SPEED TOUCH PRO

WITH FIREWALL

User Manual

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Contents

Welcome to the Speed Touch Pro with Firewall

Welcome to the Alcatel **Speed Touch™ *Pro* with Firewall** Asymmetric Digital Subscriber Line (ADSL) router.

With the Alcatel **Speed Touch™ *Pro* with Firewall** ADSL router, surfing the Internet, downloading files and interconnecting computer networks become a whole new experience.

With download speeds up to 8 Mega bits per seconds (Mbps) the **Speed Touch™ *Pro* with Firewall** is around 200 times faster than present day modems. This superior Alcatel ADSL technology outperforms all similar products on the market.

Next to the ADSL modem part, your **Speed Touch™ *Pro* with Firewall** features also a complete toolbox for excellent Local Area Network (LAN) performance. Among others the most important are a DNS server, a DHCP server, IP Routing. On top, a programmable firewall allows you to shield your local network from the Wide Area Network (WAN) and to protect your resources from intruders.

Safety instructions

Prior to connecting the **Speed Touch™ *Pro* with Firewall** , read the Safety Instructions in appendix G.

CAUTION

WARNING

The following words and symbols mark special messages throughout this document:

WARNING: indicates that failure to follow the directions could cause bodily harm or loss of life.

CAUTION: indicates that failure to follow the directions could result in damage to equipment or loss of information.

Trademarks

The following trademarks are used in this document:

- Speed Touch™ is a trademark of the Alcatel Company
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- UNIX® is a registered trademark of UNIX System Laboratories, Inc.
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Terminology

For readability, the **Speed Touch™ *Pro* with Firewall** will be referred to as ***Pro*** , or **STPro** further in this User Manual.

Service Provider

For readability, Service Provider (SP) will refer to all instances, responsible for your ADSL connections, i.e. ADSL Service Provider (ASP), Internet Service Provider (ISP), Corporate, etc.

PC, workstation, terminal, ...

For readability, PC will refer to all involved computer devices, which are able to interact with the *Pro*, i.e. Personal Computer (PC), workstation, (remote) terminal, etc.

Disclaimer

All examples throughout this document refer to :

- "Net 10" IP addresses for local network configurations
- VPI 0, or VPI 8 to identify the Virtual Path (VP) on the ADSL line.

However, your SP might prefer other values.

User Manual updates

Due to the continuous evolution of the Alcatel ADSL technology, existing products are often upgraded. Alcatel documentation changes accordingly.

For more information on the newest technological breakdowns and documents, please consult our Alcatel web site at:

http://www.alcatel.com

http://www.alcateldsl.com

1 Speed Touch Pro with Firewall Quick Guide

Aim of this Quick Guide

Use this chapter to quickly connect your *Pro* to the Internet.

In this chapter

1.1 Get Acquainted with your Speed Touch Pro with Firewall

Delivery check

Check your *Pro* package for the following items:

- The **Speed Touch™*Pro* with Firewall**
- 1 Power supply adapter with 2m (6.56ft.) connecting cable
- 2m Ethernet/ATMF straight-through cable (RJ45/RJ45)
- 2m ADSL cable (RJ11/RJ11, RJ14/RJ14)
- This User Manual, either in hard copy format, or on CD-rom.

Damaged or missing items

In the event of damaged or missing items, contact your local product dealer for further instructions.

Other materials

Your *Pro* shipping carton may also include release notes, safety and conformity declarations, and other materials.

Your STPro

Your Pro ADSL router is presented in a slim line box:

For a detailed information and a LED description, refer to Appendix D.

STPro models

Three Pro models can be identified:

- The single 10Base-T Ethernet port Pro model
- The dual port Pro model with both 10Base-T Ethernet port and ATM Forum-25.6 Mbps (ATMF-25) port
- The integrated10Base-T four port Ethernet hub Pro model.

To determine your model, refer to Appendix D.

POTS vs. ISDN

Ensure you have the correct Pro:

- A POTS Pro, connecting to an analog POTS line
- An ISDN Pro, connecting to a digital ISDN line.

See the marking label to identify your Pro.

To avoid damage to your equipment, use only the appropriate Pro.

1.2 Speed Touch Pro with Firewall Installation

Aim of this section

Execute the steps in this section and in no-time you are on the Internet.

In this section

1.2.1 What you Need

ADSL and telephone service

ADSL service must be enabled on your telephone line.

You need a central splitter, or distributed filters for decoupling ADSL, and telephone signals.

For more information, refer to Appendix B.

Ethernet port

To use the Ethernet port(s) you need at least:

- One PC/workstation with an Ethernet 10Base-T PC-Network Interface Card (NIC) installed.
- For local networking, a 10Base-T hub (if needed), and the necessary connection cables.

To use the (optional) ATMF-25 port you need:

- A PC/workstation with an ATMF-25 PC-NIC installed.
- For ATM networking, a workgroup ATM switch.

Accessing the STPro

For local configuration via HTTP/HTML, you need:

- A TCP/IP protocol suite
- A Web browser.

For native Command Line Interface (CLI) you need:

- A serial cable
- An ASCII terminal (VT100), or a PC with ASCII terminal emulation.

1.2.2 STPro Wiring

You must wire

- The Ethernet Port(s) (10Base-T)
- The (optional) ATMF-25.6Mbps Port (ATMF-25)
- The ADSL Port (Line)
- The Power Port (DC).

Ethernet port(s) (10Base-T)

Use the included LAN cable to wire your PC's Ethernet port to *Pro*'s Ethernet interface.

Refer to section 2.2 for more information.

(Optional) ATMF-25.6Mbps port (ATMF-25)

Use the included LAN cable to wire your PC's ATMF-25.6 port to the *Pro*'s ATMF-25.6 port.

Refer to section 2.3 for more information.

ADSL port (Line)

Use the included ADSL cable to wire the *Pro*'s Line port to your ADSL wall outlet.

Refer to section 3.2 for more information.

Power port (DC)

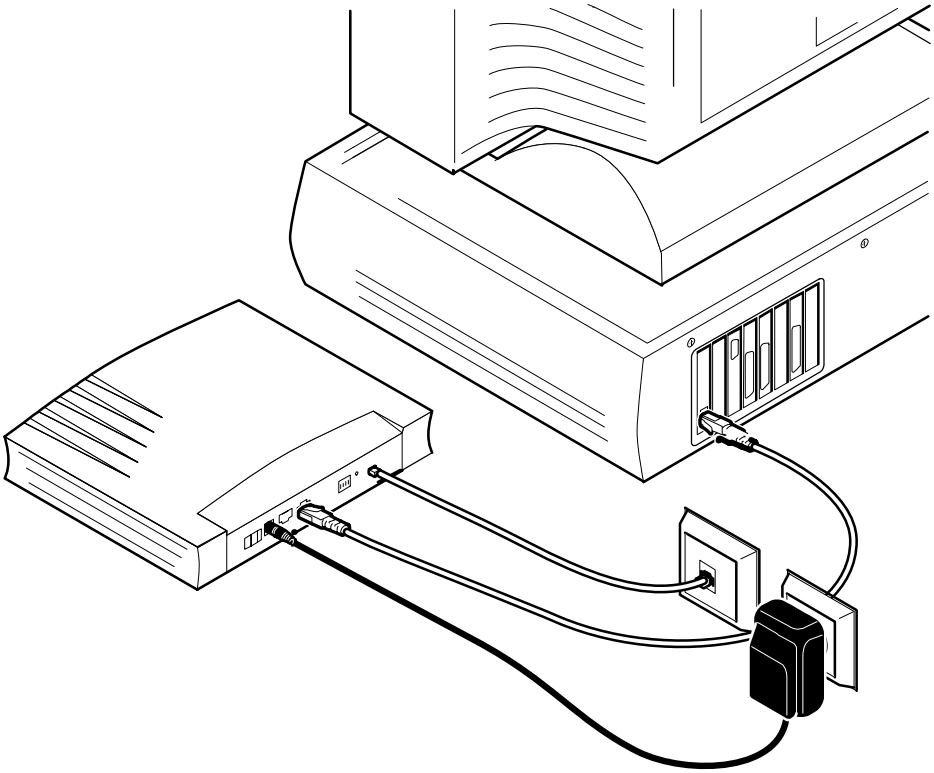
Only use the included power adapter to source your *Pro*. The *Pro* should be operated only from the type of power source, indicated on its marking label.

Refer to section 3.3 for more information.

If you are not sure of the regional power conditions, check the adapter's specifications in section F.3, and your local power company.

Check your wiring

After you finished wiring the *Pro*, the result should resemble the following figure:



Turn on your STPro

After completing all of the previous steps, you can turn on your *Pro*.

Refer to section D.3, for more information.

1.2.3 Check your Service Provider's Offering

Service Offering

The SP provides at least the following information:

- The *Virtual Channel Identifier*, that is, the **VPI/VCI** value of the VC to use on the ADSL line
- The ***Connection Service*** supported on this VC

Example: VPI/VCI = 0/35; Connection Service = PPPoE

Your *Pro* supports multiple simultaneous VCs on the ADSL line. If your SP exploits this capability, he will provide this information *per* VC.

Default STPro VPI/VCI settings

The VPI/VCI value of the default configured VCs are listed in Appendix E.

In the event that the provided VPI/VCI differ with the *Pro* defaults, you can change VC settings via the *Pro* web pages.

See section 11.3 for more information.

1.2.4 Select an STPro Packet Service

Connection service

As soon as you know the Connection Service on a VC, you can attach a Packet Service to it.

Following combinations are possible:

Connection Service	Packet Service
ETHoA (RFC1483 Bridging)	IEEE 802.1D Transparent Bridging
	MAC Encapsulated Routing
PPPoE (implies RFC1483 Bridging)	IEEE 802.1D Transparent Bridging (*)
PPPoA (RFC2364 PPPoA)	PPPoA-to-PPTP Relaying
	PPP & IP Routing
	PPP-to-DHCP Spoofing
CIP (RFC1483 Routing/RFC1577)	CIP & IP Routing

(*) A PPPoE Client application must also be installed on your PC.

Selection criteria

Criteria to prefer one Packet Service over the other for a given Connection Service are enumerated below.

- **ETHernet over ATM (ETHoA)**

  If your application relies on protocols other then TCP/IP, e.g. IPX/SPX, or PPPoE to name a few, select the **bridge**.

  Select **MER** if multiple users want to share the Internet connection.

- **PPP over ATM (PPPoA)**

  If your application relies on protocols other then TCP/IP, e.g. IPX/SPX, or NETBEUI, or if you want to avoid NAPT, select the **PPPoA-to-PPTP Relay**.

  If PPTP Tunneling is not supported by your PC's OS, and if you want to avoid NAPT, select **PPP-to-DHCP Spoofing**.

  For all other cases use **PPP & IP Routing**. This allows you to share the IP address obtained via PPP by the users on your LAN.

- **Classical IP (CIP)**

  In some special circumstances, advanced user can use the **CIP & IP routing** Packet Service.

1.2.5 Configure your STPro (If Necessary)

STPro access

In most cases your Pro provides instant Internet connectivity as it features well chosen defaults

In the exceptional cases, additional, or advanced configurations are desired, the Pro offers various access methods:

- Its web pages (See chapter 18)
- A Telnet CLI session (See subsection 19.2.1)
- A Serial CLI session (See section 19.2.2).

STPro Configuration

Configure the Pro via its web pages.

All packet services, the Pro's local networking tools, i.e. DHCP server, DNS server and IP router, and system setup tools, have their own web page.

Context related Help web pages provide detailed information.

For profound configurations the Command Line Interface (CLI) is provided.

1.2.6 Surf the Internet

Finishing setup

After wiring (and optionally configuring) your Pro, you are ready to surf the Internet.

Access Types

Depending on the used packet service(s), you can have:

- Always-On Access
- Dial-Up Access.

Always-on access

With Bridging, MER and CIP, no connection procedure is needed. Turn on your Pro, and our PC's web browser and you are Online, i.e. you are Always-on connected.

Note: Although no connection procedure is needed, in some cases the SP expects authentication before granting complete access to the remote side's resources.

Dial-up access

The Pro features also the traditional Dial-in connectivity. Now you can manually make a connection to the remote side, either via the Pro's web pages, in the case of PPP & IP Routing, or via Operating System (OS) dependent Dial-in applications, e.g. Microsoft's Dial-Up Networking, or a PPPoE session client application.

Note: During the connectioning procedure you will have to authenticate yourself, via a User Name and Password.

1.2.7 Detailed STPro Information

The STPro is more than "just" an ADSL router

Use the following parts (marked grey) of this manual to explore *Pro*'s advanced features:

Speed Touch™ *Pro* with Firewall

Wiring Guide

2 Wiring Guide – Ethernet and ATMF-25.6Mbps

In this chapter

2.1 LAN Cables

Included LAN cable

In your *Pro* package, a full wired straight-through RJ45/RJ45 cable, further referred to as LAN cable, is included.

Using LAN cables

You can use *LAN cables* other than the one provided in the box, e.g. crossover LAN cables, etc. However, make sure that these have the correct layout.

See section F.4 for more information on how to identify straight-through, and crossover LAN cables.

Note: As the included LAN cable is fully wired, it can also be used for connecting the *Pro*'s ATMF-25 port.

LAN cable types vs. port types

Determine the LAN cable type from the following table:

Port Type Interconnection	Type of LAN cable	Symbol
MDI-X to MDI ATM-Network to ATM-End	Straight-through	
MDI-X to MDI-X ATM-Network to ATM-Network MDI to MDI ATM-End to ATM-End	Crossover	

Devices and their ports

The *Pro*'s Ethernet port(s) is/are of type MDI-X; its ATMF-25.6 port is of type ATM-Network.

The PC's Ethernet port is always of type MDI, an ATM PC-NIC's port is always of type ATM-End.

The Ethernet hub's ports are always of type MDI-X; an ATM switch's ports are always of type ATM-Network.

2.2 Connecting Ethernet

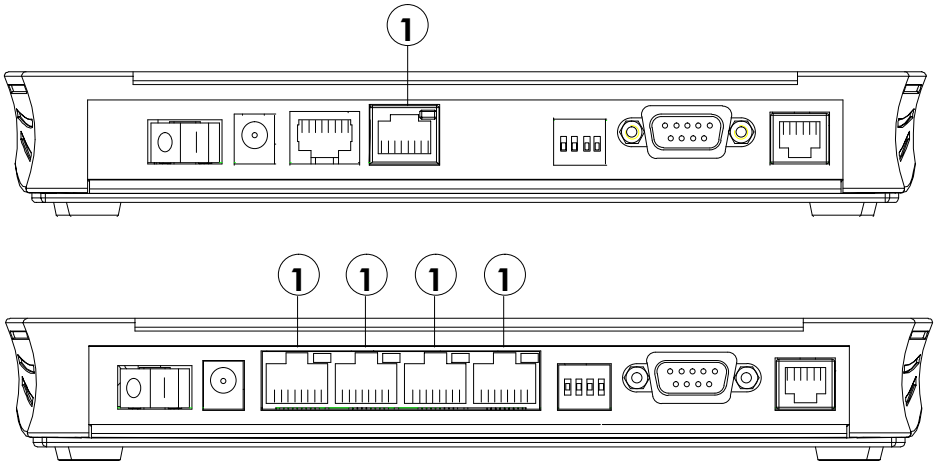
In this section

Topic	See
Ethernet Port(s) on your **STPro**	2.2.1
Single PC Ethernet Wiring	2.2.2
LAN Ethernet Wiring	2.2.2

2.2.1 Ethernet Port(s) on your STPro

Ethernet interfaces

Each Ethernet port (1) is a 10Base-T *Half Duplex* Ethernet interface of type MDI-X, connecting to either a single PC, or a workgroup hub.



STPro model Ethernet connectivity

The *Pro* models differ with regards to Ethernet configuration possibilities.

While the single, or dual port *Pro* model features one Ethernet port, the hub *Pro* model features an integrated 4-port hub.

The integrated hub allows you to create a new 10Base-T network, or to expand an existing LAN around your *Pro*, without the need of purchasing an extra external hub.

Ethernet on your PC

Your PC may have a built-in Ethernet port. If not, firstly install an Ethernet PC-NIC.

CAUTION

10Base-T Half Duplex Interfacing

Make sure the 10Base-T port(s) of your PC(s) are configured for either Auto Negotiation or Half Duplex.

Never configure the 10Base-T Ports for Full-Duplex !

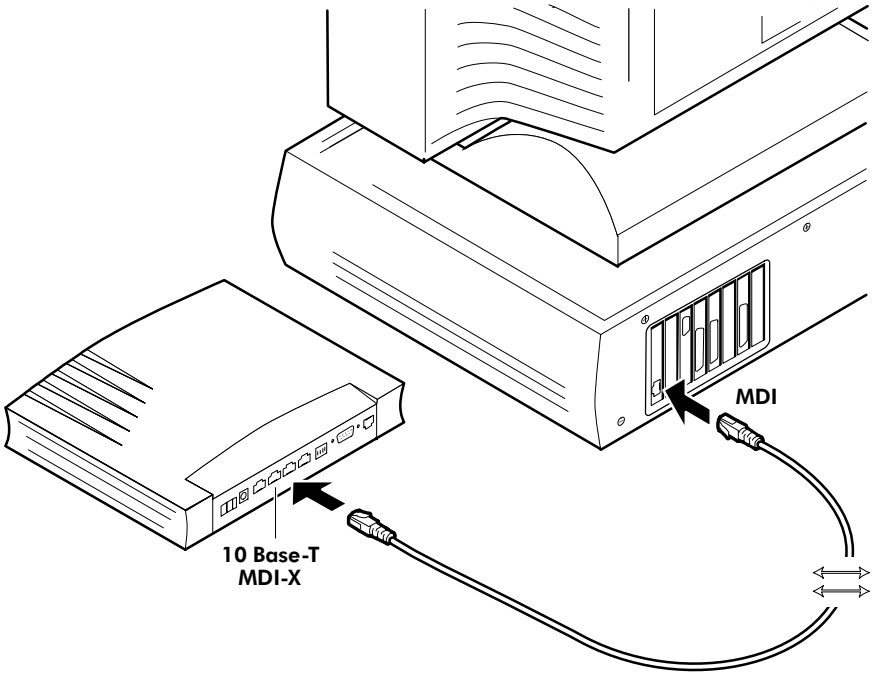
2.2.2 Single PC Ethernet Wiring

Single PC configuration

In this configuration the *Pro* is connected to a single PC. Your "LAN" consists of only one PC and the *Pro*.

Procedure

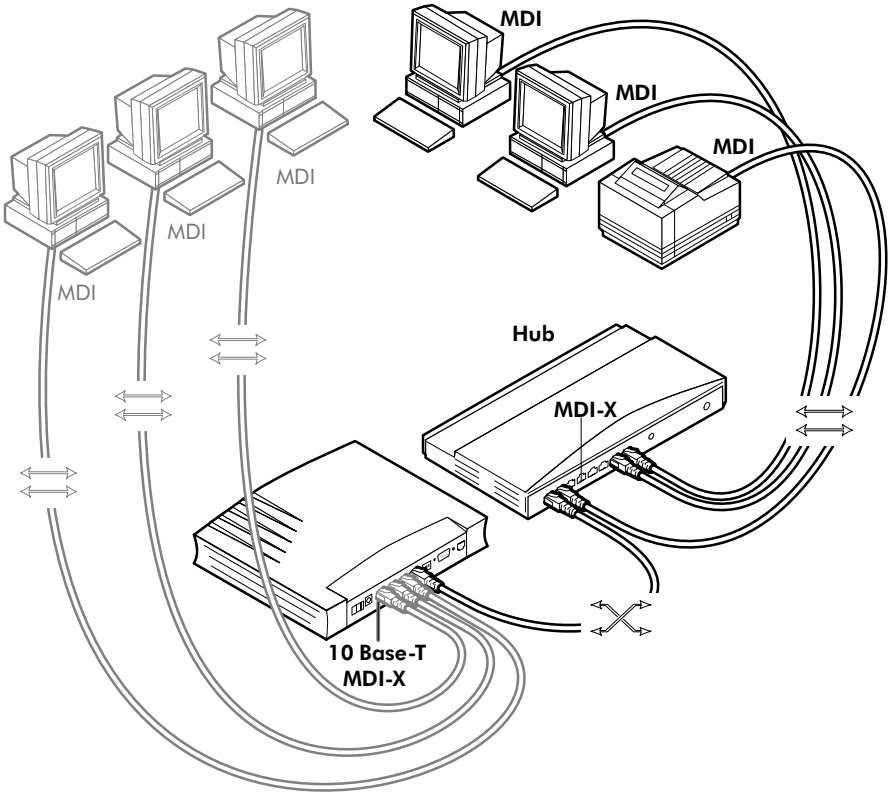
Proceed as indicated in the following figure to connect your *Pro* to a single PC:



2.2.3 LAN Ethernet Wiring

Procedure

Proceed as indicated in the following figure to make the connections for a LAN (*Pro* hub specific connections are shaded gray):



CAUTION

Cascading Repeating Hubs

Because of the limitations of Repeating Ethernet V2.0/IEEE802.3 hubs, the maximum number of *repeating* hubs cascaded in your LAN is four. This restriction does not apply to switching hubs.

MDI vs. MDI-X hub ports and the STPro

In the above figure example an MDI-X port on the hub connects the *Pro*. Therefore, a crossover LAN cable is used.

Note: On some hubs, an MDI port, indicated as “uplink” or “cascade” is present. This port can also be a switchable MDI/MDI-X Ethernet port.

2.3 Connecting the ATMF-25 Port (Optional)

Check your STPro model

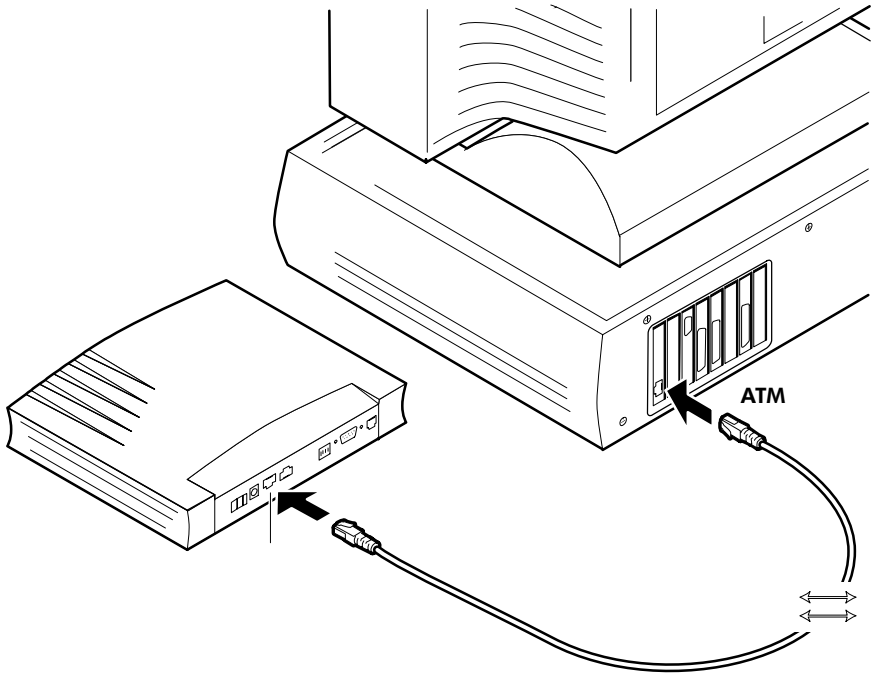
This connection procedure applies solely to the dual port *Pro* model.

ATMF-25 port

The ATMF-25 port on the single Ethernet port *Pro* model is an ATM Forum 25.6 Mbit/s compliant interface of type *"ATM Network Equipment"*; the PC-NIC's ATMF-25 port is of type *"ATM End Equipment"*.

Procedure

Proceed as in the figure to connect the *Pro* ATMF-25 port to your PC's ATMF-25 PC-NIC using the included straight-through LAN cable:



2.4 Ethernet vs. ATMF-25 Connectivity

Ethernet port(s)

Due to its inherent support for networking, Ethernet will be your natural choice for creating a small LAN.

ATMF-25 port

The (optional) ATMF-25 port provides excellent protocol transparency and native ATM application support.

Concurrent use of both ports

The dual port *Pro* model is designed for the concurrent use of both Ethernet and ATMF-25 ports. Networking configurations remain equally valid if the ports are used simultaneously.

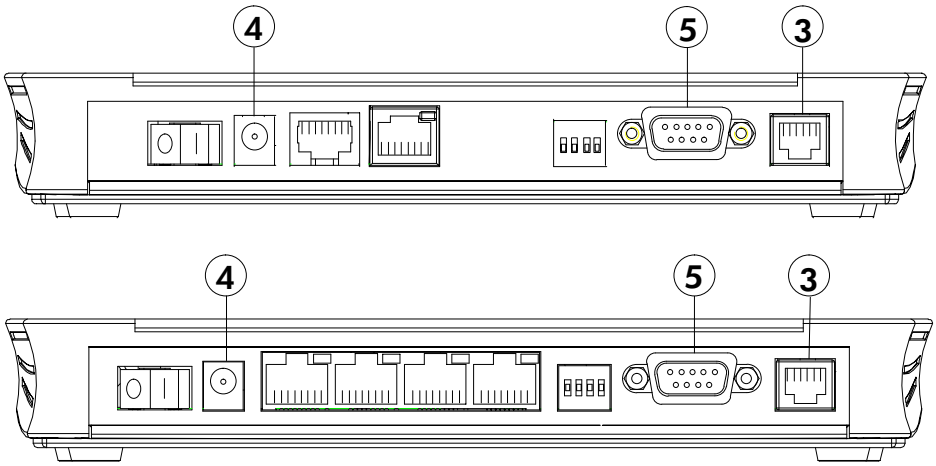
There is no performance penalty on this simultaneous use except for the sharing of the upstream and downstream ADSL bandwidth.

3 Wiring Guide – ADSL, Power and Console

In this chapter

3.1 Locating Ports

Port description



Following ports are used:

- (3): *ADSL line port*, marked “LINE”
- (4): *Power socket*, market “DC”
- (5): *Serial port*, marked “Console”.

3.2 Connecting the ADSL Port

Important information

Prior to connect the *Pro* to the ADSL line, read appendix B.

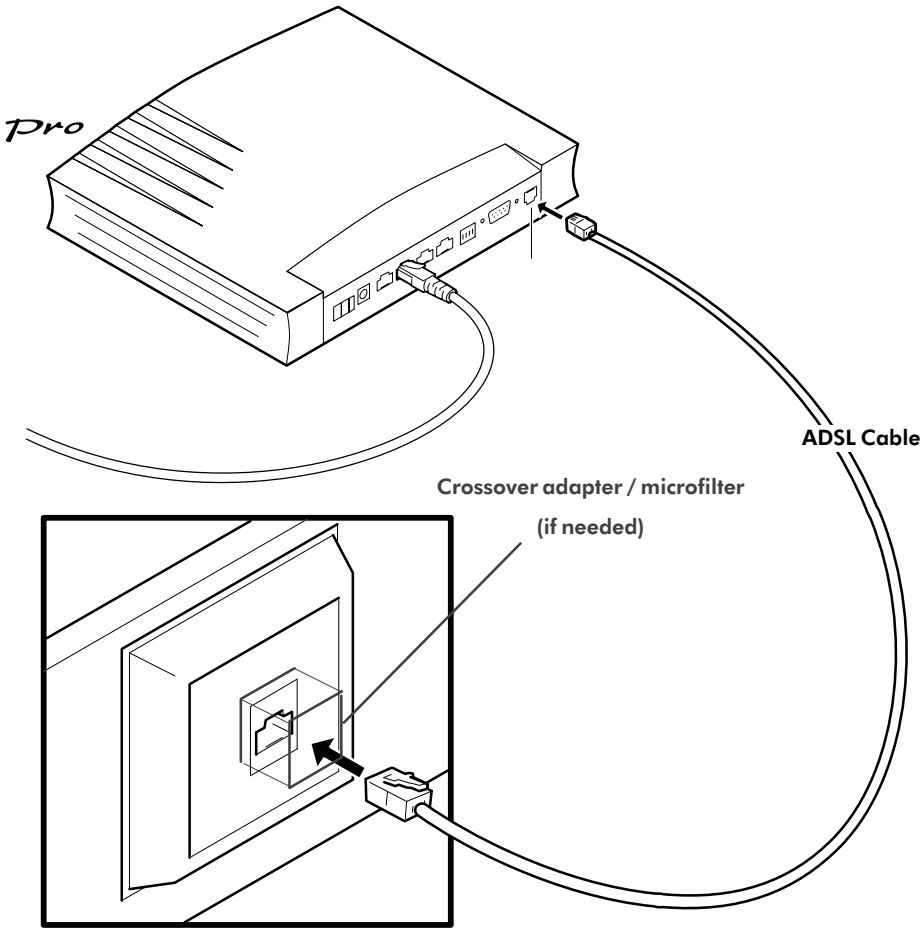
Preconditions prior to connecting

A **central splitter**, or **distributed filters** for decoupling ADSL and POTS, or ISDN signals must be installed. Crossover adapters might be required.

See appendix B for more information.

Procedure

Proceed as indicated in the following figure to connect the *Pro* to the ADSL line, using the included black ADSL cable:



3.3 Connecting the Power Adapter

Introduction

The *Pro* is delivered with a modular external power adapter converting the AC mains to $9V_{DC}$/1A unregulated output voltage.

Power adapter types

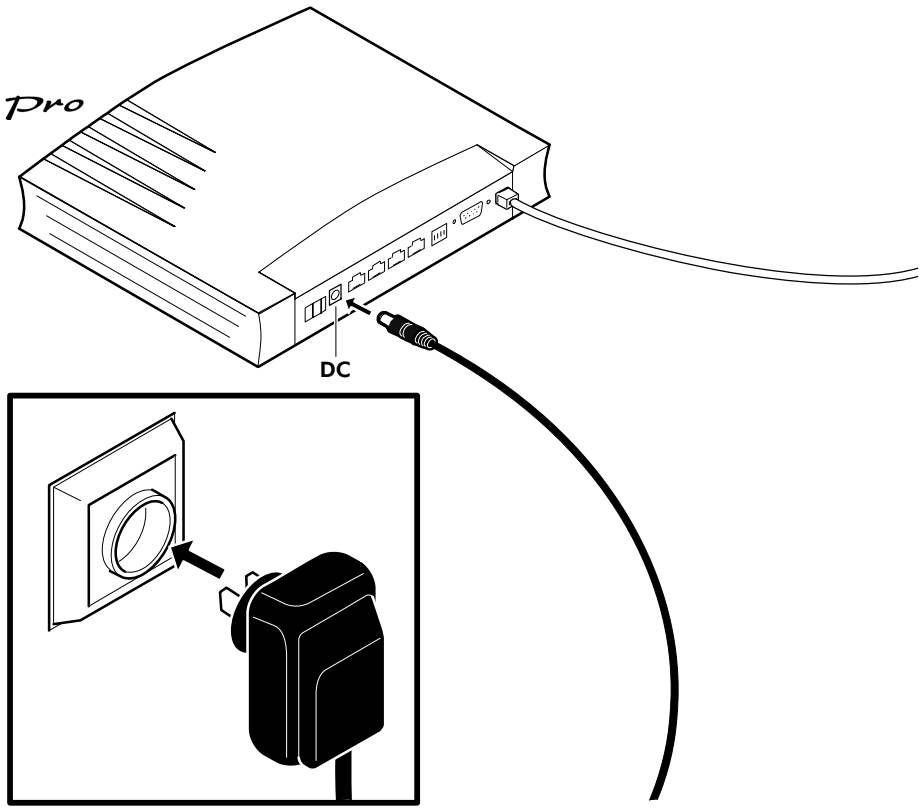
Check if the power adapter included in the *Pro* package is compatible with your local electrical power specifications.

See section F.3 for connector layout and output specifications.

If you are insure of the specifications of your local mains power, contact your local product dealer for more information.

Procedure

Proceed as follows to connect the power supply adapter :



3.4 Connecting the Serial Port (Optional)

Serial access

Like most routers, the *Pro* carries a serial port on its rear panel, featuring access from a remote host via a modem connection, or local access from a terminal.

Requirements for using the serial access

For access via the serial port, you must have the following:

- A serial cable
- An ASCII terminal (VT100), or a workstation/PC with ASCII terminal emulation, or emulation application, for local configuration via the CLI,

or

- A (voiceband) modem, for allowing remote configuration of the *Pro* via the CLI.

Procedure

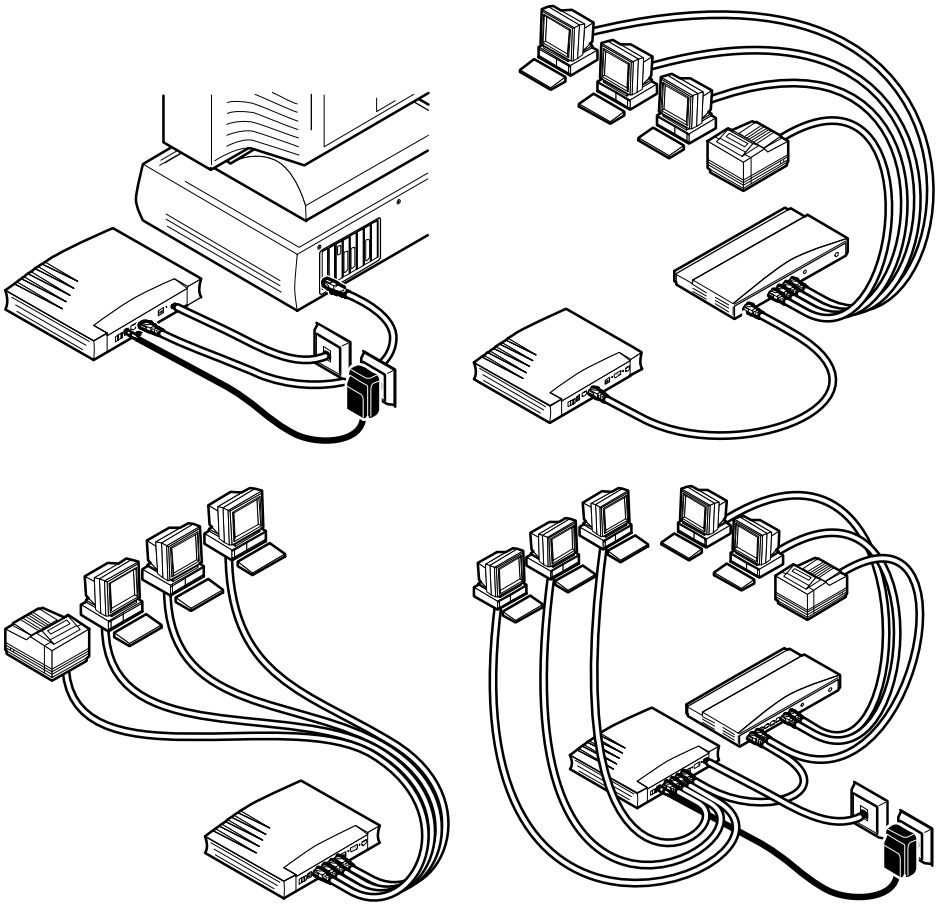
Proceed as follows to connect the *Pro* serial port:

Step	Action
1	Determine the serial port on the rear panel of your **STPro**.
2	Connect the serial cable to the **STPro** serial port.
3	Connect the other end of the serial cable to the serial interface of the (emulated) ASCII terminal, or modem.

4 Wiring Guide – Resumé

After wiring

After you finished wiring the *pro*, the result could resemble one of the following examples:



Speed Touch™ *Pro* with Firewall

Data Services

5 Data Services – Packet Services

Introduction

This chapter is about selecting the appropriate packet service for your application.

In this chapter

5.1 Supported Packet Services

What is a packet service ?

A *packet service* can be defined as:

"The actions that need to be performed on every data packet in order to filter or forward packets to the next device in the communication chain."

The STPro offers five types of packet services

- IEEE 802.1D Transparent Bridging
- MAC Encapsulated Routing
- PPPoA-to-PPTP Relaying
- PPP & IP Routing
- Classical IP & IP Routing.

Networking protocols

All examples in this manual, use the Transmission Control Protocol (TCP)/Internet Protocol (IP) suite because it is widely available (See chapter 12 for more information).

However, the *pro* ADSL router is a true multiprotocol device, as it is able to manage most other forms of protocols.

Examples in this manual

Only typical solutions are presented in this manual.

However, this does not prevent you from experimenting with various configurations and settings.

An optimal solution may be discovered through experimentation. You can also try a combination of the presented solutions.

5.2 Packet Services at a Glance

In this section

IEEE 802.1D Transparent Bridging

The *Pro IEEE802.1D Transparent Bridging* packet service offers complete protocol transparency and has inherent configuration simplicity. Yet it provides excellent forwarding performance.

MAC Encapsulated Routing

Next to the Bridge, the *Pro* contains an IP router.

The *Pro RFC1483 MAC Encapsulated Routing (MER)* packet service relies on standard IP Routing for its packet forwarding on the LAN side. However, to the remote access router on the WAN side, the *Pro* presents itself as a IEEE802.1D Bridge.

That way the remote side can be fooled, i.e. via Network Address & Port Translation (NAPT), the single public IP address, assigned to the MAC entity, i.e. the "Bridge", can be shared by multiple users on the local LAN.

PPPoA-to-PPTP Relaying

In contrast to Transparent Bridging, and MAC Encapsulated Routing, which both provide an "Always-On" type of connection, *PPPoA-to-PPTP Relaying (PPPoA/PPTP*), supports a session concept.

An important advantage of *PPPoA-to-PPTP Relaying* is that it avoids the complexity of a network router, yet to a certain extent, provides identical features.

PPP & IP Routing

Point-to-Point Protocol (PPP) combined with *IP routing* is the technology of choice to create a small IP based home-LAN.

Similar to PPPoA/PPTP, it provides a session concept. Additionally, IP routing combined with NAPT allows to multiplex users into a single VC.

CIP & IP Routing

The *Pro* IP router can also be combined with *Classical IP (CIP)*.

Classical IP is a mature technique for creating classical IP networks on top of ATM technology. It is widely supported by most, if not all remote access routers.

Although not the original aim of *Classical IP*, it is mostly used for connecting routers over wide area point-to-point links.

Selection criteria

The criteria below can help you to select the most appropriate packet service for your application:

- The configuration required by your SP
- The application protocol you wish to use (within the boundaries of the remote end)
- The session aspect: an "Always-on" connection or a connection that is established when needed, i.e. "Dial-up"
- Connectivity to a single, or simultaneously to multiple remote network(s)
- Security features such as identification, authentication and encryption
- ADSL modem vs. ADSL gateway router model.

Simultaneous use of packet services

All packet services can be active at the same time without any restriction. The *Pro* can manage any combination of the five packet services simultaneously up to a maximum number of 12 configured virtual connections.

Note: For Transparent Bridging, the maximum number of configured Bridging ports is four.

Resumé

All *Pro*'s packet services can be summarized in the following table:

Port	Packet Service	Protocol	Chapter
10Base-T Ethernet	IEEE 802.1D Bridging	Multiprotocol	6
	MAC Encapsulated Routing	TCP/IP	7
	PPPoA-to-PPTP Relaying	TCP/IP, IPX/SPX, NETBEUI	8
	PPP & IP Routing	TCP/IP	9
	CIP & IP Routing	TCP/IP	10
ATMF-25.6	ATM Cell Relaying	The functionality of ATM Cell Relaying depends on the capabilities, offered by the drivers included with the ATMF-25.6 PC-NIC.	

5.3 Internet & Corporate Intranet Access vs. LAN-to-LAN Interconnection

Exemplary applications using ADSL

This manual highlights the two most prominent ADSL applications:

- *High speed Internet access, or corporate Intranet access*
- *Private Wide Area Network (WAN) / Local Area Network (LAN) interconnection*

Internet & corporate access

Although the objective (Internet vs. Intranet access) is different, the networking model/configuration is almost identical.

Traditionally, the user must open a session by dialing into a remote access server. Prior to accessing the resources, this remote server will ask for the user's credentials.

The most appropriate *Pro* configurations are:

- PPPoA-to-PPTP Relaying (See chapter 8)
- PPP & IP Routing (See chapter 9).

LAN-to-LAN interconnection

Multiple PCs on a LAN are interconnected via public, or private wide area ADSL/ATM networks to devices on remote LANs.

In the LAN-to-LAN scenario, users are less concerned about a session concept. Their networking experience should be as if they are part of a large and widely dispersed LAN.

The most appropriate *Pro* configurations are:

- IEEE 802.1D Transparent Bridging (See chapter 6)
- MAC Encapsulated Routing (See chapter 7)
- Classical IP & IP Routing (See chapter 10).

Selecting the packet service

In the case of Internet, or corporate access, your SP will usually determine which networking model to use. In the LAN-to-LAN scenario you determine the end-to-end set-up yourself.

Independent of your application, the protocols supported at both ends of the connection must be mirror images of each other for successful communication.

5.4 Direct Networking vs. Dial-up Networking

In this section

- What is Direct Networking
- Comparison with LAN Networking
- What is Dial-Up Networking
- *Pro* & Networking
- ATMF-25 Port & Networking
- Ethernet Port(s) & Networking.

What is direct networking ?

Direct networking refers to how the network connection is experienced by the user. The connection is continuously active, thus no actions need be performed.

Powering on the local PCs and the *Pro* is enough to enable the user to interact with the network, once the initial configuration is done.

Comparison with LAN networking

Direct networking is what is typically experienced on a LAN. Initial configuration of all networking nodes in the end-to-end network is still required, but this is performed only once, i.e. when the service is enabled.

What is dial-up networking ?

In this mode, there is no initial connectivity. You must explicitly request a connection by dialing up to the remote access server.

The remote side will require you to identify and authenticate yourself.

STPro vs. networking

The *Pro* supports both direct networking, and dial-up networking solutions, independently whether you are using the Ethernet, or the ATMF-25 port.

ATMF-25 port & networking

Due to the transparent character of the ATMF-25 port, it allows both networking modes to be used.

The PC applications will actually determine whether you use the direct networking, or the dial-up networking mode.

Ethernet port(s) & networking

For the Ethernet port the scenario is more complicated as you will see below:

- Direct and continuous connectivity is accomplished via the IEEE 802.1D transparent databridge, in the *Pro*.

  See chapter 6 for more information.

- MER provides continuous connectivity

  See chapter 7 for more information.

- PPPoA-to-PPTP Relaying dial-up networking relies on the standard PPP protocol family and local tunneling, using the industry PPTP protocol.

  See chapter 8 for more information.

- PPP & IP Routing provides dial-up networking.

  See chapter 9 for more information.

- CIP & IP Routing provides continuous connectivity.

  See chapter 10 for more information.

5.5 ADSL Modem vs. ADSL Gateway

Introduction

In the configuration where multiple PCs reside on a common LAN, they must share a gateway for specific services. The most important service is ADSL for accessing the outside world.

The *Pro* can be used as a fast ADSL modem, leaving the gateway tasks to another LAN member.

However, the *Pro* is able to act as an ADSL gateway router itself. The latter is often called *home* or *residential* gateway.

Note

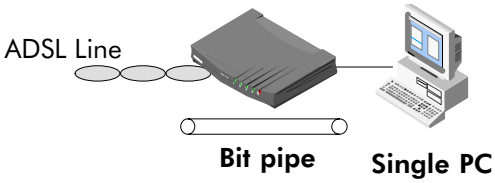
The boundaries between the ADSL modem model and the ADSL gateway function are not as clearly defined as explained in this section. They are portrayed that way to focus the attention on both models.

In this section

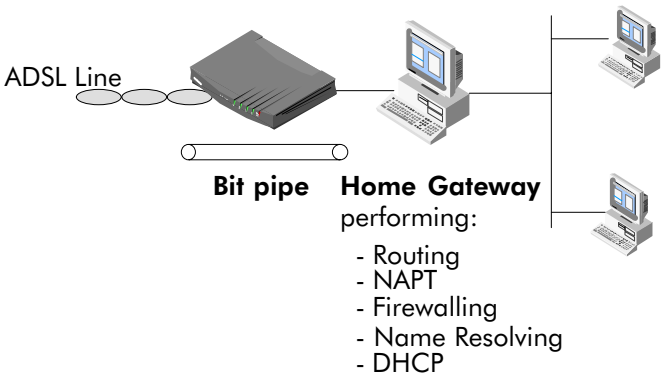
5.5.1 ADSL Modem Model

ADSL modem model

The *Pro* in this role, provides connectivity to either a single PC: or to a dedicated home gateway:



Or to a dedicated home gateway:



Role of the STPro

The desired functionality of the *Pro* ADSL router in this model, is maximum transparency. Packets arriving on inbound ports must be forwarded transparently to outbound ports. All intelligent decisions will be made in either the single PC, or the home gateway.

In fact, this functionality has been offered by voiceband modems for a long time, but then with an important speed limit.

Packet services and STPro ADSL modem model

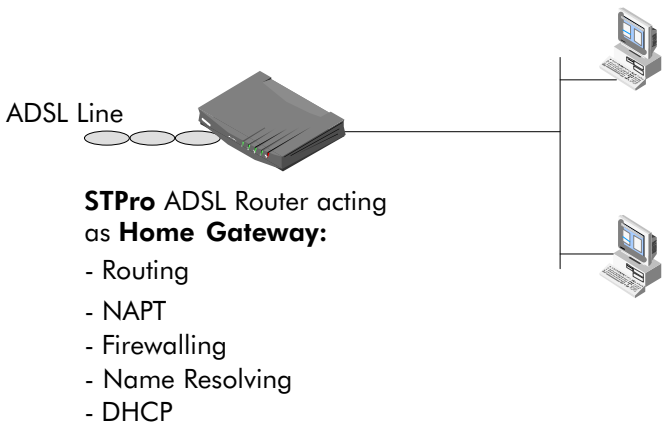
The IEEE 802.1D transparent databridge, the PPPoA-to-PPTP relay and the PPP-to-DHCP Proxy – all bound to the Ethernet port and the ATM switching capabilities of the ATMF25.6 port –, adhere best to this model.

5.5.2 ADSL Gateway Model

ADSL gateway model

The gateway to access the outside world can be a dedicated PC as shown in subsection 5.5.1.

However, the *Pro* itself is designed to act as a cost effective ADSL gateway.



Role of the STPro

To perform the gateway tasks itself, the *Pro* has, in addition to the ADSL modem part:

- An IP router (See section 12.4)
- A DHCP server (See subsection 12.1.4)
- NAPT abilities (See subsection 9.4.6)
- A DNS server for local name resolving and DNS proxying (See chapter 13)
- A Firewall (See chapter 14)

Packet services and STPro ADSL gateway model

MER, PPP & IP Routing and CIP & IP Routing are ideally suited for the ADSL gateway model.

6 Data Services – Transparent Bridging

Introduction

The *pro IEEE802.1D Transparent Bridging* packet service offers complete protocol transparency and has inherent configuration simplicity. Yet it provides excellent forwarding performance.

In this chapter

6.1 Preparatory Steps

Features

IEEE 802.1D Transparent Bridging:

- Is platform and OS independent
- Is simple to configure and easy to use
- Is a true multiprotocol device
- In the Alcatel implementation, has no performance limitations
- Has no theoretical constraints on the number of attached users
  (There is a practical limit to achieve a reasonable performance, e.g. 16 PCs)
- Features concurrent access to multiple remote destinations
- Supports up to four concurrent Bridge ports.

What you should know in advance

- The **VPI/VCI** value of the VC(s) to use on the ADSL line
- **ETHoA connection service** must be supported on this VC
- Whether IP configuration is static, or dynamic (**DHCP**)

STPro

The *Pro* comes with four preconfigured Bridging/MER phonebook entries, i.e. *Br1* ... *Br4*.

If the SP(s) impose settings which differ from the *Pro* defaults, perform the necessary adjustments via the *Pro* web pages.

See section 6.3 for more information.

PC(s)

The *Pro*'s Transparent Bridging packet service does not impose specific requirements to your PC's networking protocol layers. However, ensure that the applied protocols are properly installed and configured on your PC.

TCP/IP

For TCP/IP, your SP will assign you either static IP parameters (per PC), or will instruct you to enable DHCP on your PC(s).

CAUTION

Transparent Bridging and DHCP

If the SP requires you to use DHCP on your local PC(s), you must disable the *Pro* DHCP server.

This is to avoid conflicts between two DHCP servers, i.e. the *Pro* DHCP server and a remote DHCP server, being active at the same time.

See subsection 12.3.3 for more information.

6.2 Using Bridging

Using Bridging

From this point on, using Transparent Bridging is rather straight-forward. Turn on both your *Pro* and PC, start your Web browser and you are on the Internet.

