



QUICK START GUIDE - TIME MACHINE® LINUX FOR ORACLE 11g

EVALUATING SOLUTION-SOFT’S TIME MACHINE WITH ORACLE 11G ON LINUX O/S

The following is a quick guide to evaluating Solution-Soft’s Time Machine with Oracle11g on Linux installed on an Intel machine. This paper will show how simple it is to integrate Time Machine to perform date & time (temporal) testing with two instances of Oracle11g running under separate user accounts with different virtual dates

NOTE: This paper is specific to Time Machine for use with Linux. For those running on other platforms, please refer to the Time Machine manual or contact Solution-Soft support at support@solution-soft.com.

Time Machine for Oracle 11g is supported on Windows, AIX, HP-UX, Linux, and Solaris

System Configuration used in creating this paper:

O/S: Oracle Enterprise Linux, 1 CPU, 2.4 Gb Ram

Time Machine: Version 6.1, R6 for Linux Kernel 2.6

Oracle: Oracle 11g, Release 2

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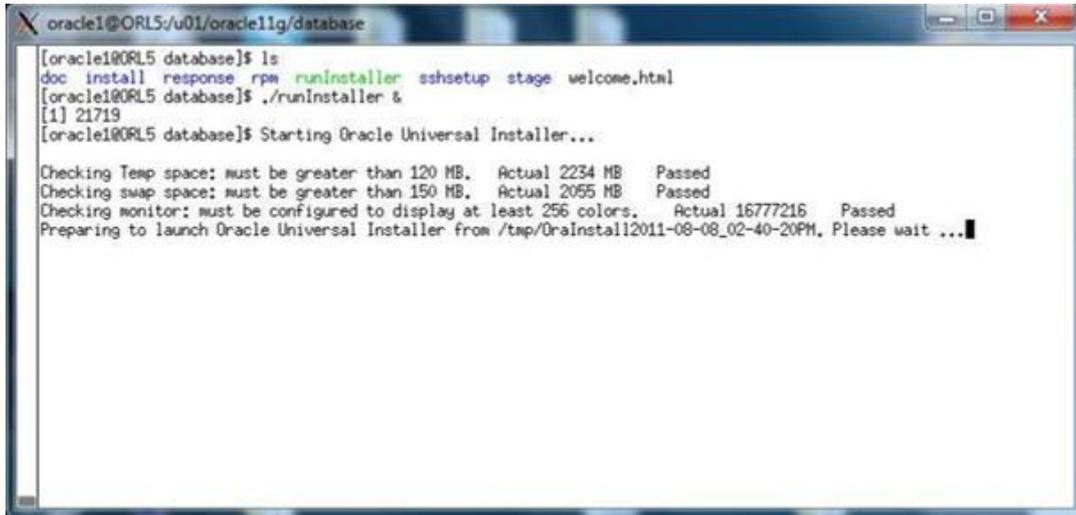
ORACLE 11G INSTALLATION

- 1. Create 2 user accounts that will be using the Oracle db. We used "oracle1" and "oracle2"
a. Create 2 folders for each user "u01" and "u02" outside of the user's home directories.
2. Download the 2 CD's for Oracle 11g on Linux
a. Files we used were linux.x64_11gR2_database_1of2.zip, linux.x64_11gR2_database_2of2.zip
3. Unzip both files inside the same directory (for Oracle1 unzip in u01, for Oracle2 unzip in u02.) Do not unzip each CD in different directories otherwise you will receive the error below:

Invalid source path './stage/Components/oracle.jdk/1.5.0.17.0/1/DataFiles' specified for unzip. Unzip command failed. Please check oraparam.ini and specify a valid source path.
: No such file or directory

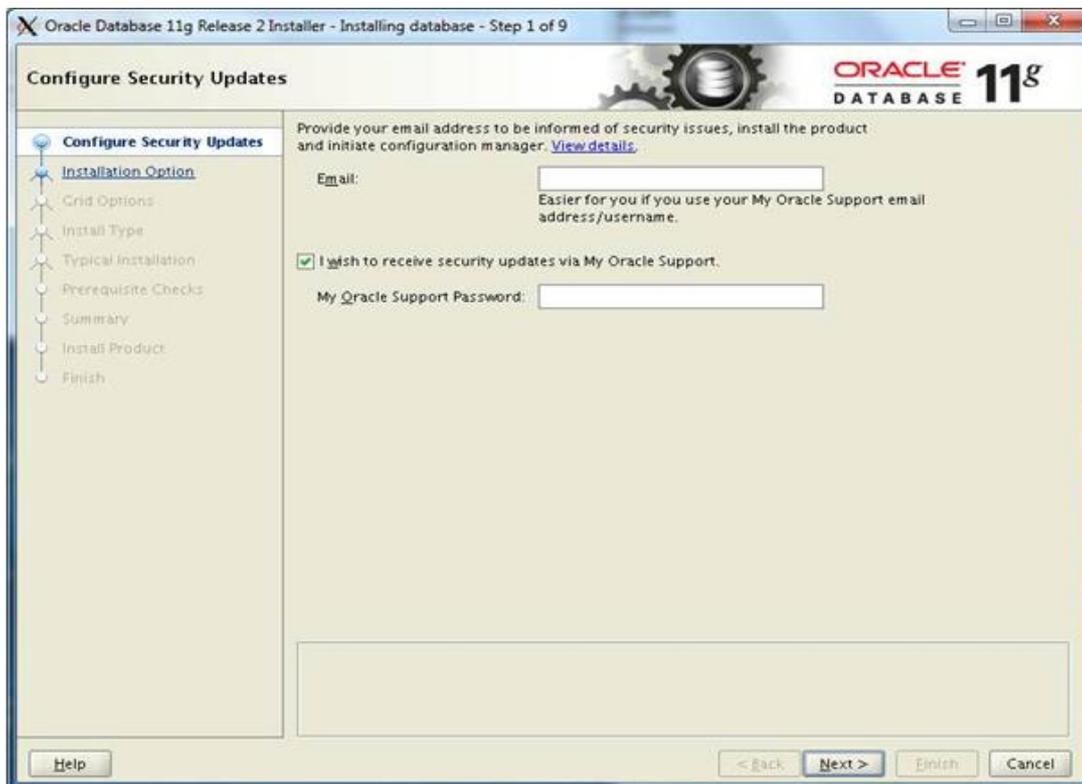
- a. Each user installing Oracle needs to have full ownership of their installation files. So in the “**oracle1**” folder the 2 zip files should be under the ownership of user “**oracle1**” before unzipping. Same goes for **oracle2**. Otherwise you need to manually change the ownership of the entire unzipped directory with chown or chmod.

4. Log in as the first user, “**oracle1**” and go into the “**u01/database/**” folder and execute “**./runInstaller**”. Then follow the installation GUI.

