Oracle® Cloud

Using the MySQL Adapter

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This guide describes how to configure and add the MySQL Adapter to an integration in Oracle Integration Cloud Service.

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Contents

Preface

Using the MySQL Adapter describes how to configure the MySQL Adapter as a connection in an integration in Oracle Integration Cloud Service.

Topics:

Audience

Using the MySQL Adapter is intended for developers who want to use the MySQL Adapter in integrations in Oracle Integration Cloud Service.

Related Resources

For more information, see these Oracle resources:

- Oracle Cloud

  `http://cloud.oracle.com`
- *Using Oracle Integration Cloud Service*
- *Using the Oracle Mapper*

Conventions

The following text conventions are used in this document:

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

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Getting Started with the MySQL Adapter

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

Topics

About the MySQL Adapter

The MySQL Adapter enables you to create an integration in Oracle Integration Cloud Service.

The MySQL Database is an open-source relational database management system (RDBMS). The MySQL Database uses the Structured Query Language (SQL). SQL enables you to add, access, and manage content in the MySQL Database. The MySQL Database is a key part of many open source Hypertext Preprocessor (PHP) applications.

The MySQL Adapter provides the following benefits:

- Support for integrations between Oracle Integration Cloud Service and an on-premises MySQL Database. The MySQL Adapter runs in an on-premises environment to achieve this integration.
- Outbound (invoke) integration support for the following:
  - Execution of stored procedures based on database schemas. When you select a stored procedure in the Adapter Endpoint Configuration Wizard, the respective IN, OUT, and IN/OUT parameters are displayed.
  - Execution of SQL statements:
    - Enables you to directly enter SQL statements.
    - Supports data manipulation language (DML) create, read, update, and delete (CRUD) statements.

- Supports validation of SQL queries.
- Supports bind variables (for example, `Employee_ID = #D`).

For more information about integrating on-premises applications with Oracle Integration Cloud Service, see *Using Oracle Integration Cloud Service*.

- Distributed polling and multithreading support.

The MySQL Adapter is one of many predefined adapters included with Oracle Integration Cloud Service. You can configure the MySQL Adapter as an invoke connection in an integration in Oracle Integration Cloud Service. For information about Oracle Integration Cloud Service, connections, and integrations, see the following sections:

- About Oracle Integration Cloud Service
- About Oracle Integration Cloud Service Connections
- About Oracle Integration Cloud Service Integrations

About Oracle Integration Cloud Service

Oracle Integration Cloud Service is a complete, secure, but lightweight integration solution that enables you to connect your applications in the cloud. It simplifies connectivity between your applications, and can connect both your applications that live in the cloud and your applications that still live on premises. Oracle Integration Cloud Service provides secure, enterprise-grade connectivity regardless of the applications you are connecting or where they reside.

Oracle Integration Cloud Service provides native connectivity to Oracle Software as a Service (SaaS) applications, such as Oracle Sales Cloud, Oracle RightNow Cloud, and so on. Oracle Integration Cloud Service *adapters* simplify connectivity by handling the underlying complexities of connecting to applications using industry-wide best practices. You only need to create a *connection* that provides minimal connectivity information for each system. Oracle Integration Cloud Service *lookups* map the different codes or terms used by the applications you are integrating to describe similar items (such as country or gender codes). Finally, the visual data mapper enables you to quickly create direct mappings between the trigger and invoke data structures. From the mapper, you can also access lookup tables and use standard XPath functions to map data between your applications.

Once you integrate your applications and activate the integrations to the runtime environment, the dashboard displays information about the running integrations so you can monitor the status and processing statistics for each integration. The dashboard measures and tracks the performance of your transactions by capturing and reporting key information, such as throughput, the number of messages processed successfully, and the number of messages that failed processing. You can also manage business identifiers that track fields in messages and manage errors by integrations, connections, or specific integration instances.

About Oracle Integration Cloud Service Connections

Connections define information about the instances of each configuration you are integrating. Oracle Integration Cloud Service includes a set of predefined *adapters*, which are the types of applications on which you can base your connections, such as Oracle Sales Cloud, Oracle Eloqua Cloud, Oracle RightNow Cloud, and others. A connection is based on an adapter. A connection includes the additional information required by the adapter to communicate with a specific instance of an application (this

can be referred to as metadata or as connection details). For example, to create a connection to a specific RightNow Cloud application instance, you must select the Oracle RightNow adapter and then specify the WSDL URL, security policy, and security credentials to connect to it.

