Oracle® Cloud

Using the Snowflake Adapter with Oracle Integration 3

F58802-17
November 2025

Oracle Cloud Using the Snowflake Adapter with Oracle Integration 3,

F58802-17

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About This Content

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

Audience

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

Documentation Accessibility

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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
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.

1

Understand the Snowflake Adapter

Review the following conceptual topics to learn about the Snowflake 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:

- Snowflake Adapter Capabilities
- Snowflake Adapter Restrictions
- What Application Version Is Supported?
- Workflow to Create and Add a Snowflake Adapter Connection to an Integration

> **Note**
>
> The Snowflake Adapter is only available in Oracle Integration 3.

Snowflake Adapter Capabilities

The Snowflake Adapter enables you to integrate the Snowflake cloud database with Oracle Integration. You can configure the Snowflake Adapter as an invoke connection in an integration in Oracle Integration.

The Snowflake Adapter provides the following capabilities:

- Provides the following benefits using an external stage/external location:
  - Supports the bulk import and export of data from cloud storage services such as Amazon Web Services (AWS), Microsoft Azure, and Google Cloud Platform (GCP) into a table of the Snowflake Cloud database.

    > **Note**
    >
    > The AWS, GCP, and Microsoft Azure cloud storage services are currently supported by Snowflake.

  - Supports the operations in an asynchronous process. You can use the Snowflake API to check the status of an asynchronous process and cancel the in-process asynchronous process.
- Provides the following benefits using an internal stage:
  - Supports the bulk import and export of data from the Snowflake database using the internal stage.
  - Supports the operations in a synchronous process. The Check/Cancel Statement Execution action does not apply to the internal stage. Once the process is completed, the Snowflake Adapter displays a response whether or not the statement is executed successfully.

- Supports executing stored procedures in the Snowflake database.
- Supports executing SQL queries against database tables.
  For complex SQL queries, use stored procedures by selecting the **Invoke a Stored Procedure** option on the invoke Action page of the Adapter Endpoint Configuration Wizard. Stored procedures can reduce the complexity of a SQL query. See Invoke Action Page.
- Supports performing the `Select`, `Insert`, `Update`, and `Insert/Update (Merge)` operations against database tables.
- Supports Authorization Code Credentials authentication.
- Supports OAuth 2.0 Client Credentials authentication using external identity providers such as Azure Active Directory, Okta, and PingFederate.
- Supports integration with publicly-accessible resources (direct connectivity over the public internet) and on-premises resources using the connectivity agent.

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

Supported Data Types

The Snowflake Adapter supports the following data types.

Category	Data Types
Numeric	• NUMBER • DECIMAL, NUMERIC • INT, INTEGER, BIGINT, SMALLINT, TINYINT, BYTEINT • FLOAT, FLOAT4, FLOAT8 • DOUBLE, DOUBLE PRECISION, REAL
String and Binary	• VARCHAR • CHAR, CHARACTER • STRING • TEXT • BINARY • VARBINARY
Logical	BOOLEAN
Date and Time	DATE
Semi-Structured	• VARIANT • OBJECT • ARRAY
GeoSpatial	GEOGRAPHY

Snowflake Adapter Restrictions

Be aware of the following constraints before configuring the Snowflake Adapter.

- The Snowflake Adapter supports only Standard Account URLs and does not support private connectivity using AWS PrivateLink, Azure Private Link, or GCP Private Service Connect.
- The Snowflake Adapter supports only a single connectivity agent for establishing a connection.

- While testing the connection on the Connection Page, the OAuth server must be public.
- The following commands are not supported in Snowflake SQL:
  - The PUT command
  - The GET command
  - The CALL command with stored procedures that return a table (stored procedures with the `RETURNS TABLE` clause)

See Limitations of the SQL API.

