

cloudera®

Cloudera JDBC Driver for Apache Hive

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Table of Contents

ABOUT THE CLouDERA JDBC DRIVER FOR APACHE HIVE	5
SYSTEM REQUIREMENTS	6
CLouDERA JDBC DRIVER FOR APACHE HIVE FILES	7
INSTALLING AND USING THE CLouDERA JDBC DRIVER FOR APACHE HIVE	8
REFERENCING THE JDBC DRIVER LIBRARIES	8
REGISTERING THE DRIVER CLASS	9
BUILDING THE CONNECTION URL	10
CONFIGURING AUTHENTICATION	12
USING NO AUTHENTICATION	12
USING KERBEROS	12
USING USER NAME	13
USING USER NAME AND PASSWORD (LDAP)	14
USING A HADOOP DELEGATION TOKEN	15
AUTHENTICATION MECHANISMS	17
CONFIGURING KERBEROS AUTHENTICATION FOR WINDOWS	19
KERBEROS ENCRYPTION STRENGTH AND THE JCE POLICY FILES EXTENSION	23
CONFIGURING SSL	25
CONFIGURING SERVER-SIDE PROPERTIES	27
CONFIGURING LOGGING	28
FEATURES	30
SQL QUERY VERSUS HIVEQL QUERY	30
DATA TYPES	30
CATALOG AND SCHEMA SUPPORT	31
WRITE-BACK	31
IHADOOPSTATEMENT	32
IHADOOPCONNECTION	35
SECURITY AND AUTHENTICATION	37
INTERFACES AND SUPPORTED METHODS	38
DRIVER CONFIGURATION OPTIONS	96
ALLOWSELFsignedCERTS	96
ASYNCEXECpollINTERVAL	96
AUTHMECH	97
CAISSUEDCERTSMISMATCH	97
CATALOGSCHEMASWITCH	97
DECIMALCOLUMNSCALE	98

DEFAULTSTRINGCOLUMNLENGTH	98
DELEGATIONTOKEN	98
DELEGATIONUID	99
HTTPPATH	99
KRBAUTHTYPE	99
KRBHOSTFQDN	100
KRBREALM	100
KRBSERVICENAME	101
LOGLEVEL	101
LOGPATH	102
PREPAREDMETALIMITZERO	102
PWD	102
ROWSFETCHEDPERBLOCK	103
SOCKETTIMEOUT	103
SSL	103
SSLKEYSTORE	104
SSLKEYSTOREPWD	104
SSLTRUSTSTORE	104
SSLTRUSTSTOREPWD	105
TRANSPORTMODE	105
UID	106
USENATIVEQUERY	106
ZK	107
CONTACT US	108
THIRD-PARTY TRADEMARKS	109

About the Cloudera JDBC Driver for Apache Hive

The Cloudera JDBC Driver for Apache Hive is used for direct SQL and HiveQL access to Apache Hadoop / Hive distributions, enabling Business Intelligence (BI), analytics, and reporting on Hadoop / Hive-based data. The driver efficiently transforms an application's SQL query into the equivalent form in HiveQL, which is a subset of SQL-92. If an application is Hive-aware, then the driver is configurable to pass the query through to the database for processing. The driver interrogates Hive to obtain schema information to present to a SQL-based application. Queries, including joins, are translated from SQL to HiveQL. For more information about the differences between HiveQL and SQL, see "Features" on page 30.

The Cloudera JDBC Driver for Apache Hive 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 Hive 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 Apache Hive 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

The driver is recommended for Apache Hive versions 0.11 through 3.1, and CDH versions 5.0 through 5.16 and 6.0 through 6.3.

Cloudera JDBC Driver for Apache Hive Files

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

- HiveJDBC4_*[Version]*.zip
- HiveJDBC41_*[Version]*.zip
- HiveJDBC42_*[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 Apache Hive

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

To access a Hive data store using the Cloudera JDBC Driver for Apache Hive, 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)

Referencing the JDBC Driver Libraries

Before you use the Cloudera JDBC Driver for Apache Hive, 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 Apache Hive to Hive 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.hive.jdbc.HS1Driver`
- `com.cloudera.hive.jdbc.HS2Driver`
- `com.cloudera.hive.jdbc.HS1DataSource`
- `com.cloudera.hive.jdbc.HS2DataSource`

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

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.hive.jdbc.HS1DataSource();
    ds.setURL(CONNECTION_URL);
    connection = ds.getConnection();
    return connection;
}
```

Building the Connection URL

Use the connection URL to supply connection information to the data source that you are accessing. The following is the format of the connection URL for the Cloudera JDBC Driver for Apache Hive, where *[Subprotocol]* is **hive** if you are connecting to a Hive Server 1 instance or **hive2** if you are connecting to a Hive Server 2 instance, *[Host]* is the DNS or IP address of the Hive server, and *[Port]* is the number of the TCP port that the server uses to listen for client requests:

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

Note:

By default, Hive uses port 10000.

By default, the driver uses the schema named **default** and authenticates the connection using the user name **anonymous**.

You can specify optional settings such as the number of 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 96.

Note:

If you specify a property that is not supported by the driver, then the driver attempts to apply the property as a Hive server-side property for the client session. For more information, see "Configuring Server-Side Properties" on page 27.

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

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

For example, to connect to port 11000 on a Hive Server 2 instance 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:hive2://localhost:11000/default2;AuthMech=3;  
UID=cloudera;PWD=cloudera
```

Important:

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

Note:

- If you specify a schema in the connection URL, you can still issue queries on other schemas by explicitly specifying the schema in the query. To inspect your databases and determine the appropriate schema to use, run the `show databases` command at the Hive command prompt.
- If you set the `transportMode` property to `http`, then the port number specified in the connection URL corresponds to the HTTP port rather than the TCP port. By default, Hive servers use 10001 as the HTTP port number.

Configuring Authentication

The Cloudera JDBC Driver for Apache Hive supports the following authentication mechanisms:

- No Authentication
- Kerberos
- User Name
- User Name And Password
- Hadoop Delegation Token

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

For information about selecting an appropriate authentication mechanism when using the Cloudera JDBC Driver for Apache Hive, see "Authentication Mechanisms" on page 17.

For information about the properties you can use in the connection URL, see "Driver Configuration Options" on page 96.

Note:

In addition to authentication, you can configure the driver to connect over SSL. For more information, see "Configuring SSL" on page 25.

Using No Authentication

Note:

When connecting to a Hive server of type Hive Server 1, you must use 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:

1. Set the `AuthMech` property to 0.
2. Set the `transportMode` property to `binary`.

For example:

```
jdbc:hive2://localhost:10000;AuthMech=0;transportMode=binary;
```

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 19. 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:

- This authentication mechanism is available only for Hive Server 2.
- For this authentication mechanism, SASL and HTTP Thrift transport protocols are supported. If the `transportMode` property is not set, the driver defaults SASL. If the `hive.server2.transport.mode` property has been set to HTTP on the server side, set the `transportMode` property to `http`.

