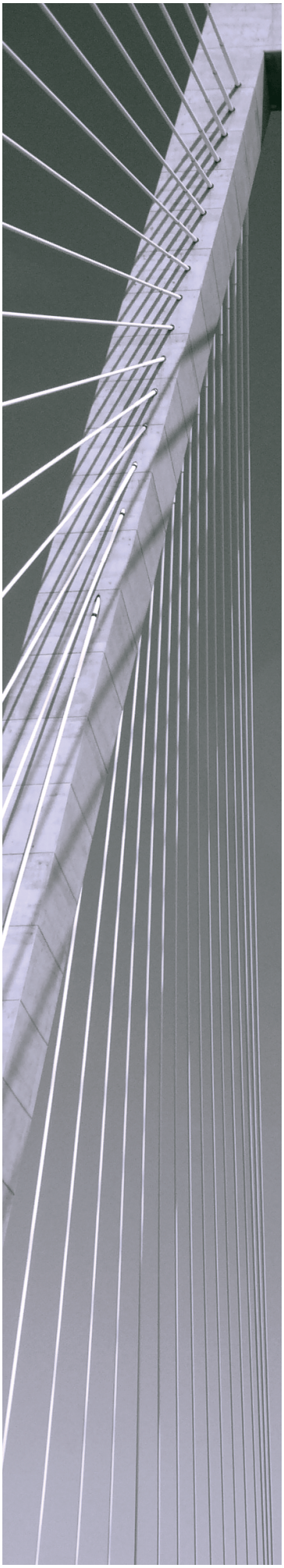

Simba Oracle ODBC Driver

Installation and Configuration Guide

Simba Technologies Inc.

Version 1.1.6

September 26, 2017

Contact Us

Simba Technologies Inc.
938 West 8th Avenue
Vancouver, BC Canada
V5Z 1E5

Tel: +1 (604) 633-0008

Fax: +1 (604) 633-0004

www.simba.com

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 all platforms.

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 *Installation and Configuration Guide* is suitable for users who are looking to access data residing within Oracle 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. Each machine that you install the driver on must meet the following minimum system requirements:

- One of the following operating systems:
  - Windows 7, 8.1, or 10
  - Windows Server 2008 or later
- 150 MB of available disk space
- Visual C++ Redistributable for Visual Studio 2013 installed (with the same bitness as the driver that you are installing).
  You can download the installation packages at https://www.microsoft.com/en-ca/download/details.aspx?id=40784.
- Oracle Instant Client library files installed in the `\lib` subfolder in the driver's installation directory. For more information, see Installing the Oracle Instant Client on Windows on page 9.

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

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 that matches the bitness of the client application:

- `Simba Oracle 1.1 32-bit.msi` for 32-bit applications
- `Simba Oracle 1.1 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 1.1 32-bit.msi** or **Simba Oracle 1.1 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.
8. After installing the Simba Oracle ODBC Driver, you must install the library files for the Oracle Instant Client. For instructions, see Installing the Oracle Instant Client on Windows on page 9.

Installing the Oracle Instant Client on Windows

After installing the Simba Oracle ODBC Driver, you need to install the library files for the Oracle Instant Client.

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 version of the Oracle Instant Client that matches the bitness of your platform and the version of Oracle that you are connecting to.
3. Extract the archive that you downloaded to a temporary location.
4. Copy the files from the temporary location to the `\lib` subfolder of the installation folder that you selected when installing 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 35.

To create a Data Source Name on Windows:

1. Open the ODBC Administrator:
   - If you are using Windows 7 or earlier, click **Start** > **All Programs** > **Simba Oracle Driver 1.1** > **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.

> **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. Depending on whether you are connecting using SSL, do one of the following to specify the necessary connection information:
   - To connect using SSL, select the **Use TNS Service Name** check box and then, in the **TNS Name** field, type the TNS name as defined by your `tnsnames.ora` file. For more information, see Configuring SSL Verification on a Windows Machine on page 11.
   - Or, to connect without using SSL, 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. In the **User** field, type your user name for accessing the database.
10. In the **Password** field, type the password corresponding to the user name you typed above.

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 40.
12. To configure logging behavior for the driver, click **Logging Options**. For more information, see Configuring Logging Options on Windows on page 12.
13. 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.

