CA Federation Manager

Java SDK Guide

r12.5

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Chapter 1: Overview of the Federation Manager Java SDK

This section contains the following topics:

Java SDK Functionality

The CA Federation Manager Java SDK is a library for interacting with an HTTP cookie that contains user identity information. The Java SDK supports two cookie formats:

- The open format cookie
- The legacy (formerly FEDProfile) cookie

The open format cookie is a string of UTF-8 bytes. This format includes associated encryption algorithms designed so that information can be securely communicated between Federation Manager and end-user applications. Applications can be written in any common Web programming language. Using the Java SDK is not required to create an open format cookie.

The current version of the Java SDK supports the legacy cookie for applications that use an earlier version of the SDK.

Typically, Federation Manager sets user identity information into an HTTP cookie for consumption by an end-user application. End-user applications can use the Java SDK to extract identity information, the authentication context, user consent, name ID, and name ID format from the cookie. Applications can set URIs for user consent and authentication context. In addition, third-party Web access managers can create a cookie and provide user credentials to Federation Manager.

Java SDK Files

The Federation Manager Java SDK is implemented as several Java archive files. You specify their location during installation. The most important file, fedsdk.jar, contains two Java interfaces (IFederationOpenIdentity.java and the legacy FederationIdentity.java) and other supporting Java classes. Your Java application must instantiate an implementation object for one of these interfaces and call the methods as your requirements dictate.

The smapi.jar archive includes classes that support customizing an assertion generator plug-in. The Javadoc includes information about the methods in these classes and all the other classes in the SDK.

Chapter 2: Installation of the Java SDK

Install the Java SDK on Windows Systems

The following procedure describes the installation on Windows platforms.

Important! You must have a Java Runtime Environment (JRE) installed on your target system. Refer to the Platform Support Matrix on the Technical Support site for the supported version.

To locate installation kits

1. Go to the Technical Support site.
2. Log on to the site.
3. Click Download Center.

Search the Download Center for the installation kit you need and download it to your local system.

To install the Federation Manager Java SDK on Windows

1. Exit all applications that are running.
2. Navigate to where the installation executable is located.
3. Double-click ca-fedmgr-java-sdk-12.5-win32.exe.

   The installation wizard starts.
4. Follow the prompts in the installation wizard.
5. After the installation is complete, reboot your system.

The installation of the Java SDK on Windows is complete.

Install the Java SDK on UNIX Systems

The Solaris and Linux operating environments support the Federation Manager Java SDK

Important! You must have a Java Runtime Environment (JRE) installed on your target system. Refer to the Platform Support Matrix on the Technical Support site for the supported version.

To locate installation kits

1. Go to the Technical Support site.
2. Log on to the site.
3. Click Download Center.

Search the Download Center for the installation kit you need and download it to your local system.

To install the Federation Manager Java SDK on UNIX

1. Exit all applications that are running.
2. Navigate to where the installation executable is located.
3. Run the binary for your platform:

   Solaris: ca-fedmgr-java-sdk-12.5-sol.bin

   Linux: ca-fedmgr-java-sdk-12.5-linux.bin

   The installation wizard starts.
4. Follow the prompts in the installation wizard and complete the installation.
5. After the installation is complete, reboot your system.

The installation of the Java SDK is complete.

Chapter 3: Federation Manager Java SDK Programming Interfaces

This section contains the following topics:

FederationIdentity Interface

The FederationIdentity interface defines methods for manipulating the Federation legacy cookie. The interface supports the following tasks:

- Initialize the SDK logger specific to an application.
- Extract user identity information from the cookie in an HTTP request, in a Java Cookie object, or in String format.
- Initialize values for the cookie name, domain, and security zone.
- Create the legacy (FEDPROFILE) cookie.
- Pass identity attributes to an application.
- Set a password for encrypting and decrypting the cookie.

Important! The FederationIdentity interface only supports password-based encryption, which is not FIPS-compatible. If you are using a FIPS-only installation, implement the IFederationOpenIdentity interface.

Cookie-Related Parameters

Federation Manager sets these cookie-related parameters to the following default values:

- The cookie domain is set to "".
- The cookie maximum age has no maximum limit.
- The cookie path is set to /.
- The cookie password is set to "".
- The cookie SSO security zone name is set to "FED".

