GateHouse AIS Provider Proxy - User Guide

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– software that connects

GateHouse AIS Provider Proxy Application
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1 Introduction

1.1 References

Reference Name	Comments
AIS Subscriber Proxy Installation Guide	Installation Guide for the GateHouse AIS Subscriber Proxy Application
AIS Provider Proxy Installation Guide	Installation Guide for the GateHouse AIS Provider Proxy Application
AIS Subscriber Proxy User Guide	User Guide for the GateHouse AIS Subscriber Proxy Application.

1.2 Definitions, Acronyms, and Abbreviations

Definition Name	Comments
AIS	Automatic Identification System
ASM	AIS Service Management
IEC Format	Refers to the following standards: IEC 61162-1, IEC/PAS 61162-100 and IEC/PAS 61162-101.
Subscriber Application	The Subscriber Application can be any type of software capable of understanding IEC format compliant AIS data. E.g. a database application storing data, a statistics program, or a chart application displaying the AIS information.
SSL	Secure Socket Layer. A commonly-used protocol for managing the security of a message transmission on the Internet. SSL is included as part of both the Microsoft and Netscape browsers and most Web server products.
TCP	Transmission Control Protocol. A communications protocol used to ensure data is received and transmitted properly.

1.3 Software Version

This user guide is for GateHouse AIS Provider Proxy v.1.2.1

1.4 About this Guide

The document at hand is the user configurations and operations manual for the Provider Proxy part of the land based AIS system supplied by GateHouse. Descriptions of how to install the proxy applications can be found in the GateHouse AIS Proxy Installation Guide.

This document is divided into five main sections:

- Chapter 2: A brief introduction to AIS technology and the suite of GateHouse AIS applications, in particular the distinctive features of the AIS Proxy applications and the functionalities associated with these.

- Chapter 3: Comprises a characterization of the "core concepts" of Provider Proxy, how the Proxy is started, and how the interface is structured.

- Chapter 4: Contains User Operations and common tasks such as logging on and logging off, changing passwords, and configuring the Provider Proxy.

- Chapter 5: Comprises a troubleshooting guide, where possible solutions to any misbehaviour in the Provider Proxy might be found.

This guide assumes that the appropriate GateHouse AIS components have been installed at your site.

Following conventions appear in this guide:

Symbol or Type Style	Represents	Example
Courier 11 + bold	A term used in the Proxy application	**Waiting to reconnect...**
Alternate color	Hyperlinks to online locations	http://www.gatehouse.dk/
Arial 11 + italic	Application paths, referring to a location in the Start Menu	*Programs - GateHouse - Provider Proxy*
Arial Unicode MS 10	File paths, referring to a location on the hard drive	C:\Program Files\GateHouse\Provider Proxy\
Courier New 9,5	File names	proxy_serverlist.ini

1.5   Target Group

The AIS Proxy applications are intended for users of the AIS system, including administrators, as well as technical support staff. The users of the AIS system are recommended to read sections 2 and 3 carefully, whereas technical support staff is recommended to read every section of this manual.

Please note that this guide contains instructions on how to configure the Provider Proxy. Because this can be a very complex task, it is recommended that it is carried out by qualified IT support personnel.

1.6   Acknowledgements

This product includes software developed by the OpenSSL Project for use in the OpenSSL Toolkit (http://www.openssl.org/) Copyright (c) 1998-2004 The OpenSSL Project. All rights reserved.

2   Overview

AIS is a VHF transponder-based communication system allowing participants to track each other and communicate through an AIS network. The AIS network is designed for automatic data communication between vessels, and between vessels and shore stations. AIS transponders (base stations) broadcast data on shared channels, and the data is received by all other transponders within VHF range, including transponder-equipped vessels (ship stations) and base stations located on shore.

According to the International Convention for the Safety of Life at Sea (SOLAS), the majority of maritime traffic are required to carry AIS equipment since 2004. Thus, authorities globally monitor traffic in their territorial waters using AIS technology.