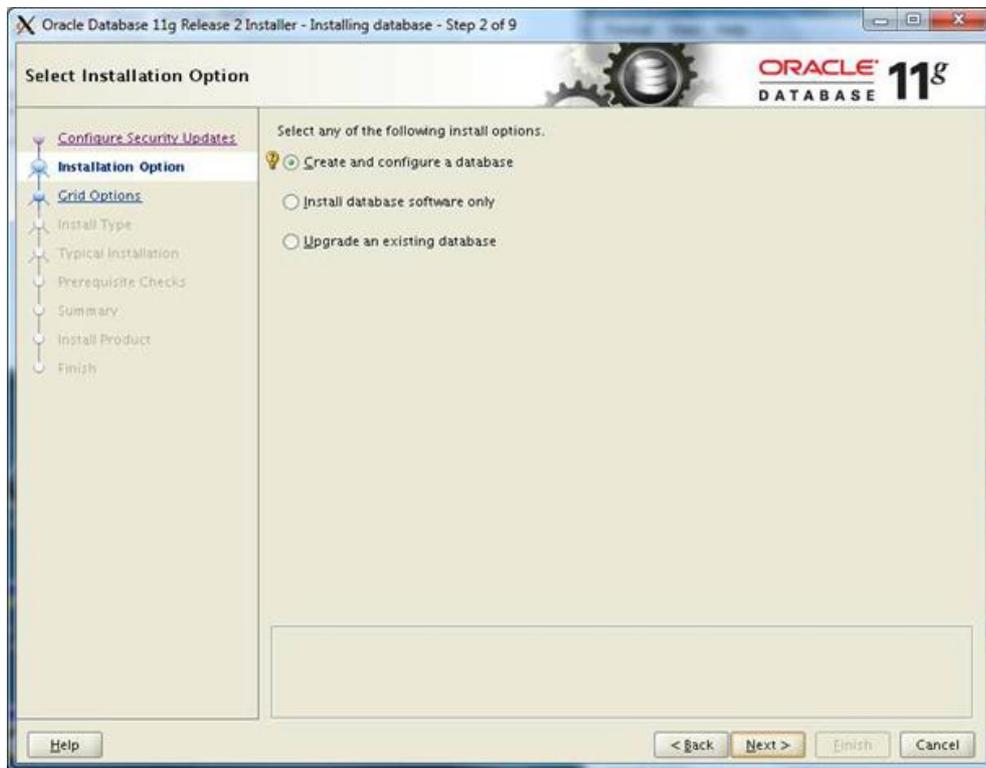


5. For *Configure Security Updates*, Enter your email address you registered with Oracle and press **Next**

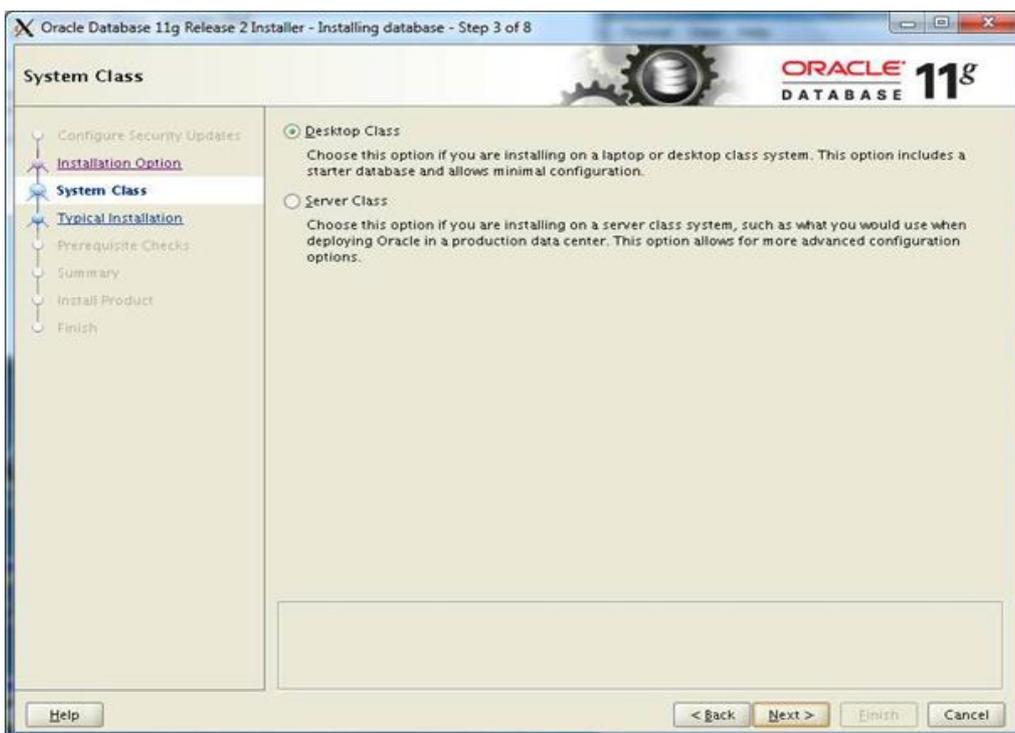
- a. The checkbox is optional; for this install we unchecked it



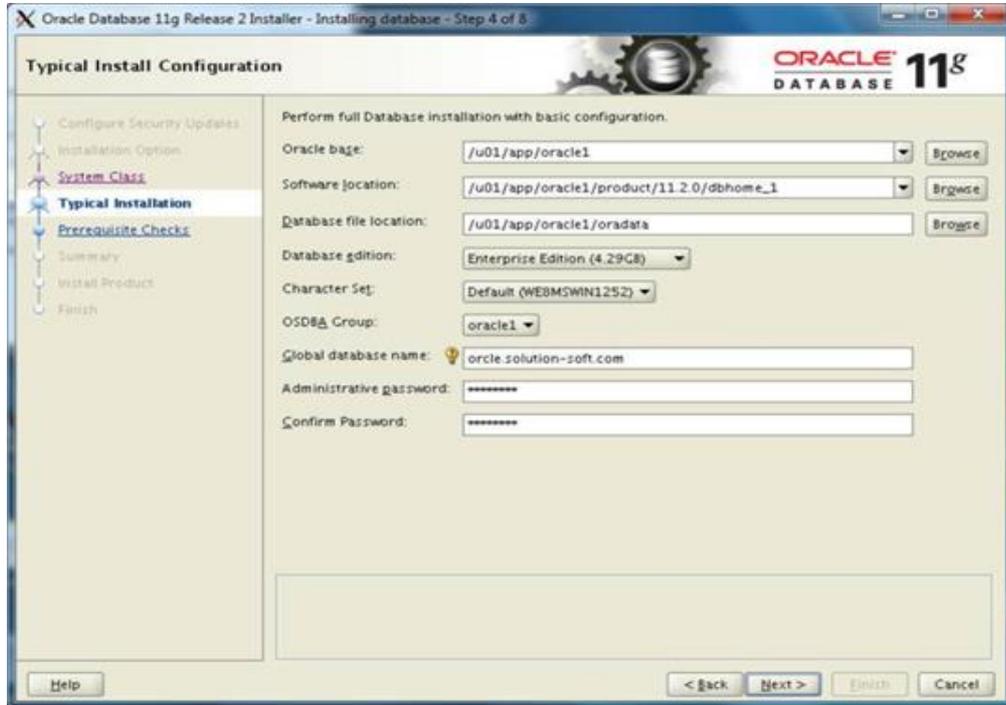
6. For *Installation Options* choose the appropriate option and click **Next**
- a. We selected “**Create and configure database**” This option creates a standard database along with installing Oracle 11g.



