Hortonworks Architecting the Future of Big Data

Hortonworks Hive ODBC Driver with SQL Connector

User Guide

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Introduction

The Hortonworks Hive ODBC Driver with SQL Connector 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 58.

The Hortonworks Hive ODBC Driver with SQL Connector 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.

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. For more information about ODBC, see the *Data Access Standards Glossary*: http://www.simba.com/resources/data-access-standards-library. For complete information about the ODBC specification, see the *ODBC API Reference*: http://msdn.microsoft.com/en-us/library/windows/desktop/ms714562(v=vs.85).aspx.

The *User Guide* is suitable for users who are looking 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 ODBC.

Contact Us

If you have difficulty using the Hortonworks Hive ODBC Driver with SQL Connector, please contact our support staff. We welcome your questions, comments, and feature requests.

Please have a detailed summary of the client and server environment (OS version, patch level, Hadoop distribution version, Hive version, configuration, etc.) ready, before you call or write us. Supplying this information accelerates support.

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Windows Driver

Installing the Driver on Windows

On 64-bit Windows operating systems, you can execute both 32- and 64-bit applications. However, 64-bit applications must use 64-bit drivers and 32-bit applications must use 32-bit drivers. Make sure that you use the version of the driver matching the bitness of the client application accessing data in Hadoop / Hive:

- `HortonworksHiveODBC32.msi` for 32-bit applications
- `HortonworksHiveODBC64.msi` for 64-bit applications

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

You install the Hortonworks Hive ODBC Driver with SQL Connector on client machines that access data stored in a Hadoop cluster with the Hive service installed and running. Each machine that you install the driver on must meet the following minimum system requirements:

- One of the following operating systems:
  - Windows 7 SP1, 8, or 8.1
  - Windows Server 2008 R2 SP1, 2012, or 2012 R2
- 100 MB of available disk space

Important: To install the driver, you must have Administrator privileges on the machine.

The driver supports Apache Hive versions 0.11 through 1.2.

To install the Hortonworks Hive ODBC Driver with SQL Connector:

1. Depending on the bitness of your client application, double-click to run **HortonworksHiveODBC32.msi** or **HortonworksHiveODBC64.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 **Change**, 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

Typically, after installing the Hortonworks Hive ODBC Driver with SQL Connector, you need to create a Data Source Name (DSN).

Alternatively, for information about DSN-less connections, see "Configuring a DSN-less Connection" on page 10.

To create a Data Source Name:

1. Open the ODBC Administrator:
   - If you are using Windows 7 or earlier, click **Start**, then click **All Programs**, then click the **Hortonworks Hive ODBC Driver 2.1** program group corresponding to the bitness of the client application accessing data in Hadoop / Hive, and then click **ODBC Administrator**.
   - Or, if you are using Windows 8 or later, on the Start screen, type **ODBC administrator**, and then click the **ODBC Administrator** search result corresponding to the bitness of the client application accessing data in Hadoop / Hive.
2. In the ODBC Data Source Administrator, click the **Drivers** tab, and then scroll down as needed to confirm that the Hortonworks Hive ODBC Driver appears in the alphabetical list of ODBC drivers that are installed on your system.
3. Choose one:
   - 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 **Hortonworks Hive ODBC Driver** and then click **Finish**.
6. In the **Data Source Name** field, type a name for your DSN.
7. Optionally, in the **Description** field, type relevant details about the DSN.
8. In the **Hive Server Type** drop-down list, select **Hive Server 1** or **Hive Server 2**.

   Note: If you are connecting through Apache ZooKeeper, then **Hive Server 1** is not supported.
9. Choose one:
   - To connect to Hive without using the Apache ZooKeeper service, in the **Service Discovery Mode** drop-down list, select **No Service Discovery**.
   - Or, to enable the driver to discover Hive Server 2 services via the ZooKeeper service, in the **Service Discovery Mode** drop-down list, select **ZooKeeper**.
10. Choose one:
    - If you selected **No Service Discovery** above, then in the **Host(s)** field, type the IP address or host name of the Hive server.
    - Or, if you selected **ZooKeeper** above, then in the **Host(s)** field, type a comma-separated list of ZooKeeper servers. Use the following format, where *[ZK_Host]*

is the IP address or host name of the ZooKeeper server and *[ZK_Port]* is the number of the TCP port that the ZooKeeper server uses to listen for client connections:

```
[ZK_Host1]:[ZK_Port1],[ZK_Host2]:[ZK_Port2]
```

11. In the **Port** field, if you selected **No Service Discovery** above, then type the number of the TCP port that the Hive server uses to listen for client connections. Otherwise, do not type a value in the field.
12. In the **Database** field, type the name of the database schema to use when a schema is not explicitly specified in a query.

    Note: 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, type the `show databases` command at the Hive command prompt.
13. In the **ZooKeeper Namespace** field, if you selected **ZooKeeper** above, then type the namespace on ZooKeeper under which Hive Server 2 znodes are added. Otherwise, do not type a value in the field.
14. In the Authentication area, configure authentication as needed. For more information, see "Configuring Authentication" on page 12.

    Note: Hive Server 1 does not support authentication. Most default configurations of Hive Server 2 require User Name authentication. To verify the authentication mechanism that you need to use for your connection, check the configuration of your Hadoop / Hive distribution. For more information, see "Authentication Options" on page 52.
15. Optionally, if the operations against Hive 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.

    Note: This option is applicable only when connecting to a Hive Server 2 instance that supports this feature.
16. In the **Thrift Transport** drop-down list, select the transport protocol to use in the Thrift layer.
17. If the Thrift Transport option is set to HTTP, then to configure HTTP options such as custom headers, click **HTTP Options**. For more information, see "Configuring HTTP Options" on page 18.
18. To configure client-server verification over SSL, click **SSL Options**. For more information, see "Configuring SSL Verification" on page 19.
19. To configure advanced driver options, click **Advanced Options**. For more information, see "Configuring Advanced Options" on page 17.
20. To configure server-side properties, click **Advanced Options** and then click **Server Side Properties**. For more information, see "Configuring Server-Side Properties" on page 20.

21. To configure the Temporary Table feature, click **Advanced Options** and then click **Temporary Table Configuration**. For more information, see "Configuring the Temporary Table Feature" on page 21 and "Temporary Tables" on page 61.

    Important: When connecting to Hive 0.14 or later, the Temporary Tables feature is always enabled and you do not need to configure it in the driver.
22. To configure logging behavior for the driver, click **Logging Options**. For more information, see "Configuring Logging Options" on page 22.
23. To test the connection, click **Test**. Review the results as needed, and then click **OK**.

    Note: If the connection fails, then confirm that the settings in the Hortonworks Hive ODBC Driver DSN Setup dialog box are correct. Contact your Hive server administrator as needed.
24. To save your settings and close the Hortonworks Hive ODBC Driver DSN Setup dialog box, click **OK**.
25. To close the ODBC Data Source Administrator, click **OK**.

Configuring a DSN-less Connection

Some client applications provide support for connecting to a data source using a driver without a Data Source Name (DSN). To configure a DSN-less connection, you can use a connection string or the Hortonworks Hive ODBC Driver Configuration tool that is installed with the Hortonworks Hive ODBC Driver with SQL Connector. The following section explains how to use the driver configuration tool. For information about using connection strings, see "DSN-less Connection String Examples" on page 54.

To configure a DSN-less connection using the driver configuration tool:

1. Choose one:
    - If you are using Windows 7 or earlier, click **Start**, then click **All Programs**, and then click the **Hortonworks Hive ODBC Driver 2.1** program group corresponding to the bitness of the client application accessing data in Hadoop / Hive.
    - Or, if you are using Windows 8 or later, click the arrow button at the bottom of the Start screen, and then find the **Hortonworks Hive ODBC Driver 2.1** program group corresponding to the bitness of the client application accessing data in Hadoop / Hive.
2. Click **Driver Configuration**, and then click **OK** if prompted for administrator permission to make modifications to the machine.

    Note: You must have administrator access to the machine to run this application because it makes changes to the registry.
3. In the **Hive Server Type** drop-down list, select **Hive Server 1** or **Hive Server 2**.

    Note: If you are connecting through Apache ZooKeeper, then **Hive Server 1** is not supported.

4. Choose one:
   - To connect to Hive without using the Apache ZooKeeper service, in the **Service Discovery Mode** drop-down list, select **No Service Discovery**.
   - Or, to enable the driver to discover Hive Server 2 services via the ZooKeeper service, in the **Service Discovery Mode** drop-down list, select **ZooKeeper.**
5. In the **ZooKeeper Namespace** field, if you selected **ZooKeeper** above, then type the namespace on ZooKeeper under which Hive Server 2 znodes are added. Otherwise, do not type a value in the field.
6. In the Authentication area, configure authentication as needed. For more information, see "Configuring Authentication" on page 12.

   Note: Hive Server 1 does not support authentication. Most default configurations of Hive Server 2 require User Name authentication. To verify the authentication mechanism that you need to use for your connection, check the configuration of your Hadoop / Hive distribution. For more information, see "Authentication Options" on page 52.
7. Optionally, if the operations against Hive are to be done on behalf of a user that is different than the authenticated user for the connection, then in the **Delegation UID** field, type the name of the user to be delegated.

   Note: This option is applicable only when connecting to a Hive Server 2 instance that supports this feature.
8. In the **Thrift Transport** drop-down list, select the transport protocol to use in the Thrift layer.
9. If the Thrift Transport option is set to HTTP, then to configure HTTP options such as custom headers, click **HTTP Options**. For more information, see "Configuring HTTP Options" on page 18.
10. To configure client-server verification over SSL, click **SSL Options**. For more information, see "Configuring SSL Verification" on page 19.
11. To configure advanced options, click **Advanced Options**. For more information, see "Configuring Advanced Options" on page 17.
12. To configure server-side properties, click **Advanced Options** and then click **Server Side Properties**. For more information, see "Configuring Server-Side Properties" on page 20.
13. To configure the Temporary Table feature, click **Advanced Options** and then click **Temporary Table Configuration**. For more information, see "Temporary Tables" on page 61 and "Configuring the Temporary Table Feature" on page 21.

    Important: When connecting to Hive 0.14 or later, the Temporary Tables feature is always enabled and you do not need to configure it in the driver.
14. To save your settings and close the Hortonworks Hive ODBC Driver Configuration tool, click **OK**.

Configuring Authentication

Some Hive servers are configured to require authentication for access. To connect to a Hive server, you must configure the Hortonworks Hive ODBC Driver with SQL Connector to use the authentication mechanism that matches the access requirements of the server and provides the necessary credentials.

For information about how to determine the type of authentication your Hive server requires, see "Authentication Options" on page 52.

ODBC applications that connect to Hive Server 2 using a DSN can pass in authentication credentials by defining them in the DSN. To configure authentication for a connection that uses a DSN, use the ODBC Data Source Administrator.

Normally, applications that are not Hive Server 2 aware and that connect using a DSN-less connection do not have a facility for passing authentication credentials to the Hortonworks Hive ODBC Driver with SQL Connector for a connection. However, the Hortonworks Hive ODBC Driver Configuration tool enables you to configure authentication without using a DSN.

Important: Credentials defined in a DSN take precedence over credentials configured using the driver configuration tool. Credentials configured using the driver configuration tool apply for all connections that are made using a DSN-less connection unless the client application is Hive Server 2 aware and requests credentials from the user.

Using No Authentication

When connecting to a Hive server of type Hive Server 1, you must use No Authentication. When you use No Authentication, Binary is the only Thrift transport protocol that is supported.

To configure a connection without authentication:

1. Choose one:
   - 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**.
   - Or, to access authentication options for a DSN-less connection, open the Hortonworks Hive ODBC Driver Configuration tool.
2. In the **Mechanism** drop-down list, select **No Authentication**.
3. If the Hive server is configured to use SSL, then click **SSL Options** to configure SSL for the connection. For more information, see "Configuring SSL Verification" on page 19.
4. To save your settings and close the dialog box, click **OK**.

Example connection string for Hive Server 1:

```
Driver=Hortonworks Hive ODBC Driver;Host=hs1_host;
Port=hs1_port;HiveServerType=1;AuthMech=0;Schema=Hive_database
```

Example connection string for Hive Server 2:

```
Driver=Hortonworks Hive ODBC Driver;Host=hs2_host;
Port=hs2_port;HiveServerType=2;AuthMech=0;Schema=Hive_database
```

Using Kerberos

Kerberos must be installed and configured before you can use this authentication mechanism. For more information, see "Configuring Kerberos Authentication for Windows" on page 25.

This authentication mechanism is available only for Hive Server 2 on non-HDInsight distributions. When you use Kerberos authentication, the Binary transport protocol is not supported.

To configure Kerberos authentication:

1. Choose one:
   - 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**.
   - Or, to access authentication options for a DSN-less connection, open the Hortonworks Hive ODBC Driver Configuration tool.
2. In the **Mechanism** drop-down list, select **Kerberos**.
3. Choose one:
   - To use the default realm defined in your Kerberos setup, leave the **Realm** field empty.
   - Or, if your Kerberos setup does not define a default realm or if the realm of your Hive Server 2 host is not the default, then, in the **Realm** field, type the Kerberos realm of the Hive Server 2.
4. In the **Host FQDN** field, type the fully qualified domain name of the Hive Server 2 host.

