ADSL Router

User Manual

ADSL Router

User Manual

December 2001, Rev01

Contents

Safety Instructions

Installing

- Use only the type of power source indicated on the marking labels.
- Use only the power adapter supplied with the product.
- Do not overload wall outlet or extension cords as this may increase the risk of electric shock or file. 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 sunshine.
- 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 file.
- Do not place this product on an unstable stand or table.

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.

Servicing

Do not attempt to disassemble or open covers of this unit 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.

Chapter 1. Introduction

1.1 Overview

ADSL Router is designed to offer cost-effective high-speed services for home or office users. It provides a downstream rate of up to 8 Mbps and upstream rate of up to 1 Mbps for ADSL connection, 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 ADSL Router.

1.1.1 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)

ATM Features

- Compliant to ATM Forum UNI 3.1 / 4.0 Permanent Virtual Circuits (PVCs)
- Support up to 8 AAL5 Virtual Circuit Channels (VCCs) for UBR, CBR, VBR-rt, and VBR-nrt with traffic shaping
- RFC1483 (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
- 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 4000 learning MAC addresses.

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 and enjoy various multimedia applications.
- ALGs (Application Level Gateways): such as NetMeeting, FTP, Quick Time, mIRC, Real Player, CuSeeMe, etc.
- Multiple Virtual Servers (e.g., Web, FTP, Mail servers) can be setup on user's local network.
- Static routes, RFC1058 RIP v1, RFC1723 RIP v2.
- DNS Relay
- ARP Proxy

Security Features

- PAP (RFC1334), CHAP (RFC1994) for PPP session
- Support IP packets filtering

Configuration and Management

- SNMPv1 agent with MIB-II, PPP MIB, ADSL Line MIB
- User-friendly embedded web configuration interface with password protected
- Telnet session for local or remote management

- TFTP firmware upgrades via web browser GUI
- Distribute IP addresses to end users via DHCP server provided by ADSL router

1.2 Before You Start

1.2.1 Package Contents

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

- ADSL Router x1
- Power Adapter and Cord x1
- Utility Software CD x1
- RJ-11 ADSL Line Cable x1
- RJ-45 Ethernet Cable x1

Depending on the service type your vendor offers, you may be provide with the devices below:

- Splitter (for G.dmt version) x1
- Micro filter (for G.lite version) x1

1.2.2 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.

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 number of IP addresses varies according to different ADSL service provider.

1.2.3 Requirements for PC on the LAN

- PC
- System OS (Windows 98/2000/NT/XP…)
- 10/100Base-T NIC
- Hub
- 10/100Base-T (UTP) network cable.

Additional Requirement on client PC

For Bridge mode and use PPPoE Software

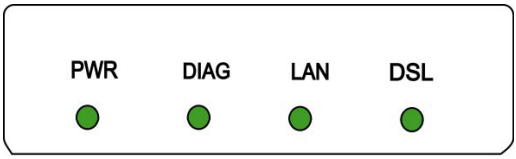
- DUN (Dial-up Network) version 1.3 or later
- PPPoE software – (Windows 95/98 CD is required during PPPoE installation)

Chapter 2.
Hardware Description & Installation

2.1 Physical Outlook

2.1.1 Front Panel

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



LED Indicators

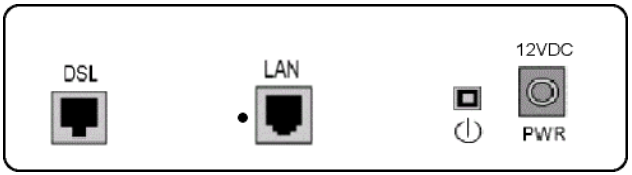
The ADSL Router is equipped with 4 LEDs on the front panel to indicate the status of the unit. When power is being applied to the ADSL Router, all the LEDs illuminate solid. After the boot up process has been complete, the LEDs are displayed as below

LEDs	Function	Color	Description
PWR	Power	Green	Off – No power is supplied to the unit. Solid – Power is connected to the unit.
DIAG	Diagnosis	Green	1.Off – Power off or initial self-test of ADSL Router is OK. 2.Blinking –blinking for software downloading of ADSL router in progress or update operation parameters located in FLASH memory in progress 3.Solid – Indicates initial self-test failure or Flash memory programming failure.

LEDs	Function	Color	Description
LAN	Link Status	Green	1.Off – Power is off or no Ethernet carrier is present. 2.Blinking – Ethernet carrier is present and data is going through Ethernet port. 3.Solid – Ethernet carrier present.
DSL	Link Status	Green	1.Off – Power off. 2. Slow blinking – ADSL handshaking is in progress. 3. Quick blinking – ADSL connection training is in progress. 4.Solid – ADSL connection is OK.

2.1.2 Rear Panel and Connections

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



- DSL: RJ-11 connector
- LAN: Ethernet 10BaseT RJ-45 connector
- ⏻: Power switch
- 12VDC: Power connector

2.2 Hardware Connection

2.2.1 Choosing a place for the ADSL Router

- Place the ADSL Router close to ADSL wall outlet and power outlet for

the cable to reach it easily.

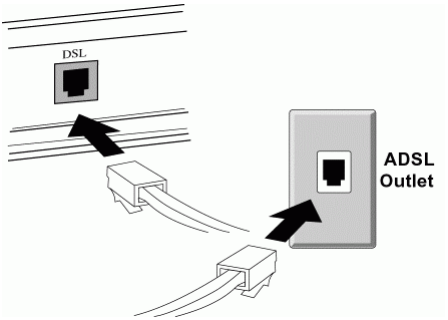
- Avoid placing the device in places where people may walk on the cables. Also keep it away from direct sunshine or heat sources.
- Place the device on a flat and stable stand.

2.2.2 Connecting the ADSL Router

Follow the steps below to connect the related devices.

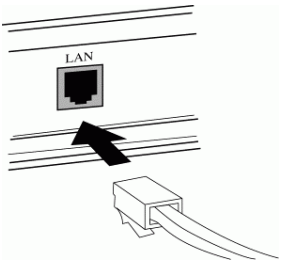
Step 1 Connecting the ADSL line.

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



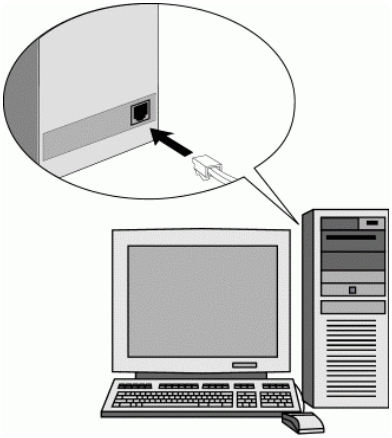
Step 2 Connecting a workstation or hub to the LAN port.

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



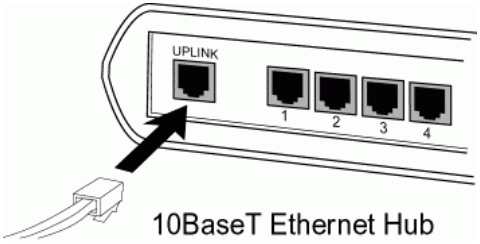
Option 1: Connect to a PC directly

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



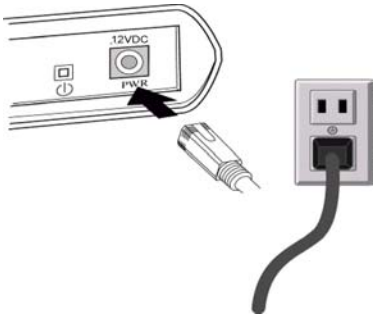
Option 2: Connect to a hub

If you want to connect more devices, connect the other end to the uplink port of the hub.



Step 3 Connecting the power adapter.

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



Step 4 Turn on the power switch.

Connecting a POTS Splitter

For Full Rate (G.dmt) standard, a POTS Splitter is necessary on subscriber's premise to keep the telephone and ADSL signals separated, giving them the capability to provide simultaneous Internet access and telephone service on the same line. To connect a POTS Splitter:

1. Connect the port **Phone** to your telephone.
2. Connect the port **Modem** to your ADSL Router.
3. Connect the port **Line** to the ADSL wall jack.

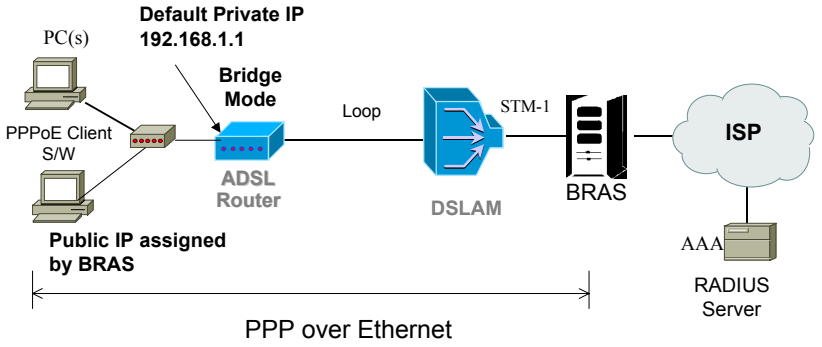
The figure below illustrates a typical connection with POTS Splitter connected:

Chapter 3.
Select A Connection Mode

Prior to configure 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 detailed Web configuration, refer to "Chapter 6 : Web Configuration".

- Bridge Mode
- Router Mode
- PPPoA+ NAT Mode
- PPPoE + NAT Mode
- Multiple PVCs Mode

3.1 Bridge Mode



*BRAS：Broadband Remote Access Server

Description:

In this example, the ADSL Router acts as a bridge which bridging PPP session over Ethernet from the LAN. Therefore, it does not require a public IP address. It only has a default private IP address (192.168.1.1) for management purpose. Client PCs on the LAN should be equipped with PPPoE software to get public IP address from BRAS.

Configuration:

Step 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 to be on the same subnet with the ADSL Router, whose default IP address is 192.168.1.1.

Step 2 Start up your browser and type 192.168.1.1 as the address to enter the web-based manager.

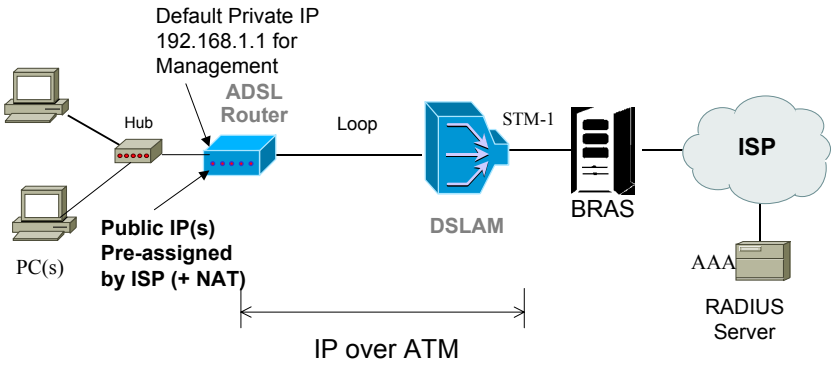
Step 3 Go to **Configuration >WAN > ATM PVC > Setup ATM PVC** and add a new ATM PVC interface. Enter the VPI/VCI values provided by your ISP and select the encapsulation type as **LLC_SNAP Bridge** or **VC_MUX Bridge**. Then click **Submit**.

Step 4 Then execute **Save** and **Restart** .

Step 5 Install PPPoE client software on the client PCs and launch the application to dial up to the ISP.

Step 6 When the connection is established, the client PCs can access the Internet.

3.2 Router Mode



* BRAS：Broadband Remote Access Server

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 connect 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.

For example: You are given the IP addresses 10.251.2.0 ~ 10.251.2.7. Then:

10.251.2.0 is network IP address

10.251.2.1 is assigned to router IP address.

10.251.2.7 is subnet broadcasting

10.251.2.2~10.251.2.6 can be assigned to public servers on the LAN.

Configuration:

Step 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 to be on the same subnet with the ADSL Router, whose default IP address is 192.168.1.1.

Step 2 Start up your browser and type 192.168.1.1 as the address to enter the web-based manager.

Step 3 Go to **Configuration > WAN > ATM PVC > Setup ATM PVC**. Select the encapsulation type as **IPoA**. Enter the public IP address in **Specify local WAN IP address** section. Then click **Submit**.

Or

Go to **Configuration > LAN > IP Address** and enter the public IP address. Then click **Submit**.

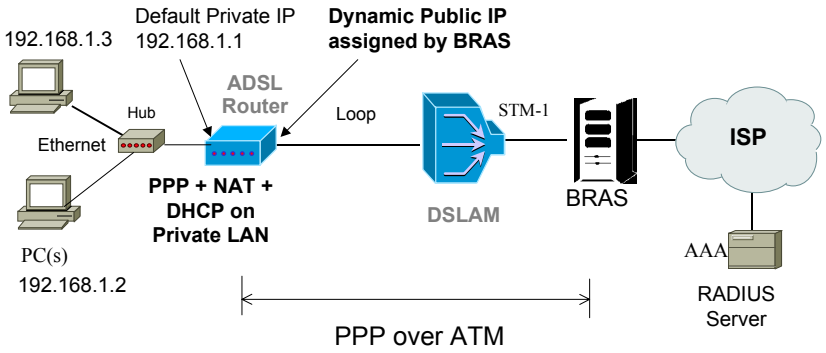
Step 4 Go to **Configuration > Advanced > IP Static Routing > Show Static Routing Table**, check the default route entry as below:
Network IP Address: 0.0.0.0
Netmask: 0.0.0.0
Interface: ATM PVC
Interface Name: *IPOA1* (The name of ATM PVC changes according to your setting in **Setup ATM PVC** page on step 3.)

