Cloudera ODBC Driver for Impala
Version 2.5.22
Introduction

Welcome to the Cloudera ODBC Driver for Impala. ODBC 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 ODBC driver, which connects an application to the database.

The Cloudera ODBC Driver for Impala is used for direct SQL and Impala SQL access to Apache Hadoop / Impala distributions, enabling Business Intelligence (BI), analytics, and reporting on Hadoop / Impala-based data. The driver efficiently transforms an application’s SQL query into the equivalent form in Impala SQL. Impala SQL is a subset of SQL-92. If an application is Impala-aware, then the driver can be configured to pass the query through to the database for processing. The driver interrogates Impala to obtain schema information to present to a SQL-based application. Queries, including joins, are translated from SQL to Impala SQL. For more information about the differences between Impala SQL and SQL, refer to the section “SQL Translation” on page 22.

The Cloudera ODBC Driver for Impala is available for Microsoft Windows, Linux, and Mac OS X. It complies with the ODBC 3.80 data standard and adds important functionality such as Unicode and 32- and 64-bit support for high-performance computing environments on all platforms. Any version of the ODBC driver will connect to an Impala server irrespective of the server’s host OS.

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

Windows Driver

System Requirements

You install the Cloudera ODBC Driver for Impala on client computers accessing data in a Hadoop cluster with the Impala server installed and running. Each computer where you install the driver must meet the following minimum system requirements:

- One of the following operating systems (32- and 64-bit editions are supported):
  - Windows® XP with SP3
  - Windows® Vista
  - Windows® 7 Professional
  - Windows® Server 2008 R2
- 25 MB of available disk space

**Important:**
To install the driver, you need Administrator privileges on the computer.

The driver has been tested using Impala 1.0.1 and Apache Thrift 0.9.0.
Installing the Driver

On 64-bit Windows operating systems, you can execute 32- and 64-bit applications transparently. You must use the version of the driver matching the bitness of the client application accessing data in Hadoop / Impala:

- ClouderaImpalaODBC32.msi for 32-bit applications
- ClouderaImpalaODBC64.msi for 64-bit applications

You can install both versions of the driver on the same computer.

Note:


To install the Cloudera ODBC Driver for Impala:

1. Depending on the bitness of your client application, double-click to run ClouderaImpalaODBC32.msi or ClouderaImpalaODBC64.msi
2. Click Next
3. Select the check box to accept the terms of the License Agreement if you agree, and then click Next
4. To change the installation location, click the Change button, then browse to the desired folder, and then click OK. To accept the installation location, click Next
5. Click Install
6. When the installation completes, click Finish

Creating a Data Source Name (DSN)

After installing the Cloudera ODBC Driver for Impala, you need to create a Data Source Name (DSN).

To create a Data Source Name (DSN):

1. Click the Start button ☰, then click All Programs, and then click the Cloudera ODBC Driver for Impala 2.5 program group corresponding to the bitness of the client application accessing data in Hadoop / Impala, and then click ODBC Administrator
2. In the ODBC Data Source Administrator, click the Drivers tab and verify that the Cloudera ODBC Driver for Impala appears in the list of ODBC drivers that are installed on your system.
3. To create a DSN that only the user currently logged into Windows can use, click the User DSN tab.
   OR
   To create a DSN that all users who log into Windows can use, click the System DSN tab.
4. Click Add
5. In the Create New Data Source dialog box, select **Cloudera ODBC Driver for Impala** and then click **Finish**

6. Use the options in the Cloudera ODBC Driver for Impala DSN Setup dialog box to configure your DSN:
   
   a. In the **Data Source Name** field, type a name for your DSN.
   
   b. Optionally, in the **Description** field, type relevant details related to the DSN.
   
   c. In the **Host** field, type the IP address or hostname of the network load balancer or one of the Impala nodes if you are deployed without an NLB.
   
   d. In the **Port** field, type the listening port for the Impala service.

   **Note:**
   
   The default port number for the Impala service is 21050.

   e. In the **Authentication** area, configure authentication as needed. For more information, see "Configuring Authentication" on page 4.

   **Note:**
   
   The default configuration of Impala requires the Cloudera ODBC Driver for Impala to be configured to use the **No Authentication** mechanism.

   f. Optionally, if the operations against Impala are to be done on behalf of a user that is different than the authenticated user for the connection, type the name of the user to be delegated in the **Delegation UID** field.

   g. To configure advanced driver options, click **Advanced Options**. For more information, see “Configuring Advanced Options” on page 7.

   h. To configure server-side properties, click **Advanced Options** and then click **Server Side Properties**. For more information, see “Configuring Server-Side Properties” on page 8.

   i. To configure logging behavior for the driver, click the **Logging Options** button. For more information, see “Configuring Logging Options” on page 9.

7. To test the connection, click **Test**. Review the results as needed, and then click **OK**. If the connection fails, then confirm that the settings in the Cloudera ODBC Driver for Impala DSN Setup dialog box are correct. Contact your Impala server administrator as needed.

8. To save your settings and close the Cloudera ODBC Driver for Impala DSN Setup dialog box, click **OK**

9. To close the ODBC Data Source Administrator, click **OK**
Configuring Authentication

The Impala server supports multiple authentication mechanisms. You must determine the authentication type your server is using and configure your DSN accordingly. The available authentication methods are as follows:

- No Authentication
- Kerberos
- User Name
- User Name and Password
- User Name and Password (SSL)
- No Authentication (SSL)

Using No Authentication

For this authentication mechanism, you do not need to configure any additional settings.

**Note:**
The default configuration of Impala requires the Cloudera ODBC Driver for Impala to be configured to use the **No Authentication** mechanism.

**To configure a connection without authentication:**

1. To access authentication options for a DSN, open the ODBC Data Source Administrator where you created the DSN, then select the DSN, and then click **Configure**
2. In the **Mechanism** list, select **No Authentication**
3. To save your settings and close the dialog box, click **OK**

Using Kerberos

Kerberos must be installed and configured before you can use this authentication mechanism. For details, see “Appendix A: Configuring Kerberos Authentication for Windows” on page 25.

**To configure Kerberos authentication:**

1. To access authentication options for a DSN, open the ODBC Data Source Administrator where you created the DSN, then select the DSN, and then click **Configure**
2. In the **Mechanism** list, select **Kerberos**
3. If your Kerberos setup does not define a default realm or if the realm of your Impala server is not the default, then type the Kerberos realm of the Impala server host in the **Realm** field.

   **OR**

   To use the default realm defined in your Kerberos setup, leave the **Realm** field empty.
4. In the **Host FQDN** field, type the fully qualified domain name of the Impala host.
5. In the **Service Name** field, type the service name of the Impala server.
For example, if the principle for the Impala server is impala/fully.qualified.domain.name@your-realm.com, then the value in the service name field is **impala**. If you are unsure of the correct service name to use for your particular Hadoop deployment, contact your Hadoop administrator.

6. In the **Transport Buffer Size** field, type the number of bytes to reserve in memory for buffering unencrypted data from the network.

