

Efficient Networks Business Class

5930

Business Gateway
User Reference Guide



Part No. 107-5930-000



Software License and Limited Warranty

© Copyright 2002, Efficient Networks, Inc.
All rights reserved. Printed in the U.S.A.

Efficient Networks and SpeedStream are registered trademarks, and the Efficient Networks logo is a trademark of Efficient Networks, Inc. All other names may be trademarks, service marks or registered trademarks held by their respective companies. This document is for information purposes only. Efficient Networks is not responsible for errors or omissions herein. Efficient reserves the right to make changes to product specifications without notice.

Efficient Networks, Inc. – End User Software License and Warranty

INSTALLATION OF THE HARDWARE AND SOFTWARE PROVIDED BY EFFICIENT NETWORKS, INC. ("EFFICIENT") CONSTITUTES ACCEPTANCE BY YOU OF THE TERMS OF THE FOLLOWING SOFTWARE LICENSE AND LIMITED WARRANTY. IF YOU DO NOT ACCEPT THESE TERMS, PLEASE RETURN THE HARDWARE AND SOFTWARE AND SOFTWARE IN ITS ORIGINAL PACKAGING TO THE VENDOR FROM WHICH YOU PURCHASED IT FOR A FULL REFUND OF THE PURCHASE PRICE.

The following describes your license to use the software (the "Software") that has been provided with your EFFICIENT DSL customer premise equipment ("Hardware") and the limited warranty that EFFICIENT provides on its Software and Hardware. EFFICIENT reserves any right not expressly granted to the end user.

Software License

The Software is protected by copyright laws and international copyright treaties. The Software is licensed and not sold to you. The definition of Software includes, but not limited to, system and operating software marketed by EFFICIENT, including firmware, embedded software, software provided on media, downloadable software, software for configuration or programmable logic elements, and all EFFICIENT maintenance and diagnostic tools associated with the above mentioned software. Accordingly, while you own the media (such as CD ROM or floppy disk) on which the software is recorded, EFFICIENT or its licensors retains ownership of the Software itself.

1. **Grant of License.** You may install and use one (and only one) copy of the Software in conjunction with the EFFICIENT provided Hardware. You may make backup copies of the system configuration as required. If the Hardware is being installed on a network, you may install the Software on the network server or other server-side device on which the Hardware is being installed and onto the client-side devices.
2. **Restrictions.** The license granted is a limited license. You may NOT:
 - sublicense, assign, or distribute copies of the Software to others;
 - decompile, reverse engineer, disassemble or otherwise reduce the Software or any part thereof to a human perceivable form;
 - modify, adapt, translate or create derivative works based upon the Software or any part thereof; or
 - rent, lease, loan or otherwise operate for profit the Software.
3. **Transfer.** You may transfer the Software only where you are also transferring the Hardware. In such cases, you must remove all copies of the Software from any devices onto which you have installed it, and must ensure that the party to whom you transfer the Hardware receives this License Agreement and Limited Warranty.
4. **Upgrades Covered.** This License covers the Software originally provided to you with the Hardware, and any additional software that you may receive from EFFICIENT, whether delivered via tangible media (CD ROM or floppy disk), downloaded from EFFICIENT, or delivered through customer support. Any such additional software shall be considered "Software" for all purposes under this License.
5. **Export Law Assurances.** You acknowledge that the Software may be subject to export control laws and regulations of the U.S.A. You confirm that you will not export or re-export the Software to any countries that are subject to export restrictions.
6. **No Other Rights Granted.** Other than the limited license expressly granted herein, no license, whether express or implied, by estoppel or otherwise, is granted to any copyright, patent, trademark, trade secret, or other proprietary rights of EFFICIENT or its licensors.
7. **Termination.** Without limiting EFFICIENT's other rights, EFFICIENT may terminate this license if you fail to comply with any of these provisions. Upon termination, you must return the Software and all copies thereof.

Limited Warranty

The following limited warranties provided by EFFICIENT extend to the original end user of the Hardware/licensee of the Software and are not assignable or transferable to any subsequent purchaser/licensee.

1. **Hardware.** EFFICIENT warrants that the Hardware will be free from defects in materials and workmanship and will perform substantially in compliance with the user documentation relating to the Hardware for a period of one year from the date the original end user received the Hardware.
2. **Software.** EFFICIENT warrants that the Software will perform substantially in compliance with the end user documentation provided with the Hardware and Software for a period of ninety days from the date the original end user received the Hardware and Software. The end user is responsible for the selection of Hardware and Software used in the end user's network. Given the wide range of third-party hardware and applications, EFFICIENT does not warrant the compatibility or uninterrupted or error free operation of our Software with the end user's systems or network.
3. **Exclusive Remedy.** Your exclusive remedy and EFFICIENT's exclusive obligation for breach of this limited warranty is, in EFFICIENT's sole option, either (a) a refund of the purchase price paid for the Hardware/Software or (b) repair or replacement of the Hardware/Software with new or remanufactured products. Any replacement Hardware or Software will be warranted for the remainder of the original warranty period or thirty days, whichever ever is longer.
4. **Warranty Procedures.** If a problem develops during the limited warranty period, the end user shall follow the procedure outlined below:
 - A. Prior to returning a product under this warranty, the end user must first call EFFICIENT at (888) 286-9375, or send an email to EFFICIENT at support@efficient.com to obtain a return materials authorization (RMA) number. RMAs are issued between 8:00 a.m. and 5:00 p.m. Central Time, excluding weekends and holidays. The end user must provide the serial number(s) of the products in order to obtain an RMA.

Software License and Limited Warranty

B. After receiving an RMA, the end user shall ship the product or defective component, including power supplies and cable, where applicable, freight or postage prepaid and insured, to EFFICIENT at 4849 Alpha Road, Dallas Texas 75244, U.S.A. Within five (5) days notice from EFFICIENT, the end user shall provide EFFICIENT with any missing items or, at EFFICIENT's sole option, EFFICIENT will either (a) replace missing items and charge the end user or (b) return the product to the end user freight collect. The end user shall include a return address, daytime phone number and/or fax. The RMA number must be clearly marked on the outside of the package.

C. Returned Products will be tested upon receipt by EFFICIENT. Products that pass all functional tests will be returned to the end user.

D. EFFICIENT will return the repaired or replacement Product to the end user at the address provided by the end user at EFFICIENT Network's expense. For Products shipped within the United States of America, EFFICIENT will use reasonable efforts to ensure delivery within five (5) business days from the date received by EFFICIENT. Expedited service is available at additional cost to the end user.

E. Upon request from EFFICIENT, the end user must prove the date of the original purchase of the product by a dated bill of sale or dated itemized receipt.

5. **Limitations.**

- The end user shall have no coverage or benefits under this limited warranty if the product has been subject to abnormal use, abnormal conditions, improper storage, exposure to moisture or dampness, unauthorized modifications, unauthorized repair, misuse, neglect, abuse, accident, alteration, improper installation, or other acts which are not the fault of EFFICIENT, including acts of nature and damage caused by shipping.
- EFFICIENT will not honor, and will not consider the warranty voided, if: (1) the seal or serial number on the Product have been tampered with or (2) there has been any attempted or actual repair or modification of the Product by anyone other than an EFFICIENT authorized service provider.
- The limited warranty does not cover defects in appearance, cosmetic, decorative or structural items, including framing, and any non-operative parts.
- EFFICIENT's limit of liability under the limited warranty shall be the actual cash value of the product at the time the end user returns the product for repair, determined by the price paid by the end user for the product less a reasonable amount for usage. EFFICIENT shall not be liable for any other losses or damages.
- The end user will be billed for any parts or labor charges not covered by this limited warranty. The end user will be responsible for any expenses related to reinstallation of the product.
- THIS LIMITED WARRANTY IS THE ONLY WARRANTY EFFICIENT MAKES FOR THE PRODUCT AND SOFTWARE. TO THE EXTENT ALLOWED BY LAW, NO OTHER WARRANTY APPLIES, WHETHER EXPRESS, IMPLIED OR STATUTORY, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

6. **Out of Warranty Repair.** Out of warranty repair is available for a fixed fee. Please contact EFFICIENT at the numbers provided above to determine out of warranty repair rate. End users seeking out of warranty repair should contact EFFICIENT as described above to obtain an RMA and to arrange for payment of the repair charge. All shipping charges will be billed to the end-user.

General Provisions

The following general provisions apply to the foregoing Software License and Limited Warranty.

1. **No Modification.** The foregoing Limited Warranty is the end user's sole and exclusive remedy and is in lieu of all other warranties, express or implied. No oral or written information or advice given by EFFICIENT or its dealers, distributors, employees or agents shall in any way extend, modify or add to the foregoing Software License and Limited Warranty. This Software License and Limited Warranty constitutes the entire agreement between EFFICIENT and the end user, and supersedes all prior and contemporaneous representation, agreements or understandings, oral or written. This Software License and Limited Warranty may not be changed or amended except by a written instrument executed by a duly authorized officer of EFFICIENT.

EFFICIENT neither assumes nor authorizes any authorized service center or any other person or entity to assume for it any other obligation or liability beyond that which is expressly provided for in this Limited Warranty including the provider or seller of any extended warranty or service agreement.

The Limited Warranty period for EFFICIENT supplied attachments and accessories is specifically defined within their own warranty cards and packaging.

2. **EXCLUSION OF INCIDENTAL, CONSEQUENTIAL AND OTHER DAMAGES.** TO THE FULL EXTENT PERMITTED BY LAW, IN NO EVENT SHALL EFFICIENT OR ITS LICENSORS BE LIABLE, WHETHER UNDER CONTRACT, WARRANTY, TORT OR ANY OTHER THEORY OF LAW FOR ANY SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES WHATSOEVER, INCLUDING BUT NOT LIMITED TO DAMAGES FOR LOSS OF PROFITS, BUSINESS INTERRUPTION, PERSONAL INJURY, LOSS OR IMPAIRMENT OF DATA OR BUSINESS INFORMATION, EVEN IF EFFICIENT HAS BEEN NOTIFIED OF THE POSSIBILITY OF SUCH DAMAGES. EFFICIENT'S OR IT'S LICENSOR'S LIABILITY TO YOU (IF ANY) FOR ACTUAL DIRECT DAMAGES FOR ANY CAUSE WHATSOEVER, AND REGARDLESS OF THE FORM OF THE ACTION, WILL BE LIMITED TO, AND SHALL NOT EXCEED, THE AMOUNT PAID FOR THE HARDWARE/SOFTWARE.

3. **General.** This Software License and Limited Warranty will be covered by and construed in accordance with the laws of the State of Texas, United States (excluding conflicts of laws rules), and shall insure to the benefit of EFFICIENT and its successor, assignees and legal representatives. If any provision of this Software License and Limited Warranty is held by a court of competent jurisdiction to be a invalid or unenforceable to any extent under applicable law, that provision will be enforced to the maximum extent permissible, and the remaining provisions of this Software License and Limited Warranty will remain in full force and effect. Any notices or other communications to be sent to EFFICIENT must be mailed by certified mail to the following address:

Efficient Networks, Inc.
4849 Alpha Road
Dallas, TX 75244
U.S.A.
Attn: Customer Service

Contents

Installation	1-1
Introduction	1-1
Installation Requirements	1-1
Package Contents	1-1
PC Requirements	1-1
Network Service Provider Requirements	1-2
Connecting Your Router	1-2
Configuring Your Computer	1-3
Microsoft Windows	1-4
Apple Macintosh	1-15
Linux	1-19
Administration Login	1-21
Easy Setup	2-1
Router Information Page	2-2
Protocol Selection Page	2-3
Point-to-Point Protocol over ATM	2-4
Point-to-Point Protocol over Ethernet over PPPoA	2-6
Point-to-Point over Ethernet over RFC 1483	2-8
RFC 1483 Networking	2-10
RFC 1483 MAC Encapsulated Routing	2-12
Dynamic Host Configuration Protocol	2-14
Local Area Network Configuration	2-16
Frequently Asked Questions	3-1
Product Specifications	4-1
Front Panel	4-1
5930 Back Panel	4-2
Hardware Specifications	4-2
Software Specifications	4-4

Contents

Support A-1

CHAPTER 1

INSTALLATION

Introduction

This User Reference Guide covers basic installation and setup of the 5930 Business Class Router.

Installation Requirements

Package Contents

Your package should contain the items listed below. If you determine anything to be damaged or missing, please contact the dealer from whom the equipment was purchased.