Video

About Oracle Integration Cloud Service Integrations

Integrations are the main ingredient of Oracle Integration Cloud Service. An integration includes at the least a trigger (source) connection (for requests sent to Oracle Integration Cloud Service) and invoke (target) connection (for requests sent from Oracle Integration Cloud Service to the target) and the field mapping between those two connections.

When you create your integrations, you build on the connections you already created by defining how to process the data for the trigger (source) and invoke (target) connections. This can include defining the type of operations to perform on the data, the business objects and fields against which to perform those operations, required schemas, and so on. To make this easier, the most complex configuration tasks are handled by Oracle Integration Cloud Service. Once your trigger (source) and invoke (target) connections are configured, the mappers between the two are enabled so you can define how the information is transferred between the trigger (source) and invoke (target) data structures for both the request and response messages.

Video

About MySQL Adapter Use Cases

The MySQL Adapter can be used in scenarios such as the following.

You can create an integration that includes a SOAP Adapter connection on the trigger (inbound) side and a MySQL Adapter on the invoke (outbound) side. For example, when configuring the invoke MySQL Adapter, you can select a stored procedure that enables you to pass an employee ID as an inbound parameter from the SOAP Adapter to an on-premises MySQL database to retrieve additional information about the employee (first name, last name, email ID, and so on). The request is sent to the on-premises agent for execution. The employee results are then returned to Oracle Integration Cloud Service.

Related Topics:

About Agents and Integrations Between On-Premises Applications and Oracle Integration Cloud Service

Managing Agent Groups and the On-Premises Agent

Monitoring Agents

Typical Workflow for Creating and Including an Adapter Connection in an Integration

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

Step	Description	More Information
1	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.	Creating a MySQL Adapter Connection
2	Create the integration. When you do this, you add trigger and invoke connections to the integration.	Creating an Integration and Adding the MySQL Adapter Connection to an Integration
3	Map data between the trigger connection data structure and the invoke connection data structure.	Mapping Integration Cloud Service Data of *Using Oracle Integration Cloud Service*
4	(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).	Creating Lookups of *Using Oracle Integration Cloud Service*
5	Activate the integration.	Managing Integrations of *Using Oracle Integration Cloud Service*
6	Monitor the integration on the dashboard.	Monitoring Integration Cloud Services of *Using Oracle Integration Cloud Service*
7	Track payload fields in messages during runtime.	Assigning Business Identifiers for Tracking Fields in Messages and Managing Business Identifiers for Tracking Fields in Messages of *Using Oracle Integration Cloud Service*
8	Manage errors at the integration level, connection level, or specific integration instance level.	Managing Errors of *Using Oracle Integration Cloud Service*

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Creating a MySQL 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

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

- Ensure that the target MySQL Database is publicly accessible.
- Ensure that you have write permissions on the database.
- Ensure that you have the required permissions to run stored procedures and packages and SQL statements against the MySQL Database.
- Know the database hostname or IP address and the port number.
- Know the database name.
- Know the username and password for connecting to the database.
- Know the agent group to associate with the MySQL Adapter. You select the agent group during connection configuration in Configuring an Agent Group.

Uploading an SSL Certificate

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

To upload a certificate:

1. From the Oracle Integration Cloud Service home page, click the **Administration** tab in the upper right corner.

   All certificates currently uploaded to the trust store are displayed in the Certificates dialog. The **Filter By** > **Type** list displays the following details:

   - **Preinstalled**: Displays the certificates automatically installed in Oracle Integration Cloud Service. These certificates cannot be deleted.
   - **Uploaded**: Displays the certificates uploaded by individual users. These certificates can be deleted and updated.

   You can also search for certificates in the **Search** field. The search results are limited to a maximum of ten records sorted by name for performance and usability reasons. To ensure that your search results are more granular, enter as much of the certificate name as possible.

2. Click **Upload** at the top of the page.
3. In the Upload Certificate dialog box, enter a unique identifier for the certificate.

   This is a name you can use to identify the certificate.

4. Click **Browse** to locate the certificate file (`.cer`).
5. Click **Upload**.
6. Click the certificate name to view details such as the subject of the certificate, the issuer of the certificate, the date the certificate was issued, and the date the certificate expires.

Creating a Connection

The first step in creating an integration is to create the connections to the applications with which you want to share data.

1. In the Integration Cloud Service toolbar, click **Designer**.
2. On the Designer Portal, click **Connections**.
3. Click **New Connection**.

   The Create Connection — Select Adapter dialog is displayed.

4. Select an adapter from the dialog. You can also search for the type of adapter to use by entering a partial or full name in the Search field, and clicking **Search**.

   The New Connection — Information dialog is displayed.

