



SKILLBUILDERS

An Oracle 10g Release 2 Upgrade Guide

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Introduction

This article documents my experience in September of 2005 using the Oracle Database Upgrade Assistant (DBUA) to upgrade an existing Oracle 10g Release 1 (10.1.0.2) database (and ASM instance) to Oracle 10g Release 2 (10.2.0.1).

This article includes step-by-step instructions about server (host) validation (using the Oracle “validate” script), software installation using the Oracle Universal installer, source database validation (using Oracle script utlu102i.sql), installing software from the “Companion CD”, performing the upgrade with the DBUA and correcting many issues encountered along the way. It includes several “warnings,” in areas where significant time was lost.

Note: In this article, the Oracle 10g Release 1 database is the “source” database, i.e. the database to be upgraded to 10g Release 2. The server platform used was Red Hat Linux AS 3 running on a Dell PE 2400.

This article should be helpful for experienced DBA’s preparing an upgrade to Release 2, even if your current database is not 10g Release 1. During this process, approximately 12 TARs were opened with Oracle Support related to problems with source database validation and the upgrade itself. Hopefully this article will make the upgrade an easier experience for you.

Documentation Required

The following documents were used to complete the upgrade:

1. Quick Installation Guide and Installation Guide – The Quick Installation Guide is a small booklet included in the box with the software media – and now available on the web at <http://www.oracle.com/pls/db102/homepage>. The complete Installation Guide is available on the 10g RDBMS DVD and on the web at the same URL.
2. Database Readme. Available on the Oracle 10g RDBMS DVD and on the aforementioned web site.
3. Oracle Database Upgrade Guide. Available on the Oracle 10g RDBMS DVD and on the aforementioned web site.
4. Oracle Database Administrator’s Reference. Available on the Oracle 10g RDBMS DVD.
5. Metalink Notes:

- Note 250262.1 – RDA 4 - Health Check / Validation Engine Guide (formerly 283748.1 – “Pre-Install checks for 10g Release 1 RDBMS)” This note provides a link to the “Health Check Validation Engine”, which will test your server for compatibility issues. Use it prior to installing an Oracle software product.
 - Note 316889.1 – “Complete checklist for manual upgrades to 10g Release 2.” Even though this note discusses manual upgrades (versus DBUA), this document contains some critical and required information that is not documented anywhere else. For example, “Ensure the user’s sys and system have 'system' as their default tablespace.” It would have saved a lot of time if this had been known before the author’s 1st attempt at the upgrade.
 - Note.272322.1 Ext/Pub Difference between UTLRP.SQL - UTLIRP.SQL - UTLIP.SQL. This note explains what these scripts do (essentially recompile invalid database objects) and the specific differences between the scripts.
6. 2-Day DBA. Available online at <http://www.oracle.com/pls/db102/homepage>.
 7. Companion CD Installation Guide. Available on the Oracle 10g Companion CD and online at <http://www.oracle.com/pls/db102/homepage>.

Software Required

In addition to a working Oracle database (10g Release 1 in this case), the following software is required for the upgrade:

- Oracle 10g Release 2 RDBMS
- Oracle 10g Release 2 Companion Disk

Steps at a Glance

The following is a summary of the steps used:

1. Backup the operating system.
2. Validate the server host environment for the Release 2 installation and correct any deficiencies. Use the Health Check Validation Engine (HCVE) for this.
3. Create the Release 2 Oracle Home if required by HCVE.
4. Backup the database to be upgraded.
5. Install the 10g Release 2 software.
6. Install available patches to Release 2 software.
7. Run the Release 2 Upgrade Information Tool (utlu102i.sql). (Note that the DBUA will do this for you, but I prefer to do it as a separate step.) This script validates that the source database (10g Release 1 in this case) is ready to be upgraded to Release 2. Correct any deficiencies identified by this script. This can include (but is not limited to):
 - Updating initialization parameters.
 - Installing additional products from the Oracle10g Release 2 Companion CD.
 - Updating stale statistics.

