



Using HammerDB with Microsoft SQL Server on Linux

This guide introduces a user familiar with testing SQL Server on Windows to using HammerDB to test the SQL Server on Linux and to use HammerDB on Linux to test SQL Server on Windows. This guide has been written from functionality available with the public preview of SQL Server on Linux and therefore features and functionality may be subject to change with subsequent.

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SQL Server on Linux Server Installation

SQL Server on Linux installation guide is [available on the Microsoft SQL Server on Linux site](#) . Follow the installation guide and ensure that you have your database server running as follows:

```
[mssql]$ systemctl status mssql-server
mssql-server.service - Microsoft(R) SQL Server(R) Database Engine
  Loaded: loaded (/usr/lib/systemd/system/mssql-server.service; enabled; vendor preset: disabled)
  Active: active (running) since Tue 2017-01-31 16:25:36 GMT; 5min ago
  Main PID: 1056 (sqlservr)
  CGroup: /system.slice/mssql-server.service
          1056 /opt/mssql/bin/sqlservr
          7530 /opt/mssql/bin/sqlservr
```

You may still administer the database server using SSMS from Windows.

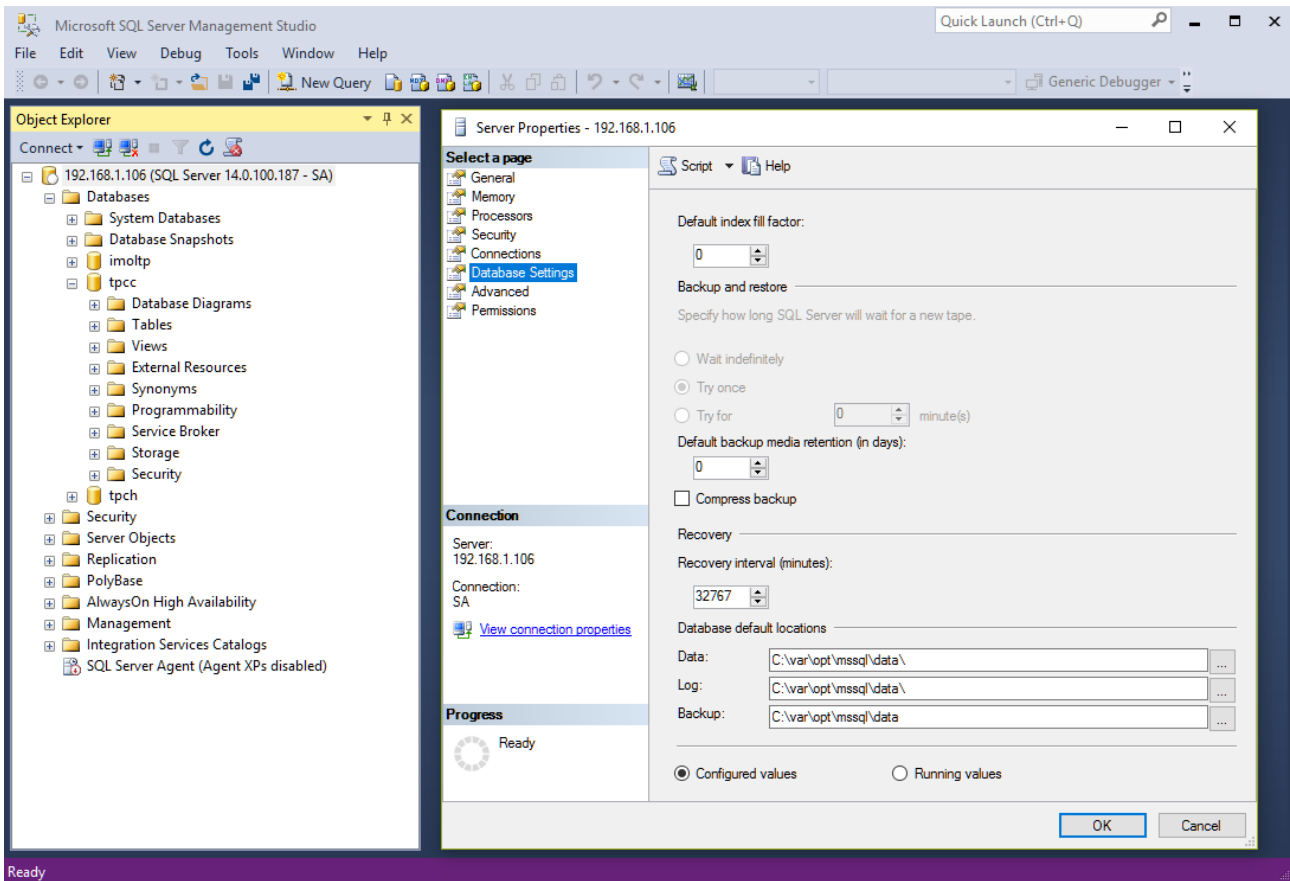


Figure 1 SSMS connected to SQL Server on Linux

Alternatively you can use the `sqlcmd` utility installed with the SQL Server tools as detailed further in this guide to run all of the commands given in the HammerDB SQL Server configuration guides for administering and tuning the database server.

```
[mssql ~]$ sqlcmd -S localhost -U SA -P Password
1> use imoltp
2> select count(*) from warehouse