   **Note:**
   In most circumstances, the default value of 1000 bytes is optimal.

7. To save your settings and close the dialog box, click **OK**

**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.

**To configure User Name authentication:**

1. To access authentication options for a DSN, open the ODBC Data Source Administrator where you created the DSN, then select the DSN, and then click **Configure**

2. In the **Mechanism** list, select **User Name**

3. In the **User Name** field, type an appropriate user name for accessing the Impala server.

4. In the **Transport Buffer Size** field, type the number of bytes to reserve in memory for buffering unencrypted data from the network.

   **Note:**
   In most circumstances, the default value of 1000 bytes is optimal.

5. To save your settings and close the dialog box, click **OK**

**Using User Name and Password**

This authentication mechanism requires a user name and a password.

**Note:**
This authentication mechanism should not be used with an Impala configuration that does not have LDAP enabled.

**To configure User Name and Password authentication:**

1. To access authentication options for a DSN, open the ODBC Data Source Administrator where you created the DSN, then select the DSN, and then click **Configure**

2. In the **Mechanism** list, select **User Name and Password**
3. In the **User Name** field, type an appropriate user name for accessing the Impala server.

4. In the **Password** field, type the password corresponding to the user name you typed in step 3.

5. To save your settings and close the dialog box, click **OK**

**Using User Name and Password (SSL)**

This authentication mechanism uses SSL and requires a user name and a password. The driver accepts self-signed SSL certificates.

**Note:**

This authentication mechanism should not be used with an Impala configuration that does not have LDAP enabled.

**To configure User Name and Password (SSL) authentication:**

1. To access authentication options for a DSN, open the ODBC Data Source Administrator where you created the DSN, then select the DSN, and then click **Configure**

2. In the **Mechanism** list, select **User Name and Password (SSL)**

3. In the **User Name** field, type an appropriate user name for accessing the Impala server.

4. In the **Password** field, type the password corresponding to the user name you typed in step 3.

5. Optionally, configure the driver to allow the common name of a CA-issued certificate to not match the host name of the Impala server by clicking **Advanced Options** and selecting the **Allow Common Name Host Name Mismatch** check box.

**Note:**

For self-signed certificates, the driver always allows the common name of the certificate to not match the host name.

6. To configure the driver to load SSL certificates from a specific file, click **Advanced Options** and type the path to the file in the **Trusted Certificates** field.

   OR

   To use the trusted CA certificates PEM file that is installed with the driver, leave the **Trusted Certificates** field empty.

7. To save your settings and close the dialog box, click **OK**

**No Authentication (SSL)**

This authentication mechanism uses SSL but does not require a user name or a password. The driver accepts self-signed SSL certificates.

**To configure No Authentication (SSL):**

1. To access authentication options for a DSN, open the ODBC Data Source Administrator where you created the DSN, then select the DSN, and then click **Configure**

2. In the **Mechanism** list, select **No Authentication (SSL)**
3. Optionally, configure the driver to allow the common name of a CA-issued certificate to not match the host name of the Impala server by clicking Advanced Options and selecting the Allow Common Name Host Name Mismatch check box.

**Note:**
For self-signed certificates, the driver always allows the common name of the certificate to not match the host name.

4. To configure the driver to load SSL certificates from a specific file, click Advanced Options and type the path to the file in the Trusted Certificates field.

   OR

   To use the trusted CA certificates PEM file that is installed with the driver, leave the Trusted Certificates field empty.

5. To save your settings and close the dialog box, click OK

**Configuring Advanced Options**

You can configure advanced options to modify the behavior of the driver.

**To configure advanced options:**

1. To access advanced options, open the ODBC Data Source Administrator where you created the DSN, then select the DSN, then click Configure, and then click Advanced Options

2. To disable translation from ODBC SQL to Impala SQL, select the Use Native Query check box.

   **Note:**
   By default, the driver applies transformations to the queries emitted by an application to convert the queries into an equivalent form in Impala SQL. If the application is Impala-aware and already emits Impala SQL, then turning off the translation avoids the additional overhead of query transformation.

3. In the Rows Fetched Per Block field, type the number of rows to be fetched per block.

   **Note:**
   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.

4. In the Socket Timeout field, type the number of seconds after which Impala closes the connection with the client application if the connection is idle.
5. To allow the common name of a CA-issued SSL certificate to not match the host name of the Impala server, select the **Allow Common Name Hostname Mismatch** check box.

   **Note:**
   Setting the **Socket Timeout** value to 0 disables the timeout feature.

6. To configure the driver to load trusted certificates (such as the certificate from the Impala server) from a specific file when authenticating the Impala server using SSL, in the **Trusted Certificates** field, enter the path to the file that contains the trusted certificates.

   **Note:**
   This setting only applies to the **User Name and Password (SSL)** and **No Authentication (SSL)** authentication mechanisms.

7. To save your settings and close the dialog box, click **OK**

### Configuring Server-Side Properties

You can use the driver to apply configuration properties to the Impala server.

**To configure server-side properties:**

1. To configure server-side properties, open the ODBC Data Source Administrator where you created the DSN, then select the DSN and click **Configure**, then click **Advanced Options**, and then click **Server Side Properties**

2. To create a server-side property, click **Add**, then type appropriate values in the **Key** and **Value** fields, and then click **OK**

3. To edit a server-side property, select the property from the list, then click **Edit**, then update the **Key** and **Value** fields as needed, and then click **OK**

4. To delete a server-side property, select the property from the list, and then click **Remove**. In the confirmation dialog box, click **Yes**

5. To force the driver to convert server-side property key names to all lower case characters, select the **Convert Key Name to Lower Case** check box.

6. To save your settings and close the Server Side Properties dialog box, click **OK**
Configuring Logging Options

To help troubleshoot issues, you can enable logging. In addition to functionality provided in the Cloudera ODBC Driver for Impala, the ODBC Data Source Administrator provides tracing functionality.

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

The driver allows you to set the amount of detail included in log files. Table 1 lists the logging levels provided by the Cloudera ODBC Driver for Impala, in order from least verbose to most verbose.

**Table 1 Logging Levels**

<table>
<thead>
<tr>
<th>Logging Level</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>OFF</td>
<td>Disables all logging.</td>
</tr>
<tr>
<td>FATAL</td>
<td>Logs very severe error events that will lead the driver to abort.</td>
</tr>
<tr>
<td>ERROR</td>
<td>Logs error events that might still allow the driver to continue running.</td>
</tr>
<tr>
<td>WARNING</td>
<td>Logs potentially harmful situations.</td>
</tr>
<tr>
<td>INFO</td>
<td>Logs general information that describes the progress of the driver.</td>
</tr>
<tr>
<td>DEBUG</td>
<td>Logs detailed information that is useful for debugging the driver.</td>
</tr>
<tr>
<td>TRACE</td>
<td>Logs more detailed information than the DEBUG level.</td>
</tr>
</tbody>
</table>

To enable the logging functionality available in the Cloudera ODBC Driver for Impala:

1. In the Cloudera ODBC Driver for Impala DSN Setup dialog box, click **Logging Options**
2. In the **Log Level** list, select the desired level of information to include in log files.
3. In the **Log Path** field, type the full path to the folder where you want to save log files.
4. If requested by technical support, type the name of the component for which to log messages in the **Log Namespace** field. Otherwise, do not type a value in the field.
5. Click **OK**

The Cloudera ODBC Driver for Impala produces a log file named `ImpalaODBC_driver.log` at the location you specify using the **Log Path** field.

