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1 What's New

New features in ODBC Driver for xBase 5.0

- Fixed connection timeout setting before opening connection

- Added support for the UTF8 encoding

- Added support for tables with duplicate column names

- Improved compatibility with Quantum GIS

- Improved compatibility with ETL Informatica PowerCenter

- Improved MS Access linked tables support

- Improved error handling when using the IgnoreDataErrors option

- Improved compatibility with FileMaker Server for Linux and macOS

New features in ODBC Driver for xBase 4.1

- Added support for the CREATE TABLE AS SELECT statement

New features in ODBC Driver for xBase 4.0

- Improved significantly the performance of DML operations

- Improved compatibility with Power BI Desktop

- Improved compatibility with 4D in macOS

- Added support for CREATE TABLE IF NOT EXISTS and DROP TABLE IF EXISTS statements

New features in ODBC Driver for xBase 3.3

- Added support for SQL_ATTR_MAX_ROWS attribute

- Improved compatibility with Visual Basic in Visual Studio

- Added support for macOS 13 Ventura

- Added support for VisualFoxPro CANDIDATE indexes

- Added support for NOT function in index expressions

- Improved compatibility with Microsoft Power BI Desktop

- Improved compatibility with Tableau Prep Builder

- Improved compatibility with Crystal Reports

New features in ODBC Driver for xBase 3.2

- Added support for Windows 11

- Improved compatibility with FICO Mosel

- Improved compatibility with FileMaker

- Improved compatibility with JMP on macOS

- Improved support for an ODBC installer on Windows 2000

- Added support for the Autoinc data type in Visual FoxPro tables

- Added support for the YEAR, MONTH and DAY functions in index expressions

New features in ODBC Driver for xBase 3.1

- MSI installer for deploying through GPO is added

New features in ODBC Driver for xBase 3.0

- Apple Silicon M1 is supported

- Compatibility with macOS Big Sur is improved

- Compatibility with Microsoft SQL Server Management Studio is improved

- Compatibility with Microsoft Access is improved

- Suport for Out values in Numeric fields is added

- Work with tables of type dBaseV and dBaseVII with the DBFFormat option set to dfAuto is improved

New features in ODBC Driver for xBase 2.3

- Native dBase functions in an SQL statement are supported

- The AllFieldsAsNullable connection option is added

- The IgnoreBrokenTables connection option is added

New features in ODBC Driver for xBase 2.2

- The IgnoreIndexErrors connection option is added

- Access to table files when performing queries is optimized

- Compatibility with RStudio is improved

- Compatibility with Microsoft SQL Server Management Studio is improved

- Compatibility with Microsoft Power BI Desktop is improved

- Compatibility with Power Pivot is improved

- Compatibility with Visual Basic is improved

New features in ODBC Driver for xBase 2.1

- Now ODBC driver activation does not require administrator privileges

- Support for connection pooling is improved

- Improved compatibility with sandboxed applications for macOS

- The IgnoreDataErrors connection option is added

- The IdentifierCase connection option is added

New features in ODBC Driver for xBase 2.0

- Now ODBC driver for macOS is distributed as a PKG package

- Now ODBC driver for Linux is distributed as DEB and RPM packages

- Possibility to force the ODBC 2.x behavior is added

New features in ODBC Driver for xBase 1.3

- Support for Clipper/Harbour is added

- Possibility to show used connection string in the connection dialog is added

New features in ODBC Driver for xBase 1.2

- Possibility to return String Types as Ansi or Unicode is added

- Compatibility with MS Access is improved

- Compatibility with Tableau is improved

- Compatibility with Omnis Studio is improved

- Compatibility with Power Pivot is improved

- Compatibility with DBeaver is improved

- Compatibility with Codebase is improved

New features in ODBC Driver for xBase 1.1

- Performance of batch operations is significantly improved

- The IndexOnReading connection parameter is added

New features in ODBC Driver for xBase 1.0

- First release of ODBC Driver for xBase

- Windows is supported

- macOS is supported

- Linux is supported

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2   General Information

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2.1 Overview

# Overview

ODBC Driver for xBase is a high-performance connectivity tool with enterprise-level features for accessing FoxPro, Visual FoxPro, dBase, and other databases in DBF file formats from ODBC-compliant reporting, analytics, BI, and ETL tools on 32-bit and 64-bit Windows, macOS, and Linux. Our ODBC driver fully supports standard ODBC API functions and data types and enables easy and secure access to live xBase data from anywhere.
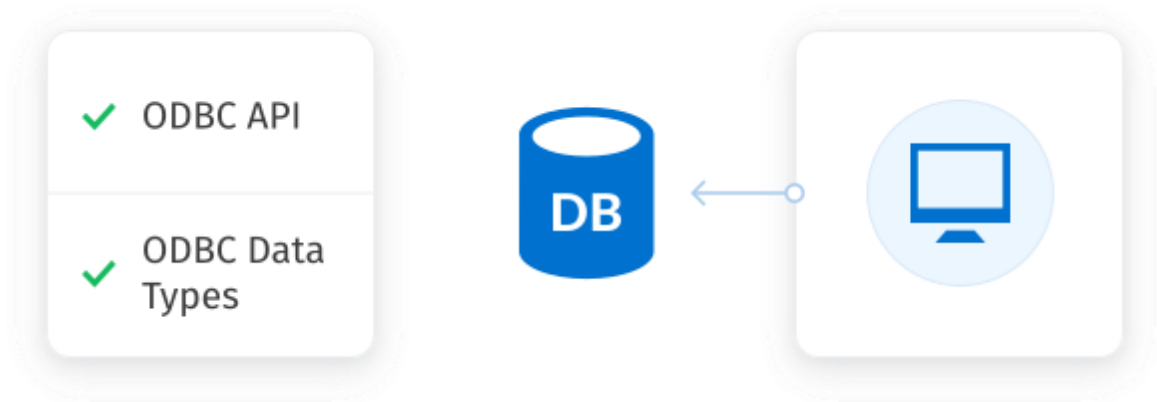
Direct connection

Our data connector enables various ODBC-aware applications to establish a direct connection to FoxPro 2, Visual FoxPro, dBase (DBF), and other xBase databases, without involving any external libraries. A direct connection increases the speed of data transmission between an external application and xBase database. It also streamlines the deployment process, since there is no need to distribute any additional client software with the driver.
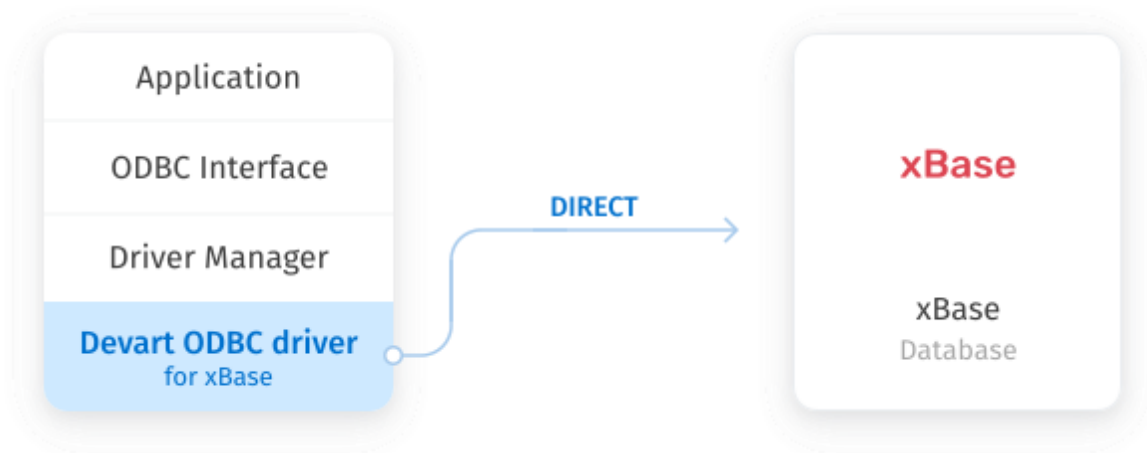
Compatibility

ODBC Driver for xBase supports FoxPro 2, Visual FoxPro, dBaseIII-dBase10, and other DBF file formats.

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2.2   Features
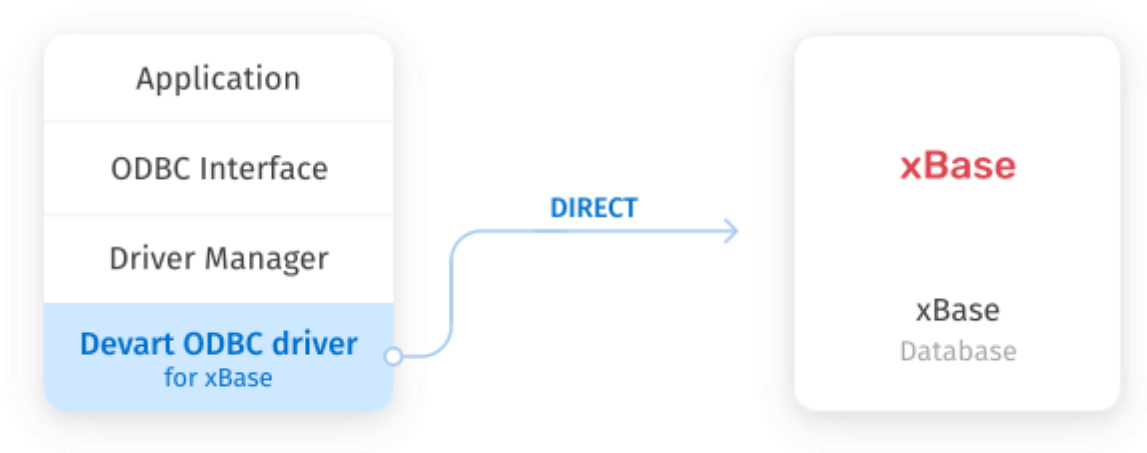
Direct Connection

Database applications based on our solution get an opportunity to establish connection to FoxPro, dBase, and other databases in DBF file formats directly. Direct Connection gives

your applications an unrivalled advantage - connection to xBase without any additional libraries. That improves performance of your applications, their quality, reliability and especially the deployment process, since there is no need to supply additional client software together with your application.
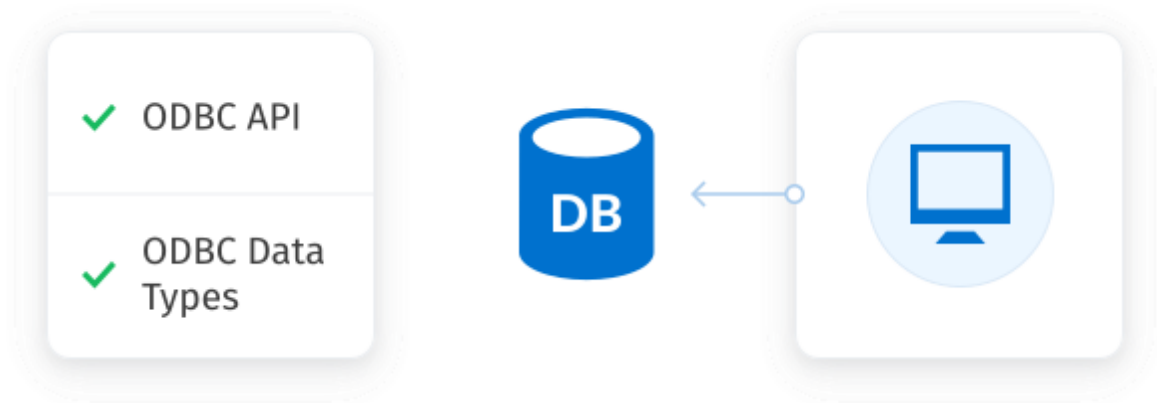
ODBC Conformance

Our ODBC driver provides full support for common ODBC interface:

• ODBC Data Types support

• ODBC API Functions support

In addition, we provide support for Advanced Connection String parameters. Thus allowing any desktop and web applications to connect to xBase from various environments and platforms, that support ODBC.
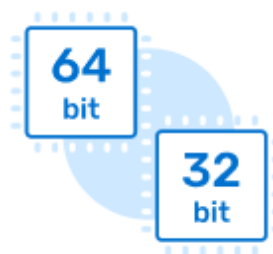
Development Platforms Variety

ODBC Driver for xBase doesn't limit your choice of the development platform and

environment. The driver installations are available for various operational systems and platforms. The current version supports Windows, both 32-bit and 64-bit. So you can develop both 32-bit and 64-bit cross-platform applications.

Database Compatibility

ODBC Driver for xBase supports FoxPro 2, Visual FoxPro, dBaseIII-dBase10, and other DBF file formats.

High Performance

All our products are designed to help you write high-performance, lightweight data access layers, therefore they use advanced data access algorithms and techniques of optimization.

Support

Visit our [Support](#) page to get instant help from knowledgeable and experienced professionals, a quick resolution of your problems, and nightly builds with hotfixes.

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2.3   Compatibility

xBase Compatibility

ODBC Driver for xBase supports:
- FoxPro 2, Visual FoxPro
- dBaseIII-dBase10
- Codebase, Clipper
- and other DBF file formats

Supported Platforms

- Windows x86 and x64 (including Windows Terminal Server)
- macOS x64 and ARM (Apple Silicon M1)
- Linux x86 and x64

Compatibility with Third-Party Tools

Application Development Tools

Adobe ColdFusion	✔
Embarcadero Delphi & C++Builder UniDAC, FireDAC, dbGo (ADO), BDE and dbExpress	✔
FileMaker	✔
Lazarus	✔

Microsoft Visual FoxPro	✓
Microsoft Visual Studio Server Explorer and ADO.NET ODBC Provider	✓
Omnis Studio	✓
PHP	✓
PowerBASIC	✓
Python	✓

Database Management

Aqua Data Studio	✓
dbForge Studio	✓
dBeaver	✓
EMS SQL Management Studio	✓
Informatica Cloud	✓
RazorSQL	✓
SQL Server Data Tools	✓
SQL Server Management Studio	✓
SQL Server Reporting Services	✓

BI & Analytics Software

Alteryx	✓
DBxtra	✓
Dundas BI	✓
IBM SPSS Statistics	✓

MicroStrategy	✔
Power BI	✔
Qlik Sense	✔
QlikView	✔
RStudio	✔
SAP Crystal Reports	✔
SAS JMP	✔
Tableau	✔
TARGIT	✔
TIBCO Spotfire	✔

Office Software Suites

LibreOffice	✔
Microsoft Access	✔
Microsoft Excel	✔
OpenOffice	✔
StarOffice	✔

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2.4 Requirements

The following requirement must be met for ODBC Driver for xBase:

- Only one version of ODBC Driver for xBase is installed on your system.

No additional client software is required on your system.

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2.6   Getting Support

This document lists several ways you can find help with using ODBC Driver for xBase describes the Priority Support program.

Support Options

There are a number of resources for finding help on installing and using ODBC Driver for xBase:

- You can find out more about ODBC Driver for xBase installation or licensing by consulting Installation and License articles of this manual respectively.

- You can get community assistance and technical support on the Community Forum.

- You can get advanced technical assistance by ODBC Driver for xBase developers through the ODBC Driver for xBase Priority Support program.

Subscriptions

The ODBC Driver for xBase Subscription program is an annual maintenance and support service for ODBC Driver for xBase users.

Users with a valid ODBC Driver for xBase Subscription get the following benefits:

- Product support through the ODBC Driver for xBase Priority Support program

- Access to new versions of ODBC Driver for xBase when they are released

- Access to all ODBC Driver for xBase updates and bug fixes

- Notifications about new product versions

Priority Support

ODBC Driver for xBase Priority Support is an advanced product support service for getting expedited individual assistance with ODBC Driver for xBase-related questions from the ODBC Driver for xBase developers themselves. Priority Support is carried out over email and has a two business day response policy. Priority Support is available for users with an active ODBC Driver for xBase Subscription.

To get help through the ODBC Driver for xBase Priority Support program, please send an email to odbc@devart.com describing the problem you are having. Make sure to include the following information in your message:

Your ODBC Driver for xBase Registration number.

- Full ODBC Driver for xBase edition name and version number. You can find the version number in DLL version information.

- The format of DBF files you are working with.

- A detailed problem description.

- If possible, ODBC Administrator Log, scripts for creating and filling in database objects, and the application using ODBC Driver for xBase.

If you have any questions regarding licensing or subscriptions, please see the FAQ or contact sales@devart.com

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3   Using ODBC Driver

1. Installation
2. Connecting to xBase
3. Connection String Parameters
4. Sandboxed Apps on macOS
5. Using with iODBC
6. Enabling ODBC Tracing

7. [Supported Data Types](#)

8. [Supported ODBC API Functions](#)

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3.1   Installation

ODBC Driver for xBase currently supports the following platforms: Windows, macOS, and Linux, both 32-bit and 64-bit.

See how to install Devart ODBC Driver for xBase :

- [Windows](#)

- [Windows Silent](#)

- [macOS](#)

- [Linux DEB](#)

- [Linux RPM](#)

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3.1.1   Windows

Installation

1. [Download](#) and run the installer.

2. Follow the instructions in the wizard.
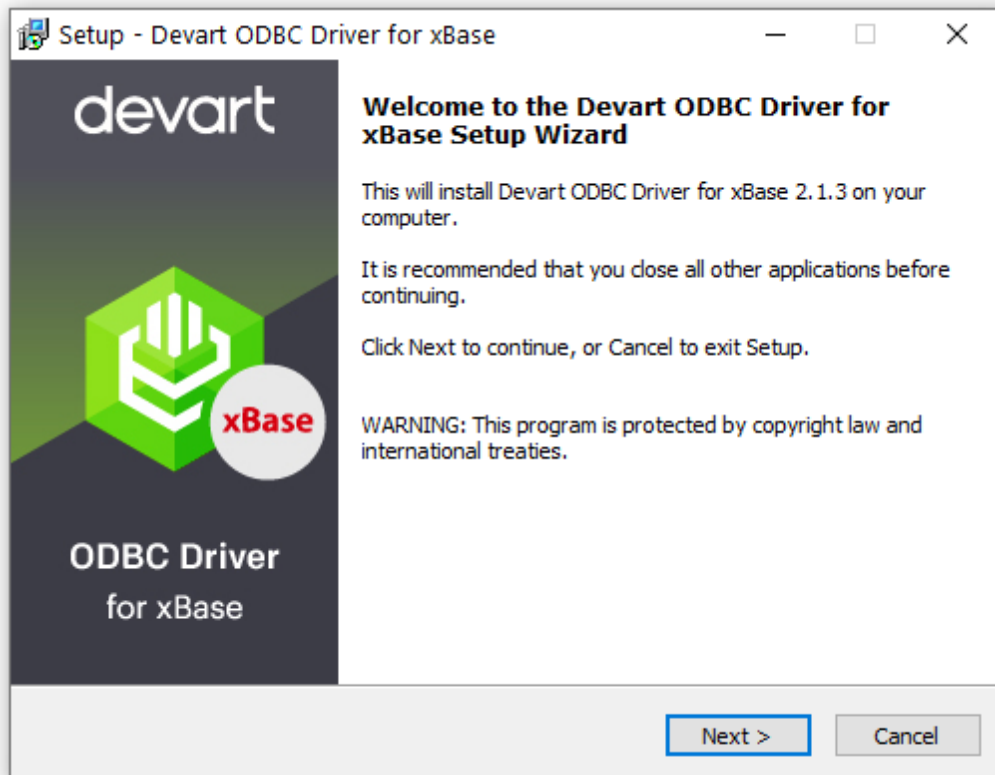
3. In case if you already have the specified installation folder on the PC or another Driver
   version is installed, you will get a warning. Click **Yes** to overwrite the old files with the
   current installation, but it is recommended to completely uninstall the previous driver
   version first, and then install the new one.

4. On the Select Components page you can select whether to install the **64-bit** version of the
   driver or not. Clear the check box if you need no 64-bit installation. There is also a check
   box on this page, that allows you to select whether to install Help and Manual.
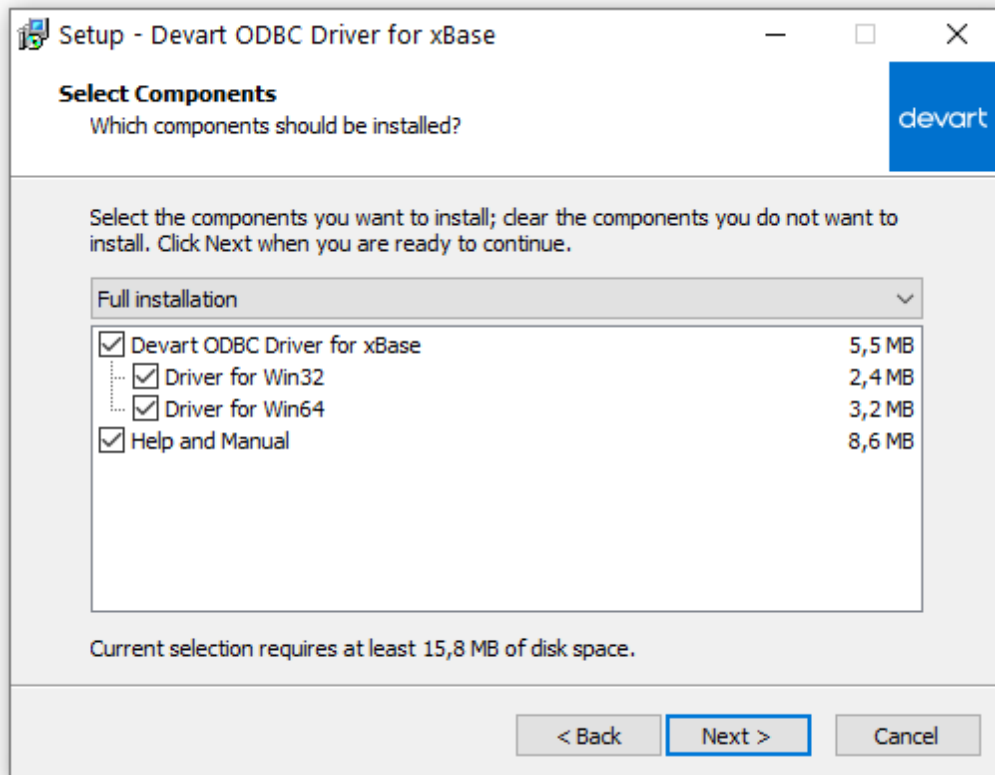
5. In the License Information dialog box, you should select the license type and activate the

   product. If you have no activation key, you can select Trial and use the driver for evaluation

   purposes.

6. If you have an activation key, select the Activation Key option. Copy the activation key from

   the registration email or your Customer Portal account and paste it into the Activation Key

   edit box.
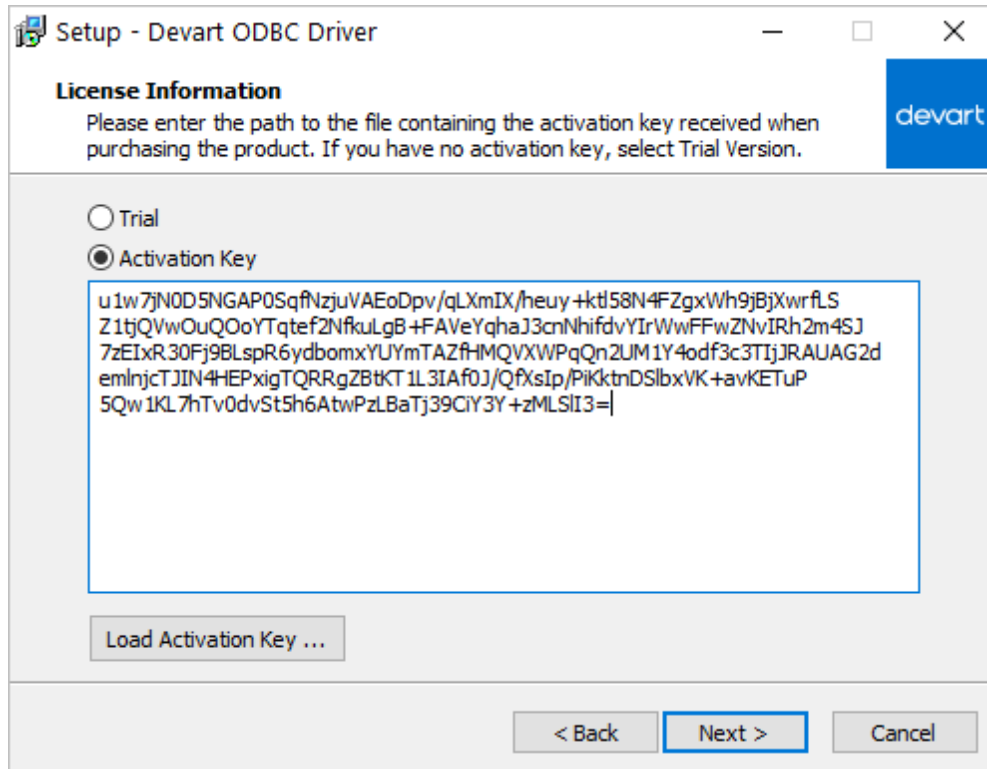
7. If you have the activation key file, click the Load Activation Key button and browse to it.
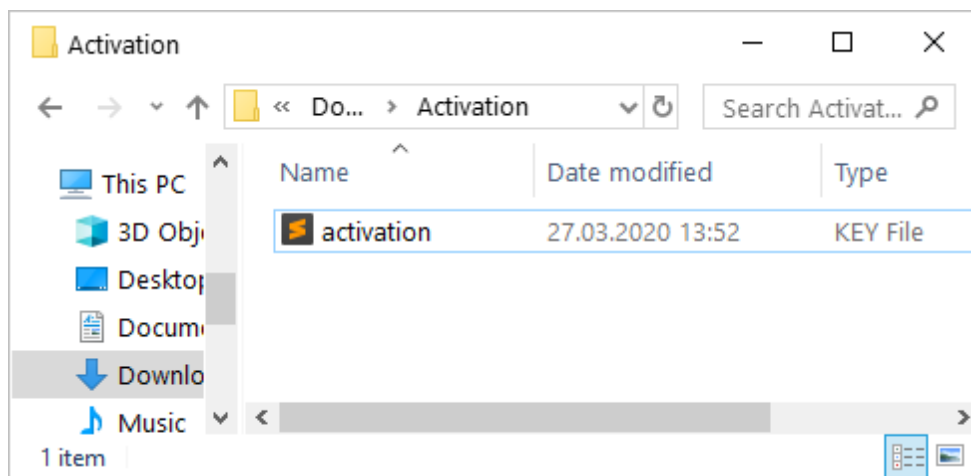
8. Click Next.

9. Click Install, then Finish.

10.After the installation is completed, you need to configure the driver.

See also:

- [Installation on macOS](#)

- [Install Linux DEB package](#)

- [Install Linux RPM package](#)

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3.1.2   Windows Silent

Silent Installation with OEM license on Windows

1. Run the Command Prompt as an administrator.

2. Use the following command-lines to perform the driver silent/very silent installation:

```
DevartODBCxBase.exe /SILENT /ActivationKey=y1c7nmgdu234laszxcvONGurjfhxm90LH
```

```
DevartODBCxBase.exe /VERYSILENT /ActivationKey=ekhdh765mh09ukr237gfHRtrilwq9
```

Note: The installation is performed by entering a license key.

```
DevartODBCxBase.exe /SILENT /ActivationFile=d:\lic.key
```

```
DevartODBCxBase.exe /VERYSILENT /ActivationFile=d:\lic.key
```

Note: The installation is performed by specifying the path to a license key file with any name.

When /SILENT is used, the installation progress is displayed, but no user interaction is required during installation.

When /VERYSILENT is used, the installation wizard dialog is hidden and the installation process is performed without user interference.

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3.1.3   macOS

Prerequisites

ODBC Driver for xBase works under control of an ODBC driver manager. ODBC driver manager is not distributed along with our driver and must be installed separately.

ODBC Driver for xBase is compatible with iODBC driver manager.

In case when using other ODBC driver managers, ODBC Driver for xBase will be installed, but it will require manual modification of configuration files of these managers.