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

Configuring SSL Verification on a Windows Machine

If you are connecting to an Oracle database that has Secure Sockets Layer (SSL) enabled, you can configure the driver to connect to an SSL-enabled socket. To do this, you need to provide the TNS name defined in the Oracle client configuration file named `tnsnames.ora`.

To configure SSL verification on a Windows machine:

1. Configure SSL authentication on your Oracle database, and make sure that the `tnsnames.ora` file is configured as needed. For more information, see "Configuring Secure Sockets Layer Authentication" in the *Oracle Database Security Guide*: https://docs.oracle.com/database/121/DBSEG/asossl.htm#DBSEG070.
2. To access the SSL options for a DSN, open the ODBC Data Source Administrator where you created the DSN, then select the DSN, and then click **Configure**.
3. Select the **Use TNS Service Name** check box.
4. In the **TNS Name** field, type the TNS name as defined by your `tnsnames.ora` file.

> **Note:**
>
> If you specify a TNS name, then you do not need to set the Host, Port, and Service Name options for your DSN.

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.
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 `oracle_driver.log` at the location that you specify in 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 47.

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. Open the ODBC Administrator:
   - If you are using Windows 7 or earlier, click **Start** > **All Programs** > **Simba Oracle Driver 1.1** > **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.

   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 machine that you install the driver on must meet the following minimum system requirements:

- macOS version 10.9, 10.10, or 10.11
- 250 MB of available disk space
- iODBC 3.52.7 or later
- Oracle Instant Client library files installed in the `/lib` subfolder in the driver's installation directory. For more information, see Installing the Oracle Instant Client on macOS on page 16.

Installing the Driver on macOS

The Simba Oracle ODBC Driver is available for macOS as a `.dmg` file named `Simba Oracle 1.1.dmg`. The driver supports both 32- and 64-bit client applications.

To install the Simba Oracle ODBC Driver on macOS:

1. Double-click **Simba Oracle 1.1.dmg** to mount the disk image.
2. Double-click **Simba Oracle 1.1.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.

9. After installing the Simba Oracle ODBC Driver, you must install the library files for the Oracle Instant Client. For instructions, see Installing the Oracle Instant Client on macOS on page 16.

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 22.

Installing the Oracle Instant Client on macOS

After installing the Simba Oracle ODBC Driver, you need to install the library files for the Oracle Instant Client.

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 both the 32-bit and 64-bit versions of the Oracle Instant Client for Oracle 12.1.
3. Extract each archive that you downloaded to a temporary location. For example, `/home/instantclient_12_1/32` for the 32-bit version and `/home/instantclient_12_1/64` for the 64-bit version.
4. For each `.dylib` library file that is used in both versions of the Oracle Instant Client, build a universal binary:
   a. Open a Terminal window.
   b. In the Terminal window, run the following commands:

```
cd /home/instantclient_12_1
```

```
lipo ./32/libclntshcore.dylib.12.1
./64/libclntshcore.dylib.12.1 -output
./libclntshcore.dylib.12.1 -create
```

```
lipo ./32/libclntsh.dylib.12.1
./64/libclntsh.dylib.12.1 -output
./libclntsh.dylib.12.1 -create
```

```
lipo ./32/libnnz12.dylib ./64/libnnz12.dylib -output
./libnnz12.dylib -create
```

```
lipo ./32/libocci.dylib.12.1 ./64/libocci.dylib.12.1
-output ./libocci.dylib.12.1 -create
```

```
lipo ./32/libociei.dylib ./64/libociei.dylib -output
./libociei.dylib -create
```

```
lipo ./32/libocijdbc12.dylib ./64/libocijdbc12.dylib
-output ./libocijdbc12.dylib -create
```

```
lipo ./32/libons.dylib ./64/libons.dylib -output
./libons.dylib -create
```

```
lipo ./32/liboramysql12.dylib
./64/liboramysql12.dylib -output
./liboramysql12.dylib -create
```

In the above example, the new binary files are created in the folder `/home/instantclient_12_1`.

5. Copy the new universal binary files that you created to the `/lib` subfolder of the installation folder that you selected when installing the driver.

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

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 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
- 270 MB of available disk space
- One of the following ODBC driver managers installed:
  - iODBC 3.52.7 or later
  - unixODBC 2.2.12 or later
- Oracle Instant Client library files installed in the `/lib` subfolder in the driver's installation directory. For more information, see Installing the Oracle Instant Client on Linux on page 20.

