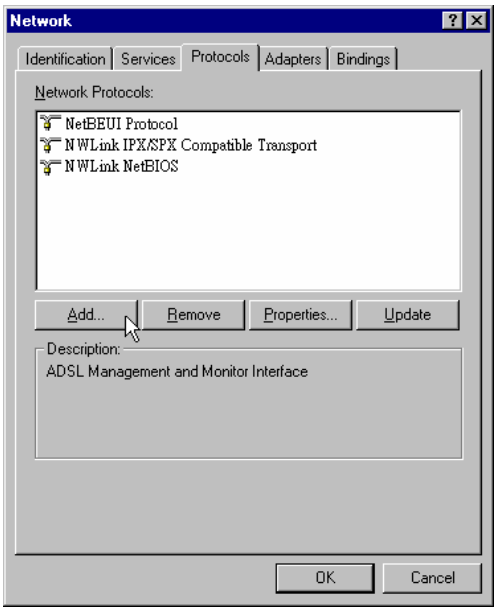
For Windows NT

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

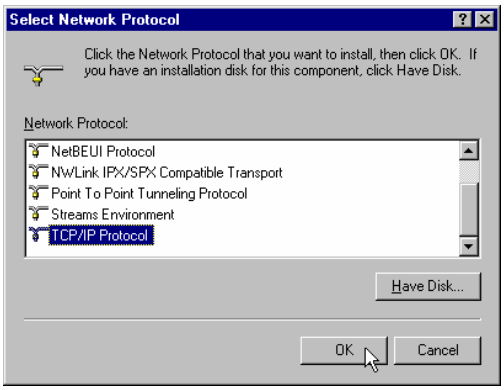
2. Double-click the **Network** icon.



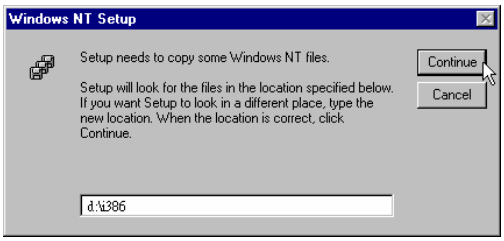
3. The **Network** window appears. On the **Protocols** tab, check out the list of installed network components.
   Option 1: If there is **no** TCP/IP Protocol, click **Add**.
   Option 2: If you have TCP/IP Protocol installed, skip to Step 7.



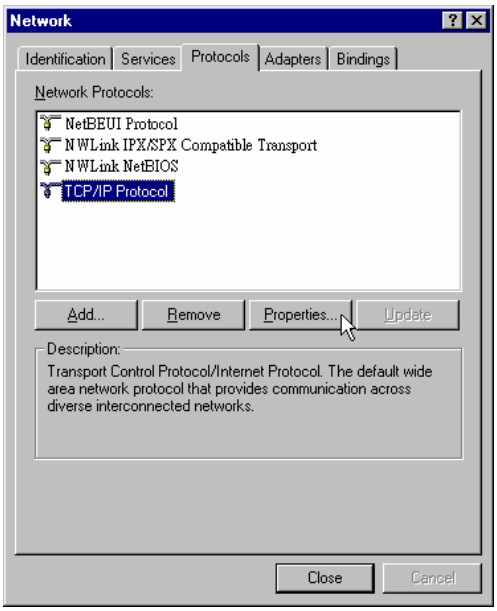
4. Highlight **TCP/IP Protocol** and click **OK**.



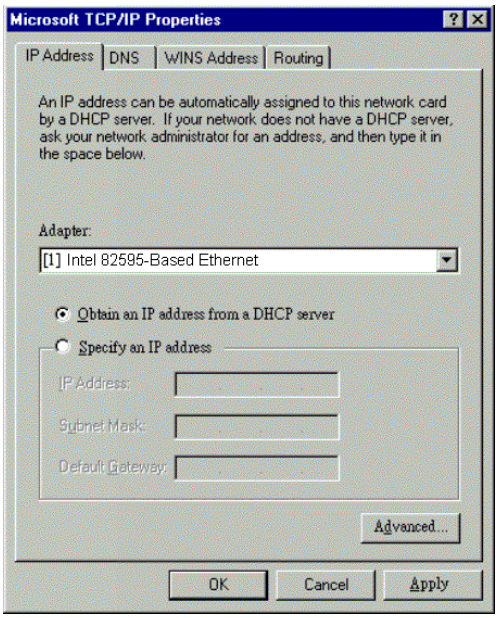
5. Insert the Windows NT CD into your CD-ROM drive and type the location of the CD. Then click **Continue**.



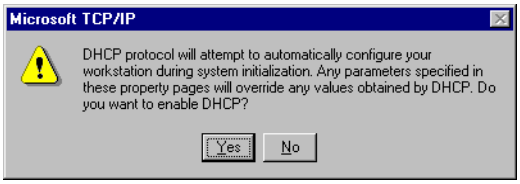
6. When returning to the **Network** window. Open the **Protocols** tab, then select **TCP/IP Protocol** and click **Properties**.



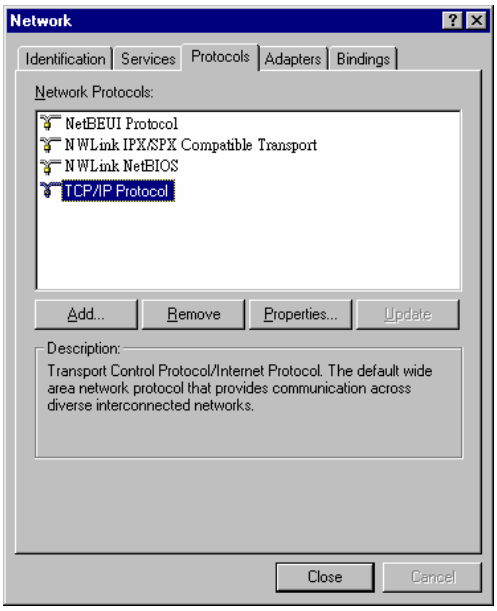
7. Enable **Obtain an IP address from a DHCP server** and click **OK**.



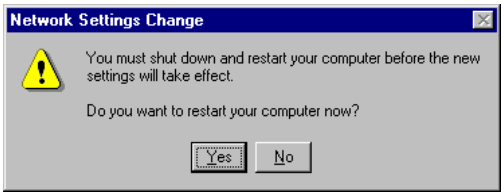
8. When prompted with the message below, click **Yes** to continue.



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

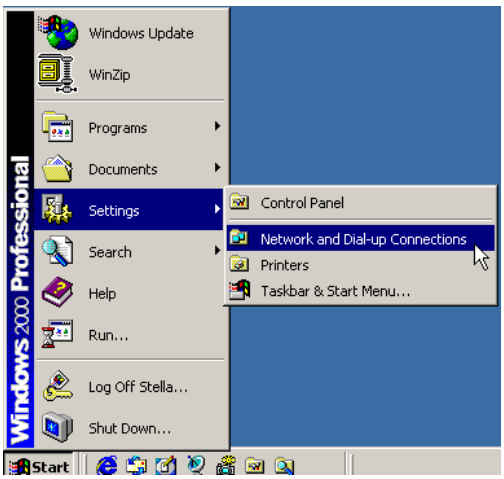


10. When prompted with **Network Settings Change** dialog box, click **Yes** to restart your computer.

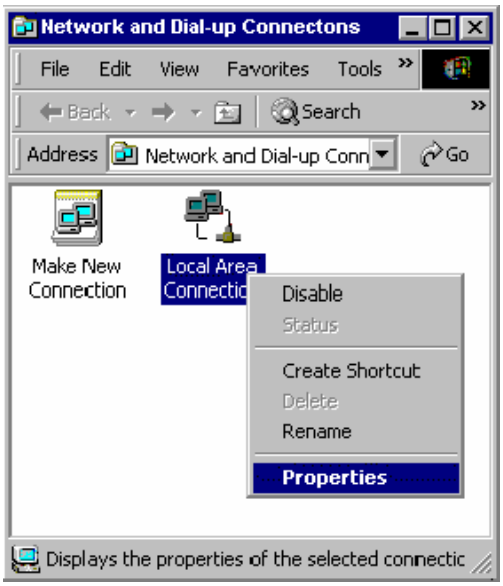


For Windows 2000

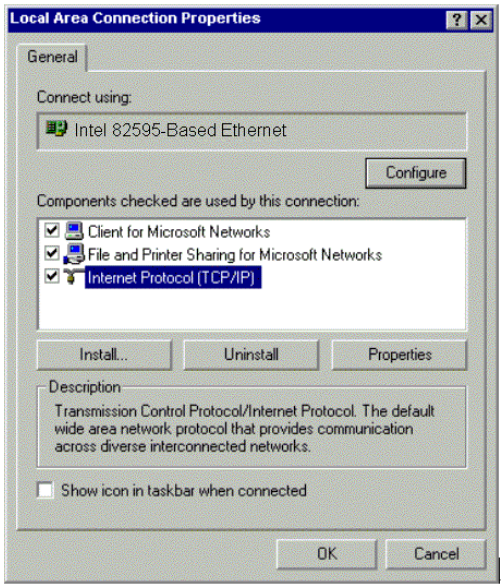
1. From the **Start** menu, point to **Settings** and then click **Network and Dial-up Connections**.



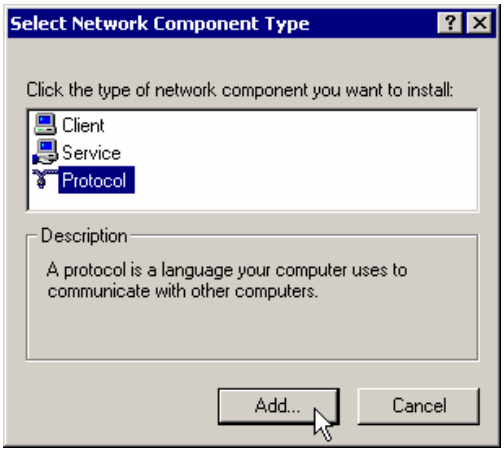
2. Right-click the **Local Area Connection** icon and then click **Properties**.



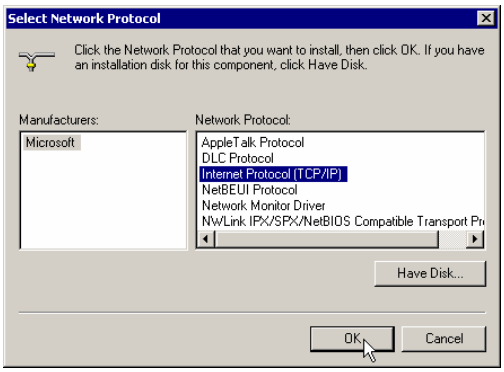
3. On the **General** tab, check out the list of installed network components.
Option 1: If there is **no** TCP/IP Protocol, click **Install**.
Option 2: If you have TCP/IP Protocol, skip to Step 6.



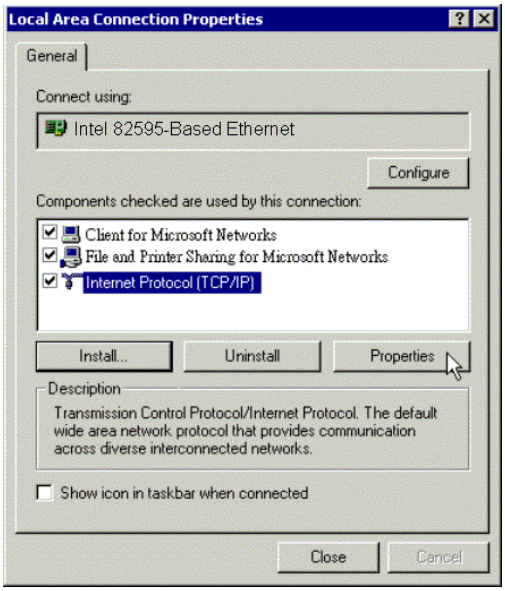
4. Highlight **Protocol** and then click **Add**.



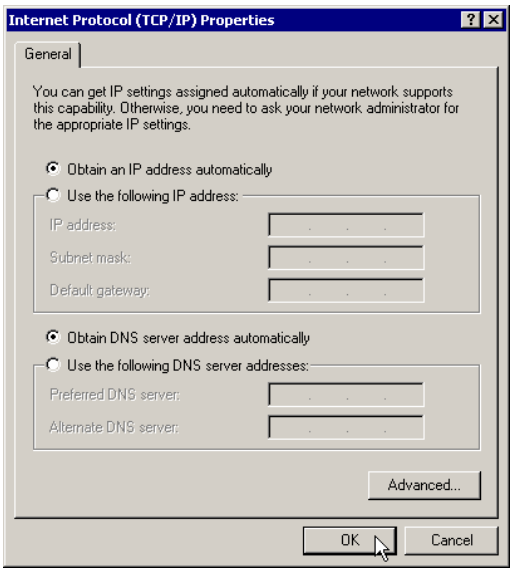
5. Click **Internet Protocol (TCP/IP)** and then click OK.



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



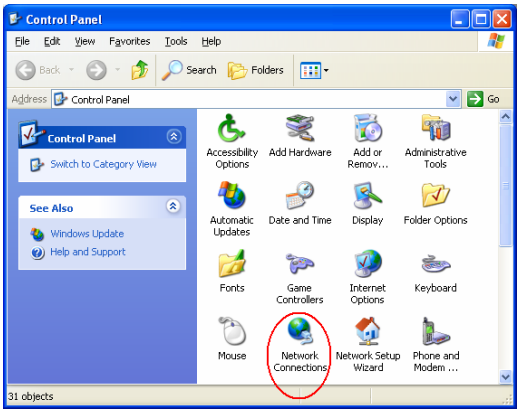
7. Under the **General** tab, enable **Obtain an IP address automatically**. Then click **OK**.



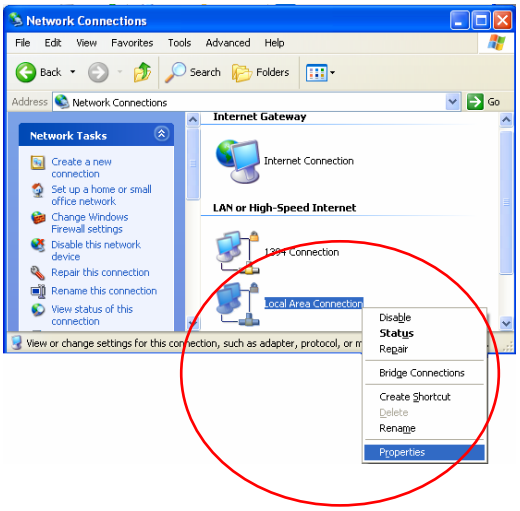
For Windows XP

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

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



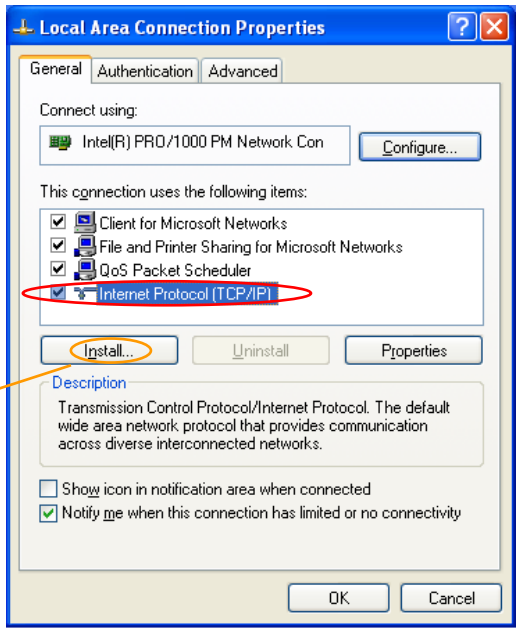
3. Right click **Local Area Connection** and then click **Properties**.



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

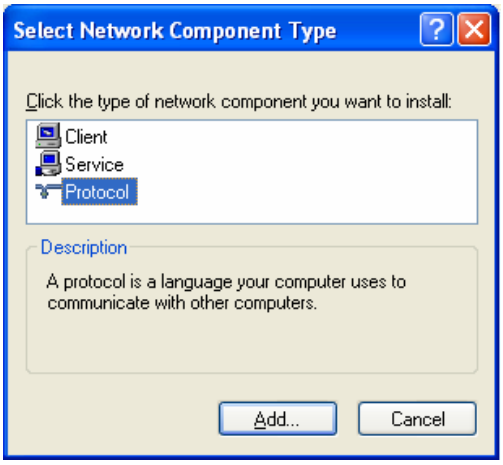
   Option 1: If there is **no** TCP/IP Protocol, click **Install**.

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

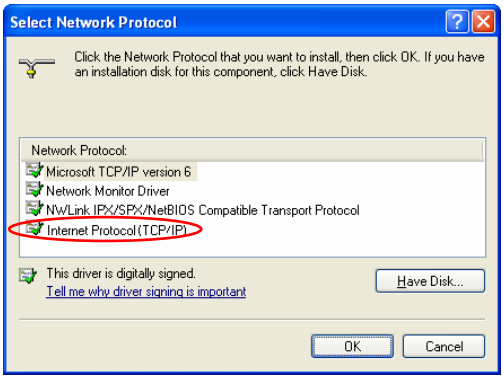


If there is **no TCP/IP** protocol installed on your PC, press **Install** to continue.

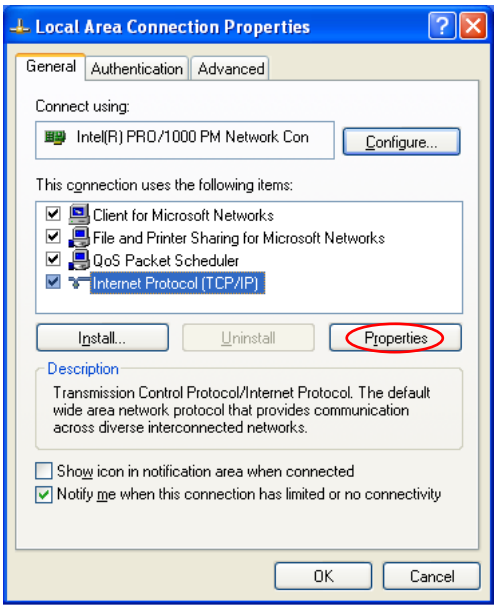
5. Highlight **Protocol** and then click **Add**.



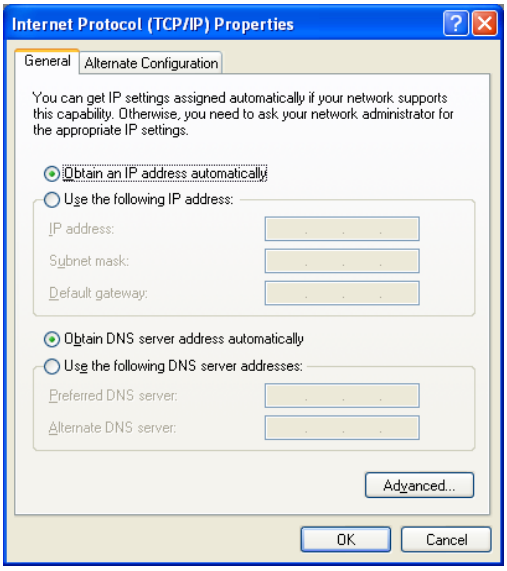
6. Click **Internet Protocol(TCP/IP)** and then click **OK**.



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

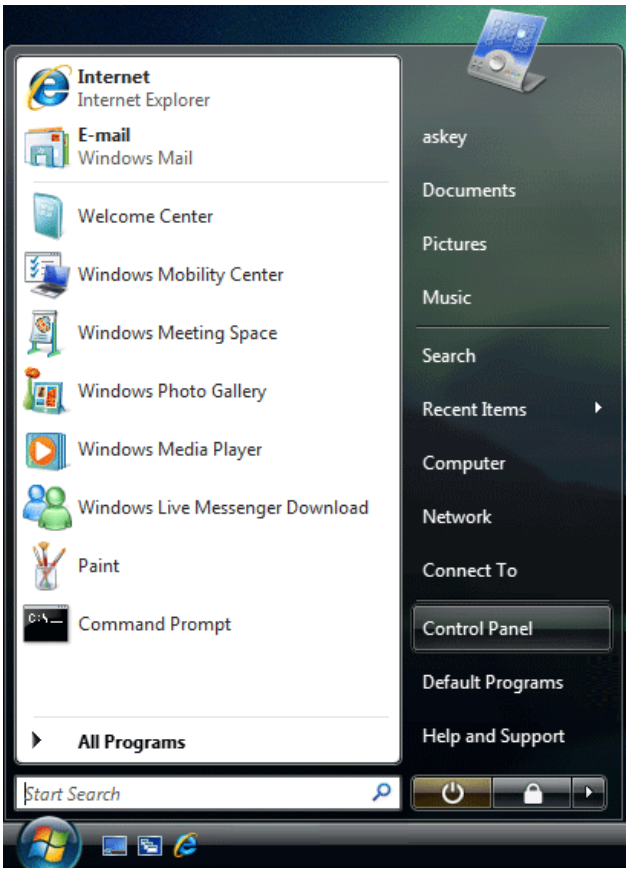


8. Under the **General** tab, select **Obtain an IP address automatically**, and **Obtain DNS server address automatically**. Then click **Ok**.

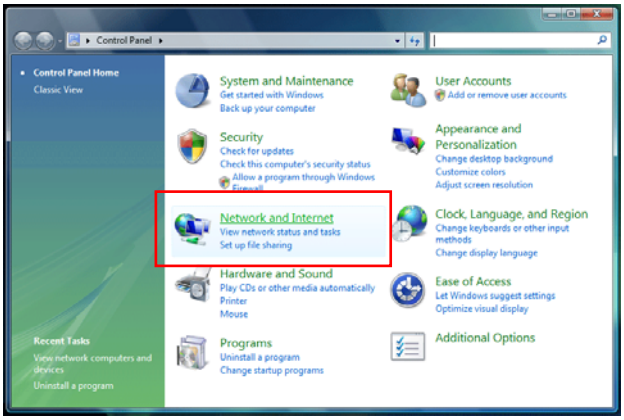


For Windows Vista

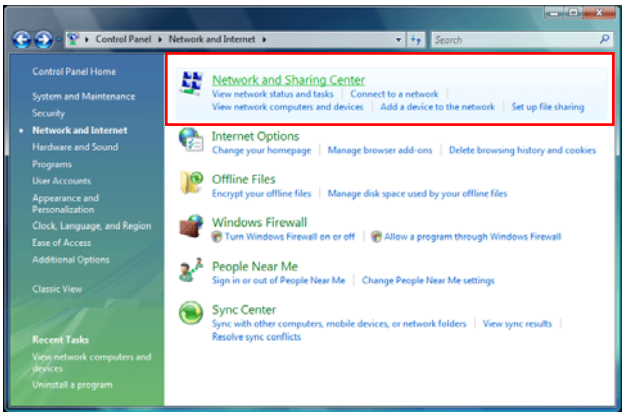
1. Open the **Start** menu, point to **Control Panel** and click it.



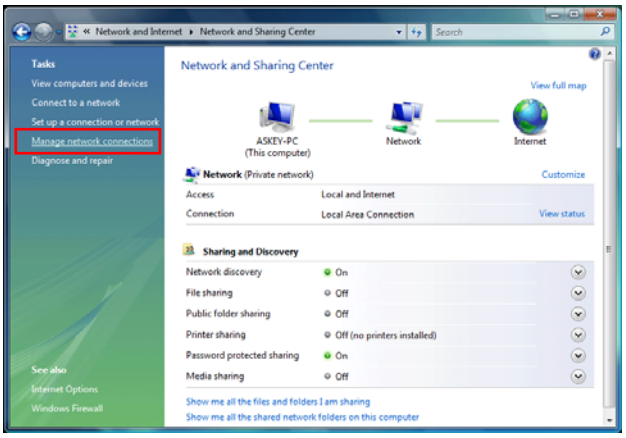
2. Click **Network and Internet.**



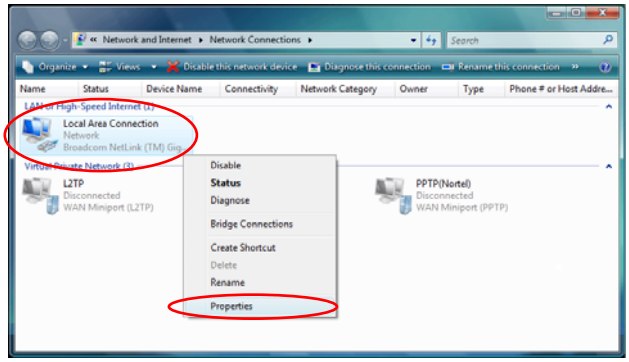
3. Select **Network and Sharing Center**.