8. Upgrade the Release 1 database.
9. If there are problems with the upgrade, restore the Release 1 database, correct the problems and retry the upgrade. (I encountered a severe error that required restoring the original Release 1 database and restarting the process. Details about the error and solution are documented later in this article.)

The following sections will provide additional details about each step in the process.

1. Backup the Operating System

Since the next step would likely force changes to the existing environment (Linux in this case) I decided it was prudent to perform a backup before proceeding. Shutdown the database and backup the operating system. In this case, the Linux “tar” command was used to backup the operating system to tape.

2. Validate Server for Oracle 10g Release 2 Installation - HCVE

As a starting point, refer to the Installation and Upgrade Guides to verify that your upgrade path is supported. For example, is upgrading from 9.2.0.4 to 10.2 supported? The path to be used here (10.1 to 10.2) was indeed supported.

Next, run the Oracle-supplied HCVE program to validate the operating system and host environment for the Oracle 10g installation. In addition to the OS, the program will check swap space, RAM, disk space, kernel parameters and more.

Refer to Metalink Note 250262.1 for specific instructions about executing the program and for the software download link.

After executing the HCVE, review the log file for failures as shown in the following log file excerpt:

```
Test "10g_rdbms_linux_hcve_082905" executed at Thu Sep  8 10:12:33 2005
```

```
Test Results
~~~~~
```

ID	NAME	RESULT	C	VALUE
10	OS certified?	PASSED	=	Certified with 10g RDBMS
20	User in /etc/passwd?	PASSED	=	userOK
30	Group in /etc/group?	PASSED	=	GroupOK
40	Input ORACLE_HOME	RECORD		/u01/app/oracle/product/10.2.0/db_1
50	ORACLE_HOME valid?	FAILED	=	OHnotvalid

If you have a failure as was the case here, scroll through the log to find more information:

```
Rule [ 50 ]: ORACLE_HOME valid?
~~~~~
```

```
Description:
```

```
-----
```

```
This rule checks if the ORACLE_HOME directory exist.
```

```

Test [ FAILED ] :
-----
OHnotvalid =~ OHexists|OHsymlink|OHNotSpecified

Action:
-----
ALERT
There is something wrong with ORACLE_HOME. Please verify the following

Return value      Action required
-----
OHnotvalid        Please ensure that the correct location is provided or
                   ensure that this directory has been created and
                   re-run this script
OHsymlink          ORACLE_HOME is a symbolic link ...

```

Correct any problems and rerun the validate program until no further errors are discovered.

3. Create the Release 2 Oracle Home

HCVE recommended I pre-create the new directory where the Oracle 10g Release 2 software would be installed. Use mkdir to create the directory, and set permissions with the following command:

```
$ chmod -R 775 /u01/app/oracle/product/10.2.0/db_2
```

4. Backup DB

Prior to attempting the upgrade of a database, it is critical that you backup the database. If errors occur during the upgrade to 10g Release 2, you will likely need to restore the database to the pre-upgrade state.

In this case, the Oracle10g Release 1 database used Automatic Storage Management (ASM), so RMAN was needed to backup the database. (Using RMAN is a good idea in any case even if you are not using ASM.) The command used was similar to the following:

```
RMAN> backup database format
'/mnt/mickeymantle/Oracle_Springsteen_Backups/%U' tag before_upgrade;
```

The RMAN environment used in this case was set to CONTROLFILE AUTOBACKUP ON, so the control file is automatically backed up when the database is backed up. Be sure you have a control file backup too.

Again, make absolutely certain that you have at least one good backup of the database. The backup created here was needed to restore the database when the 1st upgrade attempt failed.

