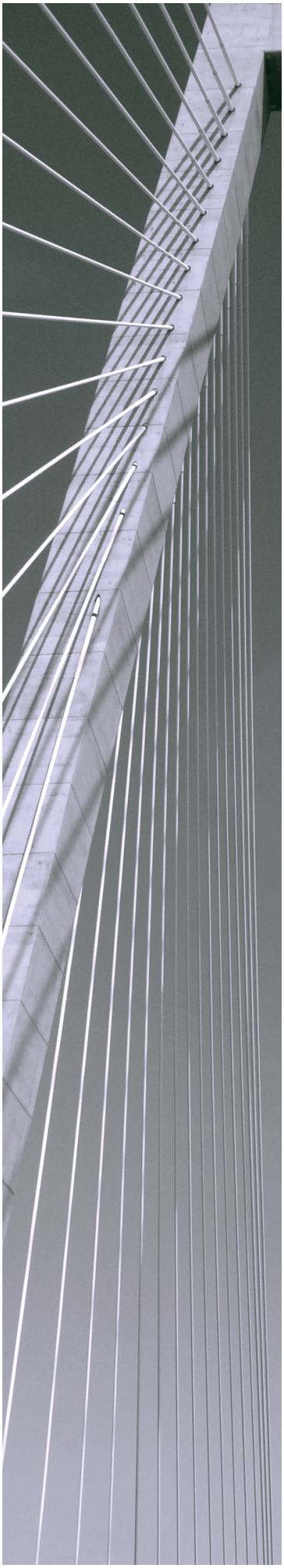

Simba Oracle ODBC Driver

Installation and Configuration Guide

Simba Technologies Inc.

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About This Guide

Purpose

The *Simba Oracle ODBC Driver Installation and Configuration Guide* explains how to install and configure the Simba Oracle ODBC Driver. The guide also provides details related to features of the driver.

Audience

The guide is intended for end users of the Simba Oracle ODBC Driver, as well as administrators and developers integrating the driver.

Knowledge Prerequisites

To use the Simba Oracle ODBC Driver, the following knowledge is helpful:

- Familiarity with the platform on which you are using the Simba Oracle ODBC Driver
- Ability to use the data source to which the Simba Oracle ODBC Driver is connecting
- An understanding of the role of ODBC technologies and driver managers in connecting to a data source
- Experience creating and configuring ODBC connections
- Exposure to SQL

Document Conventions

Italics are used when referring to book and document titles.

Bold is used in procedures for graphical user interface elements that a user clicks and text that a user types.

`Monospace font` indicates commands, source code, or contents of text files.

> **Note:**
>
> A text box with a pencil icon indicates a short note appended to a paragraph.

! Important:

A text box with an exclamation mark indicates an important comment related to the preceding paragraph.

Table of Contents

About the Simba Oracle ODBC Driver

The Simba Oracle ODBC Driver enables Business Intelligence (BI), analytics, and reporting on data that is stored in Oracle databases. The driver complies with the ODBC 3.52 data standard and adds important functionality such as Unicode, as well as 32- and 64-bit support for high-performance computing environments on Windows and Linux. For macOS, the driver provides 64-bit support.

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 *Data Access Standards* on the Simba Technologies website: https://www.simba.com/resources/data-access-standards-glossary. For complete information about the ODBC specification, see the *ODBC API Reference* from the Microsoft documentation: https://docs.microsoft.com/en-us/sql/odbc/reference/syntax/odbc-api-reference.

The *Installation and Configuration Guide* is suitable for users who are looking to access Oracle data from their desktop environment. Application developers might also find the information helpful. Refer to your application for details on connecting via ODBC.

Note:

For information about how to use the driver in various BI tools, see the *Simba ODBC Drivers Quick Start Guide for Windows*: http://cdn.simba.com/docs/ODBC_QuickstartGuide/content/quick_start/intro.htm.

Windows Driver

Windows System Requirements

Install the driver on client machines where the application is installed. Before installing the driver, make sure that you have the following:

- Administrator rights on your machine.
- A machine that meets the following system requirements:
  - One of the following operating systems:
    - Windows 10, 8.1, or 7 SP1
    - Windows Server 2016, 2012, or 2008 R2 SP1
  - 250 MB of available disk space

Before the driver can be used, the following dependencies (with the same bitness as the driver) must also be installed. If you obtained the driver from the Simba website, then your installation of the driver automatically includes these dependencies. Otherwise, you must install these dependencies manually.

- Visual C++ Redistributable for Visual Studio 2013. Download and run the installation packages available at https://www.microsoft.com/en-ca/download/details.aspx?id=40784.
- Oracle Instant Client 12.2. These library files must be installed in the `\lib` subfolder in the driver's installation directory. For detailed instructions, see Installing the Oracle Instant Client on Windows on page 9.

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 a driver whose bitness matches the bitness of the client application:

- `Simba Oracle 1.2 32-bit.msi` for 32-bit applications
- `Simba Oracle 1.2 64-bit.msi` for 64-bit applications

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

To install the Simba Oracle ODBC Driver on Windows:

1. Depending on the bitness of your client application, double-click to run **Simba Oracle 1.2 32-bit.msi** or **Simba Oracle 1.2 64-bit.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**.
7. If you received a license file through email, then copy the license file into the `\lib` subfolder of the installation folder you selected above. You must have Administrator privileges when changing the contents of this folder.

Installing the Oracle Instant Client on Windows

The Simba Oracle ODBC Driver requires Oracle Instant Client 12.2. If you obtained the driver from the Simba website, then your installation of the driver automatically includes this dependency. Otherwise, you must manually install Oracle Instant Client in the `\lib` subfolder in the installation directory of the driver.

To install the Oracle Instant Client on Windows:

1. In a web browser, navigate to http://www.oracle.com/technetwork/database/features/instant-client/index.html.
2. Download the 12.2.0.1.0 version of the Oracle Instant Client that matches the bitness of your platform. You can use the Basic package or Basic Light package depending upon your disk space.
3. Extract the archive that you downloaded to a temporary location.
4. Copy the files from the temporary location to the `\lib` subfolder in the installation directory of the driver.

Creating a Data Source Name on Windows

Typically, after installing the Simba Oracle ODBC Driver, you need to create a Data Source Name (DSN).

Alternatively, for information about DSN-less connections, see Using a Connection String on page 39.

To create a Data Source Name on Windows:

1. From the Start menu, go to **ODBC Data Sources**.

   > **Note:**
   >
   > Make sure to select the ODBC Data Source Administrator that has the same bitness as the client application that you are using to connect to Oracle.

2. In the ODBC Data Source Administrator, click the **Drivers** tab, and then scroll down as needed to confirm that the Simba Oracle 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.

   > **Note:**
   >
   > It is recommended that you create a System DSN instead of a User DSN. Some applications load the data using a different user account, and might not be able to detect User DSNs that are created under another user account.

4. Click **Add**.
5. In the Create New Data Source dialog box, select **Simba Oracle ODBC Driver** and then click **Finish**. The Simba Oracle ODBC Driver DSN Setup dialog box opens.
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. To specify the Oracle database that you want to connect to, do one of the following:
   - To use server information that is defined in your `tnsnames.ora` configuration file, do the following:
     a. Select the **Use TNS Service Name** check box.
     b. In the **TNS Name** field, type the net service name that you want to use.
     c. On your Windows machine, update the TNS_ADMIN environment variable to point to the path of the `tnsnames.ora` file.

> **Note:**
>
> For more information about the `tnsnames.ora` file, see "Local Naming Parameters in the tnsnames.ora File" in the *Oracle Database Net Services Reference*: https://docs.oracle.com/en/database/oracle/oracle-database/12.2/netrf/local-naming-parameters-in-tnsnames-ora-file.html#GUID-A3F9D023-9CC4-445D-8921-6E40BD900EAD.