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 Hive server is not the default, then set the `KrbRealm` property to the realm of the Hive server.

3. Set the `KrbHostFQDN` property to the fully qualified domain name of the Hive server host.
4. 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 99.

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

```
jdbc:hive2://node1.example.com:10000;AuthMech=1;
KrbRealm=EXAMPLE.COM;KrbHostFQDN=hs2node1.example.com;
KrbServiceName=hive;KrbAuthType=2
```

In this example, Kerberos is enabled for JDBC connections, the Kerberos service principal name is `hive/node1.example.com@EXAMPLE.COM`, the host name for the data source is `node1.example.com`, and the server is listening on port 10000 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.

Note:

This authentication mechanism is available only for Hive Server 2. Most default configurations of Hive Server 2 require User Name authentication.

To configure User Name authentication:

1. Set the `AuthMech` property to 2.
2. Set the `transportMode` property to `sasl`.
3. Set the `UID` property to an appropriate user name for accessing the Hive server.

For example:

```
jdbc:hive2://node1.example.com:10000;AuthMech=2;  
transportMode=sasl;UID=hs2
```

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.

Note:

This authentication mechanism is available only for Hive Server 2.

To configure User Name And Password authentication:

1. Set the `AuthMech` property to 3.
2. Set the `transportMode` property to the transport protocol that you want to use in the Thrift layer.
3. If you set the `transportMode` property to `http`, then set the `httpPath` property to the partial URL corresponding to the Hive server. Otherwise, do not set the `httpPath` property.
4. Set the `UID` property to an appropriate user name for accessing the Hive server.
5. Set the `PWD` property to the password corresponding to the user name you provided.

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

```
jdbc:hive2://node1.example.com:10001;AuthMech=3;  
transportMode=http;httpPath=cliservice;UID=hs2;PWD=cloudera;
```

In this example, user name and password (LDAP) authentication is enabled for JDBC connections, the LDAP user name is `hs2`, the password is `cloudera`, and the server is listening on port 10001 for JDBC connections.

Using a Hadoop Delegation Token

This authentication mechanism requires a Hadoop delegation token. This token must be provided to the driver in the form of a Base64 URL-safe encoded string. It can be obtained from the driver using the `getDelegationToken()` function, or by utilizing the Hadoop distribution `.jar` files. For a code sample that demonstrates how to retrieve the token using the `getDelegationToken()` function, see "Code Samples: Retrieving a Hadoop Delegation Token" on page 15.

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:

- This authentication mechanism is available only for Hive Server 2.
- This authentication mechanism requires that Kerberos be configured on the server.

To configure Hadoop delegation token authentication:

1. Make sure Kerberos is configured on the server.
2. Set the `AuthMech` property to 6.
3. Set the `delegationToken` property to an appropriately encoded Hadoop delegation token.

For example:

```
jdbc:hive
2
://node1.example.com:
10000;AuthMech=6;delegationToken=kP9PcyQ7prK2LwUMZMpFQ4R+5VE
```

Code Samples: Retrieving a Hadoop Delegation Token

If you are using a Hadoop delegation token for authentication, the token must be provided to the driver in the form of a Base64 URL-safe encoded string. This token can be obtained from the driver using the `getDelegationToken()` function, or by utilizing the Hadoop distribution `.jar` files.

The code samples below demonstrate the use of the `getDelegationToken()` function. For more information about this function, see "IHadoopConnection" on page 35.

The sample below shows how to obtain the token string with the driver using a Kerberos connection:

```
import
com.cloudera.hiveserver2.hivecommon.core.IHadoopConnection;
```

```

public class TestDriverGetDelegationTokenClass
{
    public static void main(String[] args) throws SQLException
    {
        // Create the connection object with Kerberos
        authentication.
        Connection kerbConnection = DriverManager.getConnection
        (
            "jdbc:hive2://localhost:10000;AuthMech=1;KrbRealm=Y
            ourRealm;KrbHostFQDN=sample.com;KrbServiceName=hiv
            e;");
        // Unwrap the java.sql.Connection object to an
        implementation of IHadoopConnection so the
        // methods for delegation token can be called.
        String delegationToken = kerbConnection.unwrap
        (IHadoopConnection.class).getDelegationToken("owner_
        name", "renewer_name");

        // The token can then be used to connect with the
        driver.
        String tokenConnectionString =
        "jdbc:hive2://localhost:10000;AuthMech=6;DelegationToke
        n=" + delegationToken;
        Connection tokenConnection =
        DriverManager.getConnection(tokenConnectionString);
    }
}

```

The sample below demonstrates how to obtain the encoded string form of the token if the delegation is saved to the UserGroupInformation. This sample requires the `hadoop-shims-common-[hadoop version].jar`, `hadoop-common-[hadoop version].jar`, and all their dependencies.

```

import org.apache.hadoop.hive.shims.Utills;
import org.apache.hive.service.auth.HiveAuthFactory;
public class TestHadoopDelegationTokenClass
{
    public static void main(String[] args) throws SQLException
    {
        // Obtain the delegationToken stored in the current
        UserGroupInformation.
        String delegationToken = Utills.getTokenStrForm
        (HiveAuthFactory.HS2_CLIENT_TOKEN);

        // The token can then be used to connect with the
        driver.
        String tokenConnectionString =
        "jdbc:hive2://localhost:10000;AuthMech=6;DelegationToke
        n=" + delegationToken;
    }
}

```



```

Connection tokenConnection =
    DriverManager.getConnection(tokenConnectionString);
}
}

```

Authentication Mechanisms

To connect to a Hive server, you must configure the Cloudera JDBC Driver for Apache Hive to use the authentication mechanism that matches the access requirements of the server and provides the necessary credentials. To determine the authentication settings that your Hive server requires, check the server configuration and then refer to the corresponding section below.

Hive Server 1

Hive Server 1 does not support authentication. You must configure the driver to use No Authentication (see "Using No Authentication" on page 12).

Hive Server 2

Hive Server 2 supports the following authentication mechanisms:

- No Authentication (see "Using No Authentication" on page 12)
- Kerberos (see "Using Kerberos" on page 12)
- User Name (see "Using User Name" on page 13)
- User Name And Password (see "Using User Name And Password (LDAP)" on page 14)
- Hadoop Delegation Token (see "Using a Hadoop Delegation Token" on page 15)

Most default configurations of Hive Server 2 require User Name authentication. If you are unable to connect to your Hive server using User Name authentication, then verify the authentication mechanism configured for your Hive server by examining the `hive-site.xml` file. Examine the following properties to determine which authentication mechanism your server is set to use:

- `hive.server2.authentication`: This property sets the authentication mode for Hive Server 2. The following values are available:
 - `NONE` enables plain SASL transport. This is the default value.
 - `NOSASL` disables the Simple Authentication and Security Layer (SASL).
 - `KERBEROS` enables Kerberos authentication and delegation token authentication.
 - `PLAINSASL` enables user name and password authentication using a cleartext password mechanism.
 - `LDAP` enables user name and password authentication using the Lightweight Directory Access Protocol (LDAP).
- `hive.server2.enable.doAs`: If this property is set to the default value of `TRUE`, then Hive processes queries as the user who submitted the query. If this property is set to `FALSE`, then queries are run as the user that runs the `hiveserver2` process.

