

# Oracle® Cloud

## Using the OData Adapter with Oracle Integration 3



F71143-08  
April 2024



Oracle Cloud Using the OData Adapter with Oracle Integration 3,

F71143-08

Copyright © 2023, 2024, Oracle and/or its affiliates.

Primary Author: Oracle Corporation

This software and related documentation are provided under a license agreement containing restrictions on use and disclosure and are protected by intellectual property laws. Except as expressly permitted in your license agreement or allowed by law, you may not use, copy, reproduce, translate, broadcast, modify, license, transmit, distribute, exhibit, perform, publish, or display any part, in any form, or by any means. Reverse engineering, disassembly, or decompilation of this software, unless required by law for interoperability, is prohibited.

The information contained herein is subject to change without notice and is not warranted to be error-free. If you find any errors, please report them to us in writing.

If this is software, software documentation, data (as defined in the Federal Acquisition Regulation), or related documentation that is delivered to the U.S. Government or anyone licensing it on behalf of the U.S. Government, then the following notice is applicable:

U.S. GOVERNMENT END USERS: Oracle programs (including any operating system, integrated software, any programs embedded, installed, or activated on delivered hardware, and modifications of such programs) and Oracle computer documentation or other Oracle data delivered to or accessed by U.S. Government end users are "commercial computer software," "commercial computer software documentation," or "limited rights data" pursuant to the applicable Federal Acquisition Regulation and agency-specific supplemental regulations. As such, the use, reproduction, duplication, release, display, disclosure, modification, preparation of derivative works, and/or adaptation of i) Oracle programs (including any operating system, integrated software, any programs embedded, installed, or activated on delivered hardware, and modifications of such programs), ii) Oracle computer documentation and/or iii) other Oracle data, is subject to the rights and limitations specified in the license contained in the applicable contract. The terms governing the U.S. Government's use of Oracle cloud services are defined by the applicable contract for such services. No other rights are granted to the U.S. Government.

This software or hardware is developed for general use in a variety of information management applications. It is not developed or intended for use in any inherently dangerous applications, including applications that may create a risk of personal injury. If you use this software or hardware in dangerous applications, then you shall be responsible to take all appropriate fail-safe, backup, redundancy, and other measures to ensure its safe use. Oracle Corporation and its affiliates disclaim any liability for any damages caused by use of this software or hardware in dangerous applications.

Oracle®, Java, MySQL, and NetSuite are registered trademarks of Oracle and/or its affiliates. Other names may be trademarks of their respective owners.

Intel and Intel Inside are trademarks or registered trademarks of Intel Corporation. All SPARC trademarks are used under license and are trademarks or registered trademarks of SPARC International, Inc. AMD, Epyc, and the AMD logo are trademarks or registered trademarks of Advanced Micro Devices. UNIX is a registered trademark of The Open Group.

This software or hardware and documentation may provide access to or information about content, products, and services from third parties. Oracle Corporation and its affiliates are not responsible for and expressly disclaim all warranties of any kind with respect to third-party content, products, and services unless otherwise set forth in an applicable agreement between you and Oracle. Oracle Corporation and its affiliates will not be responsible for any loss, costs, or damages incurred due to your access to or use of third-party content, products, or services, except as set forth in an applicable agreement between you and Oracle.

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>.

# Contents

## Preface

---

Audience	v
Documentation Accessibility	v
Diversity and Inclusion	v
Related Resources	vi
Conventions	vi

## 1 Understand the OData Adapter

---

OData Adapter Capabilities	1-1
OData Adapter Restrictions	1-2
What Application Version Is Supported?	1-2
Workflow to Create and Add an OData Adapter Connection to an Integration	1-2

## 2 Create an OData Adapter Connection

---

Prerequisites for Creating a Connection	2-1
Create a Connection	2-2
Configure Connection Properties	2-3
Configure Connection Security	2-3
Configure the Endpoint Access Type	2-5
Test the Connection	2-6
Upload a Certificate to Connect with External Services	2-7

## 3 Add the OData Adapter Connection to an Integration

---

Basic Info Page	3-1
Invoke Operations Page	3-1
Operation Page	3-3
Navigation Property Page	3-4
Invoke Query Parameters Page	3-5
Invoke Request Headers Page	3-7
Invoke Response Headers Page	3-8



# Preface

This guide describes how to configure this adapter as a connection in an integration in Oracle Integration.



## Note:

The use of this adapter may differ depending on the features you have, or whether your instance was provisioned using Standard or Enterprise edition. These differences are noted throughout this guide.

## Topics:

- [Audience](#)
- [Documentation Accessibility](#)
- [Diversity and Inclusion](#)
- [Related Resources](#)
- [Conventions](#)

## Audience

This guide is intended for developers who want to use this adapter in integrations in Oracle Integration.

## Documentation Accessibility

For information about Oracle's commitment to accessibility, visit the Oracle Accessibility Program website at <https://www.oracle.com/corporate/accessibility/>.

### Access to Oracle Support

Oracle customers that have purchased support have access to electronic support through My Oracle Support. For information, visit <https://support.oracle.com/portal/> or visit [Oracle Accessibility Learning and Support](#) if you are hearing impaired.

## Diversity and Inclusion

Oracle is fully committed to diversity and inclusion. Oracle respects and values having a diverse workforce that increases thought leadership and innovation. As part of our initiative to build a more inclusive culture that positively impacts our employees, customers, and partners, we are working to remove insensitive terms from our products and documentation.

