



WHITE PAPER

QUICK GUIDE - TIME MACHINE® WINDOWS FOR ORACLE 11g

EVALUATING SOLUTION-SOFT'S TIME MACHINE WITH ORACLE 11G ON WINDOWS O/S

The following is a quick guide to evaluating Solution-Soft's Time Machine with Oracle11g on Microsoft Windows operating system. This paper will show how simple it is to integrate Time Machine to perform date & time (temporal) testing with Oracle11g.

Note: This paper is specific to Time Machine for use with Windows. 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 Oracle11g is supported on Windows, AIX, HP-UX, Linux, and Solaris

System Configuration used in creating this paper:

OS: Windows Server 2003, 1 CPU, 2 Gb Ram

Time Machine: Version7.0.5 for Windows 64bit

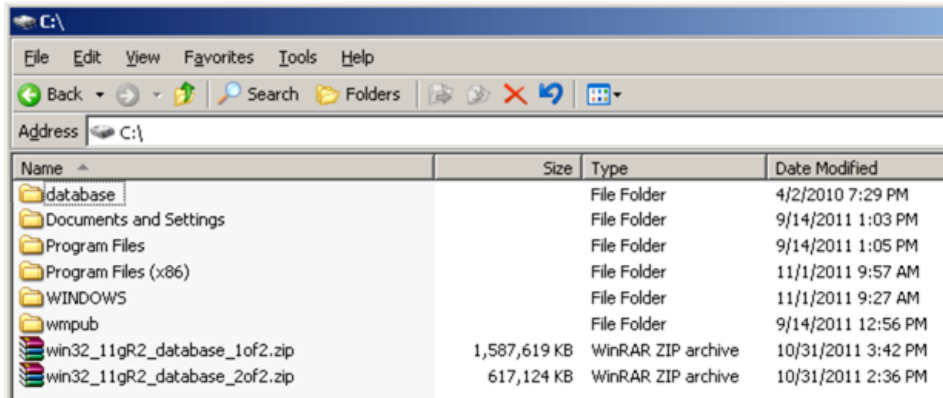
Oracle: Oracle 11g, Release 2

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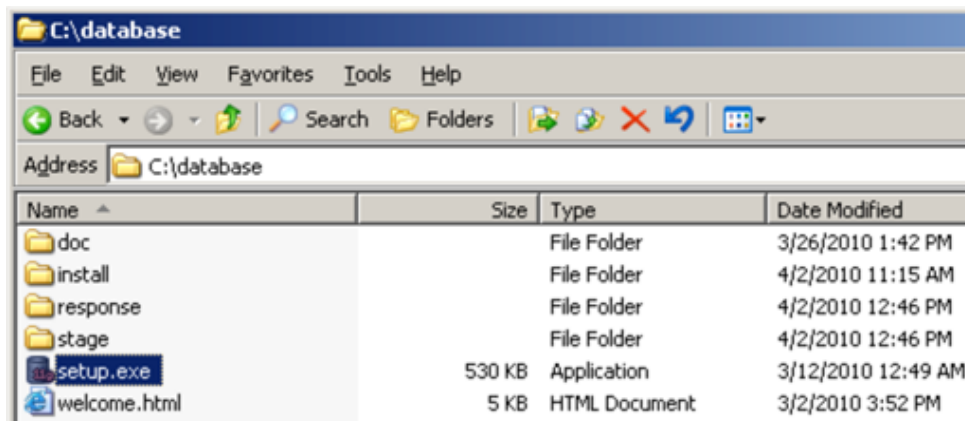
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ORACLE 11G INSTALLATION