The following table lists the authentication mechanisms to configure for the driver based on the settings in the `hive-site.xml` file.

<code>hive.server2.authentication</code>	<code>hive.server2.enable.doAs</code>	Driver Authentication Mechanism
NOSASL	FALSE	No Authentication
KERBEROS	TRUE or FALSE	Kerberos
KERBEROS	TRUE	Delegation Token
NONE	TRUE or FALSE	User Name
PLAIN SASL or LDAP	TRUE or FALSE	User Name And Password

Note:

It is an error to set `hive.server2.authentication` to NOSASL and `hive.server2.enable.doAs` to true. This configuration will not prevent the service from starting up, but results in an unusable service.

For more information about authentication mechanisms, refer to the documentation for your Hadoop / Hive distribution. See also "Running Hadoop in Secure Mode" in the Apache Hadoop documentation: http://hadoop.apache.org/docs/r0.23.7/hadoop-project-dist/hadoop-common/ClusterSetup.html#Running_Hadoop_in_Secure_Mode.

Using No Authentication

When `hive.server2.authentication` is set to NOSASL, you must configure your connection to use No Authentication.

Using Kerberos

When connecting to a Hive Server 2 instance and `hive.server2.authentication` is set to KERBEROS, you must configure your connection to use Kerberos or Delegation Token authentication.

Using User Name

When connecting to a Hive Server 2 instance and `hive.server2.authentication` is set to NONE, you must configure your connection to use User Name authentication. Validation of the credentials that you include depends on `hive.server2.enable.doAs`:

- If `hive.server2.enable.doAs` is set to TRUE, then the server attempts to map the user name provided by the driver from the driver configuration to an existing operating system user on the host running Hive Server 2. If this user name does not exist in the operating system, then the user group lookup fails and existing HDFS permissions are used. For example, if the current user group is allowed to read and write to the location in HDFS,

then read and write queries are allowed.

- If `hive.server2.enable.doAs` is set to `FALSE`, then the user name in the driver configuration is ignored.

If no user name is specified in the driver configuration, then the driver defaults to using **hive** as the user name.

Using User Name And Password

When connecting to a Hive Server 2 instance and the server is configured to use the SASL-PLAIN authentication mechanism with a user name and a password, you must configure your connection to use User Name And Password authentication.

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 Hive 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 Hive 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 96

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@CLOUDERA"
  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 Hive 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 Hive 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 96.

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:hive2://192.168.1.1:10000";

/**
 * 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;

```

Kerberos Encryption Strength and the JCE Policy Files Extension

If the encryption being used in your Kerberos environment is too strong, you might encounter the error message "Unable to connect to server: GSS initiate failed" when trying to use the driver to connect to a Kerberos-enabled cluster. Typically, Java vendors only allow encryption strength up to 128 bits by default. If you are using greater encryption strength in your environment (for example, 256-bit encryption), then you might encounter this error.

Diagnosing the Issue

If you encounter the error message "Unable to connect to server: GSS initiate failed", confirm that it is occurring due to encryption strength by enabling Kerberos layer logging in the JVM and then checking if the log output contains the error message "KrbException: Illegal key size".

To enable Kerberos layer logging in a Sun JVM:

- Choose one:
 - In the Java command you use to start the application, pass in the following

argument:

```
-Dsun.security.krb5.debug=true
```

- Or, add the following code to the source code of your application:

```
System.setProperty("sun.security.krb5.debug", "true")
```

To enable Kerberos layer logging in an IBM JVM:

➤ Choose one:

- In the Java command you use to start the application, pass in the following arguments:

```
-Dcom.ibm.security.krb5.Krb5Debug=all  
-Dcom.ibm.security.jgss.debug=all
```

- Or, add the following code to the source code of your application:

```
System.setProperty  
("com.ibm.security.krb5.Krb5Debug", "all");  
System.setProperty  
("com.ibm.security.jgss.debug", "all");
```

Resolving the Issue

After you confirm that the error is occurring due to encryption strength, you can resolve the issue by downloading and installing the *Java Cryptography Extension (JCE) Unlimited Strength Jurisdiction Policy Files* extension from your Java vendor. Refer to the instructions from the vendor to install the files to the correct location.

Important:

Consult your company's policy to make sure that you are allowed to enable encryption strengths in your environment that are greater than what the JVM allows by default.

If the issue is not resolved after you install the JCE policy files extension, then restart your machine and try your connection again. If the issue persists even after you restart your machine, then verify which directories the JVM is searching to find the JCE policy files extension. To print out the search paths that your JVM currently uses to find the JCE policy files extension, modify your Java source code to print the return value of the following call:

```
System.getProperty("java.ext.dirs")
```


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 a Hive 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 Hive 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:hive2://localhost:10000;AuthMech=3;SSL=1;  
SSLKeyStore=C:\\Users\\bsmith\\Desktop\\keystore.jks;SSLKeyStore  
Pwd=clouderaSSL123;UID=hs2;PWD=cloudera123
```

Note:

For more information about the connection properties used in SSL connections, see "Driver Configuration Options" on page 96.

Configuring Server-Side Properties

You can use the driver to apply configuration properties to the Hive server by setting the properties in the connection URL.

For example, to set the `mapreduce.job.queueName` property to `myQueue`, you would use a connection URL such as the following:

```
jdbc:hive://localhost:18000/default2;AuthMech=3;  
UID=cloudera;PWD=cloudera;mapreduce.job.queueName=myQueue
```

Note:

For a list of all Hadoop and Hive server-side properties that your implementation supports, run the `set -v` command at the Hive CLI command line or Beeline. You can also execute the `set -v` query after connecting using the driver.

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.

The settings for logging apply to every connection that uses the Cloudera JDBC Driver for Apache Hive, so make sure to disable the feature after you are done using it.

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 Apache Hive, 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:hive://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 Apache Hive produces the following log files in the location specified in the `LogPath` property:

- A `HiveJDBC_driver.log` file that logs driver activity that is not specific to a connection.
- A `HiveJDBC_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 Apache Hive:

- "SQL Query versus HiveQL Query" on page 30
- "Data Types" on page 30
- "Catalog and Schema Support" on page 31
- "Write-back" on page 31
- "IHadoopStatement" on page 32
- "IHadoopConnection" on page 35
- "Security and Authentication" on page 37
- "Interfaces and Supported Methods" on page 38

SQL Query versus HiveQL Query

The native query language supported by Hive is HiveQL. HiveQL is a subset of SQL-92. However, the syntax is different enough that most applications do not work with native HiveQL.

