VIRTUAL ACCESS
Service Provider Solutions

Service Managed Gateway™

SHDSL Application and Configuration Guide

Issue 1.0

Date 14 August 2007

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1.0 Introduction

1.1 What is SHDSL technology?

SHDSL (single-pair high-speed digital subscriber line) is the international standard for symmetric DSL developed by the ITU (International Telecommunication Union). It enables the sending and receiving of high-speed symmetrical data streams over a single telephone line at rates between 192 kbps and 2.31 Mbps. Unlike a regular dialup telephone service, SHDSL provides a continuously available, "always on" connection. SHDSL was specifically designed to provide equal capacity in both directions of the link. It was ratified by the ITU in February 2001, and is also known as G.991.2.

1.2 Types of SHDSL connections

SHDSL access services typically use the Asynchronous Transfer Mode (ATM) protocol to provide a low-level communications path between the user's access equipment and the service provider head end. The head end may be a Broadband Access Server (BAS) that sits (logically) behind the SHDSL central office Digital Subscriber Line Access Multiplexer (DSLAM) and is connected using an Asynchronous Transfer Mode (ATM) backbone. ATM is a high-speed switching technology where data is grouped into cells.

Connection between the user equipment and the BAS is then achieved using the Point- to-Point Protocol (PPP) running over the ATM connection path. PPP is a defined industry standard used widely to allow two devices to communicate across a logical link. It is extensively deployed by service providers as a means of connecting customers to Internet Protocol (IP)-based services, such as the Internet.

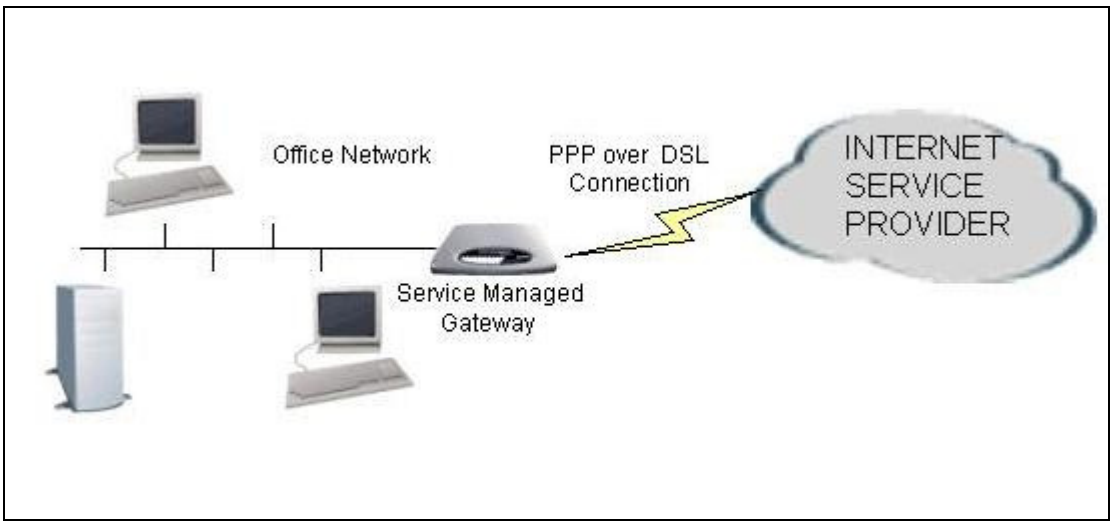

Figure 1: a PPP connection between user equipment and a broadband access server

The method of running PPP between the user equipment and the BAS may be either directly over the ATM layer (PPPoA) or over an intermediate Ethernet layer (PPPoE).

1.3 SHDSL Connection Options on your Service Managed Gateway

You can configure two main types of SHDSL service on your Service Managed Gateway:

- SHDSL Routed PPP Connection
- SHDSL Bridged Connection

If you select the Routed PPP service, you can run the PPP over ATM (PPPoA) or over Ethernet (PPPOE). The following diagrams illustrate the topology of these connections:

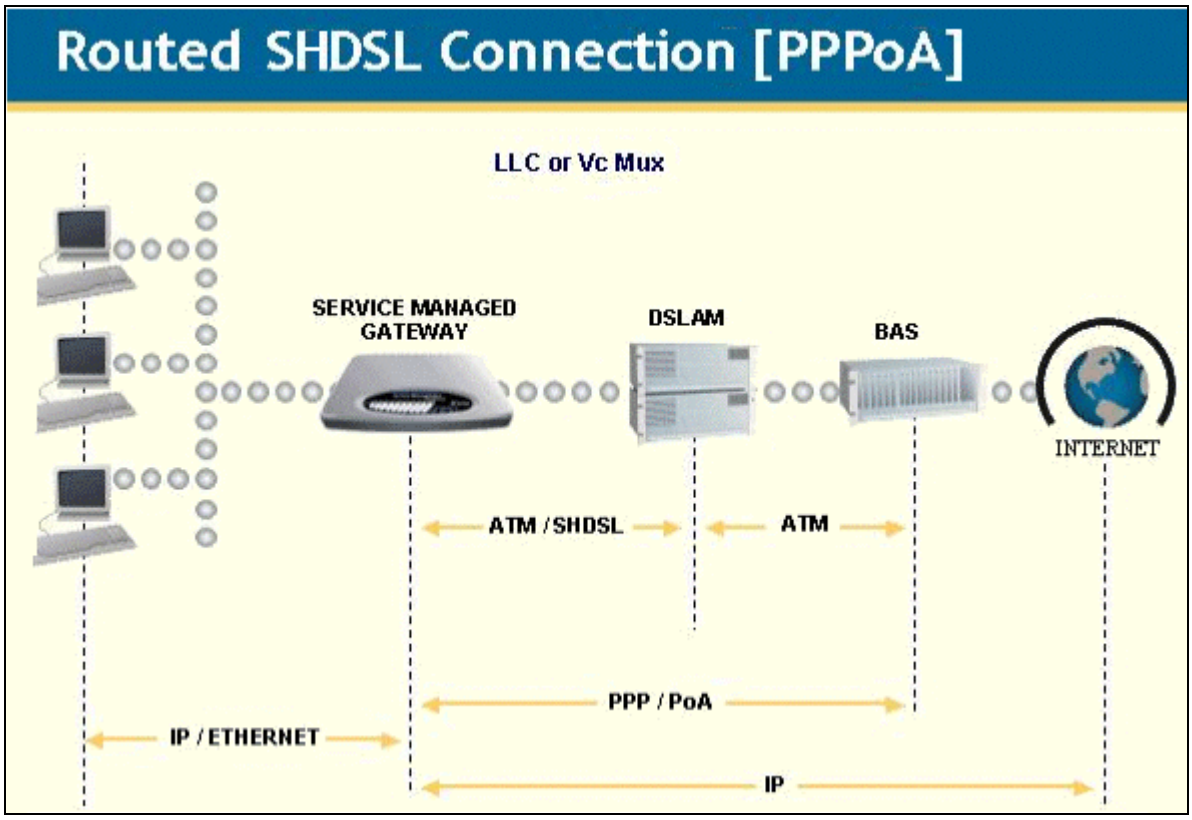

Figure 2: a routed SHDSL connection over the ATM layer (PPPoA)

