DataFlux Secure Administrator's Guide

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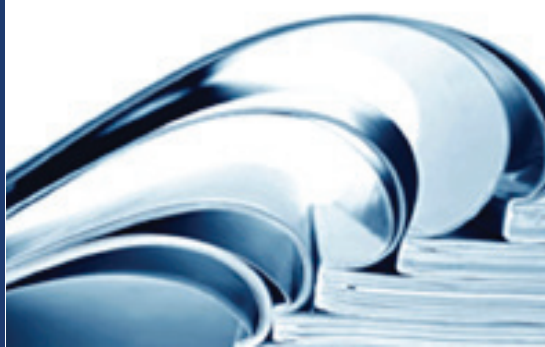

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DataFlux Secure

Administrator's Guide

Version 2.3

Applies to:
DataFlux Authentication Server 3.1
DataFlux Federation Server 3.1
DataFlux Data Management Server 2.3
DataFlux Data Management Studio 2.3

July 31, 2012

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This product includes the Web Services Description Language for Java Toolkit 1.5.1 (WSDL4J). The WSDL4J binary code is located in the file wsdl4j.jar.

Use of WSDL4J is governed by the terms and conditions of the Common Public License Version 1.0 (CPL). A copy of the CPL can be found here at http://www.opensource.org/licenses/cpl1.0.php.

Table of Contents

Introduction

Accessibility

The DataFlux Secure software includes features that improve usability of the product for users with disabilities. These features are related to accessibility standards for electronic information technology that were adopted by the United States (U.S.) Government under Section 508 of the U.S. Rehabilitation Act of 1973, as amended.

If you have questions or concerns about the accessibility of DataFlux products, send an e-mail to techsupport@dataflux.com.

Audience for this Guide

The primary audience for the *DataFlux Secure Administrator's Guide* consists of administrators who manage network servers, network security, and network authentication. The secondary audience for this document consists of managers who need to understand how DataFlux Secure is applied to the DataFlux Data Management Platform.

Conventions Used In This Document

This document uses several conventions for special terms and actions.

Typographical Conventions

The following typographical conventions may be used in this document:

Bold	A bold font represents the literal names of items that are displayed the graphical user interface.
italic	An italic font indicates non-literal, variable, or user-defined text, for subjects such as version numbers or option values.

Path Conventions

In code examples in this document, the installation path of a component of the DataFlux Data Management Platform is represented by the term *install-path*, as shown in this example:

```
install-path/bin
```

The installation path depends on the operating environment, as shown in the following typical examples:

Windows XP

```
drive:\Program Files\DataFlux\AuthServer\instance-name
```

Windows 7

```
32-bit-drive:\Program Files (x86)\DataFlux\AuthServer\instance-name
```

```
64-bit-drive:\Program Files\DataFlux\AuthServer\instance-name
```

UNIX and Linux

```
/opt/dataflux/authserver/instance-name
```

The *instance-name* is specified when you install the server. The default instance name is either server1 or client1.

Reference Publications

DataFlux Authentication Server Administrator's Guide
DataFlux Federation Server Administrator's Guide
DataFlux Data Management Server Administrator's Guide
DataFlux Drivers for ODBC and JDBC User's Guide
DataFlux Data Management Studio Installation and Configuration Guide
DataFlux Data Management Studio User's Guide

Documentation provided with this software is located in the installation folder for DataFlux. For example, C:\Program Files\DataFlux\AuthServer*instance-name*.

Many of the documents listed can be found on the MyDataFlux Portal at http://www.dataflux.com/Resources/DataFlux-Resources/MyDataFlux-Portal.aspx under **Documentation**.