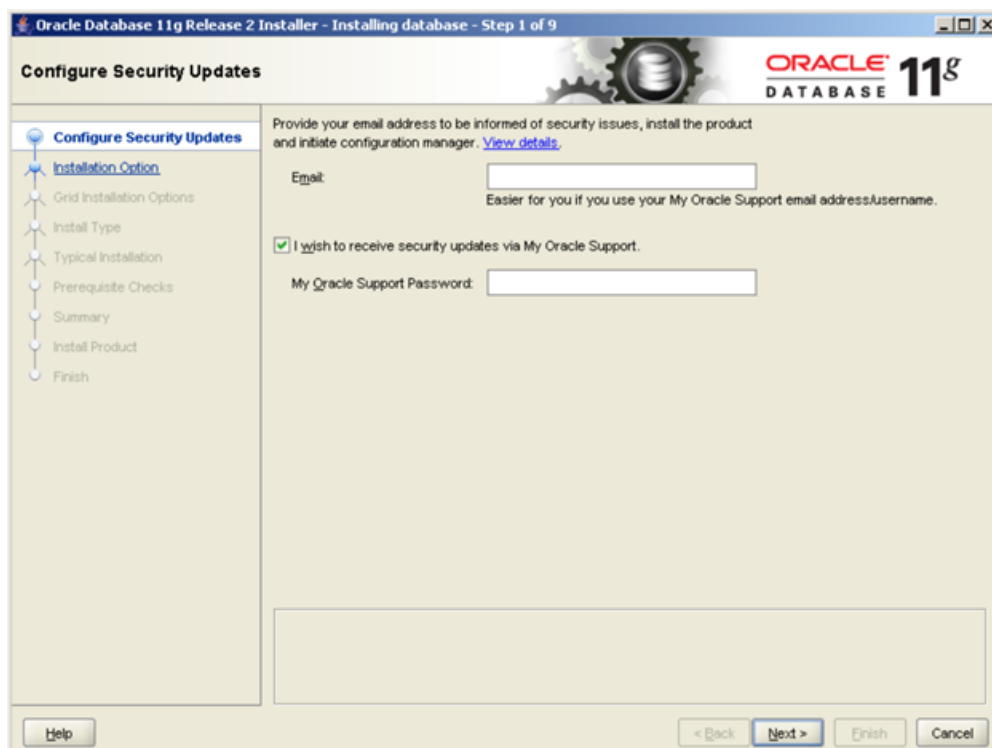
1. Download the 2 CD's for Oracle 11g on Windows 2003 from the Oracle web-site.
 - a. Files we used were **win32_11gR2_database_1of2.zip**, **win32_11gR2_database_2of2.zip**
2. Unzip both files inside the same directory, we chose the root directory C:



3. Go into the **database** folder and execute **setup.exe**



4. For *Configure Security Updates*, enter the e-mail address you registered with Oracle and press **Next**
(The checkbox is optional; for this install we unchecked it)



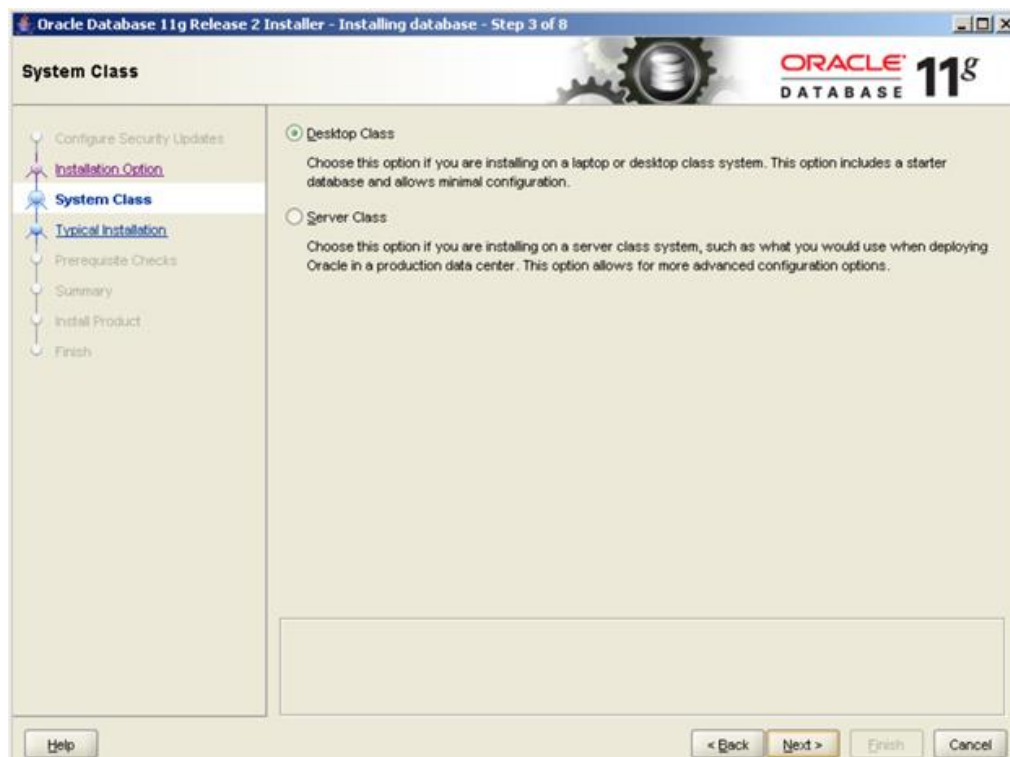
5. For *Installation Options* choose the appropriate option and click **Next**

- a. We selected “**Create and configure database**”. This option creates a standard database along with installing Oracle11g.



