Microsoft

Step-by-Step guide to Install ora2pg on Linux

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This document is meant to be used as a Quick Installation Guide for enabling migration of schema & data from Oracle to Azure Database for PostgreSQL using ora2pg tool. Complete details on the tool can be found at http://ora2pg.darold.net/documentation.html

Pre-Requisites

The following software must be installed on the Linux machine prior to installing ora2pg:

- Perl 5.10 or more

- Oracle Instant Client or Full Oracle installation

- DBD::Oracle Perl Module

- ora2pg

It is recommended that you use the order above to proceed with the installation.

Note that this guide was based on a Red Hat Enterprise Linux 7.4 virtual machine. I recommend to install everything using root user, for simplicity.

Installing Perl 5.10 or more

1) Install GCC first – not all versions of Linux comes with gcc installed. As root:

   yum install gcc

2) Create a directory for the Perl installation.

   mkdir app
   cd app

3) Download Perl

wget https://www.cpan.org/src/5.0/perl-5.28.0.tar.gz

```
[corp@redlinux2 ~]$ mkdir app
[corp@redlinux2 ~]$ cd app
[corp@redlinux2 app]$
[corp@redlinux2 app]$
[corp@redlinux2 app]$
[corp@redlinux2 app]$ wget https://www.cpan.org/src/5.0/perl-5.28.0.tar.gz
--2018-12-11 15:46:38--  https://www.cpan.org/src/5.0/perl-5.28.0.tar.gz
Resolving www.cpan.org (www.cpan.org)... 151.101.250.217, 2a04:4e42:3b::729
Connecting to www.cpan.org (www.cpan.org)|151.101.250.217|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 17914739 (17M) [application/x-gzip]
Saving to: 'perl-5.28.0.tar.gz'

100%[=====================================================================================================>] 17,914,739  --.-K/s   in 0.09s

2018-12-11 15:46:38 (181 MB/s) - 'perl-5.28.0.tar.gz' saved [17914739/17914739]
```

4) Untar/unzip Perl

   tar -xzf perl-5.28.0.tar.gz

5) Navigate to the Perl folder and configure $HOME (This will run for a while…)

   cd perl-5.28.0
   ./Configure -des -Dprefix=$HOME/

```
[corp@redlinux2 app]$ tar -xzf perl-5.28.0.tar.gz
[corp@redlinux2 app]$ ls -ltr
total 17508
drwxr-xr-x. 26 corp corp     8192 Jun 23 01:17 perl-5.28.0
-rw-rw-r--.  1 corp corp 17914739 Jun 23 02:05 perl-5.28.0.tar.gz
[corp@redlinux2 app]$ cd perl-5.28.0
[corp@redlinux2 perl-5.28.0]$ ./Configure -des -Dprefix=$HOME/
First let's make sure your kit is complete.  Checking...
Locating common programs...
Checking compatibility between /bin/echo and builtin echo (if any)...
Symbolic links are supported.
Checking how to test for symbolic links...
You can test for symbolic links with 'test -h'.
Checking for cross-compile
No targethost for running compiler tests against defined, running locally
Good, your tr supports [:lower:] and [:upper:] to convert case.
Using [:upper:] and [:lower:] to convert case.
```

6) Install Perl (it will take a while…)