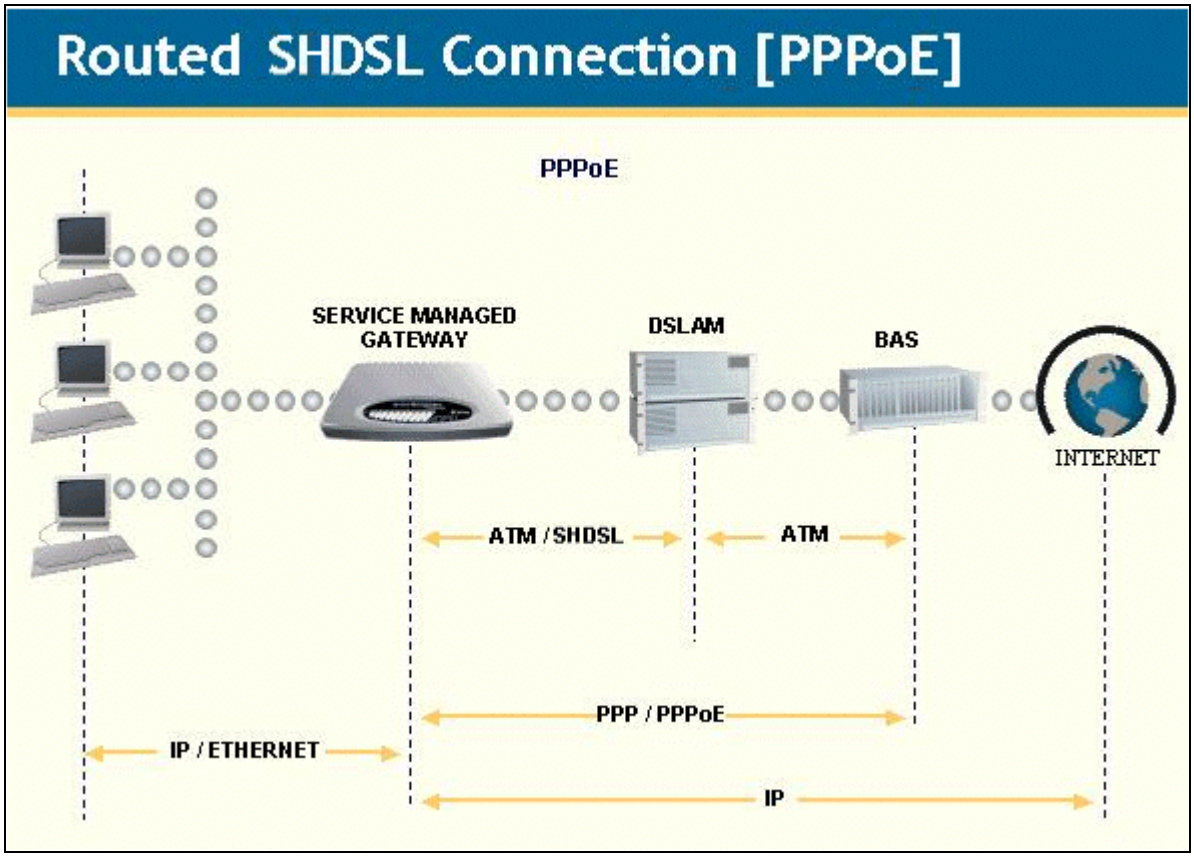

Figure 3: a routed SHDSL connection over an Ethernet layer (PPPoE)

Less commonly, you may need to configure a bridged connection over SHDSL. A bridge is a device that connects two local networks, and forwards packets between them. If your SHDSL service is delivered as a bridged connection, the Gateway has no visibility of the IP (or other) protocol. This type of service is often associated with a single PC connection where the higher-level routing is performed in the PC client software.

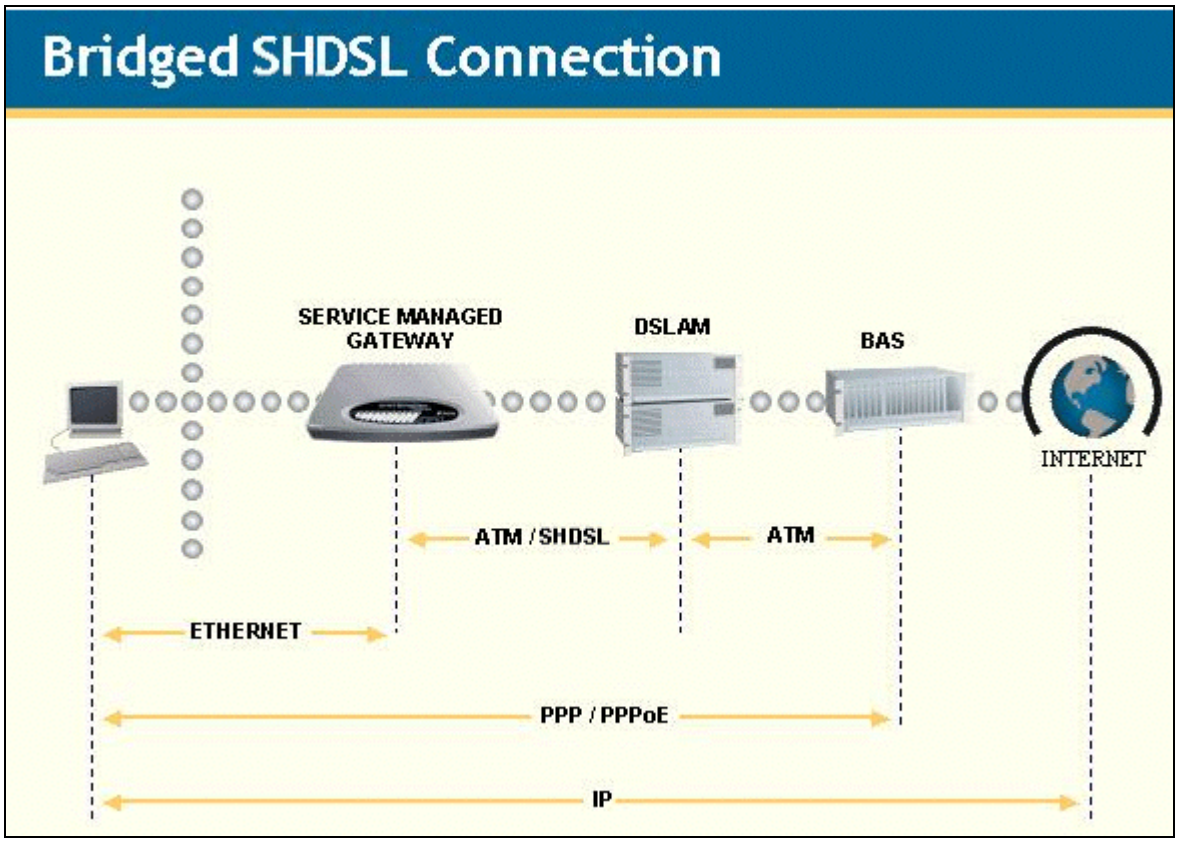

Figure 4: a bridged connection

2.0 Configuring SHDSL connections

2.1 Configuring an SHDSL connection over PPP

2.1.1 Opening the Fast Start Wizard

Your Service Managed Gateway is designed to be automatically configured by the Activator Distributed System (DSS) upon correct installation of the Gateway.

If necessary, you can bypass Activation and use the Fast Start Wizard to manually configure your Gateway. See the SHDSL installation guide for details of how to connect the router to your computer or network. When your Gateway is correctly connected to your PC, type **fast.start** into the Address field of your browser.

Figure 5: The Service Managed Gateway home page

The Service Managed Gateway home page is displayed. Click the **Fast.Start** icon to open the Fast Start wizard. The wizard will guide you through a series of forms that you must complete to configure your Gateway.

2.1.2 Disabling Activation

When you click the Fast.Start icon, the page that is displayed is called **Activation in progress**. It displays the status of the Activation process.

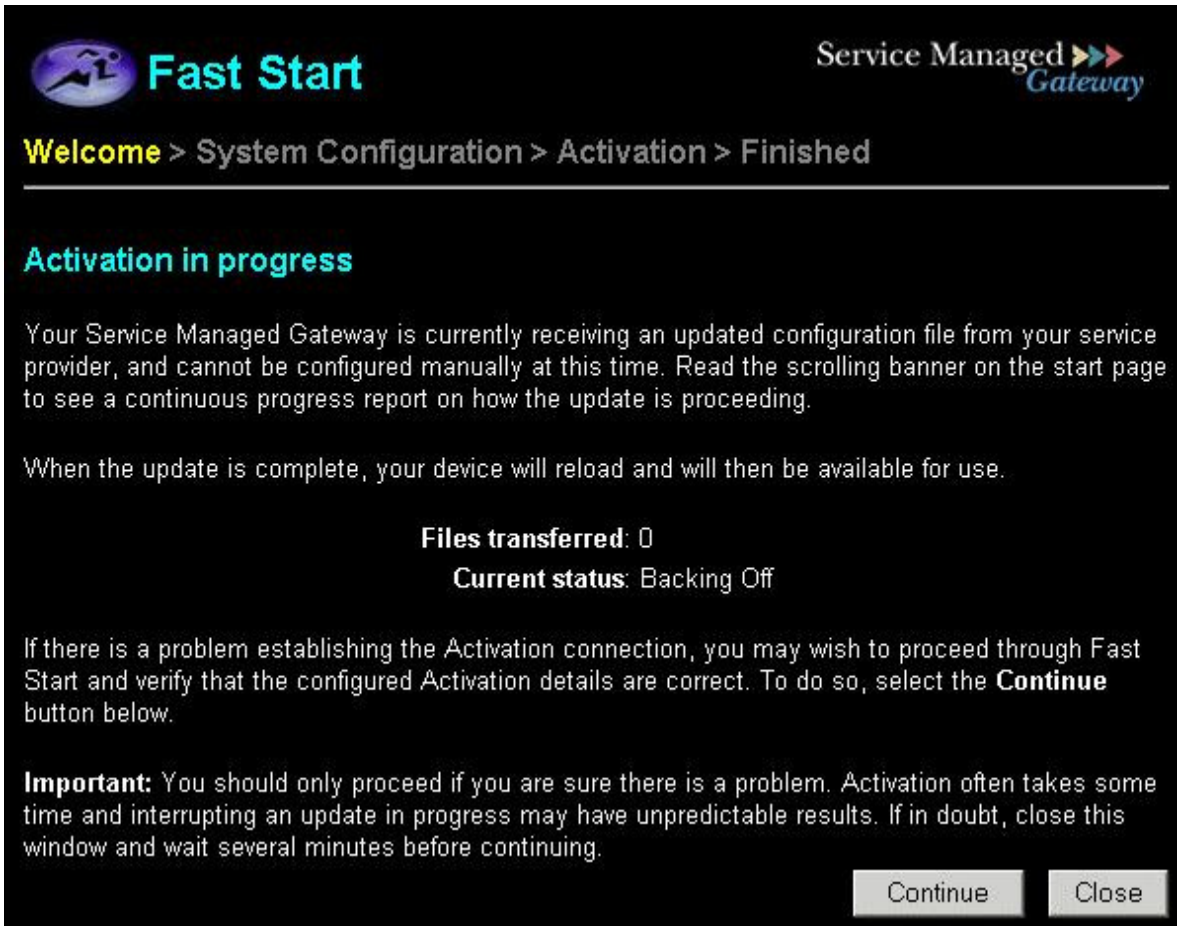

Figure 6: The Activation in progress page

To manually configure your Gateway, you must disable Activation. To do this, click the **Continue** button. If you do not need to stop Activation, click **Close**.

