Service Managed Gateway™

How to Configure a T1/E1 Connection

Issue   1.2

Date   26 August 2008

HIFN

ISO 9001
Registered

1 Introduction

1.1 What is T1/E1 technology?

T1 and E1 technologies were originally designed to support high-speed transfer of digitised voice data over telephone networks. T1 is used in North America, while E1 is used in Europe and other countries. Both technologies are supported by the T1/E1 Gateway.

While designed for digitized voice, T1 and E1 are also used for transfer of general digital data. T1 and E1 technologies provide an always-on connection. The maximum speed in T1 is 1.544 Mbps, while for E1 it is 2.048 Mpbs. Unlike ADSL, T1 and E1 are symmetrical, so the speed of the line is the same in both directions.

2 Point-to-Point Protocol (PPP) connections

2.1 What is PPP?

The Point-to-Point Protocol (PPP) is a defined industry standard that is used widely to allow two devices to communicate across a logical link. PPP is extensively deployed by service providers as a means of connecting customers to Internet Protocol (IP)-based services such as the Internet.
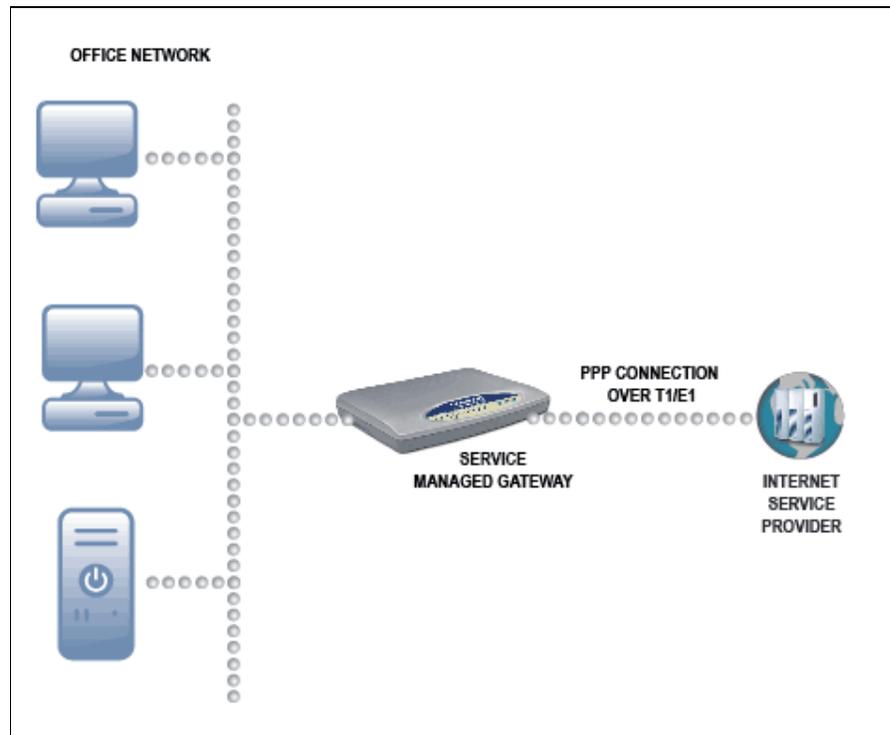

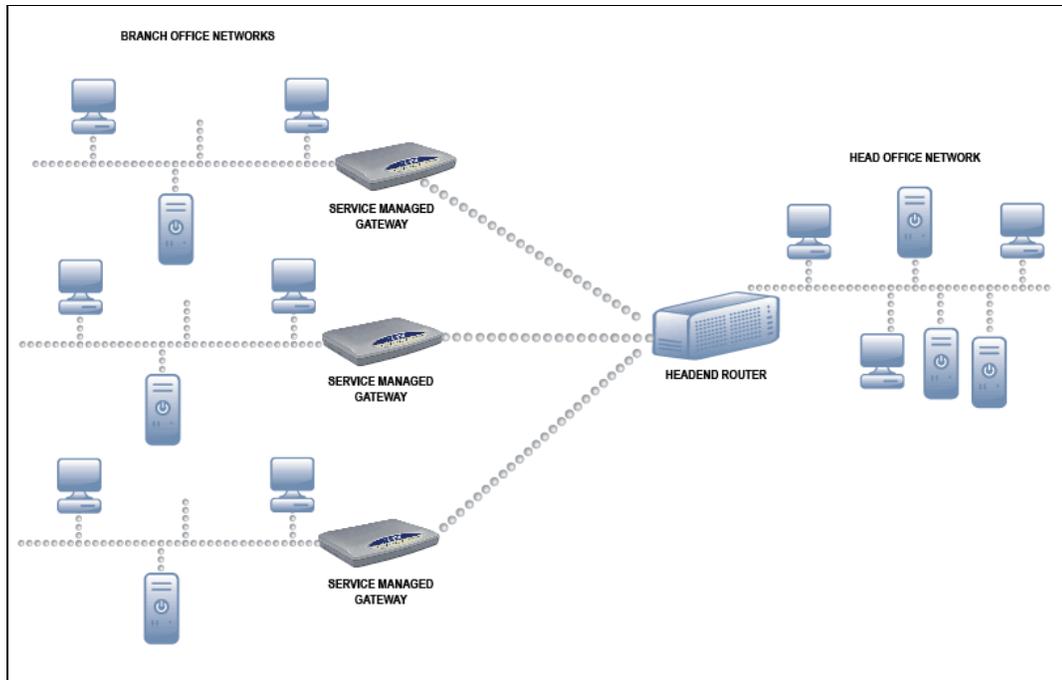**Figure 1: A PPP connection to the Internet over a T1 or E1 leased line**

Figure 2: PPP connections to branch offices over T1 or E1 leased lines

2.2 Configuring a leased line connection over PPP

2.2.1 Open the Fast Start wizard

Your Gateway is designed to be automatically configured by the Activator Distributed System (DSS) after you correctly install the Gateway.

If necessary, you can bypass activation and use the Fast.start wizard to manually configure your Gateway. Please read "Installing your Gateway" in the Gateway online documentation for details of how to physically install your Gateway. When your Gateway is correctly connected to your computer, type **fast.start** into the Address field of your browser.

Figure 3: The Gateway home page

The Gateway home page appears. Click **Fast.Start** to open the Fast Start wizard.

The wizard guides you through a series of forms that you must complete to configure your Gateway.

2.2.2 Disable activation

When you click the icon, the Activation in progress page appears. It shows the status of the activation process.

Figure 4: The Activation in progress page

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

Warning! Do not disable activation unless you are sure there is a problem.