- Or, to specify server information directly in the DSN, do the following:
  a. In the **Host** field, type the name or IP address of the Oracle server.
  b. In the **Port** field, type the number of the TCP port that the server uses to listen for client connections.

     > **Note:**
     >
     > The default port used by Oracle is 1521.

  c. In the **Service Name** field, type the service name of the Oracle database that you want to access.

9. Configure authentication as needed. For more information, see Configuring Authentication on Windows on page 12.
10. Configure SSL encryption as needed. For more information, see Configuring SSL Verification on a Windows Machine on page 13.
11. Optionally, to configure the driver to recognize table type information from the data source, select the **Enable Table Types** checkbox. For more information, see Enable Table Types on page 46.
12. Optionally, to configure advanced options including statement caching, select **Advanced Options**. For more information, see Configuring Advanced Options on Windows on page 14.
13. Optionally, to configure logging behavior for the driver, click **Logging Options**. For more information, see Configuring Logging Options on Windows on page 15.
14. 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 Simba Oracle ODBC Driver DSN Setup dialog box are correct. Contact your Oracle server administrator as needed.

15. To save your settings and close the Simba Oracle ODBC Driver DSN Setup dialog box, click **OK**.
16. To close the ODBC Data Source Administrator, click **OK**.

Configuring Authentication on Windows

All Oracle databases require authentication. You can configure the Simba Oracle ODBC Driver to provide your credentials and authenticate the connection to the database using one of the following methods:

- Using Your Oracle Database Credentials on page 12
- Using Kerberos on page 12

Using Your Oracle Database Credentials

You can configure the driver to authenticate the connection using your database credentials.

To configure authentication using your database credentials on Windows:

1. To access authentication options, open the ODBC Data Source Administrator where you created the DSN, select the DSN, and then click **Configure**.
2. Make sure that the **Use External Credentials** check box is cleared. If that check box is selected, then the User and Password fields are not available, and the driver uses Kerberos authentication instead.
3. In the **User** field, type your user name for accessing the Oracle database.
4. In the **Password** field, type the password corresponding to the user name you typed above.
5. To save your settings and close the dialog box, click **OK**.

Using Kerberos

You can configure the driver to use the Kerberos protocol to authenticate the connection. The driver retrieves and uses a Kerberos ticket based on the settings in the `sqlnet.ora` configuration file.

Before you can use this authentication mechanism, you must specify the necessary Kerberos settings in the `sqlnet.ora` file, and set the TNS_ADMIN environment variable on your machine to point to the path of the `sqlnet.ora` file. For more information, see the following:

- For information about configuring Kerberos for your Oracle database, including details about the settings required in the `sqlnet.ora` file, see "Configuring Kerberos Authentication" in the *Oracle Database Advanced Security Administrator's Guide*: https://docs.oracle.com/cd/E11882_01/network.112/e40393/asokerb.htm.
- For general information about the `sqlnet.ora` file, see "Parameters for the sqlnet.ora File" in the *Oracle Database Net Services Reference*: https://docs.oracle.com/en/database/oracle/oracle-

database/12.2/netrf/parameters-for-the-sqlnet-ora-file.html#GUID-28040885-6832-4FFC-9258-0EF19FE9A3AC.

To configure Kerberos authentication on Windows:

1. To access authentication options, open the ODBC Data Source Administrator where you created the DSN, select the DSN, and then click **Configure**.
2. Select the **Use External Credentials** check box.
3. To save your settings and close the dialog box, click **OK**.

Configuring SSL Verification on a Windows Machine

If you are connecting to an Oracle server that has Secure Sockets Layer (SSL) enabled, you can configure the driver to connect to an SSL-enabled socket. When connecting to a server over SSL, the driver supports identity verification between the client and the server.

The procedure for configuring SSL in your connection differs depending on whether or not you are connecting through TNS. For more information, see below:

- Using TNS on page 13
- Without Using TNS on page 13

Using TNS

If you have configured the driver to connect using server information that is defined in a `tnsnames.ora` configuration file, then you must make sure that the necessary SSL settings are specified in the `tnsnames.ora` file. For more information, see the following:

- For information about configuring SSL for your Oracle database, including details about the settings required in the `tnsnames.ora` file, see "Configuring Secure Sockets Layer Authentication" in the *Oracle Database Security Guide*: https://docs.oracle.com/en/database/oracle/oracle-database/12.2/dbseg/configuring-secure-sockets-layer-authentication.html#GUID-6AD89576-526F-4D6B-A539-ADF4B840819F.
- For general information about the `tnsnames.ora` configuration file, see "Local Naming Parameters in the tnsnames.ora File" in the *Oracle Database Net Services Reference*: https://docs.oracle.com/en/database/oracle/oracle-database/12.2/netrf/local-naming-parameters-in-tnsnames-ora-file.html#GUID-A3F9D023-9CC4-445D-8921-6E40BD900EAD.

Without Using TNS

If you have specified your server information directly in a DSN or connection string instead of using the `tnsnames.ora` configuration file, then you must configure the

driver to use the TCPS protocol, which enables SSL encryption on a TCP/IP connection. The driver then encrypts the connection using the SSL settings defined in the `sqlnet.ora` configuration file.

Before configuring the driver to use TCPS, you must specify the necessary SSL settings in the `sqlnet.ora` file, and set the TNS_ADMIN environment variable on your machine to point to the path of the `sqlnet.ora` file. For more information, see the following:

- For information about configuring SSL for your Oracle database, including details about the settings required in the `sqlnet.ora` file, see "Configuring Secure Sockets Layer Authentication" in the *Oracle Database Security Guide*: https://docs.oracle.com/en/database/oracle/oracle-database/12.2/dbseg/configuring-secure-sockets-layer-authentication.html#GUID-6AD89576-526F-4D6B-A539-ADF4B840819F.
- For general information about the `sqlnet.ora` file, see "Parameters for the sqlnet.ora File" in the *Oracle Database Net Services Reference*: https://docs.oracle.com/en/database/oracle/oracle-database/12.2/netrf/parameters-for-the-sqlnet-ora-file.html#GUID-28040885-6832-4FFC-9258-0EF19FE9A3AC.

To enable TCPS on Windows:

1. Open the ODBC Data Source Administrator where you created the DSN, then select the DSN, and then click **Configure**.
2. Select the **Use TCPS** check box.
3. To save your settings and close the dialog box, click **OK**.

Configuring Advanced Options on Windows

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

To configure advanced options on Windows:

1. To access advanced options, open the ODBC Data Source Administrator where you created the DSN, then select the DSN, then click **Configure**, and then click **Advanced Options**.
2. To enable statement caching, select the **Enable Statement Caching** check box and, in the **Statement Cache Size** field, specify the number of statements to cache.
3. To set the buffer size that the driver uses for data retrieval, in the **Fetch Buffer Size** field, type the size of the buffer in bytes.
4. To disable automatic implementation parameter database (IPD) population, select the **Disable Default Auto IPD** check box.

5. To save your settings and close the Advanced Options dialog box, click **OK**.
6. To close the SimbaOracle ODBC Driver DSN Setup dialog box, click **OK**.

Configuring Logging Options on Windows

To help troubleshoot issues, you can enable logging. In addition to functionality provided in the Simba Oracle ODBC Driver, 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 settings for logging apply to every connection that uses the Simba Oracle ODBC Driver, so make sure to disable the feature after you are done using it.

To enable driver logging on Windows:

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 logging level corresponding to the amount of information that you want to include in log files:

Logging Level	Description
OFF	Disables all logging.
FATAL	Logs severe error events that lead the driver to abort.
ERROR	Logs error events that might allow the driver to continue running.
WARNING	Logs events that might result in an error if action is not taken.
INFO	Logs general information that describes the progress of the driver.
DEBUG	Logs detailed information that is useful for debugging the driver.