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

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 to install and use the version of the driver that 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

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

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.

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

1. Log in as the root user, and then navigate to the folder containing the RPM package for the driver.
2. 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.
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.
4. After installing the Simba Oracle ODBC Driver, you must install the library files for the Oracle Instant Client. For instructions, see Installing the Oracle Instant Client on Linux on page 20.

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 22.

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 the version of the driver that matches the bitness of the client application. You can install both versions of the driver on the same machine.

To install the Simba Oracle ODBC 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.
4. After installing the Simba Oracle ODBC Driver, you must install the library files for the Oracle Instant Client. For instructions, see Installing the Oracle Instant Client on Linux on page 20.

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 22.

Installing the Oracle Instant Client on Linux

After installing the Simba Oracle ODBC Driver, you need to install the library files for the Oracle Instant Client.

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 version of the Oracle Instant Client that matches the bitness of your platform and the version of Oracle that you are connecting to.
3. Extract the archive that you downloaded to a temporary location.
4. Copy the files from the temporary location to the `/lib` subfolder of the installation folder that you selected when installing 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 22.
- 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 23.

After configuring the ODBC driver manager, you can configure a connection and access your data store through the driver. For more information, see Configuring ODBC Connections on a Non-Windows Machine on page 25.

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 28.

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_
      sbu.dylib
      ```

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

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

   b. Depending on whether you are connecting using SSL, do one of the following to specify the necessary connection information:
      - To connect using SSL, set the `TNS` property to the TNS name as defined by your `tnsnames.ora` file. For more information, see Configuring SSL Verification on a Non-Windows Machine on page 30.
      - Or, to connect without using SSL, set the `Host` property to the IP address or host name of the server, then set the `Port` property to the number of the TCP port that the server uses to listen for client connections, and then set the `SVC` property to the service name of the database that you want to access.

        For example:

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

   c. To configure authentication, set the `UID` property to an appropriate user name for accessing the Oracle server, and then set the `PWD` property to the password corresponding to the user name you provided.

      For example:

```
UID=jsmith
PWD=simba123
```

d. If you want to connect to the server through SSL, set the `TNS` connection property to the TNS name defined in the `tnsnames.ora` file on your Oracle server. For more information, see Configuring SSL Verification on a Non-Windows Machine on page 30.

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 40.

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 23.

For example, the following is an `odbc.ini` configuration file for macOS containing a DSN that connects to Oracle:

```
[ODBC Data Sources]
Sample DSN=Simba Oracle ODBC Driver
[Sample DSN]
Driver=/Library/simba/oracleodbc/lib/liboracleodbc_sbu.dylib
Host=192.168.222.160
Port=1521
SVC=ORCL
UID=jsmith
PWD=simba123
```

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:

```
[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
```

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_
      ```

```
sbu.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 23.

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_sbu.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 35.

For instructions about configuring SSL connections, see Configuring SSL Verification on a Non-Windows Machine on page 30.

For detailed information about all the connection properties that the driver supports, see Driver Configuration Options on page 40.

Configuring SSL Verification on a Non-Windows Machine

If you are connecting to an Oracle database that has Secure Sockets Layer (SSL) enabled, you can configure the driver to connect to an SSL-enabled socket. To do this, you need to provide the TNS name defined in the Oracle client configuration file named `tnsnames.ora`.

You can set driver configuration options 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.

To configure SSL verification on a non-Windows machine:

1. Configure SSL authentication on your Oracle database, and make sure that the `tnsnames.ora` file is configured as needed. For more information, see "Configuring Secure Sockets Layer Authentication" in the *Oracle Database Security Guide*: https://docs.oracle.com/database/121/DBSEG/asossl.htm#DBSEG070.
2. In your `odbc.ini` configuration file or connection string, set the `TNS` property to the TNS name as defined by your `tnsnames.ora` file.

> **Note:**
>
> If you define the `TNS` property, then you do not need to define the `Host`, `Port`, or `SVC` properties.

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.

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 `oracle_driver.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.

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 35.

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 40.

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 TNS name as defined by your `tnsnames.ora` file, for connecting to Oracle using SSL. For more information, see Configuring SSL Verification on a Non-Windows Machine on page 30.

- *[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 Without SSL

The following is the format of a DSN-less connection string for a basic connection to a Oracle server:

```
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;
```

Connecting to Oracle Using SSL

The following is the format of a DSN-less connection string for connecting to a Oracle server over SSL:

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

For example:

```
Driver=Simba Oracle ODBC Driver;TNS=ssl-tns;
UID=jsmith;PWD=simba123;
```

Note:

If you define the `TNS` property, then you do not need to define the `Host`, `Port`, or `SVC` properties.

Features

The Simba Oracle ODBC Driver supports all features that the Oracle Instant Client driver (11gR2) supports, along with these additional data types:

- Decimal
- Interval Day to Second
- Interval Year to Month
- Timestamp with Local Time
- Timestamp with Time Zone

For more information about the Oracle Instant Client driver, see the Oracle Database Documentation: http://www.oracle.com/technetwork/database/enterprise-edition/documentation/database-093888.html.

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

Oracle Type	SQL Type
FLOAT	SQL_FLOAT
INTEGER	SQL_DECIMAL
INTERVAL DAY TO SECOND	SQL_INTERVAL_DAY_TO_SECOND
INTERVAL YEAR TO MONTH	SQL_INTERVAL_YEAR_TO_MONTH
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 provides a mechanism that enables you to authenticate your connection using your Oracle user name and password. For detailed configuration instructions, see Creating a Data Source Name on Windows on page 9 or Creating a Data Source Name on a Non-Windows Machine on page 25.

Additionally, if you specify a TNS service name in your connection information, then the driver can establish an SSL connection based on the configuration information associated with that TNS service name. The Simba Oracle ODBC Driver supports the same SSL versions as Oracle Call Interface (OCI) 12.1, and uses the highest SSL version that is supported by both the driver and the server. For information about SSL support in OCI 12.1, see "SSL Cipher Suite Authentication, Encryption, Integrity, and TLS Versions" in the *Oracle Database Security Guide*: https://docs.oracle.com/database/121/DBSEG/asossl.htm#GUID-EFF4B2C9-2D25-473D-B718-A42754252347__CIHFADDD.

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.

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. For detailed configuration instructions, see Configuring SSL Verification on a Windows Machine on page 11 or Configuring SSL Verification on a Non-Windows Machine on page 30.

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
- Logging Options

When using a connection string or configuring a connection from a Linux or macOS 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:

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.

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

Host

Key Name	Default Value	Required
Host	None	Yes, unless connecting by SSL.

Description

The IP address or host name of the Oracle server.

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.
- 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 `oracle_driver.log` in the location specified 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 47.

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 SSL.

Description

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

Service Name

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

Description

The service name of the database.

TNS Name

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

Description

The TNS name as defined by your `tnsnames.ora` file. For more information, see Configuring SSL Verification on a Non-Windows Machine on page 30.

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

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 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.

MEMLIM

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

Description

The size of the buffer that the driver uses for data retrieval, in bytes.

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. The default setting of 100MB is equal to 5333 rows.

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 12. For information about configuring logging when using a non-Windows driver, see Configuring Logging Options on a Non-Windows Machine on page 30.

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.

- `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_oracle_driver.log`.
- `0`: The driver does not include the prefix in log file names.

Third-Party Trademarks

Linux is the registered trademark of Linus Torvalds in Canada, United States and/or other countries.

Mac, macOS, Mac OS, and OS X are trademarks or registered trademarks of Apple, Inc. or its subsidiaries in Canada, United States and/or other countries.

Microsoft, MSDN, Windows, Windows Server, Windows Vista, and the Windows start button are trademarks or registered trademarks of Microsoft Corporation or its subsidiaries in Canada, United States and/or other countries.

Oracle is a registered trademark of Oracle and/or its affiliates. Other names may be trademarks of their respective owners

Red Hat, Red Hat Enterprise Linux, and CentOS are trademarks or registered trademarks of Red Hat, Inc. or its subsidiaries in Canada, United States and/or other countries.

SUSE is a trademark or registered trademark of SUSE LLC or its subsidiaries in Canada, United States and/or other countries.

Oracle is a registered trademark of Oracle and/or its affiliates. Other names may be trademarks of their respective owners.

All other trademarks are trademarks of their respective owners.