6. For System Class choose your option and click **Next**

- a. We selected “**Desktop Class**”



7. For Typical Installation, the fields will be populated. We kept the default locations and added a password.

- a. Passwords must be 8 characters minimum containing at least one upper case letter, one lower case letter, and one number.

Oracle Database 11g Release 2 Installer - Installing database - Step 4 of 8

Typical Install Configuration

Perform full Database installation with basic configuration.

Oracle base: C:\app\Administrator Browse

Software location: C:\app\Administrator\product11.2.0\dbhome_1 Browse

Database file location: C:\app\Administrator\oradata Browse

Database edition: Enterprise Edition (3.27GB)

Character Set: Default (WE8MSWIN1252)

Global database name: orcl.168.61.135

Administrative password: *****

Confirm Password: *****

Help < Back Next > Finish Cancel

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

Oracle Database 11g Release 2 Installer - Installing database - Step 6 of 8

Summary

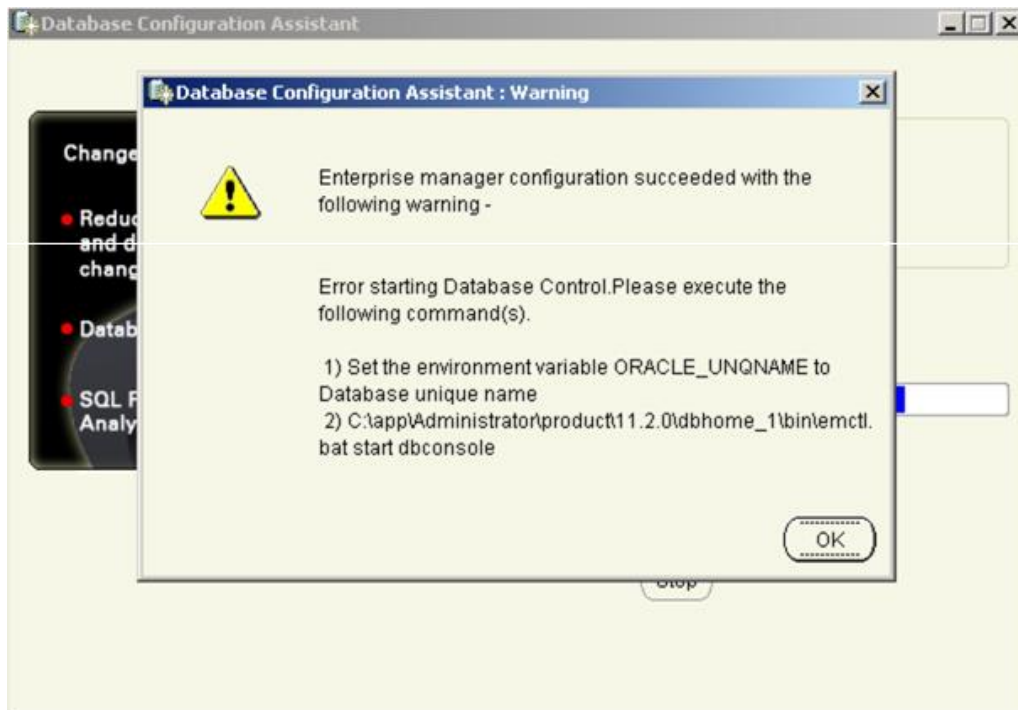
Oracle Database 11g Release 2 Installer

- Global settings**
 - Disk space: required 3.27 GB available 26.91 GB
 - Source location: C:\database\install\stage\products.xml
 - Install method: Typical installation
 - Database edition: Enterprise Edition (Create and configure a database)
 - Oracle base: C:\app\Administrator
 - Software location: C:\app\Administrator\product11.2.0\dbhome_1
- Inventory information**
 - Inventory location: C:\Program Files (x86)\Oracle\Inventory
- Database information**
 - Configuration: General Purpose / Transaction Processing
 - Global database name: orcl.168.61.135
 - Oracle system identifier (SID): orcl
 - Allocated memory: 819 MB
 - Automatic memory management option: TRUE
 - Database character set: West European (WE8MSWIN1252)

Save Response File...