Note: The default routing entry is added by system automatically when a PVC is created for the first time.

Step 5 Execute **Save** and **Restart**.

Note: If you have multiple PCs on the LAN, you may enable DHCP function on the private or public IP address. The ADSL Router implements a built-in DHCP server, which assigns IP addresses to the clients PCs on the LAN.

3.3 PPPoA + NAT Mode



* BRAS：Broadband Remote Access Server

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:

Step 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 to be

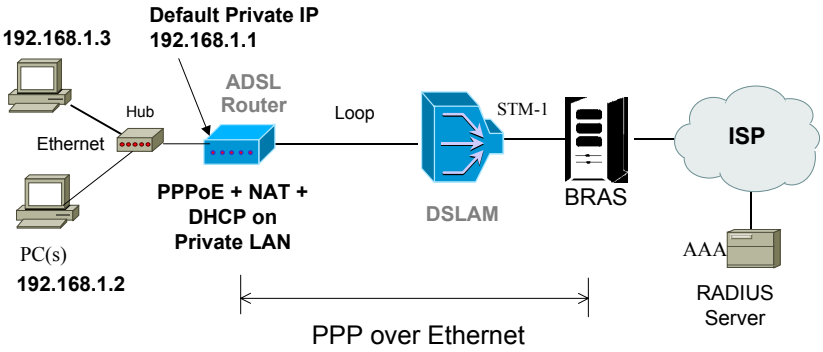
on the same subnet with the ADSL Router, whose default IP address is 192.168.1.1.

Step 2 Start up your browser and type 192.168.1.1 as the address to enter the web-based manager.

Step 3 Go to **Configuration > WAN > ATM PVC > Setup ATM PVC**. Select the encapsulation type as **PPPoA** and fill in the **User Name** and **Password** filed. Then click **Submit**.

Step 4 Execute **Save** and **Restart**.

3.4 PPPoE + NAT Mode



* BRAS：Broadband Remote Access Server

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:

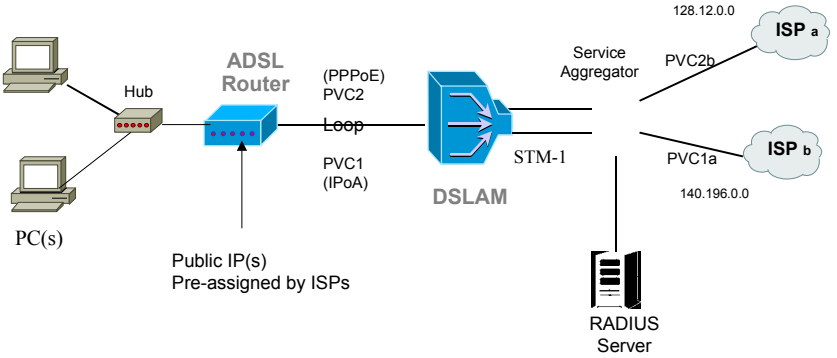
Step 1 Choose a client PC and set the IP as 192.168.1.x (x is between 2 and 254) and the gateway as 192.168.1.1 to be on the same subnet with the ADSL Router, whose default IP address is 192.168.1.1.

Step 2 Start up your browser and type 192.168.1.1 as the address to enter the web-based manager.

Step 3 Go to **Configuration > WAN > ATM PVC > Setup ATM PVC**. Select the encapsulation type as **PPPoE** and fill in the **User Name** and **Password** filed. You may leave the **Service Name** and **Access Concentrator** filed empty. Then click **Submit**.

Step 4 Execute **Save** and **Restart**.

3.5 Multiple PVCs Mode



Description:

As this ADSL Router supports a maximum of 8 PVCs in the ADSL loop, you are allowed to configure up to 8 logical channels in one physical loop. You can use mixed encapsulation types by applying them to different PVCs. However, only one PPPoA or PPPoE can exist in the 8 PVCs.

In this deployment model, the PVC1 is configure as IPoA encapsulation type; therefore, the system will add a routing entry to routing table automatically.

The PVC2 is configured as PPPoE encapsulation type, the system will also create a routing entry.

When the system starts up, it will connect to CO site through the PVCs according to the sequence they are created. Therefore the

default route will be the last PVC you created. You can also modify the default route manually from the **Setup the Static Route** function.

The traffic from CPE side will be sent to different PVCs according to the routing rules.

Configuration:

Step 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 to be on the same subnet with the ADSL Router, whose default IP address is 192.168.1.1.

Step 2 Start up your browser and type 192.168.1.1 as the address to enter the web-based manager.

Step 3 Create a PVC (e.g. PVC1) using the **IPoA** encapsulation type.
Refer to the section of "3.2 Router Mode" for details.

Step 4 Create a second PVC (e.g.PVC2) using the **PPPoE** encapsulation type. Refer to the section of "3.4 PPPoE + NAT Mode" for details.

Step 5 Execute **Save** and **Restart**.

Chapter 4.
Setting Up PC on the LAN

4.1 Set up a PC to configure the ADSL Router

You 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 easily 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).

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

- With Ethernet network interface.
- Must have TCP/IP installed.
- On the same sub-network with the ADSL Router.
- With a web browser installed: Internet Explorer 5.x or later.

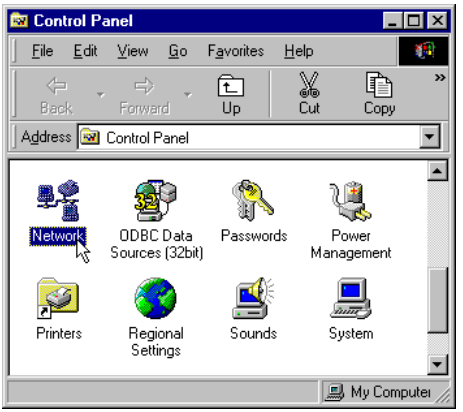
The ADSL Router is configured with the **default IP address of 192.168.1.1** and **subnet mask of 255.255.255.0**. As the **DHCP server is disabled by default**. you should assign an IP address to the host PC first for initial configuration. Once you finish configuring the ADSL Router as DHCP server, the DHCP clients should be able to access the ADSL Router.

If TCP/IP is not already installed, follow the steps below for its installation.

4.1.1 For Windows 98

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

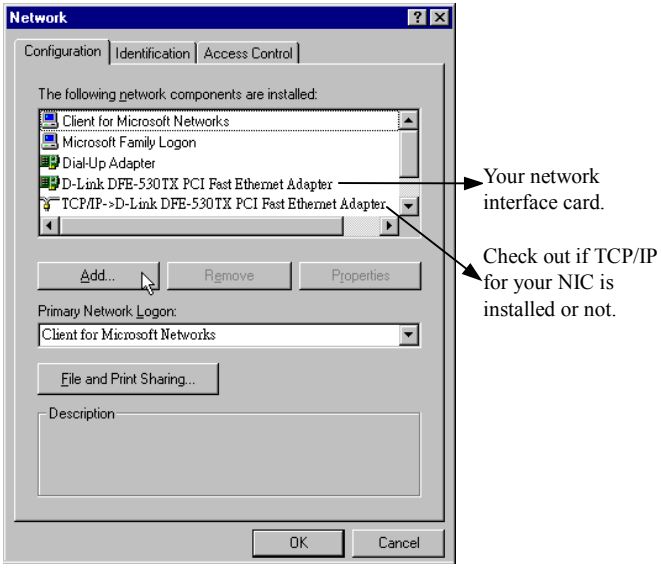
Step 2 Double-click the **Network** icon.



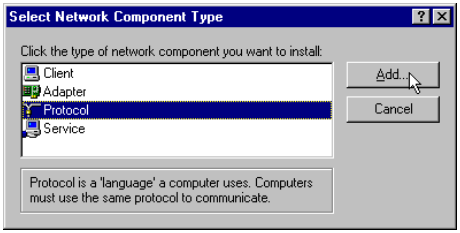
Step 3 The **Network** window appears. On the **Configuration** tab, check out the list of installed network components.

Option 1: If you have **no** TCP/IP protocol, click **Add**.

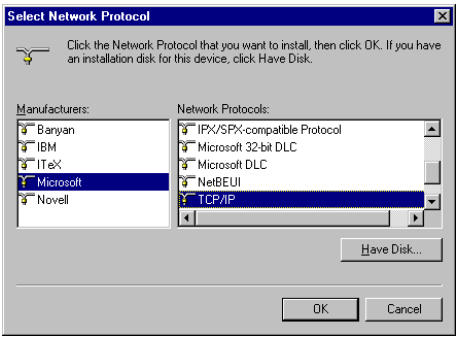
Option 2: If you have TCP/IP protocol, go to Step 6.



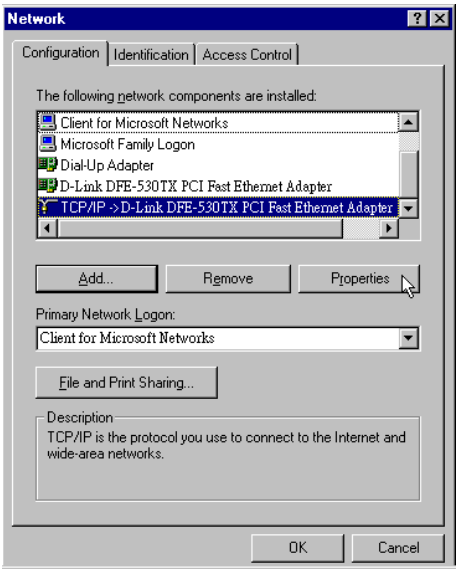
Step 4 Highlight **Protocol** and click **Add**.



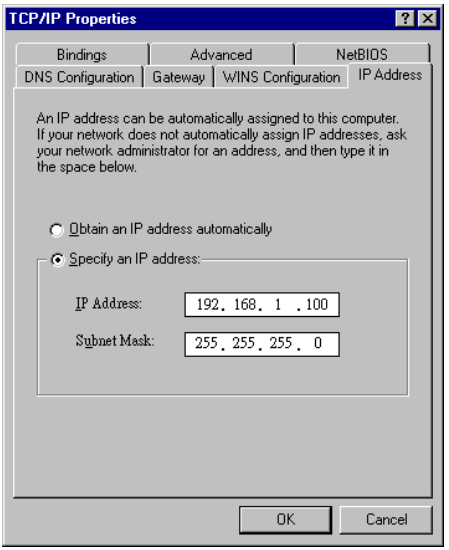
Step 5 On the left side of the windows, highlight **Microsoft** and then select **TCP/IP** on the right side. Then click **OK**.



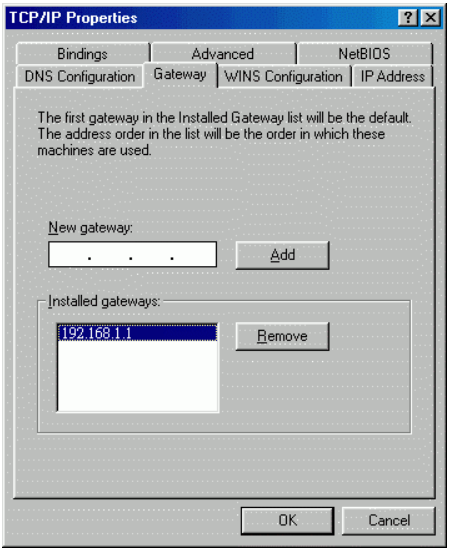
Step 6 When returning to **Network** window, highlight **TCP/IP** protocol for your NIC and click **Properties**.



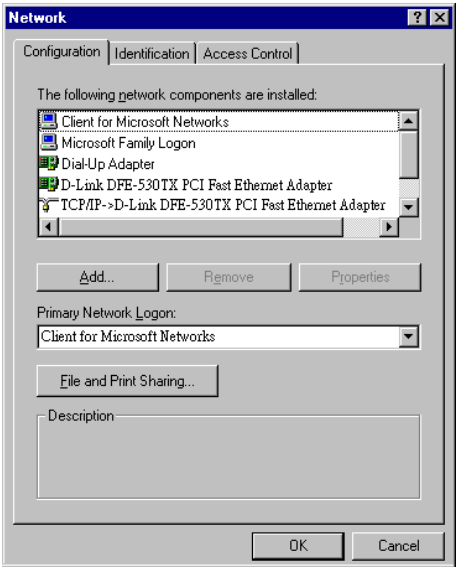
Step 7 On **IP Address** tab:
Enable **Specify an IP address** option. Enter the **IP Address**: 192.168.1.x (x is between 2 and 254) and **Subnet Mask**: 255.255.255.0 as in figure below.



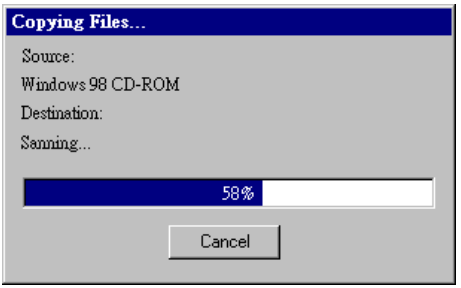
On **Gateway** tab: Add a gateway IP address: 192.168.1.1.



