Solution-Soft

Quick Guide – Time Machine Windows for Oracle 12c

The following is a quick guide to evaluating Solution-Soft's Time Machine with Oracle 12c on Microsoft Windows operating systems. This paper will show how simple it is to integrate Time Machine to perform date & time (temporal) testing with Oracle 12c.

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 is supported on Windows, AIX, HP-UX, Linux, and Solaris.

System Configuration used in creating this paper:
OS: Windows Server 2008 R2, 1 CPU, 3.73 GB RAM
Time Machine: Version 7.0.5 for Windows 64-bit
Oracle: Oracle 12c, Release 1

## Contents

Configuration (SQL*Plus)

Before starting up SQL*Plus 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 the Oracle installation process. (Note: The values below serve as an example, your environment may have a different SID or Path.)
>
> set ORACLE_SID=orcl
> set ORACLE_BASE=C:\app\oracle
> set ORACLE_HOME=C:\app\oracle\product\12.1.0\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.)
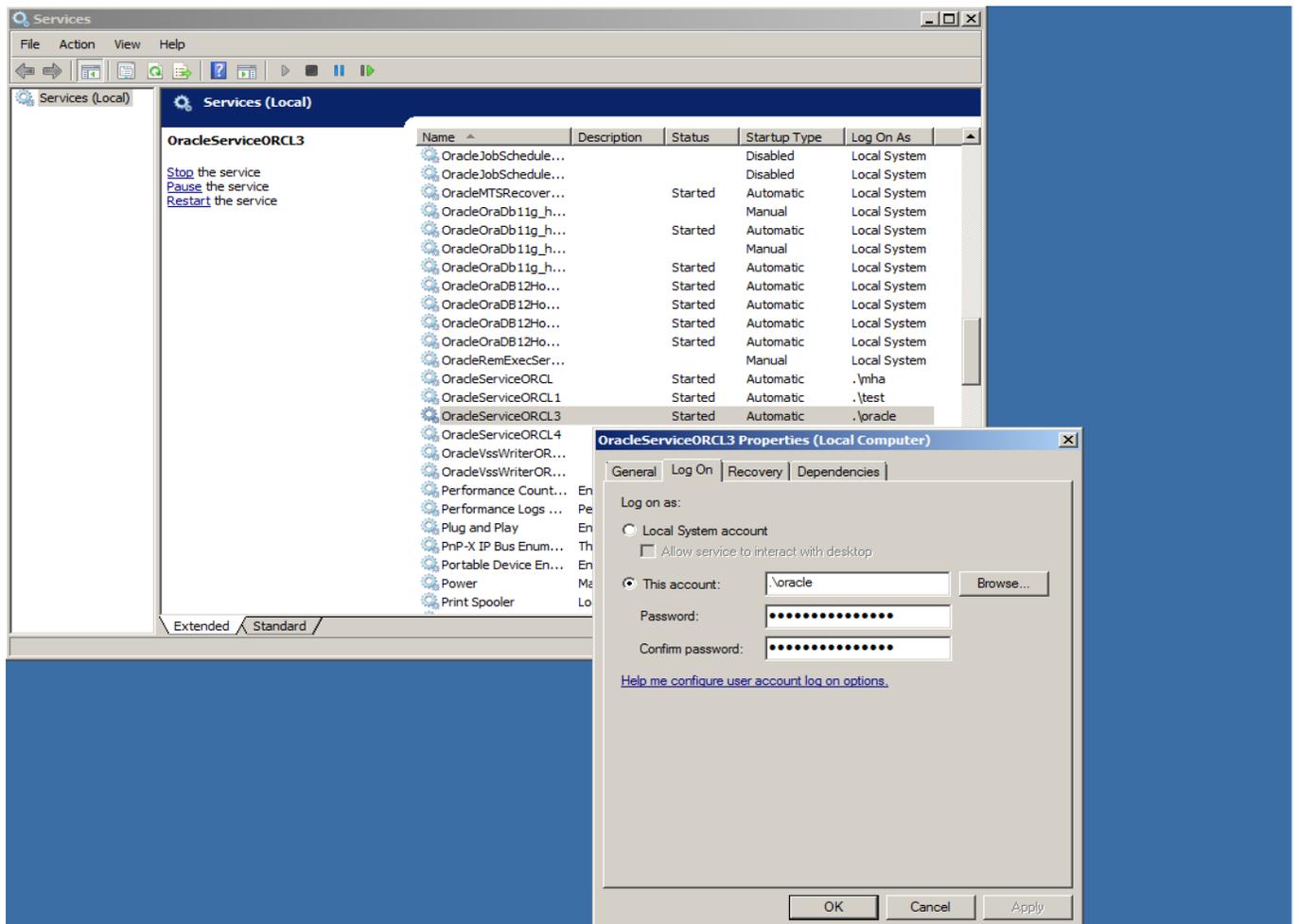
Setting Up a Second Instance