Warning! **Do not disable Activation unless you are sure there is a problem or if you must manually Activate your Service Managed Gateway.**

When you click **Continue**, a page entitled **Welcome to your Service Managed Gateway** is displayed.

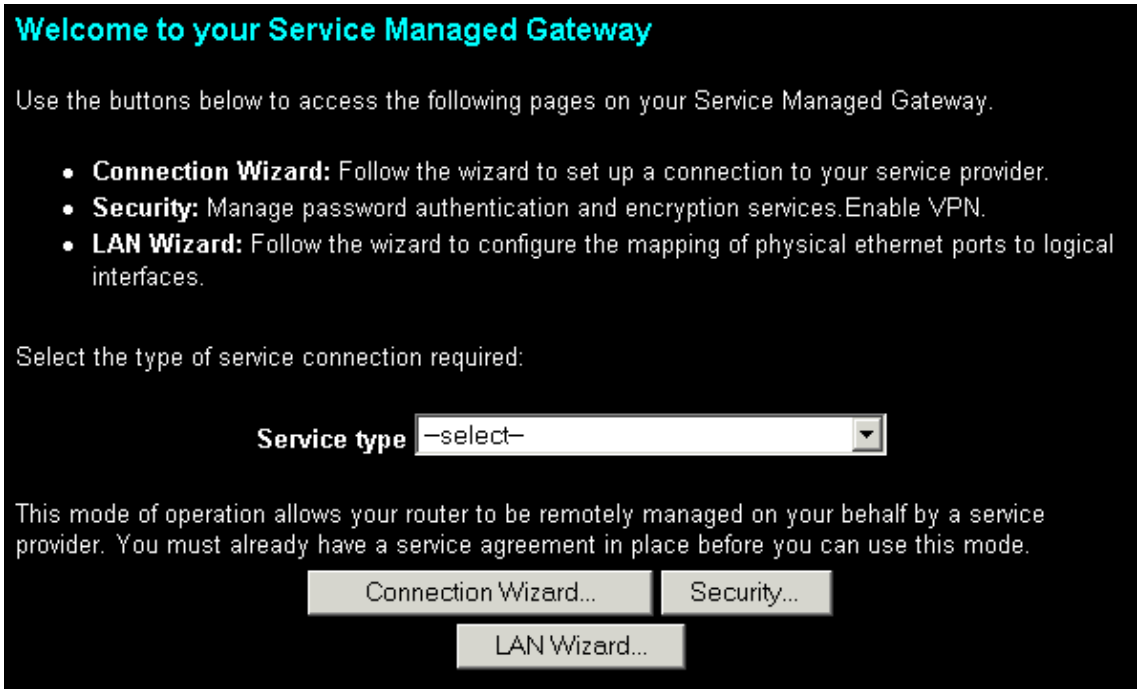

Figure 7: the Welcome page

Select **GSHDSL Routed PPP Connection** in the **Service type** drop-down list. A dialog box is displayed. Carefully read the warning in the dialog box.

Figure 8: the dialog box that lets you cancel Activation

To allow Activation to continue, click **Cancel**. The dialog box is closed and Activation continues.

To disable Activation, click **OK**. If you click OK, the Activation process ends and the next page of the Fast Start wizard is displayed.

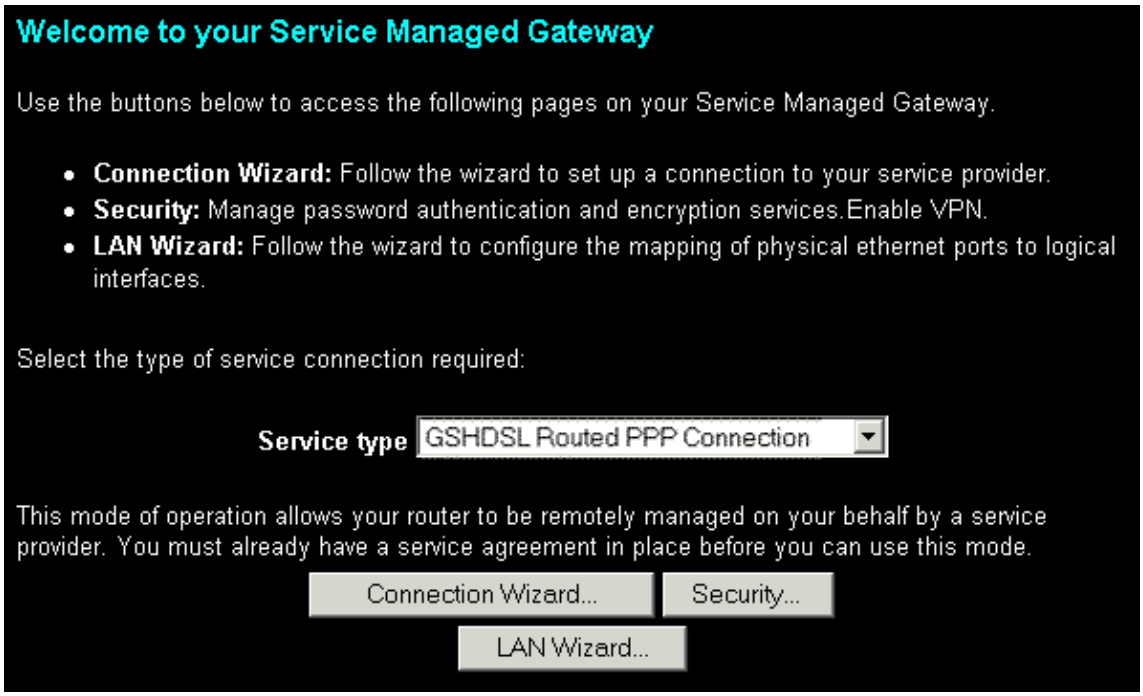

Figure 9: the Welcome page after you disable Activation

Click the **Connection Wizard** button to open the **Connections** page

2.1.3 Generating an SHDSL Connection over PPP

The Connections page lets you enter details about the connection you are creating or updating.

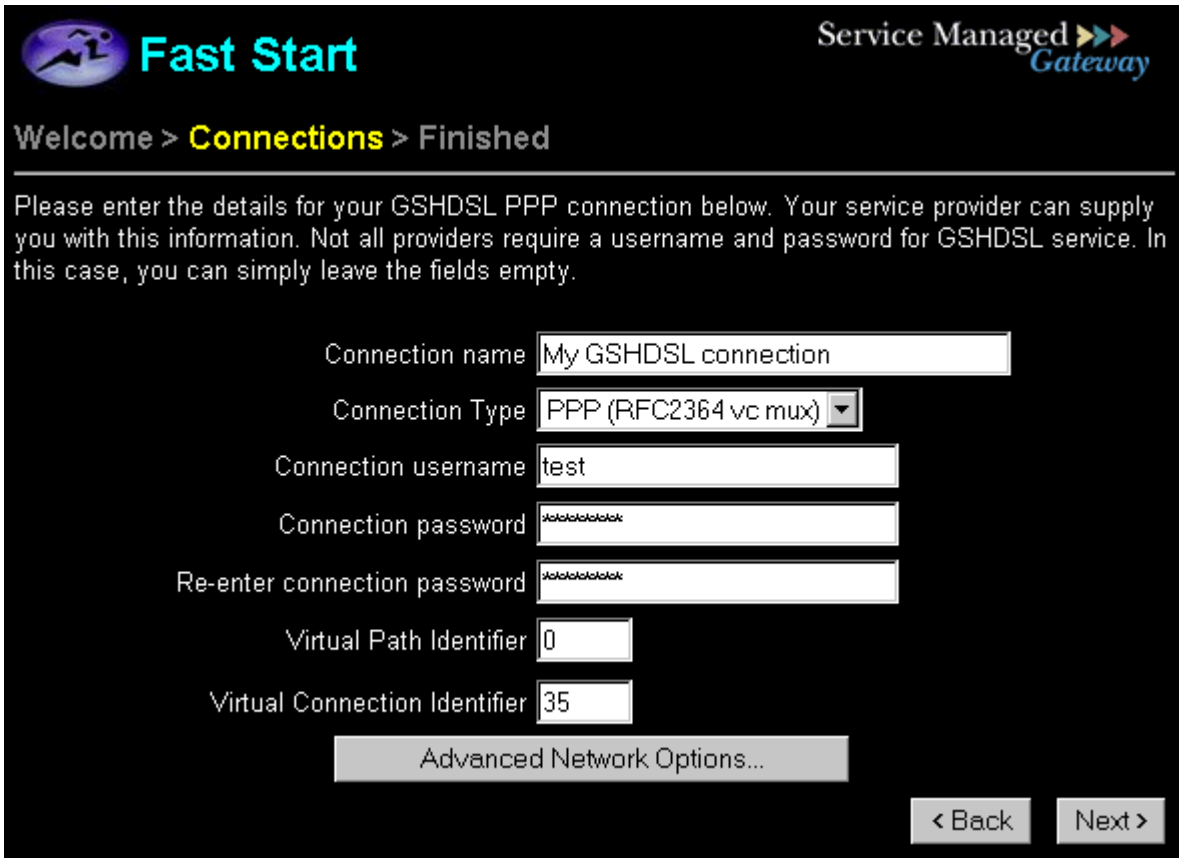

Figure 10: the Connections page

In the **Connection name** field, specify a descriptive name for your connection. This name identifies the connection for maintenance functions such as connecting, disconnecting, and viewing connection statistics.