- One Efficient Networks 5930 Business Gateway
- One Efficient Networks Documentation CD-ROM
- One AC power supply module and cord
- One Ethernet cable, RJ-45
- One DSL cable, RJ-11, purple label
- One RJ-45 to DB-9 serial port adapter (console)
- Customer Release Notes
- 5930 Business Gateway Quick Start Guide
- Safety and Certification document

PC Requirements

- CD-ROM Drive
- Ethernet network interface card
- TCP/IP network protocol installed
- Web browser
- Terminal emulation software if you want to configure your router via your computer's serial port before placing it into service on a network.

Network Service Provider Requirements

Your Network Service Provider will have sent you information to configure your 5930 for your DSL connection. Depending upon the type of service that you ordered, you should have received at least some of the items from the following list:

- DNS address
- One or more LAN IP addresses and a subnet mask
- Protocol to use, from one of the following:
 - PPP (Point-to-Point Protocol), with a user name and password
 - PPPoE (PPP over Ethernet)
 - RFC 1483 (SNAP Encapsulation)
 - RFC 1483 MER (MAC Encapsulated Routing, requiring a WAN gateway address)
 - VCI (PVC) numbers
- Network options:
 - Bridging
 - IP Routing (requires a WAN IP address and subnet mask)

Connecting Your Router

- Step 1** Place your router in a location where it will be well ventilated. Do not stack it with other devices or place it on carpet.
- Step 2** Connect your PC directly to any of the router's Ethernet ports using the RJ-45 cable provided. You may also connect additional Ethernet devices to the router's Ethernet ports.
- Step 3** Connect your router to the DSL jack using the RJ-11 cable (purple label).
- Step 4** Connect the router to an AC power supply using the power supply module and locking power cord.

Task Complete

**CAUTION:**

To reduce the risk of fire, use only 26 AWG gauge telecommunication cord to connect your DSL port on your router to a DSL telephone jack.

Configuring Your Computer

Your computer must be configured to use the TCP/IP protocol suite over the Internet, and to accept Dynamic Host Configuration Protocol address assignments from your router. Although the information and settings required to make such configurations is standard, differences exist amongst the various computer operating systems in how these configurations are presented and established. This chapter presents the TCP/IP and DHCP configuration screens in the most popular operating systems, to guide the reader through the configuration process for each operating system.

You can skip directly to the instructions for your computer operating system from the following list:

- **Microsoft Windows**
 - [Windows 98](#), see [page 1-4](#)
 - [Windows NT 4](#), see [page 1-6](#)
 - [Windows 2000](#), see [page 1-8](#)
 - [Windows ME](#), see [page 1-11](#)
 - [Windows XP](#), see [page 1-13](#)
- **Apple Macintosh**
 - [Mac OS 9.x](#), see [page 1-15](#)
 - [Mac OS X](#), see [page 1-17](#)
- **Linux OS**, see [page 1-19](#)

Microsoft Windows

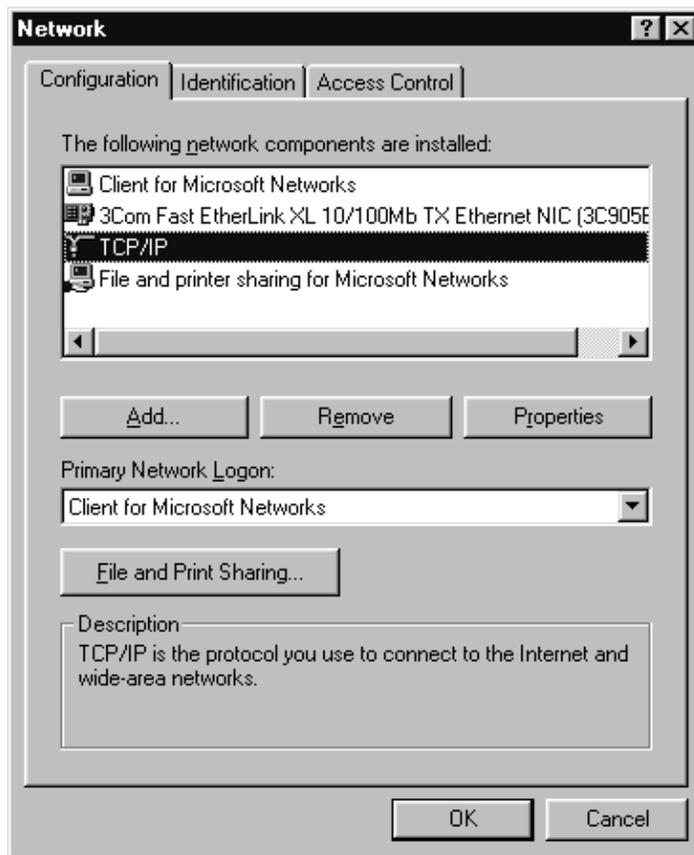
Windows 98

Step 1 On your desktop, right click on the **Network Neighborhood** icon.



Step 2 The *Network* dialog should appear. Under the Configuration tab, from the network components installed, select **TCP/IP**.

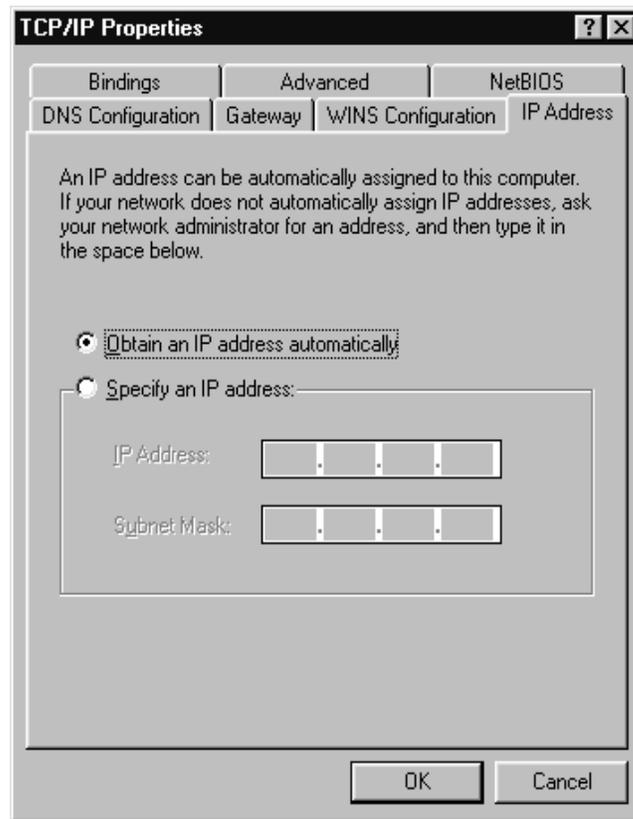
Step 3 Click **Properties** to display TCP/IP properties.



Step 4 In the *TCP/IP Properties* dialog, select the **IP Address** tab.

Step 5 Under the IP Address tab, click to select the option to **Obtain an IP address automatically**.

Step 6 Click **OK**.



Step 7 Click **OK** buttons to close each dialog.



NOTE:

You may need to restart your PC for these changes to take effect.

Task Complete

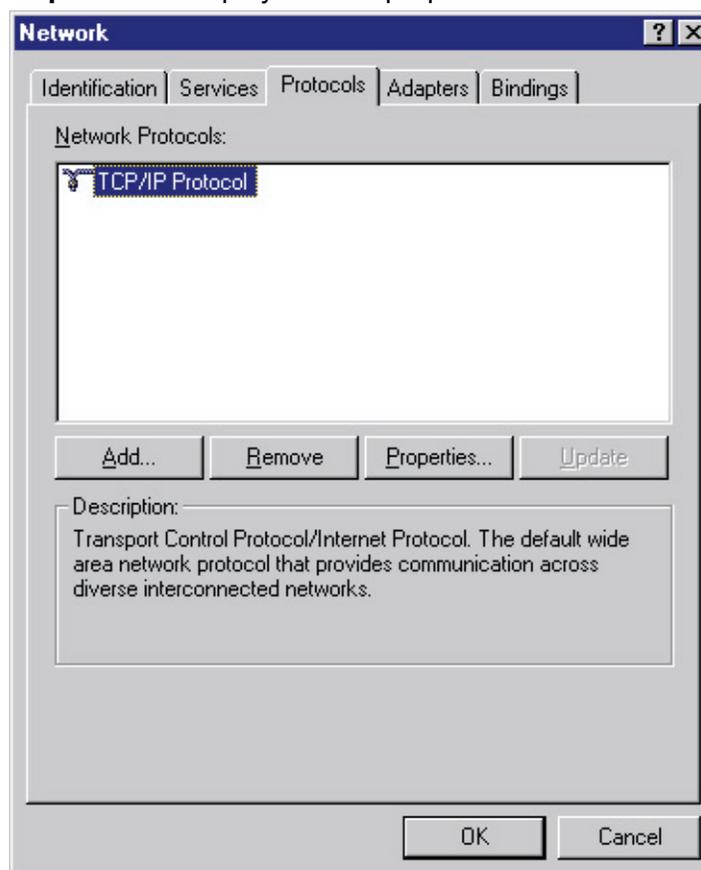
Windows NT 4

Step 1 On your desktop, right click on the **Network Neighborhood** icon.



Step 2 The *Network* dialog should appear. Under the Protocols tab, from the network protocols installed, select **TCP/IP Protocol**.

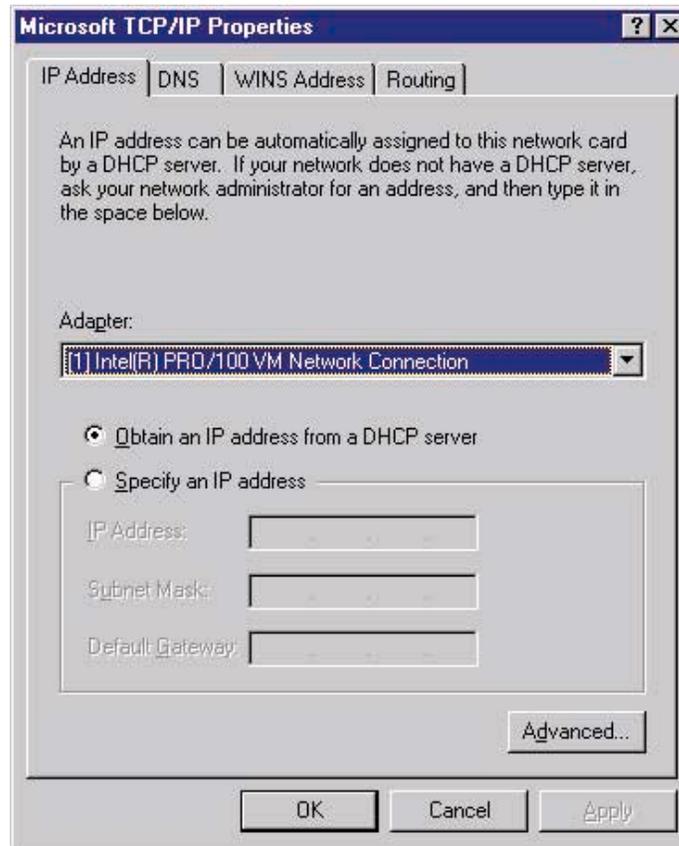
Step 3 Click **Properties** to display TCP/IP properties.



Step 4 In the Microstate *TCP/IP Properties* dialog, select the **IP Address** tab.

Step 5 Under the *IP Address* tab, click to select the option to **Obtain an IP address from a DHCP server**.

Step 6 Click **OK**.



Step 7 Click **OK** buttons to close each dialog.



NOTE:

You may need to restart your PC for these changes to take effect.