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.

Then different virtual clocks can be set against different SID to enable concurrent testing of different virtual clocks.

Time Machine Configuration

Before running Time Machine to create a virtual clock and access it from your SQL*Plus database, you need to configure the environmental variables from the Configuration (SQL*Plus) section above.

1. Open the command line and execute a time machine command to create a virtual clock
   a. We executed tmuser –a –u oracle –y 5
      i. Please refer to Time Machine manual for more information on 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\oracle\product\12.1.0\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 2018.
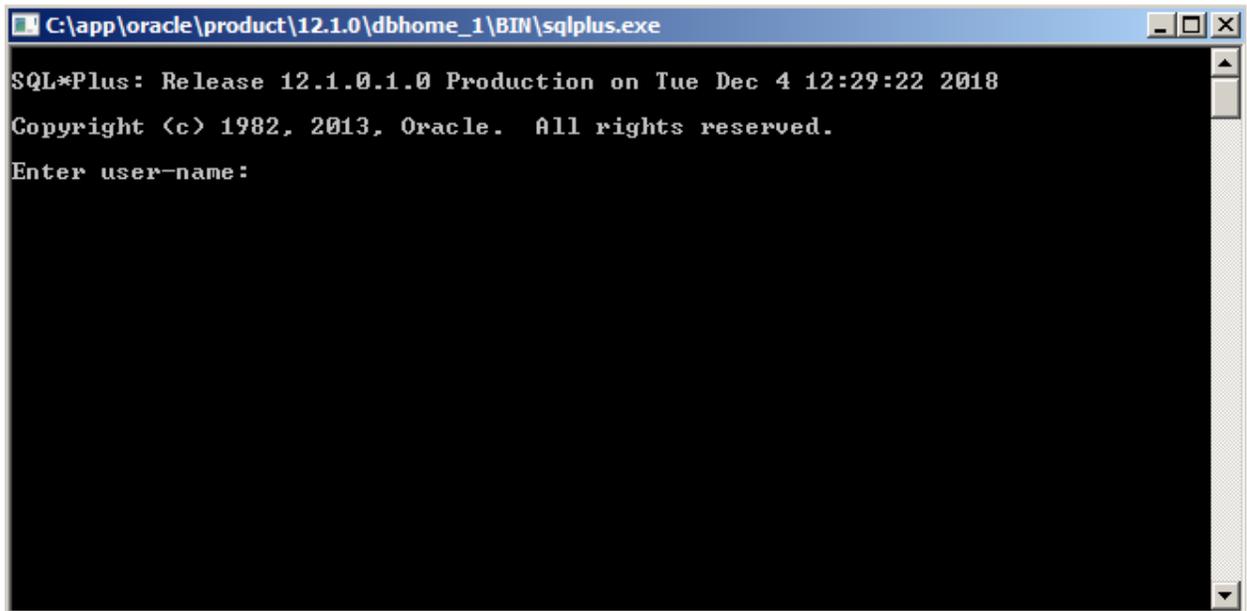
```
C:\app\oracle\product\12.1.0\dbhome_1\BIN\sqlplus.exe

SQL*Plus: Release 12.1.0.1.0 Production on Tue Dec 4 12:29:22 2018

Copyright (c) 1982, 2013, Oracle.  All rights reserved.

Enter user-name:
```