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

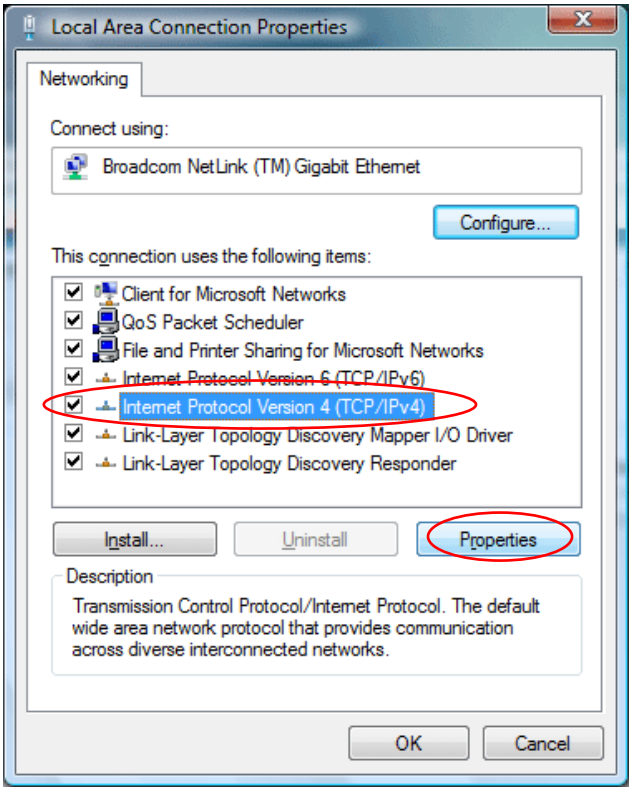


5. Right click **Local Area Connection** and select **Properties**.

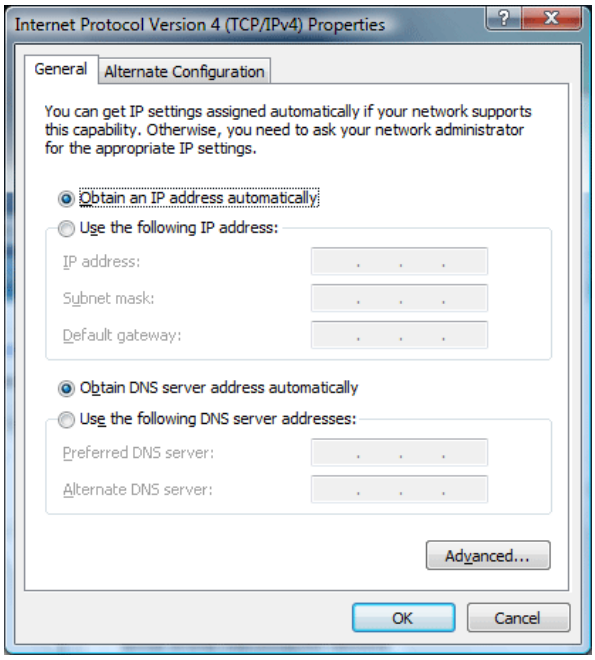


6. On the **Networking** tab, you will find Internet Protocol Version 6 and Version 4. Contact your ISP to confirm which one will be used. (We take TCP/IPv4 for example here.)

   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

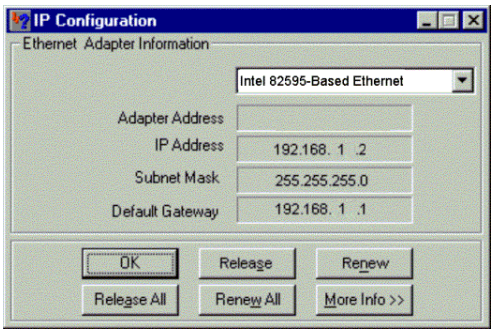
After the ADSL Router gets online, there is a chance that your PC does not renew its IP address and thus causes the PC not able to access the Internet. To solve this problem, please follow the procedures below to renew PC's IP address.

For Windows 98/ME

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

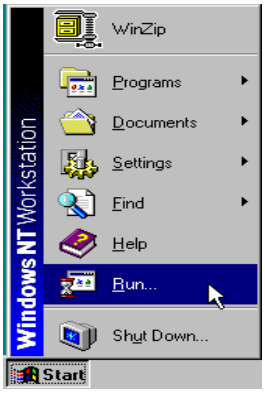
2. Type **winipcfg** in the text box and click **OK**.

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.

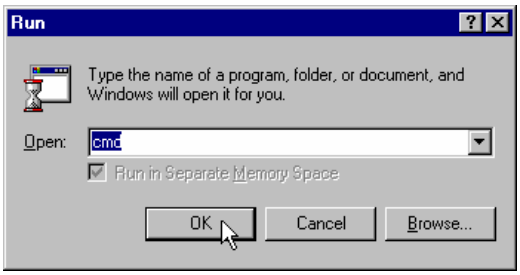


For Windows NT/2000/XP

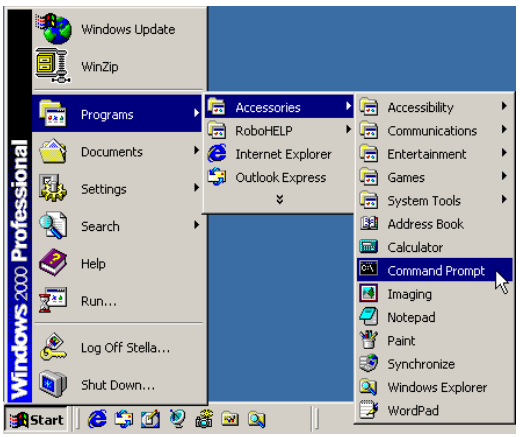
1. Open the **Start** menu, and click **Run...** on this menu.



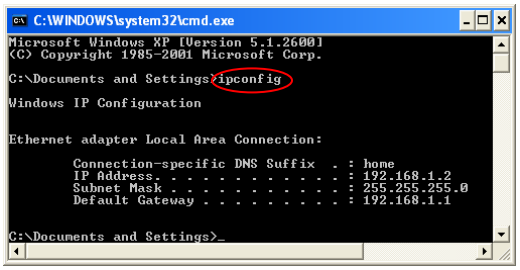
2. Type **cmd** in the text box that appears and click **OK**. Then you will see the command prompt window.



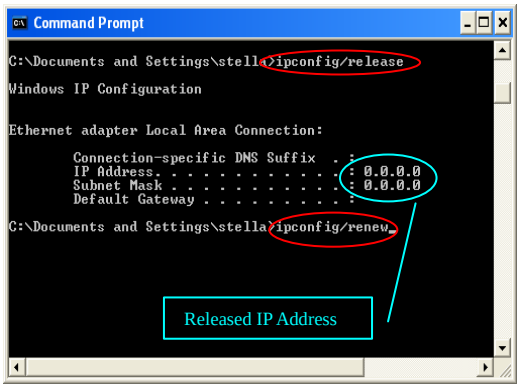
✧ Another way to open the command prompt:
From **Start** menu, point to **Programs**, select **Accessories,** and then click **Command Prompt**.



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

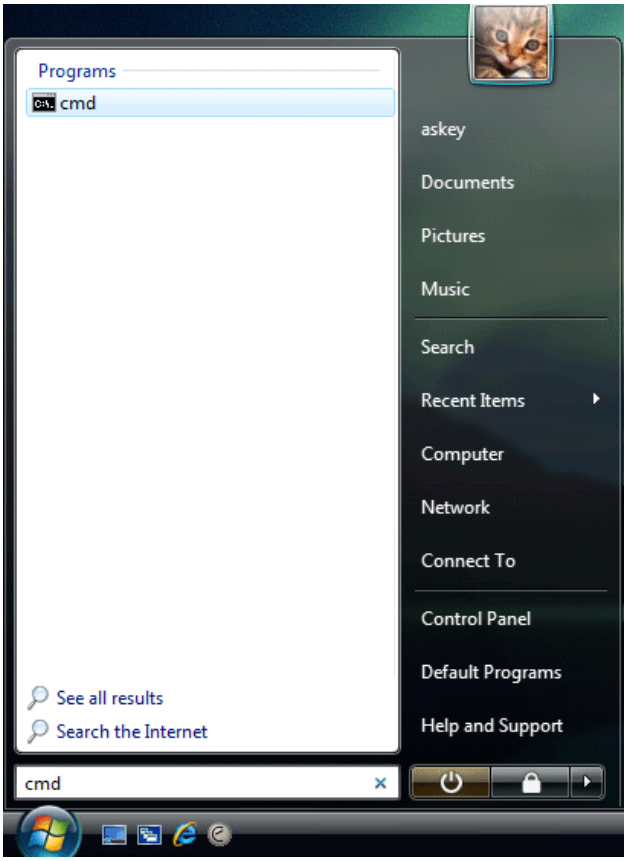


4. If the computer is holding a current IP address, type **ipconfig /release** to let go of the address, then type **ipconfig /renew** to obtain a new one.

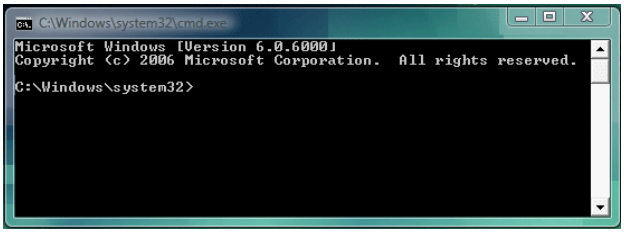


For Windows Vista

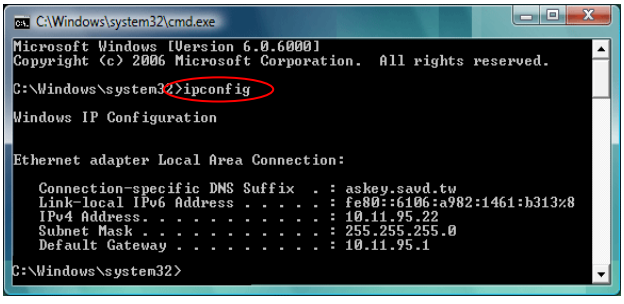
1. Open the **Start** menu, and type **cmd** in the text box then click **OK**.



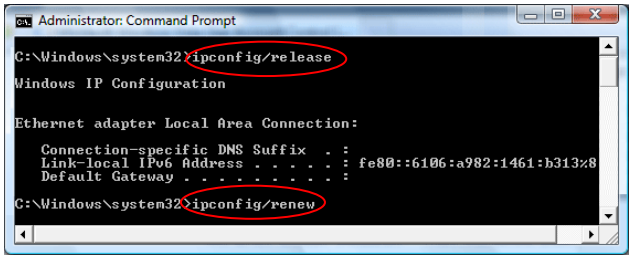
2. The command prompt window will appear.



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



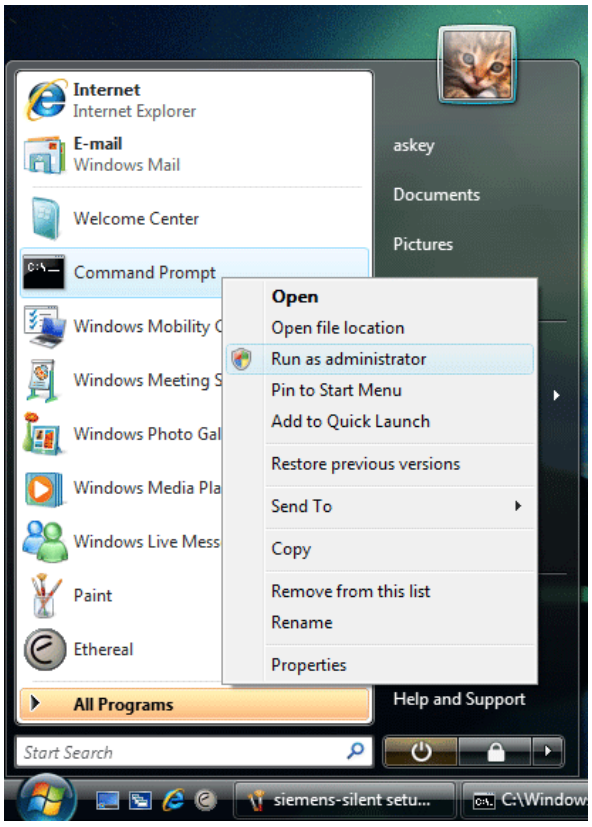
4. If the computer is holding a current IP address, type **ipconfig /release** to let go of the address, then type **ipconfig /renew** to obtain a new one.



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 Extenstion
- 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)

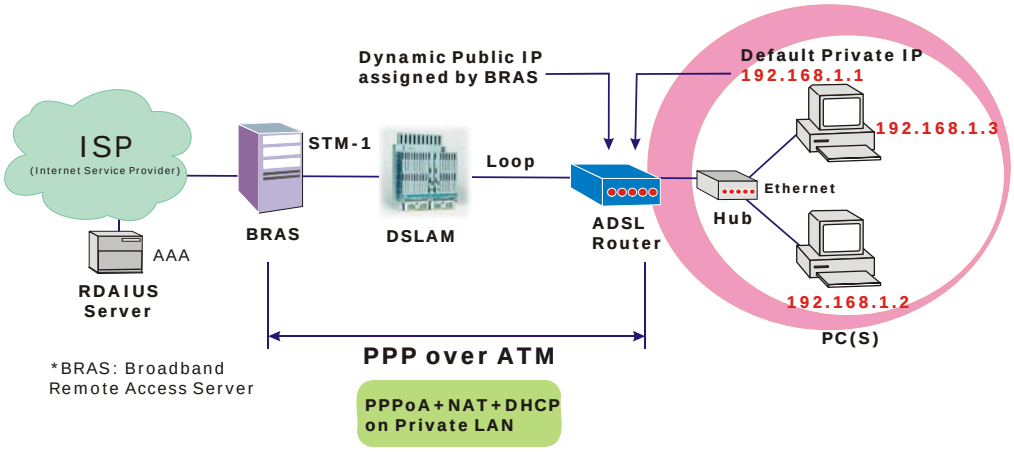
To ensure your PC accessing the Internet successfully, please check the following first.

- 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.

When 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



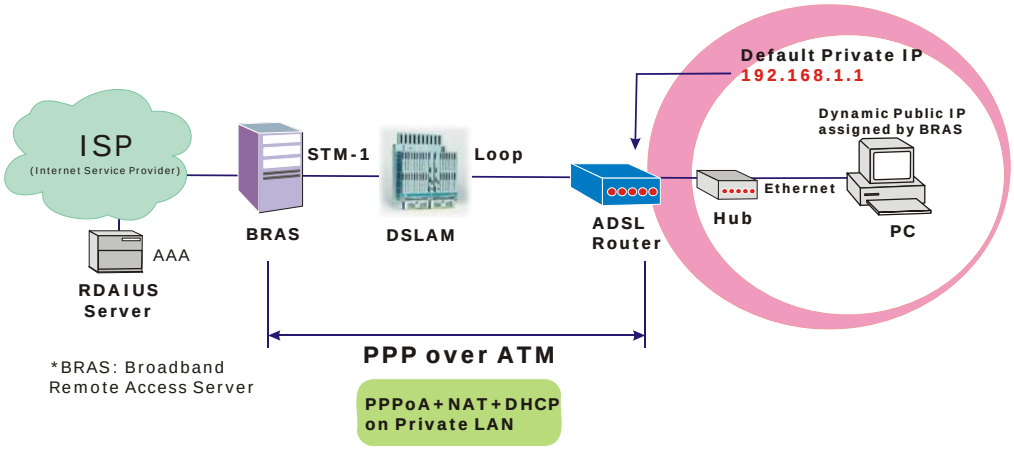
Description:

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



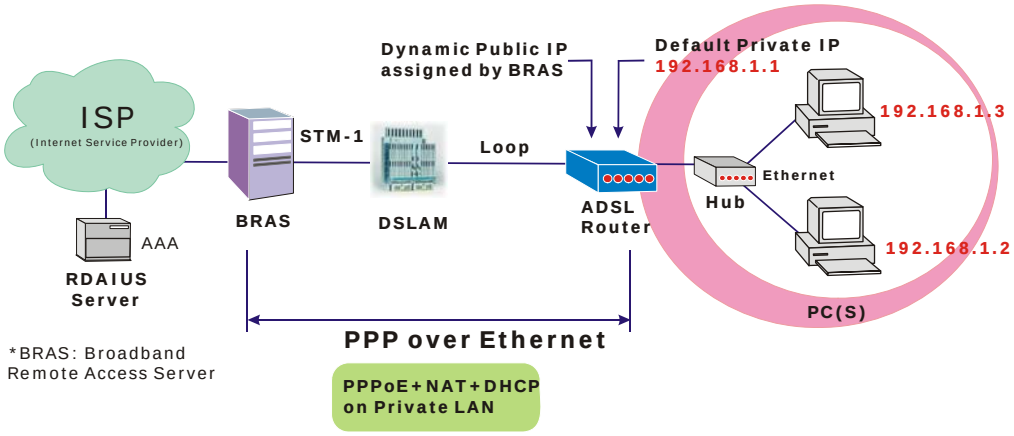
Description:

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



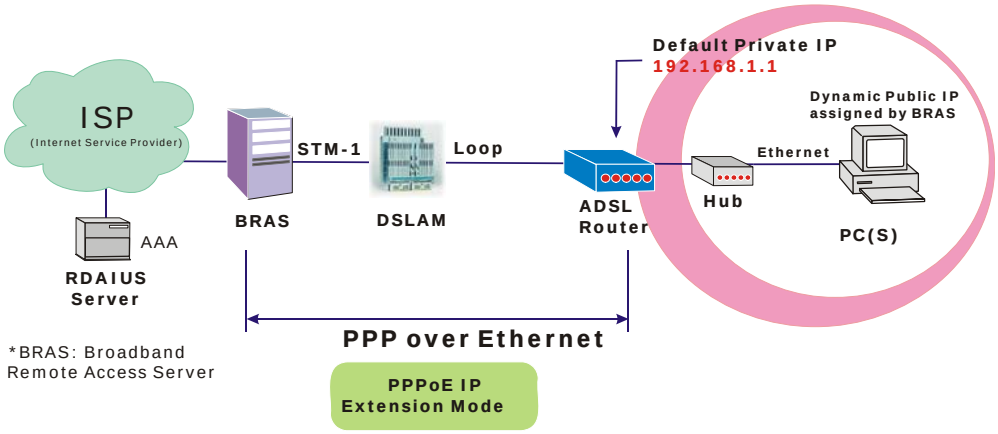
Description:

In this deployment environment, the PPPoE session is between the 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** 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



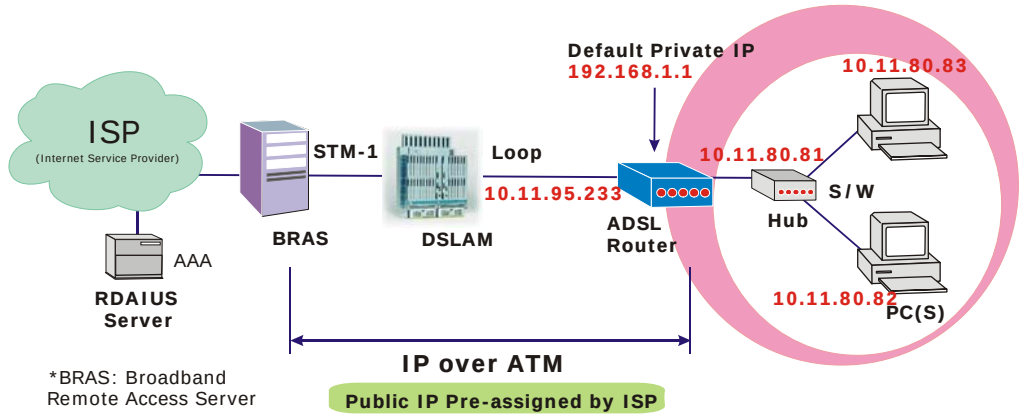
Description:

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*

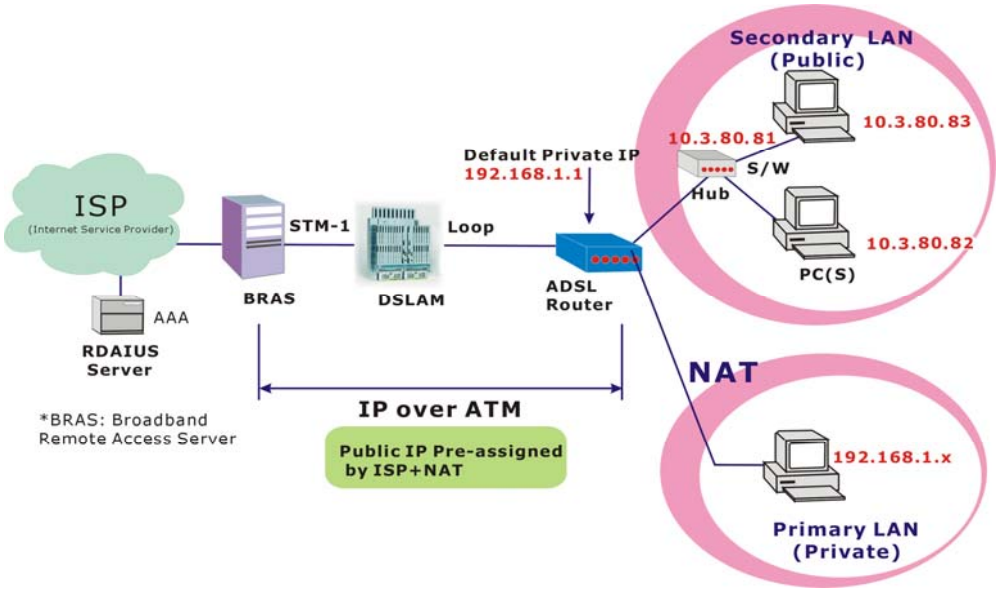
Click **Next**.

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*.