Task Complete

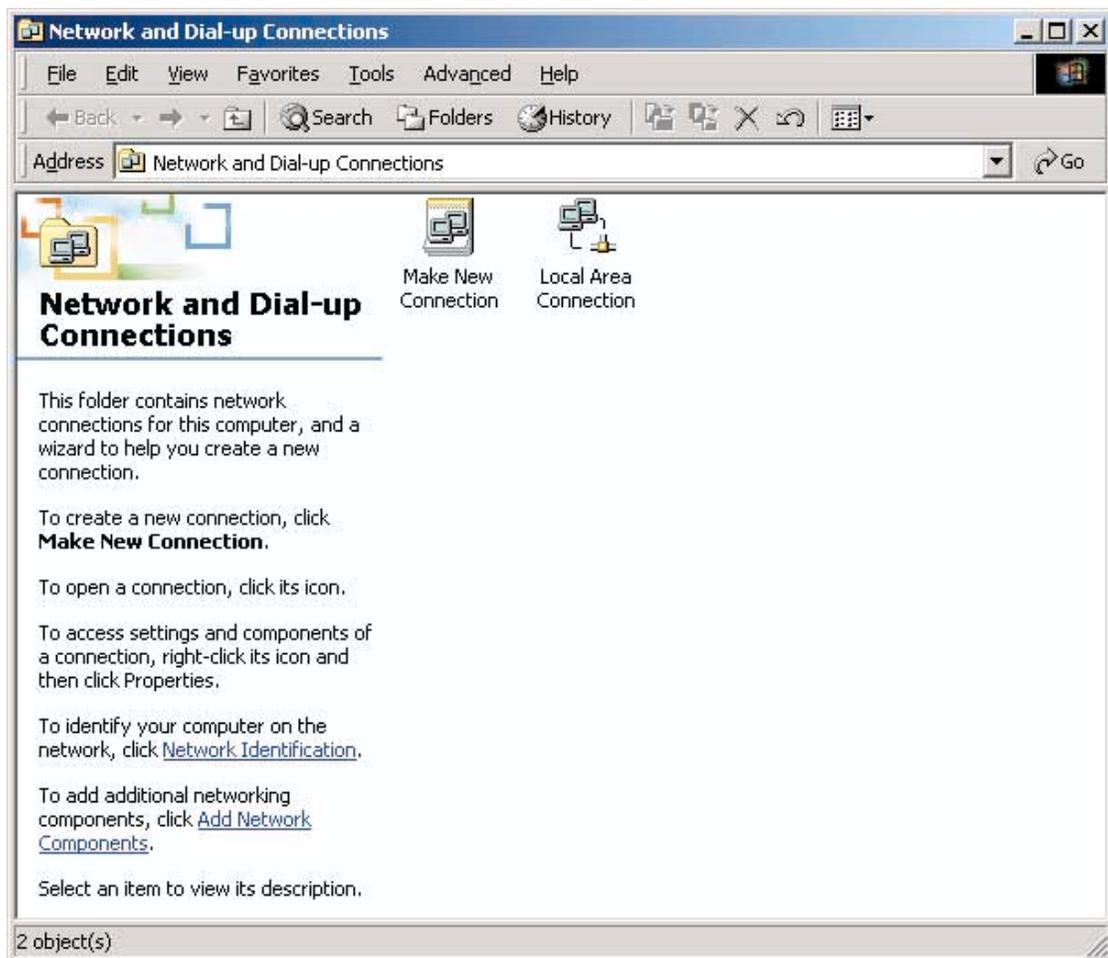
Windows 2000

Step 1 On your desktop, right click on the **My Network Places** icon.



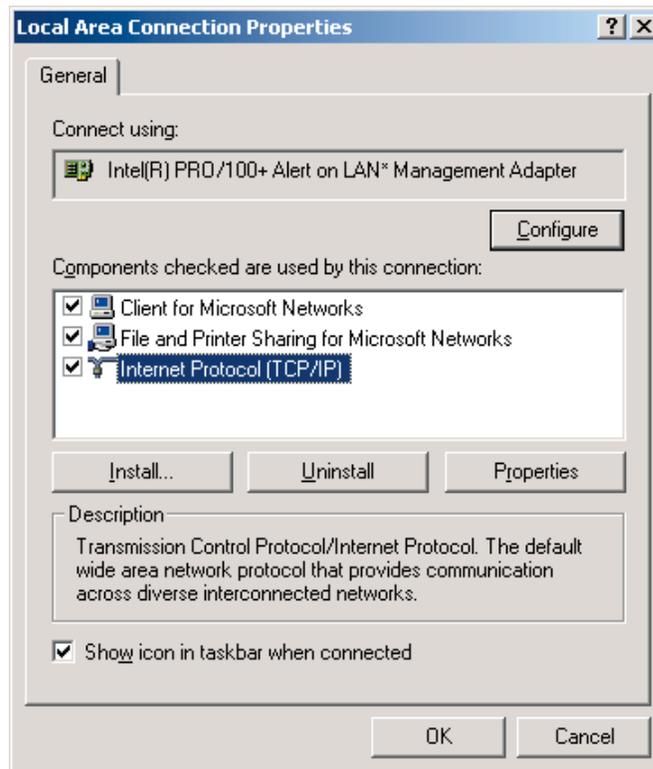
Step 2 The Network and Dial-up Connections window should appear. Right click on the **Local Area Connection** icon.

Step 3 From the menu, select **Properties**.



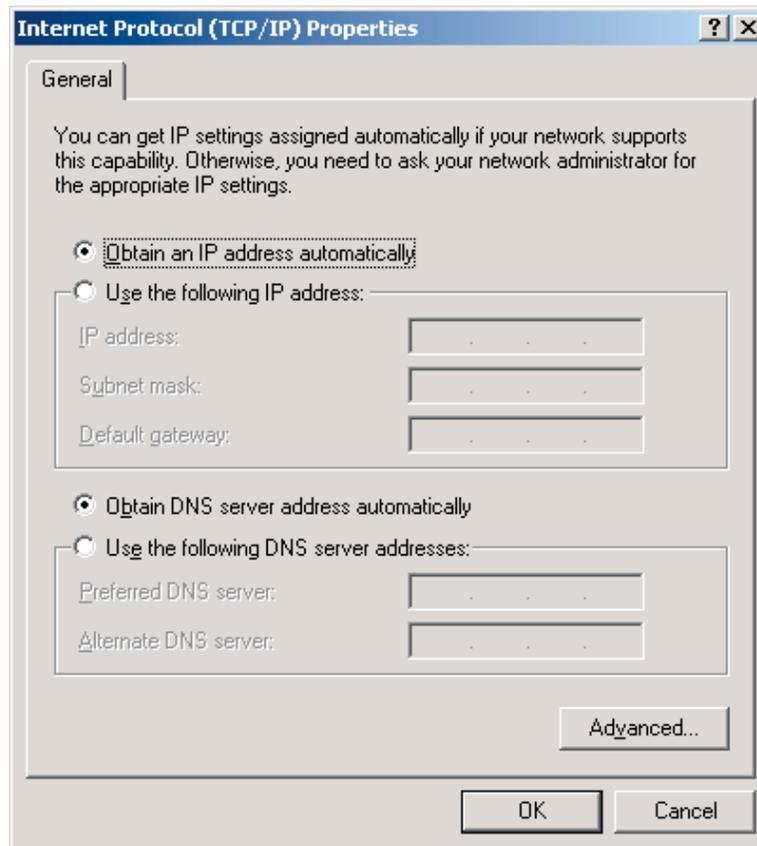
Step 4 The *Local Area Connection Properties* dialog should appear. From the list of components, select **Internet Protocol (TCP/IP)**.

Step 5 Click **Properties**.



Step 6 The *Internet Protocol (TCP/IP) Properties* dialog should appear. Select **Obtain an IP address automatically** and **Obtain DNS server address automatically**.

Step 7 Click **OK**.



Step 8 Click **OK** buttons to close each dialog.

 **NOTE:**

You may need to restart your PC for these changes to take effect.

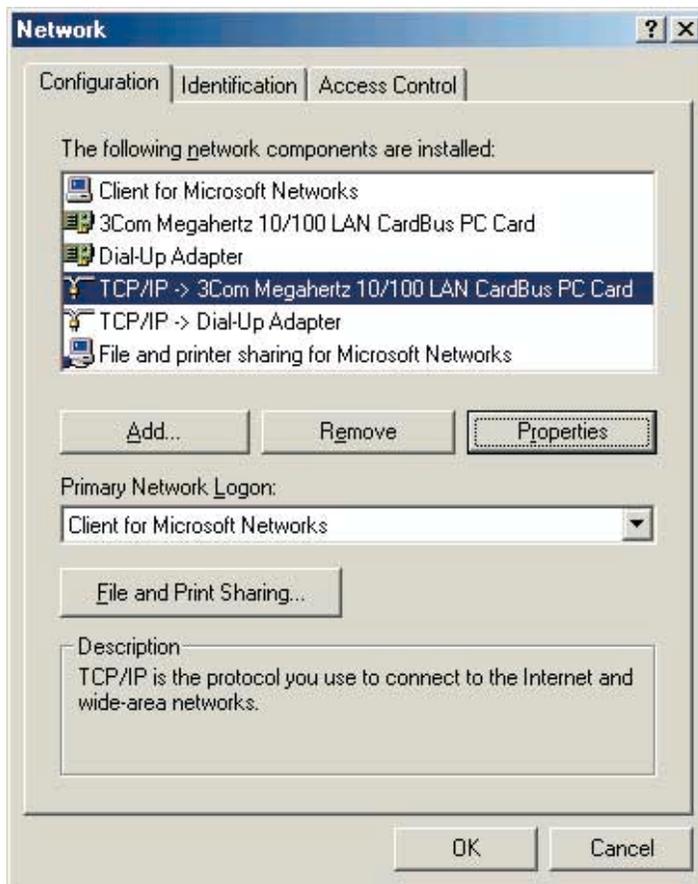
Task Complete

Windows ME

- Step 1** On your desktop, right click on the **Network Places** icon (shown below).
- Step 2** From the displayed menu, select **Properties**.

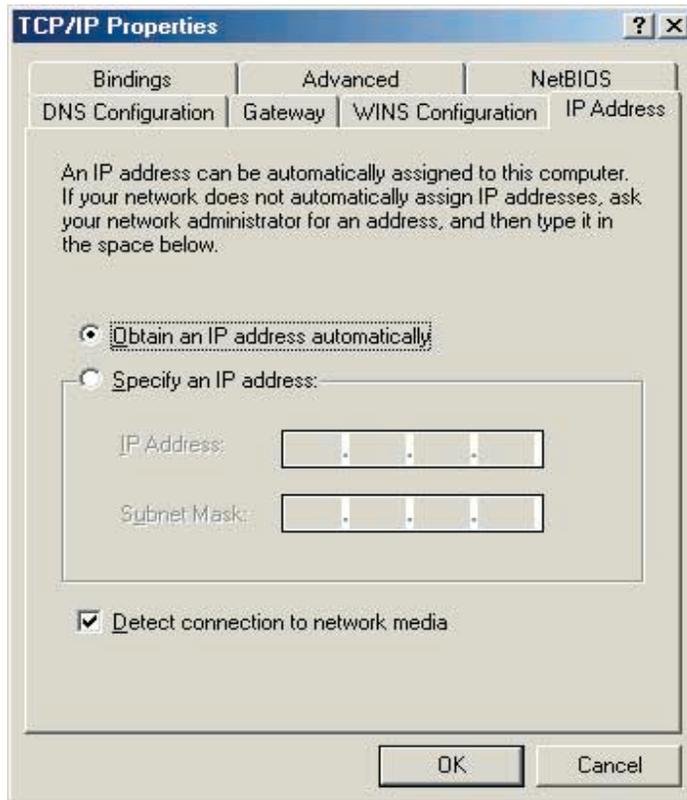


- Step 3** The *Network* dialog should appear. Under the *Configuration* tab, from the network components installed, select the **TCP/IP Protocol** associated with your network card (see the example below).



- Step 4** Click **Properties** to display *TCP/IP properties*.
- Step 5** In the *TCP/IP Properties* dialog, select the **IP Address** tab.

- Step 6** Under the *IP Address* tab, click to select the option to **Obtain an IP address automatically**.



- Step 7** Click **OK**.

- Step 8** Click **OK** buttons to close each dialog.

 **NOTE:**

You may need to restart your PC for these changes to take effect.

Task Complete

Windows XP

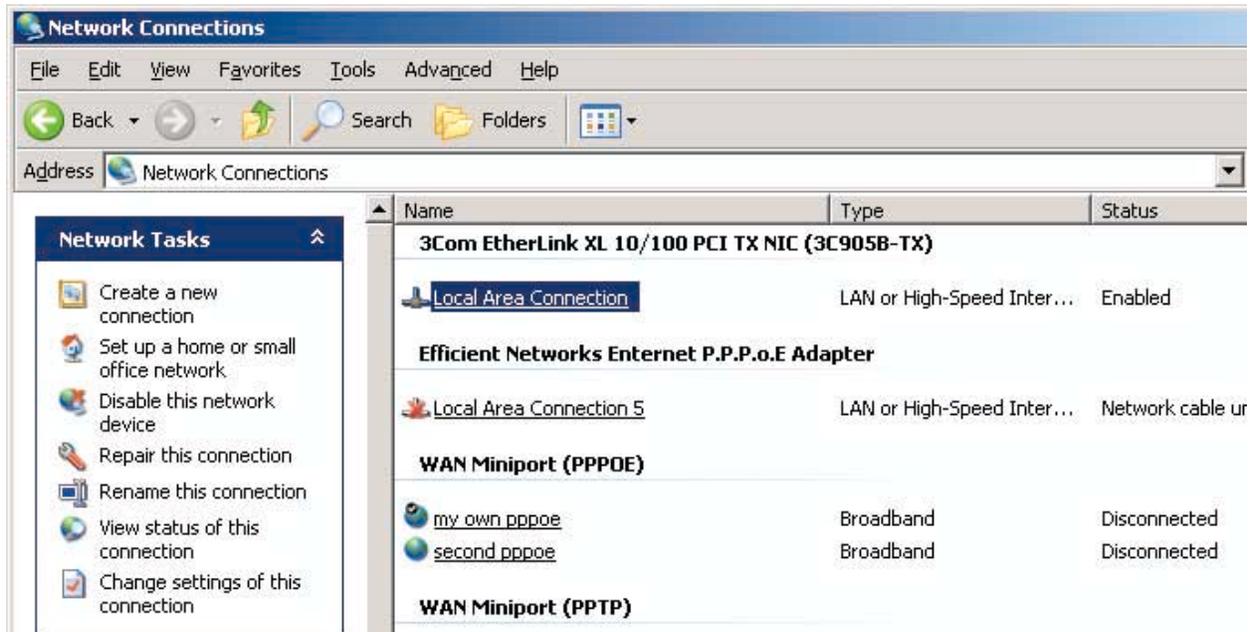
Step 1 On your desktop, click on the **My Network Places** icon (shown below).