5. Install Release 2 Software

To upgrade an existing database, install Oracle10g Release 2 software *only* (if you do not want a Release 2 starter database), and then, in a later step, migrate the existing database to Release 2. The following steps were used to install the Oracle 10g Release 2 software:

A. Stop active instances and processes

Cleanly shut down the existing database instance (shutdown or shutdown immediate) and the ASM instances (if applicable). If you are not familiar with stopping Oracle software, refer to chapter 2 of the Oracle Database Administrator's Reference for your platform (this manual comes on the Oracle10g software DVD). The following examples are for a Linux platform. For Windows environments, use Window Services to stop all Oracle-related instances and processes after cleanly shutting down the source database.

B. Stop the listener

Use the listener control utility (lsnrctl) to stop the listener. From the command prompt, enter "lsnrctl". Then enter the listener commands "stop" and "exit".

C. Stop Cluster Synchronization Services

The database in this case used ASM and, like RAC, ASM instances require that Cluster Synchronization Services (CSS) be active. Prior to installing the new Oracle software, you should stop CSS.

Enter the following command while logged in as root:

```
$ /etc/init.d/init.cssd stop
```

Refer to Chapter 2 of the Oracle Database Administrator's Reference for more information about this step if necessary.

D. Stop Enterprise Manager Database Control

Oracle 10g Release 1 (the source database in this upgrade) and above comes with a new browser-based version of Enterprise Manager (EM). This browser-based version of EM comes in two editions: Database Control and Grid Control. Database control is for single-instance environments and requires a service called "dbconsole" be started. Prior to installing Release 2, stop this service using this command:

```
$ emctl stop dbconsole
```

E. Run the Installer to Install Oracle 10g Release 2

Finally, install the Oracle10g Release 2 software using the Oracle Universal Installer (OUI). Change directory to the installation files directory and start the installer from the OS command prompt with the following command:

```
$ ./runInstaller
```

This will initialize a graphical user interface (OUI) that will guide you through the installation process. The following notes describe the screens you will see and contain information to help guide your selections on these screens.

Screen 1 – Select Installation Method

There are three considerations at this step:

1. The choice of Basic or Advanced installation. Keep “Basic Installation” selected. The Advanced Installation method is used to upgrade an existing database during the software installation and is relevant only if you want to install and upgrade as part of the same process. Even though the choice is provided, Oracle recommends doing the software installation and upgrade as separate steps.
2. *Uncheck* the “Create Starter Database” option.
3. You *must* specify a different Oracle home from the source database home (Oracle Release 1 in this case). (The new home: /u01/app/oracle/product/10.2.0/db_2 was created in Step 5 above.)

Screen 2 – Preparing to Install

No action required.

Screen 3 – Product-Specific Prerequisite Checks

OUI verifies the environment, i.e., checks memory, OS packages, kernel parameters, etc. If a failure is received, OUI highlights what failed. (This OUI step seems a lot like the Perl script that step 2 recommended you execute.) If OUI finds problems, you should:

- o Leave the Installer as-is and start a new terminal session.
- o Correct the problem(s) identified by OUI.
- o Return to the Installer.
- o Click the “Back” button.
- o Click the Forward button. At this point, OUI re-checks the environment.

Note that OUI provides the ability to override any errors and proceed. To do this, check the failed item checkbox to say “User Verified” and click the Next button. (This capability was not tested here.)

During the first attempt, the OUI checks failed with invalid values for the Linux rmem and wmem parameters. This was corrected with the following Linux commands:

```
[root@springsteen sbin]# sysctl -w net.core.rmem_max=262144
net.core.rmem_max = 262144
[root@springsteen sbin]# sysctl -w net.core.wmem_max=262144
net.core.wmem_max = 262144
[root@springsteen sbin]# sysctl -w net.core.wmem_default=262144
net.core.wmem_default = 262144
[root@springsteen sbin]# sysctl -w net.core.rmem_default=262144
net.core.rmem_default = 262144
[root@springsteen sbin]# sysctl -a |grep rmem
net.ipv4.tcp_rmem = 4096      87380   174760
net.core.rmem_default = 262144
net.core.rmem_max = 262144
[root@springsteen sbin]# sysctl -a |grep wmem
net.ipv4.tcp_wmem = 4096      16384   131072
net.core.wmem_default = 262144
net.core.wmem_max = 262144
```

The Back and Next buttons were used to recheck the environment and the following message was received:

“Warning: Non-empty Oracle home. Press Yes to continue anyway.”