Installing ODBC Driver for xBase

1. Go to Security & Privacy settings in the System Preferences.

2. Enable the *App Store and identified developers* option in the **Allows apps downloaded from** section.

*Note: If the options in **Allow apps downloaded from** section are grayed out, click on the lock icon and enter your administrator password to proceed with the installation.*

3. Download the PKG file from the Devart website.

4. Run the downloaded file, press the Allow button to proceed with the installation.
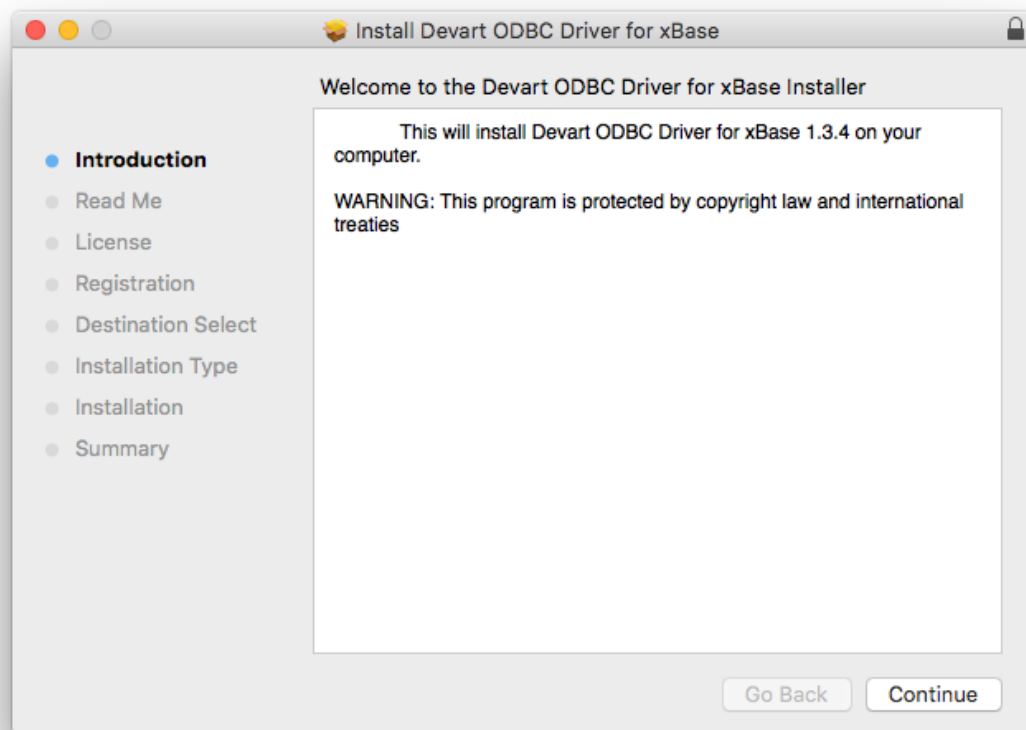
5. After reading the license agreement, click Agree.
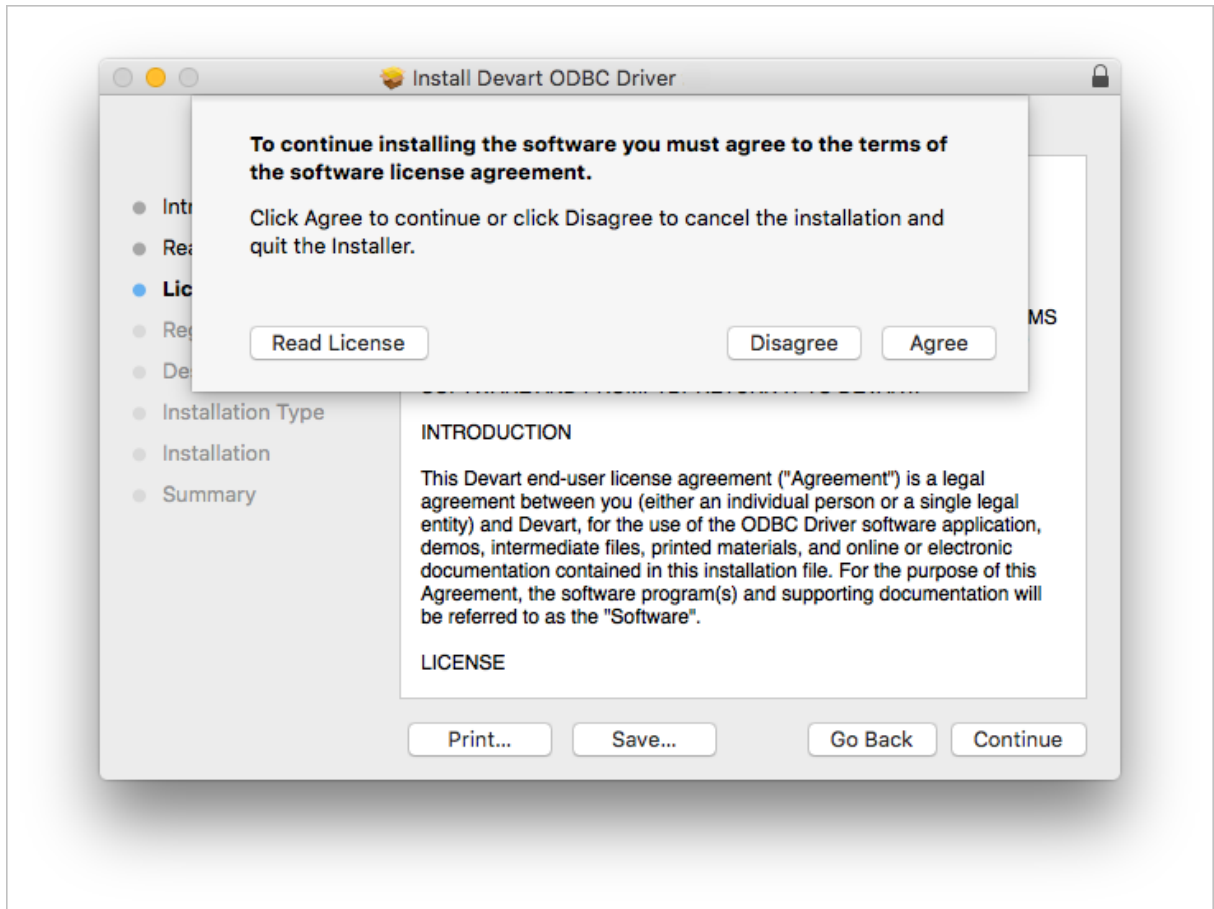
6. In the License Information dialog box, you should select the license type and activate the
   product. If you have no activation key, you can select Trial and use the driver for evaluation
   purposes.

7. If you have an activation key, select the Activation Key option. Copy the activation key from
   the registration email or your Customer Portal account and paste it into the Activation Key
   edit box.
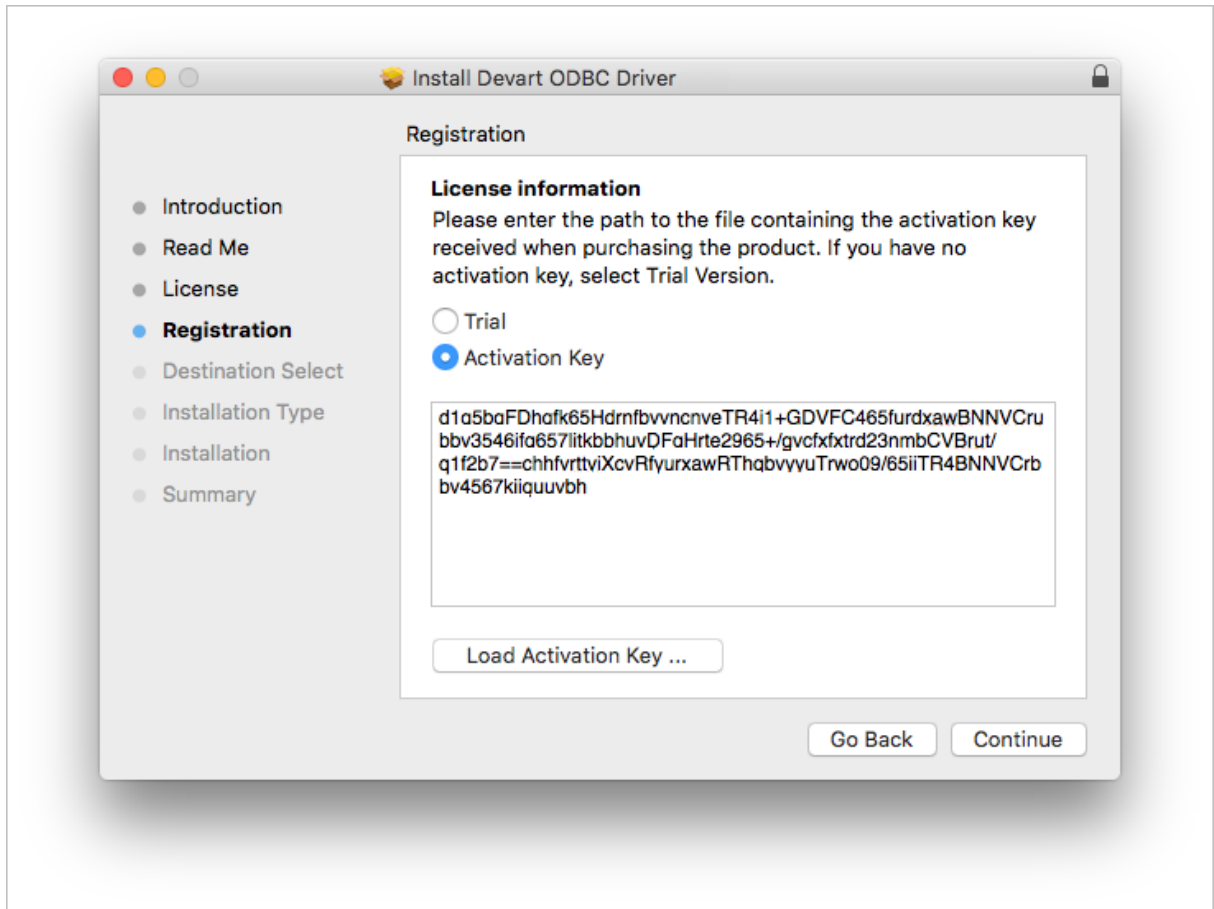
8. If you have the activation key file, click the Load Activation Key button and browse to it.
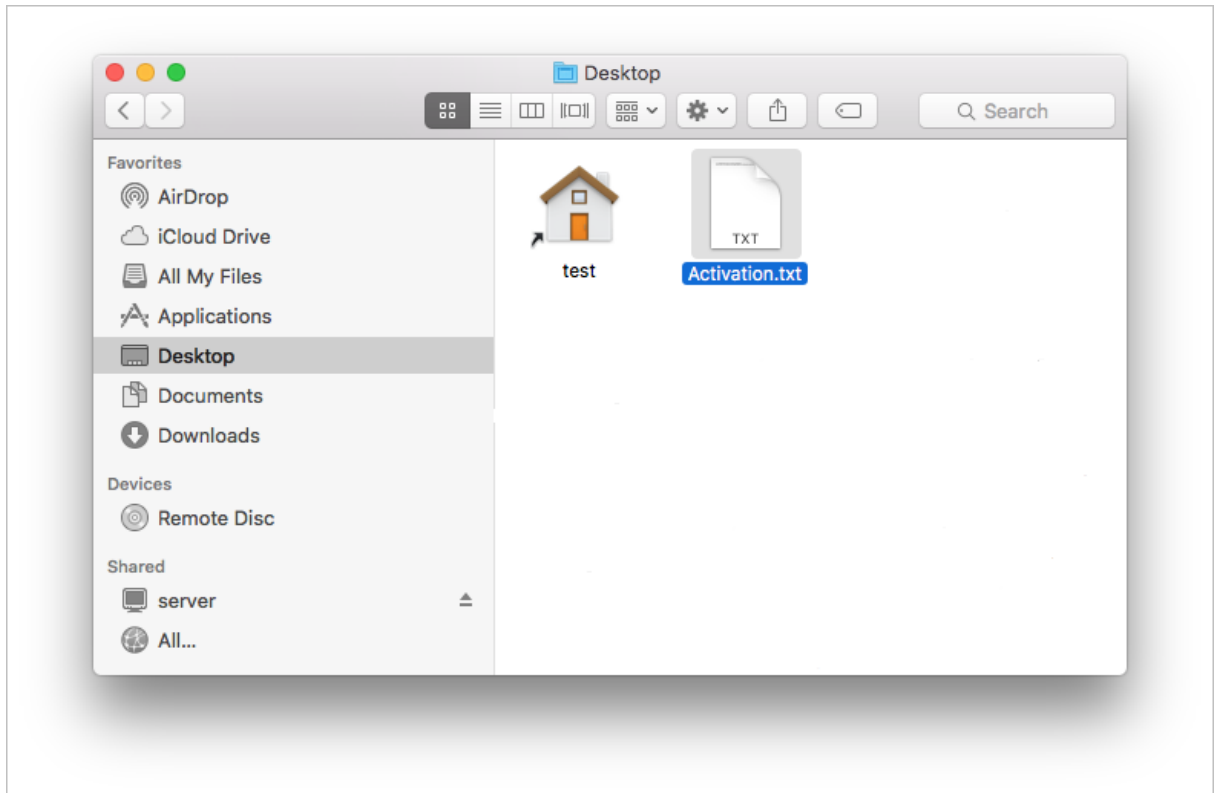
9. To complete the installation click Continue, then Install buttons.
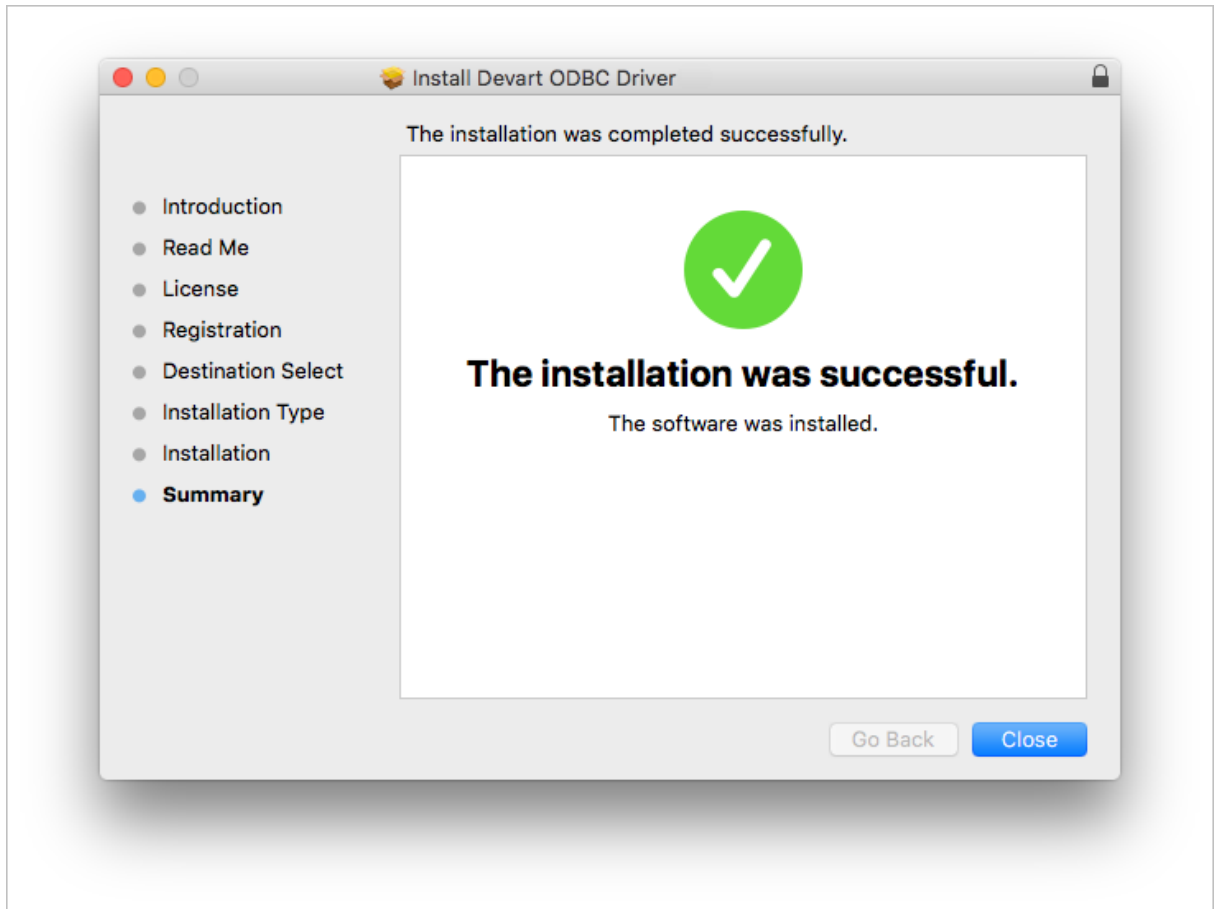
To activate the driver, perform the steps described in the Product Activation article.

See also:

- Installation on Windows

- Install Linux DEB package

- Install Linux RPM package

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3.1.4   Linux DEB

Prerequisites

ODBC Driver for xBase works under control of an ODBC driver manager. ODBC driver manager is not distributed along with our driver and must be installed separately.

[ODBC Driver for xBase](#) is compatible with [UnixODBC](#) driver manager. You can install the unixODBC driver manager using the command below:

```
sudo apt-get install odbcinst1debian2 libodbc1 odbcinst unixodbc
```

In case when using other ODBC driver managers, ODBC Driver for xBase will be installed, but it will require manual modification of configuration files of these managers.

Installation

Let's consider how to install the Devart ODBC driver on Linux from a DEB package, for example, on Ubuntu. There are two ways to install the driver either manually or via the command line.

GUI installation

1. [Download](#) the DEB package of the required bitness from the Devart website.

2. Navigate to the folder with the downloaded package ("Downloads" by default) and double-click it.

3. In the opened dialog, click the **Install** button.
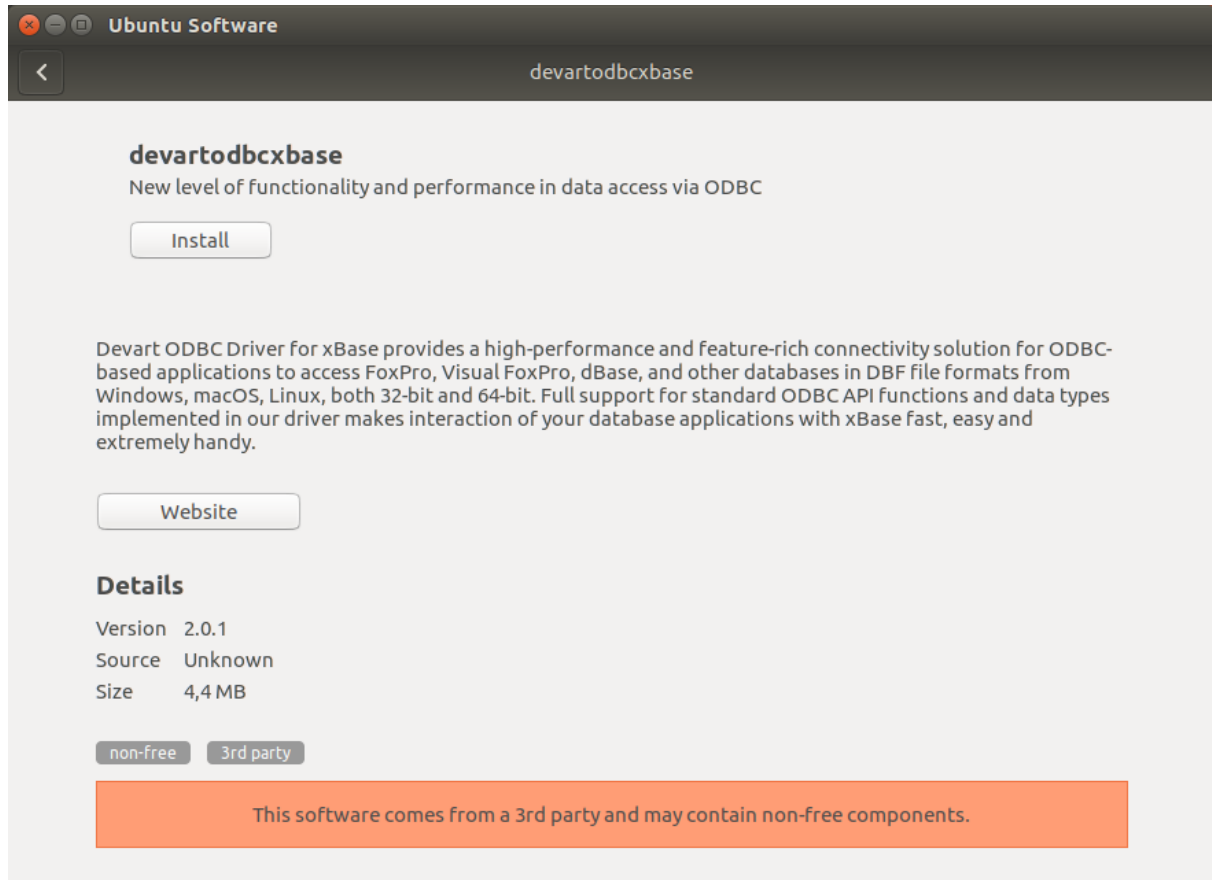
4. If the installation is successfully completed, the Install button changes into the Remove

one.

Command-line installation

1. Download the DEB package from the Devart website.

By default the required package will be downloaded into the ~/Downloads folder (or the

selected one);

2. Run the 'Terminal' program;

3. Navigate to the folder with the downloaded package cd ~/Downloads (if you downloaded

the package into another folder, you need to specify the path to this folder as the cd

command parameter):

```
cd ~/Downloads/
```

```
test@ubuntu:~$ cd ~/Downloads/
test@ubuntu:~/Downloads$
```

4. To install the devartodbcxbase_i386.deb on a 32-bit system, use the following command:

```
sudo dpkg -i devartodbcxbase_i386.deb
```

```
test@ubuntu:~$ cd ~/Downloads/
test@ubuntu:~/Downloads$ sudo dpkg -i devartodbcxbase_i386.deb
```

5. To install the devartodbcxbase_amd64.deb on a 64-bit system, use the following command:

```
sudo dpkg -i devartodbcxbase_amd64.deb
```

```
test@ubuntu:~$ cd ~/Downloads/
test@ubuntu:~/Downloads$ sudo dpkg -i devartodbcxbase_amd64.deb
```

6. Driver is installed successfully.

```
test@ubuntu:~/Downloads$ sudo dpkg -i devartodbcxbase_i386.deb
Selecting previously unselected package devartodbcxbase.
(Reading database ... 238080 files and directories currently installed.)
Preparing to unpack devartodbcxbase_i386.deb ...
Unpacking devartodbcxbase (2.0.1) ...
Setting up devartodbcxbase (2.0.1) ...
test@ubuntu:~/Downloads$
```

To activate the driver, perform the steps described in the Product Activation article.

See also:

- Install Linux RPM package

- Installation on Windows

- [Installation on macOS](#)

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3.1.5 Linux RPM

Prerequisites

[ODBC Driver for xBase](#) works under control of an ODBC driver manager. ODBC driver manager is not distributed along with our driver and must be installed separately.

ODBC Driver for xBase is compatible with [UnixODBC](#) driver manager.

In case when using other ODBC driver managers, ODBC Driver for xBase will be installed, but it will require manual modification of configuration files of these managers.

Installation

Let's consider how to install the Devart ODBC driver on Linux from an RPM package, for example, on CentOS. To install the driver, you should download the .rpm package and install it via the command line. See the detailed description of these steps below:

1. [Download](#) the RPM package from the Devart website.

By default the required package will be downloaded into the ~/Downloads folder (or the selected one);

2. Run the 'Konsole' program;

3. Navigate to the folder with the downloaded package cd ~/Downloads (if you downloaded the package into another folder, you need to specify the path to this folder as the cd command parameter):

```
cd ~/Downloads/
```

```
[test@centos7x64 ~]$ cd ~/Downloads/
[test@centos7x64 Downloads]$ ▮
```

4. To install the devart-odbc-xbase.i386.rpm on a 32-bit system, use the following command::

```
sudo rpm -ivh devart-odbc-xbase.i386.rpm
```

```
[test@localhost ~]$ sudo rpm -ivh devart-odbc-xbase.i386.rpm
```

To install the devart-odbc-xbase.x86_64.rpm on a 64-bit system, use the following command::

```
sudo rpm -ivh devart-odbc-xbase.x86_64.rpm
```

```
[test@centos7x64 ~]$ cd ~/Downloads/
[test@centos7x64 Downloads]$ sudo rpm -ivh devart-odbc-xbase.x86_64.rpm
```

5. Driver is installed successfully.

```
[test@centos7x64 ~]$ cd ~/Downloads/
[test@centos7x64 Downloads]$ sudo rpm -ivh devart-odbc-xbase.x86_64.rpm
[sudo] password for test:
Preparing...                          ############################### [100%]
Updating / installing...
   1:devart-odbc-xbase-2.0.1-1         ############################### [100%]
[test@centos7x64 Downloads]$
```

To activate the driver, perform the steps described in the Product Activation article.

See also:

- Install Linux DEB package

- Installation on Windows

- Installation on macOS

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3.2   Product Activation

See how to activate Devart ODBC Driver for xBase :

- Obtaining Activation Key

- Activation on Windows

- Activation on macOS

- Activation on Linux

- Where to see the license information

Request Support   ODBC Forum   Provide Feedback

3.2.1   Obtaining Activation Key

To obtain a product activation key, follow these instructions:

1. After purchasing the license, you receive a registration email to the email address, specified when ordering the product.

2. This email contains a Driver Activation Key and Login Credentials for the Customer Portal. Keep this information secret.