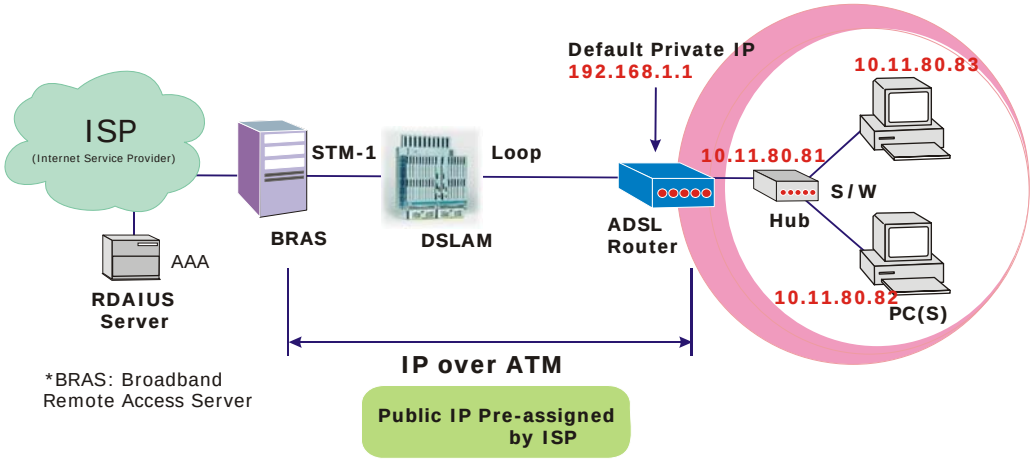
Configuration:

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*

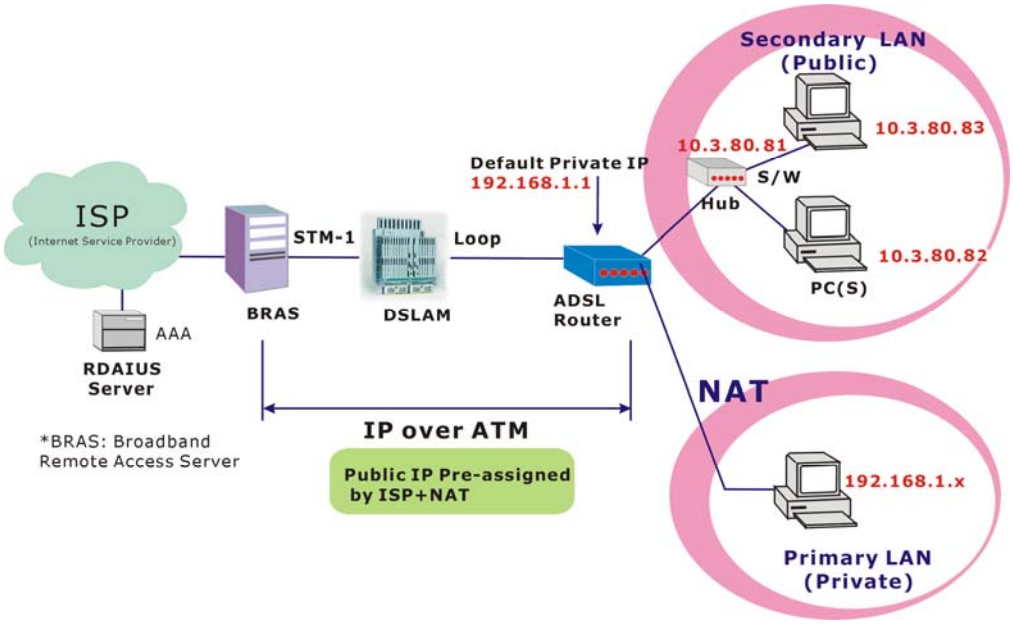
6. Check **Configure the second IP Address and Subnet Mask for LAN Interface** and enter the information needed, e.g.,
   Secondary IP Address: *10.11.80.81*
   Subnet mask: *255.255.255.248*
   Check **DHCP Server Off** and click **Next**.

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.

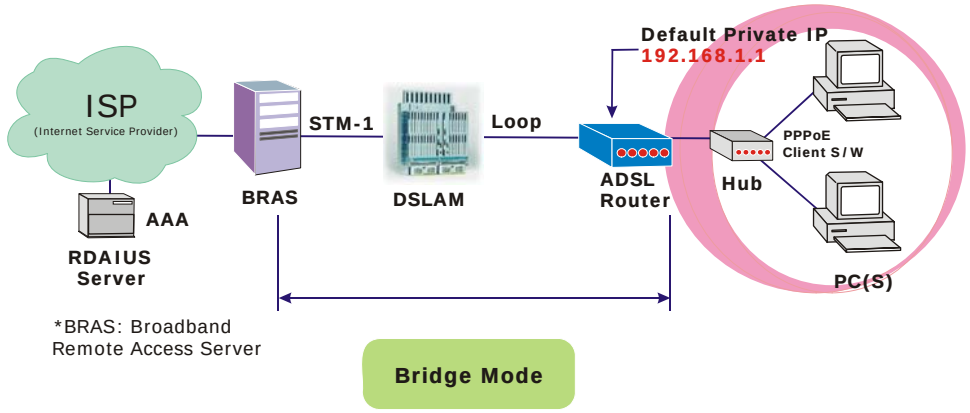
The following example uses the IP address ranging from 10.11.80.81 to 10.11.80.86 and the subnet mask is 255.255.255.248. In such circumstance, we enable NAT function but not assign any WAN IP.

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:

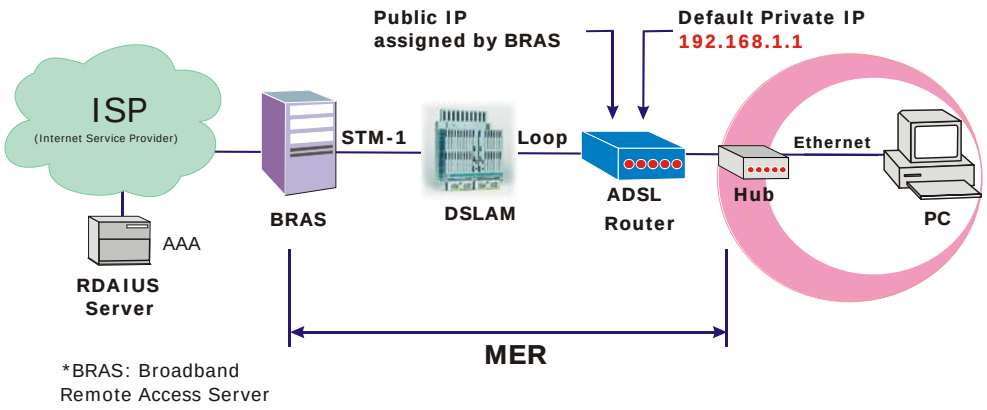
In this example, the ADSL Router acts as a bridge which bridging the PC IP addresses from LAN to WAN. The PC IP address can be a static public address that is pre-assigned by the ISP or a dynamic public address that is assigned by the ISP DHCP server, or an IP address received from PPPoE software.

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.
3. On the **Configure Internet Connection – Connection Type** page, select **Bridging** and then click the **Next** button.
4. On the **WAN IP Settings** page, select **Obtain an IP address automatically**; then, select **Obtain DNS server address automatically**.
5. Check **Enable NAT**. Then click **Next**.
6. 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**
7. Check the network information on the **Summary** page. Make sure the contents match the settings provided by your ISP. Click **Finish**.
8. 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

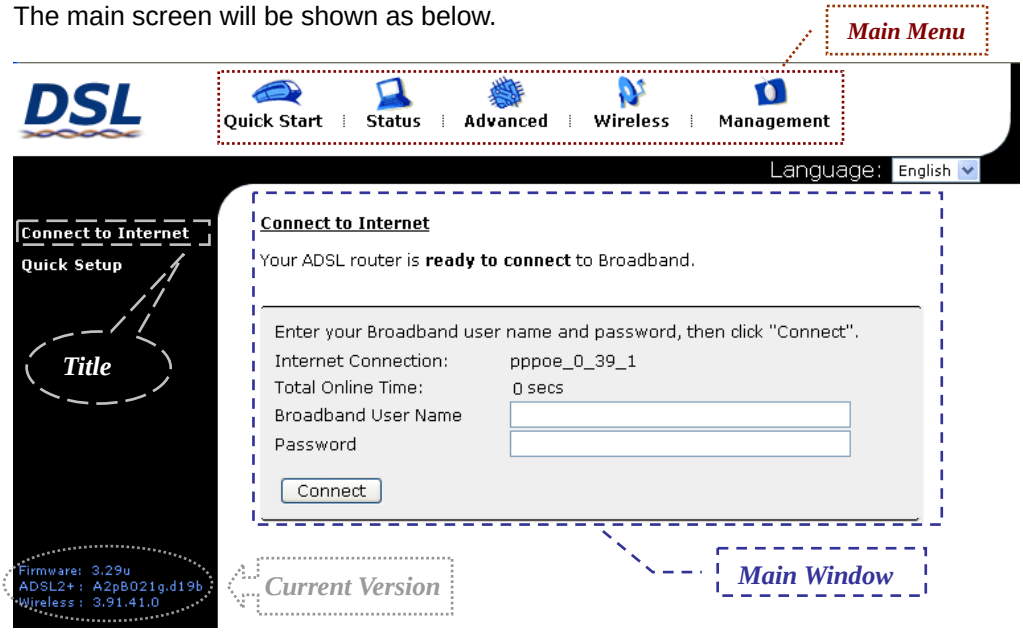
After properly configuring you host PC, please proceed as follows:

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, Wireless, 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, ADSL2+, and Wireless.

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. (However, we only offer English at present.)

Quick Start

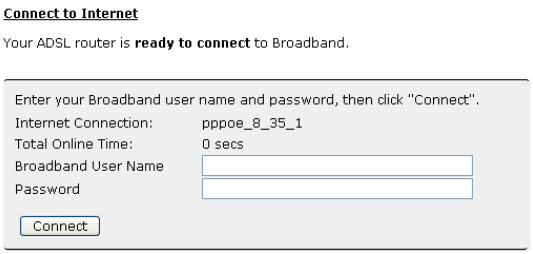
The pages under the Quick Start menu provide user a quick way to set up the router. If you do not know much about the router, you can use the Quick Start pages to adjust basic settings to activate your router.

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

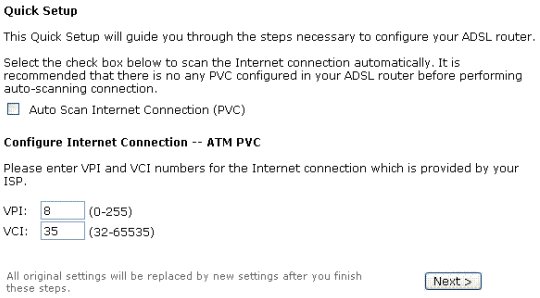
The quick setup wizard will guide you to configure the ADSL router through some specific steps. Yet different connection interface will lead to different setting pages. Refer to the following pages for detailed information.

Auto Scan Internet Connection (PVC):
If there is no any PVC configured in your ADSL router, you can check this item. Otherwise, please uncheck this box.

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.

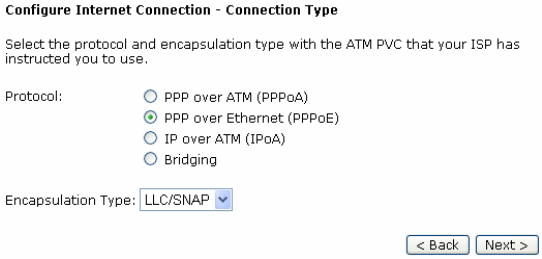


Connection Type

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.

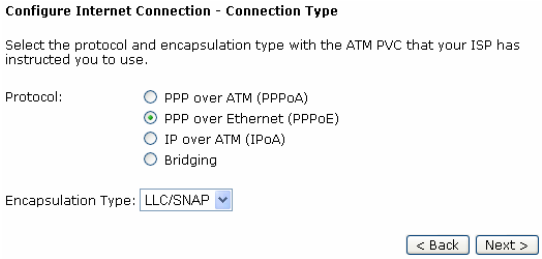


PPP over ATM/ PPP over Ethernet

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**.



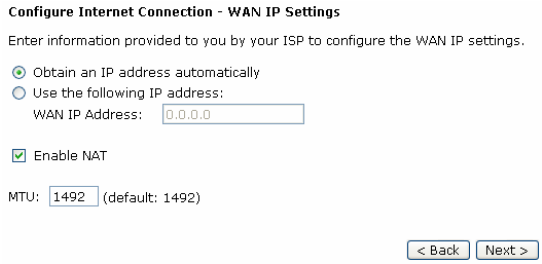
On this screen, you have to make the settings for WAN IP. To get the IP address automatically, click the **Obtain an IP address automatically** radio button. Or click **Use the following IP address** button and enter the IP address for WAN interface.

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.

Type the value into the field of **MTU**. The default setting for PPPoE is 1492; while for PPPoA is 1500.

Click **Next** for the next procedure.

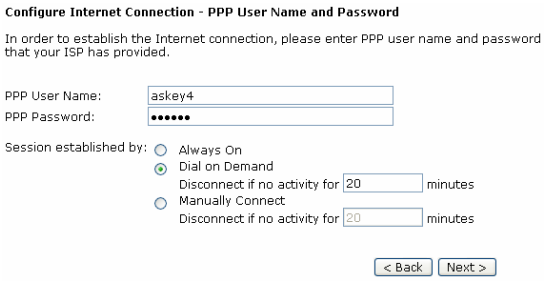


PPP Username & **PPP Password:**
Key in the username and password that you received from your ISP. (e.g., *askey4/askey*4 here.)

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.

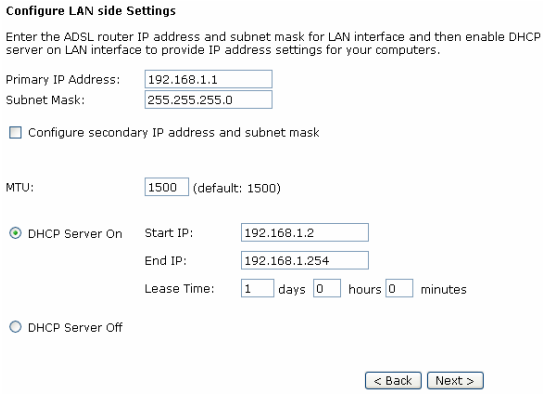
Manually Connect:
Select this item to make a connection by pressing the **Connect** hyperlink on the **Advanced Setup – Internet – Connections** web page.



Please fill in the data requested on the **Configure LAN side Settings** page.

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.

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

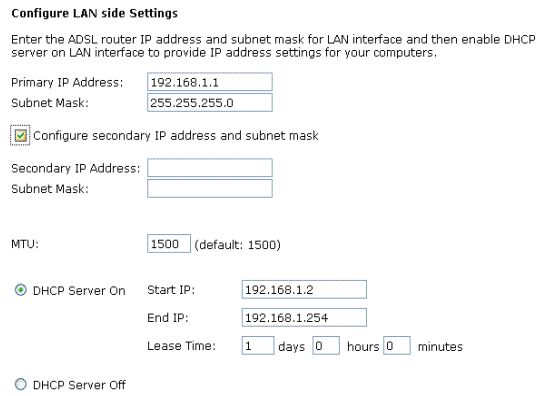
MTU: (refer to the WAN section)
The default **MTU** value for **LAN side Settings** is 1500. You may modify it if necessary.

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.

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

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

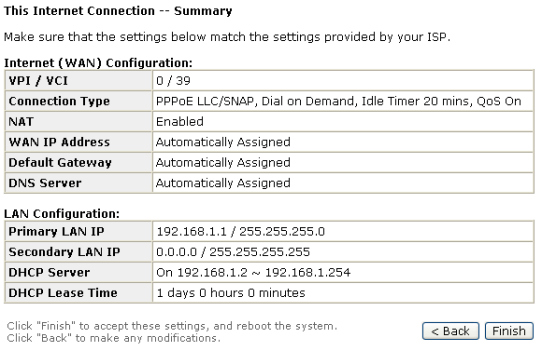


Key in all the necessary settings and click **Next** for the coming page.

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.



This Internet Connection -- Summary

Make sure that the settings below match the settings provided by your ISP.

Internet (WAN) Configuration:

VPI / VCI	0 / 39
Connection Type	PPPoE LLC/SNAP, Dial on Demand, Idle Timer 20 mins, QoS On
NAT	Enabled
WAN IP Address	Automatically Assigned
Default Gateway	Automatically Assigned
DNS Server	Automatically Assigned

LAN Configuration:

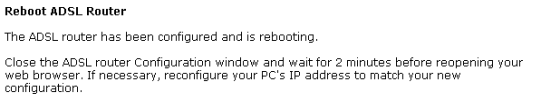
Primary LAN IP	192.168.1.1 / 255.255.255.0
Secondary LAN IP	0.0.0.0 / 255.255.255.255
DHCP Server	On 192.168.1.2 ~ 192.168.1.254
DHCP Lease Time	1 days 0 hours 0 minutes

Click "Finish" to accept these settings, and reboot the system.
Click "Back" to make any modifications.

< Back | Finish

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.



Reboot ADSL Router

The ADSL router has been configured and is rebooting.

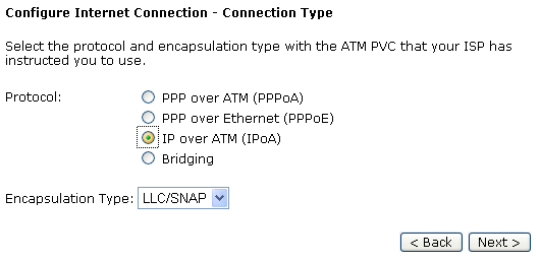
Close the ADSL router Configuration window and wait for 2 minutes before reopening your web browser. If necessary, reconfigure your PC's IP address to match your new configuration.

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.

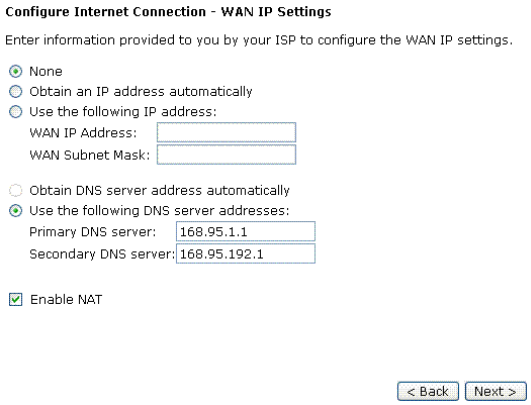
Obtain an IP address automatically:
Click this button to allow the system to get an IP address automatically.

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 you want.

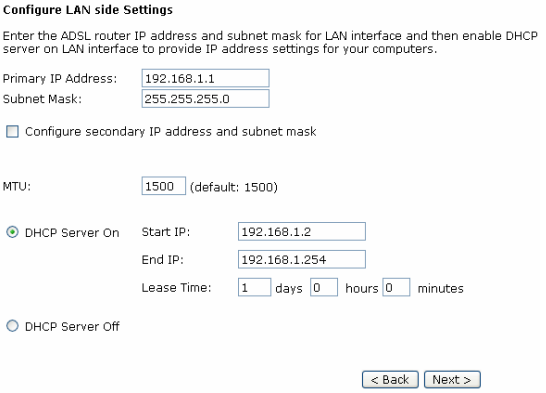


After setting up the WAN IP and DNS server information, click **Next** to open the following page.

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, 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 needed.



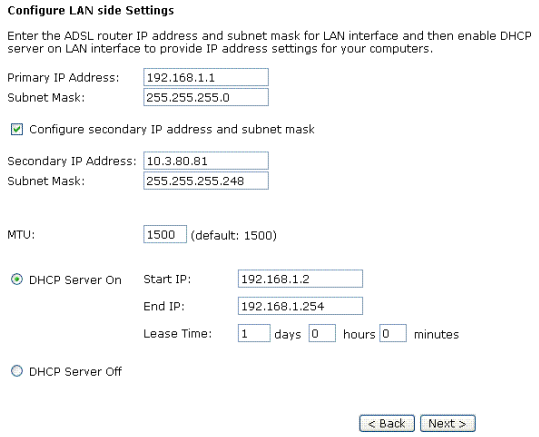
Configure the secondary IP Address and Subnet Mask for LAN interface**:**
Check this box to set up a secondary IP Address to connect to your router if they are not included in the range that DHCP server accepts. You have to key in the information received from your ISP for the LAN connection, e.g., the 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 1day.

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



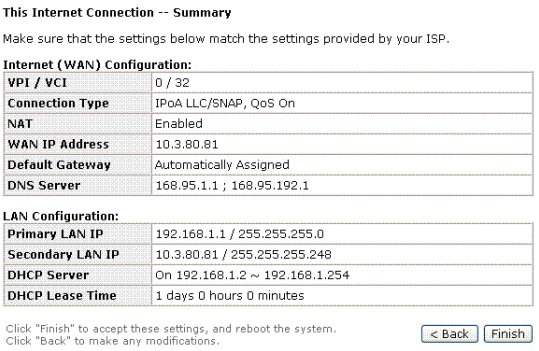
Key in all the necessary settings.
Click **Next** for the coming page.

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

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

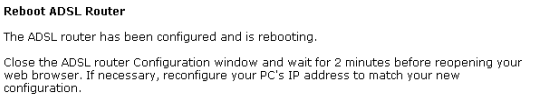
If everything is OK, click **Finish** to accept these settings.

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.

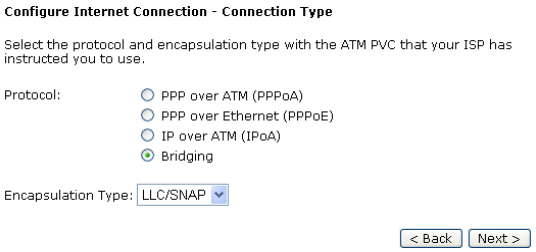


Bridging

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.

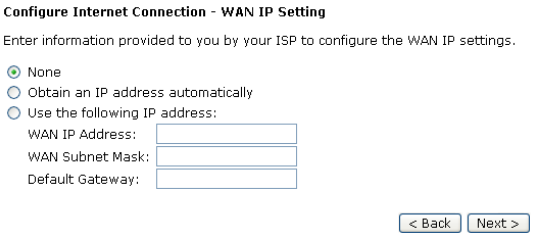
Choose **Bridging** and click **Next**.



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.

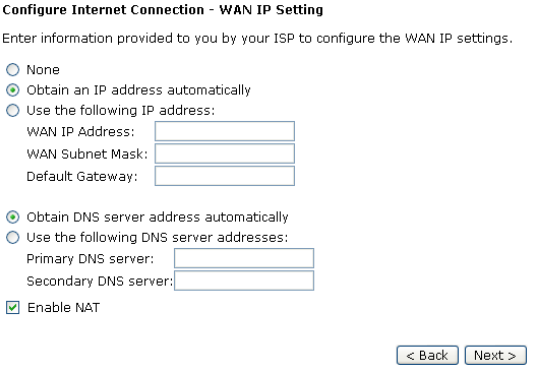


While you choose to obtain the IP address automatically or use specific IP address, you have to decide whether to select **Obtain DNS server address automatically** or **Use the following DNS server address** and enter the information provided by you ISP.

You may check **Enable NAT** if necessary.

Press **Next** to continue.

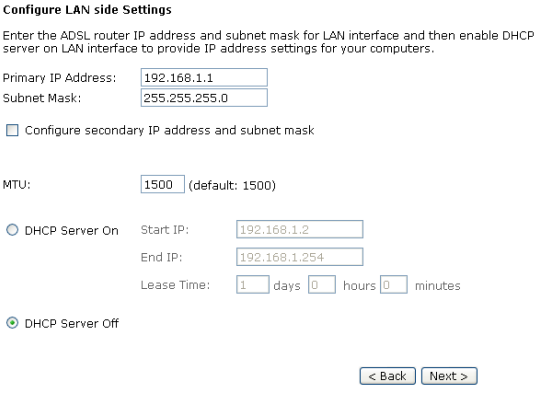
The default setting is none, shown as the figure above. While selecting **Obtain an IP address automatically** or **Use the following IP address**, the DNS setting appears, shown as the figure below.



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. If you enable this function, you have to enter the information for **Start IP, End IP** and **Lease Time.** The default value for lease time is one day.



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

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

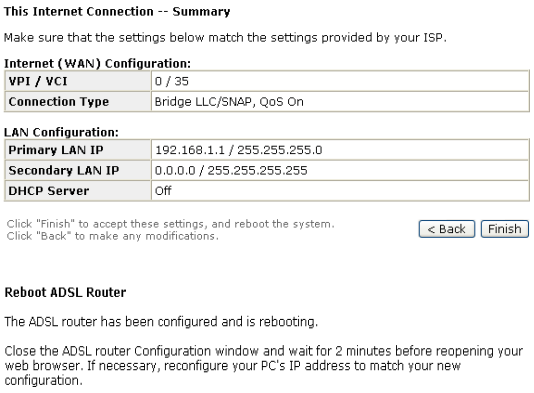
If you find anything incorrect, click **Back** to modify the settings.