Data Types

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

The following table lists the supported data type mappings.

Hive Type	SQL Type	Java Type
BIGINT	BIGINT	java.math.BigInteger
BINARY	VARBINARY	byte[]
BOOLEAN	BOOLEAN	Boolean
CHAR (Available only in Hive 0.13.0 or later)	CHAR	String
DATE	DATE	java.sql.Date
DECIMAL (In Hive 0.13 and later, you can specify scale and precision when creating	DECIMAL	java.math.BigDecimal

Hive Type	SQL Type	Java Type
tables using the DECIMAL data type.)		
DOUBLE	DOUBLE	Double
FLOAT	REAL	Float
INT	INTEGER	Long
SMALLINT	SMALLINT	Integer
TIMESTAMP	TIMESTAMP	java.sql.Timestamp
TINYINT	TINYINT	Short
VARCHAR (Available only in Hive 0.12.0 or later)	VARCHAR	String

The aggregate types (ARRAY, MAP, STRUCT, and UNIONTYPE) are not yet supported. Columns of aggregate types are treated as VARCHAR columns in SQL and STRING columns in Java.

Catalog and Schema Support

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

Note:

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

Write-back

The Cludera JDBC Driver for Apache Hive supports translation for the following syntax when connecting to a Hive Server 2 instance that is running Hive 0.14 or later:

- INSERT
- UPDATE
- DELETE

- CREATE
- DROP

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 HiveQL.

IHadoopStatement

IHadoopStatement is an interface implemented by the driver's statement class. It provides access to methods that allow for asynchronous execution of queries and the retrieval of the Yarn ATS GUID associated with the execution.

The IHadoopStatement interface is defined by the `IHadoopStatement.java` file. This file should look like the following example:

```
//
=====
=====
/// @file IHadoopStatement.java /// /// Exposed interface for
asynchronous query execution. /// /// Copyright (C) 2017 Simba
Technologies Incorporated.
//
=====
=====
package com.cloudera.hiveserver2.hivecommon.core;
import java.sql.ResultSet; import java.sql.SQLException;
import java.sql.Statement;
/**
 * An interface that extends the standard SQL Statement Interface
but allows for asynchronous
 * query execution.
 * The polling for query execution will occur when {@link
ResultSet#next()} or
 * {@link ResultSet#getMetaData()} is called.
 */ public interface IHadoopStatement extends Statement
{
    /**
     * Executes the given SQL statement asynchronously.
     * <p> * Sends the query off to the server but does not
wait for query execution to complete.
     * A ResultSet with empty columns is returned.
     * The polling for completion of query execution is done
when {@link ResultSet#next()} or
     * {@link ResultSet#getMetaData()} is called.
     * </p>
     *
     * @param sql
     * An SQL statement to be sent to the database, typically
a
     * static SQL SELECT statement.

```



```

*
* @return A ResultSet object that DOES NOT contain the
data produced by the given query; never null.
*
* @throws SQLException If a database access error
occurs, or the given SQL
* statement produces anything other than a single
* <code>ResultSet</code> object.
*/
public ResultSet executeAsync(String sql) throws
SQLException;
/**
* Returns the Yarn ATS guid.
*
* @return String The yarn ATS guid from the operation
if execution has started,
* else null.
*/
public String getYarnATSGuid(); }

```

The following methods are available for use in `IHadoopStatement`:

- `executeAsync(String sql)`

The driver sends a request to the server for statement execution and returns immediately after receiving a response from the server for the execute request without waiting for the server to complete the execution.

The driver does not wait for the server to complete query execution unless `getMetaData()` or `next()` APIs are called.

Note that this feature does not work with prepared statements.

For example:

```

import
com.cloudera.hiveserver2.hivecommon.core.IHadoopStatement;

public class TestExecuteAsyncClass
{
    public static void main(String[] args) throws SQLException
    {
        // Create the connection object.
        Connection connection = DriverManager.getConnection
        ("jdbc:hive2://localhost:10000");

        // Create the statement object.
        Statement statement = connection.createStatement();
    }
}

```

```

// Unwrap the java.sql.Statement object to an
// implementation of IHadoopStatement so the
// execution can be done asynchronously.
//
// The driver will return from this call as soon as
// it gets a response from the
// server for the execute request without waiting
// for server to complete query execution.
ResultSet resultSet =
    statement.unwrap(
        IHadoopStatement.class).executeAsync(
            "select * from example_table");

// Calling getMetaData() on the ResultSet here will
// cause the driver to wait for the server
// to complete query execution before proceeding with
// the rest of the operation.
ResultSetMetaData rsMetadata = resultSet.getMetaData();

// Excluding code for work on the result set
// metadata...

// Calling getMetaData() on the ResultSet here, and if
// getMetaData() was not call prior to
// this, will cause the driver to wait for the server
// to complete query execution before
// proceeding with the rest of the operation.
resultSet.next();

// Excluding code for work on the result set ...
}
}

```

- getYarnATSGuid()

Returns the Yarn ATS GUID associated with the current execution. Returns null if the Yarn ATS GUID is not available.

For example:

```

public class TestYarnGUIDClass
{
    public static void main(String[] args) throws SQLException
    {
        // Create the connection object.
        Connection connection = DriverManager.getConnection(
            "jdbc:hive2://localhost:10000");

        // Create the statement object.
        Statement statement = connection.createStatement();
    }
}

```

```

// Execute a query.
ResultSet resultSet = statement.executeQuery("select *
from example_table");

// Unwrap the java.sql.Statement object to an
implementation of IHadoopStatement to access the
// getYarnATSGuid() API call.
String guid = statement.unwrap(
    IHadoopStatement.class).getYarnATSGuid();
}
}

```

IHadoopConnection

IHadoopConnection is an interface implemented by the driver's statement class. It provides access to methods that allow for the retrieval, deletion, and renewal of delegation tokens.

The IHadoopStatement interface is defined by the IHadoopStatement.java file. This file should look like the following example:

```

//
=====
=====
/// @file IHadoopConnection.java
///
/// Exposed interface for the retrieval of delegation tokens.
///
/// Copyright (C) 2017 Simba Technologies Incorporated.
//
=====
=====
package com.cloudera.hiveserver2.hivecommon.core;
import java.sql.Connection;
import java.sql.SQLException;
/**
 * An interface that extends the standard SQL Connection
Interface but allows for the
 * retrieval/renewal/cancellation of delegation tokens.
 */
public interface IHadoopConnection extends Connection
{
    /**
     * Sends a cancel delegation token request to the
server.
     *
     * @param tokenString The token to cancel.
     * @throws SQLException If an error occurs while sending
the request.