To disable Cloudera ODBC Driver for Impala logging:

1. In the Cloudera ODBC Driver for Impala DSN Setup dialog box, click **Logging Options**
2. In the **Log Level** list, select **LOG_OFF**
3. Click OK

To start tracing using the ODBC Data Source Administrator:

1. In the ODBC Data Source Administrator, click the **Tracing** tab.
2. In the Log File Path area, click **Browse**. In the Select ODBC Log File dialog box, browse to the location where you want to save the log file, then type a descriptive file name in the **File name** field, and then click **Save**.
3. On the **Tracing** tab, click **Start Tracing Now**.

To stop ODBC Data Source Administrator tracing:

> On the **Tracing** tab in the ODBC Data Source Administrator, click **Stop Tracing Now**.

For further details on tracing using the ODBC Data Source Administrator, see the article *How to Generate an ODBC Trace with ODBC Data Source Administrator* at [http://support.microsoft.com/kb/274551](http://support.microsoft.com/kb/274551)

### Linux Driver

#### System Requirements

You install the Cloudera ODBC Driver for Impala on client computers accessing data in a Hadoop cluster with the Impala server installed and running. Each computer where you install the driver must meet the following minimum system requirements:

- One of the following distributions (32- and 64-bit editions are supported):
  - Red Hat® Enterprise Linux® (RHEL) 5.0 or 6.0
  - CentOS 5.0 or 6.0
  - SUSE Linux Enterprise Server (SLES) 11
- 50 MB of available disk space
- One of the following ODBC driver managers installed:
  - iODBC 3.52.7
  - unixODBC 2.3.0 or later

The Cloudera ODBC Driver for Impala has been tested using Impala 1.0.1 and Apache Thrift 0.9.0.

#### Installing the Driver

There are two versions of the driver for Linux:

- **ClouderaImpalaODBC-32-bit-Version-ReleaseNumber.i686.rpm** for 32-bit
- **ClouderaImpalaODBC-Version-ReleaseNumber.x86_64.rpm** for 64-bit

*Version* is the version number of the driver, and *Release* is the release number for this version of the driver. *LinuxDistro* is either el5 or el6. For SUSE, the *LinuxDistro* placeholder is empty.
The version of the driver that you select should match the bitness of the client application accessing your Hadoop / Impala-based data. For example, if the client application is 64-bit, then you should install the 64-bit driver. Note that 64-bit editions of Linux support both 32- and 64-bit applications. Verify the bitness of your intended application and install the appropriate version of the driver.

The Cloudera ODBC Driver for Impala driver files are installed in the following directories:

- `/opt/cloudera/impalaodbc/ErrorMessages` – Error messages files directory
- `/opt/cloudera/impalaodbc/Setup` – Sample configuration files directory
- `/opt/cloudera/impalaodbc/lib/32` – 32-bit shared libraries directory
- `/opt/cloudera/impalaodbc/lib/64` – 64-bit shared libraries directory

**To install the Cloudera ODBC Driver for Impala:**

- In Red Hat Enterprise Linux or CentOS, log in as the root user, then navigate to the folder containing the driver RPM packages to install, and then type the following at the command line, where `RPMFileName` is the file name of the RPM package containing the version of the driver that you want to install:

  ```bash
  yum --nogpgcheck localinstall RPMFileName
  ```

  OR

  ```bash
  zypper install RPMFileName
  ```

The Cloudera ODBC Driver for Impala depends on the following resources:

- cyrus-sasl-2.1.22-7 or above
- cyrus-sasl-gssapi-2.1.22-7 or above
- cyrus-sasl-plain-2.1.22-7 or above

If the package manager in your Linux distribution cannot resolve the dependencies automatically when installing the driver, then download and manually install the packages required by the version of the driver that you want to install.

**Setting the LD_LIBRARY_PATH Environment Variable**

The `LD_LIBRARY_PATH` environment variable must include the paths to the installed ODBC driver manager libraries.

For example, if ODBC driver manager libraries are installed in `/usr/local/lib`, then set `LD_LIBRARY_PATH` as follows:

```bash
export LD_LIBRARY_PATH=$LD_LIBRARY_PATH:/usr/local/lib
```
Mac OS X Driver

For information about how to set environment variables permanently, refer to your Linux shell documentation.

For information about creating ODBC connections using the Cloudera ODBC Driver for Impala, see “Configuring ODBC Connections for Linux, Mac OS X, and AIX” on page 14.

Mac OS X Driver

System Requirements

You install the Cloudera ODBC Driver for Impala on client computers accessing data in a Hadoop cluster with the Impala server installed and running. Each computer where you install the driver must meet the following minimum system requirements:

- Mac OS X version 10.6.8 or later
- 100 MB of available disk space
- iODBC 3.52.7 or above

The Cloudera ODBC Driver for Impala has been tested using Impala 1.0.1 and Apache Thrift 0.9.0.

The driver supports both 32- and 64-bit client applications.

Installing the Driver

The Cloudera ODBC Driver for Impala driver files are installed in the following directories:

- /opt/cloudera/impalaodbc/ErrorMessages – Error messages files directory
- /opt/cloudera/impalaodbc/Setup – Sample configuration files directory
- /opt/cloudera/impalaodbc/lib/universal – Binaries directory

To install the Cloudera ODBC Driver for Impala:

1. Double-click to mount the ClouderaImpalaODBC.dmg disk image.
2. Double-click ClouderaImpalaODBC.pkg to run the Installer.
3. In the installer, click Continue
4. On the Software License Agreement screen, click Continue, and when the prompt appears, click Agree if you agree to the terms of the License Agreement.
5. Optionally, to change the installation location, click Change Install Location, select the desired location, and then click Continue
6. To accept the installation location and begin the installation, click Install
7. When the installation completes, click Close

Setting the DYLD_LIBRARY_PATH Environment Variable

The DYLD_LIBRARY_PATH environment variable must include the paths to the installed ODBC driver manager libraries.
For example, if ODBC driver manager libraries are installed in /usr/local/lib, then set
DYLD_LIBRARY_PATH as follows:

```
export DYLD_LIBRARY_PATH=$LD_LIBRARY_PATH:/usr/local/lib
```

For information about how to set environment variables permanently, refer to your Mac OS X shell
documentation.

For information about creating ODBC connections using the Cloudera ODBC Driver for Impala, see
“Configuring ODBC Connections for Linux, Mac OS X, and AIX” on page 14.