7. For *System Class* choose your option and click **Next**
- a. We selected **Desktop Class**



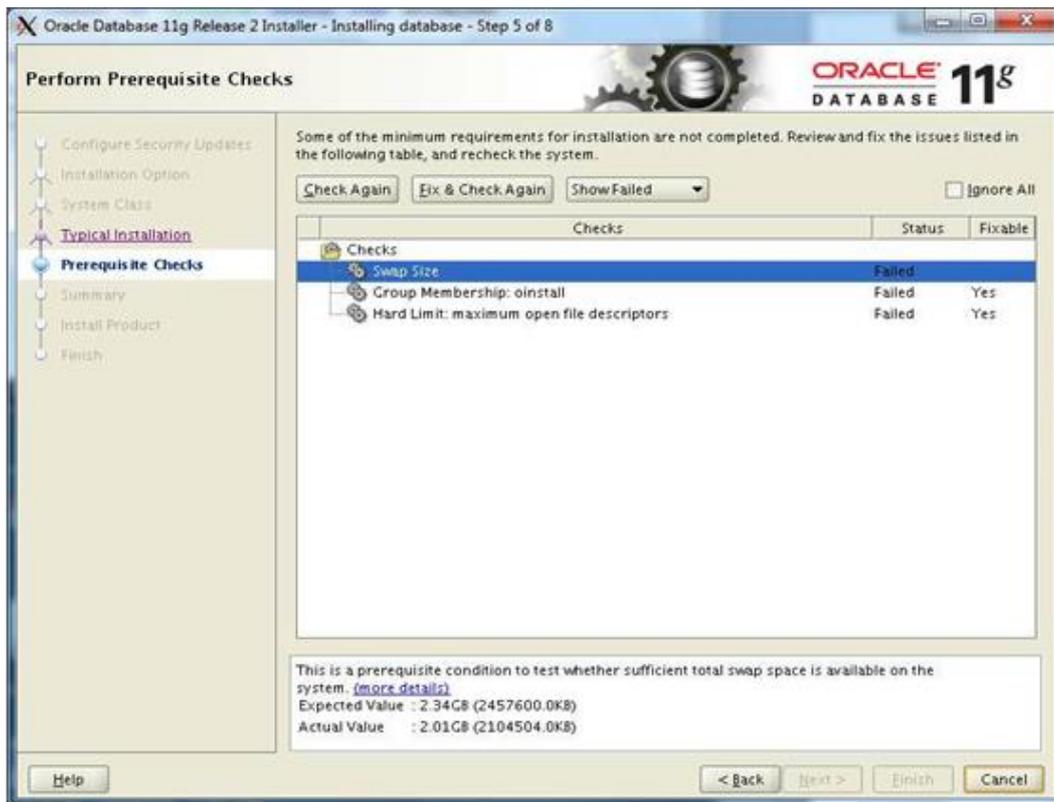
8. For *Typical Installation*, the fields will be populated. We kept the default locations and added a password
- a. Password must be 8 characters minimum containing one upper case letter, one lower case letter, and one number.



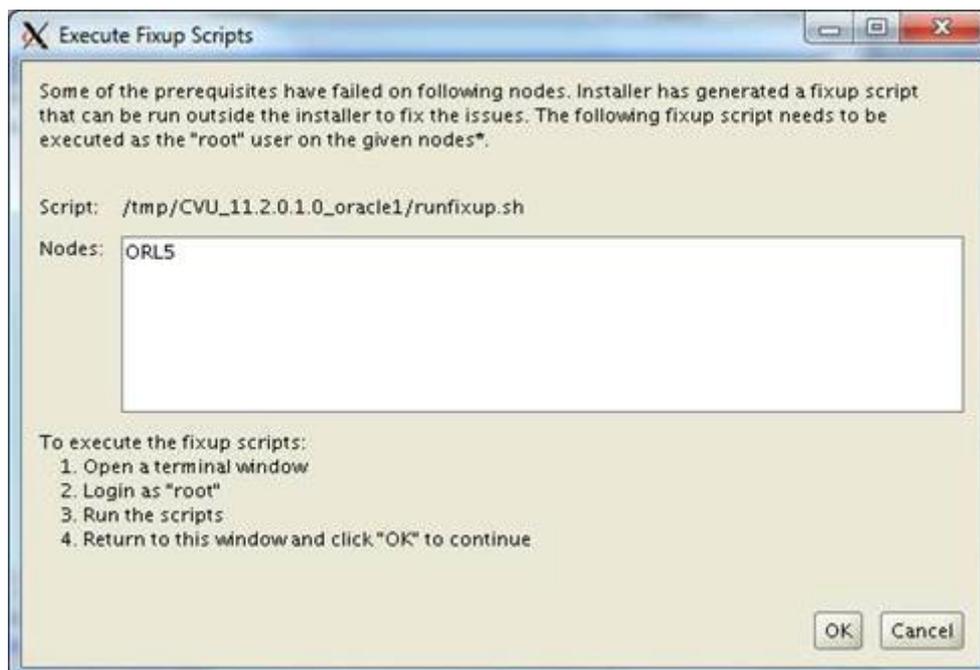
- b. If you receive the below error, change the “**Global database name**”



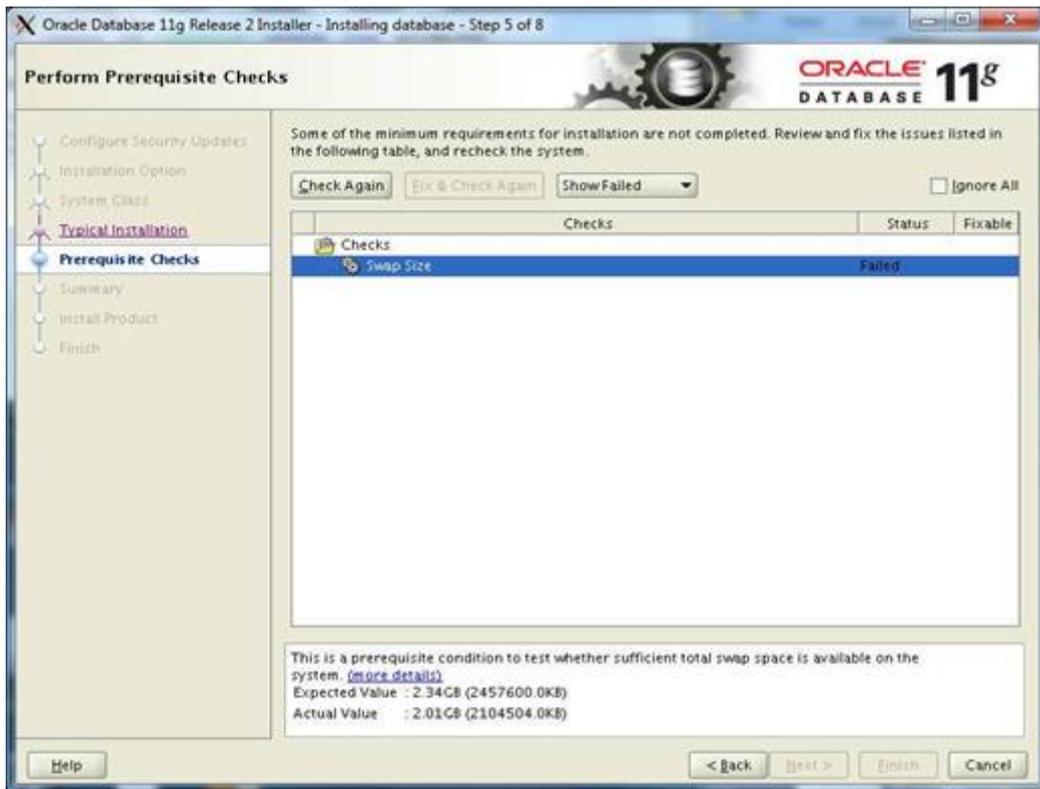
9. For *Prerequisite Checks*, the course of action will depend on your errors given.