   Note: To use the Hive server host name as the fully qualified domain name for Kerberos authentication, in the **Host FQDN** field, type **_HOST**.
5. In the **Service Name** field, type the service name of the Hive server.
6. In the **Thrift Transport** drop-down list, select the transport protocol to use in the Thrift layer.

   Important: When using this authentication mechanism, the Binary transport protocol is not supported.

7. If the Hive server is configured to use SSL, then click **SSL Options** to configure SSL for the connection. For more information, see "Configuring SSL Verification" on page 19.
8. Optionally, in the **Transport Buffer Size** field, type the number of bytes to reserve in memory for buffering unencrypted data from the network.
9. To save your settings and close the dialog box, click **OK**.

Example connection string:

```
Driver=Hortonworks Hive ODBC Driver;Host=hs2_host;
Port=hs2_port;HiveServerType=2;AuthMech=1;ThriftTransport=SASL;
Schema=Hive_database;KrbRealm=Kerberos_Realm;
KrbHostFQDN=hs2_fully_qualified_domain_name;
KrbServiceName=hs2_service_name
```

Using User Name

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

This authentication mechanism is available only for Hive Server 2 on non-HDInsight distributions. Most default configurations of Hive Server 2 require User Name authentication. When you use User Name authentication, SSL is not supported and SASL is the only Thrift transport protocol available.

To configure User Name authentication:

1. Choose one:
   - 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**.
   - Or, to access authentication options for a DSN-less connection, open the Hortonworks Hive ODBC Driver Configuration tool.
2. In the **Mechanism** drop-down list, select **User Name**.
3. In the **User Name** field, type an appropriate user name for accessing the Hive server.
4. Optionally, in the **Transport Buffer Size** field, type the number of bytes to reserve in memory for buffering unencrypted data from the network.
5. To save your settings and close the dialog box, click **OK**.

Example connection string:

```
Driver=Hortonworks Hive ODBC Driver;Host=hs2_host;
Port=hs2_port;HiveServerType=2;AuthMech=2;Schema=Hive_database;
UID=user_name
```

Using User Name And Password

This authentication mechanism requires a user name and a password.

This authentication mechanism is available only for Hive Server 2 on non-HDInsight distributions.

To configure User Name And Password authentication:

1. To access authentication options, open the ODBC Data Source Administrator where you created the DSN, then select the DSN, and then click **Configure**.
2. Choose one:
   - 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**.
   - Or, to access authentication options for a DSN-less connection, open the Hortonworks Hive ODBC Driver Configuration tool.
3. In the **Mechanism** drop-down list, select **User Name And Password**.
4. In the **User Name** field, type an appropriate user name for accessing the Hive server.
5. In the **Password** field, type the password corresponding to the user name you typed above.
6. To save the password, select the **Save Password (Encrypted)** check box.

   Important: The password is obscured, that is, not saved in plain text. However, it is still possible for the encrypted password to be copied and used.
7. In the **Thrift Transport** drop-down list, select the transport protocol to use in the Thrift layer.
8. If the Hive server is configured to use SSL, then click **SSL Options** to configure SSL for the connection. For more information, see "Configuring SSL Verification" on page 19.
9. Optionally, in the **Transport Buffer Size** field, type the number of bytes to reserve in memory for buffering unencrypted data from the network.
10. Optionally, to use SASL to handle authentication, select the **Use Simple Authentication and Security Layer (SASL)** check box.
11. To save your settings and close the dialog box, click **OK**.

Example connection string:

```
Driver=Hortonworks Hive ODBC Driver;Host=hs2_host;
Port=hs2_port;HiveServerType=2;AuthMech=3;ThriftTransport=SASL;
Schema=Hive_database;UID=user_name;PWD=password
```

Using Windows Azure HDInsight Emulator

This authentication mechanism is available only for Hive Server 2 instances running on Windows Azure HDInsight Emulator. When you use this authentication mechanism, SSL is not supported and HTTP is the only Thrift transport protocol available.

To configure a connection to a Hive server on Windows Azure HDInsight Emulator:

1. Choose one:
   - 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**.
   - Or, to access authentication options for a DSN-less connection, open the Hortonworks Hive ODBC Driver Configuration tool.
2. In the **Mechanism** drop-down list, select **Windows Azure HDInsight Emulator**.
3. In the **HTTP Path** field, type the partial URL corresponding to the Hive server.
4. In the **User Name** field, type an appropriate user name for accessing the Hive server.
5. In the **Password** field, type the password corresponding to the user name you specified above.
6. Click **HTTP Options**, and in the **HTTP Path** field, type the partial URL corresponding to the Hive server. Click **OK** to save your HTTP settings and close the dialog box.

   Note: If necessary, you can create custom HTTP headers. For more information, see "Configuring HTTP Options" on page 18.
7. To save your settings and close the dialog box, click **OK**.

   Example connection string:

```
Driver=Hortonworks Hive ODBC Driver;
Host=HDInsight_Emulator_host;
Port=HDInsight_Emulator_port;HiveServerType=2;AuthMech=5;
Schema=Hive_database;UID=user_name;PWD=password;
HTTPPath=hs2_HTTP_path
```

Using Windows Azure HDInsight Service

This authentication mechanism is available only for Hive Server 2 on HDInsight distributions. When you use this authentication mechanism, you must enable SSL and HTTP is the only Thrift transport protocol available.

To configure a connection to a Hive server on Windows Azure HDInsight Service:

1. Choose one:
   - 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**.

- Or, to access authentication options for a DSN-less connection, open the Hortonworks Hive ODBC Driver Configuration tool.

2. In the **Mechanism** drop-down list, select **Windows Azure HDInsight Service**.
3. In the **HTTP Path** field, type the partial URL corresponding to the Hive server.
4. In the **User Name** field, type an appropriate user name for accessing the Hive server.
5. In the **Password** field, type the password corresponding to the user name you typed abpve.
6. Click **HTTP Options**, and in the **HTTP Path** field, type the partial URL corresponding to the Hive server. Click **OK** to save your HTTP settings and close the dialog box.

   Note: If necessary, you can create custom HTTP headers. For more information, see "Configuring HTTP Options" on page 18.
7. Click **SSL Options** and configure SSL settings as needed. For more information, see "Configuring SSL Verification" on page 19.
8. Click **OK** to save your SSL configuration and close the dialog box, and then click **OK** to save your authentication settings and close the dialog box.

   Example connection string:

```
Driver=Hortonworks Hive ODBC Driver;
Host=Azure_HDInsight_Service_host;Port=443;
HiveServerType=2;AuthMech=6;SSL=1;Schema=Hive_database;
UID=user_name;PWD=password;HTTPPath=hs2_HTTP_path
```

Configuring Advanced Options

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

To configure advanced options:

1. Choose one:
   - To access advanced options for a DSN, open the ODBC Data Source Administrator where you created the DSN, then select the DSN, then click **Configure**, and then click **Advanced Options**.
   - Or, to access advanced options for a DSN-less connection, open the Hortonworks Hive ODBC Driver Configuration tool, and then click **Advanced Options**.
2. To disable the SQL Connector feature, select the **Use Native Query** check box.
3. To defer query execution to SQLExecute, select the **Fast SQLPrepare** check box.
4. To allow driver-wide configurations to take precedence over connection and DSN settings, select the **Driver Config Take Precedence** check box.
5. To use the asynchronous version of the API call against Hive for executing a query, select the **Use Async Exec** check box.

Note: This option is applicable only when connecting to a Hive cluster running Hive 0.12.0 or later.

6. To retrieve the names of tables in a database by using the SHOW TABLES query, select the **Get Tables With Query** check box.

   Note: This option is applicable only when connecting to Hive Server 2.

7. To enable the driver to return SQL_WVARCHAR instead of SQL_VARCHAR for STRING and VARCHAR columns, and SQL_WCHAR instead of SQL_CHAR for CHAR columns, select the **Unicode SQL Character Types** check box.
8. To enable the driver to return the hive_system table for catalog function calls such as SQLTables and SQLColumns, select the **Show System Table** check box.
9. To handle Kerberos authentication using the SSPI plugin instead of MIT Kerberos by default, select the **Use Only SSPI** check box.
10. To enable the driver to automatically open a new session when the existing session is no longer valid, select the **Invalid Session Auto Recover** check box.

    Note: This option is applicable only when connecting to Hive Server 2.

11. In the **Rows Fetched Per Block** field, type the number of rows to be fetched per block.
12. In the **Default String Column Length** field, type the maximum data length for STRING columns.
13. In the **Binary Column Length** field, type the maximum data length for BINARY columns.
14. In the **Decimal Column Scale** field, type the maximum number of digits to the right of the decimal point for numeric data types.
15. In the **Async Exec Poll Interval (ms)** field, type the time in milliseconds between each poll for the query execution status.

    Note: This option is applicable only to HDInsight clusters.

16. In the **Socket Timeout** field, type the number of seconds that an operation can remain idle before it is closed.

    Note: This option is applicable only when asynchronous query execution is being used against Hive Server 2 instances.

17. To save your settings and close the Advanced Options dialog box, click **OK**.

Configuring HTTP Options

You can configure options such as custom headers when using the HTTP transport protocol in the Thrift layer.

To configure HTTP options:

1. Choose one:
   - If you are configuring HTTP for a DSN, open the ODBC Data Source Administrator where you created the DSN, then select the DSN, then click **Configure**, and then make sure that the Thrift Transport option is set to **HTTP**.
   - Or, if you are configuring HTTP for a DSN-less connection, open the Hortonworks Hive ODBC Driver Configuration tool and then make sure that the Thrift Transport option is set to **HTTP**.
2. To access HTTP options, click **HTTP Options**.

   Note: The HTTP options are available only when the Thrift Transport option is set to HTTP.
3. In the **HTTP Path** field, type the partial URL corresponding to the Hive server.
4. To create a custom HTTP header, click **Add**, then type appropriate values in the **Key** and **Value** fields, and then click **OK**.
5. To edit a custom HTTP header, select the header from the list, then click **Edit**, then update the **Key** and **Value** fields as needed, and then click **OK**.
6. To delete a custom HTTP header, select the header from the list, and then click **Remove**. In the confirmation dialog box, click **Yes**.
7. To save your settings and close the HTTP Options dialog box, click **OK**.

Configuring SSL Verification

You can configure verification between the client and the Hive server over SSL.

To configure SSL verification:

1. Choose one:
   - To access SSL options for a DSN, open the ODBC Data Source Administrator where you created the DSN, then select the DSN, then click **Configure**, and then click **SSL Options**.
   - Or, to access advanced options for a DSN-less connection, open the Hortonworks Hive ODBC Driver Configuration tool, and then click **SSL Options**.
2. Select the **Enable SSL** check box.
3. To allow self-signed certificates from the server, select the **Allow Self-signed Server Certificate** check box.
4. To allow the common name of a CA-issued SSL certificate to not match the host name of the Hive server, select the **Allow Common Name Host Name Mismatch** check box.

5. Choose one:
   - To configure the driver to load SSL certificates from a specific PEM file when verifying the server, specify the full 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.
6. To configure two-way SSL verification, select the **Two Way SSL** check box and then do the following:
   a. In the **Client Certificate File** field, specify the full path of the PEM file containing the client's certificate.
   b. In the **Client Private Key File** field, specify the full path of the file containing the client's private key.
   c. If the private key file is protected with a password, type the password in the **Client Private Key Password** field. To save the password, select the **Save Password (Encrypted)** check box.

      Important: The password is obscured, that is, not saved in plain text. However, it is still possible for the encrypted password to be copied and used.
7. To save your settings and close the SSL Options dialog box, click **OK**.

Configuring Server-Side Properties

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

To configure server-side properties:

1. Choose one:
   - To configure server-side properties for a DSN, open the ODBC Data Source Administrator where you created the DSN, then select the DSN, then click **Configure**, then click **Advanced Options**, and then click **Server Side Properties**.
   - Or, to configure server-side properties for a DSN-less connection, open the Hortonworks Hive ODBC Driver Configuration tool, 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**. For example, to set the value of the `mapreduce.job.queuename` property to `myQueue`, type **mapreduce.job.queuename** in the **Key** field and then type **myQueue** in the **Value** field.

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

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 change the method that the driver uses to apply server-side properties, do one of the following:
   - To configure the driver to apply each server-side property by executing a query when opening a session to the Hive server, select the **Apply Server Side Properties With Queries** check box.
   - Or, to configure the driver to use a more efficient method for applying server-side properties that does not involve additional network round-tripping, clear the **Apply Server Side Properties With Queries** check box.

   Note: The more efficient method is not available for Hive Server 1, and it might not be compatible with some Hive Server 2 builds. If the server-side properties do not take effect when the check box is clear, then select the check box.
6. To configure the driver to convert server-side property key names to all lower-case characters, select the **Convert Key Name To Lower Case** check box.
7. To save your settings and close the Server Side Properties dialog box, click **OK**.

Configuring the Temporary Table Feature

You can configure the driver to create temporary tables. For more information about this feature, including details about the statement syntax used for temporary tables, see "Temporary Tables" on page 61.