We are also mindful of the necessity to maintain compatibility with our customers' existing technologies and the need to ensure continuity of service as Oracle's offerings and industry standards evolve. Because of these technical constraints, our effort to remove insensitive terms is ongoing and will take time and external cooperation.

## Related Resources

See these Oracle resources:

- Oracle Cloud at <http://cloud.oracle.com>
- *Using Integrations in Oracle Integration 3*
- *Using the Oracle Mapper with Oracle Integration 3*
- Oracle Integration documentation on the Oracle Help Center.

## Conventions

The following text conventions are used in this document:

Convention	Meaning
<b>boldface</b>	Boldface type indicates graphical user interface elements associated with an action, or terms defined in text or the glossary.
<i>italic</i>	Italic type indicates book titles, emphasis, or placeholder variables for which you supply particular values.
<code>monospace</code>	Monospace type indicates commands within a paragraph, URLs, code in examples, text that appears on the screen, or text that you enter.

# 1

## Understand the OData Adapter

Review the following topics to learn about the OData Adapter and how to use it as a connection in integrations in Oracle Integration. A typical workflow of adapter and integration tasks is also provided.

### Topics:

- [OData Adapter Capabilities](#)
- [OData Adapter Restrictions](#)
- [What Application Version Is Supported?](#)
- [Workflow to Create and Add an OData Adapter Connection to an Integration](#)

## OData Adapter Capabilities

The OData Adapter (short for Open Data Protocol) enables you to integrate a cloud application that exposes data by OData services with Oracle Integration. In addition, the OData Adapter enables you to integrate on-premises applications, which expose OData APIs, with Oracle Integration using the connectivity agent. You can configure the OData Adapter as an invoke connection in an integration in Oracle Integration.

The OData Adapter provides the following capabilities:

- Supports performing Create, Update, Delete, Get, Query, and Replace operations on the selected entity.
- Supports the query options: \$expand (select navigation properties), \$select (select required fields in response), \$filter, \$orderby, \$inlinecount, \$top, and \$skip.
- Supports consuming OData endpoints.
- Communicates with an OData API in the OData protocol.
- Supports the following batch operations for OData version 4 when you integrate cloud and on-premises applications through the connectivity agent with Oracle Integration:
  - Retrieve Operation (Get or Query)
  - Modification Operation (Create, Update, Replace, or Delete)
- Supports the JSON and ATOM-XML message formats for OData version 2.
- Supports the JSON message format for OData version 4.
- Supports custom queries for the Query operation.
- Supports adding custom headers. You can add custom headers values on the Request Headers page and/or Response Headers page.
- Provides multilevel navigation (\$expand on child entities) support for the Get and Query operations.
- Provides deep insert support for the Create operation.

- Supports operations such as Get, Query, Create, Update, Replace, Delete on a contained entity (Containment Navigation property) for OData version 4.
- Supports connecting to private resources that are in your virtual cloud network (VCN) with a private endpoint. See *Connect to Private Resources* in *Provisioning and Administering Oracle Integration 3* and [Configure the Endpoint Access Type](#). This type of connection does not use the connectivity agent.
- Supports pagination.
- Supports OData APIs protected using OAuth Client Credentials, OAuth Authorization Code Credentials, Client Certificate-Based, and Basic Authentication.
- Supports two-way SSL using the Client Certificate based security policy.

The OData Adapter is one of many predefined adapters included with Oracle Integration. See the Adapters page in the Oracle Help Center.



[Video](#)

## OData Adapter Restrictions

Note the following OData Adapter restrictions.

- The OData Adapter does not support batch operations for OData version 2.
- Field expansion on the navigation property is limited to five levels.



### Note:

There are overall service limits for Oracle Integration. A service limit is the quota or allowance set on a resource. See [Service Limits](#).

## What Application Version Is Supported?

For information about which application version is supported by this adapter, see the [Connectivity Certification Matrix](#).

## Workflow to Create and Add an OData Adapter Connection to an Integration

You follow a very simple workflow to create a connection with an adapter and include the connection in an integration in Oracle Integration.

This table lists the workflow steps for both adapter tasks and overall integration tasks, and provides links to instructions for each step.

Step	Description	More Information
1	Access Oracle Integration.	Go to <a href="https://instance_URL/ic/home">https://instance_URL/ic/home</a>

Step	Description	More Information
2	Create the adapter connections for the applications you want to integrate. The connections can be reused in multiple integrations and are typically created by the administrator.	<a href="#">Create an OData Adapter Connection</a>
3	Create the integration. When you do this, you add trigger (source) and invoke (target) connections to the integration.	Understand Integration Creation and Best Practices in <i>Using Integrations in Oracle Integration 3</i> and <a href="#">Add the OData Adapter Connection to an Integration</a>
4	Map data between the trigger connection data structure and the invoke connection data structure.	Map Data in <i>Using Integrations in Oracle Integration 3</i>
5	(Optional) Create lookups that map the different values used by those applications to identify the same type of object (such as gender codes or country codes).	Manage Lookups in <i>Using Integrations in Oracle Integration 3</i>
6	Activate the integration.	Activate an Integration in <i>Using Integrations in Oracle Integration 3</i>
7	Monitor the integration on the dashboard.	Monitor Integrations During Runtime in <i>Using Integrations in Oracle Integration 3</i>
8	Track payload fields in messages during runtime.	Assign Business Identifiers for Tracking Fields in Messages and Track Integration Instances in <i>Using Integrations in Oracle Integration 3</i>
9	Manage errors at the integration level, connection level, or specific integration instance level.	Manage Errors in <i>Using Integrations in Oracle Integration 3</i>

# 2

## Create an OData Adapter Connection

A connection is based on an adapter. You define connections to the specific cloud applications that you want to integrate. The following topics describe how to define connections.