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 the period of activating the router, ADSL speed, and the information about LAN IP address, default gateway, DNS server, firmware version, boot loader version, ADSL driver version, wireless driver version, wireless BSSID, and Ethernet MAC address. 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	00:00:22:03
ADSL Speed (DS/US)	7616/832 Kbps
LAN IP Address	192.168.1.1
Default Gateway	10.11.95.233
Primary DNS server	168.95.1.1
Secondary DNS server	168.95.192.1

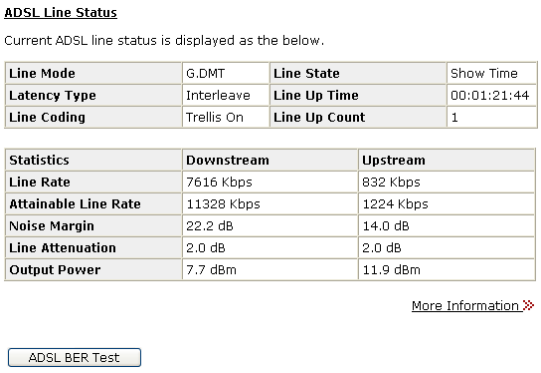
Firmware Version	3.29u
Boot Loader Version	1.0.37-0.6.7
ADSL Driver Version	A2pB021g.d19b
Wireless Driver Version	3.91.41.0 (Wireless is enabled)
Wireless BSSID	00:11:F5:8E:B9:FB
Ethernet MAC Address	00:11:F5:8E:B9:F8
USB MAC Address	00:11:F5:8E:B9:F9
Memory Size	4MB Flash / 16MB SDRAM

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 see more detailed information about ADSL Line Status.



ADSL Line Status

Current ADSL line status is displayed as the below.

Line Mode	G.DMT	Line State	Show Time
Latency Type	Interleave	Line Up Time	00:01:21:44
Line Coding	Trellis On	Line Up Count	1

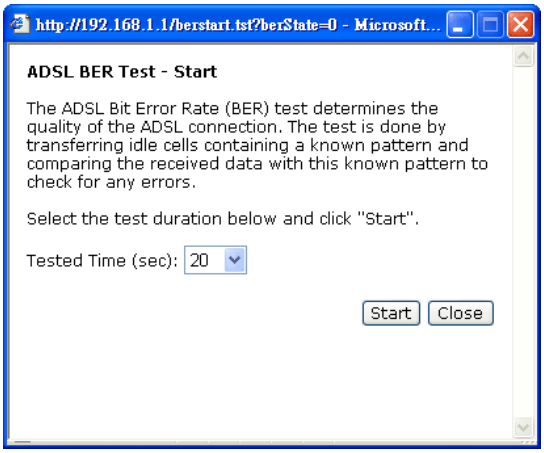
Statistics	Downstream	Upstream
Line Rate	7616 Kbps	832 Kbps
Attainable Line Rate	11328 Kbps	1224 Kbps
Noise Margin	22.2 dB	14.0 dB
Line Attenuation	2.0 dB	2.0 dB
Output Power	7.7 dBm	11.9 dBm

More Information

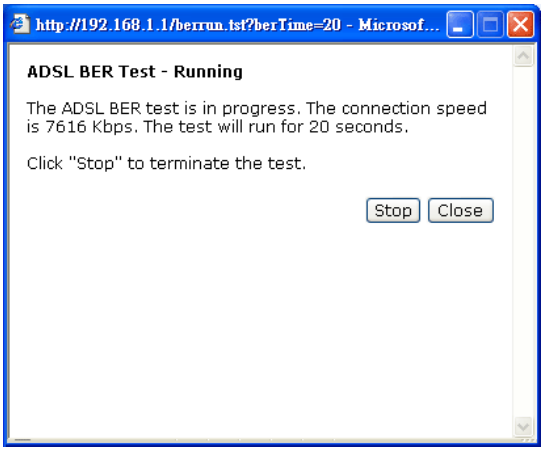
ADSL BER Test

ADSL BER Test

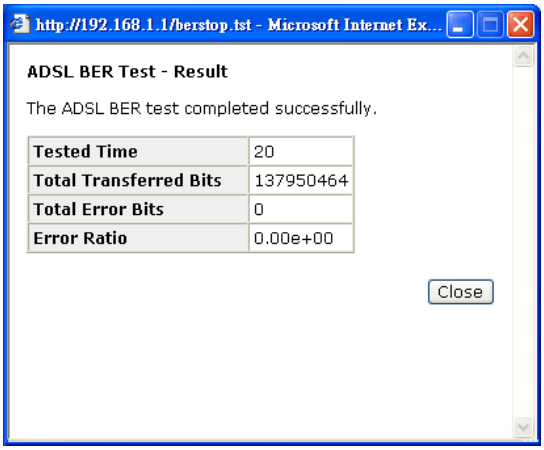
This test determines the quality of the ADSL connection. It is done by transferring idle cells containing a known pattern and comparing the received data with this known pattern to check for errors.



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 clicking **Stop** or close this dialog window by pressing **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

Current Internet connections are listed below.

PVC Name	VPI/VCI	Category	Protocol	NAT	QoS	WAN IP Address	Status / Online Time
pppoe_0_39_1	0/39	UBR	PPPoE LLC/SNAP	On	On	10.3.65.10	Up 00:00:16:52

Traffic Statistics

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

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

Traffic Statistics

The statistics of user data going through your ADSL router are listed below.

Interface	Received				Transmitted			
	Bytes	Packets	Errors	Drops	Bytes	Packets	Errors	Drops
Ethernet	0	0	0	0	3228	24	0	0
USB	441590	2915	0	0	2158843	3232	0	0
Wireless	0	0	0	0	8789	88	4	0
WAN	33072	243	0	0	26160	252	0	0

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

Those devices which get their IP addresses from your DSL Router are listed below.

Host Name	MAC Address	IP Address	Lease Time
CN	00:C1:26:0A:69:2B	192.168.1.2	00:23:55:31

Wireless Clients

This table shows the MAC address for all of the wireless LAN clients currently associated to your ADSL Router.

Wireless Clients Table

All of wireless LAN clients currently associated to your ADSL router are listed below.

NOTE: The list below might include wireless clients which are no longer connected to your ADSL router. You need to wait for a few seconds for the list to be fully updated.

MAC Address	On-line Time

Routing Table

This table shows the routing rules that your router uses.

Routing Table

All of current routing rules in your ADSL router are listed below.

Destination	Netmask	Gateway	Interface	Metric
10.3.95.233	255.255.255.255	0.0.0.0	pppoe_0_39_1	0
192.168.1.0	255.255.255.0	0.0.0.0	br0	0
0.0.0.0	0.0.0.0	10.3.95.233	pppoe_0_39_1	0

ARP Table

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

ARP Table

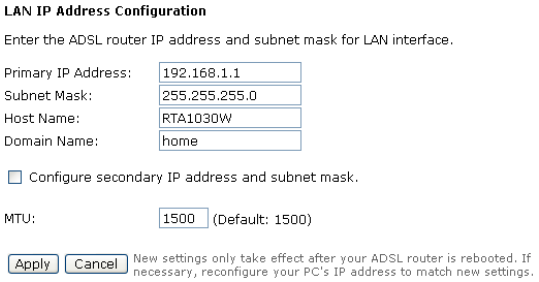
The IP-to-Physical address translation entries recorded in your ADSL router are listed below.

IP address	Physical Address	Interface	Type
192.168.1.2	00:C1:26:0A:69:2B	br0	Dynamic

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.

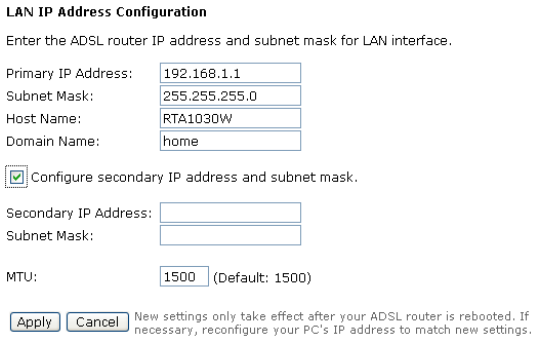


Primary IP Address:
Key in the first IP address that you received from your ISP for the LAN connection.

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. 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. Type the value into the field of **MTU**. The default setting for LAN is 1500.

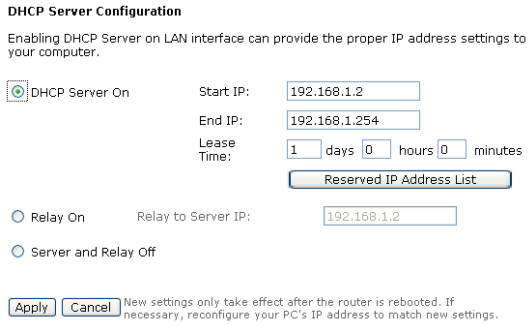
Apply:
Click this button to activate the settings listed above.

Local Network – DHCP Server

This allows you to set DHCP server on LAN interface.

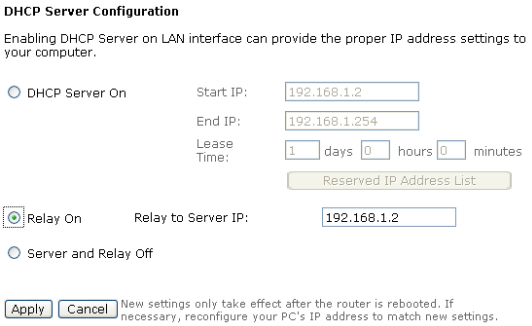
DHCP Server On:
Check this item if DHCP service is needed on the LAN. The router will assign IP address and gateway address for each of your PCs.

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.

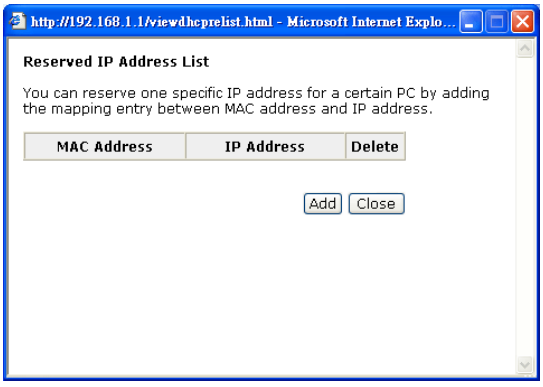
When the DHCP server is served by another device rather than the router itself, you can relay to that specific server and enter the IP address of it, as *10.11.95.2* in our example.



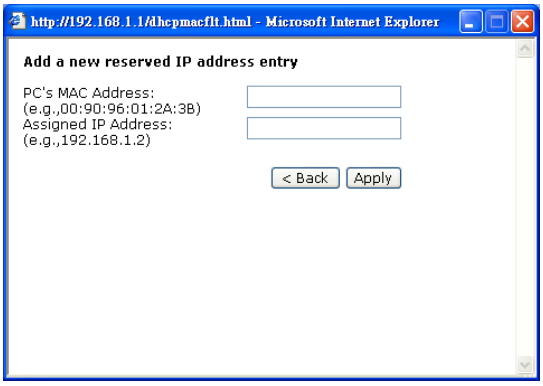
Server and Relay Off:
Check this item if DHCP service isn't needed on the LAN.

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.

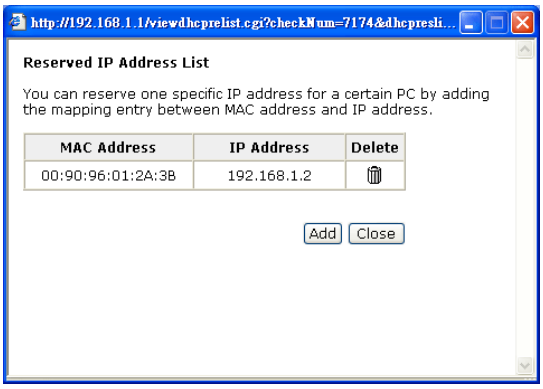


Click the **Add** button to open another dialog window, shown as the right. On **PC's MAC Address** and **Assigned IP Address** boxes, please type the correct information according to your need and click **Apply**.



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).

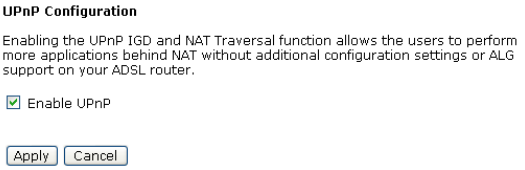
You may click **Add** button to add another set or click **Close** to exit.



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.



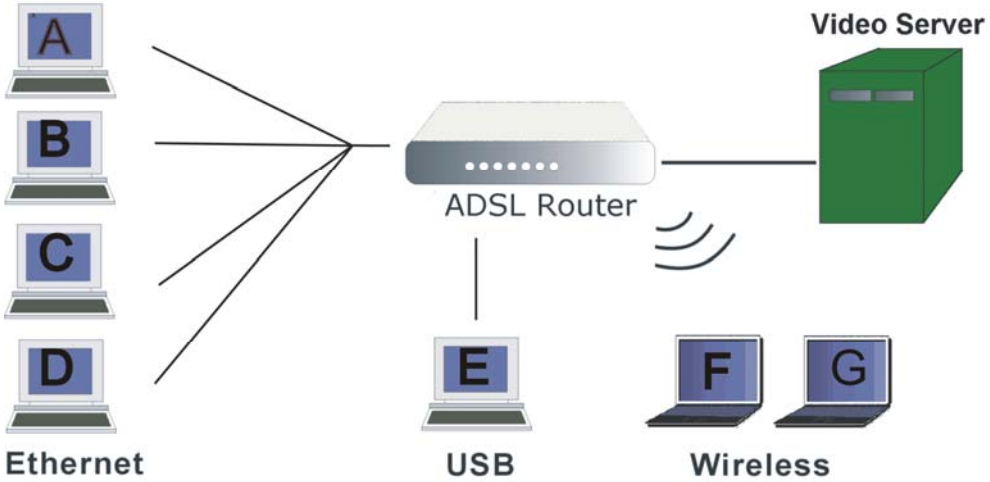
You can enable the UPnP function through this web page by checking **Enable UPnP** and press **Apply**.

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.

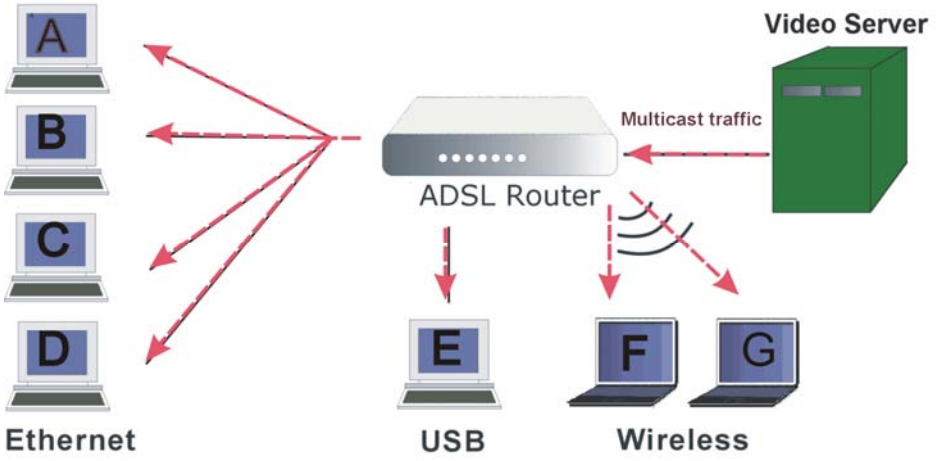
Without IGMP snooping, multicast traffic is treated in the same manner as broadcast traffic, that is, it is forwarded to all ports. With IGMP snooping, multicast traffic of a group is only forwarded to ports that have members of that group. IGMP snooping generates no additional network traffic, allowing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

The figure below shows a simple network connected via an ADSL router. There are four Ethernet clients, one using USB, and two wireless clients.

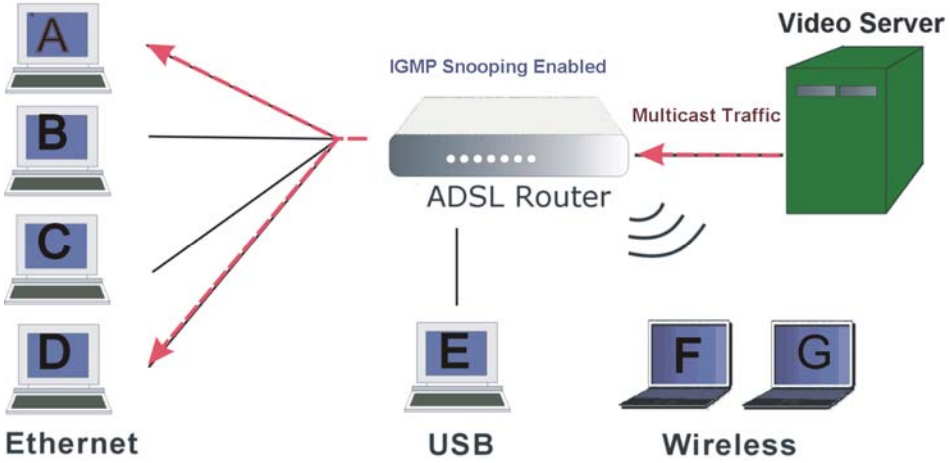


Now suppose the video server is the multicast transmitter and host A and D are

multicast receivers. If we do not turn on the IGMP snooping function, the router will forward the multicast traffic to all hosts on all interfaces and consequently block and interrupt the traffic of USB and wireless users, shown as the following figure.

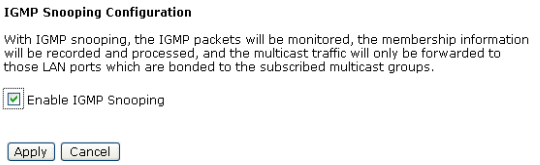


When IGMP snooping is invoked, it makes the system aware to establish the best path for multicast service to save LAN bandwidth. Refer the figure below, just as desired, only host A and D will actually receive multicast traffic when IGMP snooping is enabled.



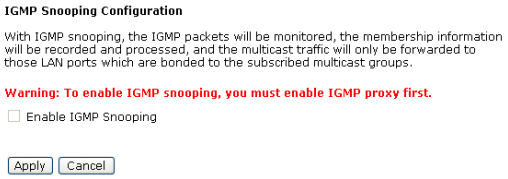
While IGMP snooping is enabled, the IGMP packets will be monitored, the membership information will be recorded and processed, and the multicast traffic will only be forwarded to those LAN interfaces, such as Ethernet, Wireless, and USB, which are bonded to the subscribed multicast groups. Thus it helps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

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



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.

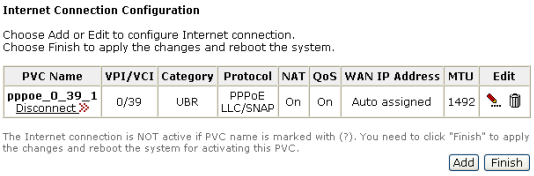
Note that the IGMP proxy must be enabled first. If the IGMP Snooping function is not available as shown in the following figure, you have to enable the IGMP Proxy first.



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.

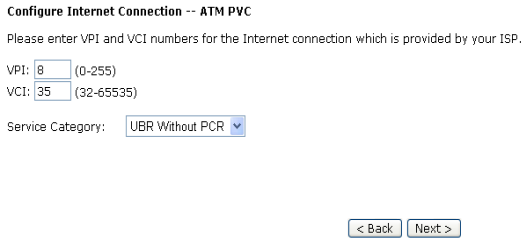
If you click the Connect hyperlink under the **PVC Name** item, the system will connect to WAN automatically. If the WAN connection is OK, you can check the detailed information directly.



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.

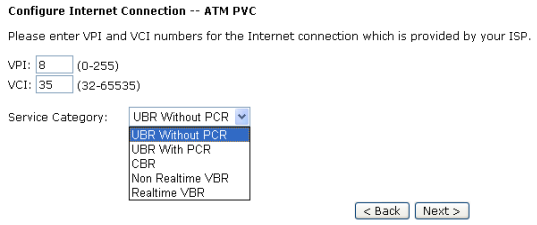
Adding a New One

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



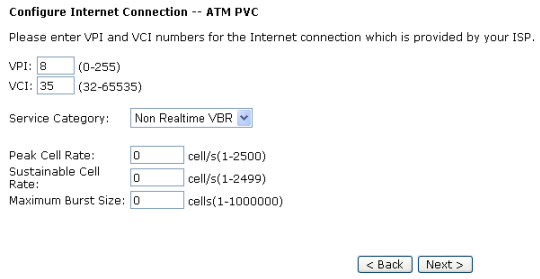
VPI (Virtual Path Identifier): Identifies the virtual path between endpoints in an ATM network. The valid range is from 0 to 255. Please refer to the value that your ISP provides.

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.



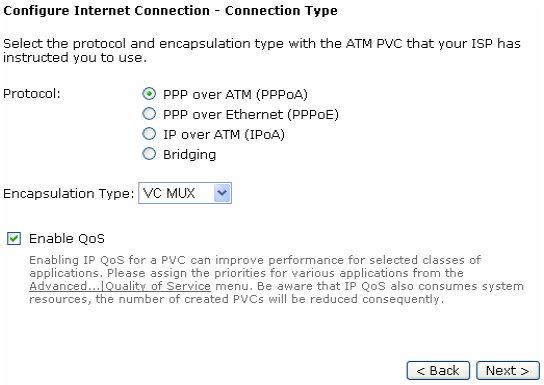
If you choose **Non Realtime VBR**, or **Realtime VBR**, you have to key in the value for the peak cell rate, sustainable cell rate, and maximum burst size.

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.

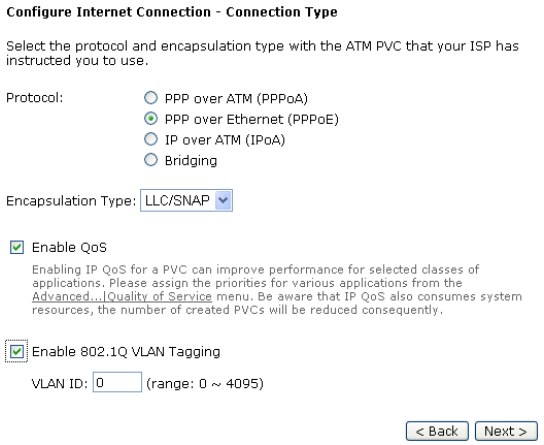
After pressing **Next**, you will see the web page listed as the right one. Choose the protocol that you would like to use. (Here is the example for choosing **PPPoA**.)

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.

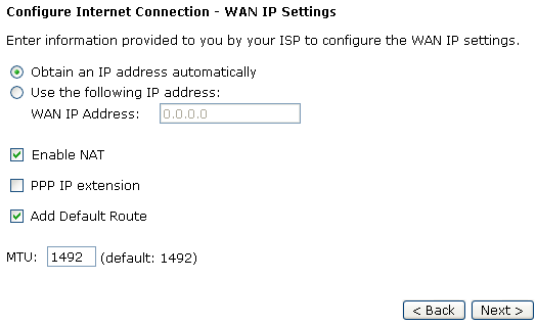
Notice that **802.1Q VLAN Tagging** function can only be invoked under **PPPoE** and **Bridging** Mode; the system will not provide this option while setting **PPPoA** or **IPoA** mode.

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.

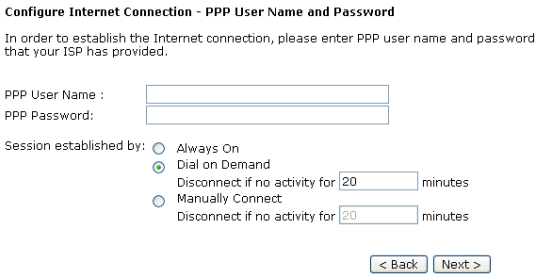
Click **Next** to continue.