3> go
Changed database context to 'imoltp'.
```

```
-----
                2
```

```
(1 rows affected)
```

```
1> select * from warehouse
2> go
```

w_id	w_ytd	w_city	w_tax	w_name	w_street_1
w_street_2				w_state	w_zip
ALdX5Yhdmhw	1	3000000.0000	.1100	otV2kWH	LxZISGlXNC
ynodx2M1449cna77	2	3000000.0000	.1500	na0LEE	B4WwcBEhY7DrU
		7gElYDjWszSjo	xC	865511111	

```
(2 rows affected)
```

```
1>
```

HammerDB and SQL Server on Linux Client Installation

HammerDB's ability to connect to and test SQL Server on both Windows and Linux is through an ODBC client. Therefore the first aspect of understanding the configuration and test of SQL Server on Linux is that although the installation processes are closely related the database server and ODBC client functionality are separate. This means that a Windows client can connect to a SQL Server on Linux database and a SQL Server on Linux client can connect to a SQL Server on Windows database. Therefore although this guide focuses on SQL Server for Linux this does not exclude mixing Windows and Linux configurations. One key difference remains however, SQL Server for Windows ships with both a 32-bit and 64-bit client whereas SQL Server for Linux ships with a 64-bit client only and therefore only 64-bit HammerDB can be used with SQL Server for Linux.

ODBC Configuration on Windows

It is beneficial to understand the configuration of the ODBC client to assist with the configuration on Linux. On HammerDB v2.22 for Windows the default client configuration is **SQL Server Native Client 11.0** and when starting the Build or Driver dialog will be displayed as the SQL Server ODBC Driver.