2.1   AIS Data

The land based AIS system sends and receives data such as:

- MMSI number
- Call sign and name
- IMO number
- Length and beam
- Type of ship
- Location of position-fixing antenna on the ship
- Position with accuracy indication and integrity status
- Time in UTC
- COG (course over ground)
- SOG (speed over ground)
- Gyro heading (if interfaced)
- Navigation status
- Rate of Turn
- Ship's draught
- Hazardous cargo type
- Destination and ETA (at Master's discretion)
- Safety related messages (reading and writing)

2.2   GateHouse AIS System

The suite of GateHouse AIS Server applications can be used to gather the vast amounts of AIS data and present these to end users in various forms. The three main GateHouse AIS Server applications are the System Configuration Tool (Sys Conf), the User Configuration Tool (User Conf) and the System Monitoring Tool (MON). This User Guide is, however, focused on operations in relation to the AIS Provider Proxy. The Provider Proxy application is a utility for AIS clients to logon to the AIS system in order to provide data.

2.3 GateHouse AIS Proxy

The purpose of the GateHouse AIS Proxy applications is to encapsulate the transfer of data in the IEC format specified for AIS data, and handle additional services such as authentication and distribution of status information.

The GateHouse AIS Proxy is capable of two different operation modes, receive or transmit data from/to an AIS Server. These different operation modes translate into two distinct proxy applications:

- The Subscriber Proxy

- The Provider Proxy

NB! Both proxy applications utilize the SSL protocol when receiving and transmitting AIS data, in order to manage the security and integrity of these data being distributed via the Internet.
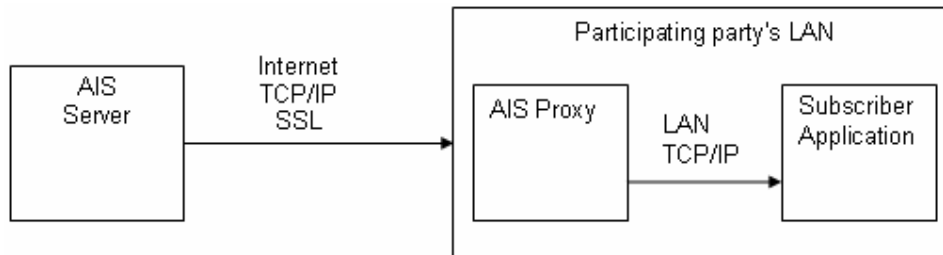
2.4 Subscriber Proxy

Figure 1: System Overview (Subscriber Proxy – Receive Data)

As shown in Figure 1, the Subscriber Proxy is physically positioned in the subscriber (client) computer network. The Subscriber Proxy allows subscriber applications to receive data from the AIS system in the IEC format.
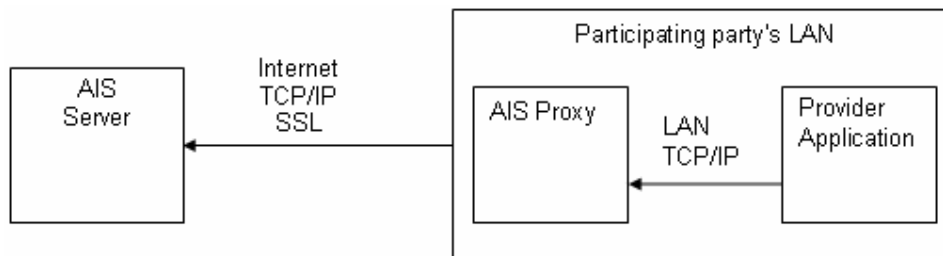
2.5 Provider Proxy

Figure 2: System Overview (Provider Proxy – Transmit Data)

Similarly, the Provider Proxy is positioned in the (client) computer network. This is illustrated in Figure 2. However, the Provider Proxy allows provider applications to transmit data to the AIS system in the IEC format.