   make
   make test
   make install

```
[corp@redlinux2 perl-5.28.0]$ make
echo @`sh  cflags "optimize='-O2'" opmini.o`  -DPERL_IS_MINIPERL -DPERL_EXTERNAL_GLOB opmini.c
@cc -c -DPERL_CORE -fwrapv -fno-strict-aliasing -pipe -fstack-protector-strong -I/usr/local/include -D_LARGEFILE_SOURCE -D_FILE_OFFSET_BITS=64 -D_F
ORTIFY_SOURCE=2 -std=c89 -O2 -Wall -Werror=declaration-after-statement -Werror=pointer-arith -Wextra -Wc++-compat -Wwrite-strings -DPERL_IS_MINIPER
L -DPERL_EXTERNAL_GLOB opmini.c
echo @`sh  cflags "optimize='-O2'" perlmini.o`  -DPERL_IS_MINIPERL -DPERL_EXTERNAL_GLOB perlmini.c
@cc -c -DPERL_CORE -fwrapv -fno-strict-aliasing -pipe -fstack-protector-strong -I/usr/local/include -D_LARGEFILE_SOURCE -D_FILE_OFFSET_BITS=64 -D_F
ORTIFY_SOURCE=2 -std=c89 -O2 -Wall -Werror=declaration-after-statement -Werror=pointer-arith -Wextra -Wc++-compat -Wwrite-strings -DPERL_IS_MINIPER
L -DPERL_EXTERNAL_GLOB perlmini.c
cc -c -DPERL_CORE -fwrapv -fno-strict-aliasing -pipe -fstack-protector-strong -I/usr/local/include -D_LARGEFILE_SOURCE -D_FILE_OFFSET_BITS=64 -D_FO
RTIFY_SOURCE=2 -std=c89 -O2 -Wall -Werror=declaration-after-statement -Werror=pointer-arith -Wextra -Wc++-compat -Wwrite-strings gv.c
cc -c -DPERL_CORE -fwrapv -fno-strict-aliasing -pipe -fstack-protector-strong -I/usr/local/include -D_LARGEFILE_SOURCE -D_FILE_OFFSET_BITS=64 -D_FO
RTIFY_SOURCE=2 -std=c89 -O2 -Wall -Werror=declaration-after-statement -Werror=pointer-arith -Wextra -Wc++-compat -Wwrite-strings toke.c
cc -c -DPERL_CORE -fwrapv -fno-strict-aliasing -pipe -fstack-protector-strong -I/usr/local/include -D_LARGEFILE_SOURCE -D_FILE_OFFSET_BITS=64 -D_FO
RTIFY_SOURCE=2 -std=c89 -O2 -Wall -Werror=declaration-after-statement -Werror=pointer-arith -Wextra -Wc++-compat -Wwrite-strings perly.c
cc -c -DPERL_CORE -fwrapv -fno-strict-aliasing -pipe -fstack-protector-strong -I/usr/local/include -D_LARGEFILE_SOURCE -D_FILE_OFFSET_BITS=64 -D_FO
RTIFY_SOURCE=2 -std=c89 -O2 -Wall -Werror=declaration-after-statement -Werror=pointer-arith -Wextra -Wc++-compat -Wwrite-strings pad.c
cc -c -DPERL_CORE -fwrapv -fno-strict-aliasing -pipe -fstack-protector-strong -I/usr/local/include -D_LARGEFILE_SOURCE -D_FILE_OFFSET_BITS=64 -D_FO
RTIFY_SOURCE=2 -std=c89 -O2 -Wall -Werror=declaration-after-statement -Werror=pointer-arith -Wextra -Wc++-compat -Wwrite-strings regcomp.c
cc -c -DPERL_CORE -fwrapv -fno-strict-aliasing -pipe -fstack-protector-strong -I/usr/local/include -D_LARGEFILE_SOURCE -D_FILE_OFFSET_BITS=64 -D_FO
RTIFY_SOURCE=2 -std=c89 -O2 -Wall -Werror=declaration-after-statement -Werror=pointer-arith -Wextra -Wc++-compat -Wwrite-strings dump.c
cc -c -DPERL_CORE -fwrapv -fno-strict-aliasing -pipe -fstack-protector-strong -I/usr/local/include -D_LARGEFILE_SOURCE -D_FILE_OFFSET_BITS=64 -D_FO
RTIFY_SOURCE=2 -std=c89 -O2 -Wall -Werror=declaration-after-statement -Werror=pointer-arith -Wextra -Wc++-compat -Wwrite-strings util.c
```

7) Once steps 1-6 are executed, check the (new) version of Perl by typing

$HOME/bin/perl -v

```
[corp@redlinux2 perl-5.28.0]$ $HOME/bin/perl -v

This is perl 5, version 28, subversion 0 (v5.28.0) built for x86_64-linux

Copyright 1987-2018, Larry Wall

Perl may be copied only under the terms of either the Artistic License or the
GNU General Public License, which may be found in the Perl 5 source kit.

Complete documentation for Perl, including FAQ lists, should be found on
this system using "man perl" or "perldoc perl".  If you have access to the
Internet, point your browser at http://www.perl.org/, the Perl Home Page.

[corp@redlinux2 perl-5.28.0]$
```