Third-Party Licenses

The licenses for the third-party libraries that are included in this product are listed below.

CityHash License

Copyright (c) 2011 Google, Inc.

Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions:

The above copyright notice and this permission notice shall be included in all copies or substantial portions of the Software.

THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT. IN NO EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.

CityHash, by Geoff Pike and Jyrki Alakuijala

http://code.google.com/p/cityhash/

dtoa License

The author of this software is David M. Gay.

Copyright (c) 1991, 2000, 2001 by Lucent Technologies.

Permission to use, copy, modify, and distribute this software for any purpose without fee is hereby granted, provided that this entire notice is included in all copies of any software which is or includes a copy or modification of this software and in all copies of the supporting documentation for such software.

THIS SOFTWARE IS BEING PROVIDED "AS IS", WITHOUT ANY EXPRESS OR IMPLIED WARRANTY. IN PARTICULAR, NEITHER THE AUTHOR NOR LUCENT MAKES ANY REPRESENTATION OR WARRANTY OF ANY KIND CONCERNING

THE MERCHANTABILITY OF THIS SOFTWARE OR ITS FITNESS FOR ANY PARTICULAR PURPOSE.

Expat License

Copyright (c) 1998, 1999, 2000 Thai Open Source Software Center Ltd

Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions:

The above copyright notice and this permission notice shall be included in all copies or substantial portions of the Software.

THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NOINFRINGEMENT. IN NO EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.

ICU License - ICU 1.8.1 and later

COPYRIGHT AND PERMISSION NOTICE

Copyright (c) 1995-2014 International Business Machines Corporation and others

All rights reserved.

Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, provided that the above copyright notice(s) and this permission notice appear in all copies of the Software and that both the above copyright notice(s) and this permission notice appear in supporting documentation.

THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT OF THIRD PARTY RIGHTS. IN NO EVENT SHALL THE COPYRIGHT HOLDER OR HOLDERS INCLUDED IN THIS NOTICE BE LIABLE FOR ANY CLAIM, OR ANY SPECIAL INDIRECT OR CONSEQUENTIAL DAMAGES,

OR ANY DAMAGES WHATSOEVER RESULTING FROM LOSS OF USE, DATA OR PROFITS, WHETHER IN AN ACTION OF CONTRACT, NEGLIGENCE OR OTHER TORTIOUS ACTION, ARISING OUT OF OR IN CONNECTION WITH THE USE OR PERFORMANCE OF THIS SOFTWARE.

Except as contained in this notice, the name of a copyright holder shall not be used in advertising or otherwise to promote the sale, use or other dealings in this Software without prior written authorization of the copyright holder.

All trademarks and registered trademarks mentioned herein are the property of their respective owners.

OpenSSL License

Copyright (c) 1998-2016 The OpenSSL Project. All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
3. All advertising materials mentioning features or use of this software must display the following acknowledgment:

   "This product includes software developed by the OpenSSL Project for use in the OpenSSL Toolkit. (http://www.openssl.org/)"
4. The names "OpenSSL Toolkit" and "OpenSSL Project" must not be used to endorse or promote products derived from this software without prior written permission. For written permission, please contact openssl-core@openssl.org.
5. Products derived from this software may not be called "OpenSSL" nor may "OpenSSL" appear in their names without prior written permission of the OpenSSL Project.
6. Redistributions of any form whatsoever must retain the following acknowledgment:

   "This product includes software developed by the OpenSSL Project for use in the OpenSSL Toolkit (http://www.openssl.org/)"

THIS SOFTWARE IS PROVIDED BY THE OpenSSL PROJECT "AS IS" AND ANY EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE OpenSSL PROJECT OR ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT,

INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

This product includes cryptographic software written by Eric Young (eay@cryptsoft.com). This product includes software written by Tim Hudson (tjh@cryptsoft.com).

Oracle Technology Network Development and Distribution License Terms for Instant Client

Export Controls on the Programs

Selecting the "Accept License Agreement" button is a confirmation of your agreement that you comply, now and during the trial term, with each of the following statements:

- You are not a citizen, national, or resident of, and are not under control of, the government of Cuba, Iran, Sudan, Libya, North Korea, Syria, nor any country to which the United States has prohibited export.
- You will not download or otherwise export or re-export the Programs, directly or indirectly, to the above mentioned countries nor to citizens, nationals or residents of those countries.
- You are not listed on the United States Department of Treasury lists of Specially Designated Nationals, Specially Designated Terrorists, and Specially Designated Narcotic Traffickers, nor are you listed on the United States Department of Commerce Table of Denial Orders.

You will not download or otherwise export or re-export the Programs, directly or indirectly, to persons on the above mentioned lists.