Important: When connecting to Hive 0.14 or later, the Temporary Tables feature is always enabled and you do not need to configure it in the driver.

To configure the Temporary Table feature:

1. Choose one:
   - To configure the temporary table feature for a DSN, 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 **Temporary Table Configuration**.
   - Or, to configure the temporary table feature for a DSN-less connection, open the Hortonworks Hive ODBC Driver Configuration tool, then click **Advanced Options**, and then click **Temporary Table Configuration**.

2. To enable the Temporary Table feature, select the **Enable Temporary Table** check box.
3. In the **Web HDFS Host** field, type the host name or IP address of the machine hosting both the namenode of your Hadoop cluster and the WebHDFS service. If this field is left blank, then the host name of the Hive server is used.
4. In the **Web HDFS Port** field, type the WebHDFS port for the namenode.
5. In the **HDFS User** field, type the name of the HDFS user that the driver uses to create the necessary files for supporting the Temporary Table feature.
6. In the **Data File HDFS Dir** field, type the HDFS directory that the driver uses to store the necessary files for supporting the Temporary Table feature.

   Note: Due to a known issue in Hive (see https://issues.apache.org/jira/browse/HIVE-4554), HDFS paths with space characters do not work with versions of Hive prior to 0.12.0.
7. In the **Temp Table TTL** field, type the number of minutes that a temporary table is guaranteed to exist in Hive after it is created.
8. To save your settings and close the Temporary Table Configuration dialog box, click **OK**.

Configuring Logging Options

To help troubleshoot issues, you can enable logging. In addition to functionality provided in the Hortonworks Hive ODBC Driver with SQL Connector, the ODBC Data Source Administrator provides tracing functionality.

Important: Only enable logging or tracing long enough to capture an issue. Logging or tracing 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. The following table lists the logging levels provided by the Hortonworks Hive ODBC Driver with SQL Connector, in order from least verbose to most verbose.

Table 1. Hortonworks Hive ODBC Driver with SQL Connector Logging Levels

Logging Level	Description
OFF	Disables all logging.
FATAL	Logs very severe error events that will lead the driver to abort.
ERROR	Logs error events that might still allow the driver to continue running.

Logging Level	Description
WARNING	Logs potentially harmful situations.
INFO	Logs general information that describes the progress of the driver.
DEBUG	Logs detailed information that is useful for debugging the driver.
TRACE	Logs more detailed information than the DEBUG level.

To enable driver logging:

1. To access logging options, open the ODBC Data Source Administrator where you created the DSN, then select the DSN, then click **Configure**, and then click **Logging Options**.
2. From the **Log Level** drop-down list, select the desired level of information to include in log files.
3. In the **Log Path** field, specify 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. In the **Max Number Files** field, type the maximum number of log files to keep.

   Note: After the maximum number of log files is reached, each time an additional file is created, the driver deletes the oldest log file.
6. In the **Max File Size** field, type the maximum size of each log file in megabytes (MB).

   Note: After the maximum file size is reached, the driver creates a new file and continues logging.
7. Click **OK**.
8. Restart your ODBC application to make sure that the new settings take effect.

The Hortonworks Hive ODBC Driver with SQL Connector produces a log file named `HiveODBC_driver.log` at the location that you specify in the Log Path field.

To disable driver logging:

1. Open the ODBC Data Source Administrator where you created the DSN, then select the DSN, then click **Configure**, and then click **Logging Options**.
2. From the **Log Level** drop-down 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 more information about tracing using the ODBC Data Source Administrator, see "How to Generate an ODBC Trace with ODBC Data Source Administrator" on the Microsoft Support website: http://support.microsoft.com/kb/274551.

Installing and Customizing a Tableau TDC File

A Tableau Data-connection Customization (TDC) file helps configure Tableau to operate more efficiently using the Hortonworks Hive ODBC Driver with SQL Connector.

Important:
Make sure that your TDC file contains the following lines:

```
<vendor name='Hive' />
<driver name='Hortonworks Hive ODBC Driver' />
```

To install a .TDC file:

1. Copy the TDC file to the `\Documents\My Tableau Repository\DataSources` directory.
2. Restart Tableau.

For more information about TDC files, see "Using a .tdc File with Tableau Server" in the Tableau Knowledge Base: http://kb.tableau.com/articles/howto/using-a-tdc-file-with-tableau-server.

For detailed information about customizing your TDC file, see "Customizing and Tuning ODBC Connections" in the Tableau Knowledge Base: http://kb.tableau.com/articles/knowledgebase/customizing-odbc-connections.

Configuring Kerberos Authentication for Windows

Active Directory

The Hortonworks Hive ODBC Driver with SQL Connector supports Active Directory Kerberos on Windows. There are two prerequisites for using Active Directory Kerberos on Windows:

- MIT Kerberos is not installed on the client Windows machine.
- The MIT Kerberos Hadoop realm has been configured to trust the Active Directory realm so that users in the Active Directory realm can access services in the MIT Kerberos Hadoop realm. For more information, see "Setting up One-Way Trust with Active Directory" in the Hortonworks documentation: http://docs.hortonworks.com/HDPDocuments/HDP2/HDP-2.1.7/bk_installing_manually_book/content/ch23s05.html.

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: http://web.mit.edu/kerberos/.

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 above.
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 an `.ini` file in the default location, which is 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 Microsoft 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. You can obtain this file from your Kerberos administrator, or from the `/etc/krb5.conf` folder on the machine that is hosting the Hive Server 2 instance.
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. You can obtain this file from your Kerberos administrator, or from the `/etc/krb5.conf` folder on the machine that is hosting the Hive Server 2 instance.
2. Place the `krb5.conf` file in an accessible directory and make note of the full path name.
3. Open the System window:
   - If you are using Windows 7 or earlier, click **Start**, then right-click **Computer**, and then click **Properties**.
   - Or, if you are using Windows 8 or later, right-click **This PC** on the Start screen, 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 **KRB5_CONFIG**.
8. In the **Variable Value** field, type the full path to the `krb5.conf` file.
9. Click **OK** to save the new variable.
10. Make sure 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 a directory named `C:\temp`.
2. Open the System window:
   - If you are using Windows 7 or earlier, click **Start**, then right-click **Computer**, and then click **Properties**.
   - Or, if you are using Windows 8 or later, right-click **This PC** on the Start screen, 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 above, and then append the file name `krb5cache`. For example, if you created the folder `C:\temp`, 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, make sure that the `krb5cache` file does not already exist as a file or a directory.
8. Click **OK** to save the new variable.
9. Make sure 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 make sure that Kerberos uses the new settings, restart your machine.

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. Open MIT Kerberos Ticket Manager.
2. In MIT Kerberos Ticket Manager, click **Get Ticket**.
3. 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 MIT Kerberos Ticket Manager.

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

1. Open a command prompt:
   - If you are using Windows 7 or earlier, click **Start**, then click **All Programs**, then click **Accessories**, and then click **Command Prompt**.
   - If you are using Windows 8 or later, click the arrow button at the bottom of the Start screen, then find the Windows System program group, and then click **Command Prompt**.
2. In the Command Prompt, type a command using the following syntax:

   ```
   kinit -k -t [KeytabPath] [Principal]
   ```

   [KeytabPath] is the full path to the keytab file. For example: `C:\mykeytabs\myUser.keytab`.

   [Principal] is the Kerberos user principal to use for authentication. For example: `myUser@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\myUser.keytab myUser@EXAMPLE.COM
   -c C:\ProgramData\MIT\krbcache
   ```

   `Krbcache` is the Kerberos cache file, not a directory.

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

Note: For information about configuring a default keytab file for your Kerberos configuration, refer to the MIT Kerberos documentation.

1. Open a command prompt:
   - If you are using Windows 7 or earlier, click **Start**, then click **All Programs**, then click **Accessories**, and then click **Command Prompt**.
   - If you are using Windows 8 or later, click the arrow button at the bottom of the Start screen, then find the Windows System program group, and then click **Command Prompt**.
2. In the Command Prompt, type a command using the following syntax:

   ```
   kinit -k [principal]
   ```

   [principal] is the Kerberos user principal to use for authentication. For example: `MyUser@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\myUser.keytab myUser@EXAMPLE.COM
-c C:\ProgramData\MIT\krbcache
```

`Krbcache` is the Kerberos cache file, not a directory.

Verifying the Version Number

If you need to verify the version of the Hortonworks Hive ODBC Driver with SQL Connector that is installed on your Windows machine, you can find the version number in the ODBC Data Source Administrator.

To verify the version number:

1. Open the ODBC Administrator:
   - If you are using Windows 7 or earlier, click **Start**, then click **All Programs**, then click the **Hortonworks Hive ODBC Driver 2.1** program group corresponding to the bitness of the client application accessing data in Hive, and then click **ODBC Administrator**.
   - Or, if you are using Windows 8 or later, on the Start screen, type **ODBC administrator**, and then click the **ODBC Administrator** search result corresponding to the bitness of the client application accessing data in Hive.
2. Click the **Drivers** tab and then find the Hortonworks Hive ODBC Driver in the list of ODBC drivers that are installed on your system. The version number is displayed in the **Version** column.

Linux Driver

Linux System Requirements

You install the Hortonworks Hive ODBC Driver with SQL Connector on client machines that access data stored in a Hadoop cluster with the Hive service installed and running. Each machine that you install the driver on must meet the following minimum system requirements:

- One of the following distributions:
  - Red Hat® Enterprise Linux® (RHEL) 5, 6, or 7
  - CentOS 5, 6, or 7
  - SUSE Linux Enterprise Server (SLES) 11 or 12
- 150 MB of available disk space
- One of the following ODBC driver managers installed:
  - iODBC 3.52.7 or later
  - unixODBC 2.2.14 or later

The driver supports Apache Hive versions 0.11 through 1.2.

Installing the Driver

There are two versions of the driver for Linux:

- `hive-odbc-native-32bit-`*`[Version]`*`-`*`[Release]`*`.`*`[LinuxDistro]`*`.i686.rpm` for the 32-bit driver
- `hive-odbc-native-`*`[Version]`*`-`*`[Release]`*`.`*`[LinuxDistro]`*`.x86_64.rpm` for the 64-bit driver

[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 bitness of the driver that you select should match the bitness of the client application accessing your Hadoop / Hive-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.

Important: Make sure that you install the driver using the RPM corresponding to your Linux distribution.

The Hortonworks Hive ODBC Driver with SQL Connector driver files are installed in the following directories:

- `/usr/lib/hive/lib/native/hiveodbc` contains release notes, the *Hortonworks Hive ODBC Driver with SQL Connector User Guide* in PDF format, and a `Readme.txt` file that provides plain text installation and configuration instructions.
- `/usr/lib/hive/lib/native/hiveodbc/ErrorMessages` contains error message files required by the driver.
- `/usr/lib/hive/lib/native/Linux-i386-32` contains the 32-bit driver and the `hortonworks.hiveodbc.ini` configuration file.
- `/usr/lib/hive/lib/native/Linux-amd64-64` contains the 64-bit driver and the `hortonworks.hiveodbc.ini` configuration file.

To install the Hortonworks Hive ODBC Driver with SQL Connector:

1. Choose one:
   - 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:

     ```
     yum --nogpgcheck localinstall [RPMFileName]
     ```
   - Or, in SUSE Linux Enterprise Server, 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:

     ```
     zypper install [RPMFileName]
     ```

The Hortonworks Hive ODBC Driver with SQL Connector depends on the following resources:

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

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:

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

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

For information about creating ODBC connections using the Hortonworks Hive ODBC Driver with SQL Connector, see "Configuring ODBC Connections for Non-Windows Platforms" on page 37.

Verifying the Version Number

If you need to verify the version of the Hortonworks Hive ODBC Driver with SQL Connector that is installed on your Linux machine, you can query the version number through the command-line interface.

To verify the version number:

- Depending on your version of Linux, at the command prompt, run one of the following commands:

```
yum list | grep hive-odbc-native
rpm -qa | grep hive-odbc-native
```

The command returns information about the Hortonworks Hive ODBC Driver with SQL Connector that is installed on your machine, including the version number.

Mac OS X Driver

Installing the Driver on Mac OSX

The Hortonworks Hive ODBC Driver with SQL Connector supports both 32- and 64-bit client applications.

You install the Hortonworks Hive ODBC Driver with SQL Connector on client machines that access data stored in a Hadoop cluster with the Hive service installed and running. Each machine that you install the driver on must meet the following minimum system requirements:

- Mac OS X version 10.9 or 10.10
- 100 MB of available disk space
- iODBC 3.52.7 or later

The driver supports Apache Hive versions 0.11 through 1.2.

The Hortonworks Hive ODBC Driver with SQL Connector driver files are installed in the following directories:

- `/opt/hortonworks/hiveodbc` contains release notes and the *Hortonworks Hive ODBC Driver with SQL Connector User Guide* in PDF format.
- `/opt/hortonworks/hiveodbc/ErrorMessages` contains error message files required by the driver.
- `/opt/hortonworks/hiveodbc/Setup` contains sample configuration files named `odbc.ini` and `odbcinst.ini`.
- `/opt/hortonworks/hiveodbc/lib` contains the driver binaries and the `hortonworks.hiveodbc.ini` configuration file.