8) Make this Perl installation the default one by adding the path to .bashrc file

export PATH=$HOME/bin/:$PATH

All commands:

yum install gcc
mkdir app
cd app
wget https://www.cpan.org/src/5.0/perl-5.28.0.tar.gz
tar -xzf perl-5.28.0.tar.gz
cd perl-5.28.0
./Configure -des -Dprefix=$HOME/
make
make test
make install
$HOME/bin/perl -v
export PATH=$HOME/bin/:$PATH

Installing Oracle Instant Client or Full Oracle Installation

1) Before proceeding with the oracle installation, please run the following commands to update certain required packages on Red Hat 7.4. As root

yum update
yum install -y binutils.x86_64 compat-libcap1.x86_64 gcc.x86_64 gcc-c++.x86_64 glibc.i686 glibc.x86_64
glibc-devel.i686 glibc-devel.x86_64 ksh compat-libstdc++-33 libaio.i686 libaio.x86_64 libaio-devel.i686
libaio-devel.x86_64 libgcc.i686 libgcc.x86_64 libstdc++.i686 libstdc++.x86_64 libstdc++-devel.i686
libstdc++-devel.x86_64 libXi.i686 libXi.x86_64 libXtst.i686 libXtst.x86_64 make.x86_64 sysstat.x86_64 zip
unzip

2) Download the oracle RPMs and copy it to the Linux machine.

3) Install the RPMs in the following order (as root):

rpm -ivh oracle-instantclient12.2-basic-12.2.0.1.0-1.x86_64.rpm
rpm -ivh oracle-instantclient12.2-devel-12.2.0.1.0-1.x86_64.rpm
rpm -ivh oracle-instantclient12.2-jdbc-12.2.0.1.0-1.x86_64.rpm
rpm -ivh oracle-instantclient12.2-sqlplus-12.2.0.1.0-1.x86_64.rpm

```
[root@redlinux2 u01]# rpm -ivh oracle-instantclient12.2-basic-12.2.0.1.0-1.x86_6
4.rpm
Preparing...                          ################################# [100%]
Updating / installing...
   1:oracle-instantclient12.2-basic-12################################# [100%]
[root@redlinux2 u01]# rpm -ivh oracle-instantclient12.2-devel-12.2.0.1.0-1.x86_64.rpm
Preparing...                          ################################# [100%]
Updating / installing...
   1:oracle-instantclient12.2-devel-12################################# [100%]
[root@redlinux2 u01]# rpm -ivh oracle-instantclient12.2-jdbc-12.2.0.1.0-1.x86_64.rpm
Preparing...                          ################################# [100%]
Updating / installing...
   1:oracle-instantclient12.2-jdbc-12.################################# [100%]
[root@redlinux2 u01]# rpm -ivh oracle-instantclient12.2-sqlplus-12.2.0.1.0-1.x86_64.rpm
Preparing...                          ################################# [100%]
Updating / installing...
   1:oracle-instantclient12.2-sqlplus-################################# [100%]
[root@redlinux2 u01]#
```

4) SET the LD_LIBRARY_PATH and ORACLE_HOME variables:

export LD_LIBRARY_PATH=/usr/lib/oracle/12.2/client64/lib
export ORACLE_HOME=/usr/lib/oracle/12.2/client64

Installing DBD::Oracle Perl Module

1) Before proceeding with the installation of the module, make sure to install Perl-Devel module (as root):

yum install perl-devel
yum install perl-DBI

2) Download the DBD::Oracle Perl Module and copy/upload it to the Linux machine

3) Untar/Unzip the module and navigate to the folder

tar xvzf DBD-Oracle-1.76.tar.gz

```
[root@redlinux2 app]# tar xvzf DBD-Oracle-1.76.tar.gz
DBD-Oracle-1.76/
DBD-Oracle-1.76/TODO
DBD-Oracle-1.76/README
DBD-Oracle-1.76/oci8.c
DBD-Oracle-1.76/INSTALL
DBD-Oracle-1.76/LICENSE
DBD-Oracle-1.76/Changes
DBD-Oracle-1.76/mkta.pl
DBD-Oracle-1.76/oci.def
DBD-Oracle-1.76/typemap
DBD-Oracle-1.76/META.yml
DBD-Oracle-1.76/MANIFEST
DBD-Oracle-1.76/Oracle.h
DBD-Oracle-1.76/dbdimp.c
DBD-Oracle-1.76/dbdimp.h
```