You can change the SSO security zone name and password using the Federation Manager Administrative UI. If you reconfigure these parameters, the values must be made known to any partner using the Federation Manager Java SDK in an out-of-band communication. Otherwise, the cookie cannot be decrypted.

IFederationOpenIdentity Interface

The IFederationOpenIdentity interface defines methods for manipulating the federation open format cookie. The interface supports the following tasks:

- Initialize the SDK logger specific to an application.
- Extract user identity information from the cookie in an HTTP request, in a Java Cookie object, or in String format.
- Initialize values for the cookie name, domain, and security zone.
- Set a shared secret used to derive a key for cookie encryption and decryption.
- Create the open format cookie.
- Pass identity attributes to an application.
- Get and set URIs for AuthnContext and UserConsent.

To obtain an implementation of the IFederationOpenIdentity interface, call one of the implementation methods defined in the IdentityFactory. These methods require specifying a string for the cryptographic transformation of the cookie.

The following password-based encryption combinations are available for standard installations:

- PBE/SHA1/AES/CBC/PKCS12PBE-1000-128
- PBE/SHA1/AES/CBC/PKCS12PBE-1000-192
- PBE/SHA1/AES/CBC/PKCS12PBE-1000-256
- PBE/SHA256/AES/CBC/PKCS12PBE-1000-128
- PBE/SHA256/AES/CBC/PKCS12PBE-1000-192
- PBE/SHA256/AES/CBC/PKCS12PBE-1000-256
- PBE/SHA1/3DES_EDE/CBC/PKCS12PBE-1000-3
- PBE/SHA256/3DES_EDE/CBC/PKCS12PBE-1000-3

Password-based encryption (PBE) combinations are not FIPS-compatible. Any of the FIPS-mode encryption combinations listed following requires using the Java SDK to operate properly.

The following encryption combinations are FIPS-compliant and also available for standard installations:

- AES128/CBC/PKCS5Padding
- AES192/CBC/PKCS5Padding
- AES256/CBC/PKCS5Padding
- 3DESEDE/CBC/PKCS5Padding

Note: All cryptographic strings and their corresponding constant names are listed in IdentityCrypto.java.

Open Format Cookie

The federation open format cookie lets applications assert user attributes to Federation Manager and consume user attributes encapsulated by Federation Manager. The open format cookie has the following general characteristics:

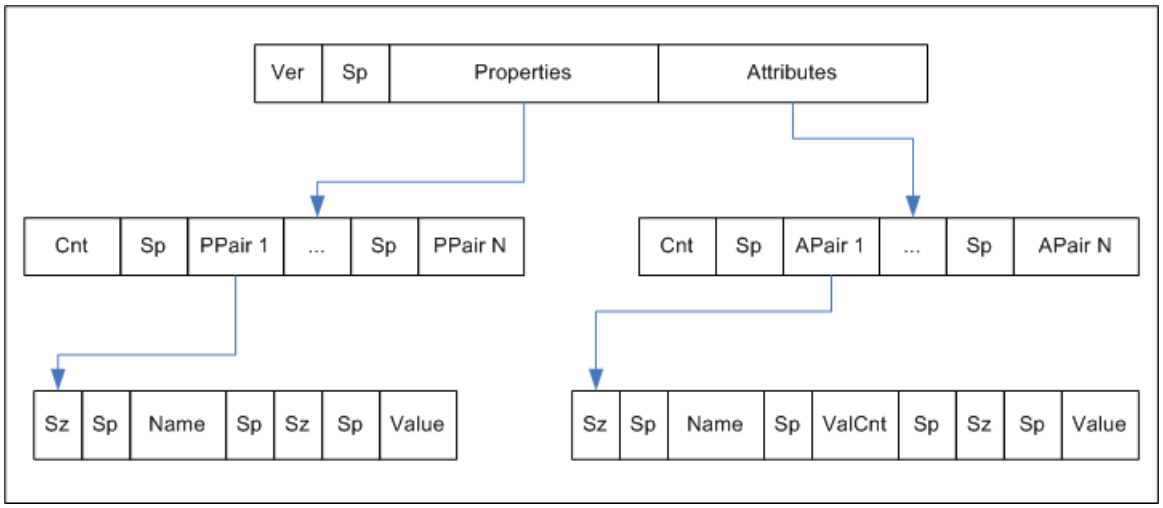
- The cookie is accessible by applications written in any programming language.
- The cookie content consists of a string of UTF-8 bytes, which supports international character sets.
- The combined size in UTF-8 bytes of each name/value pair precedes the name/value pair.
- Space characters are added for legibility.
- The cookie is simple to parse and easily extensible.