3. You can copy the Activation Key either from the registration email or at the Customer Portal account.

4. To login to the Customer Portal, use your Username and Password from the registration email.

5. To obtain your Activation Key, click the View link on the right. You will get the following dialog box:

Activation Key   ✕

u1w7jC0D8NGAE0FqbNzjuTAToDjv/qLNmIX/heuy+kt2Yi5V39cp39ih89JZ6mCb
MhlQfsILhFJgr6hQWxTEmuz1Ji+lQycFEPkmX+Z5YQPXt7e5xqMUSHsUdPjVsKfs
93Ee03mqH6a9wJ9fSQXuKK8zPlxDl81to5ff5vmppjL8EXvlaOkPRh4araau9UfK
r64rzGQxuk5jd0NfxzeykQ==

                              COPY TO CLIPBOARD   CLOSE

6. Copy the Activation Key with the Copy to Clipboard button.

See also:

- Activation on Windows

- Activation on macOS

- Activation on Linux

Request Support   ODBC Forum   Provide Feedback

3.2.2   Activation on Windows

Driver Activation After Installation

To activate your installed driver using ODBC Administrator, perform the following steps:

1. Run ODBC Administrator.

Data Sources
(ODBC)
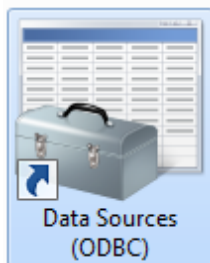
2. In the System DSN tab click the Add button.
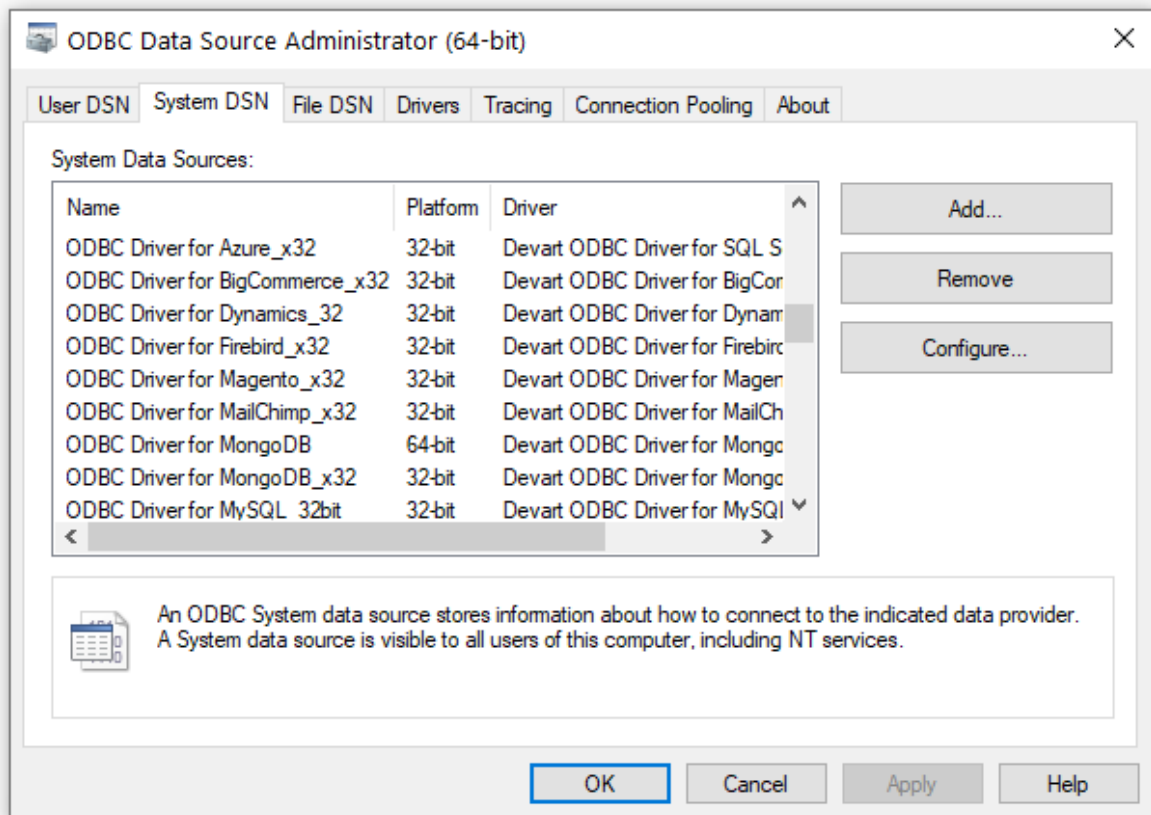
3. In the appeared dialog box, select the installed driver, click Finish.
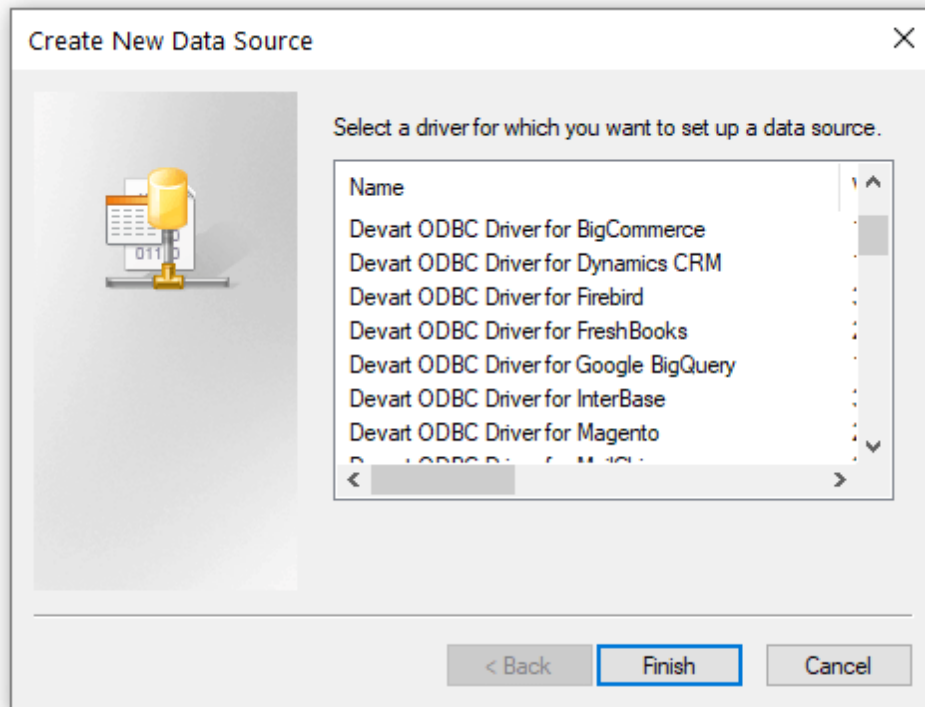
4. In the Driver Configuration dialog box, on the License tab, click the Input Activation Key
button.
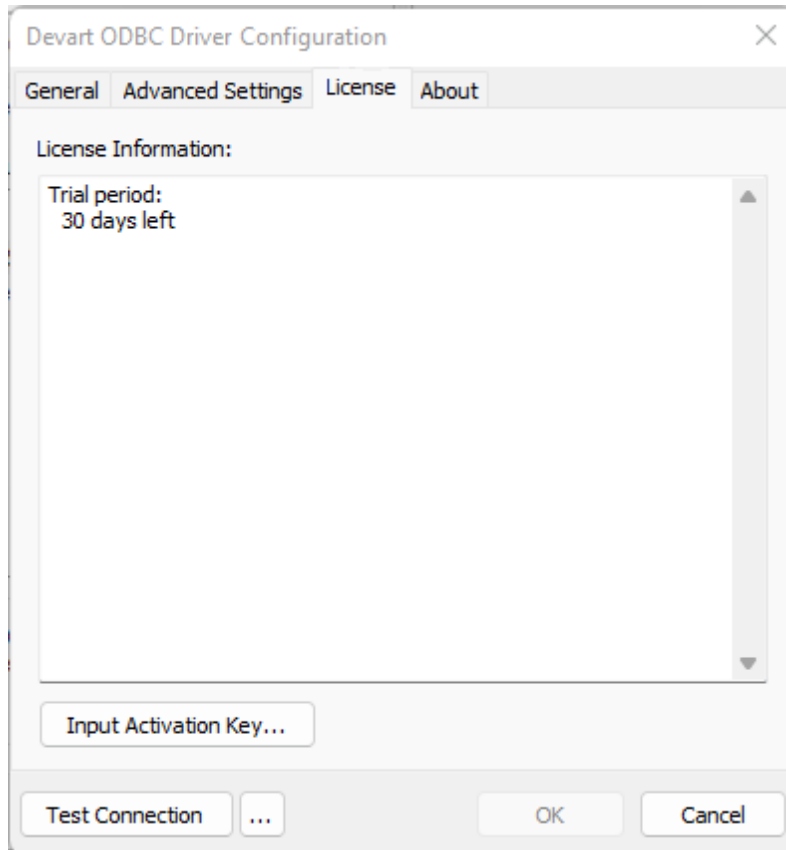
5. Copy the activation key from the registration email carefully and paste it into the Input

Activation Key edit box.
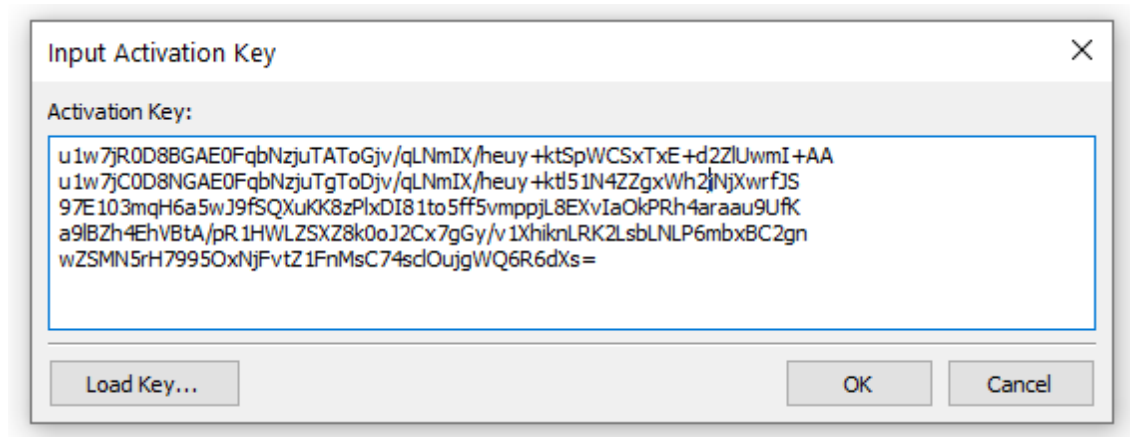
6. If you have the activation key file, click the Load Key button and browse to it.

7. Click OK.

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3.2.3   Activation on macOS

Driver Activation After Installation

If you don't activate your driver during installation, you can activate it later by following the steps:

1. Create a file with the "activation.key" name.

2. Copy the activation key from the registration email or your Customer Portal account and

   paste it into the created file.

3. Place the "activation.key" file into the folder where the driver was installed (for Devart

   ODBC Driver for xBase it is /Library/ODBC/Devart/xBase by default).

See also:

- Activation on Windows

- Activation on Linux

Request Support   ODBC Forum   Provide Feedback

3.2.4   Activation on Linux

Driver Activation After Installation

If you did not activate the driver during installation, you can activate it later:

1. Create a file with the "activation.key" name.

2. Copy the activation key from the registration email or your Customer Portal account and

   paste it into the created file.

3. Place the "activation.key" file into the folder where the driver was installed:

- for the DEB package of Devart ODBC Driver for xBase, it is */usr/share/devart/odbcxbase* by default;

- for the RPM package of Devart ODBC Driver for xBase, it is */usr/local/devart/odbcxbase* by default.

See also:

- [Activation on Windows](#)

- [Activation on macOS](#)

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3.2.5   Where to See the License Information

To see the license information of your installed driver, do the following:

1. In the Control Panel run ODBC Administrator
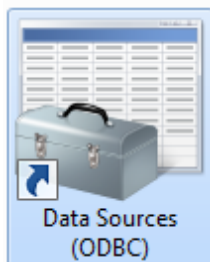
2. Open the System DSN tab and click the Add button
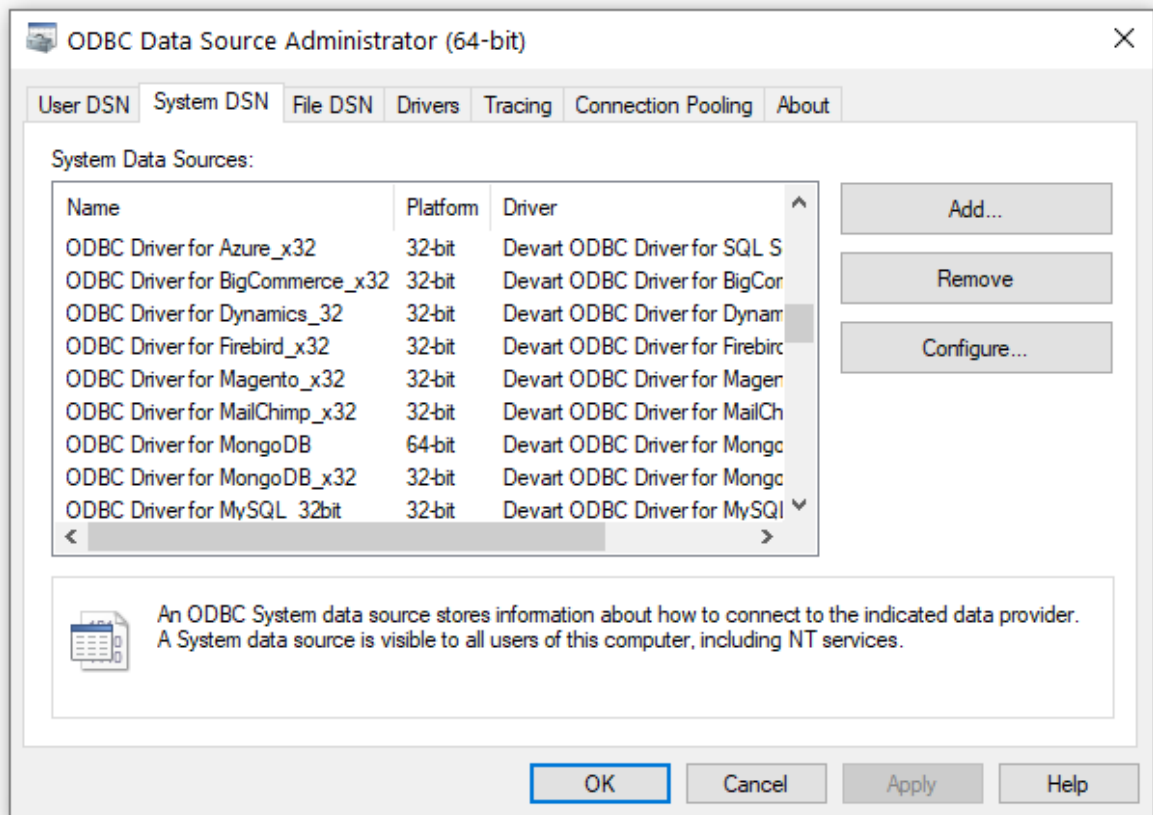
3. Select the driver and click Finish
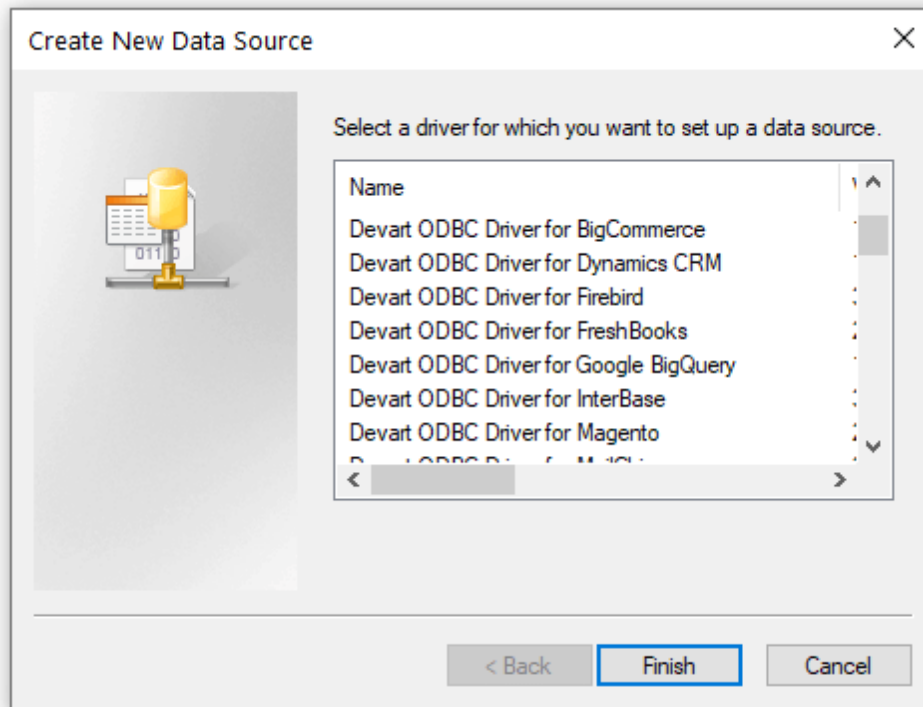
4. In the appeared dialogue, select the License tab
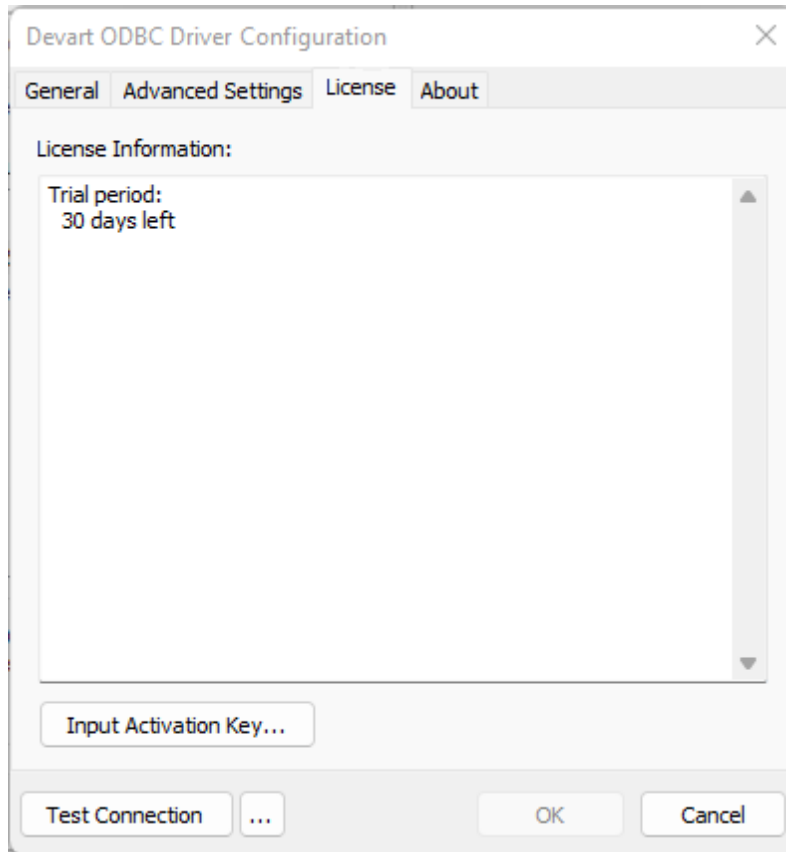
See also

- Product Activation

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3.3   Connecting to xBase

See how to connect the Devart ODBC Driver for ODBC Driver for xBase:

- Windows DSN Configuration

- macOS DSN Configuration

- Linux DSN Configuration

Request Support   ODBC Forum   Provide Feedback

3.3.1   Windows

Windows DSN Configuration

After installing the driver, create a DSN for xBase in the ODBC Data Source Administrator.

1. Open the ODBC Data Source Administrator.

- Type `ODBC Data Sources` in the Windows search box and choose the application that matches the bitness of the third-party application (32-bit or 64-bit). You can also open **ODBC Data Sources** from **Control Panel** > **Administrative Tools**. Note that before Windows 8, the icon was named **Data Sources (ODBC)**.

- Alternatively, you can run `C:\Windows\SysWOW64\odbcad32.exe` to create a 32-bit DSN or `C:\Windows\System32\odbcad32.exe` to create a 64-bit DSN.

2. Select the **User DSN** or **System DSN** tab. Most applications work with both types, yet some applications require a specific type of DSN.

3. Click **Add**. The **Create New Data Source** dialog will appear.

4. Select **Devart ODBC Driver for ODBC Driver for xBase** and click **Finish**. The driver setup dialog will open.

5. Enter the connection information in the appropriate fields.
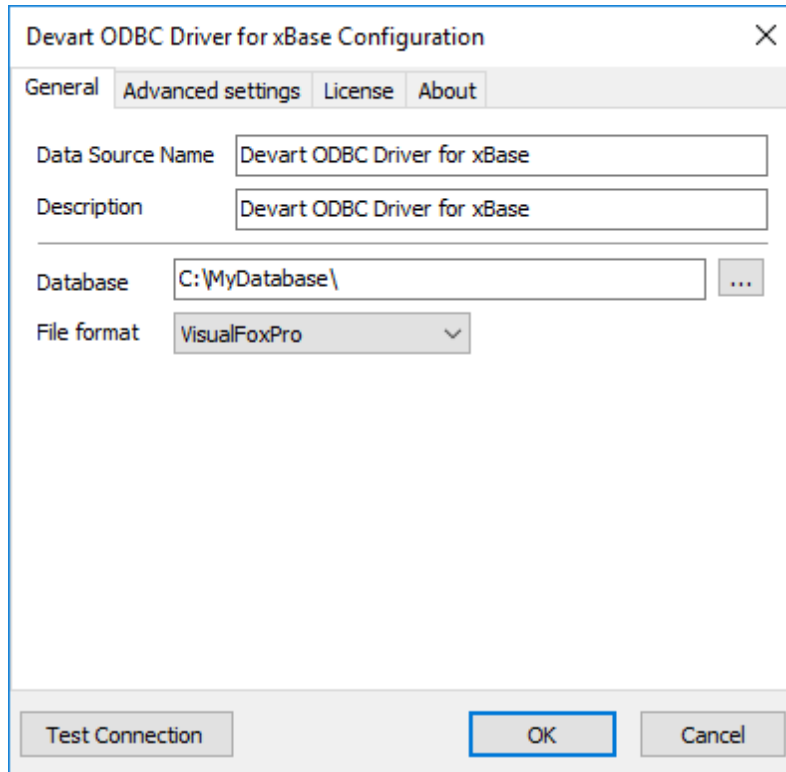
6. You may test the connectivity by clicking **Test Connection**.

7. Click **OK** to save the DSN.

See Also

Connection Options

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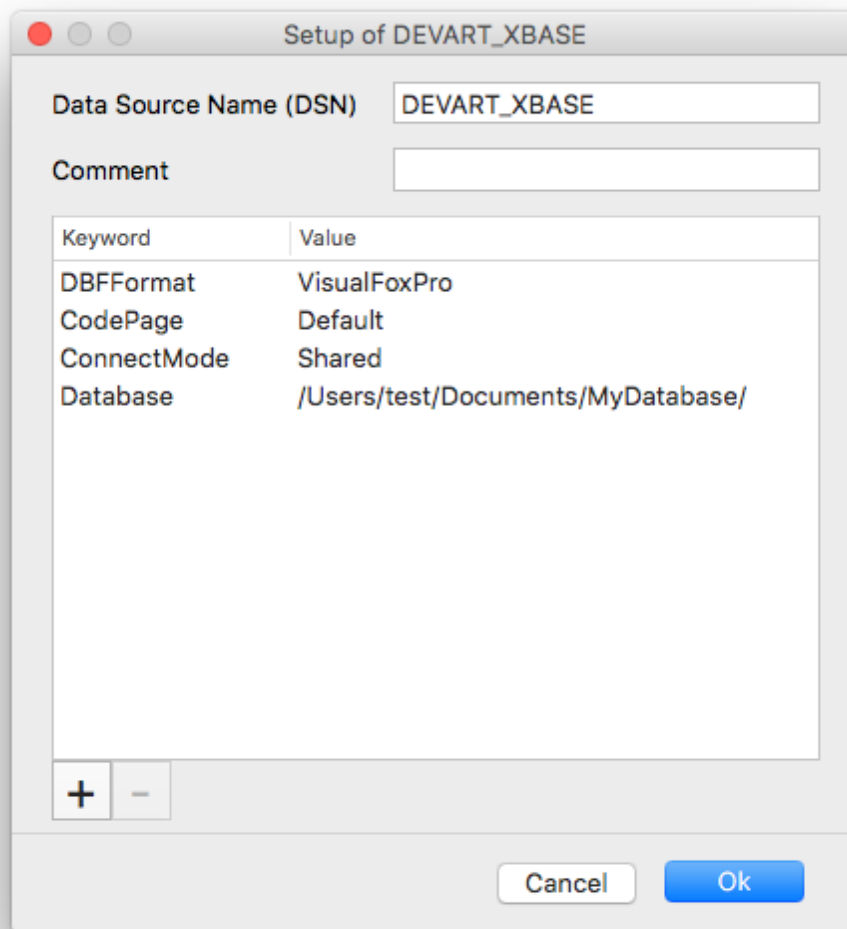Request Support   ODBC Forum   Provide Feedback

3.3.2   Mac

macOS DSN Configuration

After the driver is installed, DSN with the name DEVART_XBASE is created. You can use it to test a connection with XBASE server. For this, perform the following steps:
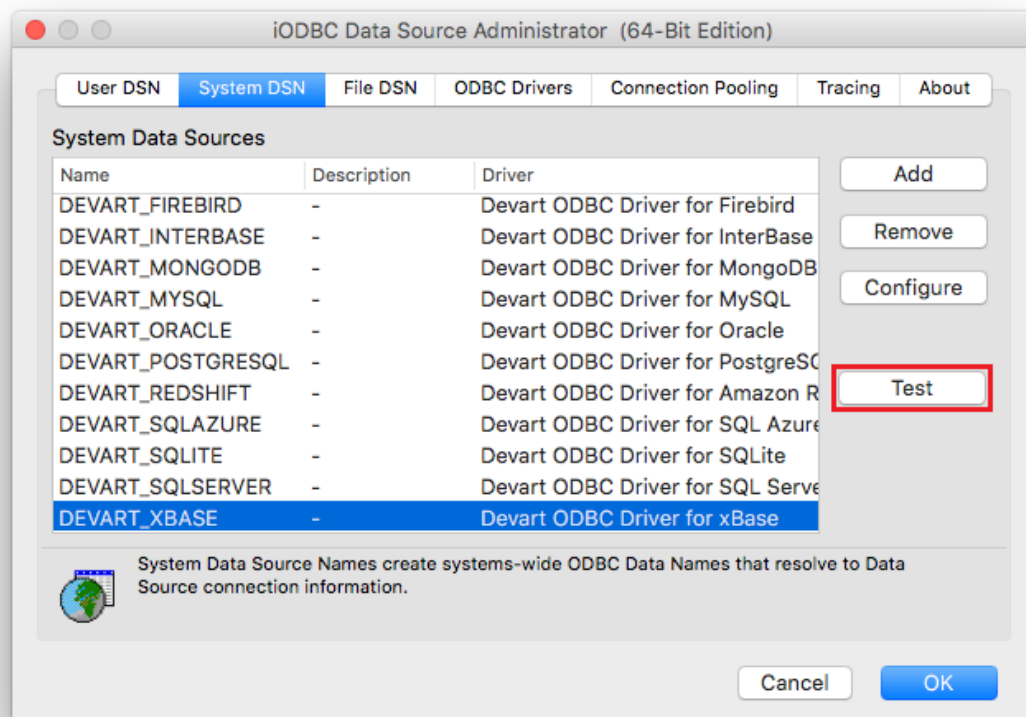
1. Run the iODBC utility of the required bitness. Find the DEVART_XBASE section and click the Configure button:
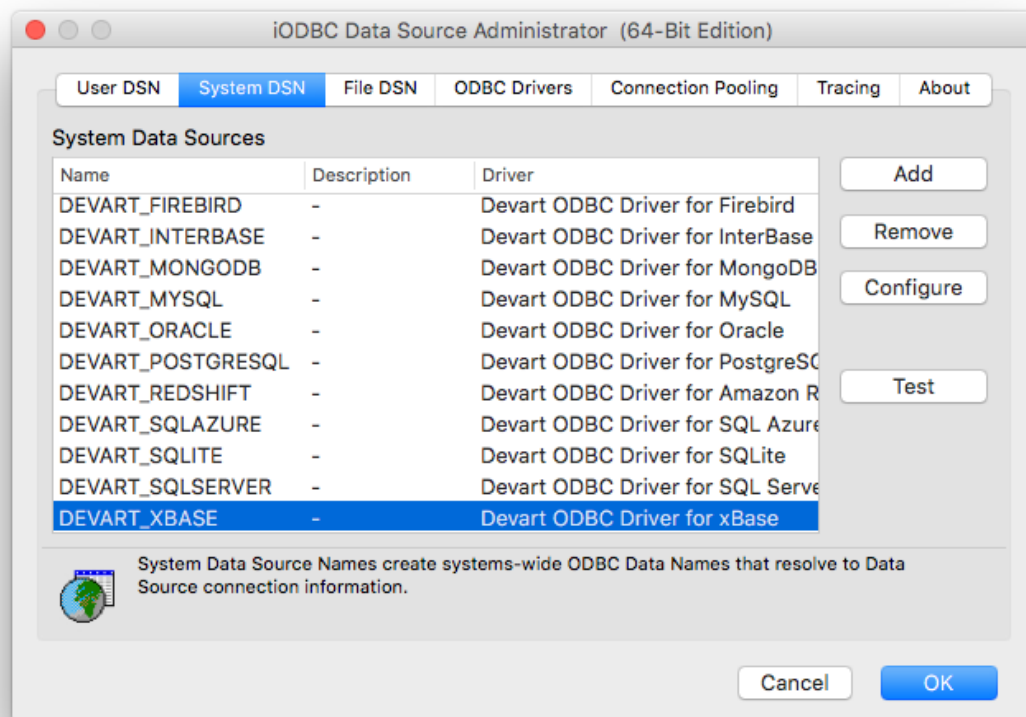
2. In the appeared dialog, specify the required connection settings and click OK.

3. Now click the Test button to establish a test connection to your data source.

See Also

[Connection Options](#)

[Request Support](#)   [ODBC Forum](#)   [Provide Feedback](#)

3.3.3   Linux

Linux DSN Configuration

After the linux ([DEB](#) or [RPM](#)) driver is installed, a DSN with the name DEVART_XBASE is created. You can use it to test the [connection with the XBASE](#) server. For this, perform the following steps:

1. Open the odbc.ini file located in the /etc folder. Find the DEVART_XBASE section and specify the required connection settings:

```
Database=<the path to the folder that contains the database files>
Format=<the used DBF format>
```

2. Run the UnixODBC Test Command utility and test a connection using the following command:

```
isql -v DEVART_XBASE
```

```
test@ubuntu:~$ isql -v DEVART_XBASE
+---------------------------------------+
| Connected!                            |
|                                       |
| sql-statement                         |
| help [tablename]                      |
| quit                                  |
|                                       |
+---------------------------------------+
SQL>
```

See Also

[Connection Options](#)

[Request Support](#) [ODBC Forum](#) [Provide Feedback](#)

3.4   Connection String Parameters

FoxPro, dBase, Clipper ODBC Connection String Parameters

The following table lists the connection string parameters for FoxPro2, VisualFoxPro, dBase, Clipper, and other DBF formats.