Overview of DataFlux Secure

Features and Scope

The DataFlux Secure software provides three features for the clients and servers of the DataFlux Data Management Platform:

- High-assurance AES encryption and decryption
- Secure Sockets Layer protection for connections that use the HyperText Transfer protocol (HTTP)
- Optional compliance with the Federal Information Processing Standard (FIPS 140-2)

DataFlux Secure is implemented as follows on the DataFlux Data Management Platform:

Platform Component	Description	Secure Features Used
DataFlux Authentication Server	Authenticates Data Management Studio users and platform services using native authentication providers in multiple domains. The server also maintains a database of users, groups, domains, logins, and shared logins. The database is queried by platform servers for authorization to local services and data.	Uses AES encryption for passwords and to communicate with platform servers. Can use SSL to communicate with SSL-enabled authentication providers. FIPS compliance is also a selectable option.
DataFlux Data Management Server	Runs jobs and services created in Data Management Studio, stores job output and data collections, and implements access controls for data, jobs, and services.	Uses AES encryption for passwords and to communicate with platform servers. Can use SSL to communicate with non-platform clients.
DataFlux Data Management Studio	Enables the creation of jobs and services that run on Data Management Servers. Administers Authentication Servers and Data Management Servers. Displays information about data sources on Federation Servers.	Uses AES encryption for passwords. Can use SSL to communicate with SSL-enabled Data Management Servers.
DataFlux Federation Server	Provides centralized access to data that is collected from databases across your enterprise.	Uses AES encryption for passwords and to communicate with platform servers. Non-platform clients can securely connect to data sources using the

Platform Component	Description	Secure Features Used
		DataFlux drivers for ODBC and JDBC. FIPS compliance is also a selectable option.
Federation Server Client	Provides the DataFlux drivers for ODBC and JDBC, which enable your applications to connect to Federation Servers. Also provides the ASBATCH utility, which administrators use for batch updates of the Authentication Server database.	These client components use AES and FIPS compliance as needed to communicate with similarly configured Federation Servers and Authentication Servers.
DataFlux Federation Server Manager	Provides a Web interface to create and update data sources and to provide access control.	Uses AES to communicate with the Federation Server and the Authentication Server.

AES

The AES (Advanced Encryption Standard) encryption algorithm is implemented in DataFlux Secure with 256-bit keys. AES is used to encrypt and decrypt passwords that are stored on disk. AES is also used to encrypt and decrypt network communication between platform servers. and clients.

The tools dfsadmin and df_cryupt generate AES-encrypted passwords for data source names (DSNs) that are created for the DataFlux drivers for ODBC and JDBC. The tools can also be used to encrypt the password that is use by the ASBATCH utility. ASBATCH needs credentials to run batch updates of the Authentication Server database. For more information about ASBATCH, see the *Authentication Server Administrator's Guide.*

The encryption tools are installed with the Federation Server. To use the tools, refer to the *Federation Server Administrator's Guide*.

SSL

Support for Secure Sockets Layer (SSL) connection protection is the second feature of the DataFlux Secure software. SSL uses private-key encryption and signed digital certificates to protect connections that have an HTTPS address. DataFlux Secure uses SSL to protect the following connections:

- Authentication Server connections to SSL-configured authentication providers such as Active Directory or LDAP.
- Data Management Server connections to your SSL-enabled SOAP applications.
- Data Management Studio connections to SSL-enabled Data Management Servers.

FIPS

This third feature of the DataFlux Secure software enables you to run your Federation Servers and Authentication Servers in compliance with FIPS 140-2. This Federal Information Processing Standard helps your company meet the security requirements of certain businesses and governmental entities.

FIPS compliance is also implemented in the Secure versions of the Federation Server Manager and the Federation Server Client. In the client package, the DataFlux drivers for ODBC and JDBC and the ASBATCH utility are all FIPS-compliant.

FIPS compliance prevents servers from connecting directly with clients that are not FIPS-compliant. If your Authentication Server and Federation Server are enabled for FIPS compliance, then your instances of Data Management Studio and Data Management Server software need to connect to those server with the DataFlux drivers for ODBC or JDBC.

For further information about FIPS 140-2, refer to the document Security Requirements for Cryptographic Modules.

Implementation

DataFlux Secure is installed as a series of dynamic linked libraries. DataFlux Secure does not provide a graphical user interface or run any daemon processes.

DataFlux Secure is distributed in software packages that are separately named and licensed to accompany individual components of the Data Management Platform.

DataFlux Secure is intended to be installed on all of the instances of Data Management Studio, Authentication Server, Federation Server, and Data Management Server in your enterprise. SSL is configured where you need it.

Each installed instance of DataFlux Secure has its own configuration topic in this document. The only configuration process of any consequence involves SSL.