When you click **Continue**, the Welcome to your Service Managed Gateway page appears.
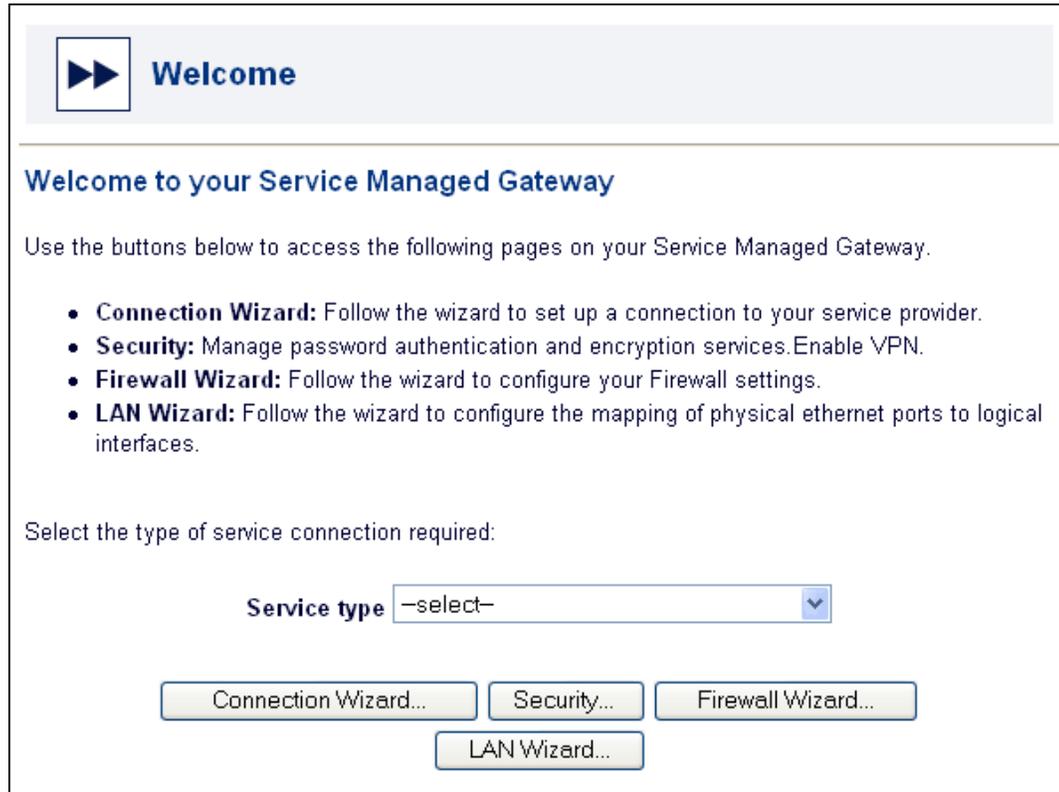
Figure 5: The Welcome page

Select **Routed T1E1 Connection** from the Service type drop-down list.

A dialog box appears. Carefully read the warning in the dialog box.
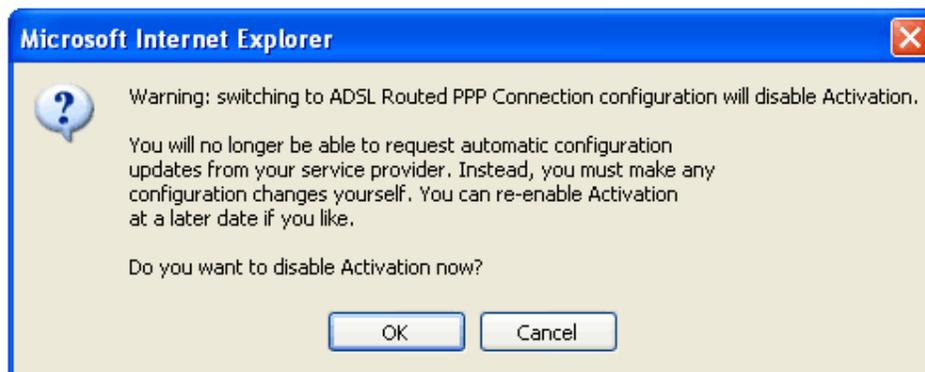

Figure 6: The dialog box that lets you cancel Activation

To allow activation to continue, click **Cancel**. The dialog box closes and activation continues.

To disable activation, click **OK**. The activation process ends and the next page of the Fast.Start wizard appears.

2.2.3 Choose the service type
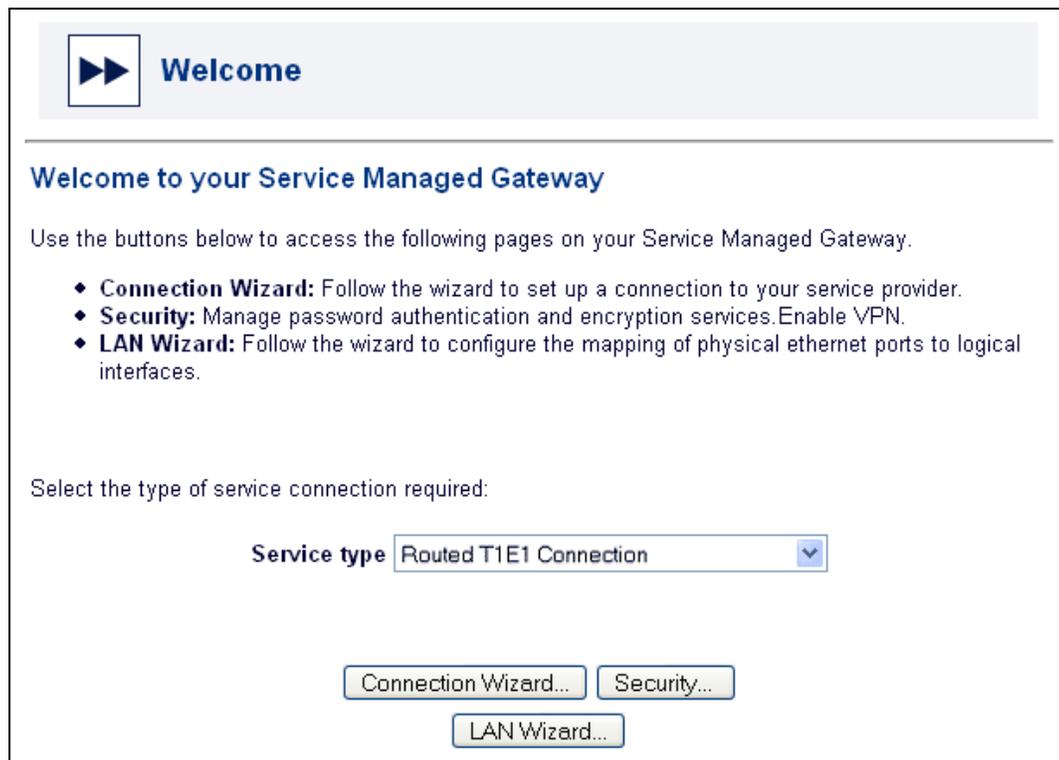
Figure 7: The Welcome page after you disable activation

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

2.2.4 Generate a T1 or E1 Connection that uses PPP

On the Connections page, click **Add a T1E1 PPP connection**. If it does not, click **PPP Configuration**, which is the blue link in the first paragraph.

When the correct Connnections page appears, click **Add a T1E1 PPP connection**, which is shown in Figure 8.

Figure 8: The Connections page

The message 'Creating new T1E1 PPP connection' pops up for a moment. Then the Access the Internet via a T1E1 connection page appears.

2.2.5 Specify connection parameters

Access the Internet via a T1E1 connection

Please enter the details for your T1E1 PPP connection below. Your service provider can supply you with this information. Not all providers require a username and password for T1E1 service. In this case, you can simply leave the fields empty.
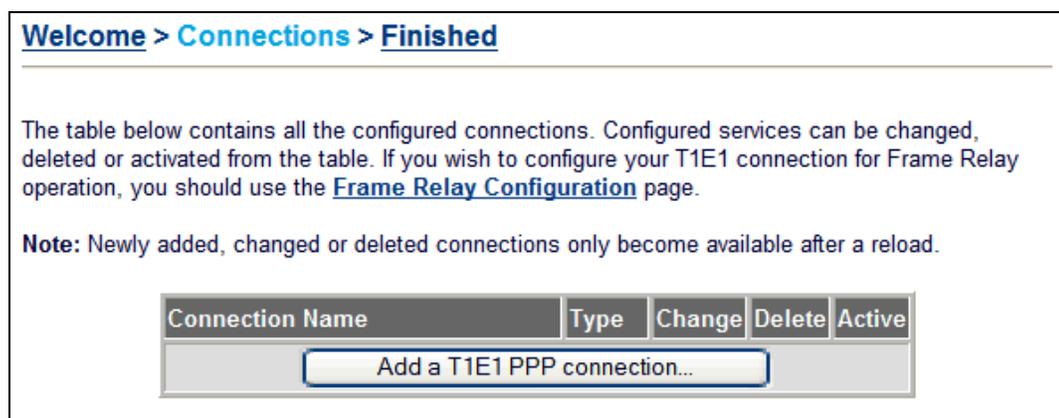
Field	Value
Connection name	
Connection username	
Connection password	
Re-enter connection password	
PCM Mode	E1 mode
Frame Format	Multi-frame format with CRC4
Line Code	HDB3 Speed 1984 Kbps

Use **Advanced Network Options** if you need to configure any options not listed above.