**AIX Driver**

**System Requirements**

You install the Cloudera ODBC Driver for Impala on client computers accessing data in a Hadoop cluster
with the Impala server installed and running. Each computer where you install the driver must meet the
following minimum system requirements:

- IBM AIX 5.3, 6.1 or 7.1 (32- and 64-bit editions are supported)
- 150 MB of available disk space
- One of the following ODBC driver managers installed:
  - iODBC 3.52.7 or above
  - unixODBC 2.3.0 or above

The Cloudera ODBC Driver for Impala has been tested using Impala 1.0.1 and Apache Thrift 0.9.0.

**Installing the Driver**

There are two versions of the driver for AIX:

- `ClouderaImpalaODBC-32-bit-Version-ReleaseNumber.ppc.rpm` for 32-bit
- `ClouderaImpalaODBC-Version-ReleaseNumber.ppc.rpm` for 64-bit

*Version* is the version number of the driver, and *Release* is the release number for this version of the
driver.

The version of the driver that you select should match the bitness of the client application accessing
your Hadoop / Impala-based data. For example, if the client application is 64-bit, then you should install
the 64-bit driver. Note that 64-bit editions of AIX support both 32- and 64-bit applications. Verify the
bitness of your intended application and install the appropriate version of the driver.

The Cloudera ODBC Driver for Impala driver files are installed in the following directories:

- `/opt/cloudera/impalaodbc/ErrorMessages`—Error messages files directory
- `/opt/cloudera/impalaodbc/Setup`—Sample configuration files directory
Configuring ODBC Connections for Linux, Mac OS X, and AIX

- `/opt/cloudera/impalaodbc/lib/32`—32-bit shared libraries directory
- `/opt/cloudera/impalaodbc/lib/64`—64-bit shared libraries directory

To install the Cloudera ODBC Driver for Impala:

- Log in as root user, then navigate to the folder containing the driver RPM packages to install, and then type the following at the command line, where `RPMFileName` is the file name of the RPM package containing the version of the driver that you want to install:

  ```bash
  rpm --install RPMFileName
  ```

Setting the LD_LIBRARY_PATH Environment Variable

The LD_LIBRARY_PATH environment variable must include the paths to the installed ODBC driver manager libraries.

For example, if ODBC driver manager libraries are installed in `/usr/local/lib`, then set LD_LIBRARY_PATH as follows:

```bash
export LD_LIBRARY_PATH=$LD_LIBRARY_PATH:/usr/local/lib
```

For information about how to set environment variables permanently, refer to your AIX shell documentation.

For information about creating ODBC connections using the Cloudera ODBC Driver for Impala, see “Configuring ODBC Connections for Linux, Mac OS X, and AIX” on page 14.

Configuring ODBC Connections for Linux, Mac OS X, and AIX

Files

ODBC driver managers use configuration files to define and configure ODBC data sources and drivers. By default, the following configuration files residing in the user’s home directory are used:

- `.odbc.ini` is used to define ODBC data sources, and it is required.
- `.odbcinst.ini` is used to define ODBC drivers, and it is optional.

Also, by default the Cloudera ODBC Driver for Impala is configured using the `cloudera.impalaodbc.ini` file, which is located in one of the following directories depending on the version of the driver that you are using:

- `/opt/cloudera/impalaodbc/lib/32` for the 32-bit driver on AIX/Linux
- `/opt/cloudera/impalaodbc/lib/64` for the 64-bit driver on AIX/Linux
- `/opt/cloudera/impalaodbc/lib/universal` for the driver on Mac OS X

The `cloudera.impalaodbc.ini` file is required.

You can set driver configuration options in your `odbc.ini` and `cloudera.impalaodbc.ini` files. Configuration options set in a `cloudera.impalaodbc.ini` file apply to all connections, whereas configuration options set
Configuring ODBC Connections for Linux, Mac OS X, and AIX

in an odbc.ini file are specific to a connection. Configuration options set in odbc.ini take precedence over configuration options set in cloudera.impalaodbc.ini. For information about the configuration options available for controlling the behavior of DSNs that are using the Cloudera ODBC Driver for Impala, see “Appendix B: Driver Configuration Options for Linux, Mac OS X, and AIX” on page 29.

Sample Files

The driver installation contains the following sample configuration files in the Setup directory:

- odbc.ini
- odbcinst.ini

The names of the sample configuration files do not begin with a period (.) so that they will appear in directory listings by default. A filename beginning with a period (.) is hidden. For odbc.ini and odbcinst.ini, if the default location is used, then the filenames must begin with a period (.)

If the configuration files do not already exist in the user’s home directory, then the sample configuration files can be copied to that directory and renamed. If the configuration files already exist in the user’s home directory, then the sample configuration files should be used as a guide for modifying the existing configuration files.

Configuring the Environment

Optionally, you can use three environment variables—ODBCINI, ODBCSYSINI, and CLOUDERAIMPALAINI—to specify different locations for the odbc.ini, odbcinst.ini, and cloudera.impalaodbc.ini configuration files by doing the following:

- Set ODBCINI to point to your odbc.ini file.
- Set ODBCSYSINI to point to the directory containing the odbcinst.ini file.
- Set CLOUDERAIMPALAINI to point to your cloudera.impalaodbc.ini file.

For example, if your odbc.ini and cloudera.impalaodbc.ini files are located in /etc and your odbcinst.ini file is located in /usr/local/odbc, then set the environment variables as follows:

```
export ODBCINI=/etc/odbc.ini
export ODBCSYSINI=/usr/local/odbc
export CLOUDERAIMPALAINI=/etc/cloudera.impalaodbc.ini
```

The search order for the cloudera.impalaodbc.ini file is as follows:

1. If the CLOUDERAIMPALAINI environment variable is defined, then the driver searches for the file specified by the environment variable.

   **Important:**
   
   CLOUDERAIMPALAINI must contain the full path, including the filename.

2. The current working directory of the application is searched for a file named cloudera.impalaodbc.ini not beginning with a period.
3. The directory ~/ (that is, $HOME) is searched for a hidden file named .cloudera.impalaodbc.ini
4. The directory /etc is searched for a file named cloudera.impalaodbc.ini not beginning with a period.

**Configuring the odbc.ini File**

ODBC Data Source Names (DSNs) are defined in the odbc.ini configuration file. The file is divided into several sections:

- **[ODBC]** is optional and used to control global ODBC configuration, such as ODBC tracing.
- **[ODBC Data Sources]** is required, listing DSNs and associating DSNs with a driver.
- A section having the same name as the data source specified in the [ODBC Data Sources] section is required to configure the data source.

The following is an example of an odbc.ini configuration file for Linux or AIX:

```
[ODBC Data Sources]
Sample Cloudera Impala DSN 32=Cloudera Impala ODBC Driver 32-bit

[Sample Cloudera Impala DSN 32]
Driver=/opt/cloudera/impalaodbc/lib/32/libclouderaimpalaodbc32.so
HOST=MyImpalaServer
PORT=21050
```

*MyImpalaServer* is the IP address or hostname of the Impala server.

The following is an example of an odbc.ini configuration file for Mac OS X:

```
[ODBC Data Sources]
Sample Cloudera Impala DSN=Cloudera Impala ODBC Driver

[Sample Cloudera Impala DSN]
Driver=/opt/cloudera/impalaodbc/lib/universal/libclouderaimpalaodbc.dylib
HOST=MyImpalaServer
PORT=21050
```

*MyImpalaServer* is the IP address or hostname of the Impala server.