### Topics:

- [Prerequisites for Creating a Connection](#)
- [Create a Connection](#)
- [Upload a Certificate to Connect with External Services](#)

## Prerequisites for Creating a Connection

You must satisfy the following prerequisites to create a connection with the OData Adapter:

- Know the OData service root URL.
- Understand OAuth Security Policies:

If you are using one of the OAuth security policies, you must have already registered your client application to complete the necessary fields on the Connections page.

Before a client application can request access to resources on a resource server, the client application must first register with the authorization server associated with the resource server.

The registration is typically a one-time task. Once registered, the registration remains valid, unless the client application registration is revoked.

At registration time, the client application is assigned a client ID and client secret (password) by the authorization server. The client ID and secret are unique to the client application on that authorization server. If a client application registers with multiple authorization servers (for example, Facebook, Twitter, and Google), each authorization server issues its own unique client ID to the client application.

@ref: <http://tutorials.jenkov.com/oauth2/authorization.html>

For OAuth configuration, read the provider documentation carefully and provide the relevant values.

### Prerequisite to Use the Client Certificate-Based Security Policy

Upload the X.509 client certificate into Oracle Integration. See [Upload a Certificate to Connect with External Services](#).

## Create a Connection

Before you can build an integration, you must create the connections to the applications with which you want to share data.

To create a connection in Oracle Integration:

1. In the navigation pane, click **Design**, then **Connections**.
2. Click **Create**.

 **Note:**

You can also create a connection in the integration canvas. See Define Inbound Triggers and Outbound Invokes.

3. In the Create connection panel, select the adapter to use for this connection. To find the adapter, scroll through the list, or enter a partial or full name in the **Search** field.
4. Enter the information that describes this connection.

Element	Description
<b>Name</b>	Enter a meaningful name to help others find your connection when they begin to create their own integrations.
<b>Identifier</b>	Automatically displays the name in capital letters that you entered in the <b>Name</b> field. If you modify the identifier name, don't include blank spaces (for example, SALES OPPORTUNITY).
<b>Role</b>	Select the role (direction) in which to use this connection (trigger, invoke, or both). Only the roles supported by the adapter are displayed for selection. When you select a role, only the connection properties and security policies appropriate to that role are displayed on the Connections page. If you select an adapter that supports both invoke and trigger, but select only one of those roles, you'll get an error when you try to drag the adapter into the section you didn't select.  For example, assume you configure a connection for the Oracle Service Cloud (RightNow) Adapter as only an <b>invoke</b> . Dragging the adapter to a <b>trigger</b> section in the integration produces an error.
<b>Keywords</b>	Enter optional keywords (tags). You can search on the connection keywords on the Connections page.
<b>Description</b>	Enter an optional description of the connection.

Element	Description
<b>Share with other projects</b>	<p><b>Note:</b> This field only appears if you are creating a connection in a project.</p> <p>Select to make this connection publicly available in other projects. Connection sharing eliminates the need to create and maintain separate connections in different projects.</p> <p>When you configure an adapter connection in a different project, the <b>Use a shared connection</b> field is displayed at the top of the Connections page. If the connection you are configuring matches the same type and role as the publicly available connection, you can select that connection to reference (inherit) its resources.</p> <p>See Add and Share a Connection Across a Project.</p>

5. Click **Create**.

Your connection is created. You're now ready to configure the connection properties, security policies, and (for some connections) access type.

## Configure Connection Properties

Enter connection information so your application can process requests.

1. Go to the **Properties** section.
2. In the **OData service root URL** field, enter an OData service root URL. For example:

```
https://host_name/path/SampleService.SVC
```

3. In the **OData version** field, select the OData version.

## Configure Connection Security

Configure security for your OData Adapter connection.

1. Go to the **Security** section.
2. Select the security policy to use.

### Note:

If you are configuring the OData Adapter for use with a two-way SSL-enabled server, you can select the Client Certificate based Security Policy for your connection.

Security Policy	Field
<b>Basic Authentication</b>	<ul style="list-style-type: none"> <li>• <b>Username</b> — The name of a user who has access to the destination web service.</li> <li>• <b>Password</b> — Enter the password.</li> </ul>