From the **Connection Type** drop-down list, select PPP over Ethernet (PPPoE), PPP (RFC2364 vc mux), or PPP (RFC 2364 llc).

If you are unsure which connection type to use for a service over PPPoA, check with your service provider.

In most cases, your service provider gives you a user name and password so you can access Internet services.

In the **Connection username** field, type the user name your service provider gave you.

In the **Connection password** field, type the password your service provider gave you.

For security, an asterisk (*) appears each time you type a character. To verify that you typed the password correctly, type it again in the **Re-enter connection password** field.

The virtual path identifier and the virtual connection identifier relate to the Asynchronous Transfer Mode (ATM) channel on which the link is established. They allow all packets sent out to have a unique identification number. Use the defaults provided here unless your service provider gives you different numbers.

The Gateway is configured to allow your service provider to assign an IP address to the connection. If this is how your service is provided and you are using the default LAN configuration so that the Gateway allocates addresses and acts as DNS server to the PCs on the LAN, then click **Next**. If this is not how your service is provided, click the **Advanced Options** button to open the Advanced Network Options pop-up window.

2.1.3.1 Configuring advanced options for your PPP network

You do not have to configure advanced options to Activate your router. If you are not familiar with advanced network options or your service provider has not given you advanced option settings, you can skip this section.

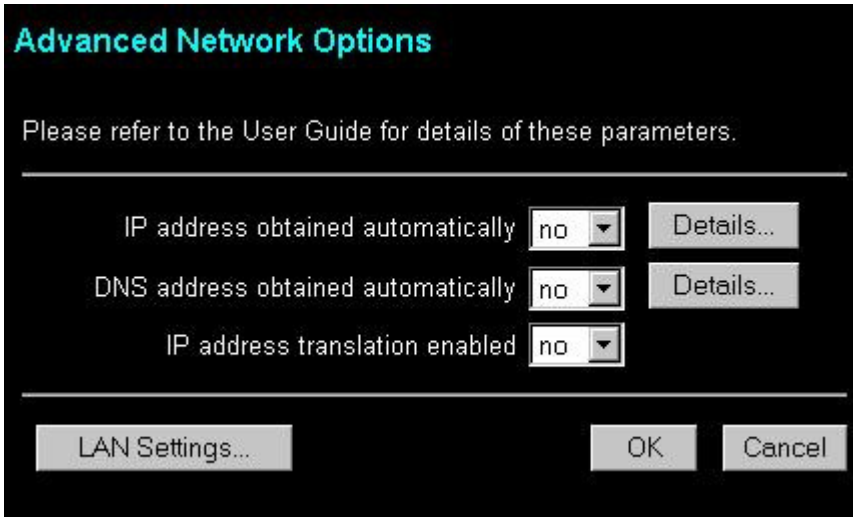

Figure 11: The Advanced Network Options window

Select **yes** in the **IP address obtained automatically** drop-down list to obtain the IP address automatically.

If you do not want to obtain the IP address automatically, select **no** from the drop-down list. Then click the **Details** button to open the **IP Addressing** pop-up window.

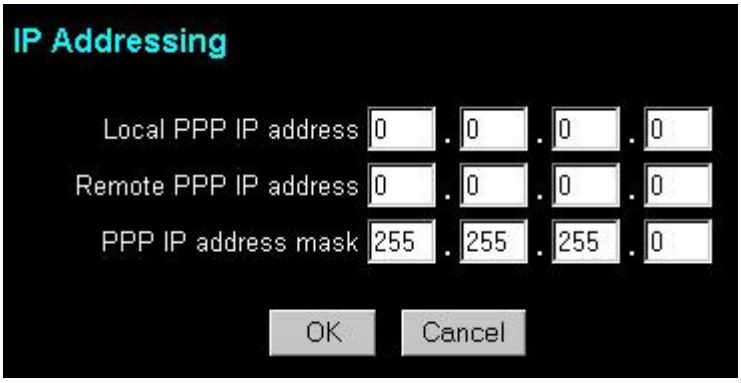

Figure 12: the IP Addressing pop-up window, which is opened from the Advanced Network options pop-up window

You service provider will give you the addresses that you should type in the three fields in the **IP Addressing** pop-up window.

If your service provider does not give you any addresses, use the addresses that are in the pop-up window when it pops up.

Click **OK** to close the IP Addressing pop-up window.

2.1.3.2 Automatically obtaining a DNS address

You do not have to configure DNS addressing. If you are not familiar with DNS addressing or your service provider has not given you DNS addresses, you can skip this section.

The Domain Name System (DNS) associates host names with IP addresses. The DNS server is responsible for tracking these associations. The DNS address is usually obtained automatically. However, if it is not, select **no** from the **DNS address obtained automatically** drop-down list. Then click the **Details** button to display the **DNS Addressing** pop-up window.

Figure 13: the DNS Addressing pop-up window, which is opened from the Advanced Network options pop-up window

Type the IP address of the primary DNS server in the **Primary DNS IP Address** field. If there is a secondary DNS server, type its address of the secondary DNS server in the **Secondary DNS IP Address** field.

Click **OK** to close the DNS Addressing pop-up window.

2.1.3.3 Enabling IP address translation

IP address translation (IPAT) can hide the devices on the local LAN by substituting the IP address of the originating device with the IP address of the Gateway. If you need to disable IP address translation for the leased line connection, select **no** from the **IP address translation enabled** drop-down list in the **Advanced Network Options** pop-up window.

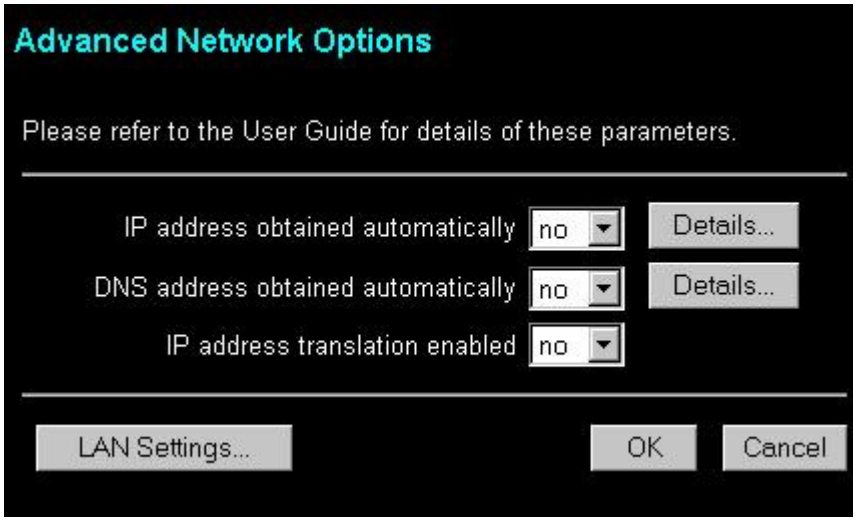

Figure 14: the Advanced Network Options pop-up window

2.1.3.4 Configuring the LAN

If you need to configure your LAN settings, click the **LAN Settings** button in the **Advanced Network Options** window. The **LAN Configuration** pop-up window is displayed.

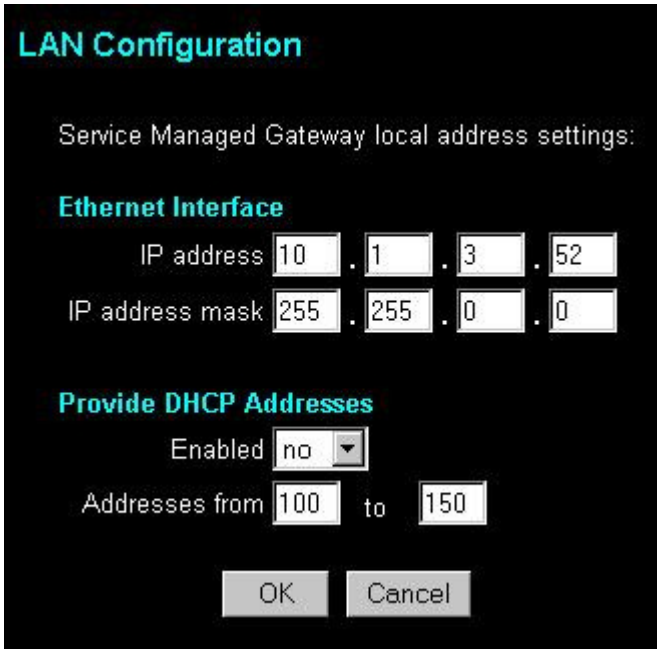

Figure 15: The LAN Configuration pop-up window for a PPP connection

To configure IP details for the LAN, type the IP address in the **IP address** fields, and type the IP address mask in the **IP address mask** fields.