Advanced Network Options...

OK   Cancel

Figure 9: Enter information about your Internet connection on this page

Field Name	Explanation
Connection name	Specify a descriptive name in this field. This name identifies the connection for maintenance functions such as connecting, disconnecting, and viewing connection statistics.
Connection username	Type the username your service provider gave you.
Connection password	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, retype it in the Re-enter connection password field.
PCM Mode	From the drop-down list, select the type of line you use. Select **E1 mode** for an E1 line, and **T1 mode** for a T1 line.
Frame Format	Frame format is the data framing format that is used on the line. Your T1/E1 service provider will tell you which frame format to select.
Line Code	From the drop-down list, select the line code that is used for encoding data. Your T1/E1 service provider will tell

	you which code to select.
Speed	From the drop-down list, select the effective speed of your line. Your T1/E1 service provider will tell you which speed to select.
	You do not have to select a speed if the frame format is Transparent.

2.2.6 Configure advanced network options

You do not have to configure advanced options to activate your Gateway. You can skip this section if you are not familiar with advanced network options or your service provider has not given you advanced option settings.

Click **Advanced Network Options**. The Advanced T1E1 Network Options window appears.

Figure 10: The advanced network options for a T1 or E1 connection

In the IP address obtained automatically window, select **yes** from the 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 **Details** to open the IP Addressing window. The IP Addressing window appears.

Figure 11: The IP Addressing window

Your service provider gives you the addresses to type in the three field in the IP Addressing window.

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

Click **OK** to close the IP Addressing window.

2.2.6.1 Automatically obtain a DNS address

You do not have to configure DNS addressing. If you are not familiar with DNS addressing or if 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. Usually the DNS address is obtained automatically. If it is not obtained automatically, select **no** from the DNS address obtained automatically drop-down list in the Advanced T1E1 Network Options window, which is shown in Figure 11. Then click **Details** to display the **DNS Addressing** window.

Figure 12: The DNS Addressing window
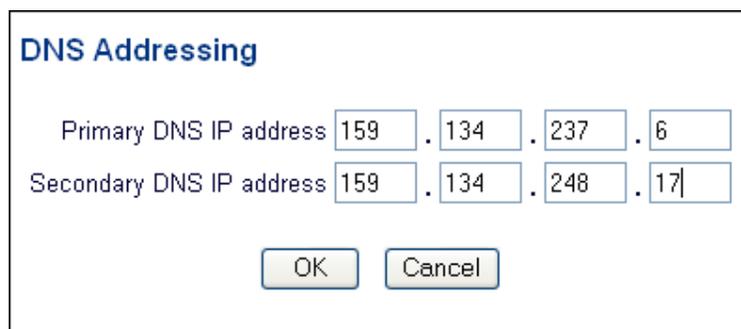
Type the IP address of the primary DNS server in the **Primary DNS IP Address** field. If there is a secondary DNS server, type its address in the **Secondary DNS IP Address** field.

Click **OK** to close the DNS Addressing window.

2.2.7 Enable IP address translation

IP address translation (IPAT) can hide the devices on the local LAN. It substitutes 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 T1E1 Network Options window, which is shown in Figure 11.

Click **OK** to close the Advanced T1E1 Network Options window.

2.2.8 Save your configuration

After you configure a T1 or E1 PPP connection, it is listed in the table displayed on the Connections page

Figure 13: The Connection table on the Connections page

Your Gateway needs to reload before newly-configured connections become available. To enable the new configuration, click **Next** to open the Finished page, where you can save your configuration.

Figure 14: The Finished page

Click **Save Configuration** to retain the new configuration in your Gateway's permanent memory. When the Gateway reloads, it displays a page where you can test the connection and register your Gateway.
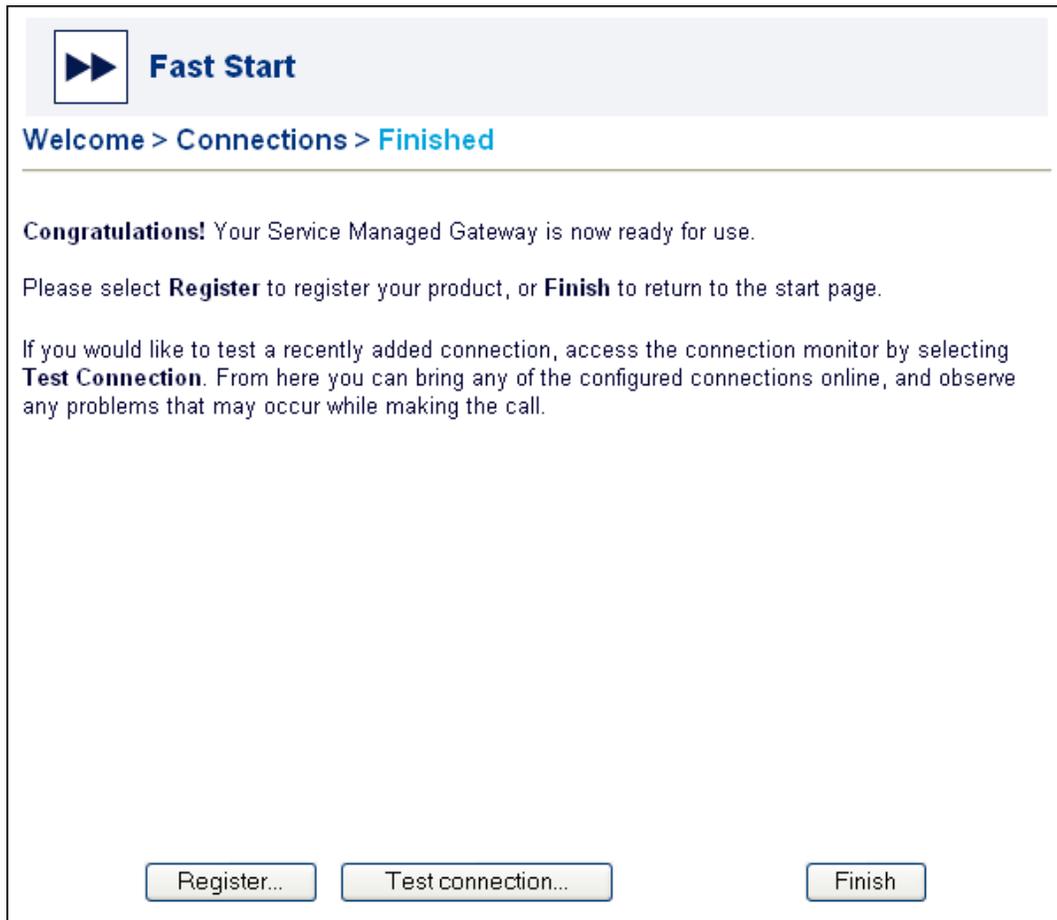