This happened because the new Release 2 Oracle Home had some directories and files from the previous attempt. Clicking “Yes” to continue produced the message:

“Passed verification!”

Screen 4 – Summary

A summary of installation options is presented. Review these carefully. Scroll over the products to see brief (but often not very helpful) descriptions of the products. Press the Install button if all is OK.

Strangely, during this install, the summary listed “Oracle Database 10g 10.2.0.1.0” twice, as if it were to be installed twice; however this did not cause any problems during the rest of the process.

Screen 5 – Install

The progress of the installation is shown on this screen. A “Stop Installation” button is provided. Hopefully, no action is required.

Screen 6 – Execute Installation Scripts

OUI identifies a script that needs to be run as root. Leave the Installer running, open a new terminal session and run the script. The terminal session during this upgrade looked like this:

```
[root@springsteen sbin]# /u01/app/oracle/product/10.2.0/db_2/root.sh
Running Oracle10 root.sh script...
```

The following environment variables are set as:

```
ORACLE_OWNER= oracle
ORACLE_HOME= /u01/app/oracle/product/10.2.0/db_2
```

```
Enter the full pathname of the local bin directory: [/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.
```

```
[root@springsteen sbin]#
```

Return to OUI and click the Next button.

Screen 7 – End of Installation

You should receive a confirmation that the software installation was “Successful.” This screen also lists the URLs of J2EE applications like iSQL*Plus (shown below) and provides an “Installed Products” button that produces an Inventory window. This is useful to review because it shows the Oracle Home names and the list of products installed in that home. The new home here is OraDb10g_home1. (Strangely, OraDb10g_home2 was used by the Release 1 installation. This could be due to the failures and retries encountered installing Release 1.)

The following J2EE Applications have been deployed and are accessible at the URLs listed below.

iSQL*Plus URL:
<http://springsteen:5560/isqlplus>

iSQL*Plus DBA URL:
<http://springsteen:5560/isqlplus/dba>

6. Install Patches to Release 2

After the Oracle 10g Release 2 software is successfully installed on the server, search Metalink for patches. No patches for 10.2.0.1 (Linux) were available as of 9/8/05.

7. Run the Upgrade Information Tool (utlu102i.sql)

Oracle supplies a “pre-upgrade” script with Oracle10g Release 2 called *utlu102i.sql* that provides a report about the readiness of your source database for upgrade to Oracle10g Release 2. It will check the initialization parameters and tablespace sizes among other things. This script can be executed many times. You may need to do this after addressing issues identified by the script.

Warning: Due to incorrect documentation and bad advice, this is a step that caused a lot of lost time. You should read the next section carefully.

Copy `rdbms/admin/utlu102i.sql` from the Release 2 Oracle Home to convenient location. (You will be executing the script from SQL*Plus while connected to the source database, so your source database SQL*Plus working directory is a logical place.)

Since the source database is probably down (because of the Release 2 software installation), restart the source database (listener, CSS and ASM if applicable, and finally the database).