Security Policy	Field
OAuth Client Credentials	<ul style="list-style-type: none"> <li>• <b>Access token URI</b> — The URL from which to obtain the access token.</li> <li>• <b>Client ID</b> — The client identifier issued to the client during the registration process.</li> <li>• <b>Client secret</b> — The client secret.</li> <li>• <b>Scope (Optional)</b> — The scope of the access request. Scopes enable you to specify which type of access you need. Scopes limit access for the OAuth token. They do not grant any additional permission beyond that which the user already possesses. This is an optional parameter that can be kept blank.</li> <li>• <b>Auth Request Media Type (Optional)</b> — The format of the data you want to receive. This is an optional parameter that can be kept blank.</li> <li>• <b>Client Authentication (Optional)</b> — You can optionally configure OAuth flows with client authentication. This is similar to the Postman user interface feature for configuring client authentication. <ul style="list-style-type: none"> <li>– <b>Send client credentials as basic auth header:</b> Pass the client ID and client secret in the header as basic authentication.</li> <li>– <b>Send client credentials in body:</b> Pass the client ID and client secret in the body as form fields.</li> </ul> </li> </ul>
OAuth Authorization Code Credentials	<ul style="list-style-type: none"> <li>• <b>Client ID</b> — The client identifier issued to the client during the registration process.</li> <li>• <b>Client secret</b> — The client secret.</li> <li>• <b>Authorization code URI</b> — The URI from which to request the authorization code.</li> <li>• <b>Access token URI</b> — URI to use for the access token.</li> <li>• <b>Scope</b> — The scope of the access request. Scopes enable you to specify which type of access you need. Scopes limit access for the OAuth token. They do not grant any additional permission beyond that which the user already possesses.</li> <li>• <b>Client authentication (Optional)</b> — You can optionally configure OAuth flows with client authentication. This is similar to the Postman user interface feature for configuring client authentication. <ul style="list-style-type: none"> <li>– <b>Send client credentials as basic auth header:</b> Pass the client ID and client secret in the header as basic authentication.</li> <li>– <b>Send client credentials in body:</b> Pass the client ID and client secret in the body as form fields.</li> </ul> </li> </ul>

Security Policy	Field
<b>Client Certificate based Security Policy</b>	<p><b>Identity keystore Alias Name:</b> Provide the identity keystore alias name of the X.509 certificate that you uploaded into Oracle Integration. See <a href="#">Prerequisites to Use the Client Certificate-Based Security Policy</a>.</p> <p><b>Note:</b> The Client Certificate-based security policy is not supported with the connectivity agent.</p>
<b>No Security Policy</b>	No fields are displayed. Select <b>No Security Policy</b> to create a connection without configuring any security policy.

 **Note:**

When you configure the OAuth Authorization Code Credentials security policy for your OData Adapter connection, the **Provide Consent** option is displayed. You must verify the connection properties by clicking **Provide Consent**. Configuring all the details alone is not sufficient.

## Configure the Endpoint Access Type

Configure access to your endpoint. Depending on the capabilities of the adapter you are configuring, options may appear to configure access to the public internet, to a private endpoint, or to an on-premises service hosted behind a fire wall.

- [Select the Endpoint Access Type](#)
- [Ensure Private Endpoint Configuration is Successful](#)

### Select the Endpoint Access Type

Select the option for accessing your endpoint.

Option	This Option Appears If Your Adapter Supports ...
<b>Public gateway</b>	Connections to endpoints using the public internet.
<b>Private endpoint</b>	<p>Connections to endpoints using a private virtual cloud network (VCN).</p> <p><b>Note:</b> To connect to private endpoints, you must complete prerequisite tasks in the Oracle Cloud Infrastructure Console. Failure to do so results in errors when testing the connection. See <a href="#">Connect to Private Resources in Provisioning and Administering Oracle Integration 3</a> and <a href="#">Troubleshoot Private Endpoints in Using Integrations in Oracle Integration 3</a>.</p>

Option	This Option Appears If Your Adapter Supports ...
<b>Connectivity agent</b>	<p>Connections to on-premises endpoints through the connectivity agent.</p> <ol style="list-style-type: none"> <li>1. Click <b>Associate agent group</b>. The Associate agent group panel appears.</li> <li>2. Select the agent group, and click <b>Use</b>.</li> </ol> <p>To configure an agent group, you must download and install the on-premises connectivity agent. See Download and Run the Connectivity Agent Installer and About Creating Hybrid Integrations Using Oracle Integration in <i>Using Integrations in Oracle Integration 3</i>.</p>

### Ensure Private Endpoint Configuration is Successful

- To connect to private endpoints, you must complete prerequisite tasks in the Oracle Cloud Infrastructure Console. Failure to do so results in errors when testing the connection. See Connect to Private Resources in *Provisioning and Administering Oracle Integration 3*.
- When configuring an adapter on the Connections page to connect to endpoints using a private network, specify the fully-qualified domain name (FQDN) and *not* the IP address. If you enter an IP address, validation fails when you click **Test**.
- IPSec tunneling and FastConnect are not supported for use with private endpoints.

## Test the Connection

Test your connection to ensure that it's configured successfully.

1. In the page title bar, click **Test**. What happens next depends on whether your adapter connection uses a Web Services Description Language (WSDL) file. Only some adapter connections use WSDLs.

If Your Connection...	Then...
Doesn't use a WSDL	The test starts automatically and validates the inputs you provided for the connection.
Uses a WSDL	<p>A dialog prompts you to select the type of connection testing to perform:</p> <ul style="list-style-type: none"> <li>• <b>Validate and Test:</b> Performs a full validation of the WSDL, including processing of the imported schemas and WSDLs. Complete validation can take several minutes depending on the number of imported schemas and WSDLs. No requests are sent to the operations exposed in the WSDL.</li> <li>• <b>Test:</b> Connects to the WSDL URL and performs a syntax check on the WSDL. No requests are sent to the operations exposed in the WSDL.</li> </ul>

2. Wait for a message about the results of the connection test.
  - If the test was successful, then the connection is configured properly.