Figure 15: The second Finished page, where you can register or test your product

To register your product, click **Register**. A registration form appears. 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 it is configured correctly. Click **Test Connection** on the Finished page to open the Connection Monitor.
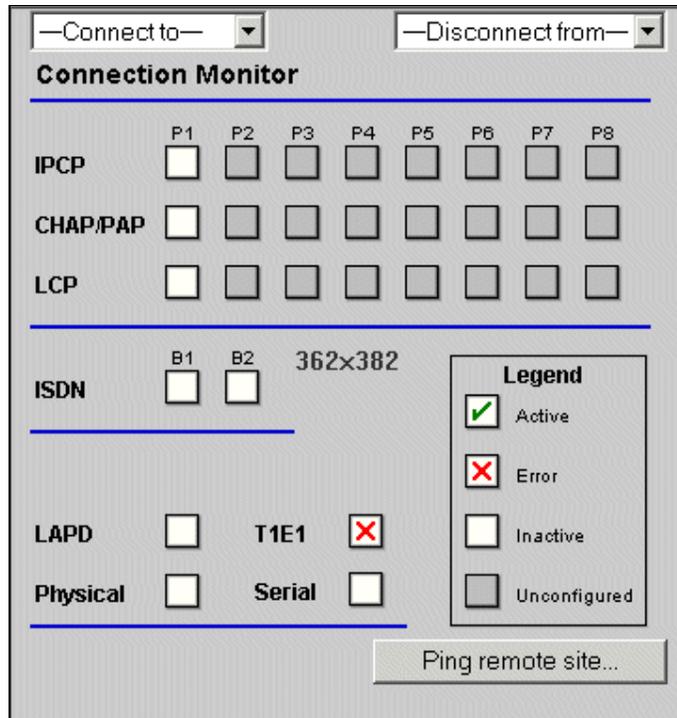
Figure 16: The Connection Monitor

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

On the Finished page, click **Finish**. Figure 17 shows this button. You 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.

2.3 Modifying a T1 or E1 connection that uses PPP

To modify the configuration of an existing leased line connection over PPP, click the **Fast.start** icon.
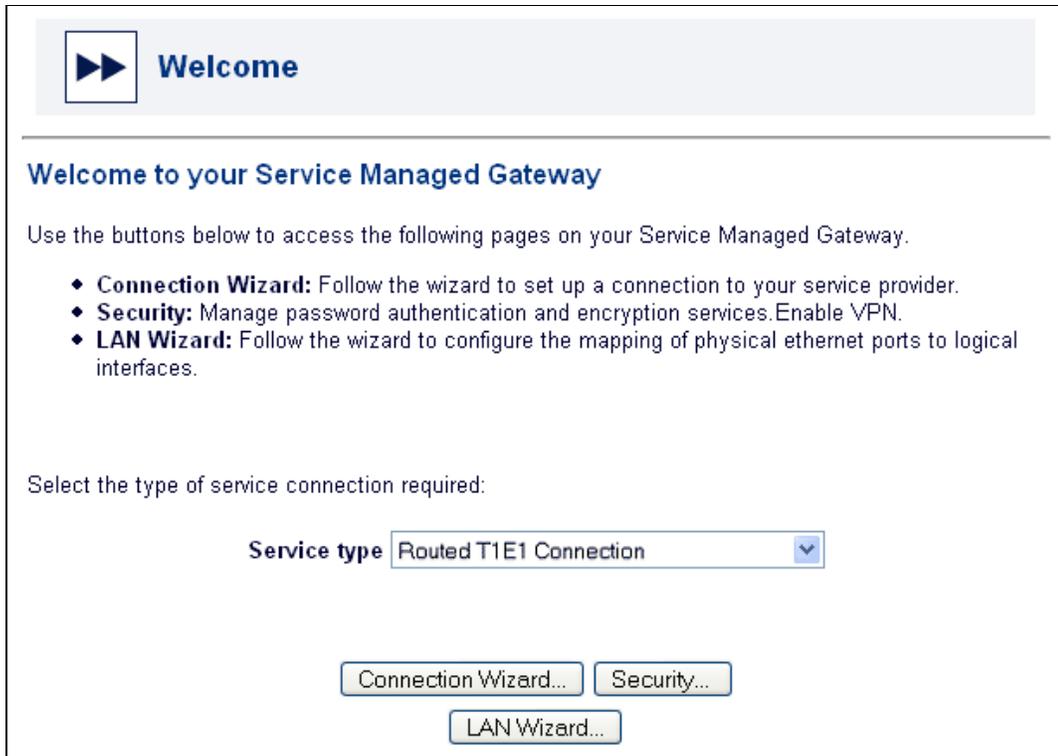
The Fast.Start **Welcome** page opens.

Figure 17: The Fast Start Welcome page

Make sure that **Routed T1E1 Connection** appears in the Service type field. Then click **Connection Wizard**. The Connections page appears.

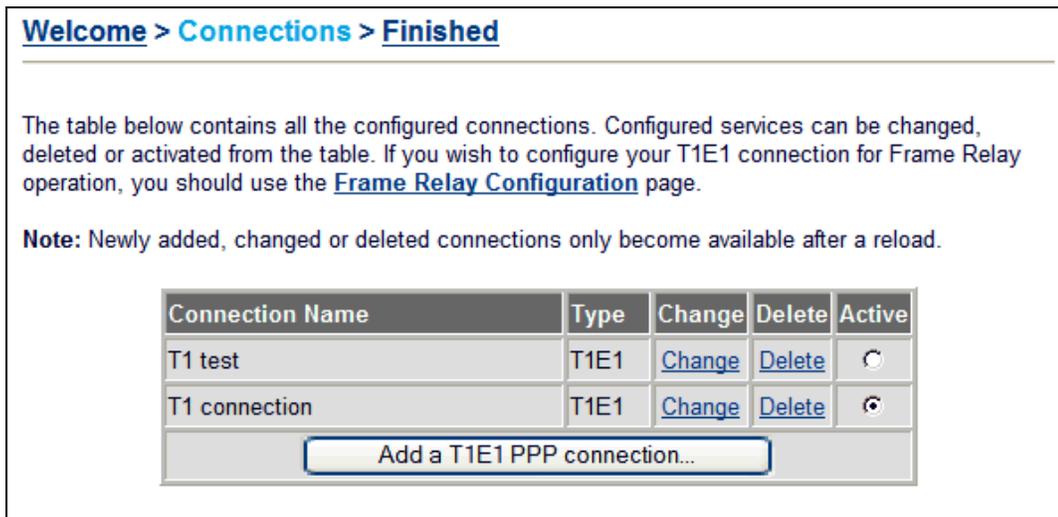The Connections page lists T1 or E1 connections that are already configured on the Gateway.

Figure 18: The Connections page, which shows connections that are already configured

Identify the name of the connection that you want to alter. Then click the **Change** link in the same row.

The Access the Internet via a T1E1 connection page appears. It shows the current configuration for the connection. For information on how to change these configuration settings, read section 2.2.5, Specify connection parameters.

2.4 Removing a T1 or E1 connection that uses PPP

To delete an existing leased line connection over PPP, click **Fast.Start**.

The Fast.Sart Welcome page opens.

Figure 19: The Fast Start Welcome page

Make sure that **Routed T1E1 Connection** appears in the Service type field. Then click **Connection Wizard**. The Connections page appears.

The Connections page lists T1 or E1 connections that are already configured on the Gateway.

Figure 20: The Connections page, which shows connections that are already configured

Identify the name of the connection that you want to alter. Then click the **Delete** link in the same row.

A dialog box appears. Click **OK** if you want to delete the connection. Click **Cancel** if you do not want to delete the connection.