Important! If the cookie contains any unsafe characters such as '=', enclose the value in double quotes. You can specify this option through the user interface, or through the SDK.

The open format cookie contains the following property information:

- Cookie Version
- Name ID
- Name ID Format
- Session ID
- AuthnContext
- UserDN (same as User ID)
- UserConsent
- Login ID
- ExpiresON (expiration time)

The following diagram shows the open format:



Key:

- Ver — the cookie format version. This value is 1.
- Sp — an ASCII space character, used only to improve readability
- Properties — information about the principal
- Attributes — SAML attributes from the Assertion
- Cnt — the number of name value pairs that follow, represented in ASCII
- Sz — the length of the name or value that follows
- ValCnt — the number of attribute values

The Backus-Naur Form (BNF) for this format is following (0* means 0 or more; 1* means at least 1).

- DIGIT = ASCII digit (0 through 9)
- CHAR = UTF-8 character
- Sp = ASCII space (character 32)
- Token = 1*CHAR
- Cookie = Version Sp Properties Attributes
- Version = 1*DIGIT
- Cnt = 1*DIGIT
- Properties = Cnt 1*PPair
- Attributes = Cnt 0*APair

- ValCnt = 1*DIGIT
- PPair = Sz Sp Name Sp Sz Sp Value
- APair = Sz Sp Name Sp ValCnt Sp Sz Sp Value
- Sz = 1*DIGIT
- Name = Token
- Value = Token

FedSdkLogger Interface

The FedSdkLogger interface provides the following methods for specifying custom logging messages:

void logTrace (string fileName, string methodName, string msg)

Logs a trace message.

void logError (string fileName, string methodName, string msg)

Logs an error message.

Chapter 4: Using the Federation Manager Java SDK

This section contains the following topics:

Program Flow at the Relying Party Using the Open Format Cookie

A brief description of Java SDK program flow at the relying party is following.

1. The Java Application creates an implementation class of the IFederationOpenIdentity interface using the IdentityFactory interface.
2. The Java application calls the extractCookie() method to extract the cookie from the HttpServletRequest object. This method also decrypts the cookie and puts the identity attributes in the Storage Map.
3. Alternatively, the Java application can also call the processCookie() method to extract all the attributes from a cookie object and set them in the Storage Map.
4. The Java application can get values for all the attributes that are put in the Storage Map using the getAttributes(), getAttribute(), getAuthnContext(), getSessionID(), getNameID(), getNameIDFormat(), and getUserConsent() methods.
5. The Java application can set values for attributes in the cookie using the setAuthnContext() and setUserConsent() methods.
6. The Java application can determine whether the cookie is no longer valid by calling the isExpired() method, with or without specifying a skew time. The method compares the expiration time stamp on the cookie, adding in the optional skew time, with the current GMT time. If the GMT time is greater, the cookie has expired. The cookie's expiration time stamp is specified using setTimeToLive() method when the cookie is created.

See the Javadoc reference for detailed information about these methods.

Program Flow at the Relying Party Using the Legacy Cookie

A brief description of Java SDK program flow at the relying party is following.

1. The Java Application creates an implementation class for the FederationIdentity interface.
2. The Java application calls the extractCookie() method to extract the cookie from the HttpServletRequest object. This method also decrypts the cookie and puts the identity attributes in the Storage Map.
3. Alternatively, the Java application can also call the processCookie() method to extract all the attributes from a cookie object and set them in the Storage Map.
4. The Java application can get values for all the attributes that are put in the Storage Map using the getAttributes(), getAttribute(), getAuthnContext(), getSessionID(), getNameID() and getNameIDFormat() methods.

Delegated Authentication Using the Open Format Cookie

Delegated authentication lets a third-party access management system authenticate a user and then share the user credentials with Federation Manager deployed at the asserting party. These credentials are shared either through a cookie, or in a query string.