> **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 a Snowflake 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	Decide where to work	• Work in a project (see why working with projects is preferred in *Using Integrations in Oracle Integration 3*). • Work outside a project.
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.	Create a Snowflake Adapter Connection
3	Create the integration. When you do this, you add trigger (source) and invoke (target) connections to the integration.	Create Integrations in *Using Integrations in Oracle Integration 3* and Add the Snowflake Adapter Connection to an Integration
4	Map data between the trigger connection data structure and the invoke connection data structure.	Map Data in *Using Integrations in Oracle Integration 3*
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 *Using Integrations in Oracle Integration 3*
6	Activate the integration.	Activate Integrations in *Using Integrations in Oracle Integration 3*

Step	Description	More Information
7	Monitor the integration on the dashboard.	Monitor Integrations in *Using Integrations in Oracle Integration 3*
8	Track payload fields in messages during runtime.	Assign Business Identifiers for Tracking Fields in Messages and Track Integration Instances in *Using Integrations in Oracle Integration 3*
9	Manage errors at the integration level, connection level, or specific integration instance level.	Manage Errors in *Using Integrations in Oracle Integration 3*

2

Create a Snowflake 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

Prerequisites for Creating a Connection

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

- Know the Parameter Values
- Configure External Identity Providers for OAuth 2.0 Client Credentials Authentication
- Create User and Security Integration In Snowflake

Know the Parameter Values

- Know the instance URL.
- Know the warehouse name.
- Know the database name.
- Know the schema name.
- Know the client ID and client secret of the integration. The client secret is retrieved using the SYSTEM$SHOW_OAUTH_CLIENT_SECRETS function.
- Ensure that the integration user (custom role) has all privileges on the warehouse, database, and schema.

When you create your Snowflake Adapter connection in Oracle Integration, you must specify the following details on the Connections page. Therefore, you must know or obtain the following values before creating a connection:

- Warehouse name
- Database name
- Schema name
- Client ID and client secret
- Refresh token

Perform the following steps to obtain these values:

> **Note**
>
> The following command examples are provided to give you an idea of what to enter.

1. Log in to your Snowflake admin account.
2. Create a warehouse using the following command. For example:

   ```
   create or replace warehouse ORACLE_WH;
   ```

   See Create Warehouse.
3. Create a database using the following command. For example:

   ```
   create or replace database snowflake_db_oracle;
   ```

   See Create Database.
4. Create a schema. See Create Schema. You receive the following schema by default if you used the commands mentioned in steps 2 and 3.

   ```
   use schema Public;
   ```

5. Create a new table in the current/specified schema. See Create Table.
6. Create a user using the following command. For example:

   ```
   create user oracle_user password='01March#2022' default_role = SYSADMIN
   ```

   See Create User.
7. Create a new Snowflake OAuth security integration using the following command in Snowflake. For example:

   ```
   create or replace security integration ORACLE_OAUTH
   type=oauth
   enabled=true
   oauth_client=CUSTOM
   oauth_client_type='CONFIDENTIAL'
   oauth_redirect_uri='https://my-development-instance.integration.us-
   region-1.domain.com/icsapis/agent/oauth/callback'
   oauth_issue_refresh_tokens=true
   oauth_refresh_token_validity=86400;
   ```

   See Create Security Integration (Snowflake Oauth).

   > **Note**
   >
   > For the OAuth refresh token value, the maximum value can be set to 7776000 (90 days).

   This step generates the client ID, client secret, and access tokens (and optionally, refresh tokens) for access to Snowflake.

   - To see the client ID and client secret of security integration, use the following command. For example:

     ```
     SELECT SYSTEM$SHOW_OAUTH_CLIENT_SECRETS('ORACLE_OAUTH');
     ```

- To see the properties of security integration, use the following command. For example:

```
desc integration ORACLE_OAUTH;
```

8. Assign a role (other than admin) to the user. See Grant Role and Alter User.
9. Provide all privileges on the warehouse, database, and schema to the custom role.
   - To provide the privileges of the database to the default role, use the following command. For example:

```
GRANT all PRIVILEGES on DATABASE snowflake_db_oracle to role sysadmin;
```

   - To provide the privileges of security integration to the default role, use the following command. For example:

```
grant all on integration ORACLE_OAUTH to role sysadmin;
```

   - To provide the privileges of predefined roles to the user, use the following command. For example:

```
grant role SYSADMIN to user oracle_user;
```

   - To provide the privileges of the warehouse to the default role, use the following command. For example:

```
grant usage on warehouse oracle_wh to role sysadmin;
```

   - To provide the privileges of the database to the default role, use the following command. For example:

```
grant usage on database snowflake_db_oracle to role sysadmin;
```

   - To provide the usage privileges of the schema to the default role, use the following command. For example:

```
grant usage on schema public to role sysadmin;
```

   See GRANT *<privileges>* … TO ROLE.