2.1.3.5 Enabling the Dynamic Host Configuration Protocol

When it is enabled, Dynamic Host Configuration Protocol (DHCP) allows the Gateway to act as a server and assign IP addresses to other IP-addressable devices on the local LAN as they attach to the network.

To configure the Dynamic Host Configuration Protocol (DHCP) to provide addresses automatically, select **yes** from the **Enabled** drop-down list. To prevent the DHCP from distributing addresses automatically, select **no** from the **Enabled** drop-down list.

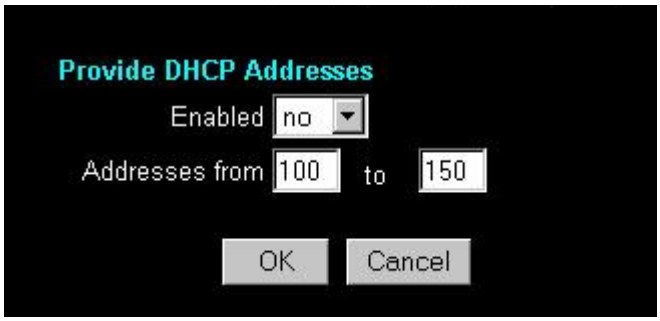

Figure 15a: The DHCP section of the LAN Configuration pop-up window

The values in the **Addresses from** and **to** fields determine the range of IP addresses available for clients when the DHCP server is enabled. In the example in Figure 14a, **Addresses from** is 100 and **to** is 150, which means that 49 IP addresses are available for local clients. Two addresses are reserved for IP broadcasts.

After you configure the LAN settings, click **OK** to close the pop-up window.

Click **OK** to close the Advanced Network Options pop-up window. Then click the **Next** button on the Connections page.

2.1.4 Saving your PPP Configuration

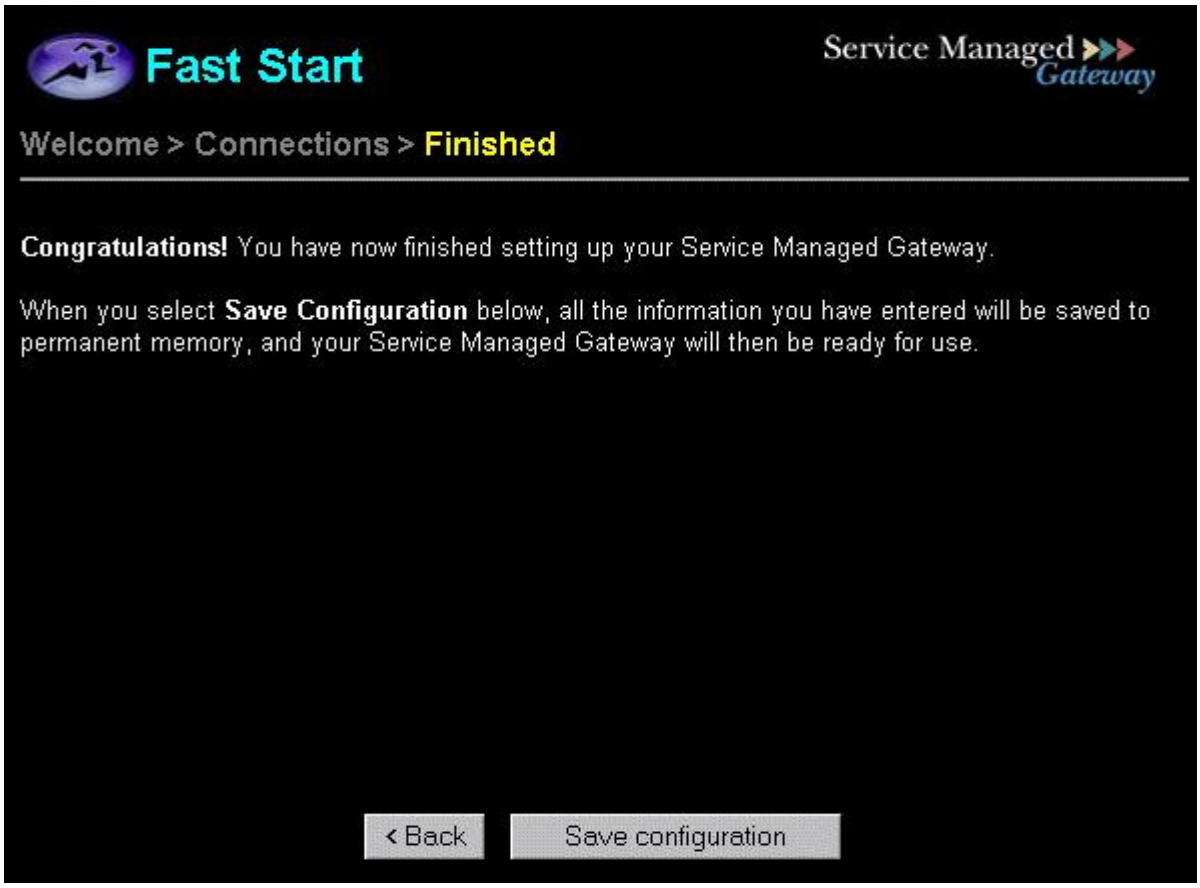

Figure 16: the first Finished page for a PPP connection, where you save the configuration

To save the new or updated SHDSL over PPP connection, click **Save configuration**. When the Gateway has reloaded, click the **Close** button to display a page where you can test the connection and register your Gateway:

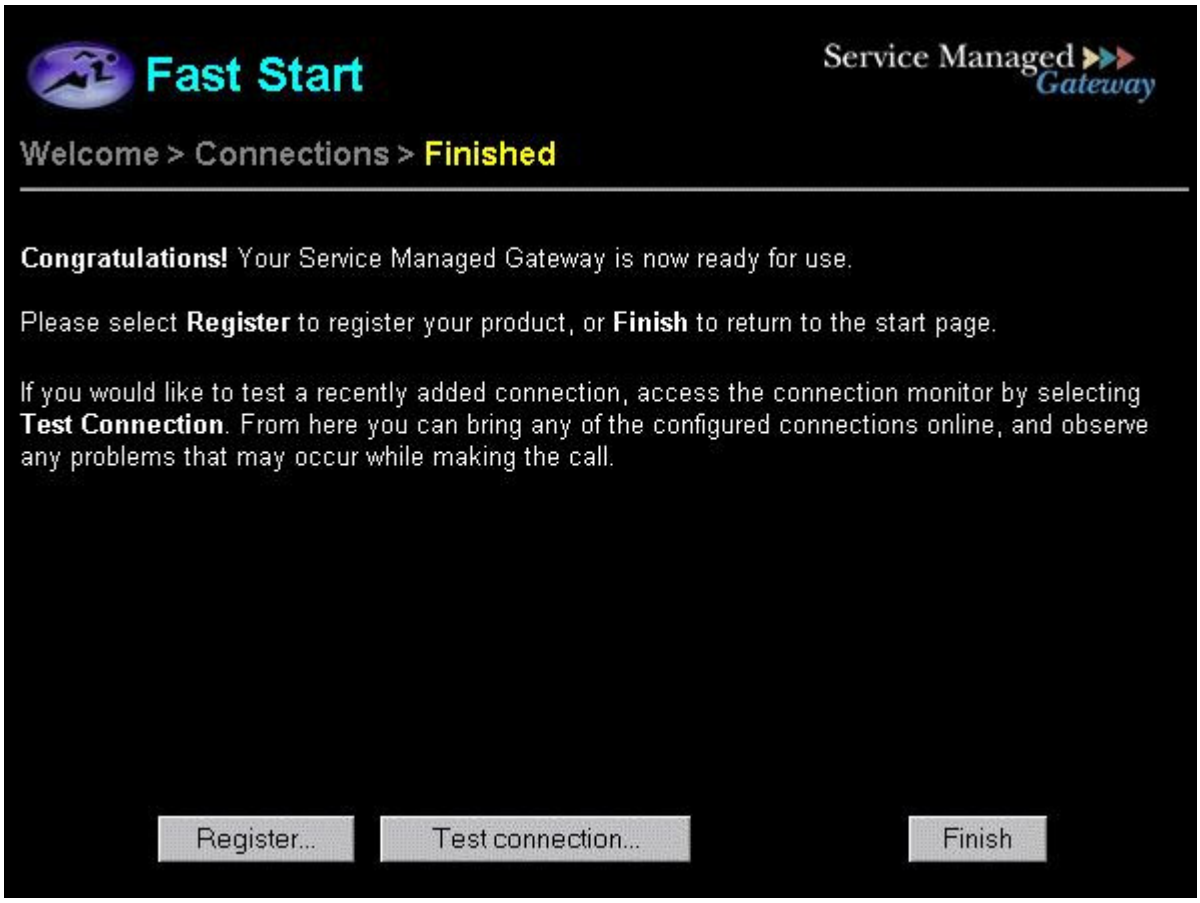

Figure 17: the second Finished page for a PPP connection

To register your product, click the **Register** button. A registration form is displayed. Fill in the form, print it, and fax it to the fax number on the form.