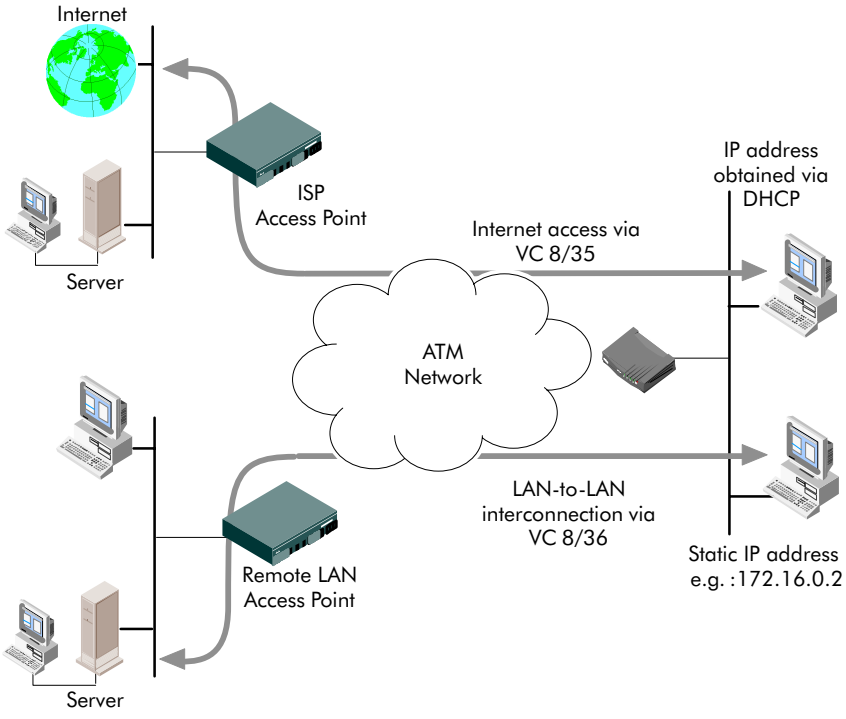
Always-on and credentials

This form of remote network access is sometimes referred to as "Always-on". No connection procedure must be performed prior to connectivity. However, the remote organization might present you with a welcome screen asking for a user name and password prior to granting access to secured servers or the Internet.

Configuration example

In the following figure an example configuration is given:

- One PC is connected to an ISP
- Another PC is connected to a remote LAN.



6.3 Bridging Configuration

Introduction

The *Pro* allows local configurations via the *Pro* web pages.

This section describes the configuration of Bridging entries, and the use of the *'Bridging'* web page.

In this section

Topic	See
Bridging Phonebook Entries	6.3.1
Bridging Entries	6.3.2

6.3.1 Bridging Phonebook Entries

Bridging phonebook entries

Central to the *Pro* VC pool management, is the *'Phonebook'* web page.

The *Pro* in its default state features the following Bridging/MER related phonebook entries:

Name	Address	Type	AutoPVC	Avail	Action
Br1	8.35	bridge	No	yes	Delete
Br2	8.36	bridge	No	yes	Delete
Br3	8.37	bridge	No	yes	Delete
Br4	8.38	bridge	No	yes	Delete
Use input fields below to add a new entry					
		any	-	-	Add

Note: Both Bridging and MER share the same type of phonebook entries, i.e. **`bridge`**.

Adding/deleting phonebook entries

See section 11.3 for more information.

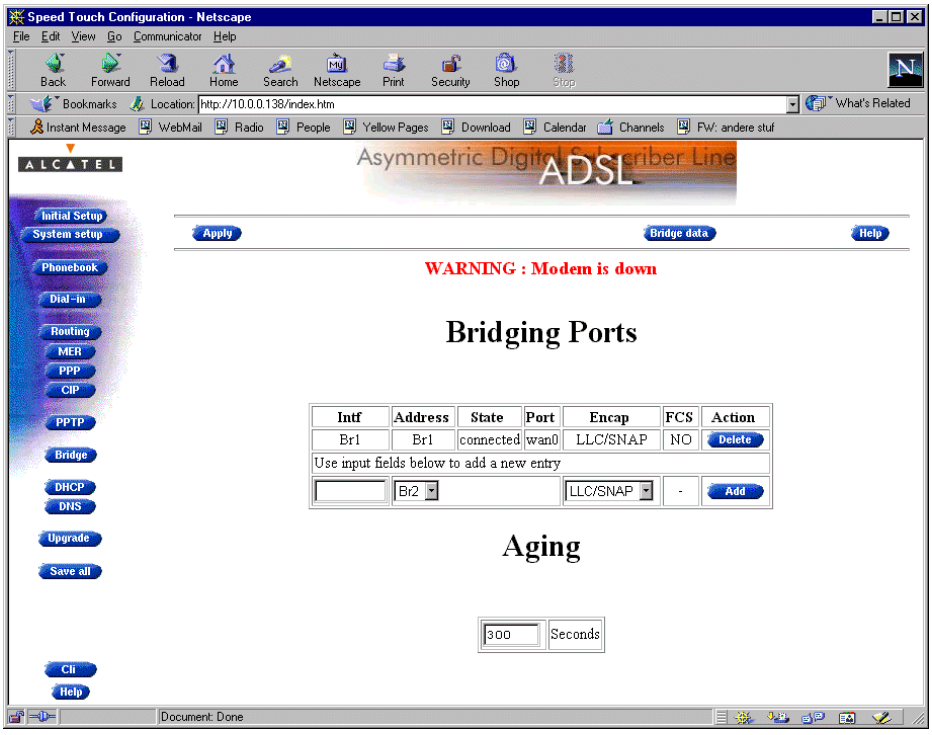
6.3.2 Bridging Entries

In this subsection

- The Pro *'Bridging'* Web Page
- The *'Bridging Ports'* Table
- *'Bridging Ports'* Table Components
- The *'Aging'* Box
- Adding Bridging Entries
- Deleting Bridging Entries.

The STPro 'Bridging' web page

Clicking Bridge in the left pane of the Pro web pages, pops up the *'Bridging'* web page (See section 18.2 for more information):



The 'Bridging Ports' table

The following figure shows the *'Bridging Ports'* table in its default state:

'Bridging Ports' table components

The following fields are shown:

Field	Description
Intf	Allows you to choose an interface name for the Bridge interface. **Note**: In most cases, the interface name will be the same as the phonebook entry name.
Destination	Indicates available Phonebook entries for Bridging. **Note**: Specific free MER/Bridging phonebook Entries are shown, as well as free 'any type' phonebook entries
State	Indicates the state of the individual LAN port. It can take following values:
Port	Indicates the name of the Bridge port on the WAN side: wan0, wan1, wan2, etc. by default.

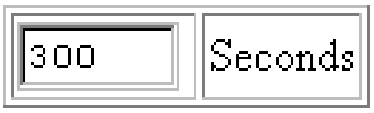
Value	Description
connected	The Bridge interface is attached to the Bridge port. In most cases this also implies that the Bridge port is connected and forwarding.
idle	The Bridge port only submits information to the filtering database. It does not participate in the relaying of frames.

Field	Description
Encap	Refers to the encapsulation, and decapsulation of Ethernet, or IEEE 802.3 frames in/from AAL5/ATM. The **STPro** is compliant with RFC 1483 "Multiprotocol Encapsulation over ATM Adaptation Layer 5" and supports both the LLC/SNAP method and the VC-MUX method for Bridged Ethernet V2.0/IEEE 802.3 PDUs. By default the encapsulation method is set to LLC/SNAP.
FCS	Is part of the RFC 1483 encapsulation method and indicates whether the last four bytes of the Medium Access Control (MAC) frames (mostly referred to as Ethernet or IEEE 802.3 frames) will be preserved or not. For all Bridge ports, the FCS is set to **NO** by default. However, via the CLI, you can set the FCS to **YES**. See chapter 19 for more information.
Action	Contains one of the two following action buttons:

Button	Action
Add	Add an entry to the list.
Delete	Delete an existing entry from the list.

The 'Aging' box

The following figure shows the *'Aging'* box of the *'Bridging'* web page:



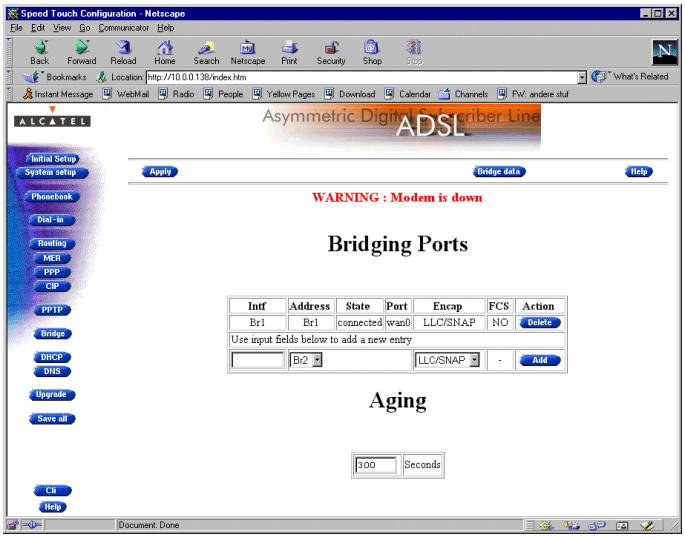
This box contains the aging timer of the bridge internal database.

If the aging time of a MAC entry has expired, this entry will be removed from the database.

Only in exceptional cases the default value of 300 seconds (5 minutes) needs to be modified. The allowed range is from 10 seconds to 12 days (IEEE 802.1D Bridging standard).

Adding Bridging entries

Proceed as follows:

Step	Action and Description
1	Browse to the *'Bridging'* web page.  The bottom row of the table allows addition of a new entry.
2	In the *'Destination'* column of the bottom row, click and select the Bridging entry you want to add to the table.
3	In the *'Encap'* column, click and select the encapsulation method for the connection, i.e. LLC/SNAP, or VC-MUX.
4	Click **Add** and **Save all** to finish the procedure.

Note

The maximum number of remote Bridging ports supported is 4. However, if no multiple connectivity is required, leave the configuration as is, to conserve ADSL upstream bandwidth.

Deleting Bridging entries

Proceed as follows:

Step	Action and Description
1	Browse to the *'Bridging'* web page.
2	Select the Bridging entry you want to delete, and click **Delete** and **Save all** to finish the procedure.

6.4 Advanced Bridging Concepts

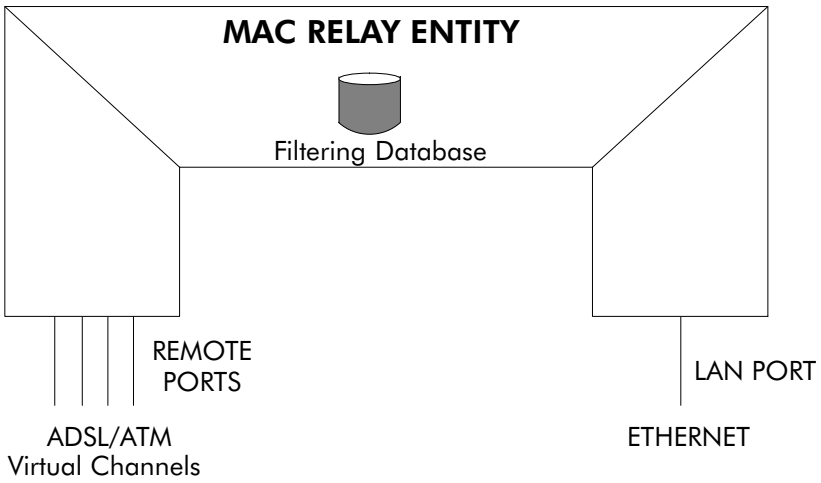
Bridging

Bridging is a LAN technology that transparently relays Ethernet frames between Bridging ports.

Depending on the destination MAC addresses of Ethernet frames, the bridge makes decisions whether to forward or discard frames.

Central to the operation of a databridge is its filtering database. All forwarding and filtering actions are based on information in this database.

Simplified bridge architecture



In this section

Topic	See
STPro Bridge Operation	6.4.1
STPro *'Bridge Data'* Web Page	6.4.2

6.4.1 STPro Bridge Operation

Introduction to bridge operation

This section describes how the *Pro* bridge operates. All of these operations have an impact on the entries in the filtering database of the bridge.

One of the characteristics of a databridge is the number of supported Bridge ports. A Bridge port is the logical equivalent of an interface. By default the *Pro* supports one local port, i.e. the Ethernet port, and four remote ports. The remote ports are mapped to virtual ATM channels on the ADSL line.

In this subsection

- Learning
- Aging
- Learning and Aging
- Flooding
- Forwarding
- Filtering
- Isolation
- Multiprotocol Bridging
- Number of Supported Devices.

Learning

If the bridge is turned on, the filtering database is empty. Over time it is filled with entries via the learning mechanism.

Ethernet frames arriving on any port are inspected for their source MAC address and put into the filtering database together with the port ID the frames arrived on.

Through this knowledge, it is able to keep traffic submitted to your local printer from crossing the bridge. Yet it allows frames belonging to sessions with remote machines to pass over the ADSL line.

Aging

Entries are aged, i.e. removed from the filtering database, after a certain time has elapsed (Aging time).

Learning and Aging

The learning and aging process make the bridge Plug & Play. Both keep the filtering database up-to-date with the current network configuration.

Example: Suppose a PC-NIC is replaced, the old MAC address is aged (and will be consequently discarded), while a new MAC address will be learned.

Flooding

If an Ethernet frame arrives, the destination MAC address is searched for in the filtering database. If the destination MAC address is not found (implying it is not yet learned), it is forwarded to all ports in the forwarding state, except the one the frame arrived on.

Note: Broadcast and multicast MAC addresses are always flooded.

Forwarding

If an Ethernet frame arrives with a destination MAC address that is found in the filtering database (implying it is already learned), it is forwarded to the port that is associated with that entry.

In contrast to flooding, forwarding is more selective.

Filtering

If the destination MAC address is found on the same port as the frame arrived on, it is filtered, i.e. silently discarded.

Indeed, it makes little sense to forward the frame on this port as the destination is directly connected to the source.

Isolation

The *Alcatel Multiport* bridge in the *pro* provides isolation between remote ports.

i.e. Frames (including broadcasts) arriving via ADSL/ATM ports will never be forwarded/flooded to another ADSL/ATM port.

Multi Protocol Bridging

Bridging actions are performed on MAC frames. The contents of the MAC frame is not of importance to the bridge.

Consequently it makes no difference whether your PCs or workstations use TCP/IP, Appletalk, IPX/SPX or any other protocol suite.

However, some operators might embed restrictions into the bridge. In this way only traffic that passes through the bridge filter will be allowed on the ADSL line.

Number of supported devices

Via the dynamic learning and aging mechanism of the bridge, the number of PCs that can be connected to either the local, or virtual ports is theoretically unlimited.

Practically, the filtering database can hold as many as 256 entries simultaneously.

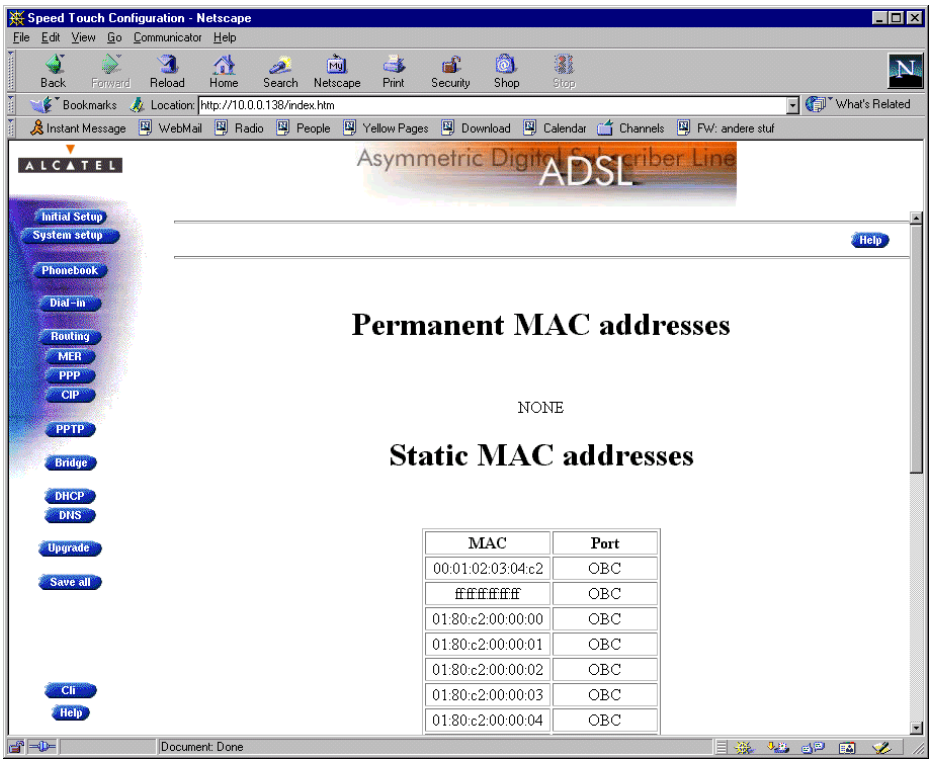
6.4.2 STPro 'Bridge Data' Web Page

Introduction

Transparent Bridging relies completely on its filtering database for managing the traffic, passing through the bridge. This filtering database is accessible via the *Pro* *'Bridging'* web page, and allows you to overview all MAC-layer entries.

The 'Bridge Data' web page

Clicking Bridge data on the *'Bridging'* web page pops up the *'Bridge Data'* web page:



Available 'Bridge Data' tables

The filtering database's MAC addresses are spread over 3 tables:

- The *'permanent MAC addresses'* table
- The *'static MAC addresses'* table
- The *'dynamic MAC addresses'* table.

Permanent MAC addresses

These are the MAC addresses that must always be resident inside the bridge, as stipulated in the IEEE802.1D standard:

- The *Pro*'s own MAC address:
  e.g. 00–80–9F–01–02–03
- The Broadcast MAC address:
  FF–FF–FF–FF–FF–FF
- The bridge group MAC address:
  01–80–C2–00–00–00
- The 16 reserved MAC addresses of IEEE802.1D:
  From 01–80–C2–00–00–01
  up to 01–80–C2–00–00–0F
- The all LANs bridge management group MAC address:
  01–80–C2–00–00–10

Static MAC addresses

This table list the MAC addresses you have added to the filtering database via the CLI. These MAC addresses, dedicated to a particular port, will never be aged by the bridge.

In principle, no static MAC addresses are to be configured.

Dynamic MAC addresses

This table lists all the MAC addresses that are currently learned by the *Pro* bridge.

While the learning process adds MAC addresses received on any of its ports, the aging process will swap them out of the table when their aging timer expired.

7 Data Services – MAC Encapsulated Routing

Introduction

Via the *Pro MAC Encapsulated Routing* packet service you can connect to an ADSL line supporting the ETHernet over ATM (ETHoA) connection service. In contrast to bridging though, packet filtering and forwarding is performed by the IP router of the *Pro* and consequently inherits all the features that come with IP.

In the following, MAC Encapsulated Routing will be referred to as MER.

Note: MAC is the standardized term for Ethernet.

In this chapter

7.1 Preparatory Steps

Features

MAC Encapsulated Routing:

- Is instantly replaceable with an IEEE Transparent Bridge
- Provides Always-on type of connections and is auto-configurable if DHCP is enabled
- If used in combination with NAPT, allows multiple users to share a single IP address
- When Firewalling is turned on, your local network is shielded for threats from the Internet.
- Supports up to 12 concurrent virtual channels assigned to MER.

What you should know in advance

- The **VPI/VCI** value of the VC(s) to use on the ADSL line
- **ETHoA connection service** must be supported on this VC
- Whether IP configuration is static, or dynamic (**DHCP**)

STPro

The *Pro* comes with four preconfigured MER/Bridging phonebook entries, i.e. *Br1 ... Br4*.

If the SP(s) impose settings which differ from the *Pro* defaults, perform the necessary adjustments via the *Pro* web pages.

See section 7.3 for more information.

PC(s)

For MER it is assumed that communication between the *Pro* and your PC(s) is performed via the Internet protocol.

You can:

- Enable the *Pro*'s DHCP server to enable dynamic IP configuration of your LAN
- Configure all LAN's IP settings statically.

7.2 Using MER

Using Bridging

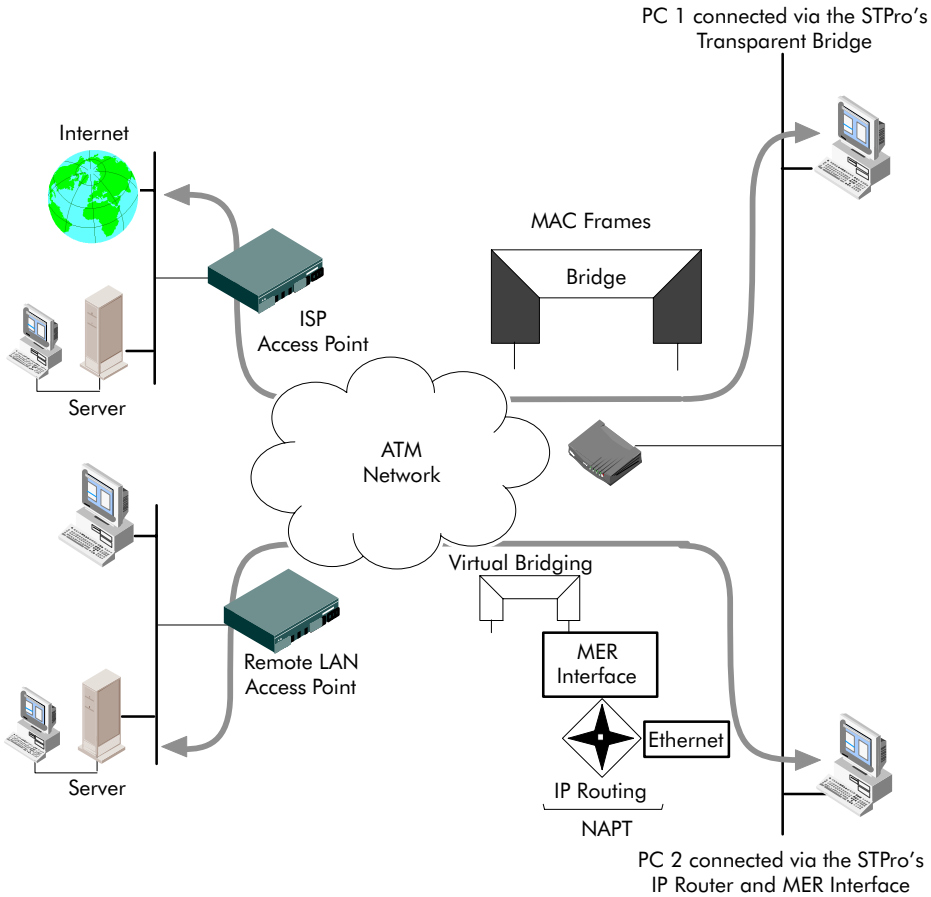
From this point on, using MER is rather straight-forward. Turn on both your *Pro* and PCs, and your connected to the remote access router.

Always-on and credentials

As MER presents itself as a Bridge, the connection behaves as for the Transparent Bridging packet service. No connection procedure must be performed prior to connectivity.

MER end-to-end architecture

In the following figure an example configuration of a Transparent Bridging connection, and a MER connection is given:



7.3 MER Configuration

Introduction

The *Pro* allows local configurations via the *Pro* web pages.

This section describes the configuration of MER entries, and the use of the *'MER'* web page.

In this section

Topic	See
MER Phonebook Entries	7.3.1
MER Entries	7.3.2

7.3.1 MER Phonebook Entries

MER phonebook entries

Central to the *Pro* VC pool management, is the *'Phonebook'* web page.

The *Pro* in its default state features the following MER related phonebook entries:

Name	Address	Type	AutoPVC	Avail	Action
Br1	8.35	bridge	No	yes	Delete
Br2	8.36	bridge	No	yes	Delete
Br3	8.37	bridge	No	yes	Delete
Br4	8.38	bridge	No	yes	Delete
Use input fields below to add a new entry					
		any	-	-	Add

Note: Both MER and Bridging share the same type of phonebook entries, i.e. **`bridge`**.

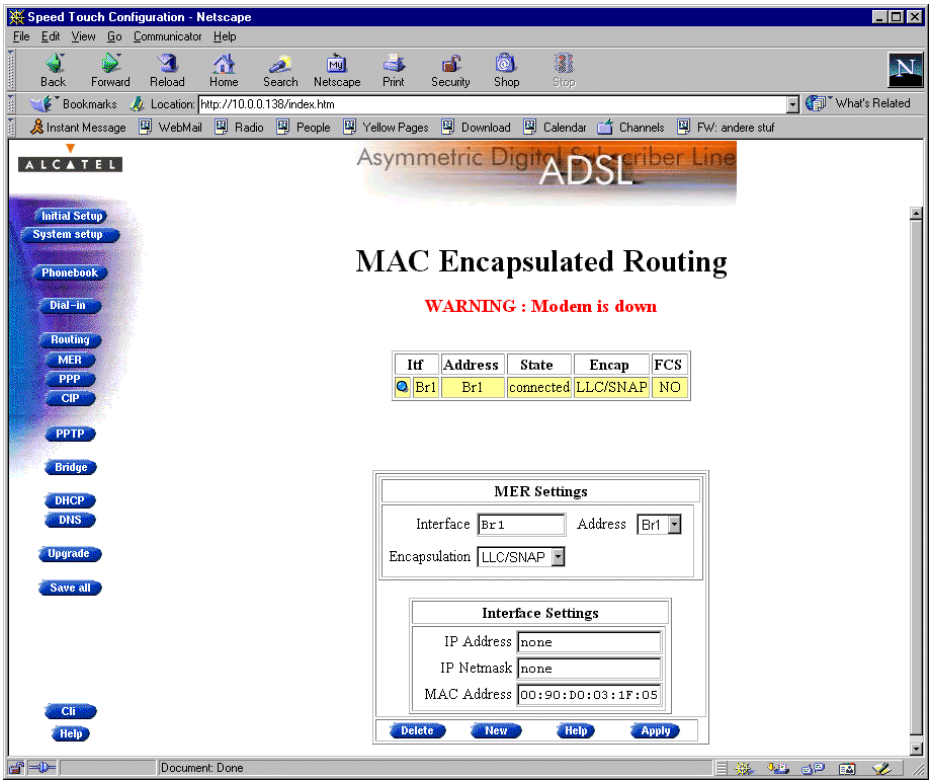
Adding/deleting phonebook entries

See section 11.3 for more information.

7.3.2 MER Entries

The STPro 'MER' web page

Clicking MER in the left pane of the *Pro* web pages, pops up the *'MER'* web page (See section 18.2 for more information):



The 'MER Connections' table

The following figure shows the *'MER Connections'* table:

Itf	Address	State	Encap	FCS
Br1	Br1	connected	LLC/SNAP	NO

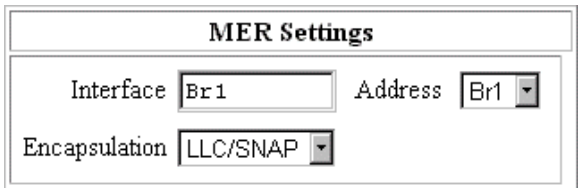
'MER Connections' table components

The following fields are shown:

Field	Description
 	Click the button next to the MER connection you want to configure. Selected MER connections are indicated by a yellow bar, and a button which is lit.
Itf	Indicates the interface name. **Note**: In most cases, the interface name will be the same as the phonebook entry name.
Address	Indicates the name you have chosen for the MER phonebook entry. **Note**: Specific free MER phonebook entries are shown, as well as free 'any type' phonebook entries
State	Indicates the state of the MER connection. It can take following values: **Value** / **Description** **Idle** – The MER interface has no WAN connection at this time. **Retry** – The MER interface tries to setup a WAN connection. **Connected** – WAN connectivity is achieved on this MER interface.
Encap	Refers to the encapsulation, and decapsulation of Ethernet, or IEEE 802.3 frames in/from AAL5/ATM. The **STPro** is compliant with RFC 1483 "Multiprotocol Encapsulation over ATM Adaptation Layer 5" and supports both the LLC/SNAP method and the VC-MUX method for Bridged Ethernet V2.0/IEEE 802.3 PDUs. By default the encapsulation method is set to LLC/SNAP.
FCS	Is part of the RFC 1483 encapsulation method and indicates whether the last four bytes of the MAC frames (mostly referred to as Ethernet or IEEE 802.3 frames) will be preserved or not. For all MER connections, the FCS is set to **NO** by default. However, via the CLI, you can set the FCS to **YES**. See chapter 19 for more information.

The 'MER Settings' table

The following figure shows the *'MER Settings'* table:



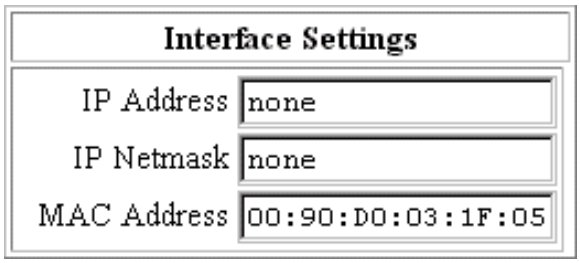
'MER Settings' table components

The following fields are shown:

Field	Description
Interface	Allows to enter an interface name for the MER connection. **Note**: You don't have to fill in a name for the MER interface. The name applied will be the same as the phonebook entry name.
Address	Indicates free MER phonebook entries, as well as free 'any type' phonebook entries.
Encapsulation	Allows to select the encapsulation method, i.e. LLC/SNAP (default), or VC-MUX.

The 'MER Interface Settings' table

The following figure shows the *'MER Interface Settings'* table:



'MER Interface Settings' table components

The following fields are shown:

Field	Description
IP Address	Allows to enter a static IP address for the MER connection. **Note**: In case no IP address is entered, the MER connection will receive an IP address from the remote access server.
IP Netmask	Allows to enter an associated IP netmask for the static IP address. **Note**: In case no IP address is entered in the IP address field, or no IP netmask is entered, the default associated netmask will be used.
MAC Address	Allows to enter a MAC address for the MER connection. This MAC address, visible for the remote access server, overrules the **STPro** MAC address. **Note**: In case no MAC address is entered, the source MAC address of the bridged frames is the **STPro** MAC address.

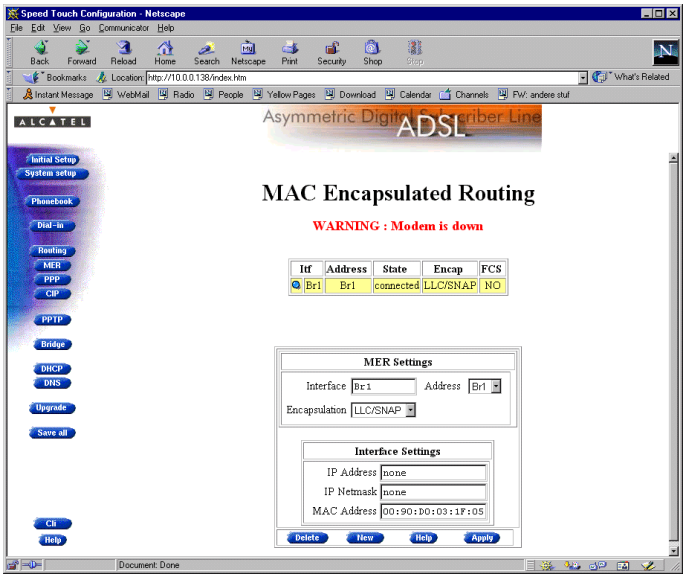
'MER Configuration' Buttons

The following buttons are available:

Field	Description
Delete	Deletes the selected MER connection.
Clear	If you create a new MER connection, this button allows to clear all configurational fields for the connection, i.e. returns them to their default settings.
New	Creates a new MER connection, in addition to (an) existing MER connection(s).
Add	Adds the configured MER connection to the '*MAC Encapsulated Routing*' table, i.e. "activates" the MER connection.
Apply	Applies changes you made to an existing MER connection. connection.

Adding MER entries

Proceed as follows:

Step	Action and Description
1	Browse to the *'MER'* web page. 
2	If the *'MAC Encapsulated Routing'* table is empty, i.e. you are creating the first MER connection, proceed with step 3. If you want to add a MER connection in addition to existing MER connections (see *'MAC Encapsulated Routing'* table), click **New**
3	In the *'Address'* field, click and select the (free) phonebook entry for your MER connection.
4	In the *'Encap'* column, click and select the encapsulation method for the connection, i.e. LLC/SNAP, or VC-MUX.
5	Optionally, enter the appropriate configuration in one, or more of the following fields: • the *'Interface'* field • the *'IP Address'* field • the *'IP Netmask'* field • the *'MAC Address'* field. **Note**: See topics 'MER Settings table' and MER Interface Settings table' in this subsection for more information.
6	Click **Apply** and **Save all** to finish the procedure.

Maximum number of MER connections

The *Pro* can manage up to 12 MER connections simultaneously. This can be achieved by deleting all other packet service entries.

Note: Check with your ASP, or corporate whether multiple end-to-end connectivity is enabled.

Reconfiguring an existing MER connection

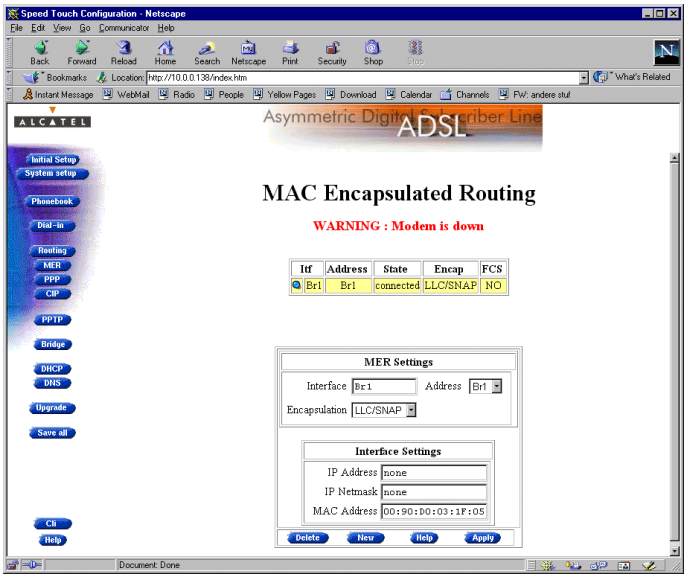
Click the selection button of a MER interface.

The settings shown in the *'MER Settings'* and *'MER Interface Settings'* table apply to the MER connection which is marked with a yellow bar and a selection button which is lit ( ).

Make the changes to the fields, and click Apply. Click Save all to make the changes persistent.

Deleting Bridging entries

Proceed as follows:

Step	Action and Description
1	Browse to the *'Bridging'* web page. 
2	Click the selection button of the MER connection you want to delete, and click Delete Click Save all to finish the procedure.

7.4 Advanced MER Concepts

In this subsection

- MAC Encapsulated Routing
- MER operation: From LAN to *Pro*'s IP router
- MER operation: From IP Router to MER
- MER operation: From MER to WAN
- Configuration and Operation Example.

MAC Encapsulated Routing

MAC Encapsulated Routing allows IP packets to be carried as bridged frames. The RFC1483 link protocol with MER is a multiprotocol encapsulation method over ATM. While the true IEEE802.1D Transparent Bridge is a hardware component of the *Pro*, for MER, the encapsulation method is implemented by software.

MER Operation: from LAN to STPro's IP router

In the PCs, IP packets are encapsulated in MAC frames, according their destination:

- For local networking, the destination MAC address is the one of the destination device, e.g. another PC
- For non-local traffic, the destination MAC address is that of the *Pro*
- In both cases, the source MAC address, is the MAC address of the source device, e.g. your PC.

All MAC frames arrive via the Ethernet segment in the *Pro*. It decapsulates the MAC frames and routes the IP packets, according their destination.

MER Operation: from STPro's IP router to MER

IP packets destinated for MER, can be subjected to NAPT, prior to end up in the appropriate MER interface

NAPT allows local LAN PCs to share the single static, or dynamically obtained public IP address for the MER connection.

MER Operation: from MER to WAN

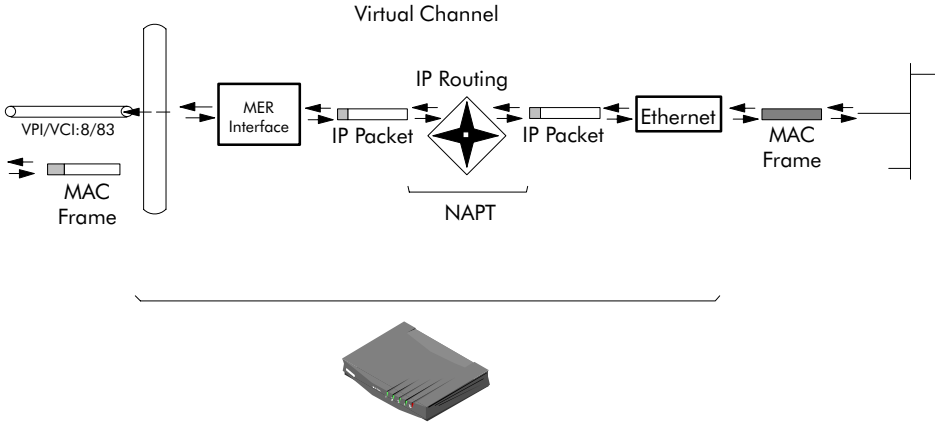
The IP packets, ending up in the MER interface are encapsulated in MAC frames:

- The source MAC address is now the *Pro* MAC address, or the MAC address, configured on the '*MER*' web page
- The destination MAC address is obtained via ARP.

Finally these MAC frames are processed to the WAN, over the ADSL line by the *Pro*, as if it were an IEEE802.1D compliant bridge, sending MAC, i.e. bridged frames.

Configuration and operation example

The figure below provides an overview of the *Pro* rear-to-front end MER operation:



8 Data Services – PPPoA-to-PPTP Relaying

Introduction

The *Pro PPPoA-to-PPTP Relaying* packet service relays PPP frames, arriving via local IP tunnels to a previously selected VC, and vice versa.

The PPP protocol that originates, or terminates in the locally attached PCs, offers a session concept, and provides security via identification, authentication and encryption.

A major advantage of *PPPoA-to-PPTP Relaying* is that it avoids the complexity of an IP router, yet to a certain extent, provides identical features.

Topics

8.1 Preparatory Steps

Features

PPPoA-to-PPTP Relaying:

- Provides standard “Dial-up” PPP behavior
- Supports security via identification, authentication and encryption
- Has multiprotocol support depending on the PPTP implementation, e.g. for MS Windows: TCP/IP, IPX/SPX and NETBEUI
- Offers complete TCP/IP protocol transparency; no NAPT is required
- Supports concurrent access to multiple remote destinations (depending on provisioning).
- Supports up to 12 concurrent virtual channels assigned to PPPoA/PPTP.

What you should know in advance

- The **VPI/VCI** value of the VC(s) to use on the ADSL line
- **PPPoA connection service** must be supported on this VC
- User name and password for your **user account**.

Note: If connectivity to multiple remote organizations is required, you need additional sets of these parameters.

STPro

The *Pro* comes with five preconfigured free PPP phonebook entries, i.e. *Relay_PPP1* ... *Relay_PPP4*, and *PPP3*.

If the SP(s) impose PPPoA/PPTP settings which differ from the *Pro* defaults, perform the necessary adjustments via the *Pro* web pages.

See section 8.4 for more information.

PC(s) Your PC must support PPP and Point-to-Point Tunnelling Protocol (PPTP).
e.g. All Microsoft Windows platforms support PPP and PPTP.

TCP/IP Before you can establish PPTP tunnels, you must configure:

- An IP address in each PC which initiates a PPTP tunnel
- An IP address in your *Pro* which terminates the PPTP tunnel(s)

To configure an IP address, or enable DHCP in your PC(s), see Appendix NO TAG.

To configure an IP address, or enable DHCP in your *Pro*, see section 12.3.

8.2 Configuring and Using a PPTP Connection

Introduction

Before you can open a PPTP tunnel towards the *Pro*, firstly you must initially configure a PPTP dial-up connection on your PC. Once this PPTP dial-up connection is configured, you can use it to open a PPPoA/PPTP connection to the remote side of the ADSL line.

Because the configuration and use of such a connection follows similar patterns for all popular OSs, this section will describe the procedures in global.

In section 8.3 an example is provided how to create and use a PPTP Dial-Up icon in MS Windows 98.

Refer to appendix C for more information on other OSs.

In this section

8.2.1 Preparing your PC for PPPoA/PPTP

Creating a PPTP connection icon

Most, if not all OSs provide a GUI guided procedure for the initial creation of a PPTP connection icon.

The result of such creation is in most cases an icon, or entry in a folder, or a table, called 'RAS', 'Dail-Up Networking', 'PPTP', 'Call sessions', etc.

PPPoA/PPTP parameters

During the initial configuration of your PPTP connection icon, you must provide the following parameters:

- A name for the PPTP connection icon
- The VPN server's IP address, or DNS hostname, i.e. the *Pro*'s IP address, or DNS hostname

Optionally, you can complete this entry with

- The VC's phonebook name to use for this connection
- A PPTP profile name

8.2.2 Using PPTP towards your STPro

Opening a session

Depending on your OS, you can open a session by either double-clicking the PPTP connection icon, or selecting it from a RAS table and clicking 'Dail-Up', or 'Connect'.

Credentials

Before you can actually browse the Internet, or contact the remote side's resources, you must supply the following credentials:

- A username
- An associated password

Note: Most, if not all OSs allow the credentials to be saved.

8.3 Example : MS Windows 98 Dial-Up Networking

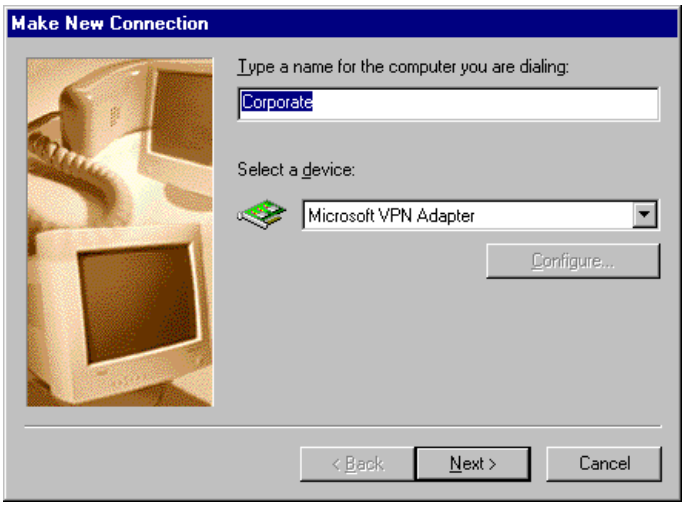
In this section

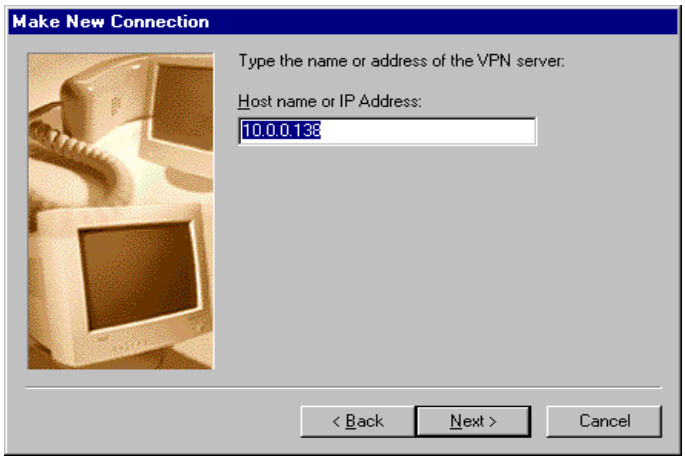
The following overview summarizes the necessary steps to setup a Microsoft Windows 98 PC for the use of PPPoA-to-PPTP Relaying:

Step	Action	See
1	Configure a *Private* IP address on your PC	NO TAG
2	Create a new Dial-Up Networking icon	8.3.1
3	Adapt Dial-Up Networking Properties	C.1
4	Create a shortcut on your desktop (optional)	8.3.2
5	Open a PPPoA/PPTP Dial-Up Session	8.3.3
6	Surf the Internet.	
7	Close a PPPoA/PPTP Dial-Up Session in Use	8.3.4

8.3.1 Create a New Dial-Up Networking Icon

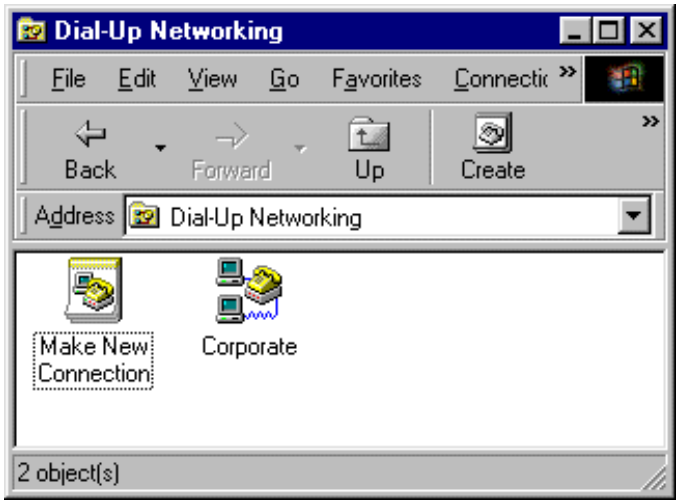
Procedure Proceed as follows:

Step	Action and Description
1	Double-click the '*My Computer*' icon on your desktop.  My Computer
2	Double-click the '*Dial-Up Networking*' icon.  Dial-Up Networking
3	Double-click the '*Make New Connection*' icon to activate the 'Make New Connection' wizard.  Make New Connection
4	If you use the Dial-Up Networking application for the first time, the 'Welcome to Dial-Up Networking' window appears. In that case, click Next >. The '*Make New Connection*' window pops up: 

Step	Action and Description
5	In the first input field of the *'Make New Connection'* window, type a name, or alias of the organization you are connecting to. **Note**: This name will appear below the Dial-Up icon at the end of this procedure.
6	In the 'Select a device' listbox of the *Make New Connection'* window, you must select the *'Microsoft VPN Adapter'* for PPTP tunneling.
7	Click [Next >] to pop up the VPN server window: 
8	Enter the DNS hostname or IP address of the Virtual Private Network (VPN) server. **Note**: "VPN server" is another word for PPTP server, which is in this case your **STPro**. The default IP address for the **STPro** is 10.0.0.138. Its default hostname is "SpeedTouch". Optionally, you can add the phonebook name to specify which VC is to be used for the connection. Optionally this phonebook name can be followed by a PPTP profile. See section 8.5 for more information.
9	A window pops up confirming that you have successfully installed a new Dial-Up connection. Click [Finish] to finish the procedure.

Result

A new icon with the name of the connection that you have just created, will be added to your *'Dial-Up Networking'* folder:



Creating multiple Dial-Up icons for multiple destinations

Per destination you can create a unique icon. To do so, repeat the steps, starting with 3 of the previous procedure.

Specific VC and PPTP Profiles

Using a specific PPP phonebook entry and/or PPTP profile is described in section 8.5.

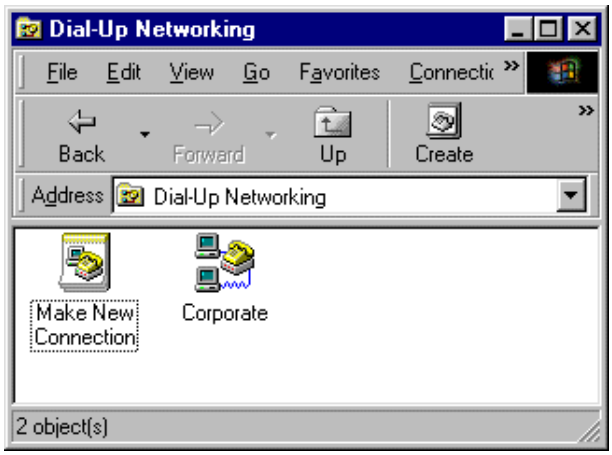
8.3.2 Create a Shortcut on your Desktop (Optional)

Introduction

To work comfortably with the Dial-Up connection(s) you created, Windows 98 offers you the possibility to place a shortcut of the connection icon on your desktop.

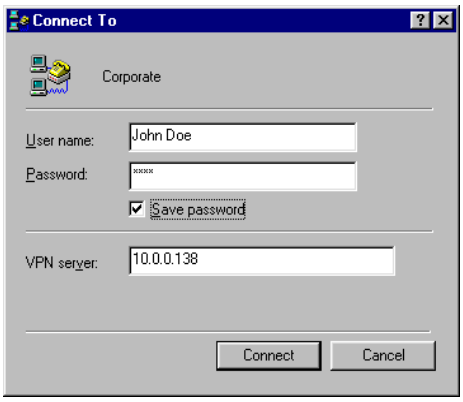
Shortcut procedure

Proceed as follows:

Step	Action and Description
1	Double-click the '*My Computer*' icon on your desktop.  My Computer
2	Double-click the '*Dial-Up Networking*' icon.  Dial-Up Networking The '*Dial-Up Networking* window pops up. 
3	Select the appropriate Dial-Up connection icon (in the example '*Corporate*') and drag it to your desktop to create a copy of the icon.  Corporate

8.3.3 Open a PPPoA/PPTP Dial-Up Session

Procedure Proceed as follows:

Step	Action and Description
1	Double-click the appropriate PPPoA/PPTP Dial-Up icon in the *'Dial-Up Networking'* folder, or double-click its shortcut on your desktop.  Corporate The *'Connect To'* window pops up 
2	Fill in your *user name* and *password*, according your user account at the ISP, or corporate. **Note**: If you want the current Dial-Up connection application to remember your credentials for future use, tick the 'Save Password' box (✓). Make sure though, that you have logged into Windows 98 when you boot your PC.
3	Click Connect The *'Connecting To Corporate'* window appears shortly before being minimized in the system tray. 
4	Start your application now, e.g. a Web browser.