Then run the script using these steps:

- Change the directory to the location of the `utlu102i.sql` script.
- Start SQL*Plus
- Login as SYSDBA
- set echo off
- spool pre-upgrade.log
- @utlu102i
- spool off

Next, analyze the log produced by the utlu102i.sql script. The following is an excerpt from the log:

```
*****
Miscellaneous Warnings
*****
WARNING: --> Deprecated CONNECT role granted to some user/roles.
.... CONNECT role after upgrade has only CREATE SESSION privilege.
WARNING: --> Database contains stale optimizer statistics.
.... Refer to the 10g Upgrade Guide for instructions to update
.... statistics prior to upgrading the database.
.... Component Schemas with stale statistics:
....   SYS
WARNING: --> Database contains INVALID objects prior to upgrade.
.... USER DAVE has 4 INVALID objects.
.... USER DMSYS has 6 INVALID objects.
.... USER OLAPSYS has 11 INVALID objects.
.... USER ORDPLUGINS has 1 INVALID objects.
.... USER PUBLIC has 22 INVALID objects.
.... USER SYS has 27 INVALID objects.
.... USER SYSMAN has 1 INVALID objects.
.... USER XDB has 2 INVALID objects.
.
```

In this case, the following issues were identified by the validation script (utlu102i.sql). Each will be discussed in more detail below.

1. Adjust Initialization Parameters (warnings for this issue are not shown in the excerpt shown above). Be careful. Some erroneous information was encountered in the utlu102i log, detailed below.
2. Install Oracle products from the “Companion CD”, included in the box with the Oracle10g R2 database DVD. (Warnings for this issue are not shown in the excerpt above).
3. Update Stale SYS Statistics. Be careful; there is an Oracle bug open on this, detailed below.
4. Recompile invalid objects. Be careful with this step. It is not actually necessary to have zero invalid objects. Executing utlpr.sql script a few times is recommended and then move on. Invalid objects should not cause errors during the upgrade.

The following sections describe how these issues were resolved.

Adjust Initialization Parameters

The pre-upgrade script will indicate whether or not you need to adjust initialization parameters.

Note that the DBUA should do this for you. However, for insurance, I:

- Created a text init.ora file on my source database (create pfile from spfile)
- Copied the text init.ora to the 10g default home location
- Made the suggested adjustments.

The pre-upgrade script recommended increasing the SGA size (to 600Mb), streams pools size and session maximum open files (session_max_open_files parameter). However, according to Oracle support, the script did not take into account the total physical memory on the server being used (1GB) and, despite the script recommendation, cache sizes should not be increased to more than ½ of the available physical memory.

Install Required Products from the Companion CD

In this case, the pre-upgrade script instructed to install the following from the 10g Companion CD:

- Java Virtual Machine JAccelerator (NCOMP) and Oracle interMedia Image Accelerator
- Ultra Search

Note that the installation and upgrade will succeed without installing these components.

Refer to the Companion CD Installation Guide – *this is very important* in order to determine which installation type to select for the products you need. Both of these products (Oracle considers interMedia part of NCOMP) are installed with the “Products Installation Type” installation.

Running the Installer on the companion CD produced the following screens:

Screen 1 – Welcome

No action required. Click Next.

Screen 2 – Select a Product to Install

The Installation Guide indicates which of the three categories to choose. For NCOMP, Oracle Database 10g Product 10.2.0.1.0 was selected.

Screen 3 – Specify Home Details

Make sure you specify the correct Oracle Home and path for the Release 2 install base.

Screen 4 – Product Specific Prerequisite Checks

A series of checks are run to insure that your environment is correctly set up for the installation.

Screen 5 – Summary

A summary of installation options is presented. Review these carefully. Scroll over the products to view a brief description. Click the Install button.

Screen 6 – Install

The progress of the installation is shown. A “Stop Installation” button is provided (hopefully not needed). The location of an installation log is also provided:

/u01/app/oracle/orainventory/logs/

Screen 7 – End of Installation

With luck, you will get the “success” message.

This screen lists the URLs of newly installed products such as ultrasearch.

Update Stale System Statistics – Warning!

After several attempts at updating SYS statistics with `dbms_stats.gather_dictionary_stats` (as recommended on page 3-10 of the Upgrade Guide), a TAR was opened on this issue. Oracle Support indicated the following: “The bug is being worked by development. Once the bug is fixed, the patch will be uploaded to Metalink. As this is just a warning message, you may ignore this for now.”