Client/Listener Configuration (External Client Accessing DB)

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\oracle\product\12.1.0\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\oracle\product\12.1.0\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://docs.oracle.com/cd/E16655_01/network.121/e17610/listenercfg.htm

The next steps show how to install the Oracle client on a remote machine. This guide installs a 64-bit Windows client and connects to the Oracle 12c database. The below link has instructions for configuring the client for Unix/Linux/Windows.

http://docs.oracle.com/cd/E16655_01/server.121/e18404/apd.htm

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 "**Instant Client - Basic**" and "**Instant Client Package - SQL*Plus**"

5. Unzip both packages into the top directory, e.g. **C:\instantclient_12_1**

6. Make a copy of the "**tnsnames.ora**" file from the server directory "**C:\app\oracle\product\12.1.0\dbhome_1\NETWORK\ADMIN**" to the client directory **C:\instantclient_12_1**

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_12_1**, environment variables need to be set.

7. Right click **My Computer** and click Properties. Click **Advanced system settings** and click **Environmental Variables…**
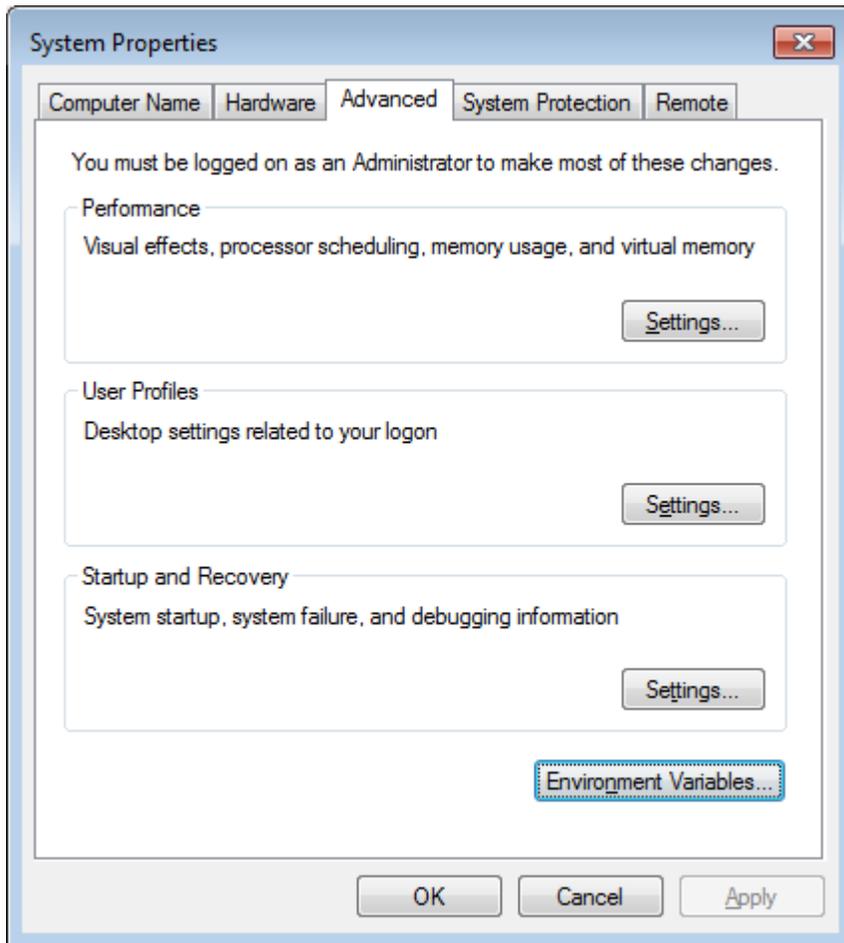