**To create a Data Source Name (DSN):**

1. Open the .odbc.ini configuration file in a text editor.
2. In the [ODBC Data Sources] section, add a new entry by typing the Data Source Name (DSN), then an equal sign (=), and then the driver name.
3. In the .odbc.ini file, add a new section with a name that matches the DSN you specified in step 2, and then add configuration options to the section. Specify configuration options as key-value pairs.

**Note:**
The default configuration of Impala requires the Cloudera ODBC Driver for Impala to be configured to use the **No Authentication** mechanism.

4. Save the .odbc.ini configuration file.

For information about the configuration options available for controlling the behavior of DSNs that are using the Cloudera ODBC Driver for Impala, see “Appendix B: Driver Configuration Options for Linux, Mac OS X, and AIX” on page 29.

**Configuring the odbcinst.ini File**

ODBC Drivers are defined in the odbcinst.ini configuration file. The configuration file is optional because drivers can be specified directly in the odbc.ini configuration file, as described in “Configuring the odbc.ini File” on page 15.

The odbcinst.ini file is divided into the following sections:

- **[ODBC Drivers]** lists the names of all the installed ODBC drivers.
- A section having the same name as the driver name specified in the [ODBC Drivers] section lists driver attributes and values.

The following is an example of an odbcinst.ini file for Linux or AIX:

```ini
[ODBC Drivers]
Cloudera Impala ODBC Driver 32-bit=Installed
Cloudera Impala ODBC Driver 64-bit=Installed
[Cloudera Impala ODBC Driver 32-bit]
Description=Cloudera Impala ODBC Driver (32-bit)
Driver=/opt/cloudera/impalaodbc/lib/32/libclouderaimpalaodbc32.so
[Cloudera Impala ODBC Driver 64-bit]
Description=Cloudera Impala ODBC Driver (64-bit)
Driver=/opt/cloudera/impalaodbc/lib/64/libclouderaimpalaodbc64.so
```

The following is an example of an odbcinst.ini file for Mac OS X:

```ini
[ODBC Drivers]
Cloudera Impala ODBC Driver=Installed
[Cloudera Impala ODBC Driver]
```
Description=Cloudera Impala ODBC Driver
Driver=/opt/cloudera/impalaodbc/lib/universal/libclouderaimpalaodbc.dylib

To define a driver:

1. Open the .odbcinst.ini configuration file in a text editor.
2. In the [ODBC Drivers] section, add a new entry by typing the driver name and then typing =Installed

**Note:**
Type a symbolic name that you want to use to refer to the driver in connection strings or DSNs.

3. In .odbcinst.ini, add a new section with a name that matches the driver name you typed in step 2, and then add configuration options to the section based on the sample odbcinst.ini file provided in the Setup directory. Specify configuration options as key-value pairs.
4. Save the .odbcinst.ini configuration file.

**Configuring the cloudera.impalaodbc.ini File**

The cloudera.impalaodbc.ini file contains configuration settings for the Cloudera ODBC Driver for Impala. Settings that you define in the cloudera.impalaodbc.ini file apply to all connections that use the driver.

**To configure the Cloudera ODBC Driver for Impala to work with your ODBC driver manager:**

1. Open the .cloudera.impalaodbc.ini configuration file in a text editor.
2. Edit the DriverManagerEncoding setting. If you are using Linux or Mac OS X, the value is usually UTF-16 or UTF-32, depending on the ODBC driver manager you use. iODBC uses UTF-32, and unixODBC uses UTF-16. To determine the correct setting to use, refer to your ODBC Driver Manager documentation.

   OR

   If you are using AIX and the unixODBC driver manager, then set the value to UTF-16. If you are using AIX and the iODBC driver manager, then set the value to UTF-16 for the 32-bit driver or UTF-32 for the 64-bit driver.
3. Edit the ODBCInstLib setting. The value is the name of the ODBCInst shared library for the ODBC driver manager you use. To determine the correct library to specify, refer to your ODBC driver manager documentation.

   The configuration file defaults to the shared library for iODBC. In Linux and AIX, the shared library name for iODBC is libiodbcinst.so. In Mac OS X, the shared library name for iODBC is libiodbcinst.dylib.
Configuring ODBC Connections for Linux, Mac OS X, and AIX

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Note:
You can specify an absolute or relative filename for the library. If you intend to use the relative filename, then the path to the library must be included in the library path environment variable. In Linux and AIX, the library path environment variable is named LD_LIBRARY_PATH. In Mac OS X, the library path environment variable is named DYLD_LIBRARY_PATH

4. Save the cloudera.impalaodbc.ini configuration file.

Configuring Authentication
The Impala server supports multiple authentication mechanisms. You must determine the authentication type your server is using and configure your DSN accordingly. The authentication methods available are as follows:

- No Authentication
- Kerberos
- User Name
- User Name and Password
- User Name and Password (SSL)
- No Authentication (SSL)

For information about the keys involved in configuring authentication, see “Appendix B: Driver Configuration Options for Linux, Mac OS X, and AIX” on page 29.

Using No Authentication
For this authentication mechanism, you do not need to configure any additional settings.

Note:
The default configuration of Impala requires the Cloudera ODBC Driver for Impala to be configured to use the **No Authentication** mechanism.

To configure a connection without authentication:

- Set the AuthMech configuration key to 0

Using Kerberos
For information on operating Kerberos, refer to the documentation for your operating system.

To configure Kerberos authentication:

1. Set the AuthMech configuration key to 1
2. If your Kerberos setup does not define a default realm or if the realm of your Impala server is not the default, then set the appropriate realm using the KrbRealm key.

   OR

   To use the default realm defined in your Kerberos setup, do not set the KrbRealm key.

3. Set the KrbFQDN key to the fully qualified domain name of the Impala host.

4. Set the KrbServiceName key to the service name of the Impala server.

   For example, if the principle for the Impala server is impala/fully.qualified.domain.name@your-realm.com, then the value in the service name field is **impala**. If you are unsure of the correct service name to use for your particular Hadoop deployment, contact your Hadoop administrator.

**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.

To configure User Name authentication:

1. Set the AuthMech configuration key for the DSN to 2
2. Set the UID key to an appropriate user for accessing the Impala server.

**Using User Name and Password**

This authentication mechanism requires a user name and a password.

Note:

This authentication mechanism should not be used with an Impala configuration that does not have LDAP enabled.

To configure User Name and Password authentication:

1. Set the AuthMech configuration key for the DSN to 3
2. Set the UID key to an appropriate user for accessing the Impala server.
3. Set the PWD key to the password corresponding to the user name you provided in step 2.

**Using User Name and Password (SSL)**

This authentication mechanism uses SSL and requires a user name and a password. The driver accepts self-signed SSL certificates.