```

```

*/
public void cancelDelegationToken(String tokenString)
throws SQLException;

/**
 * Sends a get delegation token request to the server
 and returns the token as an
 * encoded string.
 *
 * @param owner The owner of the token.
 * @param renewer The renewer of the token.
 *
 * @return The token as an encoded string.
 * @throws SQLException If an error occurs while getting
 the token.
 */
public String getDelegationToken(String owner, String
renewer) throws SQLException;

/**
 * Sends a renew delegation token request to the sever.
 *
 * @param tokenString The token to renew.
 * @throws SQLException If an error occurs while sending
 the request.
 */
public void renewDelegationToken(String tokenString)
throws SQLException;
}

```

The following methods are available for use in `IHadoopConnection`:

- `getDelegationToken(String owner, String renewer)`

The driver sends a request to the server to obtain a delegation token with the given owner and renewer.

The method should be called on a Kerberos-authenticated connection.

- `cancelDelegationToken()`

The driver sends a request to the server to cancel the provided delegation token.

- `renewDelegationToken()`

The driver sends a request to the server to renew the provided delegation token.

The following is a basic code sample that demonstrates how to use the above functions:

```

public class TestDelegationTokenClass
{
    public static void main(String[] args) throws SQLException

```

```

{
    // Create the connection object with Kerberos
    authentication.
    Connection kerbConnection = DriverManager.getConnection
    (
        "jdbc:hive2://localhost:10000;AuthMech=1;KrbRealm=Y
        ourRealm;KrbHostFQDN=sample.com;KrbServiceName=hiv
        e;");

    // Unwrap the java.sql.Connection object to an
    implementation
    // of IHadoopConnection so the methods for delegation
    token
    // can be called.
    String delegationToken = kerbConnection.unwrap
    (IHadoopConnection.class).getDelegationToken("owner_
    name", "renewer_name");

    // The token can then be used to connect with the
    driver.
    String tokenConnectionString =
    "jdbc:hive2://localhost:10000;AuthMech=6;DelegationToke
    n=" + delegationToken;
    Connection tokenConnection =
    DriverManager.getConnection(tokenConnectionString);

    // Excluding code for work with the tokenConnection ...

    // The original token (delegationToken) can be
    cancelled or renewed by unwrapping the
    java.sql.Connection object again to
    // an implementation of IHadoopConnection.

    // Renewing the token:
    kerbConnection.unwrap
    (IHadoopConnection.class).renewDelegationToken
    (delegationToken);

    // Cancelling the token:
    kerbConnection.unwrap
    (IHadoopConnection.class).cancelDelegationToken
    (delegationToken);
}
}

```

Security and Authentication

To protect data from unauthorized access, some Hive data stores require connections to be authenticated with user credentials or the SSL protocol. The Cloudera JDBC Driver for Apache Hive

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 Hive user name only, or your Hive user name and password. You must use the authentication mechanism that matches the security requirements of the Hive server. For information about determining the appropriate authentication mechanism to use based on the Hive server configuration, see "Authentication Mechanisms" on page 17. For detailed driver configuration instructions, see "Configuring Authentication" on page 12.

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 25.

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.

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 Apache Hive implements the following JDBC interfaces:

- "CallableStatement" on page 39
- "Connection" on page 48
- "DatabaseMetaData" on page 53
- "DataSource" on page 66
- "Driver" on page 67
- "ParameterMetaData" on page 68
- "PooledConnection" on page 69
- "PreparedStatement" on page 70
- "ResultSet" on page 75
- "ResultSetMetaData" on page 90
- "Statement" on page 92

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 Apache Hive 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
<code>Array getArray(int i)</code>	3.0	No	
<code>Array getArray(String parameterName)</code>	3.0	No	
<code>BigDecimal getBigDecimal(int parameterIndex)</code>	3.0	Yes	
<code>BigDecimal getBigDecimal(int parameterIndex, int scale)</code>	3.0	Yes	Deprecated.
<code>BigDecimal getBigDecimal(String parameterName)</code>	3.0	Yes	
<code>Blob getBlob(int i)</code>	3.0	No	
<code>Blob getBlob(String parameterName)</code>	3.0	No	
<code>boolean getBoolean(int parameterIndex)</code>	3.0	Yes	

Features

Method	Supported Since JDBC Version	Supported by the Driver	Notes
<code>boolean getBoolean(String parameterName)</code>	3.0	Yes	
<code>byte getByte(int parameterIndex)</code>	3.0	Yes	
<code>byte getByte(String parameterName)</code>	3.0	Yes	
<code>byte[] getBytes(int parameterIndex)</code>	3.0	Yes	
<code>byte[] getBytes(String parameterName)</code>	3.0	Yes	
<code>Clob getClob(int i)</code>	3.0	No	
<code>Clob getClob(String parameterName)</code>	3.0	No	
<code>Date getDate(int parameterIndex)</code>	3.0	Yes	
<code>Date getDate(int parameterIndex, Calendar cal)</code>	3.0	Yes	
<code>Date getDate(String parameterName)</code>	3.0	Yes	
<code>Date getDate(String parameterName, Calendar cal)</code>	3.0	Yes	
<code>double getDouble(int parameterIndex)</code>	3.0	Yes	
<code>double getDouble(String parameterName)</code>	3.0	Yes	
<code>float getFloat(int parameterIndex)</code>	3.0	Yes	

Method	Supported Since JDBC Version	Supported by the Driver	Notes
<code>float getFloat(String parameterName)</code>	3.0	Yes	
<code>int getInt(int parameterIndex)</code>	3.0	Yes	
<code>int getInt(String parameterName)</code>	3.0	Yes	
<code>long getLong(int parameterIndex)</code>	3.0	Yes	
<code>long getLong(String parameterName)</code>	3.0	Yes	
<code>Reader getNCharacterStream(int parameterIndex)</code>	4.0	No	
<code>Reader getNCharacterStream (String parameterName)</code>	4.0	No	
<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><T> T getObject(int parameterIndex, Class<T> type)</code>	4.1	No	
<code>Object getObject(int i,</code>	3.0	No	

Features

Method	Supported Since JDBC Version	Supported by the Driver	Notes
Map<String,Class<?>> map)			
Object getObject(String parameterName)	3.0	Yes	
<T> T getObject(String parameterName, Class<T> type)	4.1	No	
Object getObject(String parameterName, Map<String,Class<?>> map)	3.0	Yes	
Ref getRef(int i)	3.0	No	
Ref getRef(String parameterName)	3.0	No	
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	

Method	Supported Since JDBC Version	Supported by the Driver	Notes
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, Calendar cal)	3.0	Yes	
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	

Features

Method	Supported Since JDBC Version	Supported by the Driver	Notes
<code>void registerOutParameter(int paramIndex, int sqlType, String typeName)</code>	3.0	Yes	
<code>void registerOutParameter (String parameterName, int sqlType)</code>	3.0	Yes	
<code>void registerOutParameter (String parameterName, int sqlType, int scale)</code>	3.0	Yes	
<code>void registerOutParameter (String parameterName, int sqlType, String typeName)</code>	3.0	Yes	
<code>void setAsciiStream (String parameterName, InputStream x)</code>	4.0	Yes	
<code>void setAsciiStream (String parameterName, InputStream x, int length)</code>	3.0	Yes	
<code>void setAsciiStream (String parameterName, InputStream x, long length)</code>	4.0	Yes	
<code>void setBigDecimal (String parameterName, BigDecimal x)</code>	3.0	Yes	
<code>void setBinaryStream (String parameterName, InputStream x)</code>	4.0	Yes	
<code>setBinaryStream(String</code>	3.0	Yes	