Note: This guide discusses delegated authentication using the cookie and the Java SDK. See the *CA Federation Manager Guide* for information about delegated authentication using a query string.

If the third-party access manager and the asserting party intend to use a cookie to communicate the authenticated user ID, the access control application can follow these steps:

1. Implement the Federation Manager Java SDK.
2. Construct an implementation class for the IFederationOpenIdentity interface.
3. Call the createCookie method.

To construct the implementation class, the access control manager must know the cookie zone and password configured in Federation Manager. These values are communicated out-of-band. The third-party access management system must be in the same cookie domain as the asserting party.

The constructor from the IdentityFactory.java class to use when creating a cookie for delegated authentication is listed following.

```
/**
 * Gets an implementation of the IFederationOpenIdentity interface.
 *
 * @param cryptoInstance A cryptographic string; supported values are
 *  listed in IdentityCrypto.java.
 * @param bUseHmac A Boolean value that indicates whether to use HMAC.
 */
  public static IFederationOpenIdentity getInstance(cryptoInstance, bUseHmac)
```

The access control manager can encrypt the cookie itself using password-based encryption, or it can use one of the FIPS-compliant cryptographic strings. If you chose a FIPS-compliant string, use the encryption provided by the Java SDK.

Here is a code snippet example of the cookie creation:

```
IFederationOpernIdentity openID =
IdentityFactory.getInstance(IdentityCrypto.AES128, false);

String domain = ".moon.com";
String zone = "FED";
String name = "CryptoID"
String password = "";
```

```
openID.initCookieInfo(domain, zone, name, password);

openID.setLoginID = "TomJones";

openID.createCookie(HttpResponse);
```

The createCookie method uses the login ID to create a cookie value that is encrypted and added to the HttpSevletResponse object. After the request is redirected, the servlet container automatically passes the cookie.

Delegated Authentication Using the Legacy Cookie

Delegated authentication lets a third-party access management system authenticate a user and then share the credentials with Federation Manager deployed on the asserting party. These credentials are shared either through a cookie, or in a query string. The cookie is generated using the Federation Manager Java SDK so that Federation Manager can decrypt it.

Note: This guide discusses delegated authentication using the cookie and the Java SDK. See the *CA Federation Manager Guide* for information about delegated authentication using a query string.

If the third-party access manager intends to use a cookie to communicate the authenticated user ID, the access control application must follow these steps:

1. Implement the Java SDK.
2. Construct an implementation class of the FederationIdentity interface.
3. Call the createProfileCookie method.

To construct the implementation class, the access control manager must know the Cookie Zone and Password through an out-of-band communication. The third-party access management system must be in the same cookie domain as the asserting party.

The constructor to use when creating a cookie for delegated authentication is following.

```
/**
 * This constructor loads customized parameters for the cookie.
 *
 * @param zoneName Cookie zone name (the default is FED)
 * @param password String used for cookie encryption
 * @param domain string used to indicate the cookie domain
 * @param obj the object of FedSdkLogger class
 */
public FederationIdentityImpl(String zoneName, String password, String domain,
                              FedSdkLogger obj) throws JavaSDKException
```

Note: The last parameter is a FedSdkLogger object. If the third-party access management system implements its own logger, the reference is passed here. Otherwise, null is passed, and the SDK uses the default logging implementation.

To call the createProfileCookie method, the third-party access control application must know the ID of the Remote Entity Service Provider configured in the Asserting Party->Relying Party partnership.

The createProfileCookie method signature is following.

```
/**
 * Creates a <ZONE>PROFILE cookie and populates it with the passed in values.
 * The zone to use was configured when this object was constructed.
 * @param providerID - the provider for whom to create the cookie
```

```
     * @param loginID - the user ID
     * @param cookieVersion - the value to set the cookie version to.
     * @param response - the response object
     * @throws JavaSDKException
     */
    public void createProfileCookie(String providerID,
            String loginID,
            HttpServletResponse response) throws JavaSDKException;
```

Here is a code snippet example of the cookie creation:

```
String zone = request.getParameter("FED");
String domain = request.getParameter(".ca.com");
String password = request.getParameter("password");
FederationIdentity fedIdentity =
                new FederationIdentityImpl(zone, password, domain, null);
fedIdentity.createProfileCookie("ServiceProviderID", "JaneDoe",
httpServletResponse);
```

The createProfileCookie method uses the provider ID and user ID to create a cookie value that is encrypted and added to the HttpSevletResponse object. After the request is redirected, the servlet container automatically passes the cookie.