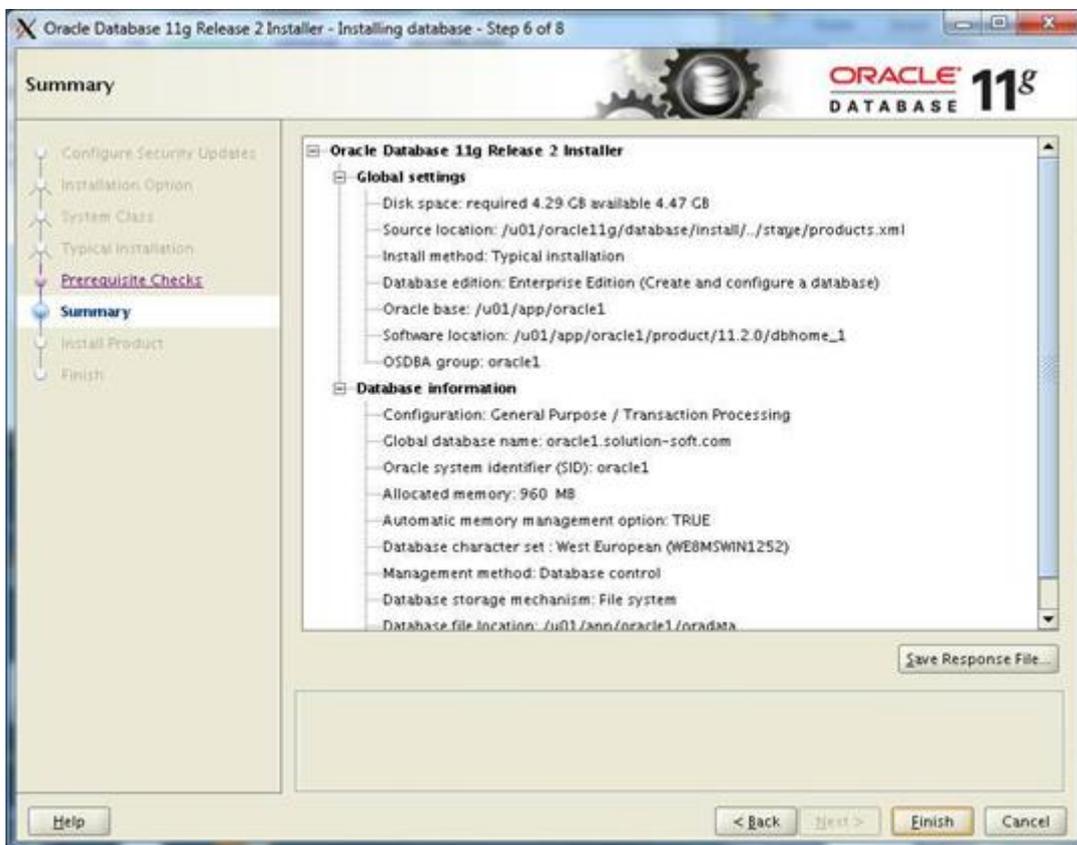
- a. Click **Fix & Check Again**
 - i. Follow the instructions on the bottom of the pop up window to execute the script



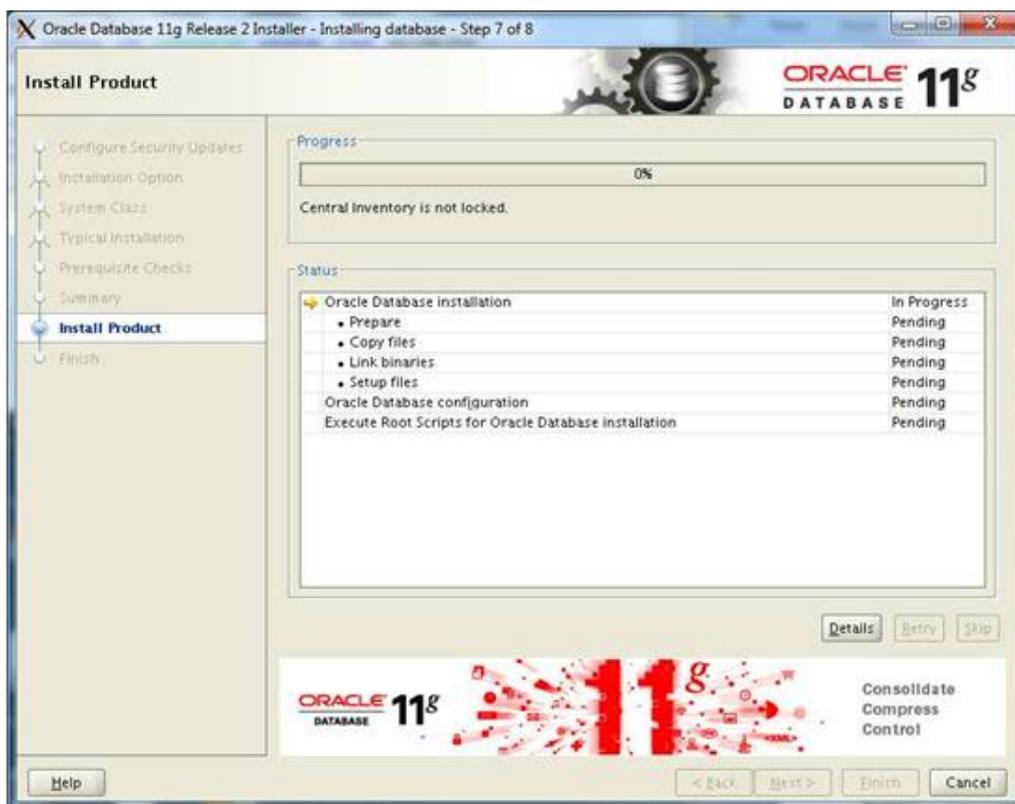
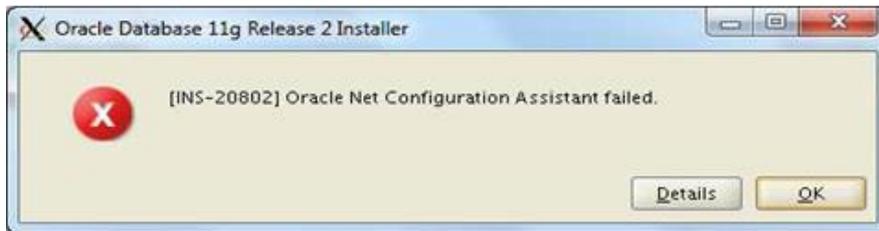
- b. If presented with a swap size error, the script will be unable to fix the issue and you will have to manually assign more space.
 - ii. However, if your usage permits it, you can click the top right **Ignore All** and click **Next**. Being as this guide is a Proof-of-Concept, we chose **Ignore All**



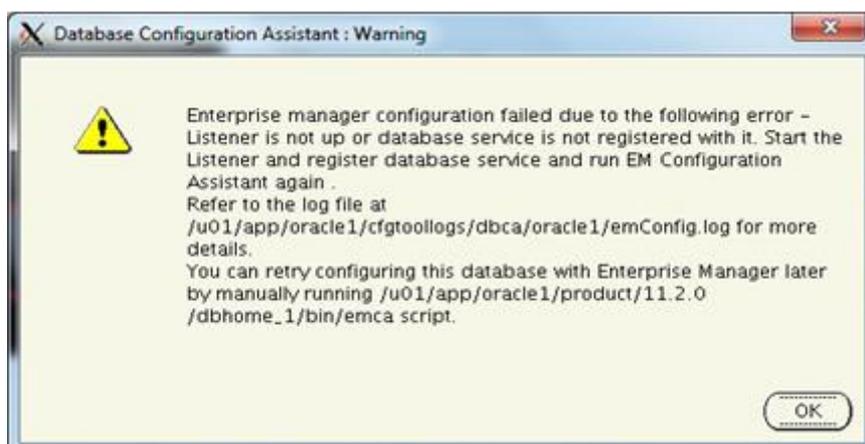
10. Click **Finish** and wait for Installation to complete