2.6   AIS Provider Proxy Functionality

The functionality of the AIS Provider Proxy application can be divided into the following four sections:

- **User Authentication Interface**
  As the system only allows authenticated users to access the data, the proxy presents a user interface where it is possible to enter the user name and password used for the authentication. The information is sent to the AIS server which does the actual authentication and assesses whether the user is allowed to receive AIS data.

- **Seamless Server Handover**
  To ensure continuity in the stream of data in the event of an AIS server breakdown, the proxy will automatically and seamlessly (it will not require any user interaction) connect to another AIS server (if available). The effect obtained is that the only thing the user will notice is a small gap in the data flow. The handling of the AIS server addresses is done at the AIS server. When the Provider Proxy is installed it must be configured with a predefined list of IP Adresses of AIS servers which the proxy can connect to. This list is supplied by staff at the AIS Control Center.

- **Security**
  Because user name, password and AIS data are transmitted over the Internet, it is important that they are protected (encrypted). The encryption is handled with SSL. It is worth noting that the proxy will try to connect to an AIS server on a predetermined port. This port must be open on the firewall guarding the AIS server. But if there is another firewall between the local computer running the proxy and the AIS server, this port has to be opened too.

- **Control Update Speed**
  It is possible to control to decide how often AIS data should be transmitted .This is especially useful when using the system on a computer with limited network bandwidth. The update speed ranges from real time (as soon as the information becomes available on the AIS server) to a user defined interval in seconds.

2.7   Target Group

The AIS Proxy applications are intended for users of the AIS system, including administrators, as well as technical support staff. The users of the AIS system are recommended to read sections two and four carefully, whereas technical support staff is recommended to read every section of this manual.

Please note that this guide contains instructions on how to configure the Provider Proxy which is capable of understanding IEC format compliant AIS data. As an example, a database application storing data, a statistics program, or a chart application displaying the AIS information.

As this can be a very complex task, it is recommended that it is carried out by qualified IT support personnel.

3 Getting Started

3.1 Starting the Provider Proxy

Start the application by clicking Provider Proxy in Start Menu under the menu folder *Programs - GateHouse - Provider Proxy:*

Figure 3: Starting the Provider Proxy

To use the system, a valid user name and password are required. To enhance security in the system, it is required that the user must change password at first logon. The process of changing a password is described in section 4.1.

3.2 Interface Description

3.2.1 User Interface

The Provider Proxy UI consists of a simple three-tabbed interface, which primary function is to let you logon to an AIS Server. Besides this primary function, the interface also allows for some configuration of the logon procedure as well the provider mode. In short, the UI consists of:

    Logon tab
    Settings tab
    Provider tab.

When starting the Provider Proxy UI, the logon tab is selected by default:

Figure 4: Starting the Provider Proxy UI

3.2.2   External Interface

For the Provider Proxy application to be able to communicate with AIS servers at the AIS Control Center, information about AIS Server IP addresses must be supplied to the respective proxy application. This information is stored in a local configuration file called:

    proxy_serverlist.ini.

By default, the Provider Proxy will connect to an AIS server, and start listening on a predetermined port and IP address, listed in this file. The file is placed in the directory:

    C:\Program Files\GateHouse\Provider Proxy\

Locate and edit this file if you wish to edit port and IP details of the default AIS server the Provider Proxy application connects to.

Editing port details in configuration files can be a very complex task, and we recommend that only qualified IT support personnel carry out the task.

4 User Operations

4.1 Changing Passwords

Change of password is done from the Provider Proxy UI Settings tab.
The following requirements apply for passwords:

- It must be at least 8 characters long.
- It must contain both uppercase and lowercase characters.
- It must contain a number character i.e. 0 1 2 3 4 5 6 7 8 9.
- It must contain a special character i.e.! " # % & / ( ) etc.
- It must be different from the previous 10 passwords used.

