

**cloudera<sup>®</sup>**

# Cloudera JDBC Driver for Impala

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## About the Cloudera JDBC Driver for Impala

The Cloudera JDBC Driver for Impala is used for direct SQL and Impala SQL access to Apache Hadoop / Impala distributions, enabling Business Intelligence (BI), analytics, and reporting on Hadoop / Impala-based data. The driver efficiently transforms an application's SQL query into the equivalent form in Impala SQL, which is a subset of SQL-92. If an application is Impala-aware, then the driver is configurable to pass the query through to the database for processing. The driver interrogates Impala to obtain schema information to present to a SQL-based application. Queries, including joins, are translated from SQL to Impala SQL. For more information about the differences between Impala SQL and SQL, see "Features" on page 25.

The Cloudera JDBC Driver for Impala complies with the JDBC 4.0, 4.1, and 4.2 data standards. JDBC is one of the most established and widely supported APIs for connecting to and working with databases. At the heart of the technology is the JDBC driver, which connects an application to the database. For more information about JDBC, see *Data Access Standards* on the Simba Technologies website: <https://www.simba.com/resources/data-access-standards-glossary>.

This guide is suitable for users who want to access data residing within Impala from their desktop environment. Application developers might also find the information helpful. Refer to your application for details on connecting via JDBC.

## System Requirements

Each machine where you use the Cloudera JDBC Driver for Impala must have Java Runtime Environment (JRE) installed. The version of JRE that must be installed depends on the version of the JDBC API you are using with the driver. The following table lists the required version of JRE for each provided version of the JDBC API.

JDBC API Version	JRE Version
4.0	6.0 to 8.0
4.1	7.0 to 8.0
4.2	8.0

The driver is recommended for Impala versions 1.0.1 through 3.2, and CDH versions 5.0 through 5.16 and 6.0 through 6.2.

## Cloudera JDBC Driver for Impala Files

The Cloudera JDBC Driver for Impala is delivered in the following ZIP archives, where *[Version]* is the version number of the driver:

- `ImpalaJDBC4_[Version].zip`
- `ImpalaJDBC41_[Version].zip`
- `ImpalaJDBC42_[Version].zip`

The archive contains the driver supporting the JDBC API version indicated in the archive name, as well as release notes and third-party license information. In addition, the required third-party libraries and dependencies are packaged and shared in the driver JAR file in the archive.

## Installing and Using the Cloudera JDBC Driver for Impala

To install the Cloudera JDBC Driver for Impala on your machine, extract the files from the appropriate ZIP archive to the directory of your choice.

To access an Impala data store using the Cloudera JDBC Driver for Impala, you need to configure the following:

- The list of driver library files (see "Referencing the JDBC Driver Libraries" on page 8)
- The `Driver` or `DataSource` class (see "Registering the Driver Class" on page 9)
- The connection URL for the driver (see "Building the Connection URL" on page 10)

### Important:

The Cloudera JDBC Driver for Impala is a forward-only, read-only driver with no transaction support. Because the driver does not support transactions, auto-commit is always set to **true**.

## Referencing the JDBC Driver Libraries

Before you use the Cloudera JDBC Driver for Impala, the JDBC application or Java code that you are using to connect to your data must be able to access the driver JAR files. In the application or code, specify all the JAR files that you extracted from the ZIP archive.

### Using the Driver in a JDBC Application

Most JDBC applications provide a set of configuration options for adding a list of driver library files. Use the provided options to include all the JAR files from the ZIP archive as part of the driver configuration in the application. For more information, see the documentation for your JDBC application.

### Using the Driver in Java Code

You must include all the driver library files in the class path. This is the path that the Java Runtime Environment searches for classes and other resource files. For more information, see "Setting the Class Path" in the appropriate Java SE Documentation.

For Java SE 6:

- For Windows:  
<https://docs.oracle.com/javase/6/docs/technotes/tools/windows/classpath.html>
- For Linux and Solaris:  
<https://docs.oracle.com/javase/6/docs/technotes/tools/solaris/classpath.html>

For Java SE 7:

- For Windows:  
<http://docs.oracle.com/javase/7/docs/technotes/tools/windows/classpath.html>
- For Linux and Solaris:  
<http://docs.oracle.com/javase/7/docs/technotes/tools/solaris/classpath.html>



For Java SE 8:

- For Windows:  
<http://docs.oracle.com/javase/8/docs/technotes/tools/windows/classpath.html>
- For Linux and Solaris:  
<http://docs.oracle.com/javase/8/docs/technotes/tools/solaris/classpath.html>

## Registering the Driver Class

Before connecting to your data, you must register the appropriate class for your application.

The following classes are used to connect the Cloudera JDBC Driver for Impala to Impala data stores:

- The `Driver` classes extend `java.sql.Driver`.
- The `DataSource` classes extend `javax.sql.DataSource` and `javax.sql.ConnectionPoolDataSource`.

The driver supports the following fully-qualified class names (FQCNs) that are independent of the JDBC version:

- `com.cloudera.impala.jdbc.Driver`
- `com.cloudera.impala.jdbc.DataSource`

The following sample code shows how to use the `DriverManager` to establish a connection for JDBC 4.0:

### Note:

In these examples, the line `Class.forName(DRIVER_CLASS);` is only required for JDBC 4.0.

```
private static Connection connectViaDM() throws Exception
{
    Connection connection = null;
    Class.forName(DRIVER_CLASS);
    connection = DriverManager.getConnection(CONNECTION_URL);
    return connection;
}
```

The following sample code shows how to use the `DataSource` class to establish a connection:

```
private static Connection connectViaDS() throws Exception
{
    Connection connection = null;
    Class.forName(DRIVER_CLASS);
    DataSource ds = new com.cloudera.impala.jdbc.DataSource();
    ds.setURL(CONNECTION_URL);
    connection = ds.getConnection();
    return connection;
}
```

```
}

```

## Building the Connection URL

Use the connection URL to supply connection information to the data store that you are accessing. The following is the format of the connection URL for the Cloudera JDBC Driver for Impala, where *[Host]* is the DNS or IP address of the Impala server and *[Port]* is the number of the TCP port that the server uses to listen for client requests:

```
jdbc:impala:// [Host] : [Port]
```

### Note:

By default, the driver uses port 28000 when `TransportMode` is set to `http`, and 21050 when `TransportMode` is not set or is set to `ssl` or `binary`.

By default, the driver uses the schema named **default**.

You can specify optional settings such as the schema to use or any of the connection properties supported by the driver. For a list of the properties available in the driver, see "Driver Configuration Options" on page 85.

### Note:

If you specify a property that is not supported by the driver, then the driver attempts to apply the property as a Impala server-side property for the client session. For more information, see "Configuring Server-Side Properties" on page 21.

The following is the format of a connection URL that specifies some optional settings:

```
jdbc:impala:// [Host] : [Port] / [Schema] ; [Property1]=[Value] ;
[Property2]=[Value] ; ...
```

For example, to connect to port 18000 on an Impala server installed on the local machine, use a schema named `default2`, and authenticate the connection using a user name and password, you would use the following connection URL:

```
jdbc:impala://node1.example.com:18000/default2;AuthMech=3;
UID=cloudera;PWD=cloudera
```

### Important:

- Properties are case-sensitive.
- Do not duplicate properties in the connection URL.

## Configuring Authentication

The Cloudera JDBC Driver for Impala supports the following authentication mechanisms:

- No Authentication
- Kerberos
- User Name
- User Name And Password

You configure the authentication mechanism that the driver uses to connect to Impala by specifying the relevant properties in the connection URL.

For information about configuring the authentication mechanism that Impala uses, see the Impala documentation: <http://www.cloudera.com/content/cloudera/en/documentation.html>.

For information about the properties you can use in the connection URL, see "Driver Configuration Options" on page 85.

### Note:

In addition to authentication, you can configure the driver to connect over SSL. For more information, see "Configuring SSL" on page 19.

## Using No Authentication

You provide this information to the driver in the connection URL. For more information about the syntax of the connection URL, see "Building the Connection URL" on page 10.

### To configure a connection without authentication:

- Set the `AuthMech` property to 0.

For example:

```
jdbc:impala://localhost:21050;AuthMech=0;
```

## Using Kerberos

Kerberos must be installed and configured before you can use this authentication mechanism. For information about configuring and operating Kerberos on Windows, see "Configuring Kerberos Authentication for Windows" on page 13. For other operating systems, see the MIT Kerberos documentation: <http://web.mit.edu/kerberos/krb5-latest/doc/>.

You provide this information to the driver in the connection URL. For more information about the syntax of the connection URL, see "Building the Connection URL" on page 10.

### Note:

The driver also supports Kerberos constrained delegation. For more details on this, see "Using Kerberos Constrained Delegation" on page 17.

**To configure default Kerberos authentication:**

1. Set the `AuthMech` property to 1.
2. To use the default realm defined in your Kerberos setup, do not set the `KrbRealm` property.

If your Kerberos setup does not define a default realm or if the realm of your Impala server is not the default, then set the `KrbRealm` property to the realm of the Impala server.

3. Set the `KrbHostFQDN` property to the fully qualified domain name of the Impala server host.
4. If you are using Kerberos Constrained Delegation, set the `userGSSCredential` property to your Kerberos GSS Credential.
5. Optionally, specify how the driver obtains the Kerberos Subject by setting the `KrbAuthType` property as follows:
  - To configure the driver to automatically detect which method to use for obtaining the Subject, set the `KrbAuthType` property to 0. Alternatively, do not set the `KrbAuthType` property.
  - Or, to create a `LoginContext` from a JAAS configuration and then use the Subject associated with it, set the `KrbAuthType` property to 1.
  - Or, to create a `LoginContext` from a Kerberos ticket cache and then use the Subject associated with it, set the `KrbAuthType` property to 2.

For more detailed information about how the driver obtains Kerberos Subjects based on these settings, see "KrbAuthType" on page 89.

For example, the following connection URL connects to a Impala server with Kerberos enabled, but without SSL enabled:

```
jdbc:impala://node1.example.com:21050;AuthMech=1;  
KrbRealm=EXAMPLE.COM;KrbHostFQDN=node1.example.com;  
KrbServiceName=impala
```

In this example, Kerberos is enabled for JDBC connections, the Kerberos service principal name is `impala/node1.example.com@EXAMPLE.COM`, the host name for the data source is `node1.example.com`, and the server is listening on port 21050 for JDBC connections.

## Using User Name

This authentication mechanism requires a user name but does not require a password. The user name labels the session, facilitating database tracking.

You provide this information to the driver in the connection URL. For more information about the syntax of the connection URL, see "Building the Connection URL" on page 10.

**To configure User Name authentication:**

1. Set the `AuthMech` property to 2.
2. Set the `UID` property to an appropriate user name for accessing the Impala server.

For example:

```
jdbc:impala://node1.example.com:21050;AuthMech=2;UID=impala
```

## Using User Name And Password (LDAP)

This authentication mechanism requires a user name and a password. It is most commonly used with LDAP authentication.

You provide this information to the driver in the connection URL. For more information about the syntax of the connection URL, see "Building the Connection URL" on page 10.

### To configure User Name And Password authentication:

1. Set the `AuthMech` property to 3.
2. Set the `UID` property to an appropriate user name for accessing the Impala server.
3. Set the `PWD` property to the password corresponding to the user name you provided.

For example, the following connection URL connects to a Impala server with LDAP authentication enabled, but without SSL or SASL enabled:

```
jdbc:impala://node1.example.com:21050;AuthMech=3;
UID=impala;PWD=cloudera;
```

In this example, user name and password (LDAP) authentication is enabled for JDBC connections, the LDAP user name is `impala`, the password is `cloudera`, and the server is listening on port 21050 for JDBC connections.

## Configuring Kerberos Authentication for Windows

You can configure your Kerberos setup so that you use the MIT Kerberos Ticket Manager to get the Ticket Granting Ticket (TGT), or configure the setup so that you can use the driver to get the ticket directly from the Key Distribution Center (KDC). Also, if a client application obtains a Subject with a TGT, it is possible to use that Subject to authenticate the connection.

### Downloading and Installing MIT Kerberos for Windows

#### To download and install MIT Kerberos for Windows 4.0.1:

1. Download the appropriate Kerberos installer:
  - For a 64-bit machine, use the following download link from the MIT Kerberos website: <http://web.mit.edu/kerberos/dist/kfw/4.0/kfw-4.0.1-amd64.msi>.
  - For a 32-bit machine, use the following download link from the MIT Kerberos website: <http://web.mit.edu/kerberos/dist/kfw/4.0/kfw-4.0.1-i386.msi>.

#### Note:

The 64-bit installer includes both 32-bit and 64-bit libraries. The 32-bit installer includes 32-bit libraries only.


2. To run the installer, double-click the `.msi` file that you downloaded.
3. Follow the instructions in the installer to complete the installation process.
4. When the installation completes, click **Finish**.

### Using the MIT Kerberos Ticket Manager to Get Tickets

#### Setting the KRB5CCNAME Environment Variable


You must set the KRB5CCNAME environment variable to your credential cache file.

#### To set the KRB5CCNAME environment variable:

1. Click **Start** , then right-click **Computer**, and then click **Properties**.
2. Click **Advanced System Settings**.
3. In the System Properties dialog box, on the **Advanced** tab, click **Environment Variables**.
4. In the Environment Variables dialog box, under the System Variables list, click **New**.
5. In the **New System Variable** dialog box, in the Variable Name field, type **KRB5CCNAME**.
6. In the **Variable Value** field, type the path for your credential cache file. For example, type `C:\KerberosTickets.txt`.
7. Click **OK** to save the new variable.
8. Make sure that the variable appears in the System Variables list.
9. Click **OK** to close the Environment Variables dialog box, and then click **OK** to close the System Properties dialog box.
10. Restart your machine.