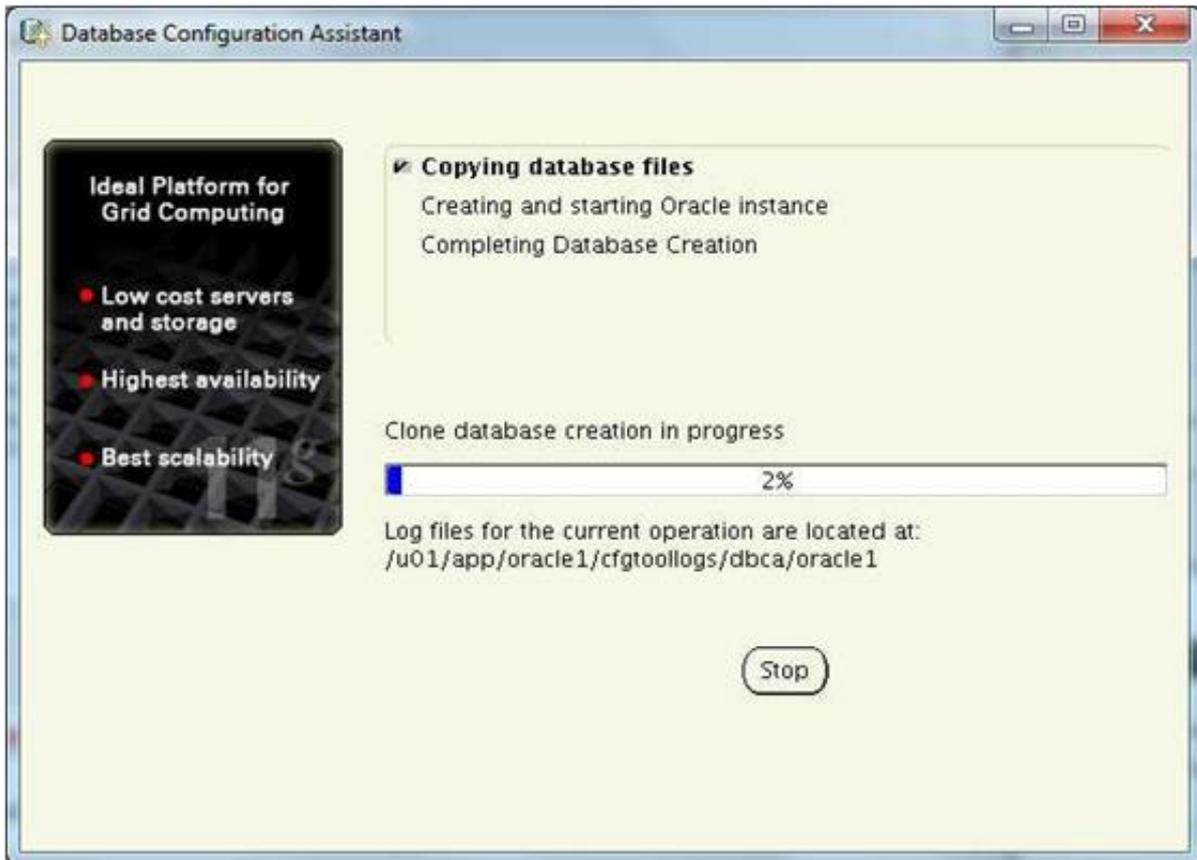


11. If the below error occurs during the install, Click **OK** to close the window and **Retry** at the main install window. For us, the **Retry** fixed the error



12. During the *Database Configuration Assistant*, if a Warning pops up, take down the info as a precaution and click **OK** to resume install.





13. On the completed *Database Configuration Assistant*, click **Password Management**.

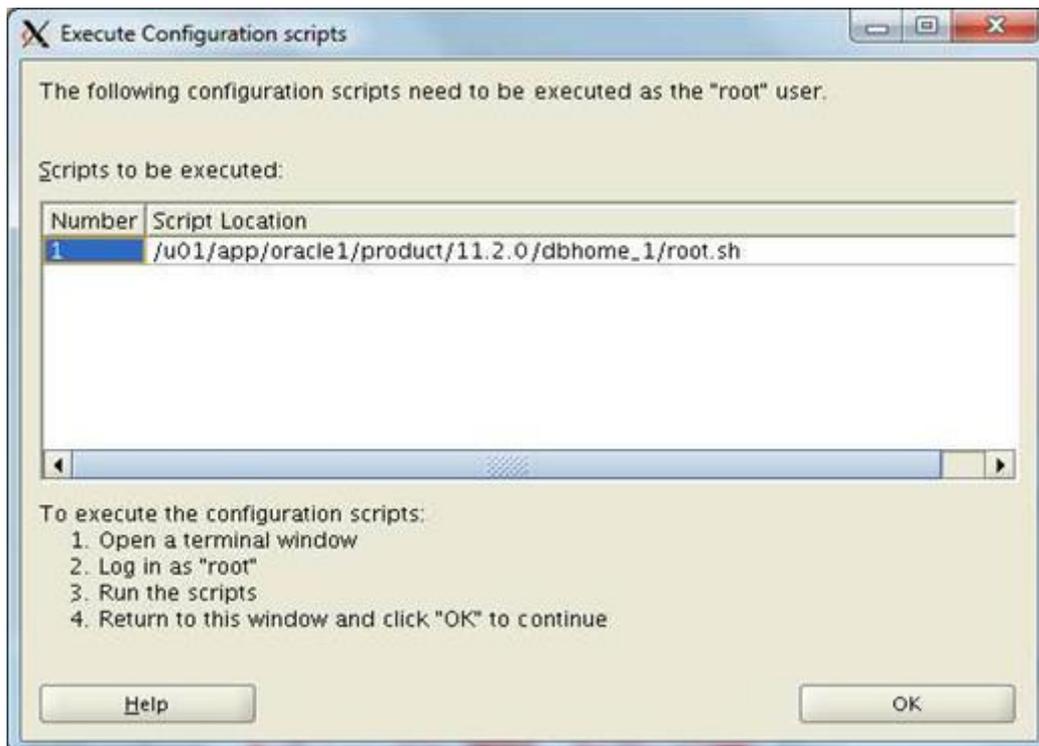


- a. For this install we assigned a default password for the accounts SYS and SYSTEM. Click **OK** when finished



- i. The password must be minimum 8 characters long and contain at least one upper case character, one lower case character and one digit.

14. Afterwards, follow the instructions to execute the **root.sh** script. When asked to “**Enter the full pathname of the local bin directory:**” we entered the default “**/usr/local/bin**” and selected the recommended answers to the remaining questions. See the terminal picture below