- If the test failed, then edit the configuration details you entered. Check for typos and verify URLs and credentials. Continue to test until the connection is successful.
3. When complete, click **Save**.

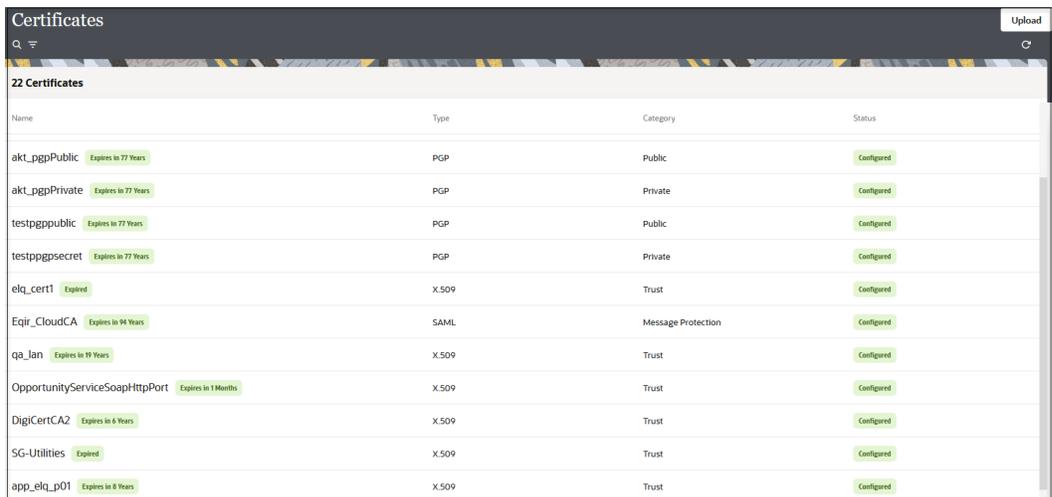
## Upload a Certificate to Connect with External Services

Certificates allow Oracle Integration to connect with external services. If the external service/ endpoint needs a specific certificate, request the certificate and then import it into Oracle Integration.

If you make an SSL connection in which the root certificate does not exist in Oracle Integration, an exception error is thrown. In that case, you must upload the appropriate certificate. A certificate enables Oracle Integration to connect with external services. If the external endpoint requires a specific certificate, request the certificate and then upload it into Oracle Integration.

For the OData Adapter, note the following certificate details for two-way SSL:

- Two-way SSL: You must add the public certificate of the HTTPS URL. After that, you must create a JKS certificate with a private key file. You must upload the JKS certificate as an identity certificate.
  - Once you upload the identity certificate, you must use an alias on the Connections page by selecting the Client Certificate based Security Policy.
1. Sign in to Oracle Integration.
  2. In the navigation pane, click **Settings**, then **Certificates**.  
All certificates currently uploaded to the trust store are displayed on the Certificates page.
  3. Click **Filter**  to filter by name, certificate expiration date, status, type, category, and installation method (user-installed or system-installed). Certificates installed by the system cannot be deleted.



Name	Type	Category	Status
akt_pppPublic <small>Expires in 77 Years</small>	PGP	Public	Configured
akt_pppPrivate <small>Expires in 77 Years</small>	PGP	Private	Configured
testppgpublic <small>Expires in 77 Years</small>	PGP	Public	Configured
testppgsecret <small>Expires in 77 Years</small>	PGP	Private	Configured
elq_cert1 <small>Expired</small>	X.509	Trust	Configured
Eqir_CloudCA <small>Expires in 94 Years</small>	SAML	Message Protection	Configured
qa_lan <small>Expires in 99 Years</small>	X.509	Trust	Configured
OpportunityServiceSoapHttpPort <small>Expires in 1 Months</small>	X.509	Trust	Configured
DigiCertCA2 <small>Expires in 4 Years</small>	X.509	Trust	Configured
SG-Utilities <small>Expired</small>	X.509	Trust	Configured
app_elq_p01 <small>Expires in 8 Years</small>	X.509	Trust	Configured

4. Click **Upload** at the top of the page.  
The Upload certificate panel is displayed.
5. Enter an alias name and optional description.

6. In the **Type** field, select the certificate type. Each certificate type enables Oracle Integration to connect with external services.
  - [Digital Signature](#)
  - [X.509 \(SSL transport\)](#)
  - [SAML \(Authentication & Authorization\)](#)
  - [PGP \(Encryption & Decryption\)](#)
  - [Signing key](#)

### Digital Signature

The digital signature security type is typically used with adapters created with the Rapid Adapter Builder. See [Learn About the Rapid Adapter Builder in Oracle Integration in \*Using the Rapid Adapter Builder with Oracle Integration 3\*](#).

1. Click **Browse** to select the digital certificate. The certificate must be an X509Certificate. This certificate provides inbound RSA signature validation. See [Implement Digital Signature Validation \(RSA\) in \*Using the Rapid Adapter Builder with Oracle Integration 3\*](#).
2. Click **Upload**.

### X.509 (SSL transport)

1. Select a certificate category.
  - a. **Trust**: Use this option to upload a trust certificate.
    - i. Click **Browse**, then select the trust file (for example, `.cer` or `.crt`) to upload.
  - b. **Identity**: Use this option to upload a certificate for two-way SSL communication.
    - i. Click **Browse**, then select the keystore file (`.jks`) to upload.
    - ii. Enter the comma-separated list of passwords corresponding to key aliases.