Configure External Identity Providers for OAuth 2.0 Client Credentials Authentication

To use the OAuth 2.0 Client Credentials security policy with the Snowflake Adapter, you must configure an external identity provider (IDP) such as Azure AD, Okta, or PingFederate to enable token-based access. Register an application in your chosen IDP and retrieve the following values required for authentication:

- Access token URI
- Client ID
- Client secret
- Scope

You use these credentials to obtain an access token that the Snowflake Adapter uses to connect securely to Snowflake without requiring user-interactive (three-legged OAuth) flows.

> **Note**
>
> These details apply only to security configuration. Connection properties and runtime behavior remain the same as existing OAuth-based integrations. If invalid credentials are provided, descriptive error messages are returned to help with troubleshooting.

For more information, see the provider-specific setup instructions:

- Azure AD: Configure Client Credentials Flow
- Okta: Set Up OAuth 2.0 for Snowflake

To learn more about how external OAuth works with Snowflake in general, see External OAuth Overview in the Snowflake Documentation.

Create User and Security Integration In Snowflake

To allow secure, token-based access to Snowflake using an external identity provider, follow these steps to create a user:

1. Obtain an access token using the following credentials from your IDP:
   - Client ID
   - Client secret
   - Access token URI
   - Scope
2. Decode the access token and extract the `sub` value. See Decode the OAuth Access Token. This `sub` value represents the user ID issued by the identity provider.
3. Create an external OAuth security integration in Snowflake. Provide the following information:
   - JWS key URL
   - OAuth issuer
   - Audience list
4. Create the user in Snowflake by using the extracted `sub` value as the value for the `LOGIN_NAME` property.
5. Grant appropriate roles and permissions to the user.
6. In the **Security** section of the Connections page in Oracle Integration, enter the same `sub` value in the **User Id** field.

Create a Connection

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

> **Note**
>
> You can also create a connection in the integration canvas. See Define Inbound Triggers, Outbound Invokes, and Actions.

To create a connection in Oracle Integration:

1. Decide where to start:
   - Work in a project (see why working with projects is preferred).
     a. In the navigation pane, click **Projects**.
     b. Select the project name.
     c. Click **Integrations**.
     d. In the **Connections** section, click **Add** if no connections currently exist or **+** if connections already exist. The Create connection panel opens.
   - Work outside a project.
     a. In the navigation pane, click **Design**, then **Connections**.
     b. Click **Create**. The Create connection panel opens.
2. 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.
3. Enter the information that describes this connection.

Element	Description
Name	Enter a meaningful name to help others find your connection when they begin to create their own integrations.
Identifier	Automatically displays the name in capital letters that you entered in the **Name** field. If you modify the identifier name, don't include blank spaces (for example, `SALES OPPORTUNITY`).
Role	Select the role (direction) in which to use this connection. **Note**: *Only* the roles supported by the adapter you selected are displayed for selection. Some adapters support all role combinations (trigger, invoke, or trigger and invoke). Other adapters support fewer role combinations. 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 **invoke**. Dragging the adapter to a **trigger** section in the integration produces an error.
Keywords	Enter optional keywords (tags). You can search on the connection keywords on the Connections page.
Description	Enter an optional description of the connection.

Element	Description
Share with other projects	**Note**: This field only appears if you are creating a connection in a project. Select to make this connection publicly available in other projects. Connection sharing eliminates the need to create and maintain separate connections in different projects. When you configure an adapter connection in a different project, the **Use a shared connection** 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. See Add and Share a Connection Across a Project.

4. Click **Create**.

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

5. Follow the steps to configure a connection.
   The connection property and connection security values are specific to each adapter. Your connection may also require configuration with an access type such as a private endpoint or an agent group.

6. Test the connection.

Configure Connection Properties

Enter connection information so your application can process requests.

1. Go to the **Properties** section.
2. Enter the instance URL in the following format:

   `https://account_locator.cloud_region_id.snowflakecomputing.com`

   > **Note**
   >
   > You must obtain the following information before you can configure your connection properties. See Prerequisites for Creating a Connection.