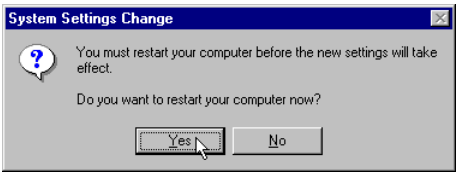
Step 8 When returning to **Network** window, click **OK**.



Step 9 Wait for Windows copying files.

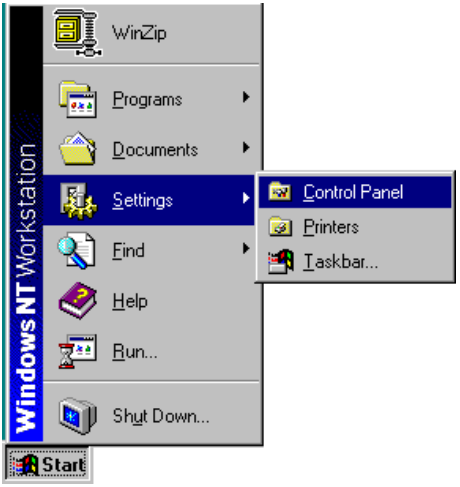


Step 10 When prompted with **System Settings Change** dialog box, click **Yes** to restart your computer.

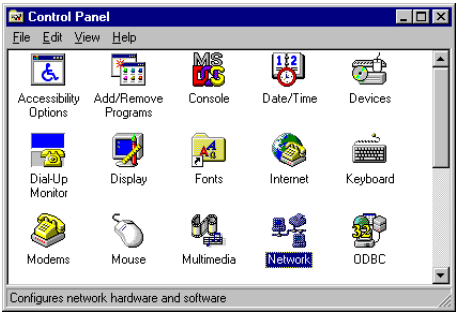


4.1.2 For Windows NT

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



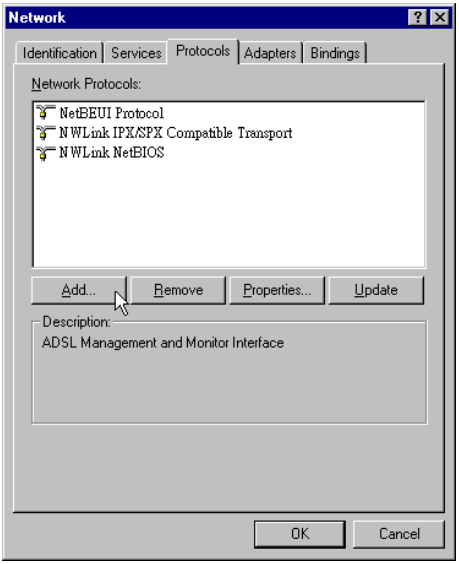
Step 2 Double-click the **Network** icon.



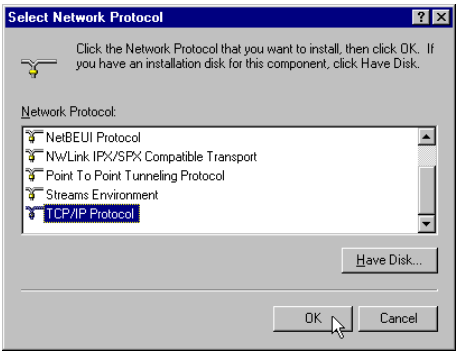
Step 3 The **Network** window appears. On the **Protocols** tab, check out the list of installed network components.

Option 1: If you have **no** TCP/IP Protocol, click **Add**.

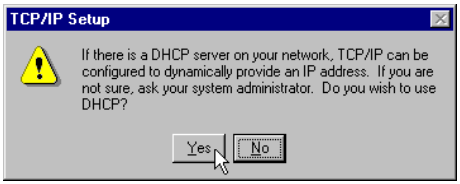
Option 2: If you have TCP/IP Protocol installed, go to Step 7.



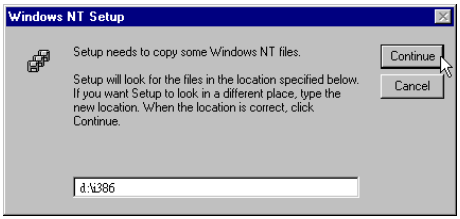
Step 4 Highlight **TCP/IP Protocol** and click **OK**.



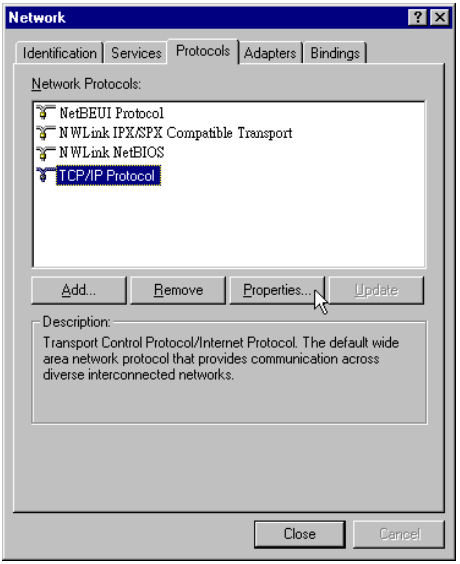
Step 5 Click **Yes** to use DHCP.



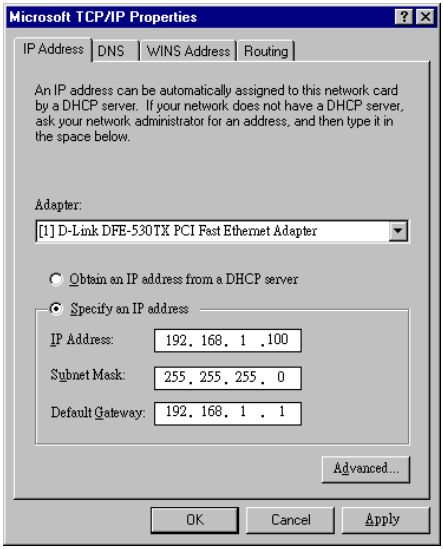
Step 6 Insert the Windows NT CD into your CD-ROM drive and type the location of the CD. Then click **Continue**.



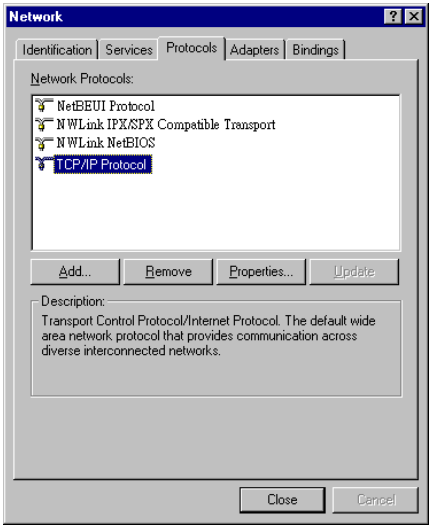
Step 7 Returning to the **Network** window, you will find the **TCP/IP Protocol** among the list. Select **TCP/IP Protocol** and click **Properties**.



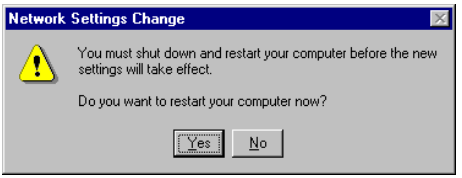
Step 8 Enable **Specify an IP address** option. Enter the **IP Address**: 192.168.1.x (x is between 2 and 254) and **Subnet Mask**: 255.255.255.0 and **Default Gateway**: 192.168.1.1 as in figure below.



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

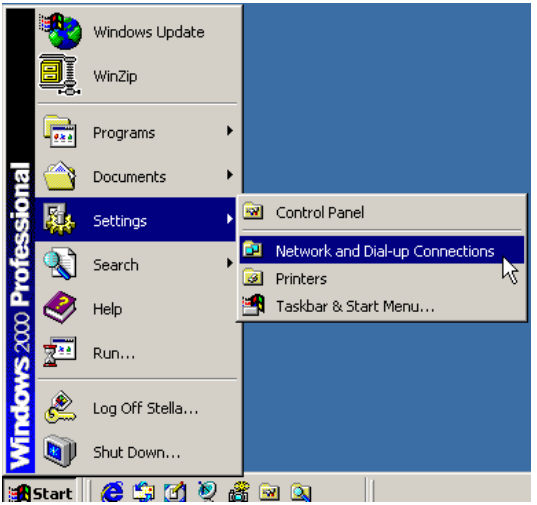


Step10 When prompted with **Network Settings Change** dialog box, click **Yes** to restart your computer.

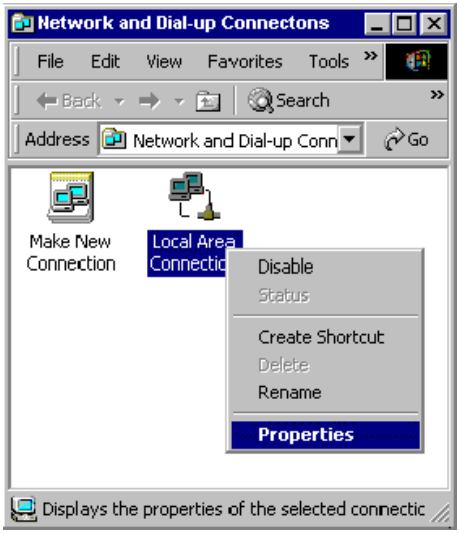


4.1.3 For Windows 2000

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



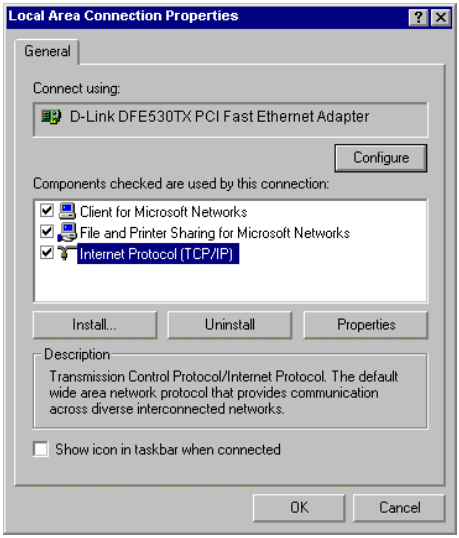
Step 2 Right-click the **Local Area Connection** icon and then click **Properties**.



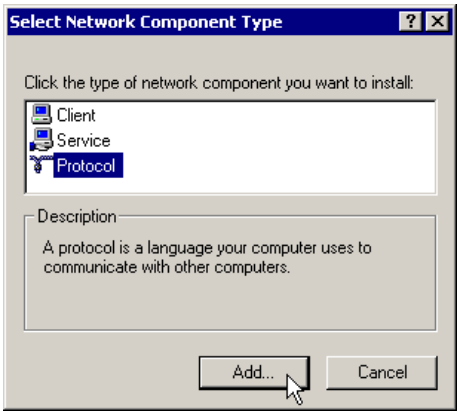
Step 3 On the **General** tab, check out the list of installed network components.

Option 1: If you have **no** TCP/IP Protocol, click **Install**.

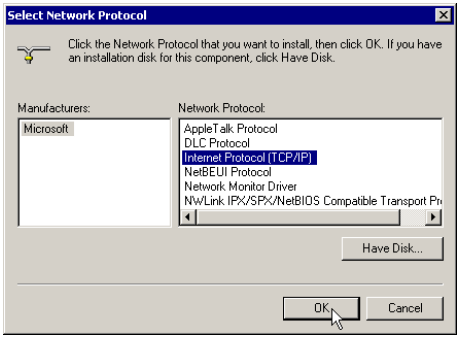
Option 2: If you have TCP/IP Protocol, go to Step 6.



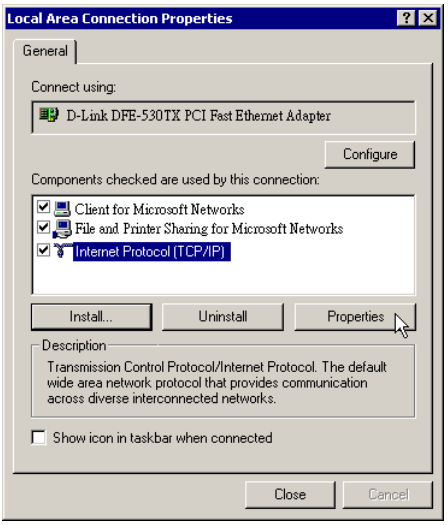
Step 4 Highlight **Protocol** and then click **Add**.



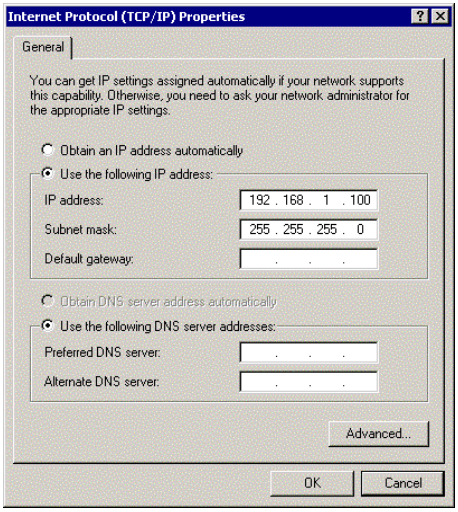
Step 5 Click **Internet Protocol(TCP/IP)** and then click **OK**.



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



Step 7 Under the **General** tab, enable **Use the following IP Address**. Enter the **IP address**: **192.168.1.x** (x is between 2 and 254), **Subnet Mask**: **255.255.255.0** and **Default gateway**: **192.168.1.1**. Then click **OK**. When prompted to restart your computer, reboot it to enable the settings.



