Informatica®

Informatica® Cloud Data Integration

# JDBC Connector

Informatica Cloud Data Integration JDBC Connector
July 2024

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# Preface

Use *JDBC Connector* to learn how to read from or write to databases with a JDBC type 4 driver by using Cloud Data Integration. Learn to create a connection, develop mappings, and run synchronization, mapping, and data transfer tasks in Data Integration.

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CHAPTER 1

# Introduction to JDBC Connector

This chapter includes the following topics:


- JDBC Connector overview, 6
- JDBC Connector assets, 6
- Administration of JDBC Connector, 7


## JDBC Connector overview

You can use JDBC connections to connect to databases with a JDBC Type 4 driver.

JDBC Connector uses the JDBC Specification 3.0 Java API and Type 4 Database Protocol Driver. JDBC supports multiple platforms. You can use JDBC connections in synchronization tasks, mappings, and mapping tasks to connect to sources, targets, and lookups. You can access tables, views, and synonyms.

You can switch mappings to advanced mode to include transformations and functions that enable advanced functionality.

**Note:** JDBC Connector extends generic connectivity to databases that Informatica does not have access to through the Informatica Cloud Data Integration native connectors. When you use JDBC Connector, Informatica does not guarantee that the functionality or performance might be equivalent to what you expect when you use the Informatica Cloud Data Integration native connectors. The database that you want to connect to might not have been tested or certified for use with JDBC Connector and you might experience connection or execution issues.

## JDBC Connector assets

Create assets in Data Integration to integrate data using JDBC Connector.

When you use JDBC Connector, you can include the following Data Integration assets:

- Data transfer task
- Mapping
- Mapping task
- Synchronization task

For more information about configuring assets and transformations, see *Mappings*, *Transformations*, and *Tasks* in the Data Integration documentation.

# Administration of JDBC Connector

Before you use JDBC objects as sources or targets in tasks, an administrator must install and configure JDBC connections.

As a user, you can use JDBC after an administrator performs the following tasks:

- Install the JDBC_IC connector for your organization.
- Use the latest database driver version that your database supports. Ensure that the JDBC driver jar files for the database are installed in the same directory on all the Secure Agent machines in the runtime environment.
- Update the CLASSPATH system variable to the path to the JDBC driver jar file. If the directory path is not specified during JDBC connection configuration, the Secure Agent obtains the jar file from the directory that is specified in the CLASSPATH system variable.

## Using the serverless runtime environment for a JDBC connection

If you want to use the serverless runtime environment for a JDBC connection, perform the following tasks:

1. Create the following structure for the serverless agent configuration in AWS or Azure: `<Supplementary file location>/serverless_agent_config`
2. Add the JDBC drivers in the Amazon S3 bucket or Azure container in the following location in your AWS or Azure account: `<Supplementary file location>/serverless_agent_config/jdbc`
3. Copy the following code snippet to a text editor:

```
version: 1
agent:
  dataIntegrationServer:
    autoApply:
      jdbc:
        drivers:
          - fileCopy:
              sourcePath: jdbc/<Driver_filename>
```

   where the source path is the directory path of the JDBC drivers in AWS or Azure.
4. Ensure that the syntax and indentations are valid, and then save the file as `serverlessUserAgentConfig.yml` in the following AWS or Azure location: `<Supplementary file location>/serverless_agent_config`
   When the .yml file runs, the JDBC drivers are copied from the AWS or Azure location to the serverless agent directory.
5. In the JDBC connection properties, specify the following directory of the serverless runtime environment in the **JDBC Jar Directory** field: `/home/cldagnt/SystemAgent/serverless/configurations/jdbc`

CHAPTER 2

# JDBC connections

This chapter includes the following topics:


- JDBC connections overview, 8
- JDBC connection properties, 8
- Rules and guidelines for JDBC connections, 9


## JDBC connections overview

Create a JDBC connection to access data from a database with a JDBC type 4 driver. You can use JDBC connections to specify sources, lookups, and targets in synchronization tasks. When you create a JDBC connection, you enter properties specific to JDBC.