3. Enter the warehouse name.
4. Enter the database name.
5. Enter the schema name.

Configure Connection Security

Configure security for your Snowflake Adapter connection.

1. Go to the **Security** section.
2. The **Security Policy** field lets you configure OAuth-based authentication. You can select either Authorization Code or Client Credentials authentication.

3. In the **Client id** field, enter the client ID that you obtained after performing the steps in the prerequisites section. See Prerequisites for Creating a Connection.
4. In the **Client secret** field, enter the client secret that you obtained after performing the steps in the prerequisites section. See Prerequisites for Creating a Connection.
5. (Optional) In the **Scope** field, the refresh token value is completed when you click **Provide Consent** to get a refresh token.
6. Click **Provide Consent** to verify the connection properties and get a refresh token. The Snowflake application login page is displayed.
7. Enter your Snowflake login credentials.
8. Once you see an access allowed message, you can test your connection.

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

1. Go to the **Access type** section.
2. Select the option for accessing your endpoint.

Option	This Option Appears If Your Adapter Supports ...
Public gateway	Connections to endpoints using the public internet.
Connectivity agent	Connections to on-premises endpoints through the connectivity agent. a. Click **Associate agent group**. The Associate agent group panel appears. b. Select the agent group, and click **Use**. 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 *Using Integrations in Oracle Integration 3*.

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.

If Your Connection...	Then...
Uses a WSDL	A dialog prompts you to select the type of connection testing to perform: • **Validate and Test**: 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. • **Test**: Connects to the WSDL URL and performs a syntax check on the WSDL. No requests are sent to the operations exposed in the WSDL.

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**.

3

Add the Snowflake Adapter Connection to an Integration

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

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

Topics:

- Basic Info Page
- Invoke Action Page
- Invoke Operations 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
What do you want to call your endpoint?	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: • No blank spaces (for example, `My Inbound Connection`) • No special characters (for example, `#;83&` or `righ(t)now4`) except underscores and hyphens • No multibyte characters
What does this endpoint do?	Enter an optional description of the connection's responsibilities. For example: `This connection receives an inbound request to synchronize account information with the cloud application.`

Invoke Action Page

Select the type of action to perform in the Snowflake database.

Element	Description
Select an action type	• **Perform Bulk Import**: Loads a large volume of data from your external stage into the target Snowflake database table. • **Perform Bulk Export**: Unloads a large volume of data from the Snowflake database table into an external stage/location. • **Invoke a Stored Procedure**: Executes a stored procedure in the Snowflake database. • **Check/Cancel Statement Execution**: Checks the status of the execution of a statement or cancel the execution of a statement. • **Perform an Operation On a Table**: Select to perform one of the following operations on a table. – **Insert** – **Update** – **Insert or Update (Merge)** – **Select** • **Run a SQL Statement**: Select to run a SQL query against the database.

Invoke Operations Page

Select the operation to perform.

- Perform Bulk Import
- Perform Bulk Export
- Invoke a Stored Procedure
- Check/Cancel Statement Execution
- Perform an Operation On a Table
- Run a SQL Statement

Perform Bulk Import

Element	Description
Select stage type	Supports the following types of stages: • **Internal stage** • **External stage** • **External location** An external stage and location refer to data files stored in an external (AWS, GCP, or Microsoft Azure) stage/location outside of Snowflake. An internal stage refers to data files stored internally within Snowflake. The Snowflake Adapter can access internal stages to import bulk data into the Snowflake database. Along with it, the Snowflake Adapter can import bulk data into the Snowflake database tables using external stages/external locations where the data is uploaded from a cloud storage service (such as AWS-S3, GCP-storage, and Microsoft Azure - storage).
Select stage name	Specify the stage name for loading data into a table from the staged files.
Stage sub path	Specify the stage subpath.
Select integration id (Only shown if you select **External location**.)	Select the integration ID.
File path (Only shown if you select **External location**.)	Enter the file path.
Select target table	Select the target Snowflake database table name (for example, `WORKERS`).