Figure 21: The dialog box that appears before you delete a connection

3 Frame relay connections

3.1 What is frame relay transmission?

Frame relay is a telecommunications access interface. Each node, or end-point, connects to a Frame Relay network, avoiding the need for leased-line connections between individual devices. For this reason, Wide Area Networks (WANs) and Local Area Networks (LANs) often use frame relay transmission for sending data.
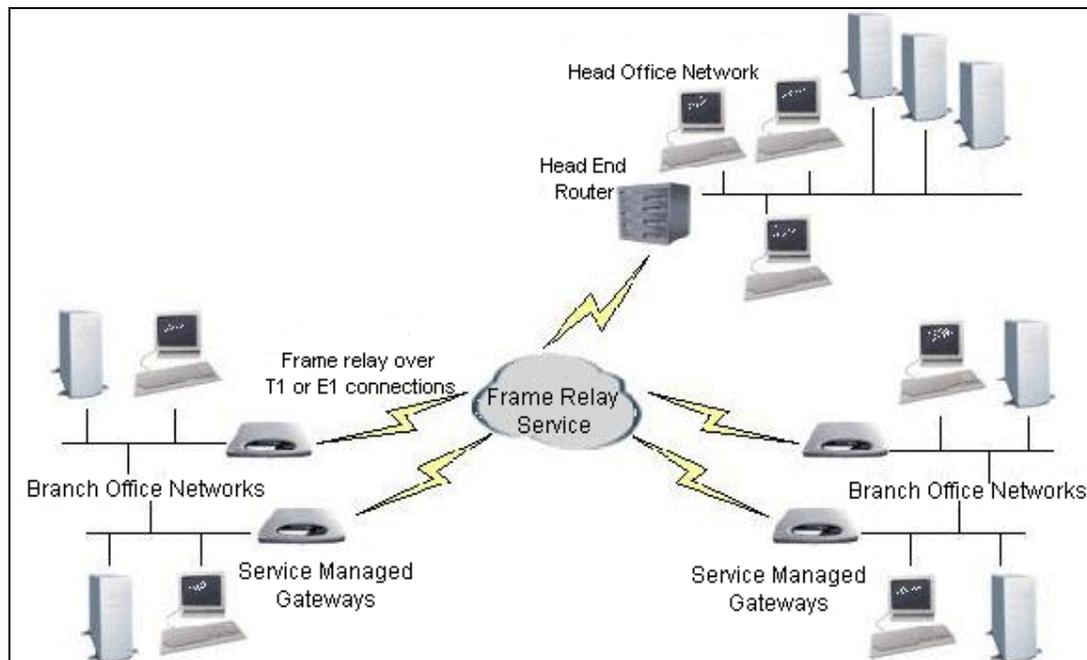

Figure 22: Frame relay connections to the branch offices over T1 or E1 leased lines

Frame relay is a packet-switching protocol. It transmits data serially in individually addressed portions, which are called frames, and the pieces are recompiled at their destination. Frames can take different routes across the network depending on resource availability.

3.2 Configuring a T1 or E1 connection that uses frame relay

3.2.1 Open the Fast Start wizard

Your Gateway is designed to be automatically configured by the Activator Distributed System (DSS) after you correctly install the Gateway.

If necessary, you can bypass activation and use the Fast.Start wizard to manually configure your Gateway. For details of how to physically install your Gateway read 'Installing your Gateway' in the Gateway HTML documentation.

When your Gateway is correctly connected to your computer, type **fast.start** into the Address field of your browser.

Figure 23: The Gateway home page

The Gateway home appears. Click **Fast.Start** to open the Fast.Start wizard.

The wizard guides you through a series of form that you must complete to configure your Gateway.

3.2.2 Disable activation

When you click the Fast.Start icon, the Activation in Progress page appears. It shows the status of the activation process.
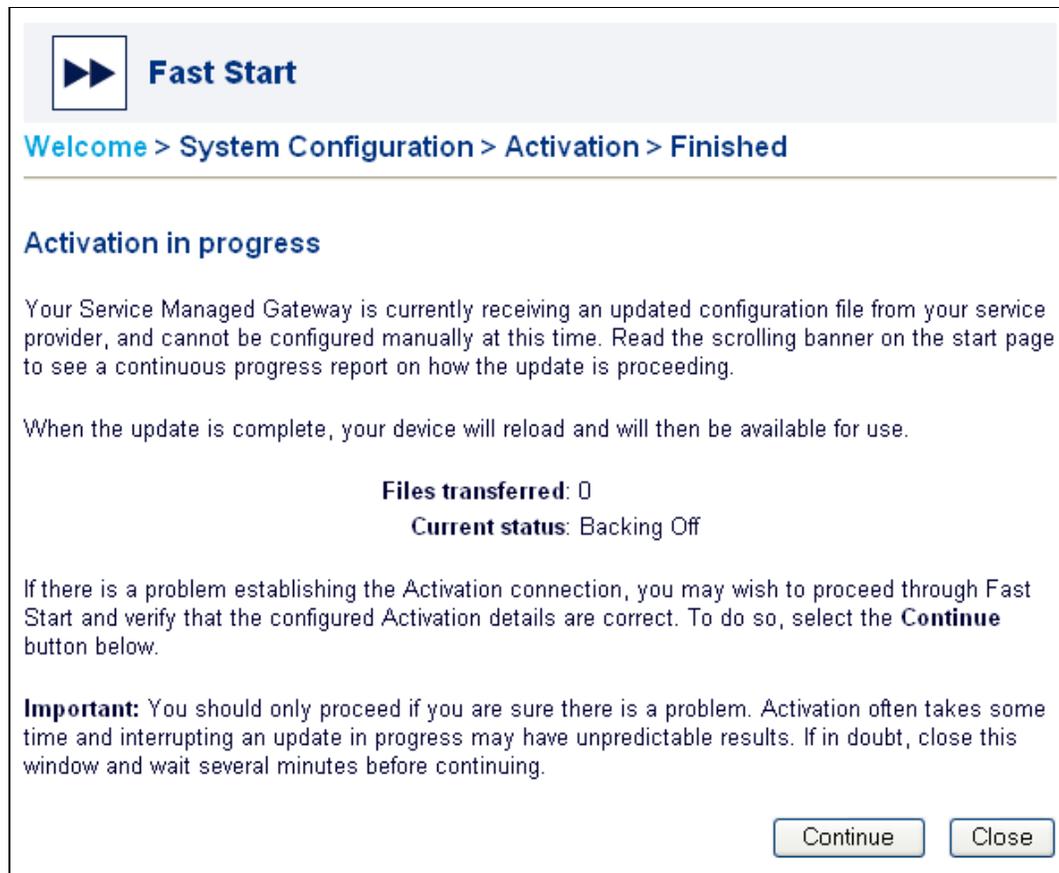
Figure 24: The Activation in progress page

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

Warning! Do not disable activation unless you are sure there is a problem.