Logging Level	Description
TRACE	Logs all driver activity.

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 Simba Oracle ODBC Driver produces a log file named `simbaoracleodbcdriver.log` at the location you specify using the Log Path field.

If you enable the `UseLogPrefix` connection property, the driver prefixes the log file name with the user name associated with the connection and the process ID of the application through which the connection is made. For more information, see UseLogPrefix on page 56.

To disable driver logging on Windows:

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**.
4. Restart your ODBC application to make sure that the new settings take effect.

Verifying the Driver Version Number on Windows

If you need to verify the version of the Simba Oracle ODBC Driver that is installed on your Windows machine, you can find the version number in the ODBC Data Source Administrator.

To verify the driver version number on Windows:

1. From the Start menu, go to **ODBC Data Sources**.

   > **Note:**
   >
   > Make sure to select the ODBC Data Source Administrator that has the same bitness as the client application that you are using to connect to Oracle.

2. Click the **Drivers** tab and then find the Simba Oracle ODBC Driver in the list of ODBC drivers that are installed on your system. The version number is displayed in the **Version** column.

macOS Driver

macOS System Requirements

Install the driver on client machines where the application is installed. Each client machine that you install the driver on must meet the following minimum system requirements:

- macOS version 10.12, 10.13, or 10.14
- 250
- iODBC 3.52.9, 3.52.10, 3.52.11, or 3.52.12

Before the driver can be used, the 64-bit edition of Oracle Instant Client 12.2 must be installed in the `/lib` subfolder in the driver's installation directory. If you obtained the driver from the Simba website, then your installation of the driver automatically includes this dependency. Otherwise, you must install Oracle Instant Client manually. For detailed instructions, see Installing the Oracle Instant Client on macOS on page 19.

Installing the Driver on macOS

The Simba Oracle ODBC Driver is available for macOS as a `.dmg` file named `Simba Oracle 1.2.dmg`. The driver supports 64-bit client applications only.

To install the Simba Oracle ODBC Driver on macOS:

1. Double-click **Simba Oracle 1.2.dmg** to mount the disk image.
2. Double-click **Simba Oracle 1.2.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**.

   > **Note:**
   >
   > By default, the driver files are installed in the `/Library/simba/oracleodbc` directory.

6. To accept the installation location and begin the installation, click **Install**.
7. When the installation completes, click **Close**.

8. If you received a license file through email, then copy the license file into the `/lib` subfolder in the driver installation directory. You must have root privileges when changing the contents of this folder.

   For example, if you installed the driver to the default location, you would copy the license file into the `/Library/simba/oracleodbc/lib` folder.

Next, configure the environment variables on your machine to make sure that the ODBC driver manager can work with the driver. For more information, see Configuring the ODBC Driver Manager on Non-Windows Machines on page 24.

Installing the Oracle Instant Client on macOS

The Simba Oracle ODBC Driver requires the 64-bit edition of Oracle Instant Client 12.2. If you obtained the driver from the Simba website, then your installation of the driver automatically includes this dependency. Otherwise, you must manually install Oracle Instant Client in the `/lib` subfolder in the installation directory of the driver.

To install the Oracle Instant Client on macOS:

1. In a web browser, navigate to http://www.oracle.com/technetwork/database/features/instant-client/index.html.
2. Download the 64-bit edition of Oracle Instant Client version 12.2.0.1.0. You can use the Basic package or Basic Light package depending upon your disk space.
3. Extract the archive that you downloaded to a temporary location.
4. Copy the files from the temporary location to the `/lib` subfolder in the installation directory of the driver.

Verifying the Driver Version Number on macOS

If you need to verify the version of the Simba Oracle ODBC Driver that is installed on your macOS machine, you can query the version number through the Terminal.

To verify the driver version number on macOS:

- At the Terminal, run the following command:

```
pkgutil --info com.simba.oracleodbc
```

The command returns information about the Simba Oracle ODBC Driver that is installed on your machine, including the version number.

Linux Driver

The Linux driver is available as an RPM file and as a tarball package.

Linux System Requirements

Install the driver on client machines where the application is installed. Each client machine that you install the driver on must meet the following minimum system requirements:

- One of the following distributions:
  - Red Hat® Enterprise Linux® (RHEL) 6 or 7
  - CentOS 6 or 7
  - SUSE Linux Enterprise Server (SLES) 11 or 12
  - Debian 8 or 9
  - Ubuntu 14.04, 16.04, or 18.04
- 270
- One of the following ODBC driver managers installed:
  - iODBC 3.52.9, 3.52.10, 3.52.11, or 3.52.12
  - unixODBC 2.3.2, 2.3.3, or 2.3.4

To install the driver, you must have root access on the machine.

Before the driver can be used, Oracle Instant Client 12.2 (with the same bitness as the driver) must be installed in the `/lib` subfolder in the driver's installation directory. If you obtained the driver from the Simba website, then your installation of the driver automatically includes this dependency. Otherwise, you must install Oracle Instant Client manually. For detailed instructions, see Installing the Oracle Instant Client on Linux on page 22.

Installing the Driver Using the RPM File

On 64-bit editions of Linux, 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 a driver whose bitness matches the bitness of the client application:

- `simbaoracle-`*`[Version]`*`-`*`[Release]`*`.i686.rpm` for the 32-bit driver
- `simbaoracle-`*`[Version]`*`-`*`[Release]`*`.x86_64.rpm` for the 64-bit driver

The placeholders in the file names are defined as follows:

- *[Version]* is the version number of the driver.
- *[Release]* is the release number for this version of the driver.

You can install both the 32-bit and 64-bit versions of the driver on the same machine.

To install the Simba Oracle ODBC Driver using the RPM File:

1. Log in as the root user.
2. Navigate to the folder containing the RPM package for the driver.
3. Depending on the Linux distribution that you are using, run one of the following commands from the command line, where *[RPMFileName]* is the file name of the RPM package:
   - If you are using Red Hat Enterprise Linux or CentOS, run the following command:

     ```
     yum --nogpgcheck localinstall [RPMFileName]
     ```

   - Or, if you are using SUSE Linux Enterprise Server, run the following command:

     ```
     zypper install [RPMFileName]
     ```

   The Simba Oracle ODBC Driver files are installed in the `/opt/simba/oracleodbc` directory.
4. If you received a license file through email, then copy the license file into the `/opt/simba/oracleodbc/lib/32` or `/opt/simba/oracleodbc/lib/64` folder, depending on the version of the driver that you installed. You must have root privileges when changing the contents of this folder.

Next, configure the environment variables on your machine to make sure that the ODBC driver manager can work with the driver. For more information, see Configuring the ODBC Driver Manager on Non-Windows Machines on page 24.

Installing the Driver Using the Tarball Package

The Simba Oracle ODBC Driver is available as a tarball package named `SimbaOracleODBC-[Version].[Release]-Linux.tar.gz`, where *[Version]* is the version number of the driver and *[Release]* is the release number for this version of the driver. The package contains both the 32-bit and 64-bit versions of the driver.

On 64-bit editions of Linux, 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 a driver whose bitness matches the bitness of the client application. You can install both versions of the driver on the same machine.

To install the driver using the tarball package:

1. Log in as the root user, and then navigate to the folder containing the tarball package.
2. Run the following command to extract the package and install the driver:

   ```
   tar  --directory=/opt -zxvf [TarballName]
   ```

   Where `[TarballName]` is the name of the tarball package containing the driver.

   The Simba Oracle ODBC Driver files are installed in the `opt/simba/oracleodbc` directory.
3. If you received a license file through email, then copy the license file into the `opt/simba/oracleodbc/lib/32` or `opt/simba/oracleodbc/lib/64` folder, depending on the version of the driver that you installed. You must have root privileges when changing the contents of this folder.