Paramet	Description

er	
AllFieldsAs Nullable	Used to open DBF tables with incorrect data (tables that have records with null values in non-nullable columns). The default value is False.
Allow NULL strings	To retrieve metadata, some parameters do not accept NULL values, and an exception is raised if a NULL value is passed. Enable these options for compatibility with those 3rd-party tools that pass NULL values to the parameters.
Empty strings as NULL	
Database	Used to specify the folder in which the database files are located.
DBF Format	Used to specify the default database format that will be used when creating new tables and working with indexes. Available values: Auto, dBaseIII, dBaseIV, dBaseV, dBaseVII, FoxPro2, VisualFoxPro, HiPerSix, Codebase and Clipper. Default value is Auto. When using Auto, for each separate table, the format is detected by its DBF file header. For any other values, DBF file header will be ignored. The format from the DBFFormat value will be forced used for all tables in the folder.
Code Page	Used to specify a code page when working with a database. Available values: Default, UnitedStatesOEM, GreekDOS, WesternEuropeanDOS, TurkishDOS, CentralEuropeanDOS, PortugueseDOS, IcelandicDOS, FrenchCanadianDOS, NordicDOS, CyrillicDOS, Thai, Japanese, ChineseSimplified, ChineseTraditional, Korean, CentralEuropeanANSI, CyrillicANSI, WesternEuropeanANSI, GreekANSI, TurkishANSI, HebrewANSI, ArabicANSI and BalticANSI. Default value is Default.
Connect Mode	Used to specify how applications access DBF table files. Exclusive Only one application can access the table file at a time. The active application holds read/write lock on the file to prevent other applications from reading or writing to it. Shared

	The default value. Multiple applications can concurrently read/write to the same table. The active application holds read/write lock on the table file, but releases the lock once it has finished reading or writing the data. Unsafe Multiple applications can concurrently read and write to the table file. This mode should be used with caution because it allows multiple applications to modify the file simultaneously. Since DBF databases do not support transactions, an attempt to change the same file simultaneously by multiple application can cause data corruption in the table file.
IgnoreBroke nTables	If set to True, corrupted tables in the directory will be ignored, and an exception won't be raised. The default value is False.
IgnoreDataE rrors	If set to True, corrupted data errors will be ignored when opening a DBF table, and an exception won't be raised. The default value is False.
IgnoreIndex Errors	If set to True, errors in database indexes will be ignored when opening a DBF table, and an exception won't be raised. The default value is False.
IgnoreMetad ataErrors	If set to True, metadata errors will be ignored when opening a DBF table, and an exception won't be raised. The default value is False.
IndexOnRea ding	Specifies a mechanism of indexing when fetching tables data. Available values: Native and Local. When set to Native, the driver will use standard DBF index (if the one exists) when fetching data. When set to Local, the driver will use its internal data indexing mechanism. Internal indexing has much more performance than native indexes, especially when performing complex queries against many tables. But note, that in this case a native index if it is present for a table, won't be updated when the table data changed (for example, when a UPDATE statement executed). So, it is recommended to use Local indexing only for querying data.
ODBC Behavior	Used to set the behavior corresponding to the ODBC specification version that a third-party tool expects. The behavior of ODBC driver can be changed by setting a value for the SQL_ATTR_ODBC_VERSION

	attribute by calling the SQLSetEnvAttr function. But some third-party tools expect the driver to exhibit ODBC 2.x behavior, but forget to call SQLSetEnvAttr with the specified version or pass an incorrect value there. In this case, the required behavior can be explicitly specified in the Connection String by setting the ODBC Behavior parameter. The possible values are: • Default - default ODBC behavior determined by a third-party tool. • Ver 2.x - ODBC 2.x behavior is explicitly set. • Ver 3.x - ODBC 3.x behavior is explicitly set.
RegionalNumberSettings	Enables the use of local regional settings when converting numbers to strings.
RegionalDateTimeSettings	Enables the use of local regional settings when converting dates and times to strings.
String Types	Sets the string value types returned by the driver as Default, Ansi or Unicode. • Default - the driver defines the string types. • Ansi - all string types will be returned as SQL_CHAR, SQL_VARCHAR and SQL_LONGVARCHAR. • Unicode - all string types will be returned as SQL_WCHAR, SQL_WVARCHAR and SQL_WLONGVARCHAR.
	The parameter value should be changed if any third-party tool supports only Ansi string types or Unicode ones.

xBase ODBC Connection String sample

```
DRIVER={Devart ODBC Driver for xBase};Database=C:\MyDatabase\;DBF
Format=VisualFoxPro;Code Page=UnitedStatesOEM;Connect
```

```
Mode=Exlusive
```

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3.5   **Sandboxed Apps on macOS**

Sandboxed Apps on macOS
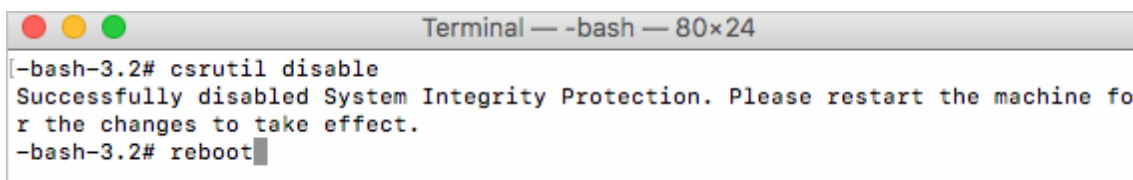
Sandboxed applications don't have permission to access iODBC Driver Manager on macOS. This is caused by the System Integrity Protection (SIP) technology on macOS which protects your files and folders from potentially malicious software by locking the application. When accessing a data source from an application like Excel through the ODBC driver for xBase, you may get an error message saying that the driver is unable to create a file.

Note that all third-party applications distributed through the Mac App Store are sandboxed.

Disabling System Integration Protection (SIP) on macOS
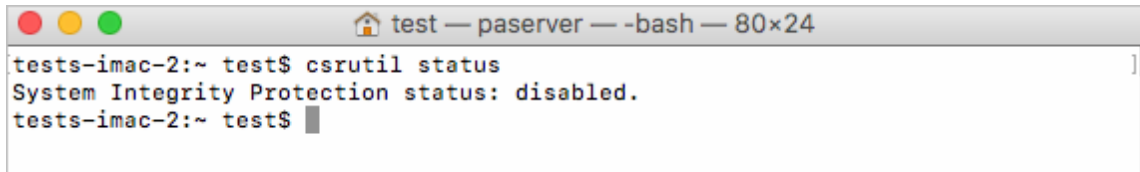
To resolve the issue, you should turn off SIP on your computer:

1. Restart your computer in **Recovery mode** (hold down **Command + R** until you see the
   Apple logo).

2. Select **Utilities** > **Terminal**.

3. In the Terminal window, enter `csrutil disable`.

```
[-bash-3.2# csrutil disable
Successfully disabled System Integrity Protection. Please restart the machine fo
r the changes to take effect.
-bash-3.2# reboot
```

4. Restart your computer.

5. Enter `csrutil status` to check the status of SIP.

```
● ● ●                🏠 test — paserver — -bash — 80×24
tests-imac-2:~ test$ csrutil status
System Integrity Protection status: disabled.
tests-imac-2:~ test$ ▮
```

Enable SIP after you finish working with an ODBC data source. To turn on SIP, enter `csrutil enable` and restart your computer.

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3.6   Using with iODBC

Using the Driver with iODBC

Among known issues with iODBC driver manager is incorrect handling of the following ODBC data types:

- SQL_WCHAR

- SQL_WVARCHAR

- SQL_WLONGVARCHAR

For this reason, we recommend using the following data types instead:

- SQL_CHAR

- SQL_VARCHAR

- SQL_LONGVARCHAR

If you have to work with the SQL_WCHAR, SQL_WVARCHAR, and SQL_WLONGVARCHAR data types, we recommend that you use the unixODBC driver manager rather than iODBC.

Request Support   ODBC Forum   Provide Feedback

3.7 Enabling ODBC Tracing

Creating an ODBC Trace Log on Windows

When you start or stop tracing in the 64-bit ODBC Administrator, the tracing is also enabled or disabled in the 32-bit ODBC Administrator, and vice versa.

If the ODBC client application you need to trace runs under Local System account or any other user login than your own, select `Machine-Wide tracing for all user identities`. For example, this option may be necessary for SSMS.

To generate a trace file using ODBC Source Administrator on Windows, follow the steps below.

1. Type `ODBC Data Sources` in the Windows 10 search box (in earlier versions of Windows, open `Control Panel` > `Administrative Tools`) and choose the application of the needed bitness.

2. Select the `Tracing` tab.

3. If necessary, change the default `Log File Path`. Make sure that the path is writable by the application, then click `Apply`.

4. Click `Start Tracing Now`.

5. Restart all application processes.

6. Click `Test Connection` in the DSN settings to make sure the driver is able to connect.

7. Reproduce the issue.

8. Click `Stop Tracing Now` on the `Tracing` tab.

9. Send us the obtained log file (for example, devart.log).

Creating an ODBC Trace Log on macOS

To enable the trace option on macOS, use the Tracing tab within ODBC Administrator.

1. Open the ODBC Administrator.

2. Select the `Tracing` tab.

3. If necessary, change the default `Log file path`.

4. Select `All the time` in the `When to trace` option.

Creating an ODBC Trace Log on Linux

To trace the ODBC calls on Linux, set the `Trace` and `TraceFile` keyword/value pairs in the `[ODBC]` section of the `/etc/odbcinst.ini` file, for example:

```
[ODBC]
Trace=Yes
TraceFile=/home/test/devart.log
```

Make sure to disable logging after obtaining a log file since it affects the read/write speed.

Request Support   ODBC Forum   Provide Feedback

3.8   Supported Data Types

Data Type Mapping

The Devart ODBC Driver for xBase supports all xBase data types.

The following table describes how the xBase data types are mapped to the ODBC data types.

xBase Data Types	ODBC Data Types
CHAR	SQL_CHAR
VARCHAR	SQL_VARCHAR
MEMO	SQL_WVARCHAR
INTEGER	SQL_INTEGER
BIGINT	SQL_BIGINT
DOUBLE	SQL_DOUBLE
FLOAT	SQL_REAL
NUMERIC	SQL_NUMERIC
LOGICAL	SQL_BIT
DATE	SQL_TYPE_DATE
TIME	SQL_TYPE_TIME
DATETIME	SQL_TYPE_TIMESTAMP

VARBINARY	SQL_VARBINARY
BLOB	SQL_LONGVARBINARY

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3.9   Supported ODBC API Functions

Supported ODBC Functions

The SQLGetInfo function returns information about the driver and data source. To find out whether a specific function is supported in the driver, call SQLGetFunctions.

For more information about the ODBC interface, see the ODBC Programmer's Reference.

ODBC Driver for xBase supports all deprecated functions for backward compatibility.

The following table lists the currently supported ODBC functions.

Function Name	Support	Standard	Purpose
SQLAllocHandle	✓	ISO 92	Obtains an environment, connection, statement, or descriptor handle.
SQLConnect	✓	ISO 92	Connects to a specific driver by data source name, user ID, and password.
SQLDriverConnect	✓	ODBC	Connects to a specific driver by connection string or requests that the

			Driver Manager and driver display connection dialog boxes for the user.
SQLAllocEnv	✓	Deprecated	Obtains an environment handle allocated from driver.
SQLAllocConnect	✓	Deprecated	Obtains a connection handle

ODBC API Calls for Obtaining Information about a Driver and Data Source

Function Name	Support	Standard	Purpose
SQLDataSources	✓	ISO 92	Returns the list of available data sources, handled by the Driver Manager
SQLDrivers	✓	ODBC	Returns the list of installed drivers and their attributes, handles by Driver Manager
SQLGetInfo	✓	ISO 92	Returns information about a specific driver and data source.
SQLGetFunctions	✓	ISO 92	Returns the functions supported by the driver.

			Returns information about supported data types.
SQLGetTypeInfo	✓	ISO 92	

ODBC API Calls for Setting and Retrieving Driver Attributes

Function Name	Support	Standard	Purpose
SQLSetConnectAttr	✓	ISO 92	Sets a connection attribute.
SQLGetConnectAttr	✓	ISO 92	Returns the value of a connection attribute.
SQLSetConnectOption	✓	Deprecated	Sets a connection option
SQLGetConnectOption	✓	Deprecated	Returns the value of a connection option
SQLSetEnvAttr	✓	ISO 92	Sets an environment attribute.
SQLGetEnvAttr	✓	ISO 92	Returns the value of an environment attribute.
SQLSetStmtAttr	✓	ISO 92	Sets a statement attribute.
SQLGetStmtAttr	✓	ISO 92	Returns the value of a statement attribute.
SQLSetStmtOption	✓	Deprecated	Sets a statement option
SQLGetStmtOption	✓	Deprecated	Returns the value of a statement option

ODBC API Calls for Preparing SQL Requests

Function Name	Support	Standard	Purpose
SQLAllocStmt	✓	Deprecated	Allocates a statement handle
SQLPrepare	✓	ISO 92	Prepares an SQL statement for later execution.
SQLBindParameter	✓	ODBC	Assigns storage for a parameter in an SQL statement.
SQLGetCursorName	✓	ISO 92	Returns the cursor name associated with a statement handle.
SQLSetCursorName	✓	ISO 92	Specifies a cursor name.
SQLSetScrollOptions	✓	ODBC	Sets options that control cursor behavior.

ODBC API Calls for Submitting Requests

Function Name	Support	Standard	Purpose
SQLExecute	✓	ISO 92	Executes a prepared statement.
SQLExecDirect	✓	ISO 92	Executes a statement
SQLNativeSql	✓	ODBC	Returns the text of an SQL statement as

			translated by the driver.
SQLDescribeParam	✓	ODBC	Returns the description for a specific parameter in a statement.
SQLNumParams	✓	ISO 92	Returns the number of parameters in a statement.
SQLParamData	✓	ISO 92	Used in conjunction with SQLPutData to supply parameter data at execution time. (Useful for long data values.)
SQLPutData	✓	ISO 92	Sends part or all of a data value for a parameter. (Useful for long data values.)

ODBC API Calls for Retrieving Results and Information about Results

Function Name	Support	Standard	Purpose
SQLRowCount	✓	ISO 92	Returns the number of rows affected by an insert, update, or delete request.
SQLNumResultCols	✓	ISO 92	Returns the number of columns in the

			result set.
SQLDescribeCol	✔	ISO 92	Describes a column in the result set.
SQLColAttribute	✔	ISO 92	Describes attributes of a column in the result set.
SQLColAttributes	✔	Deprecated	Describes attributes of a column in the result set.
SQLFetch	✔	ISO 92	Returns multiple result rows.
SQLFetchScroll	✔	ISO 92	Returns scrollable result rows.
SQLExtendedFetch	✔	Deprecated	Returns scrollable result rows.
SQLSetPos	✔	ODBC	Positions a cursor within a fetched block of data and enables an application to refresh data in the rowset or to update or delete data in the result set.
SQLBulkOperations	✔	ODBC	Performs bulk insertions and bulk bookmark operations, including update, delete, and fetch by bookmark.

ODBC API Calls for Retrieving Error or Diagnostic Information

Function Name	Support	Standard	Purpose
SQLError	✓	Deprecated	Returns additional error or status information
SQLGetDiagField	✓	ISO 92	Returns additional diagnostic information (a single field of the diagnostic data structure).
SQLGetDiagRec	✓	ISO 92	Returns additional diagnostic information (multiple fields of the diagnostic data structure).

ODBC API Calls for Obtaining Information About Database Objects (Catalog Functions)

Function Name	Support	Standard	Purpose
SQLColumnPrivileges	✓	ODBC	Returns a list of columns and associated privileges for one or more tables.
SQLColumns	✓	X/Open	Returns the list of column names in

			specified tables.
SQLForeignKeys	✔	ODBC	Returns a list of column names that make up foreign keys, if they exist for a specified table.
SQLPrimaryKeys	✔	ODBC	Returns the list of column names that make up the primary key for a table.
SQLProcedureColumns	✔	ODBC	Returns the list of input and output parameters, as well as the columns that constitute the result set for the specified procedures.
SQLProcedures	✔	ODBC	Returns the list of procedure names stored in a specific data source.
SQLSpecialColumns	✔	X/Open	Returns information about the optimal set of columns that uniquely identifies a row in a specified table, or the columns that are automatically

			updated when any value in the row is updated by a transaction.
SQLStatistics	✓	ISO 92	Returns statistics about a single table and the list of indexes associated with the table.
SQLTablePrivileges	✓	ODBC	Returns a list of tables and the privileges associated with each table.
SQLTables	✓	X/Open	Returns the list of table names stored in a specific data source.

ODBC API Calls for Performing Transactions

Function Name	Support	Standard	Purpose
SQLTransact	✓	Deprecated	Commits or rolls back a transaction
SQLEndTran	✓	ISO 92	Commits or rolls back a transaction.

ODBC API Calls for Terminating a Statement

Function Name	Support	Standard	Purpose
SQLFreeStmt	✓	ISO 92	Ends statement

			processing, discards pending results, and, optionally, frees all resources associated with the statement handle.
SQLCloseCursor	✓	ISO 92	Closes a cursor that has been opened on a statement handle.
SQLCancel	✓	ISO 92	Cancels an SQL statement.

ODBC API Calls for Terminating a Connection

Function Name	Support	Standard	Purpose
SQLDisconnect	✓	ISO 92	Closes the connection.
SQLFreeHandle	✓	ISO 92	Releases an environment, connection, statement, or descriptor handle.
SQLFreeConnect	✓	Deprecated	Releases connection handle.
SQLFreeEnv	✓	Deprecated	Releases an environment handle.

Request Support   ODBC Forum   Provide Feedback

4   Using in Third-Party Tools

This section discusses how to use ODBC Driver for xBase with ODBC-compliant tools.

- [DBeaver](#)

- [DBxtra](#)

- Oracle Database Link

- [Microsoft Access](#)

- [Microsoft Excel](#)

- [OpenOffice and LibreOffice](#)

- [PHP](#)

- [Power BI](#)

- [Python](#)

- [QlikView](#)

- [SQL Server Management Studio](#)

- [SSIS](#)

- [Tableau](#)

[Request Support](#)   [ODBC Forum](#)   [Provide Feedback](#)

4.1   Using in DBeaver

DBeaver Overview

DBeaver is a free, open source multiplatform database management tool and SQL client for developers and database administrators. DBeaver can be used to access any database or cloud application that has an ODBC or JDBC driver, such as Oracle, SQL Server, MySQl, Salesforce, or Mailchimp. Devart DBeaver provides you with the most important features you'd need when working with a database in a GUI tool, such as:

- SQL queries execution

- Metadata browsing and editing

- SQL scripts management

- Data export/import

- Data backup

- DDL generation

- ER diagrams rendering

- Test data generation

- BLOB/CLOB support

- Database objects browsing

- Scrollable resultsets

The tool comes in two editions — Community and Enterprise. Enterprise Edition supports NoSQL databases, such as MongoDB or Cassandra, persistent query manager database, SSH tunneling, vector graphics (SVG) and a few other enterprise-level features. Note though that you can access a MongoDB database from DBeaver Community Edition using the respective Devart ODBC driver. For the purposes of this guide, we'll use the Community Edition of DBeaver to retrieve data from xBase via the Open Database Connectivity driver.

Creating an ODBC Data Source to Use xBase Data in DBeaver

1. Click the **Start** menu and select **Control Panel**.

2. Select **Administrative Tools**, then click **ODBC Data Sources**.

3. Click on the **System DSN** tab if you want to set up a DSN name for all users of the system or select **User DSN** to configure DSN only for your account.

4. Click the **Add** button and double-click Devart ODBC Driver for xBase in the list.

5. Give a name to your data source and set up the connection parameters.

6. Click the **Test Connection** button to verify that you have properly configured the DSN.

When using ODBC driver for xBase with DBeaver, SQL_WVARCHAR data types may be displayed incorrectly in DBeaver. To prevent this, you need to set the string data types to Ansi either in the **Advanced Settings** tab of the driver configuration dialog or directly in the

connection string (String Types=Ansi) — all string types will be returned as SQL_CHAR, SQL_VARCHAR and SQL_LONGVARCHAR.
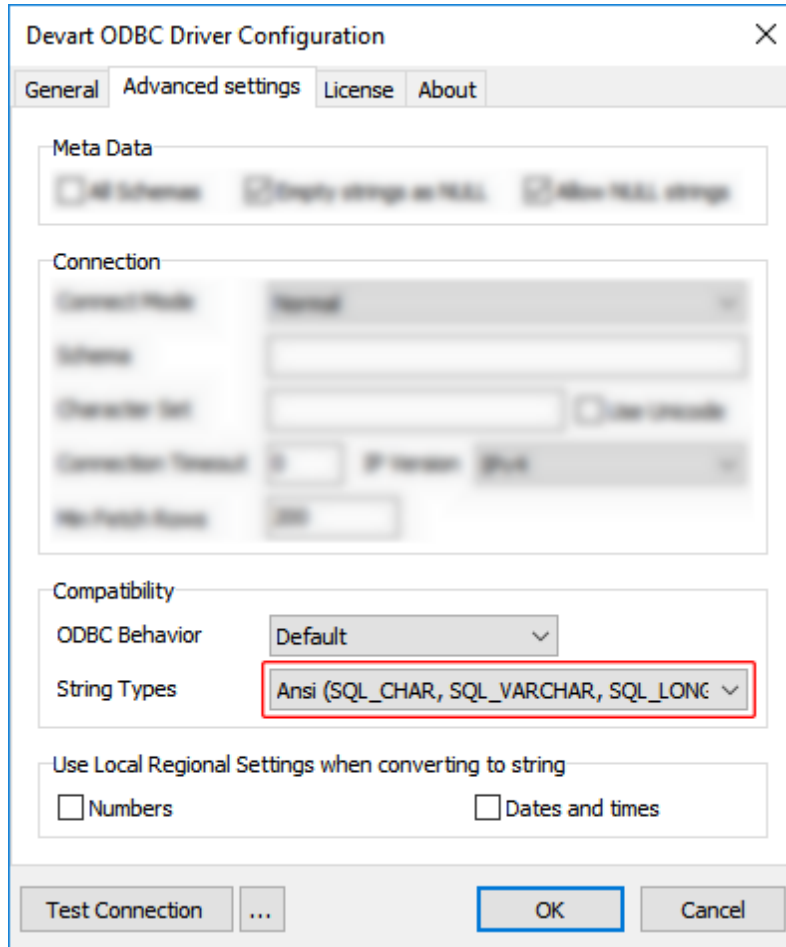
Connecting to xBase Data from DBeaver via ODBC Driver for xBase

Follow the steps below to establish a connection to xBase in DBeaver.

1. In the **Database** menu, select **New Database Connection.**
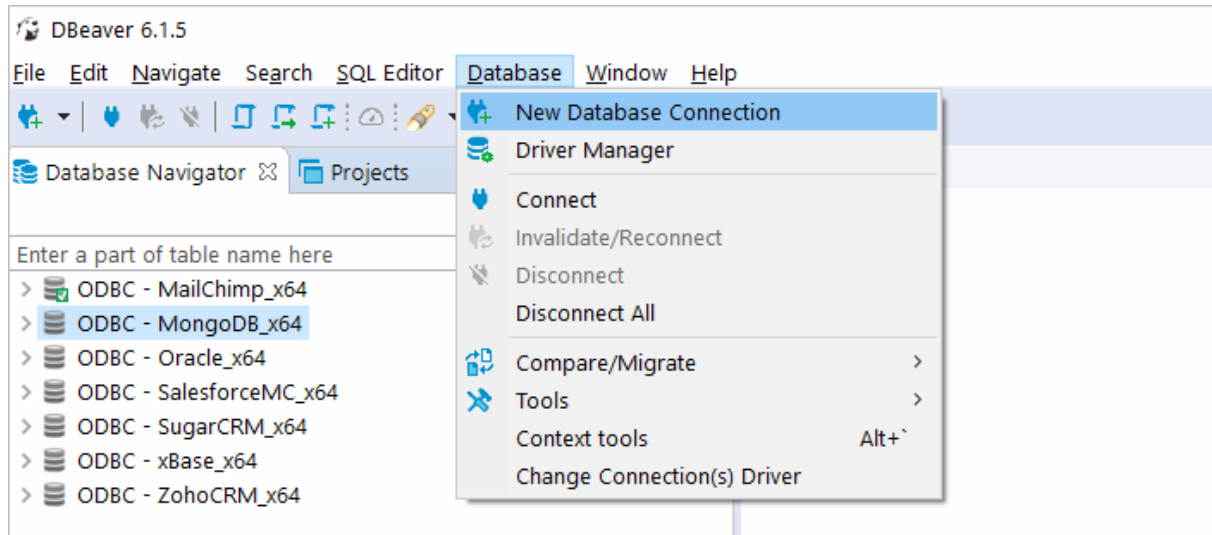
2. In the **Connect to database** wizard, select **ODBC** and click **Next**.
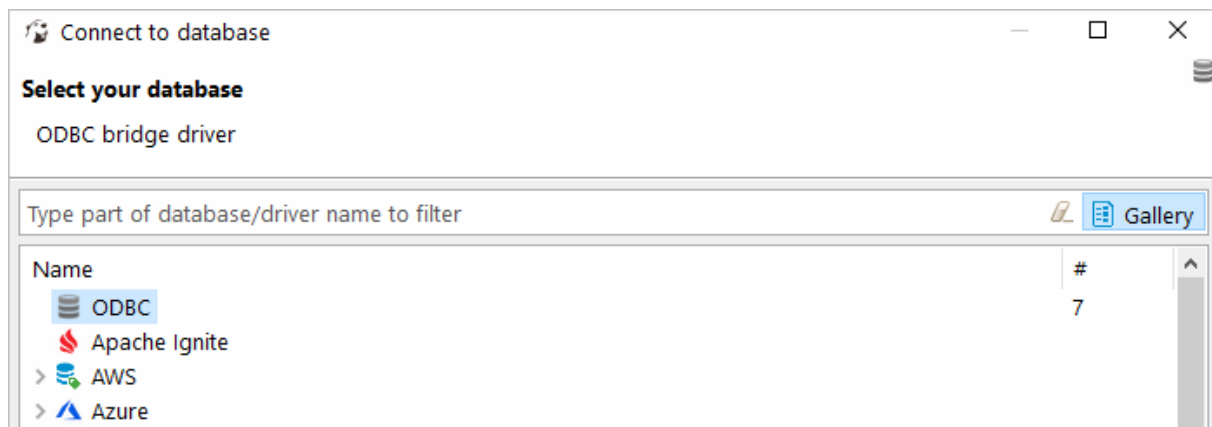
3. Enter the previously configured DSN in the **Database/Schema** field.
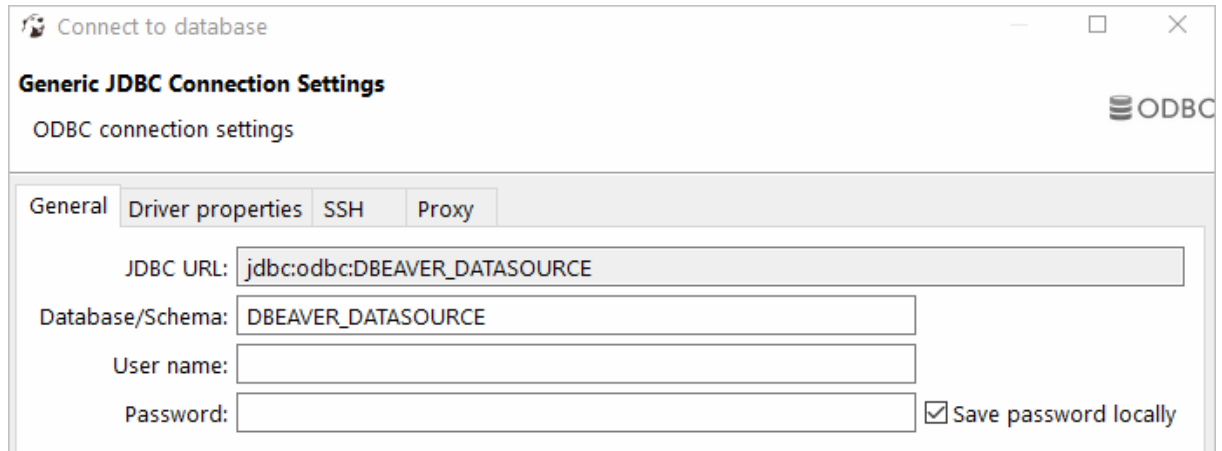
4. Click **Test Connection**. If everything goes well, you'll see the **Success** message.

