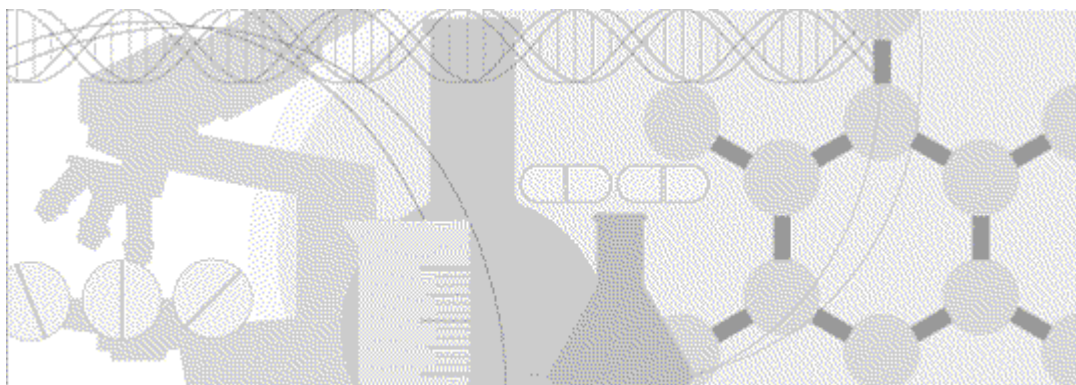


Secure Development Guide

Oracle[®] Health Sciences InForm Adapter
Release 1.3.8



ORACLE[®]

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About this guide

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Overview of this guide

The *Secure Development Guide* provides an overview of common security risks for developers using Application Programming Interfaces (APIs) with the InForm Adapter application, and information on how to address those risks.

Audience

This guide is for developers who use Application Programming Interfaces (APIs) with the InForm Adapter application and address common security risks associated with APIs.

Documentation

The product documentation is available from the following locations:

- **My Oracle Support** (<https://support.oracle.com>)—*Release Notes* and *Known Issues*.
- **Oracle Technology Network** (<http://www.oracle.com/technetwork/documentation/hsgbu-154445.html>)—The most current documentation set, excluding the *Release Notes* and *Known Issues*.

If the software is available for download, the complete documentation set is available from the Oracle Software Delivery Cloud (<https://edelivery.oracle.com>).

All documents may not be updated for every InForm Adapter release. Therefore, the version numbers for the documents in a release may differ.

Document	Description
<i>Release Notes</i>	The <i>Release Notes</i> document describes hardware and software requirements and describes the new features, enhancements, and fixed issues in this release.
<i>Known Issues</i>	The <i>Known Issues</i> document provides detailed information about the known issues in this release, along with workarounds, if available.
<i>Installation Guide</i>	The <i>Installation Guide</i> provides a brief overview of the InForm Adapter software, step-by-step instructions for installing and uninstalling the software, setting security options, and troubleshooting information.
<i>Interfaces Guide</i>	The <i>Interfaces Guide</i> provides information on using the interfaces that are included with the InForm Adapter software.
<i>Secure Configuration Guide</i>	The <i>Secure Configuration Guide</i> provides an overview of the security features provided with the InForm Adapter application including details about the general principles of application security and how to install, configure, and use the InForm Adapter application securely.
<i>Third Party Licenses and Notices</i>	The <i>Third Party Licenses and Notices</i> document includes licenses and notices for third party technology that may be included with the InForm Adapter software.
<i>Secure Development Guide</i>	The <i>Secure Development Guide</i> provides an overview of common security risks for developers using Application Programming Interfaces (APIs) with the InForm Adapter application, and information on how to address those risks.

Documentation accessibility

For information about Oracle's commitment to accessibility, visit the Oracle Accessibility Program website at <http://www.oracle.com/pls/topic/lookup?ctx=acc&id=docacc>.

If you need assistance

Access to Oracle Support

Oracle customers that have purchased support have access to electronic support through My Oracle Support. For information, visit <http://www.oracle.com/pls/topic/lookup?ctx=acc&id=info> or visit <http://www.oracle.com/pls/topic/lookup?ctx=acc&id=trs> if you are hearing impaired.

Finding InForm Adapter information and patches on My Oracle Support

The latest information about the InForm Adapter application is on the Oracle Support self-service website, My Oracle Support. Before you install and use the InForm Adapter application, check My Oracle Support for the latest information, including *Release Notes* and *Known Issues*, alerts, white papers, bulletins, and patches.

Creating a My Oracle Support account

You must register at My Oracle Support to obtain a user name and password before you can enter the site.

- 1 Open a browser to <https://support.oracle.com>.
- 2 Click the **Register** link.
- 3 Follow the instructions on the registration page.

Finding information and articles

- 1 Sign in to My Oracle Support at <https://support.oracle.com>.
- 2 If you know the ID number of the article you need, enter the number in the text box at the top right of any page, and then click the magnifying glass icon or press **Enter**.
- 3 To search the knowledge base, click the **Knowledge** tab, and then use the options on the page to search by:
 - Product name or family.
 - Keywords or exact terms.

Finding patches

You can search for patches by patch ID or number, product, or family.

- 1 Sign in to My Oracle Support at <https://support.oracle.com>.
- 2 Click the **Patches & Updates** tab.
- 3 Enter your search criteria and click **Search**.
- 4 Click the patch ID number.