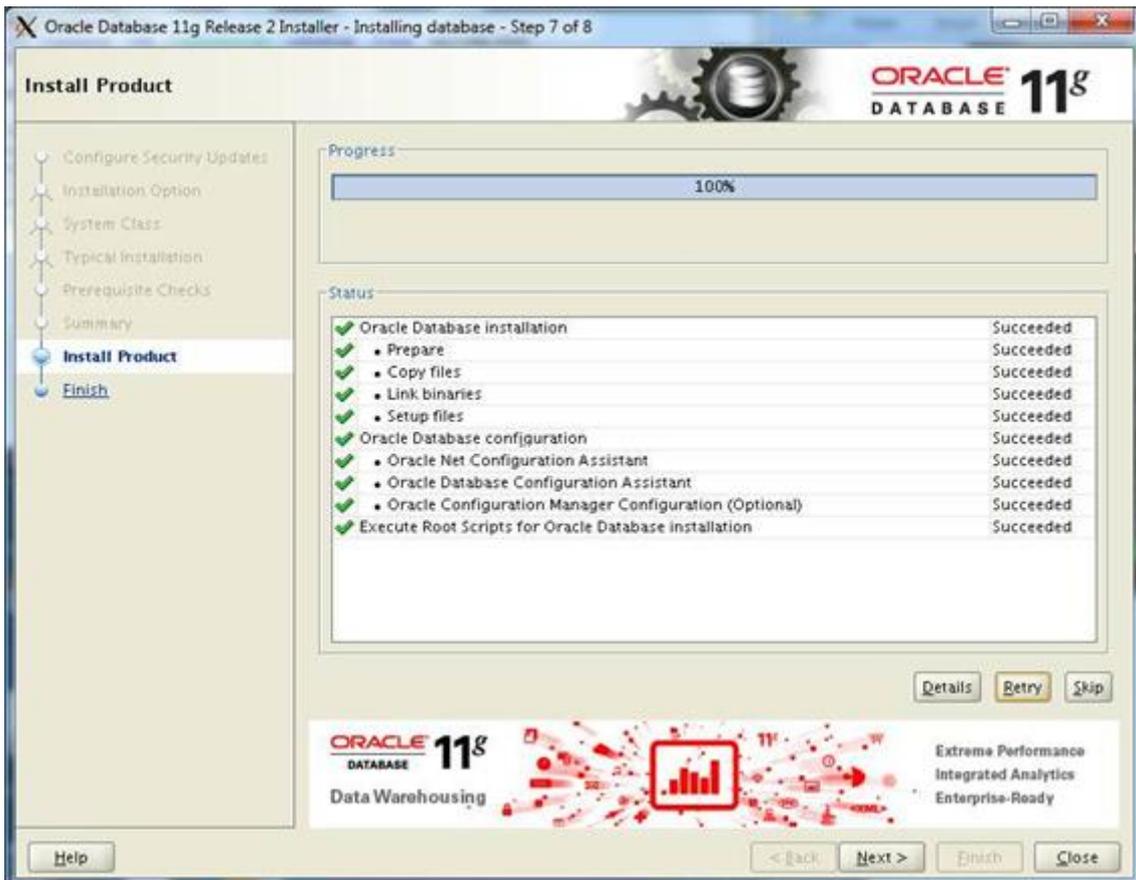
```
root@ORL5:/u01/app/oracle1/product/11.2.0/dbhome_1
Running Oracle 11g root.sh script...

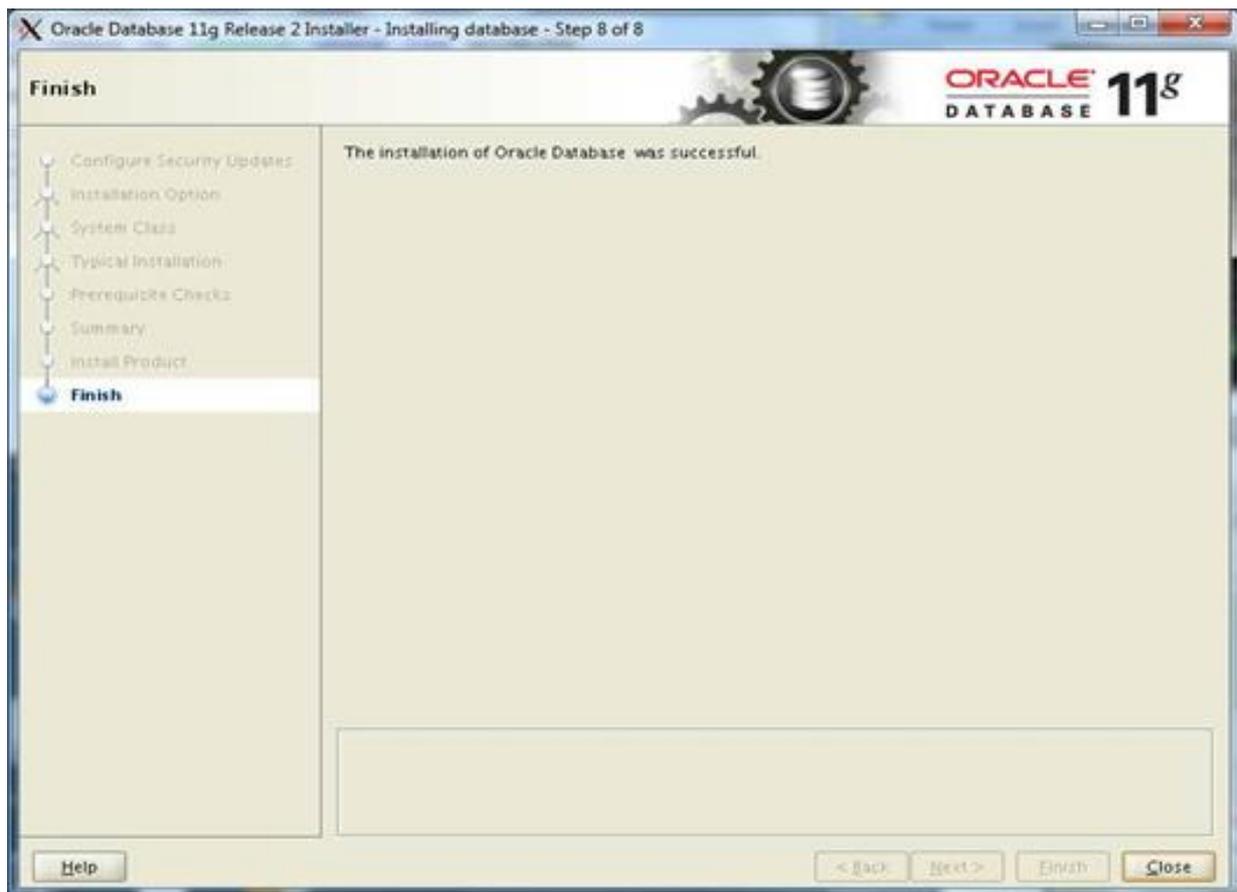
The following environment variables are set as:
ORACLE_OWNER= oracle1
ORACLE_HOME= /u01/app/oracle1/product/11.2.0/dbhome_1

Enter the full pathname of the local bin directory: [/usr/local/bin]: /usr/local
/bin
The file "dbhome" already exists in /usr/local/bin. Overwrite it? (y/n)
[n]: y
Copying dbhome to /usr/local/bin ...
The file "oraenv" already exists in /usr/local/bin. Overwrite it? (y/n)
[n]: y
Copying oraenv to /usr/local/bin ...
The file "coraenv" already exists in /usr/local/bin. Overwrite it? (y/n)
[n]: y
Copying coraenv to /usr/local/bin ...

Entries will be added to the /etc/oratab file as needed by
Database Configuration Assistant when a database is created
Finished running generic part of root.sh script.
Now product-specific root actions will be performed.
Finished product-specific root actions.
[root@ORL5 dbhome_1]#
```

15. . Click **Next** and **Close**





16. Now user “**oracle1**” is fully installed. For “**oracle2**” follow same steps; log in as oracle2, run the installer and use the same name convention but with a ‘2’.

(If installing 2 Oracle11g instances, you may get the below error. If so, go to the **/etc/orainst.loc** file and modify the file to say u02 instead of u01)



POST-INSTALL CONFIGURATION (SQLPLUS)

Before starting up SQLPLUS to access your database you need to set up oracle shell environmental variables.

1. Execute the following commands depending on your shell. These values are derived from step 8 of the "Oracle11g Install".
 - a. For csh

```
setenv ORACLE_SID "orcle"
setenv ORACLE_BASE "/u01/app/oracle1"
setenv ORACLE_HOME "/u01/app/oracle1/product/11.2.0/dbhome_1"
```
 - b. For bash

```
export ORACLE_SID=orcle
export ORACLE_BASE=/u01/app/oracle1
export ORACLE_HOME=/u01/app/oracle1/product/11.2.0/dbhome_1
```
 - c. Type "**env | grep ora**" to check if the environment variables were loaded.
2. Now go into your **"/u01/app/oracle1/product/11.2.0/dbhome_1/bin"** folder and execute **"./sqlplus"**.
3. Log into **SQL Plus**
 - a. For our guide we used **"sys as sysdba"** with the password for **SYS** we created in the "Oracle11g Install" Step 13
4. Once logged in, type **"startup"** to officially start the Oracle database for use.
 - a. If you get the error **"ORA-00845: MEMORY_TARGET not supported on this system"**, you can follow guides online to unmount/remount **"tmpfs"** and allocating more memory. However simply rebooting the machine solved the issue on our install.
5. Now you're done, press **Exit**.

TIME MACHINE CONFIGURATION

Before running Time Machine to create a virtual clock and access it from your SQLPLUS database, you need to configure the environmental variables from the Post-Install Configuration (SQLPLUS) section up above.

1. Go into the Time Machine directory (**/etc/ssstm**) and execute the below command as **root**
 - a. **tmuser -a -u oracle1 -x** (enter your own virtual date)
 - i. **-x** or **-h** or **-y** are acceptable ending parameters to create your own time. For this guide we used **-y** and created a virtual date 5 years in the future.
2. Go back to **"/u01/app/oracle1/product/11.2.0/dbhome_1/bin"** and execute **"./sqlplus"**.
3. Log in and you will see your virtual date in the sql welcome header
 - a. Below you can see our virtual date that we set for 5 years in the future, year 2016

```

oracle1@ORL5:/u01/app/oracle1/product/11.2.0/dbhome_1/bin
[oracle1@ORL5 bin]$ ./sqlplus
SQL*Plus: Release 11.2.0.1.0 Production on Mon Aug 8 20:03:41 2016
Copyright (c) 1982, 2009, Oracle. All rights reserved.
Enter user-name: █

```

CLIENT/LISTENER CONFIGURATION (EXTERNAL CLIENT ACCESSING DB)

Before running the client you need to start the Listener service. Before running the Listener service you need to make sure that you've started up the Oracle Database ("**startup**" in sqlplus).