While you are connected

Once the PPPoA/PPTP Dial-Up connection is established, you can find the MSDUN icon showing two PCs connected to each other in the system tray:

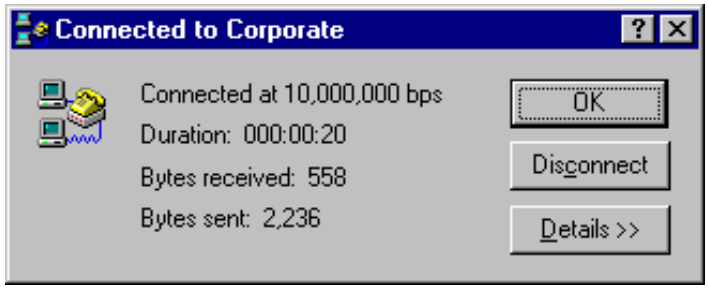
The MSDUN icon symbolizes activity on the PPPoA/PPTP connection by flashing PC(s):

- A flashing "Front" PC symbolizes upstream (T_X) link activity (from your local PC towards the remote device).
- A flashing "Behind" PC symbolizes downstream (R_X) link activity (from the remote device towards your PC).

The 'Connected To' window

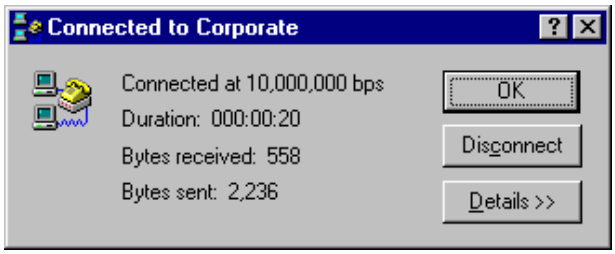
You can check the status of the connection by double-clicking the MSDUN icon  in the system tray.

A *'Connected To'* window will pop up, showing the status of the connection:



8.3.4 Close a PPPoA/PPTP Dial-Up Session in Use

Procedure Proceed as follows:

Step	Action and Description
1	If the Dial-Up connection is minimized, click the MSDUN icon  in the system tray:  The *'Connected To'* window pops up. 
2	Click Disconnect to close the PPPoA/PPTP session.

Result The PPPoA/PPTP Dial-Up connection will no longer exists. The PPPoA/PPTP connection is idle, e.g. for other hosts.

8.4 PPPoA/PPTP Configuration

Introduction

The *Pro* allows local configuration via the *Pro* web pages.

This section describes the configuration of PPPoA/PPTP entries, and how to use the *'PPTP'* web page.

In this section

Topic	See
PPPoA/PPTP Phonebook Entries	8.4.1
PPPoA/PPTP Active Connections	8.4.2

8.4.1 PPPoA/PPTP Phonebook Entries

PPTP phonebook entries

Basic to the *Pro* VC pool management, is the '*Phonebook*' web page.

The *Pro* in its default state features the following PPP related phonebook entries:

Name	Address	Type	AutoPVC	Avail	Action
RELAY_PPP1	8.48	ppp	No	yes	Delete
RELAY_PPP2	8.49	ppp	No	yes	Delete
RELAY_PPP3	8.50	ppp	No	yes	Delete
RELAY_PPP4	8.51	ppp	No	yes	Delete
PPP1	8.64	ppp	No	no	Delete
PPP2	8.65	ppp	No	no	Delete
PPP3	8.66	ppp	No	yes	Delete
DHCP_SPOOF	8.67	ppp	No	no	Delete
Use input fields below to add a new entry					
		any	-	-	Add

Note: Both PPPoA/PPTP and PPP & IP Routing share the same type of phonebook entries, i.e. **ppp**.

PPTP and PPP phonebook entries

As you notice, four phonebook entries exist, named *Relay_PPP*, which are free, and specifically suitable for PPPoA/PPTP, and four other phonebook entries, named *PPP*, and *DHCP_SPOOF*. Only use the latter in exceptional cases for PPPoA/PPTP service.

Adding/deleting phonebook entries

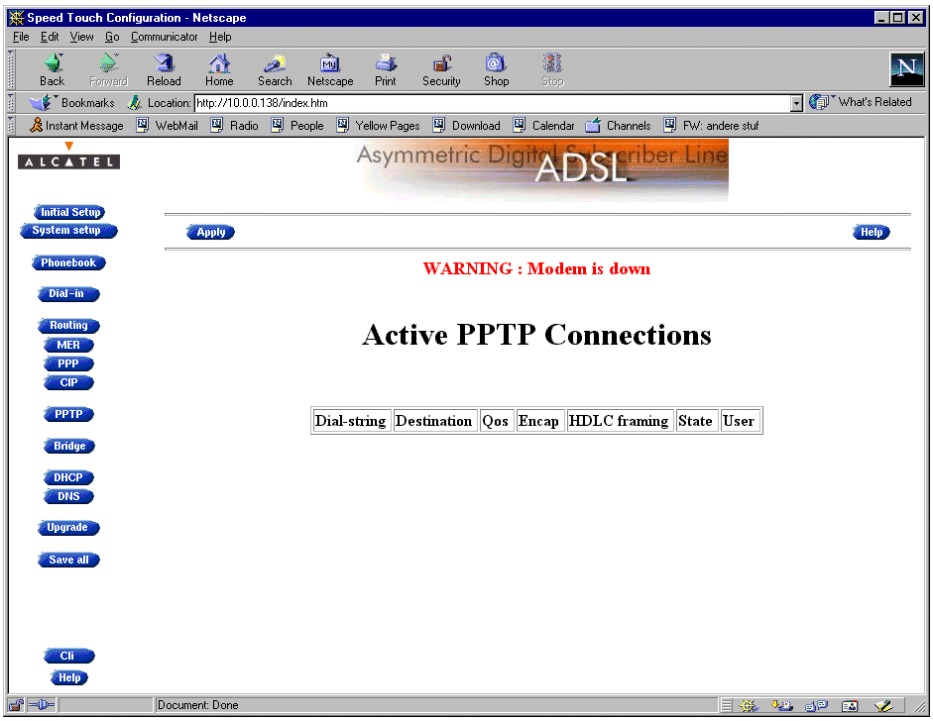
See section 11.3 for more information.

8.4.2 PPPoA/PPTP Active Connections

In this subsection

The STPro 'PPTP' web page

Clicking PPTP in the left pane of the *Pro* web pages, pops up the *'PPTP'* web page (See section 18.2 for more information):



The 'Active PPTP Connections' table

The following figure shows the *'Active PPTP Connections'* table:

Dial-string	Destination	Qos	Encap	HDLC framing	State	User

'Active PPTP Connections' table components

The following fields are shown:

Field	Description
Dial-string	Indicates the name you have chosen for the PPTP connection. **Note**: In your Dial-Up application you are able to specify which PPTP connection is to be used by adding the appropriate Dial-string, indicated here.
Destination	Indicates the PPTP phonebook entry name, active for this connection.
Qos	Indicates the Quality of Service (QoS) applicable for the PPPoA/PPTP connection. In most cases the QoS column will indicate **`default`**. Via CLI a specific QoS can be configured.
Encap	Refers to the encapsulation, and decapsulation of PPP frames in/from AAL5/ATM. The **STPro** is compliant with RFC 2364 "PPP over AAL5" and supports both the LLC/NLPID method and the VC-MUX method. By default the encapsulation method for PPP frames is VC-MUX. The encapsulation method for a PPPoA/PPTP connection can be configured via the CLI, see section 8.5 for more information.
HDLC Framing	The PPP frames arriving via a PPTP tunnel, and the PPP frames encapsulated on ATM connections, differ in format. The PPP format on AAL5 follows RFC 1661 "Point-to-Point Protocol (PPP)": PPP Frame P_ID | Information | Padding Whereas the PPP format within a tunnel follows "Point-to-Point Tunneling Protocol (PPTP)": PPP Frame Address (FF) | Control (03) | P_ID | Information | Padding The latter format has two additional bytes in front of the frame (FF-03) inherited from another encapsulation i.e., RFC 1662 "PPP in HDLC-like framing".

<table>
<tr><th>Field</th><th>Description</th></tr>
<tr><td>HDLC Framing (continued)</td><td>In order to cope with these PPP frame differences, the STPro adapts to the different formats on a 'per connection' base.
Additionally, the STPro offers the following PPP/AAL5 format configuration options via the CLI if interoperability problems should arise (See section 8.5 for more information):
<table>
<tr><th>Value</th><th>Description</th></tr>
<tr><td>Never</td><td>The STPro will make sure that FF-03 will never be found in front of a PPP frame encapsulated on a AAL5/ATM connection, independent of the actual format of the PPP frame in the tunnel. This setting is default, and follows RFC2364.</td></tr>
<tr><td>Always</td><td>The STPro will make sure that FF-03 is always in front of a PPP frame encapsulated on an AAL5/ATM connection. Although not supported by RFC2364, some equipment may rely on this format.</td></tr>
<tr><td>Keep</td><td>The STPro will not change the PPP frame arriving via a tunnel.</td></tr>
</table>
Note: This configuration possibility applies only to the upstream direction ! In the downstream direction, the STPro will always make sure that FF-03 is in front of the frame prior to put it in a PPTP tunnel.</td></tr>
<tr><td>State</td><td>Indicates the connection state of the active PPTP connection. It can take following values:
<table>
<tr><th>Value</th><th>Description</th></tr>
<tr><td>Resolving</td><td>The PPTP entry is setting up the connection.</td></tr>
<tr><td>Retry</td><td>The PPTP entry did not succeed in connecting to the remote side, and is retrying.</td></tr>
<tr><td>In Use</td><td>A user opened a session on this PPTP entry.</td></tr>
</table></td></tr>
<tr><td>User</td><td>Indicates the IP address of the host, i.e. PC, using this PPTP connection</td></tr>
</table>

Configuring PPTP profiles

PPTP profiles can be configured via the CLI.

See section 8.5 for more information.

8.5 Customizing PPPoA/PPTP Connections

Introduction

In this section the advanced configuration and use of PPPoA/PPTP connections is described.

Firstly, this section deals with some concepts on the customization of PPPoA/PPTP connections.

In this section

8.5.1 PPPoA/PPTP Phonebook Entries

Introduction

To establish a PPPoA/PPTP session, all you need to do is opening a PPTP tunnel.

However, this does only apply in the case only a single destination is reachable via one, or more VCs.

With the *Pro*, it is possible to open multiple simultaneous sessions, or even simultaneously open sessions to multiple destinations.

Customizing PPPoA/PPTP entries

Via the *Pro* *'Phonebook'* web page, you are able to add PPP phonebook entries in addition to the defaults.

You can give them names of your choice (in the name field). See section 8.4 for more information.

Using added phonebook entries

The name you gave the PPTP phonebook entries in the *Pro*'s phonebook can be used to specify which PPPoA/PPTP VC is to be issued by a particular PPTP connection icon.

PPPoA/PPTP session scenarios

The PPPoA/PPTP entries can be used in several ways:

- (All) directed to a single destination
- Directed to specific destinations.

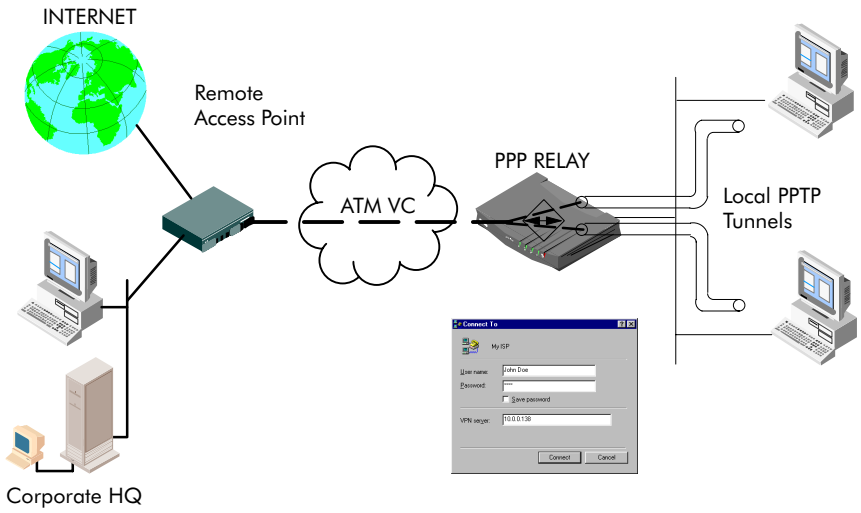
8.5.2 Single Destination

Single destination PPPoA/PPTP sessions

If the *'VPN Server'* field of the PPTP Dial-Up application is left unchanged, i.e. only the IP address of the *Pro* (or its host name) is visible, the *Pro* automatically chooses a free PPP phonebook entry from the Phonebook.

This is the most easy scenario and works best if all (one, or more) PPPoA/PPTP related PPP VCs are attached to the same remote destination.

Single destination architecture



Two scenarios

Two scenarios are possible:

- **Single PPP VC to a single destination**

  In this scenario, the SP supplied one PPP VC for connectivity. It is most applicable when a single PC is connected to the *Pro*.

- **Multiple PPP VCs to single destination**

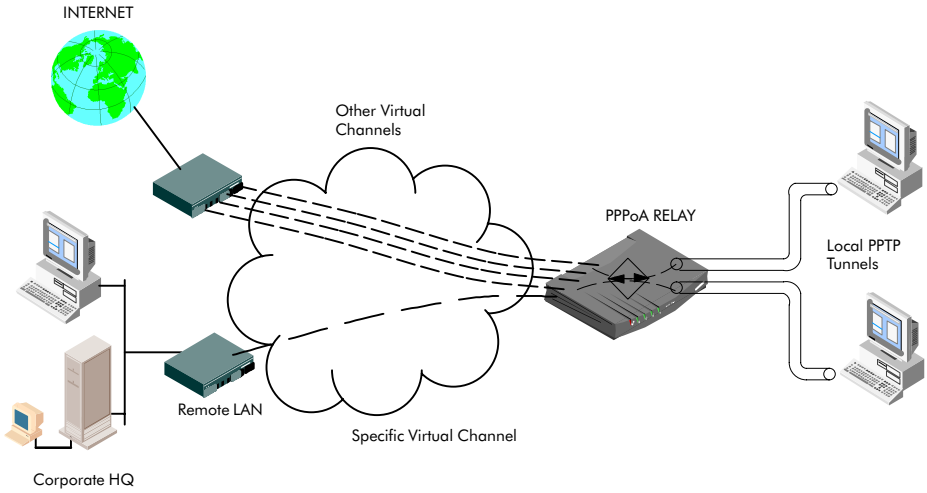
  In this scenario, the SP supplied multiple PPP VCs, all direct to the same destination. This implies that several PCs can connect to this destination at the same time (as long there is an idle channel left). Therefore, this is most applicable with a *Pro* connected to a LAN.

8.5.3 Multiple Destinations

Multiple destination PPPoA/PPTP sessions

Multiple SPs might be connected to your *Pro*, e.g., your private ISP and your corporate.
In this case, the *Pro*'s PPP VCs can be split over both locations. For example, 6 PPP VCs could be provisioned to your ISP, while 6 other PPP VCs are used for connecting to your corporate.

Multiple destination architecture



Procedure to specify a VC for a PPTP connection icon

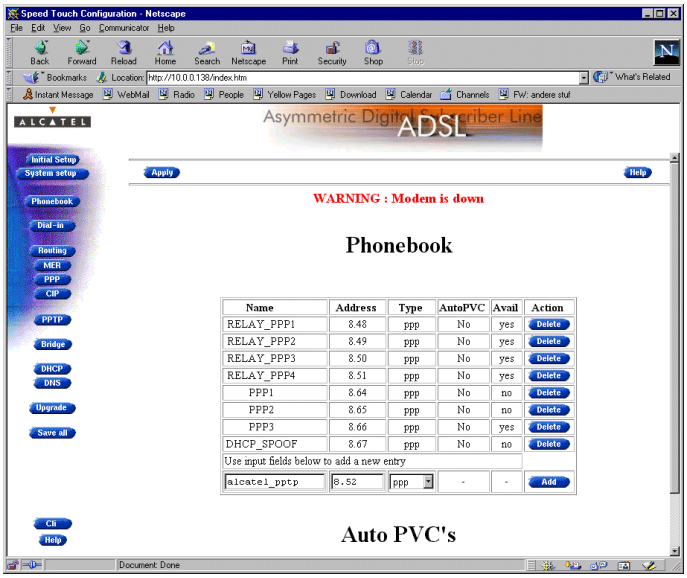
Proceed as follows to specify which VC (i.e. Phonebook entry) is to be used by a Dial-Up connection:

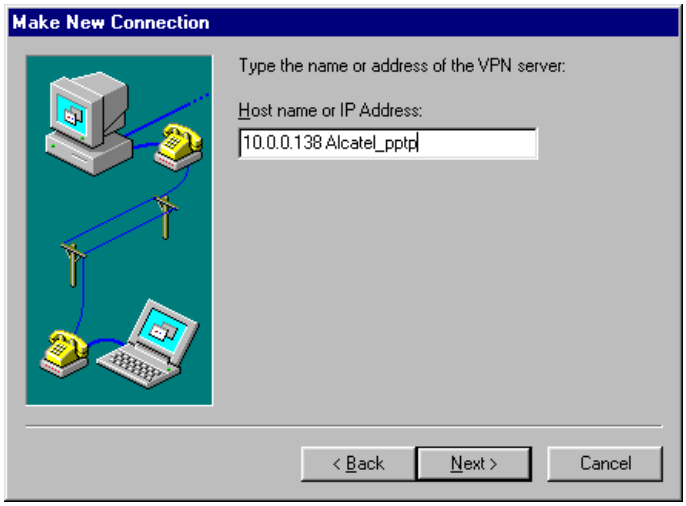
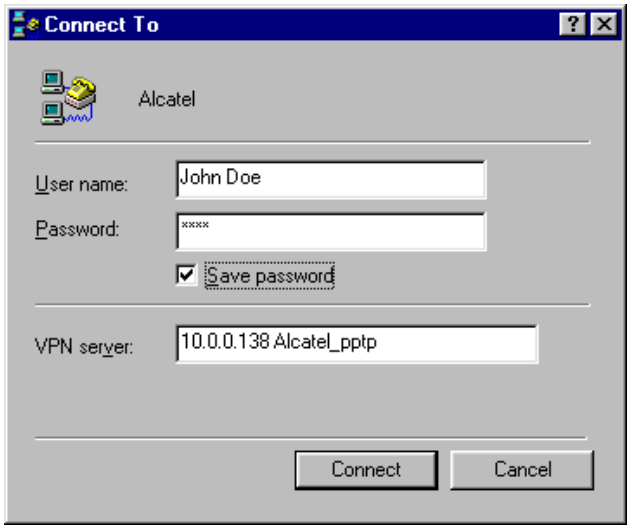
Step	Action
1	Add, if needed, a PPP phonebook entry to the **STPro**'s phonebook with the appropriate VPI/VCI values for the specific destination.
2	When creating a new PPTP tunnel configuration, add this PPP VC phonebook name next to the IP address, or DNS name of the VPN server (i.e. the **STPro**).

Result If you open this PPPoA/PPTP session, it will use the PPP Phonebook entry, specified in the VPN server field.

Note You must check with your ISP and your corporate LAN administrator to verify which cross-connections exist between the PPP VCs and the locations.

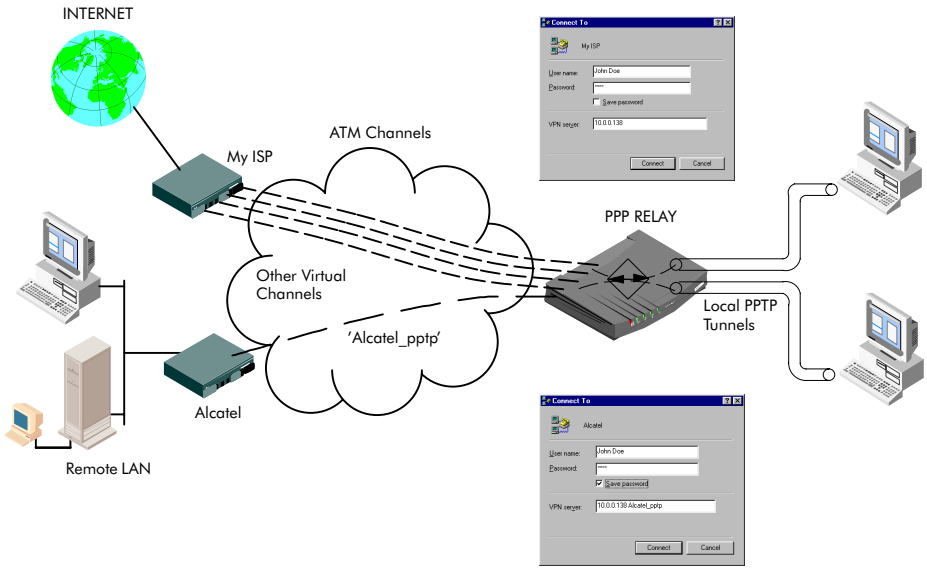
Example for Windows 9x Proceed as follows to create an MS Windows 9x Dial-Up Networking icon to the corporate 'Alcatel', which has to use the VC, named 'Alcatel_pptp':

Step	Action and Description
1	Configure a PPP phonebook entry, named 'Alcatel_pptp', in the Phonebook as described in subsection 8.4.1. 

Step	Action and Description
2	Create a Dial-Up Networking icon, named 'Alcatel', according to section 8.3.1. In step 9 of the procedure (See section 8.3.1), you not only specify the VPN server, i.e. the **STPro**, but also the VC 'Alcatel_pptp': 
3	Double-click the 'Alcatel' icon to open the PPPoA/PPTP session. The following Dial-Up window pops up:  As you can see in the 'VPN Server' field, the VC, i.e. alcatel_pptp, to be used is specified by its name. Consequently, this PPPoA/PPTP session will always use this VC for establishing a connection to the corporate 'Alcatel'.

Example Result

The following figure shows an example of both single and multiple PPPoA/PPTP connections established simultaneously.



8.5.4 Restrictions on Using Specific Virtual Channels

Similar phonebook names

The *pro* will look for a match between the string, specified next to the VPN server's DNS hostname or IP address (in the previous example the string 'Alcatel_pptp').

If however, several PPPoA/PPTP entries exist, with names starting with the same string, e.g. Alcatel_pptp1, Alcatel_pptp2, etc., it can not be determined which of these will be used to establish the connection.

Positive use of similar names

This can be used in a positive way however: if a selection of PPPoA/PPTP VCs may be used by a particular PPPoA/PPTP session, you just have to give them names with a stringmatch in the beginning, e.g. 'Alcatel_pptpX' ,where X is a number.

Case of no entry matches

In case no match is found in the *pro* phonebook, or if the specified VC is already used, the Dial-Up application will use the first available idle PPPoA/PPTP VC found in the *'PPTP connections'* table.

Consequently, again it can not be determined which PPPoA/PPTP VC will be used to establish the connection.

8.5.5 PPTP Profiles

Introduction

In most cases, the *pro*'s PPP phonebook entries are ideally suited to make PPPoA/PPTP connections over the ADSL line.

However, in case the remote access server demands specific configurations for PPPoA/PPTP, you can easily configure a PPTP profile via the CLI.

PPTP profile selections

By default a 'default' profile exists, applicable for all PPP phonebook entries. This default profile inhibits the following settings:

- Encapsulation method : VC-MUX
- HDLC framing : never
- QoS : default.

Creating a PPTP Profile

A PPTP Profile can only be created and configured via the CLI. See chapter 19 for more information on the CLI.

8.6 Advanced PPPoA/PPTP Concepts

Introduction

This section describes some advanced concepts of the *Pro*'s PPPoA-to-PPTP Relaying packet service.

Topics

Topic	See
Point-to-Point Tunneling	8.6.1
Local Tunneling	8.6.2
PPPoA-to-PPTP Relaying (PPPoA/PPTP)	8.6.3
Simultaneous PPPoA/PPTP Sessions	8.6.4

8.6.1 Point-to-Point Tunneling

What is Tunneling

Tunneling is a technique that allows to transport certain protocols over a network, which is not designed for that purpose.

Example: IPX Packets can be wrapped in IP, ready to be routed over an IP network.

At the destination, the IPX packets are decapsulated and made available in their original format again.

Tunneling applied to the STPro

Tunneling applied to the *Pro* implies that:

- Tunnels have a local scope.

  Indeed, tunnels are established between two peers on the local IP network: local PCs initiate tunnels, the *Pro* terminates these tunnels.
- IP tunnels are established and released for the duration of a session.
- The protocol carried inside the tunnels is PPP. However, various protocols can be carried inside the PPP frames.

Result of PPTP tunneling

The net result of PPTP tunneling is that PPP frames can cross the local Ethernet segment between the *Pro* and the client computer and vice versa.

This would otherwise not be possible as PPP is designed to run on point-to-point connections, e.g. Dial-Up connections, whereas Ethernet is a shared medium.

Supported LAN Protocols

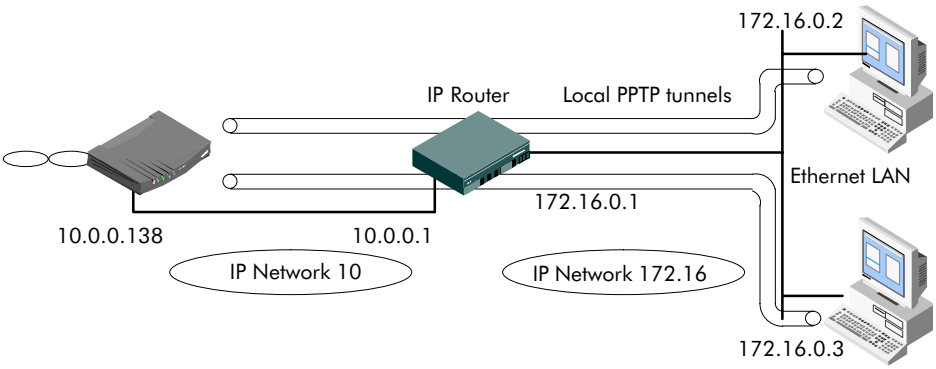
Within PPP, all kinds of protocols can be transported.

The PPP/PPTP client, however, is the limiting factor. Some OSs only allow specific protocols to be transported within PPP tunnels (e.g. TCP/IP, IPX/SPX, or NETBEUI in case of Window 9x).

8.6.2 Local Tunneling

Tunneling from behind an IP router

The *Pro* allows local tunneling from behind an IP router:



This requires settings in both *Pro* and PCs.

STPro

You must add a default route for the *Pro* via the *'Routing'* web page (See subsection 12.4.2 for more information).

In the example of the above figure, the route to be added, has the following parameters:

- Destination: 0.0.0.0/0
- Source: Any
- Gateway: 10.0.0.1

PCs

For each PC, you must add a route to its internal routing table. This route must point to the *Pro*. Proceed as follows for a Windows OS:

Step	Action and Description
1	Click Start , select *'Programs'*, and *'MS-DOS'* prompt.
2	At the DOS prompt, enter: **`route add <Destination IPaddress>`** **`<Gateway IPaddress>`** In the example of the previous figure, the command would be: `route add 10.0.0.138 172.16.0.1`
3	To verify IP connectivity, you can ping the **STPro**. If it responds, setting up PPTP tunnels is possible.

8.6.3 PPPoA-to-PPTP Relaying (PPPoA/PPTP)

What is PPPoA-to-PPTP Relaying

By opening a PPPoA/PPTP session, PPTP tunnels are established between the *Pro* and the PCs on your LAN.

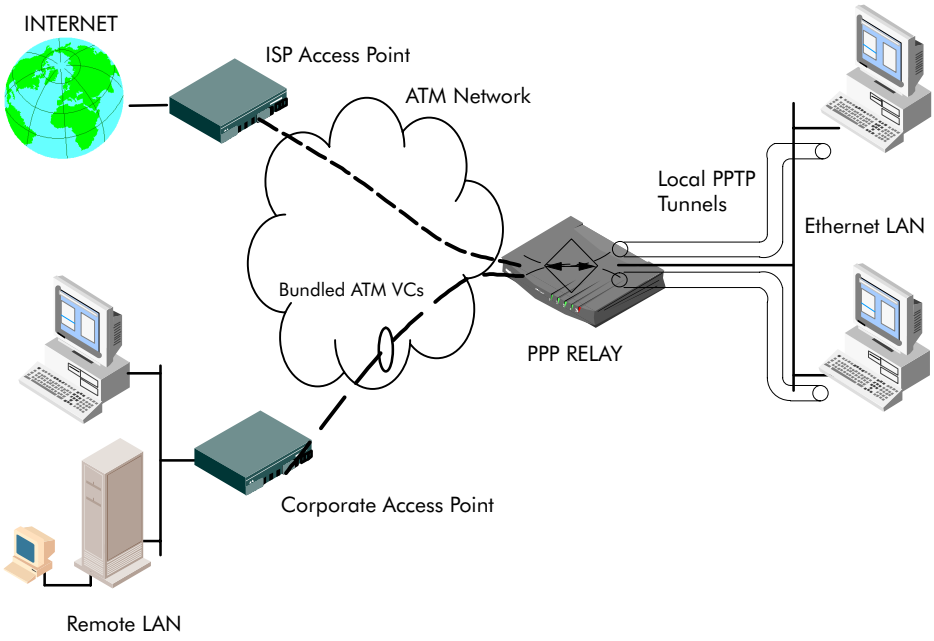
These PPTP tunnels trigger the Relaying utility of the *Pro*: it chooses a free VC from the pool of available free PPP phonebook entries and relays all PPP frames, sourced by the PPTP tunnel from the tunnel to the VC, and vice versa.

At the remote end of the VC, i.e. ADSL line, the remote access server extracts the PPP frames, reconstructs the encapsulated IP packets and forwards them to their destination, e.g. the Internet.

At the end of a PPPoA/PPTP session, the PPTP tunnel is destroyed. This triggers the *Pro*'s Relay utility to release the VC.

PPPoA/PPTP overview architecture

The figure below provides an overview of the end-to-end architecture.



8.6.4 Simultaneous PPPoA/PPTP Sessions

Upper limit of simultaneous PPPoA/PPTP sessions

PPTP tunneling does not influence your local communication; you can add as many hosts as your local network supports.

However, there is an upper limit to the number of simultaneous outbound connections. Unlike Bridging, or MER, a PPPoA/PPTP related VC cannot be shared by multiple users. A user establishing a tunnel requires at least one PPPoA/PPTP related VC.

Therefore, any user on the local network can only initiate tunnels as long as there are idle PPPoA/PPTP VCs, i.e. idle PPTP phonebook entries.

STPro and simultaneous connections

By disabling all other packet service entries in the *Pro* Phonebook, the *Pro* is capable of managing up to 12 simultaneous PPPoA/PPTP VCs.

If all PPPoA/PPTP VCs are in use, and a user tries to set-up a new tunnel, the *Pro* will refuse the request and an error message will appear on the screen.

9 Data Services – PPP & IP Routing

Introduction

The *pro* features the PPP & IP Routing packet service.

Via the PPP protocol an authenticated session is established with your SP.

IP packets, arriving over the PPP connection, are forwarded by the IP router to PCs on your LAN.

Optionally, Network Address & Port Translation (NAPT) can be enabled to isolate your local network from the Internet, or to share a single IP address.

In this chapter

9.1 Preparatory Steps

Features

PPP & IP Routing:

- Has an authenticated session concept: it supports identification, authentication and autoconfiguration.
- Requires no session client on the PC(s), avoiding special installation procedures
- Combined with NAPT, allows multiple users to share a single IP address simultaneously on a single VC
- Supports up to 12 concurrent virtual channels for PPP.

What you should know in advance

- The **VPI/VCI** value of the VC(s) to use on the ADSL line
- **PPPoA connection service** must be supported on this VC
- User name and password for your **user account**.

Note: If connectivity to multiple remote organizations is required, you need additional sets of these parameters.

STPro

The *Pro* comes with eight phonebook entries available for PPP & IP Routing, of which three are preconfigured for immediate use. If the SP(s) impose settings which differ from the *Pro* defaults, perform the necessary adjustments via the *Pro* web pages.

See sections 9.3 and 9.4 for more information.

PC(s)

In order to use the PPP & IP Routing mode of the *Pro*, the OS on your PC(s) must support the TCP/IP suite.

See chapter 12 for more information on IP.

9.2 Using PPP & IP Routing

Always-on, Dial-in and Dial-on-Demand PPP sessions

Three methods exist to open a PPP:

- **Dial-in**

  The PPP session is opened manually

- **Always-on**

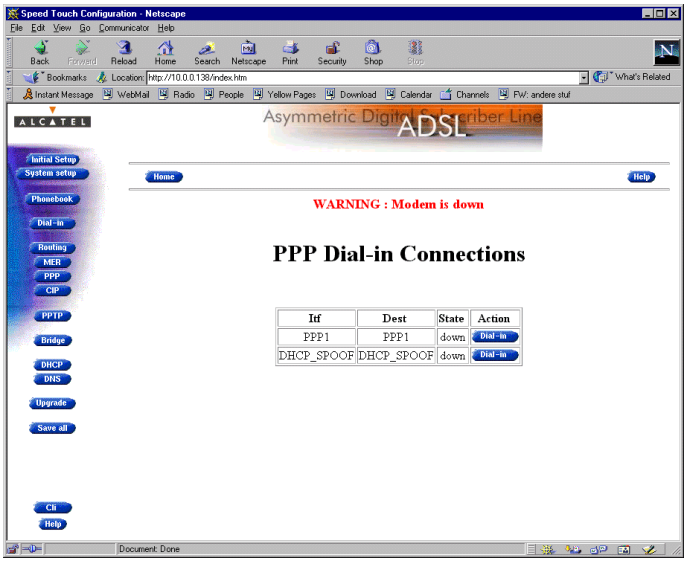
  After the *Pro* is powered and finished its POST successfully, the *Pro* automatically tries to open the PPP session

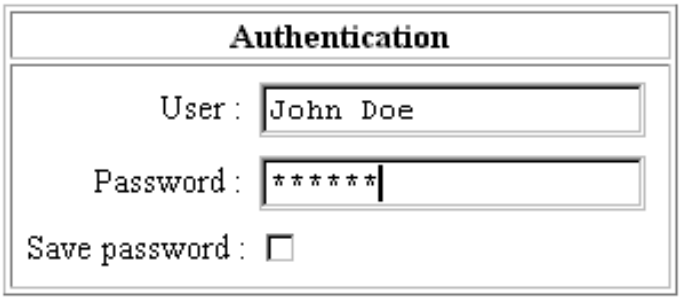
- **Dial-on-demand**

  The PPP session is opened automatically, triggered by the arrival of packets at a/the *Pro* Ethernet port, destined for a PPP connection.

Opening dial-in PPP sessions

Proceed as follows (See section 18.2 for more information):

Step	Action and Description
1	Browse to the *'Dial-in'* web page: 
2	Click Dial-in next to a PPP entry in the list.

Step	Action and Description
3	If applicable the *'Authentication'* web page pops up: Enter user name and password in the appropriate fields. 
4	Click Apply .
5	After identification and authentication, the *'PPP connections'* web page reappears. While the **STPro** tries to open the session, **trying** will appear in the *'State'* field. Once the session is active, the field displays **up**. From then, you are online, and you can start your application, or browse the Internet. **Note**: "Always-on" PPP connections will not appear in this table.

Closing dial-in PPP sessions

Proceed as follows:

Step	Action and Description
1	Browse to the *'Dial-in'* web page.
2	Active PPP sessions are indicated via **up** in the *'State'* field. Click Hang-Up next to the PPP entry you want to close the session for. The session state of the PPP entry will change to **down**, i.e. it becomes idle.

Saving credentials

If you want the *Pro* to remember your credentials, check *'Save password'* (✓) in the *'Authentication'* web page.

See subsection 9.4.4 for more information.

9.3 PPP Configuration

Introduction

The *Pro* allows local configurations via its web pages.

This section describes the enabling of PPP entries, and the use of the *'PPP'* web page.

Prior to be able to use the PPP entry, you must configure the PPP entry. This is described in section 9.4.

In this section

9.3.1 PPP Phonebook Entries

PPP phonebook entries

Central to the *Pro* VC pool management, is the *'Phonebook'* web page.

The *Pro* in its default configuration features the following PPP related phonebook entries:

Name	Address	Type	AutoPVC	Avail	Action
RELAY_PPP1	8.48	ppp	No	yes	Delete
RELAY_PPP2	8.49	ppp	No	yes	Delete
RELAY_PPP3	8.50	ppp	No	yes	Delete
RELAY_PPP4	8.51	ppp	No	yes	Delete
PPP1	8.64	ppp	No	no	Delete
PPP2	8.65	ppp	No	no	Delete
PPP3	8.66	ppp	No	yes	Delete
DHCP_SPOOF	8.67	ppp	No	no	Delete
Use input fields below to add a new entry					
		any	-	-	Add

Note: Both PPP & IP Routing and PPPoA/PPTP share the same type of phonebook entries, i.e. **ppp**.

Adding/deleting phonebook entries

See section 11.3 for more information.

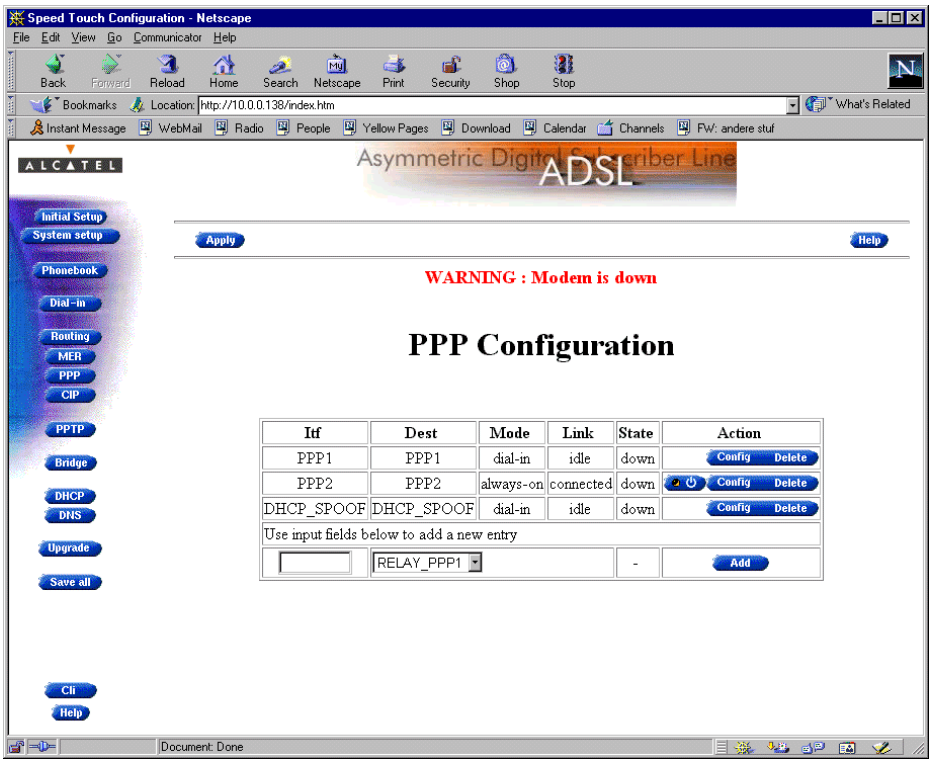
9.3.2 PPP Entries

In this subsection

- The *'PPP'* Web Page
- The *'PPP Configuration'* Table
- *'PPP Configuration'* Table Components
- Adding PPP Entries
- Deleting PPP Entries.

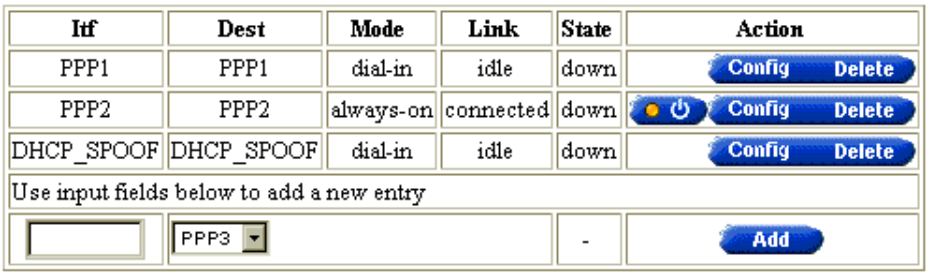
The 'PPP' web page

Clicking PPP in the left pane of the *Pro* web pages, pops up the *'PPP'* web page (See section 18.2 for more information):



The 'PPP configuration' table

The following figure shows the *'PPP Configuration'* table of the *'PPP'* web page:



'PPP Configuration' table components

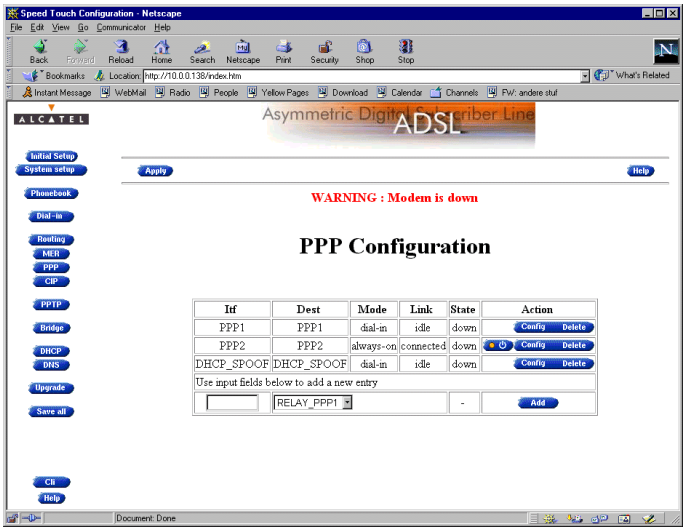
The following fields are shown:

Field	Description
Itf	Allows you to choose an interface name for the PPP interface. **Note**: In most cases, the interface name will be the same as the phonebook entry name.
Dest	Indicates available phonebook entries for PPP. **Note**: Specific free PPPoA/PPTP phonebook entries are shown, as well as free 'any type' phonebook entries
Mode	Indicates whether the PPP connection is: • An "Always-on" connection • A "Dial-in" connection • A "Dial-on-Demand" connection. See section 9.4.5 for more information.
Link	Indicates the link state of the PPP entry. It can take following values: **Value** / **Description** **idle** – The PPP entry is not activated, i.e. it does not setup a PPP connection. **Connected** – The PPP entry is active, i.e. it tries to setup a PPP connection, or PPP connectivity is achieved.

<table>
<tr><th>Field</th><th>Description</th></tr>
<tr><td>State</td><td>Indicates the active state of the PPP session.
It can take following values:
<table>
<tr><th>Value</th><th>Description</th></tr>
<tr><td>Up</td><td>The PPP session is opened and active.</td></tr>
<tr><td>Down</td><td>The PPP session is closed, the PPP connection is idle.</td></tr>
<tr><td>Trying</td><td>The PPP session is trying to reach the active state.</td></tr>
</table></td></tr>
<tr><td>Action</td><td>This field contains the three following action buttons:
<table>
<tr><th>Button</th><th>Action</th></tr>
<tr><td>  </td><td>Add a PPP entry to the list.</td></tr>
<tr><td>  </td><td>Delete an existing entry from the list.</td></tr>
<tr><td>  </td><td>Configure the PPP entry.
See subsection 9.4 for more.</td></tr>
</table>
For always-on PPP entries, also an on/off button is included:
<table>
<tr><th>Button</th><th>Action</th></tr>
<tr><td>  </td><td>The always-on PPP connection is enabled, i.e. activated.</td></tr>
<tr><td>  </td><td>The always-on PPP connection is disabled, i.e. not active.</td></tr>
</table>
Clicking the button activates/deactivates the always-on PPP connection.
Click  to make the on/off change permanent</td></tr>
</table>

Adding PPP entries

Proceed as follows:

Step	Action and Description
1	Browse to the *'PPP'* web page:  The bottom row of the table allows addition of a new entry.
2	In the *'Destination'* column of the bottom row, click ▼ and select the PPP entry you want to add to the table.
3	Optionally, enter a name for the PPP interface in the *'Itf'* column.
4	Click **Add** and **Save all** to finish the procedure.

Result

The PPP entry is added to the *'PPP Configuration'* table. Prior to be able to open a PPP session on this PPP entry, you MUST configure the PPP entry.

See section 9.4 for more information.

Deleting PPP entries

Proceed as follows:

Step	Action and Description
1	Browse to the *'PPP'* web page.
2	Select the PPP connection you want to delete, click **Delete** and **Save all** to finish the procedure.

9.4 PPP Entry Configuration

Introduction

After enabling the PPP entry in the *'PPP Configurations'* table, you must configure the PPP connection.

Configuration of PPP entries must be done per PPP entry.

This section describes the various PPP entry configurations the *Pro* offers for assuring end-to-end connectivity.

In this section

Topic	Section
The PPP Configuration Web Page	9.4.1
Link Related Configuration	9.4.1
Security Related Configuration	9.4.3
IP Routing Related Configuration	9.4.4
Connection Related Configuration	9.4.5
NAPT and PPP & IP Routing	9.4.6
NAPT and **STPro** Transparency	9.4.7

Interaction with the STPro IP router

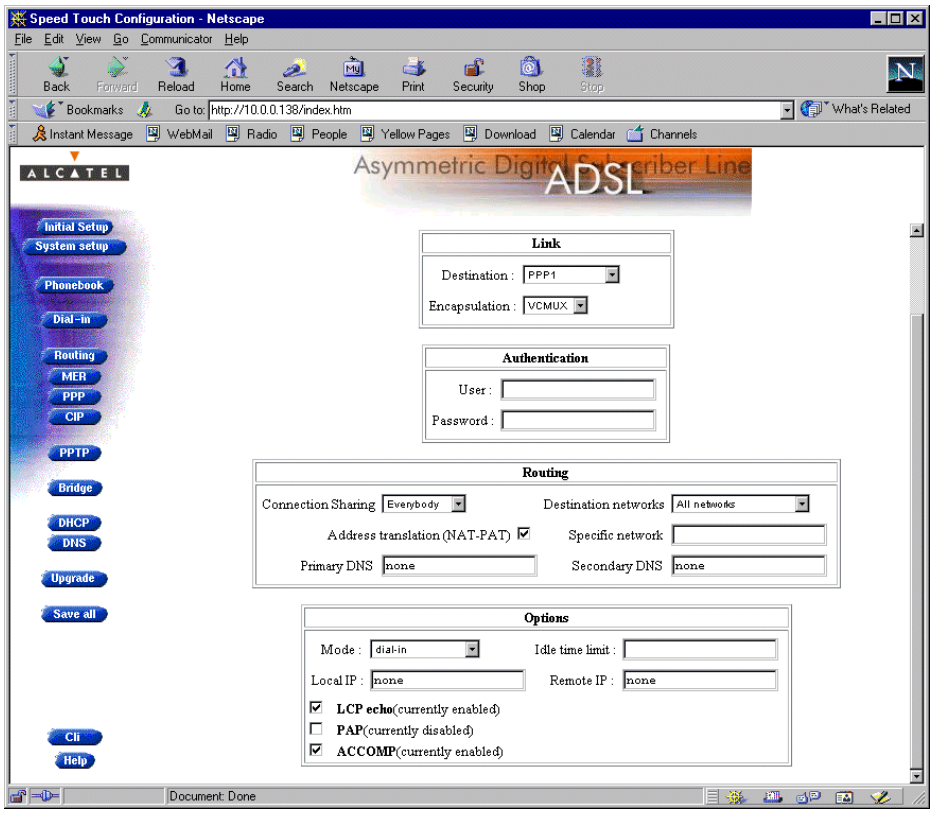
Most of the configurations described in this section, influence the IP router in the *Pro*.

See section 12.4, and subsection 12.2.4 for more information on IP routing aspects.

9.4.1 The PPP Configuration Web Page

PPP configuration web page

Clicking Config next to a PPP connection you want to configure, pops up the particular *'PPP Configuration'* web page:



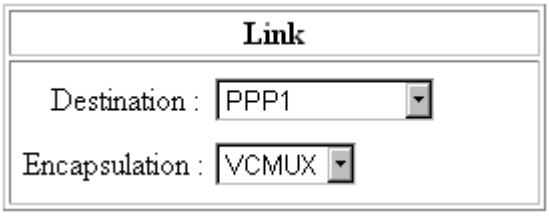
9.4.2 Link Related Configuration

Introduction

The following options allow to configure the link related aspects of your PPP connection.

'Link' box

Following figure shows the *'Link'* box:



Destination networks

The *'Link'* box contains the following fields:

- **Destination**
  Displays the PPP phonebook entry for the PPP connection.
  Click to select another free PPP phonebook entry for the PPP connection.
- **Encapsulation**
  Allows you to select the encapsulation method for the PPP connection, i.e. VC-MUX (default), or LLC/NLPID.

9.4.3 Security Related Configurations

Introduction

In most cases you will have a user account, with user name and password, at the SP.
Via the *'Authentication'* box in the *'PPP Configuration'* web page, you can fill out your credentials for permanent storage.

'Authentication' box

Following figure shows the *'Authentication'* box:

"Guest" credentials

As default, the user account *"guest"* is assumed (Both user name and password are *'guest'*).
If your SP has a guest account, you are able to open a session without having an actual subscription.

Memorizing Credentials

The *Pro* is able to memorize user name, and password per PPP connection; just fill out both, and click Save all.
The next time you establish this PPP connection, the information is retrieved from permanent storage.

Note: Leaving the entries free, forces you to identify and authenticate yourself each time the session is opened.

9.4.4 IP Routing Related Configurations

Introduction

If a PPP session is opened successfully (either manually by the user, triggered by LAN traffic, or automatic at boot time), routes are automatically added to the *Pro*'s routing table.

The settings in the PPP *'IP Routing'* box, are reflected in the routing table.