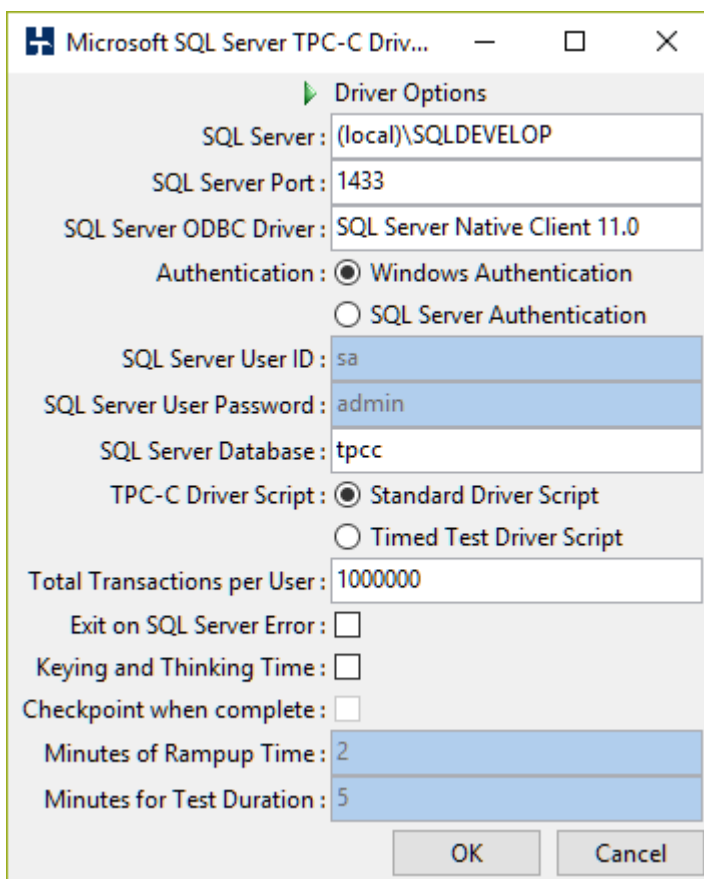


Figure 2 SQL Server ODBC Driver

This configuration is taken from the HammerDB configuration file config.xml and can be changed in that file if required. As can be seen this file also specifies an alternative for a SQL Server on Linux client.

```
<mssqlserver>
  <connection>
    <mssql_server>(local)</mssql_server>
    <mssql_linux_server>localhost</mssql_linux_server>
    <mssql_port>1433</mssql_port>
    <mssql_authentication>windows</mssql_authentication>
```

```

<mssqlsl_linux_authent>sql</mssqlsl_linux_authent>
  <mssqlsl_odbc_driver>SQL Server Native Client 11.0</mssqlsl_odbc_driver>
  <mssqlsl_linux_odbc>ODBC Driver 13 for SQL Server</mssqlsl_linux_odbc>
<mssqlsl_uid>sa</mssqlsl_uid>
<mssqlsl_pass>admin</mssqlsl_pass>
</connection>

```

On Windows the available drivers are detailed under the Drivers tab on the ODBC Data Source Administrator Tool. Here it can be seen that the SQL Server Native Client 11.0 is installed and available for use.