 **Note:**

When an identity certificate file (`.jks`) contains more than one private key, all the private keys must have the same password. If the private keys are protected with different passwords, the private keys cannot be extracted from the keystore.

- iii. Enter the password of the keystore being imported.
  - c. Click **Upload**.

### SAML (Authentication & Authorization)

1. Note that **Message Protection** is automatically selected as the only available certificate category and cannot be deselected. Use this option to upload a keystore certificate with SAML token support. Create, read, update, and delete (CRUD) operations are supported with this type of certificate.

2. Click **Browse**, then select the certificate file (.cer or .crt) to upload.
3. Click **Upload**.

### PGP (Encryption & Decryption)

1. Select a certificate category. Pretty Good Privacy (PGP) provides cryptographic privacy and authentication for communication. PGP is used for signing, encrypting, and decrypting files. You can select the private key to use for encryption or decryption when configuring the stage file action.
  - a. **Private:** Uses a private key of the target location to decrypt the file.
    - i. Click **Browse**, then select the PGP file to upload.
    - ii. Enter the PGP private key password.
  - b. **Public:** Uses a public key of the target location to encrypt the file.
    - i. Click **Browse**, then select the PGP file to upload.
    - ii. In the **ASCII-Armor Encryption Format** field, select **Yes** or **No**.
      - **Yes** shows the format of the encrypted message in ASCII armor. ASCII armor is a binary-to-textual encoding converter. ASCII armor formats encrypted messaging in ASCII. This enables messages to be sent in a standard messaging format. This selection impacts the visibility of message content.
      - **No** causes the message to be sent in binary format.
    - iii. From the **Cipher Algorithm** list, select the algorithm to use. Symmetric-key algorithms for cryptography use the same cryptographic keys for both encryption of plain text and decryption of cipher text. The following supported cipher algorithms are FIPS-compliant:
      - AES128
      - AES192
      - AES256
      - TDES
  - c. Click **Upload**.

### Signing key

A signing key is a secret key used to establish trust between applications. Signing keys are used to sign ID tokens, access tokens, SAML assertions, and more. Using a private signing key, the token is digitally signed and the server verifies the authenticity of the token by using a public signing key. You must upload a signing key to use the OAuth Client Credentials using JWT Client Assertion and OAuth using JWT User Assertion security policies in REST Adapter invoke connections. Only PKCS1- and PKCS8-formatted files are supported.

1. Select **Public** or **Private**.
2. Click **Browse** to upload a key file.

If you selected **Private**, and the private key is encrypted, a field for entering the private signing key password is displayed after key upload is complete.
3. Enter the private signing key password. If the private signing key is not encrypted, you are not required to enter a password.
4. Click **Upload**.

# 3

## Add the OData Adapter Connection to an Integration

When you drag the OData Adapter into the invoke area of an integration, the Adapter Endpoint Configuration Wizard is invoked. This wizard guides you through configuration of the Update Adapter Product Name endpoint properties.

The following sections describe the wizard pages that guide you through configuration of the OData Adapter as an invoke in an integration.

### Topics:

- [Basic Info Page](#)
- [Invoke Operations Page](#)
- [Invoke Query Parameters Page](#)
- [Invoke Request Headers Page](#)
- [Invoke Response Headers Page](#)
- [Summary Page](#)

## Basic Info Page

You can enter a name and description on the Basic Info page of each adapter in your integration.

Element	Description
<b>What do you want to call your endpoint?</b>	Provide a meaningful name so that others can understand the responsibilities of this connection. You can include English alphabetic characters, numbers, underscores, and hyphens in the name. You can't include the following characters: <ul style="list-style-type: none"><li>• No blank spaces (for example, My Inbound Connection)</li><li>• No special characters (for example, #;83&amp; or righ(t)now4) except underscores and hyphens</li><li>• No multibyte characters</li></ul>
<b>What does this endpoint do?</b>	Enter an optional description of the connection's responsibilities. For example:  <code>This connection receives an inbound request to synchronize account information with the cloud application.</code>

## Invoke Operations Page

Select the operation type to perform.

- **Single Operation:** Enables you to execute one operation at a time.

- **Batch Operation:** Enables you to execute more than one operation as a batch.

### Single Operation

If you select **Single Operation**, the following options are displayed.

Element	Description
<b>Select Operation</b>	Displays the list of operations to select. <ul style="list-style-type: none"> <li>• <b>Create:</b> Creates a new record for the selected entity.</li> <li>• <b>Update:</b> Updates the existing record for the selected entity.</li> <li>• <b>Delete:</b> Deletes a record for the selected entity.</li> <li>• <b>Get:</b> Retrieves a specific record for the selected entity.</li> <li>• <b>Query:</b> Retrieves all records for the selected entity.</li> <li>• <b>Replace:</b> Replaces the existing record for the selected entity.</li> </ul>
<b>Select Entity</b>	Displays a list of entities to select.
<b>Request and Response Media Type</b> (Displays if you select OData Version 4 on the Connections page.)	<ul style="list-style-type: none"> <li>• <b>JSON:</b> Select to represent the records using the JavaScript Object Notation (JSON) format.</li> <li>• <b>ATOM-XML:</b> Select to represent the records for OData requests and responses using the Atom-XML format.</li> </ul>
<b>Add custom request headers</b>	Select this check box to add custom request headers on the Request Headers page.
<b>Add custom response headers</b>	Select this check box to add custom response headers on the Response Headers page.
<b>Perform operation on contained Entity</b>	Select this check box to perform operations on a contained entity on the Navigation page.