AES: How it Works

When you install DataFlux Secure, you encrypt the transmission of all logins. AES uses public and private keys to encrypt and decrypt logins. The length of the keys is a strongly protective 256 bits. For connections between external SOAP clients and Data Management Servers, AES encryption can use keys with 128, 192, or 256 bits.

AES is used between the Authentication Server and the Federation and Data Management servers. AES is also used between Data Management Studio and the Authentication Server.

Without AES encryption, SASPROPRIETARY encryption is used by default, with a maximum key length of 56 bits.

With AES, any passwords that are stored on disk are stored in encrypted form using the 256-bit cipher.

Passwords are not displayed in the Studio interface.

The process of encryption for network transmission takes place as follows in this typical example. When you connect to a Federation Server from Data Management Studio, the login that you submit is encrypted before it is transmitted. The Federation Server then sends the encrypted login to the Authentication Server for authentication. A similar process is used when Studio users connect to Data Management Servers.

SSL: How it works

When DataFlux Secure is installed on Authentication Servers, SSL encrypts and decrypts communication between the Authentication Server and any LDAP or Active Directory authentication providers that also use SSL.

When DataFlux Secure is installed on a Data Management Server, SSL is used to communicate with Data Management Studio and with enterprise SOAP clients.

To access a Data Management Server using SSL, a SOAP client sends an HTTPS request to the server. At that point, the server negotiates with the client to select a cipher (encryption method). The cipher that is selected will be the first match between the ciphers that are supported on both the client and the server. All subsequent data transfers for the current request will then be encrypted with the selected encryption method.

Install and Configure

Installation Notes

DataFlux Secure is delivered in separate packages that accompany a paired instance of a component of the Data Management Platform. Each component has its own installation instructions. Use these notes in conjunction with the installation information that is provided with your particular component.

Follow these steps to install DataFlux Secure across your enterprise:

1. Contact your sales representative and let them know you are interested in DataFlux Secure. DataFlux will explain the relevant legal restrictions and eligibility requirements.
2. For each platform component, receive an install package and an accompanying Secure install package. Also receive one license for each component, and one Secure license for each component.

   Note: To simplify installation, be sure to have your license numbers available before you begin. If you obtain license numbers after you install, or if you obtain your software from SAS and you need a SETINIT, then refer to the licensing information for your platform component.
3. Replace any current license files with new license files.
4. For components that were previously installed, copy any README files that you wish to retain. README files are overwritten when you install new versions.
5. Backup the databases on your Authentication Servers and Federation Servers, as described in the respective administrator's guides.
6. Stop any active instances of your platform components before you install new versions.
7. Install the platform component using that component's installation information.

   Note: Do not uninstall any older version of your client or server until you configure and test your new software.

8. In Windows, install the version of DataFlux Secure that applies to the platform component by executing the following installation program:

   ```
   dmpversion-component-secure-winbit.exe
   ```

   Where `version` is 23, 31 or similar, and where `bit` is 32 or 64, as shown in the following example:

   ```
   df31-as-secure-win32.exe
   ```

9. In UNIX or Linux, to unzip and tar DataFlux Secure, change to the install directory of the network component and enter the following command:

   ```
   gzip -c -d path-to-gzip/dmpversion-product-secure-platform.tar.gz | tar xvf -
   ```

   Where:

path-to-gzip	is the path to the install image
version	is a version number such as 23 or 31
product	is the product name as specified in the initial install
platform	is the operating system name, which can be:
	`sol64` Solaris
	`solaris-x64` Solaris
	`lin64` Linux
	`hpux-i64` HP/UX
	`aix64` AIX

   Here is a typical example:

   ```
   gzip -c -d /opt/depot/dmp/dmp31-AuthServer-secure-sol64.tar.gz | tar xvf -
   ```

10. In Windows, if you plan to use SSL on your platform component, then download the OpenSSL software. OpenSSL is available from several suppliers, any of which are suitable for use with DataFlux Secure. One such supplier can be found at this Web site:

    http://www.slproweb.com/products/Win32OpenSSL.html

    Note: Do not uninstall any older version of your client or server until you configure and test your new software.