cd DBD-Oracle-1.76

4) Install the Perl Module

perl Makefile.PL

```
[root@redlinux2 DBD-Oracle-1.76]# perl Makefile.PL
Using DBI 1.627 (for perl 5.016003 on x86_64-linux-thread-multi) installed in /usr/lib64/perl5/vendor_perl/auto/DBI/
Configuring DBD::Oracle for perl 5.016003 on linux (x86_64-linux-thread-multi)

If you encounter any problem, a collection of troubleshooting
guides are available under lib/DBD/Oracle/Troubleshooting.
'DBD::Oracle::Troubleshooting' is the general troubleshooting
guide, while platform-specific troubleshooting hints
live in their labelled sub-document (e.g., Win32
hints are gathered in 'lib/DBD/Oracle/Troubleshooting/Win32.pod').

Installing on a linux, Ver#3.10
Using Oracle in /usr/lib/oracle/12.2/client64
DEFINE _SQLPLUS_RELEASE = "1202000100" (CHAR)
Oracle Version 12.2.0.1 (12.2)
Found direct-link candidates: libclntsh.so
Oracle sysliblist:
Found header files in /usr/include/oracle/12.2/client64.
Your LD_LIBRARY_PATH env var is set to '/usr/lib/oracle/12.2/client64/lib'

client_version=12.2


DEFINE= -Wall -Wno-comment -DUTF8_SUPPORT -DORA_OCI_VERSION=\"12.2.0.1\" -DORA_OCI_102 -DORA_OCI_112


Checking for functioning wait.ph


System: perl5.016003 linux x86-038.build.eng.bos.redhat.com 3.10.0-862.2.3.el7.x86_64 #1 smp mon apr 30 12:37:51 edt 2018 x86_64 x86_64 x86_64
inux
Compiler:   gcc -O2 -g -pipe -Wall -Wp,-D_FORTIFY_SOURCE=2 -fexceptions -fstack-protector-strong --param=ssp-buffer-size=4 -grecord-gcc-switche
64 -mtune=generic -D_REENTRANT -D_GNU_SOURCE -fno-strict-aliasing -pipe -fstack-protector -I/usr/local/include -D_LARGEFILE_SOURCE -D_FILE_OFFS
ITS=64
Linker:     /bin/ld
Sysliblist:
Linking with -lclntsh.

Checking if your kit is complete...
Looks good
LD_RUN_PATH=/usr/lib/oracle/12.2/client64/lib
Using DBD::Oracle 1.76.
Using DBD::Oracle 1.76.
Using DBI 1.627 (for perl 5.016003 on x86_64-linux-thread-multi) installed in /usr/lib64/perl5/vendor_perl/auto/DBI/
Writing Makefile for DBD::Oracle

[root@redlinux2 DBD-Oracle-1.76]# 
```