Note:

This authentication mechanism should not be used with an Impala configuration that does not have LDAP enabled.
To configure User Name and Password (SSL) authentication:

1. Set the AuthMech configuration key for the DSN to 4
2. Set the UID key to an appropriate user for accessing the Impala server.
3. Set the PWD key to the password corresponding to the user name you provided in step 2.
4. Optionally, configure the driver to allow the common name of a CA-issued certificate to not match the host name of the Impala server by setting the CAIssuedCertNamesMismatch key to 1.

Note:
For self-signed certificates, the driver always allows the common name of the certificate to mismatch the host name.

5. To configure the driver to load SSL certificates from a specific file, set the TrustedCerts key to the path of the file.

   OR

   To use the trusted CA certificates PEM file that is installed with the driver, do not specify a value for the TrustedCerts key.

No Authentication (SSL)
This authentication mechanism uses SSL but does not require a user name or a password. The driver accepts self-signed SSL certificates.

To configure No Authentication (SSL):

1. Set the AuthMech configuration key for the DSN to 5
2. Optionally, configure the driver to allow the common name of a CA-issued certificate to not match the host name of the Impala server by setting the CAIssuedCertNamesMismatch key to 1.

Note:
For self-signed certificates, the driver always allows the common name of the certificate to mismatch the host name.

3. To configure the driver to load SSL certificates from a specific file, set the TrustedCerts key to the path of the file.

   OR

   To use the trusted CA certificates PEM file that is installed with the driver, do not specify a value for the TrustedCerts key.
Features

Data Types

The following data types are supported:

- TINYINT
- SMALLINT
- INT
- BIGINT
- FLOAT
- DOUBLE
- BOOLEAN
- STRING
- TIMESTAMP
- DECIMAL(p,s)

**Note:**
The DECIMAL(p,s) data type is supported in Impala 1.4 and later.

- VARCHAR(n)
- CHAR(n)

**Note:**
The aggregate types (ARRAY, MAP, and STRUCT) are not yet supported. Columns of aggregate types are treated as STRING columns.

Catalog and Schema Support

The Cloudera ODBC Driver for Impala supports both catalogs and schemas in order to make it easy for the driver to work with various ODBC applications. Since Impala only organizes tables into schemas/databases, we have added a synthetic catalog called “IMPALA” under which all of the schemas/databases are organized. The driver also maps the ODBC schema to the Impala schema/database.

SQL Translation

The Cloudera ODBC Driver for Impala can parse queries locally prior to sending them to the Impala server. This feature allows the driver to calculate query metadata without executing the query, support query parameters, and support extra SQL features such as ODBC escape sequences and additional scalar functions that are not available in the Impala-shell tool.
Active Directory
The Cloudera ODBC Driver for Impala supports Active Directory Kerberos on Windows. There are two prerequisites for using Active Directory Kerberos on Windows:

- MIT Kerberos is not installed on client Windows machine.
- The MIT Kerberos Hadoop realm has been configured to trust the Active Directory realm, according to Cloudera’s documentation, so that users in the Active Directory realm can access services in the MIT Kerberos Hadoop realm.

Server-Side Properties
The Cloudera ODBC Driver for Impala allows you to set server-side properties via a DSN. Server-side properties specified in a DSN affect only the connection established using the DSN.

For information about setting server-side properties for a DSN, see “Configuring Server-Side Properties” on page 8.

Authentication Options
Impala supports multiple authentication mechanisms. You must determine the authentication type that your server is using. The authentication methods available in the Cloudera ODBC Driver for Impala are as follows:

- No Authentication
- Kerberos
- User Name
- User Name and Password
- User Name and Password (SSL)
- No Authentication (SSL)

Note:
The default configuration of Impala requires the Cloudera ODBC Driver for Impala to be configured to use the No Authentication mechanism.

The Impala server uses SASL (Simple Authentication and Security Layer) to support some of the authentication methods. Kerberos is supported with the SASL GSSAPI mechanism. User Name, User Name and Password, and User Name and Password (SSL) are supported with the SASL PLAIN mechanism.

<table>
<thead>
<tr>
<th>SASL mechanisms</th>
<th>Non-SASL mechanisms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kerberos</td>
<td>No Authentication</td>
</tr>
<tr>
<td>User Name</td>
<td>No Authentication (SSL)</td>
</tr>
<tr>
<td>SASL mechanisms</td>
<td>Non-SASL mechanisms</td>
</tr>
<tr>
<td>---------------------</td>
<td>---------------------</td>
</tr>
<tr>
<td>User Name and Password</td>
<td></td>
</tr>
<tr>
<td>User Name and Password (SSL)</td>
<td></td>
</tr>
</tbody>
</table>

**Note:**

Thrift (the layer for handling remote process communication between the Cloudera ODBC Driver for Impala and the Impala server) has a limitation where it cannot detect a mix of non-SASL and SASL mechanisms being used between the driver and the server. If this happens, the driver will appear to hang during connection establishment.

**Contact Us**

If you have difficulty using the driver, you can contact Cloudera Technical Support. We welcome your questions, comments, and feature requests.

**Important:**

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

For details on contacting Technical Support, see [http://www.cloudera.com/content/cloudera/en/products/cloudera-support.html](http://www.cloudera.com/content/cloudera/en/products/cloudera-support.html)
Appendix A: Configuring Kerberos Authentication for Windows

Active Directory

The Cloudera ODBC Driver for Impala supports Active Directory Kerberos on Windows. There are two prerequisites for using Active Directory Kerberos on Windows:

- MIT Kerberos is not installed on client Windows machine.
- The MIT Kerberos Hadoop realm has been configured to trust the Active Directory realm, according to Cloudera’s documentation, so that users in the Active Directory realm can access services in the MIT Kerberos Hadoop realm.

MIT Kerberos

Downloading and installing MIT Kerberos for Windows 4.0.1

For information about Kerberos and download links for the installer, see the MIT Kerberos website at http://web.mit.edu/kerberos/

To download and install MIT Kerberos for Windows 4.0.1:

1. To download the Kerberos installer for 64-bit computers, 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
   The 64-bit installer includes both 32-bit and 64-bit libraries.
   OR
   To download the Kerberos installer for 32-bit computers, 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
   The 32-bit installer includes 32-bit libraries only.
2. To run the installer, double-click the .msi file that you downloaded in step 1.
3. Follow the instructions in the installer to complete the installation process.
4. When the installation completes, click Finish

Setting Up the Kerberos Configuration File

Settings for Kerberos are specified through a configuration file. You can set up the configuration file as a .ini file in the default location (the C:\ProgramData\MIT\Kerberos5 directory) or as a .conf file in a custom location.

Normally, the C:\ProgramData\MIT\Kerberos5 directory is hidden. For information about viewing and using this hidden directory, refer to your Windows documentation.