You can create a JDBC connection on the **Connections** page, or in the Synchronization task wizard. The connection then becomes available to the entire organization to use.

## JDBC connection properties

When you set up a JDBC connection, you must configure the connection properties.

The following table describes JDBC connection properties:

| Connection property | Description |
|---|---|
| Runtime Environment | The name of the runtime environment where you want to run tasks.<br>Select a Secure Agent, Hosted Agent, or serverless runtime environment. |
| JDBC Connection URL | The JDBC URL string to connect to the database.<br>The format of the JDBC URL is: `jdbc:<subprotocol>:<subname>`,<br>where subprotocol defines the database connectivity mechanism that one or more drivers might support. The contents and syntax of the subname depends on the subprotocol.<br>For information about the formatting requirements for the JDBC URL connection string, see the JDBC driver vendor specific documentation. |

| Connection property | Description |
|---|---|
| JDBC Jar Directory | Optional. The path to the JDBC driver jar file. For example, you can enter the following directory: `C:/jdbc`. When you do not specify a directory path, the Secure Agent obtains the jar file from the directory that is specified in the CLASSPATH system variable.<br>To use the serverless runtime environment for the JDBC connection, specify the following location: `/home/cldagnt/SystemAgent/serverless/configurations/jdbc` |
| JDBC Driver Class Name | Optional. Specify the JDBC driver class name if you are using a JDBC driver without auto class load feature. If you do not specify this property, the Secure Agent loads the driver class name from the JDBC jar file. |
| Schema | Schema name, which varies by database. For example,<br>- Informix. Optional. The schema name is the database name.<br>You must enter a schema name to fetch metadata if the JDBC connection URL does not provide enough context. |
| Username | User name to connect to the database. |
| Password | Password to connect to the database. |

# Rules and guidelines for JDBC connections

Consider the following rules and guidelines for JDBC connections:

- By default, quoted identifiers are enabled and vary by the database.
- The database sets the default maximum column size in a JDBC table.

CHAPTER 3

# Synchronization tasks with JDBC

This chapter includes the following topics:


- JDBC sources in synchronization tasks, 10
- JDBC target operations in synchronization tasks, 11
- JDBC target properties in synchronization tasks, 11
- JDBC lookups in synchronization tasks, 12
- Troubleshooting a synchronization task, 12
- Synchronization example, 13


## JDBC sources in synchronization tasks

When you configure a synchronization task to use a JDBC source, you can configure advanced source properties. To optimize performance, you can configure a filter in the **Data Filters** page.

Configure a simple filter or an advanced filter to remove rows at the source. You can improve efficiency by filtering early in the data flow.

A simple filter includes a field name, operator, and value. Use an advanced filter to define a more complex filter condition, which can include multiple conditions using the AND or OR logical operators.

You can sort and group records by using Sort By and Group By fields in **Data Filters** page.

Advanced source properties appear on the **Schedule** page of the Synchronization Task wizard.

The following table describes the JDBC advanced source properties:

| Advanced Source Property | Description |
|---|---|
| Page Size | Number of rows that are cached from a JDBC source. Default is 1000. |
| Isolation Level | Determines the level of concurrency in transactions to avoid data inconsistency. Select from the following isolation levels:<br>- None<br>- TRANSACTION READ COMMITTED<br>- TRANSACTION READ UNCOMMITTED<br>- TRANSACTION REPEATABLE READ<br>- TRANSACTION SERIALIZABLE<br>Default is None. |

| Advanced Source Property | Description |
|---|---|
| Override Isolation Level | Overrides the isolation level if the database does not support it. If this option is checked, the task runs successfully with the default isolation level of the database. |
| Pre SQL | Pre-SQL command to run against the source database before reading data from the source. |
| Post SQL | Post-SQL command to run against the source database after reading data from the source. |
| Enable Pagination | Not applicable. |
| Number of rows to be fetched | Number of rows that are read from a JDBC source. Specify the number of rows fetched to limit the data retrieved. Default is zero, which indicates that an unlimited number of rows are fetched. |
| Number of rows to be skipped | Not applicable. |

# JDBC target operations in synchronization tasks

You can perform insert, update, upsert, and delete operations on a JDBC target. Configure the field mapping based on the target operation.