Element	Description
Select file format	• **File format name**: Select the file format name from the dropdown list. • **Configure file format**: Select/specify the required values for the following parameters and configure a file format. – **Select format type**: Select a format from these options: **CSV**, **AVRO**, **JSON**, **PARQUET**, **XML**, and **ORC**. – **Compression** – **Record delimiter** – **Field delimiter** – **Skip header** – **Skip blank lines** – **Date format** – **Time format** – **Timestamp format** – **Binary format** – **Escape** – **Escape unenclosed field** – **Trim space** – **Null if** – **Error on column count mismatch** – **Replace invalid characters** – **Empty field as null** – **Skip byte order mark** – **Encoding**
Configure Copy Options	Select/specify the required values for the following parameters and configure the copy options. • **On error** • **Size limit** • **Purge** • **Return failed only** • **Match by column name** • **Enforce length** • **Truncatecolumns** • **Force** • **Load uncertain files**
Transformation expression	You can enter an expression to transform data. Transformation expressions can be used to write native SQL queries. For example, if you need to import data from specific columns 10 and 20 of a stage file, then write `select $10, $20`.
Validation Mode	• **Return n rows**: Specify the number of rows to validate. You can specify a value from `0` to *n* number of rows. If you don't specify a value, it validates one row (default value). Use this option if you need to validate limited rows. • **Return errors**: Select to validate a single file. It checks all errors for a single file. • **Return all errors**: Select to validate multiple files.

Element	Description
Validate Configuration	Click to validate the configuration/query against the Snowflake database. The validation result is displayed for a successful configuration. If the configuration is invalid, you receive a response for the errors.

Perform Bulk Export

Element	Description
Select stage type	Supports the following types of stages: • **Internal Stage** • **External stage** • **External location** An external stage and location refer to data files stored in an external (AWS, GCP, or Microsoft Azure) stage/location outside of Snowflake. An internal stage refers to data files stored internally within Snowflake. The Snowflake Adapter can access internal stages to export bulk data from the Snowflake database tables. Along with it, the Snowflake Adapter can export bulk data from the Snowflake database tables to external stages/external locations (such as AWS-S3, GCP-storage, and Microsoft Azure - storage).
Select stage name	Specify the stage name for unloading data from the Snowflake database table into an external stage/ location.
Stage sub path	Specify the stage subpath.
Select integration id (Only shown if you select **External location**.)	Select the integration ID.
File path (Only shown if you select **External location**.)	Enter the file path.
Export source type	Select the export source type: • **From table**: Select the target table name. • **From transformation expression**: Enter an expression to write native SQL queries that can be injected into the SQL query followed by #.

Element	Description
Select file format	• **File format name**: Select the file format name from the dropdown list. • **Configure file format**: Select/specify the required values for the following parameters and configure a file format. – **Select format type**: Select a format from these options: **CSV**, **JSON**, and **PARQUET**. – **Compression** – **Record delimiter** – **Field delimiter** – **File extension** – **Date format** – **Time format** – **Timestamp format** – **Binary format** – **Escape** – **Escape unenclosed field** – **Field optionally enclosed by** – **Null if** – **Empty field as null**
Configure Copy Options	Select/specify the required values for the following parameters and configure the copy options. • **Overwrite** • **Single** • **Max file size** • **Include query id** • **Detailed output** • **Header**
Validation Mode	• **Return rows**: Select to validate the rows.
Validate Configuration	Click to validate the configuration/query against the Snowflake database. The validation result is displayed for a successful configuration. If the configuration is invalid, you receive a response for the errors.

Invoke a Stored Procedure

Element	Description
Select Procedure	Displays the list of stored procedures you created in Snowflake. Select the stored procedure to execute in the Snowflake database.
Filter by Procedure name	Type a keyword or the initial letters of the stored procedure to filter the display of names in the list.
Description	Displays the description of the selected stored procedure.
Input Parameters	Displays the input parameters of the selected stored procedure.

Check/Cancel Statement Execution

Element	Description
Please select any one of the following operations	Select the operation: • **Check the status of the execution of a statement** • **Cancel the execution of a statement**
Select previous operation type	Select the previous operation type: • **Import Operation** • **Export Operation** • **Procedure Operation** – **Select Procedure**: Displays the list of stored procedures. Select a stored procedure to check the status of the execution.

Perform an Operation On a Table

Select the database tables. To retrieve and display the records, you must choose the **SELECT** operation.