Help < Back Next > Finish Cancel

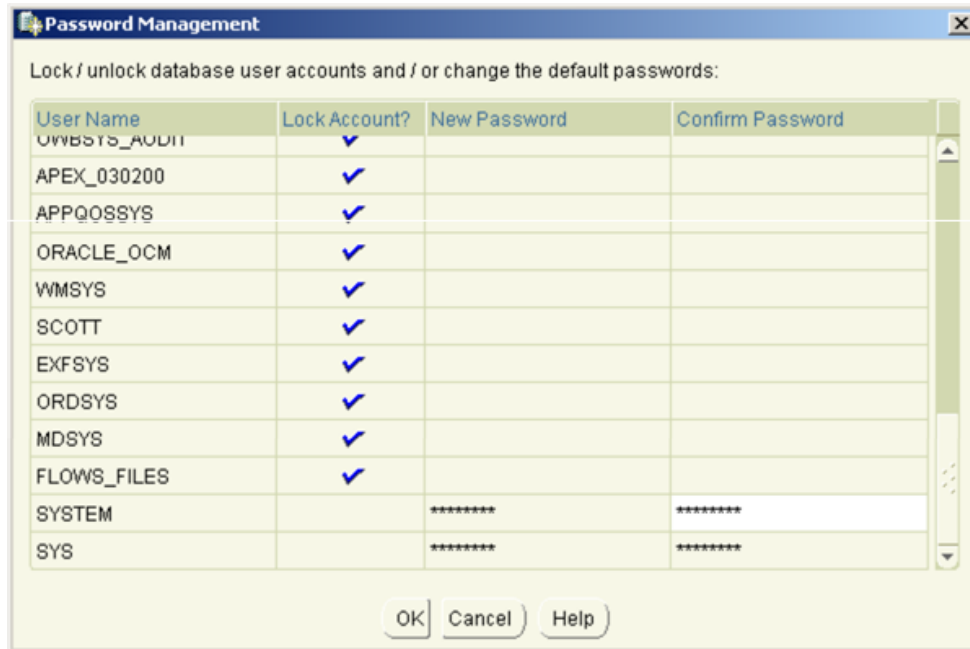
9. During the Database Configuration Assistant, if a Warning pops up, take down the info as a precaution and click OK to resume install.



10. 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.




The Password Management dialog box is titled "Password Management" and contains the instruction: "Lock / unlock database user accounts and / or change the default passwords:". It features a table with four columns: "User Name", "Lock Account?", "New Password", and "Confirm Password". The table lists several database users, with "Lock Account?" checked for all except "SYSTEM" and "SYS", which have default passwords entered. At the bottom are "OK", "Cancel", and "Help" buttons.

User Name	Lock Account?	New Password	Confirm Password
OWBSYS_AUDIT	✓		
APEX_030200	✓		
APPQOSSYS	✓		
ORACLE_OCM	✓		
WMSYS	✓		
SCOTT	✓		
EXFSYS	✓		
ORDSYS	✓		
MDSYS	✓		
FLAWS_FILES	✓		
SYSTEM		*****	*****
SYS		*****	*****

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

11. Click **Close**



The Oracle Database 11g Release 2 Installer window shows the "Finish" step of the installation. The left sidebar lists the installation steps, with "Finish" selected. The main area displays a message: "The installation of Oracle Database was successful." Below this, a "Note" section provides the Enterprise Manager Database Control URL: "https://localhost:1158/em". At the bottom, there are buttons for "Help", "< Back", "Next >", "Finish", and "Close".

Now your Oracle11g instance is installed and ready for use.

For this guide we simply used the Administrator account, but for more complicated needs you can create multiple users like **oracle1** and **oracle2**.

POST-INSTALL CONFIGURATION (SQLPLUS)

