

Setting up additional Oracle10g Databases on Redhat Linux 4 to run Time Machine

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This paper outlines the process of how to set up an additional Oracle10g server on a Redhat Linux system without having to completely reinstall the Oracle10g product. Each time this process is done, you will be able to run one more concurrent virtual clock on your system for Oracle10g testing with Solution-Soft's Time Machine®.

Excluding the time it takes you to set up your new database, setting up the Logical Oracle Database Server should take you less than an hour and the new logical server will only take about 20 MB of disk space compared to 500-700 MB required to completely install another Oracle10g server.

1. Setting up the New Oracle Account

- A. Log in as Oracle.
- B. Create the environment variable OLD_ORACLE_HOME. Set it to the value of ORACLE_HOME
- C. su root (keeping the Oracle environment)
- D. Create a new LINUX user account to be the owner of the new logical Oracle server (this paper will call it tm_ora). Make the home directory \$OLD_ORACLE_HOME/tm_ora and make oinstall the primary group and dba the secondary group.

```
Ex: [root@rl-asv4 ~]# id oracle
uid=1061(oracle) gid=1061(oinstall) groups=1061(oinstall),1062(dba)
```

```
[root@rl-asv4 ~]# /usr/sbin/useradd -u 4001 -g 1061 -G 1062 -d
/u01/app/oracle/product/10.2.0/db_1/tm_ora tm_ora
```

- E. Now create a password for the new tm_ora account

```
[root@rl-asv4 ~]# passwd tm_ora
```
- F. Verify the account settings are correct, group IDs should match those from step 1 D.

```
[root@rl-asv4 ~]# id tm_ora
uid=4001(tm_ora) gid=1061(oinstall) groups=1061(oinstall),1062(dba)
```

2. Creating Symbolic Links to the Oracle Software

- A. Still logged in as root, cd to \$OLD_ORACLE_HOME/tm_ora

- B. Create the following symbolic links:

```
ln -s ../admin admin
ln -s ../dbs dbs
ln -s ../javavm javavm
ln -s ../jlib jlib
ln -s ../jre jre
ln -s ../lib lib
ln -s ../network network
ln -s ../nls nls
ln -s ../oracore oracore
ln -s ../oradata oradata
ln -s ../ord ord
```

```
ln -s ../plsql plsql
ln -s ../precomp precomp
ln -s ../slax slax
ln -s ../sqlplus sqlplus
```

- C. Create the following directories:

```
# mkdir bin; mkdir -pv rdbms/audit; mkdir -pv rdbms/log
```

- D. Change directory to rdbms and create the symbolic link,

```
# cd rdbms; ln -s ../../rdbms/mesg mesg
```

- E. Make the new Oracle account, tm_ora, the owner of all these new links and files uunder /tm_ora and oinstall the group
- ```
cd ..; chown -hR tm_ora:oinstall *
```

- F. Change directory to bin #cd ../bin (EX: /u01/app/oracle/product/10.2.0/db\_1/tm\_ora/bin)

```
cp $OLD_ORA_HOME/bin/oracle .
```

(EX: cp /u01/app/oracle/product/10.2.0/db\_1/bin/oracle\* . )

Or (EX: cp /u01/app/oracle/product/10.2.0/db\_1/bin/oracle . )

Make the new oracle account, tm\_ora, the owner and oinstall the group

```
(EX: chown -hR tm_ora:oinstall *)
```

Turn on the setuid bit (this sets the sticky bit on the oracle binary so that is runs under the context of 'oracle')

```
chmod +s oracle
```

```
cp $OLD_ORA_HOME/bin/sqlplus .
```

Make the new oracle account, tm\_ora, the owner and oinstall the group

### 3. Files and Configuration for the New Oracle Server

- A. cp the original oracle's .bash\_profile (ex: cp /home/oracle/.bash\_profile .) to the home directory of the new oracle account i.e., cp \$OLD\_ORA\_HOME/.bash\_profile \$ORACLE\_HOME/tm\_ora/

- B. Edit the .bash\_profile) of the new oracle account, tm\_ora

- 1) Set the ORACLE\_HOME to be the home directory of tm\_ora:

```
ORACLE_HOME=$OLD_ORA_HOME/tm_ora
```

- 2) Set the PATH to include the tm\_ora home directory and the oracle home directory:

```
$PATH=$PATH:$ORACLE_HOME/bin:$OLD_ORA_HOME/bin
```

- 3) Set the ORACLE\_SID to be the SID name of the Oracle server, i.e. db2 (note this must be 8 or less characters long): ORACLE\_SID=db2

- 4) Change ORACLE\_OWNER to the new oracle user, tm\_ora :ORACLE\_OWNER=tm\_ora

- C. Edit the /etc/oratab file, i.e., vi /etc/oratab

Change the ORACLE\_HOME path for the db2 SID to point to the home directory for the tm\_ora user and set the flag to indicate whether or not to start the instance at boot time.

```
[tm_ora@rl-asv4 etc]$ more oratab
demo1:/u01/app/oracle/product/10.2.0/db_1:Y
db2:/u01/app/oracle/product/10.2.0/db_1/tm_ora:
```

- D. Change permissions on the database files and directories being used for Time Machine testing:

```
cd /u01/app/oracle/product/10.2.0/db_1/db2
chmod -R g+x *; chmod -R g+w *; chmod g+x ../db2
```

This step is necessary to allow the user tm\_ora to write log files, etc to this location.