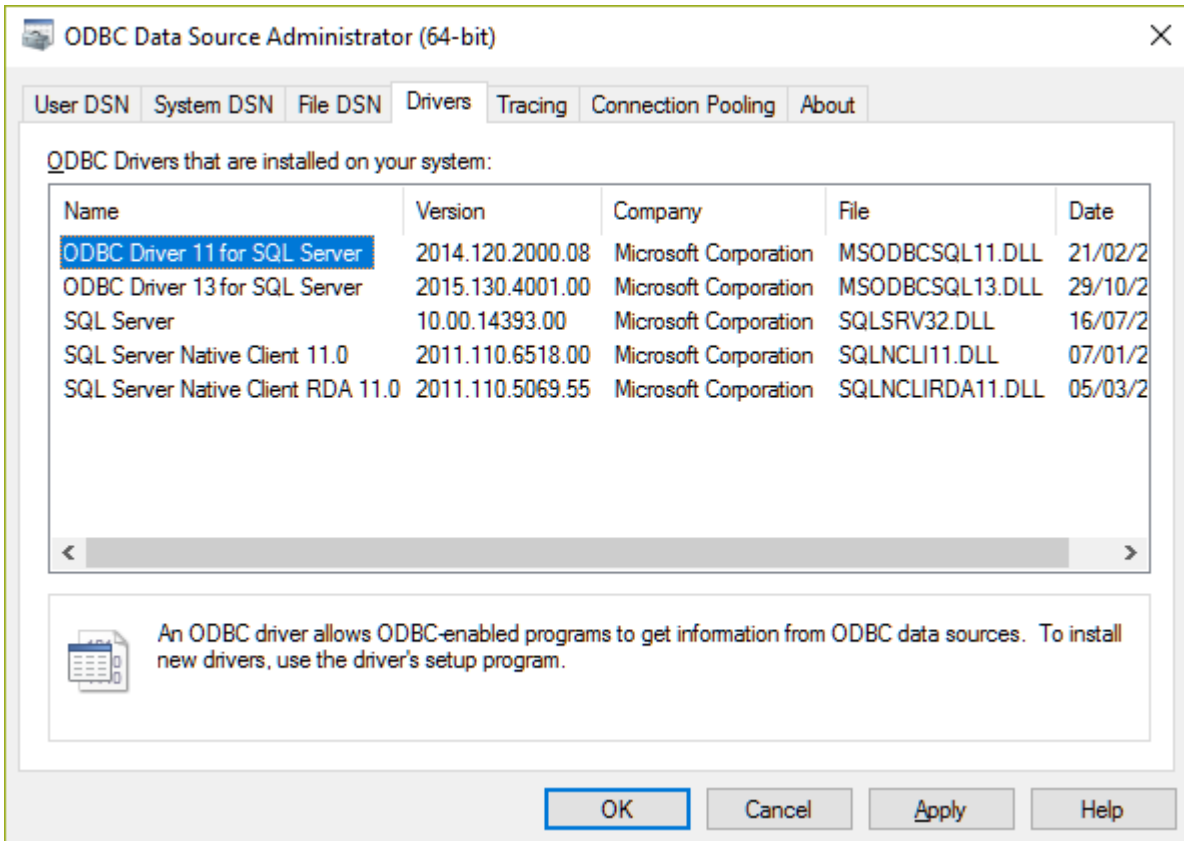


Figure 3 ODBC Data Source Administrator

HammerDB uses an ODBC interface to load the driver. To test this double-click on the tclsh86t file in the bin directory.

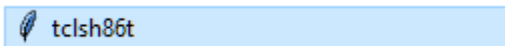


Figure 4 Command Line Shell

And type the commands as shown in Figure 5. This shows that HammerDB can recognise and load these drivers to connect to SQL Server.

```

C:\Program Files\HammerDB-2.22\bin\tclsh86t.exe
% package require tclodbc
2.5.1
% database drivers
{{SQL Server} {APILevel=2 ConnectFunctions=YYY CPTimeout=60 DriverODBCVer=03.50
FileUsage=0 SQLLevel=1 UsageCount=1}} {{SQL Server Native Client 11.0} {UsageCou
nt=1 APILevel=2 ConnectFunctions=YYY CPTimeout=60 DriverODBCVer=03.80 FileUsage=
0 SQLLevel=1}} {{ODBC Driver 11 for SQL Server} {UsageCount=1 APILevel=2 Connect
Functions=YYY CPTimeout=60 DriverODBCVer=03.80 FileUsage=0 SQLLevel=1}} {{ODBC D
river 13 for SQL Server} {UsageCount=1 APILevel=2 ConnectFunctions=YYY CPTimeout
=60 DriverODBCVer=03.80 FileUsage=0 SQLLevel=1}} {{SQL Server Native Client RDA
11.0} {UsageCount=1 APILevel=2 ConnectFunctions=YYY CPTimeout=60 DriverODBCVer=0
3.80 FileUsage=0 SQLLevel=1}}
%

```

Figure 5 ODBC package loaded

ODBC Configuration on Linux

For the equivalent installation on Linux as on Windows it is necessary to install the `mssql-tools` `unixODBC-devel` packages with installation details available [here](#). Once installation is completed run the following command to show the details for the ODBC driver, these details are stored in the file `/etc/odbcinst.ini`.

```

[mssql]$ odbcinst -q -d -n "ODBC Driver 13 for SQL Server"
[ODBC Driver 13 for SQL Server]
Description=Microsoft ODBC Driver 13 for SQL Server
Driver=/opt/microsoft/msodbcsql/lib64/libmsodbcsql-13.0.so.1.0
UsageCount=1

```

As detailed above this driver is specified in the section `mssqlsls_linux_odbc` of the `config.xml` file. For an equivalent test to Windows at the command line you can run the following test. This shows that the driver is available for HammerDB to load to connect to SQL Server on Linux.

```

[mssql HammerDB-2.22]$ export LD_LIBRARY=./lib:$LD_LIBRARY_PATH
[mssql HammerDB-2.22]$ ./bin/tclsh8.6
% package require tclodbc
2.5.1
% database drivers
{{ODBC Driver 13 for SQL Server} {{Description=Microsoft ODBC Driver 13 for SQL
Server} Driver=/opt/microsoft/msodbcsql/lib64/libmsodbcsql-13.0.so.1.0
UsageCount=1}}
%

```

Connecting and Testing HammerDB to SQL Server on Linux

Under the benchmark options dialog note that the MSSQL Server option is available from HammerDB v2.22. At previous versions this option was greyed out and no interface as detailed above was installed. Select OK to choose SQL Server.