Method	Supported Since JDBC Version	Supported by the Driver	Notes
parameterName, InputStream x, int length)			
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, InputStream inputStream, long length)	4.0	Yes	
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,	4.0	Yes	

Features

Method	Supported Since JDBC Version	Supported by the Driver	Notes
Reader reader, long length)			
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 parameterName, Date x, Calendar cal)	3.0	Yes	
void setDouble(String parameterName, double x)	3.0	Yes	
void setFloat(String parameterName, float x)	3.0	Yes	
void setInt(String parameterName, int x)	3.0	Yes	
void setLong(String parameterName, long x)	3.0	Yes	
void setNCharacterStream (String parameterName, Reader value)	4.0	Yes	
void setNCharacterStream (String parameterName, Reader value, long length)	4.0	Yes	

Method	Supported Since JDBC Version	Supported by the Driver	Notes
<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	
<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	

Method	Supported Since JDBC Version	Supported by the Driver	Notes
<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	
<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<?> iface)</code>	4.0	Yes	
<code><T> T unwrap(Class<T> 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 Apache Hive 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> .
Array <code>createArrayOf (String typeName, Object [] elements)</code>	4.0	No	
Blob <code>createBlob()</code>	4.0	No	
Clob <code>createClob()</code>	4.0	No	
NClob <code>createNClob()</code>	4.0	No	
SQLXML <code>createSQLXML()</code>	4.0	No	
Statement <code>createStatement ()</code>	3.0	Yes	
Statement <code>createStatement (int resultSetType, int resultSetConcurrency)</code>	3.0	No	
Statement <code>createStatement (int resultSetType, int resultSetConcurrency, int resultSetHoldability)</code>	3.0	No	
Struct <code>createStruct (String typeName, Object [] attributes)</code>	4.0	No	
<code>boolean getAutoCommit()</code>	3.0	Yes	Hard-coded to <code>true</code> .
<code>String getCatalog()</code>	3.0	Yes	
Properties <code>getClientInfo ()</code>	4.0	Yes	

Features

Method	Supported Since JDBC Version	Supported by the Driver	Notes
<code>String getClientInfo (String name)</code>	4.0	Yes	
<code>int getHoldability()</code>	3.0	Yes	Hard-coded to <code>CLOSE_CURSORS_AT_COMMIT</code> .
<code>DatabaseMetaData getMetaData()</code>	3.0	Yes	
<code>int getNetworkTimeout()</code>	4.1	No	
<code>String getSchema()</code>	4.1	Yes	The returned schema name does not always match the one used by statements. Statements use the schema name defined in the connection URL.
<code>int getTransactionIsolation()</code>	3.0	Yes	Hard-coded to <code>TRANSACTION_READ_UNCOMMITTED</code> .
<code>Map<String,Class<?>> 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 <code>true</code> .
<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,</code>	3.0	No	

Method	Supported Since JDBC Version	Supported by the Driver	Notes
<code>int resultSetType, int resultSetConcurrency)</code>			
<code>CallableStatement prepareCall(String sql, int resultSetType, int resultSetConcurrency, int resultSetHoldability)</code>	3.0	No	
<code>PreparedStatement prepareStatement(String sql)</code>	3.0	Yes	
<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.

Features

Method	Supported Since JDBC Version	Supported by the Driver	Notes
<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.
<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;

Method	Supported Since JDBC Version	Supported by the Driver	Notes
			only changes the value returned by <code>getSchema()</code> .
<code>void setTransactionIsolation(int level)</code>	3.0	Yes	
<code>void setTypeMap(Map<String, Class<?>> map)</code>	3.0	No	
<code>boolean isWrapperFor(Class<?> iface)</code>	4.0	Yes	
<code><T> T unwrap(Class<T> iface)</code>	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 Apache Hive 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 <code>true</code> .
<code>boolean allTablesAreSelectable()</code>	3.0	Yes	Returns <code>true</code> .
<code>boolean autoCommitFailureClosesAllResultSets()</code>	4.0	Yes	Returns <code>true</code> .

Features

Method	Supported Since JDBC Version	Supported by the Driver	Notes
<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.
<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</code>	3.0	Yes	

Method	Supported Since JDBC Version	Supported by the Driver	Notes
<code>tableNamePattern, String columnNamePattern)</code>			
<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	
<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.

Method	Supported Since JDBC Version	Supported by the Driver	Notes
<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 (`)
<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.

Method	Supported Since JDBC Version	Supported by the Driver	Notes
<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.
<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	

Features

Method	Supported Since JDBC Version	Supported by the Driver	Notes
<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	
<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

Method	Supported Since JDBC Version	Supported by the Driver	Notes
			version of the driver.
ResultSet getSuperTables(String catalog, String schemaPattern, String tableNamePattern)	3.0	Yes	
ResultSet getSuperTypes(String catalog, String schemaPattern, String typeNamePattern)	3.0	Yes	
String getSystemFunctions()	3.0	Yes	Returns 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	

Features

Method	Supported Since JDBC Version	Supported by the Driver	Notes
<code>String getUsername()</code>	3.0	Yes	
<code>ResultSet getVersionColumns(String catalog, String schema, String table)</code>	3.0	Yes	
<code>boolean insertsAreDetected(int type)</code>	3.0	Yes	
<code>boolean isCatalogAtStart()</code>	3.0	Yes	
<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	

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

Features

Method	Supported Since JDBC Version	Supported by the Driver	Notes
boolean supportsCatalogsInIndexDefinitions()	3.0	Yes	Returns true.
boolean supportsCatalogsInPrivilegeDefinitions()	3.0	Yes	Returns true.
boolean supportsCatalogsInProcedureCalls()	3.0	Yes	Returns true.
boolean supportsCatalogsInTableDefinitions()	3.0	Yes	Returns true.
boolean supportsColumnAliasing()	3.0	Yes	Returns true.
boolean supportsConvert()	3.0	Yes	Returns true.
boolean supportsConvert(int fromType, int toType)	3.0	Yes	
boolean supportsCoreSQLGrammar()	3.0	Yes	Returns true.
boolean supportsCorrelatedSubqueries()	3.0	Yes	Returns true.
boolean supportsDataDefinitionAndDataManipulationTransactions()	3.0	Yes	Returns false.
boolean supportsDataManipulationTransactionsOnly()	3.0	Yes	Returns false.
boolean supportsDifferentTableCorrelationNames()	3.0	Yes	Returns false.
boolean supportsExpressionsInOrderBy()	3.0	Yes	Returns true.