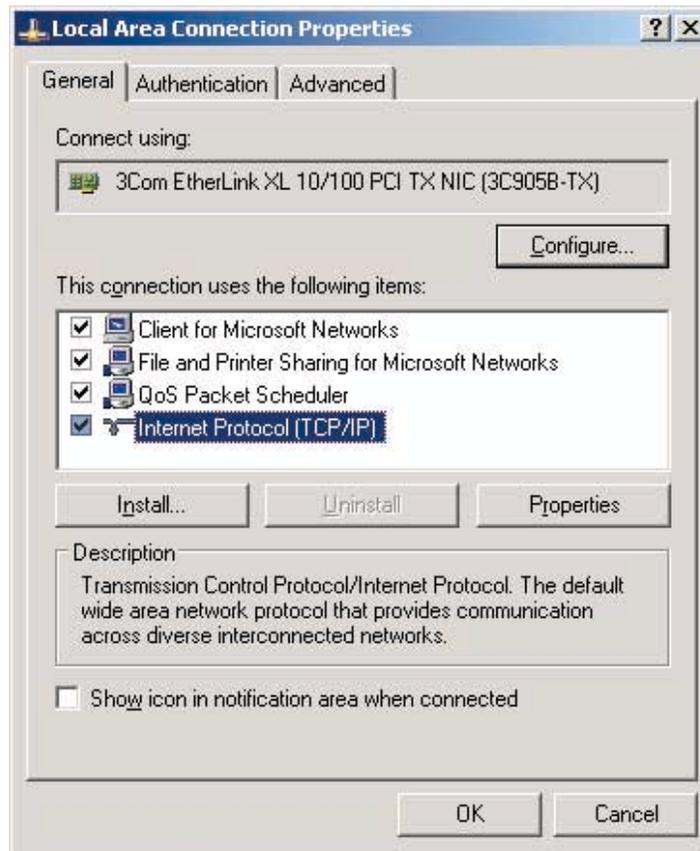
Step 2 The *My Network Places* screen should appear. Under the *Network Tasks* menu, select **View Network Connections**.



Step 3 The *Network Connections* screen should appear. Click the **Local Area Connection** icon.



- Step 4** The *Local Area Connection Properties* dialog should appear. From the list of items, select **Internet Protocol (TCP/IP)**.



- Step 5** Click **Properties**.

- Step 6** Click **OK** buttons to close each dialog.

 **NOTE:**

You may need to restart your PC for these changes to take effect.

Task Complete

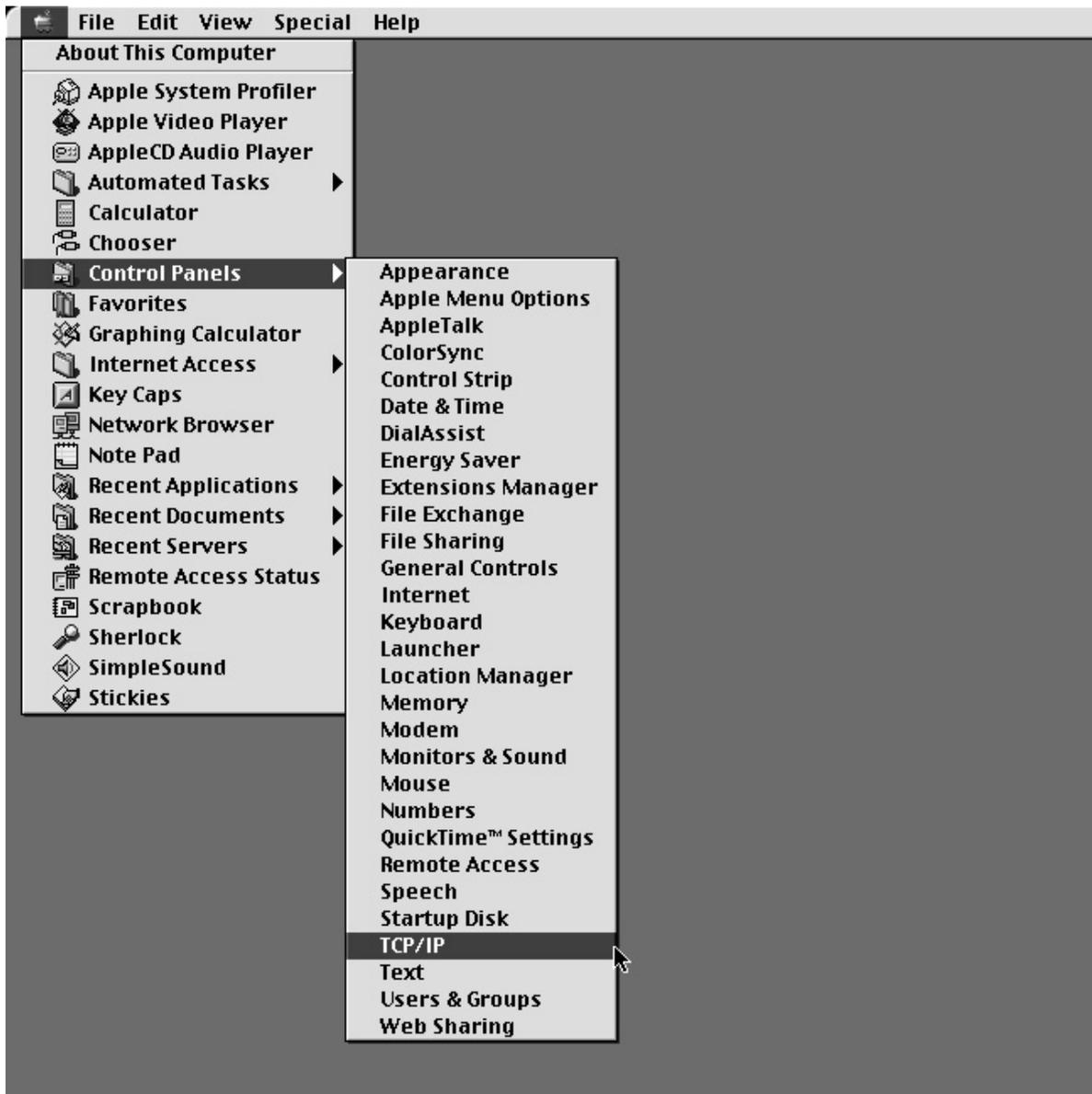
Apple Macintosh

To configure TCP/IP and DHCP on your Macintosh, please select your version of the Mac OS from the following list:

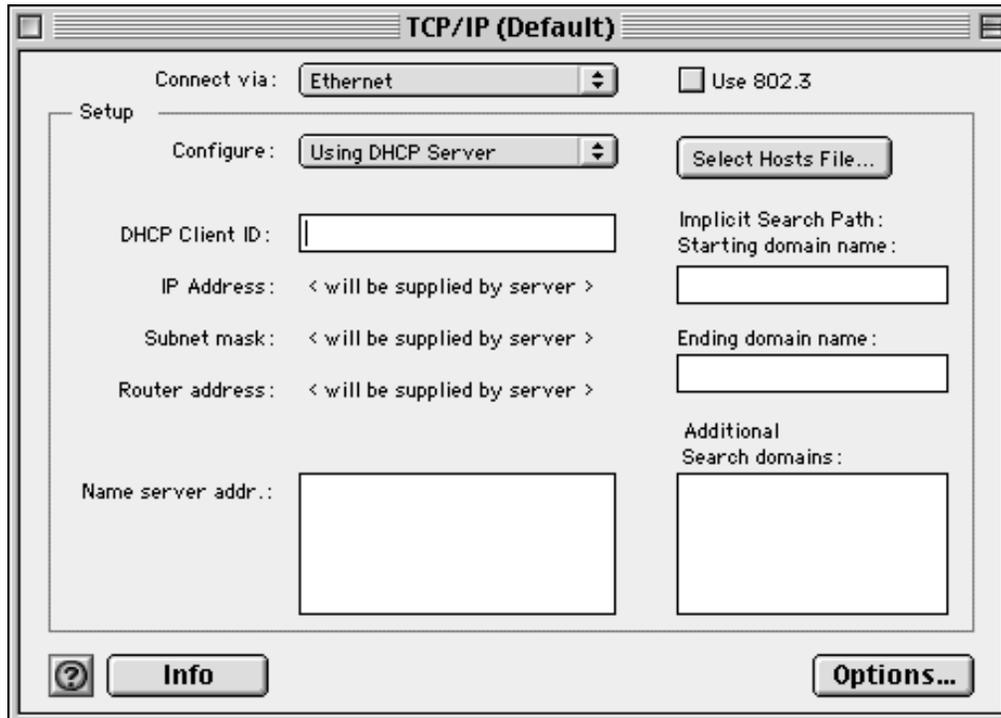
- [Mac OS 9.x](#)
- [Mac OS X](#)

Mac OS 9.x

Step 1 Under the Apple menu, select **Control Panels** and then **TCP/IP**.



- Step 2** The *TCP/IP* control panel should appear. From the *Configure* pull-down menu, select: **Using DHCP Server**.



- Step 3** Complete the fields shown with any information supplied by your service provider.
- Step 4** Click on the **upper left square** in the menu bar to close the *TCP/IP* control panel.

Task Complete

Mac OS X

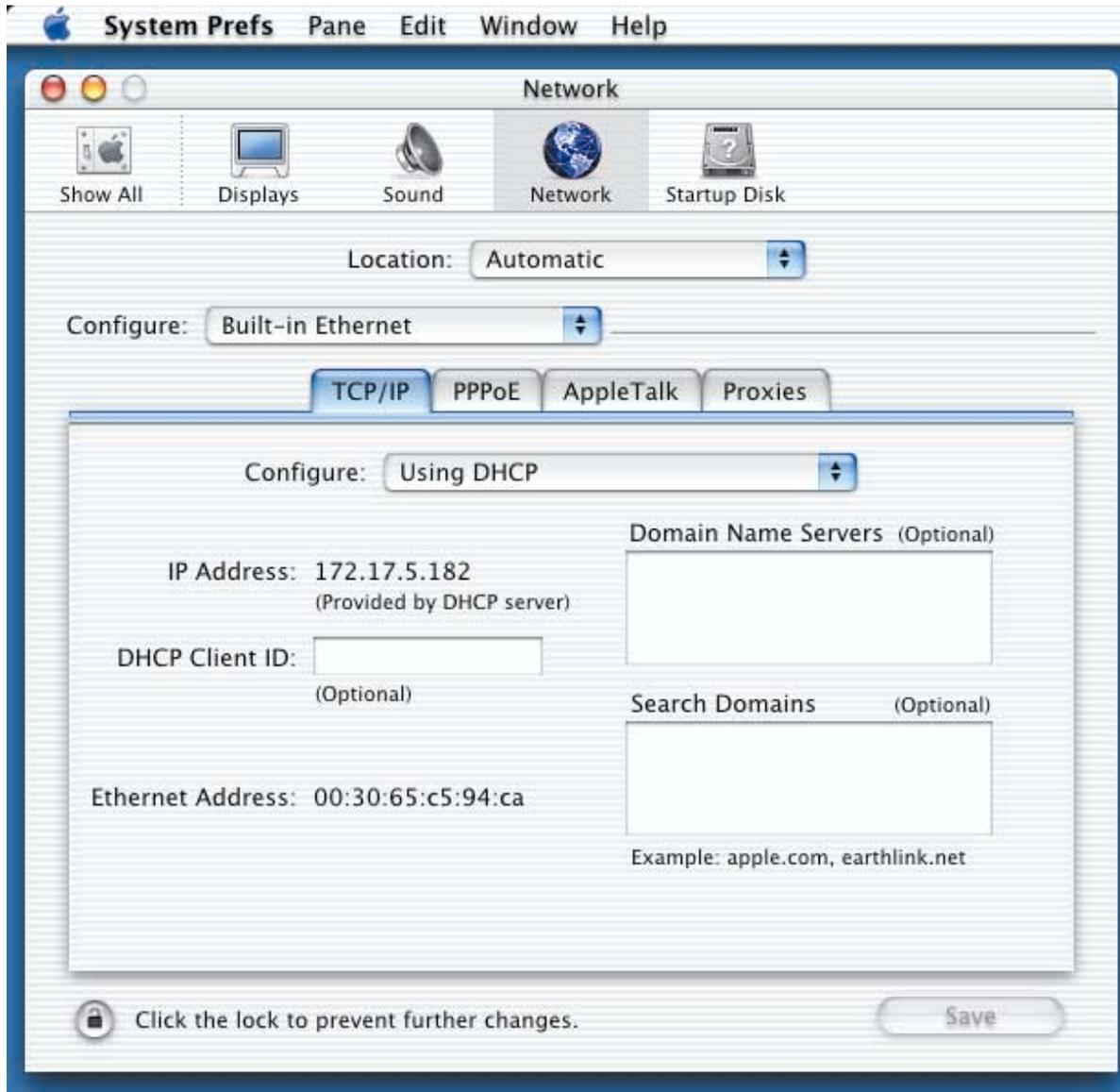
Step 1 Under the Apple menu, select **System Preferences**.