You will not use the Programs for, and will not allow the Programs to be used for, any purposes prohibited by United States law, including, without limitation, for the development, design, manufacture or production of nuclear, chemical or biological weapons of mass destruction.

EXPORT RESTRICTIONS
You agree that U.S. export control laws and other applicable export and import laws govern your use of the programs, including technical data; additional information can be found on Oracle®'s Global Trade Compliance web site (http://www.oracle.com/products/export).

You agree that neither the programs nor any direct product thereof will be exported, directly, or indirectly, in violation of these laws, or will be used for any purpose

prohibited by these laws including, without limitation, nuclear, chemical, or biological weapons proliferation.

Oracle Employees: Under no circumstances are Oracle Employees authorized to download software for the purpose of distributing it to customers. Oracle products are available to employees for internal use or demonstration purposes only. In keeping with Oracle's trade compliance obligations under U.S. and applicable multilateral law, failure to comply with this policy could result in disciplinary action up to and including termination.

Note: You are bound by the Oracle Technology Network ("OTN") License Agreement terms. The OTN License Agreement terms also apply to all updates you receive under your Technology Track subscription.

The OTN License Agreement terms below supercede any shrinkwrap license on the OTN Technology Track software CDs and previous OTN License terms (including the Oracle Program License as modified by the OTN Program Use Certificate).

Oracle Technology Network Development and Distribution License Agreement for Instant Client

"We," "us," and "our" refers to Oracle America, Inc. "You" and "your" refers to the individual or entity that wishes to use the Programs from Oracle under this Agreement. "Programs" refers to the Software Products referenced below that you wish to download and use and Program documentation. "License" refers to your right to use the Programs and Program documentation under the terms of this Agreement. The substantive and procedural laws of California govern this Agreement. You and Oracle agree to submit to the exclusive jurisdiction of, and venue in, the courts of San Francisco, San Mateo, or Santa Clara counties in California in any dispute arising out of or relating to this Agreement.

We are willing to license the Programs to you only upon the condition that you accept all of the terms contained in this Agreement. Read the terms carefully and select the "Accept" button at the bottom of the page to confirm your acceptance. If you are not willing to be bound by these terms, select the "Do Not Accept" button and the registration process will not continue.

Software Product

- Instant Client

License Rights

License.
We grant you a non-exclusive right and license to use the Programs solely for your business purposes and development and testing purposes, subject to the terms of this

Agreement. You may allow third parties to use the Programs, subject to the terms of this Agreement, provided such third party use is for your business operations only.

Distribution License
We grant you a non-exclusive right and license to distribute the Programs, provided that you do not charge your end users for use of the Programs. Your distribution of such Programs shall at a minimum include the following terms in an executed license agreement between you and the end user that: (1) restrict the use of the Programs to the business operations of the end user; (2) prohibit (a) the end user from assigning, giving, or transferring the Programs or an interest in them to another individual or entity (and if your end user grants a security interest in the Programs, the secured party has no right to use or transfer the Programs); (b) make the Programs available in any manner to any third party for use in the third party's business operations (unless such access is expressly permitted for the specific program license or materials from the services you have acquired); and (c) title to the Programs from passing to the end user or any other party; (3) prohibit the reverse engineering (unless required by law for interoperability), disassembly or decompilation of the Programs and prohibit duplication of the Programs except for a sufficient number of copies of each Program for the end user's licensed use and one copy of each Program media; (4) disclaim, to the extent permitted by applicable law, our liability for any damages, whether direct, indirect, incidental, or consequential, arising from the use of the Programs; (5) require the end user at the termination of the Agreement, to discontinue use and destroy or return to you all copies of the Programs and documentation; (6) prohibit publication of any results of benchmark tests run on the Programs; (7) require the end user to comply fully with all relevant export laws and regulations of the United States and other applicable export and import laws to assure that neither the Programs, nor any direct product thereof, are exported, directly or indirectly, in violation of applicable laws; (8) do not require us to perform any obligations or incur any liability not previously agreed to between you and us; (9) permit you to audit your end user's use of the Programs or to assign your right to audit the end user's use of the Programs to us; (10) designate us as a third party beneficiary of the end user license agreement; (11) include terms consistent with those contained in the sections of this Agreement entitled "Disclaimer of Warranties and Exclusive Remedies," "No Technical Support," "End of Agreement," "Relationship Between the Parties," and "Open Source"; and (11) exclude the application of the Uniform Computer Information Transactions Act.