Before you click **Finish**, you can test your connection to ensure that you have configured it correctly. Click the **Test Connection** button on the **Finished** page to access the Connection Monitor.

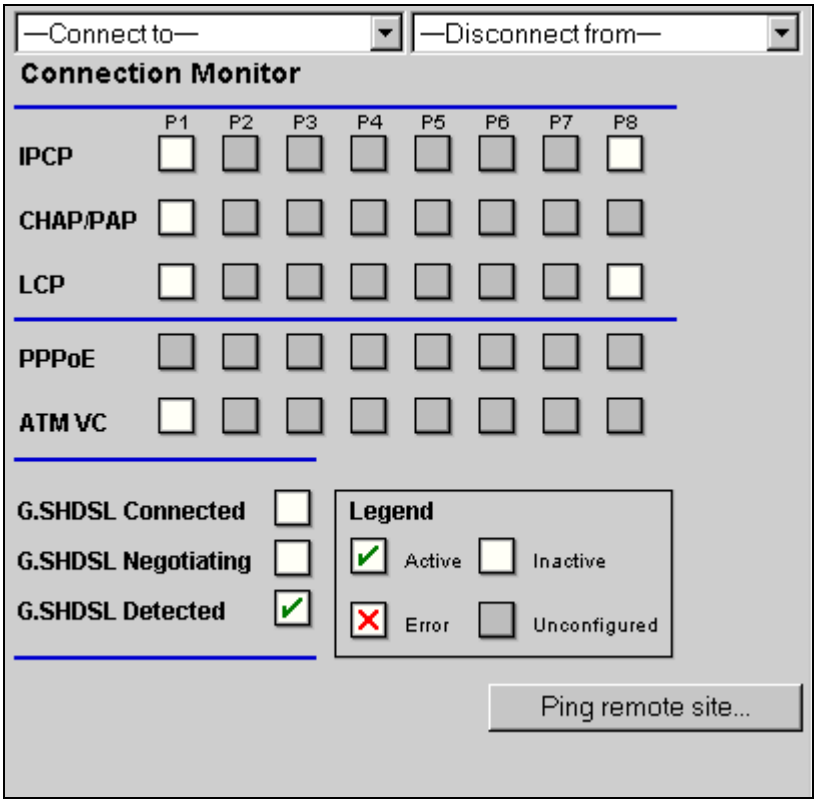

Figure 18: the Connection Monitor

If no connection details are displayed in the Connection Monitor, click a gray **ATM VC** box. A list of active VPI/VCI numbers is displayed. You can use these numbers to reconfigure the default value in the wizard.

For more information about the Connection Monitor, read the Expert Web Full Reference Documentation in the Service Managed Gateway documentation.

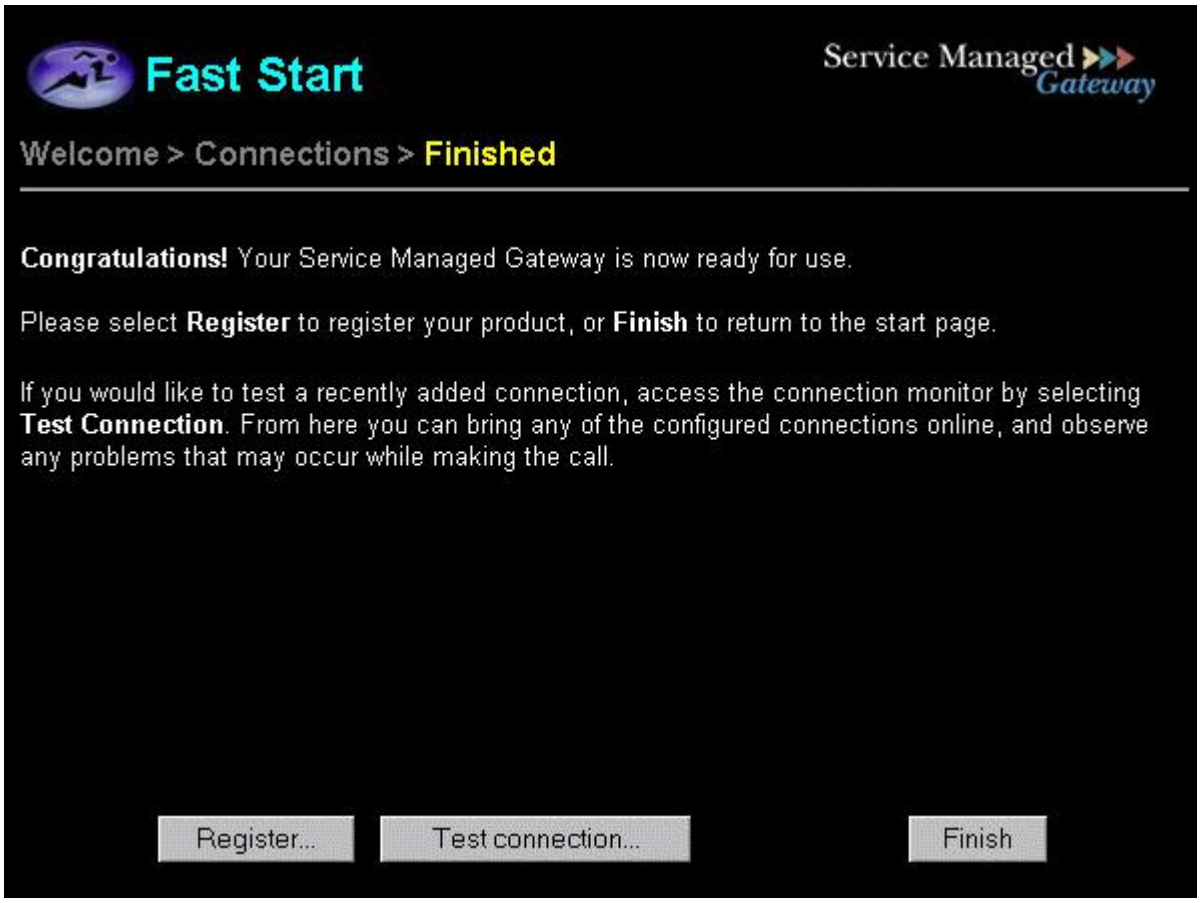

Figure 19: the second Finished page for a PPP connection

Click **Finish** to return to the Gateway home page. From the home page you can access the **Advanced** and **Status** menus to further configure, view, and monitor your Gateway.

2.2 Configuring a bridged SHDSL connection

If you configure a bridged connection on your Gateway, your service provider allocates one or more IP addresses to devices on the local network. You can still access the Internet, but in order to regain management access, you must:

- reset the Gateway using the RESET button at the back of the box, or
- assign an ISP-supported IP address to the Service Managed Gateway using the Advanced Options feature (see the section LAN configuration).

2.2.1 Opening the Fast Start Wizard

Your Service Managed Gateway is designed to be automatically configured by the Activator Distributed System (DSS) upon correct installation of the Gateway.

If necessary, you can bypass Activation and use the Fast Start Wizard to manually configure your Gateway. See the SHDSL installation guide for details of how to connect the router to your computer or network. When your Gateway is correctly connected to your PC, type **fast.start** into the Address field of your browser.

Figure 20: the home page of the Service Managed Gateway

The Service Managed Gateway home page is displayed. Click the **Fast.Start** icon to open the Fast Start wizard. The wizard will guide you through a series of forms that you must complete to configure your Gateway.

2.2.2 Disabling Activation

When you click the Fast.Start icon, the page that is displayed is called **Activation in progress**. It displays the status of the Activation process.