Note: You must be logged on to an AIS Server before you can change password. This is because all AIS system user accounts and passwords are managed remotely on the AIS Server(s). If your password has expired you will automatically be prompted to change password when logging on.

The procedure for changing password is as follows:

1) Start the Provider Proxy as described in section 3.1.

2) Select the Settings tab and click the Change Password button, which causes the Change Password dialog box to open.
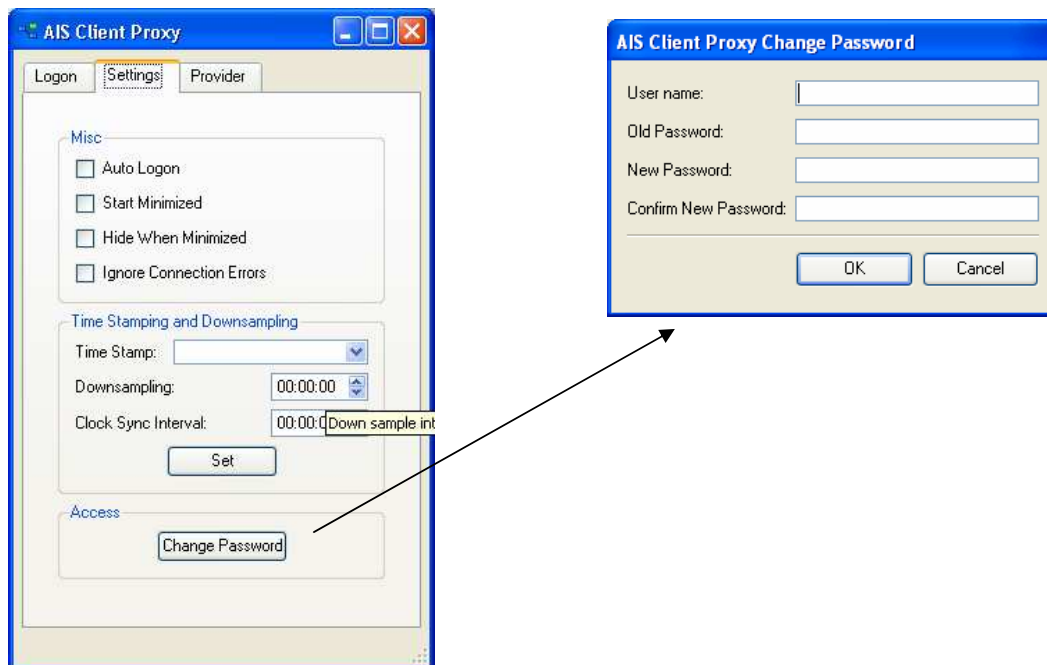
Figure 5: Change Password

3) In the User name field, enter the user name.

4) In the Old Password field, enter the old password.

5) Enter a new password in the New Password field according to the password requirements listed above and repeat the same password in the Confirm New Password field.

6) Click the OK button.

7) When the password has been changed, a confirmation window is displayed.

4.2   Logon/Logoff

Logon/Logoff processes are naturally controlled through the Logon tab in the Provider Proxy UI.

When the Provider Proxy is started, it will display a logon window as shown in Figure 6.