Recommendation: Run `dbms_stats.gather_dictionary_stats` once and move on to the next step.

Compile Invalid Objects – Warning!

The `utlu102i` log output shown above shows several schemas containing invalid objects, and Oracle recommends validating these objects prior to performing the upgrade.

Recommendation: Ignore this warning.

I ran `rdbms/admin/utlrp.sql` as SYSDBA to recompile the objects listed as invalid by the pre-upgrade script. However, re-executing `utlu102i.sql` revealed that many invalid objects remained. This was a time-consuming issue to resolve and required opening several TARs. First, Oracle wanted to see the output of this query:

```
select owner, object_name, object_type
from dba_objects
where status='INVALID' and (owner = 'PUBLIC' or OWNER = 'SYS')
order by owner, object_name, object_type
```

A lot of time was lost on this issue. Oracle Support pointed to Metalink Notes (e.g. 309814.1, 300056.1, 272322.1), recommended de-installing unneeded packages (e.g. OLAP), and then advised that “the bulk of these are public synonyms and views. These will be recompiled automatically once accessed and should not be of concern.” The goal of getting all objects cleanly compiled was abandoned and the upgrade was completed successfully, even with the invalid objects.

8. Use DBUA to Upgrade the Database

As previously mentioned, the Database Upgrade Assistant (DBUA) was used to perform this upgrade. To start the tool, run ‘`dbua`’ from the Linux prompt as shown in the next example. Be sure to start the *new* 10.2 version of the DBUA.

```
cd /u01/app/oracle/product/10.2.0/db_2/bin
./dbua
```

The following are descriptions of the screens presented by the DBUA and the actions taken:

Screen 1 – Welcome

Be sure that the Introductory Notes say it will upgrade your database to 10.2. If it does not say 10.2, you are not running the correct version of DBUA. Click the Next button.

Step 1 of 8: Upgrade Operations

This screen asks “Upgrade a database or ASM?” If you select “database” and the database uses ASM, DBUA will detect this and will provide the opportunity to upgrade the ASM instance also, so select “database”.

Step 2 of 8: Databases

A list of existing databases is presented. Select which databases you want to upgrade to 10.2. Click “Next”.

At this point a pop-up indicates that DBUA has detected ASM and asks if you want to upgrade ASM too. Click “Yes”.

Another pop-up is presented instructing you how to upgrade ASM. Start a new terminal (leave this pop-up alone for the time being) up and do the following:

1 – Shutdown IMMEDIATE the source database and ASM instance. Note that on the second (successful) attempt at upgrade, the source database was shutdown prior to starting the DBUA.

2 – As instructed by DBUA, run the following script as root:

```
[oracle@springsteen oracle]$ su - root
Password:
[root@springsteen root]# cd /u01/app/oracle/product/10.2.0/db_2/bin
[root@springsteen bin]# ./localconfig reset
Stale CSS daemon is running... killing it now
Adding to inittab
Startup will be queued to init within 90 seconds.
Checking the status of new Oracle init process...
Expecting the CRS daemons to be up within 600 seconds.
CSS is active on these nodes.
    springsteen
CSS is active on all nodes.
Oracle CSS service is installed and running under init(1M)
[root@springsteen bin]#
```

3 - Start an ASM instance.

4 - Start the database.

5 – Return to the DBUA and click “OK” on the pop-up. This takes you back to the “Step 2 of 8” screen. Click Next.

6 - The ASM detected pop-up is presented again. Click “Yes” to upgrade ASM too.

7 - Another pop-up is presented with the warnings:

- CONNECT role has changed
- Some invalid objects exist
- Stale statistics exist.

Click Yes to Continue. (These were the issues that utlu102i identified and the latter two could not be solved.)

Step 3 of 4: Recompile Invalid Objects

Note: The screen title changed to “Step 3 of 4” (previously it displayed “Step 2 of 8”).