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



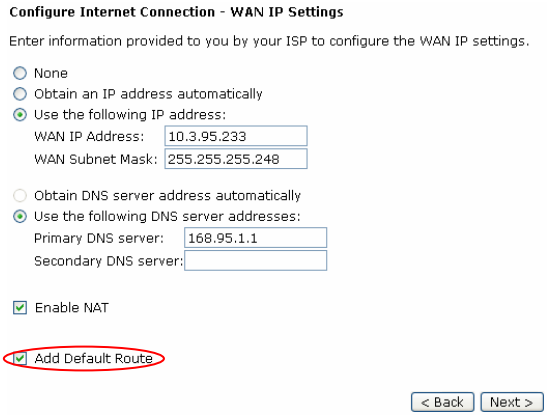
Add Default Route:
Check this item to add a default route.

The next figure following the WAN IP Settings under 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.

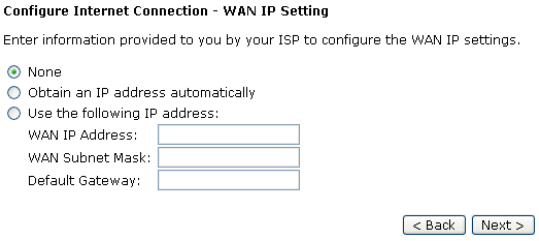
You may refer to **Quick Start-Connection Type- IPoA** section for more information.



Add Default Route:
Check this item to add a default IPoA route onto the routing table.

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.

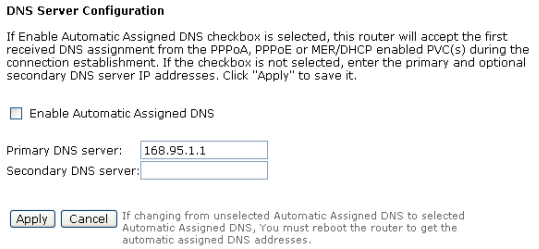


Internet – DNS Server

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.

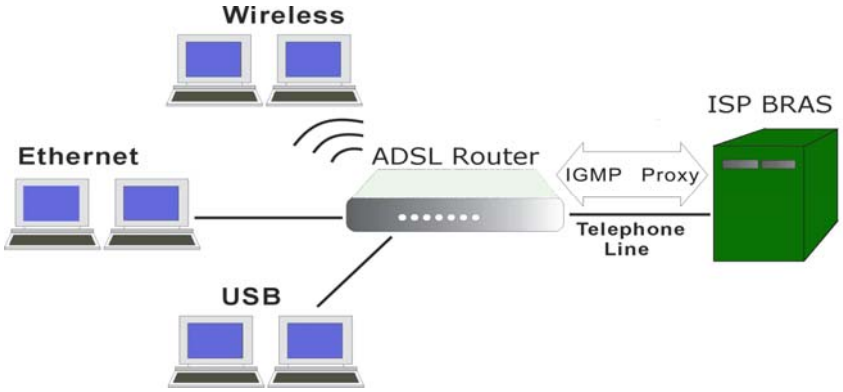
Enable Automatic Assigned DNS: Check this box to enable this function, or uncheck this box to disable it. The default setting is checked. When this function is disabled, you have to offer the **Primary DNS server** and **Secondary DNS server**.

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.



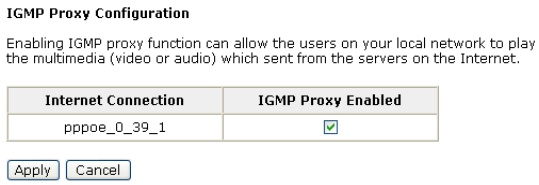
The hosts interact with the system through the exchange of IGMP messages. When you want to configure IGMP proxy, the system will interact with other routers through the exchange of IGMP messages. However, when acting as the proxy, the system performs the host portion of the IGMP task as follows:

- 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.

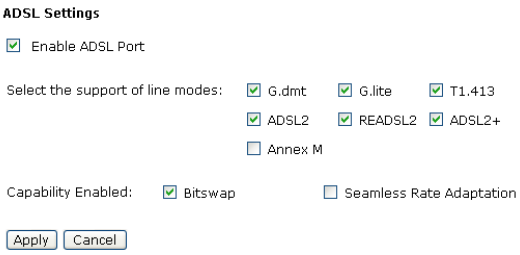
Internet Connection: This field displays the internet connection(s) that set in this router.

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 new static IP route or delete static route. 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 the static route settings.

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

Adding a New One

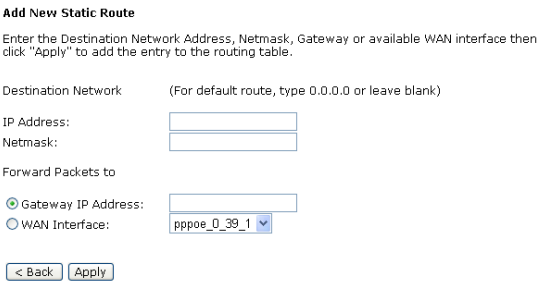
To add a static route, please click **Add**. Type the destination network address, subnet mask and gateway that you received from the ISP and click **Apply**.

IP Address:
The destination IP address 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.

Netmask:
Enter the subnet mask that you got from the ISP, 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.

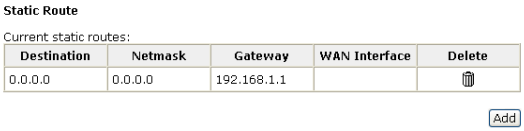


For example, type *192.168.1.1* in the field of the gateway IP address and leave the destination network blank.

Click **Apply** to view the routing result.

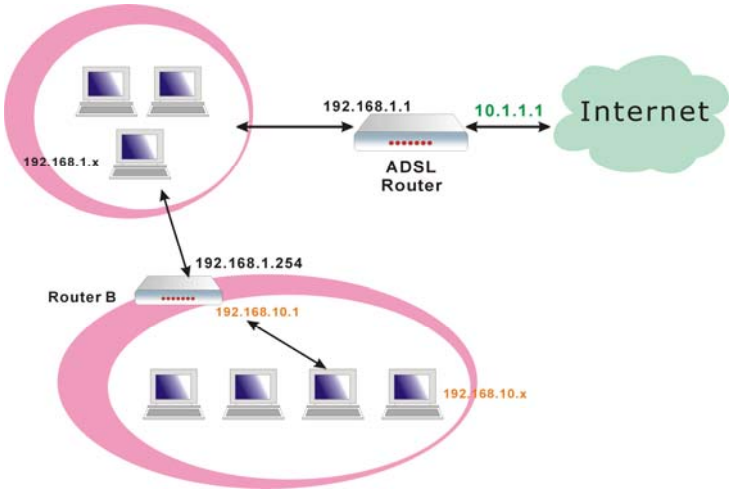
Remove Static Route

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

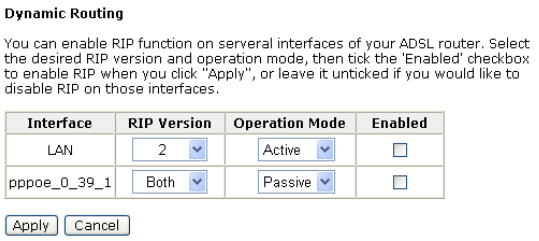
Routing Information Protocol (RIP) is utilized by means of exchanging routing information between routers. It helps the routers to determine optimal routes. This page allows you to enable/disable this function.

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.

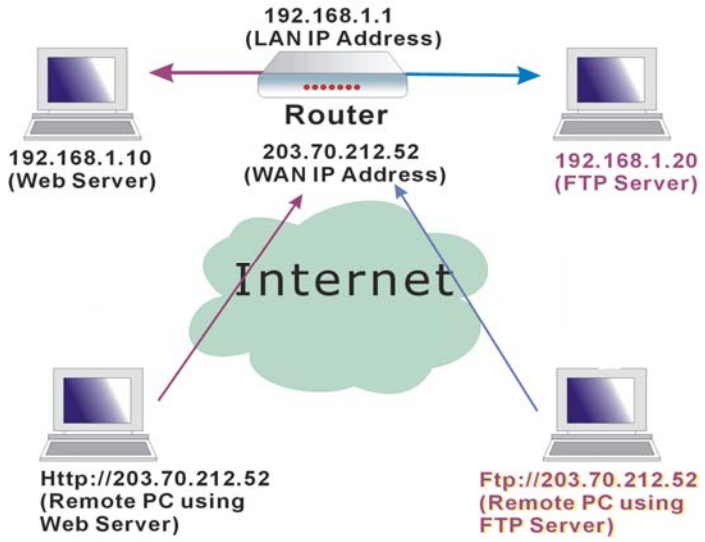
When the router receives an incoming IP packet requesting for accessing your local server, the router will recognize the service type according to the port number in this packet (e.g., port 80 indicates HTTP service and port 21 indicates FTP service). By specifying the port number, the router knows which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

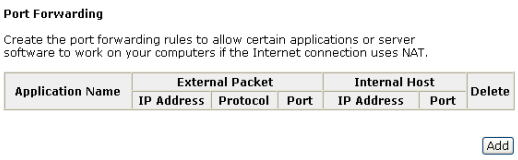
Please note that, in the above picture, both Internet users are connecting to the same IP address, but using different protocols, such as *Http://203.70.212.52* and *Ftp://203.70.212.52*.

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.

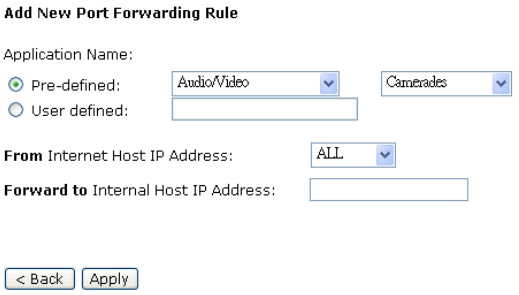
IP addresses can be automatically redirected to local servers configured with private IP addresses. In other words, depending on the requested service (TCP/UDP port number), the router redirects the external service request to the appropriate server (located at another internal IP address).

Add New Port Forwarding

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



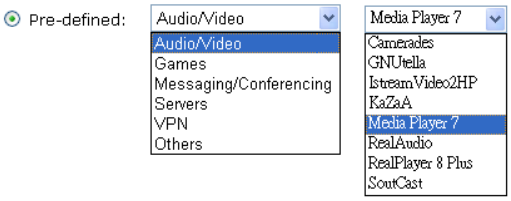
To add a new Port Forwarding, please click **Add** from the **Port Forwarding** web page.



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.

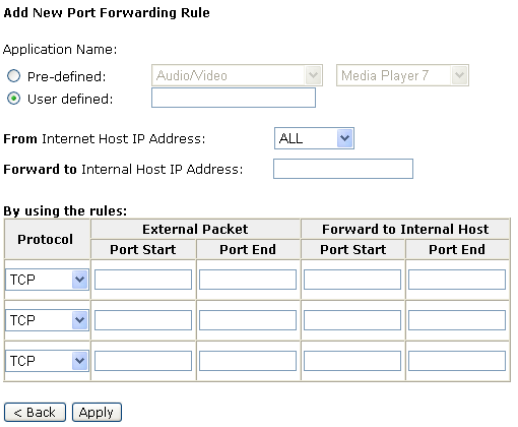
For example, if you choose *Audio/Video* in the first field, the corresponding contents of the second field would be like the drop-down list shown as the following figure.



User defined:

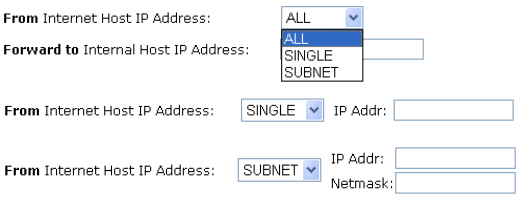
Type a new service name for building a customized service for specific purpose.

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:

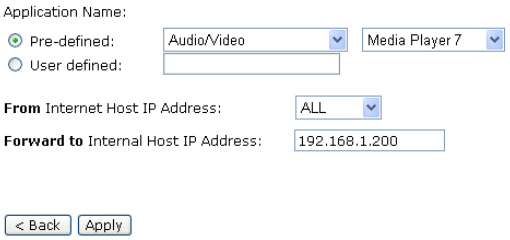
Select the initial place for port forwarding. If you choose **SINGLE**, a box will appear for you to fill in the IP address for the specific host. And, if you choose **SUBNET**, the boxes for IP address and Netmask will appear for you to fill in the IP address and subnet mask for the specific subnet.



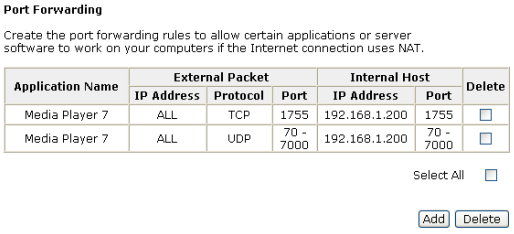
Forward to Internal Host IP Address:

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.

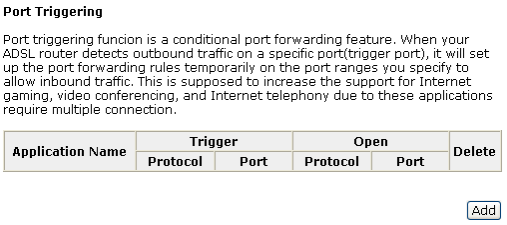


If you do not want the server that you created, check the **Delete** box of that application and click the **Delete** button to discard it.

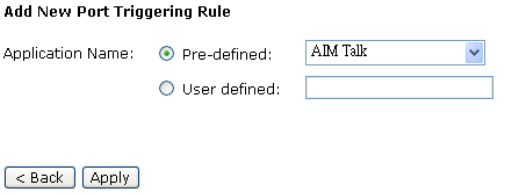
Or if you want to add another one, click **Add** to add a new one.

Virtual Server – Port Triggering

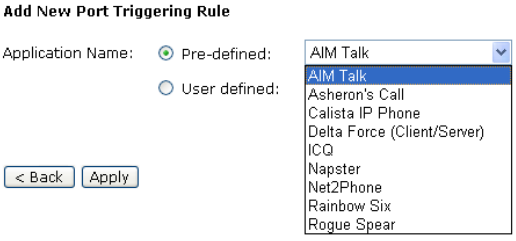
When the router detects outbound traffic on a specific port, it will set up the port forwarding rules temporarily on the port ranges that you specify to allow inbound traffic. It is supposed to increase the support for Internet gaming, video conferencing, and Internet telephony due to the applications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



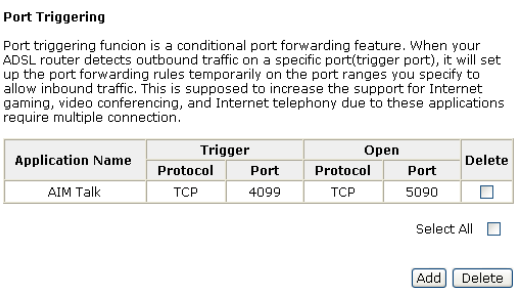
The system provides 9 items for you to choose.



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**.

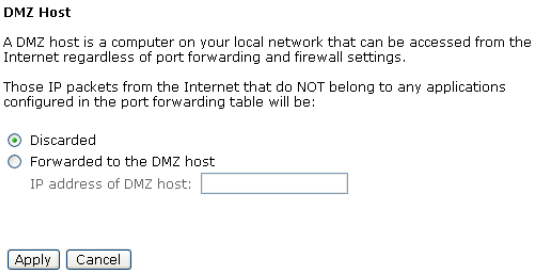
Virtual Server – DMZ Host

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 close 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**.



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 / Password：

Enter the user name and password that you registered with the provider.

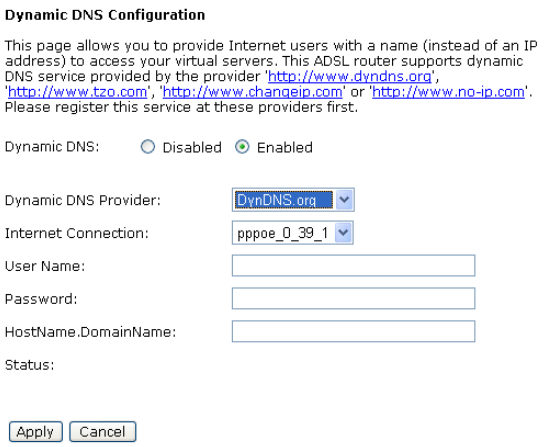
HostName.DomainName：

Key in the domain name or host 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.

When the setting is finished, click **Apply** to invoke them, or click **Cancel** if you want to discard the settings.



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.

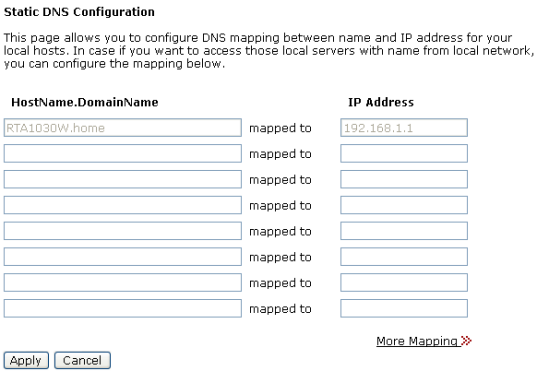
Domain Name：

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.



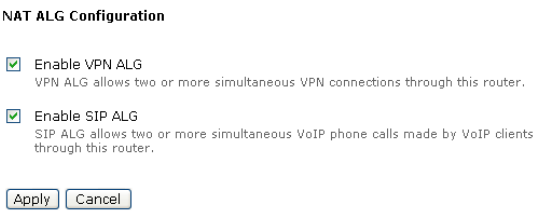
NAT ALG Configuration

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. The default setting for VPN ALG is enabled.

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

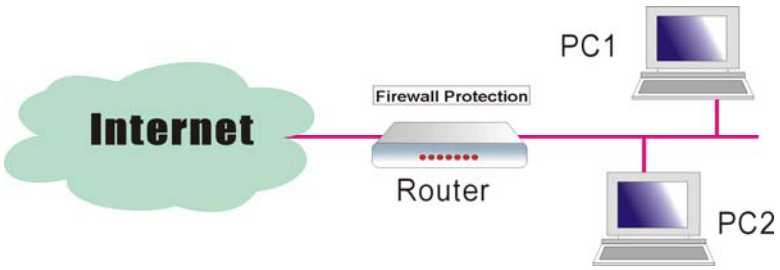
The firewall is a kind of software that interrupts the data between the Internet and your computer. It is the TCP/IP equivalent of a security gate at the entrance to your company. All data must pass through it, and the firewall (functions as a security guard) will allow only authorized data to be passed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

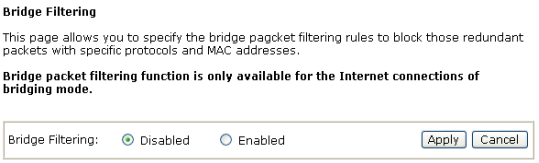
For the security of your router, set the firewall is an important issue.

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.

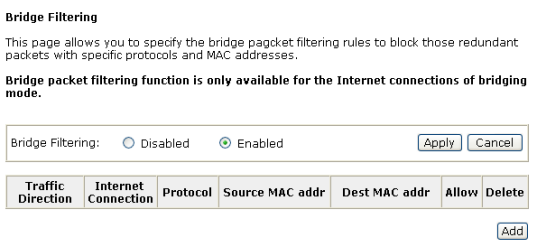
Choose **Disabled** to disable the bridge filtering function. Click **Enabled** to monitor and block redundant packets.



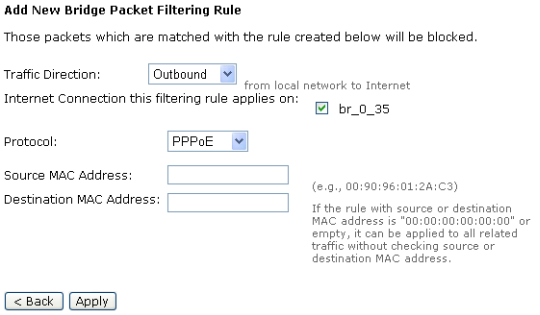
To initiate the Bridge Filtering rules, select the **Enabled** radio button and click **Apply**.

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

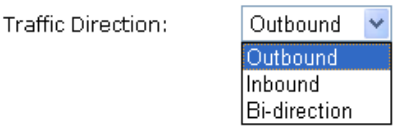
Note that the **Add** option is available only when there is a bridge mode PVC on this device.



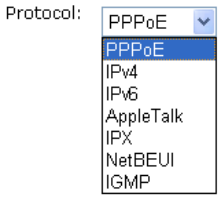
Select traffic direction from the drop down menu, and check the network interface which you want this rule to apply on. Then, choose a protocol and define the source or destination MAC address which you want to control.



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.

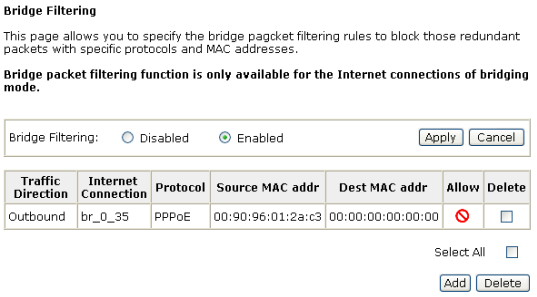


The protocols that you can choose is listed as the right figure shows. Select one proper protocol for this bridge filtering rule.



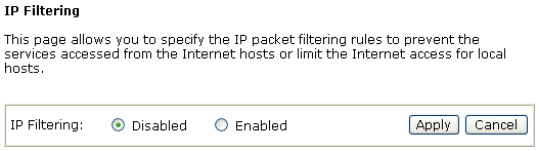
For example, if we choose Outbound, check br_0_35, select PPPoE as protocol, and enter 00:90:96:01:2A:C3 into the Source MAC Address field, then after clicking Apply, we will see the result as shown in the right.

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



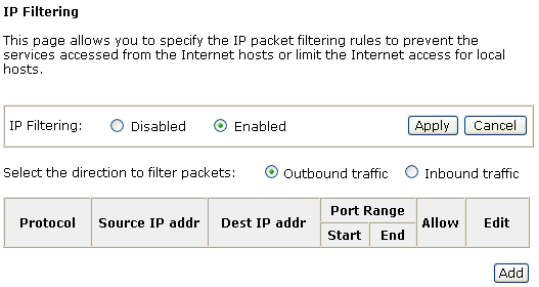
Firewall – IP Filtering

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.

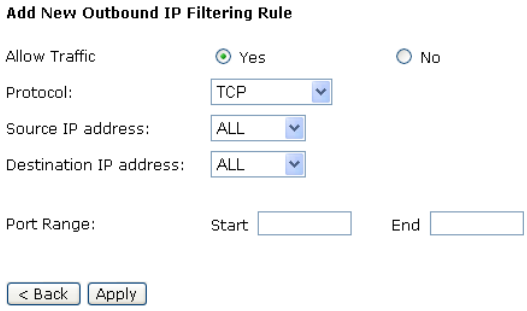
To initiate the IP Filtering, select the **Enabled** radio button and click **Apply**.



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.

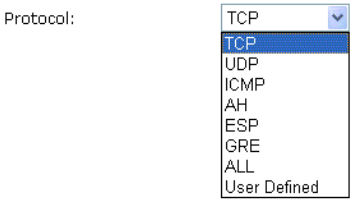
To add a new Filtering rule, click **Add**.

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



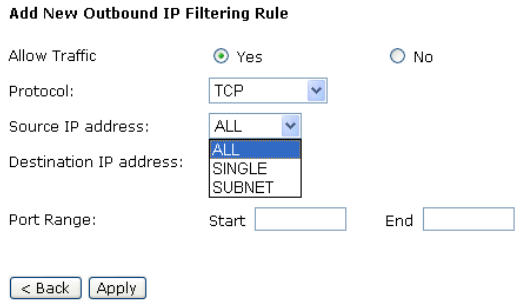
Allow Traffic:
Choose **No** to stop the data transmission, **Yes** to permit the data pass through.

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.