Figure 6: Logon Window

To log on, enter the user name and the password, then click the Logon button.
When the user has been successfully logged on, the logon window changes appearance as shown in Figure 7. Refer to section 5.1 if logon fails.
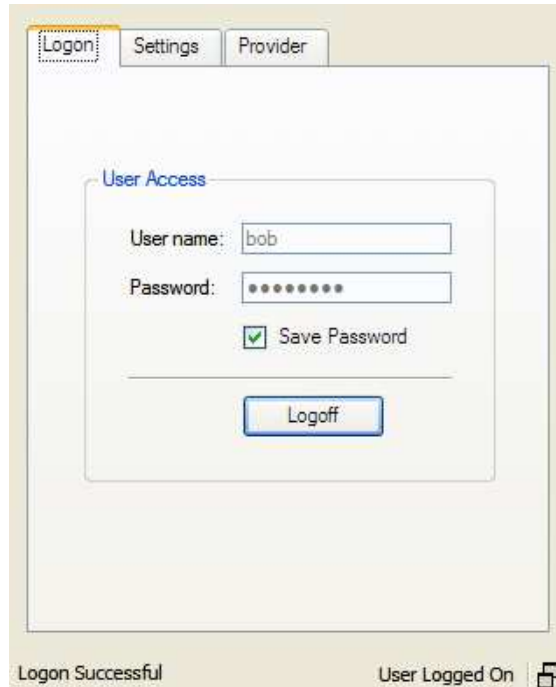
Figure 7: Logon Window - when logged on

It is possible to make the proxy application save the password (and user name) so that the next time the proxy is started there is no need to enter it again. This feature is enabled by clicking the Save Password box under the Password field. Please note that the username and password are only saved if they have been validated against the AIS server.

To close the connection to the AIS server and log the user off again, click the Logoff button.

4.2.1   Logon State

To help monitor the connection to the AIS server, the Provider Proxy has a connection indicator, which is represented by the icon in the lower right corner of the window. This can be one of 5 different icons, each indicating a different state:

- The proxy is disconnected from the AIS server.
- The proxy is connected to the AIS server.
- The proxy is receiving data from the AIS server.
- The proxy is transmitting data to the AIS server.
- The proxy is receiving and transmitting data to the AIS server.

Now that a connection to the AIS server has been successfully established, it is time to transmit some AIS data. This is achieved by configuring the Provider Proxy to create a connection to the proxy. This process will be explained in the following section.

4.3   Configuring Settings

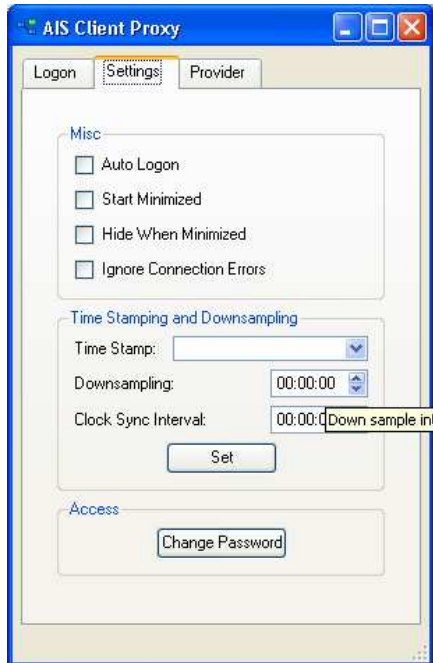The Settings pane illustrated below, allows configuration of the proxy.

Figure 8: Provider Settings

- **Auto Logon**: Indicates that the proxy will attempt to automatically logon the user when it detects that a provider application connects to it. Thus, the Auto Logon is activated by any provider application trying to connect to the proxy. Please note that it requires the "Save Password" on the "Logon" page is enabled.

- **Hide When Minimized**: Indicates that the application is removed from the task bar when minimized. Instead an icon is placed in the task tray as shown below:

Figure 9: Examples of appearances of the Task Tray Icon

The appearance of the icon changes to reflect the status of the proxy, as described in Section 4.1.

To open the window again, left-click on the icon.

- **Start Minimized**: Indicates that the application will start in the minimized state.

- **Ignore Connection Errors**: Indicates that the proxy should not stop trying to connect when it encounters a problem with the network connection, when they are of minor importance, such as a network connection being lost for a short period of time.

- **Time Stamp**: This indicates the time stamping method currently used. There are three different methods:

  - No timestamping: No time stamps are added to the AIS data.
  - BS (failover to server): Time stamps are added to the AIS data based on the time received in Base Station reports in the AIS data stream. If a Base Station report with an invalid time stamp is received the AIS server time (see the Clock Sync

Interval below) is used to time stamp messages until a Base Station Report with a valid time stamp is received again.