Step 2 The *System Preferences* window should appear. Click to select the **Network** icon.



Step 3 The *Network* window should appear. Select the **TCP/IP** tab.



Step 4 From the *Configure* pull-down menu, select **Using DHCP**.

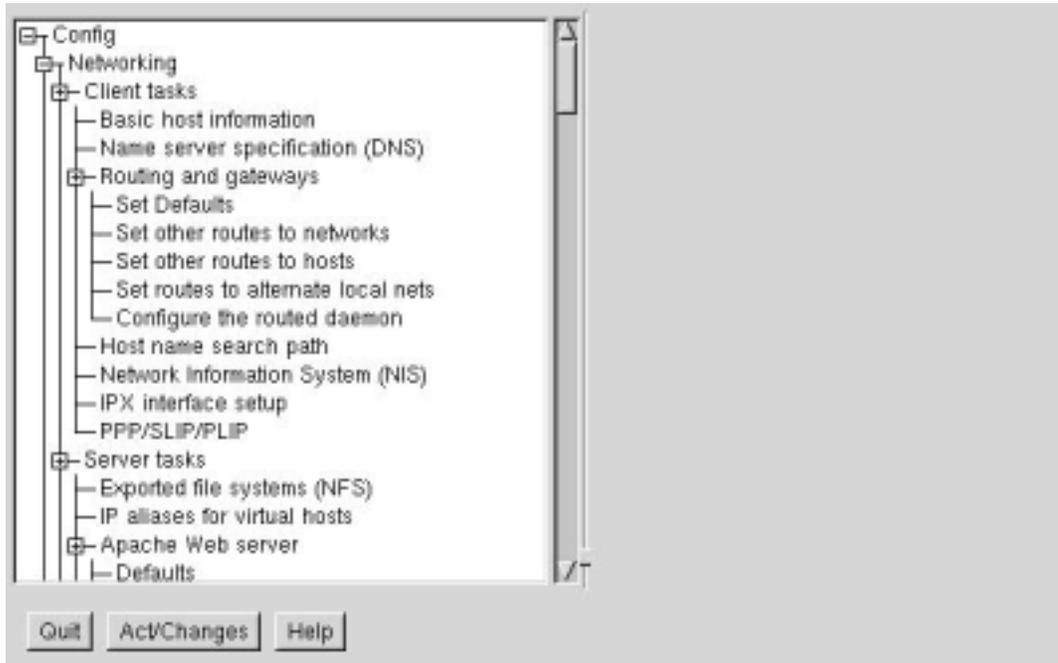
Step 5 Enter any information supplied by your service provider.

Step 6 Click **Save** button to save and exit the *Network* window.

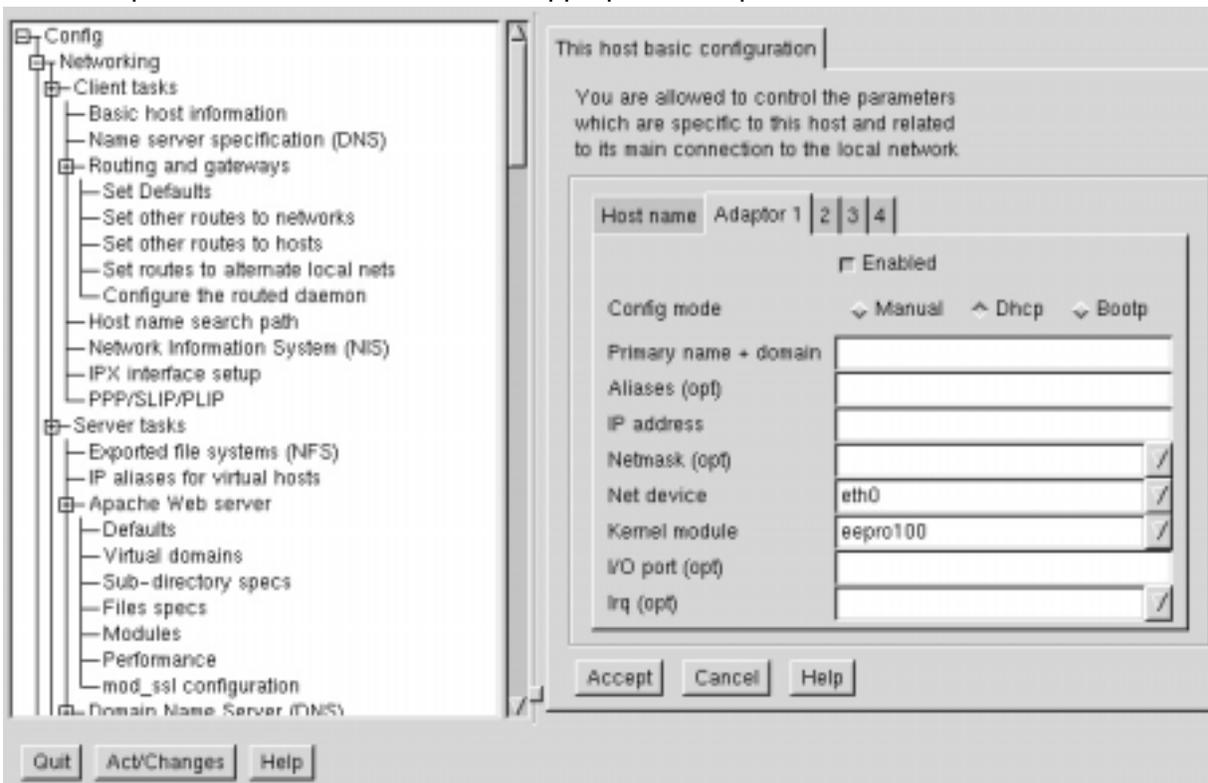
Task Complete

Linux

Step 1 From a terminal window, run **linuxconfig**.

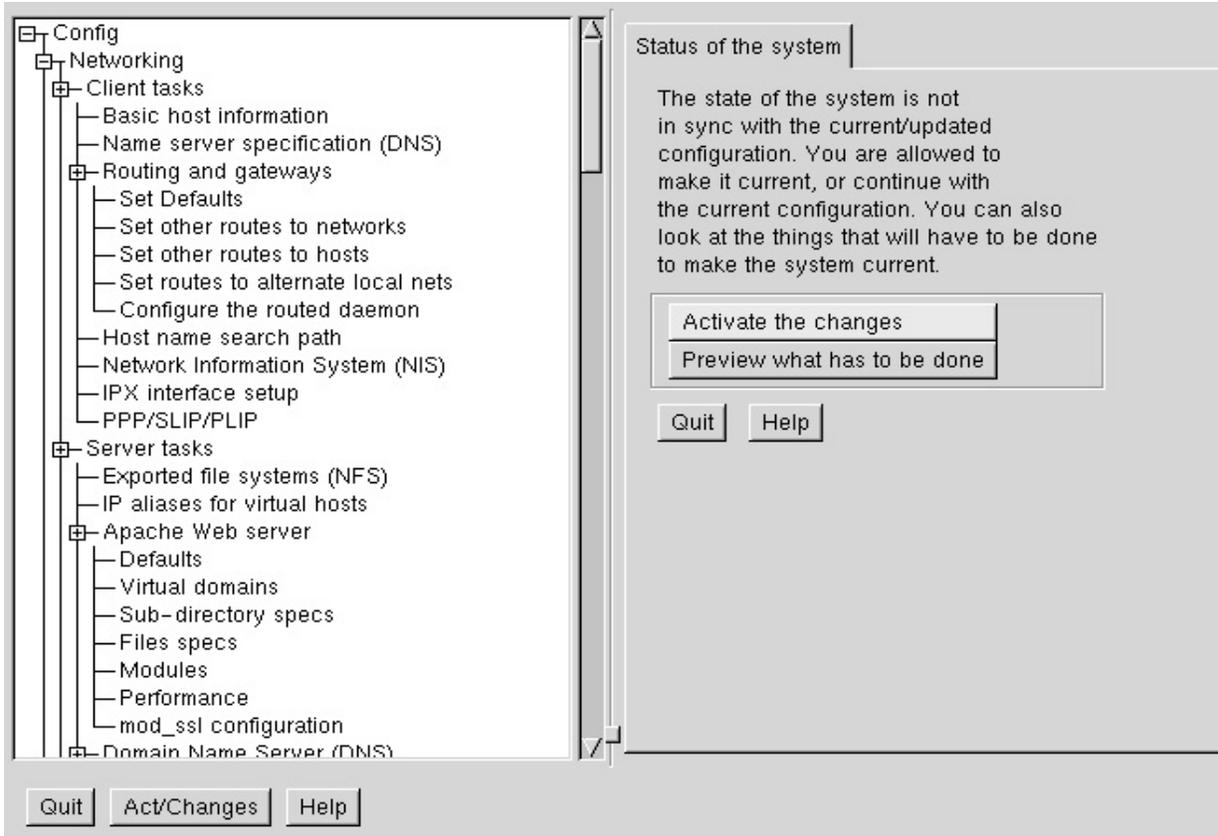


Step 2 The *Config* dialog should appear. Enter any information specified by your service provider in the fields under the appropriate Adapter tab.



Step 3 When settings are completed, Click **Accept**.

Step 4 To update the system status, ensure that the "*Activate the changes*" button is highlighted, then click **Act/Changes**.



Task Complete

Administration Login

The following procedure provides the steps for connecting to the router through the Web Management Interface. If you prefer to connect via a console session, refer to the Technical Reference Guide, “[Establishing a Connection](#)” on page 3-33.

- Step 1** Using your web browser, enter the following default router address into the address field of your browser: `http://192.168.254.254/`. A login dialog will be displayed.