Viewing xBase Database Objects and Querying Data

You can expand out the database structure in DBeaver's **Database Navigator** to visualize all
the tables in xBase database. To view and edit the data in a table, you need to right-click on
the target table name and select **View data**.The content of the table will be displayed in the
main workspace.
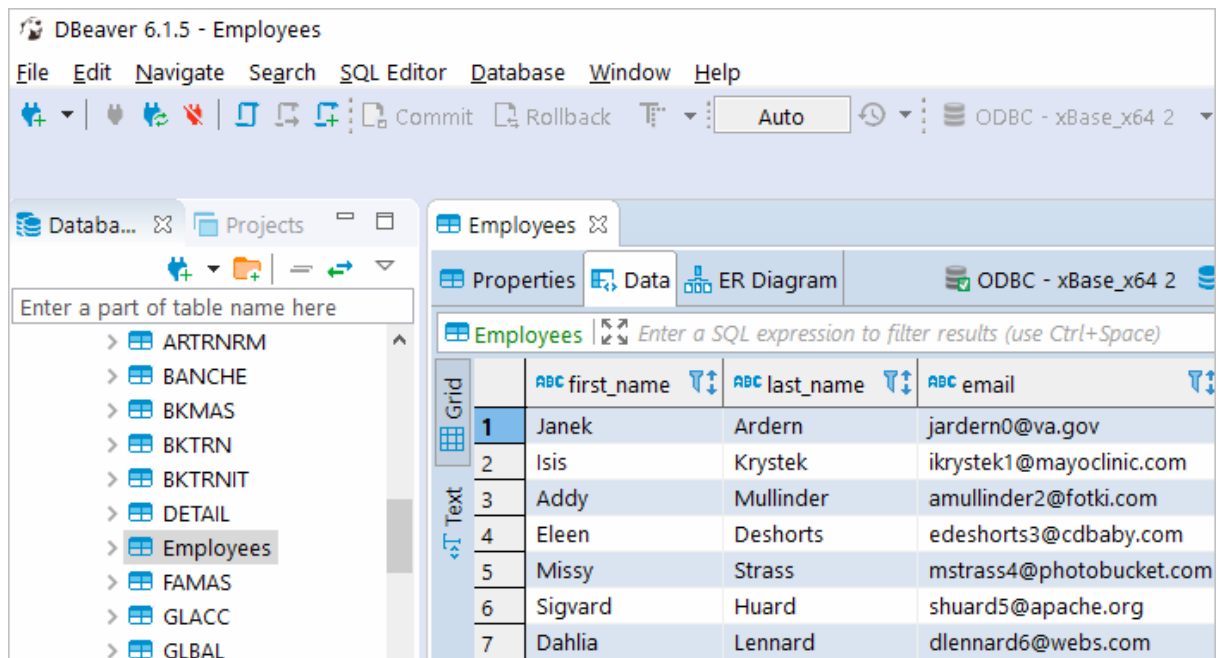
If you want to write a custom SQL query that will include only the necessary columns from the

table, you can select **New SQL Editor** in the **SQL Editor** main menu. Create your query and run it by clicking **Execute SQL Statement** to view the results in the same window.
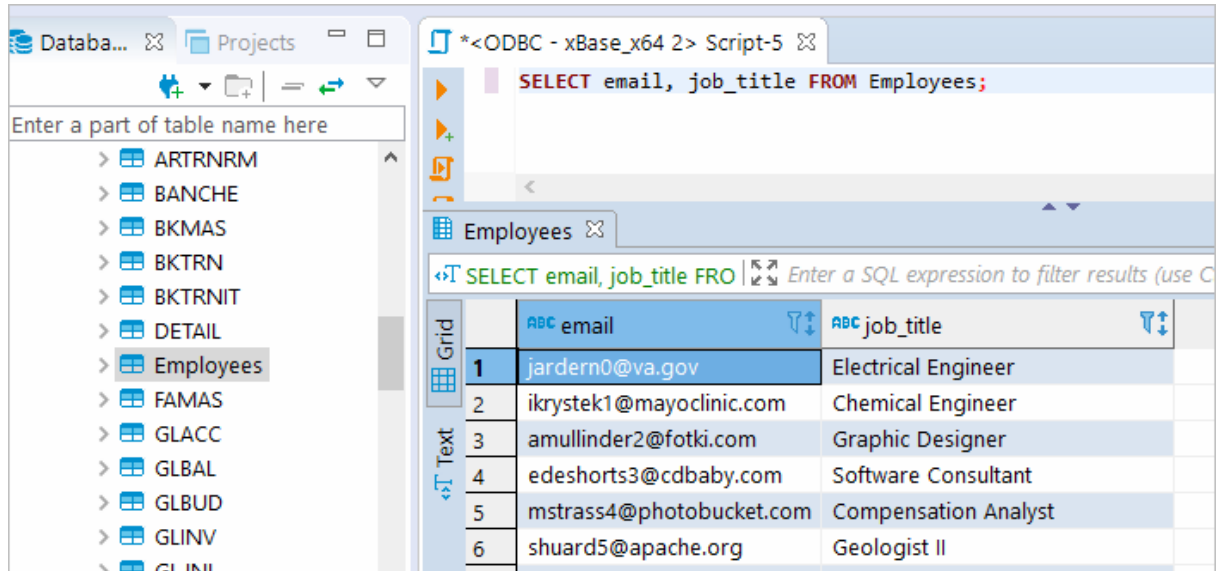
Request Support   ODBC Forum   Provide Feedback

4.3   Using in DBxtra

Troubleshooting xBase ODBC Connection in DBxtra

This page explains how to troubleshoot your ODBC connection to xBase in DBxtra.

Due to incompatibilities between DBxtra and xBase, leaving the `SQL dialect` property to its default might present various issues. To resolve compatibility issues, set the property to `MS Access 2000/XP/2003` or `ANSI SQL/2003` for DBxtra version 11.0.1 or newer, and to `ANSI SQL/2003` for versions prior to 11.0.1.

Request Support   ODBC Forum   Provide Feedback

4.4   Using in Microsoft Access

Connecting Microsoft Access to xBase Using an ODBC Driver

This article explains how to connect Microsoft Access to xBase through the standard ODBC interface. Microsoft Access is a dababase management system that combines the relational database engine with a graphical user interface. Access can be used as a substitution for

spreadsheet applications like Excel to organize, store, and retrieve large amounts of related data that can be difficult to manage in spreadsheets.

In Microsoft Access, you can connect to your xBase data either by importing it or creating a table that links to the data. Devart ODBC drivers support all modern versions of Access. It is assumed that you have already installed and configured a DSN for ODBC driver for xBase. For the purpose of this article, we tested an ODBC connection to xBase through our ODBC drivers in Microsoft Access 2003, Microsoft Access 2007, Microsoft Access 2010, Microsoft Access 2013, Microsoft Access 2016, Microsoft Access 2019. The following steps describe how to use Microsoft Access 2019 to import or link to your data in xBase.

Importing xBase Data Into Microsoft Access Through an ODBC Connection

1. Open your Microsoft Access database.

2. Select the **External Data** tab in the ribbon.

3. Expand the **New Data Source** drop-down and select **From Other Sources**, then select **ODBC Dababase**.

4. In the **Get External Data - ODBC Database** dialog box, select **Import the source data into a new table in the curent database**, and click **OK**.

5. In the **Select Data Source** dialog box, select the **Machine Data Source** tab.

6. Select the DSN that you have configured for xBase and click **OK**.

7. In the **Import Objects** dialog box, select the tables that you want to import, and click **OK**.

8. If the database objects have been successfully imported, you should the see the corresponding message in the dialog box. If you want to save the import steps to quickly repeat the process without using the wizard at a later time, select the **Save import steps** checkbox. Click **Close**.

9. The imported tables should appear in the **Tables** navigation pane on the left.

10. Double-click on the needed table to display its contents.

Linking to xBase Data in Microsoft Access Through an ODBC Connection

1. Open your Microsoft Access database.

2. Select the **External Data** tab in the ribbon.

3. Expand the **New Data Source** drop-down and select **From Other Sources**, then select **ODBC Dababase**.

4. In the **Get External Data - ODBC Database** dialog box, select **Link to the data source by creating a linked table**.

5. In the **Select Data Source** dialog box, select the **Machine Data Source** tab.

6. Select the DSN that you have configured for xBase and click **OK**.

7. In the **Link Tables** dialog box, select the table or tables that you want to link to, and click **OK**.

8. The **Select Unique Record Identifier** dialog box will prompt you to choose a field or fields that uniquely identify each record in the table. To avoid inconsistencies, it is recommended to select the primary key in the xBase table as the unique record identifier. You are linking multiple tables, you will be prompted to select unique record identifiers for each of the selected tables.

9. The linked tables should appear in the **Tables** navigation pane on the left.

10.Double-click on the needed table to display its contents.

Request Support   ODBC Forum   Provide Feedback

4.5   Using in Microsoft Excel

Connecting to xBase from Microsoft Excel using ODBC Driver for xBase

You can use Microsoft Excel to access data from a xBase database using ODBC connector. With ODBC Driver, you can import the data directly into an Excel Spreadsheet and present it as a table. Make sure that you use matching Excel and ODBC Driver, e.g. if you have installed a 64-bit ODBC Driver, you will need to use the 64-bit version of Excel.

When working with Microsoft Excel, there are different ways of retrieving data from various data sources using our ODBC drivers.

- Connecting Excel to xBase with Get & Transform (Power Query)

- [Connecting Excel to xBase with Data Connection Wizard (Legacy Wizard)](#)

- [Connecting Excel to xBase with the Query Wizard](#)

- [Connecting Excel to xBase with Microsoft Query](#)

- [Connecting Excel to xBase with PowerPivot](#)

Connecting Excel to xBase with Get & Transform (Power Query)
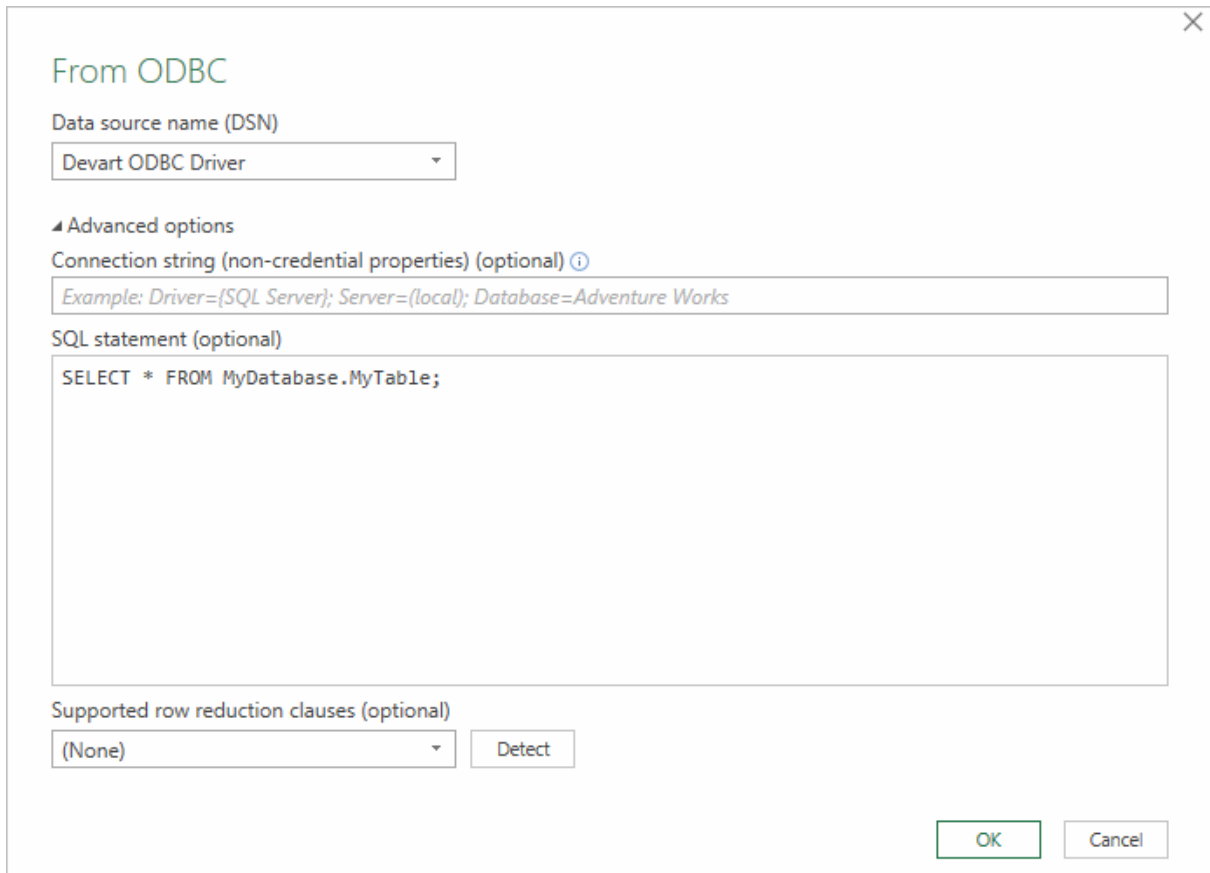
You can use Get & Transform (Power Query) to connect to xBase from Excel with ODBC.

This method assumes that you've installed an ODBC driver for xBase.

1. Click the **Data** in Excel, then expand the **Get Data** drop-down list. Click **From Other Sources > From ODBC**.
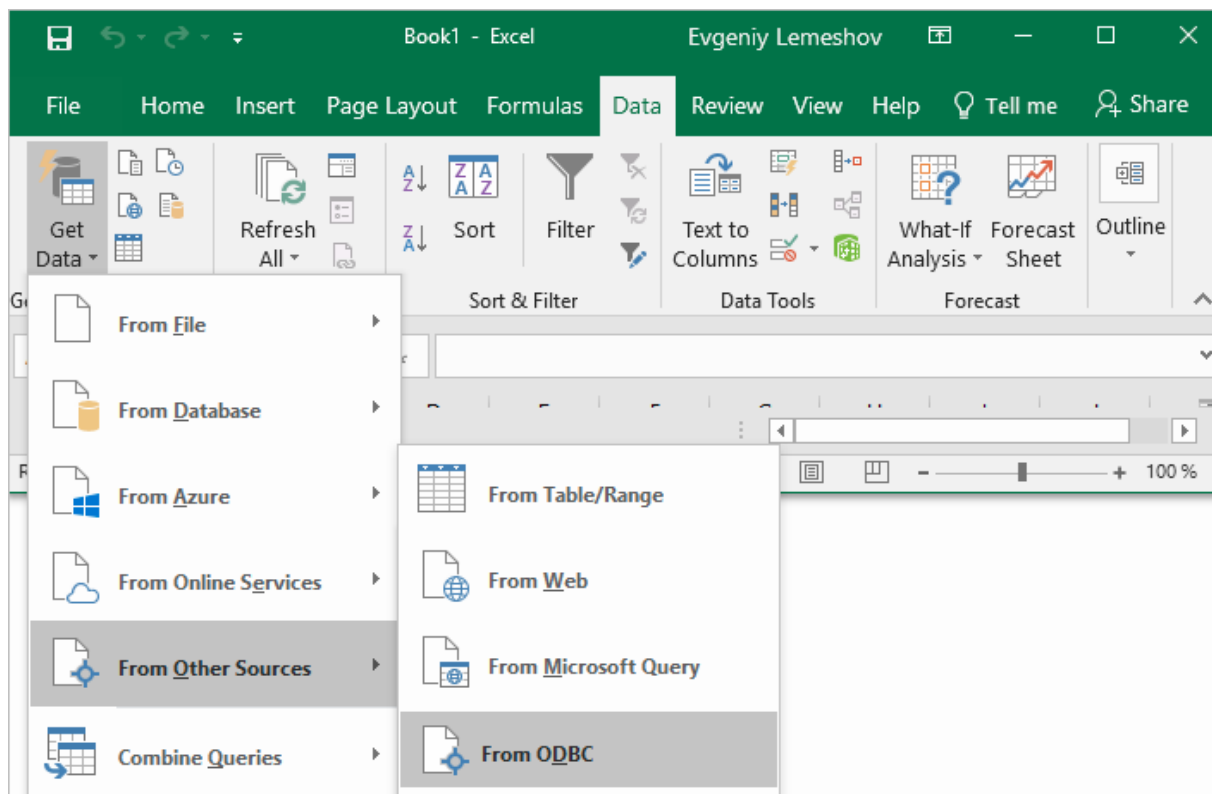
2. In the **From ODBC** dialog, choose your data source name (DSN). If you haven't configured your ODBC driver yet, you can expand the **Advanced Options** dialog box and enter the connection string for your data source (without credentials, which are defined in the

credentials dialog box in the next step). Additionally, you can enter an SQL statement that will be executed right after establishing a connection to the data source. Click **OK**.
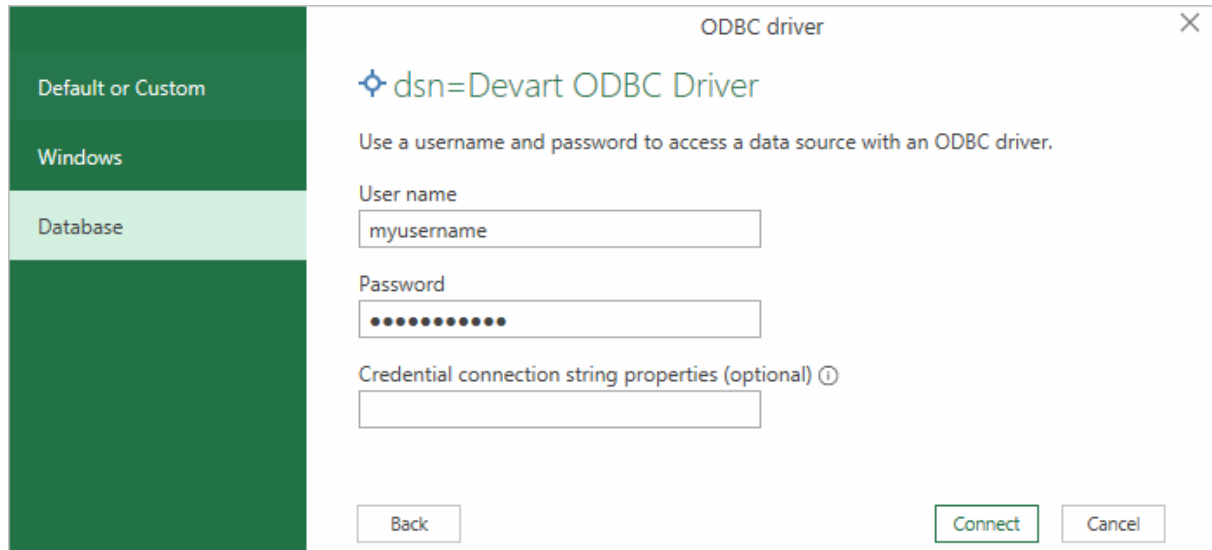
3. If you're using a database username or password, select **Database** and enter your credentials in the dialox bog, then click **Connect**.
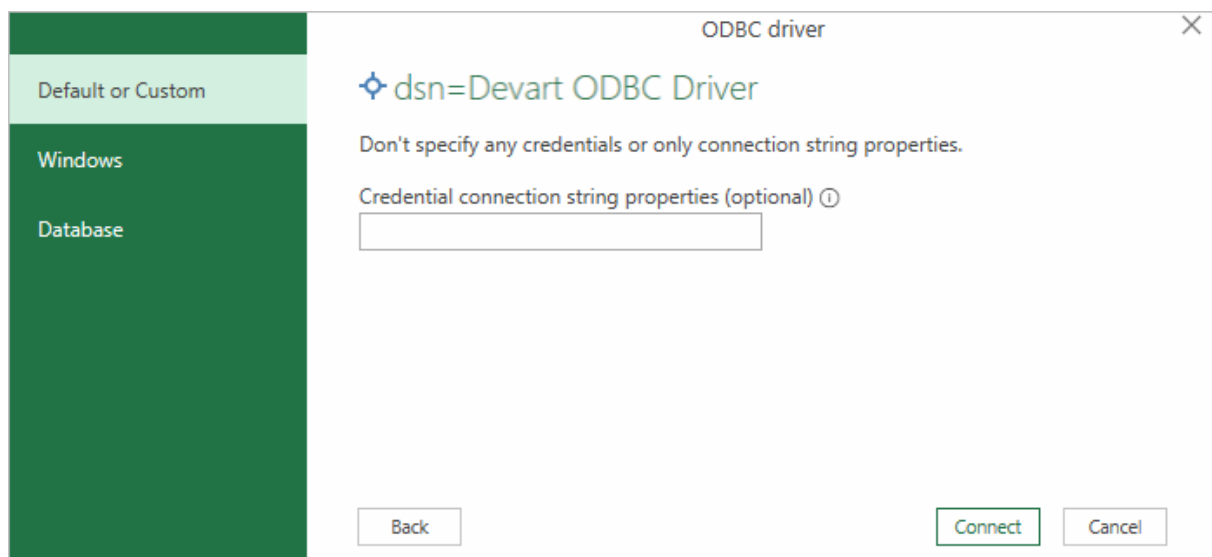
If your database is not password-protected or you've already specified your credentials in the ODBC data source settings, select **Default or Custom** and press **Connect**

4. In the window that appears, select the table you want to retrieve data from, and click **Load**.
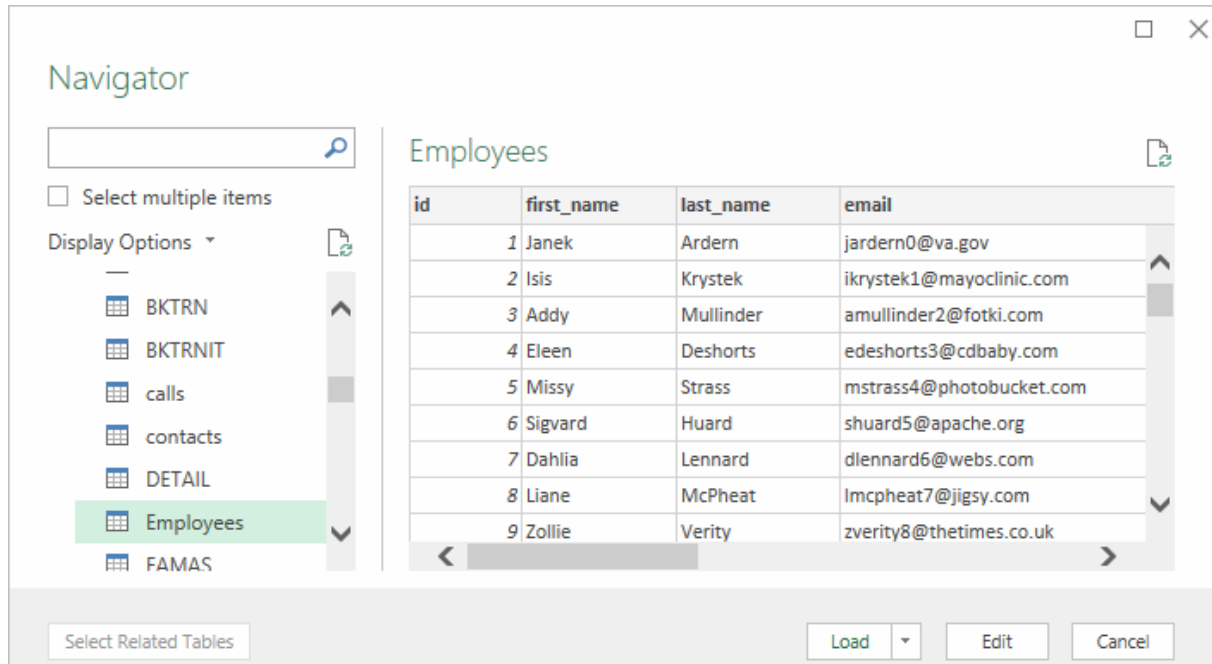
The data from the table will be a displayed in an Excel spreadsheet where you can further work with it.
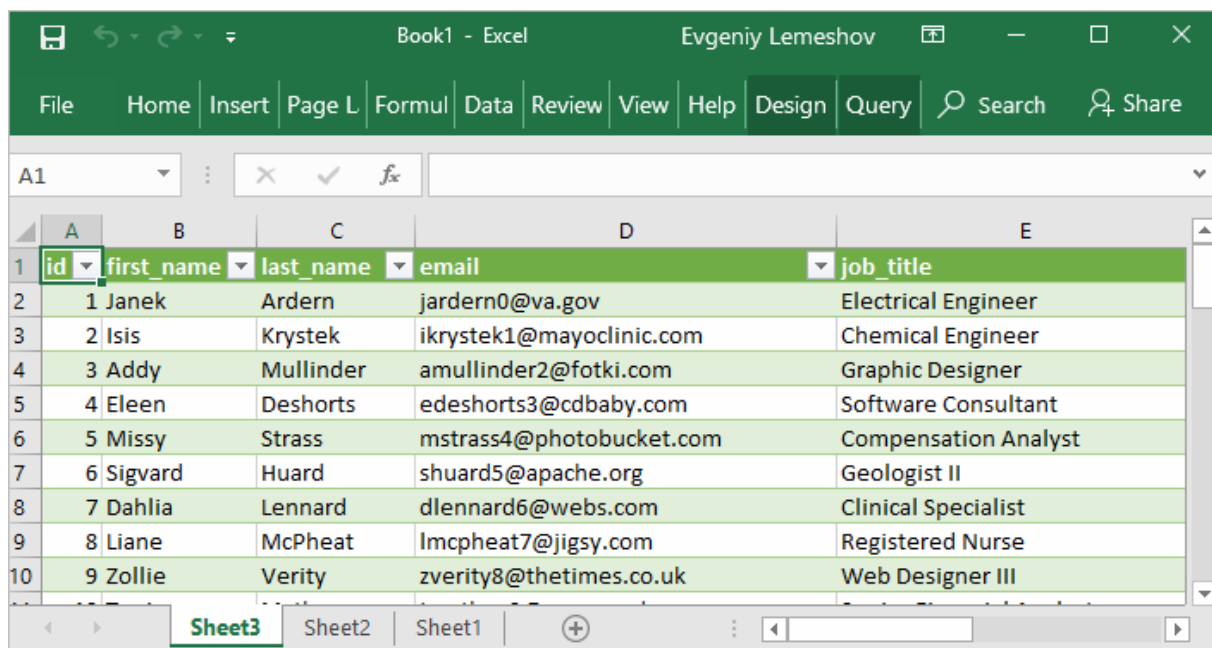
Connecting Excel to xBase with Data Connection Wizard

(Legacy Wizard)

You can use this option to connect to OLE DB or ODBC external data source that has already been defined.

1. In Excel, go to the **Data** tab. Click **From Other Sources**, and then click **From Data Connection Wizard**.

2. In the opened dialog, select **ODBC DSN** and click **Next** to continue.

3. Now select a data source you want to connect to, and click **Next**.

4. To connect to the table containing the required data, select its name and click **Next** to enter and save information about your new file or click **Finish**.

5. In the **Import data** dialog, you can select the way your data will be viewed in Excel and the place where to put it in the worksheet, and click **OK**.

6. The required data is now displayed in the existing Excel worksheet.

Connecting Excel to xBase with the Query Wizard

You can use this option to create a simple query for retrieving data from xBase to Excel via ODBC driver.

1. Open Excel, in the main menu, click the **Data** tab.

2. Click the **From Other Sources** dropdown menu, and then click **From Microsoft Query**.

3. In the appeared dialog, you can choose the data source you want to connect to.

4. After a successful connection, you can select the data you want to be displayed in Excel and click **Next**.

5. The next two steps allow filtering and sorting the data. Click **Next** to skip these procedures.

6. If you plan to further use the query, you can save it by clicking the **Save** button on the right.

7. Select **Return Data To Microsoft Excel** and click **Finish**.

8. In the **Import data** dialog, you can select the way your data will be viewed in Excel and the place where to put it in the worksheet, and click **OK**.

9. The required data is successfully imported to Excel.

Connecting Excel to xBase with Microsoft Query

You can use this option to create a more complex query for retrieving xBase data to Excel via ODBC driver.

1. Start Excel, click the **Data** tab.

2. In the appeared ribbon, click **From Other Sources**, and then click **From Microsoft Query**.

3. In the next dialog, choose the data source you want to connect to (e.g., using data source name - Devart ODBC xBase). Uncheck **Use the Query Wizard to Create/Edit Queries** and click **OK**.

4. Now you can select the tables you want to add to your query. When you finish, just click the **Add** button.

5. In the graphical editor, you can filter rows or columns of data, sort data, join multiple tables, create a parameter query, etc.

Connecting Excel to xBase with PowerPivot

You can use PowerPivot - an Excel add-in to perform data analysis and create complex data models. To load the required data, do the following:

1. In Excel, click the **PowerPivot** tab, then click **Manage** to go to the PowerPivot window.

2. In the opened window, click **From Other Sources**.

3. When the **Table Import Wizard** opens, select **Others (OLEDB/ODBC)** and click **Next**.

4. In the **Specify a Connection String** window, click the **Build** button.

5. In the **Data Link Properties** dialog, specify the data source you want to connect (e.g., using data source name - Devart ODBC xBase), and then click **Next**.

6. Now you should choose how to import the data (either select a table from the list or write a query to specify the data to be imported).

7. When the Import operation succeeded, click the **Close** button. The retrieved data is inserted in the active worksheet.

4.6   Using in SQL Server Management Studio

This section describes how to establish and troubleshoot a connection to xBase from SQL Server Management Studio using ODBC Driver for xBase.

- Creating a Linked Server

- Troubleshooting in SSMS

Request Support   ODBC Forum   Provide Feedback

4.6.1   Creating a Linked Server

Requirements

In order to avoid incorrect integration with MS SSMS, the working environment must meet the following conditions:

- The data source must be a configured system DSN. Refer to the Driver Configuration article to learn how to configure a System DSN

- The driver, studio, and SQL Server must be of the same bitness. For example, if you are using 64-bit SQL Server Management Studio on 64-bit Windows platform, then configure the 64-bit version of the driver using ODBC Administrator launched from %windir% \system32\odbcad32.exe. Otherwise, configure the driver using the 32-bit version of ODBC Administrator - launch it from %windir%\SysWOW64\odbcad32.exe.

- ODBC Driver for xBase and SQL Server must be installed on the same computer.

- .NET Framework 4.5 must be installed on the computer.

Connecting to xBase from SQL Server Management Studio using ODBC Driver for xBase

You can use the Microsoft SQL Server Management Studio to connect your xBase data to an SQL Server instance. Linked Server is a tool of MS SQL Server that allows to execute distributed queries to refer tables stored on non-SQL Server datbase in a single query. With linked servers, you can execute commands against different data sources such as xBase and merge them with your SQL Server database. You can create a linked server with one of

these methods: by using the options in the Object Explorer or by executing stored procedures.