#### Getting a Kerberos Ticket

#### To get a Kerberos ticket:

1. Click **Start** , then click **All Programs**, and then click the **Kerberos for Windows (64-bit)** or **Kerberos for Windows (32-bit)** program group.
2. Click **MIT Kerberos Ticket Manager**.
3. In the MIT Kerberos Ticket Manager, click **Get Ticket**.
4. In the Get Ticket dialog box, type your principal name and password, and then click **OK**.

If the authentication succeeds, then your ticket information appears in the MIT Kerberos Ticket Manager.

#### Authenticating to the Impala Server

You provide this information to the driver in the connection URL. For more information about the syntax of the connection URL, see "Building the Connection URL" on page 10.

#### To authenticate to the Impala server:

- Use a connection URL that has the following properties defined:

- AuthMech
- KrbHostFQDN
- KrbRealm
- KrbServiceName


For detailed information about these properties, see "Driver Configuration Options" on page 85

### Using the Driver to Get Tickets

#### Deleting the KRB5CCNAME Environment Variable

To enable the driver to get Ticket Granting Tickets (TGTs) directly, make sure that the KRB5CCNAME environment variable has not been set.

#### To delete the KRB5CCNAME environment variable:

1. Click the **Start** button , then right-click **Computer**, and then click **Properties**.
2. Click **Advanced System Settings**.
3. In the System Properties dialog box, click the **Advanced** tab and then click **Environment Variables**.
4. In the Environment Variables dialog box, check if the KRB5CCNAME variable appears in the System variables list. If the variable appears in the list, then select the variable and click **Delete**.
5. Click **OK** to close the Environment Variables dialog box, and then click **OK** to close the System Properties dialog box.

#### Setting Up the Kerberos Configuration File

#### To set up the Kerberos configuration file:

1. Create a standard `krb5.ini` file and place it in the `C:\Windows` directory.
2. Make sure that the KDC and Admin server specified in the `krb5.ini` file can be resolved from your terminal. If necessary, modify `C:\Windows\System32\drivers\etc\hosts`.

#### Setting Up the JAAS Login Configuration File

#### To set up the JAAS login configuration file:

1. Create a JAAS login configuration file that specifies a keytab file and `doNotPrompt=true`.

For example:

```
Client {
  com.sun.security.auth.module.Krb5LoginModule required
  useKeyTab=true
  keyTab="PathToTheKeyTab"
  principal="cloudera@CLLOUDERA"
  doNotPrompt=true;
```

```
};
```

2. Set the `java.security.auth.login.config` system property to the location of the JAAS file.

For example: `C:\KerberosLoginConfig.ini`.

### Authenticating to the Impala Server

You provide this information to the driver in the connection URL. For more information about the syntax of the connection URL, see "Building the Connection URL" on page 10.

#### To authenticate to the Impala server:

- Use a connection URL that has the following properties defined:
  - `AuthMech`
  - `KrbHostFQDN`
  - `KrbRealm`
  - `KrbServiceName`

For detailed information about these properties, see "Driver Configuration Options" on page 85.

### Using an Existing Subject to Authenticate the Connection

If the client application obtains a Subject with a TGT, then that Subject can be used to authenticate the connection to the server.

#### To use an existing Subject to authenticate the connection:

1. Create a `PrivilegedAction` for establishing the connection to the database.

For example:

```
// Contains logic to be executed as a privileged action
public class AuthenticateDriverAction
implements PrivilegedAction<Void>
{
// The connection, which is established as a
PrivilegedAction
Connection con;

// Define a string as the connection URL
static String ConnectionURL =
"jdbc:impala://192.168.1.1:21050";

/**
 * Logic executed in this method will have access to the
 * Subject that is used to "doAs". The driver will get
 * the Subject and use it for establishing a connection
 * with the server.
 */
}
```



```

*/
@Override
public Void run()
{
    try
    {
        // Establish a connection using the connection URL
        con = DriverManager.getConnection(ConnectionURL);
    }
    catch (SQLException e)
    {
        // Handle errors that are encountered during
        // interaction with the data store
        e.printStackTrace();
    }
    catch (Exception e)
    {
        // Handle other errors
        e.printStackTrace();
    }
    return null;
}
}

```

2. Run the PrivilegedAction using the existing Subject, and then use the connection.

For example:

```

// Create the action
AuthenticateDriverAction authenticateAction = new
AuthenticateDriverAction();
// Establish the connection using the Subject for
// authentication.
Subject.doAs(loginConfig.getSubject(), authenticateAction);
// Use the established connection.
authenticateAction.con;

```

## Using Kerberos Constrained Delegation

The driver can also be configured to use Kerberos Constrained Delegation. This feature allows a service to obtain service tickets to a restricted list of other services running on specific servers on the network after it has been presented with a service ticket. For more details on the process see: <https://technet.microsoft.com/en-ca/library/cc995228.aspx>.

The `userGSSCredential` connection property can be used in the connection URL to pass in a `GSSCredential` object. The following sample code shows how to use the property to pass the `GSSCredential` into the driver using JDBC 4.1.

```
GSSCredential userCredential = [GSSCredential]
```

## Configuring Authentication

```
Driver driver = (Driver) Class.forName
("com.cloudera.impala.jdbc.Driver").newInstance();
Properties properties = new Properties();
properties.put("userGSSCredential", userCredential);
Connection conn = driver.connect(

    "jdbc:impala://node1.example.com:21050;AuthMech=1;KrbRealm=EXAMPLE.COM;
    KrbHostFQDN=node1.example.com;KrbServiceName=impala"
    ,properties);
```

## Configuring SSL

### Note:

In this documentation, "SSL" indicates both TLS (Transport Layer Security) and SSL (Secure Sockets Layer). The driver supports industry-standard versions of TLS/SSL.

If you are connecting to an Impala server that has Secure Sockets Layer (SSL) enabled, you can configure the driver to connect to an SSL-enabled socket. When connecting to a server over SSL, the driver uses one-way authentication to verify the identity of the server.

One-way authentication requires a signed, trusted SSL certificate for verifying the identity of the server. You can configure the driver to access a specific TrustStore or KeyStore that contains the appropriate certificate. If you do not specify a TrustStore or KeyStore, then the driver uses the default Java TrustStore named `jssecacerts`. If `jssecacerts` is not available, then the driver uses `cacerts` instead.

You provide this information to the driver in the connection URL. For more information about the syntax of the connection URL, see "Building the Connection URL" on page 10.

### To configure SSL:

1. Set the `SSL` property to 1.
2. If you are not using one of the default Java TrustStores, then do one of the following:
  - Create a TrustStore and configure the driver to use it:
    - a. Create a TrustStore containing your signed, trusted server certificate.
    - b. Set the `SSLTrustStore` property to the full path of the TrustStore.
    - c. Set the `SSLTrustStorePwd` property to the password for accessing the TrustStore.
  - Or, create a KeyStore and configure the driver to use it:
    - a. Create a KeyStore containing your signed, trusted server certificate.
    - b. Set the `SSLKeyStore` property to the full path of the KeyStore.
    - c. Set the `SSLKeyStorePwd` property to the password for accessing the KeyStore.
3. Optionally, to allow the SSL certificate used by the server to be self-signed, set the `AllowSelfSignedCerts` property to 1.

### Important:

When the `AllowSelfSignedCerts` property is set to 1, SSL verification is disabled. The driver does not verify the server certificate against the trust store, and does not verify if the server's host name matches the common name or subject alternative names in the server certificate.

4. Optionally, to allow the common name of a CA-issued certificate to not match the host name of the Impala server, set the `CAIssuedCertNamesMismatch` property to 1.

## Configuring SSL

For example, the following connection URL connects to a data source using username and password (LDAP) authentication, with SSL enabled:

```
jdbc:impala://localhost:21050;AuthMech=3;SSL=1;  
SSLKeyStore=C:\\Users\\bsmith\\Desktop\\keystore.jks;SSLKeyStore  
Pwd=clouderaSSL123;UID=impala;PWD=cloudera123
```

**Note:**

For more information about the connection properties used in SSL connections, see "Driver Configuration Options" on page 85.

## Configuring Server-Side Properties

When connecting to a server that is running Impala 2.0 or later, you can use the driver to apply configuration properties to the server by setting the properties in the connection URL.

**Important:**

This feature is not supported for earlier versions of Impala, where the SET statement can only be executed from within the Impala shell.

For example, to set the `MEM_LIMIT` query option to 1 GB and the `REQUEST_POOL` query option to `myPool`, you would use a connection URL such as the following:

```
jdbc:impala://localhost:18000/default2;AuthMech=3;  
UID=cloudera;PWD=cloudera;MEM_LIMIT=1000000000;REQUEST_  
POOL=myPool
```

## Configuring Cloudera Altus Dynamic Service Discovery

You can configure the driver to discover Impala services through Altus. When service discovery is enabled, the driver connects to Impala servers that are part of an Altus cluster.

To enable service discovery, specify the name of the Altus cluster where the Impala services are hosted.

### To configure dynamic service discovery through Altus:

1. Create a connection URL that uses the following format, where *[ClusterName]* is the name of the Altus cluster on which Impala services are hosted:

```
jdbc:impala:// [ClusterName]
```

2. Optionally, to configure authentication, do the following:
  - a. Set the `AltusCredFile` property to the full path of the directory where your credentials file is stored.
  - b. Set the `AltusProfileName` property to the name of the profile that you want to use for authentication.
3. By default, Altus service discovery uses a public IP address unless the `list-cluster-instances` API returns "none" for the public IP address. To always use a private IP address, set the `AltusUsePrivateIP` property to `true`.

#### Note:

To make sure that the connection URL is compatible with all JDBC applications, escape the backslashes (\) in your directory paths by typing another backslash.

For example:

```
jdbc:impala://AltusClusterForCloudera;AltusCredFile=C:\\Documents\\  
AltusCredentialsFiles;AltusProfileName=jsmith;AltusUsePrivateIP=t  
rue;
```

For more information about the syntax of the connection URL, see "Building the Connection URL" on page 10.

## Configuring Logging

To help troubleshoot issues, you can enable logging in the driver.

**Important:**

Only enable logging long enough to capture an issue. Logging decreases performance and can consume a large quantity of disk space.

In the connection URL, set the `LogLevel` key to enable logging at the desired level of detail. The following table lists the logging levels provided by the Cloudera JDBC Driver for Impala, in order from least verbose to most verbose.

LogLevel Value	Description
0	Disable all logging.
1	Log severe error events that lead the driver to abort.
2	Log error events that might allow the driver to continue running.
3	Log events that might result in an error if action is not taken.
4	Log general information that describes the progress of the driver.
5	Log detailed information that is useful for debugging the driver.
6	Log all driver activity.

**To enable logging:**

1. Set the `LogLevel` property to the desired level of information to include in log files.
2. Set the `LogPath` property to the full path to the folder where you want to save log files. To make sure that the connection URL is compatible with all JDBC applications, escape the backslashes (`\`) in your file path by typing another backslash.

For example, the following connection URL enables logging level 3 and saves the log files in the `C:\temp` folder:

```
jdbc:impala://localhost:11000;LogLevel=3;LogPath=C:\\temp
```

3. To make sure that the new settings take effect, restart your JDBC application and reconnect to the server.

The Cloudera JDBC Driver for Impala produces the following log files in the location specified in the `LogPath` property:

- An `ImpalaJDBC_driver.log` file that logs driver activity that is not specific to a connection.

## Configuring Logging

- An `Impala_connection_[Number].log` file for each connection made to the database, where `[Number]` is a number that identifies each log file. This file logs driver activity that is specific to the connection.

If the `LogPath` value is invalid, then the driver sends the logged information to the standard output stream (`System.out`).

### To disable logging:

1. Set the `LogLevel` property to 0.
2. To make sure that the new setting takes effect, restart your JDBC application and reconnect to the server.



## Features

More information is provided on the following features of the Cloudera JDBC Driver for Impala:

- "SQL Translation" on page 25
- "Data Types" on page 25
- "Catalog and Schema Support" on page 26
- "Write-back" on page 26
- "Dynamic Service Discovery using Cloudera Altus" on page 27
- "Security and Authentication" on page 27
- "Interfaces and Supported Methods" on page 28

### SQL Translation

The Cloudera JDBC Driver for Impala is able to parse queries locally prior to sending them to the Impala server. This feature allows the driver to calculate query metadata without executing the query, support query parameters, and support extra SQL features such as JDBC escape sequences and additional scalar functions that are not available in the Impala-shell tool.

**Note:**

The driver does not support translation for queries that reference a field contained in a nested column (an ARRAY, MAP, or STRUCT column). To retrieve data from a nested column, make sure that the query is written in valid Impala SQL syntax.

### Data Types

The Cloudera JDBC Driver for Impala supports many common data formats, converting between Impala, SQL, and Java data types.

The following table lists the supported data type mappings.

Impala Type	SQL Type	Java Type
ARRAY	VARCHAR	String
BIGINT	BIGINT	java.math.BigInteger
BINARY	VARBINARY	byte[]
BOOLEAN	BOOLEAN	Boolean
CHAR (Available only in CDH 5.2 or later)	CHAR	String

Impala Type	SQL Type	Java Type
DATE	DATE	java.sql.Date
DECIMAL (Available only in CDH 5.1 or later)	DECIMAL	java.math.BigDecimal
DOUBLE (REAL is an alias for DOUBLE)	DOUBLE	Double
FLOAT	REAL	Float
INT	INTEGER	Long
MAP	VARCHAR	String
SMALLINT	SMALLINT	Integer
STRUCT	VARCHAR	String
TIMESTAMP	TIMESTAMP	java.sql.Timestamp
TINYINT	TINYINT	Short
VARCHAR (Available only in CDH 5.2 or later)	VARCHAR	String

## Catalog and Schema Support

The Cloudera JDBC Driver for Impala supports both catalogs and schemas to make it easy for the driver to work with various JDBC applications. Since Impala only organizes tables into schemas/databases, the driver provides a synthetic catalog named IMPALA under which all of the schemas/databases are organized. The driver also maps the JDBC schema to the Impala schema/database.