Advanced routing

For advanced users, the *Pro* allows manual configuration of permanent routes to dedicated destinations.

See section 12.4 for more information on the *Pro*'s IP router.

Moreover, routes can be configured via the CLI, which will only be added to the IP route table upon establishing the PPP connection.

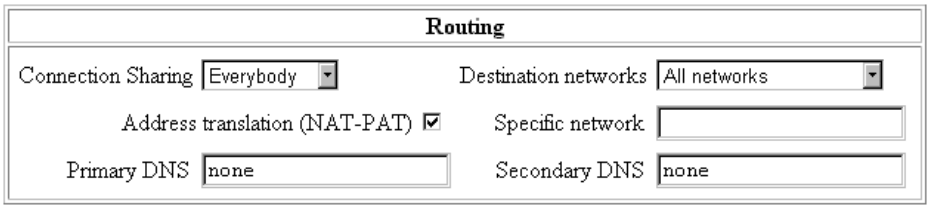
See chapter 19 for more information on the CLI.

In this subsection

- *'Routing'* box
- Connection Sharing
- Connection Sharing Subnet Values
- 'My net only' Configuration
- Destination Networks
- Destination Networks Subnet Values
- Primary and Secondary DNS Server.

'Routing' box

The following figure shows the *'Routing'* input box:



Connection sharing

The '*Connection Sharing*' field allows you to configure which LAN members, besides the PC that opened the PPP session, can use the PPP connection.

Three options are available:

- **Only Me**

  Only frames of the PC that opened the PPP session will be routed via this PPP connection.

  Suppose you opened a PPP session to your corporate and other LAN members are surfing the Internet.

  Via this option you can prevent them from using the PPP connection to your corporate as their gateway to the Internet.

- **Everybody**

  All PC(s) on the local LAN can forward frames over this PPP connection. This option is the exact opposite to '*Only me*'.

  If you open a PPP session to the Internet, other LAN members can share the PPP connection. In this way they are not required to open a session themselves.

- **My net only**

  Only PC(s) having the same network, and subnet number as the PC that opened the outbound PPP session, can use the PPP connection.

Connection sharing subnet values

The following table lists the used netmasks, related to the three possible options:

Connection Sharing value	Related Source Subnet Mask	Notation
Only Me	255.255.255.255	/32
Everybody	0.0.0.0	/0
My net Only	255.255.255.0 (default) This value depends on the sub-net mask in use.	/*

'My net Only' configuration

In case you want to privilege access via a particular PPP connection for specific PCs, proceed as follows::

Step	Action
1	Configure the PCs, to which you want to privilege outbound access via this PPP connection, in a particular subnet of your local LAN. **Note**: Don't forget to make the **STPro** also a member of this workgroup.
2	Configure the '*Connection Sharing*' box of the particular PPP connection for '*My net only*'.
3	It is sufficient now to open the PPP session of this PPP connection from one PC of this subnet.

Note: As a result, only the members of that particular subnet can share this PPP connection.

Destination networks

The '*Destination networks*' field allows you to configure which destination can be reached over the particular PPP connection.

Four options are available:

- **All networks**

  The *Pro* can potentially route frames to all destinations over this PPP connection. The PPP connection acts as if it was a default gateway.

- **Remote net only**

  A PPP connection configured for 'Remote net only', only forwards frames that is destined to this specific network. All other frames are blocked.

- **Remote host only**

  Only those frames with a destination IP address which matches exactly with this entry in the *Pro* routing table are forwarded over this PPP connection. In fact, only communication with the single remote host is possible.

- **Specific network defined below**

  If all previous cases do not fulfill your requirements, '*Specific network*' might help you out: you can specify which destination(s) are reachable over this PPP connection. Only if the destination IP address of a packet matches with this entry, the packet is forwarded over this PPP connection.

Destination networks subnet values

The following table lists the used netmasks, related to the four possible options:

Connection Sharing value	Related Source Subnet Mask	Notation
All Networks	0.0.0.0	/0
Remote net only	255.255.255.0	/0
Remote host only	255.255.255.255	/32
Specific network defined below	255.255.255.0.0 (default) This value is depending on the destination Subnet Mask.	/*

Primary and secondary DNS server

These fields allow – optionally – to enter the IP address(es) of the primary, and optionally the secondary, DNS server(s). If you supply these IP addresses, the *Pro* will negotiate these addresses with the remote side of the PPP connection. If these fields are left blank, the remote side will supply the IP addresses of the primary and secondary DNS servers.

See chapter 13 for more information on DNS.

9.4.5 Connection Related Configuration

Introduction

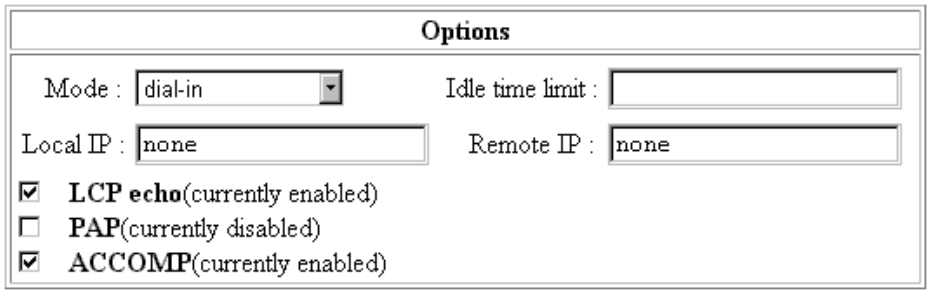
The following paragraphs explain which options that are used by a PPP entry when it opens a PPP session.

In this subsection

- *'Options'* box
- Mode: Triggering of a PPP Session
- Idle Time Limit
- Local and/or Remote IP: *Pro* PPP Client/Server Behavior
- LCP Echo (✓) Requests
- PAP (✓): Authentication Protocols
- ACCOMP (✓): PPP Framing

'Options' box

Following figure shows the *'Options'* input box:



Mode: triggering of PPP session

The 'Mode' field allows you to configure how a PPP session is opened.

Three options are available:

- **Dial-in**

  The PPP session is opened manually by clicking Dial-in next to the PPP connection in the *'Dial-in'* web page.

- **Always-on**

  After the *pro* is powered and finished its POST successfully, the *pro* automatically tries to open a PPP session for the PPP connection.

- **Dial-on-demand**

  The PPP session is opened automatically for a limited period of time. The opening of the session is triggered by the arrival of packets at a/the *pro* Ethernet port, to be sent over the PPP connection.

Note: By default one PPP connection is configured as *'Dial-in'* (i.e. *PPP1*), and another as *'Always-on'* (i.e. *PPP2*).

Idle time limit

In case you configured a PPP connection for *'Dial-on-demand'*, the *'Idle Time Limit'* box allows you to specify the time after which an opened, but unused PPP session is closed.

If left free, the idle limit time is infinite (i.e. the PPP session will never be closed).

Local and/or remote IP: STPro PPP server/client behavior

During the opening of a PPP session, IP addresses are negotiated between the two PPP peers for the PPP connection. The *Local IP'*, and *'Remote IP'* fields influence this negotiation.

Typically at the client side, the *'Local IP'*, and *'Remote IP'* boxes are left empty. This forces the client to ask the remote server for addresses.

In case you want to set up the *Pro* as PPP server, suitable values for your network configuration must be supplied:

- Setting a *local IP* address

  Forces the remote PPP client (if it allows to) to accept this IP address as the *Pro* PPP session IP address.

- Setting a *remote IP* address

  Forces the remote client (if it allows to) to accept this IP address as its PPP session IP address.

LCP echo (✓) requests

If a PPP session is up, it can issue Link Control Protocol (LCP) echo requests at regular intervals and expects LCP echo replies in return.

This checkbox allows to turn on/off LCP echo request/replies by respectively setting (✓), or clearing the flag.

By default LCP echo is on (i.e. flagged ✓), allowing the local PPP peer to detect communication errors, resulting in closing of the PPP session.

PAP (✓): used authentication protocol

The default PPP authentication protocol is Challenge Handshake Authentication Protocol (CHAP).

Setting the PAP flag (✓) will use Password Authentication Protocol (PAP) instead.

ACCOMP (✓): used PPP framing

Address and Control field COMPression (ACCOMP), sometimes abbreviated as ACCM, is by default enabled, i.e. flagged (✓).

This option flag should not be cleared, except in special circumstances, i.e. where the remote PPP server expects to see HDLC like framing (FF03 imposed to the PPP packet).

9.4.6 NAPT and PPP & IP Routing

NAPT

Network Address Translation (NAT) is a technique that allows you to shield or decouple an internal (Private) IP address from the (negotiated) external (Public) IP address.

In addition, via Port Translation (PT), this single external Public IP address is mapped onto multiple internal ports on the LAN, thus allowing multiple users to share this external IP address simultaneously.

The amalgam of address & port allocation is often referred to as NAPT.

NAPT and supported protocols

All supported protocols that are NAPT insensitive, pass transparently through NAPT.

In addition, the *Pro* supports also the following protocols as NAPT insensitive:

- All generic TCP/UDP protocols, e.g. HTTP (Hyper Text Transfer Protocol)
- Internet Control Message Protocol (ICMP)
- File Transfer Protocol (FTP)
- Internet Relay Chat (IRC)
- Real Audio
- Real Time Stream Protocol (RTSP).

Configuration of NAPT

You can enable/disable NAPT via the *'PPP Configuration'* web page per PPP entry.

In the *'Routing'* box (See subsection 9.4.4) it is possible to set/unset the NAT flag (✓).

Advanced NAPT can be configured via the CLI. See chapter 19 for more information.

NAT/PAT and STPro transparency

The NAPT feature comes at the expense of the *Pro* transparency. For consequences and solutions, see subsection 9.4.7.

9.4.7 NAPT and STPro Transparency

NAPT and STPro transparency

As described in subsection 9.4.6, the *Pro* can perform NAPT to decouple your local IP addresses from the public IP address negotiated during a PPP session.

However, this feature comes at the expense of the *Pro* transparency. This because a number of protocols that are layered on top of either TCP/IP, or UDP/IP do not adhere to the ISO/OSI reference model.

Note: The ISO Open Systems Interconnection (OSI) reference model promotes the layered implementation of communications protocol stacks. Layers from protocol stacks implemented according to this model can be changed without affecting the upper or lower layers.

In this subsection

- Consequences of NAPT on Layers
- *Pro* Solutions
- ATMF-25
- Via the PPPoA-to-PPTP Relay
- PPP-to-DHCP Spoofing.

Consequences of NAPT on layers

An important consequence is that changing IP addresses, or TCP/UDP ports via NAPT affects the other layers as well.

Due to these changes, applications that are the ultimate consumers of the protocols cannot decode the information correctly anymore.

STPro solutions

The *Pro* offers some solutions to cope with this situation.

Basically these solutions boil down in transporting Public IP addresses transparently through the *Pro* towards a device where a more advanced NAT, and/or PAT can be performed.

Some solutions are described in the following paragraphs:

- ATMF-25 (Not applicable for the *Pro* four port hub version)
- Via the PPP-to-PPTP Relay
- PPP-to-DHCP Spoofing.

ATMF-25

The ATMF-25 port offers maximum TCP/IP transparency because it switches ATM cells and does not touch TCP/IP information.

You might consider the following setup below:

Step	Action
1	Install both an ATMF-25 PC-NIC and Ethernet PC-NIC in a PC.
2	Install an OS on this PC that has routing capabilities, e.g. Windows NT, UNIX, etc.
3	Install on this PC a NAT/PAT package that supports all TCP/IP protocols. Now this PC can act as some '*home gateway*'.
4	Connect the ATMF-25 interface of the **STPro** to the ATMF-25 PC-NIC.
5	Connect your local LAN to the Ethernet PC-NIC.

Result

The Public IP address goes transparently through the *Pro* to end up in this advanced '*home gateway*', where more complex NAT, and/or PAT operations can be performed.

Via the PPP-to-PPTP Relay

A similar configuration as above can be used in combination with the *Pro* PPP-to-PPTP Relay.

Instead of installing an ATMF-25 PC-NIC, you must install a second Ethernet PC-NIC that connects to the *Pro*.

By setting up a PPTP tunnel from the *'home gateway'*, again the Public IP address is transported transparently through the *Pro* to end up in the *'home gateway'*.

PPP-to-DHCP Spoofing

A third technique is to use the PPP-to-DHCP Spoofing feature of the *Pro*. The network configuration is practically identical to the one described above:

Step	Action
1	Install two Ethernet PC-NICs in a PC.
2	Install an OS on this PC that has routing capabilities, e.g. Windows NT, UNIX, etc.
3	Install on this PC a NAT/PAT package that supports all TCP/IP protocols. Now this PC can act as some *'home gateway'*.
4	Connect (one of) the Ethernet interface(s) of the **STPro** to the PC's Ethernet PC-NIC port.
5	Connect your local LAN to the other Ethernet PC-NIC.
6	Configure the PC (acting as *'home gateway'*) as DHCP client.
7	Configure the **STPro** as DHCP server.
8	DHCP in the **STPro** must be configured for DHCP Spoofing. See subsection 12.3.4 for more information.
9	At least one PPP connection must begin with the mnemonic "DHCP" in its phonebook name, e.g. DHCP_Spoof.

Result

As soon as a DHCP request from the home gateway hits the *Pro*, a PPP/DHCP Spoofing connection is triggered. The IP parameters that are negotiated with the remote peer, are carried up to the home gateway via a DHCP reply message.

10 Data Services – Classical IP & IP Routing

Introduction

Classical IP is a popular term for RFC1577: Classical IP and ARP over ATM . This RFC describes how a classical IP network can be created with ATM technology.

"*Classical*" refers to the way IP operates in legacy LANs. i.e. IP communication between nodes within the same IP subnet is made possible by the shared nature of popular LAN media (e.g. Ethernet) and their inherent broadcast capabilities.

For communication between IP subnets, routers do intervene.

In the following, Classical IP will be referred to as CIP.

In this chapter

10.1 Preparatory Steps

Features

Classical IP:

- Next to PPPoA, is a second standardized method for creating IP networks on top of ATM technology
- Is traditionally well supported by ATM access routers at the remote end of the connection
- Similar to Bridging, provides "always on" type of connections
- Supports up to 12 concurrent virtual channels assigned to CIP.

What you should know in advance

- The **VPI/VCI** value of the VC(s) to use on the ADSL line
- **CIP connection service** must be supported on this VC
- The remote access device must issue and respond to **InATMARP** messages.

Note: If connectivity to multiple remote organizations is required, you need additional sets of these parameters.

STPro

The *Pro* comes with four preconfigured CIP entries.

If the SP(s) impose CIP settings which differ from the *Pro* defaults, perform the necessary adjustments via the *Pro* web pages.

See section 10.4 for more information.

PC(s)

In CIP mode, the *Pro* exchanges IP packets with computers on your local network. As a consequence all that is required on your local PC(s) is "standard" TCP/IP.

Prior to configuring CIP, you must establish IP connectivity with the *Pro*. The easiest method is to configure your PCs as DHCP clients. By default the *Pro* acts as DHCP server and leases IP addresses to local PCs during startup.

See subsection 12.1.4 for more information.

10.2 CIP Configuration for a LIS

Introduction

In this section the basic procedure to enable connectivity in a Logical IP Subnet (LIS) via the ADSL line is described.

In this section

10.2.1 General CIP Configuration Procedure

Decision procedure

Due to the many decisions that must be made in order to be able to configure the *Pro* to be an active member of a LIS, the procedure to be followed is best retrieved from the following decision table:

<table>
<tr><th>Step</th><th>Decision and/or Action</th><th>See</th></tr>
<tr><td>1</td><td>Are you configuring the STPro for an existing LIS ?
<table><tr><th>Answer</th><th>Action and Description</th></tr><tr><td>Yes</td><td>You must retrieve the LIS IP parameters to which your local configuration must adhere to. See topic 'Configuration for an Existing LIS' of subsection 10.2.2.</td></tr><tr><td>No</td><td>You can create the LIS with IP parameters of your choice. See topic 'Creating a New LIS' of subsection 10.2.2.
In case you create a new LIS, you must create the LIS at both end of the ADSL connection, i.e. at the local, and on the remote side.</td></tr></table></td><td>10.2.2</td></tr>
<tr><td>2</td><td>Retrieve the appropriate LIS parameters, and check on which VCs (identifiable by their VPI/VCI values) your service provider enabled the CIP packet service.</td><td>10.2.2</td></tr>
<tr><td>3</td><td>If needed, create a CIP phonebook entry, i.e. a CIP PVC, in the 'Phonebook' web page.</td><td>10.4</td></tr>
<tr><td>4</td><td>Is the remote access router a RFC1577 compliant device, e.g. another STPro?
<table><tr><th>Answer</th><th>Action and Description</th><th>See</th></tr><tr><td>Yes</td><td>The remote access router will respond to 'InATMARP' requests, thus the CIP PVC can be implicitly assigned to the CIP member.</td><td>10.2.3</td></tr><tr><td>No</td><td>The remote access router will not respond to 'InATMARP' requests submitted by the STPro, thus the CIP PVC must be explicitly assigned to the CIP member.</td><td>10.2.4</td></tr></table></td><td></td></tr>
<tr><td>5</td><td>If needed, create a CIP member in the 'CIP Interfaces' table of the 'CIP' web page.</td><td>10.4</td></tr>
<tr><td>6</td><td>Add appropriate IP routes to the STPro via the 'IP route' table on the 'Routing' web page.</td><td>10.2.6</td></tr>
<tr><td>7</td><td>Add appropriate IP routes in you PC(s).</td><td>10.2.6</td></tr>
</table>

10.2.2 Retrieving LIS Parameters

LIS

The LIS is an important CIP concept. It is a group of IP machines configured as members of the same IP subnet. In other words: they share the same IP network and subnetwork numbers.

In most cases this LIS will be a corporate LAN/WAN environment, which is interconnected via the ADSL/ATM network.

LIS parameters

In order to be able to properly configure your *Pro* for sharing the same logical IP subnet, you must know the following LIS parameters:

- The IP network number
- The IP subnetwork number
- The remote access router's RFC1577 compliancy state
- The remote access router IP address, in the case it is not RFC1577 compliant.

Of course, in case you know the IP address of one member of the LIS, and the associated netmask, you also have enough information.

Configuration for an existing LIS

For an existing LIS, you must configure the *Pro* CIP settings, according to the existing LIS parameters.

If the default CIP member's IP parameters, and the CIP connection's remote IP address, configured in the *Pro*, match with these parameters, nothing needs to be configured.

However, make sure that the CIP member's local IP address is not ambiguous within the LIS.

Creating a new LIS

In the case of creating a new LIS, you are recommended to use the default CIP configurations of the *Pro*. In case the remote access router is also a *Pro*, best results are assured.

Note: Both ends of the LIS must be properly configured for connectivity, inclusive the routing tables.

10.2.3 Implicit Assignment Mechanism

Implicit assignment

If the remote side is RFC1577 compliant, e.g. another *Pro*, your local *Pro* is able to retrieve the remote IP address of the CIP PVC, by issuing an InATMARP request on that PVC.

That way, you must not specify an IP address for the CIP PVCs you add to the *'CIP Connections'* table, it will be implicitly assigned when connecting to the LIS.

Implicit assignment example

The sequence below describes an example of an implicit assignment mechanism:

<table>
<tr><th>Phase</th><th colspan="3">Decision and Description</th></tr>
<tr><td>1</td><td colspan="3">Suppose you added a CIPPVC without supplying an IP address (e.g. CIPPVC2).</td></tr>
<tr><td>2</td><td colspan="3">The STPro will automatically issue an InATMARP request on this PVC.</td></tr>
<tr><td rowspan="4">3</td><td colspan="3">Is the remote side is RFC1577 compliant ?</td></tr>
<tr><td colspan="2">Yes</td><td>No</td></tr>
<tr><td>4</td><td colspan="2">It responds with an InATMARP reply, containing its IP address.
The CIP's remote IP address in the 'CIP Connections' table is completed.</td><td rowspan="3">"Unresolved" will show up in the 'Remote IP Address' field.
Consequently the CIPPVC cannot be assigned and IP connectivity will not exist with the remote machine.</td></tr>
<tr><td>5</td><td colspan="2">Does the remote address share a LIS with a local CIP member ?</td></tr>
<tr><td rowspan="2">6</td><td>Yes</td><td>No</td></tr>
<tr><td>the CIPPVC is assigned to this member.
Connectivity is assured.</td><td>"Unresolved" will show up.
No connectivity exists.</td></tr>
</table>

Note

The grey shaded area of the table indicates the sequence of a correct RFC1577 compliant LIS interconnection.

10.2.4 Explicit Assignment Mechanism

Explicit assignment

In the case of a remote access server which is not RFC1577 compliant, it will not respond to InATMARP requests.

As a consequence, the *Pro* can not retrieve the remote IP address to assign the CIP PVC to the CIP member.

Therefore you must explicit assign a remote IP address to the CIP PVC.

Explicit assignment example

The default configuration of the *Pro* is an example of the explicit assignment of a CIP PVC to a CIP member:

In the *'CIP Interfaces'* table, the CIP member is configured as follows:

Name	Local IP-Address	Mask
cip0	172.16.1.1	255.255.255.0

In the *'CIP Connections'* table, the remote IP address is statically configured:

Dest	Remote IP-Address
CIPPVC1	172.16.1.2

Consequently, *CIPPVC1* is explicitly assigned to *cip0*.

Note

Both local and remote IP addresses must fall within the same IP network and IP subnetwork, according the LIS parameters.

10.2.5 Configuring the STPro for CIP

Introduction

After retrieving the LIS parameters, you must configure the *Pro*, according to these parameters.

This section describes in short the global procedure for configuring your *Pro* *'Phonebook'*, and *'CIP'* web page.

Configuration of the STPro 'Phonebook' web page

By default the *Pro* is configured for a CIP VC as used in the example of section 10.2.7. If this VC is appropriate to your, and/or the ADSL provider's needs, nothing has to be configured in the *Pro* phonebook.

If this VC does not match the requirements, three other CIP phonebook entries are available to add.

However, in the case none of the entries match, you must add a CIP phonebook entry yourself.

Adding CIP phonebook entries is described in subsection 10.4.1.

Configuration of the STPro 'CIP' web page

The default CIP phonebook entry mentioned above is by default configured for a LIS according to the example of section 10.2.7. If this LIS configuration meets your requirements, nothing needs to be configured, and your *Pro* is ready for use.

However, if additional configuration is needed, you can configure CIP members yourself.

The assignment of your CIP PVC to the CIP member can be done implicit, or explicit, according the RFC1577 compliancy of the remote access router.

Configuration of the *Pro* *'CIP'* web page is fully described in subsection 10.4.2.

10.2.6 Adding Appropriate Routes to the Routing Tables

Introduction to routing

IP routing is a very important aspect for a LIS configuration.

This subsection describes how you can ensure end-to-end connectivity for a CIP environment.

- Configuring the *pro* for LIS Connectivity, Basic
- Configuring the *pro* for LIS Connectivity, Advanced
- Configuring your LAN PCs for End-to-End Connectivity
- Routing Table Configuration.

Configuring the STPro for LIS connectivity, basic

Generally, for proper CIP routing, an IP route pointing to the remote access router must exist in your *pro*'s IP routing table.

If the remote access router is RFC1577 compliant, no routes for LIS connectivity need to be configured by yourself for the *pro*'s IP router. This because it automatically adds two necessary routes as soon you configure the CIP member, i.e. two default gateways, thus any (0.0.0.0/0) as source address, and with:

- The LIS's local CIP member's IP address, i.e. the *pro*'s CIP interface address as destination

and

- The LIS's IP subnetwork (based on the CIP member's IP parameters) as destination.

As the RFC1577 compliant remote access router, falls within the same LIS as the *pro* CIP member, it is also a member of the second route's destination IP subnetwork.

If the remote access router is not RFC1577 compliant, you must add this default route (with the known remote IP address) yourself.

Configuring the STPro for LIS connectivity, advanced

The possibility exists to add routes yourself, e.g. to be more specific in the source IP address pool.

The default added routes have any as source address, meaning that all local hosts can use this gateway to connect to the LIS via the CIP interface.

However, you might want to embed restrictions in LIS access by creating a subnet in your LAN, e.g. 10.0.1.x, and privilege access to the LIS – and its beyond LAN – to this subnet by adding a route, pointing to the remote access router (implicit, or explicit), but with source IP address pool 10.0.1.0/24.

Of course, then the default IP routes, configured by default, must be deleted.

Configuration your LAN PCs for end-to-end connectivity

In order to have end-to-end connectivity from your PCs to the remote side of the CIP connection and beyond, you must add routes having the *Pro* Ethernet interface IP address as gateway.

By specifying 0.0.0.0/0 as destination, and the *Pro* local Ethernet IP address as gateway, the *Pro* is configured as the default gateway for all connection requests.

However, you can specify a destination IP address pool; e.g. if the remote LAN's IP subnetwork is 192.6.11.x, you can add routes in your PC's routing table with destination 192.6.11.0/32, and the *Pro* as gateway.

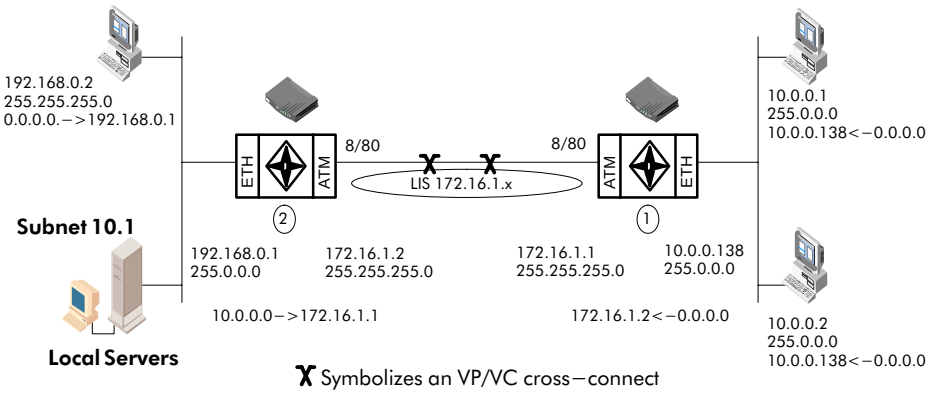
Routing table configuration

Configuring routes for the *Pro* is described in subsection 12.4.2.

10.2.7 Example Configuration

Configuration figure

The configuration of a Classical IP LIS is illustrated with the following example:



In the drawing above a LIS, 172.16.1.x, represented by the ellipse, runs between the *pro* **(1)** and the remote access router (2).

Local premisses configuration

At the local premisses an IP network, 10.x.x.x, is created.

An IP address is configured on the Ethernet port (10.0.0.138).

On the ADSL side of the *pro* **(1)** one CIP member is by default enabled. This CIP member is configured with IP address 172.16.1.1 and is part of the LIS 172.16.1.x.

One VC in the *pro* **(1)** phonebook (CIPPVC1), is explicitly assigned to this CIP member. This VC(8/80) is cross-connected to the remote destination.

Remote premisses configuration

At the remote ADSL side, the CIP LIS is terminated by the remote access router (2) and IP packets are forwarded to local servers, or the Internet and vice versa.

Here, the CIP member is configured with IP address 172.16.1.2 and is part of the same LIS 172.16.1.x.

Additionally, a VC, with the same VPI/VCI values 8/80, is assigned to this CIP member (e.g. implicit assignment, because *Pro* **(1)** is RFC1577 compliant).

Routing configuration

The routing engine must be configured with routes to the final destinations.

For the given example, the configuration is as follows:

- *Pro* **(1)** has its default route pointing to the remote access router (2)

  The local PCs of IP network 10.0.0.x have default gateways pointing to *Pro* **(1)**

- The remote access router (2) has a route for "Net10" (10.0.0.0) pointing to *Pro* **(1)**

  The remote IP network 192.168.0.x has a default gateway pointing to access router (2).

Note

You will notice that the example relies exclusively on *Private* IP addresses. Depending the application though, other IP addresses in combination with NAPT (configurable via the CLI) can be used.

10.3 Using CIP & IP Routing

CIP operation

Similar to classical LAN networking, IP Routing and CIP adhere to the "always-on" concept. That is, no special actions (e.g. dialing) must be undertaken prior to IP connectivity.

IP packets sourced by local PCs, arrive via the Ethernet segment in the *Pro*. The latter makes routing decisions based on the destination IP address of the packet. If the packet ends up in the CIP member, it will on its turn determine to which VC it has to output the packet.

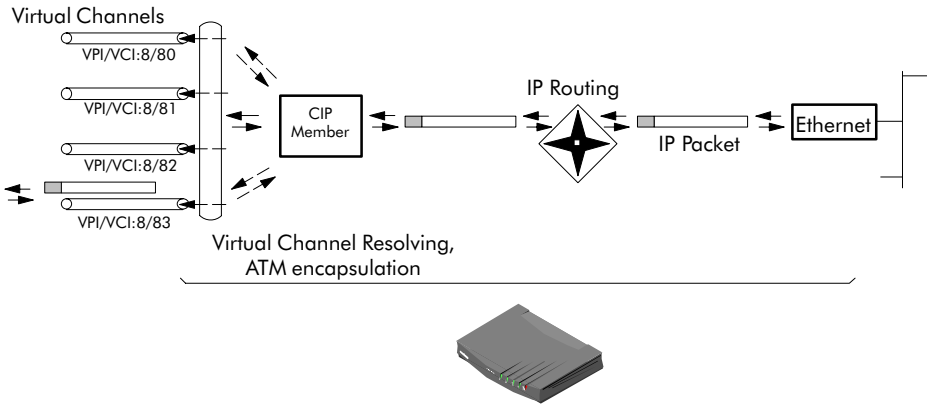
You can check IP connectivity from any PC on the local Ethernet segment. Therefor, ping the IP address at the far end of the virtual connection; e.g. for the example of subsection 10.2.7, this would be 172.16.1.2, or thus **`ping 172.16.1.2`**.

Classical IP and STPro

The IP router in the *Pro* forwards packets between the Ethernet port and the Classical IP entity sitting on top of the ADSL/ATM port. In turn, the CIP entity determines which VC it has to output the packet to, prior to ATM encapsulation.

Configuration and operation example

The figure below provides an overview of the *Pro* rear-to-front end Classical IP operation:



10.4 CIP Configuration

Introduction

The *Pro* allows local configuration via the *Pro* web pages.

This section describes the configuration of CIP entries, and how to use the *'CIP'* web page.

In this section

10.4.1 CIP Phonebook Entries

In this subsection

- CIP Phonebook Entries
- Adding CIP Phonebook Entries
- Deleting CIP Phonebook Entries.

See subsection 11.3.2 for more information.

CIP phonebook entries

Basic to the *Pro* VC pool management, is the *'Phonebook'* web page.

The *Pro* in its default state features the following CIP related phonebook entries:

Name	Address	Type	AutoPVC	Avail	Action
CIPPVC1	8.80	cip	No	no	Delete
CIPPVC2	8.81	cip	No	yes	Delete
CIPPVC3	8.82	cip	No	yes	Delete
CIPPVC4	8.83	cip	No	yes	Delete
Use input fields below to add a new entry					
		cip	-	-	Add

Adding/deleting phonebook entries

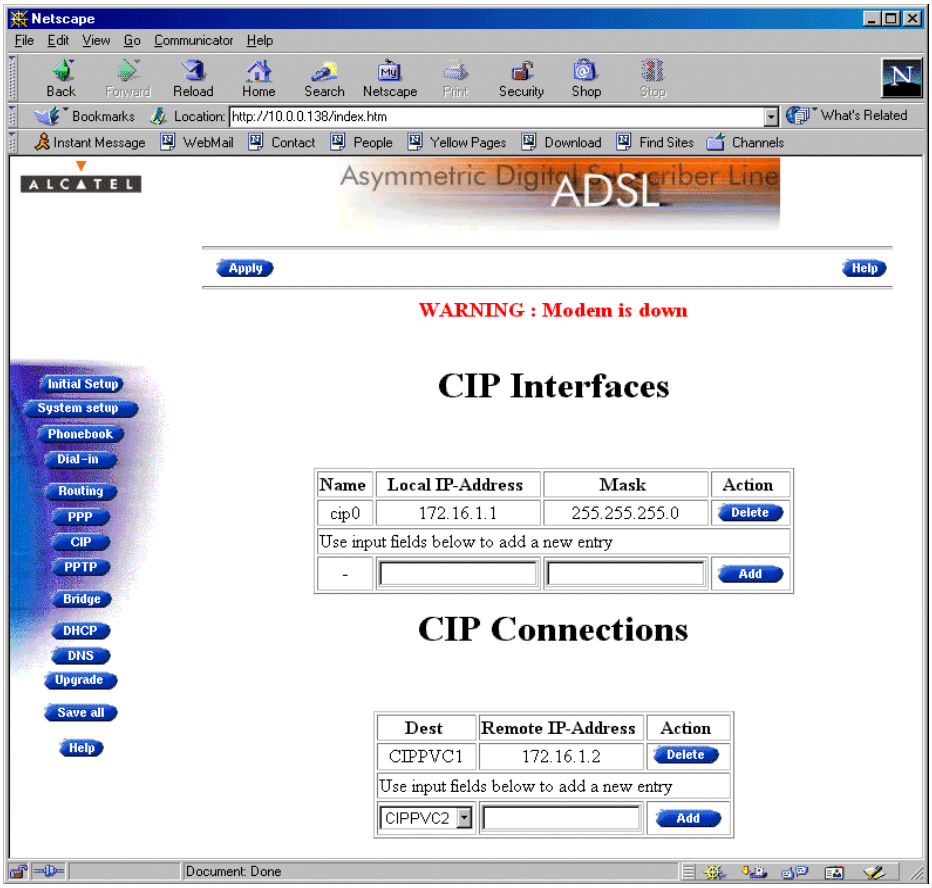
See section 11.3 for more information.

10.4.2 CIP Entries

In this subsection

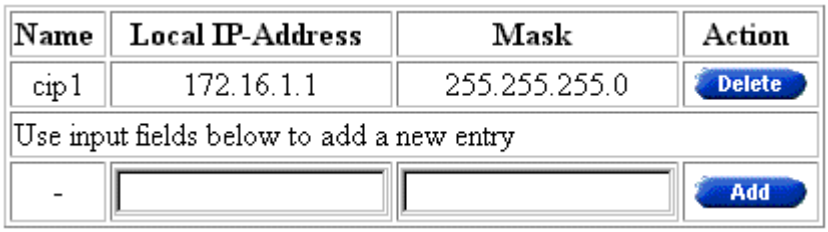
The STPro 'CIP' web page

Clicking CIP in the left pane of the *Pro* web pages, pops up the 'CIP' web page:



The 'CIP Interfaces' table

The following figure shows the *'CIP Interfaces'* table:



'CIP Interfaces' table components

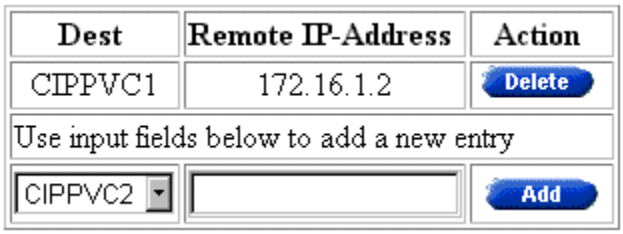
The following fields are shown:

Field	Description
Name	Indicates the CIP member name. All CIP members are named as *cipX*, where *X* is a number.
Local IP Address	Indicates the IP address of the local ADSL side of the LIS, i.e. the IP address of your CIP interface.
Mask	Indicates the netmask/subnetmask of the local IP address.
Action	This field contains one of the two following action buttons:

Button	Action
Add	Add a CIP member to the list.
Delete	Delete an existing member from the list.

The 'CIP Connections' table

The following figure shows the *'CIP Connections'* table:



'CIP Connections' table components

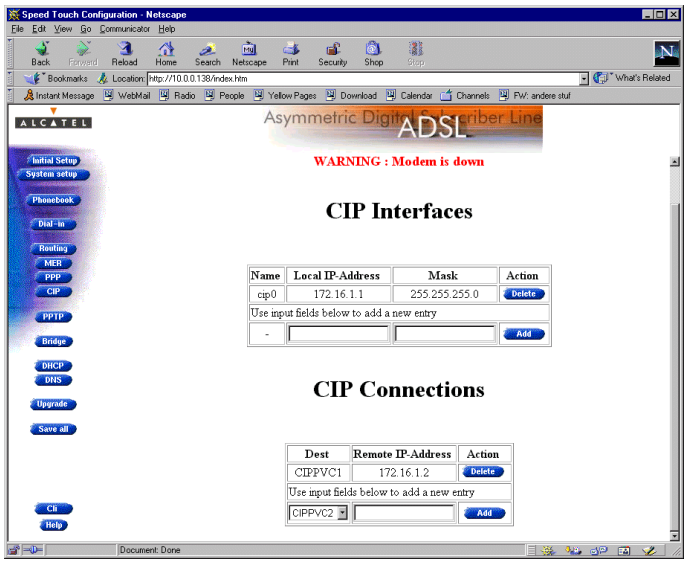
The following fields are shown:

Field	Description
Dest	Indicates the CIP VC phonebook name.
Remote IP Address	Indicates the remote IP address of the remote ADSL side of the LIS, i.e. the IP address of the remote CIP interface. **Note**: In case the VC is not cross-connected, or implicit assignment was not successful, this field shows *"Unresolved"*.
Action	This field contains one of the two following action buttons:

Button	Action
Add	Add a CIP connection to the list.
Delete	Delete an existing connection from the list.

Adding CIP members

Proceed as follows:

Step	Action and Description
1	Browse to the *'CIP'* web page:  The bottom row of the *'CIP Interfaces'* table allows addition of a new CIP member.
2	Fill in the following CIP member parameters: **Value** – **Description** **Local IP Address** – The IP address at the CIP member at your local side of the LIS. **Mask** – The associated netmask/subnetmask for that local IP address.
3	Click **Add** and **Save all** to finish the procedure.

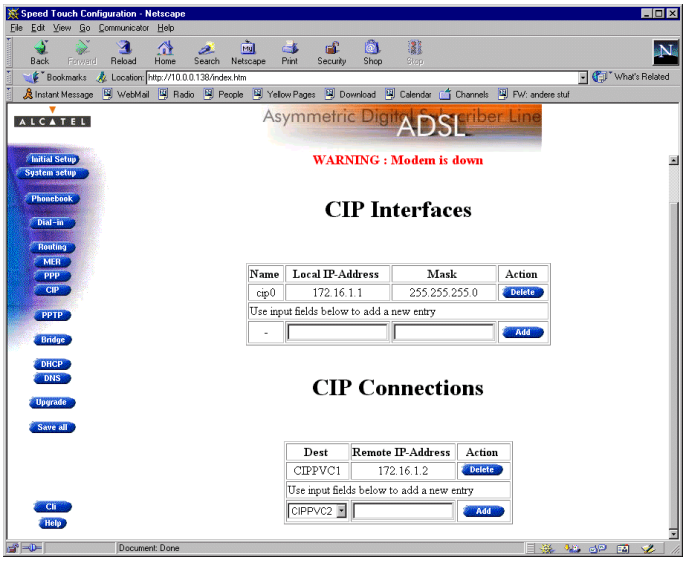
Result

A CIP member of the LIS is created at your *Pro*'s CIP interface side of the LIS. The local IP address is added to the *'IP Address'* table.

Two default routes are added to the *'IP Route'* table, both pointing to the *Pro* as gateway, but the first with the CIP member itself as destination, and the second with the LIS subnetwork IP address pool as destination.

Assigning CIP PVCs to CIP members

Proceed as follows:

Step	Action and Description
1	Browse to the *'CIP'* web page:  The bottom row of the *'CIP Connections'* table allows addition of a new CIP connection.
2	In the *'Dest'* column of the bottom row, click  and select the CIP PVC you want to assign.
3	Depending the RFC1577 compliancy of the remote access router, the following must be filled in, in the *'Remote IP address'* column: Compliancy: YES – You don't have to fill in anything; the InATMARP reply will implicitly assign the PVC to the CIP member. Compliancy: NO – You must fill in the exact IP address of the remote access router; the PVC is explicitly assigned to the CIP member.
3	Click Add and Save all to finish the procedure.

Result

A CIP PVC is assigned, and added in the *'CIP Connections'* table.

Deleting CIP entries

Proceed as follows:

Step	Action and Description
1	Browse to the *'CIP'* web page.
2	Select the CIP connection, and/or CIP member you want to delete, and click Delete
3	Click Save all to store the changes in permanent memory.

10.5 Advanced CIP Configurations

Introduction

The example of subsection 10.2.7 showed a configuration with a single VC, used for ADSL connectivity within one LIS.

In this section the use of multiple VCs to connect to a LIS, and the connectivity to multiple LISs is described.

In this section

10.5.1 Configuring Multiple CIP PVCs

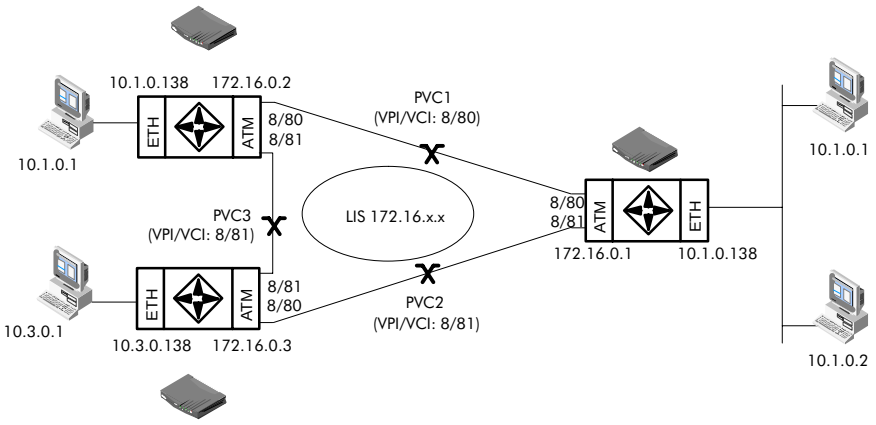
Multiple VCs for one LIS

Multiple VCs can be assigned, either explicit or implicit, to CIP members in the *'CIP Connections'* table.

By doing so, local PCs can simultaneously access multiple ADSL nodes of one LIS.

Example

The following figure shows an example of such a configuration:



Procedure

Proceed as follows to assign multiple CIP PVCs to one CIP member:

Step	Action and Description
1	Browse to the *'CIP'* web page. The bottom row of the *'CIP Connections'* table allows addition of a new CIP connection.
2	In the *'Dest'* column of the bottom row, click and select the CIP PVC you want to assign. E.g., you can select the preconfigured CIPPVC2, 3, or 4 if these are supported for the CIP packet service by the ADSL provider.

<table>
<tr><th>Step</th><th>Action and Description</th></tr>
<tr><td>3</td><td>Depending the RFC1577 compliancy of the remote access router, the following must be filled in, in the 'Remote IP address' column of the CIP PVC:
<table>
<tr><th>Compliancy</th><th>Remote IP Address</th></tr>
<tr><td>YES</td><td>You don't have to fill in anything; the InATMARP reply will implicitly assign the PVC to the CIP member.</td></tr>
<tr><td>NO</td><td>You must fill in the exact IP address of the remote access router; the PVC is explicitly assigned to the CIP member</td></tr>
</table></td></tr>
<tr><td>4</td><td>Click Add</td></tr>
<tr><td>5</td><td>Repeat steps 2, 3 and 4 until all provided cross-connects are added to the 'CIP Connections' table.</td></tr>
<tr><td>6</td><td>Click Save all to store the changes in permanent memory.</td></tr>
</table>

Result The CIP PVCs you have added, appear in the *'CIP Connections'* table.

However, check whether the remote IP addresses get resolved on these new CIPPVCs.

If yes, check IP connectivity with the remote device via a ping utility on one of the local PCs.

Note As your SP is responsible for the cross-connects, check whether he supports this advanced configuration.

10.5.2 Creating Multiple CIP Members.

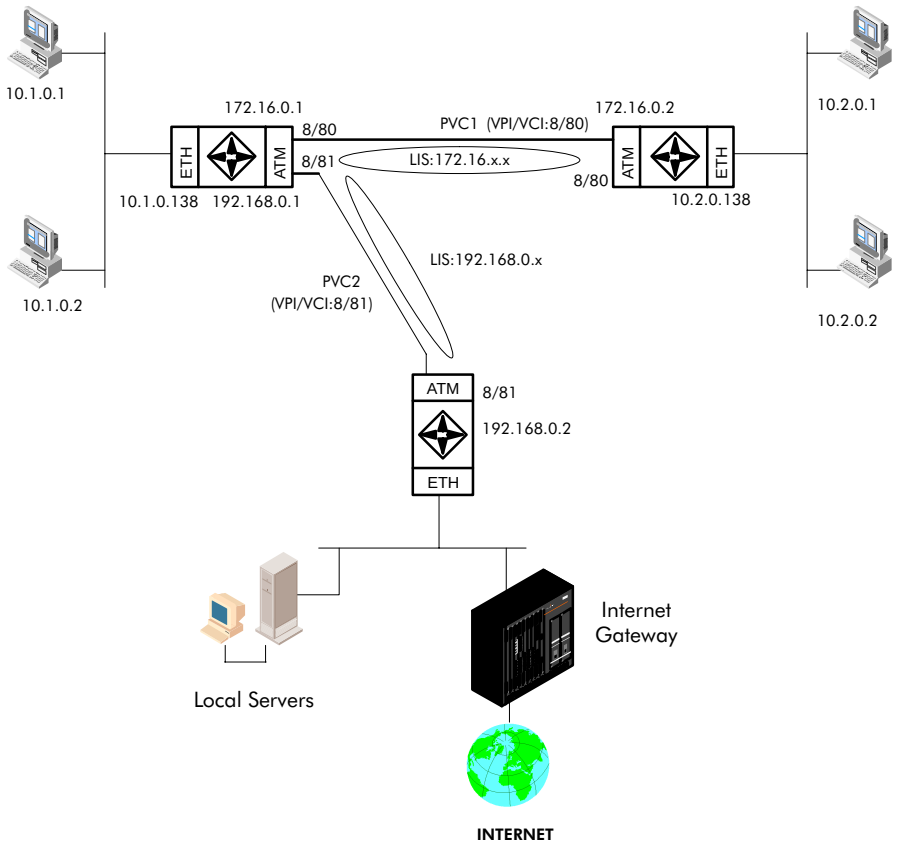
Multiple VCs for multiple LISs

You can create multiple CIP members, and consequently the *Pro* can be part of multiple LISs.

By doing so, your PC(s) can connect to multiple LISs.

Example

The following figure shows an example of such a configuration:



Adding CIP members

Proceed as follows to add multiple CIP members to the *'CIP Interfaces'* table:

Step	Action and Description
1	Browse to the *'CIP'* web page. The bottom row of the *'CIP Interfaces'* table allows addition of a new CIP member.
2	Fill in the following CIP interface parameters: **Value** / **Description** **Local IP Address** – The IP address at the additional CIP member. **Mask** – The associated netmask/subnetmask for that local IP address.
3	Click Add
4	Repeat steps 2 and 3 for each LIS you want to connect to.
5	For each additional CIP member, at least one CIP PVC must be assigned. This can be done implicit, or explicit (according each remote side's RFC1577 compliancy). See the procedure in subsection 10.5.1 for adding CIP PVCs to the *'CIP Connections'* table.
6	Click Save all to store the changes in permanent memory.

Result

The CIP members you created, appear in the *'CIP Interfaces'* table.

The CIP PVCs, you have added appear in the *'CIP Connections'* table.

However, check whether the remote IP addresses get resolved on these new CIP members and their associated CIP PVCs.

If yes, check IP connectivity with the LISs via a ping utility on one of the local PCs.

Note

As your SP is responsible for the cross-connects, check whether he supports this advanced configuration.

Speed Touch™ *Pro* with Firewall

Networking Services

11 Networking Services – ATM

Introduction

All data arriving at and departing from your *Pro* via the ADSL line is carried in ATM cells.

In this way, ATM is the fundamental communication "language" for the *Pro* towards the remote devices.

The dual port *Pro* model, equipped with the additional ATMF-25.6 port, is even capable to extend ATM connectivity up to your local PC, or LAN (via ATM switches).

In this chapter

11.1 The ATM Packet Switching Technology

ATM Switching

ATM is a connection-oriented packet switching technology using fixed-size packets, called *cells*.

These cells consist of a header and a payload and are switched through a public or private ATM network depending on the contents of the header.

End-to-end connections are formed by cross-connecting individual ATM segments in ATM switches.

In this section

11.1.1 ATM Parameters

Virtual channels

ATM uses VCs to create individual communication links between network nodes. ATM uses two types of VCs:

- Permanent Virtual Channels (PVCs) are static connections between network nodes that are configured statically. The nodes of the connection operate as if they are connected with a dedicated physical line.
- Switched Virtual Channels (SVCs) are similar to voice telephone network connections. These are temporary connections between any two end points on the network and are configured via signaling. A Switched VC (SVC) is created dynamically for each session and released when the information exchange is complete.

VCs and the STPro

Currently all *pro* ATM connections are static, i.e. of type PVC.