The screenshot shows a dialog box titled "Enter Network Password". It contains the following fields and controls:

- Site: 192.168.254.254
- Realm: administration
- User Name: superuser
- Password: *****
- Save this password in your password list
- Buttons: OK, Cancel

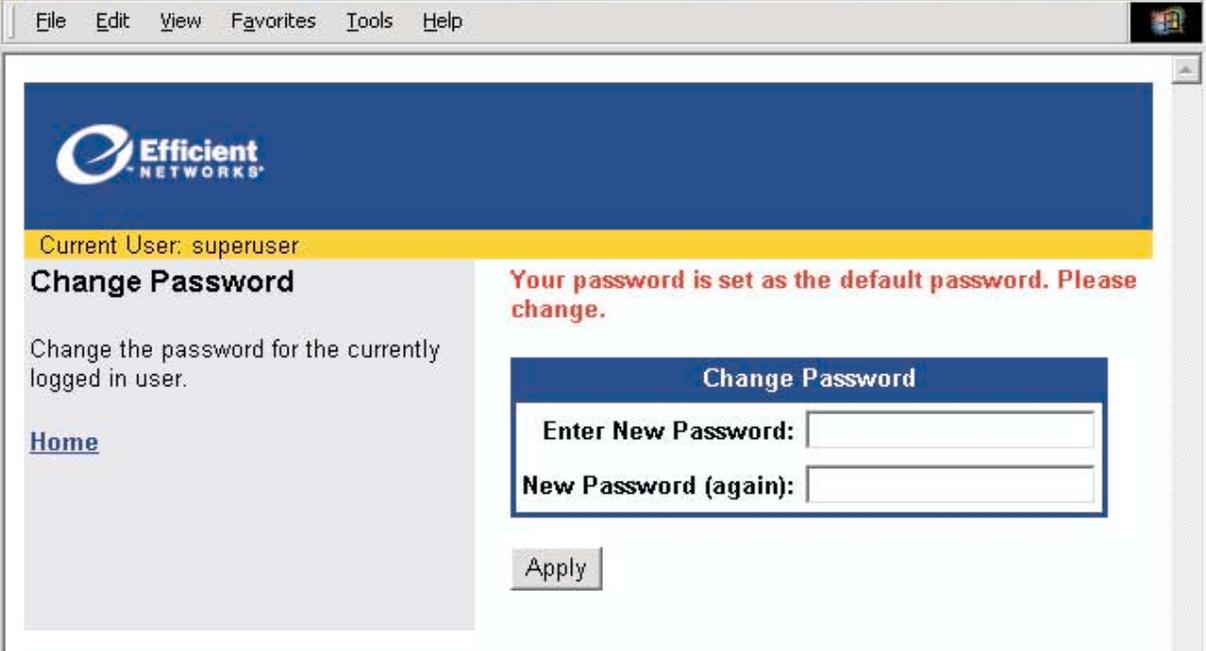
- Step 2** At the login prompt, enter the following default entries:
User Name: **superuser**
Password: **admin**

After you have logged into your router, a Change User Password screen (shown below) will be displayed, prompting you to change your password. The password is invalid by default for security purposes and must be changed to a unique password.

 **NOTE:**

Passwords are case-sensitive and must be a minimum of 6 ASCII characters.

Step 3 To change the password,



The screenshot shows a web browser window with the Efficient Networks logo at the top left. Below the logo, it says "Current User: superuser". The main heading is "Change Password". Underneath, it says "Change the password for the currently logged in user." There is a "Home" link. To the right, a red message states: "Your password is set as the default password. Please change." Below this is a "Change Password" form with two input fields: "Enter New Password:" and "New Password (again):". An "Apply" button is located below the form.

- a. Enter the **new password** in the field provided.
- b. Re-enter the **new password** in the field provided.
- c. Click **Apply** to save the password change.

With the password change, you have written a new account password to the router and your current web-based connection will be invalid (it is still using the default password). You will again be prompted with a login dialog to re-authenticate your connection.

Step 4 At the login prompt, enter the new account information as required.

The [Router Information Page](#) will be displayed; you can proceed with Easy Setup.

Task Complete

CHAPTER 2

EASY SETUP

The Easy Setup screens are designed to provide an easy step-by-step configuration of the Wide Area Network (WAN) and Local Area Network (LAN). The information required for completing these forms is obtained from your service provider. A broader overview of the configuration parameters can be found in the Technical Reference Guide.

The following Easy Setup procedure assumes you have made the appropriate connections and have logged in to the router as illustrated in the Quick Start Guide. During the Easy Setup procedure, you will configure parameters that provide fundamental router operation. Once completed, you are provided links to learn more about or perform configuration of advanced router features. If you need additional information on using the Web Management Interface, refer to [See "WEB Management Interface" on page 8-1](#) of the Technical Reference Guide.

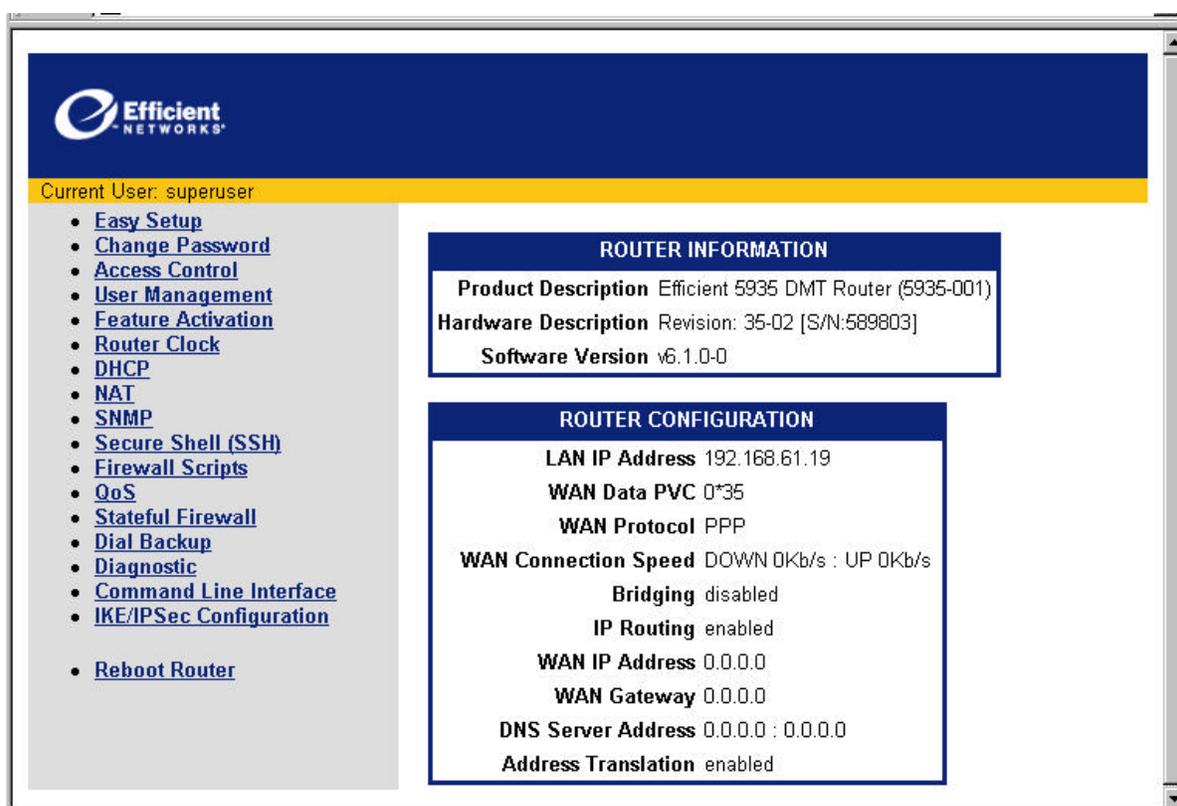
If you prefer to configure the router using the Command Line Interface, refer to the Technical Reference Guide, [Chapter 3, Installation and Setup](#).

Router Information Page

The primary page in the Web User Interface is the Router Information page. This screen displays basic router information and configuration settings. It also provides links to other router setup and control forms. On the Router Information page, the following information is presented:

- Router Information - Including the model number, software version number and options that have been enabled.
- Router Configuration - Displays router configuration details such as LAN IP address, WAN data and voice PVC (ATM), WAN protocol and WAN network settings.

The following is a typical Router Information page:



The screenshot displays the Router Information page. At the top left is the Efficient Networks logo. Below it, a yellow bar indicates the current user is 'superuser'. A navigation menu on the left lists various settings: Easy Setup, Change Password, Access Control, User Management, Feature Activation, Router Clock, DHCP, NAT, SNMP, Secure Shell (SSH), Firewall Scripts, QoS, Stateful Firewall, Dial Backup, Diagnostic, Command Line Interface, IKE/IPSec Configuration, and Reboot Router. The main content area is divided into two sections:

ROUTER INFORMATION

- Product Description: Efficient 5935 DMT Router (5935-001)
- Hardware Description: Revision: 35-02 [S/N:589803]
- Software Version: v6.1.0-0

ROUTER CONFIGURATION

- LAN IP Address: 192.168.61.19
- WAN Data PVC: 0*35
- WAN Protocol: PPP
- WAN Connection Speed: DOWN 0Kb/s : UP 0Kb/s
- Bridging: disabled
- IP Routing: enabled
- WAN IP Address: 0.0.0.0
- WAN Gateway: 0.0.0.0
- DNS Server Address: 0.0.0.0 : 0.0.0.0
- Address Translation: enabled

To proceed with Easy Setup, click the [Easy Setup](#) link on the *Router Information* page.

NOTE:

The Easy Setup procedure can be exited at any time during the configuration by clicking **Cancel** on the bottom of the configuration page. If the procedure is cancelled, no changes will be made and the WMI will return to the [Router Information Page](#).

Protocol Selection Page

The Protocol Selection Page is the initial Easy Setup screen. This form is used to entering and review information about Wide Area Network (WAN) settings.

The screenshot displays the 'Protocol Selection Page' for WAN settings. At the top, a yellow bar indicates 'Current User: superuser'. The page is divided into two main sections: 'WAN Interface (Wide Area Network)' and 'WAN Protocol'. The 'WAN Interface' section includes a text box for 'Data PVC (VPI*VCI)' with the value '0 * 36'. The 'WAN Protocol' section features a list of radio buttons for selecting a protocol: 'Point-to-Point Protocol over ATM', 'Point-to-Point Protocol over Ethernet over PPPoA', 'Point-to-Point Protocol over Ethernet over RFC1483', 'RFC 1483', and 'RFC 1483 MAC Encapsulated Routing (MER)'. The 'RFC 1483 MAC Encapsulated Routing (MER)' option is selected. Below the protocol list are 'Next' and 'Cancel' buttons. The left sidebar contains explanatory text for each section.

Current User: superuser

WAN Interface (Wide Area Network)

The information on this and subsequent screens is obtained from your service provider.

The **Permanent Virtual Circuit (PVC)** is a logical connection between the router and the service provider. It is described using two numbers, the VPI and VCI.

WAN Protocol

The **Point-to-Point Protocol (PPP)** describes a means to automatically configure a connection for authenticated users.

RFC 1483 describes methods of encapsulating network data traffic over ATM networks.

RFC 1483 MAC Encapsulated Routing (MER) uses the bridged encapsulation method from RFC 1483. This option is selected when the Network Service Provider offers a bridged network but IP routing is desired on the LAN.

WAN Interface

Data PVC (VPI*VCI) 0 * 36

WAN Protocol

- Point-to-Point Protocol over ATM
- Point-to-Point Protocol over Ethernet over PPPoA
- Point-to-Point Protocol over Ethernet over RFC1483
- RFC 1483
- RFC 1483 MAC Encapsulated Routing (MER)

Next Cancel

On the *Protocol Selection* page, begin the Easy Setup procedure by performing the following:

- Step 1** Enter the ATM Permanent Virtual Circuit (PVC) information: **VPI / VCI**.
- Step 2** Click the **radio button** to select the applicable **WAN Protocol**.
- Step 3** Click **Next** to continue.

Task Complete

Based on the selection in [Step 2](#), proceed to the appropriate page:

- ["Point-to-Point Protocol over ATM"](#) at the bottom of this page.
- ["Point-to-Point Protocol over Ethernet over PPPoA"](#) on page 2-6
- ["Point-to-Point over Ethernet over RFC 1483"](#) on page 2-8
- ["RFC 1483 Networking"](#) on page 2-10
- ["RFC 1483 MAC Encapsulated Routing"](#) on page 2-12

Point-to-Point Protocol over ATM

Selection of Point-to-Point Protocol over ATM will display the following *PPP Configuration* page.

The screenshot displays the PPP Configuration page. At the top, a yellow bar indicates the current user is 'superuser'. The page is divided into two main sections: 'Point-to-Point Protocol (PPP)' and 'PPP Networking'. The 'Point-to-Point Protocol (PPP)' section includes explanatory text for PPP, Bridging, IP Routing, Network Address Translation (NAT), and NetBIOS. The 'PPP Networking' section contains several checkboxes: 'Bridging enabled' (unchecked), 'Only bridge PPPOE traffic' (unchecked), 'IP routing enabled' (checked), 'NAT enabled' (checked), and 'Block NetBIOS traffic' (unchecked). At the bottom of the configuration area, there are three buttons: 'Previous', 'Next', and 'Cancel'.

To continue the Easy Setup procedure with PPP over ATM, continue with the following steps:

Step 1 Enter the PPP **User Name** and **Password** in the fields provided.

A PPP username and password are required for authentication when the connection is being established.

Step 2 Click to select the following *PPP Networking* options:

- **Bridging Enabled** - Bridging will forward all traffic for remote hosts that is not routed (non-IP) to the WAN. If Bridging Enabled is selected:
 - Optional, click to select *Only bridge PPPoE traffic*. Proceed to [Step 3](#). Selection of this option will allow only PPPoE traffic to be bridged, all other traffic will be dropped.
- **IP Routing Enabled** - IP Routing will route all IP packets for remote hosts to the WAN.