Method	Supported Since JDBC Version	Supported by the Driver	Notes
<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.
<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.

Features

Method	Supported Since JDBC Version	Supported by the Driver	Notes
<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.
<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.

Method	Supported Since JDBC Version	Supported by the Driver	Notes
boolean supportsSchemasInIndexDefinitions()	3.0	Yes	Returns true.
boolean supportsSchemasInPrivilegeDefinitions()	3.0	Yes	Returns true.
boolean supportsSchemasInProcedureCalls()	3.0	Yes	Returns false.
boolean supportsSchemasInTableDefinitions()	3.0	Yes	Returns true.
boolean supportsSelectForUpdate()	3.0	Yes	Returns false.
boolean supportsStatementPooling()	3.0	Yes	Returns false.
boolean supportsStoredFunctionsUsingCallSyntax()	4.0	Yes	Returns false.
boolean supportsStoredProcedures()	3.0	Yes	Returns true.
boolean supportsSubqueriesInComparisons()	3.0	Yes	Returns true.
boolean supportsSubqueriesInExists()	3.0	Yes	Returns true.
boolean supportsSubqueriesInIns()	3.0	Yes	Returns true.
boolean supportsSubqueriesInQuantifieds()	3.0	Yes	Returns true.
boolean supportsTableCorrelationNames()	3.0	Yes	Returns true.
boolean supportsTransactionIsolationLevel(int level)	3.0	Yes	

Features

Method	Supported Since JDBC Version	Supported by the Driver	Notes
<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.
<code>boolean isWrapperFor(Class<?> iface)</code>	4.0	Yes	
<code><T> T unwrap(Class<T> 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 Apache Hive 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	

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

Features

Method	Supported Since JDBC Version	Supported by the Driver	Notes
<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 Apache Hive and which 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	

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

Method	Supported Since JDBC Version	Supported by the Driver	Notes
<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 Apache Hive 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	

Method	Supported Since JDBC Version	Supported by the Driver	Notes
<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 parameterIndex, InputStream x)</code>	4.0	Yes	
<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	

Features

Method	Supported Since JDBC Version	Supported by the Driver	Notes
<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 length)</code>	3.0	Yes	
<code>void setCharacterStream(int parameterIndex, Reader reader, long length)</code>	4.0	Yes	
<code>void setClob(int parameterIndex, Clob x)</code>	3.0	No	
<code>void setClob(int parameterIndex, Reader reader)</code>	4.0	No	

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

Features

Method	Supported Since JDBC Version	Supported by the Driver	Notes
<code>parameterIndex, Reader reader, long length)</code>			
<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	
<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	

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

Features

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	
<code>BigDecimal getBigDecimal(int columnIndex)</code>	3.0	Yes	
<code>BigDecimal getBigDecimal(int columnIndex, int scale)</code>	3.0	Yes	Deprecated.

Method	Supported Since JDBC Version	Supported by the Driver	Notes
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	
getBytes(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	
Reader getCharacterStream (int columnIndex)	3.0	Yes	
Reader getCharacterStream (String columnName)	3.0	Yes	

Features

Method	Supported Since JDBC Version	Supported by the Driver	Notes
<code>Clob getClob(int i)</code>	3.0	No	
<code>Clob getClob(String colName)</code>	3.0	No	
<code>int getConcurrency()</code>	3.0	Yes	
<code>String getCursorName()</code>	3.0	Yes	
<code>Date getDate(int columnIndex)</code>	3.0	Yes	
<code>Date getDate(int columnIndex, Calendar cal)</code>	3.0	Yes	
<code>Date getDate(String columnName)</code>	3.0	Yes	
<code>Date getDate(String columnName, Calendar cal)</code>	3.0	Yes	
<code>double getDouble(int columnIndex)</code>	3.0	Yes	
<code>double getDouble(String columnName)</code>	3.0	Yes	
<code>int getFetchDirection()</code>	3.0	Yes	
<code>int getFetchSize()</code>	3.0	Yes	
<code>float getFloat(int columnIndex)</code>	3.0	Yes	
<code>float getFloat(String columnName)</code>	3.0	Yes	
<code>int getHoldability()</code>	4.0	Yes	
<code>int getInt(int columnIndex)</code>	3.0	Yes	

Method	Supported Since JDBC Version	Supported by the Driver	Notes
<code>int getInt(String columnName)</code>	3.0	Yes	
<code>long getLong(int columnIndex)</code>	3.0	Yes	
<code>long getLong(String columnName)</code>	3.0	Yes	
<code>ResultSetMetaData getMetaData()</code>	3.0	Yes	
<code>Reader getNCharacterStream(int columnIndex)</code>	4.0	No	
<code>Reader getNCharacterStream (String columnName)</code>	4.0	No	
<code>NClob getNClob(int columnIndex)</code>	4.0	No	
<code>NClob getNClob(String columnName)</code>	4.0	No	
<code>String getNString(int columnIndex)</code>	4.0	No	
<code>String getNString(String columnName)</code>	4.0	No	
<code>Object getObject(int columnIndex)</code>	3.0	Yes	
<code><T> T getObject(int columnIndex, Class<T> type)</code>	4.1	No	
<code>Object getObject(int i, Map<String,Class<?>> map)</code>	3.0	No	

Features

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

Method	Supported Since JDBC Version	Supported by the Driver	Notes
columnName)			
Time getTime(int columnIndex)	3.0	Yes	
Time getTime(int columnIndex, Calendar cal)	3.0	Yes	
Time getTime(String columnName)	3.0	Yes	
Time getTime(String columnName, Calendar cal)	3.0	Yes	
Timestamp getTimestamp(int columnIndex)	3.0	Yes	
Timestamp getTimestamp(int columnIndex, Calendar cal)	3.0	Yes	
Timestamp getTimestamp(String columnName)	3.0	Yes	
Timestamp getTimestamp(String columnName, Calendar cal)	3.0	Yes	
int getType()	3.0	Yes	
InputStream getUnicodeStream(int columnIndex)	3.0	Yes	Deprecated.
InputStream getUnicodeStream(String columnName)	3.0	Yes	Deprecated.
URL getURL(int columnIndex)	3.0	No	

Features

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

Method	Supported Since JDBC Version	Supported by the Driver	Notes
<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.
<code>void updateBigDecimal(int columnIndex, BigDecimal x)</code>	3.0	No	Not valid because the driver is read-only.

Method	Supported Since JDBC Version	Supported by the Driver	Notes
<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	
<code>void updateBlob (int columnIndex, InputStream inputStream, long length)</code>	4.0	No	

Method	Supported Since JDBC Version	Supported by the Driver	Notes
<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, Reader reader, int length)</code>	3.0	No	Not valid because the driver is read-only.
<code>void updateBlob(int columnIndex, InputStream</code>	4.0	No	

Features

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

Method	Supported Since JDBC Version	Supported by the Driver	Notes
<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	
<code>void updateNClob(int columnIndex, Reader reader, long length)</code>	4.0	No	
<code>void updateNClob(String</code>	4.0	No	

Features

Method	Supported Since JDBC Version	Supported by the Driver	Notes
<code>columnName, NClob nClob)</code>			
<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.
<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.