Channel identifiers

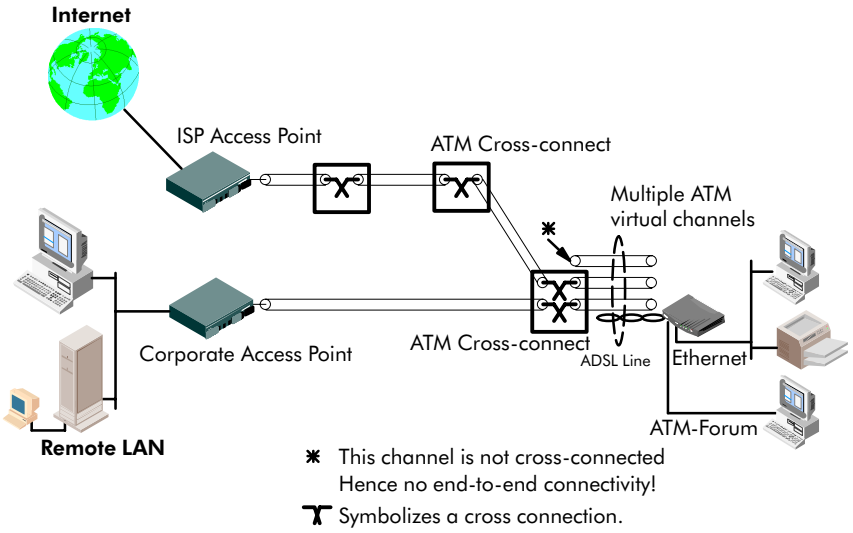
Each ATM cell carries two labels called VPI and VCI as part of its header.

An ATM channel, commonly referred to as *virtual* channel, is fully identified by these two labels. Therefore, multiple ATM channels can reside on your ADSL line.

11.1.2 ATM and the STPro

End-to-end ATM connectivity

The following figure provides an overview of the end-to-end architecture of the ATM connectivity; from your *Pro* to the remote access devices.



STPro vs. remote destination

Practically speaking, a number of VCs to one, or multiple remote destination(s) can start from/are terminated at the *Pro*.

By default, a number of channels are terminated in the *Pro* for Ethernet; others are cross-connected to the ATMF-25.6 port (if your *Pro* is equipped with a ATMF-25.6 port).

ATM provision

End-to-end ATM connectivity is the responsibility of local operators. There might be regional differences in the type and number of ATM channels that are cross-connected.

If problems are encountered, check with your local operator for more information.

STPro default PVCs

See Appendix E for the specific default ATMF and Ethernet VPI/VCI values.

11.1.3 ATM and Interfaces

ATM traffic handling

ATM traffic, arriving at the *Pro*, is switched to either the Ethernet port(s), or the (optional) ATMF-25.6 port depending on the VPI/VCI values in the individual cells.

Inside ATM VCs any protocol can be transported. However, at both endpoints – that is where the ATM channels are terminated –, the same protocol must be supported. If not, there will be no end-to-end connectivity.

ATMF-25 port

This port, optional available on the single Ethernet port *Pro*, does not terminate ATM connections, it just switches ATM cells between the ADSL and ATMF-25 port.

It is the ATMF-25.6 PC-NIC of the PC that actually initiates, or terminates ATM VCs.

It is important to check in advance which protocols are supported by the ATMF-25.6 PC-NIC driver. At least RFC 1483 and RFC 2364 should be fully implemented.

See section 11.2 for more information.

Ethernet port(s)

This port terminates a number of ATM connections and extracts frames from arriving cells and encapsulates frames in departing cells.

Only frames recognized/supported by the *Pro* on a particular ATM connection are extracted, or encapsulated.

Currently the supported encapsulations are:

- For **Bridged** connections:

  RFC 1483, Ethernet V2.0/IEEE 802.3 bridged PDUs for both the LLC/SNAP method and VC-MUX method

- For **MER** connections:

  RFC 1483, Ethernet V2.0/IEEE 802.3 bridged PDUs for both the LLC/SNAP method and VC-MUX method

- For **PPPoA/PPTP** connections:

  RFC 2364, PPP PDUs for both the LLC/NLPID method and VC-MUX method

- For **Routed PPP** connections:

  RFC 2364, PPP PDUs for both the LLC/NLPID method and VC-MUX method

- For **Routed CIP** connections:

  RFC 1483 LLC/SNAP method for Routed PDUs.

11.2 ATMF-25.6 Port Configuration

Disclaimer

This section applies only to the dual *Pro* model, equipped with both Ethernet and ATMForum-25.6Mbps port.

ATM connectivity in your LAN

If your PC (alternatively via an ATM switch) is connected to the ATMF interface, ATM service is delivered into the PC.

This implies that ATM cells, sourced by PC applications via the PC's ATMF PC-NIC port, are captured by the *Pro* ATMF-25.6 port and cross-connected, or switched to the ADSL line.

The STPro ATMF-25.6 port

The *Pro*'s ATMF port is completely transparent to upper protocol layers.

The PC ATMF-25.6 PC-NIC

The available support of the packet services depend solely on your ATMF-25.6 PC-NIC's capabilities.

Consult your ATMF-25.6 PC-NIC documentation for information on service configuration.

ATM VC support

The VPI/VCI of the VCs, default cross-connected between the ADSL line and the ATMF-25.6 port, are listed in Appendix E.

Connectivity is only possible if your ATMF-25.6 PC-NIC is sending and receiving ATM cells on one (or more) of these VCs.

11.3 The Speed Touch Pro with Firewall Phonebook

Introduction

The Pro phonebook is like any ordinary phonebook:

"A repository for names and numbers".

However, in contrast to a standard phonebook, it contains additional connectivity information.

Basic to the Pro ADSL modem operation are ATM VCs. The Pro phonebook is the management tool for all possible ATM VC connections.

This chapter describes how to use the Pro phonebook, and consequently how to manage this VC pool.

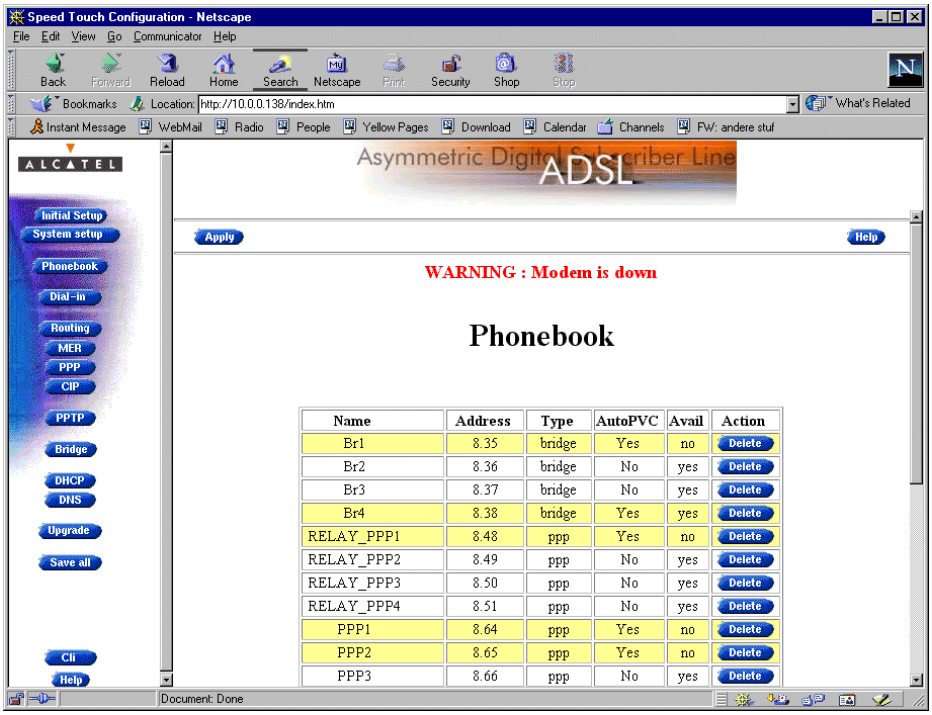
In this section

11.3.1 The STPro 'Phonebook' Web Page

In this subsection

The STPro 'Phonebook' web page

Clicking Phonebook in the left pane of the *Pro* web pages, pops up the 'Phonebook' web page (See section 18.2 for more information):



The 'Phonebook' table

The following figure shows an example of the *'Phonebook'* table of the *'Phonebook'* web page:

Name	Address	Type	AutoPVC	Avail	Action
Br1	8.35	bridge	Yes	no	Delete
Br2	8.36	bridge	No	yes	Delete
Br3	8.37	bridge	No	yes	Delete
Br4	8.38	bridge	Yes	yes	Delete
RELAY_PPP1	8.48	ppp	Yes	no	Delete
RELAY_PPP2	8.49	ppp	No	yes	Delete
RELAY_PPP3	8.50	ppp	No	yes	Delete
RELAY_PPP4	8.51	ppp	No	yes	Delete
PPP1	8.64	ppp	Yes	no	Delete
PPP2	8.65	ppp	Yes	no	Delete
PPP3	8.66	ppp	No	yes	Delete
DHCP_SPOOF	8.67	ppp	Yes	no	Delete
CIPPVC1	8.80	cip	Yes	no	Delete
CIPPVC2	8.81	cip	No	yes	Delete
CIPPVC3	8.82	cip	No	yes	Delete
CIPPVC4	8.83	cip	No	yes	Delete
Use input fields below to add a new entry					
		any	-	-	Add

'Phonebook' table components

The following fields are shown:

Field	Description
Name	Indicates the name, or alias of the virtual connection phonebook entry. Any name can be given to an entry.
Address	Indicates the VPI, and VCI value of the ATM VC, terminated on the ADSL port, for the phonebook entry. The allowed VPI range: from 0 up to 15. The allowed VCI range: from 32 up to 511. **Note**: In case your single Ethernet port **STPro** is equipped with an ATMF-25.6 port, VPI values 0 to 7 are cross-connected between the ADSL port and the ATMF-25.6 port.

<table>
<tr><th>Field</th><th>Description</th></tr>
<tr><td>Type</td><td>Represents the sort of packet services that are supported on the ATM VC.
It can take the following values:
<table>
<tr><th>Value</th><th>Packet Service</th></tr>
<tr><td rowspan="2">bridge</td><td>IEEE802.1D Transparent Bridging
See chapter 6 for more information.</td></tr>
<tr><td>MAC encapsulated Routing
See chapter 6 for more information.</td></tr>
<tr><td rowspan="2">ppp</td><td>PPPoA-to-PPTP Relaying
See chapter 8 for more information.</td></tr>
<tr><td>IP Routing & PPP.
See chapter 9 for more information.</td></tr>
<tr><td>cip</td><td>IP Routing & CIP.
See chapter 10 for more information.</td></tr>
<tr><td>any</td><td>Any kind of packet service is allowed.</td></tr>
</table></td></tr>
<tr><td>Avail</td><td>Indicates the availability of the VC phonebook entry. An entry is available if it is not configured in any packet service web page, or not in temporary use by a packet service.</td></tr>
<tr><td>Auto PVC</td><td>Indicates whether the entry is listed in the 'AutoPVC' list (yes), or not (no).
If the ATM VC related to the phonebook entry is listed in the 'AutoPVC' list, the phonebook entry row is highlighted by a yellow bar.
See subsection 11.3.3 for more information.</td></tr>
<tr><td>Action</td><td>Contains one of the two following action buttons:
<table>
<tr><th>Button</th><th>Action</th></tr>
<tr><td>Add</td><td>Add a phonebook entry to the list.</td></tr>
<tr><td>Delete</td><td>Delete a phonebook entry from the list.</td></tr>
</table></td></tr>
</table>

Phonebook Defaults

The phonebook entries, configured by default, are listed in appendix E.

The 'AutoPVC' table

The following figure shows an example of the *'AutoPVC'* table:

Type	VPI	VCI
bridge	8	35
bridge	8	38
ppp	8	48
ppp	8	61
ppp	8	65
ppp	8	67
cip	8	80

Any PVC, identified by its VPI/VCI, communicated via AutoPVC, is added to the *'AutoPVC'* table. If AutoPVC is not supported at the remote side, the *'AutoPVC'* table stays empty.

See subsection 11.3.3 for more information.

11.3.2 Using the Phonebook

Introduction

The main function of the *pro* phonebook is to present an instant overview of all possible entries and their status.

Another important function is that it helps you to navigate through the various *pro* VC connection possibilities.

In this subsection

- Restrictions for Adding Phonebook Entries
- Adding Phonebook Entries
- Deleting Phonebook Entries.

Restrictions for adding phonebook entries

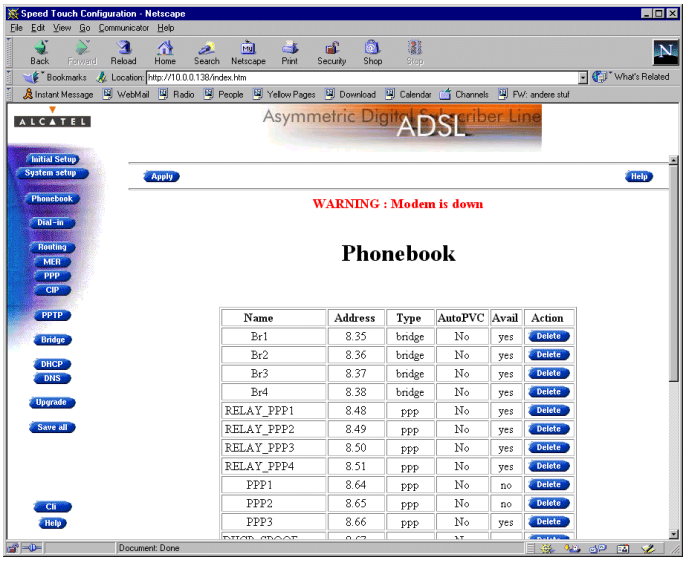
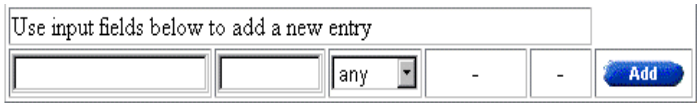
Although you are free to give any name to a phonebook entry, a few restrictions apply:

- You may not provide an entry with a name which already is supplied in the *'Phonebook'* table.
- Phonebook entries, which are intended to be used for the PPPoA-to-PPTP Relaying packet service may not start with a capital 'P', or a capital 'T'.
- In case you want to use the *pro* PPP-to-DHCP Spoofing feature, the name of the PPP entry you intend to use with this feature, must start with 'DHCP', e.g. DHCP_Spoof1, DHCP_2, etc.

Each entry in the *pro* phonebook must have a unique VC, i.e. a unique VPI/VCI combination. Adding a phonebook entry with a VPI/VCI, which is already used in the *'Phonebook'* table, will result in an error message.

Adding phonebook entries

Proceed as follows:

Step	Action and Description
1	Browse to the *'Phonebook'* web page: 
2	Scroll to the bottom row of the *'Phonebook'* table:  The bottom row of the table allows addition of a new entry.
3	In the *'Name'* column of the bottom row, enter a name of your choice for identifying the phonebook entry.
4	In the 'Address' column, enter the VC's VPI.VCI values. In most cases these values are provided by your SP.
5	In the *'Type'* column of the bottom row, click  and select the packet service of your choice, or choose *any*.
6	Click  and  to finish the procedure.

Deleting phonebook entries

Proceed as follows:

Step	Action and Description
1	Browse to the *'Phonebook'* web page.
2	Select the phonebook entry you want to delete, and click Delete
3	If the phonebook is currently in use, i.e. is connected, or configured, you are asked to confirm the deletion of the entry: **Entry 'PPP1' is in use. Delete anyway ?** OK Cancel
4	Make the following selection:
4	Click Save all to store the changes in permanent memory.

If ...	Then click ...
You are sure that the phonebook entry may be deleted ...	OK
The phonebook entry, which is in use, may not be deleted ...	Cancel

11.3.3 AutoPVC and the Phonebook

AutoPVC

The default VCs, can be remotely modified via the *AutoPVC* feature of the *Pro*.

AutoPVC operates only in conjunction with the Alcatel DSLAM and *Pro*, and offers the following functionality:

- User VCs that are to be terminated on the Ethernet port, can be notified by the *Pro*
- User VCs that need to be cross-connected between the ADSL port and the ATMF-25 port, can be remotely established.

Operation of AutoPVC

Basically the following steps are executed:

1. The ADSL operator configures VCs on the DSLAM
2. Via AutoPVC the VPI/VCI values are communicated to the *Pro*
3. AutoPVC messages are subsequently processed by the *Pro*, according to the four criteria listed below.

Criterion 1

Any PVC, or VPI/VCI communicated via AutoPVC is added to the AutoPVC list on the *'Phonebook'* web page.

If AutoPVC is not supported, this list is empty.

Criterion 2

If the VPI value is in the range from 0 up to 7, and the *Pro* is equipped with an ATMF-25 port, cross-connects will be configured between the ADSL port and the ATMF-25 port.

Criterion 3

An AutoPVC VPI value in the range from 8 up to 15 will be notified in the AutoPVC list.

If the VPI/VCI value is used in the Phonebook, this phonebook entry will be highlighted by a yellow bar.

Criterion 4 An Ethernet only *Pro* version (single port, or hub version) reacts identical as for Criteria 3, however the VPI range is now from 0 up to 15.

Example 1 If the ADSL provider configures Virtual **Path** (VP) 5 on the DSLAM, then the *Pro* cross-connects VPI 5 on the ADSL line to VPI 5 on the ATMF-25 port

Example 2 If the ADSL provider configures Virtual **Channel** (VC) 0/32 on the DSLAM, then the *Pro* cross-connects VPI/VCI 0/32 on the ADSL line to VPI/VCI 0/32 on the ATMF-25 port.

Example 3 Suppose the ADSL provider configures one of the *Pro*'s default **terminated VCs**, e.g. 8/35, on the DSLAM.

VPI/VCI 8/35 will end up in the *'AutoPVC'* list:

Type	VPI	VCI
bridge	8	35

As this VC matches with the Bridging entry *Br1,* this phonebook entry will be highlighted in the *'Phonebook'* table:

Phonebook

Name	Address	Type	AutoPVC	Avail	Action
Br1	8.35	bridge	Yes	no	Delete
Br2	8.36	bridge	No	yes	Delete

In this way the user can distinguish the activated VC from dummy phonebook entries.

12 Networking Services – IP

Introduction

For Internet access, and home networking, TCP/IP plays a crucial role. Due to the flexibility and the multitude of TCP/IP features, numerous configurations are possible.

Aim of this chapter

This chapter highlights some general IP parameters and some possible IP configurations for the below purposes:

- Internet access via your SP
- Private LAN-to-LAN interconnections over the ADSL/ATM network
- Local IP connectivity towards other PCs on your LAN.

In this chapter

12.1 General IP Information

In this section

Topic	See
IP Addresses and Subnet Masks	12.1.1
Private vs. Public IP Addresses	12.1.2
Choosing an IP Address	12.1.3
Dynamic IP Address Configuration: DHCP	12.1.4

12.1.1 IP Addresses and Subnet Masks

What is an IP address

An IP address is a 32-bit number that uniquely identifies a computer (i.e. an networking interface) on your network or the Internet.

This number is commonly represented in “dotted quad” format. Each octet (8 bits) is represented as a decimal number.

Dots are used as octet separators (e.g. 10.0.0.138).

Network part, subnet part and host part

Historically, an IP address consists of two parts: a network part and a host part.

The network part identifies the network on which a PC resides. The host part identifies a particular PC on a given network.

The dividing line between the network part and the host part can be derived from the netmask or subnet mask.

The 1 bits in the Subnet Mask represent the contiguous leading bits of the IP address that has network significance.

Example: network and subnetwork parts

For example, an IP address is 172.16.0.2 and the subnet mask is 255.255.255.0.

The binary notation of the IP address equals:

`10101100.00010000.00000000.00000010`

The dotted quad notation of the subnet mask equals:

`11111111.11111111.11111111.00000000`

Since all the 1-bits of the subnet mask have network significance, the network part of the IP address would be:

```
    10101100.00010000.00000000.00000010
AND 11111111.11111111.11111111.00000000
    10101100.00010000.00000000
```

or `172.` `16.` `0.`

The subnet part is the remaining part `00000010`

or 2.

IP address network classes

By splitting up the IP address in a network part and a subnetwork part, it is possible to divide IP addresses in four classes (In fact five).

These classes are differentiated by the initial bits of an IP address:

Class	Range from ... up to ...	Network Part Bits
A	**0**.0.0.0 ... **127**.255.255.255	8
B	**128**.0.0.0 ... **191**.255.255.255	16
C	**192**.0.0.0 ... **223**.255.255.255	24
D	**224**.0.0.0 ... **239**.255.255.255	32

Prefix notation for IP addresses

A more up to date representation of subnet masks does not refer to a subnet mask, but to a prefix length.
The prefix number equals the number of ones in the subnet mask. For example, the subnet mask 255.255.255.0 could also be written as the prefix /24.

Example: prefix notation

For example:

- IP address `10.0.0.138`
- netmask `255.255.255.0`

With the prefix method this will be written as :

- prefix IP address `10.0.0.138/24`

IP address notation and the STPro

In the routing table of the *Pro* this notation will be used.

12.1.2 Private vs. Public Addresses

Introduction

Private PC(s) do not require access to PC(s) in other enterprises, or to the Internet. Therefore it is sufficient for the PC to have an IP address that is unique within the enterprise but may be ambiguous between enterprises and on the Internet.

On the other hand there is also a need for "Internet-wide" unique IP addresses to allow web servers to be constantly online.

The first set of addresses are called *Private IP addresses*; the second set *Public IP addresses*.

Private IP addresses

In the examples throughout this document Private IP addresses are used for local IP configurations.

Private IP addresses are defined in RFC1918 "Address Allocation for Private Internets". This RFC is categorized as "Best Current Practice".

Using private addresses

In principle if an IP address is assigned to a PC and the connectivity is limited to intra-enterprise communication only, the IP address can be assumed to be privately held.

The limitation however is that communication between enterprises and connection to the Internet itself via those private IP addressed PCs is not possible, and even not allowed.

Private PC(s) accessing public services

Via mediating gateways (e.g. the *Pro*) private PC(s) can still have access to external services, e.g. the Internet.

Private IP address classes

IANA (the Internet Assigned Number Authority), defined blocks of IP addresses for private purposes:

Class Type	From	To	Number of Network Numbers
A	10.0.0.0	10.255.255.255	1
B	172.16.0.0	172.16.255.255	16 (Contiguous)
C	192.168.0.0	192.168.255.255	256 (Contiguous)

Public IP addresses

A Public IP address is an officially assigned IP address by an Internet Registry and is guaranteed to be **worldwide unique**.

As a consequence the PC to which the address is assigned, has worldwide Internet connectivity.

Using Public IP addresses

Public IP addresses are used by PC(s) that need global connectivity, outside the enterprise, and/or with the Internet; therefore these PC(s) require public IP addresses to be globally unique.

You may not assign Public IP addresses yourself. If you need a Public IP address or block of IP addresses, contact your Internet Service Provider (ISP).

The ISP must in turn contact its upstream registry, or his appropriate regional registry, e.g.: the American Registry for Internet Numbers (ARIN) (http://www.arin.net).

12.1.3 Choosing an IP Address

Introduction

Regardless of your application, IP addresses must always be configured at both ends of the connection.

Prior to configuring an IP address, you must choose a suitable one. In this subsection a few criteria are listed that may influence your choice.

Use of public IP addresses

Public IP addresses are required when accessing the Internet. Each PC on the Internet must have a unique IP address. If not, IP packets cannot be routed.

For end-to-end IP communication your ISP or LAN administrator will supply you with a Public IP address.

Use of private IP addresses

Private IP addresses are to be used for local IP communication. E.g. configuring the *Pro*, or dumping files to your local printer.

For this purpose it is best to choose addresses from the private ranges.

Further, all examples will be given with 10.x.x.x private addresses, sometimes referred to as **"Net10"** IP addresses.

Simultaneous use of public & private IP addresses

In most networking scenario's, *Private* and *Public* IP addresses will be in use simultaneously, e.g.:

- PPPoA-to-PPTP Relaying

  In this configuration, one IP layer is carried into another. Otherwise stated: on your local (home) LAN the *Public* IP layer is carried inside a *Private* IP layer (a so called IP Tunnel).

- PPP & IP Routing

  In this scenario the *Public* IP layer will be terminated in the *Pro* and translated into a *Private* IP layer via the NAPT translation feature of the *Pro*.

Local vs. end-to-end

In the various configurations, multiple IP addresses are in use at the same time, however their *scope* will differ. The Public IP addresses will run end-to-end, Private IP addresses will remain local.

Dynamic vs. static IP configuration

Both Public and Private IP addresses can either be *statically* configured, or can be distributed *dynamically* via DHCP.

See section 12.1.4 for more information.

Again, for end-to-end IP communication, your ISP or LAN administrator will decide on the method. For local configuration you can choose the method yourself.

12.1.4 Dynamic IP Address Configuration: DHCP

DHCP

DHCP is short for *Dynamic Host Configuration Protocol* and is part of the TCP/IP protocol suite. It provides a framework for passing configuration information to PC(s) on a TCP/IP network.

The intention is for individual PC(s) to extract their IP parameters from a central server, rather then configuring them manually.

Use of DHCP

A PC supporting DHCP, will receive the following IP parameters via DHCP:

- Its own IP address and subnet mask
- The IP address of the default gateway
- The IP addresses of the primary and secondary DNS servers.

Operation of DHCP

DHCP operates in client/server mode: a PC in its booting stage acts as a DHCP client and emits broadcast DHCP requests. These are intercepted by a DHCP server (on the same network) which responds with DHCP replies.

These DHCP replies contains, among other information, the IP address for the DHCP client.

Mostly this IP address is given for a limited period of time. This allows automatic reuse of an address that is no longer needed by the PC to which it was assigned.

DHCP and STPro

The task of being DHCP server can also be performed by the *Pro*.

Pro DHCP server configuration is possible via the *'DHCP'* web page. See section 12.3.3 for more information.

12.2 Packet Services and IP Addressing

Introduction

In this section the interaction between IP addresses and packet services is described.

Apart from Bridging, all packet services require the TCP/IP suite, and even the Bridging packet service will in most cases be used in combination with IP addressing.

In this section

12.2.1 Transparent Bridging and IP Addresses

IP vs. Bridging

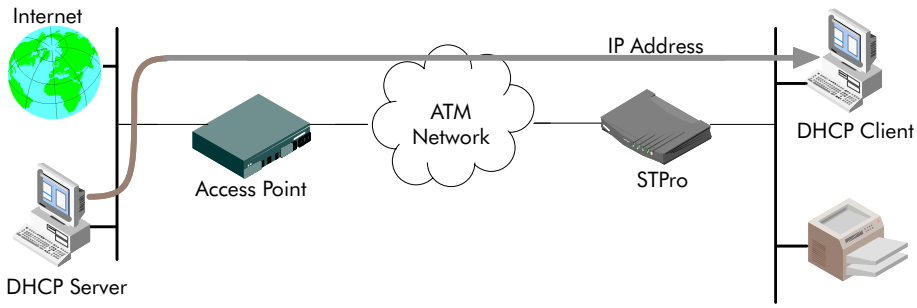
Basically, Bridging does not require any IP address at all: neither in your PC(s), nor in your *Pro*.

However, in case of Internet access or private IP networking, your PC(s) must be configured for TCP/IP.

Typical Bridging Setup

In most cases, your SP will require you to use DHCP for your PC. In this case the DHCP server is at the remote side of the ADSL connection. Therefore, also your *Pro*'s DHCP server must be disabled.

As you can see in the following figure, this typical configuration setup, illustrates the transparency of the Bridging packet service:



Using TCP/IP and Bridging

Your SP may:

- Provide you with an IP address
- Require you to use DHCP.

Local IP communication

Alternatively, a second but *Private* IP address can be manually configured for local IP communication. It depends on your OS whether it supports this combination.

e.g. Microsoft supports Logical Multihoming via Registry keys.

CAUTION

Bridging & DHCP Service

The *Pro* DHCP server is by default **enabled** (via Auto DHCP).

In case you use your *Pro* in Bridging mode and your ISP requires you to enable DHCP in your PC(s), you **must** disable the DHCP server inside the *Pro* to avoid conflicts between two DHCP servers being active at the same time.

Setting the DHCP modes of your *Pro* is described in section 12.3.3.

12.2.2 MER and IP Addresses

MER and IP addresses

Local IP addresses must be configured prior to use IP routing.

STPro IP addresses

As the Pro has a preconfigured "Net10" address (10.0.0.138), you can configure IP addresses like 10.0.0.1, 10.0.0.2, ... in your PCs, or use the Pro DHCP server.

In case another IP address is required, you can set Pro's IP address via the Pro web pages, or via a *Ping-of-Life*™.

See sections 12.3 and 17.1 for more information.

PC IP address configuration

The PC IP address can be configured statically (no DHCP), or dynamically (Pro as DHCP server).

See subsection 12.3.3 for more information.

Default gateway for the PCs

In addition, configure the Pro's IP address as default gateway in your PCs.

MER & IP routing

At the ADSL side of the Pro IP router, MER will receive an IP address from the remote access server. However, you can also configure an IP address for the MER connection on the *'MER'* web page. In this case, the Pro negotiates the acceptance of the IP address with the remote side.

Via NAPT, both Private and Public IP addresses can coexist in the router.

12.2.3 PPPoA-to-PPTP Relaying and IP Addresses

IP vs. PPPoA/PPTP

Prior to using PPTP, local IP addresses must be configured. The use of these IP addresses is limited to the local network.

Private IP addresses

Consequently you are free to choose any IP address as long as it is compatible with your local network and is unique in that same network.

As the *Pro* has a preconfigured "Net10" address (10.0.0.138), you should configure IP addresses like 10.0.0.1, 10.0.0.2, ... on your PCs.

Note: IP addresses can be configured automatically via *Pro*'s DHCP server. See section 12.3.3, for more information.

Public IP addresses

For PPPoA/PPTP, a second set of (Public) IP addresses having end-to-end scope, will automatically be negotiated via the PPP protocol inside your PC(s).

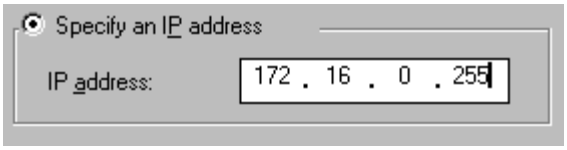
Simultaneous use of public & private IP

Both Public and Private IP addresses are active simultaneously because of PPTP tunneling. In fact two "nested" IP layers exist: the *Public* IP layer which is carried within the *Private* IP layer on the local LAN.

PPP IP address negotiation

By default the PPTP tunnel application automatically negotiates the Public IP address.

In case your SP instructs you to use a static IP address for PPPoA/PPTP, you can supply a static IP address:



12.2.4 PPP & IP Routing and IP Addresses

IP routing and IP addresses

Local IP addresses must be configured prior to use IP routing.

STPro IP addresses

As the *Pro* has a preconfigured "Net10" address (10.0.0.138), you can configure IP addresses like 10.0.0.1, 10.0.0.2, ... in your PCs, or use the *Pro* DHCP server.

In case another IP address is required, you can set *Pro*'s IP address via the *Pro* web pages, or via a *Ping-of-Life*™.

See sections 12.3 and 17.1 for more information.

PC IP address configuration

The PC IP address can be configured statically (no DHCP), or dynamically (*Pro* as DHCP server).

Default gateway for the PCs

In addition, configure the *Pro*'s IP address as default gateway in your PCs.

PPP & IP routing

At the ADSL side of the *Pro* IP router, PPP automatically negotiates an IP address with its remote PPP peer. Via NAPT, both Private and Public IP addresses can coexist in the router.

PPP IP address negotiation

You can configure the PPP local IP address of the *Pro*. In special circumstances, you can configure a remote IP address for the PPP connection.

See subsection 9.4.5 for more information.

NAPT

NAPT is enabled by default on PPP connections. In case your LAN uses Public IP addresses, NAPT is not required.

See subsection 9.4.6 for more information.

12.3 Speed Touch Pro with Firewall and IP Addressing

Introduction

Like any other member of a LAN, the *Pro* must be locally identified by an IP address to be able to communicate with other local LAN devices.

This section deals with the IP address configuration of the *Pro* for local communication only.

In this section

12.3.1 STPro IP Address Types

Assigning IP addresses to the STPro

IP addresses can be assigned to the *pro* in several ways. Summarized, following IP address types exist:

- The default IP address: 10.0.0.138
- IP addresses assigned via the *'Initial Setup'* web page
- IP addresses assigned via a *'Ping-of-Life™*
- IP addresses assigned via the *'Routing'* web page.

Moreover, IP addresses can be configured, and/or negotiated during connection sessions (e.g. MER, and PPP & IP Routing).

STPro and multiple IP addresses

As the *pro* IP layer supports logical multi-homing (one interface supporting multiple IP addresses), the statically configured IP address(es) and dynamically required IP address(es) can be active at the same time.

'IP address' table

If you browse to the 'Routing' web page (See section 18.2 for more information), you can find the *'IP address'* table. This table summarizes all IP addresses configured on any of the *pro* interfaces:

Intf	Address	Netmask	Type	Transl	Action
eth0	10.0.0.138	255.0.0.0	Extra	none	Delete
cip0	172.16.1.1	255.255.255.0	CIP	none	-
loop	127.0.0.1	255.0.0.0	Auto	none	-
Use input fields below to add a new entry					
eth0			Extra	none	Add

'IP address' table components

The following fields are shown:

Field	Description
Intf	Indicates the interface (Intf) to which the IP parameter set was assigned to. It can take several values depending on the packet services that are active. The Ethernet (eth0) and the Loopback (loop) are always present.
Address	Shows the IP address of the interface.
Netmask	If available, it shows the Netmask of the interface.
Type	Indicates the origin of the IP parameters. It can take following values: **Value** / **Description** **Auto** – Implies that the parameters were acquired automatically through DHCP, or are typical standard IP addresses (e.g. *'loop'*). **User** – Implies that an additional IP parameter set was added through the *'Initial Setup'* web page. **Extra** – Implies that an additional IP parameter set was added through the *'Routing'* web page. The default IP address 10.0.0.138 is also of this type. **Temp** – Implies that this (additional) IP parameter set was added via a *Ping-of-Life*™.
Transl	This field indicates the translation performed. It can take following values: **Value** / **Description** **None** – No address translation is performed on this address. **NAT** – NAPT is performed on this address.
Action	Contains one of the two following action buttons: **Button** / **Action** Add – Add an IP address to the list. Delete – Delete an IP address from the list.

12.3.2 Static IP Address Configuration

Default STPro IP address

The *Pro* comes with a preconfigured "Net10" IP address, i.e. 10.0.0.138.

In case you add the *Pro* to an existing LAN, it could be that you must configure a "User Defined" IP address, other than the "Net 10" address, appropriate for the LAN's IP settings.

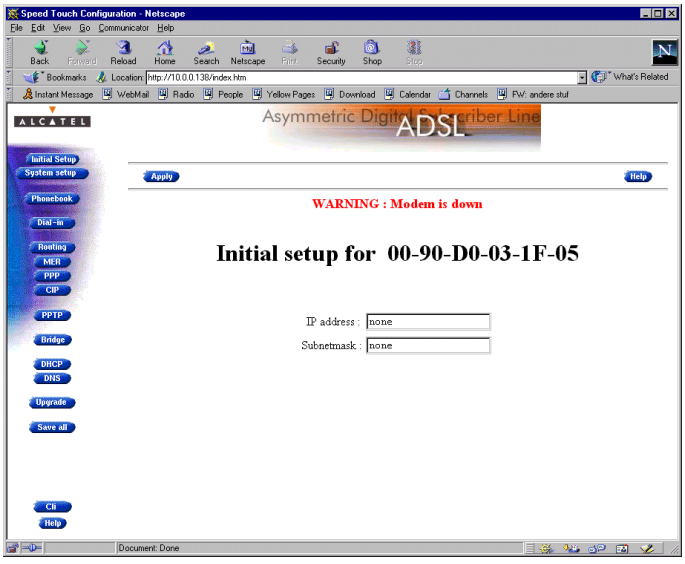
In this subsection

- Setting an IP Address via the *'Initial Setup'* Web Page
- Setting an IP Address via the *'Routing'* Web Page
- *Pro* Associated Netmasks
- Sample Configuration: Single PC
- Sample Configuration: Small Workgroup.

See section 18.2 for more information.

Setting an IP address via the 'Initial Setup' web page

Proceed as follows:

Step	Action and Description
1	Browse to the *'Initial Setup'* web page: 

Step	Action and Description
2	In the *'IP Address'* field you can configure a user defined IP address for the **STPro**. This IP address will show up as ***"User"*** in the **STPro** *'IP address'* table (See section 12.3.1).
3	In the *'Subnetmask'* field you must configure an appropriate netmask for applying subnetting in your LAN.
4	Click Add. As a result, the new IP settings are applied.
5	To verify connectivity, point your Web browser to the new IP address. Make sure though that your PC shares the same subnetwork.
6	Click Save all to store the IP settings to permanent storage.

Setting an IP address via the 'Routing' web page

Proceed as follows to configure an "Extra" IP address:

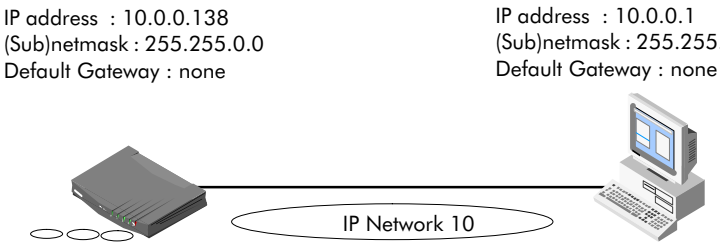
Step	Action and Description
1	Browse to the *'Routing'* web page.
2	In the *'IP address'* table, you can configure an extra IP address, using the table's bottom row. Fill in the bottom row as follows: • Intf: "Eth0" • IP address: the IP address for the **STPro**. • Netmask: the appropriate netmask.
3	Click Add. As a result, the new IP settings are applied.
4	To verify connectivity, point your browser to the new address. Make sure though that your PC shares the same subnetwork. Click Save all to store the IP settings to permanent storage.

STPro associated netmasks

(Private) IP Address Class	Associated Netmask	Example IP Address
A (1.x.x.x to 126.x.x.x)	255.0.0.0	10.x.x.x
B (128.0.x.x to 191.255.x.x)	255.255.0.0	172.16.x.x
C (192.0.0.x to 223.255.255.x)	255.255.255.0	192.168.x.x

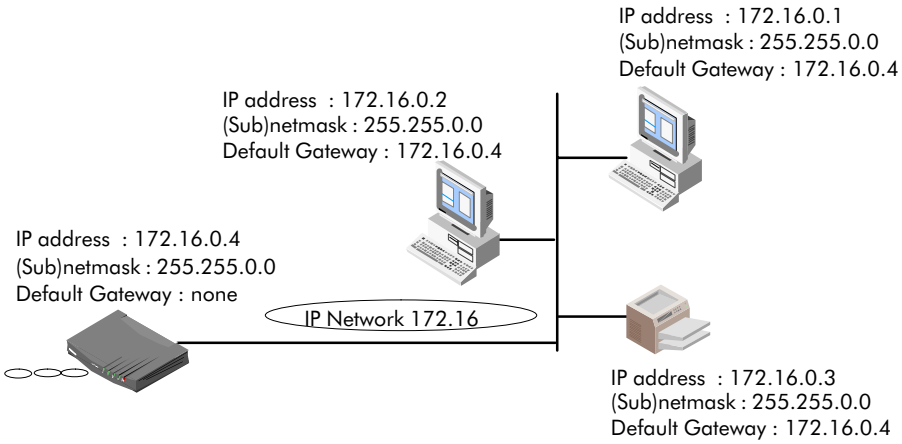
Sample configuration: single PC

In the below figure, a simple configuration is given: One PC is attached to the *Pro*:



Sample configuration: small workgroup

You can setup a local workgroup around the *Pro* as shown in the figure below:



Note: Notice that the default gateways in the PCs point to the *Pro*.

12.3.3 Dynamic IP Address Configuration: DHCP

STPro DHCP client/server setting

Depending on the size and complexity of your network, a few DHCP configurations can be envisaged:

LAN Type	DHCP Mode	Argumentation
Simple	No	All few members of the small LAN have static IP addresses, including the **STPro**.
Medium sized	Server	For small home LANs it might be worthwhile to configure all of your LAN devices as DHCP clients, and the **STPro** as the DHCP server. In this configuration each time a computer starts, it will obtain its IP configuration from the **STPro**.
Advanced	Client	For advanced networks, the role of DHCP server might be performed by an IP node other than the **STPro** on the local LAN. Typically such functions are attributed to home gateways: computers having better networking capabilities than the other PC(s) on the home LAN. All local PCs remain configured as DHCP clients, including the **STPro**.

Default STPro DHCP configuration

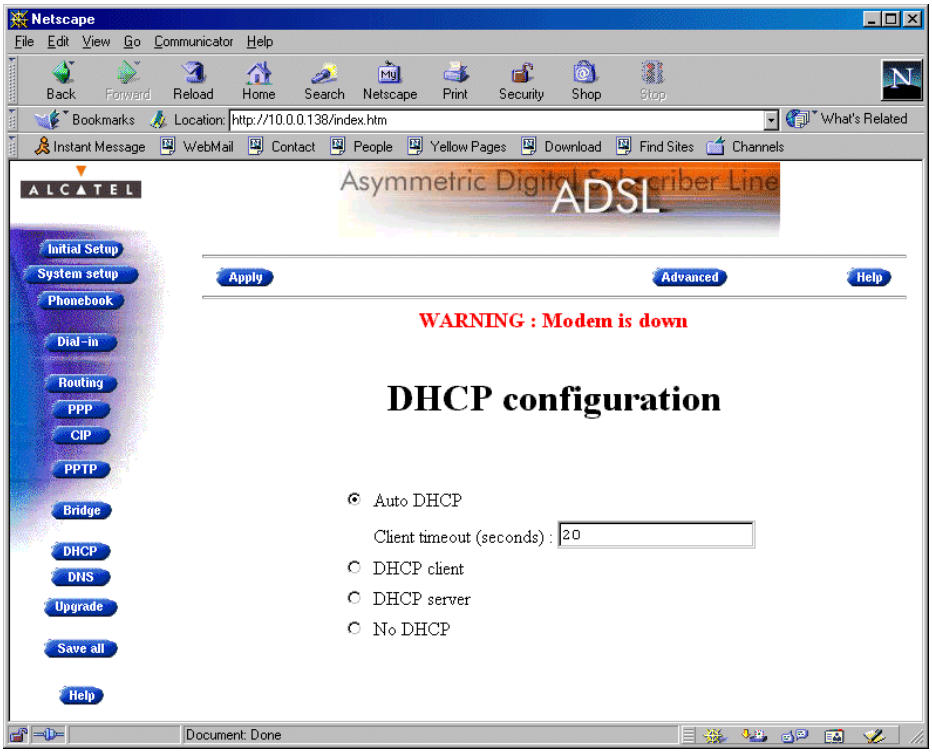
For the *Pro*, the DHCP server is by default enabled, i.e. set for *'Auto DHCP'*.

In this subsection

- The *Pro* *'DHCP'* Web Page
- Configuring the *Pro* for LANs without DHCP Server
- Configuring the *Pro* as DHCP Server
- Configuring the *Pro* as DHCP Client
- Configuring the *Pro* Auto DHCP
- Dynamic IP Addressing.

The STPro 'DHCP' web page

Clicking DHCP in the left pane of the *pro* web pages, pops up the 'DHCP' web page:



Configuring the STPro for a LAN without DHCP

To setup the *pro* without DHCP, tick No DHCP on the *'DHCP'* web page.

In this configuration, it is assumed that all members, the *pro* included, have static IP addresses.

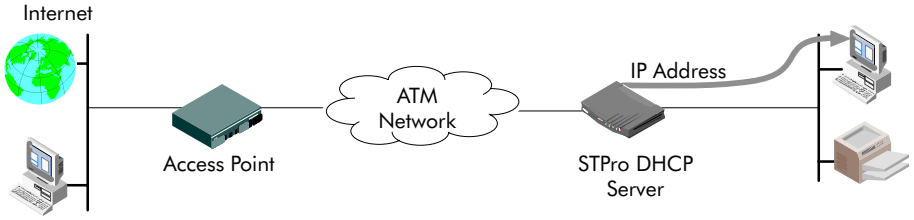
See subsection 12.3.2 for static IP addressing of the *pro*.

Note: This configuration might be required in case you use the Transparent Bridging packet service.

Configuring the STPro as DHCP server

To setup the *Pro* as DHCP server, tick ◉ DHCP server on the '*DHCP*' web page.

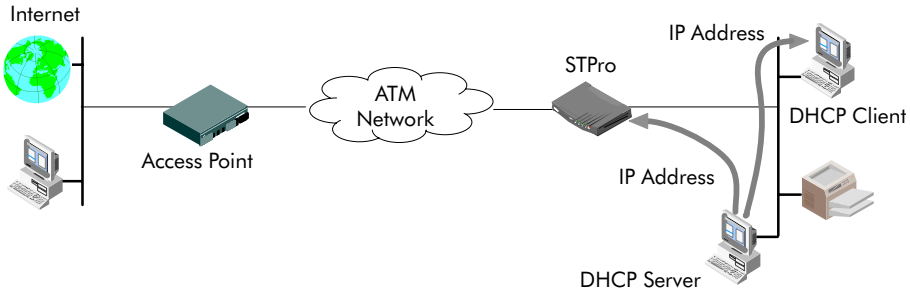
Via the '*DHCP Server Configuration*' web page, you can configure the *Pro* DHCP server settings. See subsection 12.3.4 for more information.



Note: This setting might cause side effects with Bridging. See section 12.2.1 for more information.

Configuring the STPro as DHCP client

To setup the *Pro* as DHCP client, tick ◉ DHCP client on the '*DHCP*' web page.

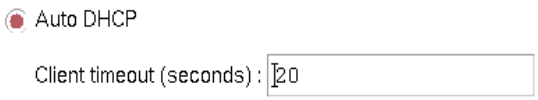


Configuring the STPro for Auto DHCP

One of the *Pro* features is that it can automatically revert from DHCP client to DHCP server.

At boot time the *Pro* probes the LAN for a specified time limit ('*Client timeout*') to check wether another DHCP server is available on the network. If so, it will act as a DHCP client. If no response is received within the specified time, the *Pro* becomes a DHCP server.

To allow the *Pro* to act as Auto DHCP client/server, tick



on the '*DHCP*' web page.

Additionally, you can configure the '*Client timeout*' in seconds.

Via the '*DHCP server configuration*' web page, you can configure the *Pro* DHCP server settings. See subsection 12.3.4 for more information.

Automatic IP addressing

OSs supporting '*Automatic IP Addressing*', might initially not establish IP connectivity with the *Pro*. This is because the IP address they assimilated is not within the *Pro* '*Auto DHCP*' server range.

To prevent this problem, please power on your LAN devices after the *Pro* has come online.

Indeed, when the *Pro* is in 'Auto DHCP', it will first operate as a DHCP client. After the client timeout exceeded, it switches to DHCP server mode, but this might be to late as some clients will already selected an automatic IP address.

Dynamic IP addressing is a feature allowing DHCP clients to assign themselves an IP address.

This happens when there is no DHCP server on the network, or when the server is temporarily down. After automatic assignment, the DHCP client will issue DHCP requests at regular instances.

If the DHCP server is back online, the client will now lease an IP address from the server, after discarding its temporary automatic IP address.

12.3.4 Configuring the STPro DHCP Server

Introduction

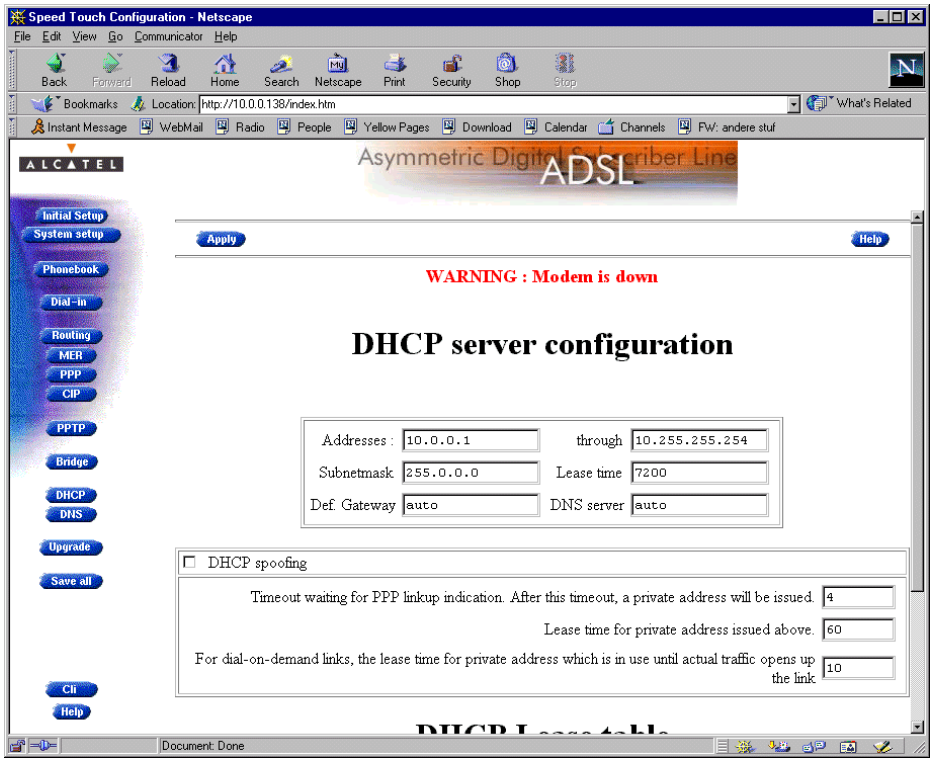
If the *pro* is configured for *'Auto DHCP'* or *'DHCP server'*, additional configuration must be done.