Options presented on this screen and my choices were:

- Recompile objects after upgrade? Yes, but it will take more time.
- Parallel compilation? Yes.
- Turn off archiving for duration of upgrade? Yes, saves time.

Step 4 of 4: Summary

A summary of upgrade options is presented with a recommendation to backup the database before proceeding. (Note that the Upgrade Guide implied that DBUA would perform a backup but this capability was not apparently visible.) Since the backup was performed before the installation, this was not necessary here. Click the Finish button.

Progress Screen

This screen presents the upgrade progress. With lots of luck, you will get to the “successful upgrade” screen!

Other Critical Issues

The following critical issues were not addressed by any of the Oracle documentation (although there was some mention of these points in the Metalink notes), but were identified with the help of Oracle Support:

- Prior to starting DBUA, set the ORACLE_HOME environment to point to the 10.2 installation, not the database you’re upgrading. You can check this with the Linux ‘env’ command. A script was created to do the following:

```
[oracle@springsteen oracle]$ more 10gr2_env
# setup for 10g R2 environment

export ORACLE_BASE=/u01/app/oracle
export ORACLE_HOME=$ORACLE_BASE/product/10.2.0/db_2
export
PATH=/usr/kerberos/bin:/usr/local/bin:/usr/bin:/bin:/usr/X11R6/bin:/home/oracle/bin:/sbin:/u01/app/oracle/product/10.2.0/db_2/bin
```

- Oracle Support advised: “Ensure the user’s SYS and SYSTEM have 'SYSTEM' as their default tablespace.” This caused a failure in the first upgrade attempt.
- If this is a re-run of the DBUA, you will need to delete the log files created by the previous run before starting the DBUA again. You can find them in cfgtoollogs directories upgrade and (possibly) upgrade0:

```
[oracle@springsteen oracle]$ cd
$ORACLE_HOME/cfgtoollogs/dbua/linux3/upgrade
[oracle@springsteen upgrade]$ ls
```

```

ASMInstance.log   Oracle_Server.log   PreUpgrade.log   ultraSearchCfg.log
ASMUpgrade.log    Oracle_Text.log     sqls.log         UpgradeResults.html
emConfig.log      PostUpgrade.log     trace.log        upgrade.xml

```

- If this is a re-run of the DBUA, check to see if the previous run of DBUA left any updates in /etc/oratab. Remove these entries prior to rerunning DBUA.
- Oracle Support advised shutting down the database to be upgraded (Oracle10g Release 1 in my case) prior to the upgrade. The documentation did not state this, but when the upgrade finally worked, the R1 database was shutdown, so you should accept this recommendation. However, the database and ASM instance were up during the first attempt at using DBUA, and this did not seem to be a problem.
- Prior to starting the DBUA, use the Linux ‘ipcs’ and ‘free’ commands to check whether or not semaphores are allocated to crashed instances of a database.
- After a successful upgrade and, at the appropriate time, change the COMPATIBLE parameter to 10.2. If left at 10.1, it will cause errors on things that require 10.2 compatibility, such as the Data Pump SAMPLE parameter.
- If you suffer an upgrade failure and restore the database to its state prior to the upgrade, remember to add the TEMPFILE. (Note that Oracle 10g Release 2 recreates the TEMPFILE, so this will not be necessary in the future.)

```
SQL> alter tablespace temp add tempfile;
```
- If you need to abort the upgrade, click the “Stop” button on the Progress screen. However, my experience was that the upgrade process would not stop. The Log file indicated that progress of the upgrade continued so the processes were killed manually.

9. Correct DBUA Upgrade Errors

Unfortunately, during the first attempt at upgrading, the DBUA displayed a screen with the message:

“ORA- 00959 Tablespace USERS does not exist.”