### Note:

Setting the `CatalogSchemaSwitch` connection property to `1` will cause Impala catalogs to be treated as schemas in the driver as a restriction for filtering.

## Write-back

The Cloudera JDBC Driver for Impala supports translation for the following syntax:

- INSERT
- CREATE
- DROP

The driver also supports translation for UPDATE and DELETE syntax, but only when querying Kudu tables while connected to an Impala server that is running Impala 2.7 or later.

If the statement contains non-standard SQL-92 syntax, then the driver is unable to translate the statement to SQL and instead falls back to using Impala SQL.

## Dynamic Service Discovery using Cloudera Altus

The Cloudera JDBC Driver for Impala can be configured to discover Impala services via Cloudera Altus, and connect to servers that are part of an Altus cluster.

For information about configuring this feature, see "Configuring Cloudera Altus Dynamic Service Discovery" on page 22.

## Security and Authentication

To protect data from unauthorized access, some Impala data stores require connections to be authenticated with user credentials or the SSL protocol. The Cloudera JDBC Driver for Impala provides full support for these authentication protocols.

**Note:**

In this documentation, "SSL" indicates both TLS (Transport Layer Security) and SSL (Secure Sockets Layer). The driver supports industry-standard versions of TLS/SSL.

The driver provides mechanisms that allow you to authenticate your connection using the Kerberos protocol, your Impala user name only, or your Impala user name and password. You must use the authentication mechanism that matches the security requirements of the Impala server. For detailed driver configuration instructions, see "Configuring Authentication" on page 11.

Additionally, the driver supports SSL connections with one-way authentication. If the server has an SSL-enabled socket, then you can configure the driver to connect to it.

It is recommended that you enable SSL whenever you connect to a server that is configured to support it. SSL encryption protects data and credentials when they are transferred over the network, and provides stronger security than authentication alone. For detailed configuration instructions, see "Configuring SSL" on page 19.

The SSL version that the driver supports depends on the JVM version that you are using. For information about the SSL versions that are supported by each version of Java, see "Diagnosing TLS, SSL, and HTTPS" on the Java Platform Group Product Management Blog: [https://blogs.oracle.com/java-platform-group/entry/diagnosing\\_tls\\_ssl\\_and\\_https](https://blogs.oracle.com/java-platform-group/entry/diagnosing_tls_ssl_and_https).

**Note:**

The SSL version used for the connection is the highest version that is supported by both the driver and the server, which is determined at connection time.

## Interfaces and Supported Methods

The Cloudera JDBC Driver for Impala implements the following JDBC interfaces:

- "CallableStatement" on page 28
- "Connection" on page 38
- "DatabaseMetaData" on page 43
- "DataSource" on page 56
- "Driver" on page 57
- "ParameterMetaData" on page 57
- "PooledConnection" on page 58
- "PreparedStatement" on page 59
- "ResultSet" on page 65
- "ResultSetMetaData" on page 79
- "Statement" on page 81

However, the driver does not support every method from these interfaces. For information about whether a specific method is supported by the driver and which version of the JDBC API is the earliest version that supports the method, refer to the following sections.

The driver does not support the following JDBC features:

- Array
- Blob
- Clob
- Ref
- Savepoint
- SQLData
- SQLInput
- SQLOutput
- Struct

### CallableStatement

The `CallableStatement` interface extends the `PreparedStatement` interface.

The following table lists the methods that belong to the `CallableStatement` interface, and describes whether each method is supported by the Cloudera JDBC Driver for Impala and which version of the JDBC API is the earliest version that supports the method.

For detailed information about each method in the `CallableStatement` interface, see the Java API documentation:

<http://docs.oracle.com/javase/1.5.0/docs/api/java/sql/CallableStatement.html>.

Method	Supported Since JDBC Version	Supported by the Driver	Notes
Array <code>getArray(int i)</code>	3.0	No	
Array <code>getArray(String parameterName)</code>	3.0	No	
BigDecimal <code>getBigDecimal(int parameterIndex)</code>	3.0	Yes	
BigDecimal <code>getBigDecimal(int parameterIndex, int scale)</code>	3.0	Yes	Deprecated.
BigDecimal <code>getBigDecimal(String parameterName)</code>	3.0	Yes	
Blob <code>getBlob(int i)</code>	3.0	No	
Blob <code>getBlob(String parameterName)</code>	3.0	No	
boolean <code>getBoolean(int parameterIndex)</code>	3.0	Yes	
boolean <code>getBoolean(String parameterName)</code>	3.0	Yes	
byte <code>getByte(int parameterIndex)</code>	3.0	Yes	
byte <code>getByte(String parameterName)</code>	3.0	Yes	
byte[] <code>getBytes(int parameterIndex)</code>	3.0	Yes	
byte[] <code>getBytes(String parameterName)</code>	3.0	Yes	
Clob <code>getClob(int i)</code>	3.0	No	
Clob <code>getClob(String parameterName)</code>	3.0	No	

## Features

Method	Supported Since JDBC Version	Supported by the Driver	Notes
Date getDate(int parameterIndex)	3.0	Yes	
Date getDate(int parameterIndex, Calendar cal)	3.0	Yes	
Date getDate(String parameterName)	3.0	Yes	
Date getDate(String parameterName, Calendar cal)	3.0	Yes	
double getDouble(int parameterIndex)	3.0	Yes	
double getDouble(String parameterName)	3.0	Yes	
float getFloat(int parameterIndex)	3.0	Yes	
float getFloat(String parameterName)	3.0	Yes	
int getInt(int parameterIndex)	3.0	Yes	
int getInt(String parameterName)	3.0	Yes	
long getLong(int parameterIndex)	3.0	Yes	
long getLong(String parameterName)	3.0	Yes	
Reader getNCharacterStream(int parameterIndex)	4.0	No	
Reader	4.0	No	

Method	Supported Since JDBC Version	Supported by the Driver	Notes
<code>getNCharacterStream(String parameterName)</code>			
<code>NClob getNClob(int parameterIndex)</code>	4.0	No	
<code>NClob getNClob(String parameterName)</code>	4.0	No	
<code>String getNString(int parameterIndex)</code>	4.0	No	
<code>String getNString(String parameterName)</code>	4.0	No	
<code>Object getObject(int parameterIndex)</code>	3.0	Yes	
<code>&lt;T&gt; T getObject(int parameterIndex, Class&lt;T&gt; type)</code>	4.1	No	
<code>Object getObject(int i, Map&lt;String,Class&lt;?&gt;&gt; map)</code>	3.0	No	
<code>Object getObject(String parameterName)</code>	3.0	Yes	
<code>&lt;T&gt; T getObject(String parameterName, Class&lt;T&gt; type)</code>	4.1	No	
<code>Object getObject(String parameterName, Map&lt;String,Class&lt;?&gt;&gt; map)</code>	3.0	Yes	
<code>Ref getRef(int i)</code>	3.0	No	
<code>Ref getRef(String parameterName)</code>	3.0	No	

## Features

Method	Supported Since JDBC Version	Supported by the Driver	Notes
RowId getRowId(int parameterIndex)	4.0	No	
RowId getRowId(String parameterName)	4.0	No	
short getShort(int parameterIndex)	3.0	Yes	
short getShort(String parameterName)	3.0	Yes	
SQLXML getSQLXML(int parameterIndex)	4.0	No	
SQLXML getSQLXML(String parameterName)	4.0	No	
String getString(int parameterIndex)	3.0	Yes	
String getString(String parameterName)	3.0	Yes	
Time getTime(int parameterIndex)	3.0	Yes	
Time getTime(int parameterIndex, Calendar cal)	3.0	Yes	
Time getTime(String parameterName)	3.0	Yes	
Time getTime(String parameterName, Calendar cal)	3.0	Yes	
Timestamp getTimestamp(int parameterIndex)	3.0	Yes	
Timestamp getTimestamp(int parameterIndex,	3.0	Yes	



Method	Supported Since JDBC Version	Supported by the Driver	Notes
Calendar cal)			
Timestamp getTimestamp (String parameterName)	3.0	Yes	
Timestamp getTimestamp (String parameterName, Calendar cal)	3.0	Yes	
URL getURL(int parameterIndex)	3.0	No	
URL getURL(String parameterName)	3.0	No	
void registerOutParameter(int parameterIndex, int sqlType)	3.0	Yes	
void registerOutParameter(int parameterIndex, int sqlType, int scale)	3.0	Yes	
void registerOutParameter(int paramIndex, int sqlType, String typeName)	3.0	Yes	
void registerOutParameter (String parameterName, int sqlType)	3.0	Yes	
void registerOutParameter (String parameterName, int sqlType, int scale)	3.0	Yes	
void registerOutParameter (String parameterName, int sqlType, String	3.0	Yes	

## Features

Method	Supported Since JDBC Version	Supported by the Driver	Notes
typeName)			
void setAsciiStream (String parameterName, InputStream x)	4.0	Yes	
void setAsciiStream (String parameterName, InputStream x, int length)	3.0	Yes	
void setAsciiStream (String parameterName, InputStream x, long length)	4.0	Yes	
void setBigDecimal (String parameterName, BigDecimal x)	3.0	Yes	
void setBinaryStream (String parameterName, InputStream x)	4.0	Yes	
setBinaryStream (String parameterName, InputStream x, int length)	3.0	Yes	
void setBinaryStream (String parameterName, InputStream x, long length)	4.0	Yes	
void setBlob (String parameterName, Blob x)	4.0	Yes	
void setBlob (String parameterName, InputStream inputStream)	4.0	Yes	
void setBlob (String parameterName,	4.0	Yes	

Method	Supported Since JDBC Version	Supported by the Driver	Notes
InputStream inputStream, long length)			
void setBoolean(String parameterName, boolean x)	3.0	Yes	
void setByte(String parameterName, byte x)	3.0	Yes	
void setBytes(String parameterName, byte[] x)	3.0	Yes	
void setCharacterStream (String parameterName, Reader reader)	4.0	Yes	
void setCharacterStream (String parameterName, Reader reader, int length)	3.0	Yes	
void setCharacterStream (String parameterName, Reader reader, long length)	4.0	Yes	
void setClob(String parameterName, Clob x)	4.0	Yes	
void setClob(String parameterName, Reader reader)	4.0	Yes	
void setClob(String parameterName, Reader reader, long length)	4.0	Yes	
void setDate(String parameterName, Date x)	3.0	Yes	
void setDate(String	3.0	Yes	

## Features

Method	Supported Since JDBC Version	Supported by the Driver	Notes
<code>parameterName, Date x, Calendar cal)</code>			
<code>void setDouble(String parameterName, double x)</code>	3.0	Yes	
<code>void setFloat(String parameterName, float x)</code>	3.0	Yes	
<code>void setInt(String parameterName, int x)</code>	3.0	Yes	
<code>void setLong(String parameterName, long x)</code>	3.0	Yes	
<code>void setNCharacterStream(String parameterName, Reader value)</code>	4.0	Yes	
<code>void setNCharacterStream(String parameterName, Reader value, long length)</code>	4.0	Yes	
<code>void setNClob(String parameterName, NClob value)</code>	4.0	Yes	
<code>void setNClob(String parameterName, Reader reader)</code>	4.0	Yes	
<code>void setNClob(String parameterName, Reader reader, long length)</code>	4.0	Yes	
<code>void setNString(String parameterName, String value)</code>	4.0	Yes	
<code>void setNull(String parameterName, int sqlType)</code>	3.0	Yes	

Method	Supported Since JDBC Version	Supported by the Driver	Notes
<code>void setNull(String parameterName, int sqlType, String typeName)</code>	3.0	Yes	
<code>void setObject(String parameterName, Object x)</code>	3.0	Yes	
<code>void setObject(String parameterName, Object x, int targetSqlType)</code>	3.0	Yes	
<code>void setObject(String parameterName, Object x, int targetSqlType, int scale)</code>	3.0	Yes	
<code>void setRowId(String parameterName, RowId x)</code>	4.0	Yes	
<code>void setShort(String parameterName, short x)</code>	3.0	Yes	
<code>void setSQLXML(String parameterName, SQLXML xmlObject)</code>	4.0	Yes	
<code>void setString(String parameterName, String x)</code>	3.0	Yes	
<code>void setTime(String parameterName, Time x)</code>	3.0	Yes	
<code>void setTime(String parameterName, Time x, Calendar cal)</code>	3.0	Yes	
<code>void setTimestamp(String parameterName, Timestamp x)</code>	3.0	Yes	

## Features

Method	Supported Since JDBC Version	Supported by the Driver	Notes
<code>void setTimestamp(String parameterName, Timestamp x, Calendar cal)</code>	3.0	Yes	
<code>void setURL(String parameterName, URL val)</code>	3.0	Yes	
<code>boolean wasNull()</code>	3.0	Yes	
<code>boolean isWrapperFor(Class&lt;?&gt; iface)</code>	4.0	Yes	
<code>&lt;T&gt; T unwrap(Class&lt;T&gt; iface)</code>	4.0	Yes	

## Connection

The following table lists the methods that belong to the `Connection` interface, and describes whether each method is supported by the Cloudera JDBC Driver for Impala and which version of the JDBC API is the earliest version that supports the method.

For detailed information about each method in the `Connection` interface, see the Java API documentation: <http://docs.oracle.com/javase/1.5.0/docs/api/java/sql/Connection.html>.