When you map the primary key field, the synchronization application can identify the records to insert, update, upsert, or delete.

When you run a task with the insert, update, or upsert operations to a JDBC target, map the primary key field and all other fields that you want to update.

When you run a task with the delete operation on a JDBC target, map the primary key field only. You do not need to map any other fields.

When you write to a Postgres JDBC target field of the bit data type, the synchronization task fails due to a PostgreSQL and JDBC limitation.

If you create a synchronization task with a JDBC target object and a specified precision value (for example, 6,3) for decimals, if the target contains a decimal field with a precision that exceeds the specified precision value, the task fails. This is due to a Derby limitation.

# JDBC target properties in synchronization tasks

You can also configure advanced target properties when you schedule the synchronization task.

When you configure a synchronization task to use a JDBC target, you can configure advanced target properties. Advanced target properties appear on the **Schedule** page of the Synchronization Task wizard.

The following table describes the JDBC advanced target properties:

| Advanced Target Property | Description |
|---|---|
| Commit Interval | Interval in rows between commits. Default is 100. |
| Number of Retries | An integer value. Number of times to retry if the query execution fails due to a closed connection. Default is 5. |
| Retry Wait Period | Interval in seconds between two retry attempts. Default is 3 seconds. |
| Pre SQL | Pre-SQL command to run against the target database before writing data to the target. |
| Post SQL | Post-SQL command to run against the target database after writing data to the target. |
| Success File Directory | Directory for the success file. Specify a directory path that is available on each Secure Agent machine in the runtime environment. By default, Data Integration writes the success rows file to the following directory: `<Secure Agent installation directory>/apps/Data_Integration_Server/data/success`<br>Enter a directory local to the Secure Agent. Ensure that your administrator has granted you access to this directory. |
| Error File Directory | Directory for the error rows file. Specify a directory path that is available on each Secure Agent machine in the runtime environment. By default, Data Integration writes the error rows file to the following directory: `<Secure Agent installation directory>/apps/Data_Integration_Server/data/error`<br>Enter a directory local to the Secure Agent. Ensure that your administrator has granted you access to this directory. |

# JDBC lookups in synchronization tasks

When you configure field mappings in a synchronization task, you can create a lookup to a JDBC object.

When you use a JDBC object as a lookup, you do not need to configure specific JDBC properties.

# Troubleshooting a synchronization task

The solution to the following situations might help you troubleshoot JDBC Synchronization task.

**The synchronization task fails.**

When you run a synchronization task to write data to a JDBC target, the task fails with an SQLSyntaxErrorException error if the following conditions occur:

- The JDBC target has fields of the decimal data type with a precision over 31.
- The commit interval is greater than 1.
- You have specified the success file directory or error file directory.

To resolve the error, use fields of the decimal data type with a precision of 0-31 when the commit interval is greater than one and you have specified the success file directory or error file directory.