Although the author (bravely or stupidly) pressed the “Ignore” button, the error kept repeating. The DBUA log contained the following information:

```

$ more +/ORA-00959 Oracle_Server.log

create index system.mview$_adv_workload_idx_01
2      on system.mview$_adv_workload (collectionid#, queryid#)
3  /
on system.mview$_adv_workload (collectionid#, queryid#)
*
ERROR at line 2:
ORA-00959: tablespace 'USERS' does not exist

```

The source database did not have a USERS tablespace and the user SYSTEM’s default tablespace was set to USERS. It was assumed creating a USERS tablespace would solve this problem; however, Oracle support said, “Ensure that the users sys and system have 'system' as their default tablespace.”

It was then necessary to kill the upgrade processes, restore the source (10g Release 1) database, correct the problem and restart the upgrade process.

Restoring the Original Database

Since the upgrade had been aborted, it was necessary to recover the original database and start over. The technique used for restore and recovery follows. It is useful to examine an excerpt from a LIST BACKUP command. Note the name of the controlfile backup on September 6:

```
BS Key  Type LV Size          Device Type Elapsed Time Completion Time
----- -- --
171     Full  5M           DISK         00:00:00      06-SEP-05
      BP Key: 180   Status: AVAILABLE Compressed: NO  Tag:
TAG20050906T162558
      Piece Name: +GROUP1/linux3/autobackup/2005_09_06/s_568306352.439.5
      Controlfile Included: Ckp SCN: 18443438      Ckp time: 06-SEP-05
```

```
BS Key  Type LV Size          Device Type Elapsed Time Completion Time
----- -- --
172     Full  6M           DISK         00:00:00      09-SEP-05
      BP Key: 181   Status: AVAILABLE Compressed: NO  Tag:
TAG20050909T123950
      Piece Name: +GROUP1/linux3/autobackup/2005_09_09/s_568552020.990.7
      Controlfile Included: Ckp SCN: 18923739      Ckp time: 09-SEP-05
```

Next, the controlfile was restored:

```
RMAN> shutdown immediate
RMAN> startup nomount
```

```
connected to target database (not started)
Oracle instance started
```

```
Total System Global Area      788529152 bytes

Fixed Size                      781200 bytes
Variable Size                   518788208 bytes
Database Buffers                268435456 bytes
Redo Buffers                     524288 bytes
```

```
RMAN> set dbid 2410307274;
```

```
executing command: SET DBID
```

```
RMAN> restore controlfile from
'+GROUP1/linux3/autobackup/2005_09_06/s_568306352.439.5';
```

```
Starting restore at 20-SEP-05
allocated channel: ORA_DISK_1
channel ORA_DISK_1: sid=270 devtype=DISK
```

```
channel ORA_DISK_1: restoring controlfile
channel ORA_DISK_1: restore complete
output filename=+GROUP1/linux3/controlfile/current.261.3
output filename=+GROUP1/linux3/controlfile/current.260.3
Finished restore at 20-SEP-05
```

Lastly, restore the database and open with the RESETLOGS option:

```
RMAN> mount database;

database mounted
released channel: ORA_DISK_1

RMAN> run {
2> allocate channel d1 type disk;
3> allocate channel t1 type sbt;
4> restore database;
5> }

allocated channel: d1
channel d1: sid=270 devtype=DISK

allocated channel: t1
channel t1: sid=265 devtype=SBT_TAPE
channel t1: NMO v4.1.0.0

Starting restore at 20-SEP-05
. . .
RMAN> alter database open resetlogs;
```

Various errors from the ALTER DATABASE OPEN RESETLOGS command occurred. It did not work until after exiting and re-entering RMAN. (There was not sufficient time to open a TAR on this.)

Summary

After completing the upgrade and reflecting on all this, it doesn't seem so bad. It must be true that the human mind tends to remember the good and blank out the rest. I hope this article helped you prepare properly and avoid some of the pitfalls.

Bio

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Dave provides Oracle consulting services, writes Oracle course books and teaches Oracle subjects throughout the world. He can be reached at dave@skillbuilders.com.