You may allow your end users to permit third parties to use the Programs on such end user's behalf for the purposes set forth in the end user license agreement, subject to the terms of such agreement. You shall be financially responsible for all claims and damages to us caused by your failure to include the required contractual terms set forth above in each end user license agreement between you and an end user. We are a third party beneficiary of any end user license agreement between you and the end user, but do not assume any of your obligations thereunder, and you agree that you will

not enter into any end user license agreement that excludes us as a third party beneficiary and will inform your end users of our rights.

If you want to use the Programs for any purpose other than as expressly permitted under this Agreement you must contact us to obtain the appropriate license. We may audit your use of the Programs. Program documentation is either shipped with the Programs, or documentation may be accessed online at http://www.oracle.com/technetwork/indexes/documentation/index.html.

You agree to: (a) defend and indemnify us against all claims and damages caused by your distribution of the Programs in breach of this Agreement and/or failure to include the required contractual provisions in your end user agreement as stated above; (b) keep executed end user agreements and records of end user information including name, address, date of distribution and identity of Programs distributed; (c) allow us to inspect your end user agreements and records upon request; and, (d) enforce the terms of your end user agreements so as to effect a timely cure of any end user breach, and to notify us of any breach of the terms.

Ownership and Restrictions
We retain all ownership and intellectual property rights in the Programs. You may make a sufficient number of copies of the Programs for the licensed use and one copy of the Programs for backup purposes.

You may not:

- use the Programs for any purpose other than as provided above;
- charge your end users for use of the Programs;
- remove or modify any Program markings or any notice of our proprietary rights;
- assign this agreement or give the Programs, Program access or an interest in the Programs to any individual or entity except as provided under this agreement;
- cause or permit reverse engineering (unless required by law for interoperability), disassembly or decompilation of the Programs;
- disclose results of any Program benchmark tests without our prior consent.

Export
You agree that U.S. export control laws and other applicable export and import laws govern your use of the Programs, including technical data; additional information can be found on Oracle's Global Trade Compliance web site located at http://www.oracle.com/products/export/index.html. You agree that neither the Programs nor any direct product thereof will be exported, directly, or indirectly, in violation of these laws, or will be used for any purpose prohibited by these laws including, without limitation, nuclear, chemical, or biological weapons proliferation.

Disclaimer of Warranty and Exclusive Remedies

THE PROGRAMS ARE PROVIDED "AS IS" WITHOUT WARRANTY OF ANY KIND. WE FURTHER DISCLAIM ALL WARRANTIES, EXPRESS AND IMPLIED, INCLUDING WITHOUT LIMITATION, ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NONINFRINGEMENT.

IN NO EVENT SHALL WE BE LIABLE FOR ANY INDIRECT, INCIDENTAL, SPECIAL, PUNITIVE OR CONSEQUENTIAL DAMAGES, OR DAMAGES FOR LOSS OF PROFITS, REVENUE, DATA OR DATA USE, INCURRED BY YOU OR ANY THIRD PARTY, WHETHER IN AN ACTION IN CONTRACT OR TORT, EVEN IF WE HAVE BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. OUR ENTIRE LIABILITY FOR DAMAGES HEREUNDER SHALL IN NO EVENT EXCEED ONE THOUSAND DOLLARS (U.S. $1,000).

No Technical Support
Our technical support organization will not provide technical support, phone support, or updates to you or end users for the Programs licensed under this agreement.

Restricted Rights
If you distribute a license to the United States government, the Programs, including documentation, shall be considered commercial computer software and you will place a legend, in addition to applicable copyright notices, on the documentation, and on the media label, substantially similar to the following:

NOTICE OF RESTRICTED RIGHTS
"Programs delivered subject to the DOD FAR Supplement are 'commercial computer software' and use, duplication, and disclosure of the programs, including documentation, shall be subject to the licensing restrictions set forth in the applicable Oracle license agreement. Otherwise, programs delivered subject to the Federal Acquisition Regulations are 'restricted computer software' and use, duplication, and disclosure of the programs, including documentation, shall be subject to the restrictions in FAR 52.227-19, Commercial Computer Software-Restricted Rights (June 1987). Oracle Corporation, 500 Oracle Parkway, Redwood City, CA 94065."

End of Agreement
You may terminate this Agreement by destroying all copies of the Programs. We have the right to terminate your right to use the Programs if you fail to comply with any of the terms of this Agreement, in which case you shall destroy all copies of the Programs.