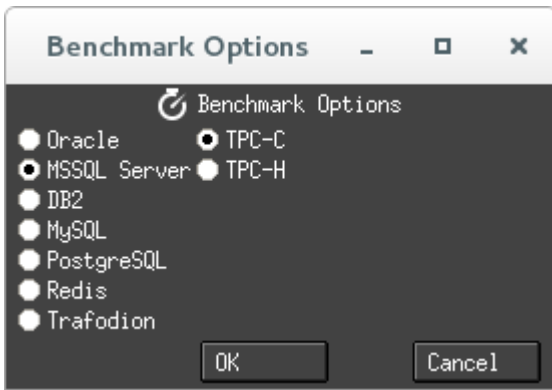


Figure 6 SQL Server on Linux Active

Under the build or driver options the correct driver is chosen for you particular platform according to the details given in the config.xml file. For authentication specify SQL Server Authentication and the user ID and Password that you have tested with the sqlcmd utility.

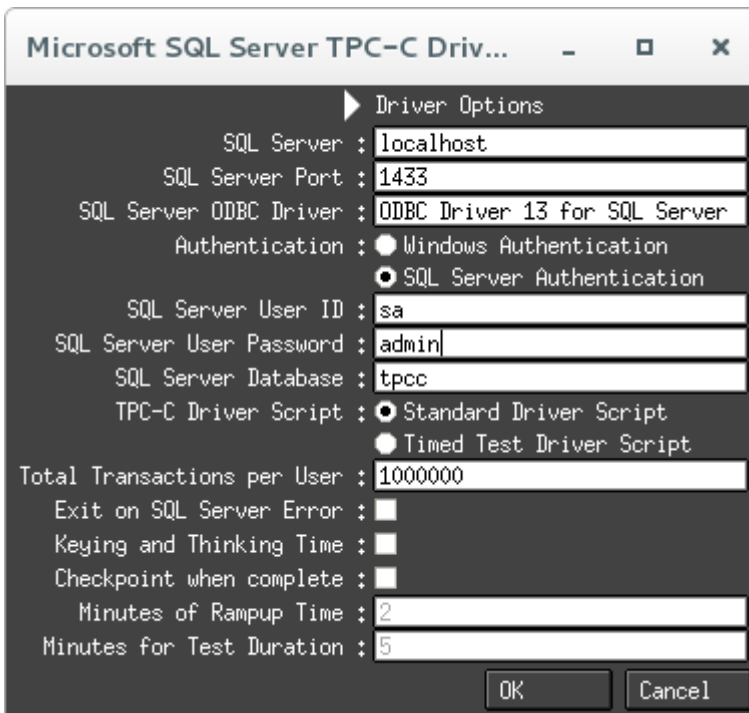


Figure 6 ODBC Driver on Linux

If configured correctly you can now run HammerDB from a Linux client to connect to SQL Server. All current HammerDB guides for SQL Server apply equally both to Windows and Linux and all tests and functionality remain the same. For example both OLTP/TPC-C including In-memory and OLAP/TPC-H tests can be run against SQL Server on Linux.