When you click **Continue**, the Welcome to your Gateway page appears. It features buttons that let you manually activate your Gateway.
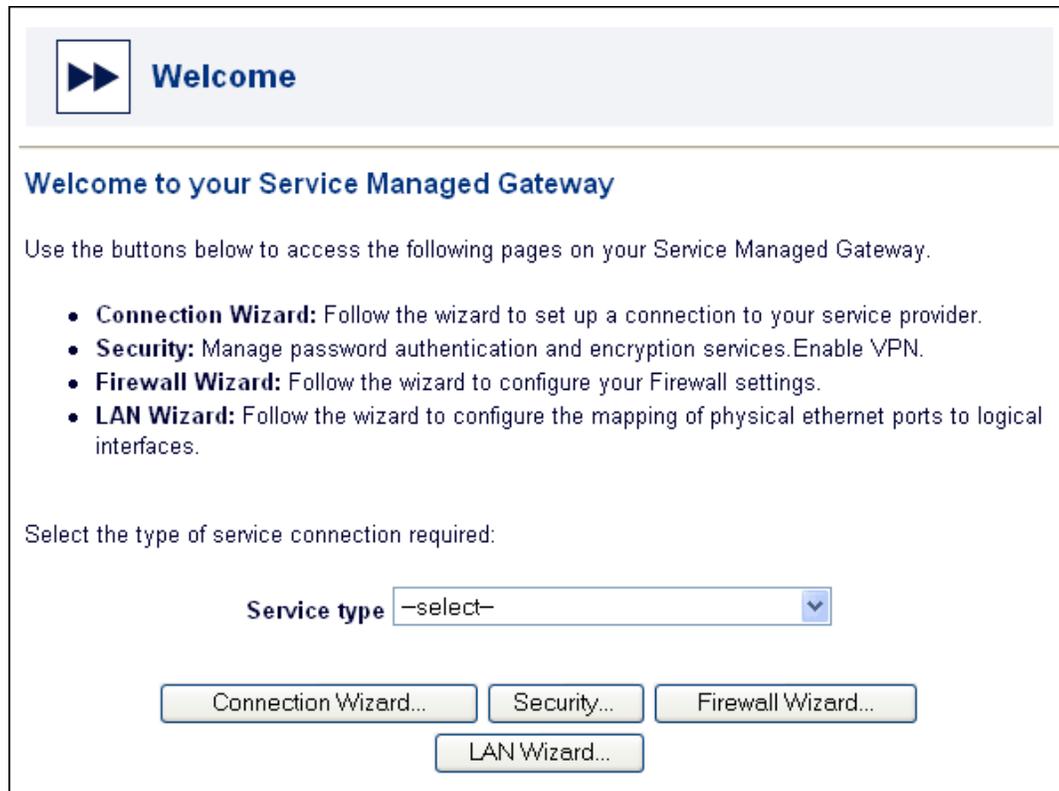
Figure 25: The Welcome page

Select **Routed T1E1 Connection** from the Service type drop-down list.

A dialog box appears. Carefully read the warning in the dialog box.
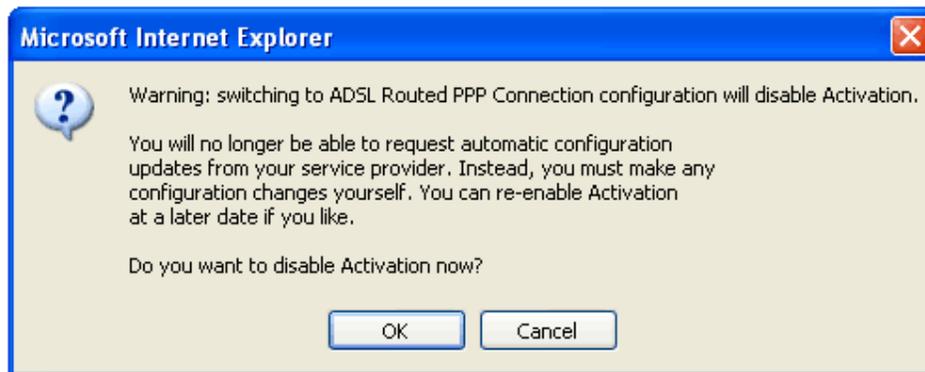

Figure 26: The dialog box that lets you cancel Activation

To allow activation to continue, click **Cancel**. The dialog box closes and activation continues.

To disable activation, click **OK**. The activation process ends and the next page of the Fast.Start wizard appears.

3.2.3 Choose the service type

Figure 27: The welcome page after you disable activation

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

3.2.4 Generate a T1 or E1 connection that uses frame relay

The Connections page enables you to add a leased line connection that uses a frame relay connection to your Gateway.

Make sure that the page displays the button **Add a T1E1 frame relay PVC**, which is shown in Figure 28. If it does not, click **Frame Relay Configuration** in the first paragraph on the page in your SMG web.
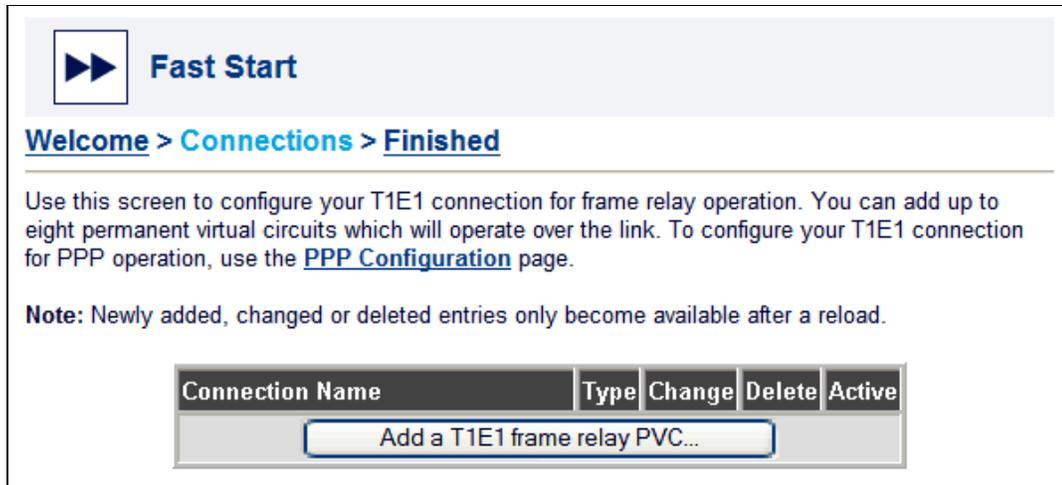
Figure 28: The Connections page

If the button is labelled **Add a T1E1 PPP connection**, the wrong connection page is displayed. You must click the text **Frame Relay Configuration**, which is shown in blue in the first paragraph on the page.

Click **Add a leased line Frame Relay PVC**.

The message 'Creating new leased line Frame Relay connection' appears. Then the Access a remote network using frame relay over Leased line page appears.

3.2.5 Specify connection parameters

Figure 29: Enter information about your frame relay connection on this page

Field name	Description
Connection name	Specify a descriptive name for your connection in this field. This name is used to identify the connection for maintenance functions such as connecting, disconnecting, and viewing connection statistics.
Data Link Connection Identifier	Enter the Data Link Connection Identifier (DLCI) number assigned to the virtual circuit in this field. Your service provider gives you this information.
Assign an IP address to this link	In some applications it may be necessary to assign a local and remote IP address to the connection. If IP addressing is required, select **yes**.Then click **Details** to display the Frame Relay IP Addressing window. Figure 30 shows the Frame Relay IP Addressing window.

Figure 30: The Frame Relay IP Addressing window

Field name	Description
Local IP address	Enter the IP address assigned to the Gateway's end of the connection in this field
Remote IP address	Enter the IP address assigned to the remote end of the connection in this field.
IP address mask	Enter the IP subnetwork mask in this field.
IP address translation enabled	IP address translation can be used to hide the devices on the local LAN by substituting the IP address of the originating device with the IP address of the router. To enable IP address translation, select **yes** from the drop-down list. Select **no** if you do not want to enable IP address translation. Click **OK** to close the IP Addressing window.

Field name	Description
PCM mode	From the drop-down list, select the type of line you use. Select **E1 mode** for an E1 line, and **T1 mode** for a T1 line.
Frame Format	Frame format is the data framing format that is used on the line. Your T1/E1 service provider will tell you which frame format to select.
Line Code	From the drop-down list, select the line code that is used for encoding data. Your T1/E1 service provider will tell you which code to select.
Speed	From the drop-down list, select the effective speed of your line. Your T1/E1 service provider will tell you which speed to select. You do not have to select a speed if the frame format is Transparent.

At this point, you can click **OK** to see the new or modified configuration listed on the Connections page.

However, if you need to configure additional network parameters, refer to section 3.2.5.1, 'Configure advanced network options'.

3.2.5.1 Configure advanced network options

You do not have to configure advanced options to activate your Gateway. You can skip this section if you are not familiar with advance network options or if your service provider has not given you advanced option settings.