5. Enter the information to describe the connection.

   - Enter a meaningful name to help others find your connection when they begin to create their own integrations. The name you enter is automatically added in capital letters to the **Identifier** field. If you modify the identifier name, do not include a blank space (for example, `OSC Inbound`).
   - Select the role (direction) in which to use this connection (trigger, invoke, or both). Only the roles supported by this 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, then try to drag the adapter into the section you did not select, you receive an error (for example, configure an Oracle RightNow Cloud Adapter as only an invoke, but drag the adapter to the trigger section).

- Enter an optional description of the connection.

6. Click **Create**.

   Your connection is created and you are now ready to configure connection details, such as email contact, connection properties, security policies, and connection login credentials.

Adding a Contact Email

From the Connection Administrator section of the connection, you can add a contact email address for notifications.

1. In the **Email Address** field, enter an email address to receive email notifications when problems occur.
2. In the upper right corner, click **Save**.

Configuring Connection Properties

Enter connection information so your application can process requests.

1. Click **Configure Connectivity**.
2. Enter the host name or IP address of the database server.
3. Enter the database server port number.
4. Enter the database name.

5. Click **OK**.
6. Configure connection security. See Configuring Connection Security.

Configuring Connection Security

Configure security for your MySQL Adapter connection by selecting the security policy and security token.

1. Create a connection. See Creating a Connection.
2. Click **Configure Security**.

   The **Security Policy** field displays **Username Password Token**. This value cannot be changed.
3. Complete the **Username**, **Password**, and **Confirm Password** fields.
4. Click **OK**.
5. Add an agent group. See Configuring an Agent Group.

Configuring an Agent Group

Configure an agent group for accessing your on-premises application.

1. Click **Configure Agents**.

   The Select an Agent Group page appears.
2. Click the name of the agent group.
3. Click **Use**.
4. Test the connection. See Testing the Connection.

Related Topics:

About Agents and Integrations Between On-Premises Applications and Oracle Integration Cloud Service

Managing Agent Groups and the On-Premises Agent

Monitoring Agents

Testing the Connection

Test your connection to ensure that it is successfully configured.

1. In the upper right corner of the page, click **Test**.

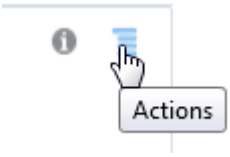
   If successful, the following message is displayed and the progress indicator shows 100%.

   ```
   The connection test was successful!
   ```
2. If your connection was unsuccessful, an error message is displayed with details. Verify that the configuration details you entered are correct.
3. When complete, click **Save**.

Editing a Connection

You can edit connection settings after creating a new connection.

1. In the Oracle Integration Cloud Service toolbar, click **Designer**.
2. On the Designer Portal, click **Connections**.
3. On the Connections page, search for the connection name.
4. Select **Edit** from the connection **Actions** menu or click the connection name.



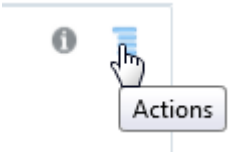
The Connection page is displayed.

5. To edit the notification email contact, change the email address in the **Email Address** field.
6. To edit the connection properties, click **Configure Connectivity**. Note that some connections do not include this button. If your connector does not include a **Configure Connectivity** button, then click the **Configure Credentials** button.

Cloning a Connection

You can clone a copy of an existing connection. It is a quick way to create a new connection.

1. In the Oracle Integration Cloud Service toolbar, click **Designer**.
2. On the Designer Portal, click **Connections**.
3. On the Connections page, search for the connection name.
4. Select **Clone** from the connection **Actions** menu.



The Clone Connection dialog is displayed.

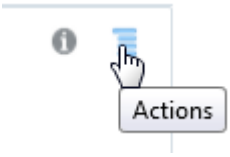
5. Enter the connection information.
6. Click **Clone**.
7. Click **Edit** to configure the credentials of your cloned connection. Cloning a connection does not copy the credentials.

See Editing a Connection for instructions.

Deleting a Connection

You can delete a connection from the connection menu.

1. In the Oracle Integration Cloud Service toolbar, click **Designer**.
2. On the Designer Portal, click **Connections**.
3. On the Connections page, search for the connection name.
4. Click **Delete** from the connection **Actions** menu.



   The Delete Connection dialog is displayed if the connection is not used in an integration.

5. Click **Yes** to confirm deletion.

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Creating an Integration

Integrations use the adapter connections you created to your applications, and define how information is shared between those applications. You can create, import, modify, or delete integrations; create integrations to publish or subscribe to messages; add and remove request and response enrichment triggers; and create routing paths for different invoke endpoints in integrations. Click the following topics for more information.