- o BS (failover to no time stamp): Time stamps are added to the AIS data based on the time received in Base Station reports in the AIS data stream. If a Base Station report with an invalid time stamp is received the AIS server time no timestamps will added until a Base Station Report with a valid time stamp is received again.

- **Down Sampling** [in seconds]: Can be used to reduce the amount of data transmitted to the AIS system. Each ship typically sends a position report every 6 seconds. The proxy down sampling interval can be reduced to e.g. a 6-minute interval (360 seconds) between transmissions, thus reducing the amount of information transmitted. This will drastically reduce the load on the Internet connection. All events are still transmitted. It is only the position reports that are down sampled.

- **Clock Sync Interval:** Indicate how often the proxy will calculate the clock skew relative to the AIS server when connected.

The system is constructed so that staff at the AIS Control Center is able to set a minimum down sample interval. Users of the Provider Proxy application can specify a larger down sample interval, but not lower than the one defined by the staff at the AIS Control Center.

4.4 Selecting Provider Mode

4.4.1 Configuring Client Mode

Figure 10: Provider in Client Mode

In client mode the provider proxy will connect to a specified IP/Port address (as shown in Figure 10) where the provider application is running.
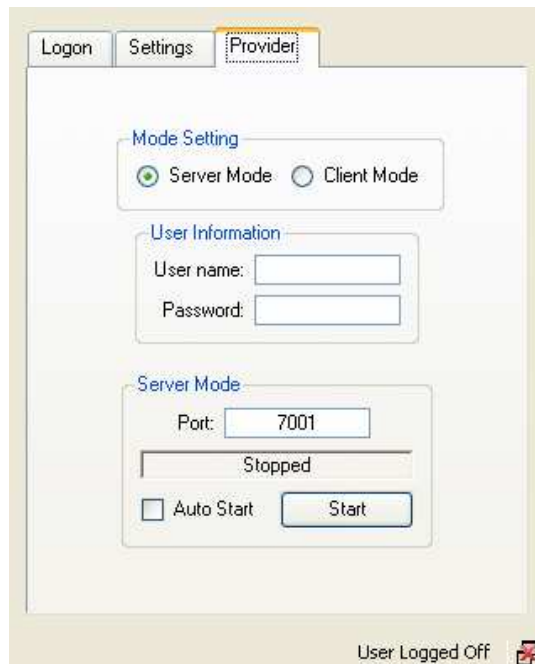
To make the client connect to the provider application first enter the IP address of the computer where the provider application is running, this is done in the field labelled "Host address:". Please note that it is only possible to enter an IP address and not a host name. Enter the port number where the provider application is listening in the field labelled "Port:"

Click the "Connect" button to connect to the computer running the provider application. The status line will change from **Disconnected** to **Connecting**, and when the connection is established the status will be **Connected**. In the event that there is not any reply on the address specified, the status will change to **Waiting to reconnect**, after 3 seconds another attempt to connect will be made. This will continue until either a connection is established or the "Cancel" button is clicked.

By selecting the "Auto Connect", the provider proxy will connect to the address specified when the proxy program is started.

Depending on the configuration of the proxy, it might also offer the option to send a user name and a password to the provider application, as shown in Figure 10.

4.4.2   Configuring Server Mode

Figure 11: Provider in Server Mode

In server mode the provider proxy will open a TCP socket and wait for a connection from the provider application, as shown in Figure 11. Data from the provider application is forwarded to the AIS server by the Provider Proxy.

To start the server listening for a connect signal from the provider application, click the "Start" button. The status line will change from **Stopped** to **Listening**, and when a connection with the provider application is established the status will change to **Connected**.

By changing the number in the field labelled "Port:" the provider proxy will listen on the specified port. Please note that it is only possible to change the port number when the server is in the stopped state.