Next, configure the environment variables on your machine to make sure that the ODBC driver manager can work with the driver. For more information, see Configuring the ODBC Driver Manager on Non-Windows Machines on page 24.

Installing the Oracle Instant Client on Linux

The Simba Oracle ODBC Driver requires Oracle Instant Client 12.2. If you obtained the driver from the Simba website, then your installation of the driver automatically includes this dependency. Otherwise, you must manually install Oracle Instant Client in the `/lib` subfolder in the installation directory of the driver.

To install the Oracle Instant Client on Linux:

1. In a web browser, navigate to http://www.oracle.com/technetwork/database/features/instant-client/index.html.
2. Download the 12.2.0.1.0 version of the Oracle Instant Client that matches the bitness of your platform. You can use the Basic package or Basic Light package depending upon your disk space.
3. Extract the archive that you downloaded to a temporary location.
4. Copy the files from the temporary location to the `/lib` subfolder in the installation directory of the driver.

Verifying the Driver Version Number on Linux

If you need to verify the version of the Simba Oracle ODBC Driver that is installed on your Linux machine, you can query the version number through the command-line

interface if the driver was installed using an RPM file.

To verify the driver version number on Linux:

- Depending on your package manager, at the command prompt, run one of the following commands:
  - `yum list | grep SimbaOracleODBC`
  - `rpm -qa | grep SimbaOracleODBC`

The command returns information about the Simba Oracle ODBC Driver that is installed on your machine, including the version number.

Configuring the ODBC Driver Manager on Non-Windows Machines

To make sure that the ODBC driver manager on your machine is configured to work with the Simba Oracle ODBC Driver, do the following:

- Set the library path environment variable to make sure that your machine uses the correct ODBC driver manager. For more information, see Specifying ODBC Driver Managers on Non-Windows Machines on page 24.
- If the driver configuration files are not stored in the default locations expected by the ODBC driver manager, then set environment variables to make sure that the driver manager locates and uses those files. For more information, see Specifying the Locations of the Driver Configuration Files on page 25.

After configuring the ODBC driver manager, you can configure a connection and access your data store through the driver.

Specifying ODBC Driver Managers on Non-Windows Machines

You need to make sure that your machine uses the correct ODBC driver manager to load the driver. To do this, set the library path environment variable.

macOS

If you are using a macOS machine, then set the DYLD_LIBRARY_PATH environment variable to include the paths to the ODBC driver manager libraries. For example, if the libraries are installed in `/usr/local/lib`, then run the following command to set DYLD_LIBRARY_PATH for the current user session:

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

For information about setting an environment variable permanently, refer to the macOS shell documentation.

Linux

If you are using a Linux machine, then set the LD_LIBRARY_PATH environment variable to include the paths to the ODBC driver manager libraries. For example, if the libraries are installed in `/usr/local/lib`, then run the following command to set LD_LIBRARY_PATH for the current user session:

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

For information about setting an environment variable permanently, refer to the Linux shell documentation.

Specifying the Locations of the Driver Configuration Files

By default, ODBC driver managers are configured to use hidden versions of the `odbc.ini` and `odbcinst.ini` configuration files (named `.odbc.ini` and `.odbcinst.ini`) located in the home directory, as well as the `simba.oracleodbc.ini` file in the `lib` subfolder of the driver installation directory. If you store these configuration files elsewhere, then you must set the environment variables described below so that the driver manager can locate the files.

If you are using iODBC, do the following:

- Set ODBCINI to the full path and file name of the `odbc.ini` file.
- Set ODBCINSTINI to the full path and file name of the `odbcinst.ini` file.
- Set SIMBAINI to the full path and file name of the `simba.oracleodbc.ini` file.

If you are using unixODBC, do the following:

- Set ODBCINI to the full path and file name of the `odbc.ini` file.
- Set ODBCSYSINI to the full path of the directory that contains the `odbcinst.ini` file.
- Set SIMBAINI to the full path and file name of the `simba.oracleodbc.ini` file.

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

For iODBC:

```
export ODBCINI=/usr/local/odbc/odbc.ini
export ODBCINSTINI=/usr/local/odbc/odbcinst.ini
export SIMBAINI=/etc/simba.oracleodbc.ini
```

For unixODBC:

```
export ODBCINI=/usr/local/odbc/odbc.ini
export ODBCSYSINI=/usr/local/odbc
```

```
export SIMBAINI=/etc/simba.oracleodbc.ini
```

To locate the `simba.oracleodbc.ini` file, the driver uses the following search order:

1. If the SIMBAINI environment variable is defined, then the driver searches for the file specified by the environment variable.
2. The driver searches the directory that contains the driver library files for a file named `simba.oracleodbc.ini`.
3. The driver searches the current working directory of the application for a file named `simba.oracleodbc.ini`.
4. The driver searches the home directory for a hidden file named `.simba.oracleodbc.ini` (prefixed with a period).
5. The driver searches the `/etc` directory for a file named `simba.oracleodbc.ini`.

Configuring ODBC Connections on a Non-Windows Machine

The following sections describe how to configure ODBC connections when using the Simba Oracle ODBC Driver on non-Windows platforms:

Creating a Data Source Name on a Non-Windows Machine

When connecting to your data store using a DSN, you only need to configure the `odbc.ini` file. Set the properties in the `odbc.ini` file to create a DSN that specifies the connection information for your data store. For information about configuring a DSN-less connection instead, see Configuring a DSN-less Connection on a Non-Windows Machine on page 30.

If your machine is already configured to use an existing `odbc.ini` file, then update that file by adding the settings described below. Otherwise, copy the `odbc.ini` file from the `Setup` subfolder in the driver installation directory to the home directory, and then update the file as described below.

To create a Data Source Name on a non-Windows machine:

1. In a text editor, open the `odbc.ini` configuration file.

   > **Note:**
   >
   > If you are using a hidden copy of the `odbc.ini` file, you can remove the period (`.`) from the start of the file name to make the file visible while you are editing it.

2. In the `[ODBC Data Sources]` section, add a new entry by typing a name for the DSN, an equal sign (=), and then the name of the driver.

   For example, on a macOS machine:

```
[ODBC Data Sources]
Sample DSN=Simba Oracle ODBC Driver
```

As another example, for a 32-bit driver on a Linux machine:

```
[ODBC Data Sources]
Sample DSN=Simba Oracle ODBC Driver 32-bit
```

3. Create a section that has the same name as your DSN, and then specify configuration options as key-value pairs in the section:
   a. Set the `Driver` property to the full path of the driver library file that matches the bitness of the application.

      For example, on a macOS machine:

      ```
      Driver=/Library/simba/oracleodbc/lib/liboracleodbc_
      sb64.dylib
      ```

      As another example, for a 32-bit driver on a Linux machine:

      ```
      Driver=/opt/simba/oracleodbc/lib/32/liboracleodbc_
      sb32.so
      ```

   b. To specify the Oracle database that you want to connect to, do one of the following:
      - To use server information that is defined in your `tnsnames.ora` configuration file, do the following:
        i. Set the `TNS` property to the net service name that you want to use.
        ii. On your Linux or macOS machine, update the TNS_ADMIN environment variable to point to the path of the `tnsnames.ora` file.

        For example:

        ```
        TNS=oracleconnection1
        ```

      - Or, to specify server information directly in the DSN, do the following:
        i. Set the `Host` property to the IP address or host name of the Oracle server.
        ii. Set the `Port` property to the number of the TCP port that the server uses to listen for client connections.
        iii. Set the SVC property to the service name of the Oracle database that you want to access.