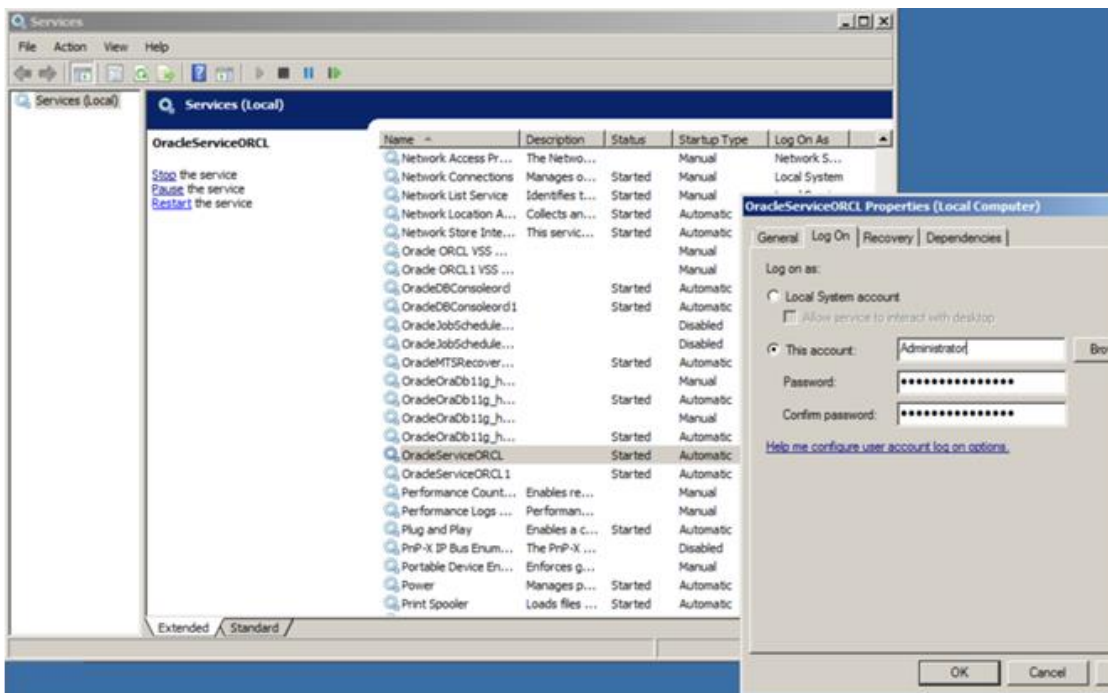
Before starting up SQLPLUS to access your database you need to set up oracle shell environmental variables.

1. Execute the below commands in the command line. These values are derived from step 7 of the "Oracle11g Install".

```
set ORACLE_SID=orcl
set ORACLE_BASE=C:\app\Administrator
set ORACLE_HOME=C:\app\Administrator\product\11.2.0\dbhome_1
```

- a. Type set to check if the environment variables were loaded.

Within Services, right-click Properties on the Oracle service and change the Log on as to this account in the Log On tab. (This account will be used by Time Machine to change the clock.)



By default Oracle SQL server should be started automatically when Windows starts, however if it does not then you must follow the below steps to login and startup the service.

- a. Go into **C:\app\Administrator\product\11.2.0\dbhome_1\BIN** folder (your Oracle Installation directory) and execute **SQLPLUS.EXE**

2. Log in to **sqlplus**

- a. We used “**sys as sysdba**” with the password for SYS during the install

3. Once logged in, type “**startup**” to officially start the Oracle database for use.

SETTING UP A SECOND INSTANCE

With one instance of Oracle; all users connect to that instance will see the same virtual clock. It is sometimes useful to have multiple Oracle instances; so that different users can test concurrently with different virtual clocks. Or one group of users can see one virtual clock and other group can see the system clock.

To set up a second instance for concurrent time testing, install oracle under a different user with a different SID.

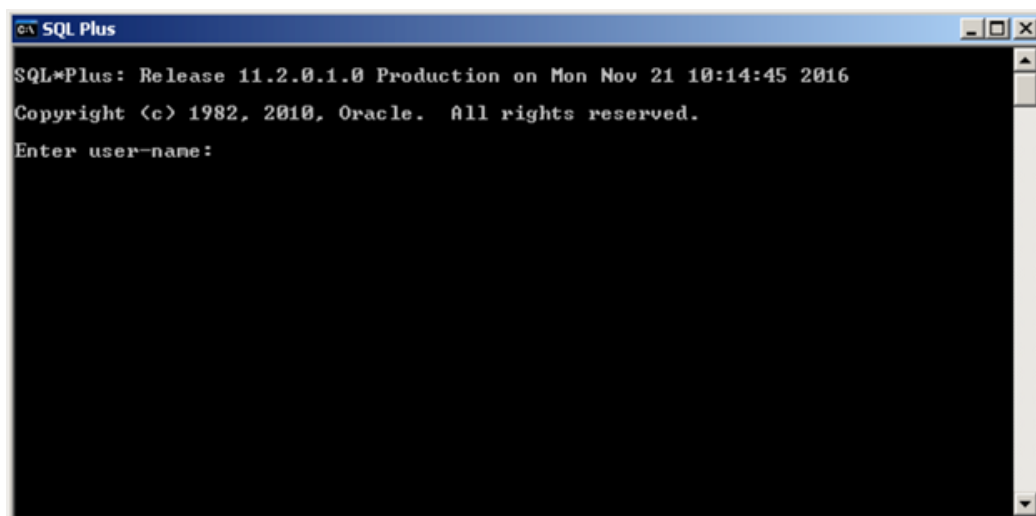
Remember to change the Log On As in Services for the second instance of Oracle under the new SID.