    In the UNIX and Linux operating environments, OpenSSL is delivered as part of the kernel.

11. Refer to the relevant configuration topic to configure DataFlux Secure.

12. Repeat the installation steps for your other platform components. For Windows components that will implement SSL, you can copy the DLL files for OpenSSL from a previous component.

13. Start your clients and servers.

14. Replace existing passwords to store them with AES encryption.

Configure Data Management Studio

The DataFlux Secure software is required to be installed with Data Management Studio when that client connects to secured servers in the Data Management Platform. The secured servers at your site can include the Data Management Server, the Federation Server, and the Authentication Server.

Data Management Studio requires the use of SSL when that client communicates with a Data Management Server that uses SSL. To configure SSL on a client host, you can copy the SSL libraries from the Data Management Server. Another alternative is to install OpenSSL as described in the Installation Notes.

>  Note: In Studio, when you define your SSL-enabled Data Management Server (in the Management Server window), make sure that the Server field contains an HTTPS address, rather than the name of the network host.

When Data Management Studio needs to connect to a Federation Server or Authentication Server that is enabled for FIPS compliance, you need to configure Studio to communicate with the a DataFlux driver for ODBC or JDBC, rather than using a direct platform connection. For further information on the drivers, see the *DataFlux Drivers for ODBC and JDBC User's Guide*.

The configuration files for Data Management Studio are not affected by the installation of DataFlux Secure.

Configure Data Management Server

Overview

When configured with DataFlux Secure, the Data Management Server uses AES encryption as needed to increase security for proprietary interprocess communication with the clients and servers of the Data Management Platform.

To add security to connections with external clients, the Data Management Server can be configured to use the Single Sockets Layer. When configured with SSL, the Data Management Server uses SSL exclusively. Non-SSL communication is rejected.

Configure Access to FIPS-Compliant Servers

Federation Servers and Authentication Servers with DataFlux Secure can be enabled for compliance with FIPS 140-2. If your Data Management Server needs to connect to a FIPS-enabled server, then the Data Management Server needs to connect with a DataFlux driver, either ODBC or JDBC. Standard platform connections cannot be made when you enable FIPS compliance. For further information on the drivers, see the *DataFlux Drivers for ODBC and JDBC User's Guide*.

Configure SSL

Follow these steps to configure SSL on your Data Management Server:

1. If the Data Management Server is running, then stop the server.
2. Open the configuration file dmserver.cfg.
3. Add the following option to enable SSL (required):
   ```
   DMSERVER/SOAP/SSL = YES
   ```
   Enter a value of NO to disable SSL on the Data Management Server.
4. To identify a key file and password, add these two options:
   ```
   DMSERVER/SOAP/SSL/KEY_FILE = path-to-key-file
   DMSERVER/SOAP/SSL/KEY_PASSWD = encrypted-password-for-key-file
   ```
   Client authentication is required with SSL.
5. To identify trusted certificates (if you use certificates):
   ```
   DMSERVER/SOAP/SSL/CA_CERT_FILE = trusted-certificates-filename
   DMSERVER/SOAP/SSL/CA_CERT_PATH = path-to-trusted-certificates-file
   ```
6. Save and close the configuration file.
7. Start the Data Management Server.

Configure Federation Server

Enable AES and FIPS on Windows

After you install a DataFlux Federation Server with DataFlux Secure, you select one shortcut to enable AES encryption and another shortcut to enable AES encryption and compliance with FIPS 140-2.

With the server stopped, double-click the following shortcut to enable AES encryption **with** FIPS compliance:

```
install-path/Set Security - FIPS
```

Note: Enabling compliance with FIPS 140-2 requires that Data Management Studio, Data Management Server, and Web Studio use the DataFlux drivers for ODBC or JDBC to communicate with the Federation Server.

Note: Enabling AES encryption on a Federation Server requires that you also enable AES encryption on all associated instances of Authentication Server, Data Management Server, and Data Management Studio.