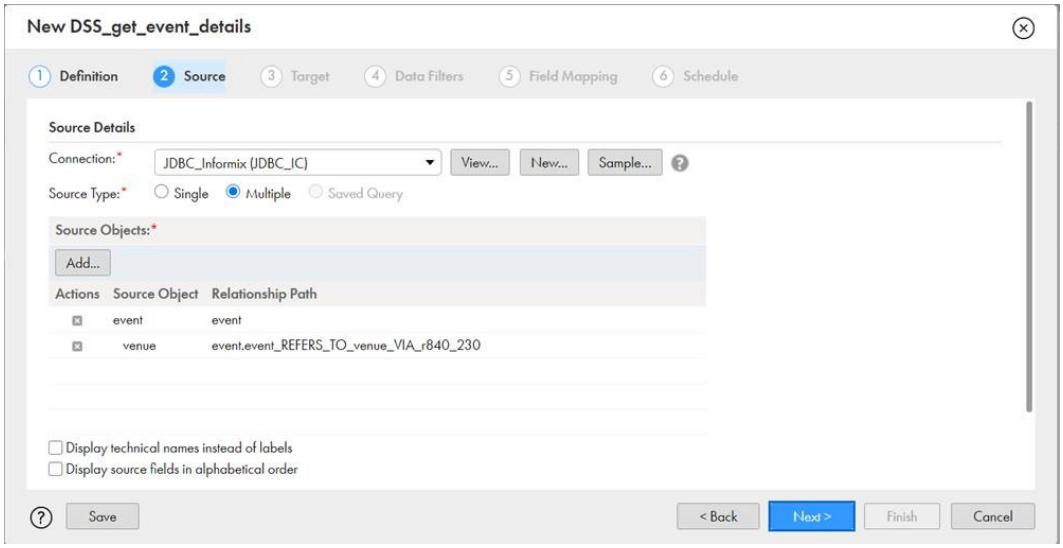
# Synchronization example

You need to synchronize event data and venue data between an Informix database and Sybase to create an event catalog. In Informix, you have an event object and a venue object. You need to read from these related Informix objects before writing to Sybase. For the initial data load, configure a synchronization task to insert data to Sybase. For incremental updates, schedule a synchronization task to upsert data to Sybase.

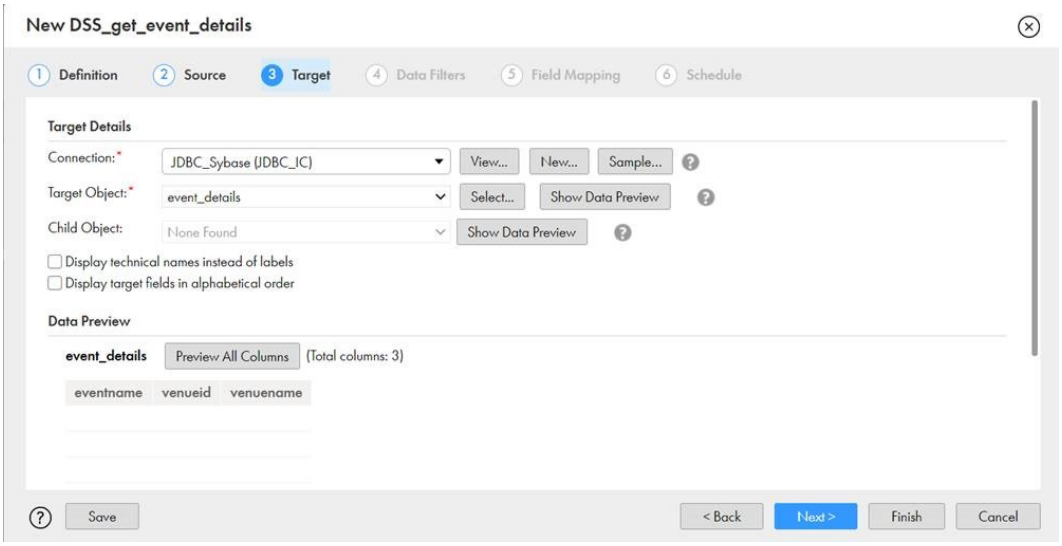
Create JDBC_IC connections to connect to the Informix database and Sybase database. Configure a synchronization task to use the insert operation.

Select the Informix objects you want to use, and the predefined relationship displays.