In this subsection

- The *'DHCP server configuration'* Web Page
- DHCP Server IP Addressing Box
- DHCP Spoofing Box
- DHCP Lease Table.

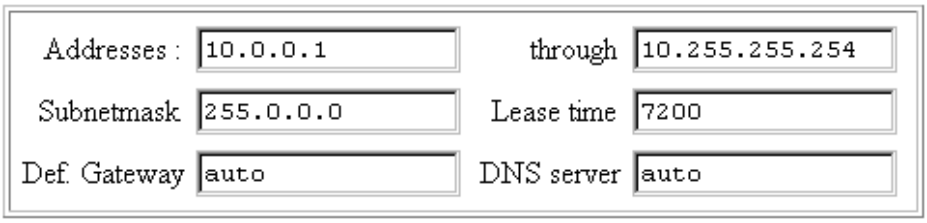
The 'DHCP server configuration' web page

Clicking Advanced on the *'DHCP'* web page, pops up the *'DHCP server configuration'* web page:



DHCP server IP addressing box

This box allows to specify the *Pro* DHCP server features:



DHCP server IP addressing box options

You can configure following parameters:

Field	This configures ...	Default
Addresses through ...	The range of addresses the DHCP server can choose an IP address from for lease.	"Net10"
Subnet Mask	The subnetting applied to the local network, scoped by the DHCP server.	no subnetting
Lease Time	The time (Lease Time) IP addresses can be assigned to a device by DHCP.	7200 seconds
Default Gateway	The IP address of the default gateway.	*'auto'* (*)
DNS Server	The IP address of the DNS server.	*'auto'* (**)

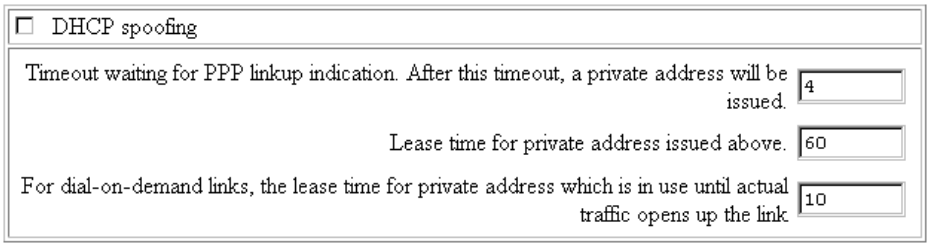
(*) Setting *'auto'* in the *'Def. Gateway'* field means, that there will be referred to the *'Routing'* web page.

(**) Setting *'auto'* in the *'DNS server'* field means, that there will be referred to the *'DNS'* web page.

DHCP spoofing box

This box allows you to set the DHCP spoofing parameters for PPP-to-DHCP spoofing connections.

See section 9.4.7 for more information on PPP-to-DHCP spoofing.



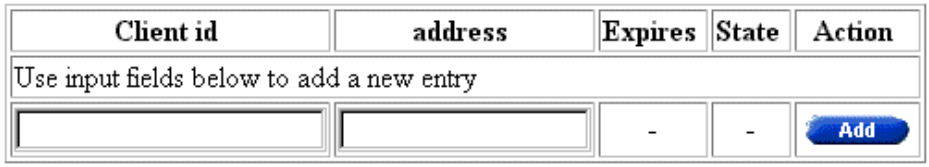
DHCP spoofing box options

You can configure following parameters:

Field	This configures ...	Default
Timeout	The time limit the **STPro** is waiting for a negotiated PPP connection session IP address. After timeout a Private PPP connection session IP address will be issued.	4 seconds
Lease Time	The time (Lease Time) the Private PPP connection session IP address, issued after timeout, can be assigned to the **STPro**.	60 seconds
Dial-on-Demand Lease Time	The lease time for the Private PPP dial-on-demand IP address which is in use until actual traffic opens up the link.	10 seconds

DHCP lease table

This table allows you to manually assign IP addresses to devices, identified by there MAC address, with the possibility to let this lease expire after some specified time.



DHCP lease table options

You can configure following parameters:

Field	Description
Client ID	Configures the MAC address of the device the **STPro** leases to.
Address	Configures the lease IP address for the device.
State	Indicates if the lease is: **on**: Device is up, running and using the lease. **off**: Device is unreachable. **expired**: Timeout time limit has expired for the lease.
Action	Contains one of the two following action buttons: **Add**: Manually add a lease to the list. **Delete**: Delete an existing lease.

12.4 IP Routing

Introduction

Next to the ADSL router part, the *Pro* supports also standard IP routing via its IP router.

This section aims to familiarize you with the *Pro* IP router abilities.

In this section

Topic	See
The **STPro** IP router	12.4.1
Configuring the **STPro** IP Routing Table	12.4.2

12.4.1 The STPro IP Router

Introduction

Because the *Pro* can act as an IP router, it has the ability to access machines in other networks than its own. This can be achieved by adding specific routes to its IP routing table.

This subsection provides some general information on the *Pro* IP router functionality.

Features

IP routing:

- Is a standard and a well-known principle, mainly due to the widespread Internet use
- Has broad application support, as it is implemented in most, if not all Operating Systems (Windows, Unix, MAC OS, ...).

Configuring an IP routing table

The routes in an ordinary routing table or Forwarding Information Base (FIB) include, among others, destination IP addresses, subnet masks and gateways.

When an IP packet arrives at the router, the router examines the destination IP address. The router looks up the most specific match in the routing table for that destination address. Finding the most specific match equals finding the longest subnet mask for that IP address.

For example, the subnet mask 255.255.255.0 is more specific than 255.255.0.0 because the network part in the first case is longer (and thus more specific) than the network part in the second case.

Once the most specific match is found, the router forwards the IP packet to the gateway associated with that match.

Simplified example of a traditional IP routing table

The following table is an example of an IP routing table:

Route Destination	Subnet Mask	Gateway
30.0.0.2	255.255.255.255	30.0.0.10
10.0.0.0	255.255.255.0	10.0.0.138
0.0.0.0	0.0.0.0	20.0.0.10

The STPro IP routing table

Depending on the configuration made, the *Pro* may use an extended routing table.

In addition to the data contained in an ordinary routing table, it contains information about the source IP address and the source subnet mask.

The lookup principle may also be extended: not only the combination of destination IP address and subnet mask is looked up, but also the combination of source IP address and subnet mask.

The extended IP routing table gives extra functionality to the *Pro* and is explained in subsection 12.4.2.

Example of the STPro extended IP routing table

The following table is an example of the *Pro* extended IP routing table:

Dest. IP Address	Dest. Subnet Mask	Source IP Address	Source Subnet Mask	Gateway
30.0.0.2	255.255.255.255	10.0.0.2	255.255.255.255	30.0.0.10
10.0.0.0	255.255.255.0	10.0.0.0	255.255.255.0	10.0.0.138
0.0.0.0	0.0.0.0	10.0.0.0	255.255.255.0	20.0.0.10

12.4.2 Configuring the STPro IP Routing Table

Introduction

The main function of the IP router in the *pro*, is to route IP packets from the local network to the remote networks over the ATM/ADSL connections and vice versa.

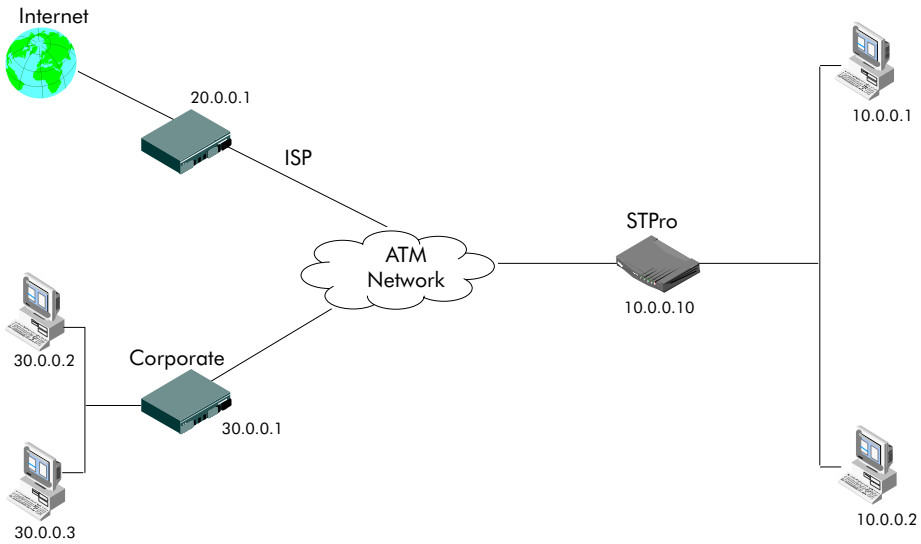
In this subsection, configuration of the STPro IP routing table is described.

In this subsection

- General ATM/ADSL End-to-End IP Architecture
- ATM/ADSL IP Routing
- *pro* Power-on IP Routing Table Configuration
- IP Route Table
- Adding Specific Routes to the *'IP Route'* Table
- Criteria for a Valid IP Route.

General ATM/ADSL end-to-end IP architecture

The figure below provides an overview of the general end-to-end IP architecture:



ATM/ADSL IP routing

Routing to ATM/ADSL connections actually means:

- Routing between the local LAN and Classical Logical IP subnets and vice/versa
- Routing between the local LAN and PPP connections and vice/versa.

Basically the IP router only cares about IP addresses, i.e. the 'Destination IP address' of any packet received on any of its interfaces (PPP, CIP or Ethernet) is looked up in the IP routing table. The lookup process will determine the best route that may lead to the final destination of the packet. Consequently it will forward the packet to the interface that may reach this destination.

STPro power-on IP routing table configuration

When the *Pro* is powered on, routes are automatically configured in the routing table, e.g.:

- As soon as the Ethernet interface is up and running, a route (being the IP address of the Ethernet interface) is added
- If a CIP member is created and configured with an IP address, this IP address will show up in the table
- The IP address negotiated between the remote peer and a PPP connection (configured for Always-On) will also be automatically added to the routing table.

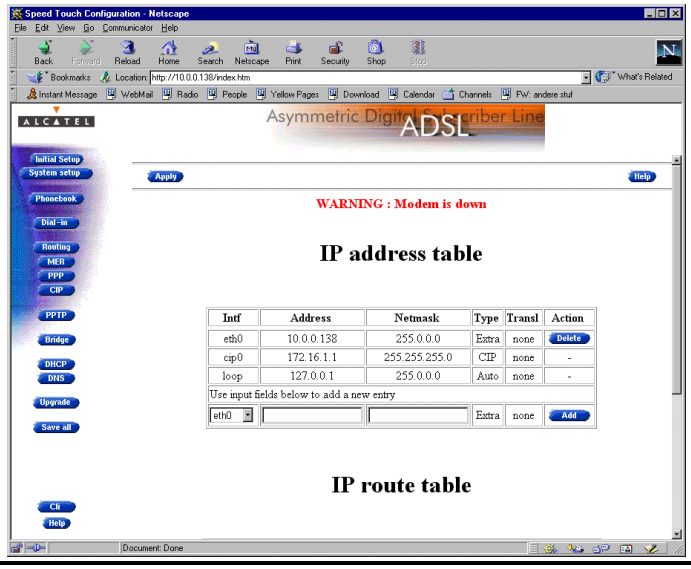
'IP route' table

If you browse to the 'Routing' web page (See section 18.2 for more information), you can find the *'IP route'* table:

Destination	Source	Gateway	Intf	Action
10.0.0.0/8	10.0.0.0/8	10.0.0.138	eth0	Delete
255.255.255.255/32	any	10.0.0.138	eth0	Delete
10.0.0.138/32	any	10.0.0.138	eth0	Delete
172.16.1.1/32	any	172.16.1.1	cip0	Delete
127.0.0.1/32	any	127.0.0.1	loop	Delete
172.16.1.0/24	any	172.16.1.1	cip0	Delete
10.0.0.0/8	any	10.0.0.138	eth0	Delete
Use input fields below to add a new entry				
			-	Add

Adding specific routes to the 'IP route' table

Proceed as follows:

Step	Action and Description
1	Browse to the *'Routing'* web page: 

<table>
<tr><th>Step</th><th>Action and Description</th></tr>
<tr><td>2</td><td>In the 'IP route' table, you can configure an IP route, using the table's bottom row.
Fill in the following IP route parameters:
<table>
<tr><th>Value</th><th>Description</th></tr>
<tr><td>Destination</td><td>The IP prefix of the destination, or "next-hop" device.</td></tr>
<tr><td>Source</td><td>The IP prefix of the source device (pool).
Specifying any, indicates that all traffic, coming from the Ethernet interface, is sent over this route</td></tr>
<tr><td>Gateway</td><td>The IP address of the gateway.</td></tr>
</table>
Note: See section 12.1.1 for more information on the prefix notation.</td></tr>
<tr><td>3</td><td>Click Add</td></tr>
<tr><td>4</td><td>Click Save all to store the changes in permanent memory.</td></tr>
</table>

Criteria for a valid IP route

The criteria for an IP route to be valid are that:

- The destination and source entries must yield correct prefixes
- The gateway must be directly connected.

13 Networking Services – DNS

Introduction

IP addresses are fundamental to the operation of the Internet. They not only uniquely identify Internet nodes but also allow IP routers to forward datagrams to their destinations.

IP addresses, being 32-bit numbers, are ideally suited for computers but are far from usable to humans.

Therefore, the *Domain Name System*, or *DNS*, was designed: a distributed database, held by a hierarchical system of servers, that is used by TCP/IP applications to map between hostnames and IP addresses.

This chapter describes *Pro*'s DNS abilities.

In this chapter

13.1 Speed Touch Pro with Firewall DNS Resolving

Introduction

The Pro features a DNS server for the locally attached PCs, and as DNS relay for non-local DNS hostnames.

Local DNS resolving

The same mechanism for resolving computer names to IP addresses when browsing the Internet, applies to your local network.

Instead of using the IP addresses for a local IP node e.g. 10.0.0.138 for the Pro, you can give your nodes names and let a local DNS server, e.g. the Pro itself, do the resolving.

Example of local DNS resolving

In the following example, a LAN is built around the Pro.

In this scenario, it is assumed that the Pro acts as DHCP server, and as DNS server for the local network.

During start-up, a first PC launches a DHCP request on the LAN.

One of the fields in the DHCP request contains the computer name e.g. *YourPC*.

The Pro reacts by intercepting this request and returns a DHCP reply containing:

- The IP address for his computer, e.g. 10.0.0.1
- The local domain name, e.g. *lan* (default)
- The IP address of the local DNS server, e.g. 10.0.0.138 being the Pro (default).

A second PC, named *MyPC*, is powered on and is configured via a DHCP reply as below:

- The IP address for his computer, e.g. 10.0.0.2
- The local domain name, i.e. *lan*
- The IP address of the local DNS server, i.e. 10.0.0.138

Result of local DNS resolving

In the example scenario, it is now possible to ping both PCs, *MyPC*, and *YourPC*, by referring to their computer names instead of their IP addresses.

Local DNS resolving mechanism

The mechanism as follows:

Phase	Description
1	Apply a **`ping YourPC`** on *MyPC*.
2	Via this command, *MyPC* launches a DNS request, basically asking: "What is the IP address of *YourPC.lan* ?"
3	As the **STPro** is the DNS server, it will respond with the appropriate IP address, being 10.0.0.1.
4	The ping utility in *MyPC* will now submit the ping to 10.0.0.1 which may eventually reply.

Non-local DNS resolving

The *Pro* resolves names within the local domain, i.e. *lan* (default *Pro* setting) as described above.

However, all other domain names, e.g. `Alcatel.com`, cannot be resolved by the *Pro*, and are forwarded over the appropriate link on the ADSL line.

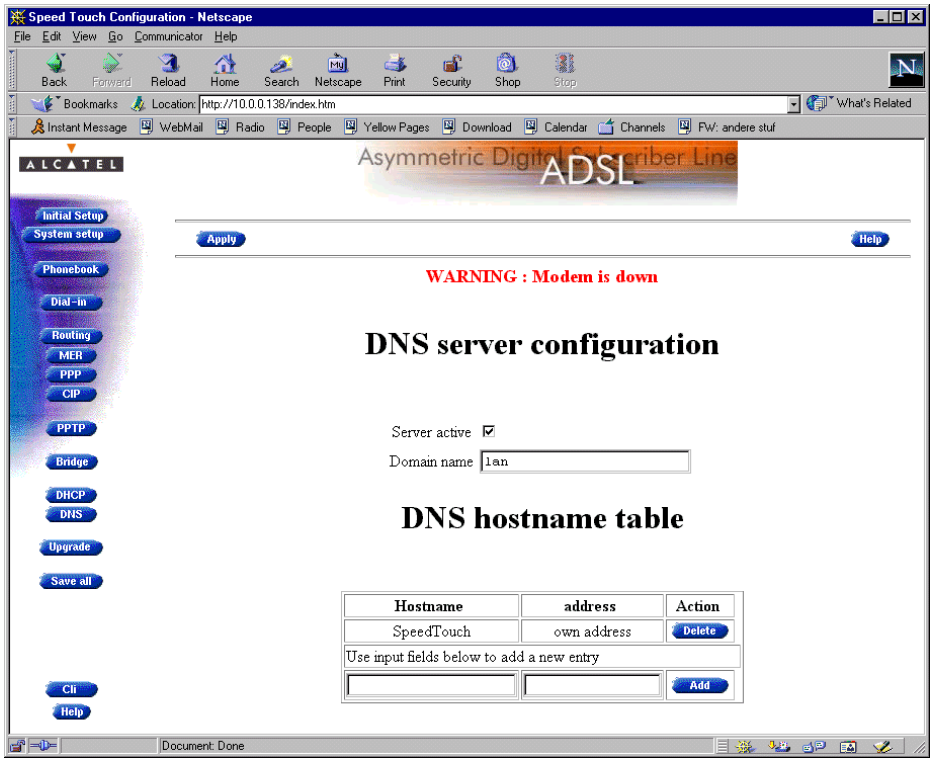
13.2 Configuring the Speed Touch Pro Firewall DNS Server

In this subsection

The example of section 13.1, refers to a new LAN, using the default *Pro* configuration, thus as well as Auto DHCP server, as DNS server.
In case the *Pro* is added to a existing LAN, configuration of the *Pro* DNS server might be necessary to meet the existing LAN conditions.

The STPro 'DNS' web page

Clicking DNS in the left pane of the *Pro* web pages, pops up the 'DNS' web page:



DNS server field

This field allows configuration of the *Pro* DNS server:

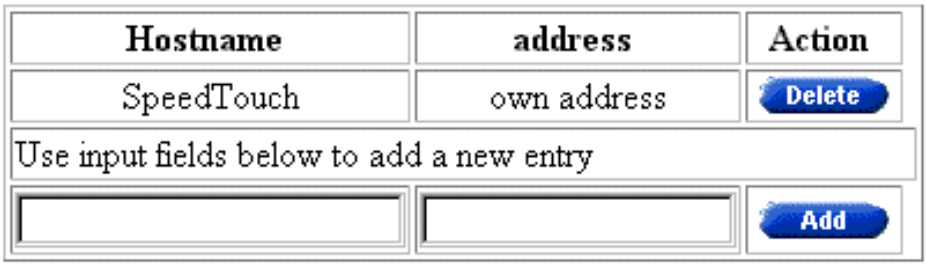
DNS server field components

You can configure the following parameters:

Field	Description	Default
Server active	This check box enables (✓), or disables the **STPro** DNS server.	✓, **STPro** DNS server active.
Domain Name	Specifies the domain name of your LAN. This name is communicated by the DNS server to the local PCs, and is subsequently used by the PCs to complete a DNS request.	lan

DNS hostname table

This table allows you to manually configure DNS hostnames to hosts, identified by their IP address:



DNS hostname table components

You can configure the following parameters:

Field	Description
Hostname	A DNS hostname of your choice for the PC.
Address	The IP address of the PC to which you assign the DNS hostname.

14 Networking Services – Firewalling

Introduction

A Firewall is a security gateway that controls access between a private LAN domain, often referred to as Intranet, and the public Internet.

It secures the entry points to the network, in such a way that access is only allowed to authorized traffic. Therefore, to effectively control the flow of data, firewall protection should be placed at each point where the network connects to the WAN, or the Internet.

This chapter aims to familiarize you with the operation of the *Pro*'s programmable Firewall.

In this chapter

14.1 Operation of the Firewall

What is the STPro Firewall

The *Pro* Firewall is a set of related programs that protects the resources of your local network from users from other networks.

Basically, a firewall examines each network packet to determine whether to forward it toward its destination. Firewalls work in most cases closely together with a proxy server that makes network requests on behalf of your local network users.

For the *Pro* Firewall the *Pro* acts as well as network gateway and proxy server to contact the outside world via the ADSL line

The *Pro* Firewall is in fact a packet filter: inside and outside nodes are visible to each other at the IP level, but the firewall filters out, i.e. blocks the passage of certain packets, based on their header.

How the STPro Firewall works

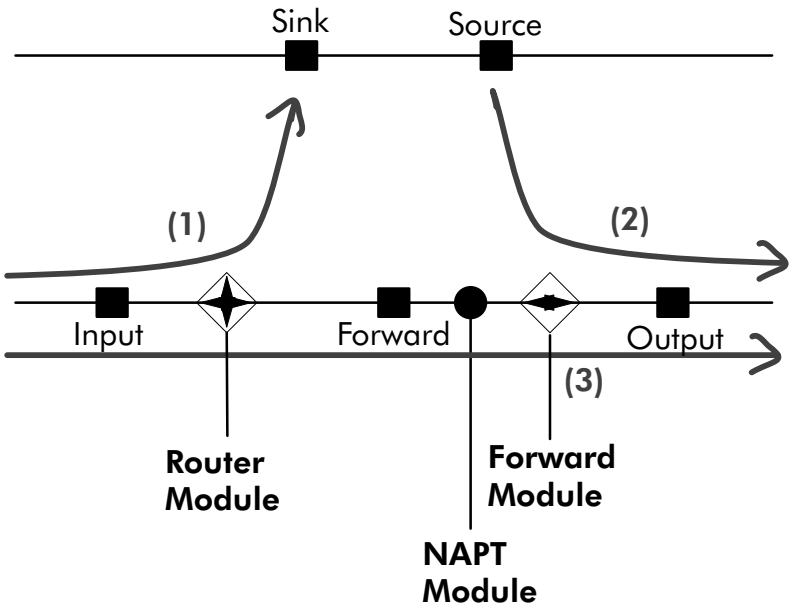
Packets are intercepted at certain Packet Interception Point (PIP), called *hooks*, in the *Pro* IP router. At this points, they are matched against a chain, which comprises rules (at least one). These rules determine the type of control implemented on the packets.

Incoming and outgoing traffic is validated by comparing certain values in the packets with configured Firewall parameters. The parameters in a rule can be divided according to the protocol to which they belong: a first group validates traffic on the interface level, a second group on IP level, a third group filters on TCP, UDP, and ICMP level.

14.2 Firewall Model

STPro Firewall Model

The following figure shows a model of the *Pro* Firewall:



STPro Firewall modules

The following modules can be identified (See Firewall model):

- **Router Module** : This module, which has nothing to do with the *Pro* IP router, is responsible for the traffic "within" the *Pro* Firewall, i.e. it routes the packets towards the Sink PIP or Forward PIP.
- **Forward Module** : This module is responsible for forwarding the packets toward the output.
- **NAPT Module** : This module is responsible for the translation of IP addresses, in case firewalling is used with NAPT.

STPro Firewall hooks

The following hooks, or PIPs can be determined (See Firewall model):

- **Input** : The point of all incoming traffic

  At this point it can be determined whether the packet is allowed to reach the *Pro* IP router, or the local host.

- **Sink** : The point of all traffic destined to the *Pro* IP router

  At this point it can be determined whether the packet is allowed to address the local host.

- **Forward** : The point of all traffic to be forwarded by the *Pro*

  At this point it can be determined whether the packet is allowed to be handled, i.e. routed, by the *Pro* IP router.

- **Source** : The point of all traffic sourced by the *Pro* IP router

  At this point it can be determined whether the packet is allowed to leave the local host.

- **Output** : The point of all outgoing traffic

  At this point it can be determined whether the packet is allowed to leave the *Pro* IP router, or local host.

STPro Firewall streams

The following streams (See Firewall model) can run through the PIPs:

- **(1) Input –> Sink** : The flow of packets exclusively destined to the *Pro*.
- **(2) Source–> Output** : The flow of packets sourced exclusively by the *Pro* itself
- **(3) Input –> Forward –> Output** : The flow of packets sourced by the WAN, forwarded towards the local network, or vice versa.

14.3 Firewall Actions

STPro Firewall actions

Once a packet is intercepted in a hook, and a rule is found to be applicable, one of the following actions can be performed on the packet:

- **Accept**
  The packet will be submitted to the next processing stage, without further action.
- **Deny**
  The packet will not be submitted to the next processing stage. A message will be sent to the sender that the packet could not be delivered, e.g. with an ICMP “host unreachable” error message.
- **Drop**
  The packet will not be submitted to the next processing stage, without any further action.
- **Count**
  Each packet passing through is counted, without any further action.

14.4 Firewall Criteria

STPro Firewall criteria

At every hook (PIP) a separate access list, called *chain*, containing an ordered list of rules will operate on each processed packet, resulting in a specific treatment of this packet (See topic '*Pro* Firewall Actions').

A rule is able to operate on the following packet criteria:

- **Interface** related
- **IP** related
- **TCP** related
- **UDP** related
- **ICMP** related.

Interface related criteria

- Source interface
- Source interface group
- Destination interface
- Destination interface group.

IP related criteria

- Source IP address
- Source IP netmask
- Destination IP address
- Destination IP netmask
- Type of service
- Protocol (TCP, UDP, or ICMP).

TCP related criteria

- Source Port number
- Source Port number range
- Destination Port number
- Destination Port number range
- Synchronization flag
- Urgent flag

UDP related criteria

- Source Port number
- Source Port number range
- Destination Port number
- Destination Port number range

ICMP related criteria

- Type
- code number
- Code number range.

14.5 Firewalling and NAPT

What is NAPT

NAT (Network Address Translation), is the translation of an IP address used within one network to another IP address, known within another network.

NAPT (Network Address and Port Translation) uses a combination of IP addressing and port number mapping to create unique combinations. That way, the Pro can determine which packet, sourced by the WAN, is destined to which device on your local LAN, and vice versa, without revealing the internal device information towards the remote side.

STPro Firewall and NAPT

The position of the *Input, NAPT, Forward* and *Output* logical processing modules in the overall Pro Firewall model is relative to the traffic direction. In contrast, the Pro's WAN and LAN interfaces are physical interfaces; their position is not relative to the traffic direction.

The NAPT module is situated between the Forward and Output hook (See Pro Firewall model). Since the traffic direction will determine input, and output, the NAPT module can always be positioned between the Forward and Output module.

If you set rules on a hook, you should know if the packets that pass through that hook contain IP addresses that are NAPT-translated or not.

If rules are set on the Output hook and NAPT is active, the IP packets that pass that hook will contain **translated** IP addresses. If you want to avoid certain traffic, by setting rules that filter on certain (ranges of) IP addresses, you should be aware of the location where the rule will be verified, since, depending on the hook, another IP address will be seen by the Firewall.

As a conclusion: if NAPT is activated, the IP address that identifies a local device, will be different depending on the direction of the traffic.

14.6 Firewall Configuration

Configuring the STPro Firewall

In order to create a Firewall, suitable for your needs, you can create a chain on every hook at the *Pro*. In each chain rules can be applied with configurable parameters. Rules can also refer to a previously defined access list, thus allowing nested access lists, or chains.

You can configure the *Pro* firewall only via the CLI.

See chapter 19 for more information.

Default STPro Firewall configuration

The *Pro* Firewall is enabled by default with following behavior:

Packets migrating

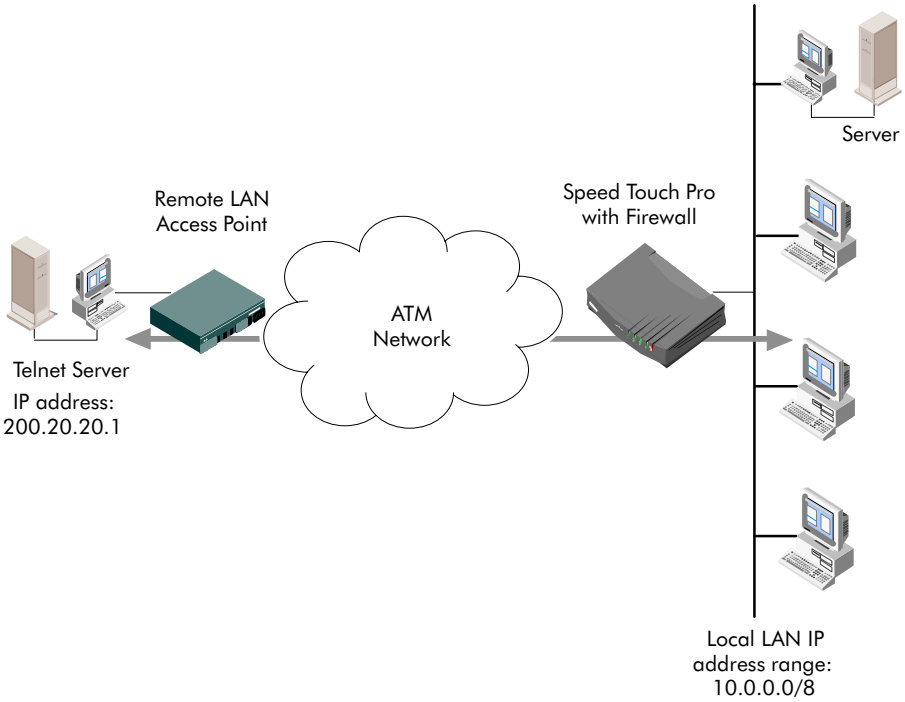
- from WAN to WAN are dropped
- from *Pro* to WAN are dropped, except Port 53 (DNS)
- from *Pro* to LAN are allowed
- from LAN to *Pro* are allowed
- from LAN to WAN are allowed
- from WAN to LAN are allowed
- from a remote LAN to local LAN are allowed
- from local LAN to a remote LAN are allowed.

14.7 Firewall Configuration Examples

Example setup

In the following two simple examples are provided to show the working and configuration of the *Pro* Firewall.

Both are based on a small LAN, consisting of the *Pro* and a small number of PCs, all configured with dynamic 'Net10' IP addresses, leased by the *Pro*'s DHCP server:



In both examples the *Pro* Firewall must block all services, except an outgoing Telnet service towards one specified remote Telnet server, with IP address 200.20.20.1.

Example 1: Firewall configuration without NAPT

NAPT is not applied on your local LAN for this ADSL connection. This means that the IP addresses are not hidden for the remote side of the connection.

In the following table, the rules to apply are summarized:

Flow	Source	Dest.	Prot.	Source port	Dest. port	ACK =1	Action
Out	10.0.0.0/8	200.20.20.1	TCP	1024-65535	23	–	accept
In	200.20.20.1	10.0.0.0/8	TCP	23	1024-65535	Yes	accept
Any	External	10.0.0.0/8	Any	Any	Any	–	drop

For the *pro* Firewall, this will result in the following CLI configuration:

1. A chain must be created, e.g. 'Telnet':

   ```
   firewall chain create chain=Telnet
   ```

2. Following rules must be created for that chain:
   - For the outgoing Telnet service packets:

     ```
     firewall rule create chain=Telnet src=10.0.0.0/8
     dst=200.20.20.1 srcintfgrp=lan prot=tcp
     srcport=1024 srcportend=65535 dstport=23
     action=accept
     ```

   - For incoming Telnet service reply packets:

     ```
     firewall rule create chain=Telnet src=200.20.20.1
     dst=10.0.0.0/8 srcintfgrp=wan prot=tcp srcport=23
     dstport=1024 dstportend=65535 ack=yes
     action=accept
     ```

   - For blocking all other services:

     ```
     firewall rule create chain=Telnet action=drop
     ```

3. The chain 'Telnet' must be assigned to the *input* hook:

   ```
   firewall assign hook=input chain=Telnet
   ```

Example 2: Firewall configuration with NAPT

NAPT is applied for this ADSL connection; all outgoing 'Net10' IP addressed packets are translated into the 192.6.11.10 IP address. So the complete local LAN is presented towards the remote side as the single IP address 192.6.11.10.

In the following table, the rules to apply are summarized:

Flow	Source	Dest.	Prot.	Source port	Dest. port	ACK =1	Action
Out	10.0.0.0/8	200.20.20.1	TCP	1024-65535	23	–	accept
In	200.20.20.1	192.6.11.10	TCP	23	1024-65535	Yes	accept
Any	External	Internal	Any	Any	Any	–	drop

For the *pro* Firewall, this will result in the following CLI configuration:

1. A chain must be created, e.g. 'Telnet':

   ```
   firewall chain create chain=Telnet
   ```

2. Following rules must be created for that chain:
   - For the outgoing Telnet service packets:

     ```
     firewall rule create chain=Telnet src=10.0.0.0/8
     dst=200.20.20.1 srcintfgrp=lan prot=tcp
     srcport=1024 srcportend=65535 dstport=23
     action=accept
     ```

   - For incoming Telnet service reply packets:

     ```
     firewall rule create chain=Telnet src=200.20.20.1
     dst=192.6.11.10 srcintfgrp=wan prot=tcp srcport=23
     dstport=1024 dstportend=65535 ack=yes
     action=accept
     ```

   - For blocking all other services:

     ```
     firewall rule create chain=Telnet action=drop
     ```

3. The chain 'Telnet' must be assigned to the *input* hook:

   ```
   firewall assign hook=input chain=Telnet
   ```

More information

See chapter 19 for more information on *pro*'s Firewall CLI configuration.

Speed Touch™ *Pro* with Firewall

Maintenance

15 Maintenance – Software Upgrade

Software Upgrade

The *pro* supports two software upgrade possibilities:

- A new version of the software can be downloaded via the ADSL line to your *pro*.
- You can upload new *pro* software yourself from a PC on your local LAN.

Both features, presented in this chapter, are simultaneously supported. However the final result depends on the ADSL provider's policy.

In this chapter

15.1 Upload Software from a PC

Introduction

Alcatel ADSL products continue to evolve.

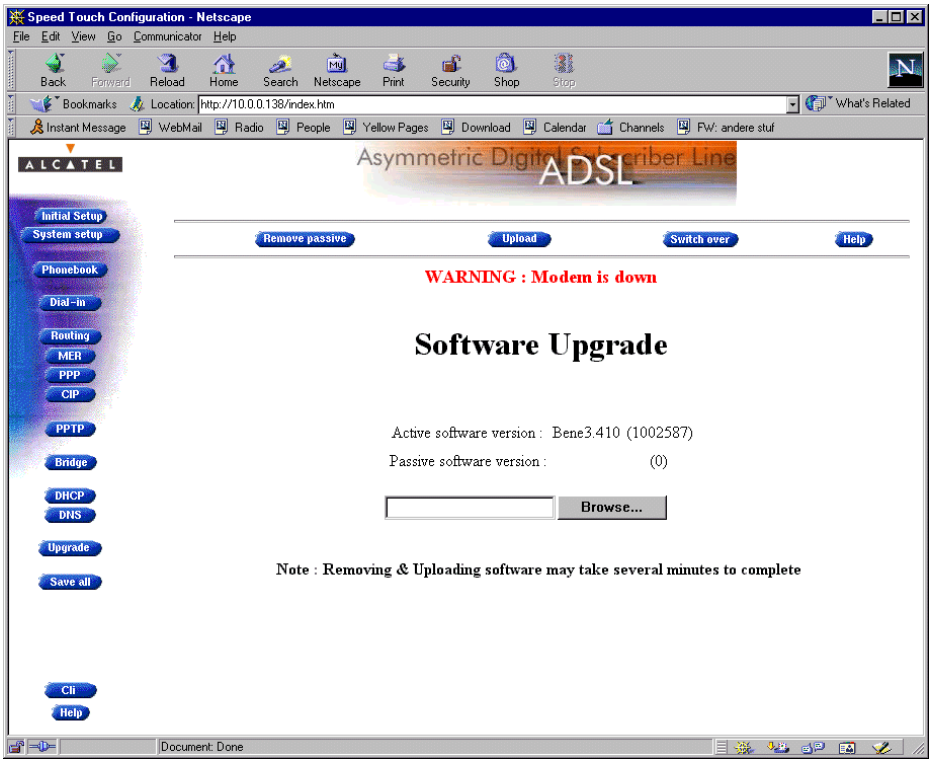
By upgrading software, the *Pro* is able to follow this evolution.

In this section

- The *'Software Upgrade'* Web Page
- *'Upgrade'* Web Page Components
- *'Upgrade'* Web Page Buttons
- Upgrade Preconditions
- Uploading Upgrade Software
- Activating Upgrade Software.

The 'Software Upgrade' web page

Click Upgrade to pop up the *'Upgrade'* web page:



'Upgrade' web page components

The following fields are shown:

- *'Active software version'*

  Indicates the software version that the *Pro* is currently using.

- *'Passive software version'*

  Indicates the software version resident in the *Pro*, but not used. This could be a newer version which is yet to be switched to active, but also a dormant older version.

- *Software path* field

  Allows you to specify the path to the *Pro* upgrade software package to be uploaded.

  Clicking Browse... allows you to browse to the location of the upgrade software.

'Upgrade' web page components

The following buttons are available:

Button	Functionality
Upload	To start the upload process. The software package indicated by the *Software path* will be transferred to the **STPro** to become the passive software version.
Remove passive	To remove the passive software version from the **STPro** memory.
Switch over	To switch active and passive software versions after a successful upload. Your **STPro** will reboot and come online again with the new version.

Upgrade Preconditions

A valid *Pro* software package must reside either on your harddisk, on a floppy disk, or CD-rom.

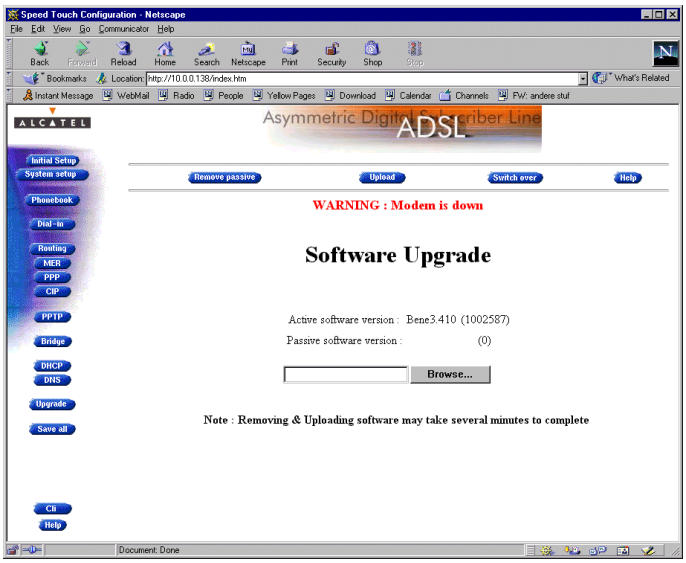
For new software upgrade packages, please contact your SP, or check the Alcatel web sites at:

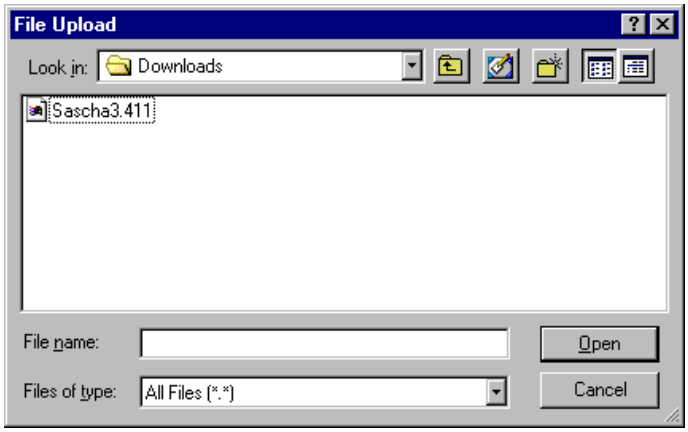
http://www.alcatel.com

http://www.alcateldsl.com

Uploading software

Proceed as follows:

Step	Action and Description
1	Browse to the *'Software Upgrade'* web page  In the *'Active software version'* field the software package that is running is labeled.
2	Check whether the *'Passive software version'* field is empty. If not, click **Remove passive**
3	Click **Browse...** next to the *Software path* input field to locate the upgrade software package **Note**: If the path is known, you can immediately enter it in the *Software path input field* and skip step 4 in this procedure.

Step	Action and Description
4	The *'File Upload'* window pops up:  This window allows you to browse to the location of the upgrade software package on either your harddisk, floppy, or CD-rom.
5	Click on the appropriate upgrade software package name to select it, and click Open As a result, the upgrade software location will be inserted in the *Software path* field.
6	Click Upload to start the upload. As a result the upgrade software package name will appear in the *'Passive software version'* field. **Note**: In case you did not remove the passive version, prior to uploading new software, the upload will be unsuccessful and an error message will appear.

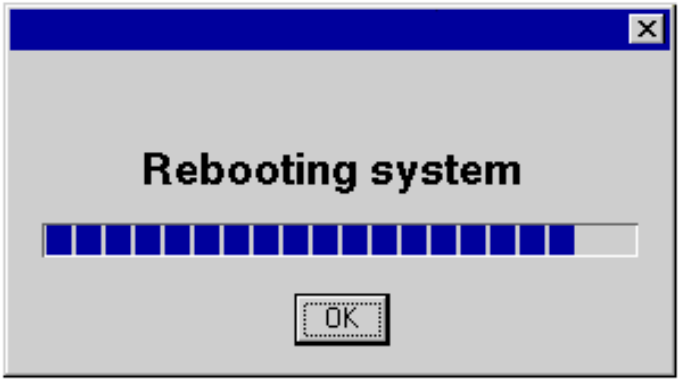
Upload Result

After a successful upload, two software versions are stored on the *Pro*:

- The running, active version
- The dormant, passive version.

Activating upgrade software

Proceed as follows to switch passive upgrade and active running software versions:

Step	Action and Description
1	If needed, browse to the *'Upgrade'* web page. **Note**: Make sure a passive software version is labeled in the *'Passive software version'* field. If not, firstly upload a upgrade software package as described in the previous procedure.
2	Click Switch over to start the switching of the two versions. After switching the versions, the **STPro** reboots: 

Result

After reboot your *pro* will come online with the new version.

In the *'Upgrade'* web page you will notice that active and passive versions (prior to the upgrade) have trade places.

15.2 Software Download

Introduction

The *pro* supports a second software upgrade possibility: a new version of the software can be downloaded from the ADSL network to your *pro*.

This can be done via the *pro* dedicated control VCs.

Software Download

This feature is controlled by the SP.

At some point in time he might decide to upgrade the software in your *pro*.

Software download will happen almost unnoticed, while you are connected to the ADSL line.

The removal of a possible dormant software version, the download itself, and the switching of both versions is performed automatically.

ADSL service can be interrupted for a short period due to a reboot of the *pro*.

Result

You will notice a change in the software version if you browse to the *pro* *'Software Upgrade'* web page.

16 Maintenance – Speed Touch Pro with Firewall Security

In this chapter

Your Pro is a highly advanced product, operating according the many configurations set via the Pro Web interface, or via the CLI.

In this way, Pro operation is vulnerable to misconfiguration by other users.

Therefore, the Pro can be secured from such users by a system password to restrict access to the Web interface, or the CLI.

This chapter describes how to set such a system password.

Note

Never use an obvious system password to protect the Pro, as your name, birth date, or phone number.

CAUTION

Forgetting the System Password

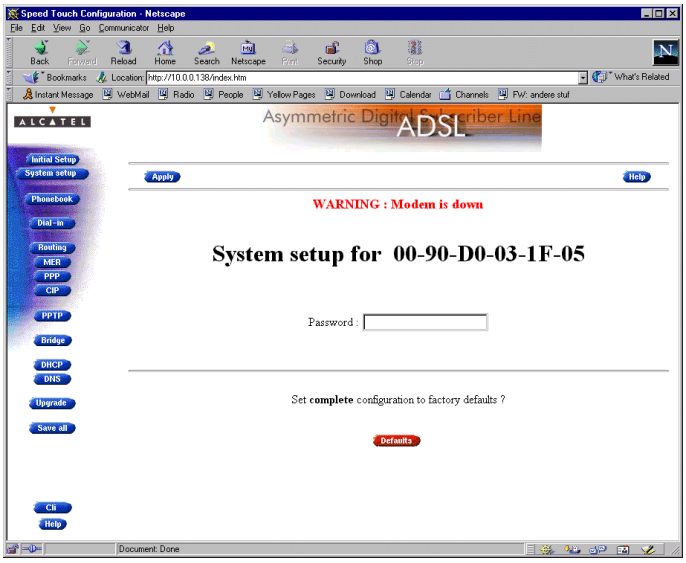
In case you forgot the system password, you are no longer able to access the web interface, or the CLI, and you will be no longer able to (re)configure the Pro settings.

Therefore, write your system password down and keep it on a save place.

Otherwise, a *Switch-to-Defaults*, must be performed, restoring all original settings of the Pro.

Setting a system password

Proceed as follows:

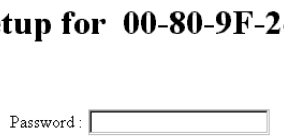
Step	Action and Description
1	Browse to the *'System'* web page. 
2	In the *'Password'* field, fill in a password. **Note**: Asterisks will appear instead of the password. The number of asterisks is at random: **System setup for 00-80-9F-24-AB-CF** Password : ********
3	Click Apply in the header frame.
4	To make your password permanent, click Save all in the menu frame.
5	Authenticate yourself, using the system password, you just configured.

Result

Every time you want to access the *Pro* web pages, or (Telnet) CLI, you must authenticate yourself, using the system password you configured.

Clearing a system password

Proceed as follows to set a system password for your Pro:

Step	Action and Description
1	Browse to the *'System'* web page.
2	In the *'Password'* field, delete the asterisks 
3	Click Apply in the header frame.
4	To make the deletion permanent, click Save all in the menu frame.

Result

No authentication is required anymore to access the Pro web pages, or the (Telnet) CLI.

17 Maintenance – Lost Speed Touch Pro with Firewall

Introduction

Non accessibility to your *Pro* may occur if wrongly configured, simply by forgetting its IP address, or forgetting the system password.

Due to the flexible nature of the *Pro*, you may end up in a situation where restoring all of the original defaults is the only solution.

The *Pro* has tools to cope with these situations.

In this chapter

17.1 Ping-of-Life

Introduction

The *Pro* offers a unique method to supply an IP address to the *Pro*'s Ethernet port.

This method, the *Ping-of-Life*™, allows to provide the *Pro* with an IP address, without affecting other configurational settings.

General procedure

The principle is fairly simple: a special ping packet will deliver an IP address to your *Pro*.

Generally the procedure is as follows:

Step	Action
1	Pre-configure the intended IP address and a special MAC group address in the ARP cache of one of your PCs.
2	Power cycle the **STPro**, and allow the POST to end (this takes about 30 seconds).
3	Ping this same IP address within 60 seconds after the **STPro** ended its POST. If everything goes well, the **STPro** has assimilated this IP address.
4	Save the new IP setting via the **STPro** web pages.

Note

Most TCP/IP packages support the *ARP* and *PING* command. The *Ping-of-Life* can be executed from any PC on your local network.

The Ping-of-Life™ procedure

Proceed as follows:

Step	Action and Description
1	Turn off the **STPro**.
2	Open an DOS window (Windows OS), or a terminal window (UNIX, Linux) on a PC.

Step	Action and Description
3	In the DOS window, or terminal window, execute: **`arp -a`** This command allows you to overview the current entries in the ARP cache.
4	Add a static entry to the ARP cache, according to following syntax: **`arp -s <STPro IP address> 01-90-D0-80-01-01`** or **`arp -s <STPro IP address> 01:90:D0:80:01:01`** **`<STPro IP address>`** is a placeholder for the IP address to be assigned to the **STPro**.
5	Verify if this step was successful. Execute: **`arp -a`** a second time. In the entries list, your **`arp -s`** command entry should be added.
6	Turn on the **STPro** and allow the POST to end.
7	Ping the IP address you just entered in the ARP cache within 60 seconds: **`ping <STPro IP address>`**
8	If successful, the **STPro** has configured this IP address and will reply to the ping.
8	You may clear the entry in the ARP cache by issuing the following command: **`arp -d <STPro IP address>`** **Note**: Leaving the entry in the ARP cache does not harm the general operation.
10	Browse to the **STPro** web pages, and click Save all to make the new IP address permanent.

Ping-of-Life™ with multiple PC-NICs

If your PC is equipped with multiple PC-NICs, make sure that the procedure is applied to the one connected to the *Pro*.