#### 4. Setting up SQL/NET

(For the following login as tm\_ora, the new oracle owner)

- A. Change directories to /network/admin

```
#cd $ORACLE_HOME/network/admin
```

(Ex: /u01/app/oracle/product/10.2.0/db\_1/tm\_ora/network/admin)

- B. Modify or edit listener.ora so that it resembles the following:

```
listener.ora Network Configuration File:
/u01/app/oracle/product/10.2.0/db_1/network/admin/listener.ora
Generated by Oracle configuration tools.

LSNR1 = # for DB 'demo1'
 (DESCRIPTION_LIST =
 (DESCRIPTION =
 (ADDRESS_LIST =
 (ADDRESS = (PROTOCOL = TCP) (HOST = rl-asv4) (PORT = 1522))
)
)
)
LSNR2 = # for DB 'db2'
 (DESCRIPTION_LIST =
 (DESCRIPTION =
 (ADDRESS_LIST =
 (ADDRESS = (PROTOCOL = TCP) (HOST = rl-asv4) (PORT = 1521))
)
)
)
SID_LIST_LSNR1 =
(SID_LIST =
 (SID_DESC =
 (GLOBAL_DBNAME = demo1)
 (ORACLE_HOME = /u01/app/oracle/product/10.2.0/db_1)
 (SID_NAME = demo1)
)
)
SID_LIST_LSNR2 =
(SID_LIST =
 (SID_DESC =
 (GLOBAL_DBNAME = db2)
 (ORACLE_HOME = /u01/app/oracle/product/10.2.0/db_1)
 (SID_NAME = db2)
)
)
)
```

- C. Configure the client connection settings in tnsnames.ora, ex: \$ORACLE\_HOME/network/admin

```
tnsnames.ora Network Configuration File:
/u01/app/oracle/product/10.2.0/db_1/network/admin/tnsnames.ora
Generated by Oracle configuration tools.

DB2 =
 (DESCRIPTION =
 (ADDRESS = (PROTOCOL = TCP) (HOST = rl-asv4) (PORT = 1521))
 (CONNECT_DATA =
 (SERVER = DEDICATED)
 (SERVICE_NAME = db2.solution-soft.com)
)
)
)
```

```

DEMO1 =
 (DESCRIPTION =
 (ADDRESS = (PROTOCOL = TCP) (HOST = rl-asv4) (PORT = 1522))
 (CONNECT_DATA =
 (SERVER = DEDICATED)
 (SERVICE_NAME = demo1)
)
)
EXTPROC_CONNECTION_DATA =
 (DESCRIPTION =
 (ADDRESS_LIST =
 (ADDRESS = (PROTOCOL = IPC) (KEY = EXTPROC1))
)
 (CONNECT_DATA =
 (SID = PLSExtProc)
 (PRESENTATION = RO)
)
)
)

```

## 5. Testing the Set Up

- A. Bring down Oracle if it is running.
- B. As “root” put the new oracle account onto Time Machine (this example assumes the tm\_ora uid == 4001)
 

```
tmuser -a -u 4001 -x 022812552012
```
- C. Start up the oracle listener
 

```
su - oracle
% lsnrctl start
```

- D. Start up the original Oracle database (“demo1”), owned by oracle and query the database time:

```

su - oracle
% [oracle@rl-asv4 ~]$ sqlplus

SQL*Plus: Release 10.2.0.1.0 - Production on Fri Nov 10 11:22:49 2006
Copyright (c) 1982, 2005, Oracle. All rights reserved.

```

```

Enter user-name: / as sysdba
Connected to an idle instance.

```

```

SQL> startup open
ORACLE instance started.