For example:

```
Host=192.168.222.160
Port=1521
SVC=ORCL
```

> **Note:**
>
> If you specify `TNS` in addition to `Host`, `Port`, and `SVC`, the `TNS` setting takes precedence and the driver connects using the server information defined in the `tnsnames.ora` configuration file.

c. Configure authentication as needed. For more information, see Configuring Authentication on a Non-Windows Machine on page 33.

d. Configure SSL encryption as needed. For more information, see Configuring SSL Verification on a Non-Windows Machine on page 34.

e. Optionally, set additional key-value pairs as needed to specify other optional connection settings. For detailed information about all the configuration options supported by the Simba Oracle ODBC Driver, see Driver Configuration Options on page 45.

4. Save the `odbc.ini` configuration file.

> **Note:**
>
> If you are storing this file in its default location in the home directory, then prefix the file name with a period (`.`) so that the file becomes hidden. If you are storing this file in another location, then save it as a non-hidden file (without the prefix), and make sure that the ODBCINI environment variable specifies the location. For more information, see Specifying the Locations of the Driver Configuration Files on page 25.

For example, the following is an `odbc.ini` configuration file for macOS containing a DSN that connects to Oracle, with statement caching enabled and the number of statements in the statement cache set to 20. Also, the driver uses 1000000 bytes as the buffer size for data retrieval:

```
[ODBC Data Sources]
Sample DSN=Simba Oracle ODBC Driver
[Sample DSN]
Driver=/Library/simba/oracleodbc/lib/liboracleodbc_
sb64.dylib
Host=192.168.222.160
Port=1521
SVC=ORCL
```

```
UID=jsmith
PWD=simba123
ENABLESTMTCACHE=true
STMTCACHESIZE=20
MEMLIM=1000000
```

As another example, the following is an `odbc.ini` configuration file for a 32-bit driver on a Linux machine, containing a DSN that connects to Oracle, with statement caching enabled and the number of statements in the statement cache set to 20. Also, the driver uses 1000000 bytes as the buffer size for data retrieval:

```
[ODBC Data Sources]
Sample DSN=Simba Oracle ODBC Driver 32-bit
[Sample DSN]
Driver=/opt/simba/oracleodbc/lib/32/liboracleodbc_sb32.so
Host=192.168.222.160
Port=1521
SVC=ORCL
UID=jsmith
PWD=simba123
ENABLESTMTCACHE=true
STMTCACHESIZE=20
MEMLIM=1000000
```

You can now use the DSN in an application to connect to the data store.

Configuring a DSN-less Connection on a Non-Windows Machine

To connect to your data store through a DSN-less connection, you need to define the driver in the `odbcinst.ini` file and then provide a DSN-less connection string in your application.

If your machine is already configured to use an existing `odbcinst.ini` file, then update that file by adding the settings described below. Otherwise, copy the `odbcinst.ini` file from the `Setup` subfolder in the driver installation directory to the home directory, and then update the file as described below.

To define a driver on a non-Windows machine:

1. In a text editor, open the `odbcinst.ini` configuration file.

   > **Note:**
   >
   > If you are using a hidden copy of the `odbcinst.ini` file, you can remove the period (`.`) from the start of the file name to make the file visible while you are editing it.

2. In the `[ODBC Drivers]` section, add a new entry by typing a name for the driver, an equal sign (=), and then `Installed`.

   For example:

   ```
   [ODBC Drivers]
   Simba Oracle ODBC Driver=Installed
   ```

3. Create a section that has the same name as the driver (as specified in the previous step), and then specify the following configuration options as key-value pairs in the section:
   a. Set the `Driver` property to the full path of the driver library file that matches the bitness of the application.

      For example, on a macOS machine:

      ```
      Driver=/Library/simba/oracleodbc/lib/liboracleodbc_
      sb64.dylib
      ```

      As another example, for a 32-bit driver on a Linux machine:

      ```
      Driver=/opt/simba/oracleodbc/lib/32/liboracleodbc_
      sb32.so
      ```

   b. Optionally, set the `Description` property to a description of the driver.

      For example:

      ```
      Description=Simba Oracle ODBC Driver
      ```

4. Save the `odbcinst.ini` configuration file.

> **Note:**
>
> If you are storing this file in its default location in the home directory, then prefix the file name with a period (.) so that the file becomes hidden. If you are storing this file in another location, then save it as a non-hidden file (without the prefix), and make sure that the ODBCINSTINI or ODBCSYSINI environment variable specifies the location. For more information, see Specifying the Locations of the Driver Configuration Files on page 25.

For example, the following is an `odbcinst.ini` configuration file for macOS:

```
[ODBC Drivers]
Simba Oracle ODBC Driver=Installed
[Simba Oracle ODBC Driver]
Description=Simba Oracle ODBC Driver
Driver=/Library/simba/oracleodbc/lib/liboracleodbc_
sb64.dylib
```

As another example, the following is an `odbcinst.ini` configuration file for both the 32- and 64-bit drivers on Linux:

```
[ODBC Drivers]
Simba Oracle ODBC Driver 32-bit=Installed
Simba Oracle ODBC Driver 64-bit=Installed
[Simba Oracle ODBC Driver 32-bit]
Description=Simba Oracle ODBC Driver (32-bit)
Driver=/opt/simba/oracleodbc/lib/32/liboracleodbc_sb32.so
[Simba Oracle ODBC Driver 64-bit]
Description=Simba Oracle ODBC Driver (64-bit)
Driver=/opt/simba/oracleodbc/lib/64/liboracleodbc_sb64.so
```

You can now connect to your data store by providing your application with a connection string where the `Driver` property is set to the driver name specified in the `odbcinst.ini` file, and all the other necessary connection properties are also set. For more information, see "DSN-less Connection String Examples" in Using a Connection String on page 39.

For instructions about configuring specific connection features, see the following:

- Configuring Authentication on a Non-Windows Machine on page 33
- Configuring SSL Verification on a Non-Windows Machine on page 34

For detailed information about all the connection properties that the driver supports, see Driver Configuration Options on page 45.

Configuring Authentication on a Non-Windows Machine

All Oracle databases require authentication. You can configure the Simba Oracle ODBC Driver to provide your credentials and authenticate the connection to the database using one of the following methods:

- Using Your Oracle Database Credentials on page 33
- Using Kerberos on page 33

You can set the connection properties described below in a connection string or in a DSN (in the `odbc.ini` file). Settings in the connection string take precedence over settings in the DSN.

Using Your Oracle Database Credentials

You can configure the driver to authenticate the connection using your database credentials.

To configure authentication using your database credentials on a non-Windows machine:

1. Set the `UseExternalCredentials` property to `false`.
2. Set the `UID` property to your user name for accessing the Oracle database.
3. Set the `PWD` property to the password corresponding to the user name you typed above.

Using Kerberos

You can configure the driver to use the Kerberos protocol to authenticate the connection. The driver retrieves and uses a Kerberos ticket based on the settings in the `sqlnet.ora` configuration file.

Before you can use this authentication mechanism, you must specify the necessary Kerberos settings in the `sqlnet.ora` file, and set the TNS_ADMIN environment variable on your machine to point to the path of the `sqlnet.ora` file. For more information, see the following:

- For information about configuring Kerberos for your Oracle database, including details about the settings required in the `sqlnet.ora` file, see "Configuring Kerberos Authentication" in the *Oracle Database Advanced Security Administrator's Guide*: https://docs.oracle.com/cd/E11882_01/network.112/e40393/asokerb.htm.

- For general information about the `sqlnet.ora` file, see "Parameters for the sqlnet.ora File" in the *Oracle Database Net Services Reference*: https://docs.oracle.com/en/database/oracle/oracle-database/12.2/netrf/parameters-for-the-sqlnet-ora-file.html#GUID-28040885-6832-4FFC-9258-0EF19FE9A3AC.