To install the Hortonworks Hive ODBC Driver with SQL Connector:

1. Double-click **hive-odbc-native.dmg** to mount the disk image.
2. Double-click **hive-odbc-native.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**, then 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=$DYLD_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 Hortonworks Hive ODBC Driver with SQL Connector, see "Configuring ODBC Connections for Non-Windows Platforms" on page 37.

Verifying the Version Number

If you need to verify the version of the Hortonworks Hive ODBC Driver with SQL Connector that is installed on your Mac OS X machine, you can query the version number through the Terminal.

To verify the version number:

- At the Terminal, run the following command:

```
pkgutil --info com.hortonworks.hiveodbc
```

The command returns information about the Hortonworks Hive ODBC Driver with SQL Connector that is installed on your machine, including the version number.

Debian Driver

Installing the Driver on Debian

You install the Hortonworks Hive ODBC Driver with SQL Connector on client machines that access data stored in a Hadoop cluster with the Hive service installed and running. Each machine that you install the driver on must meet the following minimum system requirements:

- Debian 6 or 7 (Ubuntu 12.04 LTS and Ubuntu 14.04 LTS)
- 150 MB of available disk space
- One of the following ODBC driver managers installed:
  - iODBC 3.52.7 or later
  - unixODBC 2.2.14 or later

The driver supports Apache Hive versions 0.11 through 1.2. It supports both 32- and 64-bit client applications.

There are two versions of the driver for Debian:

- `hive-odbc-native-32bit-[Version]-[Release]_i386.deb` for the 32-bit driver
- `hive-odbc-native-[Version]-[Release]_amd64.deb` for the 64-bit driver

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

The bitness of the driver that you select should match the bitness of the client application accessing your Hadoop / Hive-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 Debian support both 32- and 64-bit applications. Verify the bitness of your intended application and install the appropriate version of the driver.

The Hortonworks Hive ODBC Driver with SQL Connector driver files are installed in the following directories:

- `/usr/lib/hive/lib/native/hiveodbc/ErrorMessages` contains error message files required by the driver.
- `/usr/lib/hive/lib/native/hiveodbc/Setup` contains sample configuration files named `odbc.ini` and `odbcinst.ini`.
- `/usr/lib/hive/lib/native/Linux-i386-32` contains the 32-bit driver and the `hortonworks.hiveodbc.ini` configuration file.
- `/usr/lib/hive/lib/native/Linux-amd64-64` contains the 64-bit driver and the `hortonworks.hiveodbc.ini` configuration file.

To install the Hortonworks Hive ODBC Driver with SQL Connector:

1. In Ubuntu, log in as the root user, then navigate to the folder containing the driver Debian packages to install, and double-click **hive-odbc-native-32bit-*Version*-*Release*_i386.deb** or **hive-odbc-native-*Version*-*Release*_amd64.deb**.
2. Follow the instructions in the installer to complete the installation process.

The Hortonworks Hive ODBC Driver with SQL Connector 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 Ubuntu 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 path 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:

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

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

For information about creating ODBC connections using the Hortonworks Hive ODBC Driver with SQL Connector, see "Configuring ODBC Connections for Non-Windows Platforms" on page 37.

Verifying the Version Number

If you need to verify the version of the Hortonworks Hive ODBC Driver with SQL Connector that is installed on your Debian machine, you can query the version number through the command-line interface.

To verify the version number:

- At the command prompt, run the following command:

```
dpkg -l | grep hive-odbc-native
```

The command returns information about the Hortonworks Hive ODBC Driver with SQL Connector that is installed on your machine, including the version number.

Configuring ODBC Connections for Non-Windows Platforms

The following sections describe how to configure ODBC connections when using the Hortonworks Hive ODBC Driver with SQL Connector with non-Windows platforms:

- "Configuration Files" on page 37
- "Sample Configuration Files" on page 38
- "Configuring the Environment" on page 38
- "Defining DSNs in odbc.ini" on page 39
- "Specifying ODBC Drivers in odbcinst.ini" on page 41
- "Configuring Driver Settings in hortonworks.hiveodbc.ini" on page 42
- "Configuring Service Discovery Mode" on page 42
- "Configuring Authentication" on page 43
- "Configuring SSL Verification" on page 46
- "Configuring Server-Side Properties" on page 47
- "Configuring Logging Options" on page 50
- "Testing the Connection" on page 48

Configuration Files

ODBC driver managers use configuration files to define and configure ODBC data sources and drivers. By default, the following configuration files are used:

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

These files are located in the user's home directory.

Also, by default the Hortonworks Hive ODBC Driver with SQL Connector is configured using the `hortonworks.hiveodbc.ini` file. This file is located in one of the following directories depending on the version of the driver that you are using:

- `/usr/lib/hive/lib/native/Linux-i386-32` for the 32-bit driver on Linux/Debian.
- `/usr/lib/hive/lib/native/Linux-amd64-64` for the 64-bit driver on Linux/Debian.
- `/opt/hortonworks/hiveodbc/lib/universal` for the driver on Mac OS X.

The `hortonworks.hiveodbc.ini` file is required.

Note: The `hortonworks.hiveodbc.ini` file in the `/lib` subfolder provides default settings for most configuration options available in the Hortonworks Hive ODBC Driver with SQL Connector.

You can set driver configuration options in your `odbc.ini` and `hortonworks.hiveodbc.ini` files. Configuration options set in a `hortonworks.hiveodbc.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 `hortonworks.hiveodbc.ini`. For information about the configuration options available for controlling the behavior of DSNs that are using the Hortonworks Hive ODBC Driver with SQL Connector, see "Driver Configuration Options" on page 64.

Sample Configuration Files

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

- `odbc.ini`
- `odbcinst.ini`

These sample configuration files provide preset values for settings related to the Hortonworks Hive ODBC Driver with SQL Connector.

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

If the configuration files do not exist in the home directory, then you can copy the sample configuration files to the home directory, and then rename the files. If the configuration files already exist in the home directory, then use the sample configuration files as a guide to modify the existing configuration files.

Configuring the Environment

Optionally, you can use three environment variables, ODBCINI, ODBCSYSINI, and HORTONWORKSHIVEINI, to specify different locations for the `odbc.ini`, `odbcinst.ini`, and `hortonworks.hiveodbc.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 HORTONWORKSHIVEINI to point to your `hortonworks.hiveodbc.ini` file.

For example, if your `odbc.ini` and `hortonworks.hiveodbc.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 HORTONWORKSHIVEINI=/etc/hortonworks.hiveodbc.ini
```

The following search order is used to locate the `hortonworks.hiveodbc.ini` file:

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

   Important: HORTONWORKSHIVEINI must specify the full path, including the file name.
2. The directory containing the driver's binary is searched for a file named `hortonworks.hiveodbc.ini` (not beginning with a period).
3. The current working directory of the application is searched for a file named `hortonworks.hiveodbc.ini` (not beginning with a period).
4. The directory `~/`, that is, $HOME, is searched for a hidden file named `.hortonworks.hiveodbc.ini` (beginning with a period).
5. The directory `/etc` is searched for a file named `hortonworks.hiveodbc.ini` (not beginning with a period).

Defining DSNs in odbc.ini

Note: If you are using a DSN-less connection, then you do not need to configure the `odbc.ini` file. For information about configuring a DSN-less connection, see "DSN-less Connection String Examples" on page 54.

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

- `[ODBC]` is optional. This section is used to control global ODBC configuration, such as ODBC tracing.
- `[ODBC Data Sources]` is required. This section lists the DSNs and associates them 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/Debian:

```
[ODBC]
InstallDir=/usr/local/odbc
[ODBC Data Sources]
Hortonworks Hive DSN 32=Hortonworks Hive ODBC Driver 32-bit
```

```
[Hortonworks HiveDSN 32]
Driver=/usr/lib/hive/lib/native/Linux-i386-
32/libhortonworkshiveodbc32.so
HOST=[MyHiveServer]
PORT=10000
```

[MyHiveServer] is the IP address or host name of the Hive server.

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

```
[ODBC]
InstallDir=/usr/local/odbc
[ODBC Data Sources]
Hortonworks Hive ODBC DSN=Hortonworks Hive ODBC Driver
[Hortonworks Hive ODBC DSN]
Driver=/opt/hortonworks/hiveodbc/lib/universal/libhortonworkshi
veodbc.dylib
HOST=[MyHiveServer]
PORT=10000
```

[MyHiveServer] is the IP address or host name of the Hive server.

To create a Data Source Name:

1. In a text editor, open the `odbc.ini` configuration file.
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. Add a new section to the file, with a section name that matches the DSN you specified above, and then add configuration options to the section. Specify the configuration options as key-value pairs.

   Note: Hive Server 1 does not support authentication. Most default configurations of Hive Server 2 require User Name authentication, which you configure by setting the `AuthMech` key to `2`. To verify the authentication mechanism that you need to use for your connection, check the configuration of your Hadoop / Hive distribution. For more information, see "Authentication Options" on page 52.
4. Save the `odbc.ini` configuration file.

For information about the configuration options available for controlling the behavior of DSNs that are using the Hortonworks Hive ODBC Driver with SQL Connector, see "Driver Configuration Options" on page 64.

Specifying ODBC Drivers in odbcinst.ini

ODBC drivers are defined in the `odbcinst.ini` configuration file. This configuration file is optional because drivers can be specified directly in the `odbc.ini` configuration file, as described in "Defining DSNs in odbc.ini" on page 39.

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

- `[ODBC Drivers]` lists the names of all the installed ODBC drivers.
- For each driver, a section having the same name as the driver name specified in the `[ODBC Drivers]` section lists the driver attributes and values.

The following is an example of an `odbcinst.ini` configuration file for Linux/Debian:

```
[ODBC Drivers]
Hortonworks Hive ODBC Driver 32-bit=Installed
Hortonworks Hive ODBC Driver 64-bit=Installed
[Hortonworks Hive ODBC Driver 32-bit]
Description=Hortonworks Hive ODBC Driver (32-bit)
Driver=/usr/lib/hive/lib/native/Linux-i386-
32/libhortonworkshiveodbc32.so
[Hortonworks Hive ODBC Driver 64-bit]
Description=Hortonworks Hive ODBC Driver (64-bit)
Driver=/usr/lib/hive/lib/native/Linux-amd64-
64/libhortonworkshiveodbc64.so
```

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

```
[ODBC Drivers]
Hortonworks Hive ODBC Driver=Installed
[Hortonworks Hive ODBC Driver]
Description=Hortonworks Hive ODBC Driver
Driver=/opt/hortonworks/hiveodbc/lib/universal/libhortonworkshi
veodbc.dylib
```

To define a driver:

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

   Note: Give the driver a symbolic name that you want to use to refer to the driver in connection strings or DSNs.
3. Add a new section to the file with a name that matches the driver name you typed above, and then add configuration options to the section based on the sample

odbcinst.ini file provided in the Setup directory. Specify the configuration options as key-value pairs.

4. Save the odbcinst.ini configuration file.

Configuring Driver Settings in hortonworks.hiveodbc.ini

The hortonworks.hiveodbc.ini file contains configuration settings for the Hortonworks Hive ODBC Driver with SQL Connector. Settings that you define in this file apply to all connections that use the driver.

You do not need to modify the settings in the hortonworks.hiveodbc.ini file to use the driver and connect to your data source.

However, to help troubleshoot issues, you can configure the hortonworks.hiveodbc.ini file to enable logging in the driver. For information about configuring logging, see "Configuring Logging Options" on page 50.

Configuring Service Discovery Mode

You can configure the Hortonworks Hive ODBC Driver with SQL Connector to discover Hive Server 2 services via ZooKeeper.

To enable service discovery via ZooKeeper:

1. Open the odbc.ini configuration file in a text editor.
2. Set the ServiceDiscoveryMode connection attribute to 1.
3. Set the ZKNamespace connection attribute to specify the namespace on ZooKeeper under which Hive Server 2 znodes are added.
4. Set the Host connection attribute to specify the ZooKeeper ensemble as a comma-separated list of ZooKeeper servers. For example, type the following, where *[ZK_Host]* is the IP address or host name of the ZooKeeper server and *[ZK_Port]* is the number of the TCP port that the ZooKeeper server uses to listen for client connections:

   [ZK_Host1]:*[ZK_Port1]*,*[ZK_Host2]*:*[ZK_Port2]*

   Important: When ServiceDiscoveryMode is set to 1, connections to Hive Server 1 are not supported and the Port connection attribute is not applicable.
5. Save the odbc.ini configuration file.

   Depending on whether service discovery mode is enabled or disabled, you might need to provide different connection attributes or values in your connection string or DSN. For more information about connection attributes, see "Driver Configuration Options" on page 64.

Configuring Authentication

Some Hive servers are configured to require authentication for access. To connect to a Hive server, you must configure the Hortonworks Hive ODBC Driver with SQL Connector to use the authentication mechanism that matches the access requirements of the server and provides the necessary credentials.

For information about how to determine the type of authentication your Hive server requires, see "Authentication Options" on page 52.

You can select the type of authentication to use for a connection by defining the `AuthMech` connection attribute in a connection string or in a DSN (in the `odbc.ini` file). Depending on the authentication mechanism you use, there might be additional connection attributes that you must define. For more information about the attributes involved in configuring authentication, see "Driver Configuration Options" on page 64.

Using No Authentication

When connecting to a Hive server of type Hive Server 1, you must use No Authentication. When you use No Authentication, Binary is the only Thrift transport protocol that is supported.

To configure a connection without authentication:

1. Set the `AuthMech` connection attribute to `0`.
2. If the Hive server is configured to use SSL, then configure SSL for the connection. For more information, see "Configuring SSL Verification" on page 46.

Example connection string for Hive Server 1:

```
Driver=Hortonworks Hive ODBC Driver;Host=hs1_host;
Port=hs1_port;HiveServerType=1;AuthMech=0;Schema=Hive_database
```

Example connection string for Hive Server 2:

```
Driver=Hortonworks Hive ODBC Driver;Host=hs2_host;
Port=hs2_port;HiveServerType=2;AuthMech=0;Schema=Hive_database
```

Kerberos

Kerberos must be installed and configured before you can use this authentication mechanism. For more information, refer to the MIT Kerberos documentation.

This authentication mechanism is available only for Hive Server 2 on non-HDInsight distributions. When you use Kerberos authentication, the Binary transport protocol is not supported.

To configure Kerberos authentication:

1. Set the `AuthMech` connection attribute to `1`.
2. Choose one:
   - To use the default realm defined in your Kerberos setup, do not set the `KrbRealm` attribute.
   - Or, 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 appropriate realm using the `KrbRealm` attribute.
3. Set the `KrbHostFQDN` attribute to the fully qualified domain name of the Hive Server 2 host.

   Note: To use the Hive server host name as the fully qualified domain name for Kerberos authentication, set `KrbHostFQDN` to `_HOST`.
4. Set the `KrbServiceName` attribute to the service name of the Hive server.
5. Set the `ThriftTransport` connection attribute to the transport protocol to use in the Thrift layer.

   Important: When using this authentication mechanism, Binary (`ThriftTransport=0`) is not supported.
6. If the Hive server is configured to use SSL, then configure SSL for the connection. For more information, see "Configuring SSL Verification" on page 46.

Example connection string:

```
Driver=Hortonworks Hive ODBC Driver;Host=hs2_host;
Port=hs2_port;HiveServerType=2;AuthMech=1;ThriftTransport=SASL;
Schema=Hive_database;KrbRealm=Kerberos_Realm;
KrbHostFQDN=hs2_fully_qualified_domain_name;
KrbServiceName=hs2_service_name
```

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.

This authentication mechanism is available only for Hive Server 2 on non-HDInsight distributions. Most default configurations of Hive Server 2 require User Name authentication. When you use User Name authentication, SSL is not supported and SASL is the only Thrift transport protocol available.

To configure User Name authentication:

1. Set the `AuthMech` connection attribute to `2`.
2. Set the `UID` attribute to an appropriate user name for accessing the Hive server.

Example connection string:

```
Driver=Hortonworks Hive ODBC Driver;Host=hs2_host;
Port=hs2_port;HiveServerType=2;AuthMech=2;
Schema=Hive_database;UID=user_name
```

Using User Name And Password

This authentication mechanism requires a user name and a password.

This authentication mechanism is available only for Hive Server 2 on non-HDInsight distributions.

To configure User Name And Password authentication:

1. Set the `AuthMech` connection attribute to `3`.
2. Set the `UID` attribute to an appropriate user name for accessing the Hive server.
3. Set the `PWD` attribute to the password corresponding to the user name you provided above.
4. Set the `ThriftTransport` connection attribute to the transport protocol to use in the Thrift layer.
5. If the Hive server is configured to use SSL, then configure SSL for the connection. For more information, see "Configuring SSL Verification" on page 46.

Example connection string:

```
Driver=Hortonworks Hive ODBC Driver;Host=hs2_host;
Port=hs2_port;HiveServerType=2;AuthMech=3;ThriftTransport=SASL;
Schema=Hive_database;UID=user_name;PWD=password
```

Using Windows Azure HDInsight Emulator

This authentication mechanism is available only for Hive Server 2 instances running on Windows Azure HDInsight Emulator. When you use this authentication mechanism, SSL is not supported and HTTP is the only Thrift transport protocol available.

To configure a connection to a Hive server on Windows Azure HDInsight Emulator:

1. Set the `AuthMech` connection attribute to `5`.
2. Set the `HTTPPath` attribute to the partial URL corresponding to the Hive server.
3. Set the `UID` attribute to an appropriate user name for accessing the Hive server.
4. Set the `PWD` attribute to the password corresponding to the user name you provided above.
5. If necessary, you can create custom HTTP headers. For more information, see "http.header." on page 84.

Example connection string:

```
Driver=Hortonworks Hive ODBC Driver;
Host=HDInsight_Emulator_host;
Port=HDInsight_Emulator_port;HiveServerType=2;AuthMech=5;
Schema=Hive_database;UID=user_name;PWD=password;
HTTPPath=hs2_HTTP_path
```

Using Windows Azure HDInsight Service

This authentication mechanism is available only for Hive Server 2 on HDInsight distributions. When you use this authentication mechanism, you must enable SSL and HTTP is the only Thrift transport protocol available.

To configure a connection to a Hive server on Windows Azure HDInsight Service:

1. Set the `AuthMech` connection attribute to `6`.
2. Set the `HTTPPath` attribute to the partial URL corresponding to the Hive server.
3. Set the `UID` attribute to an appropriate user name for accessing the Hive server.
4. Set the `PWD` attribute to the password corresponding to the user name you typed above.
5. If necessary, you can create custom HTTP headers. For more information, see "http.header." on page 84.
6. Configure SSL settings as needed. For more information, see "Configuring SSL Verification" on page 46.

Example connection string:

```
Driver=Hortonworks Hive ODBC Driver;
Host=Azure_HDInsight_Service_host;Port=443;
HiveServerType=2;AuthMech=6;SSL=1;Schema=Hive_database;
UID=user_name;PWD=password;HTTPPath=hs2_HTTP_path
```

Configuring SSL Verification

You can configure verification between the client and the Hive server over SSL.

To configure SSL verification:

1. Open the `odbc.ini` configuration file in a text editor.
2. To enable SSL, set the `SSL` attribute to `1`.
3. To allow self-signed certificates from the server, set the `AllowSelfSignedServerCert` attribute to `1`.
4. To allow the common name of a CA-issued SSL certificate to not match the host name of the Hive server, set the `CAIssuedCertNamesMismatch` attribute to `1`.

5. Choose one:
   - To configure the driver to load SSL certificates from a specific PEM file when verifying the server, set the `TrustedCerts` attribute to the full path of the PEM file.
   - Or, to use the trusted CA certificates PEM file that is installed with the driver, do not specify a value for the `TrustedCerts` attribute.
6. To configure two-way SSL verification, set the `TwoWaySSL` attribute to `1` and then do the following:
   a. Set the `ClientCert` attribute to the full path of the PEM file containing the client's certificate.
   b. Set the `ClientPrivateKey` attribute to the full path of the file containing the client's private key.
   c. If the private key file is protected with a password, set the `ClientPrivateKeyPassword` attribute to the password.
7. Save the `odbc.ini` configuration file.

Configuring Server-Side Properties

You can use the driver to apply configuration properties to the Hive server. You can set these server-side properties in a DSN (in the `odbc.ini` file) or in a connection string.

Important: If server-side properties are set in both the `odbc.ini` file and the connection string, the ones set in the connection string take precedence.

To configure server-side properties:

1. To set a server-side property, use the syntax `SSP_[SSPKey]=[SSPValue]`, where *[SSPKey]* is the name of the server-side property and *[SSPValue]* is the value to specify for that property. For example, to set the `mapreduce.job.queuename` property to `myQueue`, type the following:

   ```
   SSP_mapreduce.job.queuename=myQueue
   ```

   Note:
   - When setting a server-side property in a connection string, it is recommended that you enclose the value in braces (`{ }`) to make sure that special characters can be properly escaped.
   - For a list of all Hadoop and Hive server-side properties that your implementation supports, type `set -v` at the Hive CLI command line or Beeline. You can also execute the `set -v` query after connecting using the driver.
2. To change the method that the driver uses to apply server-side properties, do one of the following:
   - To configure the driver to apply each server-side property by executing a query when opening a session to the Hive server, set the `ApplySSPWithQueries`

property to `1`.

- Or, to configure the driver to use a more efficient method for applying server-side properties that does not involve additional network round-tripping, set the `ApplySSPWithQueries` property to `0`.

Note: The more efficient method is not available for Hive Server 1, and it might not be compatible with some Hive Server 2 builds. If the server-side properties do not take effect when the `ApplySSPWithQueries` property is set to `0`, then set it to `1`.

3. To disable the driver's default behavior of converting server-side property key names to all lower-case characters, set the `LCaseSspKeyName` property to `0`.
4. Save the `odbc.ini` configuration file.

Testing the Connection

To test the connection, you can use an ODBC-enabled client application. For a basic connection test, you can also use the test utilities that are packaged with your driver manager installation. For example, the iODBC driver manager includes simple utilities called iodbctest and iodbctestw. Similarly, the unixODBC driver manager includes simple utilities called isql and iusql.

- "Using the iODBC Driver Manager" on page 48
- "Using the unixODBC Driver Manager" on page 49

Using the iODBC Driver Manager

You can use the iodbctest and iodbctestw utilities to establish a test connection with your driver. Use iodbctest to test how your driver works with an ANSI application, or use iodbctestw to test how your driver works with a Unicode application.

Note: There are 32-bit and 64-bit installations of the iODBC driver manager available. If you have only one or the other installed, then the appropriate version of iodbctest (or iodbctestw) is available. However, if you have both 32- and 64-bit versions installed, then you need to make sure that you are running the version from the correct installation directory.

For more information about using the iODBC driver manager, see http://www.iodbc.org.

To test your connection using the iODBC driver manager:

1. Run iodbctest or iodbctestw.
2. Optionally, if you do not remember the DSN, then type a question mark (`?`) to see a list of available DSNs.
3. Type an ODBC connection string using the following format, specifying additional connection attributes as needed:

```
DSN=[DataSourceName];[Key]=[Value]
```

[DataSourceName] is the DSN that you are using for the connection. *[Key]* is any connection attribute that is not already specified as a configuration key in the DSN, and *[Value]* is the value for the attribute. Add key-value pairs to the connection string as needed, separating each pair with a semicolon (;).

Or, If you are using a DSN-less connection, then type an ODBC connection string using the following format, specifying additional connection attributes as needed:

```
Driver=[DriverNameOrFile];HOST=[MyHiveServer];
PORT=[PortNumber];Schema=[DefaultSchema];
HiveServerType=[ServerType]
```

The placeholders in the connection string are defined as follows:

- *[DriverNameOrFile]* is either the symbolic name of the installed driver defined in the `odbcinst.ini` file or the absolute path of the shared object file for the driver. If you use the symbolic name, then you must make sure that the `odbcinst.ini` file is configured to point the symbolic name to the shared object file. For more information, see "Specifying ODBC Drivers in odbcinst.ini" on page 41.
- *[MyHiveServer]* is the IP address or hostname of the Hive Server.
- *[PortNumber]* is the number of the TCP port that the Hive server uses to listen for client connections.
- *[DefaultSchema]* is the database schema to use when a schema is not explicitly specified in a query.
- *[ServerType]* is either `1` (for Hive Server 1) or `2` (for Hive Server 2).

If the connection is successful, then the `SQL>` prompt appears.

Note: For information about the connection attributes that are available, see "Driver Configuration Options" on page 64.

Using the unixODBC Driver Manager

You can use the isql and iusql utilities to establish a test connection with your driver and your DSN. isql and iusql can only be used to test connections that use a DSN. Use isql to test how your driver works with an ANSI application, or use iusql to test how your driver works with a Unicode application.

Note: There are 32-bit and 64-bit installations of the unixODBC driver manager available. If you have only one or the other installed, then the appropriate version of isql (or iusql) is available. However, if you have both 32- and 64-bit versions installed, then you need to make sure that you are running the version from the correct installation directory.

For more information about using the unixODBC driver manager, see http://www.unixodbc.org.

To test your connection using the unixODBC driver manager:

- Run isql or iusql by using the corresponding syntax:
  - `isql` *`[DataSourceName]`*
  - `iusql` *`[DataSourceName]`*

`[DataSourceName]` is the DSN that you are using for the connection.

If the connection is successful, then the `SQL>` prompt appears.

Note: For information about the available options, run isql or iusql without providing a DSN.

Configuring Logging Options

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.

Use the `LogLevel` key to set the amount of detail included in log files. The following table lists the logging levels provided by the Hortonworks Hive ODBC Driver with SQL Connector, in order from least verbose to most verbose.

Table 2. Hortonworks Hive ODBC Driver with SQL ConnectorLogging Levels

LogLevel Value	Description
0	Disables all logging.
1	Logs very severe error events that lead the driver to abort.
2	Logs error events that might still allow the driver to continue running.
3	Logs potentially harmful situations.
4	Logs general information that describes the progress of the driver.
5	Logs detailed information that is useful for debugging the driver.
6	Logs more detailed information than `LogLevel=5`.

To enable logging:

1. Open the `hortonworks.hiveodbc.ini` configuration file in a text editor.
2. Set the `LogLevel` key to the desired level of information to include in log files. For example:

   ```
   LogLevel=2
   ```

3. Set the `LogPath` key to the full path to the folder where you want to save log files. For example:

   ```
   LogPath=/localhome/employee/Documents
   ```

4. Set the `LogFileCount` key to the maximum number of log files to keep.

   Note: After the maximum number of log files is reached, each time an additional file is created, the driver deletes the oldest log file.

5. Set the `LogFileSize` key to the maximum size of each log file in megabytes (MB).

   Note: After the maximum file size is reached, the driver creates a new file and continues logging.

6. Save the `hortonworks.hiveodbc.ini` configuration file.
7. Restart your ODBC application to make sure that the new settings take effect.

   The Hortonworks Hive ODBC Driver with SQL Connector produces a log file named `HiveODBC_driver.log` at the location you specify using the `LogPath` key.

To disable logging:

1. Open the `hortonworks.hiveodbc.ini` configuration file in a text editor.
2. Set the `LogLevel` key to `0`.
3. Save the `hortonworks.hiveodbc.ini` configuration file.

Authentication Options

To connect to a Hive server, you must configure the Hortonworks Hive ODBC Driver with SQL Connector 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 type and then refer to the corresponding section below.

Hive Server 1

You must use No Authentication as the authentication mechanism. Hive Server 1 instances do not support authentication.

Hive Server 2 on an HDInsight Distribution

If you are connecting to HDInsight Emulator running on Windows Azure, then you must use the Windows Azure HDInsight Emulator mechanism.

If you are connecting to HDInsight Service running on Windows Azure, then you must use the Windows Azure HDInsight Service mechanism.

Hive Server 2 on a non-HDInsight Distribution

Note: Most default configurations of Hive Server 2 on non-HDInsight Distributions require User Name authentication.

Configuring authentication for a connection to a Hive Server 2 instance on a non-HDInsight Distribution involves setting the authentication mechanism, the Thrift transport protocol, and SSL support. To determine the settings that you need to use, check the following three properties in the `hive-site.xml` file in the Hive server that you are connecting to:

- `hive.server2.authentication`
- `hive.server2.transport.mode`
- `hive.server2.use.SSL`

Use the following table to determine the authentication mechanism that you need to configure, based on the `hive.server2.authentication` value in the `hive-site.xml` file:

Table 3. Authentication Mechanism to Use

hive.server2.authentication	Authentication Mechanism
NOSASL	No Authentication

hive.server2.authentication	Authentication Mechanism
KERBEROS	Kerberos
NONE	User Name
LDAP	User Name and Password

Use the following table to determine the Thrift transport protocol that you need to configure, based on the `hive.server2.authentication` and `hive.server2.transport.mode` values in the `hive-site.xml` file:

Table 4. Thrift Transport Protocol Setting to Use

hive.server2.authentication	hive.server2.transport.mode	Thrift Transport Protocol
NOSASL	binary	Binary
KERBEROS	binary or http	SASL or HTTP
NONE	binary or http	SASL or HTTP
LDAP	binary or http	SASL or HTTP

To determine whether SSL should be enabled or disabled for your connection, check the `hive.server2.use.SSL` value in the `hive-site.xml` file. If the value is true, then you must enable and configure SSL in your connection. If the value is false, then you must disable SSL in your connection.

For detailed instructions on how to configure authentication when using the Windows driver, see "Configuring Authentication" on page 12.

For detailed instructions on how to configure authentication when using a non-Windows driver, see "Configuring Authentication" on page 43.

Using a Connection String

For some applications, you might need to use a connection string to connect to your data source. For detailed information about how to use a connection string in an ODBC application, refer to the documentation for the application that you are using.

The connection strings in the following topics are examples showing the minimum set of connection attributes that you must specify to successfully connect to the data source. Depending on the configuration of the data source and the type of connection you are working with, you might need to specify additional connection attributes. For detailed information about all the attributes that you can use in the connection string, see "Driver Configuration Options" on page 64.

- "DSN Connection String Example" on page 54
- "DSN-less Connection String Examples" on page 54

DSN Connection String Example

The following is an example of a connection string for a connection that uses a DSN:

```
DSN=[DataSourceName];
```

[DataSourceName] is the DSN that you are using for the connection.

You can set additional configuration options by appending key-value pairs to the connection string. Configuration options that are passed in using a connection string take precedence over configuration options that are set in the DSN.

For information about creating a DSN on a Windows machine, see "Creating a Data Source Name" on page 7. For information about creating a DSN on a non-Windows machine, see "Defining DSNs in odbc.ini" on page 39.

DSN-less Connection String Examples

Some applications provide support for connecting to a data source using a driver without a DSN. To connect to a data source without using a DSN, use a connection string instead.

The placeholders in the examples are defined as follows, in alphabetical order:

- *[DomainName]* is the fully qualified domain name of the Hive server host.
- *[Namespace]* is the namespace on ZooKeeper under which Hive Server 2 znodes are added.
- *[PortNumber]* is the number of the TCP port that the Hive server uses to listen for client connections.
- *[Realm]* is the Kerberos realm of the Hive server host.

- *[Server]* is the IP address or host name of the Hive server to which you are connecting.
- *[ServerURL]* is the partial URL corresponding to the Hive server.
- *[ServiceName]* is the Kerberos service principal name of the Hive server.
- *[YourPassword]* is the password corresponding to your user name.
- *[YourUserName]* is the user name that you use to access the Hive server.

Connecting to a Hive Server 1 Instance

The following is the format of a DSN-less connection string that connects to a Hive Server 1 instance:

```
Driver=Hortonworks Hive ODBC Driver;HiveServerType=1;
Host=[Server];Port=[PortNumber];
```

For example:

```
Driver=Hortonworks Hive ODBC Driver;HiveServerType=1;
Host=192.168.222.160;Port=10000;
```

Connecting to a Standard Hive Server 2 Instance

The following is the format of a DSN-less connection string for a standard connection to a Hive Server 2 instance. By default, the driver is configured to connect to a Hive Server 2 instance that requires User Name authentication, and the driver uses **anonymous** as the user name.

```
Driver=Hortonworks Hive ODBC Driver;Host=[Server];Port=
[PortNumber];
```

For example:

```
Driver=Hortonworks Hive ODBC
Driver;Host=192.168.222.160;Port=10000;
```

Connecting to a Hive Server 2 Instance Without Authentication

The following is the format of a DSN-less connection string that for a Hive Server 2 instance that does not require authentication.

```
Driver=Hortonworks Hive ODBC Driver;Host=[Server];
Port=[PortNumber];AuthMech=0;
```

For example:

```
Driver=Hortonworks Hive ODBC Driver;Host=192.168.222.160;
Port=10000;AuthMech=0;
```

Connecting to a Hive Server that Requires Kerberos Authentication

The following is the format of a DSN-less connection string that connects to a Hive Server 2 instance requiring Kerberos authentication:

```
Driver=Hortonworks Hive ODBC Driver;
Host=[Server];Port=[PortNumber];AuthMech=1;
KrbRealm=[Realm];KrbHostFQDN=[DomainName];
KrbServiceName=[ServiceName];
```

For example:

```
Driver=Hortonworks Hive ODBC Driver;
Host=192.168.222.160;Port=
10000;AuthMech=1;KrbRealm=HORTONWORKS;
KrbHostFQDN=localhost.localdomain;KrbServiceName=hive;
```

Connecting to a Hive Server that Requires User Name And Password Authentication

The following is the format of a DSN-less connection string that connects to a Hive Server 2 instance requiring User Name And Password authentication:

```
Driver=Hortonworks Hive ODBC Driver;
Host=[Server];Port=[PortNumber];AuthMech=3;
UID=[YourUserName];PWD=[YourPassword];
```

For example:

```
Driver=Hortonworks Hive ODBC Driver;
Host=192.168.222.160;Port=10000;AuthMech=3;UID=hortonworks;
PWD=hortonworks;
```

Connecting to a Hive Server on Windows Azure HDInsight Emulator

The following is the format of a DSN-less connection string that connects to a Hive Server 2 instance running on Windows Azure HDInsight Emulator:

```
Driver=Hortonworks Hive ODBC Driver;
Host=[Server];Port=[PortNumber];AuthMech=5;
UID=[YourUserName];PWD=[YourPassword];
HTTPPath=[ServerURL];
```

For example:

```
Driver=Hortonworks Hive ODBC Driver;
Host=192.168.222.160;Port=10000;AuthMech=5;UID=hortonworks;
PWD=hortonworks;HTTPPath=gateway/sandbox/hive;
```

Connecting to a Hive Server on Windows Azure HDInsight Service

The following is the format of a DSN-less connection string that connects to a Hive Server 2 instance running on Windows Azure HDInsight Service:

```
Driver=Hortonworks Hive ODBC Driver;
Host=[Server];Port=[PortNumber];AuthMech=6;SSL=1;
```

```
UID=[YourUserName];PWD=[YourPassword];
HTTPPath=[ServerURL];
```

For example:

```
Driver=Hortonworks Hive ODBC Driver;
Host=192.168.222.160;Port=10000;AuthMech=6;
SSL=1;UID=hortonworks;PWD=hortonworks;
HTTPPath=gateway/sandbox/hive;
```

Features

More information is provided on the following features of the Hortonworks Hive ODBC Driver with SQL Connector:

- "SQL Connector for HiveQL" on page 58
- "Data Types" on page 58
- "Catalog and Schema Support" on page 60
- "hive_system Table" on page 60
- "Server-Side Properties" on page 60
- "Get Tables With Query" on page 62
- "Active Directory" on page 62
- "Write-back" on page 62
- "Dynamic Service Discovery using ZooKeeper" on page 63

SQL Connector for HiveQL

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

To bridge the difference between SQL and HiveQL, the SQL Connector feature translates standard SQL-92 queries into equivalent HiveQL queries. The SQL Connector performs syntactical translations and structural transformations. For example:

- **Quoted Identifiers**: The double quotes (") that SQL uses to quote identifiers are translated into back quotes (`) to match HiveQL syntax. The SQL Connector needs to handle this translation because even when a driver reports the back quote as the quote character, some applications still generate double-quoted identifiers.
- **Table Aliases**: Support is provided for the AS keyword between a table reference and its alias, which HiveQL normally does not support.
- **JOIN**, **INNER JOIN**, and **CROSS JOIN**: SQL JOIN, INNER JOIN, and CROSS JOIN syntax is translated to HiveQL JOIN syntax.
- **TOP N/LIMIT**: SQL TOP N queries are transformed to HiveQL LIMIT queries.

Data Types

The Hortonworks Hive ODBC Driver with SQL Connector supports many common data formats, converting between Hive data types and SQL data types.

The following table lists the supported data type mappings.

Table 5. Supported Data Types

Hive Type	SQL Type
BIGINT	SQL_BIGINT
BINARY	SQL_VARBINARY
BOOLEAN	SQL_BIT
CHAR(n)	SQL_CHAR **Note:** SQL_WCHAR is returned instead if the Unicode SQL Character Types configuration option (the `UseUnicodeSqlCharacterTypes` key) is enabled.
DATE	SQL_TYPE_DATE
DECIMAL	SQL_DECIMAL
DECIMAL(p,s)	SQL_DECIMAL
DOUBLE	SQL_DOUBLE
FLOAT	SQL_REAL
INT	SQL_INTEGER
SMALLINT	SQL_SMALLINT
STRING	SQL_VARCHAR **Note:** SQL_WVARCHAR is returned instead if the Unicode SQL Character Types configuration option (the `UseUnicodeSqlCharacterTypes` key) is enabled.
TIMESTAMP	SQL_TYPE_TIMESTAMP
TINYINT	SQL_TINYINT
VARCHAR(n)	SQL_VARCHAR

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

The interval types (YEAR TO MONTH and DAY TIME) are supported only in query expressions and predicates. Interval types are not supported as column data types in tables.

Catalog and Schema Support

The Hortonworks Hive ODBC Driver with SQL Connector supports both catalogs and schemas to make it easy for the driver to work with various ODBC 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 ODBC schema to the Hive schema/database.

hive_system Table

A pseudo-table called hive_system can be used to query for Hive cluster system environment information. The pseudo-table is under the pseudo-schema called hive_system. The table has two STRING type columns, envkey and envvalue. Standard SQL can be executed against the hive_system table. For example:

```
SELECT * FROM HIVE.hive_system.hive_system WHERE envkey LIKE
'%hive%'
```

The above query returns all of the Hive system environment entries whose key contains the word "hive". A special query, `set -v`, is executed to fetch system environment information. Some versions of Hive do not support this query. For versions of Hive that do not support querying system environment information, the driver returns an empty result set.

Server-Side Properties

The Hortonworks Hive ODBC Driver with SQL Connector allows you to set server-side properties via a DSN. Server-side properties specified in a DSN affect only the connection that is established using the DSN.

You can also specify server-side properties for connections that do not use a DSN. To do this, use the Hortonworks Hive ODBC Driver Configuration tool that is installed with the Windows version of the driver, or set the appropriate configuration options in your connection string or the `hortonworks.hiveodbc.ini` file. Properties specified in the driver configuration tool or the `hortonworks.hiveodbc.ini` file apply to all connections that use the Hortonworks Hive ODBC Driver with SQL Connector.

For more information about setting server-side properties when using the Windows driver, see "Configuring Server-Side Properties" on page 20. For information about setting server-side properties when using the driver on a non-Windows platform, see "Driver Configuration Options" on page 64.

Temporary Tables

The driver supports the creation of temporary tables and lets you insert literal values into temporary tables. Temporary tables are only accessible by the ODBC connection that created them, and are dropped when the connection is closed.

CREATE TABLE Statement for Temporary Tables

The driver supports the following DDL syntax for creating temporary tables:

```
<create table statement> := CREATE TABLE <temporary table name>
<left paren><column definition list><right paren>

<column definition list> := <column definition>[, <column
definition>]*

<column definition> := <column name> <data type>

<temporary table name> := <double quote><number sign><table
name><double quote>

<left paren> := (

<right paren> := )

<double quote> := "

<number sign> := #
```

The following is an example of a SQL statement for creating a temporary table:

```
CREATE TABLE "#TEMPTABLE1" (C1 DATATYPE_1, C2 DATATYPE_2, ...,
Cn DATATYPE_n)
```

The temporary table name in a SQL query must be surrounded by double quotes ("), and the name must begin with a number sign (#).

Note: You can only use data types that are supported by Hive.

INSERT Statement for Temporary Tables

The driver supports the following DDL syntax for inserting data into temporary tables:

```
<insert statement> := INSERT INTO <temporary table name> <left
paren><column name list><right paren> VALUES <left
paren><literal value list><right paren>

<column name list> := <column name>[, <column name>]*

<literal value list> := <literal value>[, <literal value>]*

<temporary table name> := <double quote><number sign><table
name><double quote>

<left paren> := (

<right paren> := )
```

```
<double quote> := "
<number sign> := #
```

The following is an example of a SQL statement for inserting data into temporary tables:

```
INSERT INTO "#TEMPTABLE1" values (VAL(C1), VAL(C2) ... VAL(Cn)
)
```

VAL(C1) is the literal value for the first column in the table, and VAL(Cn) is the literal value for the nth column in the table.

Note: The INSERT statement is only supported for temporary tables.

Get Tables With Query

The Get Tables With Query configuration option allows you to choose whether to use the SHOW TABLES query or the GetTables API call to retrieve table names from a database.

Hive Server 2 has a limit on the number of tables that can be in a database when handling the GetTables API call. When the number of tables in a database is above the limit, the API call will return a stack overflow error or a timeout error. The exact limit and the error that appears depends on the JVM settings.

As a workaround for this issue, enable the Get Tables with Query configuration option (or `GetTablesWithQuery` key) to use the query instead of the API call.

Active Directory

The Hortonworks Hive ODBC Driver with SQL Connector supports Active Directory Kerberos on Windows. There are two prerequisites for using Active Directory Kerberos on Windows:

- MIT Kerberos is not installed on the client Windows machine.
- The MIT Kerberos Hadoop realm has been configured to trust the Active Directory realm so that users in the Active Directory realm can access services in the MIT Kerberos Hadoop realm. For more information, see "Setting up One-Way Trust with Active Directory" in the Hortonworks documentation: http://docs.hortonworks.com/HDPDocuments/HDP2/HDP-2.1.7/bk_installing_manually_book/content/ch23s05.html.

Write-back

The Hortonworks Hive ODBC Driver with SQL Connector supports translation for INSERT, UPDATE, and DELETE syntax when connecting to a Hive Server 2 instance that is running Hive 0.14 or later.

Dynamic Service Discovery using ZooKeeper

The Hortonworks Hive ODBC Driver with SQL Connector can be configured to discover Hive Server 2 services via the ZooKeeper service.

For information about configuring this feature in the Windows driver, see "Creating a Data Source Name" on page 7 or "Configuring a DSN-less Connection" on page 10. For information about configuring this feature when using the driver on a non-Windows platform, see "Configuring Service Discovery Mode" on page 42.

Driver Configuration Options

Driver Configuration Options lists the configuration options available in the Hortonworks Hive ODBC Driver with SQL Connector alphabetically by field or button label. Options having only key names, that is, not appearing in the user interface of the driver, are listed alphabetically by key name.

When creating or configuring a connection from a Windows machine, the fields and buttons are available in the Hortonworks Hive ODBC Driver Configuration tool and the following dialog boxes:

- Hortonworks Hive ODBC Driver DSN Setup
- Advanced Options
- Server Side Properties
- SSL Options
- HTTP Properties

When using a connection string or configuring a connection from a Linux/Mac OS X/Debian machine, use the key names provided.

Note: You can pass in configuration options in your connection string, or set them in your `odbc.ini` and `hortonworks.hiveodbc.ini` files if you are using a non-Windows version of the driver. Configuration options set in a `hortonworks.hiveodbc.ini` file apply to all connections, whereas configuration options passed in in the connection string or set in an `odbc.ini` file are specific to a connection. Configuration options passed in using the connection string take precedence over configuration options set in `odbc.ini`. Configuration options set in `odbc.ini` take precedence over configuration options set in `hortonworks.hiveodbc.ini`.

Configuration Options Appearing in the User Interface

The following configuration options are accessible via the Windows user interface for the Hortonworks Hive ODBC Driver with SQL Connector, or via the key name when using a connection string or configuring a connection from a Linux/Mac OS X/Debian machine:

- "Allow Common Name Host Name Mismatch" on page 65
- "Allow Self-signed Server Certificate" on page 66
- "Apply Properties with Queries" on page 66
- "Async Exec Poll Interval" on page
- "Host FQDN" on page 73
- "HTTP Path" on page 73
- "Invalid Session Auto Recover" on page 74
- "Mechanism" on page 74
- "Password" on page 75
- "Port" on page 75

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- "Binary Column Length" on page 67
- "Client Certificate File" on page 67
- "Client Private Key File" on page 67
- "Client Private Key Password" on page 68
- "Convert Key Name to Lower Case" on page 68
- "Data File HDFS Dir" on page 68
- "Database" on page 69
- "Decimal Column Scale" on page 69
- "Default String Column Length" on page 69
- "Delegation UID" on page 70
- "Driver Config Take Precedence" on page 70
- "Enable SSL" on page 70
- "Enable Temporary Table" on page 71
- "Fast SQLPrepare" on page 71
- "Get Tables With Query" on page 71
- "HDFS User" on page 72
- "Hive Server Type" on page 72
- "Host(s)" on page 72
- "Realm" on page 75
- "Rows Fetched Per Block" on page 76
- "Save Password (Encrypted)" on page 76
- "Service Discovery Mode" on page 76
- "Service Name" on page 77
- "Show System Table" on page 77
- "Socket Timeout" on page 77
- "Temp Table TTL" on page 78
- "Thrift Transport" on page 78
- "Trusted Certificates" on page 79
- "Two Way SSL" on page 79
- "Unicode SQL Character Types" on page 80
- "Use Async Exec" on page 80
- "Use Native Query" on page 80
- "Use Only SSPI Plugin" on page 81
- "User Name" on page 81
- "Web HDFS Host" on page 82
- "Web HDFS Port" on page 82
- "ZooKeeper Namespace" on page 82

Allow Common Name Host Name Mismatch

Key Name	Default Value	Required
`CAIssuedCertNamesMismatch`	Clear (`0`)	No

Description

This option specifies whether a CA-issued SSL certificate name must match the host name of the Hive server.

- Enabled (`1`): The driver allows a CA-issued SSL certificate name to not match the host name of the Hive server.

- Disabled (0): The CA-issued SSL certificate name must match the host name of the Hive server.

Note: This setting is applicable only when SSL is enabled.

Allow Self-signed Server Certificate

Key Name	Default Value	Required
AllowSelfSignedServerCert	Clear (0)	No

Description

This option specifies whether the driver allows self-signed certificates from the server.

- Enabled (1): The driver authenticates the Hive server even if the server is using a self-signed certificate.
- Disabled (0): The driver does not allow self-signed certificates from the server.

Note: This setting is applicable only when SSL is enabled.

Apply Properties with Queries

Key Name	Default Value	Required
ApplySSPWithQueries	Selected (1)	No

Description

This option specifies how the driver applies server-side properties.

- Enabled (1): The driver applies each server-side property by executing a `set` *`SSPKey=SSPValue`* query when opening a session to the Hive server.
- Disabled (0): The driver uses a more efficient method for applying server-side properties that does not involve additional network round-tripping. However, some Hive Server 2 builds are not compatible with the more efficient method.

Note: When connecting to a Hive Server 1 instance, this option is always enabled.

Async Exec Poll Interval

Key Name	Default Value	Required
AsyncExecPollInterval	100	No

Description

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

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

Note: This option is applicable only to HDInsight clusters.

Binary Column Length

Key Name	Default Value	Required
`BinaryColumnLength`	`32767`	No

Description

The maximum data length for BINARY columns.

By default, the columns metadata for Hive does not specify a maximum data length for BINARY columns.

Client Certificate File

Key Name	Default Value	Required
`ClientCert`	None	Yes, if two-way SSL verification is enabled.

Description

The full path to the `.pem` file containing the client's SSL certificate.

Note: This setting is applicable only when two-way SSL is enabled.

Client Private Key File

Key Name	Default Value	Required
`ClientPrivateKey`	None	Yes, if two-way SSL verification is enabled.

Description

The full path to the `.pem` file containing the client's SSL private key.

If the private key file is protected with a password, then provide the password using the driver configuration option "Client Private Key Password" on page 68.

Note: This setting is applicable only when two-way SSL is enabled.

Client Private Key Password

Key Name	Default Value	Required
`ClientPrivateKeyPassword`	None	Yes, if two-way SSL verification is enabled and the client's private key file is protected with a password.

Description

The password of the private key file that is specified in the Client Private Key File field (`ClientPrivateKey`).

Convert Key Name to Lower Case

Key Name	Default Value	Required
`LCaseSspKeyName`	Selected (`1`)	No

Description

This option specifies whether the driver converts server-side property key names to all lower-case characters.

- Enabled (`1`): The driver converts server-side property key names to all lower-case characters.
- Disabled (`0`): The driver does not modify the server-side property key names.

Data File HDFS Dir

Key Name	Default Value	Required
`HDFSTempTableDir`	`/tmp/simba`	No

Description

The HDFS directory that the driver uses to store the necessary files for supporting the Temporary Table feature.

Note: Due to a problem in Hive (see https://issues.apache.org/jira/browse/HIVE-4554), HDFS paths with space characters do not work with versions of Hive prior to 0.12.0.

This option is not applicable when connecting to Hive 0.14 or later.

Database

Key Name	Default Value	Required
Schema	default	No

Description

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.

Note: To inspect your databases and determine the appropriate schema to use, at the Hive command prompt, type `show databases`.

Decimal Column Scale

Key Name	Default Value	Required
DecimalColumnScale	10	No

Description

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

Default String Column Length

Key Name	Default Value	Required
Default StringColumnLength	255	No

Description

The maximum number of characters that can be contained in STRING columns.

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

Delegation UID

Key Name	Default Value	Required
DelegationUID	None	No

Description

If a value is specified for this setting, the driver delegates all operations against Hive to the specified user, rather than to the authenticated user for the connection.

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

Driver Config Take Precedence

Key Name	Default Value	Required
DriverConfigTakePrecedence	Clear (0)	No

Description

This option specifies whether driver-wide configuration settings take precedence over connection and DSN settings.

- Enabled (1): Driver-wide configurations take precedence over connection and DSN settings.
- Disabled (0): Connection and DSN settings take precedence instead.

Enable SSL

Key Name	Default Value	Required
SSL	Clear (0)	No

Description

This option specifies whether the client verifies the Hive server using SSL.

- Enabled (1): The client verifies the Hive server using SSL.
- Disabled (0): SSL is disabled.

Note:
This option is applicable only when connecting to a Hive server that supports SSL.

Enable Temporary Table

Key Name	Default Value	Required
EnableTempTable	Clear (0)	No

Description

This option specifies whether the driver supports the creation and use of temporary tables.

- Enabled (1): The driver supports the creation and use of temporary tables.
- Disabled (0): The driver does not support temporary tables.

Important: When connecting to Hive 0.14 or later, the Temporary Tables feature is always enabled and you do not need to configure it in the driver.

Fast SQLPrepare

Key Name	Default Value	Required
FastSQLPrepare	Clear (0)	No

Description

This option specifies whether the driver defers query execution to SQLExecute.

- Enabled (1): The driver defers query execution to SQLExecute.
- Disabled (0): The driver does not defer query execution to SQLExecute.

Note: When using Native Query mode, the driver executes the HiveQL query to retrieve the result set metadata for SQLPrepare. As a result, SQLPrepare might be slow. If the result set metadata is not required after calling SQLPrepare, then enable Fast SQLPrepare.

Get Tables With Query

Key Name	Default Value	Required
GetTablesWithQuery	Selected (1)	No

Description

This option specifies whether the driver uses the SHOW TABLES query or the GetTables Thrift API call to retrieve the names of the tables in a database.

- Enabled (`1`): The driver uses the SHOW TABLES query to retrieve the names of the tables in a database.
- Disabled (`0`): The driver uses the GetTables Thrift API call to retrieve the names of the tables in a database.

Note: This option is applicable only when connecting to a Hive Server 2 instance.

HDFS User

Key Name	Default Value	Required
`HDFSUser`	`hdfs`	No

Description

The name of the HDFS user that the driver uses to create the necessary files for supporting the Temporary Tables feature.

This option is not applicable when connecting to Hive 0.14 or later.

Hive Server Type

Key Name	Default Value	Required
`HiveServerType`	Hive Server 2 (`2`)	No

Description

This option specifies the type of Hive server.

- Hive Server 1 (`1`): The driver connects to a Hive Server 1 instance.
- Hive Server 2 (`2`): The driver connects to a Hive Server 2 instance.

Note: If Service Discovery Mode is enabled, then connections to Hive Server 1 are not supported.

Host(s)

Key Name	Default Value	Required
`HOST`	None	Yes

Description

If Service Discovery Mode is disabled, specify the IP address or host name of the Hive server.

If Service Discovery Mode is enabled, specify a comma-separated list of ZooKeeper servers in the following format, where *[ZK_Host]* is the IP address or host name of the ZooKeeper server and *[ZK_Port]* is the number of the TCP port that the ZooKeeper server uses to listen for client connections:

[ZK_Host1]:*[ZK_Port1]*,*[ZK_Host2]*:*[ZK_Port2]*

Host FQDN

Key Name	Default Value	Required
KrbHostFQDN	None	Yes, if the authentication mechanism is Kerberos.

Description

The fully qualified domain name of the Hive Server 2 host.

You can set the value of Host FQDN to `_HOST` to use the Hive server host name as the fully qualified domain name for Kerberos authentication. If Service Discovery Mode is disabled, then the driver uses the value specified in the Host connection attribute. If Service Discovery Mode is enabled, then the driver uses the Hive Server 2 host name returned by ZooKeeper.

HTTP Path

Key Name	Default Value	Required
HTTPPath	`/hive2` if using Windows Azure HDInsight Service (6) `/` if using non-Windows Azure HDInsight Service with Thrift Transport set to HTTP(2)	No

Description

The partial URL corresponding to the Hive server.

Invalid Session Auto Recover

Key Name	Default Value	Required
InvalidSessionAutoRecover	Selected (1)	No

Description

This option specifies whether the driver automatically opens a new session when the existing session is no longer valid.

- Enabled (1): The driver automatically opens a new session when the existing session is no longer valid.
- Disabled (0): The driver does not automatically open new sessions.

Note: This option is applicable only when connecting to Hive Server 2.

Mechanism

Key Name	Default Value	Required
AuthMech	No Authentication (0) if you are connecting to Hive Server 1. User Name (2) if you are connecting to Hive Server 2.	No

Description

The authentication mechanism to use.

Select one of the following settings, or set the key to the corresponding number:

- No Authentication (0)
- Kerberos (1)
- User Name (2)
- User Name And Password (3)
- Windows Azure HDInsight Emulator (5)
- Windows Azure HDInsight Service (6)

Password

Key Name	Default Value	Required
PWD	None	Yes, if the authentication mechanism is User Name And Password (2), Windows Azure HDInsight Emulator (5), or Windows Azure HDInsight Service (6).

Description

The password corresponding to the user name that you provided in the User Name field or UID key.

Port

Key Name	Default Value	Required
PORT	• non-HDInsight clusters: 10000 • Windows Azure HDInsight Emulator: 10001 • Windows Azure HDInsight Service: 443	Yes, if Service Discovery Mode is disabled.

Description

The number of the TCP port that the Hive server uses to listen for client connections.

Realm

Key Name	Default Value	Required
KrbRealm	Depends on your Kerberos configuration.	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 option.

Rows Fetched Per Block

Key Name	Default Value	Required
RowsFetchedPerBlock	10000	No

Description

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

Valid values for this setting include any positive 32-bit integer. However, testing has shown that performance gains are marginal beyond the default value of 10000 rows.

Save Password (Encrypted)

Key Name	Default Value	Required
N/A	Selected (1)	No

Description

This option specifies whether the password is saved in the registry.

- Enabled (1): The password is saved in the registry.
- Disabled (0): The password is not saved in the registry.

This option is available only in the Windows driver. It appears in the Hortonworks Hive ODBC Driver DSN Setup dialog box and the SSL Options dialog box.

Important: The password is obscured (not saved in plain text). However, it is still possible for the encrypted password to be copied and used.

Service Discovery Mode

Key Name	Default Value	Required
ServiceDiscoveryMode	No Service Discovery (0)	No

Description

This option specifies whether the driver uses the ZooKeeper service.

- Enabled (`1`): The driver discovers Hive Server 2 services via the ZooKeeper service.
- Disabled (`0`): The driver connects to Hive without using the ZooKeeper service.

Service Name

Key Name	Default Value	Required
`KrbServiceName`	None	Yes, if the authentication mechanism is Kerberos.

Description

The Kerberos service principal name of the Hive server.

Show System Table

Key Name	Default Value	Required
`ShowSystemTable`	Clear (`0`)	No

Description

This option specifies whether the driver returns the hive_system table for catalog function calls such as `SQLTables` and `SQLColumns`.

- Enabled (`1`): The driver returns the hive_system table for catalog function calls such as `SQLTables` and `SQLColumns`.
- Disabled (`0`): The driver does not return the hive_system table for catalog function calls.

Socket Timeout

Key Name	Default Value	Required
`SocketTimeout`	`60`	No

Description

The number of seconds that an operation can remain idle before it is closed.

Note: This option is applicable only when asynchronous query execution is being used against Hive Server 2 instances.

Temp Table TTL

Key Name	Default Value	Required
TempTableTTL	10	No

Description

The number of minutes a temporary table is guaranteed to exist in Hive after it is created.

This option is not applicable when connecting to Hive 0.14 or later.

Thrift Transport

Key Name	Default Value	Required
ThriftTransport	Binary (0) if you are connecting to Hive Server 1. SASL (1) if you are connecting to Hive Server 2.	No

Description

The transport protocol to use in the Thrift layer.

Select one of the following settings, or set the key to the corresponding number:

- Binary (0)
- SASL (1)
- HTTP (2)

Trusted Certificates

Key Name	Default Value	Required
TrustedCerts	The cacerts.pem file in the \lib folder or subfolder within the driver's installation directory. The exact file path varies depending on the version of the driver that is installed. For example, the path for the Windows driver is different from the path for the Mac OS X driver.	No

Description

The location of the .pem file containing trusted CA certificates for authenticating the Hive server when using SSL.

If this option is not set, then the driver defaults to using the trusted CA certificates .pem file installed by the driver.

Note: This setting is applicable only when SSL is enabled.

Two Way SSL

Key Name	Default Value	Required
TwoWaySSL	Clear (0)	No

Description

This option specifies whether two-way SSL is enabled.

- Enabled (1): The client and the Hive server verify each other using SSL. See also the driver configuration options "Client Certificate File" on page 67, "Client Private Key File" on page 67, and "Client Private Key Password" on page 68.
- Disabled (0): The server does not verify the client. Depending on whether one-way SSL is enabled, the client might verify the server. For more information, see "Enable SSL" on page 70.

Note: This option is applicable only when connecting to a Hive server that supports SSL. You must enable SSL before Two Way SSL can be configured. For more information, see "Enable SSL" on page 70.

Unicode SQL Character Types

Key Name	Default Value	Required
UseUnicodeSqlCharacterTypes	Clear (0)	No

Description

This option specifies the SQL types to be returned for string data types.

- Enabled (1): The driver returns SQL_WVARCHAR for STRING and VARCHAR columns, and returns SQL_WCHAR for CHAR columns.
- Disabled (0): The driver returns SQL_VARCHAR for STRING and VARCHAR columns, and returns SQL_CHAR for CHAR columns.

Use Async Exec

Key Name	Default Value	Required
EnableAsyncExec	Clear (0)	No

Description

This option specifies whether to execute queries synchronously or asynchronously.

- Enabled (1): The driver uses an asynchronous version of the API call against Hive for executing a query.
- Disabled (0): The driver executes queries synchronously.

Due to a problem in Hive 0.12.0 (see https://issues.apache.org/jira/browse/HIVE-5230), Hive returns generic error messages for errors that occur during query execution. To see the actual error message relevant to the problem, turn off asynchronous query execution and execute the query again.

Note: This option only takes effect when connecting to a Hive cluster running Hive 0.12.0 or higher.

Use Native Query

Key Name	Default Value	Required
UseNativeQuery	Clear (0)	No

Description

This option specifies whether the driver uses native HiveQL queries, or converts them into an equivalent form in HiveQL.

- Enabled (1): The driver does not transform the queries emitted by an application, and executes HiveQL queries directly.
- Disabled (0): The driver transforms the queries emitted by an application 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.

Use Only SSPI Plugin

Key Name	Default Value	Required
UseOnlySSPI	Clear (0)	No

Description

This option specifies how the driver handles Kerberos authentication: either with the SSPI plugin or with MIT Kerberos.

- Enabled (1): The driver handles Kerberos authentication by using the SSPI plugin instead of MIT Kerberos by default.
- Disabled (0): The driver uses MIT Kerberos to handle Kerberos authentication, and only uses the SSPI plugin if the gssapi library is not available.

Important: This option is available only in the Windows driver.

User Name

Key Name	Default Value	Required
UID		Yes, if the authentication mechanism is User Name And Password (2), Windows Azure HDInsight Emulator (5), or Windows Azure HDInsight Service (6). No, if the authentication mechanism is User Name (2).

Description

The user name that you use to access Hive Server 2.

Web HDFS Host

Key Name	Default Value	Required
WebHDFSHost	The Hive server host.	No

Description

The host name or IP address of the machine hosting both the namenode of your Hadoop cluster and the WebHDFS service.

This option is not applicable when connecting to Hive 0.14 or later.

Web HDFS Port

Key Name	Default Value	Required
WebHDFSPort	50070	No

Description

The WebHDFS port for the namenode.

This option is not applicable when connecting to Hive 0.14 or later.

ZooKeeper Namespace

Key Name	Default Value	Required
ZKNamespace	None	Yes, if Service Discovery Mode is enabled.

Description

The namespace on ZooKeeper under which Hive Server 2 znodes are added.

Configuration Options Having Only Key Names

The following configuration options do not appear in the Windows user interface for the Hortonworks Hive ODBC Driver with SQL Connector and are only accessible when using a connection string or configuring a connection from a Linux/Mac OS X/Debian machine:

- "ADUserNameCase" on page 83
- "Driver" on page 83
- "ForceSynchronousExec" on page 84
- "http.header." on page 84
- "SSP_" on page 85

ADUserNameCase

Default Value	Required
Unchanged	No

Description

Use this option to control whether the driver changes the user name part of an AD Kerberos UPN to all upper-case or all lower-case. The following values are possible:

- `Upper`: Change the user name to all upper-case.
- `Lower`: Change the user name to all lower-case.
- `Unchanged`: Do not modify the user name.

Note: This option is applicable only when using Active Directory Kerberos from a Windows client machine to authenticate.

Driver

Key Name	Default Value	Required
`Driver`	The default value varies depending on the version of the driver that is installed. For example, the value for the Windows driver is different from the value of the Mac OS X driver.	Yes

Description

The name of the installed driver (`Hortonworks Hive ODBC Driver`) or the absolute path of the Hortonworks Hive ODBC Driver with SQL Connector shared object file.

ForceSynchronousExec

Default Value	Required
0	No

Description

When this option is enabled (`1`), the driver is forced to execute queries synchronously when connected to an HDInsight cluster.

When this option is disabled (`0`), the driver is able to execute queries asynchronously when connected to an HDInsight cluster.

Note: This option is applicable only to HDInsight clusters.

http.header.

Default Value	Required
None	No

Description

Set a custom HTTP header by using the following syntax, where *[HeaderKey]* is the name of the header to set and *[HeaderValue]* is the value to assign to the header:

```
http.header.[HeaderKey]=[HeaderValue]
```

For example:

```
http.header.AUTHENTICATED_USER=john
```

After the driver applies the header, the http.header. prefix is removed from the DSN entry, leaving an entry of *[HeaderKey]=[HeaderValue]*

The example above would create the following custom HTTP header:

```
AUTHENTICATED_USER: john
```

Note: The http.header. prefix is case-sensitive. This option is applicable only when you are using HTTP as the Thrift transport protocol. For more information, see "Thrift Transport" on page 78.

SSP_

Default Value	Required
None	No

Description

Set a server-side property by using the following syntax, where *[SSPKey]* is the name of the server-side property and *[SSPValue]* is the value for that 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.
- When setting a server-side property in a connection string, it is recommended that you enclose the value in braces (`{ }`) to make sure that special characters can be properly escaped.

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Cyrus SASL

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dtoa

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