By selecting the "Auto Start", the provider proxy will start listening for a provider application when the proxy program is started.

Depending on the configuration of the proxy, it might also offer the option to send a user name and a password to the provider application, as shown in Figure 11.

5   Troubleshooting

If you are experiencing issues with the Provider Proxy program, try closing it and starting it again. If the problem persists, the following sections might provide you with a solution to the problem.

If the problem could not be resolved and you need to report it to the system administrator, be sure to always include the error code in the report.

5.1   Logon Fails

5.1.1   Invalid User Information

If logon fails, when entering user name/password and clicking the "Logon" button, instead of being logged on, you may see the window shown in Figure 12:
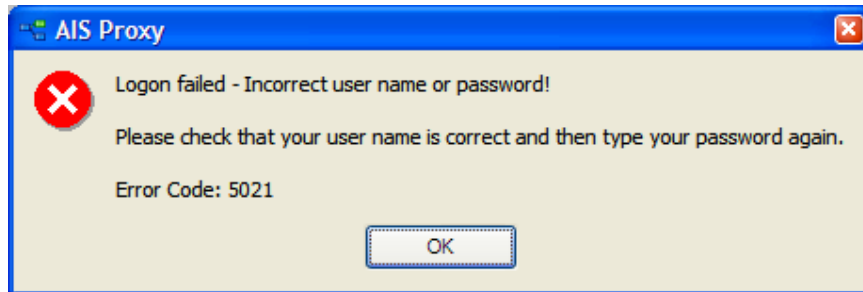

Figure 12: Failed logon popup

This window indicates that the user name or password have been entered incorrectly. Make sure that caps lock is not enabled; type the user name and password again, and then try logging on.

Note that failing to enter the correct password for the same user name three times will disable the user account, and can subsequently only be enabled again by staff at the AIS Control Center.

If the problem persists, contact your system administrator for additional help to solve the problem.

5.1.2   Expired Password

Also, a failed logon attempt may result in the popup window shown in Figure 13.

Figure 13: Expired password popup

In this case, the password needs to be changed before the user can log on. Please refer to section 4.1 for details on how to change the password.

5.1.3   No Network Connection

If the proxy was unable to establish a connection to any of the known AIS servers, it will display the popup window shown in Figure 14.

Figure 14: Unable to establish a connection

The problem indicates that there is no working internet route to the AIS servers. Contact your system administrator and make sure that your local firewall is not blocking the connection. A full list of the IP addresses and port numbers, which the proxy must be capable of connecting to, is available in the `proxy_serverlist.ini` file. The file is located in the directory, where the proxy is installed, as described in section 3.2.2.

5.2   Clicking the Logon button opens an SSL Error Popup Window

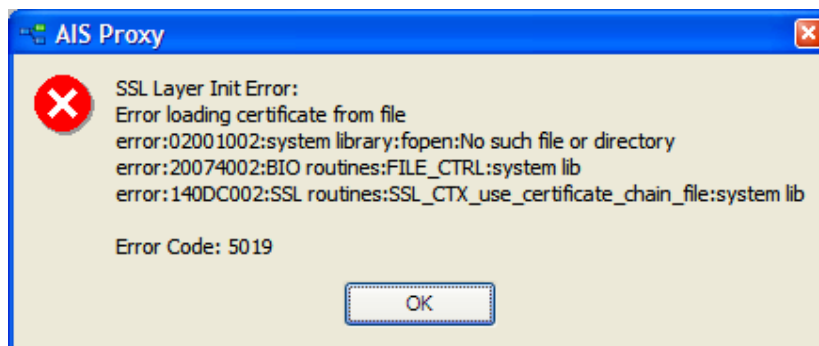The SSL error popup window is shown in Figure 15.

Figure 15: SSL error popup

This is because the `client.pem` file is missing from the proxy directory.

For instructions on how to configure this correctly, refer to the AIS Proxy Installation Guide.