8. Create a new "User Variables" called **TNS_ADMIN** with the installed client folder **C:\instantclient_12_1** as the Variable value.
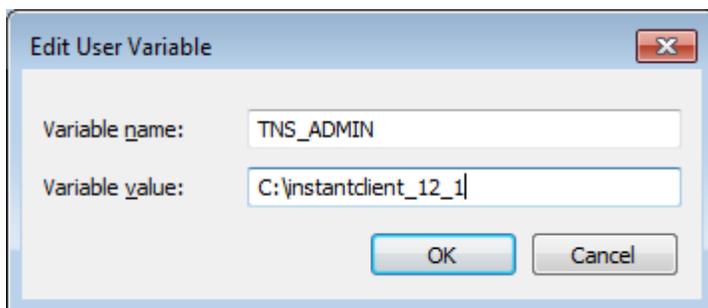
9. Scroll down in "System variables" and edit the "**Path**" variable. Paste the location **C:\instantclient_12_1** in the Variable value in front of all the present values. Make sure to include a '**;**' to separate it from the current values. (Shown below)
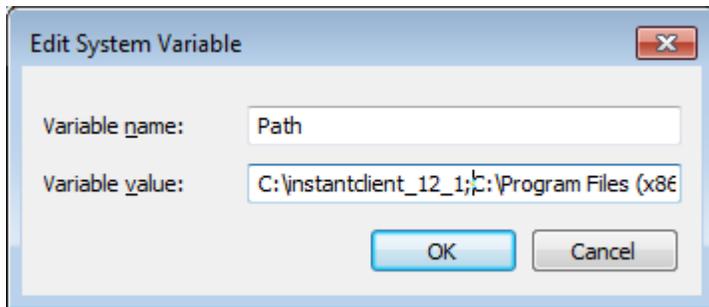
10. Press **OK**. Your final window should look similar to below
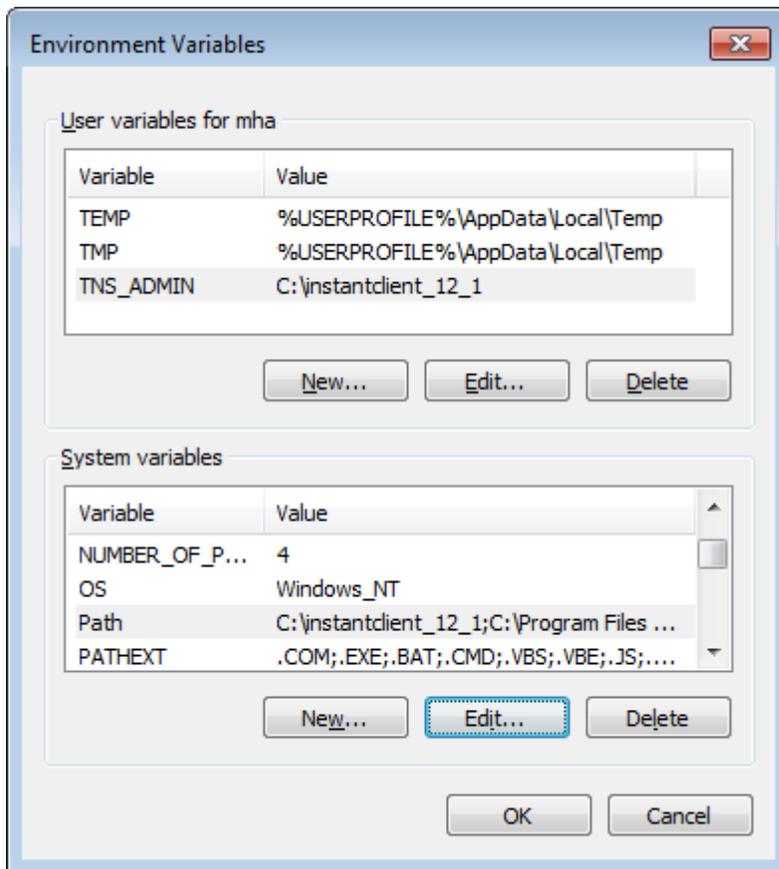
11. Open the **C:\instantclient_12_1** folder and execute the **sqlplus.exe**

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. **ORCL3** 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.