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. Open the command line and execute a time machine command to create a virtual clock
 - a. We executed `tmuser -a -u Administrator -y 5`
 - i. Please refer to Time Machine manual for more info of the acceptable commands
 - ii. Any user can be given a virtual clock, the key is to assign a virtual clock to the user who will be running the SQL database, otherwise the database will not receive the virtual time.
2. Go into `C:\app\Administrator\product\11.2.0\dbhome_1\BIN\` and execute **SQLPLUS.EXE**
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.



Windows automatically starts up the Listener service, but if you get a connection error, make sure the service is started by following steps 1 and 2 below. (Oracle Database must be started first before Listener).

1. Go to the “**C:\app\Administrator\product\11.2.0\dbhome_1\BIN**” and execute “**lsnrctl**”.
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 “**C:\app\Administrator\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.

The next steps show how to install the Oracle client on a remote machine. 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.

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

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

<https://www.oracle.com/technetwork/database/database-technologies/instant-client/overview/index.html>

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

Version 11.2.0.1.0

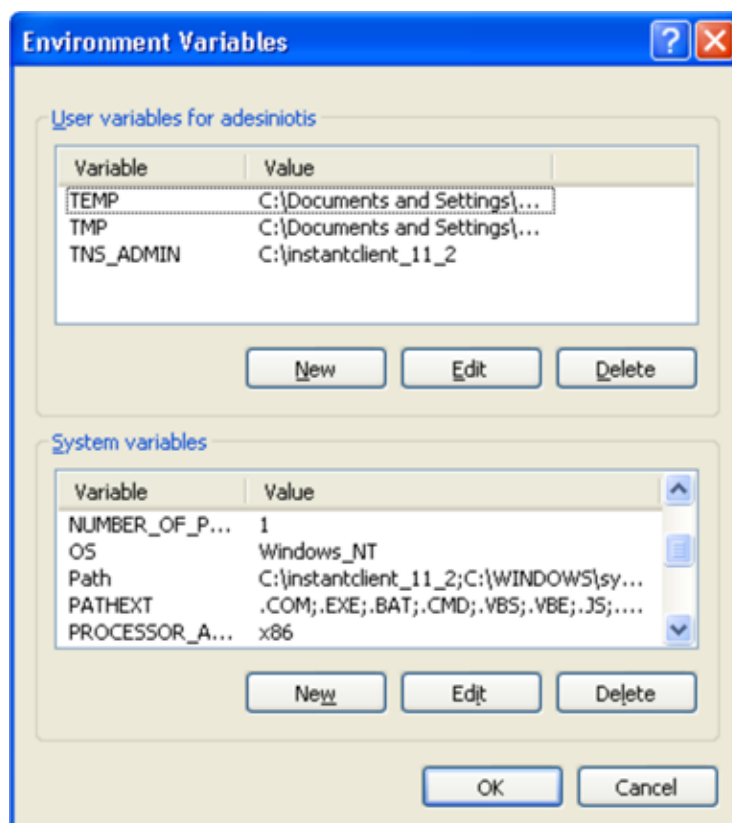
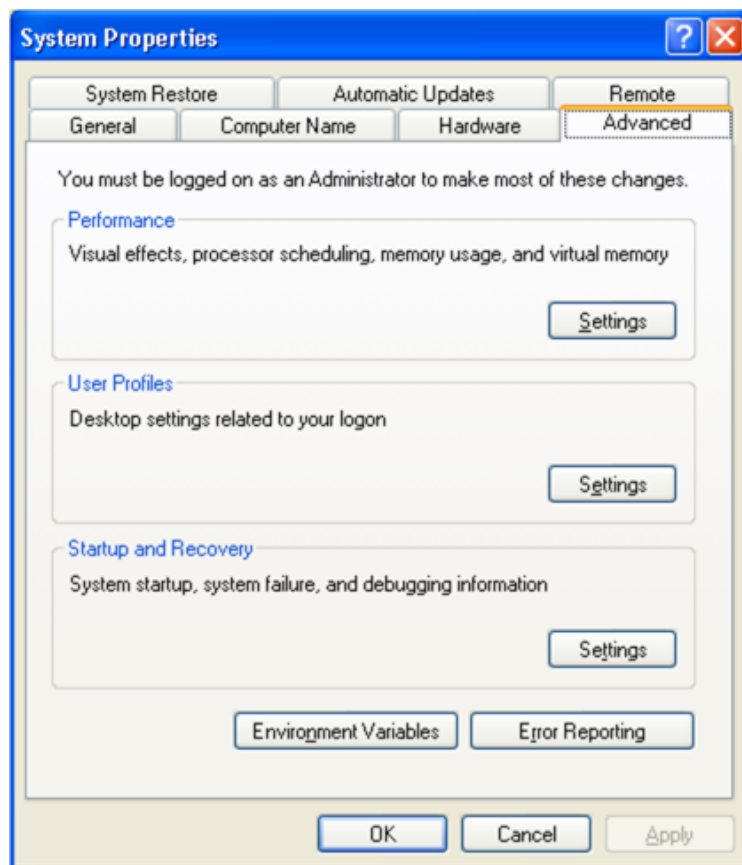
Instant Client Package - Basic: All files required to run OCI, OCCI, and JDBC-OCI applications
instantclient-basic-win32-11.2.0.1.0.zip (51,458,190 bytes)