make && make install

```
[root@redlinux2 DBD-Oracle-1.76]# make && make install
cp lib/DBD/Oracle/Troubleshooting/Cygwin.pod blib/lib/DBD/Oracle/Troubleshooting/Cygwin.pod
cp lib/DBD/Oracle.pm blib/lib/DBD/Oracle.pm
cp Oracle.h blib/arch/auto/DBD/Oracle/Oracle.h
cp lib/DBD/Oracle/Troubleshooting/Hpux.pod blib/lib/DBD/Oracle/Troubleshooting/Hpux.pod
cp lib/DBD/Oracle/Troubleshooting/Vms.pod blib/lib/DBD/Oracle/Troubleshooting/Vms.pod
cp lib/DBD/Oracle/Troubleshooting/Linux.pod blib/lib/DBD/Oracle/Troubleshooting/Linux.pod
cp lib/DBD/Oracle/GetInfo.pm blib/lib/DBD/Oracle/GetInfo.pm
cp lib/DBD/Oracle/Troubleshooting.pod blib/lib/DBD/Oracle/Troubleshooting.pod
cp dbdimp.h blib/arch/auto/DBD/Oracle/dbdimp.h
cp ocitrace.h blib/arch/auto/DBD/Oracle/ocitrace.h
cp lib/DBD/Oracle/Troubleshooting/Sun.pod blib/lib/DBD/Oracle/Troubleshooting/Sun.pod
cp lib/DBD/Oracle/Troubleshooting/Macos.pod blib/lib/DBD/Oracle/Troubleshooting/Macos.pod
cp lib/DBD/Oracle/Troubleshooting/Aix.pod blib/lib/DBD/Oracle/Troubleshooting/Aix.pod
cp lib/DBD/Oracle/Object.pm blib/lib/DBD/Oracle/Object.pm
cp lib/DBD/Oracle/Troubleshooting/Win64.pod blib/lib/DBD/Oracle/Troubleshooting/Win64.pod
cp lib/DBD/Oracle/Troubleshooting/Win32.pod blib/lib/DBD/Oracle/Troubleshooting/Win32.pod
cp mk.pm blib/arch/auto/DBD/Oracle/mk.pm
/usr/bin/perl -p -e "s/~DRIVER~/Oracle/g" /usr/lib64/perl5/vendor_perl/auto/DBI/Driver.xst > Oracle.xsi
/usr/bin/perl /usr/share/perl5/vendor_perl/ExtUtils/xsubpp  -typemap /usr/share/perl5/ExtUtils/typemap -typemap typemap  Oracle.xs > Oracle.xsc &&
mv Oracle.xsc Oracle.c
gcc -c  -I/usr/include/oracle/12.2/client64 -I/usr/lib64/perl5/vendor_perl/auto/DBI -D_REENTRANT -D_GNU_SOURCE -fno-strict-aliasing -pipe -fstack-p
rotector -I/usr/local/include -D_LARGEFILE_SOURCE -D_FILE_OFFSET_BITS=64 -O2 -g -pipe -Wall -Wp,-D_FORTIFY_SOURCE=2 -fexceptions -fstack-protector-
strong --param=ssp-buffer-size=4 -grecord-gcc-switches -m64 -mtune=generic   -DVERSION=\"1.76\" -DXS_VERSION=\"1.76\" -fPIC "-I/usr/lib64/perl5/COR
E"  -Wall -Wno-comment -DUTF8_SUPPORT -DORA_OCI_VERSION=\"12.2.0.1\" -DORA_OCI_102 -DORA_OCI_112 Oracle.c
gcc -c  -I/usr/include/oracle/12.2/client64 -I/usr/lib64/perl5/vendor_perl/auto/DBI -D_REENTRANT -D_GNU_SOURCE -fno-strict-aliasing -pipe -fstack-p
rotector -I/usr/local/include -D_LARGEFILE_SOURCE -D_FILE_OFFSET_BITS=64 -O2 -g -pipe -Wall -Wp,-D_FORTIFY_SOURCE=2 -fexceptions -fstack-protector-
strong --param=ssp-buffer-size=4 -grecord-gcc-switches -m64 -mtune=generic   -DVERSION=\"1.76\" -DXS_VERSION=\"1.76\" -fPIC "-I/usr/lib64/perl5/COR
E"  -Wall -Wno-comment -DUTF8_SUPPORT -DORA_OCI_VERSION=\"12.2.0.1\" -DORA_OCI_102 -DORA_OCI_112 dbdimp.c
gcc -c  -I/usr/include/oracle/12.2/client64 -I/usr/lib64/perl5/vendor_perl/auto/DBI -D_REENTRANT -D_GNU_SOURCE -fno-strict-aliasing -pipe -fstack-p
rotector -I/usr/local/include -D_LARGEFILE_SOURCE -D_FILE_OFFSET_BITS=64 -O2 -g -pipe -Wall -Wp,-D_FORTIFY_SOURCE=2 -fexceptions -fstack-protector-
strong --param=ssp-buffer-size=4 -grecord-gcc-switches -m64 -mtune=generic   -DVERSION=\"1.76\" -DXS_VERSION=\"1.76\" -fPIC "-I/usr/lib64/perl5/COR
E"  -Wall -Wno-comment -DUTF8_SUPPORT -DORA_OCI_VERSION=\"12.2.0.1\" -DORA_OCI_102 -DORA_OCI_112 oci8.c
Running Mkbootstrap for DBD::Oracle ()
chmod 644 Oracle.bs
rm -f blib/arch/auto/DBD/Oracle/Oracle.so
gcc  -shared -O2 -g -pipe -Wall -Wp,-D_FORTIFY_SOURCE=2 -fexceptions -fstack-protector-strong --param=ssp-buffer-size=4 -grecord-gcc-switches -m64
-mtune=generic -Wl,-z,relro  Oracle.o dbdimp.o oci8.o  -o blib/arch/auto/DBD/Oracle/Oracle.so  \
   -L/usr/lib/oracle/12.2/client64/lib -lclntsh      \

chmod 755 blib/arch/auto/DBD/Oracle/Oracle.so
cp Oracle.bs blib/arch/auto/DBD/Oracle/Oracle.bs
chmod 644 blib/arch/auto/DBD/Oracle/Oracle.bs
Manifying blib/man3/DBD::Oracle::Troubleshooting.3pm
Manifying blib/man3/DBD::Oracle::Troubleshooting::Cygwin.3pm
Manifying blib/man3/DBD::Oracle.3pm
Manifying blib/man3/DBD::Oracle::Troubleshooting::Sun.3pm
Manifying blib/man3/DBD::Oracle::Troubleshooting::Macos.3pm
Manifying blib/man3/DBD::Oracle::Troubleshooting::Hpux.3pm
Manifying blib/man3/DBD::Oracle::Troubleshooting::Vms.3pm
Manifying blib/man3/DBD::Oracle::Object.3pm
```