To configure Kerberos authentication on a non-Windows machine:

- Set the `UseExternalCredentials` property to `true`.

Configuring SSL Verification on a Non-Windows Machine

If you are connecting to an Oracle server that has Secure Sockets Layer (SSL) enabled, you can configure the driver to connect to an SSL-enabled socket. When connecting to a server over SSL, the driver supports identity verification between the client and the server.

The procedure for configuring SSL in your connection differs depending on whether or not you are connecting through TNS. For more information, see below:

- Using TNS on page 34
- Without Using TNS on page 35

Using TNS

If you have configured the driver to connect using server information that is defined in a `tnsnames.ora` configuration file, then you must make sure that the necessary SSL settings are specified in the `tnsnames.ora` file. For more information, see the following:

- For information about configuring SSL for your Oracle database, including details about the settings required in the `tnsnames.ora` file, see "Configuring Secure Sockets Layer Authentication" in the *Oracle Database Security Guide*: https://docs.oracle.com/en/database/oracle/oracle-database/12.2/dbseg/configuring-secure-sockets-layer-authentication.html#GUID-6AD89576-526F-4D6B-A539-ADF4B840819F.
- For general information about the `tnsnames.ora` configuration file, see "Local Naming Parameters in the tnsnames.ora File" in the *Oracle Database Net Services Reference*: https://docs.oracle.com/en/database/oracle/oracle-database/12.2/netrf/local-naming-parameters-in-tnsnames-ora-file.html#GUID-A3F9D023-9CC4-445D-8921-6E40BD900EAD.

Without Using TNS

If you have specified your server information directly in a DSN or connection string instead of using the `tnsnames.ora` configuration file, then you must configure the driver to use the TCPS protocol, which enables SSL encryption on a TCP/IP connection. The driver then encrypts the connection using the SSL settings defined in the `sqlnet.ora` configuration file.

Before configuring the driver to use TCPS, you must specify the necessary SSL settings in the `sqlnet.ora` file, and set the TNS_ADMIN environment variable on your machine to point to the path of the `sqlnet.ora` file. For more information, see the following:

- For information about configuring SSL for your Oracle database, including details about the settings required in the `sqlnet.ora` file, see "Configuring Secure Sockets Layer Authentication" in the *Oracle Database Security Guide*: https://docs.oracle.com/en/database/oracle/oracle-database/12.2/dbseg/configuring-secure-sockets-layer-authentication.html#GUID-6AD89576-526F-4D6B-A539-ADF4B840819F.
- For general information about the `sqlnet.ora` file, see "Parameters for the sqlnet.ora File" in the *Oracle Database Net Services Reference*: https://docs.oracle.com/en/database/oracle/oracle-database/12.2/netrf/parameters-for-the-sqlnet-ora-file.html#GUID-28040885-6832-4FFC-9258-0EF19FE9A3AC.

To enable TCPS on a non-Windows machine:

- Set the `UseTCPS` property to `true`.

Configuring Logging Options on a Non-Windows Machine

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

! Important:

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

The settings for logging apply to every connection that uses the Simba Oracle ODBC Driver, so make sure to disable the feature after you are done using it.

Logging is configured through driver-wide settings in the `simba.oracleodbc.ini` file, which apply to all connections that use the driver.

To enable logging on a non-Windows machine:

1. Open the `simba.oracleodbc.ini` configuration file in a text editor.
2. To specify the level of information to include in log files, set the `LogLevel` property to one of the following numbers:

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

3. Set the `LogPath` key to the full path to the folder where you want to save log files.
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. Optionally, to prefix the log file name with the user name and process ID associated with the connection, set the `UseLogPrefix` property to `1`.

7. Save the `simba.oracleodbc.ini` configuration file.
8. Restart your ODBC application to make sure that the new settings take effect.

The Simba Oracle ODBC Driver produces a log file named `simbaoracleodbcdriver.log` at the location you specify using the `LogPath` key.

If you set the `UseLogPrefix` property to `1`, then each file name is prefixed with *`[UserName]_[ProcessID]_`*, where *[UserName]* is the user name associated with the connection and *[ProcessID]* is the process ID of the application through which the connection is made. For more information, see UseLogPrefix on page 56.

To disable logging on a non-Windows machine:

1. Open the `simba.oracleodbc.ini` configuration file in a text editor.
2. Set the `LogLevel` key to `0`.
3. Save the `simba.oracleodbc.ini` configuration file.
4. Restart your ODBC application to make sure that the new settings take effect.

Testing the Connection on a Non-Windows Machine

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

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 the connection string for connecting to your data store, and then press ENTER. For more information, see Using a Connection String on page 39.

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

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.

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 sections 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 45.

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.

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:

- *[DBService]* is service name of the database that you want to access.
- *[PortNumber]* is the number of the TCP port that the Oracle server uses to listen for client connections.
- *[Server]* is the IP address or host name of the Oracle server to which you are connecting.
- *[TNSName]* is the net service name from your `tnsnames.ora` file that you want to use for your connection.
- *[YourPassword]* is the password corresponding to your user name.
- *[YourUserName]* is the user name that you use to access the Oracle server.

Connecting to Oracle Using Your Oracle Database Credentials

The following is the format of a DSN-less connection string for connecting to Oracle using your database credentials:

```
Driver=Simba Oracle ODBC Driver;Host=[Server];
Port=[PortNumber];SVC=[DBService];UID=[YourUserName];
PWD=[YourPassword];
```

For example:

```
Driver=Simba Oracle ODBC Driver;Host=192.168.222.160;
Port=1521;SVC=ORCL;UID=jsmith;PWD=simba123;
```

If you are connecting to the server through SSL, then set the `UseTCPS` property to `true`. For example:

```
Driver=Simba Oracle ODBC Driver;Host=192.168.222.160;
Port=2484;SVC=ORCL;UID=jsmith;PWD=simba123;
UseTCPS=true;
```

Connecting to Oracle Using Kerberos

The following is the format of a DSN-less connection string for connecting to Oracle using the Kerberos protocol:

```
Driver=Simba Oracle ODBC Driver;Host=[Server];
Port=[PortNumber];SVC=
[DBService];UseExternalCredentials=true;
```

For example:

```
Driver=Simba Oracle ODBC Driver;Host=192.168.222.160;
Port=1521;SVC=ORCL;UseExternalCredentials=true;
```

If you are connecting to the server through SSL, then set the `UseTCPS` property to `true`. For example:

```
Driver=Simba Oracle ODBC Driver;Host=192.168.222.160;
Port=2484;SVC=ORCL;UseExternalCredentials=true;
UseTCPS=true;
```

Connecting to Oracle Through TNS

The following is the format of a DSN-less connection string for connecting to a Oracle through TNS. In this example, the driver authenticates the connection using Oracle database credentials; however, you can configure the driver to authenticate through Kerberos instead, as shown in the examples above.

```
Driver=Simba Oracle ODBC Driver;TNS=[TNSName];
UID=[YourUserName];PWD=[YourPassword];
```

For example:

```
Driver=Simba Oracle ODBC Driver;TNS=oracleconnection1;
UID=jsmith;PWD=simba123;
```

If you are connecting to the server through SSL, make sure that the TNS_ADMIN environment variable on your machine points to a `tnsnames.ora` configuration file that contains the necessary SSL settings. For more information, see Configuring SSL Verification on a Windows Machine on page 13 or Configuring SSL Verification on a Non-Windows Machine on page 34.

Features

The Simba Oracle ODBC Driver supports the following features:

Data Types

The Simba Oracle ODBC Driver supports many common data formats, converting between Oracle data types and SQL data types.

The table below lists the supported data type mappings.