Method	Supported Since JDBC Version	Supported by the Driver	Notes
<code>void clearWarnings()</code>	3.0	Yes	
<code>void close()</code>	3.0	Yes	
<code>void commit()</code>	3.0	Yes	Auto-commit cannot be set to <code>false</code> because it is hard-coded to <code>true</code> .
<code>Array createArrayOf(String typeName, Object [] elements)</code>	4.0	No	
<code>Blob createBlob()</code>	4.0	No	

Method	Supported Since JDBC Version	Supported by the Driver	Notes
Clob createClob()	4.0	No	
NClob createNClob()	4.0	No	
SQLXML createSQLXML()	4.0	No	
Statement createStatement()	3.0	Yes	
Statement createStatement(int resultSetType, int resultSetConcurrency)	3.0	No	
Statement createStatement(int resultSetType, int resultSetConcurrency, int resultSetHoldability)	3.0	No	
Struct createStruct(String typeName, Object[] attributes)	4.0	No	
boolean getAutoCommit()	3.0	Yes	Hard-coded to true.
String getCatalog()	3.0	Yes	
Properties getClientInfo()	4.0	Yes	
String getClientInfo(String name)	4.0	Yes	
int getHoldability()	3.0	Yes	Hard-coded to CLOSE_CURSORS_AT_COMMIT.
DatabaseMetaData getMetaData()	3.0	Yes	
int getNetworkTimeout()	4.1	No	
String getSchema()	4.1	Yes	The returned schema name does not always match the

Method	Supported Since JDBC Version	Supported by the Driver	Notes
			one used by statements. Statements use the schema name defined in the connection URL.
<code>int getTransactionIsolation()</code>	3.0	Yes	Hard-coded to TRANSACTION_READ_UNCOMMITTED.
<code>Map&lt;String,Class&lt;?&gt;&gt; getTypeMap()</code>	3.0	No	
<code>SQLWarning getWarnings()</code>	3.0	Yes	
<code>boolean isClosed()</code>	3.0	Yes	
<code>boolean isReadOnly()</code>	3.0	Yes	Returns true.
<code>boolean isValid(int timeout)</code>	4.0	Yes	
<code>String nativeSQL(String sql)</code>	3.0	Yes	
<code>CallableStatement prepareCall(String sql)</code>	3.0	No	
<code>CallableStatement prepareCall(String sql, int resultSetType, int resultSetConcurrency)</code>	3.0	No	
<code>CallableStatement prepareCall(String sql, int resultSetType, int resultSetConcurrency, int resultSetHoldability)</code>	3.0	No	
<code>PreparedStatement prepareStatement(String sql)</code>	3.0	Yes	



Method	Supported Since JDBC Version	Supported by the Driver	Notes
<code>PreparedStatement prepareStatement(String sql, int autoGeneratedKeys)</code>	3.0	No	
<code>PreparedStatement prepareStatement(String sql, int[] columnIndexes)</code>	3.0	No	
<code>PreparedStatement prepareStatement(String sql, int resultSetType, int resultSetConcurrency)</code>	3.0	No	
<code>PreparedStatement prepareStatement(String sql, int resultSetType, int resultSetConcurrency, int resultSetHoldability)</code>	3.0	No	
<code>PreparedStatement prepareStatement(String sql, String[] columnNames)</code>	3.0	No	
<code>void releaseSavepoint (Savepoint savepoint)</code>	3.0	No	Savepoints are not available because transactions are not supported.
<code>void rollback()</code>	3.0	No	Savepoints are not available because transactions are not supported.
<code>void rollback(Savepoint savepoint)</code>	3.0	No	Savepoints are not available because transactions are not supported.
<code>void setAutoCommit (boolean autoCommit)</code>	3.0	Yes	Ignored because auto-commit is hard-coded to true.

## Features

Method	Supported Since JDBC Version	Supported by the Driver	Notes
<code>void setCatalog(String catalog)</code>	3.0	Yes	
<code>void setClientInfo(Properties properties)</code>	4.0	Yes	
<code>void setClientInfo(String name, String value)</code>	4.0	Yes	
<code>void setHoldability(int holdability)</code>	3.0	Yes	
<code>void setNetworkTimeout(Executor executor, int milliseconds)</code>	4.1	No	
<code>void setReadOnly(boolean readOnly)</code>	3.0	Yes	
<code>Savepoint setSavepoint()</code>	3.0	No	Savepoints are not available because transactions are not supported.
<code>Savepoint setSavepoint(String name)</code>	3.0	No	Savepoints are not available because transactions are not supported.
<code>void setSchema(String schema)</code>	4.1	Yes	Does not actually change the schema name used by newly created statements; only changes the value returned by <code>getSchema()</code> .
<code>void setTransactionIsolation(int level)</code>	3.0	Yes	
<code>void setTypeMap(Map&lt;String, Class&lt;?&gt;&gt; map)</code>	3.0	No	
<code>boolean isWrapperFor</code>	4.0	Yes	

Method	Supported Since JDBC Version	Supported by the Driver	Notes
(Class<?> iface)			
<T> T unwrap(Class<T> iface)	4.0	Yes	

### DatabaseMetaData

The following table lists the methods that belong to the `DatabaseMetaData` interface, and describes whether each method is supported by the Cloudera JDBC Driver for Impala and which version of the JDBC API is the earliest version that supports the method.

For detailed information about each method in the `DatabaseMetaData` interface, see the Java API documentation: <http://docs.oracle.com/javase/1.5.0/docs/api/java/sql/DatabaseMetaData.html>.

Method	Supported Since JDBC Version	Supported by the Driver	Notes
<code>boolean allProceduresAreCallable()</code>	3.0	Yes	Returns true.
<code>boolean allTablesAreSelectable()</code>	3.0	Yes	Returns true.
<code>boolean autoCommitFailureClosesAllResultSets()</code>	4.0	Yes	Returns true.
<code>boolean dataDefinitionCausesTransactionCommit()</code>	3.0	Yes	Returns false.
<code>boolean dataDefinitionIgnoredInTransactions()</code>	3.0	Yes	Returns false.
<code>boolean deletesAreDetected(int type)</code>	3.0	Yes	Returns true.
<code>boolean doesMaxRowSizeIncludeBlobs()</code>	3.0	Yes	Returns false.

## Features

Method	Supported Since JDBC Version	Supported by the Driver	Notes
<code>boolean generatedKeyAlwaysReturned()</code>	4.1	Yes	
<code>ResultSet getAttributes(String catalog, String schemaPattern, String typeNamePattern, String attributeNamePattern)</code>	3.0	Yes	
<code>ResultSet getBestRowIdentifier(String catalog, String schema, String table, int scope, boolean nullable)</code>	3.0	Yes	
<code>ResultSet getCatalogs()</code>	3.0	Yes	
<code>String getCatalogSeparator()</code>	3.0	Yes	
<code>String getCatalogTerm()</code>	3.0	Yes	
<code>ResultSet getClientInfoProperties()</code>	4.0	Yes	
<code>ResultSet getColumnPrivileges(String catalog, String schema, String table, String columnNamePattern)</code>	3.0	Yes	
<code>ResultSet getColumns(String catalog, String schemaPattern, String tableNamePattern, String columnNamePattern)</code>	3.0	Yes	
<code>Connection getConnection()</code>	3.0	Yes	
<code>ResultSet getCrossReference(String primaryCatalog, String primarySchema, String primaryTable, String foreignCatalog, String foreignSchema, String foreignTable)</code>	3.0	Yes	
<code>int getDatabaseMajorVersion()</code>	3.0	Yes	

Method	Supported Since JDBC Version	Supported by the Driver	Notes
<code>int getDatabaseMinorVersion()</code>	3.0	Yes	
<code>String getDatabaseProductName()</code>	3.0	Yes	Hard-coded to Impala.
<code>String getDatabaseProductVersion()</code>	3.0	Yes	
<code>int getDefaultTransactionIsolation()</code>	3.0	Yes	Hard-coded to TRANSACTION_READ_UNCOMMITTED.
<code>int getDriverMajorVersion()</code>	3.0	Yes	
<code>int getDriverMinorVersion()</code>	3.0	Yes	
<code>String getDriverName()</code>	3.0	Yes	Hard-coded to ImpalaJDBC.
<code>String getDriverVersion()</code>	3.0	Yes	
<code>ResultSet getExportedKeys(String catalog, String schema, String table)</code>	3.0	Yes	
<code>String getExtraNameCharacters()</code>	3.0	Yes	Returns an empty String.
<code>ResultSet getFunctionColumns(String catalog, String schemaPattern, String functionNamePattern, String columnNamePattern)</code>	4.0	Yes	
<code>ResultSet getFunctions(String catalog, String schemaPattern, String functionNamePattern)</code>	4.0	Yes	
<code>String getIdentifierQuoteString()</code>	3.0	Yes	Returns a backquote (`)

## Features

Method	Supported Since JDBC Version	Supported by the Driver	Notes
<code>ResultSet getImportedKeys(String catalog, String schema, String table)</code>	3.0	Yes	
<code>ResultSet getIndexInfo(String catalog, String schema, String table, boolean unique, boolean approximate)</code>	3.0	Yes	
<code>int getJDBCMajorVersion()</code>	3.0	Yes	
<code>int getJDBCMinorVersion()</code>	3.0	Yes	
<code>int getMaxBinaryLiteralLength()</code>	3.0	Yes	Returns 0.
<code>int getMaxCatalogNameLength()</code>	3.0	Yes	Returns 128.
<code>int getMaxCharLiteralLength()</code>	3.0	Yes	Returns 0.
<code>int getMaxColumnNameLength()</code>	3.0	Yes	Returns 128.
<code>int getMaxColumnsInGroupBy()</code>	3.0	Yes	Returns 0.
<code>int getMaxColumnsInIndex()</code>	3.0	Yes	Returns 0.
<code>int getMaxColumnsInOrderBy()</code>	3.0	Yes	Returns 0.
<code>int getMaxColumnsInSelect()</code>	3.0	Yes	Returns 0.
<code>int getMaxColumnsInTable()</code>	3.0	Yes	Returns 0.
<code>int getMaxConnections()</code>	3.0	Yes	Returns 0.
<code>int getMaxCursorNameLength()</code>	3.0	Yes	Returns 0.
<code>int getMaxIndexLength()</code>	3.0	Yes	Returns 0.
<code>int getMaxProcedureNameLength()</code>	3.0	Yes	Returns 0.
<code>int getMaxRowSize()</code>	3.0	Yes	Returns 0.

Method	Supported Since JDBC Version	Supported by the Driver	Notes
<code>int getMaxSchemaNameLength()</code>	3.0	Yes	Returns 128.
<code>int getMaxStatementLength()</code>	3.0	Yes	Returns 0.
<code>int getMaxStatements()</code>	3.0	Yes	Returns 0.
<code>int getMaxTableNameLength()</code>	3.0	Yes	Returns 128.
<code>int getMaxTablesInSelect()</code>	3.0	Yes	Returns 0.
<code>int getMaxUserNameLength()</code>	3.0	Yes	Returns 0.
<code>String getNumericFunctions()</code>	3.0	Yes	Returns the Numeric Functions list from the specification related to the JDBC version of the driver.
<code>ResultSet getPrimaryKeys(String catalog, String schema, String table)</code>	3.0	Yes	
<code>ResultSet getProcedureColumns(String catalog, String schemaPattern, String procedureNamePattern, String columnNamePattern)</code>	3.0	Yes	
<code>ResultSet getProcedures(String catalog, String schemaPattern, String procedureNamePattern)</code>	3.0	Yes	
<code>String getProcedureTerm()</code>	3.0	Yes	Returns procedure.
<code>ResultSet getPseudoColumns(String catalog, String schemaPattern, String tableNamePattern, String columnNamePattern)</code>	4.1	Yes	

## Features

Method	Supported Since JDBC Version	Supported by the Driver	Notes
<code>int getResultSetHoldability()</code>	3.0	Yes	Returns <code>CLOSE_CURSORS_AT_COMMIT</code> .
<code>RowIdLifetime getRowIdLifetime()</code>	4.0	Yes	Returns <code>ROWID_UNSUPPORTED</code> .
<code>ResultSet getSchemas()</code>	3.0	Yes	
<code>ResultSet getSchemas(String catalog, String schemaPattern)</code>	4.0	Yes	
<code>String getSchemaTerm()</code>	3.0	Yes	Returns schema.
<code>String getSearchStringEscape()</code>	3.0	Yes	Returns a backslash ( <code>\</code> ).
<code>String getSQLKeywords()</code>	3.0	Yes	Returns an empty String.
<code>int getSQLStateType()</code>	3.0	Yes	Returns <code>sqlStateSQL99</code> .
<code>String getStringFunctions()</code>	3.0	Yes	Returns the String Functions list from the specification related to the JDBC version of the driver.
<code>ResultSet getSuperTables(String catalog, String schemaPattern, String tableNamePattern)</code>	3.0	Yes	
<code>ResultSet getSuperTypes(String catalog, String schemaPattern, String typeNamePattern)</code>	3.0	Yes	
<code>String getSystemFunctions()</code>	3.0	Yes	Returns



Method	Supported Since JDBC Version	Supported by the Driver	Notes
			DATABASE, IFNULL, USER.
ResultSet getTablePrivileges(String catalog, String schemaPattern, String tableNamePattern)	3.0	Yes	
ResultSet getTables(String catalog, String schemaPattern, String tableNamePattern, String[] types)	3.0	Yes	
ResultSet getTableTypes()	3.0	Yes	
String getTimeDateFunctions()	3.0	Yes	Returns the Time and Date Functions list from the specification related to the JDBC version of the driver.
ResultSet getTypeInfo()	3.0	Yes	
ResultSet getUDTs(String catalog, String schemaPattern, String typeNamePattern, int[] types)	3.0	Yes	
String getURL()	3.0	Yes	
String getUsername()	3.0	Yes	
ResultSet getVersionColumns(String catalog, String schema, String table)	3.0	Yes	
boolean insertsAreDetected(int type)	3.0	Yes	
boolean isCatalogAtStart()	3.0	Yes	

## Features

Method	Supported Since JDBC Version	Supported by the Driver	Notes
<code>boolean isReadOnly()</code>	3.0	Yes	Returns true.
<code>boolean locatorsUpdateCopy()</code>	3.0	Yes	Returns false.
<code>boolean nullPlusNonNullIsNull()</code>	3.0	Yes	Returns true.
<code>boolean nullsAreSortedAtEnd()</code>	3.0	Yes	Returns false.
<code>boolean nullsAreSortedAtStart()</code>	3.0	Yes	Returns false.
<code>boolean nullsAreSortedHigh()</code>	3.0	Yes	Returns false.
<code>boolean nullsAreSortedLow()</code>	3.0	Yes	Returns true.
<code>boolean othersDeletesAreVisible(int type)</code>	3.0	Yes	
<code>boolean othersInsertsAreVisible(int type)</code>	3.0	Yes	
<code>boolean othersUpdatesAreVisible(int type)</code>	3.0	Yes	
<code>boolean ownDeletesAreVisible(int type)</code>	3.0	Yes	
<code>boolean ownInsertsAreVisible(int type)</code>	3.0	Yes	
<code>boolean ownUpdatesAreVisible(int type)</code>	3.0	Yes	
<code>boolean storesLowerCaseIdentifiers()</code>	3.0	Yes	Returns false.
<code>boolean storesLowerCaseQuotedIdentifiers()</code>	3.0	Yes	Returns false.
<code>boolean storesMixedCaseIdentifiers()</code>	3.0	Yes	Returns true.