The system displays details about the patch. You can view the Read Me file before downloading the patch.

- 5 Click **Download**, and then follow the instructions on the screen to download, save, and install the patch files.

Finding Oracle documentation

The Oracle website contains links to Oracle user and reference documentation. You can view or download a single document or an entire product library.

Finding Oracle Health Sciences documentation

For Oracle Health Sciences applications, go to the Oracle Health Sciences Documentation page at <http://www.oracle.com/technetwork/documentation/hsgbu-clinical-407519.html>.

Note: Always check the Oracle Health Sciences Documentation page to ensure you have the most up-to-date documentation.

Finding other Oracle documentation

- 1 Do one of the following:
 - Go to <http://www.oracle.com/technology/documentation/index.html>.
 - Go to <http://www.oracle.com>, point to the **Support** tab, and then click **Product Documentation**.
- 2 Scroll to the product you need, and click the link.

Finding prerequisite software for Oracle Health Sciences applications

Prerequisite software for Oracle Health Sciences applications is available from the following locations:

- Download the latest major or minor release from the Oracle Software Delivery Cloud (<https://edelivery.oracle.com/>).

For information on the credentials that are required for authorized downloads, click **FAQ** on the main page of the Oracle Software Delivery Cloud portal.

- Download subsequent patch sets and patches from My Oracle Support (<https://support.oracle.com>).

To find patch sets or patches, select the **Patches & Updates** tab.

If a previous version of prerequisite software is no longer available on the Oracle Software Delivery Cloud, log a software media request Service Request (SR). Previous versions of prerequisite software are archived and can usually be downloaded. After you open an SR, you can check its status:

- US customers: Call 1-800-223-1711.
- Outside the US: Check www.oracle.com/us/support/contact/index.html for your local Oracle Support phone number.

For more information on logging a media request SR, go to My Oracle Support for Document 1071023.1: Requesting Physical Shipment or Download URL for Software Media (<https://support.oracle.com/epmos/faces/DocumentDisplay?id=1071023.1>).

CHAPTER 1

Secure development for the InForm Adapter

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Overview of InForm Adapter secure development

The *Secure Development Guide* provides an overview of the security options provided with the InForm Adapter application that help mitigate some of the common security risks. The recommendations in this document are not exhaustive and there is no guarantee that implementing all the suggestions provides sufficient protection for all security threats, as you cannot delegate responsibility for secure application development to a third party or a single document. This document is to help developers who know the security tools and features that they can use to implement application security. This document does not replace a formal code review process.

The InForm Adapter software provides the following web services that can be called by client applications:

- ODM interface
- Discrepancy interface

Transport layer protection

If your client is calling InForm Adapter web services that are hosted by Oracle, you must use Transport Layer Security (TLS) 1.1 or above to avoid man-in-the-middle attacks. In general, it is more secure to use TLS 1.2 for any client calling the InForm Adapter web services. Web client developers should enforce encrypted data transport when the application transports sensitive data and should validate that all certificates are legitimate and signed by public authorities.

Ciphers should be restricted to modern implementations.

Web service authentication

To address web service client authentication attacks, the InForm Adapter software supports username token and X.509 client certificate authentication. To ensure the integrity of web client authentication, the proper handling of the authentication artifacts should be followed.

The ODM and Discrepancy interfaces support username token authentication. Refer to the *Interfaces Guide* for information on how to invoke the ODM and Discrepancy web services using username token authentication. Because ODM is a WSE web service and Discrepancy is a WCF web service, their security headers use different formats. Make sure you refer to the correct section for the interface you are calling from your client.

To ensure that the web client authentication is secure, the password for the username token should be treated with the utmost care, as password exposure can compromise the authentication mechanisms. The InForm Adapter software does not store the password in clear-text on the file system and does not log the password. As such, the client web service password should be protected in the same fashion. The password should always be stored in an encrypted form. To reduce password exposure during password exchange, do not transfer the password through unencrypted side channels between web service endpoint parties. The authentication of each side channel endpoint is also a concern during the password exchange and is open to social engineering attacks if not done properly.

The Discrepancy interface also supports X.509 certificate authentication. The client application must sign the message with the X.509 private certificate and the public X.509 certificate must be installed on the InForm Adapter application server. For the X.509 certificate authentication, a trusted public certification authority (CA) should be used to validate the legitimacy of the organization controlling the web service client endpoint. The use of a trusted public CA reduces the chances of social engineering attacks based on username token password handling. Public CAs provide different levels of organization checks, depending on the costs of their services. More organization checks ensure fewer chances of a social engineering attack.

SQL injection

SQL injection issues occur when an SQL query is built using input from an untrusted source. This could allow an attacker to modify an SQL statement or to execute dangerous SQL commands.

The InForm Adapter interface web service uses bind variables and does not dynamically generate SQL, which makes SQL injection impossible.

XML injection

XML injection issues occur when the data used to construct XML code, which may contain XML metacharacters, is not encoded properly. The InForm Adapter software handles this by using standard XML processing components that construct the XML documents. It is recommended that the client code also uses standard XML processing components to ensure that data is properly encoded. If XML is constructed manually, the developer should ensure that any untrusted data is properly encoded to prevent XML injection.

Secure misconfiguration

Consult the *Secure Configuration Guide* to ensure the product API is locked down appropriately.