To enable AES encryption **without** enabling FIPS compliance, double-click the following shortcut:

```
install-path/Set Security - AES
```

If, in the future, you need to disable FIPS compliance and AES encryption, and implement the default 56-bit SASPROPRIETARY encryption algorithm, double-click the following shortcut:

```
install-path/Set Security - SAS
```

Enable AES and FIPS on UNIX or Linux

After you install a DataFlux Federation Server with DataFlux Secure, you execute the set_secure command to enable AES encryption and, optionally, to enable compliance with FIPS 140-2.

With the server stopped, enter the following command to enable AES encryption **with** FIPS compliance:

```
install-path/bin/set_secure fips
```

Note: Enabling compliance with FIPS 140-2 requires that Data Management Studio, Data Management Server, and Web Studio use the DataFlux drivers for ODBC or JDBC to communicate with the Federation Server.

Note: Enabling AES encryption on a Federation Server requires that you also enable AES encryption on all associated instances of Authentication Server, Data Management Server, and Data Management Studio.

To enable AES encryption **without** enabling FIPS compliance, enter:

```
install-path/bin/set_secure aes
```

If, in the future, you need to disable FIPS compliance and AES encryption, and implement the default 56-bit SASPROPRIETARY encryption algorithm, enter:

```
install-path/bin/set_secure sas
```

Configure Authentication Server

Enable AES and FIPS on Windows

After you install a DataFlux Authentication Server with DataFlux Secure, you select one shortcut to enable AES encryption and another shortcut to enable AES encryption and compliance with FIPS 140-2.

With the server stopped, double-click the following shortcut to enable AES encryption **with** FIPS compliance:

```
install-path/Set Security - FIPS
```

Note: Enabling compliance with FIPS 140-2 requires that Data Management Studio, Data Management Server, and Web Studio use the DataFlux drivers for ODBC or JDBC to communicate with the Authentication Server.

Note: Enabling AES encryption on an Authentication Server requires that you also enable AES encryption on all associated instances of Federation Server, Data Management Server, and Data Management Studio.

To enable AES encryption **without** enabling FIPS compliance, double-click the following shortcut:

```
install-path/Set Security - AES
```

If, in the future, you need to disable FIPS compliance and AES encryption, and implement the default 56-bit SASPROPRIETARY encryption algorithm, double-click the following shortcut:

```
install-path/Set Security - SAS
```

Enable AES and FIPS on UNIX or Linux

After you install a DataFlux Authentication Server with DataFlux Secure, you execute the set_secure command to enable AES encryption and, optionally, to enable compliance with FIPS 140-2.

With the server stopped, enter the following command to enable AES encryption **with** FIPS compliance:

```
install-path/bin/set_secure fips
```

Note: Enabling compliance with FIPS 140-2 requires that Data Management Studio, Data Management Server, and Web Studio use the DataFlux drivers for ODBC or JDBC to communicate with the Authentication Server.

Note: Enabling AES encryption on an Authentication Server requires that you also enable AES encryption on all associated instances of Federation Server, Data Management Server, and Data Management Studio.

To enable AES encryption **without** enabling FIPS compliance, enter:

```
install-path/bin/set_secure aes
```

If, in the future, you need to disable FIPS compliance and AES encryption, and implement the default 56-bit SASPROPRIETARY encryption algorithm, enter:

```
install-path/bin/set_secure sas
```

Configure SSL

Common Steps for All Operating Environments

Follow these steps to configure SSL on an Authentication Server in the Windows, UNIX, or Linux operating environment:

1. Stop the Authentication Server.

2. Open the configuration file as_serv_aspsql.xml.

3. To enable SSL communication with an LDAP authentication provider, add the following option to the SetEnv option set:
```
<OptionSet name="SetEnv">
   <Option name="LDAP_TLSMODE">1</Option>
</OptionSet>
```

4. To enable SSL communication with an Active Directory authentication provider, add the following option:
```
<OptionSet name="SetEnv">
   <Option name="AD_TLSMODE">1</Option>
</OptionSet>
```

5. In the configuration file, you can invoke client authentication by adding the following option, or by adding the following value if the option already exists:
```
<Option name="SSLCLIENTAUTH">1</Option>
```

If your Authentication Server is installed on Windows, then continue to the next topic. Otherwise, go to Configure SSL on UNIX/Linux.