4.2 Configure PC to get IP address from DHCP

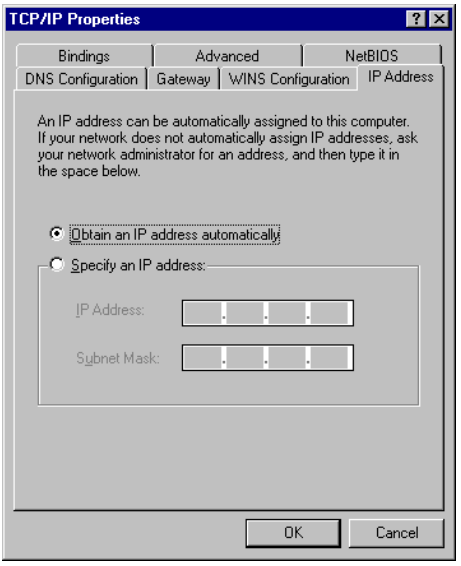
If your ADSL Router operates as a DHCP server for the client PCs on the LAN, you should configure the client PCs to obtain a dynamic IP address.

Please follow the previous section to install TCP/IP component. Only that you do not need to specify an IP address when configuring TCP/IP properties.

The following describes the procedures for CPEs to get IP address:

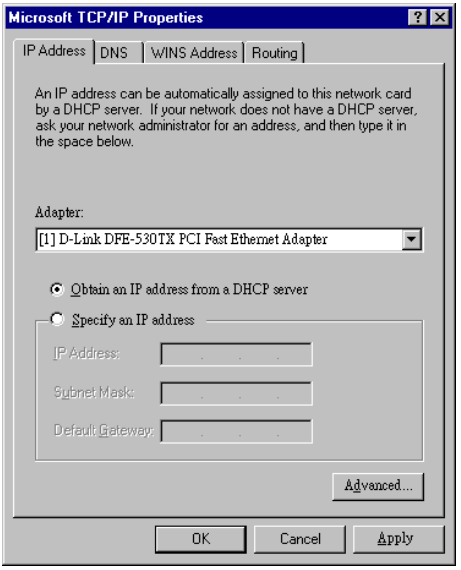
For Windows 98

On the **IP Address** tab, select **Obtain an IP address automatically**. Then click **OK**.

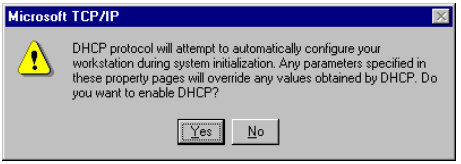


Windows NT

On the **IP Address** tab, click on the drop-down arrow of **Adapter** to select required adapter. Enable **Obtain an IP address from a DHCP server** and then click **OK**.

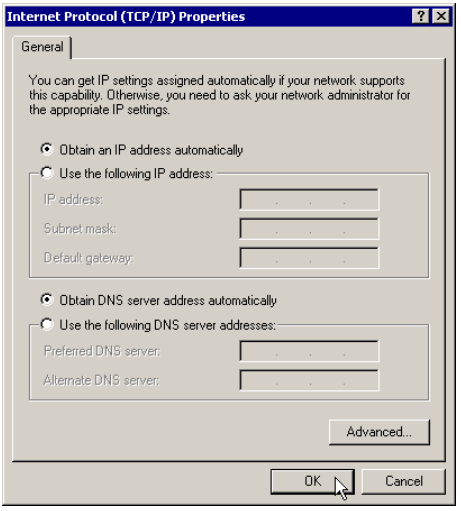


When prompted with the message below, click **Yes** to continue.



Windows 2000

Enable **Obtain an IP address automatically** and then click OK.



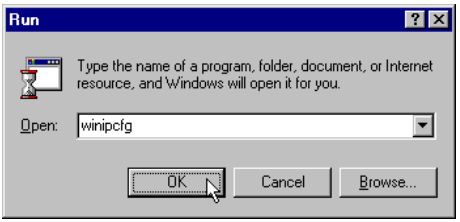
4.3 Renew IP Address on Client PC

There is a chance that your PC does not renew its IP address after the ADSL Router is on line and the PC can not access the Internet. Please follow the procedures below to renew PC's IP address.

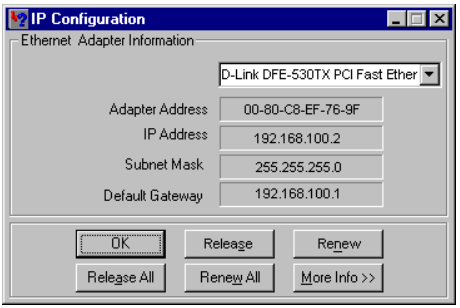
4.3.1 For Windows 98

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

Step 2 Type **`winipcfg`** in the dialog box and the click **OK**.

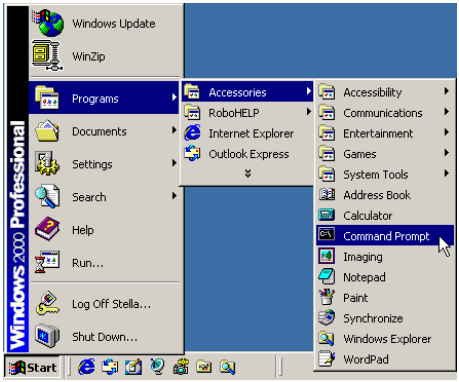


Step 3 When the figure below appears, click **Release** and then **Renew** to get an IP address.



4.3.2 For Windows 2000

Step 1 From the **Start** menu, point to **Programs**, **Accessories** and then click **Command Prompt**.



Step 2 Type **`ipconfig`** at prompt. Then you will see the IP information from DHCP server.

Step 3 If you want to get a new IP address, type **`ipconfig /release`** to release the previous IP address and then type **`ipconfig /renew`** to get a new one.

4.3.3 For Windows NT4.0

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

Step 2 Type **cmd** in the dialog box and the click **OK**.

Step 3 Type **ipconfig** at prompt. Then you will see the IP information from DHCP server.

Step 4 If you want to get a new IP address, type **ipconfig /release** to release the previous IP address and then type **ipconfig /renew** to get a new one.

Chapter 5.
Web Configuration Overview

5.1 Using Web-Based Manager

Once your host PC is properly configured as described in "4.1 Set up a PC to configure the ADSL Router", please proceed as follows:

1. Start your web browser and type the private IP address of the ADSL Router in the URL field: **192.168.1.1.**
2. After connecting to the device, you will be prompted to enter username and password. By default, the username is **admin** and the password is **private**.

If you login successfully, the main page of **ADSL ROUTER-CONTROL PANEL** appears. From now on the ADSL Router acts as a web server sending HTML pages/forms on your request. You can fill out these pages/forms and submit them to the ADSL Router.

5.2 Outline of Web Manager

The home page of the **ADSL ROUTER - CONTROL PANEL** is composed of 3 areas:

- **Title**: It indicates the title of this management interface.
- **Main Menu**: It displays a list of menu organized under four headings: **System**, **Configuration**, **Status** and **Tools**.

  System: When you first enter the web manager, the **System** page is displayed in the main window. It shows the basic information of your ADSL Router.

  Configuration: It displays the configuration categories of the ADSL Router, including **LAN**, **WAN** and **Advanced** settings.

  Status: Displays the current status of the ADSL Router.

  Tool: Allows you to perform the tasks including saving

configuration, upgrading and resetting.

You can move the mouse cursor over the sub-menu to display the hierarchy popup menu. Clicking on each of the item will bring out its content in main window accordingly.

- **Main Window**: It is the current workspace of the web management, containing configuration or status information.

Chapter 6.
Web Configuration

6.1 System

This page shows the basic information of your ADSL Router, including the standard compliant, hardware board, software version, etc. It provides a general overview of your ADSL Router.

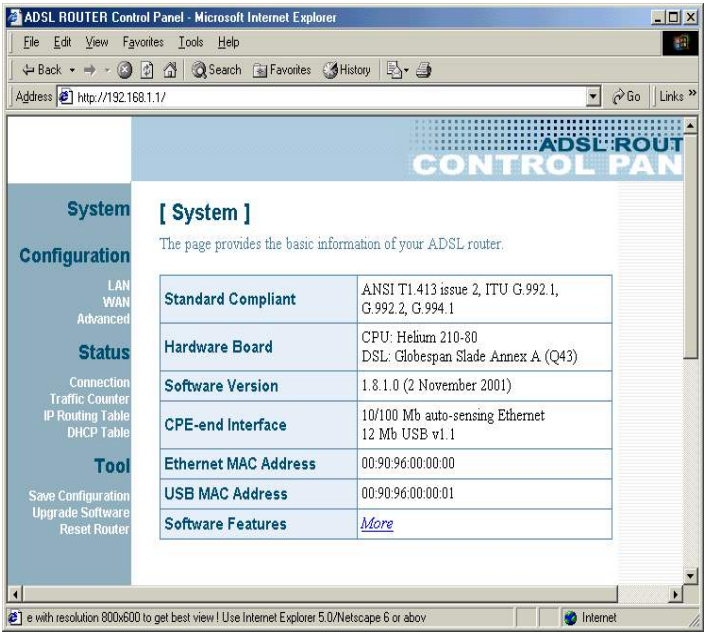


Figure 6-1 System

6.2 LAN Configuration

LAN Configuration allows you to define the public/private IP address over the LAN interface.

6.2.1 IP Address

Configuration > LAN > IP Address

This page allows you to define the public/private IP address over the LAN interface.

Private IP Address

Private IP address is used for the purpose of system management. When it is assigned, PC on the LAN is able to use the specified address to access this ADSL Router through Ethernet.

By default, the IP address and subnet mask is **192.168.1.1** and **255.255.255.0** respectively. It is recommended NOT to change the default settings. To use the default values, simply check the **Use Default IP Address and Subnet Mask** checkbox. This will give you an available range of IP addresses from 192.168.1.2 to 192.168.1.254 that can be assigned to PCs on the LAN.

Public IP Address

If you applies for multiple IP address from your ISP, you will have a range of IP address for the ADSL Router and other network devices on the LAN.

ARP (Address Resolution Protocol) Proxy function: ARP proxy is a protocol in which an intermediate device (for example, a router) sends an ARP response on behalf of an end node to the requesting host.

For example, if the router receives an ARP request for a host not on the same interface as the ARP sender, if the router has all of its routes to that host through other interfaces, then it generates a proxy ARP reply packet giving its own local data link address. The host that sent the ARP request then sent its packets to the router, which forwards them to the intended host. Proxy ARP is disabled by default.

Figure 6-2 IP Address

6.2.2 DHCP Function

Configuration > LAN > DHCP Function

The ADSL Router implements a built-in DHCP (Dynamic Host Configuration Protocol) server, which dynamically assigns IP addresses and DNS server to the PCs on the LAN. DHCP function spares you the hassle of manually assigning a fixed IP address to each PC on the LAN. It is probably you already have a DHCP server on your network and you do not enable this function.

Enable DHCP Server On: When you check the box to enable DHCP function, you should select which interface (Private or Public IP Address) to be the DHCP server.

DHCP lease time: Specify the time that a network device can lease a private IP address before the ADSL Router reassigning the IP address. By default, it is 1 day/ 0 hour/ 0 minutes.

Primary / Secondary DNS IP address: Set up the IP address of the primary and secondary DNS (Domain Name System) server. The DNS server address will be passed to the DHCP clients along with the IP address. The DHCP clients use the DNS to map a domain name to its corresponding IP address and vice versa.

If DNS IP is left as 0.0.0.0, then you should specify the DNS on each client PC.

Reserved IP Addresses: You may reserve some private IP addresses for certain purpose, e.g., web/FTP server or the client PCs that do not use DHCP.

To reserve an IP address, select it from the **IP Address Available** pool and then click on the right arrow button. To de-select an IP reserved address, select it from the **Reserved IP Address** pool and then click on the left arrow button.

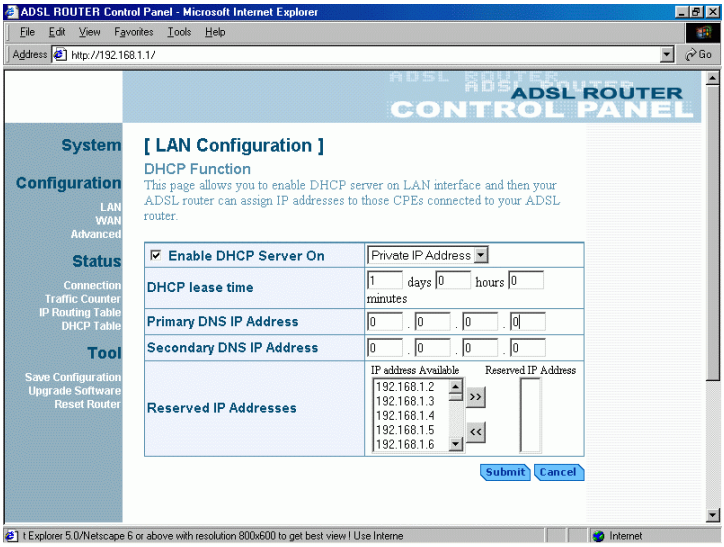


Figure 6-3 DHCP Function

6.2.3 Routing Protocol

Configuration > LAN > Routing Protocol

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

By default, RIP is disabled with **RIP Function OFF** selected. You are allowed to enable RIP over the Private/Public LAN interface. Upon each interface, you can customize the RIP on **Receive Mode** and **Transmit Mode** respectively.