Method	Supported Since JDBC Version	Supported by the Driver	Notes
boolean storesMixedCaseQuotedIdentifiers()	3.0	Yes	Returns true.
boolean storesUpperCaseIdentifiers()	3.0	Yes	Returns false.
boolean storesUpperCaseQuotedIdentifiers()	3.0	Yes	Returns false.
boolean supportsAlterTableWithAddColumn()	3.0	Yes	Returns false.
boolean supportsAlterTableWithDropColumn()	3.0	Yes	Returns false.
boolean supportsANSI92EntryLevelSQL()	3.0	Yes	Returns true.
boolean supportsANSI92FullSQL()	3.0	Yes	Returns false.
boolean supportsANSI92IntermediateSQL()	3.0	Yes	Returns false.
boolean supportsBatchUpdates()	3.0	Yes	Returns false.
boolean supportsCatalogsInDataManipulation()	3.0	Yes	Returns true.
boolean supportsCatalogsInIndexDefinitions()	3.0	Yes	Returns true.
boolean supportsCatalogsInPrivilegeDefinitions()	3.0	Yes	Returns true.
boolean supportsCatalogsInProcedureCalls()	3.0	Yes	Returns true.
boolean	3.0	Yes	Returns true.

## Features

Method	Supported Since JDBC Version	Supported by the Driver	Notes
<code>supportsCatalogsInTableDefinitions()</code>			
<code>boolean supportsColumnAliasing()</code>	3.0	Yes	Returns true.
<code>boolean supportsConvert()</code>	3.0	Yes	Returns true.
<code>boolean supportsConvert(int fromType, int toType)</code>	3.0	Yes	
<code>boolean supportsCoreSQLGrammar()</code>	3.0	Yes	Returns true.
<code>boolean supportsCorrelatedSubqueries()</code>	3.0	Yes	Returns true.
<code>boolean supportsDataDefinitionAndDataManipulationTransactions()</code>	3.0	Yes	Returns false.
<code>boolean supportsDataManipulationTransactionsOnly()</code>	3.0	Yes	Returns false.
<code>boolean supportsDifferentTableCorrelationNames()</code>	3.0	Yes	Returns false.
<code>boolean supportsExpressionsInOrderBy()</code>	3.0	Yes	Returns true.
<code>boolean supportsExtendedSQLGrammar()</code>	3.0	Yes	Returns false.
<code>boolean supportsFullOuterJoins()</code>	3.0	Yes	Returns true.
<code>boolean supportsGetGeneratedKeys()</code>	3.0	Yes	Returns false.
<code>boolean supportsGroupBy()</code>	3.0	Yes	Returns true.
<code>boolean supportsGroupByBeyondSelect()</code>	3.0	Yes	Returns true.

Method	Supported Since JDBC Version	Supported by the Driver	Notes
<code>boolean supportsGroupByUnrelated()</code>	3.0	Yes	Returns false.
<code>boolean supportsIntegrityEnhancementFacility()</code>	3.0	Yes	Returns false.
<code>boolean supportsLikeEscapeClause()</code>	3.0	Yes	Returns true.
<code>boolean supportsLimitedOuterJoins()</code>	3.0	Yes	Returns false.
<code>boolean supportsMinimumSQLGrammar()</code>	3.0	Yes	Returns true.
<code>boolean supportsMixedCaseIdentifiers()</code>	3.0	Yes	Returns false.
<code>boolean supportsMixedCaseQuotedIdentifiers()</code>	3.0	Yes	Returns true.
<code>boolean supportsMultipleOpenResults()</code>	3.0	Yes	Returns false.
<code>boolean supportsMultipleResultSets()</code>	3.0	Yes	Returns false.
<code>boolean supportsMultipleTransactions()</code>	3.0	Yes	Returns true.
<code>boolean supportsNamedParameters()</code>	3.0	Yes	Returns false.
<code>boolean supportsNonNullableColumns()</code>	3.0	Yes	Returns false.
<code>boolean supportsOpenCursorsAcrossCommit()</code>	3.0	Yes	Returns false.
<code>boolean supportsOpenCursorsAcrossRollback()</code>	3.0	Yes	Returns false.
<code>boolean supportsOpenStatementsAcrossCommit()</code>	3.0	Yes	Returns true.

## Features

Method	Supported Since JDBC Version	Supported by the Driver	Notes
<code>boolean supportsOpenStatementsAcrossRollback()</code>	3.0	Yes	Returns true.
<code>boolean supportsOrderByUnrelated()</code>	3.0	Yes	Returns false.
<code>boolean supportsOuterJoins()</code>	3.0	Yes	Returns false.
<code>boolean supportsPositionedDelete()</code>	3.0	Yes	Returns false.
<code>boolean supportsPositionedUpdate()</code>	3.0	Yes	Returns false.
<code>boolean supportsResultSetConcurrency(int type, int concurrency)</code>	3.0	Yes	
<code>boolean supportsResultSetHoldability(int holdability)</code>	3.0	Yes	
<code>boolean supportsResultSetType(int type)</code>	3.0	Yes	
<code>boolean supportsSavepoints()</code>	3.0	Yes	Returns false.
<code>boolean supportsSchemasInDataManipulation()</code>	3.0	Yes	Returns true.
<code>boolean supportsSchemasInIndexDefinitions()</code>	3.0	Yes	Returns true.
<code>boolean supportsSchemasInPrivilegeDefinitions()</code>	3.0	Yes	Returns true.
<code>boolean supportsSchemasInProcedureCalls()</code>	3.0	Yes	Returns false.
<code>boolean supportsSchemasInTableDefinitions()</code>	3.0	Yes	Returns true.

Method	Supported Since JDBC Version	Supported by the Driver	Notes
<code>boolean supportsSelectForUpdate()</code>	3.0	Yes	Returns false.
<code>boolean supportsStatementPooling()</code>	3.0	Yes	Returns false.
<code>boolean supportsStoredFunctionsUsingCallSyntax()</code>	4.0	Yes	Returns false.
<code>boolean supportsStoredProcedures()</code>	3.0	Yes	Returns true.
<code>boolean supportsSubqueriesInComparisons()</code>	3.0	Yes	Returns true.
<code>boolean supportsSubqueriesInExists()</code>	3.0	Yes	Returns true.
<code>boolean supportsSubqueriesInIns()</code>	3.0	Yes	Returns true.
<code>boolean supportsSubqueriesInQuantifieds()</code>	3.0	Yes	Returns true.
<code>boolean supportsTableCorrelationNames()</code>	3.0	Yes	Returns true.
<code>boolean supportsTransactionIsolationLevel(int level)</code>	3.0	Yes	
<code>boolean supportsTransactions()</code>	3.0	Yes	Returns false.
<code>boolean supportsUnion()</code>	3.0	Yes	Returns true.
<code>boolean supportsUnionAll()</code>	3.0	Yes	Returns true.
<code>boolean updatesAreDetected(int type)</code>	3.0	Yes	Returns true.
<code>boolean usesLocalFilePerTable()</code>	3.0	Yes	Returns false.
<code>boolean usesLocalFiles()</code>	3.0	Yes	Returns false.

Method	Supported Since JDBC Version	Supported by the Driver	Notes
<code>boolean isWrapperFor(Class&lt;?&gt; iface)</code>	4.0	Yes	
<code>&lt;T&gt; T unwrap(Class&lt;T&gt; iface)</code>	4.0	Yes	

### DataSource

The following table lists the methods that belong to the `DataSource` interface, and describes whether each method is supported by the Cloudera JDBC Driver for Impala and which version of the JDBC API is the earliest version that supports the method.

For detailed information about each method in the `DataSource` interface, see the Java API documentation: <http://docs.oracle.com/javase/1.5.0/docs/api/javax/sql/DataSource.html>.

Method	Supported Since JDBC Version	Supported by the Driver	Notes
<code>Connection getConnection()</code>	3.0	Yes	
<code>Connection getConnection(String username, String password)</code>	3.0	Yes	
<code>int getLoginTimeout()</code>	3.0	Yes	
<code>PrintWriter getLogWriter()</code>	3.0	Yes	
<code>Logger getParentLogger()</code>	4.1	No	The driver does not use <code>java.util.logging</code> .
<code>void setLoginTimeout(int seconds)</code>	3.0	Yes	
<code>void setLogWriter(PrintWriter out)</code>	3.0	Yes	



Method	Supported Since JDBC Version	Supported by the Driver	Notes
<code>boolean isWrapperFor(Class&lt;?&gt; iface)</code>	4.0	Yes	
<code>&lt;T&gt; T unwrap(Class&lt;T&gt; iface)</code>	4.0	Yes	

### Driver

The following table lists the methods that belong to the `Driver` interface, and describes whether each method is supported by the Cloudera JDBC Driver for Impala and which version of the JDBC API is the earliest version that supports the method.

For detailed information about each method in the `Driver` interface, see the Java API documentation: <http://docs.oracle.com/javase/1.5.0/docs/api/java/sql/Driver.html>.

Method	Supported Since JDBC Version	Supported by the Driver	Notes
<code>boolean acceptsURL(String url)</code>	3.0	Yes	
<code>Connection connect(String url, Properties info)</code>	3.0	Yes	
<code>int getMajorVersion()</code>	3.0	Yes	
<code>int getMinorVersion()</code>	3.0	Yes	
<code>Logger getParentLogger()</code>	4.1	No	
<code>DriverPropertyInfo[] getPropertyInfo(String url, Properties info)</code>	3.0	Yes	
<code>boolean jdbcCompliant()</code>	3.0	Yes	

### ParameterMetaData

The following table lists the methods that belong to the `ParameterMetaData` interface, and describes whether each method is supported by the Cloudera JDBC Driver for Impala and which

## Features

version of the JDBC API is the earliest version that supports the method.

For detailed information about each method in the `ParameterMetaData` interface, see the Java API documentation:

<http://docs.oracle.com/javase/1.5.0/docs/api/java/sql/ParameterMetaData.html>.

Method	Supported Since JDBC Version	Supported by the Driver	Notes
<code>String getParameterClassName (int param)</code>	3.0	Yes	
<code>int getParameterCount()</code>	3.0	Yes	
<code>int getParameterMode(int param)</code>	3.0	Yes	
<code>int getParameterType(int param)</code>	3.0	Yes	
<code>String getParameterTypeName(int param)</code>	3.0	Yes	
<code>int getPrecision(int param)</code>	3.0	Yes	
<code>int getScale(int param)</code>	3.0	Yes	
<code>int isNullable(int param)</code>	3.0	Yes	
<code>boolean isSigned(int param)</code>	3.0	Yes	
<code>boolean isWrapperFor (Class&lt;?&gt; iface)</code>	4.0	Yes	
<code>&lt;T&gt; T unwrap(Class&lt;T&gt; iface)</code>	4.0	Yes	

## PooledConnection

The following table lists the methods that belong to the `PooledConnection` interface, and describes whether each method is supported by the Cloudera JDBC Driver for Impala and which version of the JDBC API is the earliest version that supports the method.

For detailed information about each method in the `PooledConnection` interface, see the Java API documentation:

<http://docs.oracle.com/javase/1.5.0/docs/api/javax/sql/PooledConnection.html>.

Method	Supported Since JDBC Version	Supported by the Driver	Notes
<code>void addConnectionEventListener(ConnectionEventListener listener)</code>	3.0	Yes	
<code>void addStatementEventListener(StatementEventListener listener)</code>	4.0	Yes	
<code>void close()</code>	3.0	Yes	
<code>Connection getConnection()</code>	3.0	Yes	
<code>void removeConnectionEventListener(ConnectionEventListener listener)</code>	3.0	Yes	
<code>void removeStatementEventListener(StatementEventListener listener)</code>	4.0	Yes	Removes the specified <code>StatementEventListener</code> from the list of components that will be notified when the driver detects that a <code>PreparedStatement</code> has been closed or is invalid.

### PreparedStatement

The `PreparedStatement` interface extends the `Statement` interface.

The following table lists the methods that belong to the `PreparedStatement` interface, and describes whether each method is supported by the Cloudera JDBC Driver for Impala and which version of the JDBC API is the earliest version that supports the method.

For detailed information about each method in the `PooledConnection` interface, see the Java API documentation:

<http://docs.oracle.com/javase/1.5.0/docs/api/java/sql/PreparedStatement.html>.