Below are major advantages of using SQL Server Linked Servers to connect to xBase:

1. The ability to connect other database instances on the same or remote server.

2. The ability to run distributed queries on heterogeneous data sources across the organization.

3. The ability to work with diverse data sources in the same way.

How to configure a SQL Server Linked Server to connect to xBase

You can follow the steps to create a linked server for xBase in SQL Server Management Studio by using Object Explorer:

1. Start your Management Studio and choose your SQL Server instance.

2. In the **Object Explorer pane**, expand the **Server Objects**, right-click on **Linked Servers** and then click on **New Linked Server**.

3. Configure your linked server in the dialog box:

   - Give a name for your server in the **Linked server** field.

   - Under **Server type**, select **Other data source** .

   - Choose **Microsoft OLE DB Provider for ODBC Drivers** in the **Provider** drop-down list.

   - In the **Data source** field, enter the name of your DSN, e.g. Devart ODBC Driver for xBase . Alternatively, you can input the ODBC Driver connection string in the **Provider** field.

The linked server will appear under the Linked Servers in the Object Explorer Pane. You can now issue distributed queries and access xBase databases through SQL Server.

Retrieving Data From xBase

Ensure the **Allow inprocess option** of MSDASQL OLE DB Provider for ODBC Drivers is enabled. For this, find the **MSDASQL** provider in the list of Linked Servers and double-click on it
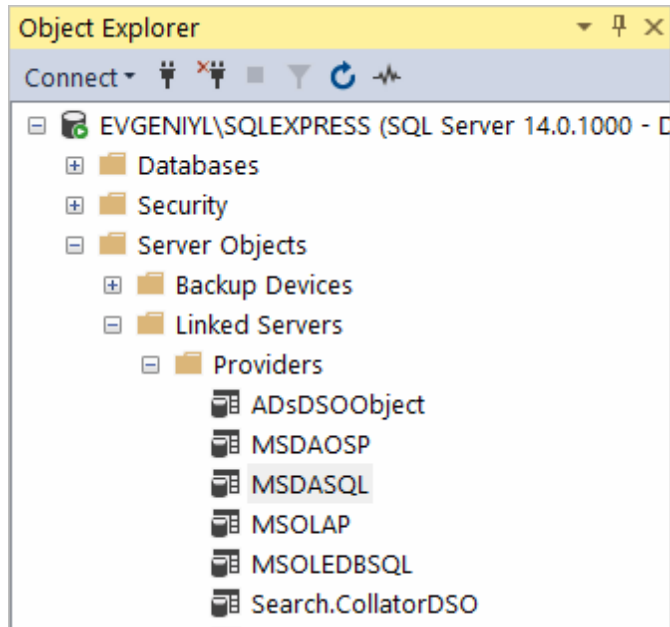
In the appeared **Provider Options** window, enable the **Allow inprocess** checkbox:
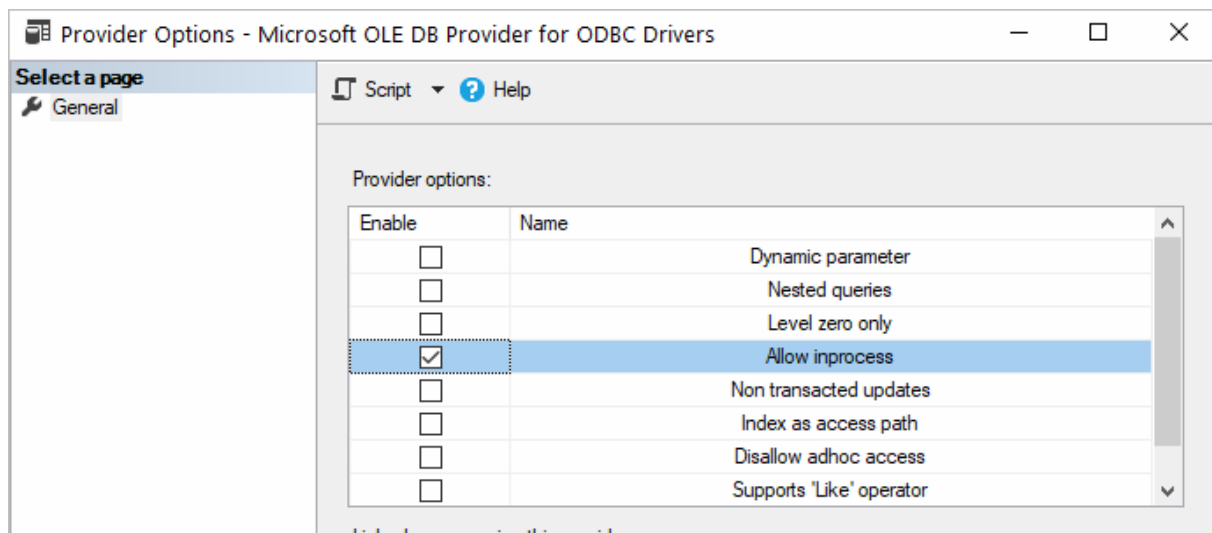
Create a new **Linked Server**
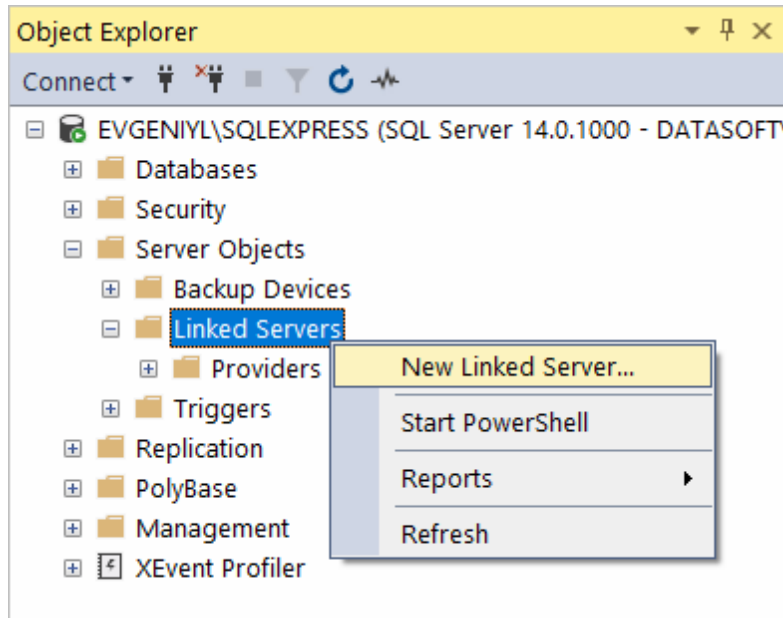
Make sure to select **Microsoft OLE DB Provider for ODBC Drivers**:
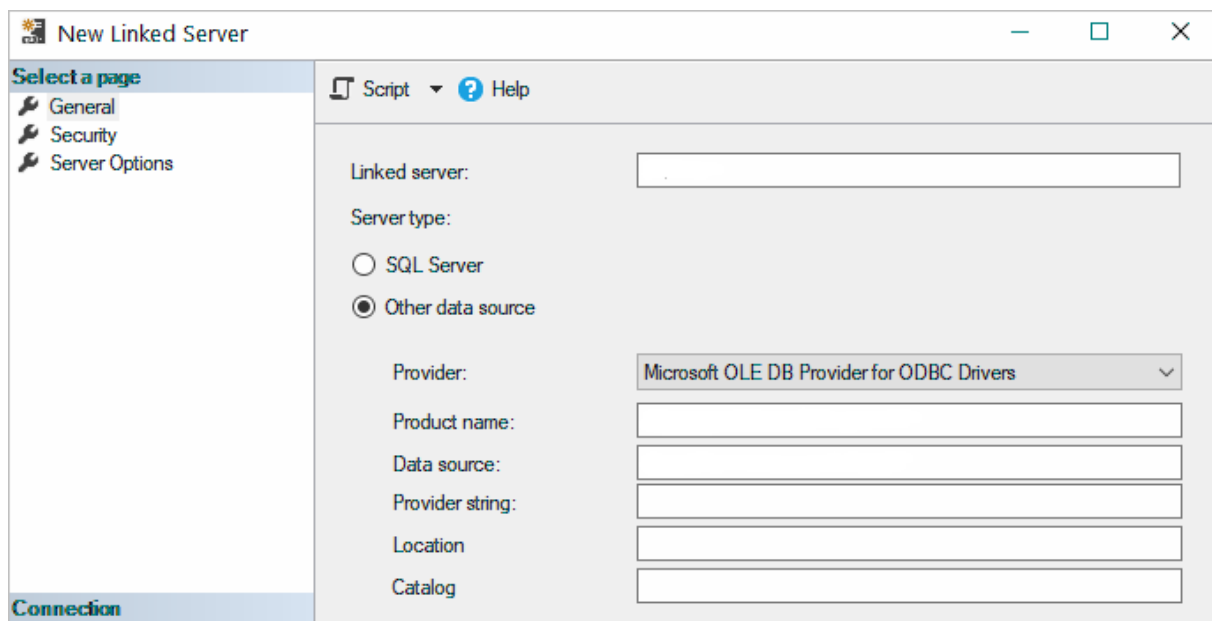
Now you need to input the Linked Server name, e.g. XBASE. In the Product Name and Data Source fields you need to indicate the System DSN that you've previously created - more info on System DSN setup can be found here.
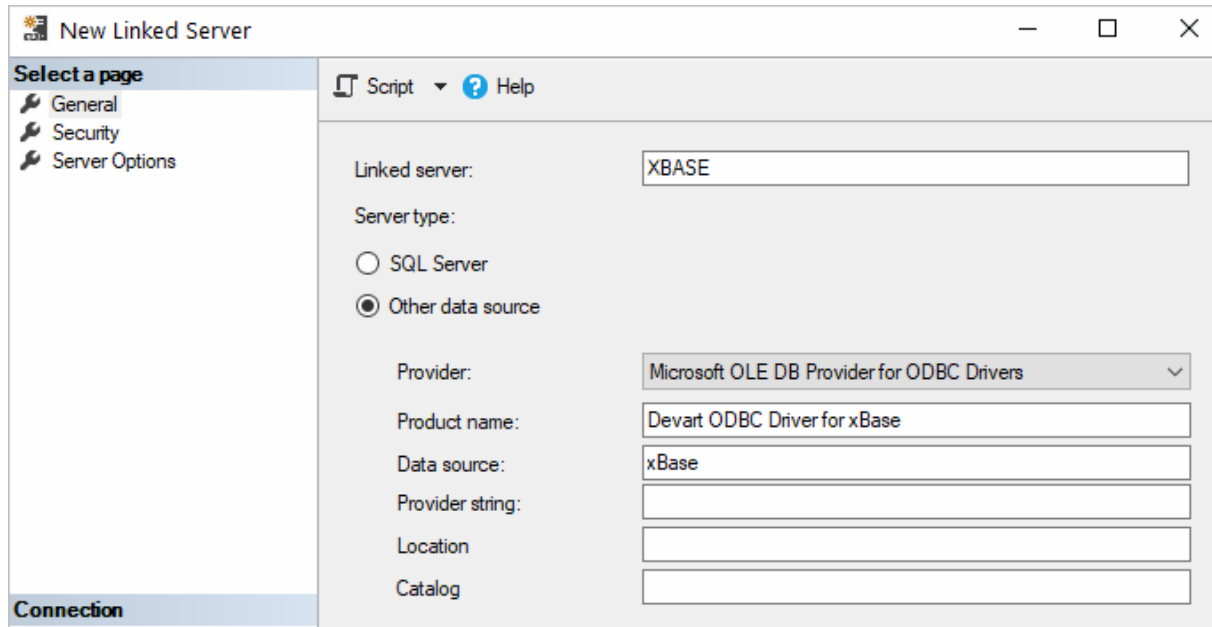
The xBase tables are already available to be fetched. To query the linked server, click **New Query** in the toolbar:
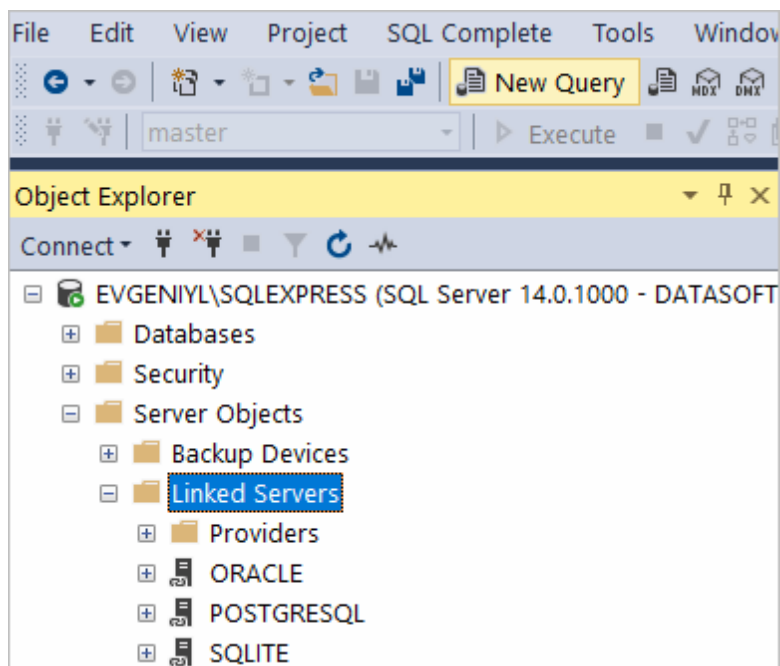
Enter your SQL query in the editor window and click **Execute** to run the query:
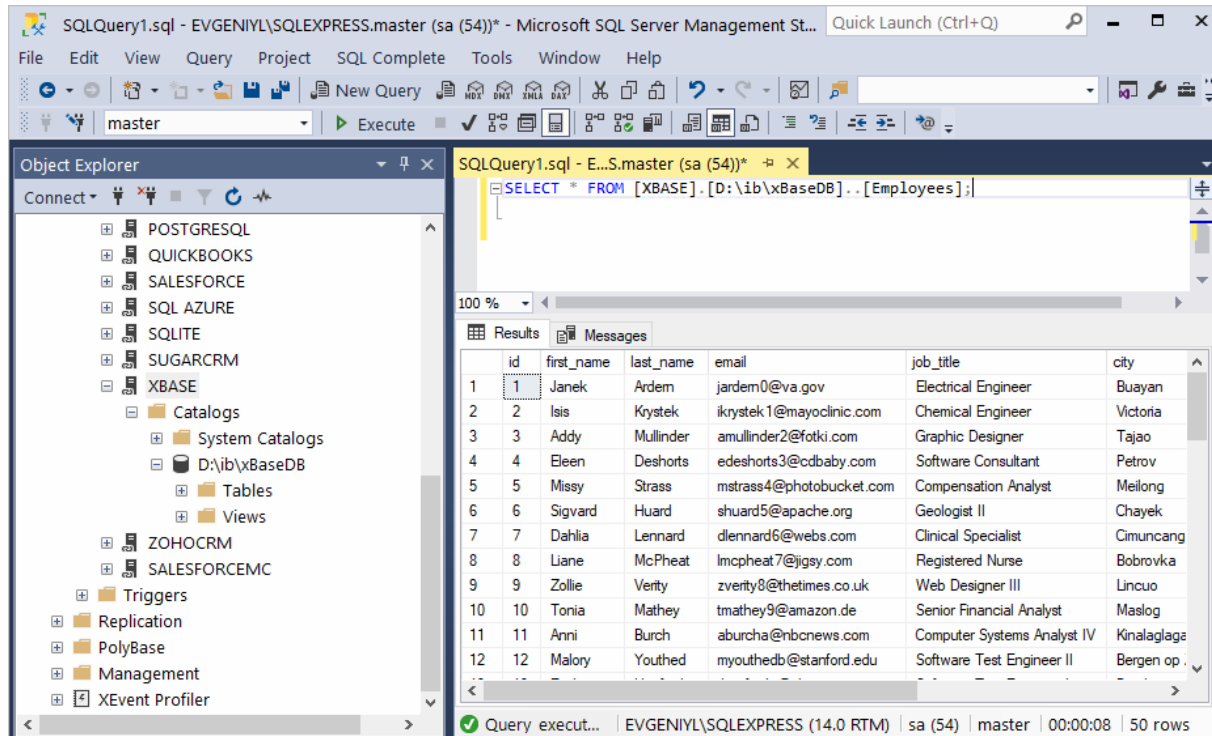
As a result, you can see the contents of the selected table retrieved directly from the xBase account you are connected to.

See also

- Troubleshooting SSMS

Request Support   ODBC Forum   Provide Feedback

4.6.2   Troubleshooting in SSMS

When creating a linked server in SSMS, most errors happen due to security issues with DCOM class MSDAINITIALIZE. We need to alter the DCOM Class MSDAINITIALIZE security settings to make it work.

Following are the steps:

1. Open Component Services (Start>Run>DCOMCNFG)

2. Expand Component Services>Computers>My Computer>DCOM Config

3. From the list of DCOM components on the right side, select **MSDAINITIALIZE** and go to its

properties:
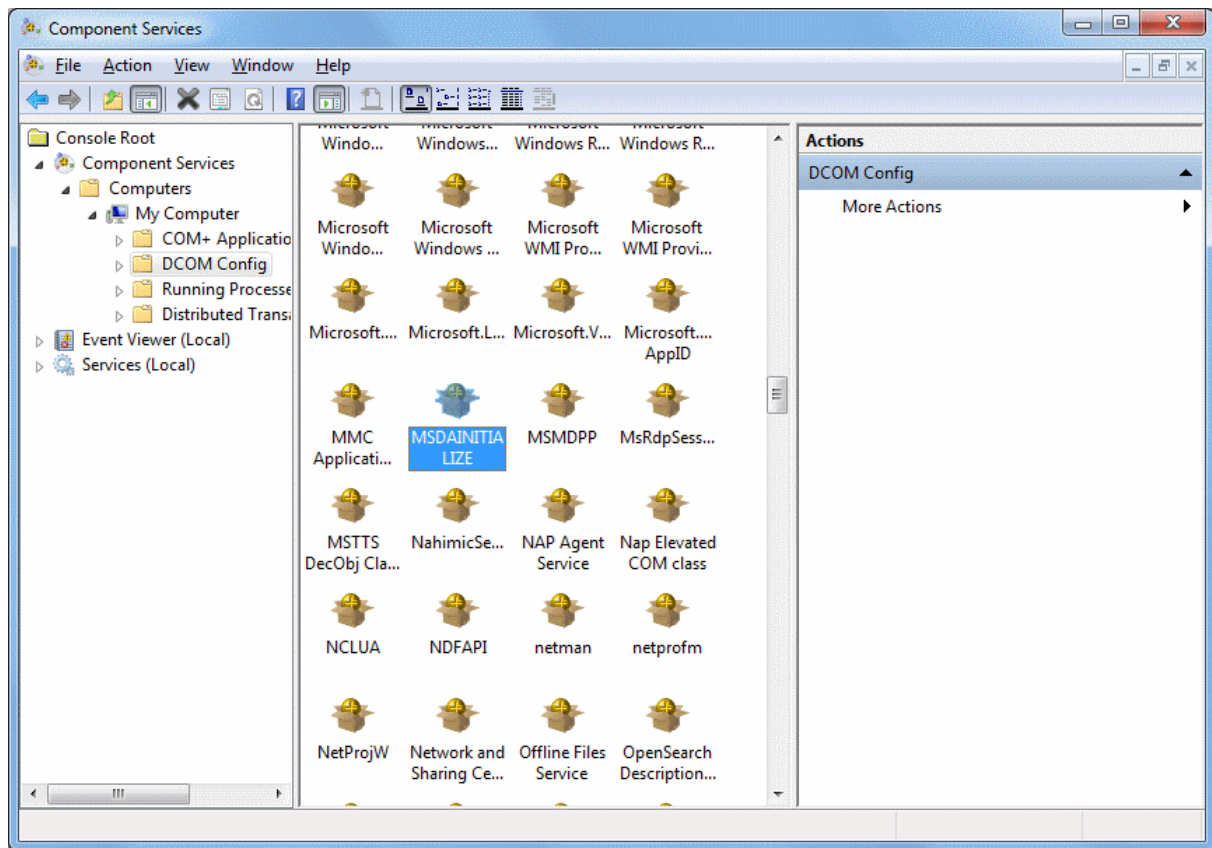
4. Go to the Security Tab, Choose 'Customize' and click on the 'Edit' Button:
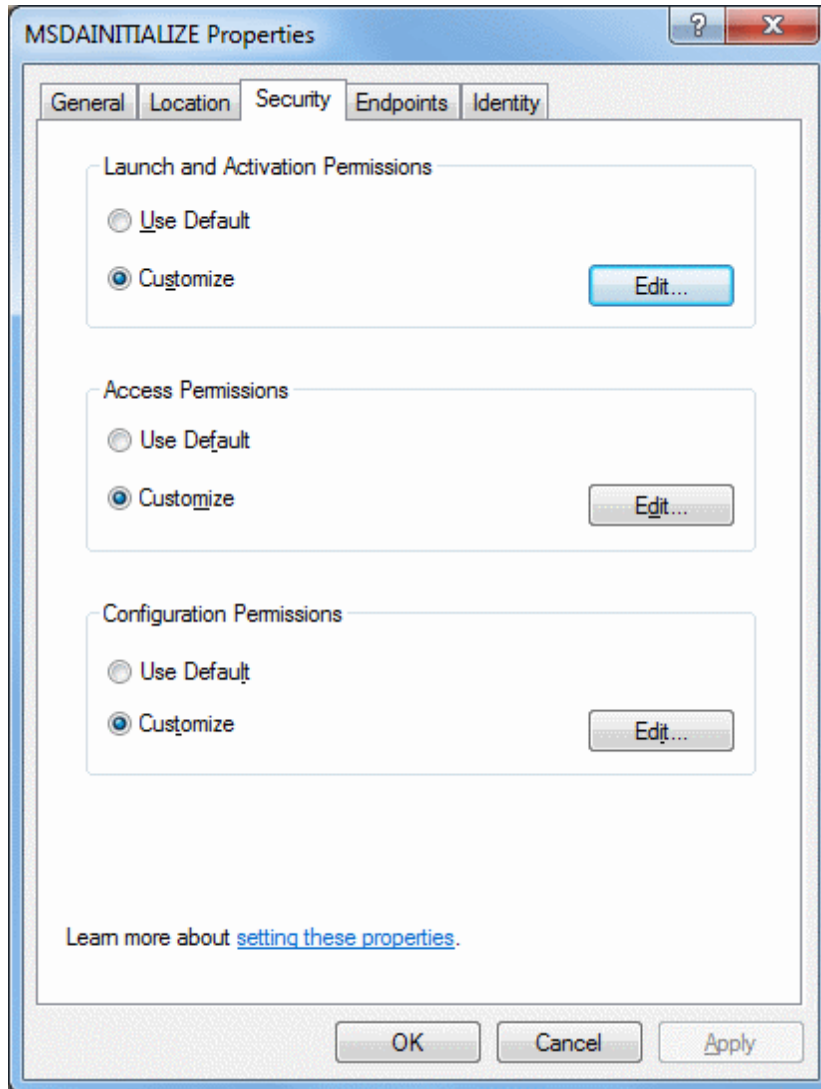
5. Add the Domain User who is accessing the linked server and 'Allow' all the permissions available (Local Launch, Remote Launch, Local Activation, Remote Activation). If you are connecting to SQL server using SQL account, you need to provide this permission to the account under which the SQL service is running.

6. Do this for all the 3 sections in the above screenshot.

To edit the Security settings, we followed the below steps:

1. Start > Run > Regedit

2. Find the Key: HKEY_LOCAL_MACHINE\SOFTWARE\Classes\AppID\{2206CDB0-19C1-11D1-89E0-00C04FD7A829}

3. Right Click>Permissions>Advanced>Owner Tab:
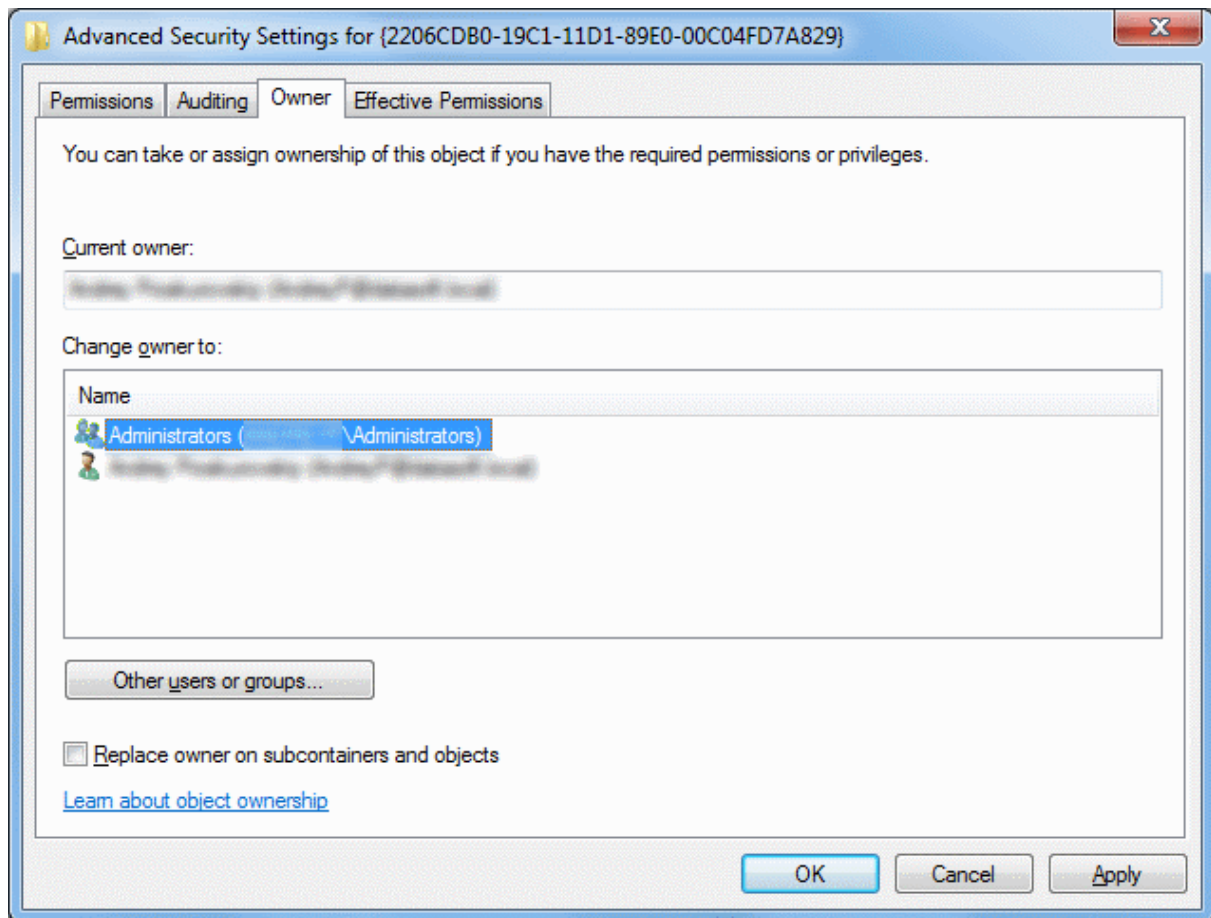
4. Change the owner to Administrators.

5. Now, grant 'Full Control' to Administrators:
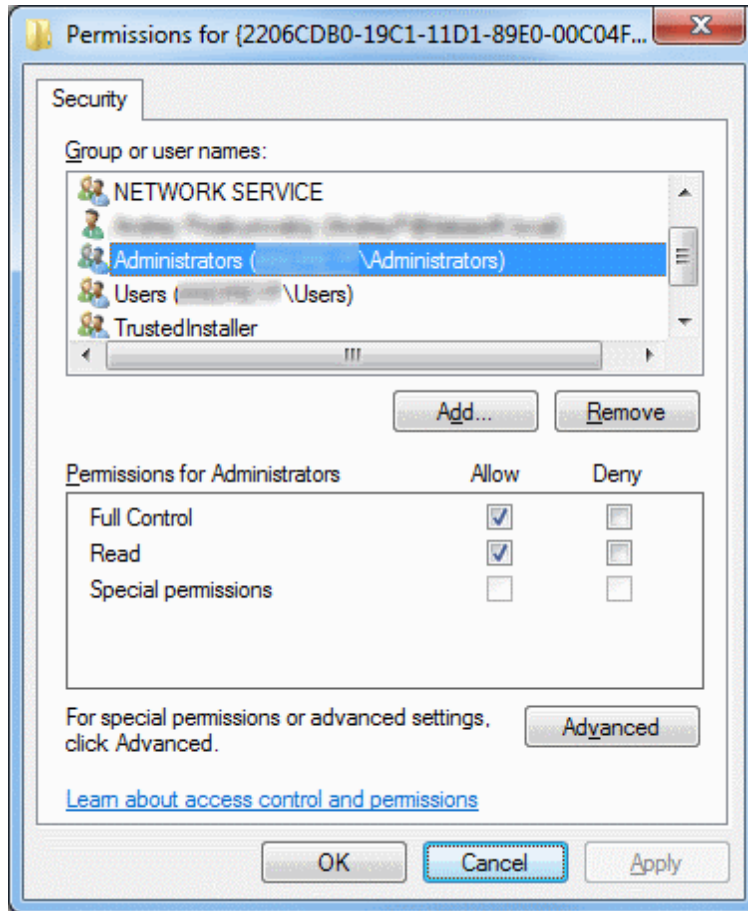
After this you should be able to edit MSDAINITIALIZE security settings .