Relationship Between the Parties
The relationship between you and us is that of licensee/licensor. Neither party will represent that it has any authority to assume or create any obligation, express or implied, on behalf of the other party, nor to represent the other party as agent, employee, franchisee, or in any other capacity. Nothing in this Agreement shall be construed to limit either party's right to independently develop or distribute software

that is functionally similar to the other party's products, so long as proprietary information of the other party is not included in such software.

Open Source
"Open Source" software - software available without charge for use, modification and distribution - is often licensed under terms that require the user to make the user's modifications to the Open Source software or any software that the user 'combines' with the Open Source software freely available in source code form. If you use Open Source software in conjunction with the Programs, you must ensure that your use does not: (i) create, or purport to create, obligations of us with respect to the Oracle Programs; or (ii) grant, or purport to grant, to any third party any rights to or immunities under our intellectual property or proprietary rights in the Oracle Programs. For example, you may not develop a software program using an Oracle Program and an Open Source program where such use results in a program file(s) that contains code from both the Oracle Program and the Open Source program (including without limitation libraries) if the Open Source program is licensed under a license that requires any "modifications" be made freely available. You also may not combine the Oracle Program with programs licensed under the GNU General Public License ("GPL") in any manner that could cause, or could be interpreted or asserted to cause, the Oracle Program or any modifications thereto to become subject to the terms of the GPL.

Entire Agreement
You agree that this Agreement is the complete agreement for the Programs and licenses, and this Agreement supersedes all prior or contemporaneous Agreements or representations. If any term of this Agreement is found to be invalid or unenforceable, the remaining provisions will remain effective.

Last updated: 01/24/08

Should you have any questions concerning this License Agreement, or if you desire to contact Oracle for any reason, please write:
Oracle America, Inc.
500 Oracle Parkway,
Redwood City, CA 94065

Oracle may contact you to ask if you had a satisfactory experience installing and using this OTN software download.

Original SSLeay License

Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)

All rights reserved.

This package is an SSL implementation written by Eric Young (eay@cryptsoft.com). The implementation was written so as to conform with Netscapes SSL.

This library is free for commercial and non-commercial use as long as the following conditions are aheared to. The following conditions apply to all code found in this distribution, be it the RC4, RSA, lhash, DES, etc., code; not just the SSL code. The SSL documentation included with this distribution is covered by the same copyright terms except that the holder is Tim Hudson (tjh@cryptsoft.com).

Copyright remains Eric Young's, and as such any Copyright notices in the code are not to be removed. If this package is used in a product, Eric Young should be given attribution as the author of the parts of the library used. This can be in the form of a textual message at program startup or in documentation (online or textual) provided with the package.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

1. Redistributions of source code must retain the copyright notice, this list of conditions and the following disclaimer.
2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
3. All advertising materials mentioning features or use of this software must display the following acknowledgement:

   "This product includes cryptographic software written by Eric Young (eay@cryptsoft.com)"

   The word 'cryptographic' can be left out if the rouines from the library being used are not cryptographic related :-).
4. If you include any Windows specific code (or a derivative thereof) from the apps directory (application code) you must include an acknowledgement:

   "This product includes software written by Tim Hudson (tjh@cryptsoft.com)"

THIS SOFTWARE IS PROVIDED BY ERIC YOUNG ``AS IS'' AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHOR OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)

ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

The licence and distribution terms for any publically available version or derivative of this code cannot be changed. i.e. this code cannot simply be copied and put under another distribution licence [including the GNU Public Licence.]

Stringencoders License

Copyright 2005, 2006, 2007

Nick Galbreath -- nickg [at] modp [dot] com

All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

> Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
>
> Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
>
> Neither the name of the modp.com nor the names of its contributors may be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT OWNER OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

This is the standard "new" BSD license:

http://www.opensource.org/licenses/bsd-license.php