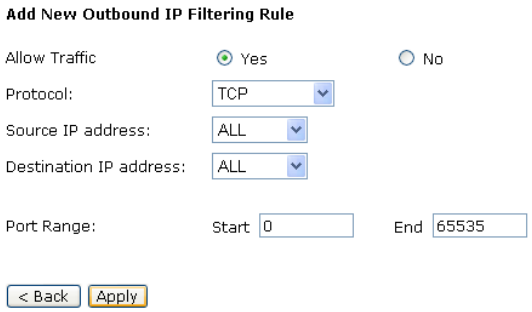


The setting **All** means that all the IP addressed in the network are allowed or denied to pass through in Internet.
If you choose **Single**, you will have to key in the specific IP address as the start/end point to let the router identify for granting or denying passing through.
If you choose **Subnet**,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

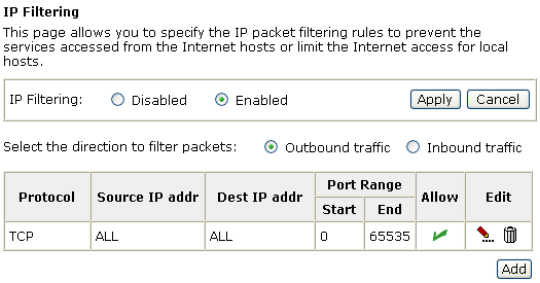
Port Range:
The port range is from 0 to 65535. Please key in the start point and end point for the IP Filtering.

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

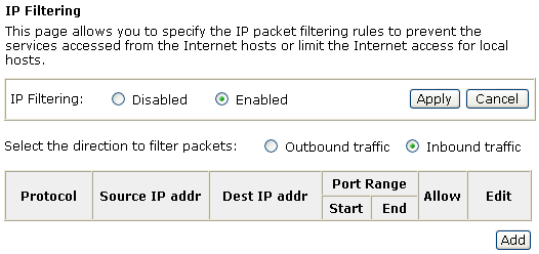
Here provides an example shown in the right column. Select *TCP* as the **Protocol** type, and make the **Source and Destination IP address** to include *All*, then type *0* and *65535* as the **start and end port**.



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.

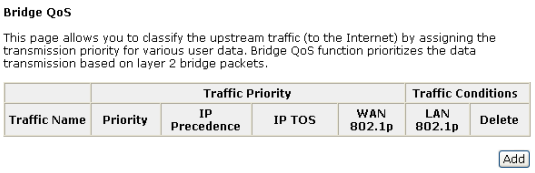


Quality of Service

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.

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.



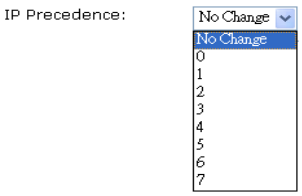
The Bridge QoS allows you to set the settings based on layer two bridge packets.

Traffic Class Name:
Key in a name as the traffic class for identification.

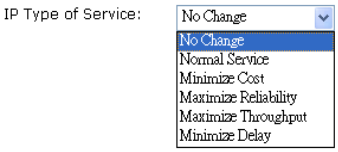
802.1p Priority:
Each incoming packet will be mapped to a specific priority level, so that these levels may be acted on individually to deliver traffic differentiation. Please choose the number (from *0* to *7*, low to high priority) for the 802.1p Priority.

Traffic Priority:
There are three options – *Low, Medium,* and *High* that you can choose.

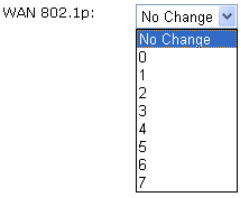
IP Precedence:
The number you choose here decides the type of the IP address processed. *No change* is the default setting.



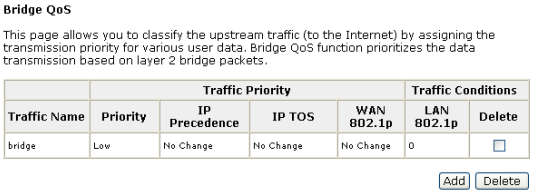
IP type of Service:
The system provides some types of service for you to choose. The meaning of each type is the same as the denotation. The default one is *No change*.



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, and set **IP Precedence**, **IP type of service**, and **WAN 802.1p** as *no change*, after clicking **Apply**, you will get the result as the figure in the right column.

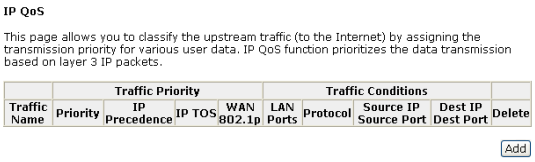


Thus when the users' data matches the traffic condition, the transmission will get a low traffic priority.

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

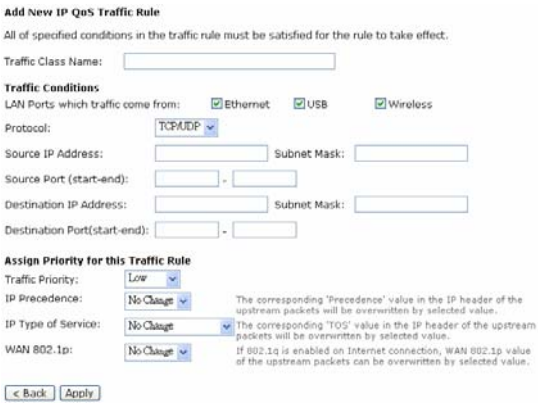
Quality of Service – IP QoS

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.

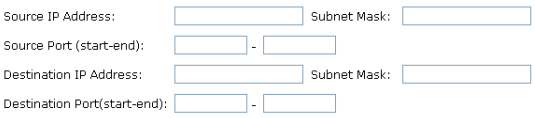
To add a new IP QoS setting, press **Add** in the page of **Quality of Service – IP QoS**, a page same as the right side will appear.



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 interfaces.

Protocol:
Choose a proper interface for this function. If you don't know how to select, simply use the default one, *TCP/UDP*.

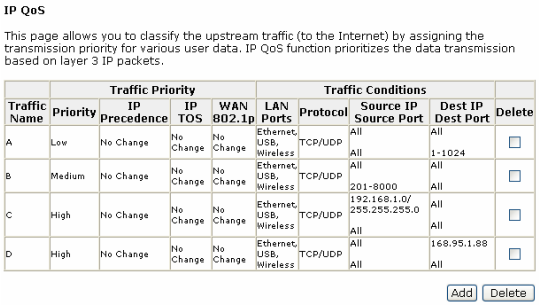


Source IP/ Subnet Mask/ Port: Key in the **source IP address** (ex.: *192.168.1.0*) and **subnet mask** (ex.: *255.255.255.0*) for the application (ex.: FTP, HTTP, and so on) that you want to invoke the QoS traffic rule. You may simply enter the **source port**, ranging from *0* to *65535*, as the traffic 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/ IP Precedence/ IP type of Service/ WAN 802.1p: Please refer to Bridge QoS**.**

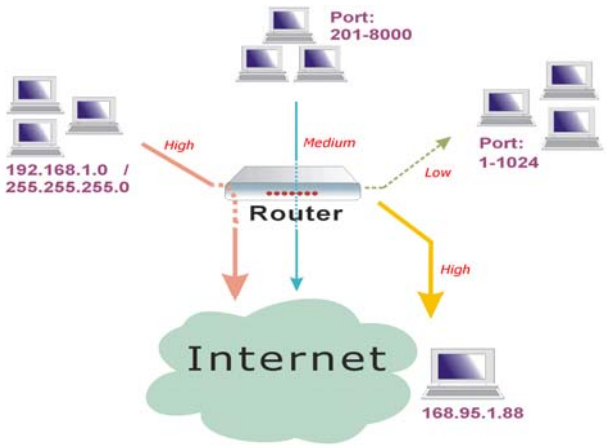
After you click **Apply**, the new QoS setting will be shown as the graphic on the right side.



According to the example, we set four rules for IP QoS. In traffic *A*, we set *1-1024* as the **destination port**, 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*.

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 as below.

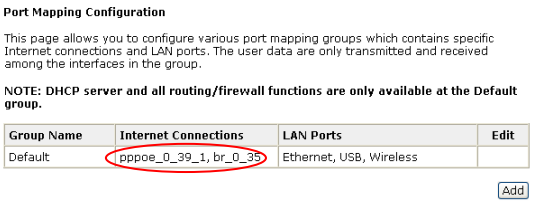


While there are many PCs getting online, the PCs using *port 201-8000* to access the internet will have **medium** traffic priority, the PCs carrying *192.168.1.x/ 255.255.255.0* as IP address will have **high** traffic priority. In addition, PCs heading to *port 1-1024* will have a **low** priority,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

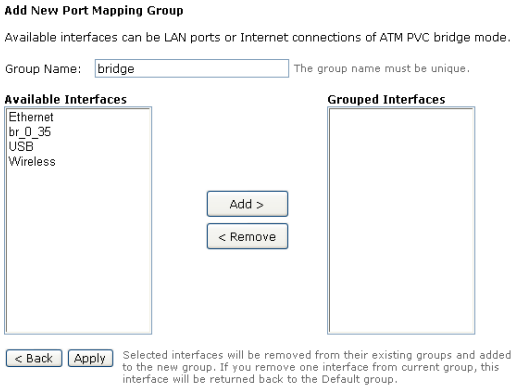
Normally, this function only needed when more than two PVCs are available, for example, if we have two PVCs, one uses PPPoE and the other uses Bridge mode, we may want to group certain connection to a specific port, especially when some devices may consume higher bandwidth.



In our following demonstration, we have two PVCs; they are *pppoe_0_39_1*and *br_0_35.*

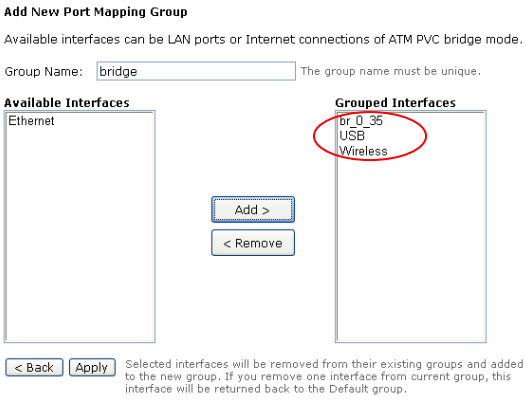
Click **Add** to create a new port mapping group.

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



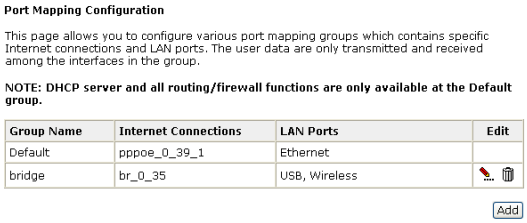
Available Interfaces:
The available interfaces (such as Ethernet, USB, wireless, etc.) will be displayed in the left side box. When you choose it and click **Add**, it will be transferred into the **Grouped Interfaces** at the right side box. Yet, if you want to remove the interface from the current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

Now we are going to map USB and Wireless interfaces with the bridge mode PVC. Click *br_0_35* and press **Add** button, then use the same way to add USB and Wireless to grouped interfaces. The items will be moved to the right box.



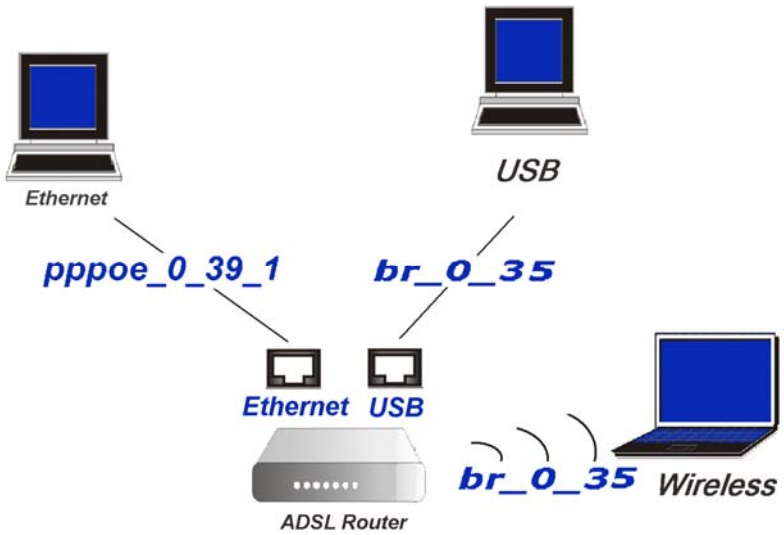
When the setting is done, click **Apply**.

Now we can check the result of this configuration; there are a default group with PPPoE mode on the Ethernet interface and another group named bridge, in which the bridge mode be applied on USB and Wireless interfaces.



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.



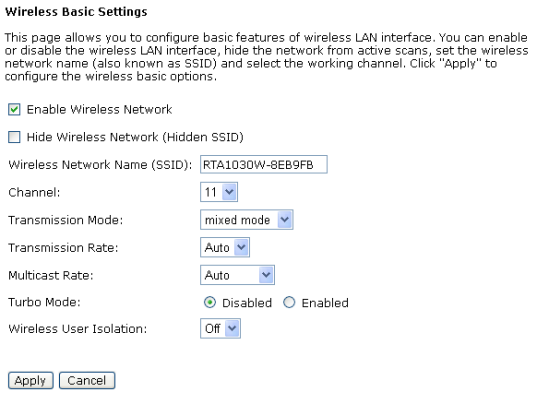
Under this configuration, any devices that attempt to connect via USB or Wireless interface will connect to the internet through the bridge mode PVC **br_0_35**, while the PCs using the Ethernet interface will access the internet by the PPPoE connection **pppoe_0_39_1**.

Wireless

This page allows you to configure the router as an Access Point. You may setup the settings for security, access control, and repeater features for this device.

Basic

To set the basic configuration for the wireless features, please open **Basic** page from the Wireless menu.



Enable Wireless Network:
Click this check box to enable the wireless network function.

Hide Wireless Network:
Check this box to hide the SSID of this AP (access point). Then other people in the network cannot find the SSID of this device.

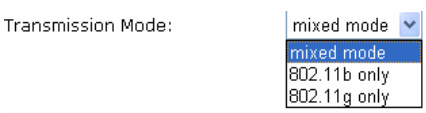
Wireless Network Name (SSID):
The system will detect the SSID of your router and displayed in this field for your reference.

The SSID is the identification characters of a router. The default words will be shown on this page. If you do not check “Hidden SSID” item, the router will periodically broadcasts its SSID to allow the wireless clients within the range to recognize its presence. This can create a security hole since any wireless clients which got the broadcast might associate to your system.

Please note that if you want to communicate, all wireless clients should use the same SSID with the router or access point.

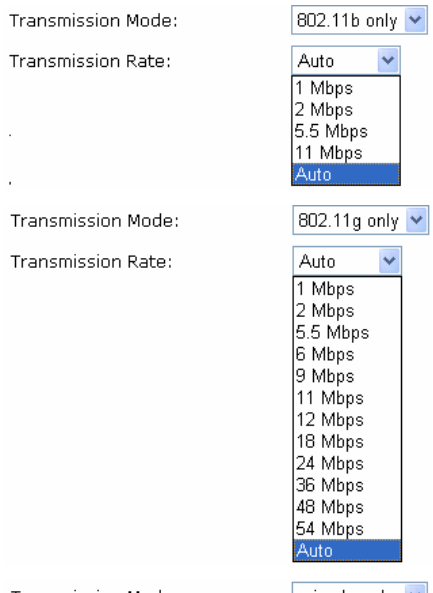
Channel:
The frequency in which the radio links are about to be established. Select one channel that you want from the drop down list.

As an administrator of network, one must search which channels are available and then assign one available channel as the communication channel. All the other clients that match the SSID and pass security authentication can access this device and will use the same channel that you set here.



Transmission Mode:
It decides the mode of data transmission. Choose the one that you want to use from the drop-down menu. There are **802.11b only**, **802.11g only** and **Mixed Mode** provided here.

Transmission Rate:
It decides the speed of data transmission. Choose any one of it by using the drop-down menu. This setting will change by the transmission mode that you set above. The transmission rate settings under **802.11b only** include 1, 2, 5.5, 11Mbps and Auto. The transmission rates for **802.11g** settings include 1, 2, 5.5, 6, 9, 11, 12, 18, 24, 36, 48, 54Mbps and Auto. As for **mixed mode**, only Auto is available.

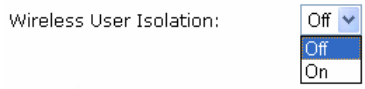


Multicast Rate:
When the multicast transmitting traffics are large, the transmission will be delayed in some way. If you want to speed up the rate, modify from the drop-down list.

For example, you may select *802.11g only* as the **transmission mode**, and select high **multicast rate** like *54 Mbps*.

Turbo Mode:
When it is enabled, the data transmission will be faster for this router. Check **Enabled** to invoke this function for speeding up the transmission, or check **Disabled** to close this function.

Wireless User Isolation:
To make the communication between the clients, please choose Off. To cut the communication between the clients, please choose On.

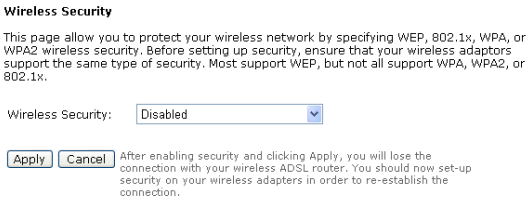


Click **Apply** to invoke the settings.

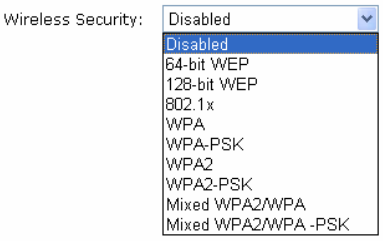
Security

To configure security features for the Wireless interface, please open **Security** item from **Wireless** menu. This web page offers eight authentication protocols for you to secure your data while connecting to networks. There are nine selections including 64-bit and 128-bit WEP, 802.1X, WPA, WPA-PSK, WPA2, WPA2-PSK, mixed WPA2/WPA, and mixed WPA2/WPA-PSK. Different item leads to different web page settings. Please read the following information carefully.

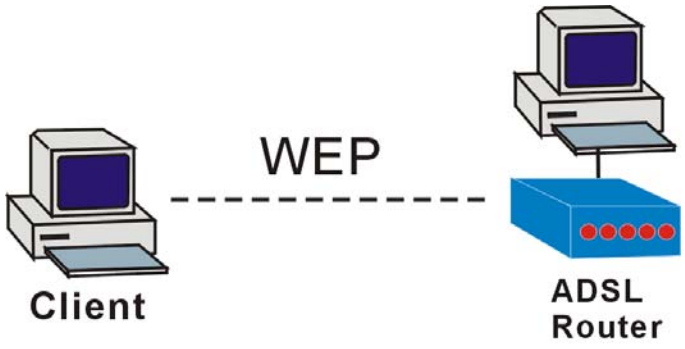
Wireless Security:
The **Disabled** item offers you the less protection for wireless communication. If you choose **Disabled**, the Encryption Keys will not be shown on this page.



There are nine wireless security modes for you to select.

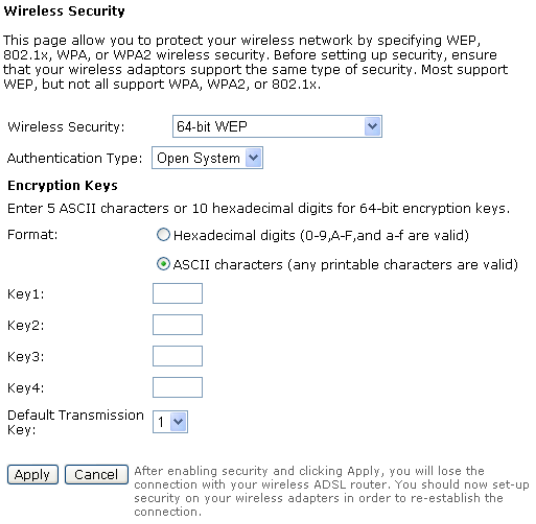


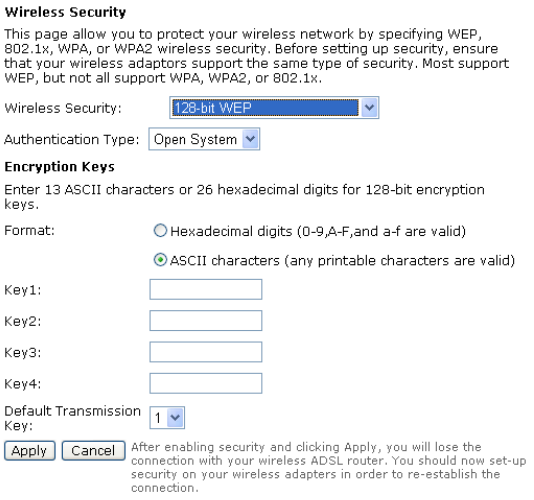
For 64-bit WEP/128-bit WEP



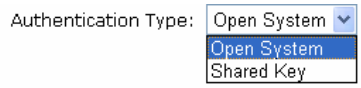
Protected by WEP only

Wireless Security:
Select the WEP mode for the security function; there are two options**, 64-bit** and **128-bit**. Before being transmitted, the data will be encrypted using the encryption key. For example, if you set 64-bit in this field, then the receiving station must be set to use 64 Bit Encryption, and have the same Key value at the same time; otherwise, it will not be able to decrypt the data.



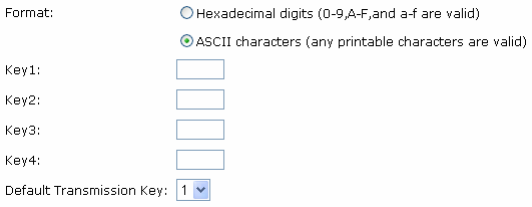


Authentication Type:
The ADSL Router supports two authentication types: **Open System** and **Shared key**. This should be considered with the WEP (Wired Equivalent Privacy) mechanism.



Open System means that it allows any client to authenticate and attempt to communicate with a bridge. The client can only communicate if its WEP keys match the router's WEP keys.

Shared Key means that a bridge or router will send an unencrypted text string to any client attempting to communicate with the router. The client requesting authentication encrypts the text and sends back to the router. Both unencrypted and encrypted can be monitored, yet it leaves the bridge open to be attacked by any intruder if he calculates the WEP key by comparing the text strings. That is why shared key authentication can be less secure than open authentication.



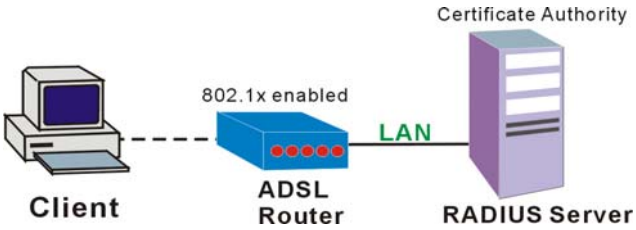
Format:
Choose the form of encryption key. You have to select either **Hexadecimal digits** or **ASCII characters** and type the keys on the fields of Key 1 to Key 4.

Key 1 to 4:
Fill out the WEP keys according to the key length. For **64-bit** WEP mode, the content you can type is 5 characters or 10 hexadecimal digits. For **128-bit** WEP mode, the content you can type is 13 characters or 26 hexadecimal digits.

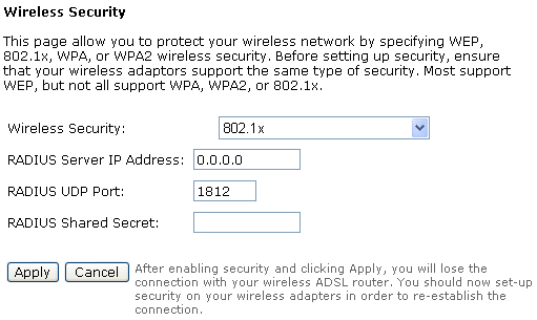
Default Transmission Key:
Select one of the network keys that you set on the Key boxes as the default one.

When the settings are done, click **Apply** for activation.