Configure SSL on Windows

If your Authentication Server is installed on Windows, and if your SSL implementation calls for the exchange of digital certificates, then follow these steps to complete the SSL configuration process. If your SSL configuration does not exchange digital certificates, then you can save and close the configuration file and restart the Authentication Server.

If your SSL configuration does call for the exchange of digital certificates, then add only the options that apply to your site. For example, if your site does not check for revoked digital certificates, then you need not add the options SSLCRLCHECK and SSLCRLLOC.

1. In the configuration file as_serv_aspsql.xml, you can add the following option or value to identify the issuer of the digital certificate:
```
<Option name="SLLCERTISS">issuer-name</Option>
```

   The SSLCERTISS option is used with the SSLCERTSERIAL option to uniquely identify a digital certificate from the Microsoft Certificate Store.

2. You can set the following option to specify the serial number of the digital certificate:
```
<Option name="SSLCERTSERIAL">serial-number</Option>
```

3. If your SSL configuration checks a Certificate Revocation List (CRL) when a digital certificate is validated, then you can specify the following options:
```
<Option name="SSLCRLCHECK">1</Option>
<Option name="SSLCRLLOC">path-to-CRL-file</Option>
```

   A CRL is published by a Certificate Authority (CA). Each CRL contains only the revoked digital certificates that were issued by that particular CA.

4. Save and close the configuration file.

5. Start the Authentication Server.

Configure SSL on UNIX or Linux

If your Authentication Server is installed on UNIX or Linux, then follow these steps to complete the SSL configuration process.

All of the following steps apply to the exchange of digital certificates. If your SSL configuration does not include the exchange digital certificates, then you can skip these steps, save and close the configuration file, and restart your Authentication Server.

If your SSL configuration does call for the exchange of digital certificates, then add only the options that apply to your site. For example, if your site does not check for revoked digital certificates, then you need not add the options SSLCRLCHECK and SSLCRLLOC.

1. In the configuration file as_serv_aspsql.xml, you can add the following option or value to specify the file that lists your trusted certificate authorities:

   ```
   <Option name="SSLCALISTLOC">file-path</Option>
   ```

   The list in the file must be PEM-encoded (base64).

2. If your site checks a Certificate Revocation List (CRL) when a digital certificate is validated, then you can specify the following required options:

   ```
   <Option name="SSLCRLCHECK">1</Option>
   <Option name="SSLCRLLOC">path-to-CRL-file</Option>
   ```

   A CRL is published by a Certificate Authority (CA). Each CRL contains only the revoked digital certificates that were issued by that particular CA.

3. If your site exchanges digital certificates in the SSL validation process, then you can specify the protocol that is used at your site:

   ```
   <Option name="SSLREQCERT">ALLOW|DEMAND|NEVER|TRY</Option>
   ```

   ALLOW
   The Authentication Server asks for a certificate. If a certificate is not provided, then the session proceeds. If a certificate is provided and if it fails to validate, then the session proceeds.

   DEMAND
   The Authentication Server asks for a certificate. If the certificate fails to validate, then the session is immediately terminated.

   NEVER
   The Authentication Server does not ask for a certificate.

   TRY
   The Authentication Server asks for a certificate. If a certificate is not provided, then the session proceeds. If a certificate is provided, and if the certificate fails to validate, then the session is immediately terminated.

   If you do not add the SSLREQCERT option to your configuration file, then the default value is DEMAND.

   If you specify SSLREQCERT and LDAP_SSLREQCERT, then the value of SSLREQCERT applies to all of your authentication providers except your LDAP authentication provider.

4. If your Authentication Server uses an LDAP authentication provider, and if your site exchanges digital certificates, then you can specify a separate validation protocol for LDAP authentication provider:

   ```
   <Option name="LDAP_SSLREQCERT">ALLOW|DEMAND|NEVER|TRY</Option>
   ```

   If you specify LDAP_SSLREQCERT and SSLREQCERT, then SSLREQCERT applies to all authentication providers other than LDAP. LDAP_SSLREQCERT applies to the LDAP provider only.

5. To enable or disable a subject name check in your SSL validation process, you can specify the SSLNameCheck option. The name check ensures that the subject name in the authentication provider's certificate matches the subject name that is expected by the Authentication Server. The subject name that is expected is specified by the option LDAP_HOST or AD_HOST.