Note:

For more information on configuring Kerberos, refer to the MIT Kerberos documentation.
To set up the Kerberos configuration file in the default location:

1. Obtain a `krb5.conf` configuration file from your Kerberos administrator.
   
   OR
   
   Obtain the configuration file from the following location on the machine that is hosting the Hive Server 2: `/etc/krb5.conf`

2. Rename the configuration file from `krb5.conf` to `krb5.ini`

3. Copy the `krb5.ini` file to the `C:\ProgramData\MIT\Kerberos5` directory and overwrite the empty sample file.

To set up the Kerberos configuration file in a custom location:

1. Obtain a `krb5.conf` configuration file from your Kerberos administrator.

   OR

2. Place the `krb5.conf` file in an accessible directory and make note of the full path name.

3. Click the Start button, then right-click Computer, and then click Properties

4. Click Advanced system settings

5. In the System Properties dialog box, click the Advanced tab and then click Environment Variables

6. In the Environment Variables dialog box, under the System variables list, click New

7. In the New System Variable dialog box, in the Variable name field, type `KRBS_CONFIG`

8. In the Variable value field, type the absolute path to the `krb5.conf` file from step 2.

9. Click OK to save the new variable.

10. Ensure that the variable is listed in the System variables list.

11. Click OK to close the Environment Variables dialog box, and then click OK to close the System Properties dialog box.

Setting Up the Kerberos Credential Cache File

Kerberos uses a credential cache to store and manage credentials.

To set up the Kerberos credential cache file:

1. Create a directory where you want to save the Kerberos credential cache file.
   
   For example, create the following directory: `C:\temp`

2. Click the Start button, then right-click Computer, and then click Properties

3. Click Advanced system settings

4. In the System Properties dialog box, click the Advanced tab and then click Environment Variables
5. In the Environment Variables dialog box, under the System variables list, click New
6. In the New System Variable dialog box, in the Variable name field, type KRB5CCNAME
7. In the Variable value field, type the path to the folder you created in step 1, and then append the file name krb5cache
   For example, if you created the folder C:\temp in step 1, then type C:\temp\krb5cache

   Note:
   krb5cache is a file (not a directory) that is managed by the Kerberos software, and it should not be created by the user. If you receive a permission error when you first use Kerberos, ensure that the krb5cache file does not already exist as a file or a directory.

8. Click OK to save the new variable.
9. Ensure that the variable appears in the System variables list.
10. Click OK to close the Environment Variables dialog box, and then click OK to close the System Properties dialog box.
11. To ensure that Kerberos uses the new settings, restart your computer.

Obtaining a Ticket for a Kerberos Principal

A principal refers to a user or service that can authenticate to Kerberos. To authenticate to Kerberos, a principal must obtain a ticket by using a password or a keytab file. You can specify a keytab file to use, or use the default keytab file of your Kerberos configuration.

To obtain a ticket for a Kerberos principal using a password:

1. Click the Start button, then click All Programs, and then click the Kerberos for Windows (64-bit) or the 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.

To obtain a ticket for a Kerberos principal using a keytab file:

1. Click the Start button, then click All Programs, then click Accessories, and then click Command Prompt
2. In the Command Prompt, type a command using the following syntax:

   kinit -k -t keytab_file principal

   keytab_file is the full path to the keytab file.

   For example: C:\mykeytabs\impalaserver.keytab
**principal** is the Kerberos principal to use for authentication.

For example: `impala/impalaserver.example.com@EXAMPLE.COM`

3. If the cache location KRB5CCNAME is not set or used, then use the `-c` option of the `kinit` command to specify the location of the credential cache.

In the command, the `-c` argument must appear last. For example:

```
kinit -k -t C:\mykeytabs\impala.keytab impala/HOST@HADOOP.NET -c c:\ProgramData\MIT\krbcache
```

**Note:**

Krbcache is the Kerberos cache file, not a directory.

To obtain a ticket for a Kerberos principal using a default keytab file:

**Note:**

For information about configuring a default keytab file for your Kerberos configuration, consult the MIT Kerberos documentation.

1. Click the **Start** button, then click **All Programs**, then click **Accessories**, and then click **Command Prompt**

2. In the Command Prompt, type a command using the following syntax:

```
kinit -k principal
```

**principal** is the Kerberos principal to use for authentication.

For example: `impala/impalaserver.example.com@EXAMPLE.COM`

3. If the cache location KRB5CCNAME is not set or used, then use the `-c` option of the `kinit` command to specify the location of the credential cache.

In the command, the `-c` argument must appear last. For example:

```
kinit -k impala/HOST@HADOOP.NET -c c:\ProgramData\MIT\krbcache
```

**Note:**

Krbcache is the Kerberos cache file, not a directory.
Appendix B: Driver Configuration Options for Linux, Mac OS X, and AIX

The configuration options that you can use to control the behavior of the Cloudera ODBC Driver for Impala are listed and described in Table 2.

**Note:**

You can set configuration options in your odbc.ini and cloudera.impalaodbc.ini files. Configuration options set in a cloudera.impalaodbc.ini file apply to all connections, whereas configuration options set in an odbc.ini file are specific to a connection. Configuration options set in odbc.ini take precedence over configuration options set in cloudera.impalaodbc.ini.

### Table 2 Driver Configuration Options

<table>
<thead>
<tr>
<th>Key</th>
<th>Default Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AuthMech</td>
<td>0</td>
<td>The authentication mechanism to use. The following values are possible:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0 – No Authentication</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1 – Kerberos</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 2 – User Name</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 3 – User Name and Password</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 4 – User Name and Password (SSL)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 5 – No Authentication (SSL)</td>
</tr>
<tr>
<td>CAIssuedCertNamesMismatch</td>
<td>0</td>
<td>Whether to allow the common name of a CA-issued SSL certificate to mismatch</td>
</tr>
<tr>
<td></td>
<td></td>
<td>the host name of the Impala server. The following values are possible:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 0 – Do not allow the names to mismatch.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1 – Allow the names to mismatch.</td>
</tr>
</tbody>
</table>

**Note:**

This setting is only applicable to the User Name and Password (SSL) and No Authentication (SSL) authentication mechanisms.
### Appendix B: Driver Configuration Options for Linux, Mac OS X, and AIX

<table>
<thead>
<tr>
<th>Key</th>
<th>Default Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Database</td>
<td>default</td>
<td>The name of the database schema to use when a schema is not explicitly specified in a query. You can still issue queries on other schemas by explicitly specifying the schema in the query.</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Note:</strong> To inspect your databases and determine the appropriate schema to use, type the <code>show databases</code> command at the Impala command prompt.</td>
</tr>
<tr>
<td>DelegationUID</td>
<td></td>
<td>Use this option to delegate all operations against Impala to a user that is different than the authenticated user for the connection.</td>
</tr>
<tr>
<td>Driver</td>
<td></td>
<td>The location of the Cloudera ODBC Driver for Impala shared object file.</td>
</tr>
<tr>
<td>HOST</td>
<td></td>
<td>The IP address or hostname of the Impala server.</td>
</tr>
<tr>
<td>KrbFQDN</td>
<td></td>
<td>The fully qualified domain name of the Impala host used.</td>
</tr>
<tr>
<td>KrbRealm</td>
<td></td>
<td>If there is no default realm configured or if the realm of the Impala host is different from the default realm for your Kerberos setup, use this option to define the realm of the Impala host.</td>
</tr>
<tr>
<td>KrbServiceName</td>
<td></td>
<td>The Kerberos service principal name of the Impala server. By convention the service name is <code>impala</code>, but the name may be different in your server environment.</td>
</tr>
</tbody>
</table>
| LCaseSspKeyName   | 1             | Whether the driver converts server-side property key names to all lower case characters. The following values are possible:  
- 0 – Do modify the server-side property key names.  
- 1 – Convert server-side property key names to all lower case characters.                                                                                                                                                                                                 |
### Appendix B: Driver Configuration Options for Linux, Mac OS X, and AIX