Method	Supported Since JDBC Version	Supported by the Driver	Notes
<code>void addBatch()</code>	3.0	Yes	
<code>void clearParameters()</code>	3.0	Yes	
<code>boolean execute()</code>	3.0	Yes	
<code>ResultSet executeQuery()</code>	3.0	Yes	
<code>int executeUpdate()</code>	3.0	Yes	
<code>ResultSetMetaData getMetaData()</code>	3.0	Yes	
<code>ParameterMetaData getParameterMetaData()</code>	3.0	Yes	
<code>void setArray(int parameterIndex, Array x)</code>	3.0	No	
<code>void setAsciiStream(int parameterIndex, InputStream x)</code>	4.0	Yes	
<code>void setAsciiStream(int parameterIndex, InputStream x, int length)</code>	3.0	Yes	
<code>void setAsciiStream(int parameterIndex, InputStream x, long length)</code>	4.0	Yes	
<code>void setBigDecimal(int parameterIndex, BigDecimal x)</code>	3.0	Yes	
<code>void setBinaryStream(int</code>	4.0	Yes	

Method	Supported Since JDBC Version	Supported by the Driver	Notes
<code>parameterIndex, InputStream x)</code>			
<code>void setBinaryStream(int parameterIndex, InputStream x, int length)</code>	3.0	Yes	
<code>void setBinaryStream(int parameterIndex, InputStream x, long length)</code>	4.0	Yes	
<code>void setBlob(int parameterIndex, Blob x)</code>	3.0	No	
<code>void setBlob(int parameterIndex, InputStream inputStream)</code>	4.0	No	
<code>void setBlob(int parameterIndex, InputStream inputStream, long length)</code>	4.0	No	
<code>void setBoolean(int parameterIndex, boolean x)</code>	3.0	Yes	
<code>void setByte(int parameterIndex, byte x)</code>	3.0	Yes	
<code>void setBytes(int parameterIndex, byte[] x)</code>	3.0	Yes	
<code>void setCharacterStream (int parameterIndex, Reader reader)</code>	4.0	Yes	
<code>void setCharacterStream (int parameterIndex, Reader reader, int</code>	3.0	Yes	

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Method	Supported Since JDBC Version	Supported by the Driver	Notes
length)			
void setCharacterStream (int parameterIndex, Reader reader, long length)	4.0	Yes	
void setClob(int parameterIndex, Clob x)	3.0	No	
void setClob(int parameterIndex, Reader reader)	4.0	No	
void setClob(int parameterIndex, Reader reader, long length)	4.0	No	
void setDate(int parameterIndex, Date x)	3.0	Yes	
void setDate(int parameterIndex, Date x, Calendar cal)	3.0	Yes	
void setDouble(int parameterIndex, double x)	3.0	Yes	
void setFloat(int parameterIndex, float x)	3.0	Yes	
void setInt(int parameterIndex, int x)	3.0	Yes	
void setLong(int parameterIndex, long x)	3.0	Yes	
void setNCharacterStream (int parameterIndex, Reader value)	4.0	No	

Method	Supported Since JDBC Version	Supported by the Driver	Notes
<code>void setNCharacterStream(int parameterIndex, Reader value, long length)</code>	4.0	No	
<code>void setNClob(int parameterIndex, NClob value)</code>	4.0	No	
<code>void setNClob(int parameterIndex, Reader reader)</code>	4.0	No	
<code>void setNClob(int parameterIndex, Reader reader, long length)</code>	4.0	No	
<code>void setNString(int parameterIndex, String value)</code>	4.0	No	
<code>void setNull(int paramIndex, int sqlType, String typeName)</code>	3.0	Yes	
<code>void setObject(int parameterIndex, Object x)</code>	3.0	Yes	
<code>void setObject(int parameterIndex, Object x, int targetSqlType)</code>	3.0	Yes	
<code>void setObject(int parameterIndex, Object x, int targetSqlType, int scale)</code>	3.0	Yes	
<code>void setRef(int parameterIndex, Ref x)</code>	3.0	No	
<code>void setRowId(int parameterIndex, RowId x)</code>	4.0	No	

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Method	Supported Since JDBC Version	Supported by the Driver	Notes
<code>void setShort(int parameterIndex, short x)</code>	3.0	No	
<code>void setSQLXML(int parameterIndex, SQLXML xmlObject)</code>	4.0	Yes	
<code>void setString(int parameterIndex, String x)</code>	3.0	Yes	
<code>void setTime(int parameterIndex, Time x)</code>	3.0	Yes	
<code>void setTime(int parameterIndex, Time x, Calendar cal)</code>	3.0	Yes	
<code>void setTimestamp(int parameterIndex, Timestamp x)</code>	3.0	Yes	
<code>void setTimestamp(int parameterIndex, Timestamp x, Calendar cal)</code>	3.0	Yes	
<code>void setUnicodeStream(int parameterIndex, InputStream x, int length)</code>	3.0	Yes	Deprecated.
<code>void setURL(int parameterIndex, URL x)</code>	3.0	No	
<code>boolean isWrapperFor(Class&lt;?&gt; iface)</code>	4.0	Yes	
<code>&lt;T&gt; T unwrap(Class&lt;T&gt; iface)</code>	4.0	Yes	



## ResultSet

The following table lists the methods that belong to the `ResultSet` interface, and describes whether each method is supported by the Cloudera JDBC Driver for Impala and which version of the JDBC API is the earliest version that supports the method.

For detailed information about each method in the `ResultSet` interface, see the Java API documentation: <http://docs.oracle.com/javase/1.5.0/docs/api/java/sql/ResultSet.html>.

Method	Supported Since JDBC Version	Supported by the Driver	Notes
<code>boolean absolute(int row)</code>	3.0	No	
<code>void afterLast()</code>	3.0	No	
<code>void beforeFirst()</code>	3.0	No	
<code>void cancelRowUpdates()</code>	3.0	No	Not valid because the driver is read-only.
<code>void clearWarnings()</code>	3.0	Yes	
<code>void close()</code>	3.0	Yes	
<code>void deleteRow()</code>	3.0	No	Not valid because the driver is read-only.
<code>int findColumn(String columnName)</code>	3.0	Yes	
<code>boolean first()</code>	3.0	No	
<code>Array getArray(int i)</code>	3.0	No	
<code>Array getArray(String colName)</code>	3.0	No	
<code>InputStream getAsciiStream(int columnIndex)</code>	3.0	Yes	
<code>InputStream getAsciiStream(String columnName)</code>	3.0	Yes	

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Method	Supported Since JDBC Version	Supported by the Driver	Notes
BigDecimal getBigDecimal(int columnIndex)	3.0	Yes	
BigDecimal getBigDecimal(int columnIndex, int scale)	3.0	Yes	Deprecated.
BigDecimal getBigDecimal(String columnName)	3.0	Yes	
BigDecimal getBigDecimal(String columnName, int scale)	3.0	Yes	Deprecated.
InputStream getBinaryStream(int columnIndex)	3.0	Yes	
InputStream getBinaryStream(String columnName)	3.0	Yes	
Blob getBlob(int i)	3.0	No	
Blob getBlob(String colName)	3.0	No	
boolean getBoolean(int columnIndex)	3.0	Yes	
boolean getBoolean(String columnName)	3.0	Yes	
getByte(int columnIndex)	3.0	Yes	
byte getByte(String columnName)	3.0	Yes	
byte[] getBytes(int columnIndex)	3.0	Yes	
byte[] getBytes(String columnName)	3.0	Yes	

Method	Supported Since JDBC Version	Supported by the Driver	Notes
Reader getCharacterStream (int columnIndex)	3.0	Yes	
Reader getCharacterStream (String columnName)	3.0	Yes	
Clob getClob(int i)	3.0	No	
Clob getClob(String colName)	3.0	No	
int getConcurrency()	3.0	Yes	
String getCursorName()	3.0	Yes	
Date getDate(int columnIndex)	3.0	Yes	
Date getDate(int columnIndex, Calendar cal)	3.0	Yes	
Date getDate(String columnName)	3.0	Yes	
Date getDate(String columnName, Calendar cal)	3.0	Yes	
double getDouble(int columnIndex)	3.0	Yes	
double getDouble(String columnName)	3.0	Yes	
int getFetchDirection()	3.0	Yes	
int getFetchSize()	3.0	Yes	
float getFloat(int columnIndex)	3.0	Yes	
float getFloat(String	3.0	Yes	

## Features

Method	Supported Since JDBC Version	Supported by the Driver	Notes
columnName)			
int getHoldability()	4.0	Yes	
int getInt(int columnIndex)	3.0	Yes	
int getInt(String columnName)	3.0	Yes	
long getLong(int columnIndex)	3.0	Yes	
long getLong(String columnName)	3.0	Yes	
ResultSetMetaData getMetaData()	3.0	Yes	
Reader getNCharacterStream(int columnIndex)	4.0	No	
Reader getNCharacterStream(String columnLabel)	4.0	No	
NClob getNClob(int columnIndex)	4.0	No	
NClob getNClob(String columnLabel)	4.0	No	
String getNString(int columnIndex)	4.0	No	
String getNString(String columnLabel)	4.0	No	
Object getObject(int columnIndex)	3.0	Yes	
<T> T getObject(int	4.1	No	

Method	Supported Since JDBC Version	Supported by the Driver	Notes
<code>columnIndex, Class&lt;T&gt; type)</code>			
<code>Object getObject(int i, Map&lt;String,Class&lt;?&gt;&gt; map)</code>	3.0	No	
<code>Object getObject(String columnName)</code>	3.0	No	
<code>&lt;T&gt; T getObject(String columnName, Class&lt;T&gt; type)</code>	4.1	No	
<code>Object getObject(String colName, Map&lt;String,Class&lt;?&gt;&gt; map)</code>	3.0	Yes	
<code>Ref getRef(int i)</code>	3.0	No	
<code>Ref getRef(String colName)</code>	3.0	No	
<code>int getRow()</code>	3.0	Yes	
<code>RowId getRowId(int columnIndex)</code>	4.0	No	
<code>RowId getRowId(String columnLabel)</code>	4.0	No	
<code>short getShort(int columnIndex)</code>	3.0	Yes	
<code>short getShort(String columnName)</code>	3.0	Yes	
<code>SQLXML getSQLXML(int columnIndex)</code>	4.0	No	
<code>SQLXML getSQLXML(String columnLabel)</code>	4.0	No	

## Features

Method	Supported Since JDBC Version	Supported by the Driver	Notes
Statement <code>getStatement()</code>	3.0	Yes	
String <code>getString(int columnIndex)</code>	3.0	Yes	
String <code>getString(String columnName)</code>	3.0	Yes	
Time <code>getTime(int columnIndex)</code>	3.0	Yes	
Time <code>getTime(int columnIndex, Calendar cal)</code>	3.0	Yes	
Time <code>getTime(String columnName)</code>	3.0	Yes	
Time <code>getTime(String columnName, Calendar cal)</code>	3.0	Yes	
Timestamp <code>getTimestamp(int columnIndex)</code>	3.0	Yes	
Timestamp <code>getTimestamp(int columnIndex, Calendar cal)</code>	3.0	Yes	
Timestamp <code>getTimestamp(String columnName)</code>	3.0	Yes	
Timestamp <code>getTimestamp(String columnName, Calendar cal)</code>	3.0	Yes	
int <code>getType()</code>	3.0	Yes	
InputStream <code>getUnicodeStream(int columnIndex)</code>	3.0	Yes	Deprecated.
InputStream	3.0	Yes	Deprecated.

Method	Supported Since JDBC Version	Supported by the Driver	Notes
<code>getUnicodeStream(String columnName)</code>			
URL <code>getURL(int columnIndex)</code>	3.0	No	
URL <code>getURL(String columnName)</code>	3.0	No	
<code>SQLWarning getWarnings()</code>	3.0	Yes	
<code>void insertRow()</code>	3.0	No	Not valid because the driver is read-only.
<code>boolean isAfterLast()</code>	3.0	Yes	
<code>boolean isBeforeFirst()</code>	3.0	Yes	
<code>boolean isClosed()</code>	4.0	Yes	
<code>boolean isFirst()</code>	3.0	Yes	
<code>boolean isLast()</code>	3.0	No	
<code>boolean last()</code>	3.0	No	
<code>void moveToCurrentRow()</code>	3.0	No	Not valid because the driver is read-only.
<code>void moveToInsertRow()</code>	3.0	No	Not valid because the driver is read-only.
<code>boolean next()</code>	3.0	Yes	
<code>boolean previous()</code>	3.0	No	
<code>void refreshRow()</code>	3.0	No	
<code>boolean relative(int rows)</code>	3.0	No	
<code>boolean rowDeleted()</code>	3.0	Yes	Hard-coded to false.

## Features

Method	Supported Since JDBC Version	Supported by the Driver	Notes
<code>boolean rowInserted()</code>	3.0	Yes	Hard-coded to <code>false</code> .
<code>boolean rowUpdated()</code>	3.0	Yes	Hard-coded to <code>false</code> .
<code>void setFetchDirection(int direction)</code>	3.0	No	Not valid because the driver is forward-only.
<code>void setFetchSize(int rows)</code>	3.0	Yes	
<code>void updateArray(int columnIndex, Array x)</code>	3.0	No	
<code>void updateArray(String columnName, Array x)</code>	3.0	No	
<code>void updateAsciiStream(int columnIndex, InputStream x)</code>	4.0	No	Not valid because the driver is read-only.
<code>void updateAsciiStream(int columnIndex, InputStream x, int length)</code>	3.0	No	Not valid because the driver is read-only.
<code>void updateAsciiStream(int columnIndex, InputStream x, long length)</code>	4.0	No	Not valid because the driver is read-only.
<code>void updateAsciiStream(String columnName, InputStream x)</code>	4.0	No	Not valid because the driver is read-only.
<code>void updateAsciiStream(String columnName, InputStream x, int length)</code>	3.0	No	Not valid because the driver is read-only.
<code>void updateAsciiStream(String columnName, InputStream x, long length)</code>	4.0	No	Not valid because the driver is read-only.