If IP Routing enabled is selected, click to select the following options:

- **NAT Enabled** - Network Address Translation (NAT) allows multiple workstations on your LAN to share a single, public IP address. All outgoing traffic appears to originate from the router's IP address.
- **Block Net BIOS Traffic** - NetBIOS is a PC networking protocol that can keep network connections open inadvertently. To avoid excess connection charges, such traffic should be blocked on any metered network service.

Step 3 Click **Next** to proceed with Easy Setup, [Dynamic Host Configuration Protocol](#) configuration (see [page 2-14](#)).

Task Complete

Point-to-Point Protocol over Ethernet over PPPoA

Selection of Point-to-Point Protocol over Ethernet over PPPoA will display the following *PPPoE Configuration* page.

Current User: superuser

Point-to-Point Protocol over Ethernet over PPPoA

PPPoE requires a username and password.

PPPoE Service Name requires a name. Default is * for any.

PPPoE Timer requires a specific duration (in seconds) or the default permanent setting.

PPPoE only Filter is used to specify that only PPPoE traffic will be bridged.

PPPoA Setting is used for PPPoE over PPPoA.

PPPoE Setting

Username:

Password:

Service Name:

PPPoE Timer:

PPPoE only Filter

PPPoA Setting

Username:

Password:

To continue the Easy Setup procedure with PPPoE, continue with the following steps:

- Step 1** Enter the PPP **User Name** and **Password** in the field provided.
- A PPP Username and password are required for authentication when the connection is being established.
- Step 2** Enter the PPPoE **Service Name** in the field provided.
- PPPoE requires the domain name of your network service provider. Use * as a default (for all services). Enter the domain name of your network service provider in the Service Name field.
- Step 3** Enter the **timeout interval** (measured in seconds) into the *PPPoE Timer* field.
- PPPoE Timer will set a timeout interval for periods of inactivity. After the number of seconds elapses, the PPP connection closes to limit timed connection charges from your service provider. The default entry of “permanent” will keep the PPP connection open constantly, with no timeout interval.
- Step 4** As required, click to select **PPPoE only Filter**.
- This selection will filter all traffic on the bridge to allow PPPoE only. Check this box if you will only connect to your network service using PPPoE.

Step 5 Click **Next** to proceed with Easy Setup, [Dynamic Host Configuration Protocol](#) configuration (see [page 2-14](#)).

Task Complete

Point-to-Point over Ethernet over RFC 1483

Selection of Point-to-Point Protocol over Ethernet over RFC 1483 will display the following *PPPoE Configuration* page.

Current User: superuser

Point-to-Point Protocol over Ethernet over RFC1483

PPPoE requires a username and password.

PPPoE Service Name requires a name. Default is * for any.

PPPoE Timer requires a specific duration (in seconds) or the default permanent setting.

PPPoE only Filter is used to specify that only PPPoE traffic will be bridged.

PPPoE Setting

Username:

Password:

Service Name:

PPPoE Timer:

PPPoE only Filter

Previous Next Cancel

To continue the Easy Setup procedure with PPPoE, continue with the following steps:

Step 1 Enter the PPP **User Name** and **Password** in the fields provided.

A PPP Username and password are required for authentication when the connection is being established.

Step 2 Enter the PPPoE **Service Name** in the field provided.

PPPoE requires the domain name of your network service provider. Use * as a default (for all services). Enter the domain name of your network service provider in the Service Name field.

Step 3 Enter the **timeout interval** (measured in seconds) into the *PPPoE Timer* field.

PPPoE Timer will set a timeout interval for periods of inactivity. After the number of seconds elapses, the PPP connection closes to limit timed connection charges from your service provider. The default entry of "permanent" will keep the PPP connection open constantly, with no timeout interval.

Step 4 As required, click to select **PPPoE only Filter**.

This selection will filter all traffic on the bridge to allow PPPoE only. Check this box if you will only connect to your network service using PPPoE.

Step 5 Click **Next** to proceed with Easy Setup, [Dynamic Host Configuration Protocol](#) configuration (see [page 2-14](#)).

Task Complete

RFC 1483 Networking

Selection of RFC 1483 will display the following *RFC 1483 Networking configuration* page.

Current User: superuser

RFC 1483 Networking

Bridging designates that all traffic to remote hosts that is not routed will be forwarded.

IP Routing routes IP traffic to remote hosts.

The **IP address and Subnet Mask** define the IP address and network of the interface. This information is required in order to use NAT.

Network Address Translation (NAT) makes all connections appear to originate from the IP address of this interface.

NetBIOS is a PC networking protocol that may keep connections open inadvertently, thus incurring excess charges in fee-for-service agreements.

RFC 1483 Networking

Bridging enabled

Only bridge PPPOE traffic

IP routing enabled

Obtain configuration automatically from WAN using DHCP

Configure IP Routing manually

IP Address

Subnet Mask

NAT enabled

Block NetBIOS traffic

To continue the Easy Setup procedure with RFC 1483, continue with the following steps:

Step 1 Click to select *one* of the following.

- ***Bridging enabled***
- ***IP routing enabled***

If bridging is selected, all traffic to remote computers that is not routed will be bridged. Next, continue to [Step 2](#).

If IP routing enabled was selected, an IP address and subnet mask must be obtained; proceed to [Step 3](#).

 **NOTE:**

If your Network Service Provider has not provided specifics for use in making these settings, select the following *IP Routing*, *Obtain configuration automatically from WAN*, and *NAT enabled*.

Step 2 Optional, click to select *Only bridge PPPoE traffic*. Proceed to [Step 4](#).

Selection of this option will allow only PPPoE traffic to be bridged, all other traffic will be dropped.

Step 3 Obtain an IP address, select from the two bulleted options below:

- *IP configuration automatically from a DHCP server on the WAN Using DHCP.*

(1) Click the radio button to select this option.

- *Configure IP Routing manually.* This procedure requires the following:

(1) Click the radio button to select this option.

(2) Enter a unique **IP Address** in the field provided.

(3) Enter a unique **Subnet Mask** in the field provided.

If IP routing enabled is selected, click to select the following options:

- **NAT Enabled** - Network Address Translation (NAT) allows multiple workstations on your LAN to share a single, public IP address. All outgoing traffic appears to originate from the router's IP address.
- **Block Net BIOS Traffic** - NetBIOS is a PC networking protocol that can keep network connections open inadvertently. To avoid excess connection charges, such traffic should be blocked on any metered network service.

Step 4 Click **Next** to proceed with Easy Setup, [Dynamic Host Configuration Protocol](#) configuration (see [page 2-14](#)).

Task Complete

RFC 1483 MAC Encapsulated Routing

Selection of RFC 1483 MAC Encapsulated Routing (MER) will display the following *RFC 1483 MER Networking configuration* page.

Current User: superuser

RFC 1483 MER Networking

Bridging designates that all traffic to remote hosts that is not routed will be forwarded.

IP Routing routes IP traffic to remote hosts.

The **IP address and Subnet Mask** define the IP address and network of the interface. This information is required in order to use NAT.

The **Default Gateway** is the IP address of the next-hop router.

Network Address Translation (NAT) makes all connections appear to originate from the IP address of this interface.

NetBIOS is a PC networking protocol that may keep connections open inadvertently, thus incurring excess charges in fee-for-service agreements.

RFC 1483 MER Networking

Bridging enabled

Only bridge PPPOE traffic

IP routing enabled

Obtain configuration automatically from WAN using DHCP

Configure IP Routing manually

IP Address

Subnet Mask

Default Gateway

NAT enabled

Block NetBIOS traffic

To continue the Easy Setup procedure with RFC 1483 MER, continue with the following steps:

Step 1 Click to select one of the following.

- ***Bridging enabled***
- ***IP routing enabled***

If bridging is selected, all traffic to remote computers that is not routed will be bridged. Next, continue to [Step 2](#).

If IP routing enabled was selected, an IP address and subnet mask must be obtained; proceed to [Step 3](#).

 **NOTE:**

If your Network Service Provider has not provided specifics for use in making these settings, select the following *IP Routing*, *Obtain configuration automatically from WAN*, and *NAT enabled*.

Step 2 Optional, click to select *Only bridge PPPoE traffic*. Proceed to [Step 4](#).

Selection of this option will allow only PPPoE traffic to be bridged, all other traffic will be dropped.

Step 3 Obtain an IP address, select from the bulleted options below:

- *Obtain configuration automatically from WAN using DHCP*

(1) Click the **radio button** to select this option.

- *Configure IP routing manually*. This procedure requires the following:

(1) Click the **radio button** to select this option.

(2) Enter a unique **IP Address** in the field provided.

(3) Enter a unique **Subnet Mask** in the field provided.

If IP Routing enabled is selected, click to select the following options:

- **NAT Enabled** - Network Address Translation (NAT) allows multiple workstations on your LAN to share a single, public IP address. All outgoing traffic appears to originate from the router's IP address.
- **Block Net BIOS Traffic** - NetBIOS is a PC networking protocol that can keep network connections open inadvertently. To avoid excess connection charges, such traffic should be blocked on any metered network service.

Step 4 Click **Next** to proceed with Easy Setup, [Dynamic Host Configuration Protocol](#) configuration (see [page 2-14](#)).

Task Complete

Dynamic Host Configuration Protocol

The next step in Easy Setup is configuration of DHCP. DHCP dynamically assigns IP configuration information to PCs on the LAN, thus avoiding the need to set IP configurations for each PC manually. For more information on DHCP, see “[DHCP \(Dynamic Host Configuration Protocol\)](#)” on page 4-2.

This configuration form also provides for configuration of DNS (Domain Name Service). DNS maps host names to IP addresses. The Easy Setup *DHCP* Configuration page is shown below.

Current User: superuser

Dynamic Host Configuration Protocol (DHCP)

DHCP assigns IP configuration information to hosts on the LAN thus avoiding the need for manual setup.

Domain Name Service (DNS) maps names to addresses.

The **Domain Name** identifies the default network name.

Domain Name Servers map host names to IP addresses.

Windows Internet Naming Service (WINS) maps NetBIOS names to IP addresses.

Dynamic Host Configuration Protocol (DHCP)

DHCP server enabled on LAN

Obtain DNS information automatically

Configure DNS manually

Domain Name

Primary DNS Server

Secondary DNS Server

Primary WINS Server

Secondary WINS Server

To continue the Easy Setup procedure by configuring DHCP, continue with the following steps:

Step 1 Optional, click to select ***DHCP server enabled on the LAN.***

Selecting this option will allow the DHCP server to dynamically assign IP address information to all LAN-side machines.

Step 2 Configure Domain Name Service. Select one of the bulleted options

- *Obtain DNS information automatically*

Selecting this option will enable the DNS on the router. The DNS server address will be learned when DHCP client requests are placed over the WAN link.

- *Configure DNS manually*

Selection of manual DNS configuration requires a minimum of one *DNS Server Address* and a *Domain Name*. This information should be provided by the Service Provider. Enter the DNS information as described below:

- a. Enter the **Domain Name** in the field provided.
This sets the router's DNS domain name
- b. Enter the **IP address** of the *Primary DNS Server* in the field provided.
This establishes where DNS requests will be sent.
- c. Optional, enter the **IP address** of the *Secondary DNS Server* in the field provided.
This establishes where DNS requests will be sent if the primary DNS server is unavailable.
- d. Enter the **IP address** of the *Primary WINS Server* in the field provided.
The Windows Internet Naming Service (WINS) maps NetBIOS names to IP addresses similar to DNS. This establishes where WINS requests will be sent.
- e. Optional, enter the **IP address** of the *Secondary WINS Server* in the field provided.
This establishes where WINS requests will be sent if the primary server is unavailable.

Step 3 Click **Next** to continue Easy Setup.

Task Complete

Local Area Network Configuration

The final screen in Easy Setup is for Local Area Network (LAN) configuration.

Current User: superuser

LAN IP Configuration

The **IP Address** is the network address of the router. This address must be globally unique unless NAT is enabled.

Subnet Mask is used along with the IP address to determine whether or not the local IP traffic should be forwarded.

LAN IP Configuration	
IP Address	192.168.61.6
Subnet Mask	255.255.255.0

Previous Save and Reboot Cancel

To continue the Easy Setup procedure by configuring the LAN IP address, continue with the following steps:

Step 1 Enter the **IP Address** in the field provided.

The IP address is the network address of your router. This address must be globally unique, unless NAT has been enabled.