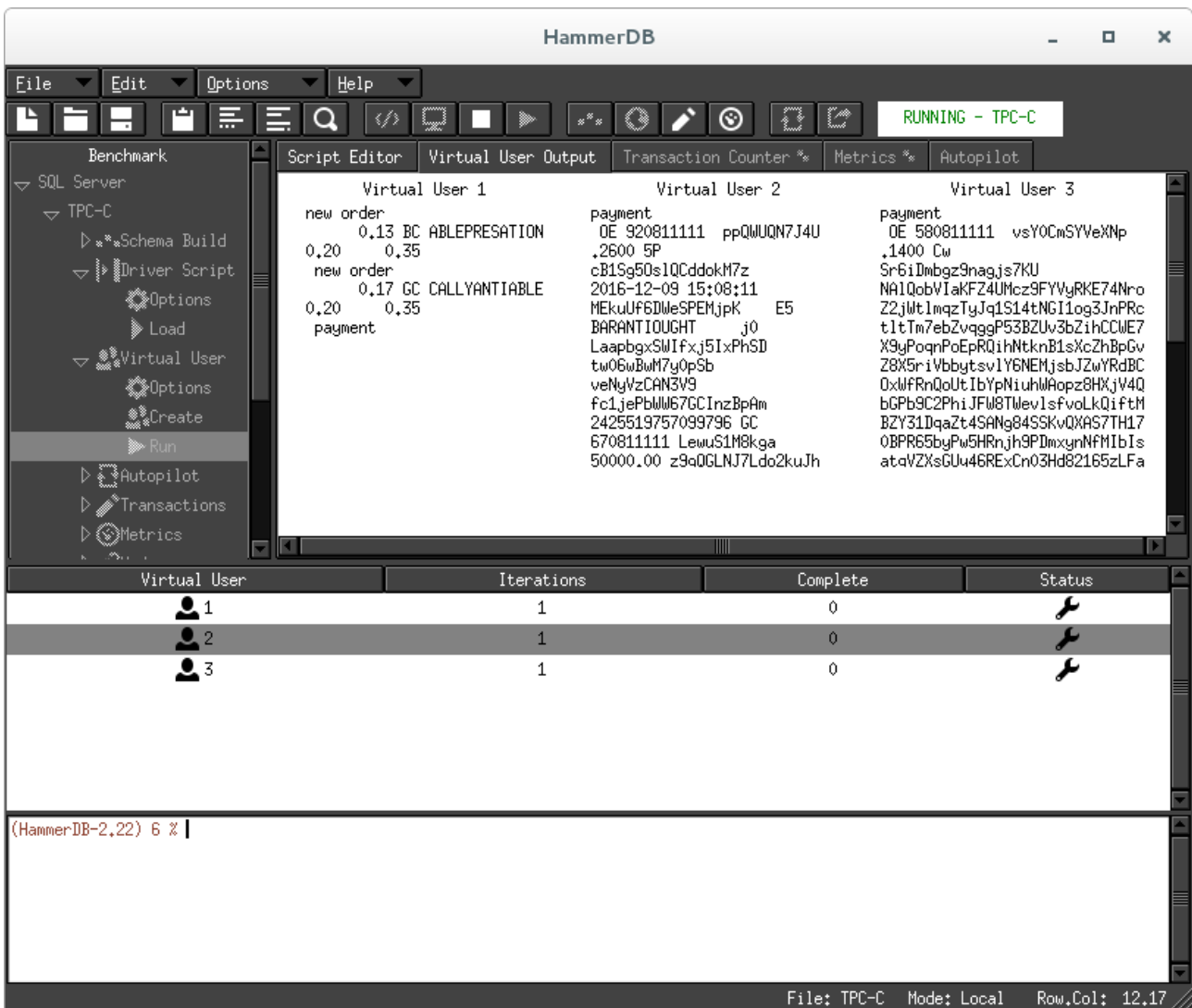


Figure 7 Running HammerDB on SQL Server on Linux

Troubleshooting

The following TCP communication errors have been observed on a Linux client that is busy servicing requests with a large number of users.

```
08S01 -2147467259 {[Microsoft][ODBC Driver 13 for SQL Server]Communication link failure}
08S01 10054 {[Microsoft][ODBC Driver 13 for SQL Server]TCP Provider: Error code 0x2746}
```

These errors have not been observed on Windows clients running HammerDB and as both the HammerDB code and interface code are identical at the HammerDB layer are believed to related to the underlying TCP configuration or ODBC configuration for SQL Server on Linux.

Support and Questions

For help use the HammerDB Sourceforge forum available at the HammerDB sourceforge project.