Method	Supported Since JDBC Version	Supported by the Driver	Notes
<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 columnIndex, Timestamp x)</code>	3.0	No	Not valid because the driver is read-only.
<code>void updateTimeStamp (String columnName, Timestamp x)</code>	3.0	No	Not valid because the driver is read-only.

Method	Supported Since JDBC Version	Supported by the Driver	Notes
<code>boolean wasNull()</code>	3.0	Yes	
<code>boolean isWrapperFor(Class<?> iface)</code>	4.0	Yes	
<code><T> T unwrap(Class<T> 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 Apache Hive 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(int column)</code>	3.0	Yes	
<code>String getColumnName(int column)</code>	3.0	Yes	
<code>int getColumnType(int column)</code>	3.0	Yes	

Method	Supported Since JDBC Version	Supported by the Driver	Notes
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	
boolean isSigned(int column)	3.0	Yes	
boolean isWritable(int column)	3.0	Yes	

Features

Method	Supported Since JDBC Version	Supported by the Driver	Notes
<code>boolean isWrapperFor(Class<?> iface)</code>	4.0	Yes	
<code><T> T unwrap(Class<T> 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 Apache Hive 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 sql)</code>	3.0	Yes	
<code>boolean execute(String sql, int autoGeneratedKeys)</code>	3.0	No	
<code>boolean execute(String sql, int[] columnIndexes)</code>	3.0	No	

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

Features

Method	Supported Since JDBC Version	Supported by the Driver	Notes
(int current)			
int getQueryTimeout()	3.0	Yes	
ResultSet getResultSet()	3.0	Yes	
int getResultSetConcurrency()	3.0	Yes	Hard-coded to CONCUR_READ_ONLY.
int getResultSetHoldability()	3.0	Yes	Hard-coded to CLOSE_CURSORS_AT_COMMIT.
int getResultSetType()	3.0	Yes	Hard-coded to TYPE_FORWARD_ONLY.
int getUpdateCount()	3.0	Yes	
SQLWarning getWarnings()	3.0	Yes	
boolean isClosed()	4.0	Yes	
boolean isCloseOnCompletion()	4.1	Yes	
boolean isPoolable()	4.0	Yes	
void setCursorName(String name)	3.0	No	
void setEscapeProcessing(boolean enable)	3.0	Yes	
void setFetchDirection(int direction)	3.0	No	
void setFetchSize(int rows)	3.0	Yes	
void setMaxFieldSize(int max)	3.0	Yes	

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

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.

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 Hive is asynchronous. It does not mean that JDBC asynchronous operations are supported.

Note:

This option is applicable only to HDInsight clusters.

AuthMech

Default Value	Data Type	Required
Depends on the <code>transportMode</code> setting. For more information, see "TransportMode" on page 105.	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.
- 6 for Hadoop Delegation Token.

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 Hive 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 Hive catalogs as schemas or as catalogs.

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

DecimalColumnScale

Default Value	Data Type	Required
10	Integer	No

Description

The maximum number of digits to the right of the decimal point for numeric data types.

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 Hive does not specify a maximum data length for STRING columns.

DelegationToken

Default Value	Data Type	Required
None	String	Yes, if <code>AuthMech</code> is set to 6 (Hadoop Delegation Token)

Description

A Hadoop delegation token for authentication.

This token must be provided to the driver in the form of a Base64 URL-safe encoded string. It can be obtained from the driver using the `getDelegationToken()` function, or by utilizing the Hadoop distribution `.jar` files.

DelegationUID

Default Value	Data Type	Required
None	String	No

Description

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

Note:

This option is applicable only when connecting to a Hive Server 2 instance that supports this feature.

httpPath

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

Description

The partial URL corresponding to the Hive 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:hive2://localhost:10002;AuthMech=3;transportMode=http;
httpPath=cliservice;UID=jsmith;PWD=cloudera123;
```

Note:

By default, Hive 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 Hive Server 2 host.

KrbRealm

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

Description

The realm of the Hive Server 2 host.

If your Kerberos configuration already defines the realm of the Hive Server 2 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 Hive 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.

The settings for logging apply to every connection that uses the Cloudera JDBC Driver for Apache Hive, so make sure to disable the feature after you are done using it.

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:

Driver Configuration Options

- A `HiveJDBC_driver.log` file that logs driver activity that is not specific to a connection.
- A `HiveJDBC_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.

PreparedMetaLimitZero

Default Value	Data Type	Required
0	Integer	No

Description

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

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

PWD

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

Description

The password corresponding to the user name that you provided using the property "UID" on page 106.

Important:

If you set the `AuthMech` to 3, the default `PWD` value is not used and you must specify a password.

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 Hive 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 104.

Note:

The Cloudera JDBC Driver for Apache Hive accepts TrustStores and KeyStores for one-way SSL authentication. See also the property "SSLTrustStore" on page 104.

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 104.

SSLTrustStore

Default Value	Data Type	Required
<p>jssecacerts, if it exists.</p> <p>If jssecacerts does not exist, then cacerts is used.</p>	String	No

Default Value	Data Type	Required
The default location of cacerts is jre\lib\security\.		

Description

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

See also the property "SSLTrustStorePwd" on page 105.

Note:

The Cloudera JDBC Driver for Apache Hive accepts TrustStores and KeyStores for one-way SSL authentication. See also the property "SSLKeyStore" on page 104.

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 104.

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.

When connecting to a Hive Server 1 instance, you must use this setting. 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=3` by default. This setting is valid only when the `AuthMech` property is set to 3.

If you set this property to `http`, then the port number in the connection URL corresponds to the HTTP port rather than the TCP port, and you must specify the `httpPath` property. For more information, see "`httpPath`" on page 99.

UID

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

Description

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

Important:

If you set the `AuthMech` to 3, the default `UID` value is not used and you must specify a user name.

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 HiveQL.

Note:

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

zk

Default Value	Data Type	Required
None	String	No

Description

The connection string to one or more ZooKeeper quorums, written in the following format where *[ZK_IP]* is the IP address, *[ZK_Port]* is the port number, and *[ZK_Namespace]* is the namespace:

```
[ZK_IP]:[ZK_Port]/[ZK_Namespace]
```

For example:

```
jdbc:hive2://zk=192.168.0.1:2181/hiveserver2
```

Use this option to enable the Dynamic Service Discovery feature, which allows you to connect to Hive servers that are registered against a ZooKeeper service by connecting to the ZooKeeper service.

You can specify multiple quorums in a comma-separated list. If connection to a quorum fails, the driver will attempt to connect to the next quorum in the list.

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.

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