Receive Mode: It incorporates the RIP information when receiving the RIP packets.

Transmit Mode: It broadcasts the routing table.

RIP Version : When enabling RIP, you can select the RIP version from **RIPv1**, **RIPv2** or both (**RIPv1 and RIPv2**).

Disable RIP: To disable RIP, just select **RIP Function OFF** from the drop-down list.

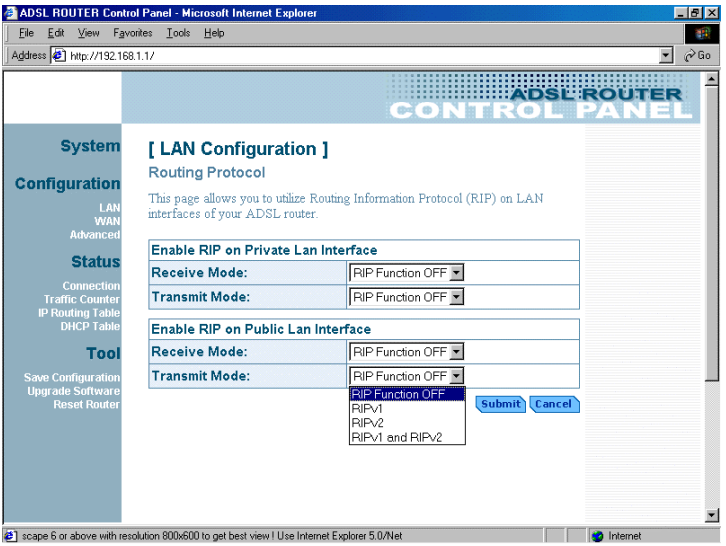


Figure 6-4 Routing Protocol

6.3 WAN

This section shows you how to set up connections over the WAN.

6.3.1 DSL Setting

Configuration > WAN > DSL Setting

DSL Line Mode: The ADSL Router supports multi-mode standard: **ANSI T1.413**, **G.lite** (ITU-T G.992.2)and **G.dmt** (ITU-T G.922.1). Choose an appropriate line mode according to the setting of DSLAM in central office.

The DSL line mode you specify will be applied to the entire ADSL Router unit. All ATM PVC profiles created will use the same line mode. Consult your ISP to find out which option applies to your DSL line.

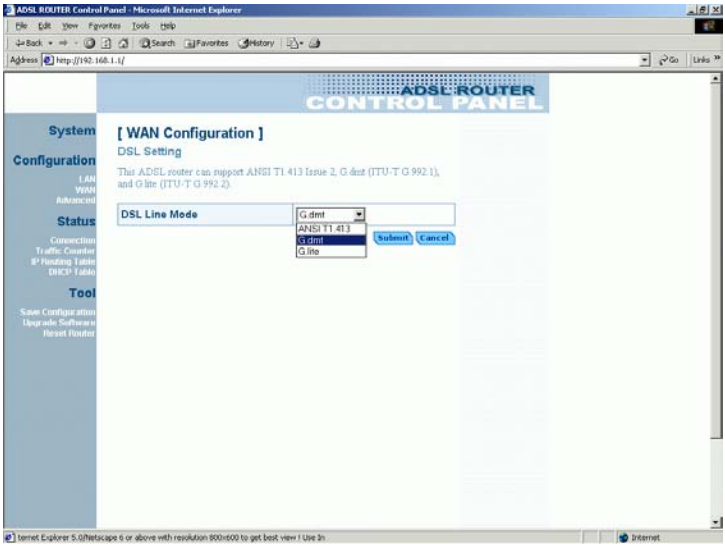


Figure 6-5 DSL Setting

6.3.2 ATM PVC

Setup the ATM PVC Interface

Configuration > WAN > ATM PVC > Setup the ATM PVC Interface

The ADSL Router supports for Asynchronous Transfer Mode (ATM) over ADSL. To set up connections over the WAN, you have to define ATM PVC interface for each remote connection. On this page, you can specify VPI, VCI, ATM service type and PCR information, etc. You are allowed to set up up to 8 PVC interfaces.

Select an ATM PVC Interface: Firstly, select an existing ATM PVC interface or **New Interface** to edit its parameters. Click **Delete** if you want to delete it.

■ **ATM Properties**

ATM PVC Name: Enter a name for this ATM PVC profile.

VPI (Virtual Path Identifier): Identifies the virtual path between endpoints in an ATM network. The valid range is from 0 to 255.

VCI (Virtual Channel Identifier): Identifies the virtual channel endpoints in an ATM network. The valid range is from 32 to 4095 (1 to 31 is reserved for well-known protocols).

ATM Service Type: Currently, the ADSL Router supports the **UBR (Unspecified Bit Rate)** service type.

PCR (Peak Cell Rate): Specify the PCR cells per second.

Send out an OAM F5 Loopback Cell: When you are using an ATM encapsulation, you can define how often to generate an OAM F5 loopback cell on the virtual circuit. It helps you verify the existence of connection on VC. The valid range is 6 to 255. If set to zero, the loopback cell will not be send.

You can check **End-to-End** to have the flow cover the entire virtual connection. Otherwise, you can check **Segment** to cover only parts of the virtual connection. In this case, you should specify the loopback location ID of the segment.

■ **Data Encapsulation**

Data Encapsulation: It allows you to select the encapsulation type used to connect with ATM. The options are **Bridge**, **IPoA**, **PPPoA** and **PPPoE**. Various additional parameters will need to be configured according to the data encapsulation specified.

If **Bridge** or **PPPoA** or **PPPoE** is selected, you will need to choose **VC-MUX** or **LLC_SNAP** encapsulation based on the setting of the ISP. Consult your ISP for this information.

■ **IP Configuration - For IPoA/ PPPoA/ PPPoE only**

Specified Local WAN IP Address: When enabled, you can specify a WAN IP for your router, either a fixed or dynamic IP address.

- **Fixed WAN IP Address**: If a fixed WAN IP is entered, note that this IP address and the subnet mask could not be the same with the public LAN interface.
- **Dynamic WAN IP Address**: When enabled, the ADSL Router will get a dynamic WAN IP address whenever it connects to the remote server or ISP.

Enable Network Address Translation (NAT) - For IPoA/ PPPoA/ PPPoE only

If you apply for only one public IP address from your ISP and the multiple client PCs need to access the Internet, you should enable NAT function. NAT translates a private IP within one network to a public IP address, either a static or dynamic one.

Enable In-ARP – For IPoA only

When you enable the Inverse Address Resolution Protocol (In-ARP), a protocol mapping between an ATM PVC and a network address is learned dynamically as a result of the exchange of ATM Inverse ARP packets.

Remote IP Address – For IPoA only

If you do not check the **Enable In-ARP** box, a static map is needed. You should enter a specified IP address in this field.

Note: When you initially add a PVC for the IPoA, a default routing of **0.0.0.0** is added automatically to the IP Static Routing. Since the default routing has been added, it will not be added next time you add a PVC.
If you set up more than one PVC profiles and the first PVC is deleted, then you have to manually add the default routing.

■ **PPPoA Configuration**

User Name/Password: The user name and password to access the remote server or ISP.

Enable Idle Time-Out: This value specifies the idle minutes that elapse before the ADSL Route automatically disconnects the PPP session. If no traffic is passing through during the span of time your specified, the PPP session is terminated.

Dial On Demand: If checked, under disconnected status, if any client PC sends out request for connection, the ADSL Router will dial the ISP automatically. In this case, if the system administrator wants to disconnect the PPP session, just click the **Disconnect** button.

Auto Dial-up At Startup: When enabled, a PPP session will be automatically launched whenever the ADSL Router starts up.

Connect/Disconnect: These two buttons allow you to connect or disconnect instantly without having to restart or turn off the device. To connect or disconnect the line, you may just click the corresponding button with having to click **Submit** button. However, your customized settings, e.g, enabling Auto Dial-Up At Startup, will not really take effect until you click **Submit** button and perform the **Save** and **Restart** task.

■ **PPPoE Configuration**

The parameters for PPPoE configuration are generally the same as those of PPPoA. The additional parameters are:

Service Name: Enter the name of your PPPoE service here.

Access Concentrator: Enter the access concentrator of your PPPoE service here.

Note: PPPoA and PPPoE cannot be specified simultaneously on the ADSL Router. If you have specify PPPoA as data encapsulation type in one ATM PVC, you cannot specify PPPoE in another ATM PVC.