#### Cloudera ODBC Driver for Impala

<table>
<thead>
<tr>
<th>Key</th>
<th>Default Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PORT</td>
<td>10000</td>
<td>The listening port for the service.</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Note:</strong> The default port number for the Impala service is 21050.</td>
</tr>
<tr>
<td>PWD</td>
<td></td>
<td>The password a user account on the host that is running Impala.</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Note:</strong> This setting is required if AuthMech is set to User Name and Password or User Name and Password (SSL).</td>
</tr>
<tr>
<td>RowsFetchedPerBlock</td>
<td>10000</td>
<td>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.</td>
</tr>
<tr>
<td>SocketTimeout</td>
<td>0</td>
<td>The number of seconds after which Impala closes the connection with the client application if the connection is idle. When this setting is set to 0, the connection does not time out.</td>
</tr>
<tr>
<td>Key</td>
<td>Default Value</td>
<td>Description</td>
</tr>
<tr>
<td>------------------</td>
<td>---------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| SSP_             |               | Set a server-side property by using the following syntax, where SSPKey is the name of the server-side property to set and SSPValue is the value to assign to the server-side property:  
SSP_SSPKey=SSPValue
For example:
SSP_mapred.queue.names=myQueue
After the driver applies the server-side property, the SSP_ prefix is removed from the DSN entry, leaving an entry of SSPKey=SSPValue

**Note:**
The SSP_ prefix must be upper case. |
| TrustedCerts     |               | The location of the file containing trusted CA certificates for authenticating the Impala server when using SSL.
If this setting is not set, then the driver defaults to using the trusted CA certificates file installed by the driver.

**Note:**
This setting is only applicable to the User Name and Password (SSL) and No Authentication (SSL) authentication mechanisms. |
| TSaslTransportBufSize | 1000          | The number of bytes to reserve in memory for buffering unencrypted data from the network.                                                                                                                  |
|                  |               | **Note:**
In most circumstances, the default value of 1000 bytes is optimal.                                                                                                                                         |
## Appendix B: Driver Configuration Options for Linux, Mac OS X, and AIX

#### Cloudera ODBC Driver for Impala

<table>
<thead>
<tr>
<th>Key</th>
<th>Default Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>UID</td>
<td>anonymous</td>
<td>The user name of an existing account on the host that is running Impala.</td>
</tr>
</tbody>
</table>

**Note:**
This setting is required if AuthMech is set to **User Name and Password** or **User Name and Password (SSL)**. It is optional if AuthMech is set to **User Name**.

| UseNativeQuery   | 0             | By default, the driver transforms the queries emitted by an application to convert the queries into an equivalent form in Impala SQL. Use this option to specify whether or not the driver transforms queries. The following values are possible:  
- **0** – Transform the queries into Impala SQL.  
- **1** – Do not transform the queries (use the native query instead). |

**Note:**
If the application is Impala-aware and already emits Impala SQL, then set this option to 1 to avoid the extra overhead of query transformation.
# Appendix C: ODBC API Conformance Level

## Conformance Level

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Core</td>
<td>SQLAllocHandle</td>
<td>Core</td>
<td>SQLGetStmtAttr</td>
</tr>
<tr>
<td>Core</td>
<td>SQLBindCol</td>
<td>Core</td>
<td>SQLGetTypeInfo</td>
</tr>
<tr>
<td>Core</td>
<td>SQLBindParameter</td>
<td>Core</td>
<td>SQLNativeSql</td>
</tr>
<tr>
<td>Core</td>
<td>SQLCancel</td>
<td>Core</td>
<td>SQLNumParams</td>
</tr>
<tr>
<td>Core</td>
<td>SQLCloseCursor</td>
<td>Core</td>
<td>SQLNumResultCols</td>
</tr>
<tr>
<td>Core</td>
<td>SQLColAttribute</td>
<td>Core</td>
<td>SQLParamData</td>
</tr>
<tr>
<td>Core</td>
<td>SQLColumns</td>
<td>Core</td>
<td>SQLPrepare</td>
</tr>
<tr>
<td>Core</td>
<td>SQLConnect</td>
<td>Core</td>
<td>SQLPutData</td>
</tr>
<tr>
<td>Core</td>
<td>SQLCopyDesc</td>
<td>Core</td>
<td>SQLRowCount</td>
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<td>SQLEncryptCol</td>
<td>Core</td>
<td>SQLSetConnectAttr</td>
</tr>
<tr>
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<td>SQLDisconnect</td>
<td>Core</td>
<td>SQLSetCursorName</td>
</tr>
<tr>
<td>Core</td>
<td>SQLDriverconnect</td>
<td>Core</td>
<td>SQLSetDescField</td>
</tr>
<tr>
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<td>SQLEndTran</td>
<td>Core</td>
<td>SQLSetDescRec</td>
</tr>
<tr>
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<td>SQLExecDirect</td>
<td>Core</td>
<td>SQLSetEnvAttr</td>
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<tr>
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<td>SQLExecute</td>
<td>Core</td>
<td>SQLSetStmtAttr</td>
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<tr>
<td>Core</td>
<td>SQLFetch</td>
<td>Core</td>
<td>SQLSpecialColumns</td>
</tr>
<tr>
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<td>SQLFetchScroll</td>
<td>Core</td>
<td>SQLStatistics</td>
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<tr>
<td>Core</td>
<td>SQLFreeHandle</td>
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<td>SQLTables</td>
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<td>Level 1</td>
<td>SQLProcedureColumns</td>
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<tr>
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<td>Level 1</td>
<td>SQLProcedures</td>
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<tr>
<td>Core</td>
<td>SQLGetDescField</td>
<td>Level 1</td>
<td>SQLProcedureColumns</td>
</tr>
</tbody>
</table>

[^1]: ODBC Compliance levels are Core, Level 1 and Level 2. These are defined in the ODBC Specification published with the Interface SDK from Microsoft.

### Appendix C: ODBC API Conformance Level

<table>
<thead>
<tr>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Core</td>
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<td>Level 2</td>
<td>SQLColumnPrivileges</td>
</tr>
<tr>
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<td>SQLGetDiagField</td>
<td>Level 2</td>
<td>SQLDescribeParam</td>
</tr>
<tr>
<td>Core</td>
<td>SQLGetDiagRec</td>
<td>Level 2</td>
<td>SQLForeignKeys</td>
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<tr>
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<td>Level 2</td>
<td>SQLTablePrivileges</td>
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<td>Core</td>
<td>SQLGetFunctions</td>
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<td></td>
</tr>
<tr>
<td>Core</td>
<td>SQLGetInfo</td>
<td></td>
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</tr>
</tbody>
</table>

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