```

```

Total System Global Area 536870912 bytes
Fixed Size 1220408 bytes
Variable Size 163578056 bytes
Database Buffers 364904448 bytes
Redo Buffers 7168000 bytes

```

```
Database mounted.
```

```
Database opened.
```

```
SQL> select sysdate from dual;
```

```
SYSDATE
```

```

```

```
10-NOV-06
```

```
SQL> exit
```

- E. Login as the new Oracle user tm\_ora:

```
su - tm_ora
```

**NOTE:** verify that your oracle database is set correctly, for instance running “set | grep SID” in this case should return “ORACLE\_SID=db2”

```
set | grep SID
```

F. Start up the new Oracle database (“db2”) owned by tm\_ora and get the DB time:

```
[tm_ora@rl-asv4 ~]$ sqlplus

SQL*Plus: Release 10.2.0.1.0 - Production on Tue Feb 28 13:11:48 2012
Copyright (c) 1982, 2005, Oracle. All rights reserved.

Enter user-name: / as sysdba

SQL> startup open
ORACLE instance started.

Total System Global Area 167772160 bytes
Fixed Size 1218292 bytes
Variable Size 71305484 bytes
Database Buffers 88080384 bytes
Redo Buffers 7168000 bytes
Database mounted.
Database opened.
SQL> select sysdate from dual;

SYSDATE

28-FEB-12

SQL> select to_char(sysdate, 'Dy DD-Mon-YYYY HH24:MI:SS') as "Current Time"
from dual;

Current Time

Tue 28-Feb-2012 13:12:31
```

## 6. Configure and test the setup from an SQL client on another machine. This paper was created using Oracle’s SQL\*PLUS on a Windows XP system

- On the Windows system change directories to the Oracle install path  
`cd D:\oracle\ora92\network\ADMIN`
- Edit sqlnet.ora and tnsnames.ora such that the ports for db2 and demo1 match the settings made on the Linux box. Please see addendum for examples of these files.
- Connect using SQL\*Plus to both db2 & demo1 and retrieve the date’s from each.

```
D:\oracle\ora92\network\ADMIN>sqlplus sysman/frank@demo1

SQL*Plus: Release 9.2.0.1.0 - Production on Fri Oct 27 16:27:05 2006
Copyright (c) 1982, 2002, Oracle Corporation. All rights reserved.

Connected to:
Oracle Database 10g Enterprise Edition Release 10.2.0.1.0 - Production
With the Partitioning, OLAP and Data Mining options

SQL> select sysdate from dual;

SYSDATE

10-NOV-06

SQL> exit

D:\oracle\ora92\network\ADMIN>sqlplus sysman/frank@db2

SQL*Plus: Release 9.2.0.1.0 - Production on Fri Oct 27 16:27:24 2006
Copyright (c) 1982, 2002, Oracle Corporation. All rights reserved.
```

Connected to:  
Oracle Database 10g Enterprise Edition Release 10.2.0.1.0 - Production  
With the Partitioning, OLAP and Data Mining options

```
SQL> select sysdate from dual;
```

```
SYSDATE

28-FEB-12
```

## 7. Addendum

1) Sample bash\_profile file for user 'tm\_ora'

```
.bash_profile
Get the aliases and functions
if [-f ~/.bashrc]; then
 . ~/.bashrc
fi

User specific environment and startup programs

ORACLE_HOME=/u01/app/oracle/product/10.2.0/db_1/tm_ora
OLD_ORA_HOME=/u01/app/oracle/product/10.2.0/db_1

LD_LIBRARY_PATH=/usr/lib:/usr/openwin/lib:$ORACLE_HOME/lib:/usr/games/lib
ORACLE_PATH=/u01/app/oracle/product/10.2.0/db_1/bin
PATH=$PATH:$HOME/bin:$ORACLE_HOME/bin:$OLD_ORA_HOME/bin

ORACLE_SID=db2
ORACLE_OWNER=tm_ora
ORA_NLS33=$ORACLE_HOME/nls/admin/data

export PATH
export ORACLE_PATH
export ORACLE_HOME
export OLD_ORACLE_HOME
export ORA_NLS33
unset USERNAME

echo $ORACLE_HOME
```

2) Windows tnsnames.ora file

```
TNSNAMES.ORA Network Configuration File: D:\oracle\ora92\network\admin\tnsnames.ora
Generated by Oracle configuration tools.

DB2 =
 (DESCRIPTION =
 (ADDRESS_LIST =
 (ADDRESS = (PROTOCOL = TCP) (HOST = rl-asv4) (PORT = 1521))
)
 (CONNECT_DATA =
 (SERVICE_NAME = demo1)
)
)
DEMO1 =
 (DESCRIPTION =
 (ADDRESS_LIST =
 (ADDRESS = (PROTOCOL = TCP) (HOST = rl-asv4) (PORT = 1522))
)
 (CONNECT_DATA =
 (SERVICE_NAME = demo1)
)
)
)
```

3) Windows sqlnet.ora file

```
SQLNET.ORA Network Configuration File: D:\oracle\ora92\network\admin\sqlnet.ora
Generated by Oracle configuration tools.
NAMES.DEFAULT_DOMAIN = solution-soft.com
SQLNET.AUTHENTICATION_SERVICES= (NTS)
NAMES.DIRECTORY_PATH= (TNSNAMES, ONAMES, HOSTNAME)
```