For more details refer to the below link
      http://docs.oracle.com/cd/E16655_01/server.121/e18404/apd.htm

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.
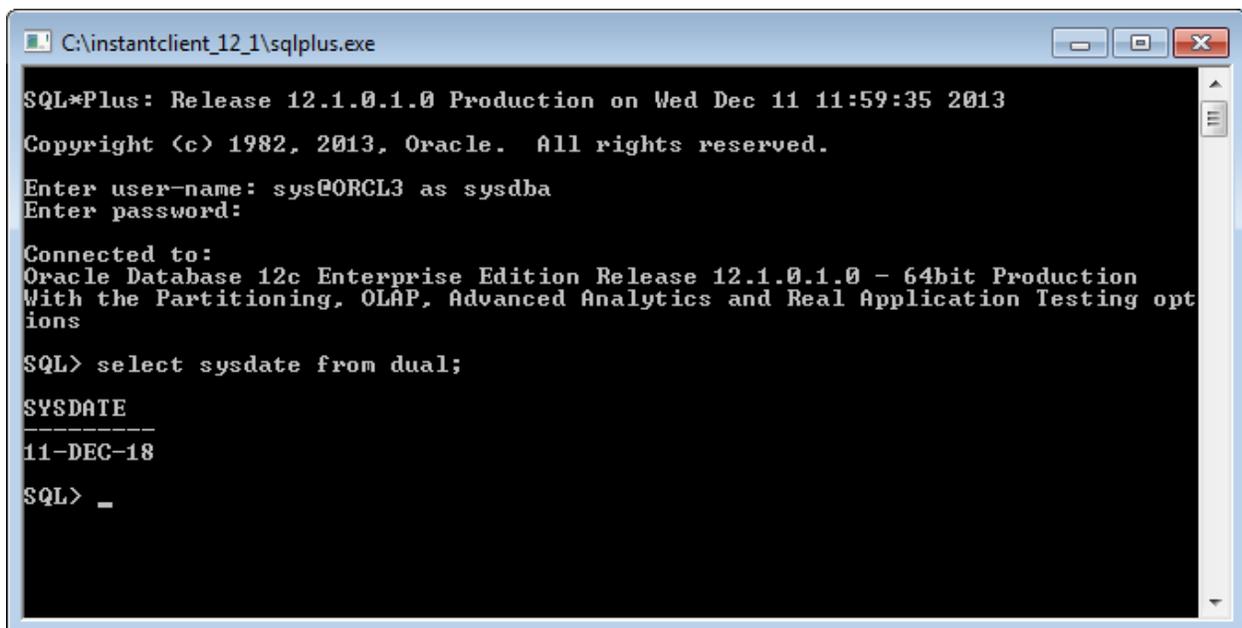
```
C:\instantclient_12_1\sqlplus.exe

SQL*Plus: Release 12.1.0.1.0 Production on Wed Dec 11 11:59:35 2013

Copyright (c) 1982, 2013, Oracle.  All rights reserved.

Enter user-name: sys@ORCL3 as sysdba
Enter password:

Connected to:
Oracle Database 12c Enterprise Edition Release 12.1.0.1.0 - 64bit Production
With the Partitioning, OLAP, Advanced Analytics and Real Application Testing opt
ions

SQL> select sysdate from dual;

SYSDATE
---------
11-DEC-18

SQL> _
```

As you can see, the SQL call retrieves the virtual date we created (5 years in the future to 2018), 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\oracle\product\12.1.0\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.