Element	Description
What operation do you want to perform on Table?	Select to perform one of the following operations on a table: • **Insert** • **Update** • **Insert or Update (Merge)** • **Select**
Schema	Select the database schema that includes the tables to process.
Table Name	Enter a filter with which to search the schema (for example, %TAB to search for tables with TAB in the name).
Table Type	Specify the table type filter to get a subset of the appropriate database objects, then click **Search**. • **ALL** • **TABLE** • **VIEW**
Filter By	Enter the initial letters to filter the display of table names.
Available	Lists the tables that meet the selection criteria.
Selected	Lists your table selection.
Import Tables	Click to import the tables. The page is refreshed for you to select the parent database table.
Primary Keys	Appears when you select tables without a primary key defined. Select the virtual primary key for the table. **Note**: Having the primary key at the database level is the best practice.
Select the parent database table	Select the parent (root) table from the list. If using multiple related tables, this is the top-level parent table in the relationship. After making your selection, the page is refreshed for you to view and edit the table relationships.
Add || Remove Tables	Click to add more tables or remove tables no longer in use.

Element	Description
Review and manage parent database table relationships	Click **Edit** to view and edit the table relationships. The relationships automatically identified by the adapter are displayed. See Review and manage parent database table relationships Option.
Review and filter columns from selected database tables	Click **Edit** to view and edit the table attributes. You can deselect any attributes to exclude from the database queries. Primary key attributes cannot be excluded. See Review and filter columns from selected database tables Option.
Review and edit SQL query (Displayed only if the **Select** operation is selected.)	Click **Edit** to view and edit the default SQL query. See Review and edit SQL query Option.

Review and manage parent database table relationships Option

Specify values for the **Review and manage parent database table relationships** option.

Element	Description
Create New	Click to create a new relationship.
Parent Table	Select the parent table.
Child Table	Select the child table.
Relationships	Select the relation type (one-to-many, one-to-one, or one-to-one with the foreign key on the child table). For example, if you selected **EMPLOYEE** as the parent table and **ORDERS** as the child table, the following options are displayed: • **EMPLOYEE has a 1:1 Relationship with ORDERS** • **EMPLOYEE has a 1:1 Relationship with ORDERS (Foreign Key on Child table)** • **EMPLOYEE has a 1:M Relationship with ORDERS**
Attribute Name	Applies attributes to the table relationship.

Review and filter columns from selected database tables Option

Specify values for the **Review and filter columns from selected database tables** option.

Element	Description
Select the Columns	View and deselect attributes automatically created by the adapter. Deselect any attributes to exclude from the database query.

Review and edit SQL query Option

Specify values for the **Review and edit SQL query** option.

> **Note**
>
> This is only applicable for a `Select` operation on a table.

Element	Description
SQL Edit	Click to manually edit the query in the **SQL Query** field.
Parameter	Click to specify a bind parameter.
Add New	Click to add new criteria to the SQL query.
Remove	Click to remove the SQL criteria you specified.
Maximum Number of Records to be fetched	Select the number of records to fetch with this SQL query.

Run a SQL Statement

> **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.

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

Summary Page

You can review the specified adapter configuration values 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 **Go back**. To cancel your configuration details, click **Cancel**.

4

Troubleshoot the Snowflake Adapter

Review the following topic to learn about troubleshooting issues with the Snowflake Adapter.

Topics:

- Error When Table is Created with Column Names Inside Double Quotes While Using a Transformation Expression

Error When Table is Created with Column Names Inside Double Quotes While Using a Transformation Expression

This documentation assumes that you know the command to create/replace the table in the specified schema. A table can have multiple columns with names and different data types. However, if you create a table with column names defined inside double quotes/quotation marks, the column names become case-sensitive. For example:

```
CREATE OR REPLACE TABLE EMPLOYEES("Name" VARCHAR, "Role"
VARCHAR, "EmpId" VARCHAR;) )
```

The following error occurs while using a transformation expression (bulk import operation) in the Adapter Endpoint Configuration Wizard.

```
SQL compilation error: error line <value> at position <value>\\ninvalid
identifier 'NAME'\",\n  \"sqlState\"…
```

Solution: Ensure that you use the command to create/replace a table and define column names without double quotes ("-"). For example:

```
CREATE OR REPLACE TABLE EMPLOYEES(Name VARCHAR, Role VARCHAR, EmpId VARCHAR).
```