Method	Supported Since JDBC Version	Supported by the Driver	Notes
<code>void updateBigDecimal(int columnIndex, BigDecimal x)</code>	3.0	No	Not valid because the driver is read-only.
<code>void updateBigDecimal(String columnName, BigDecimal x)</code>	3.0	No	Not valid because the driver is read-only.
<code>void updateBinaryStream(int columnIndex, InputStream x)</code>	4.0	No	Not valid because the driver is read-only.
<code>void updateBinaryStream(int columnIndex, InputStream x, int length)</code>	3.0	No	Not valid because the driver is read-only.
<code>void updateBinaryStream(int columnIndex, InputStream x, long length)</code>	4.0	No	Not valid because the driver is read-only.
<code>void updateBinaryStream(String columnName, InputStream x)</code>	4.0	No	Not valid because the driver is read-only.
<code>void updateBinaryStream(String columnName, InputStream x, int length)</code>	3.0	No	Not valid because the driver is read-only.
<code>void updateBinaryStream(String columnName, InputStream x, long length)</code>	4.0	No	Not valid because the driver is read-only.
<code>void updateBlob(int columnIndex, InputStream inputStream)</code>	4.0	No	
<code>void updateBlob(int columnIndex, Blob x)</code>	3.0	No	

## Features

Method	Supported Since JDBC Version	Supported by the Driver	Notes
<code>void updateBlob(int columnIndex, InputStream inputStream, long length)</code>	4.0	No	
<code>void updateBlob(String columnName, InputStream inputStream)</code>	4.0	No	
<code>void updateBlob(String columnName, Blob x)</code>	3.0	No	
<code>void updateBlob(String columnLabel, InputStream inputStream, long length)</code>	4.0	No	
<code>void updateBoolean(int columnIndex, boolean x)</code>	3.0	No	Not valid because the driver is read-only.
<code>void updateBoolean(String columnName, boolean x)</code>	3.0	No	Not valid because the driver is read-only.
<code>void updateByte(int columnIndex, byte x)</code>	3.0	No	Not valid because the driver is read-only.
<code>void updateByte(String columnName, byte x)</code>	3.0	No	Not valid because the driver is read-only.
<code>void updateBytes(int columnIndex, byte[] x)</code>	3.0	No	Not valid because the driver is read-only.
<code>void updateBytes(String columnName, byte[] x)</code>	3.0	No	Not valid because the driver is read-only.
<code>void updateCharacterStream(int columnIndex, Reader x, int length)</code>	3.0	No	Not valid because the driver is read-only.
<code>void updateCharacterStream(String columnName,</code>	3.0	No	Not valid because the driver is read-only.

Method	Supported Since JDBC Version	Supported by the Driver	Notes
Reader reader, int length)			
void updateBlob(int columnIndex, InputStream inputStream)	4.0	No	
void updateClob(int columnIndex, Clob x)	3.0	No	
void updateBlob(int columnIndex, InputStream inputStream, long length)	4.0	No	
void updateBlob(String columnName, InputStream inputStream)	4.0	No	
void updateClob(String columnName, Clob x)	3.0	No	
void updateBlob(String columnName, InputStream inputStream, long length)	4.0	No	
void updateDate(int columnIndex, Date x)	3.0	No	Not valid because the driver is read-only.
void updateDate(String columnName, Date x)	3.0	No	Not valid because the driver is read-only.
void updateDouble(int columnIndex, double x)	3.0	No	Not valid because the driver is read-only.
void updateDouble(String columnName, double x)	3.0	No	Not valid because the driver is read-only.
void updateFloat(int columnIndex, float x)	3.0	No	Not valid because the driver is read-only.
void updateFloat(String	3.0	No	Not valid because the driver

Method	Supported Since JDBC Version	Supported by the Driver	Notes
<code>columnName, float x)</code>			is read-only.
<code>void updateInt(int columnIndex, int x)</code>	3.0	No	Not valid because the driver is read-only.
<code>void updateInt(String columnName, int x)</code>	3.0	No	Not valid because the driver is read-only.
<code>void updateLong(int columnIndex, long x)</code>	3.0	No	Not valid because the driver is read-only.
<code>void updateLong(String columnName, long x)</code>	3.0	No	Not valid because the driver is read-only.
<code>void updateNCharacterStream(int columnIndex, Reader x)</code>	4.0	No	
<code>void updateNCharacterStream(int columnIndex, Reader x, long length)</code>	4.0	No	
<code>void updateNCharacterStream(String columnName, Reader reader)</code>	4.0	No	
<code>void updateNCharacterStream(String columnName, Reader reader, long length)</code>	4.0	No	
<code>void updateNClob(int columnIndex, NClob nClob)</code>	4.0	No	
<code>void updateNClob(int columnIndex, Reader reader)</code>	4.0	No	

Method	Supported Since JDBC Version	Supported by the Driver	Notes
<code>void updateNClob(int columnIndex, Reader reader, long length)</code>	4.0	No	
<code>void updateNClob(String columnName, NClob nClob)</code>	4.0	No	
<code>void updateNClob(String columnName, Reader reader)</code>	4.0	No	
<code>void updateNClob(String columnName, Reader reader, long length)</code>	4.0	No	
<code>void updateNString(int columnIndex, String nString)</code>	4.0	No	
<code>void updateNString(String columnName, String nString)</code>	4.0	No	
<code>void updateNull(int columnIndex)</code>	3.0	No	Not valid because the driver is read-only.
<code>void updateNull(String columnName)</code>	3.0	No	Not valid because the driver is read-only.
<code>void updateObject(int columnIndex, Object x)</code>	3.0	No	Not valid because the driver is read-only.
<code>void updateObject(int columnIndex, Object x, int scale)</code>	3.0	No	Not valid because the driver is read-only.
<code>void updateObject(String columnName, Object x)</code>	3.0	No	Not valid because the driver is read-only.
<code>void updateObject(String columnName, Object x, int scale)</code>	3.0	No	Not valid because the driver is read-only.

## Features

Method	Supported Since JDBC Version	Supported by the Driver	Notes
<code>void updateRef(int columnIndex, Ref x)</code>	3.0	No	Not valid because the driver is read-only.
<code>void updateRef(String columnName, Ref x)</code>	3.0	No	Not valid because the driver is read-only.
<code>void updateRow()</code>	3.0	No	Not valid because the driver is read-only.
<code>void updateRowId(int columnIndex, RowId x)</code>	4.0	No	
<code>void updateRowId(String columnName, RowId x)</code>	4.0	No	
<code>void updateShort(int columnIndex, short x)</code>	3.0	No	Not valid because the driver is read-only.
<code>void updateShort(String columnName, short x)</code>	3.0	No	Not valid because the driver is read-only.
<code>void updateSQLXML(int columnIndex, SQLXML xmlObject)</code>	4.0	No	
<code>void updateSQLXML(String columnName, SQLXML xmlObject)</code>	4.0	No	
<code>void updateString(int columnIndex, String x)</code>	3.0	No	Not valid because the driver is read-only.
<code>void updateString(String columnName, String x)</code>	3.0	No	Not valid because the driver is read-only.
<code>void updateTime(int columnIndex, Time x)</code>	3.0	No	Not valid because the driver is read-only.
<code>void updateTime(String columnName, Time x)</code>	3.0	No	Not valid because the driver is read-only.
<code>void updateTimeStamp(int</code>	3.0	No	Not valid because the driver

Method	Supported Since JDBC Version	Supported by the Driver	Notes
<code>columnIndex, Timestamp x)</code>			is read-only.
<code>void updateTimestamp (String columnName, Timestamp x)</code>	3.0	No	Not valid because the driver is read-only.
<code>boolean wasNull()</code>	3.0	Yes	
<code>boolean isWrapperFor (Class&lt;?&gt; iface)</code>	4.0	Yes	
<code>&lt;T&gt; T unwrap(Class&lt;T&gt; iface)</code>	4.0	Yes	

### ResultSetMetaData

The following table lists the methods that belong to the `ResultSetMetaData` interface, and describes whether each method is supported by the Cloudera JDBC Driver for Impala and which version of the JDBC API is the earliest version that supports the method.

For detailed information about each method in the `ResultSetMetaData` interface, see the Java API documentation:

<http://docs.oracle.com/javase/1.5.0/docs/api/java/sql/ResultSetMetaData.html>.

Method	Supported Since JDBC Version	Supported by the Driver	Notes
<code>String getCatalogName (int column)</code>	3.0	Yes	
<code>String getColumnClassName (int column)</code>	3.0	Yes	
<code>int getColumnCount()</code>	3.0	Yes	
<code>int getColumnDisplaySize (int column)</code>	3.0	Yes	
<code>String getColumnLabel</code>	3.0	Yes	

## Features

Method	Supported Since JDBC Version	Supported by the Driver	Notes
(int column)			
String getColumnName(int column)	3.0	Yes	
int getColumnType(int column)	3.0	Yes	
String getColumnTypeName(int column)	3.0	Yes	
int getPrecision(int column)	3.0	Yes	
int getScale(int column)	3.0	Yes	
String getSchemaName(int column)	3.0	Yes	
String getTableName(int column)	3.0	Yes	
boolean isAutoIncrement(int column)	3.0	Yes	
boolean isCaseSensitive(int column)	3.0	Yes	
boolean isCurrency(int column)	3.0	Yes	
boolean isDefinitelyWritable(int column)	3.0	Yes	
int isNullable(int column)	3.0	Yes	
boolean isReadOnly(int column)	3.0	Yes	
boolean isSearchable(int column)	3.0	Yes	



Method	Supported Since JDBC Version	Supported by the Driver	Notes
<code>column)</code>			
<code>boolean isSigned(int column)</code>	3.0	Yes	
<code>boolean isWritable(int column)</code>	3.0	Yes	
<code>boolean isWrapperFor(Class&lt;?&gt; iface)</code>	4.0	Yes	
<code>&lt;T&gt; T unwrap(Class&lt;T&gt; iface)</code>	4.0	Yes	

### Statement

The following table lists the methods that belong to the `Statement` interface, and describes whether each method is supported by the Cloudera JDBC Driver for Impala and which version of the JDBC API is the earliest version that supports the method.

For detailed information about each method in the `Statement` interface, see the Java API documentation: <http://docs.oracle.com/javase/1.5.0/docs/api/java/sql/Statement.html>.

Method	Supported Since JDBC Version	Supported by the Driver	Notes
<code>void addBatch(String sql)</code>	3.0	Yes	
<code>void cancel()</code>	3.0	Yes	
<code>void clearBatch()</code>	3.0	Yes	
<code>void clearWarnings()</code>	3.0	Yes	
<code>void close()</code>	3.0	Yes	
<code>void closeOnCompletion()</code>	4.1	Yes	
<code>boolean execute(String</code>	3.0	Yes	

## Features

Method	Supported Since JDBC Version	Supported by the Driver	Notes
sql)			
boolean execute(String sql, int autoGeneratedKeys)	3.0	No	
boolean execute(String sql, int[] columnIndexes)	3.0	No	
boolean execute(String sql, String[] columnNames)	3.0	No	
int[] executeBatch()	3.0	No	
ResultSet executeQuery (String sql)	3.0	Yes	
int executeUpdate (String sql)	3.0	Yes	
int executeUpdate (String sql, int autoGeneratedKeys)	3.0	No	
int executeUpdate (String sql, int[] columnIndexes)	3.0	No	
int executeUpdate (String sql, String[] columnNames)	3.0	No	
Connection getConnection ()	3.0	Yes	
int getFetchDirection()	3.0	Yes	
int getFetchSize()	3.0	Yes	
ResultSet getGeneratedKeys ()	3.0	Yes	

Method	Supported Since JDBC Version	Supported by the Driver	Notes
<code>int getMaxFieldSize()</code>	3.0	Yes	
<code>int getMaxRows()</code>	3.0	Yes	
<code>boolean getMoreResults()</code>	3.0	Yes	
<code>boolean getMoreResults (int current)</code>	3.0	No	
<code>int getQueryTimeout()</code>	3.0	Yes	
<code>ResultSet getResultSet()</code>	3.0	Yes	
<code>int getResultSetConcurrency()</code>	3.0	Yes	Hard-coded to <code>CONCUR_READ_ONLY</code> .
<code>int getResultSetHoldability()</code>	3.0	Yes	Hard-coded to <code>CLOSE_CURSORS_AT_COMMIT</code> .
<code>int getResultSetType()</code>	3.0	Yes	Hard-coded to <code>TYPE_FORWARD_ONLY</code> .
<code>int getUpdateCount()</code>	3.0	Yes	
<code>SQLWarning getWarnings()</code>	3.0	Yes	
<code>boolean isClosed()</code>	4.0	Yes	
<code>boolean isCloseOnCompletion()</code>	4.1	Yes	
<code>boolean isPoolable()</code>	4.0	Yes	
<code>void setCursorName(String name)</code>	3.0	No	
<code>void setEscapeProcessing (boolean enable)</code>	3.0	Yes	
<code>void setFetchDirection</code>	3.0	No	

## Features

Method	Supported Since JDBC Version	Supported by the Driver	Notes
<code>(int direction)</code>			
<code>void setFetchSize(int rows)</code>	3.0	Yes	
<code>void setMaxFieldSize(int max)</code>	3.0	Yes	
<code>void setMaxRows(int max)</code>	3.0	Yes	
<code>void setPoolable(boolean poolable)</code>	4.0	Yes	
<code>void setQueryTimeout(int seconds)</code>	3.0	Yes	
<code>boolean isWrapperFor(Class&lt;?&gt; iface)</code>	4.0	Yes	
<code>&lt;T&gt; T unwrap(Class&lt;T&gt; iface)</code>	4.0	Yes	

## Driver Configuration Options

Driver Configuration Options lists and describes the properties that you can use to configure the behavior of the Cloudera JDBC Driver for Impala.

You can set configuration properties using the connection URL. For more information, see "Building the Connection URL" on page 10.

**Note:**

Property names and values are case-sensitive.