In the following syntax, **`<Interface IP address>`** identifies the particular PC-NIC:

`arp -<a,s,d> <STPro IP address> -N <interface IP address>`

CAUTION

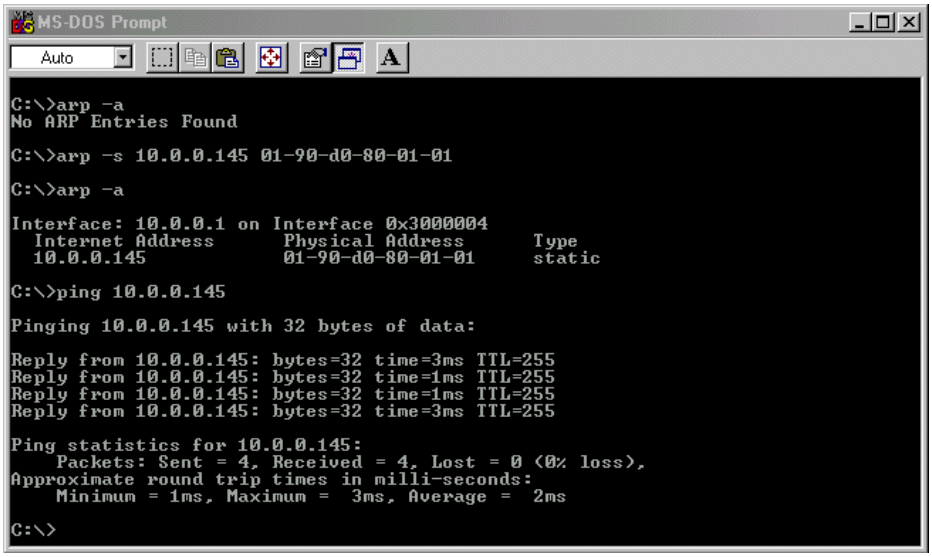
IP Addresses and Subnet Masks

Make sure that the intended *Pro* IP address and your PC share the same IP (sub)network.

If not, the ping will be submitted with the MAC address of the default router instead of the special MAC group address.

Example DOS box

In the following figure all the steps are shown as an example of setting *Pro*'s IP address to 10.0.0.145 from a PC with an MS Windows OS:



The 'Ping -t' command

You can avoid waiting 30 and then 60 seconds by proceeding as follows:

Step	Action and Description
1 .. 5	Follow the *Ping-of-Life*™ procedure as described, from step 1 up to step 5.
6	Initiate a continuous pinging, by executing **`ping -t <STPro IP address>`**
7	Turn on the **STPro**.
8	After the POST, the **STPro** will reply to the ping.
9	Terminate the continuous ping by pressing CTRL-C.
10	Save the IP address via the **STPro** web pages.

17.2 Speed Touch Pro with Firewall Reset

Overview of the To-Defaults methods

To restore Pro's original settings, three methods are provided:

- Two local software methods:
  - *Browse-to-Defaults*

    Which sets all parameters to original defaults, but keeps the system password and IP address.
  - *Ping-to-Defaults*™

    Which sets all parameters to original defaults, including the system password and IP address.
- One hardware method:
  - *Switch-to-Defaults*.

    Which sets all parameters to original defaults, including the system password and IP address.

CAUTION

Restoring Original Settings

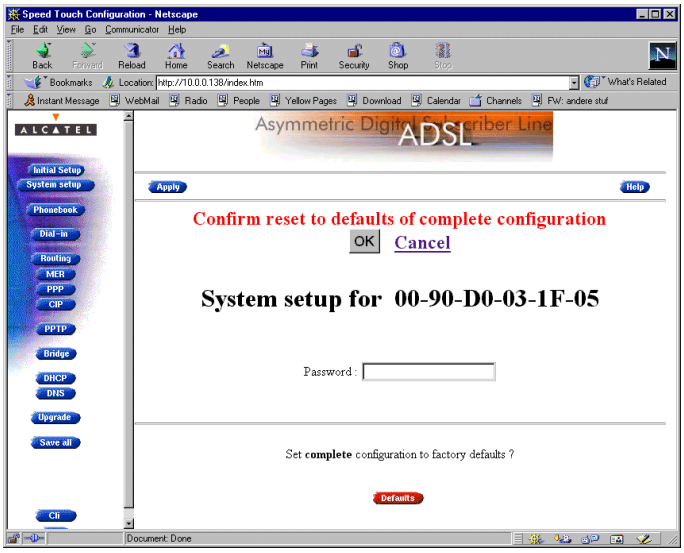
Be careful when using To-*Defaults* procedures as these destroy changes you previously made to the Pro internal settings.

A reset to defaults via a *Ping-to-Defaults*™, or via a *Switch-to-Defaults*, also implies the Pro's IP address is reset to 10.0.0.138. As a consequence, IP connectivity with the Pro could be lost. In that case you must execute a *Ping-of-Life*™.

In this section

17.2.1 Browse-to-Defaults

Procedure Proceed as follows:

Step	Action and Description
1	Browse to the *'System'* web page. 
2	If you are sure to reset the **STPro** to its original defaults, click **Defaults**
3	The **STPro** will ask to confirm the reset: **Confirm reset to defaults of complete configuration** **OK** **Cancel**
4	Make the following selection: **If ...** / **Then click ...** You are sure that you want to reset the **STPro** completely ... / OK You do not want to continue with the reset to original defaults ... / Cancel
4	To make the reset permanent, click **Save all** in the menu frame.
5	Press the reload button of your Web browser.

Browse-to-Defaults result After reset, all original configurations of the *Pro* are restored, except the *Pro* system password, and Ethernet IP address(es).

17.2.2 Ping-to-Defaults

Introduction

A second software method to reset all settings to the original defaults is the *Ping-to-Defaults*™.

The technique is identical to that used for the *Ping-of-Life*™, except that another MAC address is used, i.e. **`01-90-D0-80-01-FF`**.

Procedure

Proceed as follows:

Step	Action and Description
1	Turn off the **STPro**.
2	Open an MSDOS command prompt window (Windows OS), or a terminal window (UNIX, Linux).
3	Add a static entry to the ARP cache, according to following syntax: **`arp -s <IP address> 01-90-D0-80-01-FF`** This **`<IP address>`** can be any address within your subnet as long as it is not used by any other member of your local network.
4	Verify if this step was successful. Execute **`arp -a`** In the entries list, your **`arp -s`** command entry should be added.
5	Turn on the **STPro** and allow the POST to end.
6	Ping the IP address **`<IP address>`** you just entered in the ARP cache: **`ping <IP address>`**
7	You **must** clear the entry in the ARP cache by issuing the following command: **`arp -d <IP address>`**
8	If needed, reconfigure the **STPro**'s IP address.

Note

The IP address **`<IP address>`** used to perform a *Ping-to-Defaults*™ is not assimilated by your *Pro*. The *Pro* will restart with the original defaults, including the default IP address 10.0.0.38.

17.2.3 Switch-to-Defaults

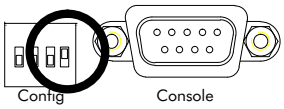
Introduction

At the back of the *Pro* there is a a set of DIP switches labeled "Config".

Via these switches a hardware reset of the *Pro*, the *Switch-to-Defaults*, is possible.

Procedure

Proceed as follows:

Step	Action and Description
1	Make sure your **STPro** is turned on.
2	Put DIP switch number 4 in the UP position:  You will notice that the PWR/Alarm LED flashes amber.
3	Power cycle the **STPro** and wait to allow the POST to end. The **STPro** will come online with manufacturing defaults.
4	Reset the DIP switch in its original position. If not, the 'PWR/Alarm' LED will flash amber as a warning.
5	After a reset to original defaults a reconfiguration of **STPro**'s IP address might be necessary. This because the reset to defaults also resets your **STPro**'s IP address to its default value 10.0.0.138.

CAUTION

DIP Switch Position

Leaving the DIP switch in the UP position, will cause unintended reset to manufacturing defaults !

18 Maintenance – Speed Touch Pro with Firewall Web Interface

Introduction

The *Pro* comes with integrated local configuration capabilities.

Two methods exist:

- Configuration via a Web Browser
- Configuration through a Command Line Interface (CLI).

The STPro web interface

The local configuration via the *Pro* web interface, is based on the HyperText Transfer Protocol (HTTP) server/Web browser concept.

It allows configuration of your *Pro* via a Web browser through HyperText Markup Language (HTML) web pages from any local PC attached to the Ethernet interface(s).

In this chapter

18.1 Web Interface Preconditions

Preconditions

When your PC is connected to a Proxy server for accessing the Internet, you must change your Web browser preferences, because the Pro is a local device and its IP address cannot be resolved by the Proxy server.

Therefore, prior to access the Pro web pages, make sure that, either:

- Your Web browser is not using a Proxy server
- The Pro IP address is not submitted to the Proxy server.

Note

The procedures described, are methods for:

- Netscape Navigator, version 2.0 or above
- Microsoft Internet Explorer, version 2.2 or above.

In this section

This section covers the following topics:

18.1.1 Disabling Proxy Servers

Introduction

This subsection describes how to disable Proxy servers for your Web browser.

As a consequence of this action, connectivity through the Proxy server to the Internet is lost.

Therefore, after configuring your Pro, do not forget to reset your Web browser to its original settings !

Disabling Proxy servers for Netscape Navigator

1. Select '*Edit*' from the toolbar
2. Select '*Preferences*'
3. In the '*Category*' box select *Advanced, Proxies*
4. Click the option button '*Direct Connection to the Internet*'.

Disabling Proxy servers for Internet Explorer

1. Right-click the '*Internet*' icon
2. From the pop-up menu select '*Properties*'
3. Clear the *'Use Proxy Server'* check box.

Web browser versions

Since several versions of these Web browsers exist, the proxy settings might be located in other menus than the ones described above. Consult the documentation of your Web browser for more information on proxy settings.

18.1.2 Disabling Proxying for Local IP Addresses

Introduction

This subsection describes how to avoid that IP addresses, you can connect to directly, as for the Pro, are passed over to the Proxy server.

However, this option can only be used if the Proxy servers are manually configured, i.e. are not automatically configured, or if the Proxy servers are known by name, and port.

Disabling Proxying for Netscape Navigator

1. Select '*Edit*' from the toolbar
2. Select '*Preferences*'
3. In the '*Category*' box select *Advanced, Proxies*
4. Under *'Manual Proxies'*, click the *view* button
5. In the *Exceptions* box, add the IP address of your Pro, or the IP subnetwork address pool.

Disabling Proxying for Internet Explorer

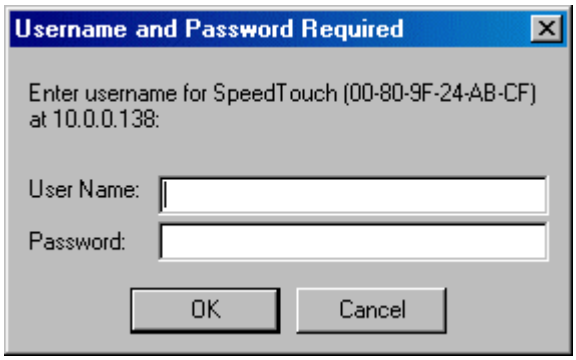
1. Select 'Tools' from the toolbar
2. From the pop-up menu select 'Internet Options'
3. In the *'Internet Options'* window, select the *'Connections'* tab
4. Click the *'LAN Settings...'* button
5. In the *'Proxy Server'* box, check the *'Bypass Proxy servers for local addresses'* box, and click *'Advanced'*
6. In the *'Exceptions'* settings, add the Pro IP address.

Web browser versions

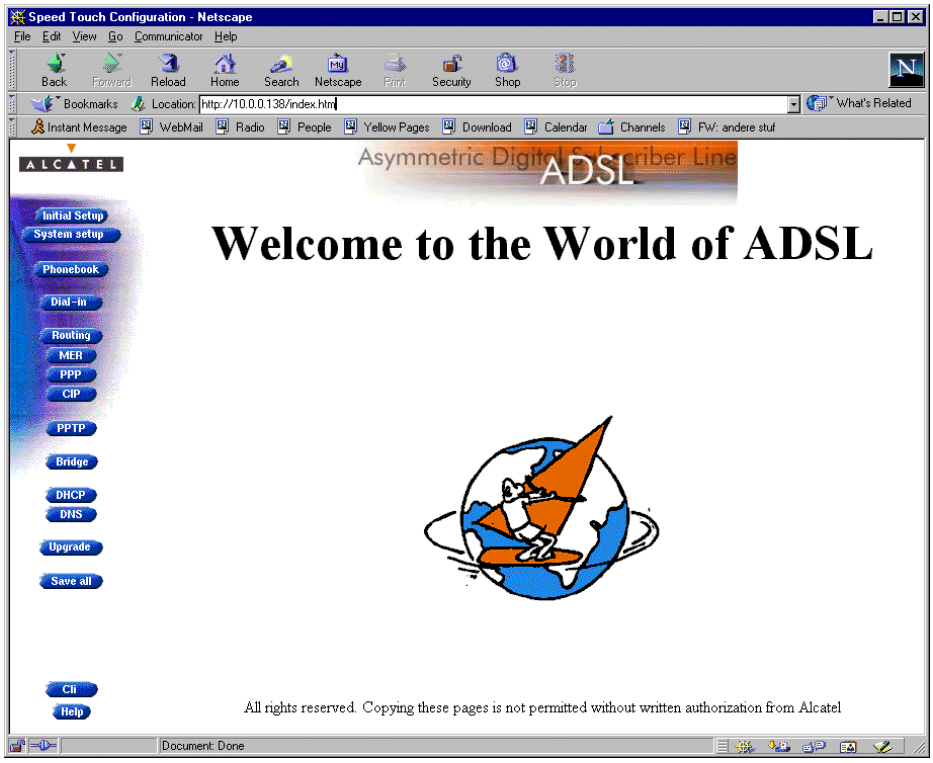
Since several versions of these Web browsers exist, the proxy settings might be located in other menus than the ones described above. Consult the documentation of your Web browser for more information on proxy settings.

18.2 Browsing to the Web Pages

Procedure Proceed as follows:

Step	Action and Description
1	Start the Web browser on your PC or workstation.
2	Contact the **STPro** by entering either: ▶ The **STPro** IP address or ▶ The **STPro** DNS hostname. **Note**: The default IP address is **10.0.0.138** The default DNS hostname is **SpeedTouch**.
3	If a system password was set (See chapter 16 for more information), an authentication window will pop up:  Enter the system password in the *'Password'* field and press Enter.

Result As a result the *'Welcome to the World of ADSL'* web page pops up:



From now on the *Pro* acts as a Web server sending HTML pages/forms at your request. You can fill out these pages/forms and submit them to the *Pro*. The latter scans the pages and makes configurations accordingly.

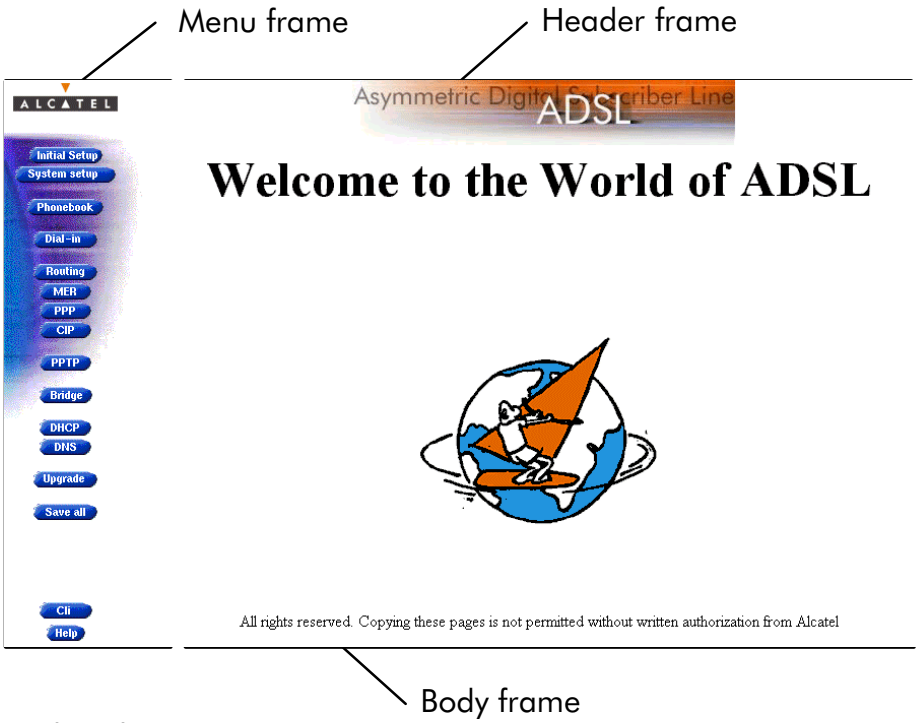
18.3 Web Page Structure

In this section

- *Pro* Web Page Frames
- Header Frame Components
- Menu Frame Components
- Body Frame Components.

STPro web page frames

All web pages can be divided into three sections:



Each web page contains:

- A horizontal bar, referred to as *Menu frame* hereafter
- A vertical pane, referred to as *Header frame* hereafter
- The user field, referred to as *Body frame* hereafter.

Header frame components

The header frame is present in all of the *Pro* web pages.

Under the generic ADSL banner it contains on most pages also subject related command buttons.

Two command buttons are always available:

Button	Functionality
Apply	To let the changes you made, take effect. However, you must still click Save all to store the changes to permanent memory.
Help	To pop up the **STPro** online help pages.

Subject related command buttons are only visible in the appropriate web page you have selected.

Menu frame components

The Menu frame is generic for all *Pro*'s web pages.

Each menu button represents a *Pro* configuration web page, yielding all configurational possibilities related to menu subject.

The following buttons are available:

Click this button ...	To ...	See
ALCATEL	Return to the *'Welcome to the World of ADSL'* web page.	18.2
Initial Setup	Configure user defined **STPro** IP parameters.	12.3.2
System setup	Set a System password Perform a *Browse-to-Defaults*.	16 17.2.1
Phonebook	Overview the record of all possible, and existing ATM connection information.	11.3
Dial-in	Dial-in to WAN via the PPP packet service.	9.2
Routing	Configure the **STPro** IP router.	12.4.1
MER	Configure the MER packet service.	7.3
PPP	Configure the PPP packet service.	9.3
CIP	Configure the CIP packet service.	10.4
PPTP	Overview active PPTP connections.	8.4

Click this button ...	To ...	See
Bridge	Configure the Bridging packet service. View Bridging MAC layer data.	6.3 6.4.2
DHCP	Configure the **STPro** DHCP server/client.	12.3.3
DNS	Configure the **STPro** DNS server/client.	13.2
Upgrade	Upgrade **STPro** software.	15
Save all	Save all changes made to persistent memory.	
Cli	Open the *'CLI'* web pages to allow detailed configuration of the **STPro**.	19.1
Help	Pop up the **STPro** online help pages.	

19 Maintenance – Speed Touch Pro with Firewall Command Line Interface

Introduction

For advanced configurations, with full control over all the *Pro* functions, the *Pro* exhibits a low level interface, i.e. the Command Line Interface (CLI).

As the CLI has far more configurational possibilities than the regular *Pro* web pages, it is intended for experienced users only.

The CLI is accessible via:

- The *Pro* web pages
- A Telnet session via Ethernet IP connectivity
- The serial *'Console'* port.

In this chapter

19.1 CLI via the Web Pages

In this section

- CLI Web Page Requirements
- The *Pro* *'CLI'* Web Page
- CLI Commands Basics
- Example: Command Group Description
- Executing Commands
- Example: Command Execution
- Detailed CLI Commands Description

CLI web page requirements

To be able to access the *'CLI'* web page, you need the following:

- Microsoft's Internet Explorer 4.0, or better

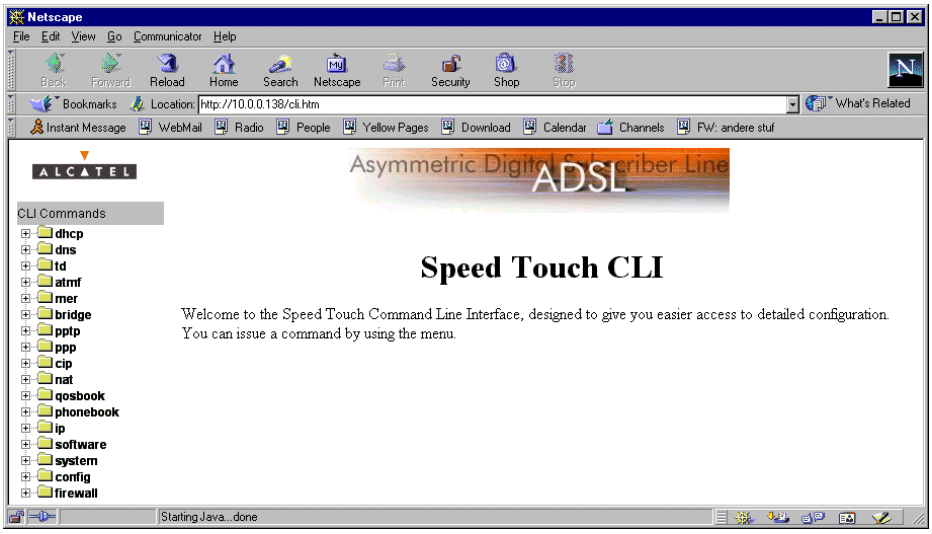
or

- Netscape's Communicator 4.06, or better.

Both web browsers must support JavaScript.

The STPro 'CLI' web page

Clicking Cli in the left pane of the *Pro* web pages, pops up the *'CLI'* web page (See section 18.2 for more information):

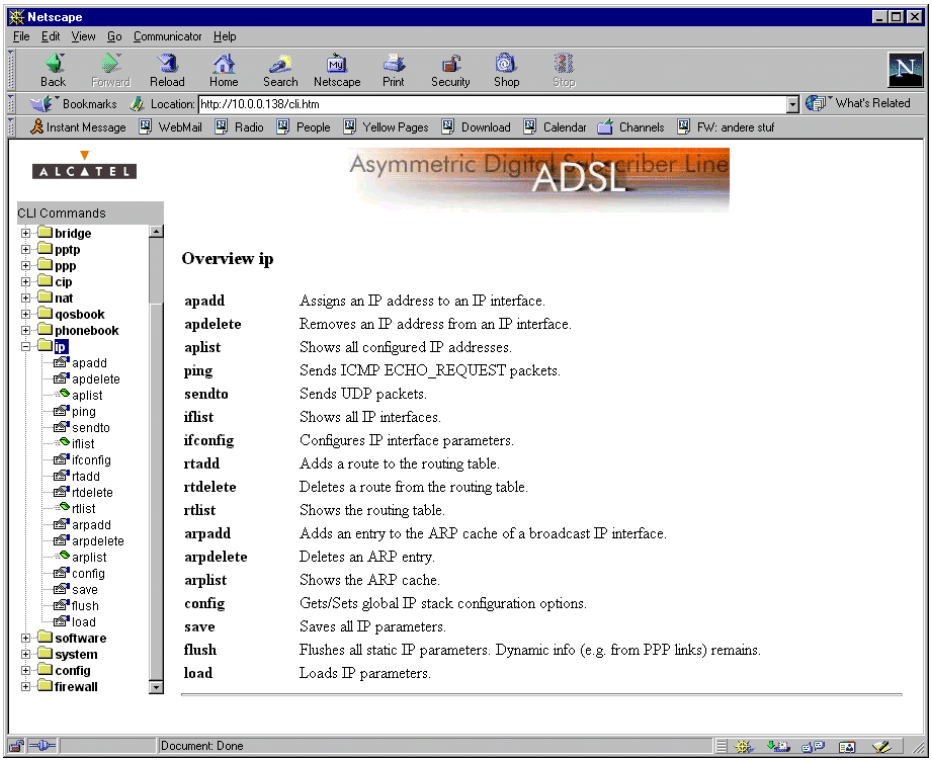


CLI commands basics

All CLI groups and commands are placed in a menu. You can open a group by clicking the ⊞ mark next to a group name, or clicking the group name.

Example: command group description

The following example shows the output if you click ⊞ next to the *'ip'* group name:



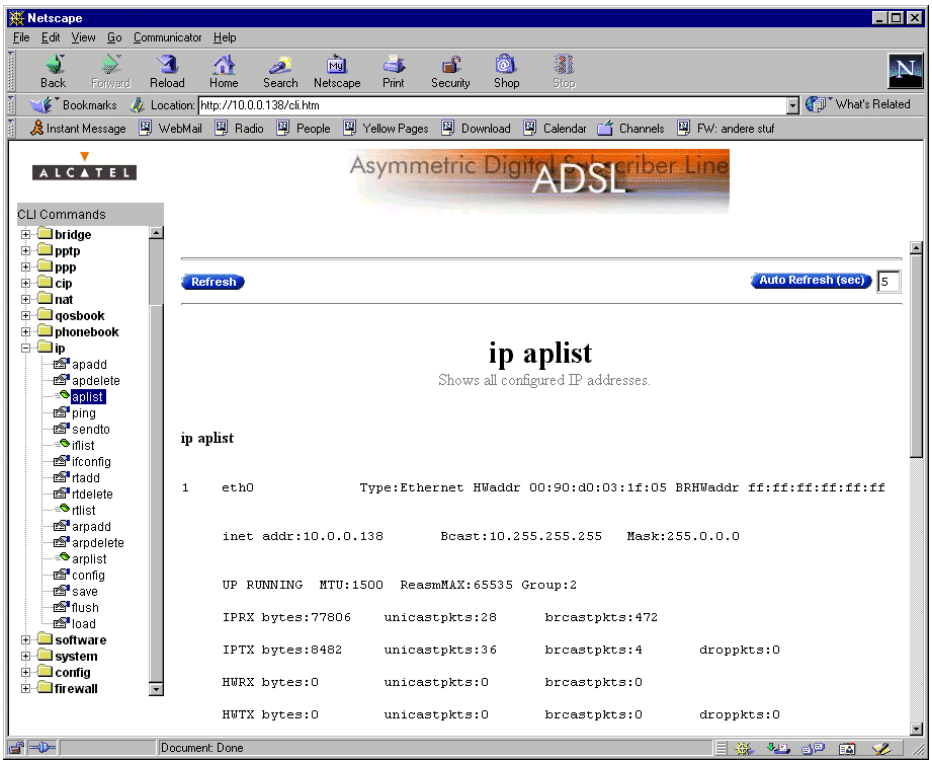
Executing commands

Clicking on a command name will execute it. Commands without parameters are indicated with , and are executed immediately.

Commands which require additional parameters are indicated with . After you configured all parameters, you must click Apply to execute the command.

Example: command execution

Clicking *'aplist'* in the *'ip'* command group generates the following immediate output:



CLI Reference Manual

A CLI Reference manual with detailed CLI configuration description of all the commands can be found at:

http://www.alcatel.com

http://www.alcateldsl.com

19.2 Native CLI Access

Introduction

Next to the CLI access via the *Pro* web pages, you can use native access via the serial port, or via a basic Telnet session.

This allows configuration via a character based CLI. As a consequence, the use of a web browser, or even any graphical, or operational environment is avoided.

In this chapter

19.2.1 CLI through a Telnet Session

Introduction

Via a PC, or terminal connected to the Ethernet interface of the *Pro* you can execute CLI commands.

However, you must gain access to the *Pro* first, by opening a TCP/IP Telnet session.

Note

The examples throughout this section all refer to Microsoft Windows OSs. However, all the concepts remain equally valid for other OSs.

In this section

- Telnet Features
- Telnet Requirements
- Opening a Telnet Session to your *Pro*
- Closing a Telnet Session.

Telnet features

Telnet is:

- A fairly general, bi-directional, eight-bit byte-oriented communication facility
- A standard method of interfacing terminal devices to each other.

Telnet requirements

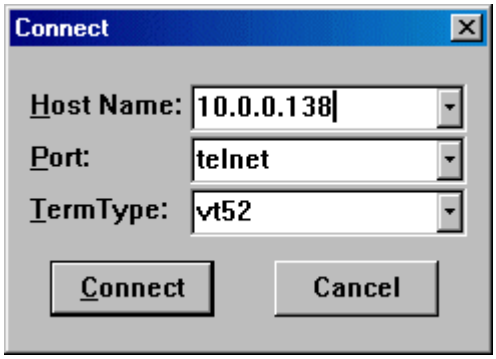
Prior to using Telnet, you need:

- A connected, and configured *Pro*, with known IP address, or DNS hostname, and, if applicable, the system password
- A PC, or terminal connected to the LAN

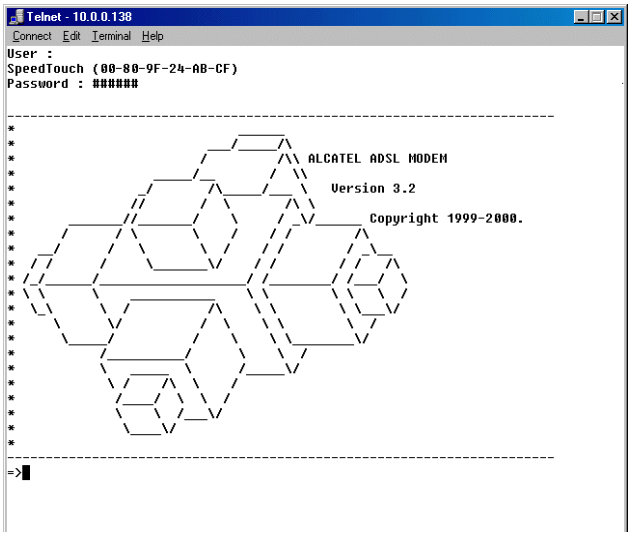
  Note: LAN is referred to as a network containing at least one PC, or terminal, and your *Pro*.
- A TCP/IP suite installed on this PC, or terminal
- A Telnet session application installed on this PC, or terminal.

Opening a Telnet session to your STPro

Proceed as follows:

Step	Action and Description
1	Click Start from the system tray on your desktop.
2	Select *'Programs'* and click MS-DOS Prompt to open a DOS window.
3	The DOS window pops up:  At the DOS prompt, enter: **telnet**.
4	The *'Telnet'* window pops up:  In the toolbar, you select *'Connect'*, and click *'Remote System...'*.
5	The *'Connect'* window pops up:  In the *Host Name'* field, enter the **STPro** IP address, or its DNS hostname. **Note**: The default IP address is **10.0.0.138** The default DNS hostname is **SpeedTouch**.

Step	Action and Description
6	Click **Connect**
7	The **STPro** will prompt you with **User:**
8	Press 'Enter'.
9	The following step depends on the following: **If ...** / **Then ...** A system password was set before → You must supply the password, prior to gaining CLI access. No system password was set → No passwords must be supplied, and you have immediate CLI access.
10	The **STPro** CLI banner will appear:



Result At this point you reached the CLI prompt, preceded by the opening CLI banner:

=>

CLI commands can be executed now.

Closing a Telnet Session

CLI access to your *Pro* is released, either via timeout, or by holding down the 'Ctrl' tab and pressing ']'.

To quit the Telnet application, enter **quit**, or hold down the 'Ctrl' tab and press 'C'.

Note You can perform a quick release from the CLI to your OS's prompt, by holding down the 'Ctrl' tab and pressing 'C' at the CLI prompt.

19.2.2 CLI via Serial Access

Advantages of the CLI via serial access

The CLI via serial access:

- Provides CLI command connectivity to the *Pro*, without the need of a TCP/IP configuration
- Allows remote *Pro* configuration via an intermediate POTS modem, or ISDN modem/router.

Serial access requirements

For serial access, you need:

- A serial cable.
- An ASCII terminal (VT100), or a PC with ASCII terminal emulation, for local configuration

or

- A POTS, or ISDN modem/router for remote configuration

Serial connection settings

Setup the serial interface of your ASCII terminal, or PC for:

- 9600 BAUD
- 8 databits
- no parity, 1 stopbit.

Accessing the CLI

As soon the connection is made, your terminal is ready for the CLI. Just press 'Enter' to pop up the CLI banner, possibly after supplying the *Pro* system password.

19.2.3 CLI Command Basics

Introduction

Although it is not the aim of this subsection to give a complete overview of all possible configurational *Pro* items, this subsection describes some of the generalities of the native CLI environment.

General CLI information

Once you accessed your *Pro*, you will get the CLI prompt: **=>**.

From this point you can start entering your commands.

The CLI access is structured in what is called “levels”.

The **=>** prompt indicates that you are in the “root” level of CLI.

CLI help

Typing **help** at the root prompt shows you the available command groups:

```
=>help
Following commands are available :
help              : Displays this help information
?                 : Displays this help information
exit              : Exits group selection.
..                : Exits group selection.

Following command groups are available :
dhcp            dns           td          atmf        mer
bridge          pptp          ppp         cip         nat
qosbook         phonebook     ip          software    system
config          firewall
=>
```

Navigating through CLI levels

Entering the name of a command group, accesses you to this specific level.

For example , entering **=>config** followed by pressing ’Enter’, brings you to the ’config’ level.

This is indicated by its own prompt: **[config]=>**

Command group help

Typing **help** at the command group level prompt shows you the available commands.

For example , entering **help** at the 'config' level generates the following output:

```
[config]=>help
Following command groups are available :
save   : Saves complete configuration.
erase  : Removes all saved data.
load   : Loads saved or factory default configuration.
flush  : Flushes complete configuration.
reset  : Flush & restore factory default configuration.
[config]=>
```

Command help

Typing **help** followed by a command generates shows you a description of the command, and a parameter syntax, if applicable:

For example , entering **help reset** in the 'config' level generates the following output:

```
[config]=>help reset
   [keep_ip = <{no|yes}>]
     Reset IP settings or not.  Resetting IP can break
     current telnet/http session !
[config]=>
```

Command execution

Typing the command executes the command. In most cases you must also provide related parameters.

The consequences of a command execution have immediate effect. However, only after executing the **save** command, the new settings are stored in persistent memory.

CLI Reference Manual

A CLI Reference manual with detailed CLI configuration description of all the commands can be found at:

http://www.alcatel.com

http://www.alcateldsl.com

Speed Touch™ *Pro* with Firewall

Appendices

Abbreviations

ACCOMP	Address and Control field COMPression
ADSL	Asymmetric Digital Subscriber Line
ARIN	American Registry for Internet Numbers
ASP	ADSL Service Provider
ATMF-25	ATM Forum-25.6 Mbps
CHAP	Challenge Handshake Authentication Protocol
CIP	Classical IP
CLI	Command Line Interface
DTE	Data Terminal Equipment
ETHoA	ETHernet over ATM
FIB	Forwarding Information Base
FTP	File Transfer Protocol
GUI	Graphical User Interface
HTML	HyperText Markup Language
HTTP	HyperText Transfer Protocol
ICMP	Internet Control Message Protocol
IP	Internet Protocol
IRC	Internet Relay Chat
ISDN	Integrated Services Digital Network
ISP	Internet Service Provider
LAN	Local Area Network
LCP	Link Control Protocol
LIS	Logical IP Subnet
MAC	Medium Access Control
Mbps	Mega bits per seconds
MER	MAC Encapsulated Routing
NAPT	Network Address & Port Translation
NIC	Network Interface Card
NID	Network Interface Device
OS	Operating System
OSI	Open Systems Interconnection

PAP	Password Authentication Protocol
PC	Personal Computer
PIP	Packet Interception Point
POST	Power On Self Test
POTS	Plain Old Telephone Service
PPP	Point-to-Point Protocol
PPPoA	PPP over ATM
PPTP	Point-to-Point Tunnelling Protocol
PT	Port Translation
QoS	Quality of Service
RAS	Remote Access Services
REN	Ringer Equivalence Number
ROW	Rest Of the World
RTSP	Real Time Stream Protocol
SP	Service Provider
SVC	Switched VC
TCP	Transmission Control Protocol
URL	Uniform Resource Locator
VP	Virtual Path
VPN	Virtual Private Network
WAN	Wide Area Network

AppendixA Troubleshooting

Introduction

This appendix provides information on how to identify and correct some common problems you may encounter when using, and configuring the Pro.

If the following troubleshooting tips have not resolved the problem, contact the company from which you purchased the Pro for assistance.

Configuration problems

In case you encounter ADSL connectivity problems due to misconfiguration, you might consider a reset to original defaults as described in chapter 17.
However, be aware that a reset to original defaults destroys all configurational changes you made to the Pro internal settings.

Trouble solving table

The following table provides possible solutions to some problems:

Problem	Solution
STPro *does not work.* *(none off the LEDs lights up)*	Make sure the **STPro** is plugged into an electrical outlet.
	Make sure the power switch on the **STPro** modem is turned on.
ATMF connection does not work.	Make sure the cable is securely connected to the ATMF-25 port.
No Ethernet connectivity.	Make sure the cable(s) are securely connected to the 10Base-T port(s).
	Make sure you are using the correct cable type for your Ethernet equipment.
Telnet session from a Windows PC is not possible.	The **STPro** system password is longer than 8 characters. Change the **STPro** system password.
Poor ***STPro*** *modem performance.*	Make sure the **STPro** is installed as instructed in this user manual.
Windows Error 730. *(Windows98/98SE)*	TCP/IP is not installed on your PC. Install the TCP/IP protocol suite on this PC.

AppendixB ADSL Connectivity

Introduction

ADSL is state-of-the-art technology, used for unlocking the potential bandwidth of the widely available public telephone network.

In this appendix

B.1 ADSL Exposed

ADSL

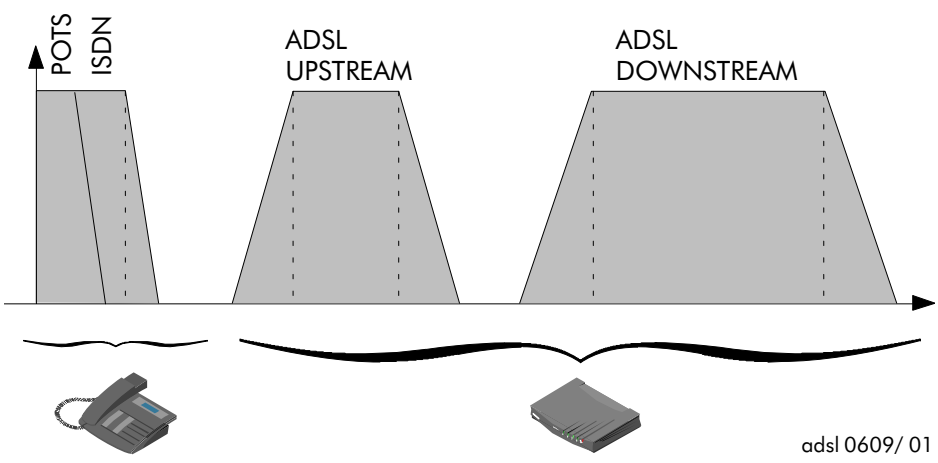
ADSL is short for *Asymmetric Digital Subscriber Line*. This somewhat cryptic name is best explained in straightforward terms:

- **Line**: ADSL uses the ordinary existing copper line, known as "local loop", running between your local premises and the telephone central office.
- **Subscriber**: That's you, the end user. Because this is what service providers or operators call their customers.
- **Digital**: ADSL is a digital transmission technology. To a certain extend, digital information is not affected by impairments on the telephone line, thus achieving a higher reliability.
- **Asymmetric**: ADSL can transmit data much faster from the Internet towards the end user than vice versa.

ADSL vs. POTS

As Plain Old Telephone Service (POTS) or Integrated Services Digital Network (ISDN), and ADSL occupy distinct frequency spectra, ADSL service can coexist with these conventional telephone services.

Frequency spectrum



B.2 Preconditions

Before you start using ADSL service

Prior to using the *Pro*, you MUST contact your SP. The SP will inform you whether the ADSL service is already enabled. If not, the SP will advice you on how to proceed.

Requirements to use ADSL service

Your SP must provide you with:

- A telephone line (POTS, or ISDN) which supports ADSL service
- Guidelines for in-house cabling
- A splitter or filters to decouple conventional phone signals and ADSL signals.

STPro and telephone service

Two variants of the *Pro* models exist: a POTS variant, and an ISDN variant.
To identify your variant, see the marking label on your *Pro*.

POTS, or ISDN vs. telephone equipment

In all cases you must use the appropriate equipment according your local telephone service, this to avoid damage to your equipment and the telephone line.

In case your local telephone line is POTS, only use:

- A POTS *Pro* variant
- A POTS/ADSL splitter, or POTS/ADSL filters.

In case your local telephone service is ISDN, only use:

- A ISDN *Pro* variant
- A ISDN/ADSL splitter, or ISDN/ADSL filters.

B.3 Splitters and Filters

Mutual POTS/ADSL, or ISDN/ADSL interference

Next to existing POTS, or ISDN signals, ADSL signals are added to the wires in central telephony offices.

Although POTS, or ISDN and ADSL occupy distinct channels, they might influence one another.

Consequences of interference

In devices such as phones, modems, answering machines and fax machines (collectively referred to as telephony devices) ADSL signals can cause audible noise.

Telephony devices can in turn interfere with ADSL signals, causing deterioration in data throughput.

Solutions to avoid this interference

To avoid this mutual interference, an electronic central splitter, or distributed filters need to be installed.

Inside the STPro

Inside the *Pro*, dedicated filters remove the POTS, or ISDN signals. Consequently, only the ADSL signals remain to be processed by the *Pro* ADSL router.

Home installation

As a variety of configurations are deployed, ask your ADSL provider for advice. He will usually prefer one solution rather than another.

In the following sections

Topic	See
Central Splitter	B.4
Distributed Filters	B.5

B.4 Central Splitter

Introduction

In this section some configuration features of the central splitter are described.

WARNING

In all cases contact your ADSL service provider about splitter installation.

Public telephone lines carry voltages that **can cause electric shock**.

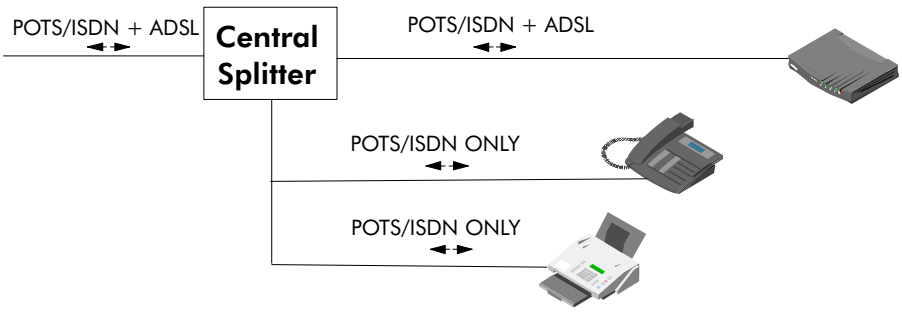
You may only install splitters yourself if the splitter model clearly stipulates that self-installation is allowed. All other splitters may only be installed by qualified service personnel.

In this section

- General Configuration
- Splitter Installation and In-House Cabling
- In-House ADSL Service
- Splitter Locations
- The Network Interface Device (NID)
- Indoor Splitter Installation.

General configuration

In the below configuration the public telephone line terminates into a central splitter.



Splitter installation and in-house cabling

The central splitter is installed as follows:

- The POTS/ADSL, or ISDN/ADSL line is connected to the splitter input
- One output, containing POTS, or ISDN signals only, is connected to the existing in-house POTS, or ISDN network for your ordinary telephone service
- The other output, containing POTS/ADSL, or ISDN/ADSL, is either connected to:
  - A dedicated spare wire pair in the existing telephone cable to connect to the *Pro*
  - A newly installed cable to connect to the *Pro* if no spare wire pair is available.

Note: Ensure that the installed cables are of sufficient quality.

In-house ADSL service

Depending upon the existing wiring and sockets, ADSL should now be present from all of your telephony wall sockets. When using a new dedicated cable, ADSL service is only present from the wall sockets attached to this cable.

Splitter Locations

The central splitter can be either external, or internal to your home.

The NID

An outdoor splitter is installed by the SP in what is often referred to as Network Interface Device, or NID.

The NID is mostly an outdoor enclosure terminating and securing the public telephone cable. For the telephone operator it is the demarcation point between the public and private section of your line.

Indoor splitter installation

Depending on splitter type and your SP's instructions, you are allowed to install the indoor splitter yourself. For more information, check the manual, supplied with the indoor splitter.

B.5 Distributed Filters

Introduction

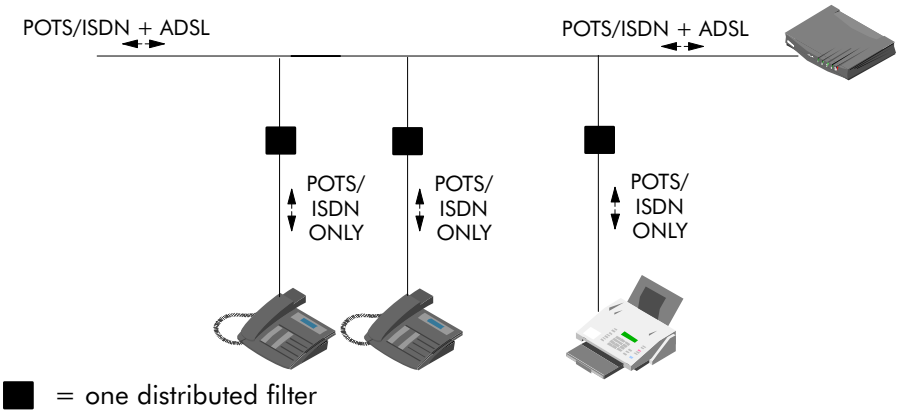
In this section some configuration features of distributed filters are described.

In this section

- General Configuration
- In-house ADSL Service
- Filter Installation.

General configuration

In this configuration, the combined POTS/ADSL, or ISDN/ADSL signals are distributed over the complete in-house wiring.



In-house ADSL service

You can connect your *Pro* to any wall outlet supporting POTS/ADSL, or ISDN/ADSL service.

Filter installation

For optimum ADSL performance, and for telephony device protection from the ADSL signals, you must insert filters in front of any connected telephony device inside your house.

B.6 ADSL Line Pinning

Introduction

This section provides information on the possible ADSL pinning terminations.

STPro ADSL connector pinning, and included ADSL cable

Depending on the model variant you purchased, ADSL is terminated on pins 2/5, or 3/4 of the ADSL port (See section F.2).

To identify your model variant, see the marking label on your *Pro*.

The included ADSL cable is a full wired RJ11/RJ11 cable.

Splitter/filter ADSL connector pinning

In case a central splitter is installed, ADSL signals are present on pins 2 and 5 of the ADSL enabled wall socket.

POTS, or ISDN telephone service is terminated on pins 3 and 4 of the wall socket.

In case distributed filters are used, both ADSL and POTS, or ISDN, service is present on pins 3 and 4 of the wall sockets.

Crossover adapters

Depending on how ADSL and POTS, or ISDN are distributed over your in-house wiring, and depending on your *Pro* model variant, crossover adapters might be required.

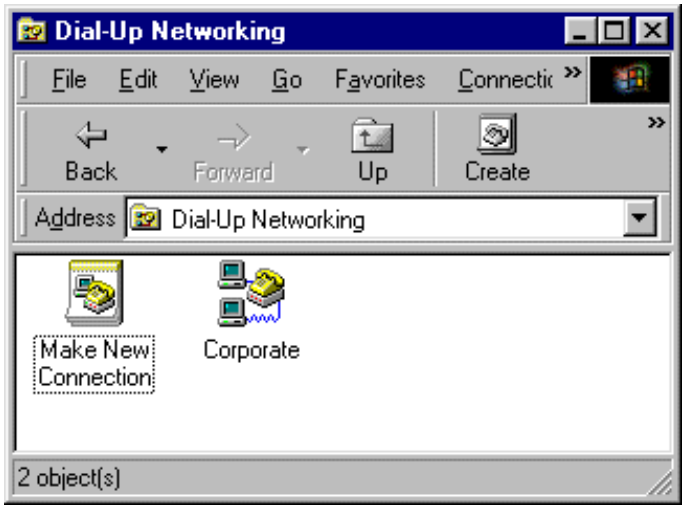
AppendixC Microsoft Dial-Up Networking

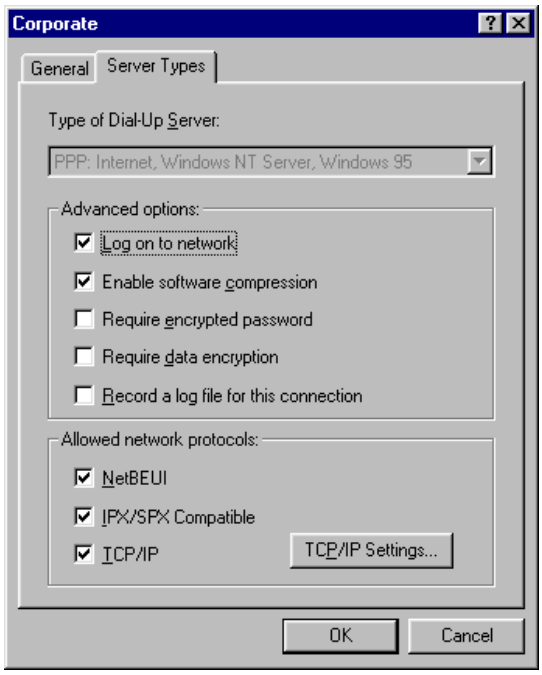
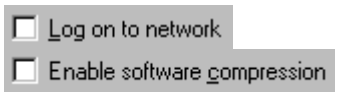
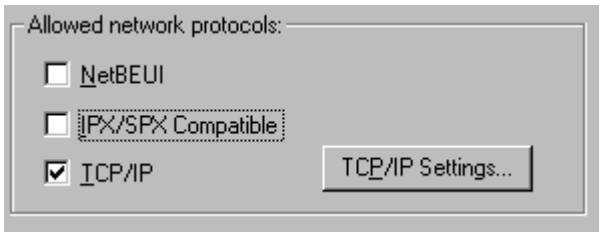
In this appendix

C.1 Adapting Dial-Up Networking Properties

Dial-Up connection properties procedure

Proceed as follows:

Step	Action and Description
1	Double-click the '*My Computer*' icon on your desktop.  My Computer
2	Double-click the '*Dial-Up Networking*' icon.  Dial-Up Networking The '*Dial-Up Networking* window pops up. 
3	Right-click the Dial-Up connection icon '*Corporate*' created via the previous procedure.  Corporate As a result, a selection box pops down: 
4	In the selection box, select '*Properties*'. The '*Corporate*' window appears.