   ```
   <Option name="SSLNameCheck">1</Option>
   ```

   The SSLNameCheck option does not apply to your LDAP authentication provider if you also specify the option LDAP_SSLNameCheck.

   The default value of SSLNameCheck is False (0) if SSLReqCert is set to NEVER or ALLOW, otherwise the default is True (1).

   To disable subject name checks, specify a value of 0 (zero or FALSE for this binary option):

   ```
   <Option name="SSLNameCheck">0</Option>
   ```

6. To separately enable or disable a subject name check for your LDAP authentication provider, you can add the option LDAP_SSLNameCheck:

   ```
   <Option name="LDAP_SSLNameCheck">1</Option>
   ```

   or

   ```
   <Option name="LDAP_SSLNameCheck">0</Option>
   ```

   The LDAP_SSLNameCheck option applies only to your LDAP authentication provider. All other subject name checks are governed by the option SSLNameCheck.

   The default value of LDAP_SSLNameCheck is False (0) if LDAP_SSLReqCert is set to NEVER or ALLOW, otherwise the default is True (1).

7. If your site *does not* use a PKCS #12 DER encoding package to store the Authentication Server's certificate and private key, then you can specify the location of the Authentication Server's certificate, private key, and password:

   ```
   <Option name="SSLCERTLOC">path-to-certificate-file</Option>
   <Option name="SSLPVTKEYLOC">path-to-the-certificate's-private-key-file</Option>
   <Option name="SSLPVTKEYPASS">encrypted-password-to-key-file</Option>
   ```

   The certificate and private key must be PEM-encoded (base64).

8. If your site does use a PKCS #12 DER encoding package file to store the Authentication Server's certificate and private key, then you can specify the location of the package file and the decryption password for that package file:

   ```
   <Option name="SSLPKCS12LOC">path-to-certificate-file</Option>
   ```

```
<Option name="SSLPKCS12PASS">encrypted-pwd-for-encoded-package-file</Option>
```

If you specify SSLPKCS12LOC, then the SSLCERTLOC and SSLPVTKEYLOC options are ignored.

9. Save and close the configuration file.
10. In the operating environment, append the OpenSSL library path to include the path to the LD_LIBRARY_PATH environment variable.
11. Start the Authentication Server.

The following example depicts typical SSL configuration options for an LDAP authentication provider:

```
<OptionSet name="SetEnv">
   <Option name="LDAP_HOST">sample1.sample.com</Option>
   <Option name="LDAP_PORT">636</Option>
   <Option name="LDAP_BASE">CN=Users,DC=SAMPLE,DC=com</Option>
   <Option name="LDAP_IDATTR">sample-account-name</Option>
            <Option name="LDAP_PRIV_DN">Administrator@sample.com</Option>
              <Option name="LDAP_PRIV_PW">DataFlux01</Option>
   <Option name="LDAP_TLSMODE">1</Option>
</OptionSet>
<Option name="SSLCALISTLOC">/home/certs/sample.pem </Option>
<Option name="AuthProviderDomain">LDAP:mydomain</Option>
<Option name="PrimaryProviderDomain">mydomain</Option>
```

The following example depicts typical SSL configuration options for an Active Directory authentication provider:

```
<OptionSet name="SetEnv">
         <Option name="AD_HOST">sample01.plt.rdc.sample.com</Option>
   <Option name="AD_PORT">636</Option>
   <Option name="AD_TLSMODE">1</Option>
 </OptionSet>
 <Option name="SSLCALISTLOC">/home/certs/sample.pem</Option>
 <Option name="AuthProviderDomain">ADIR:mydomain</Option>
<Option name="PrimaryProviderDomain”>mydomain</Option>
```

Replace Passwords

After you install and configure DataFlux Secure on your clients and servers, follow these steps to replace any existing passwords on your Federation Servers or Authentication Servers. When you replace these passwords, they are stored on disk using AES encryption.

Passwords that you do not replace will remain functional, but they will continue to be stored using the less-protective SASPROPRIETARY encryption algorithm.

When you replace passwords, you should enter the same passwords that were already in use. By doing so, you avoid having to update accounts in the operating environment.