The advanced options for frame relay let you configure a remote DNS server. If you need to configure a remote DNS server, click **Advanced** in the Access a remote network using frame relay over T1E1 page. The Advanced Options page appears.

Figure 31: The Advanced Options window for a frame relay connection

Type the address of the remote DNS server in the IP address of remote DNS server field.

Click **OK** to close the Advanced Options window.

Click **OK** on the Access a remote network using frame relay over T1E1 page. The Connections page appears, and the new connection is included in the connections table.

Figure 32: A new connection in the frame relay connections page

3.2.6 Save your configuration

You must reload the Gateway before you can use the new connection. Click **Next**. The first Finished page appears.
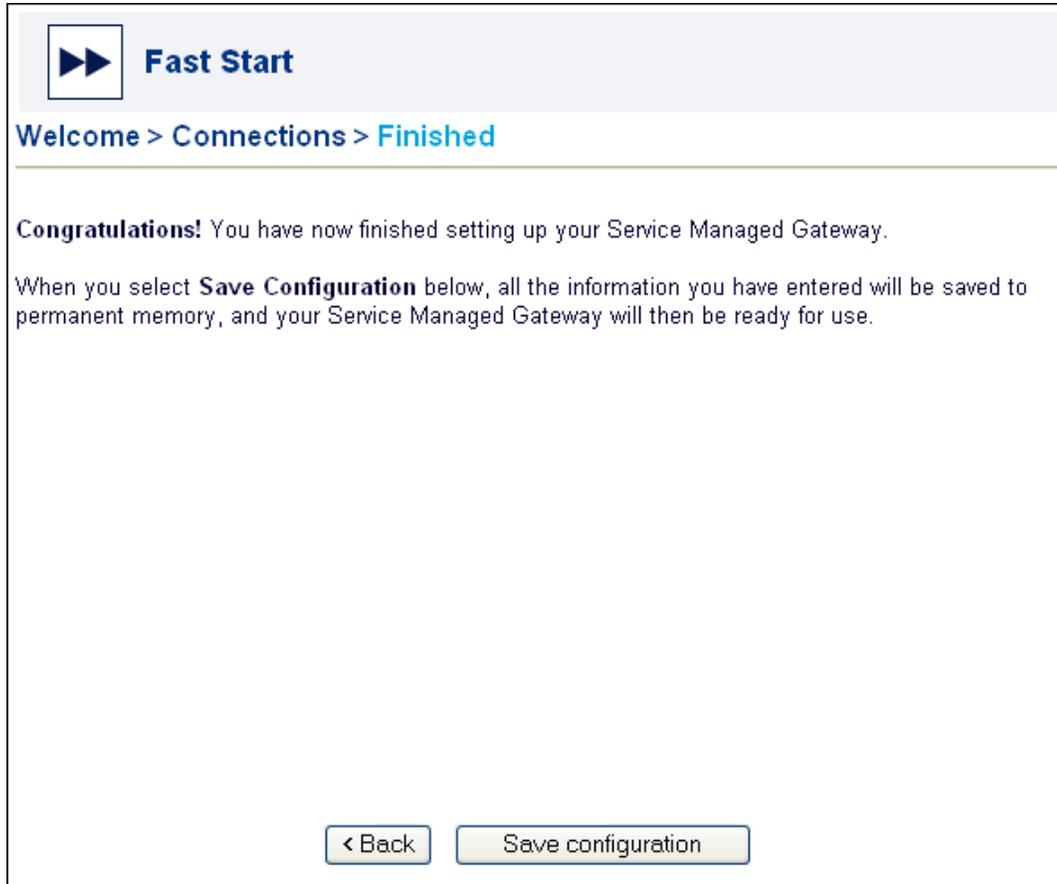

Figure 33: The first finished page for a frame relay connection

Click **Save Configuration** to keep the new configuration in your Gateway's permanent memory. When the Gateway reloads, it displays a page where you can test the connection and register your Gateway.
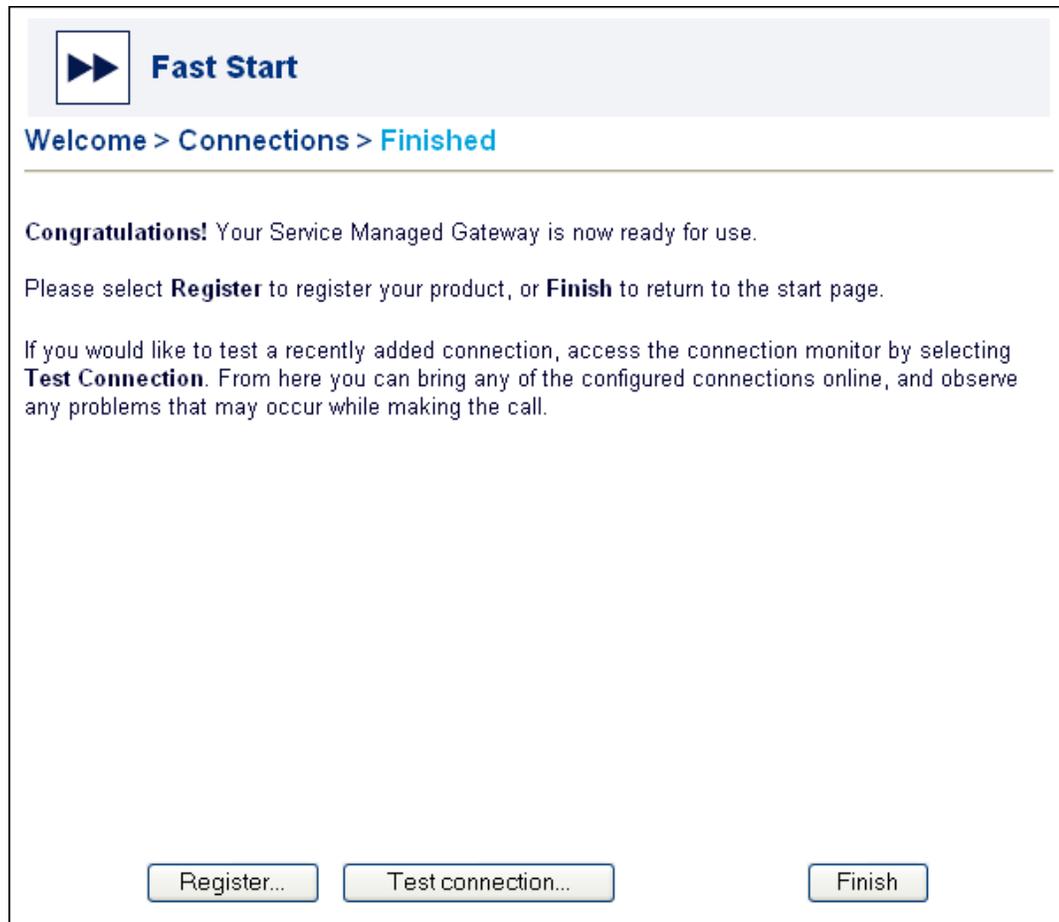
Figure 34: The second finished page for a frame relay connection

To register your product, click **Register**. A registration form appears. 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 it is configured correctly. Click **Test Connection** on the Finished page to open the Connection Monitor.
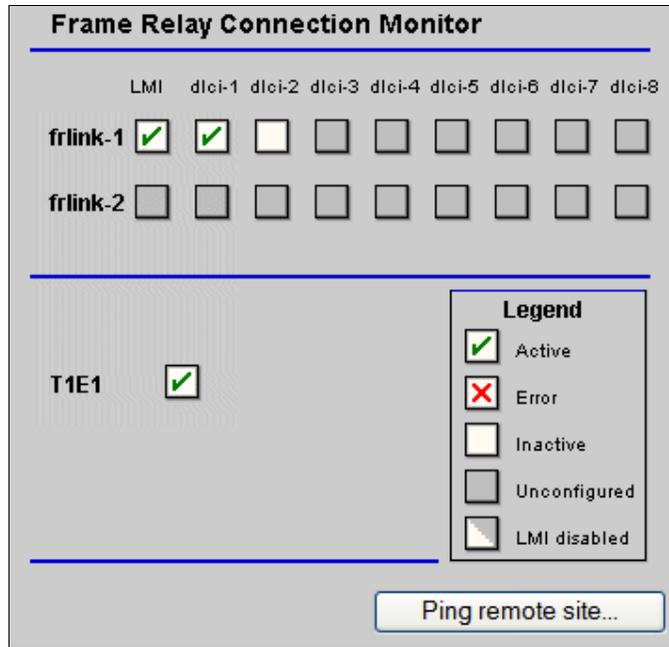
Figure 35: The Frame Relay Connection Monitor

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

On the Finished page, click **Finish**. You 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.