Step	Action and Description
5	In the *'Corporate'* window you select the *'Server Types'* tab to pop up the following window: 
6	Ensure that *'Log on to the network'* and *'Enable software compression'* boxes are blank, i.e. not flagged:  In the *'Allowed network protocols'* ensure that only *'TCP/IP'* is selected, i.e. flagged (✓): 
7	Click OK to finish the procedure.

C.2 Upgrade Procedure for MS Windows 95

Introduction

This section explains how to download and install the *"Windows Dial-Up Networking 1.3 Performance and Security Upgrade for Windows 95"* needed for the *Pro*'s PPPoA-to-PPTP Relaying packet service.

PC/workstation requirements

The Windows 95 PC(s)/workstation(s) must meet the following minimum requirements :

- Pentium-class processor 90MHz or higher
- 16MB of memory.

Download requirements

For downloading the *"Windows Dial-Up Networking 1.3 Performance and Security Upgrade for Windows 95"* one PC needs to have Internet access via a voiceband modem.

Prior to installing the upgrade

If you have installed Windows 95 from a CD-rom, you will need to have the Windows 95 CD-rom ready prior to start the installation process.

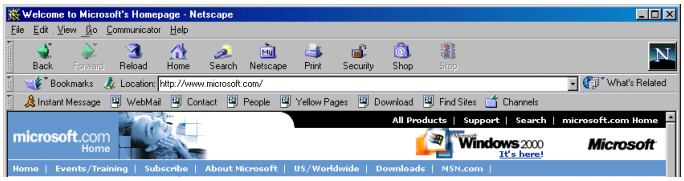
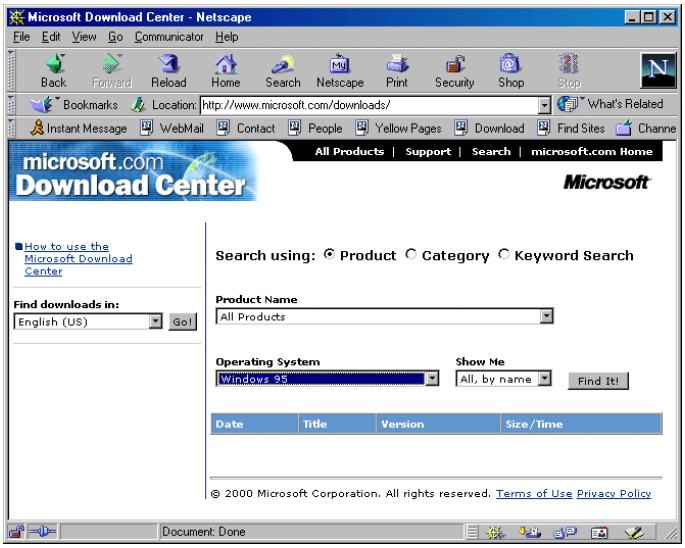
To enable Windows95 VPN server support

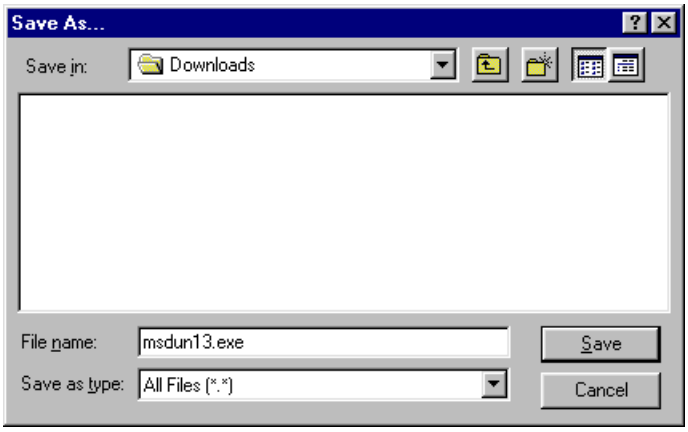
You must:

- Download the Dial-Up Networking Upgrade
- Install the Dial-Up Networking Upgrade

Download the Dial-Up Networking Upgrade

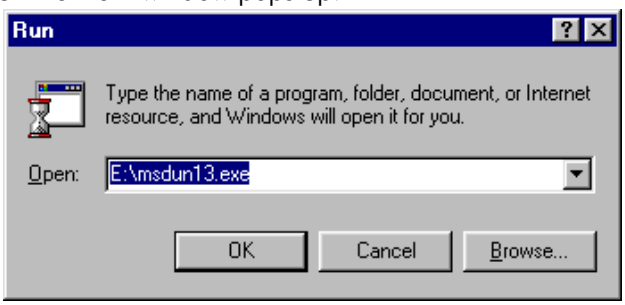
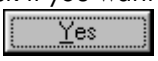
Proceed as follows:

Step	Action and Description
1	Browse to the Microsoft website at l'http://www.microsoft.com' by entering this address in the Uniform Resource Locator (URL) field of your Web browser: 
2	Click the *'Downloads'* button in the Microsoft homepage's taskbar. You will be guided to Microsoft's *'Download Center'*. 
3	In the *'Download Center'* web page, select Windows 95 as OS: 
4	Click 
5	On the resulting web page all available downloads for Windows 95 are listed. In the list, look for the *'Dial-Up Networking Performance & Security Upgrade'* and click it.  **Note**: You can also use Microsoft's Search Tool to locate the Upgrade file. Therefor, search on *'MSDUN13.EXE'*.
6	A *'Read me first'* web page pops up, informing how the download will progress. to proceed, click 

Step	Action and Description
7	In the following web page, select the Dial-Up Networking Graphical User Interface (GUI) language. To proceed, click Download Now
8	The next web page allows you to choose the nearest download site. Select one, and click Download Now A *'Save As...'* window pops up, asking you to specify a location for the MSDUN13.exe file to be downloaded. 
9	Specify a location for the storage. To execute the download, click Save

Installing the Dial-Up Networking Upgrade

Proceed as follows:

Step	Action and Description
1	Click 'Start' from the system tray on your desktop:  **Note**: All other applications must be closed.
2	Select *'Run'* from the menu list. As a result the *'Run'* window pops up: 
3	Specify the path (the one that you specified during the download procedure) for the MSDUN13.EXE file in the '*Open*' box of the *'Run'* window. **Note**: You can also browse to the file, by clicking 
4	Click 
5	The system will ask if you want to start the MSDUN13 installation. Click  to proceed.
6	An *'End-User License Agreement'* window pops up. To accept, click  As a result the installation starts.
7	During the installation, setup will ask you twice to restart your computer. To proceed each time, click  Upon restart, the installer will rebuild your driver twice: once for Dial-Up-Networking and once to enable Virtual Private Networking.

C.3 Configuring PPTP Tunneling for Windows NT

In this section

The following overview summarizes the procedures to setup your Windows NT PC for the use of PPTP Dial-Up connections over standard telephone lines and Virtual Private Network connections over IP networks such as the Internet:

Step	Action	See
1	Make sure that *Microsoft Service Pack 3* has been installed on your PC(s).	
2	Configure a *Private* IP address on your PC	NO TAG
3	Install the PPTP Tunneling network protocol	C.4
4	Configure RAS for PPTP Tunneling	C.5
5	Create PPTP Dial-up phonebook entries	C.6

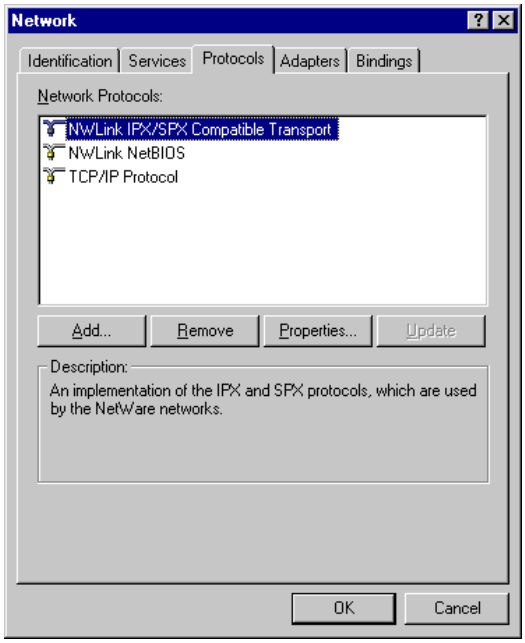
CAUTION

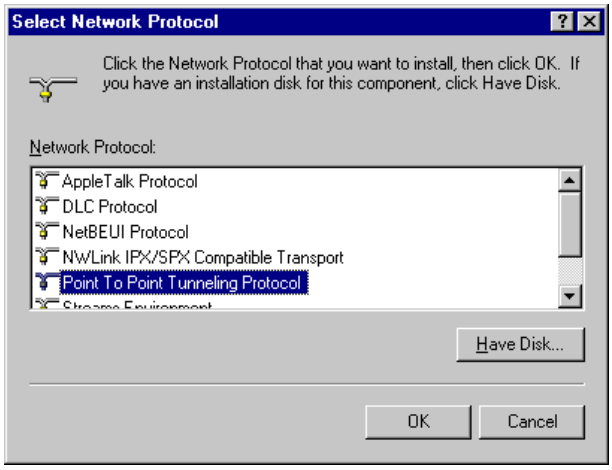
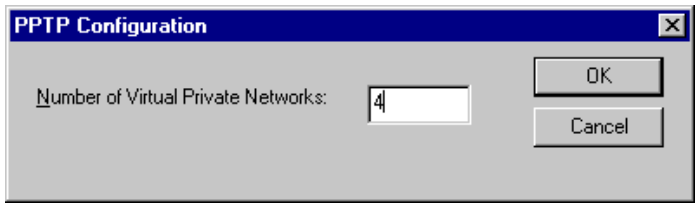
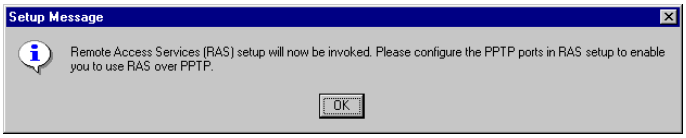
Microsoft Service Pack 3 Installation

Make sure that *'Microsoft Service Pack 3'* has been installed on your PC before you start creating tunnel sessions.

C.4 Installing the PPTP Tunneling Network Protocol (WinNT)

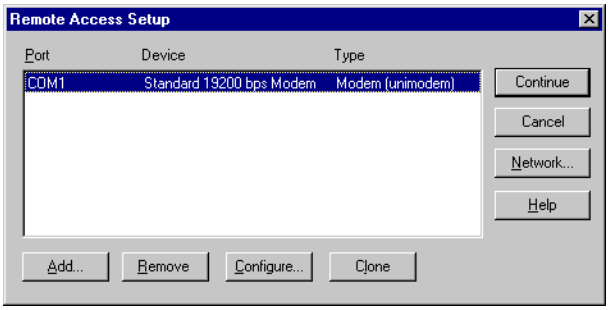
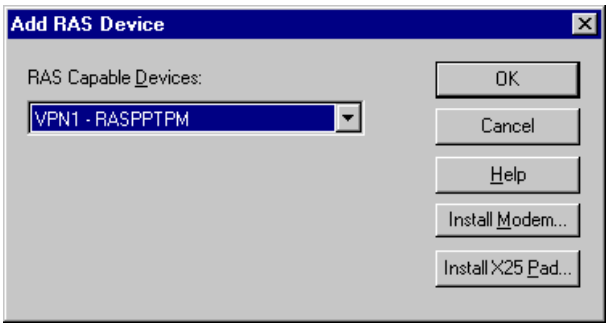
Procedure Proceed as follows:

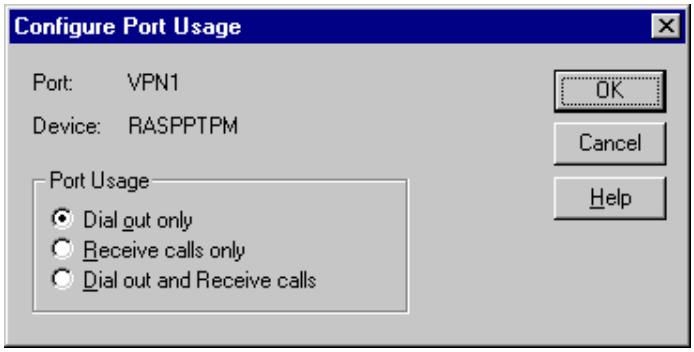
Step	Action and Description
1	Double-click the '*My Computer*' icon on your desktop.  My Computer
2	Double-click the '*Control Panel*' icon.  Control Panel
3	In the '*Control Panel*' folder, double-click the 'Network' icon.  Network As a result the '*Network*' window pops up. 

Step	Action and Description
4	Select the *'Protocol'* tab and click Add to pop up the *'Select Network Protocol'* window: 
5	Select the *'Point-to-Point Tunneling Protocol'*, and click OK
6	Setup now needs to copy some Windows NT files and prompts you for the proper path to the installation files. Specify the path and click Continue The installation will load all necessary PPTP files.
7	The *'PPTP Configuration'* box pops up.  This box presents you with a key question : how many VPNs do you want to enable for access to the Remote Access Services (RAS) server. Type the number of VPNs you want in the VPN field.
8	Click OK to pop up the *'System Message'* box: 
9	Click OK to continue.

C.5 Configuring RAS for PPTP Tunneling (WinNT)

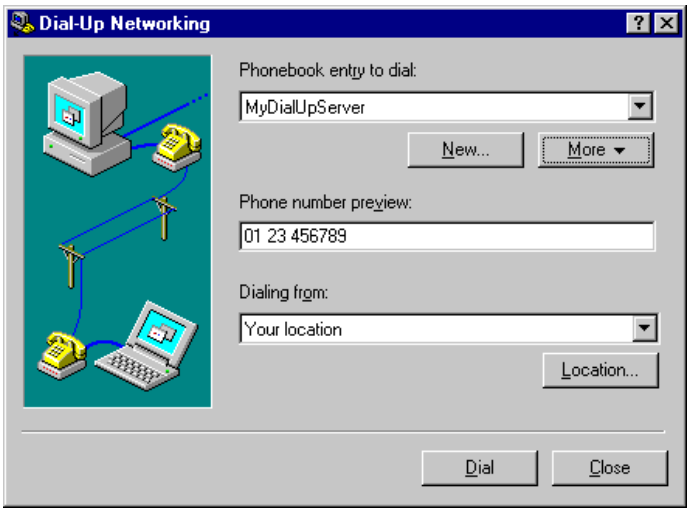
Procedure Proceed as follows:

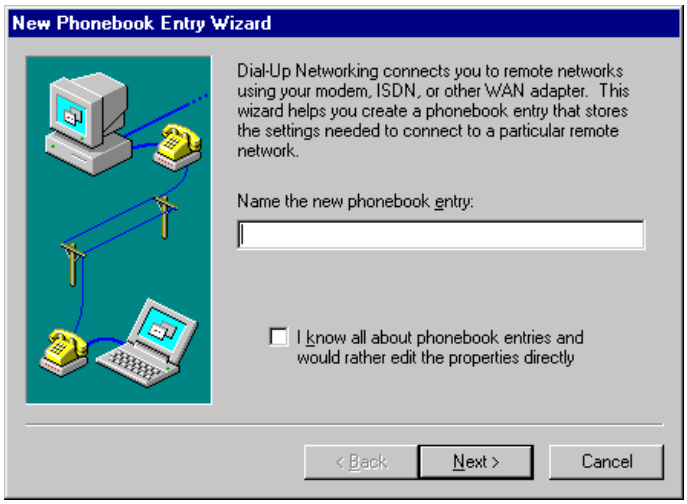
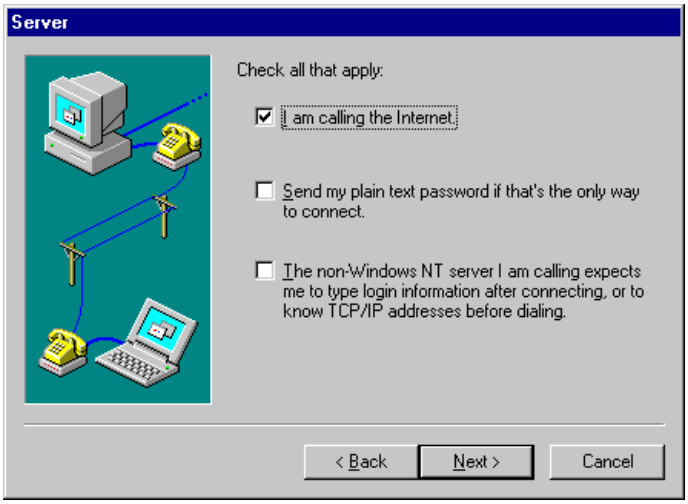
Step	Action and Description
1	After the '*Installing the PPTP Tunneling Network Protocol*' procedure, the '*Remote Access Setup*' window pops up. Click Add to add new created VPN ports to the RAS configuration.  In the example window, one (voiceband) modem is shown, which already was configured for RAS.
2	The '*Add RAS Device*' window pops up.  You must add each port individually. To do so, double-click on the correct port and click OK
3	The '*Remote Access Setup*' window reappears, now with the VPN port added to the device list. Repeat steps 1 and 2 until all VPN ports are listed in the '*Remote Access Setup*' window.
4	At this point the ports are configured by default for dial-in only. To change this, select a port in the '*Remote Access Setup*' window and click Configure...

Step	Action and Description
5	The '*Configure Port Usage*' window pops up.  Select the '*Dial-out only*' option and click OK
6	The '*Remote Access Setup*' window returns. Repeat steps 4 and 5 until all VPN ports are configured for dial-out only.
7	In addition, you can also define which tunneled protocols you will allow through the VPNs. To do so, highlight each port and click Network...
8	Enable, or disable the protocols in the '*Network Configuration*' window and click OK **Note**: You can enable or disable IP, IPX or NETBEUI sessions for each port.
9	The '*Remote Access Setup*' window returns. Repeat steps 7 and 8 until the network configuration for each VPN port is configured.
10	In the '*Remote Access Setup*' window, click Continue
11	Click Close
12	The RAS application will inform you it needs to be restarted in order for the changes to take effect. To restart, click Yes

C.6 Creating PPTP Dial-Up phonebook Entries (WinNT)

Procedure Proceed as follows:

Step	Action and Description
1	Double-click the '*My Computer*' icon on your desktop.  My Computer
2	Double-click the '*Dial-Up Networking*' icon.  Dial-Up Networking **Note**: If the Dial-Up phonebook was empty, a window appears to inform you that no entries exist in the phonebook. Click OK to continue with step 4.
3	The '*Dial-Up Networking*' window pops up.  The '*Phonebook entry to dial*' box lists all existing entries. To add a new phonebook entry, click New...

Step	Action and Description
4	The *'New Phonebook Entry Wizard'* window pops up.  Enter a name for the entry you are creating; the entry will be saved in the phonebook under this name.
5	Click Next >
6	The *'Server'* window pops up.  Activate all the options that apply, and click Next >

Step	Action and Description
7	The *'Phone Number'* window pops up.  Enter the 'Phone number', i.e. the IP address, or DNS hostname, of the **STPro**. Optionally, you can add the phonebook name to specify which VC is to be used for the connection. Optionally this phonebook name can be followed by a PPTP profile. See section 8.5 for more information.
8	Click Next > to proceed. A window pops up, announcing the successful creation of a new tunnel.
9	Click Finish to finish the procedure.

Creating multiple PPTP Dial-up phonebook entries

Per destination you can create a unique PPTP Dial-up phonebook entry. To do so, repeat the steps, starting with 3 of the previous procedure.

Specific VC and PPTP Profile

Using a specific PPTP phonebook entry and/or PPTP profile is described in section 8.5.

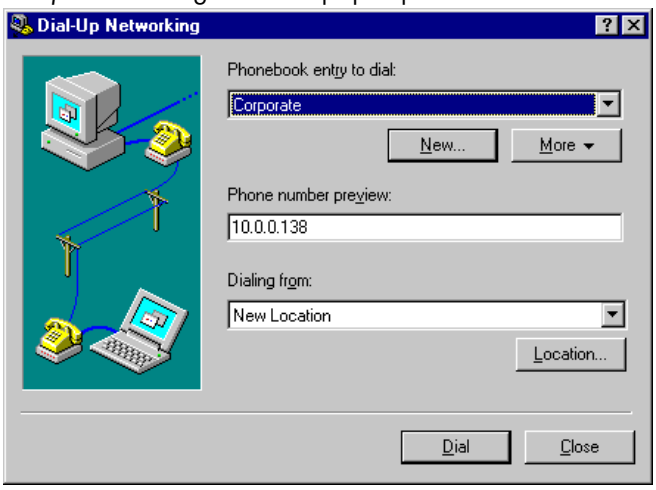
C.7 Using PPTP Tunneling for Windows NT

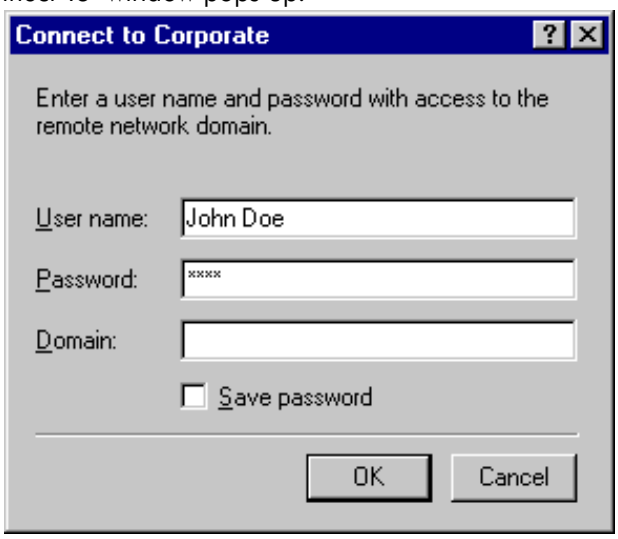
In this section

- Opening a PPTP Tunnel Session
- NT Dial-Up Networking in Detail
- Closing a PPTP Tunnel Session.

Opening a PPTP Tunnel session

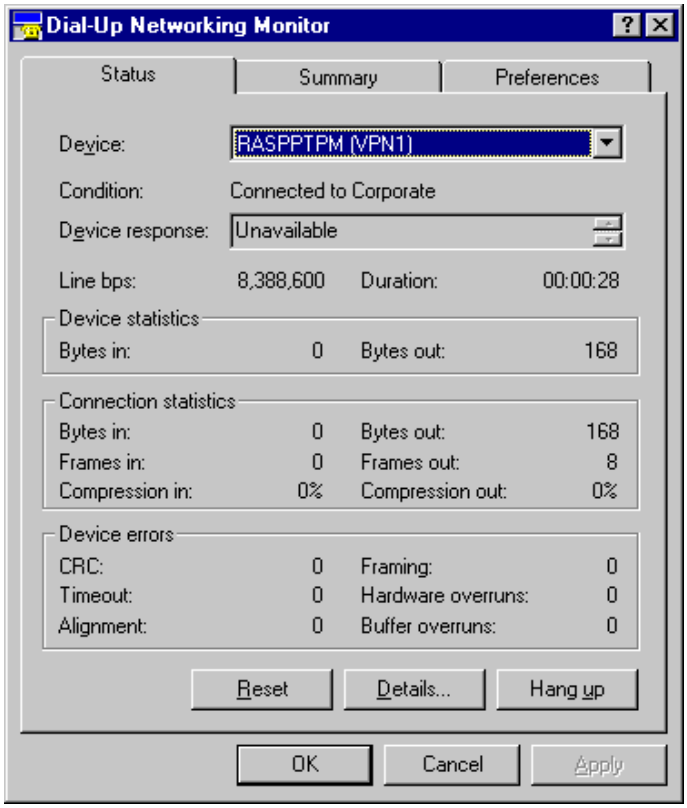
Proceed as follows:

Step	Action and Description
1	Double-click the *'My Computer'* icon on your desktop.  My Computer
2	Double-click the *'Dial-Up Networking'* icon.  Dial-Up Networking
3	The *'Dial-Up Networking'* window pops up.  Select the appropriate entry (e.g. *'Corporate'*) in the *'Phonebook entry to dial'* listbox, and click Dial

Step	Action and Description
4	The '*Connect To*' window pops up.  Enter your user name and password for the VPN server. Enter the optional information in the '*Domain*' box. This is only required by some Microsoft NT VPN servers. **Note**: To save your password, tick '*Save password*' (✓).
5	Click OK **Note**: Steps 4 and 5 need only be executed the first time the tunnel is set up. After the tunnel is set up, the '*Connecting to*' window will directly appear on your desktop.
6	The '*Connecting To*' window pops up.  This window informs you of the status of the connection process.
Result	Once the connection is established, an MSDUN icon representing the Dial-Up connection appears on your system tray.

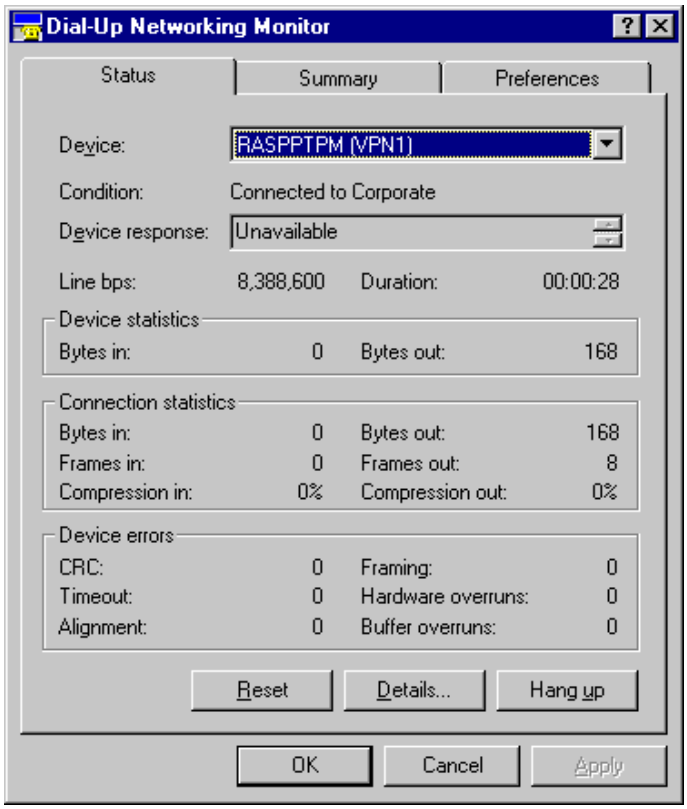
NT Dial-Up Networking in detail

During your session, you can view the connection status by clicking the Dial-Up icon in the system tray. The following window will pop up:



Closing a PPTP Tunnel session

Proceed as follows:

Step	Action and Description
1	Click the appropriate connection icon on your system tray to pop up the *'Dial-Up Networking Monitor'* window: 
2	Click 
Result	The connection to your SP no longer exists.

C.8 Platform Limitations of Windows Dial-Up Networking

Windows 95/98

Three limitations exist when using the Windows 9x OS:

- **One Tunnel**

  Windows 9x only allows you to set up one tunnel at a time. This implies that you cannot connect to both your ISP and your corporate simultaneously from one PC.

- **Tunneling within a Tunnel**

  Tunneling within a tunnel is not possible with Windows 9x, due to its single tunnel limitation.

- **Local Connectivity is Lost**

  After you set up a tunnel, communication with local LAN devices may be lost. This is because Windows 9x adds a new default gateway to its routing table. This new default gateway points to the tunnel. As TCP/IP is designed to use only one default gateway, connectivity through the original gateway will be lost.

  As soon as the tunnel is terminated, connectivity through the original default gateway is again possible.

  You can circumvent this problem by manually adding routes to local destinations in the routing table (See section 12.4).

Windows NT

Windows NT does not share the first two limitations with Windows 9x:

- **Multiple Tunnels**

  You can set up multiple tunnels; consequently you can connect to multiple remote destinations simultaneously.

- **Tunneling within a Tunnel**

  A tunnel within another tunnel is also possible, assuring better end-to-end security.

AppendixD STPro Layout and Behaviour

Introduction

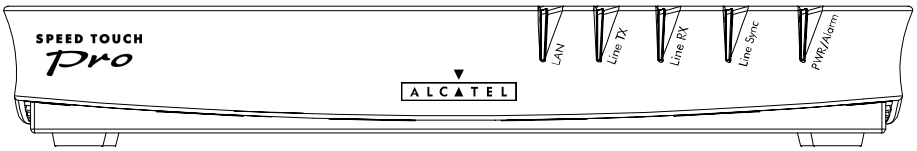
This appendix describes how your *Pro* looks like, describes its LEDs description, and describes its start-up behaviour.

In this appendix

D.1 Front Panel Layout and LED Description

Front panel layout

All *Pro* models have a similar front panel:



Five front panel LEDs

The *Pro* is equipped with 5 LEDs on its front panel, indicating the state of the device:

Indicator			Description
Name	**Color**	**State**	
LAN	Green	Flashing	Data is flowing from/to the Ethernet port.
		Off	No activity on the Ethernet interface.
Line TX	Green	Flashing	ATM cells are being sent over the ADSL line.
		Off	No transmission activity.
Line RX	Green	Flashing	ATM cells are being received via the ADSL line.
		Off	No reception activity.
Line Sync	Green	Flashing	During initialization of the ADSL line.
		On	ADSL line synchronization achieved.
PWR/Alarm	Green	On	Power on, normal operation.
	Red	Flashing	Power on, POST(*) pending.
		On	Power on, POST(*) failed.

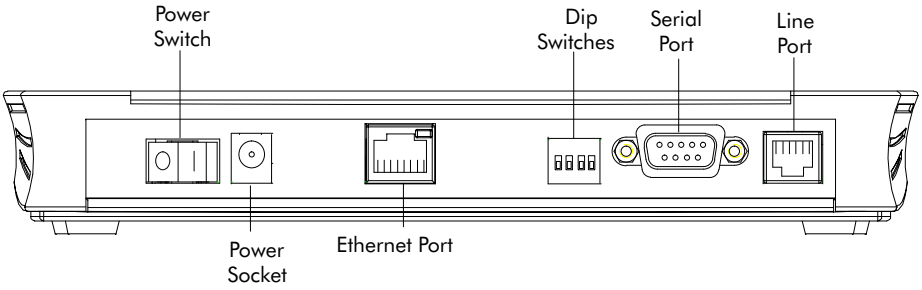
(*) Power On Self Test (POST)

D.2 Rear Panel Layout

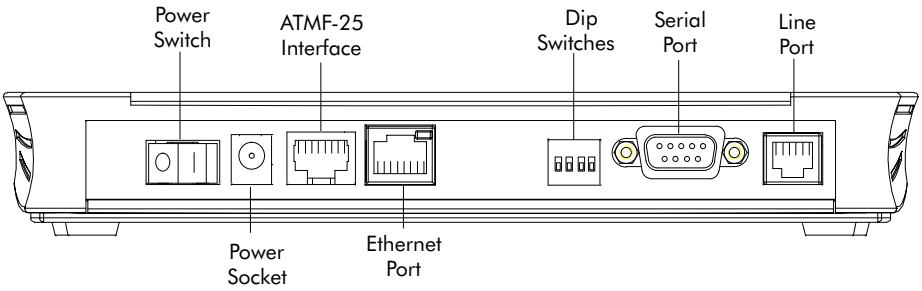
Rear panel differences

The rear panel differs depending on the *Pro* model.

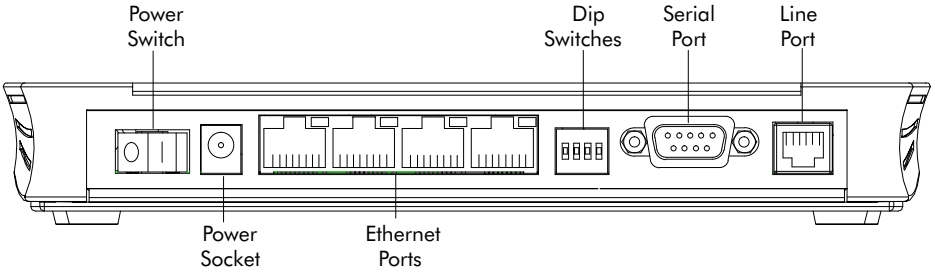
Single port model



Dual port model

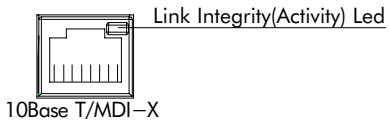


Hub model



Ethernet port(s) LED

Each of the Ethernet ports on the rear panel has a LED:



adsl 0800/ 01

Indication of link integrity

For all Pro models :

If the Pro and other LAN device(s) are properly connected and powered on, the particular green LED lights up.

Indication of link activity

For the hub Pro model only :

The flashing green LED indicates reception of data (R_X) via the particular hub port.

D.3 Power On/Off Behaviour

Turning on/off the STPro

You can turn the *Pro* on (**I**), or off (**O**) with the power switch.

POST phases

As soon your *Pro* is turned on, you can check the "PWR/Alarm" LED (See section D.1) to see how the POST progresses.

Phase	"PWR/Alarm" LED Indication	Description
1	Flashing red	POST pending
2	Solid red	POST failed
	Solid green	Normal operation

Your *Pro* is ready for service.

Checking link integrity

If the LAN devices which are directly connected to the *Pro* Ethernet port(s) are powered on, the link integrity/activity LED of the particular port lights up green.

AppendixE STPro Original Settings

Introduction

This chapter lists all of the *Pro* original settings.

These settings apply at the time the *Pro* leaves the factory and after a reset to original defaults.

In this chapter

E.1 General settings

STPro IP address	10.0.0.138
STPro DNS name	SpeedTouch
STPro domain name	lan
STPro DNS server	Active
STPro DHCP server	AutoDHCP
STPro Firewall	On (default settings)

E.2 IEEE802.1D Transparent Bridging Defaults

Phonebook entries

Name	VPI	VCI	State
Br1	8	35	Free
Br2	8	36	Free
Br3	8	37	Free
Br4	8	38	Free

ATM encapsulation RFC1483 LLC/SNAP for Bridged PDUs (FCS not preserved)

Aging Time 5 minutes (300 seconds)

E.3 MAC Encapsulated Routing Defaults

Phonebook entries

Name	VPI	VCI	State
Br1	8	35	Free
Br2	8	36	Free
Br3	8	37	Free
Br4	8	38	Free

ATM encapsulation

RFC1483 LLC/SNAP for Bridged PDUs

E.4 PPPoA-To-PPTP Relaying Defaults

Phonebook entries

Name	VPI	VCI	State
RELAY_PPP1	8	48	Free
RELAY_PPP2	8	49	Free
RELAY_PPP3	8	50	Free
RELAY_PPP4	8	51	Free
PPP1	8	64	Configured (PPP & IP routing)
PPP2	8	65	Configured (PPP & IP routing)
PPP3	8	66	Free

ATM encapsulation

RFC2364 VC-MUX for PPP PDUs

E.5 PPP Defaults

Phonebook entries

Name	VPI	VCI	State
RELAY_PPP1	8	48	Free
RELAY_PPP2	8	49	Free
RELAY_PPP3	8	50	Free
RELAY_PPP4	8	51	Free
PPP1	8	64	Configured (PPP & IP routing)
PPP2	8	65	Configured (PPP & IP routing)
PPP3	8	66	Free
DHCP_SPOOF	8	67	Configured (PPP to DHCP Spoofing)

ATM encapsulation

RFC2364 VC-MUX of PPP PDUs

PPP configuration, authentication

Name	User	Password
PPP1	guest	guest
PPP2	guest	guest
DHCP_SPOOF	guest	guest

PPP configuration, routing

Name	Connection Sharing	NAPT
PPP1	Everybody	✓
PPP2	Everybody	✓
DHCP_SPOOF	Only me	

PPP configuration, options

Name	Mode	LCP echo	ACCOMP
PPP1	Dial-in	✓	✓
PPP2	Always-on	✓	✓
DHCP_SPOOF	Dial-in	✓	✓

E.6 CIP Defaults

Phonebook entries

Name	VPI	VCI	State
CIPPVC1	8	80	Configured
CIPPVC2	8	81	Free
CIPPVC3	8	82	Free
CIPPVC4	8	83	Free

ATM encapsulation

RFC1577–RFC1483 LLC/SNAP for Routed non-ISO PDUs

CIP configuration

Enabled CIP member	cip0
CIP member IP address	172.16.1.1 (255.255.255.0)
VC explicitly assigned	CIPPVC1
VC's IP address	172.16.1.2
NAPT	disabled

E.7 Global Default VPI/VCI Values

ATMF-25.6 port (optional)

VPI	VCI	Service channel
0 ... 5	0 ... 511	End-User

Ethernet port(s)

VPI	VCI	Service channel
0	21	ADSL/ATM Loopback Channel
1	21	
8	35	IEEE802.1D Transparent Bridging
8	36	MAC Encapsulated Routing
8	37	
8	38	
8	48	PPPoA-to-PPTP Relaying
8	49	PPP
8	50	
8	51	
8	64	
8	65	
8	66	
8	67	
8	80	CIP
8	81	
8	82	
8	83	
15	16	SNMP/ASAM agent communication channel for the Alcatel ASAM
15	64	Software download channel

AppendixF Hardware Reference

Introduction

This appendix provides physical specifications and connector pin assignments for the *Pro*.

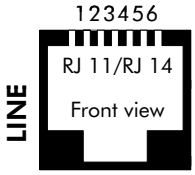
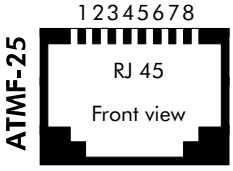
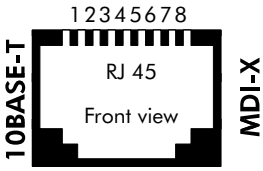
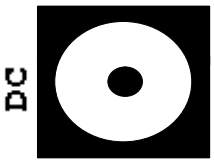
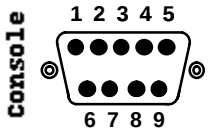
In this appendix

F.1 Specifications

Physical specifications	210mm W x 185mm D x 35mm H
Operating environment	Temperature: 5°C to 40°C (40F to 105F) Humidity: 20% to 80%
Power requirements	AC voltage: 100 to 120 V_{AC}, 220 to 240 V_{AC} Frequency: 50/60 Hz Power consumption: $7W_{max}$
Hardware platform	LAN interfaces: 1, or 4 10Base-T (RJ45) MDI-X Ethernet port(s) 1 ATMF-25 port (optional) WAN interface: ADSL line (RJ11) port Serial interface: RS232
ADSL router specifications	Up to 8Mbps downstream Up to 1Mbps upstream ADSL standard compliancy: ▶ ITU G.DMT (Full rate G.992.1 Annex A) ▶ ITU G.LITE (Lite rate G.992.2) ▶ Full rate ANSI T1.413 Issue2 ▶ ITU Automode

F.2 Connector Pin Assignments

STPro port description

Port	Pin No.	Signal Name	Function	Model Reference
	2	Wire A	Subscriber line wire A	2/5 model
	3	Wire A	Subscriber line wire A	3/4 model
	4	Wire B	Subscriber line wire B	
	5	Wire B	Subscriber line wire B	2/5 model
	1	R_{X+}	Receive data from DTE* (+)	
	2	R_{X-}	Receive data from DTE* (−)	
	7	T_{X+}	Transmit data to DTE* (+)	
	8	T_{X-}	Transmit data to DTE* (−)	
	1	R_{X+}	Receive data from DTE* (+)	
	2	R_{X-}	Receive data from DTE* (−)	
	3	T_{X+}	Transmit data to DTE* (+)	
	6	T_{X-}	Transmit data to DTE* (−)	
	Inner	$+9V_{DC}$	Power supply connection (+)	
	Outer	GND	Power supply connection (ground)	
	2	RD [RS232-9]	Received data	
	3	SD [RS232-9]	Transmitted data	
	5	DCD [RS232-9]	Signal common	

Note: (*) Data Terminal Equipment (DTE)

Free connector pins

Connector pins not mentioned are not connected.

F.3 Power Supply Adapter

Power adapter use

The *Pro* is equipped with one of the following pluggable power supply adapters listed in the table.
Due to the special characteristics of the output class II AC adaptor, use only the **AULT Incorporated** types, or equivalents, listed in the table.

Power adapter models

Model Reference	**AC/DC**	**Plugtype**	**AULTInc. Model** (or equivalent)
US model	120V/9V	North America wall plug	P48−091000−Axxxx
UK/Sing model	230V/9V	UK wall plug	F48−091000−Axxxx
ROW* model	230V/9V	Euro wall plug	D48−091000−Axxxx
Australia model	240V/9V	Australia wall plug	E48−091000−Axxxx
Korea Model	220V/9V	Korea wall plug	Q48−091000−Axxxx

Note: (*) Rest Of the World (ROW)

Output specifications

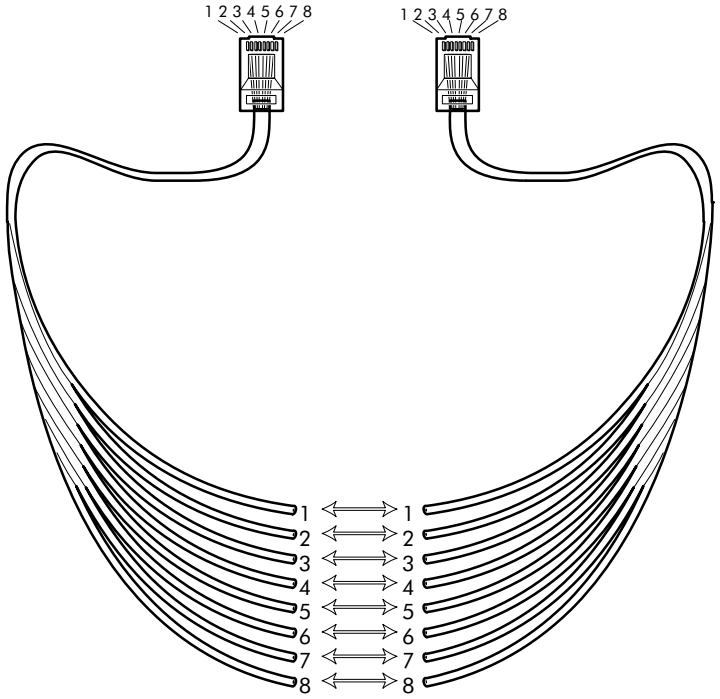
The supplied adapter has the following output specifications:

- $9V_{DC}$/1A unregulated output voltage
- Maximum 860 mV_{eff} ripple voltage
- Maximum 1A output current
- Limited power source (according to IEC/EN 60950, sub-clause 2.11 and UL1950).

F.4 LAN Cables Layout

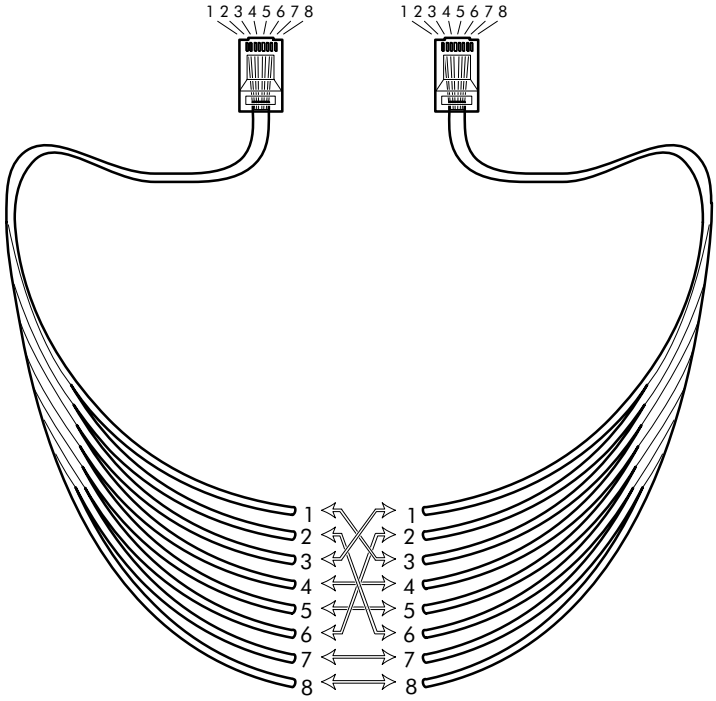
Straight-through LAN cable

Straight-through LAN cables with the following layout are applicable for interconnecting Ethernet ports, and ATMF-25.6 ports:



Crossover LAN cable

Crossover LAN cables with the following layout are applicable for interconnecting Ethernet ports, and ATMF-25.6 ports:



AppendixG Safety and Agency Regulatory Notices

Aim of this appendix

This appendix provides basic Safety Information on Alcatel's **Speed Touch**™ product.

Prior to using the **Speed Touch**™ product, read this appendix carefully.

Reading all instructions

Follow all warnings and instructions marked on the product.

In this appendix

This chapter covers the following topics:

STORE THESE INSTRUCTIONS CAREFULLY

G.1 Safety Instructions

Climatic conditions

The **Speed Touch**™ product equipment is intended for:

- In-house stationary desktop use; the maximum ambient temperature may not exceed 40°C (104°F).
- It must not be mounted in a location exposed to direct or excessive solar and/or heat radiation.
- It must not be exposed to heat trap conditions and must not be subjected to water or condensation.
- It must be installed in a Pollution Degree 2 environment.

Cleaning

Unplug this product from the wall outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning.

Water and moisture

Do not use this product near water, for example, near a bathtub, wash bowl, kitchen sink, laundry tub, in a wet basement or near a swimming pool.

Power supply adapter

The **Speed Touch**™ product comes with a portable power supply adapter.

Due to the special characteristics of the output of the class II AC adaptor, only use the models or equivalent listed in the power adapter table in Appendix F.

Power sources

The powering of this product must adhere to the power specifications indicated on the marking labels. If you are insure of the type of power supply to your home, consult your product dealer or local power company.

The mains socket outlet must be close to the equipment and easily accessible.

The **Speed Touch**™ product equipment is not intended to be connected to an IT-type power system.

Power cord protection

Do not allow anything to rest on the power cord. Do not locate this product where the cord will be subject to persons walking on it.

Overloading

Do not overload wall (mains) outlets and extension cords as this increases the risk of fire or electric shock.

Servicing

To reduce the risk of electric shock, do not disassemble this product. None of its internal parts are user-replaceable; therefore, there is no reason to access the interior. Opening or removing covers may expose you to dangerous voltages. Incorrect reassembly could cause electric shock if the appliance is subsequently used.

If service or repair work is required, take it to a qualified service dealer.

Damage requiring service

Unplug this product from the wall outlet and refer servicing to qualified service personnel under the following conditions:

- When the power supply 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.
- If the product has been dropped or damaged in any way.
- If the product exhibits a distinct change in performance.

Modem/Telephone use

Avoid using a modem/telephone (other than a cordless type) during an electric storm. There is a slight risk of electric shock caused by lightning.

Do not use the telephone to report a gas leak in the vicinity of the leak.

If telephone service is required on the same line, a central splitter, or distributed filter(s) must be installed for optimal ADSL performance.

Depending on your ADSL configuration and type of splitter/filters, installation must be carried out by qualified service personnel.

Consult your telephone service company or ADSL service provider for instructions.

Modifications

Changes or modifications not expressly approved by Alcatel could invalidate the users authority to operate this equipment.

STORE THESE INSTRUCTIONS CAREFULLY

G.2 European Community Declaration of Conformity

CE

Products with the CE marking comply with both EMC and Low Voltage Directives issued by the Commission of the European Community.

EC Declaration of Conformity

A copy of the European Community Declaration of Conformity is provided in your **Speed Touch**™ product shipping box.

G.3 Radio Frequency Interference Statement

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

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

This equipment complies with Part 68 of the FCC Rules. On the back of this equipment is a label that contains, among other information, the FCC certification number (FCC ID) and Ringer Equivalence Number (REN) for this equipment. If requested, this information must be provided to the telephone company.

An FCC compliant telephone cord and modular plug is provided with this equipment. This equipment is designed to be connected to the telephone network or premises wiring using a compatible modular jack that is Part 68 compliant (See Appendix F: Hardware Reference) for details.

The Ringer Equivalence Number (REN) is used to determine the quantity of devices that may be connected to the telephone line. Excessive RENs on the telephone line may result in the devices not ringing in response to an incoming call. Typically, the sum of RENs should not exceed five (5.0). To be certain of the number of devices that may be connected to a line (as determined by the total RENs) contact the local telephone company.

If this equipment causes harm to the telephone network, the telephone company will notify you in advance that temporary discontinuance of service may be required. But if advance notice is not practical, the telephone company will notify the customer as soon as possible. Also you will be advised of your right to file a compliant with the FCC if you believe it is necessary.

The telephone company may make changes to its facilities, equipment, operations or procedures that could affect the operation of the equipment. If this happens the telephone company will provide advance notice so you can make the necessary modifications to maintain uninterrupted service.

If the equipment is causing harm to the telephone network, the telephone company may request that you disconnect the equipment until the problem is resolved. Connection to party lines is subject to state tariffs (contact the state public utility commission, public service commission or corporation commission for information).

No repairs can be performed by the customer, if you experience trouble with this equipment for repair or warranty information, please contact: (919) 850−1231 for locations in North America.

G.4 Canadian DOC Class B Notice

Notification of Canadian RF Interference Statements

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus as set out in the radio interference regulations of the Canadian Department of Communication.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicable aux appareils numérique de classe B prescrites dans le règlement sur le brouillage radioélectrique édicté par le Ministère des Communications du Canada.