Follow these steps to replace passwords:

1. Complete all of the configuration steps before you replace passwords.
2. Open Data Management Studio.

3. Click the **Administration** riser in the lower left corner.
4. If your enterprise uses a Federation Server, right-click that server, and then select **Open**.
5. Right-click the server again and select **Connect**.
6. Select **Tools -> Federation Server Options**.
7. Click the **Advanced** tab.
8. Replace the password for the Shared Login Manager and click **OK**.
9. Repeat the preceding steps for any other Federation Servers in your enterprise that were operational before you installed DataFlux Secure.
10. Right-click your Authentication Server and select **Open**.
11. Log on to your Authentication Server with an account that has administrative privileges.
12. Click the **Shared Logins** riser.
13. Right-click a shared login and select **Edit**.
14. Replace the outgoing password for the shared login, and click **OK**. Note that the outgoing login is the one that establishes the connections to your network data source.
15. Repeat the preceding password replacement steps for all of your other shared logins.
16. Repeat the preceding steps for any other Authentication Servers in your enterprise that were operational before you installed DataFlux Secure.
17. Refer to the next topic to replace all user passwords on any other Authentication Servers in your enterprise.

Replace User Passwords

If you were a user of DataFlux Data Management Studio before you installed DataFlux Secure, then follow these steps to replace your passwords on your Authentication Server. When you replace your passwords, you store them on disk using AES encryption.

1. Open Data Management Studio.
2. Click the **Administration** riser.
3. Right-click your Authentication Server and select **Open**.
4. Click the **Users** riser.
5. Double-click your user name to display your logins.
6. For all of your logins that have passwords, right-click the login and click **Edit**.
7. In the **Edit** dialog box, replace the existing login with the same login, then click **OK**.

Administer

After you install and configure DataFlux Secure on your Data Management Platform, the software requires no maintenance other than the periodic replacement of the license file.

When you upgrade a client or server that uses DataFlux Secure, make sure that you also update or replace DataFlux Secure. Also be sure to retain or replace the DataFlux Secure license file as part of the upgrade.

Regarding the uninstall process; DataFlux Secure is an add-on product, so it does not appear by name on your computer as a separately removable program or process.

DataFlux Secure does not have a separate uninstall process. If you uninstall a client or server that uses DataFlux Secure, then DataFlux Secure is removed along with the client or server.

Troubleshoot

If you cannot open a trusted connection between two hosts, then you should first ensure that DataFlux Secure has been installed on each host. Next, confirm that the configuration files on both hosts contain the option values and environment variables that are described in the Install and Configure chapter.

If DataFlux Secure has been installed and configured on both hosts, you can check the log files on the hosts to help isolate the error. To obtain additional information, contact DataFlux Technical Support to temporarily increase the amount of data that is collected in the log files.

For additional information on logging, including the locations of the log files, refer to the *Data Management Studio User's Guide* and to the *Administrator's Guides* for the Federation Server, Data Management Server, and Authentication Server.

Glossary

A

Advanced Encryption Standard

AES, from the US National Institute of Standards and Technology, defines symmetric-key encryption using key lengths of 128, 192, and 256 bits. DataFlux Secure uses 256-bit keys.

authentication provider

a software component that is used for identifying and authenticating users. For example, an LDAP server or the host operating system can provide authentication.

C

Certificate Revocation List

a CRL contains a list of digital certificates that were revoked by a specific Certification Authority.

Certification Authority

CA, a commercial or private organization that provides security services to the e-commerce market. A Certification Authority creates and maintains digital certificates, which help to preserve the confidentiality of an identity. Microsoft, VeriSign, and Thawte are examples of commercial Certification Authorities.

D

domain name

identifies a collection of network devices. When supplied in a login, the domain name identifies an authentication provider.

K

key

provides the basis for the transformation of plaintext into ciphertext for encryption, and the reverse for decryption.

L

login

a combination of a user ID, password, and optional domain name that is supplied by users for the purpose of authentication.

S

Secure Sockets Layer

SSL is a protocol that provides network security and privacy. SSL uses encryption algorithms RC2, RC4, DES, TripleDES, and AES. SSL provides a high level of security. It was developed by Netscape Communications.