#### Note:

The **Deep Insert** operation and **Operations on Contained Entity** operation can be performed only under the **Single Operation** option.

### Batch Operation

If you select **Batch Operation**, the following options are displayed.

The list of batch operations is displayed. You can add or remove the batch operations to perform.



#### Note:

- A maximum of five operations can be executed per batch operation.
- A minimum of two operations must be selected to perform a batch.
- Within a single modification operation, a maximum of five operations (such as create, update, replace, or delete) can be selected.

Element	Description
<b>Click to add an Operation to the List</b>	Select to configure an operation. A new page appears when you click this option.
<b>Add custom request headers</b>	Select this check box to add custom request headers on the Request Headers page.
<b>Add custom response headers</b>	Select this check box to add custom response headers on the Response Headers page.

**Note:**

Based on the selections made on this page, separate tabbed pages are shown in the Request Header page and/or Response Header page for configuring the headers.

**Click to Add an Operation to the List**

This page appears when you select the **Click to add an Operation to the List** option.

Element	Description
<b>Select an Operation Type</b>	Select one of the following operation types to perform: <ul style="list-style-type: none"> <li>• <b>Retrieve Operation</b></li> <li>• <b>Modification Operation</b></li> </ul>
<b>Select Operation</b>	Select one of the following operations to perform in the target application. The operations available for selection depend upon the operation type you selected. If you select <b>Retrieve Operation</b> , the following operations are displayed for selection: <ul style="list-style-type: none"> <li>• <b>Get</b>: Retrieves a specific record for the selected entity.</li> <li>• <b>Query</b>: Retrieves all records for the selected entity.</li> </ul> If you select <b>Modification Operation</b> , the following operations are displayed for selection: <ul style="list-style-type: none"> <li>• <b>Create</b>: Creates a new record for the selected entity.</li> <li>• <b>Update</b>: Updates the existing record for the selected entity.</li> <li>• <b>Delete</b>: Deletes a record for the selected entity.</li> <li>• <b>Replace</b>: Replaces the existing record for the selected entity.</li> </ul>
<b>Select Entity</b>	Displays a list of entities to select.

## Operation Page

The Operation page appears when you select the **Click to add an Operation to the List** option.

Element	Description
<b>Select an Operation Type</b>	Select one of the following operation types to perform: <ul style="list-style-type: none"> <li>• <b>Retrieve Operation</b></li> <li>• <b>Modification Operation</b></li> </ul>

Element	Description
<b>Select Operation</b>	<p>Select one of the following operations to perform in the ServiceNow application.</p> <p>The operations available for selection depend upon the operation type you selected.</p> <p>If you select <b>Retrieve Operation</b>, the following operations are displayed for selection.</p> <ul style="list-style-type: none"> <li>• <b>Get</b>: Retrieves specific record for the selected entity.</li> <li>• <b>Query</b>: Retrieves all records for the selected entity.</li> </ul> <p>If you select <b>Modification Operation</b>, the following operations are displayed for selection:</p> <ul style="list-style-type: none"> <li>• <b>Create</b>: Creates a new record for the selected entity.</li> <li>• <b>Update</b>: Updates the existing record for the selected entity.</li> <li>• <b>Delete</b>: Deletes a record for the selected entity.</li> <li>• <b>Replace</b>: Replaces the existing record for the selected entity.</li> </ul>
<b>Select Entity</b>	Displays a list of entities to select.

## Navigation Property Page

The Navigation Property page appears when you select **Create** under **Single Operation** on the Operation page.

### Deep Insert Operation

Element	Description
<b>Select child navigation property</b>	Select or deselect the child navigation properties for an entity selected on the Operation page. Select the required navigation properties on which you want to perform the deep insert operation.

### Operation on Contained Entity

The Navigation Property page appears when you select the **Perform operation on contained Entity** check box under **Single Operation** on the Operation page.



#### Note:

To use an operation on a contained entity, ensure that you select **V4** in the **OData Version** field on the Connections page.

Element	Description
<b>Perform operation on contained entity by selecting any one navigation property</b>	Select or deselect the child navigation property for an entity selected on the operation page. Select the required any one navigation property on which you want to perform the operation.

## Invoke Query Parameters Page

Configure the query parameters to control the amount and order of the records returned in the response. Based on the selections you made on the Operations page, the following fields are displayed on the Query Parameters page.