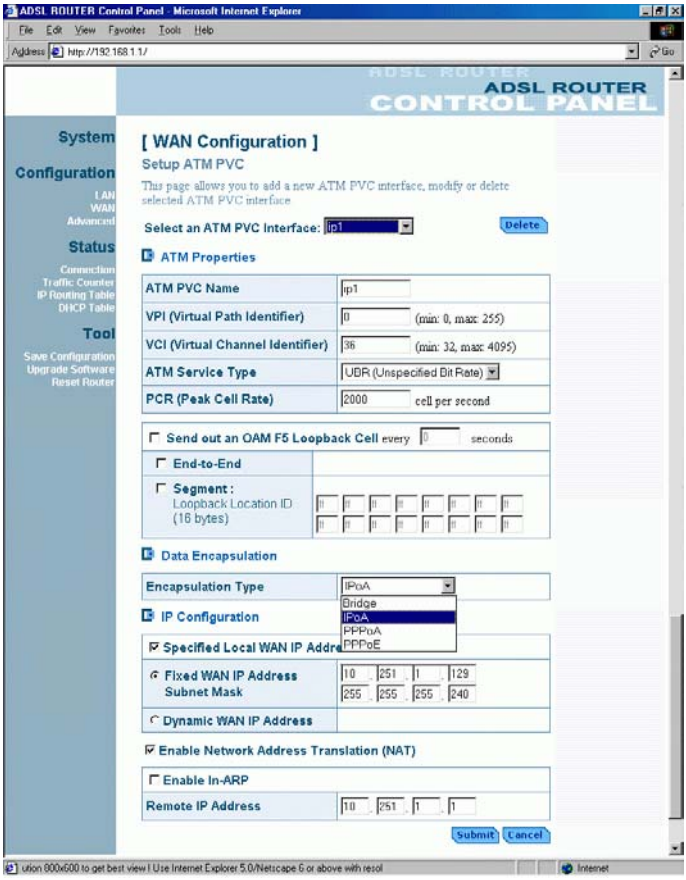


Figure 6-6 Setup ATM PVC-IPoA

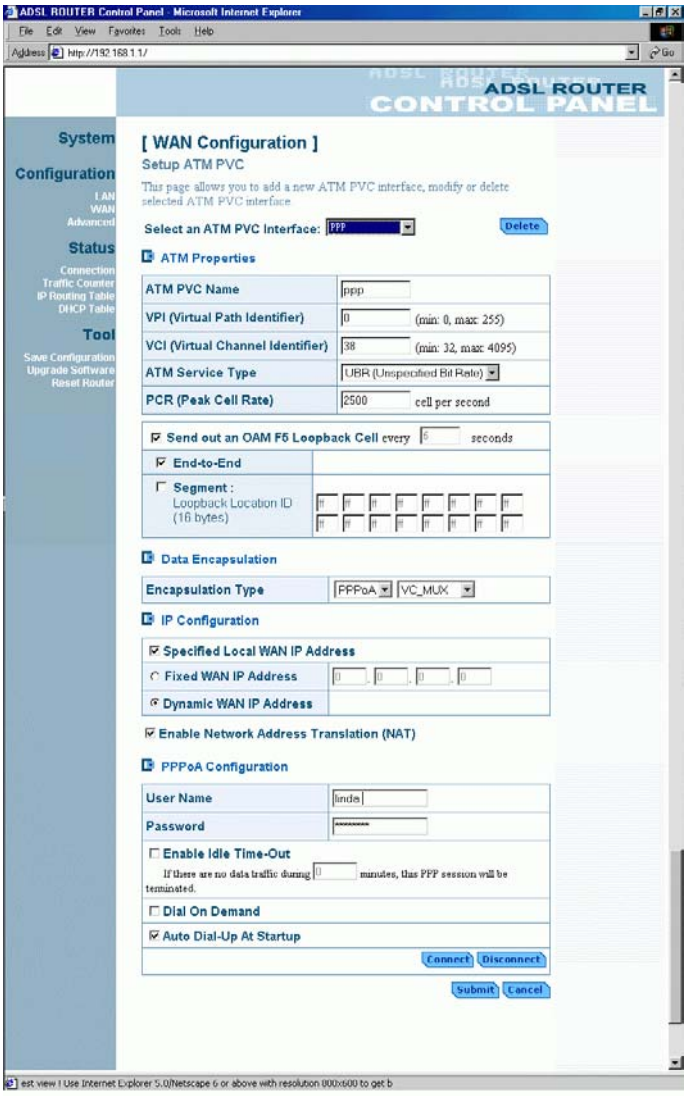


Figure 6-7 Setup ATM PVC-PPPoA

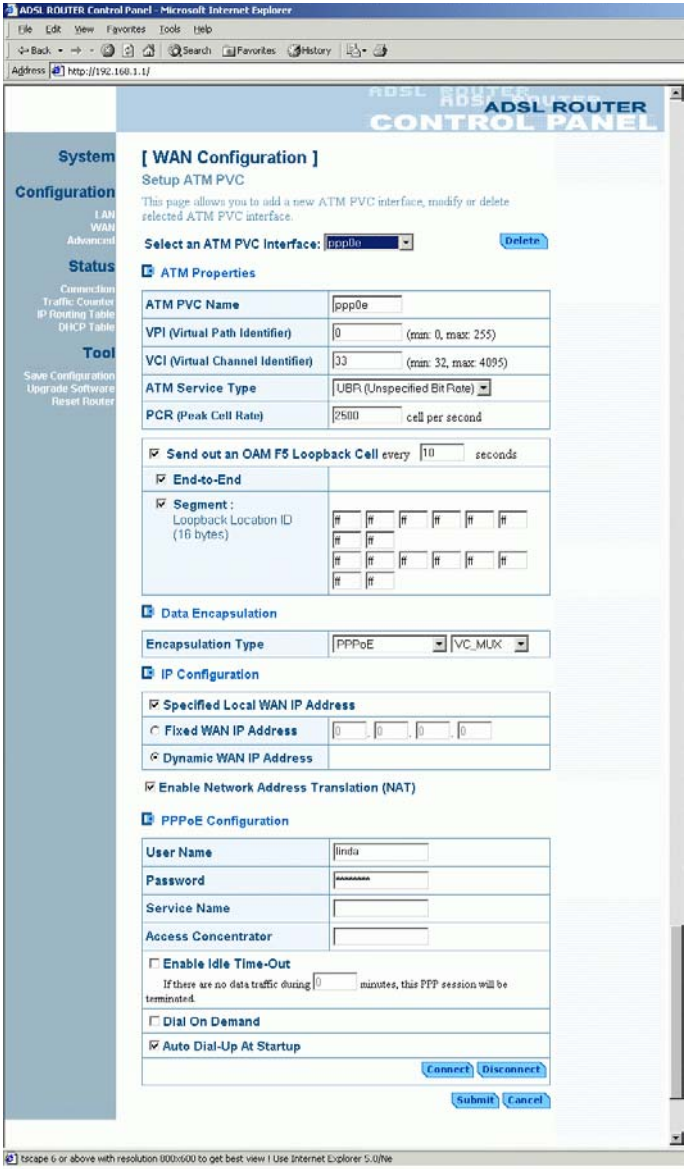


Figure 6-8 Setup ATM PVC-PPPoE

6.4 ADVANCED

6.4.1 Administrative Security

Configuration > Advanced > Administrative Security

For administration security, specify required **User Name** and **Password**. It limits this web-based manager access to users with the correct password. By default, the user name and password is **admin** and **private** respectively.

Note: After clicking **Submit** to change the use name and password, the new setting takes effect currently. When you continue to access other pages, you will be prompted to re-login with new user name and password immediately.

To save the new settings to flash memory and take effect next time your reboot the ADSL Router, after clicking **Submit**, you should perform the task of **Save & Restart**.

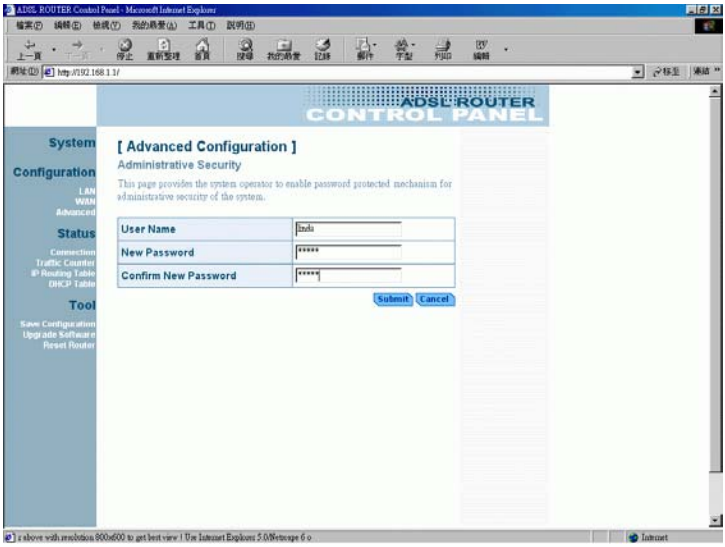


Figure 6-9 Administrative Security

6.4.2 IP Static Routing

Setup the Static Route

Configuration > Advanced > IP Static Routing > Setup the 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. This page allows you to add new static IP route or delete/modify IP route.

Select a Static Route: Firstly, select an existing static route or **New Entry** to edit its parameters. Click **Delete** if you want to delete it.

Network IP Address: The destination IP address of the network where data packets are to be sent.

Netmask: The subnet mask of the destination IP address.

Gateway IP address: The IP address of the gateway on the LAN where data packets are to be sent. This is to be configured only when the LAN interface is configured as route; otherwise leave it as 0.0.0.0.

Interface: Specify whether data packets are to be sent to through **LAN** or **WAN** interface.

ATM PVC: Allows you to select a specific ATM PVC profile. It can only be configured if you choose **WAN** on the **Interface** field above; otherwise it is grayed-out.

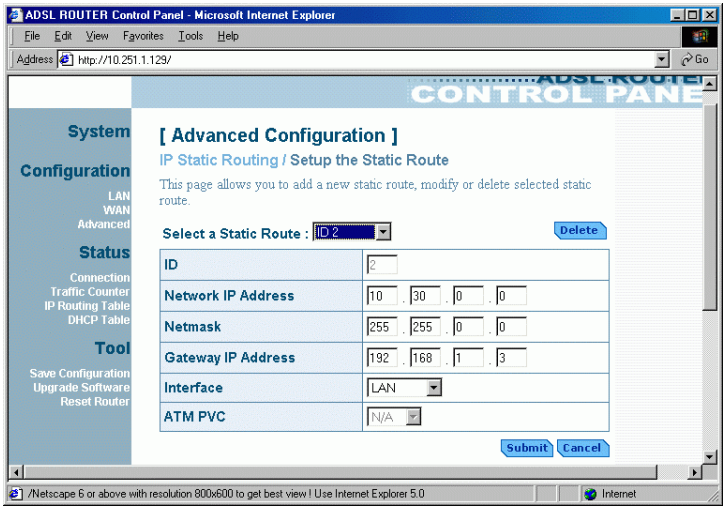


Figure 6-10 Setup the Static Route

Show Static Routing Table

Configuration > Advanced > IP Static Routing > Show Static Routing Table

The routing table on this page shows all current static routes configured in your ADSL Router.

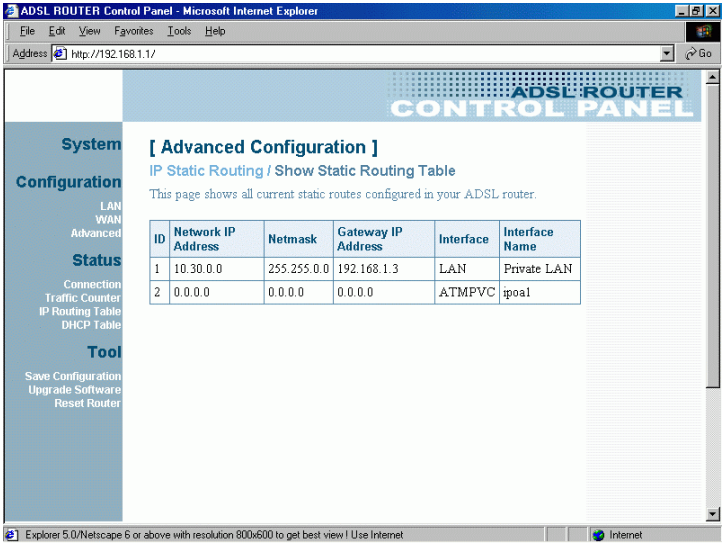


Figure 6-11 Show Static Routing Table

6.4.3 IP Packet Filtering

The ADSL Router uses filters to determine if a package should be passed. You can specify your filter rule on the source side and destination side. Up to 16 filters are allowed.

Setup the IP Packet Filter

Configuration > Advanced > IP Packet Filtering > Setup the IP Packet Filter

This page allows you to add a new IP packet filter, modify or delete selected IP packet filter. To add an IP packet filter, select **New Entry**. Otherwise, select a required entry to edit or delete it.

Interface Name : Select a proper interface name according to your destination. For remote site destination through PVC, select a PVC you set up. For local destination, select **Private LAN** or **Public LAN** according to the subnet.

Source IP address/subnet mask: If you wish to filter the packet on the source side, enter the source IP address which identifies each device on the network. Then enter the subnet mask where an IP address belongs to. The field is disregarded you leave it as 0.0.0.0.

Destination IP address/subnet mask: If you wish to filter the packet on the destination side, enter the IP address which identifies each device on the Internet. Then enter the subnet mask where an IP address belongs to. The field is disregarded you leave it as 0.0.0.0.

Destination TCP/IP Port: Enter the port number that identifies the service, e.g., web service is on port 80 and FTP on port 21.

Protocol Type: It governs the information flow within a communications infrastructure. You may select the protocol from **TCP** or **UDP** type.

Each data packet that enters the ADSL Router will undergo data filtering. Data packet is allowed to pass or not depending on whether a match is found. For either true or false condition, the packets can be set to:

Pass: A matching packet is passed automatically.

Discard: A matching packet is discarded.

Go to next filter: A matching packet goes to next filter in sequence.

Example: You want to control certain traffic leaving from your LAN to certain destination:

From 192.168.1.2 to 210.122.56.35;
From 192.168.1.9 to 140.113.1.9;
From 192.168.1.7 to 130.3.1.11

Then you may set your filter rule as below:

Source IP	Destination IP	If true	If false
192.168.1.2	210.122.56.35	Discard	Go to next filter
192.168.1.9	140.113.1.9	Discard	Go to next filter
192.168.1.7	130.3.1.11	Discard	Pass

Then the packets matching the criteria will be blocked; those beyond these filtering rules can pass through the ADSL Router.

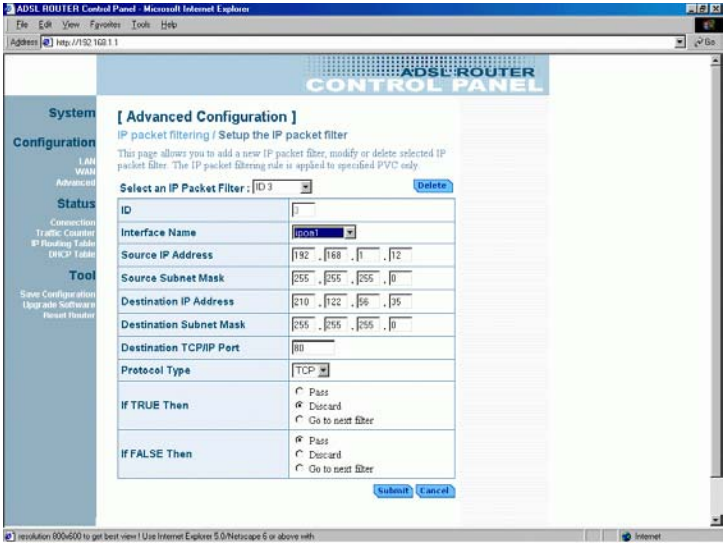


Figure 6-12 Setup the IP packet filter

Show IP Packet Filtering Table

Configuration > Advanced > IP Packet Filtering > Show IP Packet Filtering Table

This page shows the information of existing filtering rules, including Interface Name, the IP address and subnet mask on both source side and destination side, the port and the protocol. You can monitor the filtering table by selecting a certain interface or **All** to show all the filtering rules.

To view the filter rules of outgoing traffic, you should select the WAN IP interface. To view the filter rules of incoming traffic, you should select the LAN IP interface.

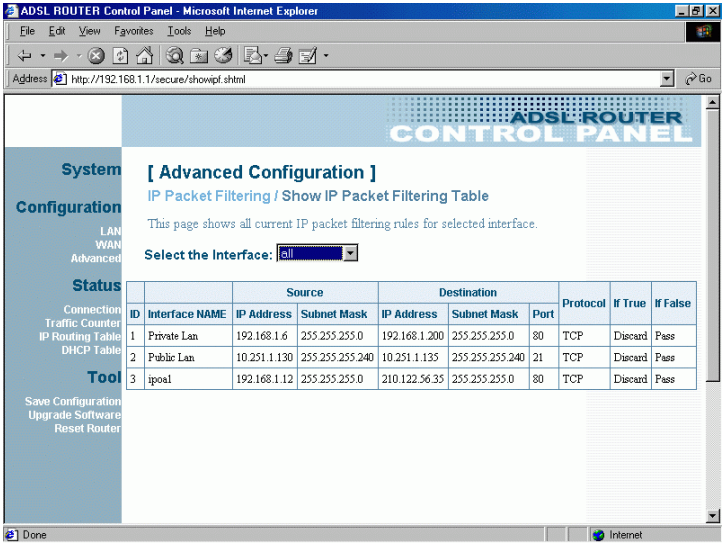


Figure 6-13 Show IP Packet Filtering Table

6.4.4 Virtual Server

Setup the Virtual Sever Setting

Configuration > Advanced > Virtual Server > Setup the Virtual Server Setting

You can designate virtual servers, e.g., FTP, web, telnet or mail server, on your local network and make them accessible to the outside world. The NAT function will translate the internal LAN IP addresses to a single address that is unique on the Internet.

Protocol: Select a protocol used by the virtual server.

ATM PVC Name: Select a PVC used by incoming data.

TCP/Port: Enter the service port number. The most often used port is listed as below:

FTP(21), HTTP(80), Telnet(23), SMTP(25)

IP Address: Specify the inside IP address of the virtual server.