1. Go to the "**u01/app/oracle1/product/11.2.0/dbhome_1/bin**" and execute "**./lsnrctl**".
 - a. If you receive the below error, you must go into the "listener.ora" file located in the directory `u01/app/oracle1/product/11.2.0/dbhome_1/network/admin` and comment out with the '#' character the line '(ADDRESS = (PROTOCOL = IPC)(KEY = EXTPROC1521))'

```

TNSLSNR for Linux: Version 11.2.0.1.0 - Production
System parameter file is /u01/app/oracle1/product/11.2.0/dbhome_1/network/admin/listener.ora
Log messages written to /u01/app/oracle1/diag/tnslsnr/ORL5/listener/alert/log.xml
Error listening on: (DESCRIPTION=(ADDRESS=(PROTOCOL=IPC)(KEY=EXTPROC1521)))
TNS-12555: TNS:permission denied
TNS-12560: TNS:protocol adapter error
TNS-00525: Insufficient privilege for operation
Linux Error: 1: Operation not permitted

```

Fixed listener.ora file

```

# listener.ora Network Configuration File:
# Generated by Oracle configuration tools.
LISTENER =
  (DESCRIPTION_LIST =
    (DESCRIPTION =
      # (ADDRESS = (PROTOCOL = IPC)(KEY = EXTPROC1521))
      (ADDRESS = (PROTOCOL = TCP)(HOST = localhost)(PORT = 1521))
    )
  )

ADR_BASE_LISTENER = /u01/app/oracle1

```

2. Enter **“start”**

3. Now the listener service is started and you can make outside client queries to the database.
 - a. The Listener Configuration uses 3 files **“listener.ora” “tnsnames.ora” “sqlnet.ora”** located in **“u01/app/oracle1/product/11.2.0/dbhome_1/network/admin”** that can be configured as you wish. However the default configuration is fine and how we left it in this guide. For more details please refer to

http://download.oracle.com/docs/cd/E11882_01/network.112/e10836/listenercfg.htm

The next steps show how to install the Oracle client. This guide installs a 32bit Windows client and connects to the Oracle11g database. The below link has instructions for configuring the client for Unix/Linux/Windows.

http://download.oracle.com/docs/cd/E11882_01/server.112/e16604/apd.htm#SQPUG157

4. Download the **“Oracle Instant Client”** for your correct platform with the below link

<http://www.oracle.com/technetwork/database/features/instant-client/index-097480.html>

- a. Download the **“Client Basic”** and **“Client Package – SQL *Plus”** We used the packages below.

Version 11.2.0.1.0

Instant Client Package - Basic: All files required to run OCI, OCCI, and JDBC-OCI applications

[instantclient-basic-win32-11.2.0.1.0.zip](#) (51,458,910 bytes)

*Instant Client Package - SQL*Plus: Additional libraries and executable for running SQL*Plus with Instant Client

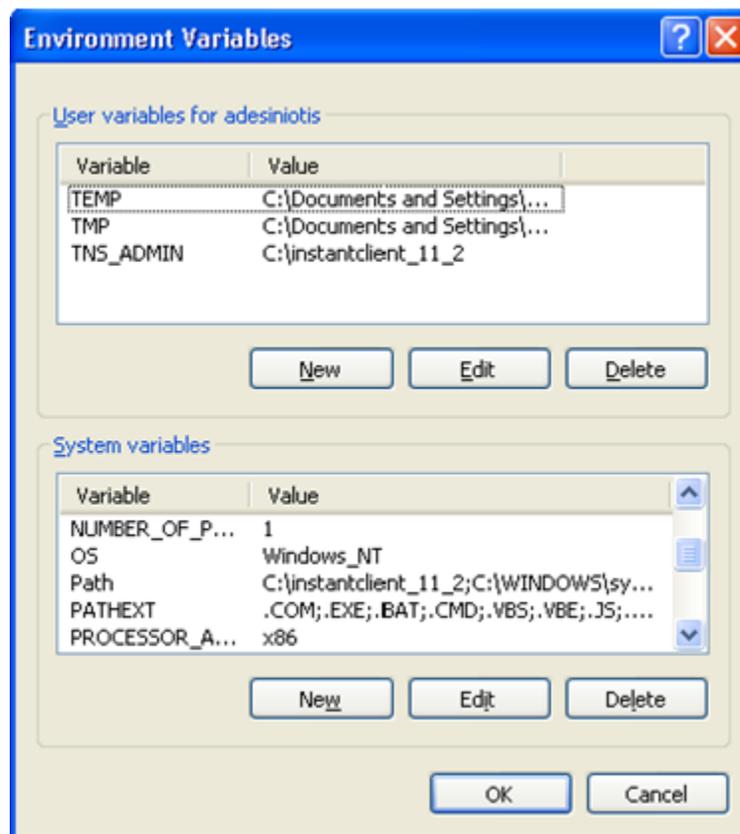
[instantclient-sqlplus-win32-11.2.0.1.0.zip](#) (758,913 bytes)

5. Unzip both packages into the top directory, e.g. **C:\instantclient_11_2**

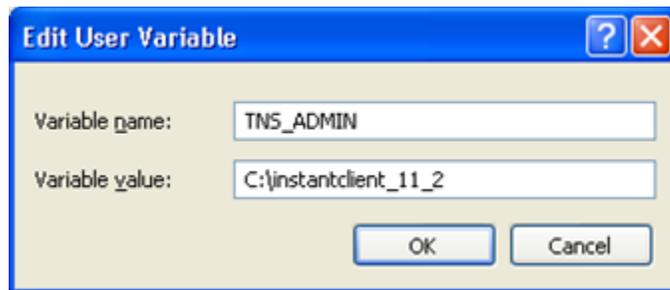
6. Make a copy of the **“tnsnames.ora”** file from the server directory **“u01/app/oracle1/product/11.2.0/dbhome_1/network/admin”** to the client directory **C:\instantclient_11_2**
 - a. If any problems occur connecting the client, make sure the HOST value inside the **“tnsnames.ora”** is the explicit IP address of the server 192.xxx.xx.xxx
 - b. You may also need to explicitly enter the address 192.xxx.xx.xxx in replace of **“localhost”** in the listener.ora and tnsnames.ora files in the server directory

Before running the **sqlplus.exe** inside **C:\instantclient_11_2**, environment variables need to be set.

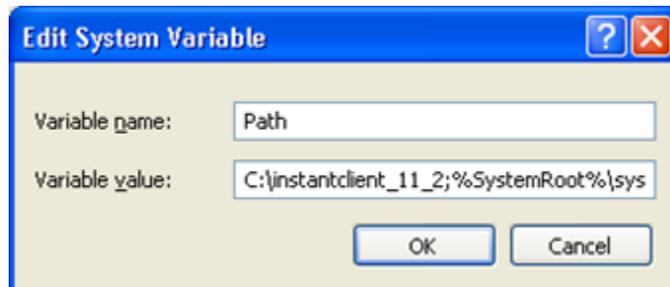
7. Right click **My Computer** and click the **Advanced Tab** and click **Environmental Variables**