3.3 Modifying an existing T1 or E1 frame relay connection

To modify the configuration of an existing leased line frame relay connection, first click **Fast.Start**.

The Fast.Start **Welcome** page opens.
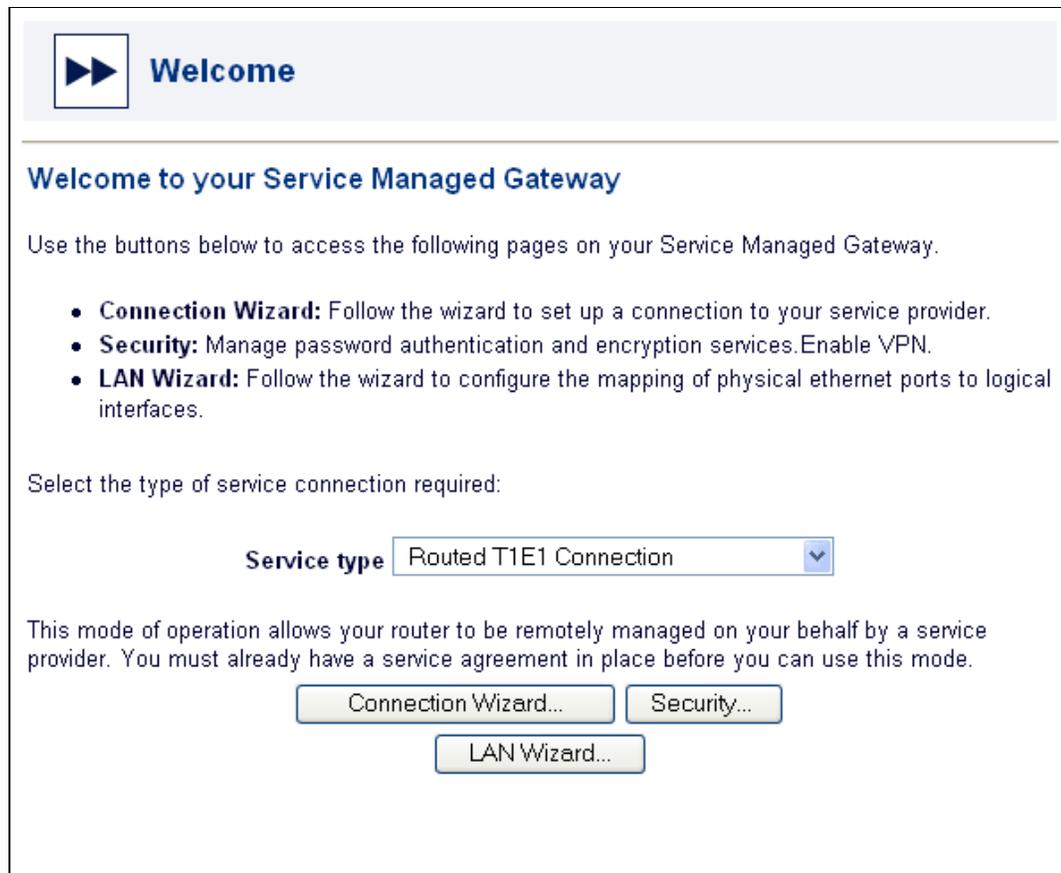
Figure 36: The Fast Start Welcome page

Make sure that **Routed T1E1 Connection** appears in the Service type field. Then click **Connection Wizard**. The Connections page appears

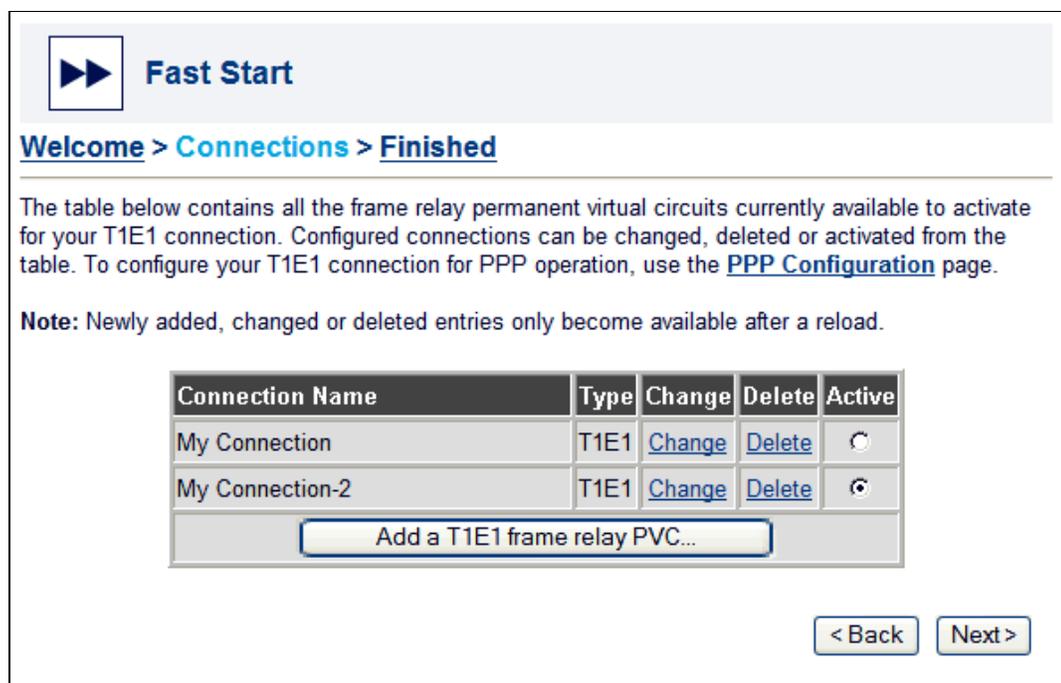The Connections page lists connections that are already configured on the Gateway.

Figure 37: The Connections page, which shows Connections that are already configured

Identify the name of the connection that you want to change. Then click the **Change** link in the same row.

The Access a remote network using frame relay over T1E1 page appears. It shows the current configuration for the connection. For information on how to change these configuration settings, read section 3.2.5, Specify connection parameters.

3.4 Removing a T1 or E1 frame relay connection

To delete an existing leased line frame relay connection, first click **Fast.Start**.

The Fast Start **Welcome** page opens.

Figure 38: The Fast Start welcome page

Make sure that **Routed T1E1 Connection** appears in the Service type field. Then click **Connection Wizard**. The Connections page appears.

The Connections page lists connections that are already configured on the Gateway.

Figure 39: The Connections page, which shows connections that are already configured

Identify the name of the connection that you want to delete. Then click **Delete** link in the same row.

A dialog box appears. Click **OK** if you want to delete the connection. Click **Cancel** if you do not want to delete the connection.

Figure 40: The dialog box that appears before you delete a connection