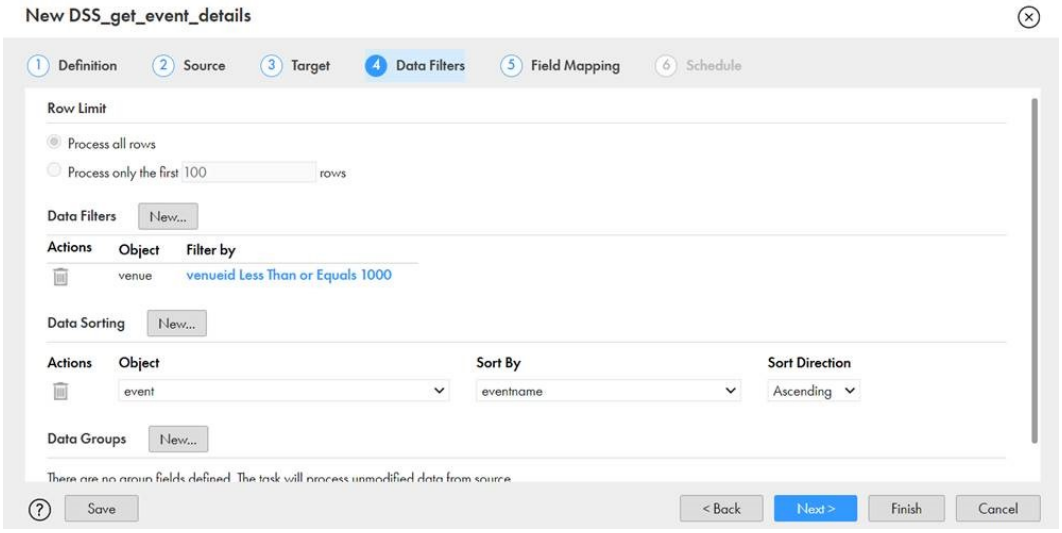
The following image shows the event object and the venue object added as source objects:



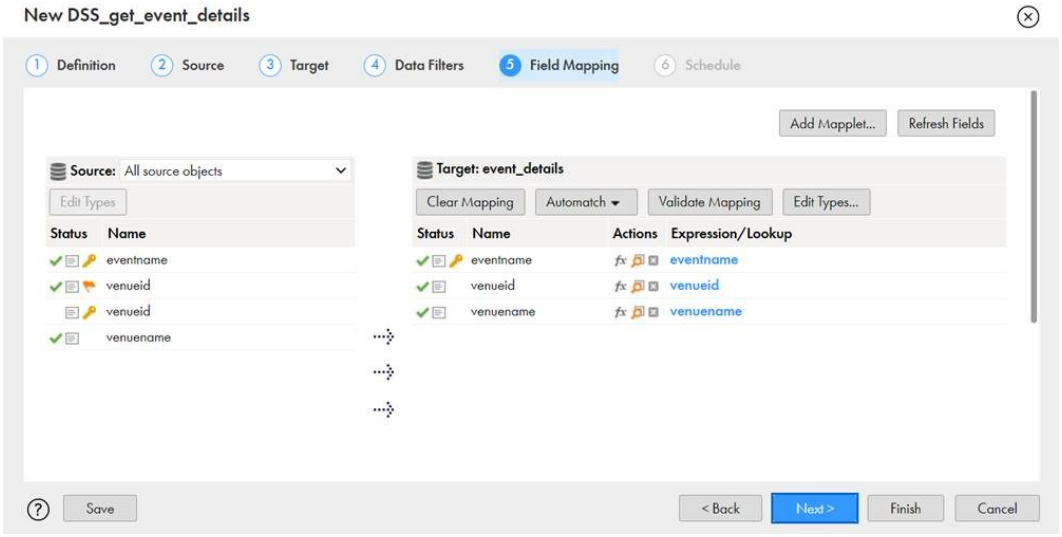
Select the Sybase target object in which you need to load the data.