Federation Manager Java SDK Logging

The default Java SDK logger writes messages to the standard output stream. Logging is disabled by default.

To enable Federation Manager Java SDK logging

1. Copy the sdkloggingconfig.properties file from the *sdkroo*t\sample folder and place it in any desired folder. Be sure that the folder is in the CLASSPATH.
2. Set the the value of the sdk.logging.enable parameter to Y in the sdkloggingconfig.properties file.

Logging is enabled.

Java SDK Sample Application Overview

The Java SDK sample application simulates a relying party Java application. The application consumes the cookie sent by the Federation Manager deployment running at the relying part of the federation partnership.

The sample application demonstrates how a Java application can get the cookie from the incoming request and extract user identity information and the assertion attributes that are sent to the relying party. The sample application requires that Federation Manager is installed at the relying party and is configured to redirect the user to the URL of the sample application servlet.

Java SDK Sample Application Deployment

Deployment of the Java SDK sample application requires installing Tomcat and Federation Manager at the relying party.

To deploy the Java SDK sample application

1. Install the Java SDK package at any preferred location.
2. Set the environment variable FEDSDKROOT to the installation Directory of Java SDK.

   Note: The value of FEDSDKROOT points to the location of the SDK directory. Example: C:\Program Files\CA\Federation Manager\sdk.

   This environment variable is set automatically on Windows, but must be exported manually on UNIX platforms.
3. Install Tomcat 5.0 and set the TOMCAT_HOME environment variable to point to the Tomcat root folder.

   Note: Tomcat must be installed on a different system from the one Federation Manager is installed on.
4. Deploy FEDSDKROOT\sample\javasdk/war to the Web server by copying it to the TOMCAT_HOME\webapps\ folder.
5. Start the Tomcat server.
6. Try accessing the link “http://<FQDN of Tomcat Host>:<port num>/” to determine whether Tomcat is up and running.
7. If you are using the legacy (FEDPROFILE) cookie, update fedsample.properties in the TOMCAT_HOME\webapps\javasdk\WEB-INF\classes folder as follows:
   - RedirectMode is the value of redirect mode. Use LEGACY for the legacy cookie.

     Default value: OPEN
   - CookieZone is the value of CookieZone as set in the Federation Manager UI in the Deployment Settings dialog.

     Default value: FED
   - EncryptionPassword is the value of the password as set in the Federation Manager UI in the Deployment Settings dialog.

     Default value: blank

- ProviderId is the value of provider identifier as set in the Federation Manager Create Partnership dialog

  Default value: blank

- CharsetEncoding is the Charset Encoding of the response that is displayed on the screen.

  Default value: UTF-8

- ShowAttributeMap specifies whether the data in the Assertion Mapis displayed. The value is no when data in the Assertion Map is not to be displayed/ The value is yes when all the data in the Assertion Map is to be displayed. This value is configured in the Federation Manager Create Partnership dialog. If the value is set to no, only the list of attributes mentioned in SpSideAttributeKey parameter are displayed.

  Default value: no

- SpSideAttributeKey specifies the attribute or attributes (comma separated) from the request that are displayed.

  Default value: blank

8. If you are using the open format cookie, update fedsample.properties in the TOMCAT_HOME\webapps\javasdk\WEB-INF\classes folder as follows:

   - RedirectMode is the value redirect mode. Use OPEN for the open format cookie.
   - CookieDomain is the value of cookie domain as set in the Federation Manager Create Partnership dialog.
   - CookieName is the value of the cookie name as set in the Federation Manager Create Partnership dialog.
   - CryptoInstance is the value of the encryption transformation, which is configured in the Federation Manager Create Partnership dialog.
   - UseHmac specifies the value of the Enable HMAC check box as set in the Federation Manager Create Partnership dialog. Use the value no when the check box is not checked, or the value yes when the check box is checked.
   - ShowAttributeMap specifies whether the data in the Assertion Mapis displayed. The value is no when data in the Assertion Map is not to be displayed/ The value is yes when all the data in the Assertion Map is to be displayed. This value is configured in the Federation Manager Create Partnership dialog. If the value is set to no, only the list of attributes mentioned in SpSideAttributeKey parameter are displayed.
   - SpSideAttributeKey specifies the attribute or attributes (comma separated) from the request that are displayed.
   - CharsetEncoding specifies the charset encoding of the response that is displayed on the screen.