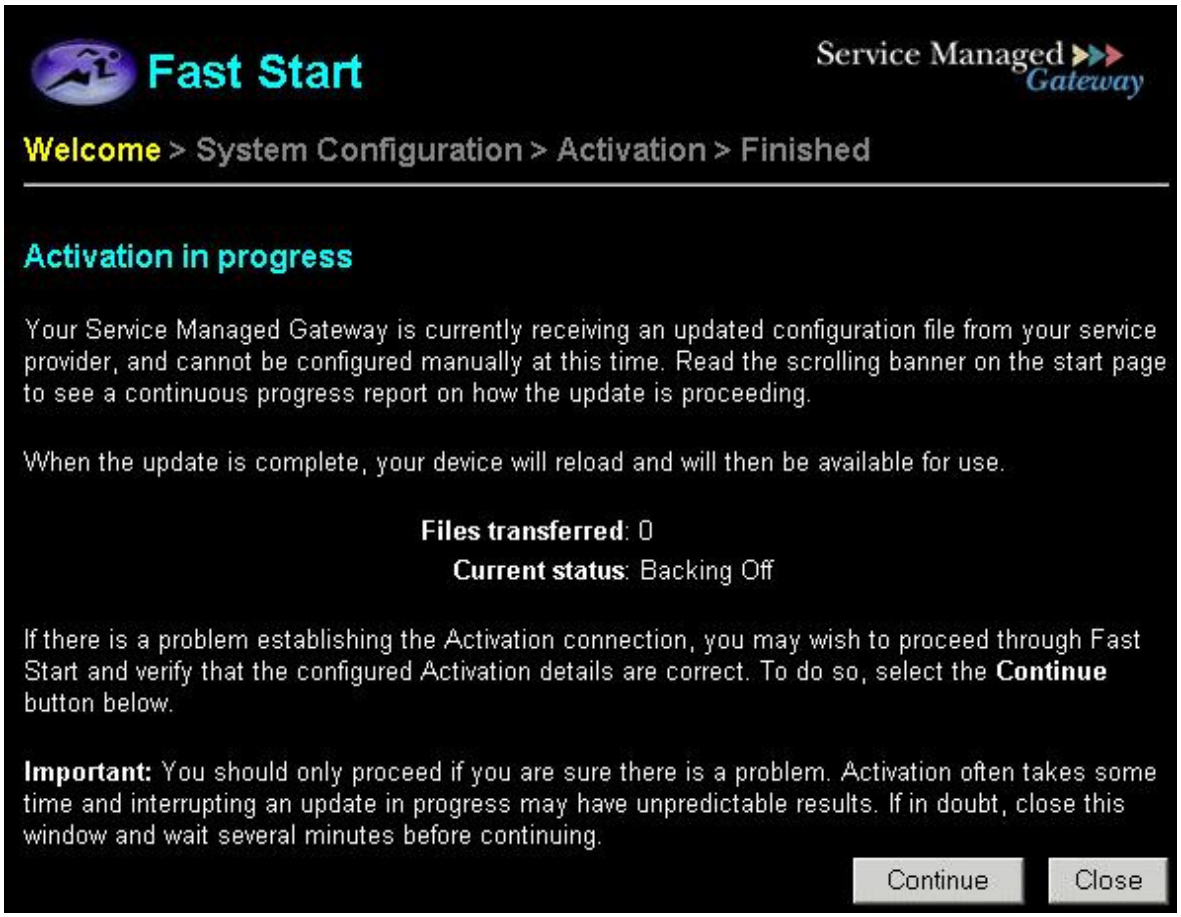

Figure 21: the Activation in progress page

To manually configure your Gateway, you must disable Activation. To do this, click the **Continue** button. If you do not need to stop Activation, click **Close**.

Warning! **Do not disable Activation unless you are sure there is a problem or if you must manually Activate your Service Managed Gateway.**

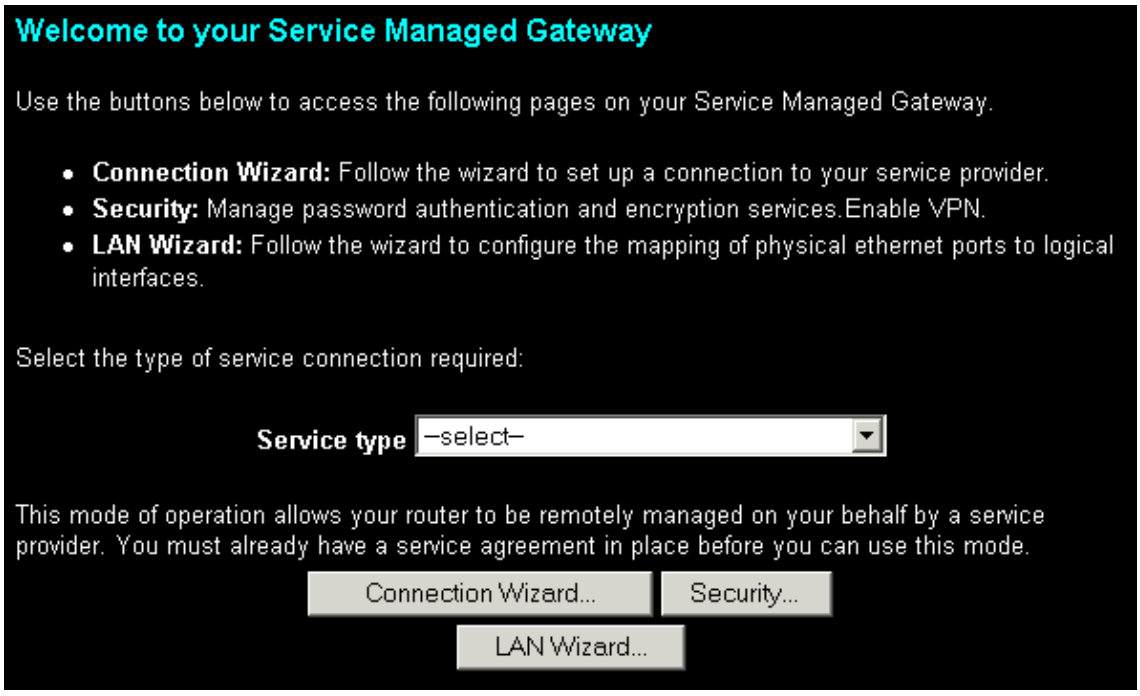

Figure 22: the Welcome page

From the **Service type** drop-down list, select **GSHDSL Bridged Connection**. Carefully read the warning in the dialog box.

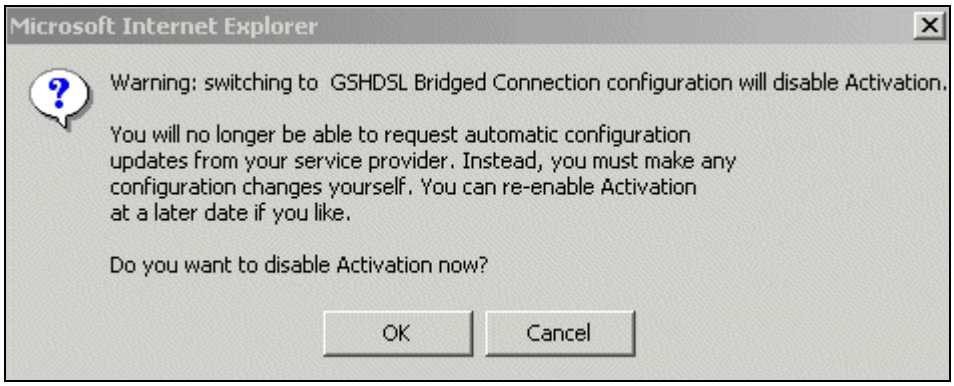

Figure 23: the dialog box that lets you cancel Activation

To allow Activation to continue, click **Cancel**. The dialog box is closed and Activation continues.

To disable Activation, click **OK**. If you click OK, the Activation process ends and the next page of the Fast Start wizard is displayed.

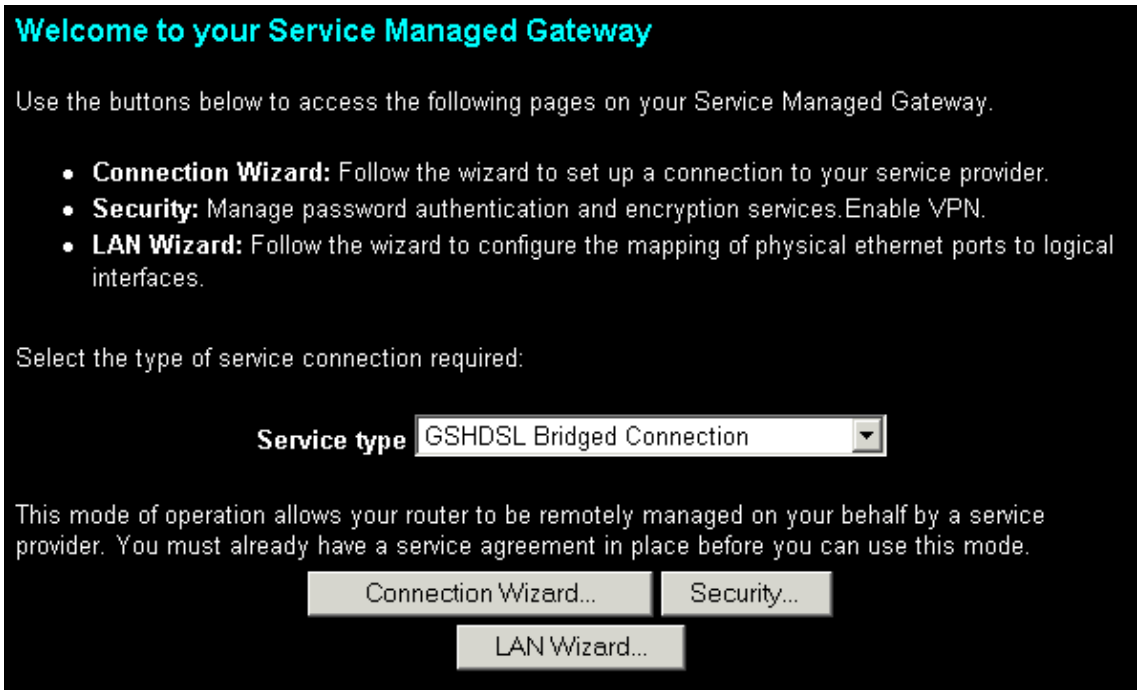

Figure 24: the Welcome page after you disable Activation

Click the **Connection Wizard** button to open the **Connections** page

2.2.3 Generating a Bridged Connection

The **Connections** page lets you enter details about the connection you are creating or updating.