Use a filter if you want to filter the incoming source records.



Map the fields that you want to insert.




Save and run the task for the initial data load.

You can synchronize the data incrementally after the initial data migration. Create a synchronization task that uses the upsert operation with the same Informix source and the same Sybase target. To upsert data that has changed since the last synchronization, configure a simple data filter that uses the $LastRunTime or $LastRunDate variable.

Save the task and configure it to run on a schedule so the data remains synchronized.

CHAPTER 4

# Mappings and mapping tasks with JDBC

Use the Data Integration Mapping Designer to create a mapping. When you create a mapping, you configure a source or target to represent the object.

In advanced mode, the Mapping Designer updates the mapping canvas to include transformations and functions that enable advanced functionality.

## JDBC sources in mappings

When you configure a mapping to use a JDBC source, you can configure the source properties.

Specify the name and description of the JDBC source. Configure the source and advanced source properties for the JDBC object.

The following table describes the JDBC source properties:

| Property | Description |
|---|---|
| Connection Name | Name of the source connection. |
| Source Type | Source type. Select one of the following types:<br>- Single. Select to specify a single JDBC object.<br>- Multiple. Select to specify multiple JDBC objects. Related objects appear based on simple primary key-foreign key relationship.<br>- Query. Select to specify user defined query to select data from source object.<br>- Parameter. Select to specify a parameter name. You can configure the source object in a mapping task associated with a mapping that uses this source transformation. |
| Object | Source object for the mapping. |
| Filter | Configure a simple filter or an advanced filter to remove rows at the source. You can improve efficiency by filtering early in the data flow. |

The following table describes the JDBC advanced source properties:

| Advanced Source Property | Description |
|---|---|
| Page Size | Number of rows that are cached from a JDBC source. Default is 1000. |
| Isolation Level | Determines the level of concurrency in transactions to avoid data inconsistency. Select from the following isolation levels:<br>- None<br>- TRANSACTION READ COMMITTED<br>- TRANSACTION READ UNCOMMITTED<br>- TRANSACTION REPEATABLE READ<br>- TRANSACTION SERIALIZABLE<br>Default is None. |
| Override Isolation Level | Overrides the isolation level if the database does not support it. If this option is checked, the task runs successfully with the default isolation level of the database. |
| Enable Pagination | Not applicable. |
| Pre SQL | Pre-SQL command to run against the source database before reading data from the source. |
| Post SQL | Post-SQL command to run against the source database after reading data from the source. |
| Tracing Level | Sets the amount of detail that appears in the log file. You can choose terse, normal, verbose initialization or verbose data. Default is normal. |

# JDBC targets in mappings

When you configure a mapping to use a JDBC target, you can configure target properties.

Specify the name and description of the JDBC target. Configure the target and advanced target properties for the JDBC object.

The following table describes the target properties that you can configure in a Target transformation:

| Property | Description |
|---|---|
| Connection | Name of the target connection. |
| Target Type | Target type. Select one of the following target types:<br>- Single. Select to specify a single JDBC object.<br>- Parameter. Select to specify a parameter name. You can configure the source object in a mapping task associated with a mapping that uses this source transformation. |

| Property | Description |
|---|---|
| Object | Name of the target object. You can select an existing object. |
| Operation | Target operation. Select one of the following operations:<br>- Insert.<br>- Update.<br>- Upsert.<br>- Delete.<br>- Data Driven. Configure an expression to specify an update strategy based on the data. You can use the DD_INSERT constant in an expression. |