9. The following parameters must be updated if you are testing light weight provisioning:
   - EnableProvisioningTest specifies whether light weight provisioning is enabled. Use the value no if provisioning is not enabled. Use the value yes to enable testing light-weight provisioning.
   - AssertionConsumerUrl specifies the supply Assertion Consumer URL.
   - UDType specifies odbc or ldap, depending on the User Directory type. The connection parameters associated with the type must be specified.
10. Update the sdkloggingconfig.properties file to enable logging. Logging is disabled by default.
11. Install Federation Manager at the relying party of a Federation partnership and define an asserting party-relying party partnership.
    a. Select appropriate Redirect mode.
    b. Specify the Target URL of the partnership. Enter one of the following:
    - The URL of the SDK Sample App, such as http://<FQDN of target machine>:<Tomcat port>/javasdk/SpSideAttributeServlet.
    - The url of the relying party, http://<FQDN of SP>:CA Portal and in proxyrules.xml(location: %FEDROOT%\ proxy-engine\conf\proxyrules.xml make the entry http://<FQDN of target machine>:<Tomcat port>/javasdk/SpSideAttributeServlet.

The sample application is now deployed and ready to run.

Java SDK Sample Application Execution

After you have installed Tomcat and Federation Manager, you can run the Java SDK sample application.

To run the Java SDK sample application

1. Start the Tomcat Server where the sample application is deployed:
   - On Windows, use the services control panel.
   - On UNIX, use the startup script of Tomcat.
2. Run the configured federation transaction to redirect to the SDK Sample Application.

   The sample application decodes the legacy cookie and displays the user identity information contained in the cookie.

Java SDK Sample Application Customization

The sample application can be modified using build.bat or build.sh scripts to regenerate the fedsdksample.jar.

To customize the sample Java application

1. Modify SpSideServlet or SpSideAttributeServlet.java as desired.
2. Verify that the JDK is installed and JAVA_HOME is set appropriately for your JDK installation.
3. Run build.bat (Windows) or build.sh (UNIX) to build the fedsdksample.jar file.

The customized version of the sample application is ready to run.

Chapter 5: Customize an Assertion with an Assertion Generator Plug-in

This section contains the following topics:

Assertion Generator Plug-in Overview

You can modify the assertion content using an assertion generator plug-in. The plug-in enables you to customize the content of an assertion based on the business agreements between you and your partners and vendors. One plug-in is allowed for each partner.

There are several steps to configuring an assertion generator plug-in.

1. Install the Federation Manager SDK, if you have not done so already.
2. Implement the AssertionGeneratorPlugin.java interface, which is part of the Federation Manager SDK.
3. Deploy your assertion generator plug-in implementation class.
4. Configure the plug-in the assertion generator plug-in parameters in the Administrative UI.

Implement the AssertionGeneratorPlugin Interface

The first step in creating a custom assertion generator plug-in is to implement the AssertionGeneratorPlugin interface. The following requirements apply to the implementation class:

- The implementation must provide a public default constructor method that contains no parameters.
- The implementation must be stateless, so that many threads can use a single plug-in class.
- The implementation must include a call to the customizeAssertion methods. You can overwrite the existing implementations of these methods as your requirements dictate. See the sample programs.
- The syntax requirements and use of the parameter string that is passed into the customizeAssertion method is the responsibility of the custom object.

Note: The folder *federation_mgr_sdk_home*\sample\com\ca\federation\sdk\plugin\sample includes two sample implementation classes.

Deploy an Assertion Generator Plug-in

After you have coded your implementation class for the AssertionGeneratoPlugin interface, compile it and verify that Federation Manager can find your executable file.

To deploy the assertion generator plug-in

1. Compile the assertion plug-in code in one of the following ways:
   - If you are using a sample plug-in, use the build script for your platform to compile the plug-in. The build scripts are installed in the directory *federation_mgr_sdk_home*\sample. The build scripts are:

     Windows: build_plugin.bat

     UNIX: build_plugin.sh

     A compiled sample plug-in, fedpluginsample.jar, is in the directory *federation_mgr_sdk_home*\jar.
   - If you write your own plug-in, include the smapi.jar when you compile your plug-in.