For 802.1X Wireless Network



When a wireless client requests to access a network, it is required to be authenticated by a central authentication server (RADIUS Server). Only an authenticated user can be granted by the network access and thereby those unauthorized will be blocked.



Wireless Security:
Choose **802.1x** as the authentication protocol, your data transmission between the router and the clients will be protected with the settings that you set in this web page.

RADIUS Server IP Address:
RADIUS Server is a protocol for carrying authentication, authorization, and configuration information between a Network Access Server which desires to authenticate its links and a shared Authentication Server. Please enter the IP Address for the RADIUS Server.

RADIUS UDP Port:
Port *1812* is the reserved RADIUS-authentication port described in RFC 2138. Earlier AP (RADIUS clients) use port 1945. The default value will be shown on this box. You can keep and use it.

RADIUS Shared Secret:
A shared secret is like a password, which is used between RADIUS Server and the specific AP (RADIUS client) to verify identity. Both RADIUS Server and the AP (RADIUS client) must use the same shared secret for successful communication. Enter the words for the share secret.

After finishing the settings, click **Apply** for activation.

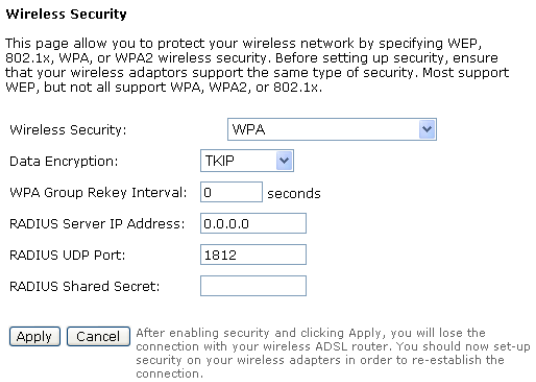
802.1x environment Configuration

You will need the following components for establishing an 802.1x environment in your network.

- Windows 2000/2003/NT Server: RADIUS server equipped with “Internet Authentication Service”. Certificate Services installed.
- AP (Router): connected to Windows 2000 Advanced Server through the LAN port with DHCP server and 802.1x enabled.
- 802.1x client: a WLAN card supporting WEP.
- Authentication Mechanism.

For WPA (Wi-Fi Protected Access)

The **WPA (WiFi-Protected Access)** authentication is suitable for enterprises. It must be used in conjunction with an authentication server such as RADIUS to provide centralized access control and management. It can provide stronger encryption and authentication solution than none WPA modes.



Data Encryption:
Select the data encryption method for the WPA mode. There are three types that you can choose, **TKIP, AES, TKIP+AES**.

TKIP (Temporary Key Integrity Protocol) takes the original master key only as a starting point and derives its encryption keys mathematically from this master key. Then it regularly changes and rotates the encryption keys so that the same encryption key will never be used twice.

AES (Advanced Encryption Standard) provides security between client workstations operating in ad hoc mode. It uses a mathematical ciphering algorithm that employs variable key sizes of 128, 192 or 256 bits.

TKIP+AES combine the features and functions of TKIP and AES.

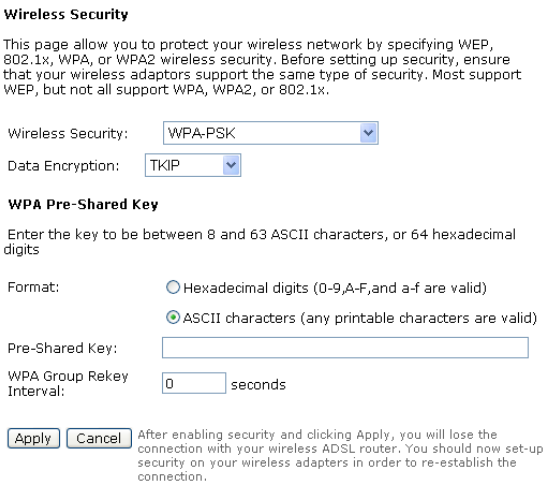
WPA Group Rekey Interval:
Enter the time for the WPA group rekey interval. The unit is second. With increasing rekey interval, user bandwidth requirement is reduced. On the other hand, the longer the rekey interval, the longer the delay for a new user to gain group access.

RADIUS Server IP Address, RADIUS UDP Port, and **RADIUS Shared Secret:**
Please refer to the elucidation in the previous **802.1x** section.

After finishing the settings, click **Apply** for activation.

For WPA-PSK; WPA2-PSK; Mixed WPA2/WPA-PSK

WPA-PSK (WPA-Pre-Shared Key) is useful for small places without authentication servers such as the network at home. It allows the use of manually-entered keys or passwords and is designed to be easily set up for home users.



Data Encryption:
Select the encryption type for the WPA mode. There are three types that you can choose, **TKIP, AES, TKIP+AES**. (For more information please refer to **WPA** section.)

Format:
Choose the form of encryption key. You have to select either **Hexadecimal digits** or **ASCII characters** and type the keys on the fields of Pre-Share Key.

Pre-Share Key:
Please enter the key between 8 and 63 characters, or 64 hexadecimal digits. Only the devices with a matching key that you set here can join this network.

WPA Group Rekey Interval:
Enter the time for the WAP group rekey interval. The unit is second. With increasing rekey interval, user bandwidth requirement is reduced.

After finished settings, click **Apply** for activation.

For WPA2; Mixed WPA2/WPA

Wireless Security:
The **WPA2** is suitable for enterprises. It must be used in conjunction with an authentication server such as RADIUS to provide centralized access control and management. It can provide stronger encryption and authentication solution than other WPA mode.

Data Encryption:
Select the encryption type for the WPA2 mode. There are three types that you can choose, **TKIP, AES, TKIP+AES**. **(**For detailed information please refer to **WPA** section.)

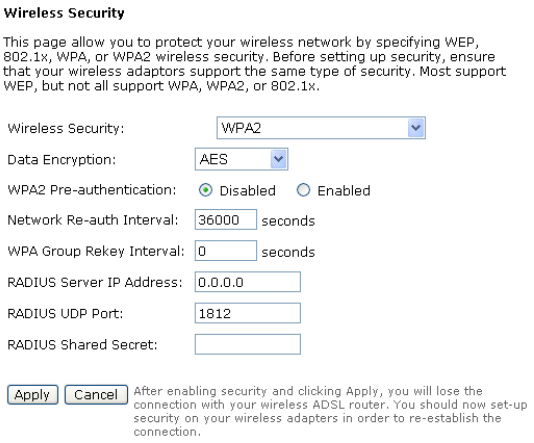
WPA2 Pre-authentication:
The wireless client that has associated with one AP (router A) can do the authentication with another AP (router B) in advance. If the client roams to AP (B), it can associate with AP (B) quickly. Please click **Enabled** to activate this function.

Network Re-auth Interval:
When a wireless client has associated with the AP for a period of time longer than the setting here, it would be disconnected and the authentication will be executed again. The default value is *36000*, you may modify it.

WPA Group Rekey Interval:
Enter the time for the WPA group rekey interval. The unit is second. With increasing rekey interval, user bandwidth requirement is reduced.

RADIUS Server IP Address, RADIUS UDP Port, and **RADIUS Shared Secret:**
Please refer to the elucidation in the previous **802.1x** section.

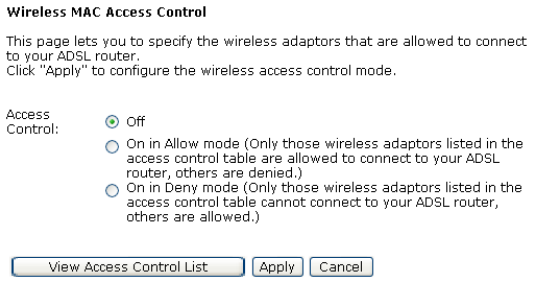
When the settings are finished, click **Apply** for activation.



Access Control

The web page allows you to enable the wireless MAC control configuration.

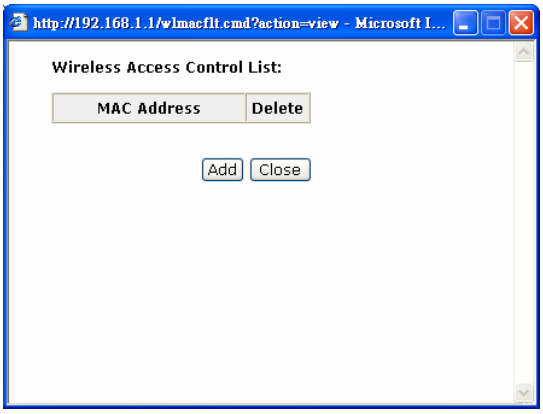
Access Control:
Click **Off** to disable this function. Click **On in Allow mode** to allow the devices using matched MAC address to link to the AP. And click **On in Deny mode** to disturb the listed wireless MAC address to access the AP.



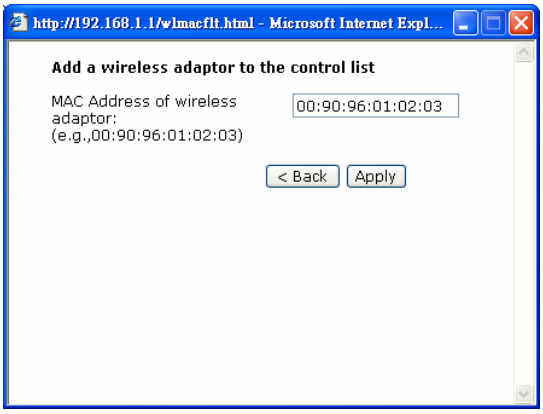
View Access Control List:
Click this button to view the wireless access control list and to add a new MAC address.

The Wireless Access Control List dialog allows you to add a new MAC address and view current MAC addresses that you had added.

To add a new MAC address to your wireless MAC address filter, click on the **Add** button.

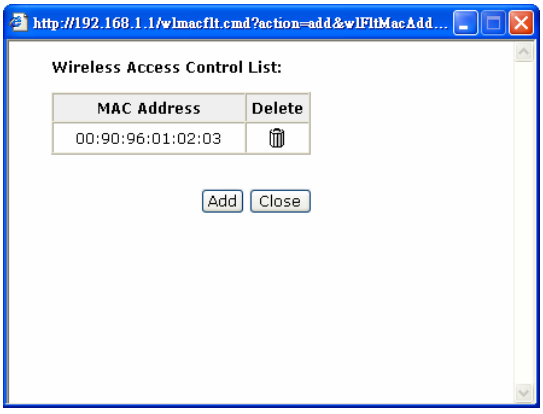


MAC Address of Wireless adaptor:
Key in the MAC Address to be filtered. And click **Apply**.



The result of the added MAC address will be shown on the table.

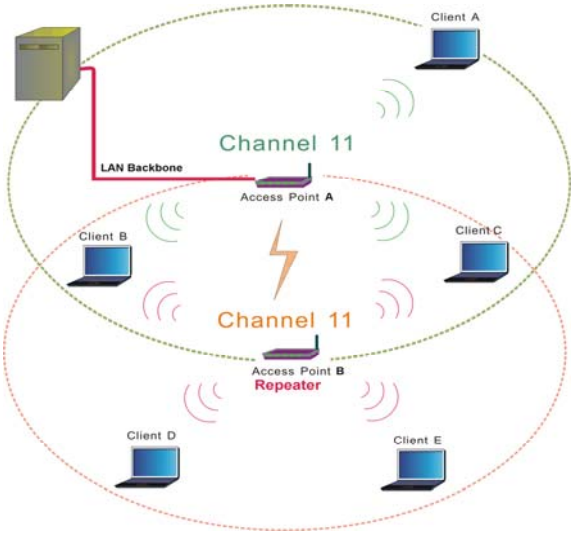
If you want to delete the added MAC address, simply click the delete button , a dialog box will be prompted to confirm the deleting. Click **Yes**, and then the selected one will be erased.



Repeater

A **repeater** is an electronic device that receives a weak or low-level signal and retransmits it at a higher level or higher power, so that the signal can cover longer distances without degradation.

The example figure illustrates the relationship among the AP, the repeater, and the clients. In this example, client A, B, and C can access AP-A, but client D and E cannot. In this case, AP-B works as the repeater for AP-A, and thus client D and E may receive the signal smoothly.



The web page allows you to configure the wireless distribution system for the wireless network.

AP Mode:
Choose an AP mode that you would like to use.

Search Other Repeaters:
You can configure other routers as your repeater by setting up repeater feature mutually. Click the **Scan Now** button to search other repeater in the wireless network automatically. The result will be shown on the chart.

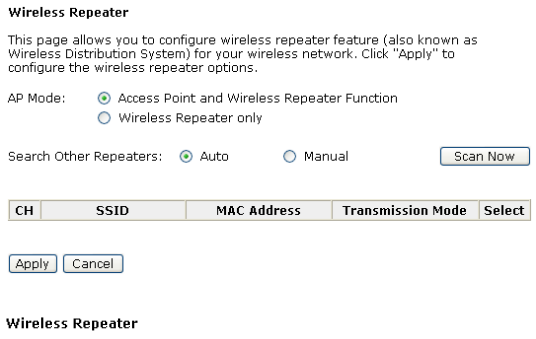
Note: To configure the repeater function among routers, they must use the same **SSID** and **WEP key**, so that they may work as repeater for each other.

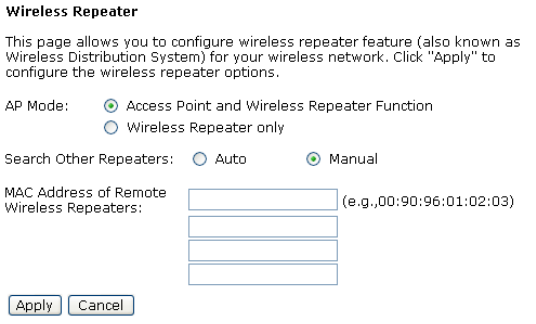
If you select **Manual** for **Search Other Repeaters**, you will need to type the MAC address for wireless repeaters in the boxes of **MAC Address of Remote Wireless Repeaters**.

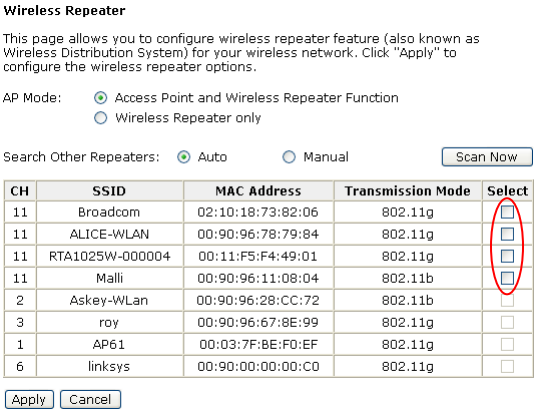
The right figure shows an example of executing the function of auto-searching repeaters.

You may select the routers (which use the same channel as yours) from the table and configure the same SSID and WEP key with the one you chose, so that they can function as repeaters to extend the coverage area for each other.

When you finish the settings, please click **Apply** to invoke them.







Management

Diagnostics

To check the linking status for the network and your computer, a diagnostic test can guide you to detect the network problem. The testing items are listed and examined one by one. If the previous one is failed, than the items following that one will be failed, too. Use this diagnostic test to detect the connectivity mistakes whenever linking problem occurs.

Press **Run Diagnostic Tests** on the Diagnostic Tests page.

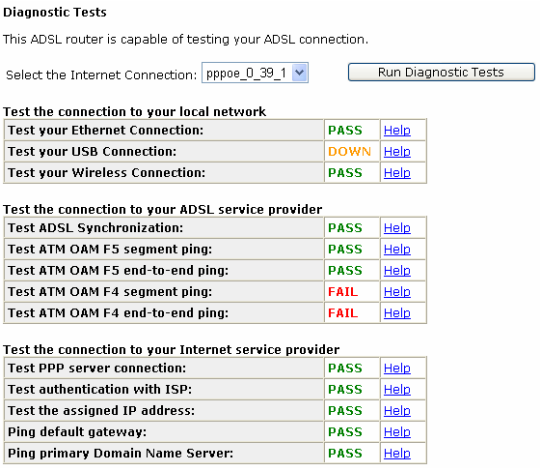
The Result would be shown on the same page.

For the item which passes through the diagnostics, a "**PASS**" will be displayed on the right side of that item.

If not, a "**FAIL**" will be presented there.

If there is no device using that port, a "DOWN" will be displayed.

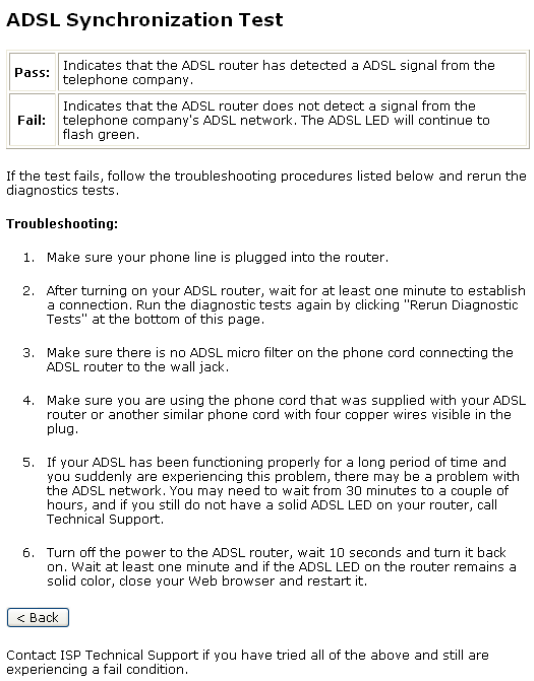
Press the **Help** link to know what the result (Pass, Fail) represents for.



Take the **Help** link of **ADSL Synchronization** for example.

It not only explains the situation for Pass and Fail, but offers the troubleshooting procedures for you to follow.

Press **Back** to return.



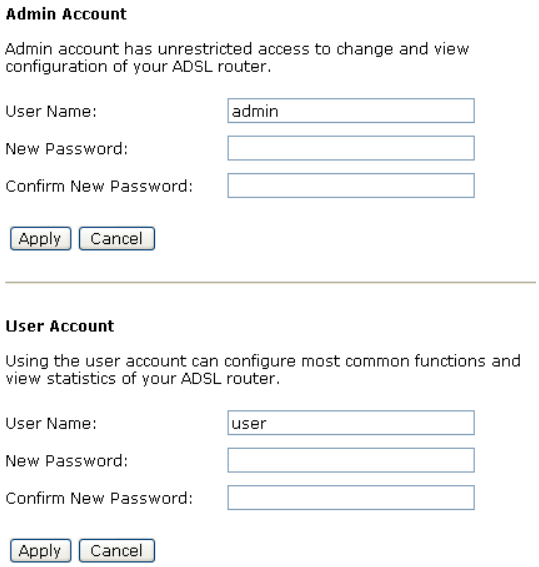
Management Accounts

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 seven 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.

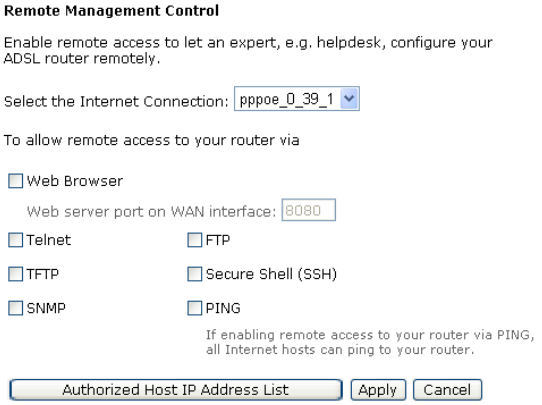
FTP:
Choose this box if you want to have remote control through FTP.

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

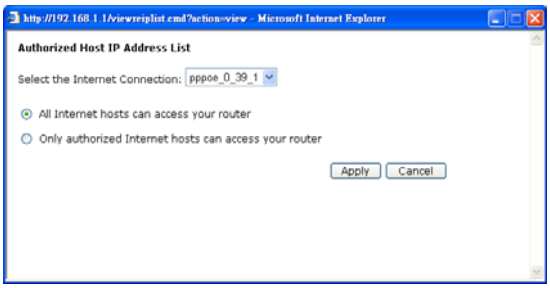
Secure Shell (SSH):
Choose this box if you want to have remote control through SSH.

SNMP:
Choose this box if you want to have remote control through SNMP agent.

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 IAD or only authorized internet hosts can access. Click **Apply** to save your setting.

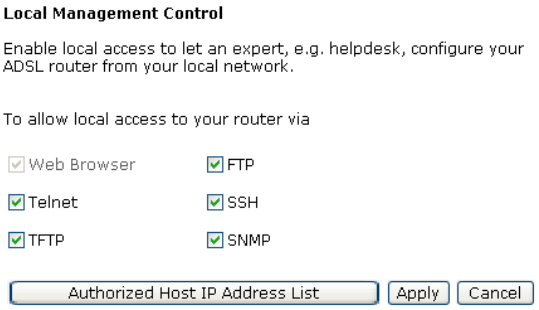


Management Control – From Local

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.



Internet Time

The router's clock 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.

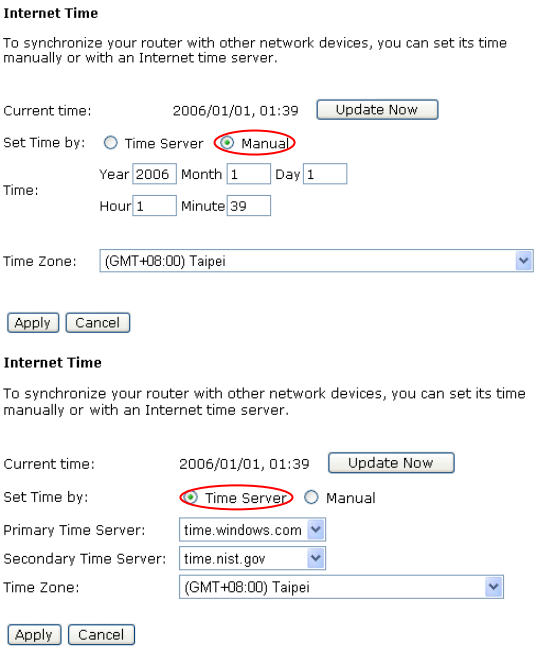
If you select **Time Server**, the system will set time via time server automatically.

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.

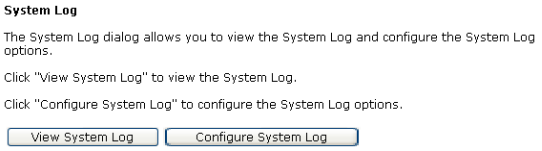
Cancel:
Discard the new configuration and reserve the original settings.



System Log

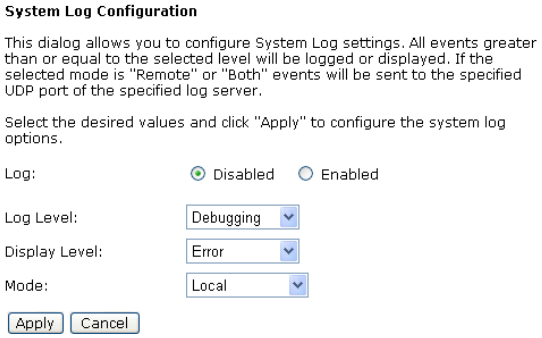
As shown on the web page, you can view the system log and configure system log whenever you want.

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



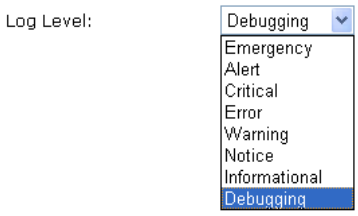
Configuring System Log

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.

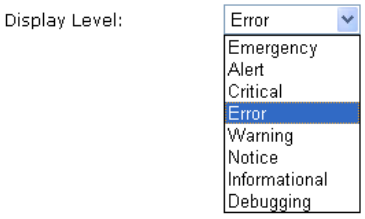
Log Level:
This function enables you to decide how detailed the messages will be stored. Set a proper level according to your needs. The default Log Level is **Debugging**.



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.