Topic

- Creating Integrations (in *Using Oracle Integration Cloud Service*)

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Adding the MySQL Adapter Connection to an Integration

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

The following sections describe the wizard pages that guide you through configuration of the MySQL Adapter as an invoke in an integration. The MySQL Adapter cannot be used as a trigger in an integration.

Topics

For more information about the MySQL Adapter, see About the MySQL Adapter.

Configuring Basic Information Properties

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

Topics

What You Can Do from the Basic Info Page

You can specify the following values on the Basic Info page. The Basic Info page is the initial wizard page that is displayed whenever you drag the MySQL Adapter to the invoke area.

- Specify a meaningful name.
- Specify the type of operation to run against the MySQL Database:
  - Select a stored procedure to invoke in the MySQL Database. This selection takes you to the Invoke a Stored Procedure page when you click **Next**.
  - Select a SQL statement to run against the MySQL Database. This selection takes you to the Run a SQL Statement page when you click **Next**.

What You See on the Basic Info Page

The following table describes the key information on the Basic Info page.

Element	Description
What do you want to call your endpoint?	Provide a meaningful name so that others can understand the connection. For example, if you are creating a database connection for adding new employee data, you may want to name it `CreateEmployeeInDB`. You can include English alphabetic characters, numbers, underscores, and dashes in the name. You cannot include the following: • Blank spaces (for example, `My DB Connection`) • Special characters (for example, `#;83&` or `righ(t)now4`) • Multibyte characters
What operation do you want to perform?	Select the type of operation for this connection to perform: • **Invoke a Stored Procedure**: Select to invoke a stored procedure in the database. • **Run a SQL Statement**: Select to run a SQL query against the database.

Configuring MySQL Adapter Invoke a Stored Procedure Properties

Enter the MySQL Adapter invoke stored procedure parameters.

Topics

What You Can Do from the Invoke a Stored Procedure Page

You can specify the following values on the Invoke a Stored Procedure page. The Invoke a Stored Procedure page is the wizard page that is displayed if you selected Invoke a Stored Procedure as the operation type on the Basic Info page.

- Select the database schema that includes the data you want to query (for example, you want to query details about an employee based on their employee ID).
- Select a stored procedure or package from the list that is displayed after you select the database schema.

What You See on the Invoke a Stored Procedure Page

The following table describes the key information on the Invoke a Stored Procedure page.

Element	Description
Select Schema	Select a database schema from the list. This action refreshes the page to display fields for selecting a package or procedure to invoke.
Select Package	Select the database package.
Select Procedure	Select the stored procedure. The page is refreshed to display the in (inbound), out (outbound), and in/out (inbound/outbound) parameters available with this procedure.
Arguments	Display the in, out, and in/out parameters that are passed with this procedure.

Configuring MySQL Adapter Invoke SQL Statement Properties

Enter the MySQL Adapter SQL statement parameters.

Topics

- What You Can Do from the Invoke Create a SQL Statement Page
- What You See on the Invoke Create a SQL Statement Page

Note:

- Do not use schema/database names in SQL queries. Configure the details in the connection. For example:

  ```
  Update HR.employee set HR.employee.first_name = 'Name' where
  HR.employee.employee_id='1'
  ```

  can be changed to a simple query, such as:

  ```
  Update employee set first_name = 'Name' where employee_id='1'
  ```

  where HR is used in the connection details. This restricts a user with specific privileges to a particular schema/database.

- When configuring the adapter as an invoke connection, ensure that proper spaces are provided between key words for a pure SQL statement. For example, the following statement fails during integration activation because there is no blank space between VALUES and (#.

  ```
  INSERT INTO table_name VALUES(#EMPNO, #EMPNAME)
  ```

  Add a blank space between VALUES and (#, and the statement is successfully processed.

  ```
  INSERT INTO table_name VALUES (#EMPNO, #EMPNAME)
  ```

What You Can Do from the Invoke Create a SQL Statement Page

You can specify the following values on the Invoke Create a SQL Statement page. The Create a SQL Statement page is the wizard page that is displayed if you selected Run a SQL Statement as the operation type on the Basic Info page.

- Enter a SQL query.
- Validate the SQL query to verify the query syntax is correct and the specified tables, fields, and values exist. When a SQL query is validated successfully, the **Status** field displays `Success!`

What You See on the Invoke Create a SQL Statement Page

The following table describes the key information on the invoke Create a SQL Statement page.