The following table describes the JDBC advanced target properties:

| Advanced Target Property | Description |
|---|---|
| Commit Interval | Interval in rows between commits. Default is 100. |
| Number of Retries | An integer value. Number of times to retry if the query execution fails due to a closed connection. Default is 5. |
| Retry Wait Period | Interval in seconds between two retry attempts. Default is 3 seconds. |
| Pre SQL | Pre-SQL command to run against the target database before writing data to the target. |
| Post SQL | Post-SQL command to run against the target database after writing data to the target. |
| Success File Directory | Directory for the success file. Specify a directory path that is available on each Secure Agent machine in the runtime environment. By default, Data Integration writes the success rows file to the following directory: `<Secure Agent installation directory>/apps/Data_Integration_Server/data/success`<br>Enter a directory local to the Secure Agent. Ensure that your administrator has granted you access to this directory. |
| Error File Directory | Directory for the error rows file. Specify a directory path that is available on each Secure Agent machine in the runtime environment. By default, Data Integration writes the error rows file to the following directory: `<Secure Agent installation directory>/apps/Data_Integration_Server/data/error`<br>Enter a directory local to the Secure Agent. Ensure that your administrator has granted you access to this directory. |
| Forward Reject Rows | Determines whether the transformation passes rejected rows to the next transformation or drops rejected rows. By default, the mapping task forwards rejected rows to the next transformation. |

# JDBC lookups in mappings

In a mapping, you can configure a Lookup transformation to represent a JDBC object. When you use a JDBC object as a lookup, you do not need to configure specific JDBC properties.

You can't configure a Lookup transformation in a data transfer task.

APPENDIX A

# JDBC data type reference

This appendix includes the following topic:


- JDBC and transformation data types, 20


## JDBC and transformation data types

Data Integration uses the JDBC type 4 driver to read data. The Secure Agent converts the JDBC data type to the transformation data type, and uses the transformation data type to move data across platforms.

When Data Integration writes to a JDBC target, the Secure Agent converts the transformation data type to the corresponding JDBC data type.

The following table compares the JDBC data types that Data Integration supports to the transformation data types:

| JDBC Data Type | Transformation Data Type | Range |
|---|---|---|
| BIGINT | Bigint | -9,223,372,036,854,775,808 to 9,223,372,036,854,775,807<br>Precision 19, scale 0 |
| BINARY | Binary | 1 to 104,857,600 bytes |
| BIT | Integer | -2,147,483,648 to 2,147,483,647<br>Precision 10, scale 0 |
| BLOB | Binary | 1 to 104,857,600 bytes |
| BOOLEAN | Integer | -2,147,483,648 to 2,147,483,647<br>Precision 10, scale 0 |
| CHAR | String | 1 to 104,857,600 characters |
| CLOB | Text | 1 to 104,857,600 characters |
| DATE | Date/Time | Jan 1, 0001 A.D. to Dec 31, 9999 A.D.<br>(precision to the nanosecond) |
| DECIMAL | Decimal | Precision 1 to 28, scale 0 to 28 |

| JDBC Data Type | Transformation Data Type | Range |
|---|---|---|
| DOUBLE | Double | Precision 15 |
| FLOAT | Double | Precision 15 |
| INTEGER | Integer | -2,147,483,648 to 2,147,483,647<br>Precision 10, scale 0 |
| LONGVARBINARY | Binary | 1 to 104,857,600 bytes |
| LONGVARCHAR | Text | 1 to 104,857,600 characters |
| NUMERIC | Decimal | Precision 1 to 28, scale 0 to 28 |
| REAL | Double | Precision 15 |
| SMALLINT | Integer | -2,147,483,648 to 2,147,483,647<br>Precision 10, scale 0 |
| TIME | Date/Time | Jan 1, 0001 A.D. to Dec 31, 9999 A.D.<br>(precision to the nanosecond) |
| TIMESTAMP | Date/Time | Jan 1, 0001 A.D. to Dec 31, 9999 A.D.<br>(precision to the nanosecond) |
| TINYINT | Integer | -2,147,483,648 to 2,147,483,647<br>Precision 10, scale 0 |
| VARBINARY | Binary | 1 to 104,857,600 bytes |
| VARCHAR | String | 1 to 104,857,600 characters |

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