*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)

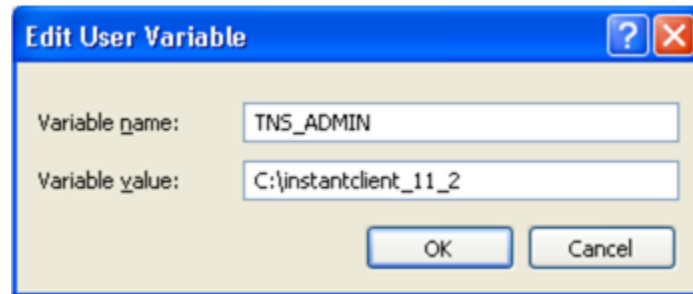
5. Unzip both packages into the top directory, e.g. **C:\instantclient_11_2**
6. Make a copy of the “**tnsnames.ora**” file from the server directory “**C:\app\Administrator\product\11.2.0\dbhome_1\NETWORK\ADMIN**” to the client directory **C:\instantclient_11_2**
 - a. If any problems occur connecting 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**

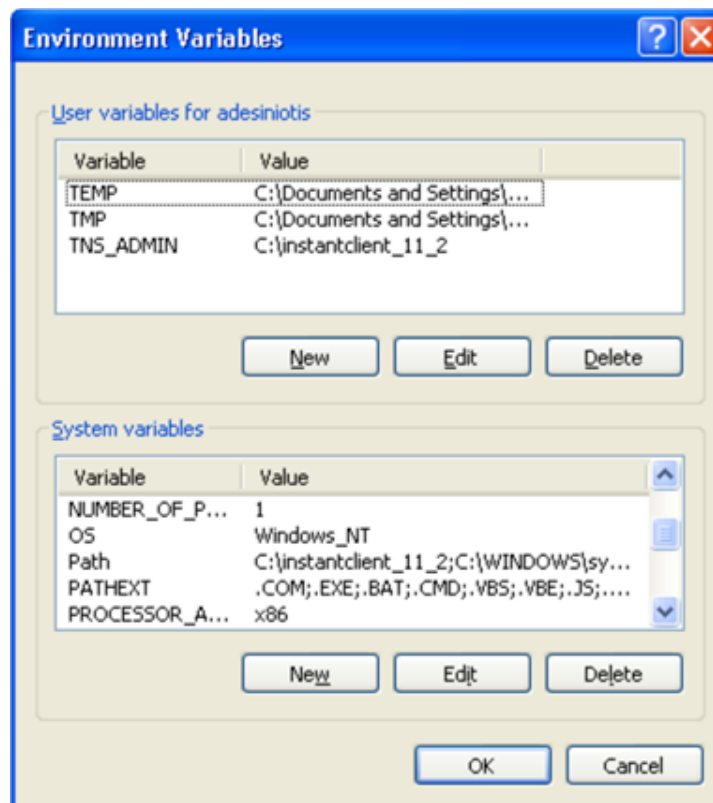


8. Create a new “User Variables” called **TNS_ADMIN** with the installed client folder **C:\instantclient_11_2** as the Variable Value



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 “;” to separate it from the current values, as below.