If you selected **Query** on the Operations page, the following options are displayed:

**Configure Query parameters:**

- [Query Expression](#)
- [Query Builder](#)

### Query Expression

Element	Description
<b>Select navigation properties</b>	<p>Select to get the child entities associated with a selected entity type in the response. That is, users can expand the navigation property of an entity.</p> <ul style="list-style-type: none"> <li>• <b>Filters by navigation name:</b> Enter the initial letters to filter the display of navigation properties names.</li> <li>• <b>Configure expand parameters:</b> Lists the expand parameters that meet the selection criteria.</li> <li>• <b>Your selected expand parameters:</b> Lists your expand parameters selection.</li> </ul>
<b>Select required fields in response</b>	<p>Allows users to request a specific set of properties (required fields) for an entity.</p> <ul style="list-style-type: none"> <li>• <b>Filters by field name:</b> Enter the initial letters to filter the display of field names.</li> <li>• <b>Configure fields:</b> Lists the fields that meet the selection criteria.</li> <li>• <b>Your selected fields:</b> Lists your field selection.</li> </ul>
<b>Top n records (\$top)</b>	Allows users to get only the first <i>n</i> (for example, 50) records in the response.
<b>Skip n records (\$skip)</b>	Allows users to skip the first <i>n</i> (for example, 20) records in the response.
<b>Count of records (\$inlinecount)</b>	Allows users to include a count of records in the response.
<b>Add \$orderby Query Parameter</b>	Allows users to sort the result set in a particular order: ascending or descending.
<b>Add \$filter Query Parameter</b>	Allows users to filter the set of resources that are returned in the response by applying conditions.
<b>Click to see generated query</b>	Click <b>Generate Query</b> to generate the report query. After you provide the required details and click <b>Generate Query</b> , the generated report query is displayed.

## Query Builder

Element	Description
<b>Enter Query</b>	<p>Enter a valid query statement. You can enter a static query. For example:</p> <pre>expand=to_PurchaseOrderItem&amp;select=PurchaseOrder, CompanyCode, PurchaseOrderType,PurchasingDocumentDeletionCode, AddressPostalCode,to_PurchaseOrderItem&amp;top=20&amp;skip=2&amp;inlinecount= allpages&amp;orderby=PurchaseOrder desc&amp;filter=PurchaseOrder eq '450000002' and PurchaseOrderType ne 'stri'</pre> <p>You can also enter a dynamic query. For example:</p> <pre>expand=to_PurchaseOrderItem&amp;select=PurchaseOrder, CompanyCode, PurchaseOrderType,PurchasingDocumentDeletionCode, AddressPostalCode, to_PurchaseOrderItem&amp;top=#top&amp;skip=#skip&amp;inlinecount=#inlinecount&amp;orderby=#orderby &amp;filter=#filter</pre>
<b>Click here to test query</b>	<p>Click <b>Validate Query</b> to validate the query. If a query is valid, a <b>Success</b> message is displayed and the query response is displayed for a successful query. If the query is invalid, a <b>Fail</b> message is displayed.</p>

If you selected **Get** on the Operations page, the following options are displayed:

### Configure Query parameters:

- [Query Expression](#)
- [Query Builder](#)

### Query Expression

Element	Description
<b>Select navigation properties</b>	<p>Select to get the child entities associated with a selected entity type in the response. That is, users can expand the navigation property of an entity.</p> <ul style="list-style-type: none"> <li>• <b>Filters by navigation name:</b> Enter the initial letters to filter the display of navigation properties names.</li> <li>• <b>Configure expand parameters:</b> Lists the expand parameters that meet the selection criteria.</li> <li>• <b>Your selected expand parameters:</b> Lists your expand parameters selection.</li> </ul>

Element	Description
<b>Select required fields in response</b>	<p>Allows users to request a specific set of properties (required fields) for an entity.</p> <ul style="list-style-type: none"> <li>• <b>Filters by field name:</b> Enter the initial letters to filter the display of field names.</li> <li>• <b>Configure fields:</b> Lists the fields that meet the selection criteria.</li> <li>• <b>Your selected fields:</b> Lists your field selection.</li> </ul>

### Query Builder

Element	Description
<b>Enter Query</b>	<p>Enter a valid query statement. For example:</p> <pre>expand=to_PurchaseOrderItem&amp;select=PurchaseOrder</pre>
<b>Click here to test query</b>	<p>Click <b>Validate Query</b> to validate the query. If a query is valid, a <b>Success</b> message is displayed and the query response is displayed for a successful query. If the query is invalid, a <b>Fail</b> message is displayed.</p>

#### Note:

To use multilevel navigation, you can enter a query as follows.

- For OData version 2:

```
expand=toPaymentMethodAssignmentV3/countryNav/currencyNav/statusNav
```

- For OData version 4:

```
expand=_PurchaseOrderItem(expand=_PurchaseOrderScheduleLineTP(expand=_SubcontractingComponent))
```

## Invoke Request Headers Page

Enter the request header details for the OData Adapter. You can configure and view custom OData request header parameters for the OData Adapter.

---

Element	Description
<b>Add Custom Request Header</b>	Configure the custom request headers. Click <b>Add</b> to add a custom header name and description. Click <b>Remove</b> to remove the custom headers.

---

## Invoke Response Headers Page

Enter the response header details for the OData Adapter. You can configure and view custom OData response header parameters for the OData Adapter.

---

Element	Description
<b>Add Custom Response Header</b>	Configure the custom response headers. Click <b>Add</b> to add a custom header name and description. Click <b>Remove</b> to remove the custom headers.

---

## Summary Page

You can review the specified adapter configuration values on the Summary page.

---

Element	Description
<b>Summary</b>	<p>Displays a summary of the configuration values you defined on previous pages of the wizard.</p> <p>The information that is displayed can vary by adapter. For some adapters, the selected business objects and operation name are displayed. For adapters for which a generated XSD file is provided, click the XSD link to view a read-only version of the file.</p> <p>To return to a previous page to update any values, click the appropriate tab in the left panel or click <b>Go back</b>.</p> <p>To cancel your configuration details, click <b>Cancel</b>.</p>

---