Installing ora2pg

1) Download ora2pg and copy/upload it to the Linux machine

2) Untar/unzip the file

   tar xjf ora2pg-19.1.tar.bz2

3) Navigate to the ora2pg folder

   cd ora2pg-19.1/

4) Install ora2pg

   perl Makefile.PL

```
[root@redlinux2 ora2pg-19.1]# perl Makefile.PL
Checking if your kit is complete...
Looks good
Writing Makefile for Ora2Pg

Done...
-----------------------------------------------------------------------
Please read documentation at http://ora2pg.darold.net/ before asking for help
-----------------------------------------------------------------------
Now type: make && make install
[root@redlinux2 ora2pg-19.1]# 
```

   make && make install

```
[root@redlinux2 ora2pg-19.1]# make && make install
cp lib/Ora2Pg.pm blib/lib/Ora2Pg.pm
cp lib/Ora2Pg/GEOM.pm blib/lib/Ora2Pg/GEOM.pm
cp lib/Ora2Pg/PLSQL.pm blib/lib/Ora2Pg/PLSQL.pm
cp lib/Ora2Pg/MySQL.pm blib/lib/Ora2Pg/MySQL.pm
cp scripts/ora2pg blib/script/ora2pg
/usr/bin/perl -MExtUtils::MY -e 'MY->fixin(shift)' -- blib/script/ora2pg
cp scripts/ora2pg_scanner blib/script/ora2pg_scanner
/usr/bin/perl -MExtUtils::MY -e 'MY->fixin(shift)' -- blib/script/ora2pg_scanner
Manifying blib/man3/ora2pg.3
Installing /usr/local/share/perl5/Ora2Pg.pm
Installing /usr/local/share/perl5/Ora2Pg/GEOM.pm
Installing /usr/local/share/perl5/Ora2Pg/PLSQL.pm
Installing /usr/local/share/perl5/Ora2Pg/MySQL.pm
Installing /usr/local/share/man/man3/ora2pg.3
Installing /usr/local/bin/ora2pg
Installing /usr/local/bin/ora2pg_scanner
Installing default configuration file (ora2pg.conf.dist) to /etc/ora2pg
Appending installation info to /usr/lib64/perl5/perllocal.pod
[root@redlinux2 ora2pg-19.1]#
```

Testing ora2pg installation

Type ora2pg –version as following:

ora2pg --version

References

http://ora2pg.darold.net/documentation.html

https://www.oracle.com/technetwork/database/enterprise-edition/downloads/index.html

https://metacpan.org/pod/DBD::Oracle

Feedback and suggestions

If you have feedback or suggestions for improving this data migration asset, please contact the Data Migration Jumpstart Team (askdmjfordmtools@microsoft.com). Thanks for your support!

Note: For additional information about migrating various source databases to Azure, see the Azure Database Migration Guide.