Element	Description
SQL Query	Enter a SQL query.
Status	Display the results of the SQL query validation. The **Status** field displays `Success!` when a query is successfully validated.

Configuring MySQL Adapter Trigger Polling Properties

Import the MySQL Adapter tables and select the root database table for the service query.

Topics

What You Can Do from the Trigger Polling Page

You can import root database tables on the trigger Polling page.

What You See on the Trigger Polling Page

The following table describes the key information on the trigger Polling page.

Element	Description
Import Tables	Imports tables and the root database table for the service query.

Element	Description
Remove Tables	Removes tables. Select **Remove Tables**, clear the checkbox to the right of the table you want to remove, and click **Ok**. You cannot remove the root database table.
Review and Manage relationships reachable from the root database table.	Appears after importing tables. Select **Edit** to open the Relations page where you can view, create, and remove relationships between tables.
Review and verify the attributes created from the imported tables and relationships.	Appears after importing tables. Select **Edit** to open the Attributes Filtering page where you can review, verify, select or deselect the attributes in the object model created from the imported tables and the defined relationships.
Polling Strategy and Options	Appears after importing tables. Select **Edit** to open the Polling Strategy and Options page where you can define the polling strategy and specify polling options.

What You See on the Trigger Manage Tables Page

The following table describes the key information on the trigger Manage Tables page. The trigger Manage Tables page appears when you select **Import Tables** on the MySQL Adapter trigger Poll for a New or Changed Records page.

Element	Description
Schema	Selects the schema for the tables and views you are importing.
Tables	The name of the table to which the schema or view is applied. The list next to the **Tables** field allows these selections: • All — selects all available tables and views. • Table — selects tables. • View — selects views.
Available Tables	Lists the tables that meet the selection criteria.
Selected Tables	Lists your table selection.
Primary Keys	Appears when you select tables without a primary key defined. Selects the virtual primary key for the table.

What You See on the Trigger Relations Page

The following table describes the key information on the trigger Relations page. The trigger Relations page appears when you select **Edit** for the Review and Manage relationships reachable from the root database table option on theMySQL Adapter trigger Poll for a New or Changed Records page.

Element	Description
Create New	Opens the Create Relation page with these options: • Parent Table — selects the parent table for the relationship between tables. • Child Table — selects the child table for the relationship between tables. • Relationship — defines the relationship between the parent and child tables. • Attribute Name — Applies attributes to the table relationship. • Mapping — Displays the mapping for the table relationship.
Detach	Opens the Relationships list in a new window.

What You See on the Trigger Polling Strategy and Options Page

The following table describes the key information on the trigger Polling Strategy and Options page. The trigger Polling Strategy and Options page appears when you select **Edit** for Polling Strategy and Options on theMySQL Adapter trigger Poll for a New or Changed Records page.

Element	Description
Logical Delete Field	Selects a field in the root database table. To allow the selection, polling must be enabled in the Status column.
Read Value	Identifies the value that is used to indicate a row has been read. For example, PROCESSED. Surrounding quotes are not required.
Unread Value	Indicates the rows to process. Only rows with Logical Delete Field and column values that match the UnRead Value are read.
Polling Frequency (Sec)	Specifies the polling frequency for new records or events.
Batch Size	Specifies the number of table rows to process during a transaction.

Reviewing Configuration Values on the Summary Page

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

Topics

What You Can Do from the Summary Page

You can review configuration details from the Summary page. The Summary page is the final wizard page for each adapter after you have completed your configuration.

- View the configuration details you defined for the adapter. For example, if you have defined an inbound trigger (source) adapter with a request business object and immediate response business object, specific details about this configuration are displayed on the Summary page.
- Click **Done** if you want to save your configuration details.
- Click a specific tab in the left panel or click **Back** to access a specific page to update your configuration definitions.
- Click **Cancel** to cancel your configuration details.

What You See on the Summary Page

The following table describes the key information on the Summary page.

Element	Description
Summary	Displays a summary of the configuration values you defined on previous pages of the wizard. 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. To return to a previous page to update any values, click the appropriate tab in the left panel or click **Back**.

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Creating Mappings and Lookups in Integrations

You must map data between trigger connections and invoke connections in integrations. You can also optionally create lookups in integrations.

Topics

- Mapping Integration Cloud Service Data (in *Using Oracle Integration Cloud Service*)
- Creating Lookups (in *Using Oracle Integration Cloud Service*)

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Administering Integrations

Oracle Integration Cloud Service provides you with the information and tools required to activate, monitor, and manage your integrations in the runtime environment.

Topic

- Administering Integration Cloud Service (in *Using Oracle Integration Cloud Service*)