Step 2 Enter the **Subnet Mask** in the field provided.

The subnet mask is used along with the IP address to determine if specific LAN IP traffic should be forwarded to the WAN.

Step 3 Click **Save and Reboot**.

Changes made within the Easy Setup procedure will be saved and made persistent across system reboot functions. The router will reboot with the new configuration settings.



Step 4 On completion of the reboot process, you will be required to login. If after 3 minutes, the [Router Information Page](#) is not displayed, click the link in the restart message to establish the WMI connection at the new IP address. The message is shown below.

Your router will restart at <http://192.168.61.19/>. If your browser can not reload automatically in 3 minutes, please click the link. Thanks for waiting...

Task Complete

Additional Features

Several additional features are available that provide custom system operation as well as advanced router functions. To learn more about how to configure any of these features, select from the list below.

- **User Management** - The system supports role-based management of up to 15 users. Each user can have specified access and management privileges as described in [“User Authentication” on page 5-2](#) of the Technical Reference Guide. User management through the Web Management Interface (WMI) is also illustrated in [“User Management” on page 8-17](#). The number of user accounts can be increased through the optional [Radius](#) feature.
- **Access Control** - The Access Control feature restricts administrative access and control of your router to a select group of hosts. For additional information and procedures, refer to [“Controlling Remote Management” on page 5-15](#) in the Technical Reference Guide.
- **DHCP** - This feature manages your IP address pool. For additional information, refer to the Technical Reference Guide, [“DHCP \(Dynamic Host Configuration Protocol\)” on page 4-2](#) or to configure the feature via the WMI, [“DCHP Configuration” on page 8-35](#).
- **NAT** - Network Address Translation is used to translate addressing between the Local and Wide Area Networks. Three types of NAT are available. For more information, refer to the Technical Reference Guide, [“Network Address Translation \(NAT\)” on page 4-17](#) or to configure this feature via the WMI, [“NAT” on page 8-38](#).
- **SNMP** - SNMP provides for the exchange of messages between a management client and a management agent. These messages can be used to gather system status information or to set operational parameters where supported. SNMP is discussed in the Technical Reference Guide on [page 7-2](#), or can be configured through the WMI as described in [“SNMP” on page 8-41](#).
- **Router Clock** - Allows you to adjust the router clock. This can be performed via the WMI on the [“Router Clock Page” on page 8-34](#).
- **Feature Activation** - Optional system capabilities are available through the use of software "keys". These keys are entered in the system to enable a variety of system capabilities. To learn more about feature keys, [“Key Enabled Features” on page 4-29](#) of the Technical Reference Guide, or see [“Feature Activation” on page 8-26](#) for WMI procedures.
- **Firewalls** - Two types of firewalls are available on the router, one an IP filtering Firewall is described in [“IP Filtering” on page 5-23](#) of the Technical Reference Guide. Additionally, a key-enabled [Stateful Firewall](#) is available which provides a more robust, session-based firewall. The [Stateful Firewall](#) is described in the Technical Reference Guide, [page 5-34](#).

This page intentionally left blank.

CHAPTER 3

FREQUENTLY ASKED QUESTIONS

Which cable do I use to connect a new LAN device to the router?

If you are connecting your LAN device to one of the Ethernet ports on your router, use an RJ-45 cable.

The ports of the 5930 Ethernet switch will automatically sense whether the connection is to a PC, or to another hub or switch.

Can I connect the router to a 100Base-T hub?

Yes. Use either a straight through or a crossover cable. The router switch will auto-sense the connection and adjust accordingly.

What is the router password?

The router provides a role-based management solution with one initial user account; the default settings for this account are: username **superuser** and password **admin**.

You will be required to change the default password when you connect to the router for the first time using these default parameters.

What security options do I have?

A number of security options are available both as standard and key enabled features. These features include local security to protect access to the router, data security that protects local and remote traffic, and network security that protects the integrity of the network machines. For more information on the security features of your router, refer to the Technical Reference Guide, [Chapter 5, Security](#).

Can I have an FTP, Mail or Web server and use NAT?

Yes, but you need to configure your router appropriately using the NAT Setting screen or the Command Line Interface (CLI). By entering a remote system or addServer command, you can add FTP, Mail, NetMeeting or Web servers to your LAN. These can then be accessed from another LAN or the Internet while NAT is enabled.

What is MER?

MER (MAC Encapsulated Routing) allows your router to perform routing on the LAN side and bridging on the WAN side. MER is needed only when your Network Service Provider doesn't support IP routing. MER adds NAT functionality, thereby providing greater security and more IP addresses for your LAN than what is provided by your NSP.

Why can't I get a response after entering a URL in my browser?

If you do not get a response, try pinging the IP address. If you get a response to ping-
ing, then your Domain Name Service (DNS) is probably failing. You should contact
your NSP for DNS assistance. If you do not get a response, then try pinging the WAN
Gateway address (of your NSP) to confirm that your router can connect with the NSP.

If pinging fails, check the router's lights. The WAN lights on the router front should be
green. Also check your cable connections. If everything appears correct, check your IP
configuration and ensure that the gateway and LAN IP addresses match.

How can I connect my modem for dial backup if the connector on my dialup modem doesn't match the console port on the router?

You need the Dial Backup Cable Kit (part number 120-0501-001), available from the
Efficient Networks web site at the following address: <http://www.efficient.com>

My modem is not a V.90. Can I use it for dial backup?

Yes, you can use a non-V.90 modem with your router for dial backup. Be sure to use
the correct initialization string for your modem (consult your modem documentation).

CHAPTER 4

PRODUCT SPECIFICATIONS

Front Panel



Figure 4-1: 5930 Business Gateway Front Panel

Table 4-1: Front Panel Light Indications

Light	Color	Indications
Power	Green Off	Power is ON Power is OFF
Test	Yellow: Yellow flashing: Green: (2 sec blink) Off:	Running Power On Self Test Self Test Failure Self Test successful (heartbeat) Router is shut down
WAN	Yellow: Yellow flashing: Green: Off:	Establishing DSL modem link Establishing DSL throughput DSL modem link successful DSL modem link is shut down
LAN	Green flashing: Green: Off:	Data traffic detected LAN status - OK LAN status - Not OK

5930 Back Panel

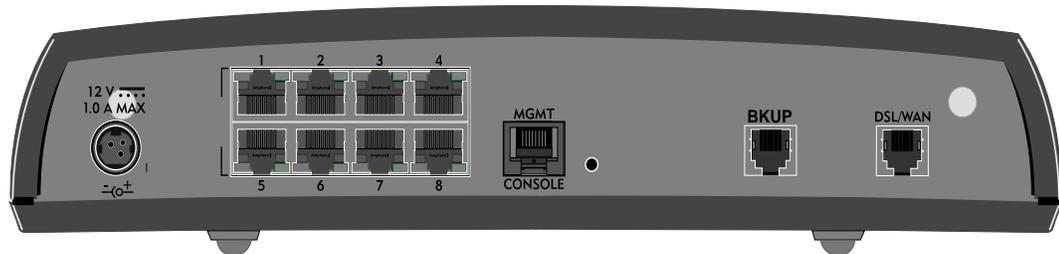


Figure 4-2: 5930 Router Back Panel

Table 4-2: 5930 Back Panel Port Functions

Connection	Function
Power	Uses a 12V DC/AC power adapter.
Ethernet Ports	Eight Ethernet T-100 switch ports (8-pin, RJ-45)
Management Port	This 8-pin, RJ-45 port provides RS232 connectivity for console connections or a dial backup analog (external) modem connection.
Backup	A 6-pin RJ-11 port connects the internal modem.
DSL/WAN Port	A 6-pin RJ-11 connects the DSL.

Hardware Specifications

Physical Specifications

- Dimensions: 11.75W x 6D x 2.25H inches
- 29.8W x 15.2D x 5.7H cm
- Weight: 1.5 lbs.
- .68 Kg.

Operational Environment

- Temperature: 40°F to 105°F
- 5°C to 40°C
- Humidity: 20% to 80% non-condensing

Power Requirements

- AC Voltage:100 to 120V AC or 220 to 240V AC
- Frequency:50/60 Hz
- Consumption:10W maximum

Processor

- Motorola® MPC855T
- 8 MB DRAM, 4 MB Flash Memory
- Motorola® MPC180 Encryption Processor

LAN Interface

- Built-in eight port Ethernet switch with RJ-45 connectors
- Green/Amber LEDs
- LAN speed of 10 or 100 Mbps, full or half duplex, with auto-sense switch

WAN Interface

- One Digital Subscriber Line interface as follows:
- ADSL, Annex A
- RJ-11 with 2-3 pinout (center pair)

Serial Interface

- One RS-232 asynchronous console or external modem port (RJ-45)

Agency Approvals

- CE Mark
- TUV
- Safety:UL 1950, CSA 22.2, EN 60950
- Emissions:FCC Part 15 Class B, EN55022
- Immunity:EN50082-1, EN55024

Software Specifications

Bridging

- Transparent bridging including Spanning Tree protocol (IEEE 802.1D)
- Bridge filters

Routing

- TCP/IP with RIP1 (RFC 1058), RIP1 compatible and RIP2 (RFC 1389) or static routing on the LAN or WAN
- Novell® IPX with RIP/SAP (RFC 1552)
- DHCP client (RFC 2132)
- DHCP server - Automatic assignment of IP address, mask, default gateway and DNS server addresses to workstations (RFC 2131, 2132)
- DHCP relay agent (RFC 1542)
- DNS relay
- Multiple subnets on LAN
- Virtual routing
- Virtual Router Redundancy Protocol (RFC 2338)

Configuration Management

- Easy Setup Web Management Interface
- Microsoft® Windows configuration management via SNMP
- TFTP download/upload of new software and configuration files
- Performance monitor
- Dynamic event and history logging
- Administration through HTTP, SNMP, Telnet or VT100 terminal
- Network boot uses the BootP server (RFC 2131, RFC 2132)

Differentiated Services - Quality of Service provisioning

- Weighted Fair Queuing (WFQ)
- Differentiated Services (DiffServ)

Dial Backup

- Internal V.90 modem¹
- Failover to external V.90 or ISDN modem via console port
- Web graphical user interface
- User selectable fail/restore criteria
- Optional modem connector (DB9 or DB25)
- Supports L2TP and IPSec tunnel failover

Asynchronous Transfer Mode (ATM)

- Encapsulation (IP, Bridging, and Bridge Encapsulated Routing) (RFC 1483)
- PPP over ATM (LLC and VC multiplexing) (RFC 2364)
- PPP over Ethernet
- Classical IP (RFC 1577)
- AAL5 for data
- Multiple Virtual Circuits (VCs)
- Virtual Circuit (VC) traffic shaping (UBR, VBR, CBR)
- L610 OAM F5 loopback

IP Address Translation

- Network renumbering (RFC 1631)
- Network Address Translation (NAT/PAT)
- LAN servers supported with NAT
- Support for NAT inside an IPSec tunnel

Protocol Conformance Testing

- RFC 1483 (Bay Networks™, Cabletron™, Cisco™, RedBack™)
- PPP over ATM (Cisco, Escalate™, RedBack) (RFC 2364)

PPP (RFC 1661)

- Data compression of up to 4:1 (STAC™ LZS) (RFC 1974)
- Van Jacobsen header compression (RFC 1144)
- Spoofing and filtering (IP-RIP, IPX-RIP, SAP, Watchdog, serialization)
- Automatic IP and DNS assignment (RFC 1877)
- PPP over Ethernet (RFC 2516)

Security

- Role-based management
- User authentication (PAP/CHAP) with PPP (RFC 1334, RFC 1994)
- Password control for Configuration Manager
- SNMP password and community name reassignment
- HTTP/Syslog/SNMP/Telnet port reassignment, access control list
- VPN support (L2TP, IPsec, IKE, DES, 3DES)
- Firewall (IP filtering)
- Stateful Firewall (ICSA Compliant)¹
- Secure Management Communications – IPsec and SSH
- Radius Server support
- Optional VPN Hardware Acceleration support ¹

¹ Key-Enabled feature

APPENDIX A

Support

For specific product support, contact the organization that provided or sold the equipment to you. If you need to contact your Network Service Provider for technical support, please have the following information ready:

- Router model number (on the bottom of the unit)
- Router software version. If you are unsure about your router's software version, it can be identified by one of the following methods:
 - To display on the command line, enter: ver
 - To display via the Web Management Interface, go to the Router Information Page (click Home)
- Web User Interface
- Date of purchase
- OS Type (e.g. Windows 95, 98, 2000, NT, MacOS, or Unix)
- A detailed description of the problem

End of Document

This page intentionally left blank.