See also

- Error message when you try to create an instance of an OLE DB provider in SQL Server: "Cannot create an instance of OLE DB provider"

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4.7   Using in OpenOffice and LibreOffice

Connecting to xBase from OpenOffice and LibreOffice using ODBC Driver for xBase

The article describes how to use Apache OpenOffice and LibreOffice to access ODBC data sources using the respective driver. You can access xBase data from Open Office Base or LibreOffice Base — desktop database management systems. Note that the Windows version of OpenOffice is 32-bit, and you may get the error "The specified DSN contains an architecture mismatch between the Driver and Application" when trying to access a data source through a 64-bit ODBC Driver. To get rid of the error message, set up the 32-bit version of the driver.

To connect to an ODBC data source from OpenOffice or LibreOffice using our driver for xBase, perform the steps below:

1. Start OpenOffice or LibreOffice, click **Database** to open the **Database Wizard**.
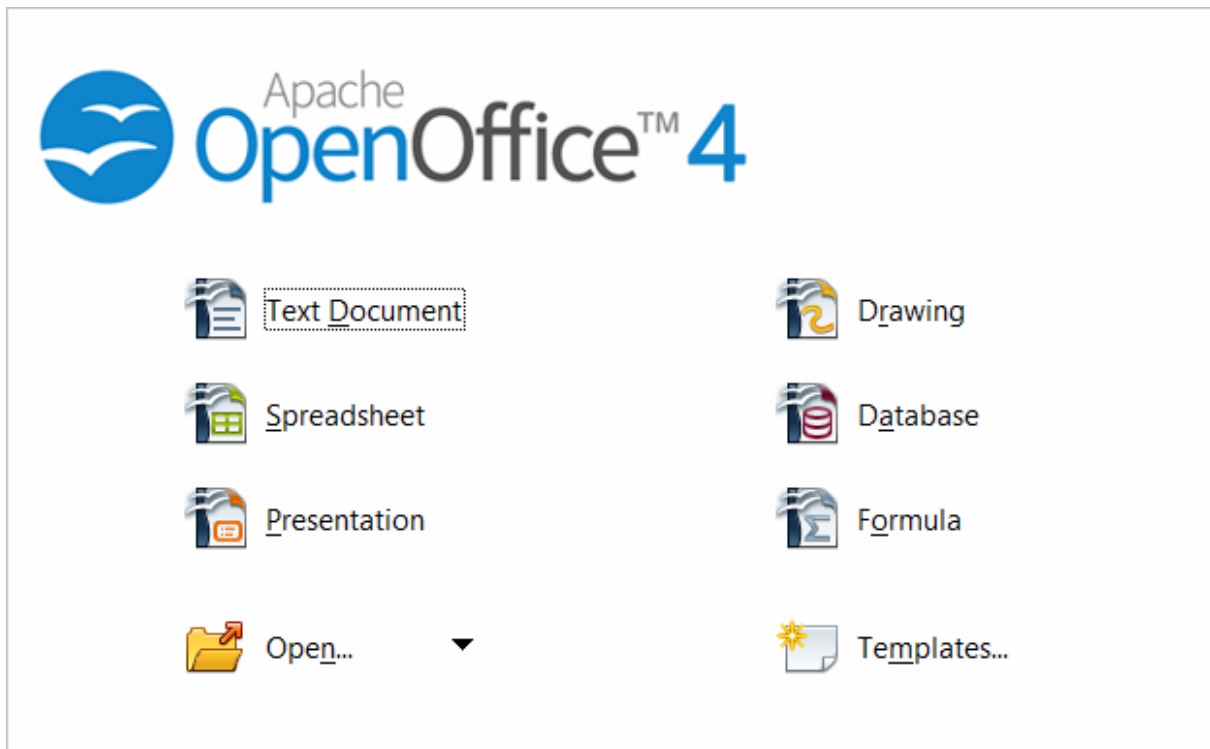
Alternatively, you can launch the **Database Wizard** from OpenOffice or LibreOffice Calc, Writer or any other tool by choosing **File > New > Database**.
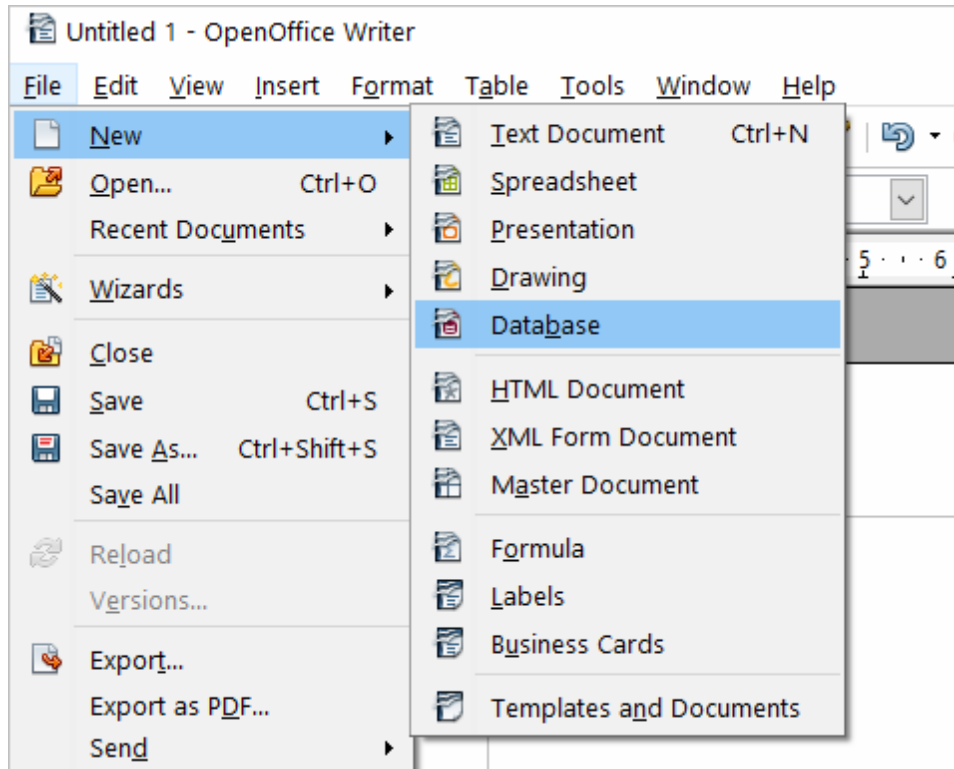
2. In the **Database Wizard dialog box**, click **Connect to an existing database**, select **ODBC** from the drop-down list, and click **Next**.
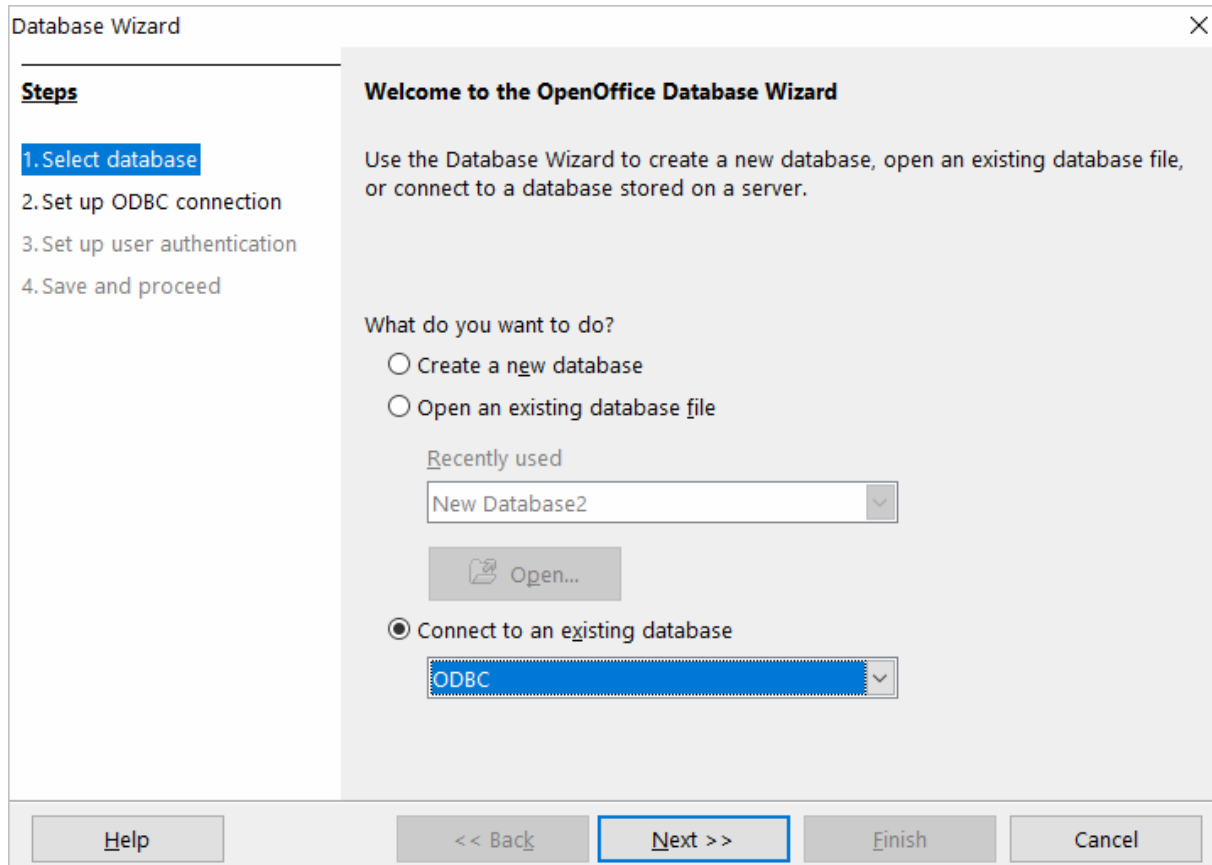
3. Specify the name of the data source you want to connect to. You can either type the name of your data source into the field, e.g. **ODBC Driver for xBase**, or you can click **Browse**, double-click the data source you need, and then click **Next**.
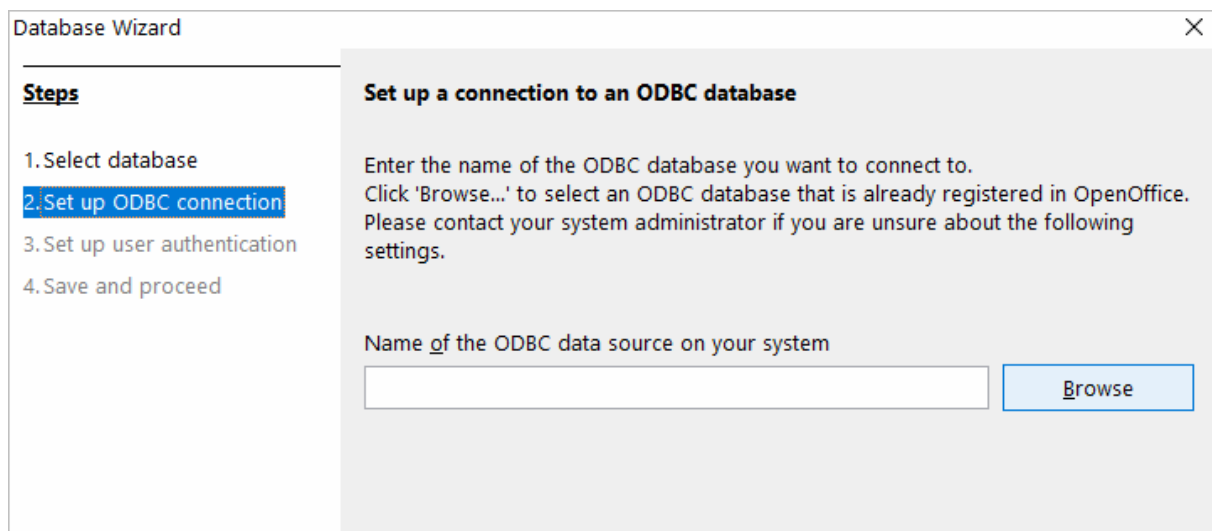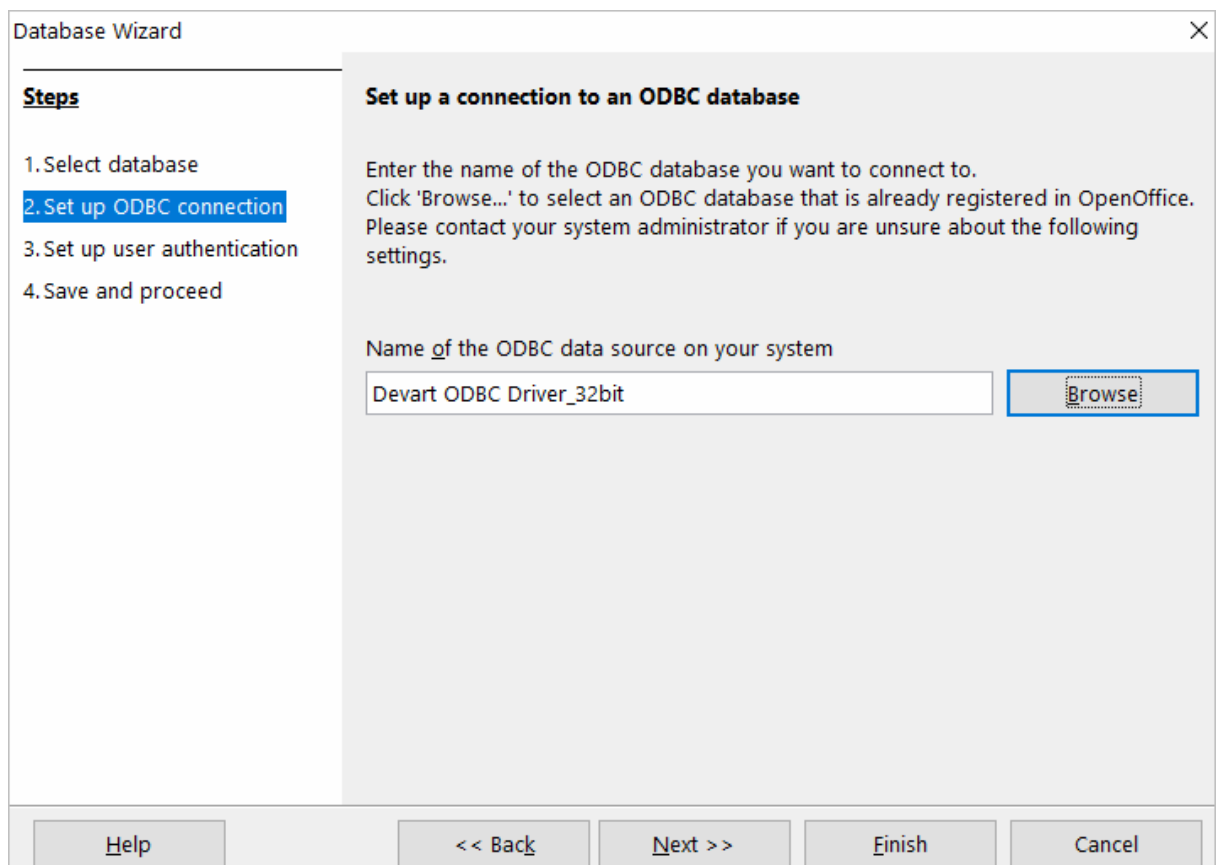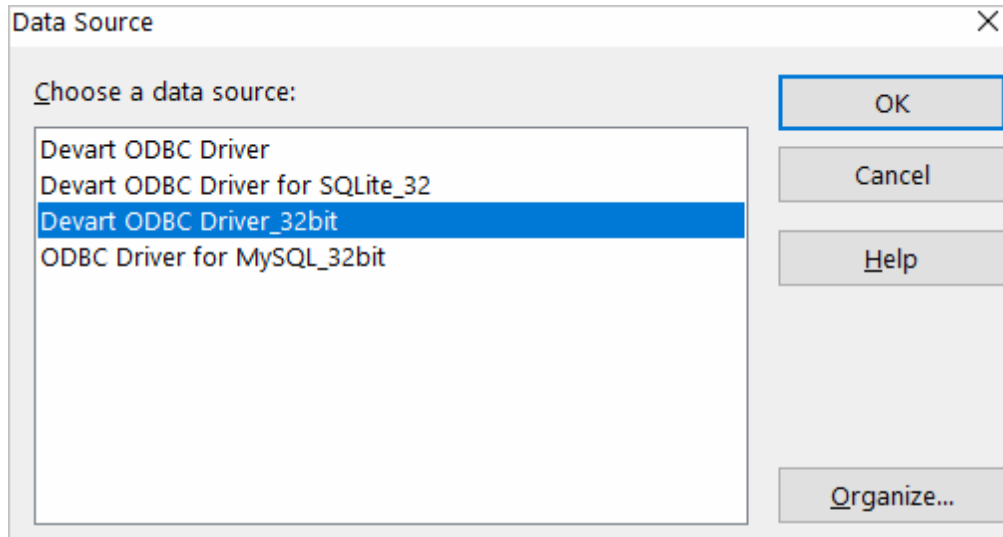
4. If your database requires a user name, type it into the **User name** field. If you are
   connecting to a password protected database, check the **Password required** field.
   Alternatively, you can specify these parameters in the data source settings of your ODBC

Driver for xBase and leave these fields empty in **Database Wizard**.

To test the connection to your data source, click **Test Connection**, input your credentials and click **OK**.
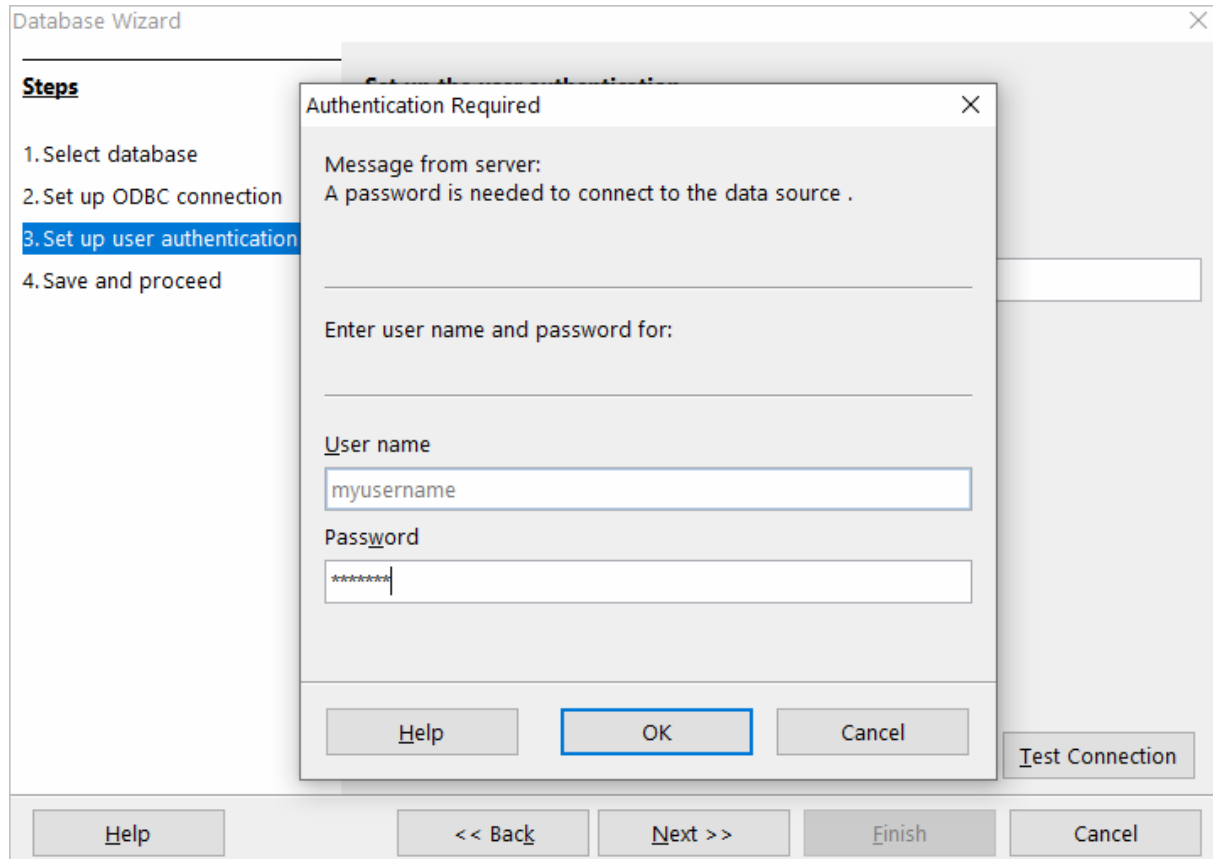
If you have entered valid credentials, you will see a success message. Click **Next** to proceed to the final step.

5. You can keep the default selection in this dialog box and click **Finish**.
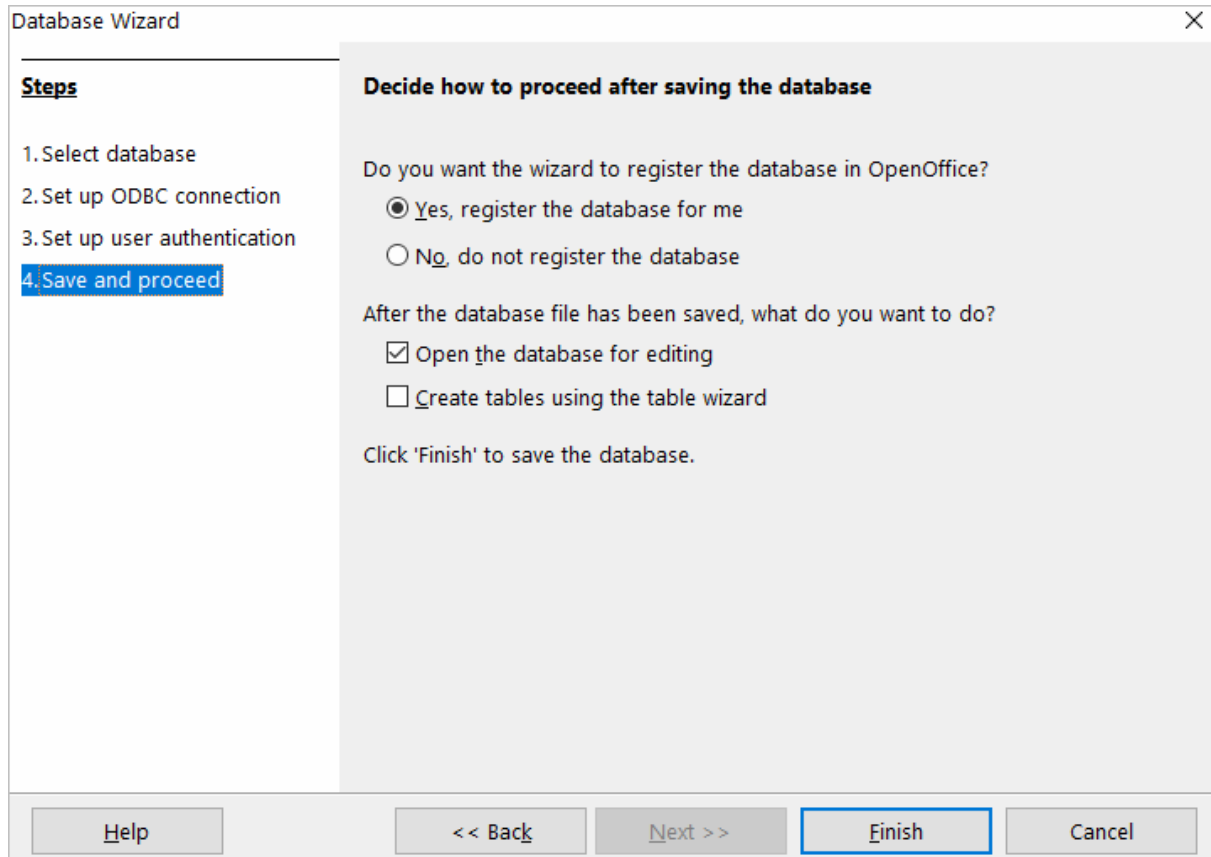
You will be prompted to give a name to your new database and select the directory where you want to store it.
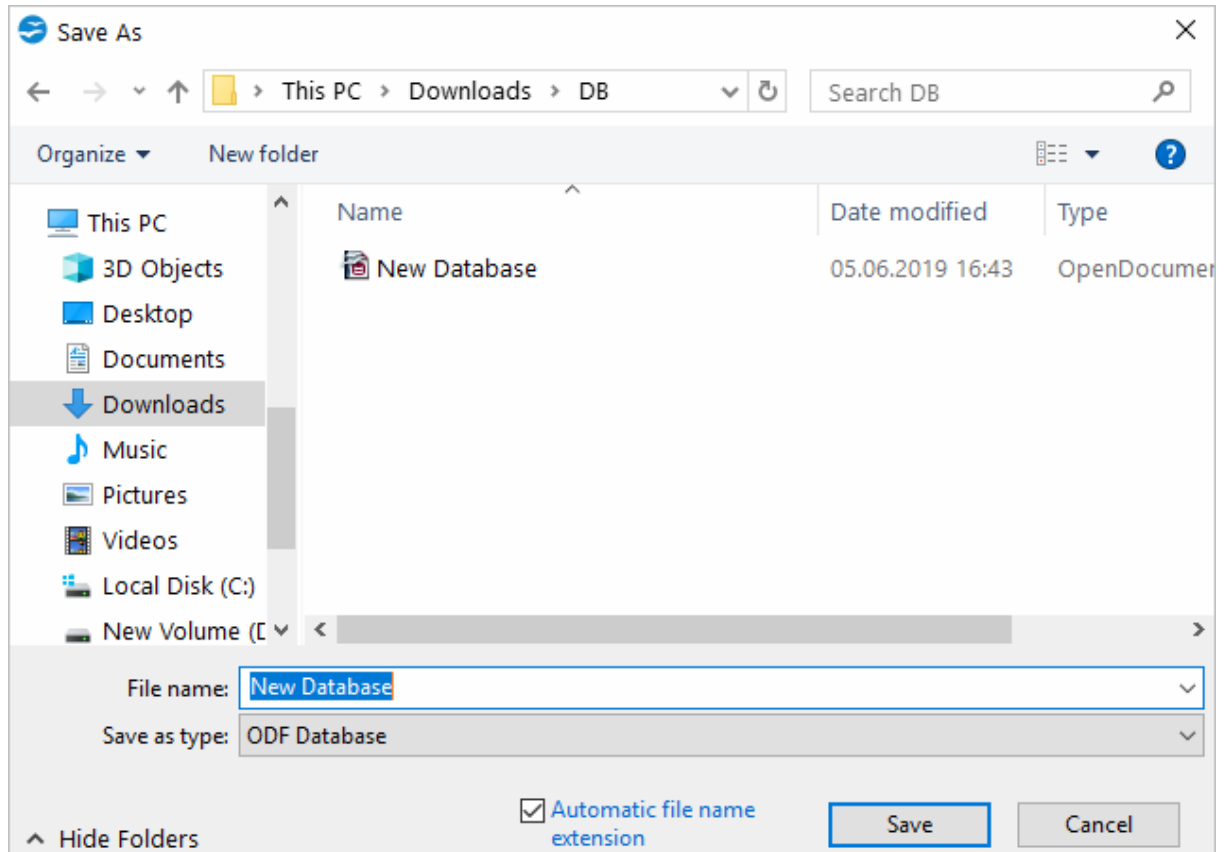
6. When the database opens, you will see the list of tables from your data source diplayed in OpenOffice or LibreOffice Base workspace. To view the data from a specific table, double-click the table name.