TCP/IP Port: The ADSL Router supports port mapping function. It allows you to map certain service (such as an FTP server or web server) using the private IP address of the virtual server. Incoming data packets sent to a specific IP port can be mapped to the port you specify in this filed.

For example, your virtual server runs FTP service on a non-standard port 29 instead of on the default port 21. In this case, external host will still access the FTP service on the port 21. With port mapping function , the packets sent to port 21 will be forwarded to port 29.

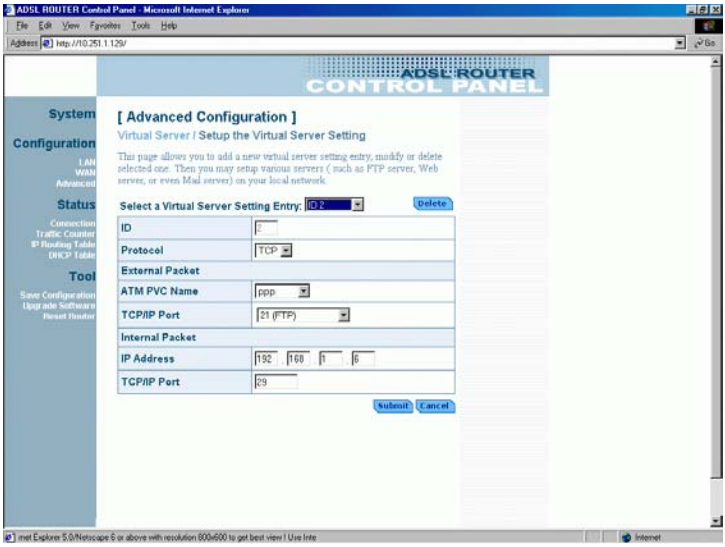


Figure 6-14 Setup the Virtual Server Setting

Show All Virtual Server settings

Configuration > Advanced > Virtual Server > Show All Virtual Server Settings

This page shows all the virtual server rules configured in your ADSL Router.

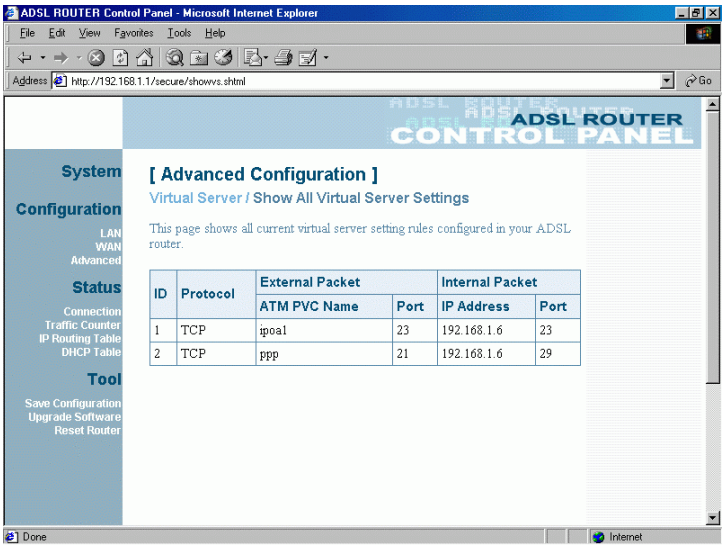


Figure 6-15 Show All Virtual Server Settings

6.5 Status

Status feature displays information on many functions. It provides you with a easy way to monitor the current status. The information can be useful to system administrator if you experience problems.

Each page under Status feature displays a **Refresh** button. You may click this button to update and display the changes on respective function.

6.5.1 DSL Line Connection

Status > Connection > DSL Line Connection

This page shows the current DSL line connection status.

Downstream/Upstream Speed: The downstream/upstream speed of DSL line.

Latency Mode: Displays whether a fast or interleaved latency path is specified.

Trellis coding: Indicates trellis coding is enabled or disabled. Trellis coding is a method of providing better performance in a noisy environment. It helps to transmit at faster line rates with lower error rates, thus providing a faster overall throughput in a moderately noisy environment.

Line Attenuation: Indicates the signal attenuation caused by line length. It increases with line length and frequency and decreases as wire diameter increases.

Noise Margin: Signal to noise ratio. The ratio of good data (signal) to bad (noise) on the line, expressed in decibels (dB).

Loss of Signal /Frame: Indicates the loss of signals or frames detected.

CRC Error: Cyclic Redundancy Checksum generated.

Error second Second: The accumulated seconds of the seconds during which packet error message occur.

System Uptime: The time from system startup.

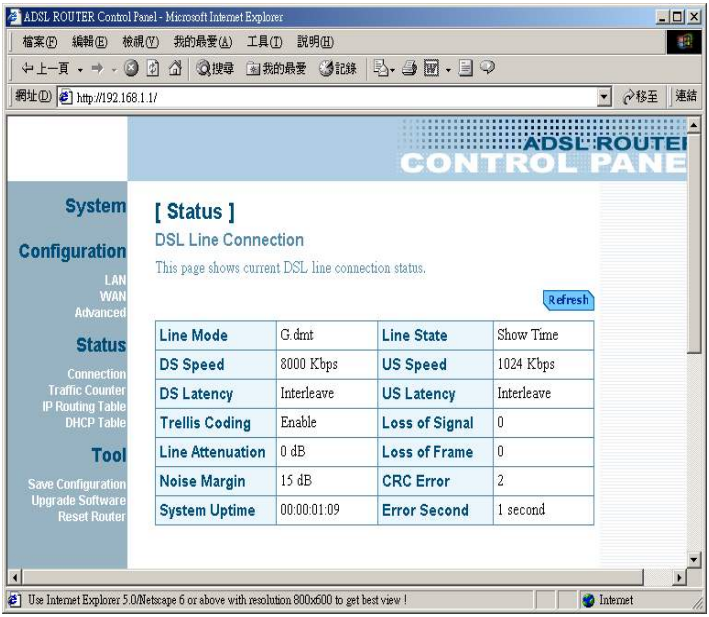


Figure 6-16 DSL Line Connection

6.5.2 ATM PVC Connection

Status > Connection > ATM PVC Connection

This page shows all the ATM PVC interfaces you defined. For each ATM PVC interface, it shows the parameter you defined for ATM PVC name, VPI/VCI values, Encapsulation Type and NAT IP. It also shows the packets sent/received and its status.

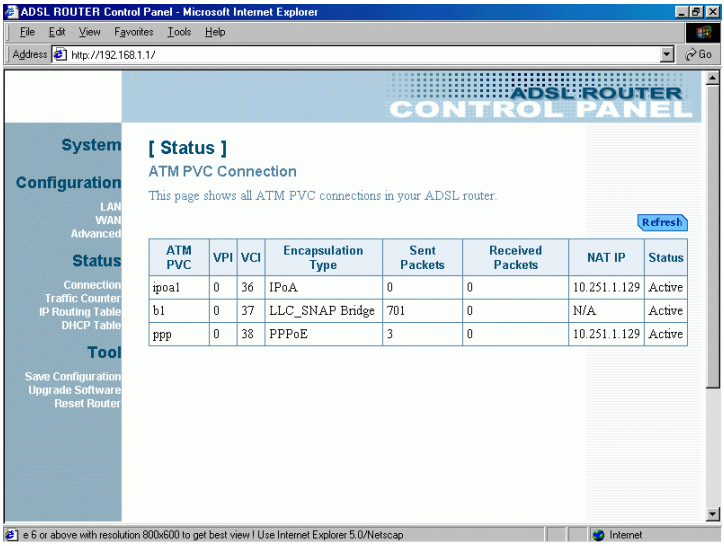


Figure 6-17 ATM PVC Connection

6.5.3 PPP Connection

Status > Connection > PPP Connection

This page shows all the PPPoA or PPPoE connections of your ADSL Router.

In **Local WAN IP** field, it displays either a fixed IP or dynamic IP obtained from DSLAM, according to your configuration.

The information on **Phase**, **State** and **On-Line Time** help you verify the connection to the DSLAM.

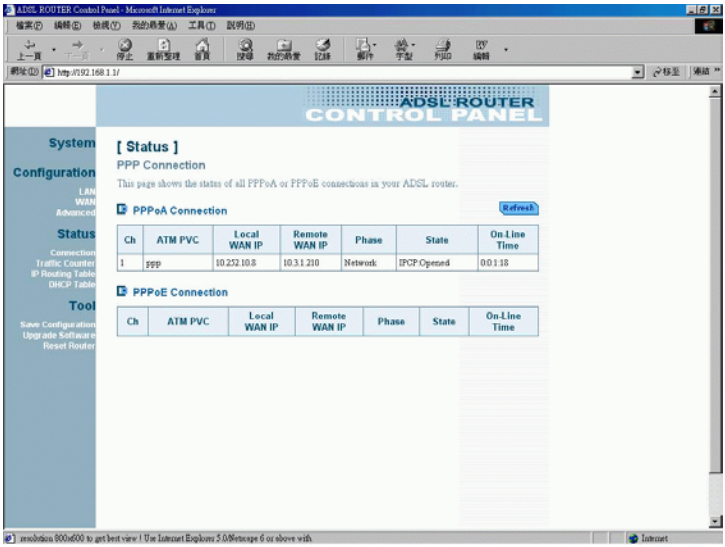


Figure 6-18 PPP Connection

6.5.4 Traffic Counter

User Data

Status > Traffic Counter >User Data

This page shows the records of data going through the LAN and WAN interface. For each interface, cumulative totals are displayed for **Sent/Received Packets** and **Sent/Received Bytes**.

By clicking **Clear**, all the records will be reset.

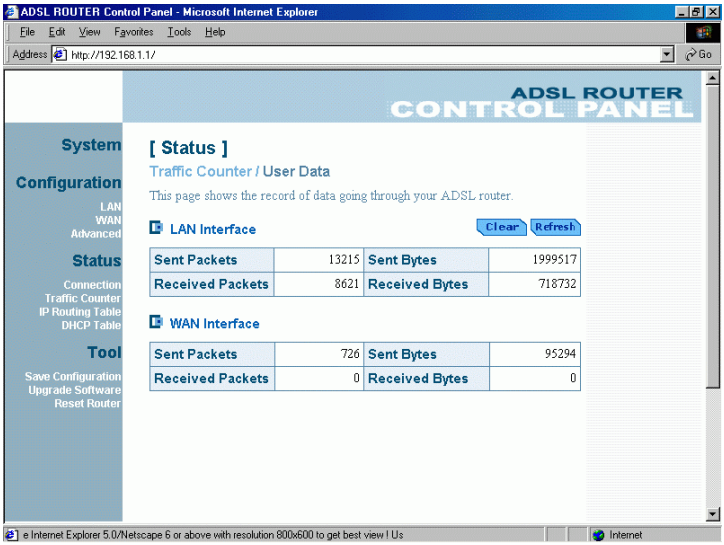


Figure 6-19 User Data

ATM OAM Cell

Status > Traffic Counter >ATM OAM Cell

This page shows the records of ATM OAM loopback cells going through your ADSL Router.

Sent Packets: Indicates the packets sent out by the ADSL Router.

Received Packets: Indicated the packets received from remote end, excluding the echoing back cells.

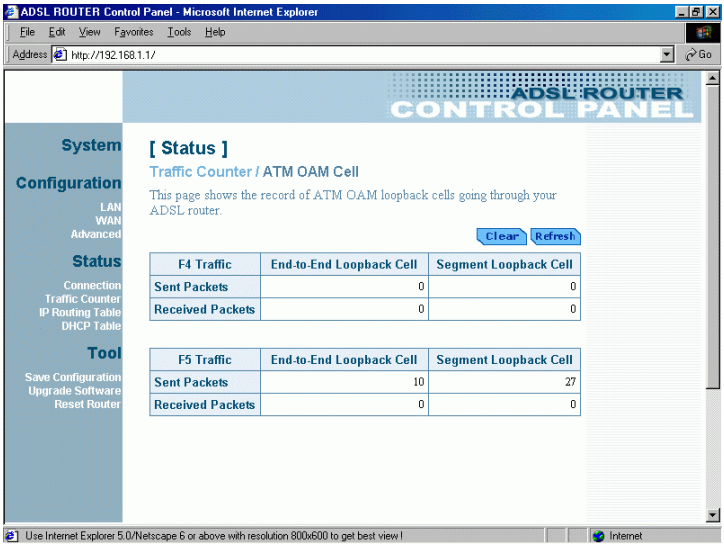


Figure 6-20 ATM OAM Cell

6.5.5 IP Routing Table

Status > IP Routing Table

This page shows all the routing rules of data packets going through your ADSL Router if it runs in routing mode.

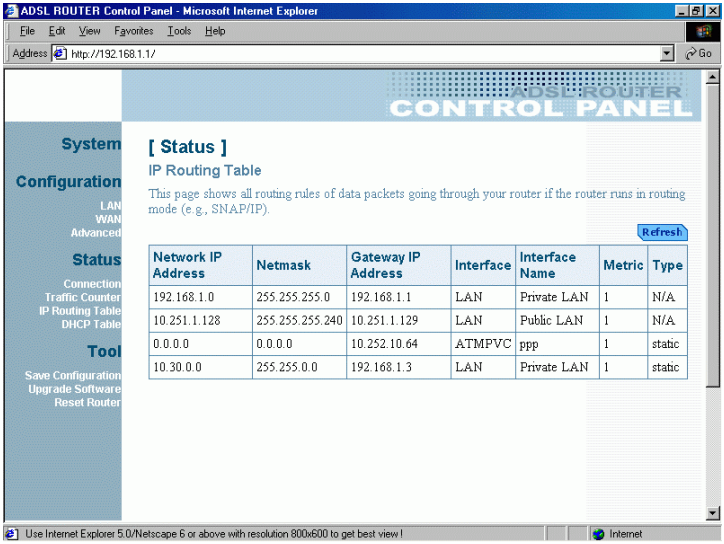


Figure 6-21 IP Routing Table

6.5.6 DHCP Table

Status > DHCP Table

This page 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**.