Oracle Type	SQL Type
BFILE	SQL_LONGVARBINARY
BINARY_DOUBLE	SQL_DOUBLE
BINARY_FLOAT	SQL_REAL
BLOB	SQL_LONGVARBINARY
CHAR	SQL_CHAR
CLOB	SQL_LONGVARCHAR
DATE	SQL_TYPE_TIMESTAMP
DECIMAL	SQL_DECIMAL
DOUBLE_PRECISION	SQL_DOUBLE
FLOAT	SQL_FLOAT
INTEGER	SQL_DECIMAL
INTERVAL_DAY_TO_SECOND	SQL_INTERVAL_DAY_TO_SECOND
INTERVAL_YEAR_TO_MONTH	SQL_INTERVAL_YEAR_TO_MONTH

Oracle Type	SQL Type
NCHAR	SQL_WCHAR
NCLOB	SQL_WLONGVARCHAR
NUMBER	SQL_DECIMAL
NUMBER([1-38])	SQL_DECIMAL
NUMBER([1-38], [0-38])	SQL_DECIMAL
NVARCHAR2	SQL_WVARCHAR
RAW	SQL_VARBINARY
REAL	SQL_DOUBLE
ROWID	SQL_WCHAR
TIMESTAMP	SQL_TYPE_TIMESTAMP
TIMESTAMP_ WITH_LOCAL_TIME_ ZONE	SQL_TYPE_TIMESTAMP
TIMESTAMP_WITH_TIME_ZONE	SQL_TYPE_TIMESTAMP
UROWID	SQL_WCHAR
VARCHAR	SQL_VARCHAR
VARCHAR2	SQL_VARCHAR

Security and Authentication

To protect data from unauthorized access, Oracle data stores require connections to be authenticated with user credentials and sometimes the SSL protocol. The Simba Oracle ODBC Driver provides full support for these authentication protocols.

Note:

In this documentation, "SSL" refers to both TLS (Transport Layer Security) and SSL (Secure Sockets Layer). The driver supports the same SSL/TLS versions as Oracle Call Interface (OCI) 12.2.

The driver provides a mechanism that enables you to authenticate your connection using your Oracle database credentials or the Kerberos protocol. Authentication through Kerberos requires you to provide a `sqlnet.ora` configuration file that contains the necessary Kerberos settings. For detailed configuration instructions, see Configuring Authentication on Windows on page 12 or Configuring Authentication on a Non-Windows Machine on page 33.

Additionally, the driver supports SSL encryption with identity verification. The driver supports the same SSL versions as Oracle Call Interface (OCI) 12.2. For information about SSL support in OCI 12.2, see "SSL Cipher Suite Authentication, Encryption, Integrity, and TLS Versions" in the *Oracle Database Security Guide*: https://docs.oracle.com/en/database/oracle/oracle-database/12.2/dbseg/configuring-secure-sockets-layer-authentication.html#GUID-EFF4B2C9-2D25-473D-B718-A42754252347.

Note:

If you try to establish an SSL connection to a server that is using an earlier version of OCI, the connection might fail due to differences in the supported SSL features.

If you are connecting through TNS, then your SSL settings must be specified in your `tnsnames.ora` configuration file. Otherwise, you must enable TCPS support in the driver and then provide a `sqlnet.ora` configuration file that contains the necessary SSL settings. For detailed configuration instructions, see Configuring SSL Verification on a Windows Machine on page 13 or Configuring SSL Verification on a Non-Windows Machine on page 34.

It is recommended that you use SSL whenever you connect to a server that is configured to support it. SSL encryption protects data and credentials when they are transferred over the network, and provides stronger security than authentication alone.

Driver Configuration Options

Driver Configuration Options lists the configuration options available in the Simba Oracle ODBC Driver 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 described below are available in the following dialog boxes:

- Simba Oracle ODBC Driver DSN Setup
- Advanced Options
- Logging Options

When using a connection string or configuring a connection from a non-Windows machine, use the key names provided below.

Configuration Options Appearing in the User Interface

The following configuration options are accessible via the Windows user interface for the Simba Oracle ODBC Driver, or via the key name when using a connection string or configuring a connection from a Linux or macOS machine:

Disable Default Auto IPD

Key Name	Default Value	Required
DisableDefaultAutoIPD	Clear (0)	No

Description

This option indicates whether automatic implementation parameter database (IPD) population is enabled or not.

- Enabled (1): The driver does not automatically populate the IPD.
- Disabled (0): The driver automatically populates the IPD.

Enable Statement Caching

Key Name	Default Value	Required
EnableStmtCache	Clear (false)	No

Description

This option indicates whether statement caching is enabled or not.

- Enabled (true): The driver caches statements, increasing performance for parsing the same statements multiple times in the same connection. Be aware that the driver uses more memory when statement caching is enabled.
- Disabled (false): The driver does not cache statements. When statement caching is disabled, the driver uses less memory.

The default size of the cache is 20 statements. For more information about the cache size, see Statement Cache Size on page 51.

Enable Table Types

Key Name	Default Value	Required
EnableTableTypes	Clear (0)	No

Description

This option specifies whether the driver recognizes table type information from the data source. By default, the driver only recognizes a single, generic table type.

- Enabled (`1`): The driver recognizes the following table types: TABLE, SYSTEM TABLE, and GLOBAL TEMPORARY.
- Disabled (`0`): All tables returned from the data source have the generic type TABLE.

Fetch Buffer Size

Key Name	Default Value	Required
`MEMLIM`	`104857600` (100 MB)	No

Description

The size of the buffer that the driver uses for data retrieval, in bytes. The minimum value for the buffer size is `32000` (32 KB).

This property determines the maximum number of rows that the driver can retrieve each time during array fetches. The maximum number of rows is calculated using the `MEMLIM` value and the maximum size of one row.

Note:

To confirm the number of rows that the driver retrieves at a time based on your `MEMLIM` setting, enable driver logging on the `DEBUG` level and then run a query. The log file includes information about the number of rows per fetch relative to the `MEMLIM` setting.

For information about configuring logging when using the Windows driver, see Configuring Logging Options on Windows on page 15.

For information about configuring logging when using a non-Windows driver, see Configuring Logging Options on a Non-Windows Machine on page 35.

Host

Key Name	Default Value	Required
Host	None	Yes, unless connecting through TNS.

Description

The IP address or host name of the Oracle server.

Note:

If you are connecting using a connection string or from a non-Windows machine, and the TNS property is set, the driver uses the server information defined in the specified net service name instead of this value.

Log Level

Key Name	Default Value	Required
LogLevel	OFF (0)	No

Description

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

Important:

- Only enable logging long enough to capture an issue. Logging decreases performance and can consume a large quantity of disk space.
- The settings for logging apply to every connection that uses the Simba Oracle ODBC Driver, so make sure to disable the feature after you are done using it.
- This option is not supported in connection strings. To configure logging for the Windows driver, you must use the Logging Options dialog box. To configure logging for a non-Windows driver, you must use the simba.oracleodbc.ini file.

Set the property to one of the following values:

- OFF (0): Disable all logging.
- FATAL (1): Logs severe error events that lead the driver to abort.
- ERROR (2): Logs error events that might allow the driver to continue running.
- WARNING (3): Logs events that might result in an error if action is not taken.
- INFO (4): Logs general information that describes the progress of the driver.
- DEBUG (5): Logs detailed information that is useful for debugging the driver.
- TRACE (6): Logs all driver activity.

When logging is enabled, the driver produces a log file named `simbaoracleodbcdriver.log` at the location that you specify in the Log Path (`LogPath`) property.

If you enable the `UseLogPrefix` connection property, the driver prefixes the log file name with the user name associated with the connection and the process ID of the application through which the connection is made. For more information, see UseLogPrefix on page 56.

Log Path

Key Name	Default Value	Required
`LogPath`	None	Yes, if logging is enabled.