7. To create an SQL query, click **Queries** in the **Database** pane, then click **Create Query in SQL View…**
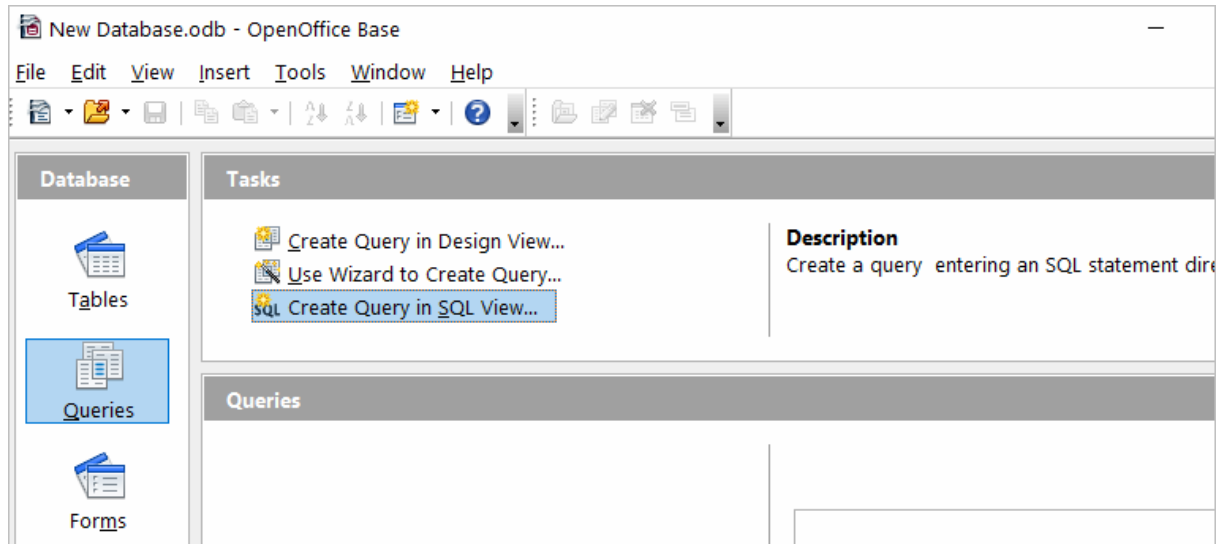
Enter your query in the query text box and click **Run Query (F5)**. The date will be fetched from the database and displayed in Open Office or LibreOffice, respectively.
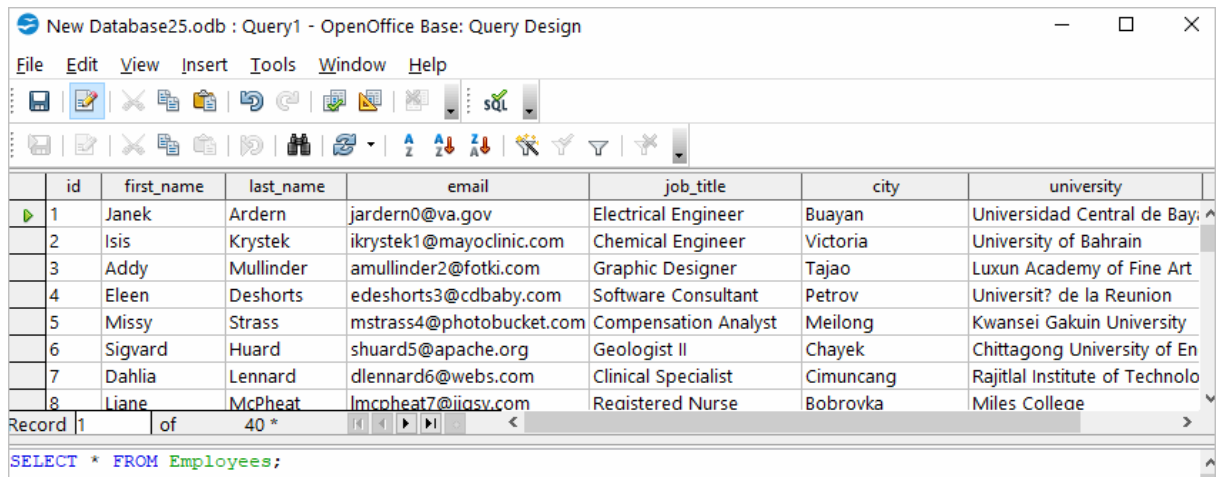
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4.8   Using in PHP

Connecting to xBase from PHP using ODBC Driver for xBase

PHP is one of the most popular programming languages for website development. ODBC drivers are connectors that make PHP development database agnostic — your software written in PHP will function with any vendor's database management system. You can use functions like odbc_exec() to prepare and execute SQL statements against any databases like MySQL, SQLite, PostgreSQL, etc.

PHP-based projects usually require a data storage, whether a traditional database or a cloud-based database. You can establish a connection to them using ODBC interface. With our ODBC drivers, you can access various data sources and retrieve tables and fields from a database.

Below is a sample PHP script for accessing xBase via ODBC. The script connects to xBase database and fetches all records from a table:

Step 1: Connect to ODBC data source

The *odbc_connect()* function is used to connect to an ODBC data source. Note that the function takes three mandatory parameters: the data source name, username and password. If your database is not password-protected or doesn't require a username, leave these parameters empty. In the following example, a connection is established using the *odbc_connect()* function in PHP.

```
<?php
    $user = "myusername";
    $password = "mypassword";
    $ODBCConnection = odbc_connect("DRIVER={Devart ODBC Driver for xBase};Da
```

Step 2: Execute an SQL statement

If connection is successful, the *odbc_exec()* function is used to execute a SELECT statement against the *dept* table in the *autotest* database.

```
$SQLQuery = "SELECT * FROM autotest.dept";
    $RecordSet = odbc_exec($ODBCConnection, $SQLQuery);
```

Step 3: Print the result set

The *odbc_fetch_row()* function is used to return records from the result set. While *odbc_fetch_row()* returns rows, the *odbc_result_set()* function prints a set of result in HTML table. After all rows from the result set have been printed, the *odbc_close()* function closes the connection.

```
    while (odbc_fetch_row($RecordSet)) {
        $result = odbc_result_all($RecordSet, "border=1");
```

```
    }
    odbc_close($ODBCConnection);
?>
```

You can modify this script by specifying general settings for each Devart ODBC driver to use any of them with your PHP projects.

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4.9 Using in Power BI

Importing xBase Data into Power BI Through an ODBC Connection

Power BI is a popular business intelligence solution that is comprised of services, apps, and connectors that allow you to pull raw data from various sources and create meaningful reports. To connect Power BI to a data source such as xBase, you can use a corresponding ODBC driver.

This tutorial explores how to connect to xBase and import data into Power BI Desktop using an ODBC driver. It is assumed that you have already installed and configured a DSN for ODBC driver for xBase.

1. Run Power BI Desktop and click **Get Data**.

2. Select the **Other** category in the **Get Data** dialog box, then select **ODBC**. Click **Connect** to confirm the choice.

3. In the **From ODBC** dialog box, expand the **Data Source Name (DSN)** drop-down list and select the previously configured DSN for xBase

4. If you would like to enter a SQL statement to narrow down the returned results, click the **Advanced options** arrow, which expands the dialog box, and type or paste your SQL statement.

5. Click **OK**. If your data source is password-protected, Power BI will prompt you for user credentials. Type your **Username** and **Password** in the respective fields and click.

6. Now you should see the data structures in your data source. You can preview the contents of the database objects by clicking on them.

7. To load the xBase data into Power BI for analysis, select the needed table and click **Load**.

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4.10   Using in Python

Installing the ODBC Driver for xBase

One of the most convenient methods to connect to an external database or access cloud data from Python is via ODBC. Devart has developed a range of ODBC Drivers for Python to work with databases and cloud services.

If you don't have Python installed on your machine, go to the Python official website, download the appropriate installer and run it. You will also need to install the **pyodbc** module — the easiest way to do that is by using the *pip install pyodbc* command in the Python interactive mode. Next, you need to [download the ODBC Driver](#) for xBase. To use the ODBC driver as a translation layer between the application and the database, you need to configure it by following the installation [instructions](#).

Connecting to xBase from Python using ODBC Driver for xBase

Here's an example to show you how to [connect to xBase](#) via Devart ODBC Driver in Python. First we import the pyodbc module, then create a connection to the database, insert a new row and read the contents of the EMP table while printing each row to the Python interactive console. To execute the script, you can type the code directly in the interactive console or add the code to a file with the .py extension and run the file from the command prompt.

Step 1: Connect

```
import pyodbc
cnxn = pyodbc.connect('DRIVER={Devart ODBC Driver for xBase};Database=mydata
```

Step 2: Insert a row

Here's a simple example of how to execute an *insert* statement to test the connection to the database. The script inserts a new record to the EMP table.

```
cursor = cnxn.cursor()
cursor.execute("INSERT INTO EMP (EMPNO, ENAME, JOB, MGR) VALUES (535, 'Scott
```

Step 3: Execute query

The *cursor.execute()* function retrieves rows from the *select* query on a dataset. The *cursor.fetchone()* function iterates over the result set returned by *cursor.execute()* while the *print()* function prints out all records from the table to the console.

```
cursor = cnxn.cursor()
cursor.execute("SELECT * FROM EMP")
row = cursor.fetchone()
while row:
 print (row)
 row = cursor.fetchone()
```

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4.11   Using in QlikView

Connecting to xBase from QlikView using ODBC Driver for xBase

This tutorial describes how to connect and configure QlikView to retrieve data from xBase for further analysis. QlikView is a data visualization tool that connects and pulls data from different popular databases like MySQL, MongoDB, Oracle, SQL Server, Postgres, etc. to present it in a single view. The business intelligence platform identifies relationships in your data and discovers patterns and opportunities to support your decision making.

QlikView supports the ODBC connectivity interface for communication with external data sources. An ODBC data source must be configured for the database you want to access. You can create an ODBC connection using a DSN during the ODBC driver installation or later.

To connect to an ODBC data source from QlikView using our driver for xBase, perform the steps below:

1. Open the QlikView client application and click **File > New**. Close the **Getting Started** wizard and open **File > Edit Script (CTRL+E)**.
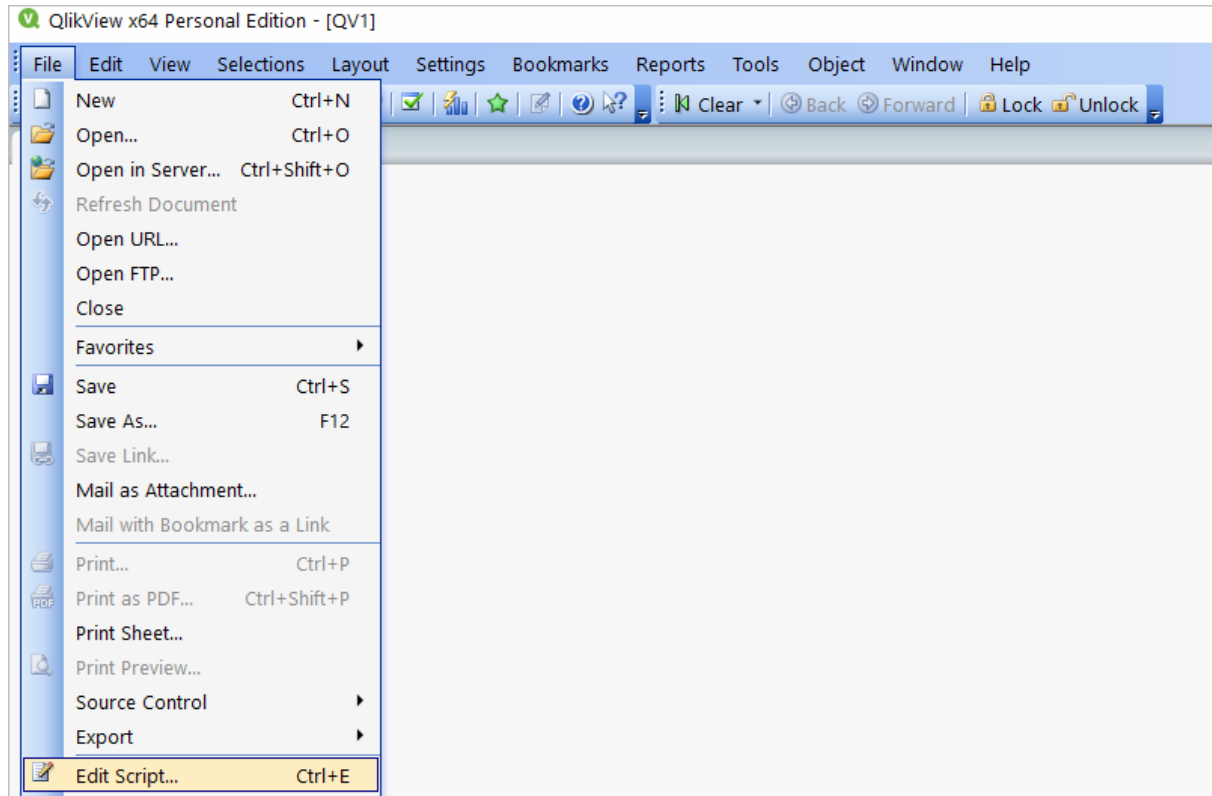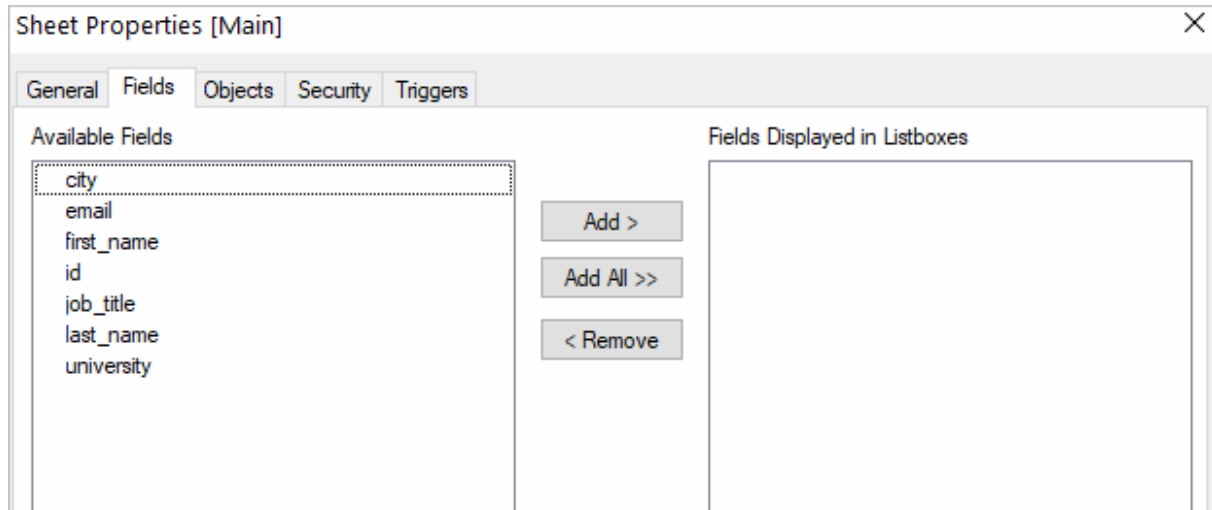
2. In the **Data** tab, choose **ODBC** from the **Database** drop-down and click **Connect**. Select the **Data Source** you created earlier, type in the **User ID** and **Password** if your database is password-protected. You can test the connection by choosing **Test Connection**. The **Connection Test succeeded** message should appear. Click **OK** to connect to your data source.
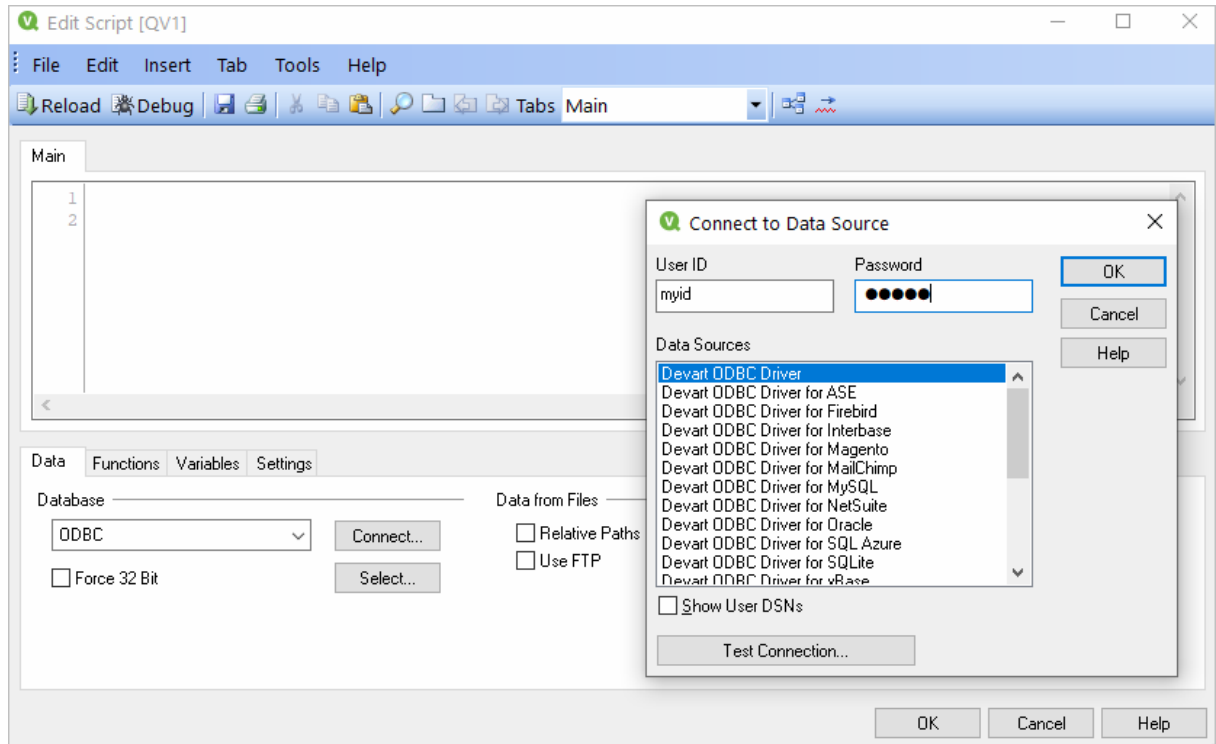
3. To retrieve the data from your data source, you can enter an SQL query and press **F5**. You will be suggested to choose fields to be displayed.
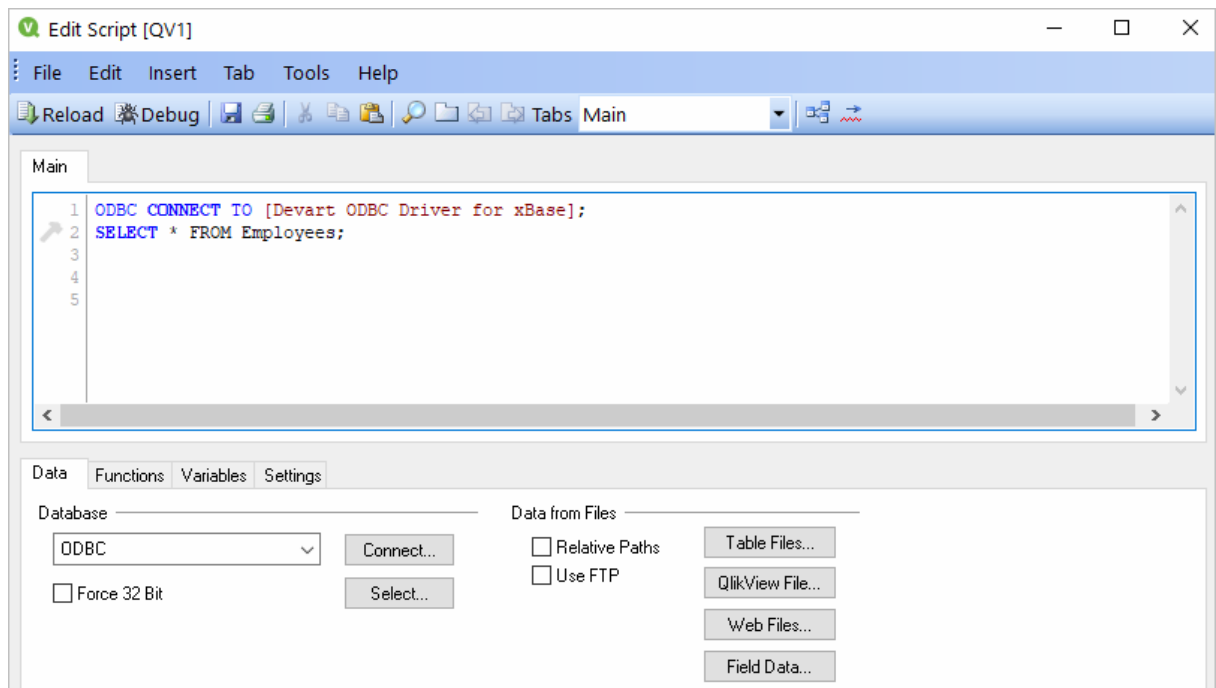
4. Alternatively, you can click **Select**, and QlikView will show you the database structure window where you can compose a SELECT statement for the data to be fetched. You can choose a different database from the database drop-down list. Select the necessary tables and fields. You can retrieve date from multiple tables and fields by selecting them and clicking **Add**. When you are ready with your SELECT statement, click **OK**. You will get back to the main script editor with your SQL statement. Press **F5** to execute the script and select the fields to be displayed in QlikView.
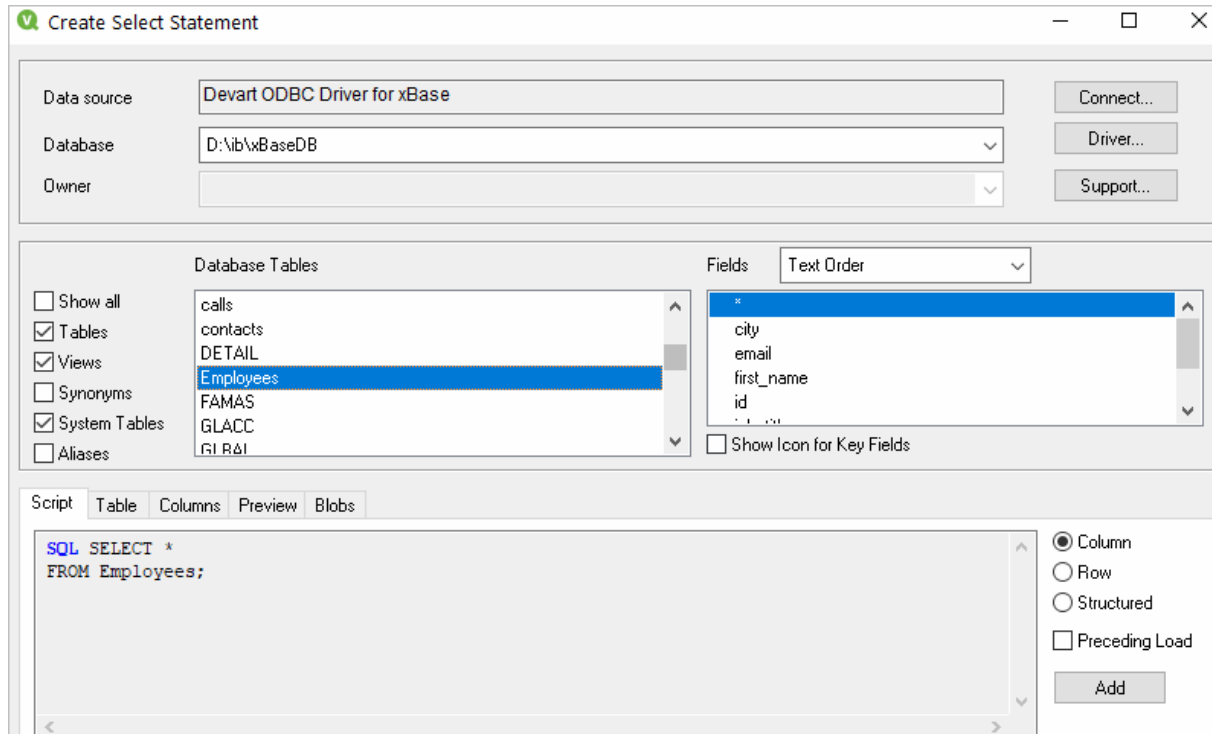
5. Once the data has been fetched, you can choose a table layout to present the data in a table. Choose **Layout > New Sheet Object > Table Box**. Select the fields to be added to the tablebox and click **OK**.

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4.12   Using in SSIS

SQL Server Integration Services (SSIS) is a component of SQL Server that is designed to perform various data migration tasks. When using Devart ODBC Driver for xBase as a translation layer between the data source and SSIS, the driver and SSIS communicate via Microsoft ODBC version 3.x.

Note that when you extract data from an ODBC data source using the `SQLExecDirect` function, an issue may occur: SSIS expects the ODBC 2.x behavior, while the ODBC driver continues to fetch data from a data source via ODBC version 3.x. To prevent any issues when using SQLExecDirect, you should force the ODBC 2.x behavior in the DSN settings: open the `Advanced Settings` tab and select `Ver 2.x` from the `ODBC Behavior` dropdown.
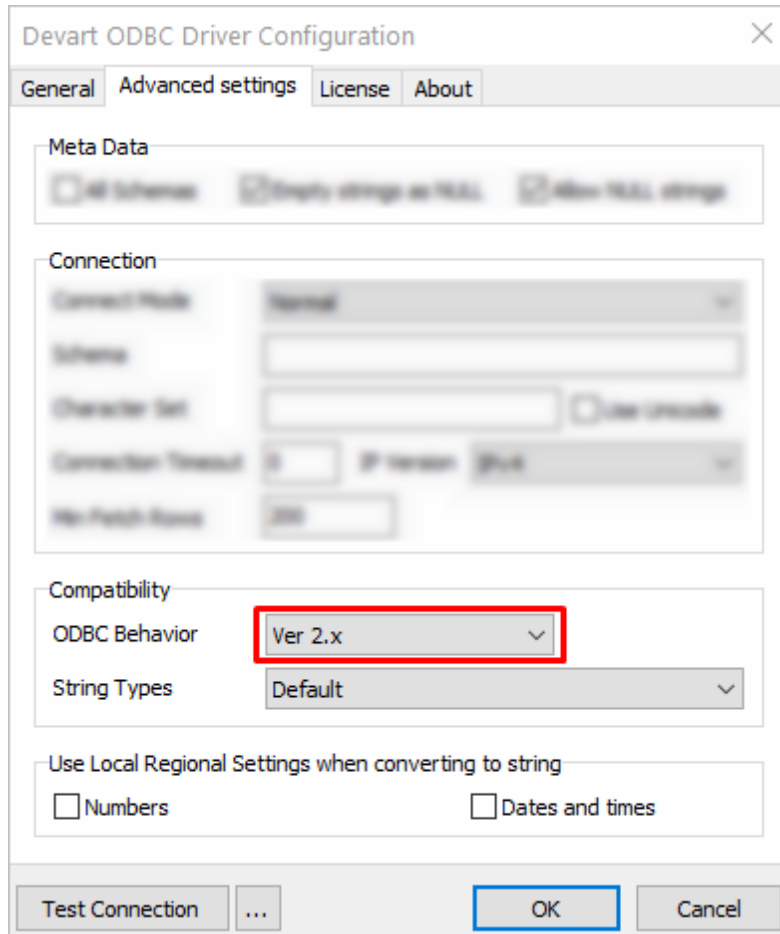
4.13   Using in Tableau

This section describes how to establish and troubleshoot a connection to xBase from Tableau using ODBC Driver for xBase.

- Using in Tableau

- Troubleshooting in Tableau on macOS

4.13.1 Using in Tableau

Importing xBase Data Into Tableau Through an ODBC Connection

This article explains to establish and ODBC connection to xBase from Tableau Desktop. Tableau is a data visualization tool that allows you to pull in raw data, perform analysis on it, and create meaningful reports to get actionable insights. With Tableau Desktop and our suite of ODBC drivers, you can connect to various relational and non-relational databases, both cloud and on-premise.

1. Run Tableau Desktop.

2. On the start page, select **More...** in the **Connect** pane.

3. Choose **Other Databases (ODBC)**.

4. Expand the **DSN** drop-down list and select the DSN that you have created and configured for xBase. Alternatively, if you have not created a DSN, you can choose the **Driver** option and select Devart ODBC Driver for xBase from the drop-down.

5. Click **Connect**.

6. After a successful connection, click **Sign in**.

7. Select the needed database and schema in xBase.

8. You should see the list of all tables you have access to in the connected data source.

9. Drag-and-drop the table name to the area where it says **Drag tables here** to retrieve the data, or click **New Custom SQL** to write a query that will select only specific data from the table.

10. Hit **Update Now** to retrieve and display the data.

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4.13.2 Troubleshooting in Tableau on macOS

Troubleshooting ODBC Connection in Tableau on macOS

The iODBC driver manager incorrectly handles the SQL_WCHAR and SQL_WVARCHAR

ODBC data types. To work with these data types in Tableau, create a Tableau Datasource Customization (`.tdc`) file in '*Users\[your name]\Documents\My Tableau Repository \Datasources*' — for example, *devart-xbase.tdc*, and add the following capabilities to the file:

```
<?xml version='1.0' encoding='utf-8' ?>
<connection-customization class='genericodbc' enabled='true' version='1.0'>
<vendor name='xBase' />
<driver name='Devart ODBC Driver for xBase' />
    <customizations>
        <customization name='CAP_ODBC_BIND_SUPPRESS_WIDE_CHAR' value='yes'
    </customizations>
</connection-customization>
```

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