2. In the JVMOptions.txt file, modify the -Djava.class.path value so it includes the classpath for the plug-in. Locate the JVMOptions.txt file in the directory *federation_mgr_home*\siteminder\config.

   You can place the plug-in jar in any directory and have the JVMOptions.txt file point to it. To use the sample plug-in, modify the classpath to point to fedpluginsample.jar; however, do not modify the classpath for smapi.jar.

   Note: To use Apache Xerces or Xalan in your plug-in, use the Xerces or Xalan binary files installed with Federation Manager. The binaries are not installed with the Federation Manager SDK. Using these files is necessary for compatibility reasons.

3. Restart the Federation Manager services.

   Restarting the services helps ensure that Federation Manager uses the latest version of the assertion generator plug-in.

Enable the Assertion Generator Plug-in

After writing an assertion generator plug-in and compiling it, you enable the plug-in by configuring settings in the Federation Manager UI. The UI parameters let Federation Manager know where to find the plug-in.

Do not configure the plug-in settings until you deploy the plug-in (see page 28).

To enable the Assertion Generator plug-in

1. Log on to the Federation Manager UI.
2. Navigate to the Assertion Configuration step of the Partnership wizard for the partnership you want to modify.

3. Enter values for the Assertion Generator Plug-in settings that follow:

Plug-in Class

Specifies the Java class name of the plug-in. Enter a name. This plug-in is invoked at run time.

Example: com.mycompany.assertiongenerator.AssertionSample

The plug-in class can parse and modify the assertion, and then return the result to Federation Manager for final processing. Specify an Assertion Generator plug-in for each relying party. A compiled sample plug-in is included in the SDK. You can view complied sample assertion plug-ins in the directory *federation_mgr_sdk_home*/jar.

Note: You can also view the source code for the Federation Manager sample plug-ins in the directory *federation_mgr_sdk_home*\sample\com\ca\federation\sdk\plugin\sample.

Plug-in Parameter

(Optional). Specifies the string that Federation Manager passes to the plug-in as a parameter at run time. The string can contain any value; there is no specific syntax to follow.

The plug-in interprets the parameters that it receives. For example, the parameter could be the name of an attribute or the string can contain an integer that instructs the plug-in to do something.

Reference information (method signatures, parameters, return values, data types), and the constructor for UserContext class and the APIContext class, are in the *Javadoc Reference*. Refer to the AssertionGeneratorPlugin interface in the Javadoc.

Chapter 6: The Message Consumer Plug-in

The SiteMinder SAML (1.x and 2.0) authentication schemes process response messages. For business reasons, for example, you might want to add additional steps to further process a response. The Message Consumer Extension API defines an interface that enables you to elaborate on the SAML response in two ways during the authentication process:

- To report detailed failure reasons during user disambiguation
- To customize user credential validation

The Java MessageConsumerPlugin API implements the Message Consumer Extension (MCE) interface. You can code to your own requirements and then integrate the custom plug-in into Federation Manager.

The MessageConsumerPlugin class includes the following four methods:

Method	Description
init()	Performs any initialization procedures that the plug-in requires. Federation Manager calls this method once for each plug-in instance, when the plug-in is loaded.
release()	Performs any rundown procedures that the plug-in requires. Federation Manager calls this method once for each plug-in instance, when Federation Manager is shutting down.
postDisambiguateUser()	Provides processing to disambiguate a user when the authentication scheme is unable to do so, or to add data for new federation users to a user store. Note that this method receives the decrypted assertion. The decrypted assertion is added to the properties map passed to MCP under the key "_DecryptedAssertion".
postAuthenticateUser()	Provides any additional code to determine the final outcome of assertion processing, regardless of whether the policy server processing results in success or failure.

Federation Manager provides the following samples of the Message Consumer plug-in class:

- *fed_mgr_sdk_home*\sample\com\ca\federation\sdk\plugin\sample\MessageConsumerPluginSample
- *fed_mgr_sdk_home*\sample\com\ca\federation\sdk\plugin\sample\MessageConsumerSAML2

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