Description

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

Important:

This option is not supported in connection strings. To configure logging for the Windows driver, you must use the Logging Options dialog box. To configure logging for a non-Windows driver, you must use the `simba.oracleodbc.ini` file.

Max File Size

Key Name	Default Value	Required
`LogFileSize`	`20`	No

Description

The maximum size of each log file in megabytes (MB). After the maximum file size is reached, the driver creates a new file and continues logging.

! Important:

This option is not supported in connection strings. To configure logging for the Windows driver, you must use the Logging Options dialog box. To configure logging for a non-Windows driver, you must use the `simba.oracleodbc.ini` file.

Max Number Files

Key Name	Default Value	Required
`LogFileCount`	`50`	No

Description

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

! Important:

This option is not supported in connection strings. To configure logging for the Windows driver, you must use the Logging Options dialog box. To configure logging for a non-Windows driver, you must use the `simba.oracleodbc.ini` file.

Password

Key Name	Default Value	Required
`PWD`	None	Yes

Description

The password corresponding to the user name that you provided in the User field (the `UID` key).

Port

Key Name	Default Value	Required
Port	None	Yes, unless connecting through TNS.

Description

The TCP port that the Oracle server uses to listen for client connections.

Note:

If you are connecting using a connection string or from a non-Windows machine, and the TNS property is set, the driver uses the server information defined in the specified net service name instead of this value.

Service Name

Key Name	Default Value	Required
SVC	None	Yes, unless connecting through TNS.

Description

The service name of the database.

Note:

If you are connecting using a connection string or from a non-Windows machine, and the TNS property is set, the driver uses the service name specified through that setting instead of this value.

Statement Cache Size

Key Name	Default Value	Required
StmtCacheSize	20	No

Description

This option indicates the number of statements that the statement cache can contain. Even though the Simba Oracle ODBC Driver does not place any restriction on the size of the statement cache, you must be aware of the maximum number of open cursors allowed in your data source. For example, if the cache size is set to a value higher than the maximum number of open cursors allowed in your data source, you may see an error such as the following:

```
ORA-01000: maximum open cursors exceeded
```

TNS Name

Key Name	Default Value	Required
TNS	None	Yes, if connecting through TNS.

Description

The net service name from your `tnsnames.ora` file that you want to use for your connection. Set this property when you want to connect to Oracle using server information that is defined in your `tnsnames.ora` file, instead of specifying server information directly in a DSN or connection string.

For more information about the `tnsnames.ora` configuration file, see "Local Naming Parameters in the tnsnames.ora File" in the *Oracle Database Net Services Reference*: https://docs.oracle.com/en/database/oracle/oracle-database/12.2/netrf/local-naming-parameters-in-tnsnames-ora-file.html#GUID-A3F9D023-9CC4-445D-8921-6E40BD900EAD.

Use External Credentials

Key Name	Default Value	Required
UseExternalCredentials	Clear (`false`)	No

Description

This option specifies whether the driver uses the Kerberos protocol to authenticate the connection.

- Enabled (`true`): The driver uses the Kerberos protocol to authenticate the connection. The driver retrieves and uses a Kerberos ticket based on the settings in the `sqlnet.ora` configuration file. The `sqlnet.ora` configration file must be specified by the TNS_ADMIN environment variable on your machine.

  Note:
  - For information about configuring Kerberos on your Oracle database, including details about the settings required in the `sqlnet.ora` file, see "Configuring Kerberos Authentication" in the *Oracle Database Advanced Security Administrator's Guide*: https://docs.oracle.com/cd/E11882_01/network.112/e40393/asokerb.htm.
  - For general information about the `sqlnet.ora` file, see "Parameters for the sqlnet.ora File" in the *Oracle Database Net Services Reference*: https://docs.oracle.com/en/database/oracle/oracle-database/12.2/netrf/parameters-for-the-sqlnet-ora-file.html#GUID-28040885-6832-4FFC-9258-0EF19FE9A3AC.

- Disabled (`false`): The driver does not use the Kerberos protocol.

Use TCPS

Key Name	Default Value	Required
`UseTCPS`	Clear (`false`)	No

Description

This option specifies whether the driver connects to Oracle over the TCPS protocol, which provides SSL/TLS encryption on a TCP/IP connection.

- Enabled (`true`): The driver connects over the TCPS protocol, encrypting the connection using the SSL settings defined in the `sqlnet.ora` configuration file. The `sqlnet.ora` file must be specified by the TNS_ADMIN environment variable on your machine.

Note:

- For information about configuring SSL on your Oracle database, including details about the settings required in the `sqlnet.ora` file, see "Configuring Secure Sockets Layer Authentication" in the *Oracle Database Security Guide*: https://docs.oracle.com/en/database/oracle/oracle-database/12.2/dbseg/configuring-secure-sockets-layer-authentication.html#GUID-6AD89576-526F-4D6B-A539-ADF4B840819F.
- For general information about the `sqlnet.ora` file, see "Parameters for the sqlnet.ora File" in the *Oracle Database Net Services Reference*: https://docs.oracle.com/en/database/oracle/oracle-database/12.2/netrf/parameters-for-the-sqlnet-ora-file.html#GUID-28040885-6832-4FFC-9258-0EF19FE9A3AC.

- Disabled (`false`): The driver does not use the TCPS protocol.

User

Key Name	Default Value	Required
`UID`	None	Yes

Description

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

Configuration Options Having Only Key Names

The following configuration options do not appear in the Windows user interface for the Simba Oracle ODBC Driver. They are accessible only when you use a connection string or configure a connection on macOS or Linux.

- Driver on page 55
- DriverLocale on page 55
- Locale on page 55

The `UseLogPrefix` property must be configured as a Windows Registry key value, or as a driver-wide property in the `simba.oracleodbc.ini` file for macOS or Linux.

- UseLogPrefix on page 56

Driver

Key Name	Default Value	Required
Driver	Simba Oracle ODBC Driver when installed on Windows, or the absolute path of the driver shared object file when installed on a non-Windows machine.	Yes

Description

On Windows, the name of the installed driver (Simba Oracle ODBC Driver).

On other platforms, the name of the installed driver as specified in odbcinst.ini, or the absolute path of the driver shared object file.

DriverLocale

Key Name	Default Value	Required
DriverLocale	en-US	No

Description

The locale to use for error messages.

This is a driver-wide setting, and cannot be specified in a DSN or connection string.

If both Locale and DriverLocale are specified, Locale takes precedence.

Locale

Key Name	Default Value	Required
Locale	en-US	No

Description

The locale to use for error messages.

If both `Locale` and `DriverLocale` are specified, `Locale` takes precedence.

UseLogPrefix

Key Name	Default Value	Required
`UseLogPrefix`	`0`	No

Description

This option specifies whether the driver includes a prefix in the names of log files so that the files can be distinguished by user and application.

! Important:

To configure this option for the Windows driver, you create a value for it in one of the following registry keys:

- For a 32-bit driver installed on a 64-bit machine: **HKEY_LOCAL_MACHINE\SOFTWARE\Wow6432Node\Simba\Simba Oracle ODBC Driver\Driver**
- Otherwise: **HKEY_LOCAL_MACHINE\SOFTWARE\Simba\Simba Oracle ODBC Driver\Driver**

Use `UseLogPrefix` as the value name, and either `0` or `1` as the value data.

To configure this option for a non-Windows driver, you must use the `simba.oracleodbc.ini` file.

Set the property to one of the following values:

- `1`: The driver prefixes log file names with the user name and process ID associated with the connection that is being logged.

  For example, if you are connecting as a user named "jdoe" and using the driver in an application with process ID 7836, the generated log file would be named `jdoe_7836_simbaoracleodbcdriver.log`.
- `0`: The driver does not include the prefix in log file names.

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