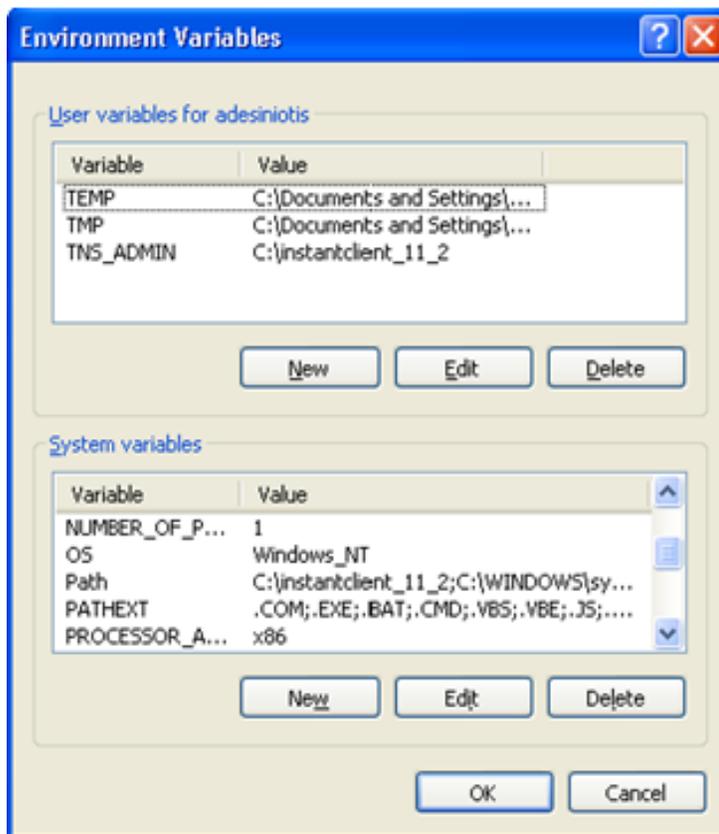
8. Create a new “User Variables” called **TNS_ADMIN** with the installed client folder **C:\instantclient_11_2** as the Variable Value



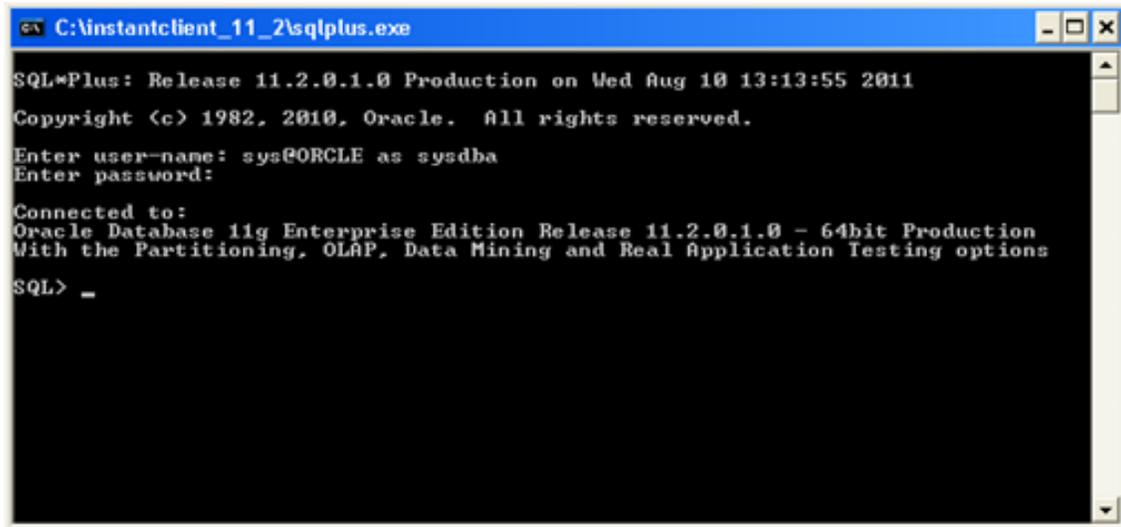
9. Scroll down the “System variables” and edit the “Path” variable. Paste the location **C:\instantclient_11_2** in the Variable value in front of all the present values. Make sure to include a ‘;’ to separate it from the current values, as below.



10. Press OK. Your final window should look similar to below



11. Open the `C:\instantclient_11_2` folder and execute the `sqlplus.exe`
12. For the sake of testing, use the username `sys` and the password we created before to log in. The format is `username@identifier`. Then your password.
 - a. **ORACLE** is the identifier from our `tnsnames.ora` file. It's a representation of hostname/sid.
 - b. If you get the error "**ORA-12543: TNS: destination host unreachable**" and your configuration is completely correct, then turn off the firewall on the server/database system and you will be able to connect with the client.

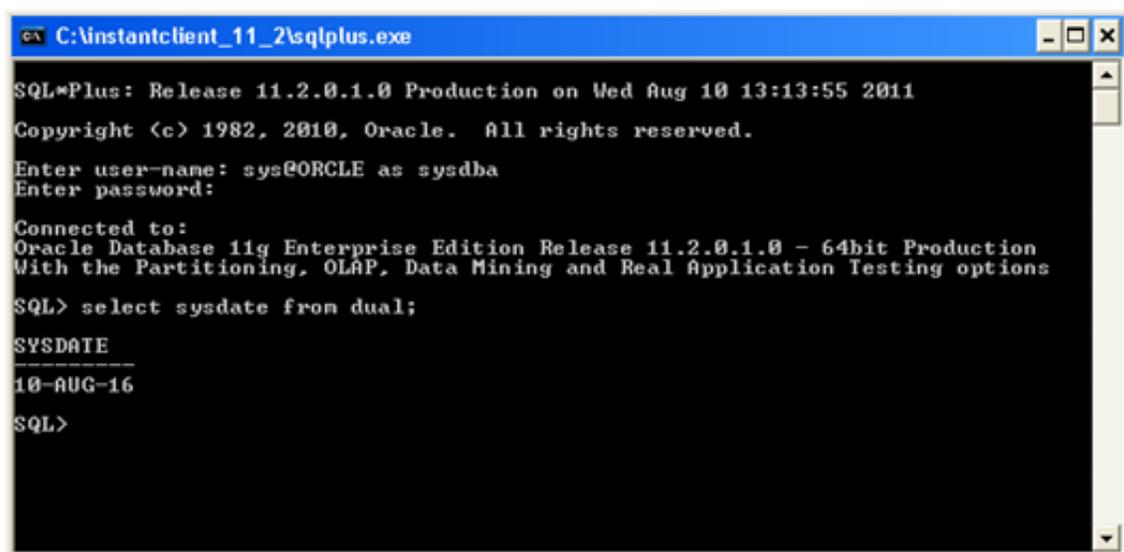


```
C:\instantclient_11_2\sqlplus.exe
SQL*Plus: Release 11.2.0.1.0 Production on Wed Aug 10 13:13:55 2011
Copyright (c) 1982, 2010, Oracle. All rights reserved.
Enter user-name: sys@ORACLE as sysdba
Enter password:
Connected to:
Oracle Database 11g Enterprise Edition Release 11.2.0.1.0 - 64bit Production
With the Partitioning, OLAP, Data Mining and Real Application Testing options
SQL> _
```

For more details, refer to the link below:

https://docs.oracle.com/cd/E11882_01/server.112/e16604/apd.htm#SQPUG157

13. You've successfully installed an Oracle client and remotely logged into your database server. Below is the final screenshot of accessing the virtual date, created earlier in the guide, from the client.



```
C:\instantclient_11_2\sqlplus.exe
SQL*Plus: Release 11.2.0.1.0 Production on Wed Aug 10 13:13:55 2011
Copyright (c) 1982, 2010, Oracle. All rights reserved.
Enter user-name: sys@ORACLE as sysdba
Enter password:
Connected to:
Oracle Database 11g Enterprise Edition Release 11.2.0.1.0 - 64bit Production
With the Partitioning, OLAP, Data Mining and Real Application Testing options
SQL> select sysdate from dual;
SYSDATE
-----
10-AUG-16
SQL>
```

As you can see, the SQL call retrieves the virtual date we created (5 years in the future to 2016), differing from the SQL header system date.

- a. If you do not get the virtual date, you have to restart the LISTENER service.
 - i. Close and reopen the client without logging in.
 - ii. Go to the “**u01/app/oracle1/product/11.2.0/dbhome_1/bin**” and execute “**./lsnrctl**”.
 - iii. Enter “**stop**” then “**start**”
 - iv. Log into the client and check the date. You will now see the virtual date.



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