Figure 25: the Connections page for a bridged connection

The virtual path identifier and virtual connection identifier fields relate to the Asynchronous Transfer Mode (ATM) channel on which the link is established. They allow all packets sent out to have a unique identification number. Use the defaults provided in the **Virtual Path Identifier** field and the **Virtual Connection Identifier** field unless your service provider gives you different numbers.

2.2.4 Setting the Service Managed Gateway's LAN IP Address

To manage Internet access through your Service Managed Gateway bridge, you can assign a LAN IP address to the Gateway. This address must be allocated by your service provider.

To assign a LAN IP address to your Service Managed Gateway, click the **Advanced Options** button on the Connections page. The **LAN Configuration** pop-up window is displayed.

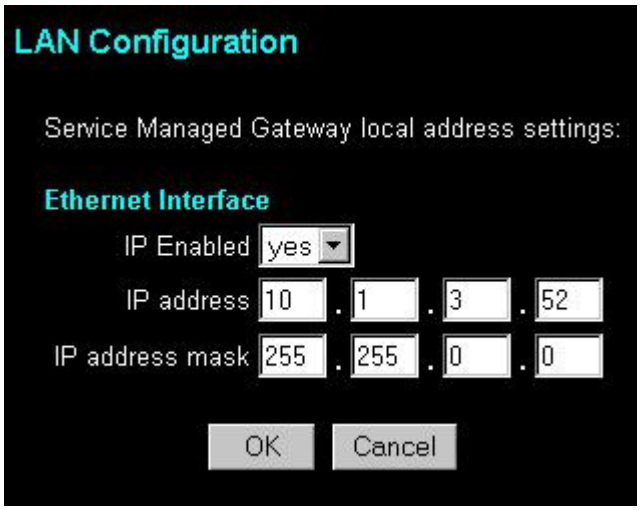

Figure 26: the LAN Configuration pop-up window for a bridged connection

To use your Gateway as a router as well as a bridge, select **yes** from the **IP Enabled** drop-down menu.

Type the IP address in the **IP address** fields. Contact your service provider if you are not sure of the correct address for these fields.

Warning: **Unless you are sure that the address you are assigning is unique and part of the same address scheme, do not fill in this form.**

Type the IP address mask in the **IP address mask** fields

After you have configured the local settings, click **OK** to close the LAN Configuration window.

Click **Next** on the Connections page.

2.2.5 Saving your Bridged Configuration

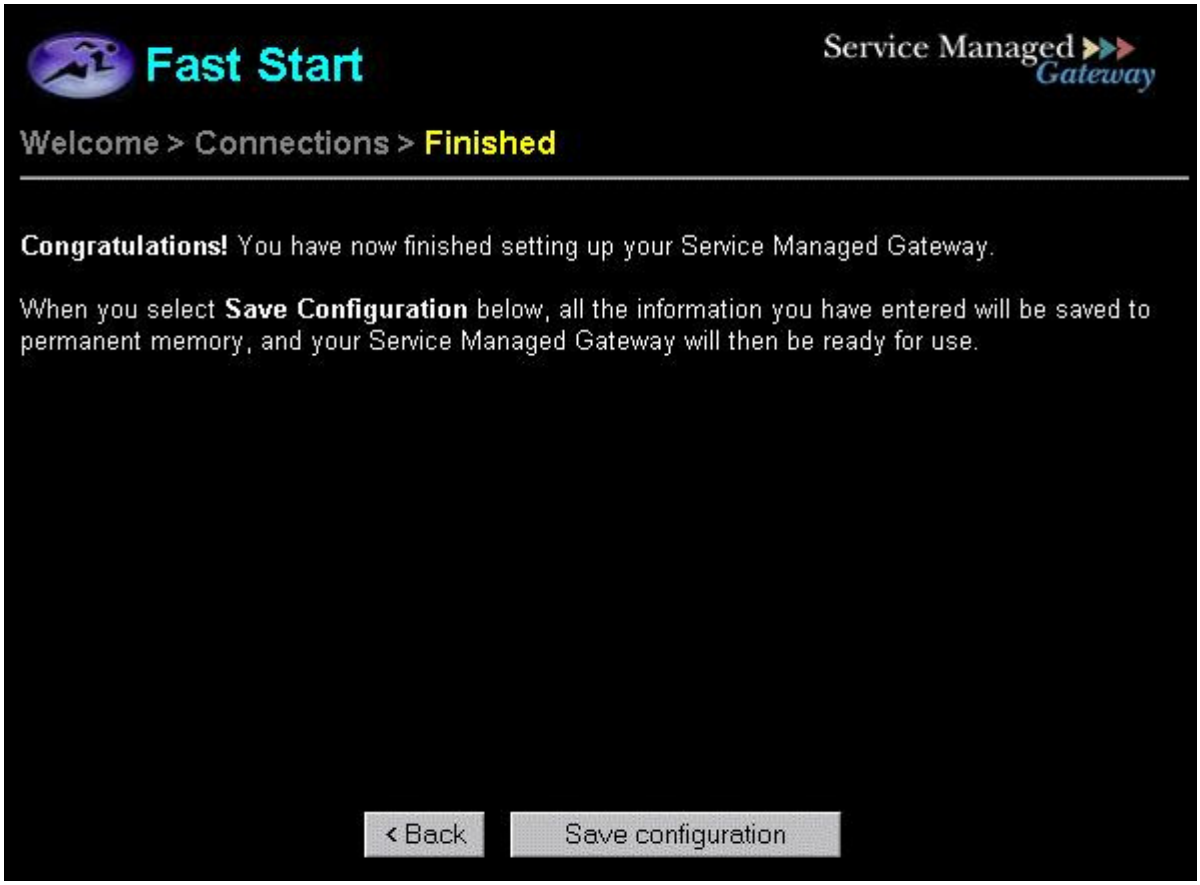

Figure 27: the Finished page for a bridged connection

To save the new or updated bridged connection, click **Save configuration**. The **Reloading device** page is displayed.

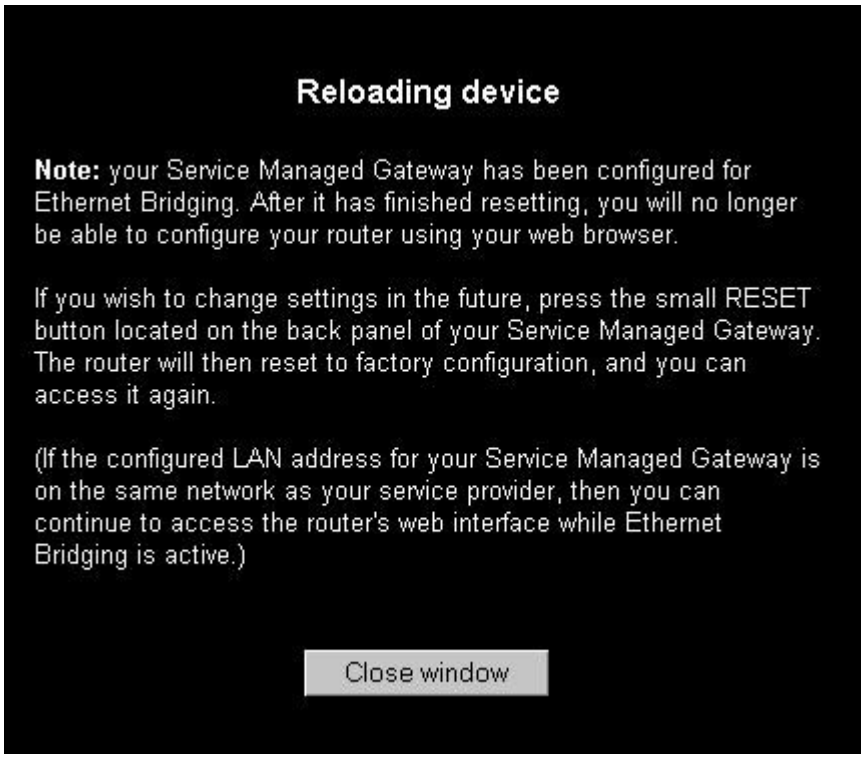

Figure 28: the Reloading device pop-up window

When the Gateway has reloaded, click the **Close window** button.