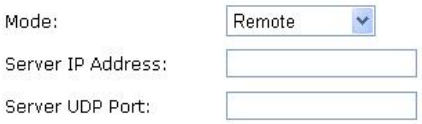
Display Level:
For the convenience of the users, the display level can function as a filter. It decides the level for the messages to exhibit when the user wants to view the logs on the local side. For example, for a programmer or engineer, he/she may want to know about *debugging or informational* level 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.



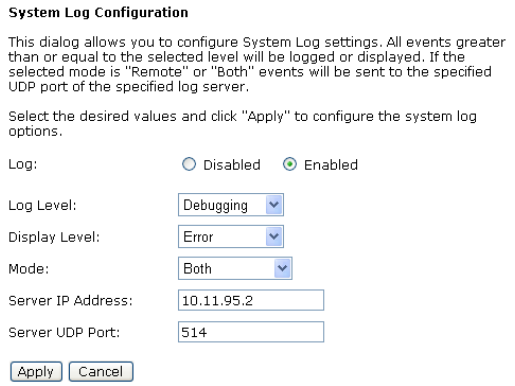
Note:
Display Level only filters for the *local* side. All the messages will be displayed on the remote Log Server.

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.



Viewing System Log – Remote Side (Server)

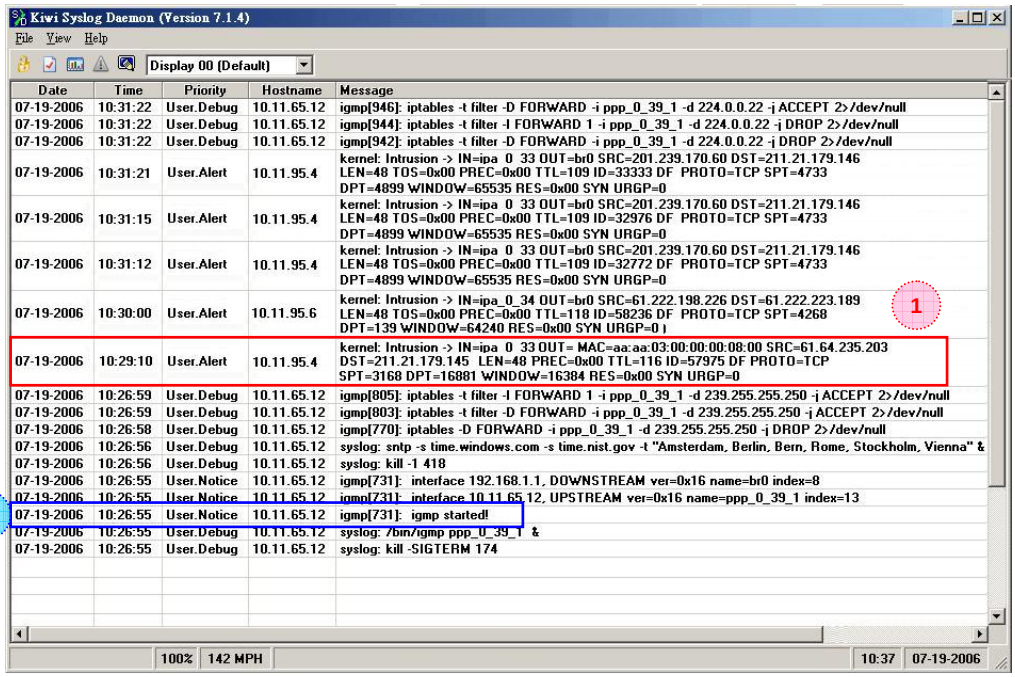
To view the system log on the Log Server (*10.11.95.2*), a log viewing tool must be installed.

1. Download the **Kiwi Syslog Daemon** from **Kiwi Enterprises**.
   - Kiwi Syslog Daemon is a freeware Syslog Daemon for Windows. It receives, logs, displays and forwards Syslog messages from hosts such as routers, switches, and any other syslog enabled device. You can choose other logger tools; here, we use Kiwi for example.

Download the tool from the Kiwi Enterprises website.

2. Install the Kiwi Syslog server software on the PC (*10.11.95.2)*.

3. Open the **Kiwi Syslog Daemon** application. You will get to a screen shown as follows.

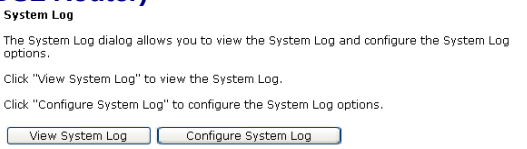


The **Date** and **Time** record the logging time. The **Priority** field shows the log level, the **Hostname** exhibits the position of the host, and the **Message** column displays the process the description of it—before the colon is the name of the process and after the colon is the elaboration for that process.

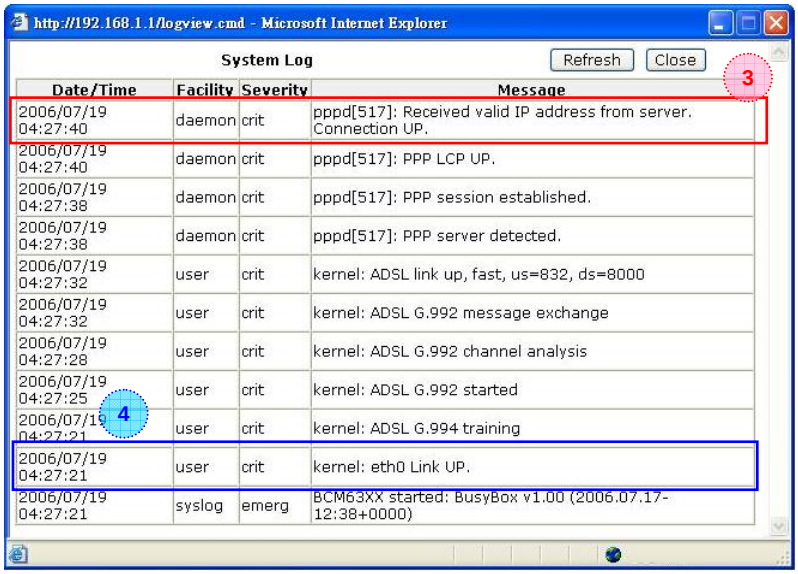
For example, message 1 shows *alert* level information which is a kernel process containing detailed intrusion information; message 2 displays *notice* level information which is an IGMP process exhibiting that the IGMP function had been started.

Viewing System Log – Local Side (ADSL Router)

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



The system log record on the router will be displayed on a screen shown as below.



The **Date/Time** records the logging time, and the Facility field distinguishes different classes of system log message. The **Severity** field shows the log level, and the **Message** column displays the process and the description of it—the name of the process appears before the colon and the elaboration for that process after the colon.

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.

You can press **Refresh** to update the log files or press **Close** to close the window.

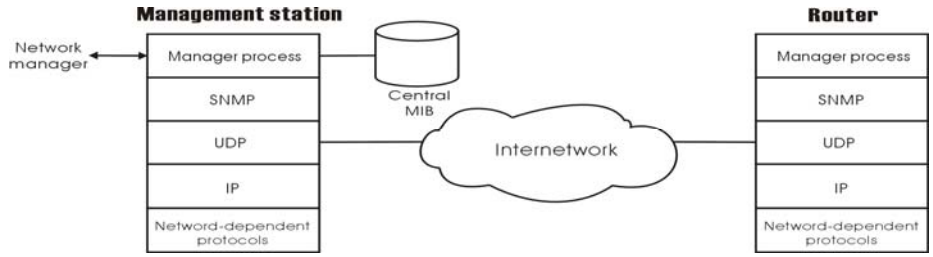
Note that the earlier messages may be automatically replaced by the updated information when the buffer is overflowed on the router.

SNMP Setting

SNMP, the abbreviation of Simple Network Management Protocol, is used to refer to a collection of specifications for network management that include the protocol itself, the definition of data structures and associated concepts.

A management station performs the **monitoring function** by retrieving the value of MIB objects. The management station and agents are linked by a network management protocol that is SNMP. The SNMP includes three key capabilities: **get, set** and **trap**. A single management station can handle many agents as long as SNMP remains relatively “simple”, so the number can be high (hundreds or so).

The following picture is the typical configuration of protocols for SNMP. As for a stand-alone management station, a manager process controls access to a central MIB at the management station and provides an interface to the network manager. The manager process achieves network management by using SNMP, which will be implemented on top of the UDP, IP and the relevant network-dependent protocols (e.g., Ethernet).



For an agent device that supports other applications, such as FTP, both TCP and UDP are required. An agent may issue a trap message in response to an event that affects the MIB and the underlying managed resources.

Note: There is no ongoing connection maintained between a management station and its agents. Instead, each exchange is a separate transaction between a management station and an agent.

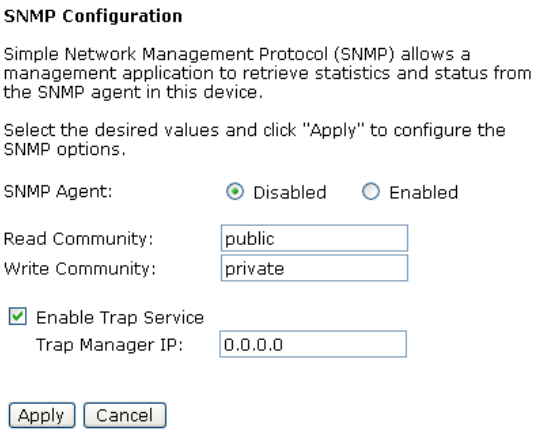
Each agent is responsible for notifying the management station of any ***unusual event***; for example, if the agent crashes and is rebooting, a link fails or an overload condition as defined by the packet load crosses some threshold. These events are communicated in SNMP messages known as **traps**.

SNMP Agent:
Choose **Disable** to close this function; choose **Enabled** to open this function.

Read Community:
SNMP community for reading access only. The default setting is **public**. Please key in the data that your ISP provided.

Write Community:
SNMP community for reading and writing access. The default setting is **private**. Please key in the data that your ISP provided.

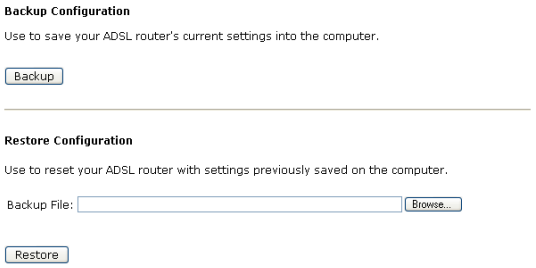
Enable Trap Service:
Configure the SNMP service to send a trap when it receives a request for information that does not contain the correct community name and does not match an accepted host name for the service. Check this box to enable this function, otherwise uncheck it.



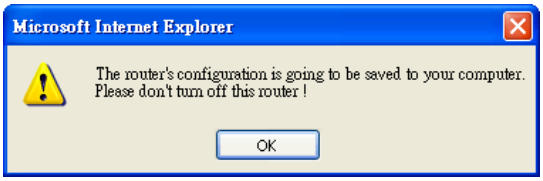
Trap Manager IP:
Type an IP address as the remote workstation. If any abnormal condition happens, you can advice remote workstation through SNMP agent.

Backup Config

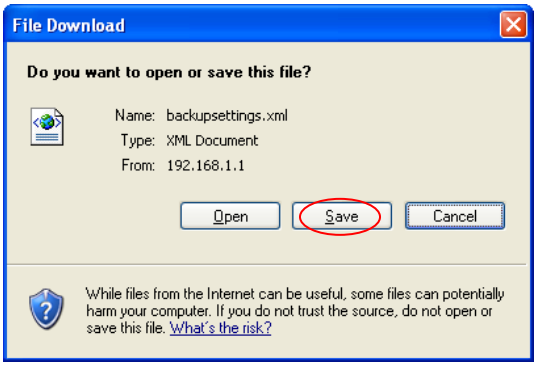
To backup your settings of the router, you can use **Backup Config** web page to save the configuration.



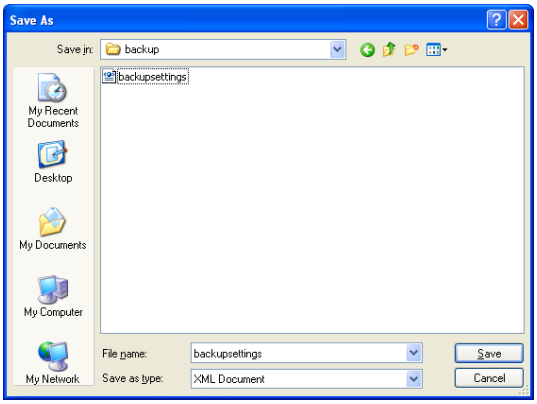
Click **Backup** button and the warning window will be prompted. Click **OK** to continue the backup procedure.



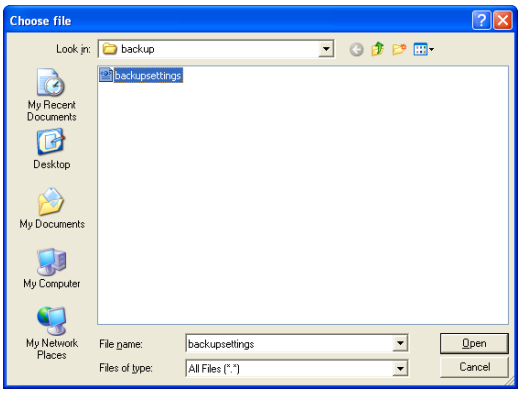
The system will ask your command about the next procedure. Click **Save** to backup.



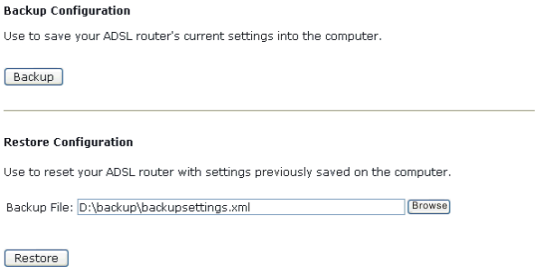
You may change the file name and choose a place to save the backup file.



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.



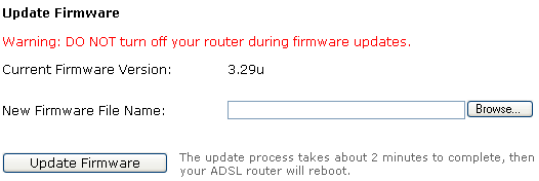
After opening the backup file, click **Restore**.



Update Firmware

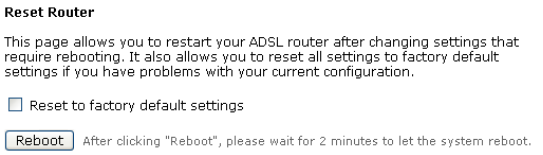
If you have to or want to update the firmware for this router, you can open the **Update Firmware** web page and choose the correct file by pressing **Browse**. Then click the **Update Firmware** button. The system will execute the update procedure automatically. When it is finished, the system will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

Note: Router must not turn off during firmware updates.

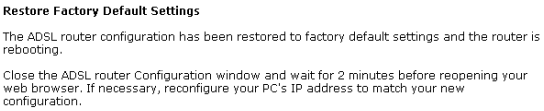


Reset Router

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**.



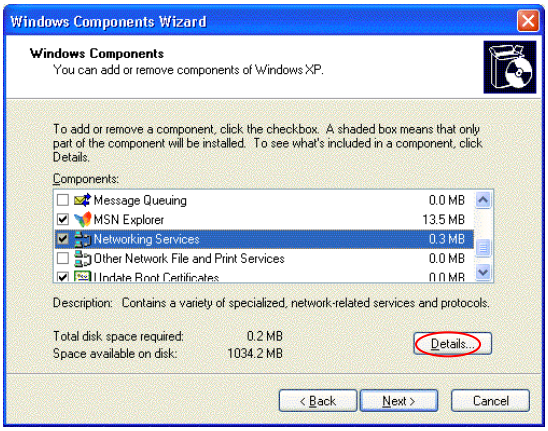
UPnP for XP

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 places, or attached to the Internet.

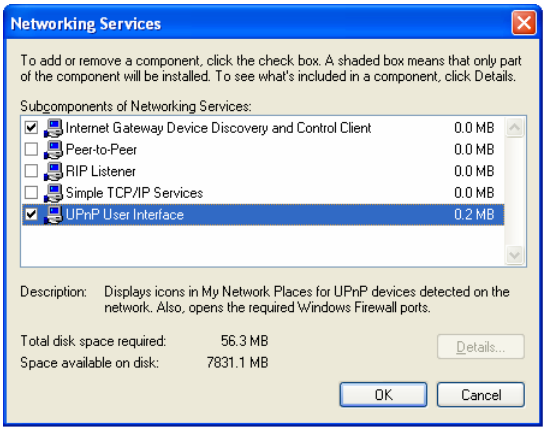
Only **Windows XP** supports UPnP function.

Please follow the steps below for installing UPnP components.

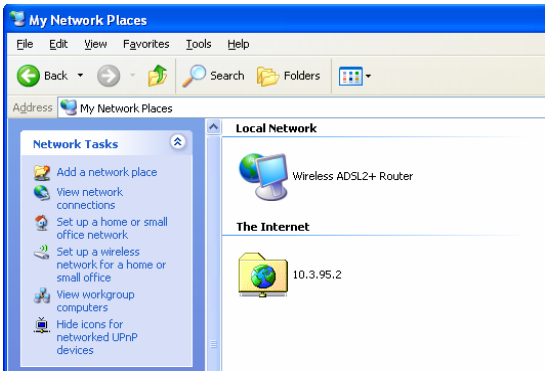
1. Click on the **Start** menu, point to **Settings** and click on **Control Panel**.
2. Select **Add or Remove Programs > Add/Remove Windows Components** to open **Windows Components Wizard** dialog box.



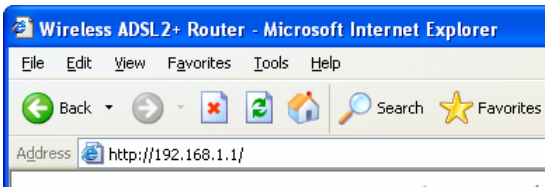
3. Select **Networking Services** and click **Details.** Click the **UPNP User Interface** check box.
4. Click **OK**. The system will install UPnP components automatically.



5. After finishing the installation, go to **My Network Places**. You will find an icon (e.g., Wireless 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 configuration 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 addresses 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

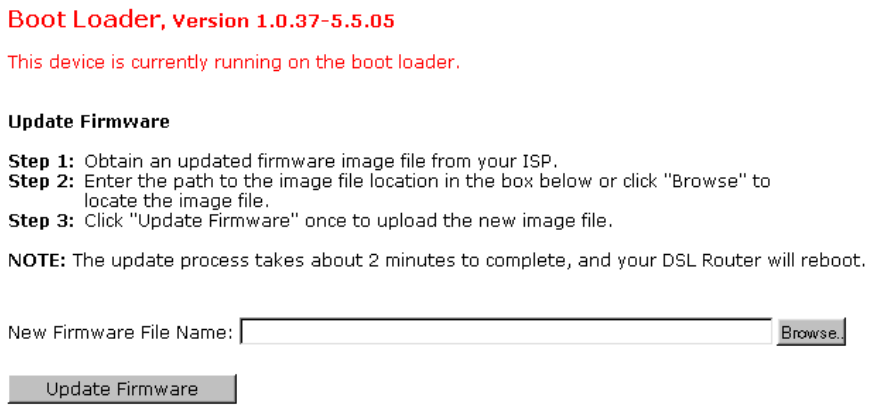
  Then the DNS is not reachable. Check your DNS setting on the ADSL Router.

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 and 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 you 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.

RIP (Routing Information Protocol)

RIP is a routing protocol that uses the distance-vector routing algorithms to calculate least-hops routes to a destination. It is used on the Internet and is common in the NetWare environment. It exchanges routing information with other routers. It includes V1, V2 and V1&V2, which controls the sending and receiving of RIP packets over Ethernet.

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, metasignaling channel or a generic broadcast signaling channel. Your ISP should supply you with the values.

Appendix A: Specifications

Interface	● One RJ-11 port for ADSL connection ● One RJ-45 ports for IEEE 802.3/802.3u 10/100 Base-T auto-sensing and auto-crossover Ethernet connection ● One USB client port compliant to USB 1.1 ● On-board wireless LAN module for IEEE 802.11b/g (2.4 GHz) wireless LAN connection ● One hidden 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 Environment Requirement	Power Adaptor: Input 120±10 or 230±10 VAC; Output 12 VAC, 1A Power Consumption: less than 10 Watt Ambient Temperature: 0 to 40°C (32 to 96°F) Relative Humidity: 20% to 90% (non-condensing)
Physical	Dimensions: 165mm(L) x 120mm(W) x 42mm(H) Weight: 300g

Appendix B: Client Setup for 802.1x, WPA, and WPA-PSK

Retreiving Client Certificate

✧ This step is only required if you intend to authenticate with EAP/TLS.

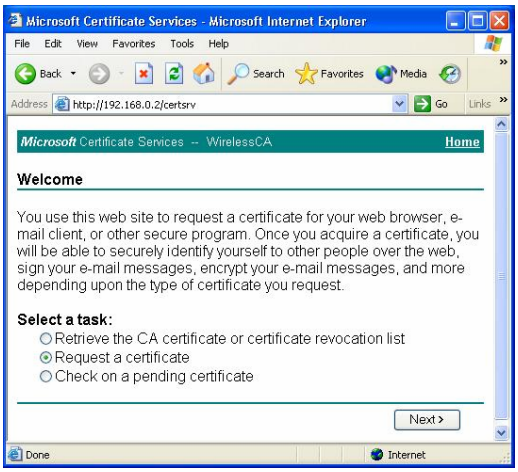
While there are many ways you may receive a certificate from your Certificate Authority, the example here is to show you how to retrieve your certificate from a Microsoft Certificate Services server via its easy web interface.

1. Please connect the client to a network that doesn't require port authentictaion.
2. Open up Microsoft Explorer, connect to your CA via the url **http://yourserver/certsrv** (see your local administrator if it has been changed from the default).

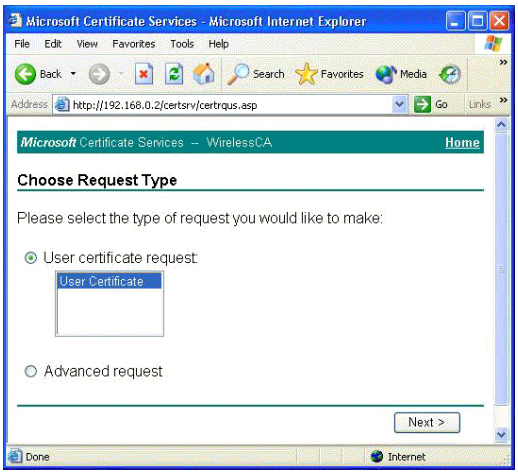
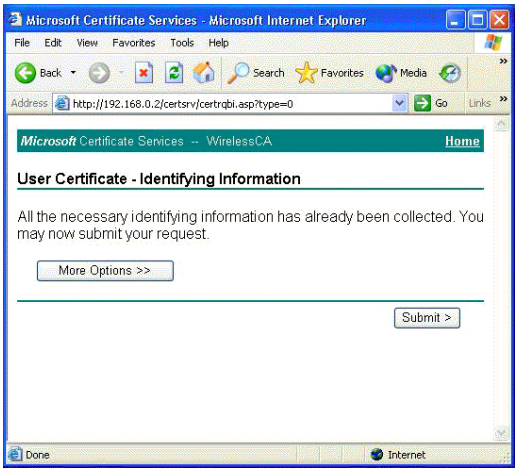
   For example, if the Microsoft Certificate Service server uses the IP address 192.168.0.2, then we have to key in *http://192.168.0.2/certsrv* on the url box.

3. You will be asked to log in, use your domain credentials. (e.g., *ABC*)

4. Make sure that **Request a certificate** is selected, and click **Next.**



5. Select **User Certificate**, then **Next**.



6. Click **Submit** in the following step.