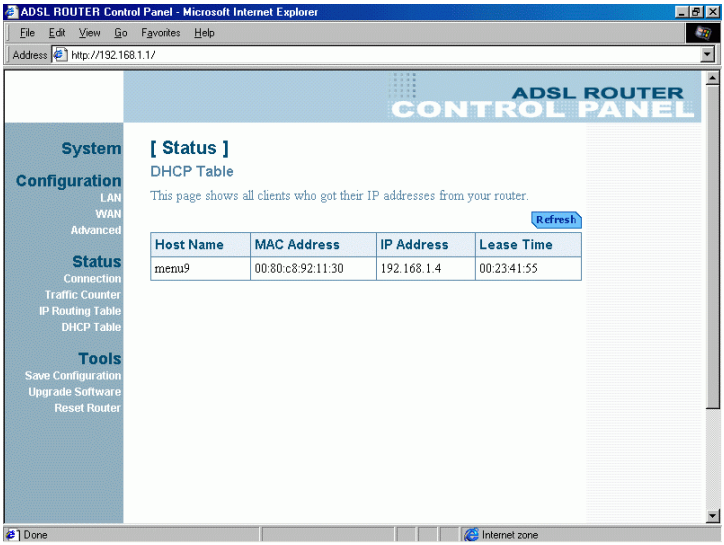


Figure 6-22 DHCP Table

6.6 Tools

6.6.1 Save Configuration

Tools > Save Configuration

Whenever you specify or modify a parameter, your customizations will be *currently* effective after clicking **Submit**. However, you should perform the **Save** & **Restart** task to have current settings take effect.

By clicking **Save**, new settings are saved to the flash memory of the ADSL Router. Do not turn off the ADSL Router during saving configuration.

Note: After clicking **Save**, you have to go to **Tools > Reset Router** page to perform the **Restart** task.

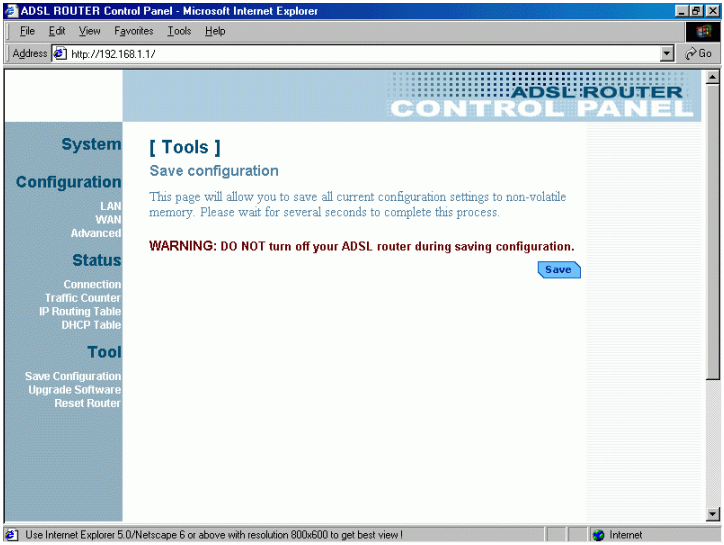


Figure 6-23 Save configuration

6.6.2 Upgrade Software

Tools > Upgrade Software

The ADSL Router supports the upgrading by using TFTP (Trivial File Transfer Protocol). The original configuration will still exist and not reset to the factory defaults. To transfer the firmware file, follow the steps below:

1. Enter the IP address of the TFTP server.
2. Enter the file name of the software image.
3. Click **Upgrade**.

Note:

1. Before upgrading firmware, make sure TFTP server is running.
2. After clicking **Upgrade**, you don't have to click **Save** & **Restart**. The unit will automatically reboot.
3. Do not interrupt the upgrade process otherwise it might cause damage to your ADSL Router.

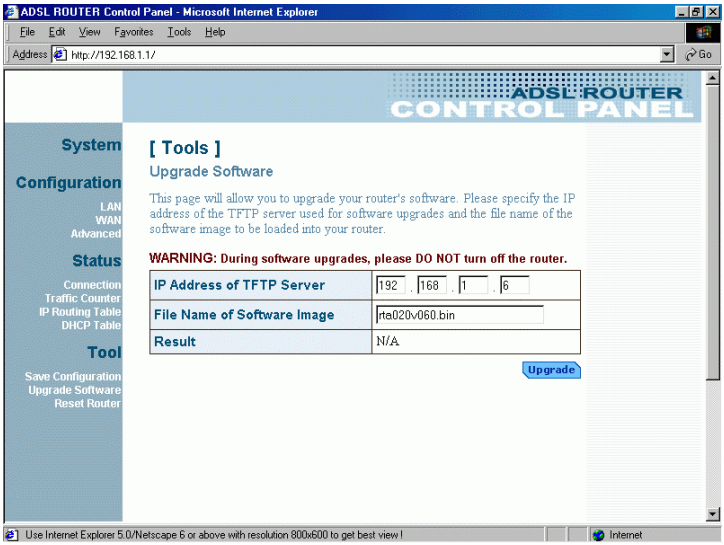


Figure 6-24 Upgrade Software

6.6.3 Reset Router

Tools > Reset Router

After clicking **Save**, you should click **Restart** to have new settings take effect. After restarting, you should wait for several seconds to let the system come up.

When restarting the system, your brower session will be disconnected. This may appear as if you browser is hungup. Please wait until the device finish restarting. When the device finish restarting, the web manager is reloaded and the **System** page is displayed.

Note: If **Reset to factory default settings** is checked, the settings will return to factory defaults, including the **Username** and **Password**.

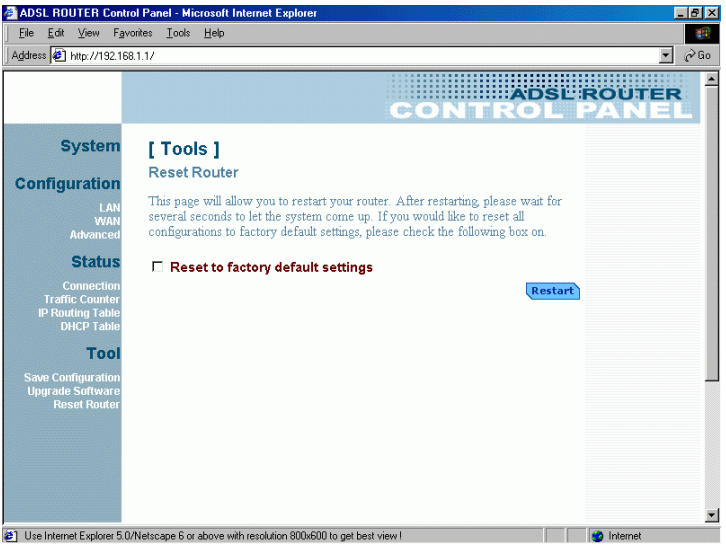


Figure 6-25 Reset Router

Chapter 7.
Configuration Parameters

This chapter presents a more detailed description of the ADSL Router's configuration parameters.

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 192.168.1.2 to 192.168.2.254. These PCs are not accessible by the outside word 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 torn 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, metasignalling channel or a generic broadcast signaling channel. Your ISP should supply you with the values.

Chapter 8. Troubleshooting

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

8.1 Problems with LAN

1. **PCs on the LAN can not 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.

2. **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.

8.2 Problems with WAN

You cannot access the Internet.

a. If your ADSL Router is set to routing mode and you use private IP addresses on the LAN, go to **WAN Configuration > ATM PVC > Setup the ATM PVC Interface** page. Make sure that **Enable network address Translation (NAT)** is checked.

b. Check the IP settings:

Go to **LAN Configuration > IP Address page,** ensure you specify IP address on **Public IP Address** field.

Or go to **WAN Configuration > ATM PVC > Setup the**

ATM PVC Interface page, ensure you specify IP address on **Specified Local WAN IP address** field

c. Check the physical connection between the ADSL Router and the LAN.

If the DSL 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:

```
Relay 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 time out
```

Then the connection is fail. Check the cable between the ADSL Router and the network.

d. Check the DNS setting of the ADSL Router.

At the DOS prompt, ping the IP address of the DNS provided by your ISP. For example, if your DNS IP is 168.95.1.1, then ping 168.95.1.1. If the following response occurs:

```
Relay from 168.65.1.1 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 time out
```

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

8.3 Problems with Upgrading

The following lists the error messages that you may see during

upgrading and the action to take.

1. **Error Message**: invalid checksum

   Possible cause: The firmware file to be used is damaged or the file format is wrong.

   Action: Make sure that your firmware file format is valid or get a new firmware file.

2. **Error Message**: invalid hardcode

   Possible cause: The firmware file is not compatible with the model of your ADSL Router.

   Action: Download a compatible firmware from the web.

3. **Error Message**: unknown flags type

   Possible cause: The firmware version is not compatible.

   Action: Download a compatible firmware from the web.

4. **Error Message**: internal isfs error / internal flashfs error

   Possible cause: System error occurs. It may caused by the lack of memory.

   Action: Reboot your ADSL Router and perform the upgrade task again.

5. **Error Message**: invalid file format

   Possible cause: The firmware file format is invalid.

   Action: Check the file format is correct, otherwise download a firmware file with correct format.

6. **Error Message**: get an error message

   Possible cause: The TFTP server responses with error message.

   Action: Make sure the file name you enter is correct. Otherwise the TFTP server may response with the error message “File not found”.

7. **Error Message**: transfer time out

   Possible cause: The transfer session is interrupted.

   Action: a. Make sure the TFTP server is on the same subnet with the ADSL Router.

   b. Make sure you the IP address of the TFTP server you specify is correct and that your TFTP server is started.

   c. If error still occurs, reboot your ADSL Router and perform the upgrade task again.

8. **Error Message**: firmware update in process

   Possible cause: The upgrade is already in process.

   Action: Do not turn off your ADSL Router otherwise you will cause damage to the device.

9. **Error Message**: no remote server IP

   Possible cause: The IP address of the TFTP server is not specified.

   Action: Specify the IP address of the TFTP server is not specified.

10. **Error Message**: can't allocate update buffer

    Possible cause: It may caused by the lack of memory.

    Action: Reboot your ADSL Router and perform the upgrade task again.

Chapter 9. Specification

9.1 SOFTWARE

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)

ATM Features

- Compliant to ATM Forum UNI 3.1 / 4.0 Permanent Virtual Circuits (PVCs)
- Support up to 8 AAL5 Virtual Circuit Channels (VCCs) for UBR, CBR, VBR-rt, and VBR-nrt with traffic shaping
- RFC1483 (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
- 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 4000 learning MAC addresses

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 and enjoy various multimedia applications.
- ALGs (Application Level Gateways): such as NetMeeting, FTP, Quick Time, mIRC, Real Player, CuSeeMe, etc.
- Multiple Virtual Servers (e.g., Web, FTP, Mail servers) can be setup on user's local network.
- Static routes, RFC1058 RIP v1, RFC1723 RIP v2.
- DNS Relay
- ARP Proxy

Security Features

- PAP (RFC1334), CHAP (RFC1994) for PPP session
- Support IP packets filtering

Configuration and Management

- SNMPv1 agent with MIB-II, PPP MIB, ADSL Line MIB
- User-friendly embedded web configuration interface with password protected
- Telnet session for local or remote management
- TFTP firmware upgrades via web browser GUI
- Distribute IP addresses to end users via DHCP server provided by ADSL router

9.2 Hardware

Interface

- One RJ-11 port for ADSL connection

- One RJ-45 port for IEEE 802.3 10/100 Base-T auto-sensing Ethernet connection

Regulatory Approvals and Compliance

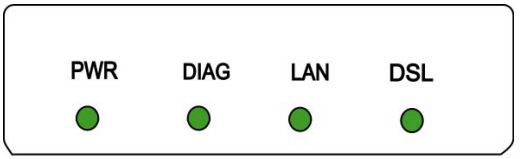
- EMI/Immunity: FCC part 15 and part 68 class B
- Safety: UL, CE

Power Requirement and Operation Environment Requirement

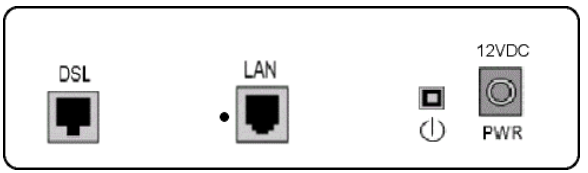
- Power Adaptor: Input 110±10 or 230±10 VAC; Output 12 VDC, 1A
- Power Consumption: less than 10 Walt
- Ambient Temperature: 0 to 45°C (32 to 113°F)
- Relative Humidity: 20% to 90% (non-condensing)Physical

Physical

- Front Panel : 4 LEDs



- Back Panel



- Dimensions: 159mm(L) x 122mm(W) x 41.5mm(H)
- Weight:282g.