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

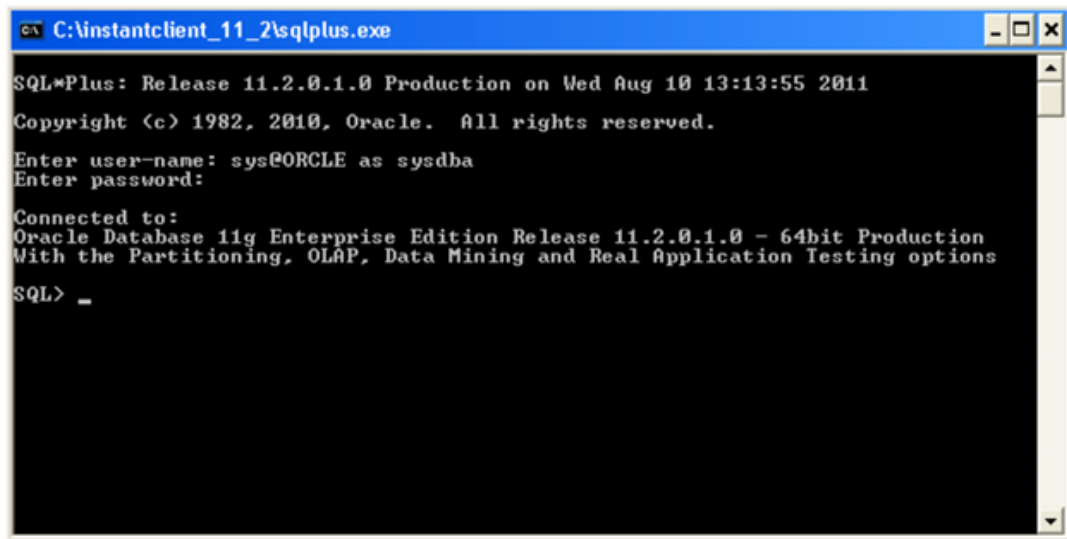


11. Open the **C:\instantclient_11_2** folder and execute the **sqlplus.exe**

12. For the sake of testing, use the username **sys** and the password we created before to log in. The form at is **username@identifier**. Then your password.

a. **ORCLE** 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@ORCLE as sysdba
Enter password:

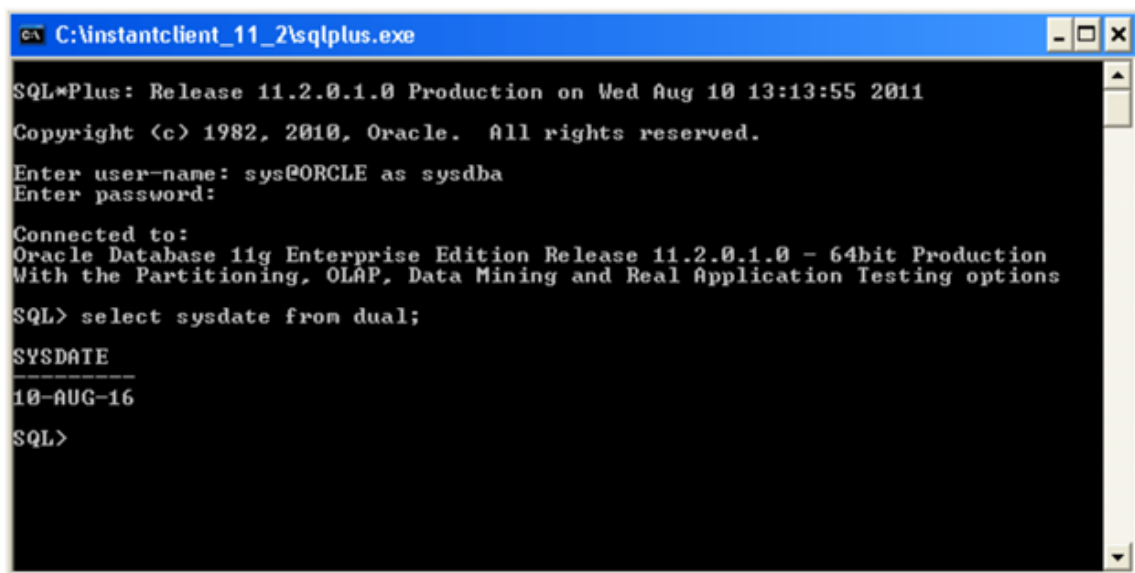
Connected to:
Oracle Database 11g Enterprise Edition Release 11.2.0.1.0 - 64bit Production
With the Partitioning, OLAP, Data Mining and Real Application Testing options

SQL> _
```

For more details refer to the below link

http://download.oracle.com/docs/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@ORCLE 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 "C:\app\Administrator\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.



Solution-Soft

SolutionSoft Systems, Inc.
2350 Mission College Blvd., Suite #777
Santa Clara, CA 95054, U.S.A.
Phone: 1.408.346.1400
Sales: 1.408.346.1415

Europe
SolutionSoft Systems, Inc.
Trnska 8, Suite 7
Belgrade, Serbia, 11000
Phone: +1381 11 403 1523

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