### AllowSelfSignedCerts

Default Value	Data Type	Required
0	Integer	No

#### Description

This property specifies whether the driver allows the server to use self-signed SSL certificates.

- 1: The driver allows self-signed certificates.

**Important:**

When this property is set to 1, SSL verification is disabled. The driver does not verify the server certificate against the trust store, and does not verify if the server's host name matches the common name in the server certificate.

- 0: The driver does not allow self-signed certificates.

**Note:**

This property is applicable only when SSL connections are enabled.

### AltusCredFile

Default Value	Data Type	Required
<code>\$HOME/.altus/credentials</code>	String	No

#### Description

The full path of the directory that contains your credentials file for accessing an Altus cluster.

**Note:**

This property is applicable only when dynamic service discovery through Altus is enabled.

**AltusProfileName**

Default Value	Data Type	Required
default	String	No

**Description**

The name of the profile in the credentials file that you want to use to access an Altus cluster. See also "AltusCredFile" on page 85.

**Note:**

This property is applicable only when dynamic service discovery through Altus is enabled.

**AltusUsePrivateIP**

Default Value	Data Type	Required
false	Boolean	No

**Description**

This property indicates whether Altus Service discovery always uses a private IP address to establish the connection.

- `true`: The driver always uses a private IP address when Altus service discovery is enabled.
- `false`: The driver uses a public IP address when Altus service discovery is enabled, unless the `list-cluster-instances` API returns "none" for the public IP address.

**AsyncExecPollInterval**

Default Value	Data Type	Required
10	Integer	No

**Description**

The time in milliseconds between each poll for the asynchronous query execution status.

"Asynchronous" refers to the fact that the RPC call used to execute a query against Impala is asynchronous. It does not mean that JDBC asynchronous operations are supported.

## AuthMech

Default Value	Data Type	Required
Depends on the <code>transportMode</code> setting. For more information, see "TransportMode" on page 96.	Integer	No

### Description

The authentication mechanism to use. Set the property to one of the following values:

- 0 for No Authentication.
- 1 for Kerberos.
- 2 for User Name.
- 3 for User Name And Password.

## CAIssuedCertsMismatch

Default Value	Data Type	Required
0	Integer	No

### Description

This property specifies whether the driver requires the name of the CA-issued SSL certificate to match the host name of the Impala server.

- 0: The driver requires the names to match.
- 1: The driver allows the names to mismatch.

**Note:**

This property is applicable only when SSL connections are enabled.

## CatalogSchemaSwitch

Default Value	Data Type	Required
0	Integer	No

### Description

This property specifies whether the driver treats Impala catalogs as schemas or as catalogs.

- 1: The driver treats Impala catalogs as schemas as a restriction for filtering.
- 0: Impala catalogs are treated as catalogs, and Impala schemas are treated as schemas.

### DefaultStringLength

Default Value	Data Type	Required
255	Integer	No

#### Description

The maximum number of characters that can be contained in STRING columns. The range of DefaultStringLength is 0 to 32767.

By default, the columns metadata for Impala does not specify a maximum data length for STRING columns.

### DelegationUID

Default Value	Data Type	Required
None	String	No

#### Description

Use this option to delegate all operations against Impala to a user that is different than the authenticated user for the connection.

### httpPath

Default Value	Data Type	Required
None	String	Yes, if transportMode=http.

#### Description

The partial URL corresponding to the Impala server.

The driver forms the HTTP address to connect to by appending the httpPath value to the host and port specified in the connection URL. For example, to connect to the HTTP address `http://localhost:10002/cliservice`, you would use the following connection URL:

```
jdbc:impala://localhost:10002;AuthMech=3;transportMode=http;
httpPath=cliservice;UID=jsmith;PWD=cloudera123;
```



**Note:**

By default, Impala servers use `cliservice` as the partial URL.

**KrbAuthType**

Default Value	Data Type	Required
0	Integer	No

**Description**

This property specifies how the driver obtains the Subject for Kerberos authentication.

- 0: The driver automatically detects which method to use for obtaining the Subject:
  1. First, the driver tries to obtain the Subject from the current thread's inherited `AccessControlContext`. If the `AccessControlContext` contains multiple Subjects, the driver uses the most recent Subject.
  2. If the first method does not work, then the driver checks the `java.security.auth.login.config` system property for a JAAS configuration. If a JAAS configuration is specified, the driver uses that information to create a `LoginContext` and then uses the Subject associated with it.
  3. If the second method does not work, then the driver checks the `KRB5_CONFIG` and `KRB5CCNAME` system environment variables for a Kerberos ticket cache. The driver uses the information from the cache to create a `LoginContext` and then uses the Subject associated with it.
- 1: The driver checks the `java.security.auth.login.config` system property for a JAAS configuration. If a JAAS configuration is specified, the driver uses that information to create a `LoginContext` and then uses the Subject associated with it.
- 2: The driver checks the `KRB5_CONFIG` and `KRB5CCNAME` system environment variables for a Kerberos ticket cache. The driver uses the information from the cache to create a `LoginContext` and then uses the Subject associated with it.

**KrbHostFQDN**

Default Value	Data Type	Required
None	String	Yes, if <code>AuthMech=1</code> .

**Description**

The fully qualified domain name of the Impala host.

**KrbRealm**

Default Value	Data Type	Required
Depends on your Kerberos configuration	String	No

**Description**

The realm of the Impala host.

If your Kerberos configuration already defines the realm of the Impala host as the default realm, then you do not need to configure this property.

**KrbServiceName**

Default Value	Data Type	Required
None	String	Yes, if AuthMech=1.

**Description**

The Kerberos service principal name of the Impala server.

**LogLevel**

Default Value	Data Type	Required
0	Integer	No

**Description**

Use this property to enable or disable logging in the driver and to specify the amount of detail included in log files.

**Important:**

Only enable logging long enough to capture an issue. Logging decreases performance and can consume a large quantity of disk space.

Set the property to one of the following numbers:

- 0: Disable all logging.
- 1: Enable logging on the FATAL level, which logs very severe error events that will lead the driver to abort.
- 2: Enable logging on the ERROR level, which logs error events that might still allow the driver to continue running.

- 3: Enable logging on the WARNING level, which logs events that might result in an error if action is not taken.
- 4: Enable logging on the INFO level, which logs general information that describes the progress of the driver.
- 5: Enable logging on the DEBUG level, which logs detailed information that is useful for debugging the driver.
- 6: Enable logging on the TRACE level, which logs all driver activity.

When logging is enabled, the driver produces the following log files in the location specified in the `LogPath` property:

- An `ImpalaJDBC_driver.log` file that logs driver activity that is not specific to a connection.
- An `Impala_connection_[Number].log` file for each connection made to the database, where `[Number]` is a number that distinguishes each log file from the others. This file logs driver activity that is specific to the connection.

If the `LogPath` value is invalid, then the driver sends the logged information to the standard output stream (`System.out`).

## LogPath

Default Value	Data Type	Required
The current working directory.	String	No

### Description

The full path to the folder where the driver saves log files when logging is enabled.

#### Note:

To make sure that the connection URL is compatible with all JDBC applications, it is recommended that you escape the backslashes (`\`) in your file path by typing another backslash.

## LowerCaseResultSetColumnName

Default Value	Data Type	Required
1	Integer	No

### Description

This property specifies the letter case that the driver uses when returning the column name aliases in the `ResultSetMetadata`.

- 1: The column name aliases in the `ResultSetMetadata` are returned in lower-case characters, matching the server-side behavior.
- 0: The column name aliases are returned in the same letter case as specified in the query.

## OptimizedInsert

Default Value	Data Type	Required
1	Integer	No

### Description

This property specifies whether the driver tries to optimize INSERT statements by bypassing translation.

Each time the driver translates an INSERT statement, it executes the DESCRIBE command to identify the data types of the columns that it is inserting data into. These additional commands consume resources and might reduce driver performance.

- 1: The driver tries to optimize INSERT statements by bypassing translation and using other methods to identify column types.
- 0: The driver does not attempt the optimization, and translates INSERT statements normally.

#### Note:

If the optimization fails, the driver falls back to translating INSERT statements normally. This additional overhead might further reduce driver performance.

## PreparedMetaLimitZero

Default Value	Data Type	Required
1	Integer	No

### Description

This property specifies whether the `PreparedStatement.getMetadata()` call will request metadata from the server with `LIMIT 0`, increasing performance.

- 1: The `PreparedStatement.getMetadata()` call uses `LIMIT 0`.
- 0: The `PreparedStatement.getMetadata()` call does not use `LIMIT 0`.

## PWD

Default Value	Data Type	Required
None	String	Yes, if <code>AuthMech=3</code> .

**Description**

The password corresponding to the user name that you provided using the property "UID" on page 96.

**RowsFetchedPerBlock**

Default Value	Data Type	Required
10000	Integer	No

**Description**

The maximum number of rows that a query returns at a time.

Any positive 32-bit integer is a valid value, but testing has shown that performance gains are marginal beyond the default value of 10000 rows.

**SocketTimeout**

Default Value	Data Type	Required
0	Integer	No

**Description**

The number of seconds that the TCP socket waits for a response from the server before raising an error on the request.

When this property is set to 0, the connection does not time out.

**SSL**

Default Value	Data Type	Required
0	Integer	No

**Description**

This property specifies whether the driver communicates with the Impala server through an SSL-enabled socket.

- 1: The driver connects to SSL-enabled sockets.
- 0: The driver does not connect to SSL-enabled sockets.

**Note:**

SSL is configured independently of authentication. When authentication and SSL are both enabled, the driver performs the specified authentication method over an SSL connection.

**SSLKeyStore**

Default Value	Data Type	Required
None	String	No

**Description**

The full path of the Java KeyStore containing the server certificate for one-way SSL authentication.

See also the property "SSLKeyStorePwd" on page 94.

**Note:**

The Cloudera JDBC Driver for Impala accepts TrustStores and KeyStores for one-way SSL authentication. See also the property "SSLTrustStore" on page 94.

**SSLKeyStorePwd**

Default Value	Data Type	Required
None	Integer	Yes, if you are using a KeyStore for connecting over SSL.

**Description**

The password for accessing the Java KeyStore that you specified using the property "SSLKeyStore" on page 94.

**SSLTrustStore**

Default Value	Data Type	Required
<p>jssecacerts, if it exists.</p> <p>If jssecacerts does not exist, then cacerts is used.</p> <p>The default location of cacerts is jre\lib\security\.</p>	String	No

**Description**

The full path of the Java TrustStore containing the server certificate for one-way SSL authentication.

See also the property "SSLTrustStorePwd" on page 95.

**Note:**

The Cloudera JDBC Driver for Impala accepts TrustStores and KeyStores for one-way SSL authentication. See also the property "SSLKeyStore" on page 94.

**SSLTrustStorePwd**

Default Value	Data Type	Required
None	String	Yes, if using a TrustStore

**Description**

The password for accessing the Java TrustStore that you specified using the property "SSLTrustStore" on page 94.

**StripCatalogName**

Default Value	Data Type	Required
1	Integer	No

**Description**

This property specifies whether the driver removes catalog names from query statements if translation fails or if the `UseNativeQuery` property is set to 1.

- 1: If query translation fails or if the `UseNativeQuery` property is set to 1, then the driver removes catalog names from the query statement.
- 0: The driver does not remove catalog names from query statements.

**SupportTimeOnlyTimestamp**

Default Value	Data Type	Required
1	Integer	No

**Description**

This property specifies whether the driver supports `TIMESTAMP` data that only contains a time value.

- 1: The driver supports `TIMESTAMP` data that only contains a time value.
- 0: The driver returns an error when working with `TIMESTAMP` data that only contains a time value.

## TransportMode

Default Value	Data Type	Required
sasl	String	No

### Description

The transport protocol to use in the Thrift layer.

- `binary`: The driver uses the Binary transport protocol.

If you use this setting and do not specify the `AuthMech` property, then the driver uses `AuthMech=0` by default. This setting is valid only when the `AuthMech` property is set to 0 or 3.

- `sasl`: The driver uses the SASL transport protocol.

If you use this setting but do not specify the `AuthMech` property, then the driver uses `AuthMech=2` by default. This setting is valid only when the `AuthMech` property is set to 1, 2, or 3.

- `http`: The driver uses the HTTP transport protocol.

If you use this setting but do not specify the `AuthMech` property, then the driver uses `AuthMech=0` by default. This setting is valid only when the `AuthMech` property is set to 0 or 3.

### Note:

This option replaces and supersedes the deprecated `UseSasl` option.

## UID

Default Value	Data Type	Required
anonymous	String	Yes, if <code>AuthMech=3</code> .

### Description

The user name that you use to access the Impala server.



## UseNativeQuery

Default Value	Data Type	Required
0	Integer	No

### Description

This property specifies whether the driver transforms the queries emitted by applications.

- 1: The driver does not transform the queries emitted by applications, so the native query is used.
- 0: The driver transforms the queries emitted by applications and converts them into an equivalent form in Impala SQL.

**Note:**

If the application is Impala-aware and already emits Impala SQL, then enable this option to avoid the extra overhead of query transformation.

## UseSasl (deprecated)

Default Value	Data Type	Required
1	Integer	No

### Description

This option is deprecated. Use `TransportMode` instead (see "TransportMode" on page 96).

This property indicates if SASL is used in conjunction with the User Name and Password Authentication Mechanism (`AuthMech=3`).

- 0: No SASL authentication is used. User credentials are still passed to the server for services such as Sentry.
- 1: SASL authentication is used.

## Contact Us

If you are having difficulties using the driver, our [Community Forum](#) may have your solution. In addition to providing user to user support, our forums are a great place to share your questions, comments, and feature requests with us.

If you are a Subscription customer you may also use the [Cloudera Support Portal](#) to search the Knowledge Base or file a Case.

**Important:**

To help us assist you, prior to contacting Cloudera Support please prepare a detailed summary of the client and server environment including operating system version, patch level, and configuration.