

Migration from Oracle[®] 10g (10.2.0.2) on Red Hat[®] Enterprise Linux[®] 4 Update 4 x86_64 to Oracle 10g (10.2.0.3) on Red Hat Enterprise Linux 4 Update 5 x86_64

The purpose of this document is to provide a procedure for upgrading a cluster running Oracle 10g (10.2.0.2) on Red Hat Enterprise Linux AS 4 Update 4 x86_64 to Oracle 10g (10.2.0.3) on Red Hat Enterprise Linux AS 4 Update 5 x86_64.

Assumptions

This document makes the following assumptions:

- All the systems in the cluster are running 64-bit Red Hat Enterprise Linux 4 update 4 and Oracle 10g (10.2.0.2) with ASM as cluster file system.
- The voting disk, ocr and sp-file are on the shared storage.
- The systems in the cluster are compatible with the software and hardware configuration as described in the "Oracle Database 10g Extended Memory 64 Technology (EM64T) Enterprise Edition – Linux Deployment Guide Version 2.0" document. This document can be obtained at the website <http://www.dell.com/10g>

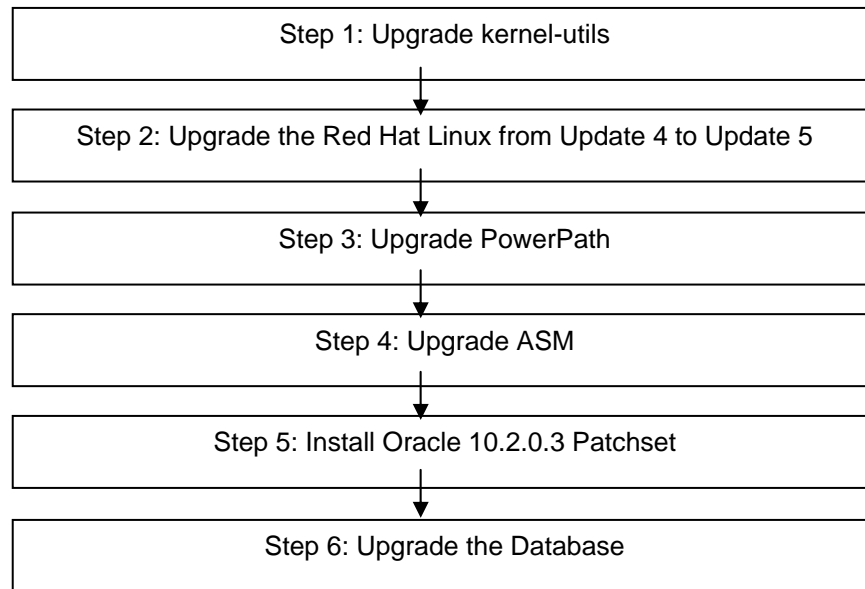
Requirements

During the migration the following CD's and documents will be required:

1. Red Hat Enterprise Linux 4 Update 5 AS x86_64 CD's.
2. EMC[®] PowerPath[®] (4.5.3) RPM for RHEL 4 Update 5 x86_64.
3. ASMLib (oracleasm-2.6.9-55, oracleasm-lib-2.0.2-1) RPM's for RHEL 4 Update 5 x86_64.
4. Oracle 10g 10.2.0.3 Patchset.

Migration Path:

Migration will be performed in the following 6 steps:



Step 1: Upgrading kernel-utils

Follow these steps on each node to upgrade Kernel:

- Mount the 2nd RHEL 4 Update 5 x86_64 CD.
- Locate kernel-utils-2.4-13.1.99.x86_64.rpm RPM.
- Type the following command to upgrade the Kernel:
`rpm -Uvh kernel-utils-2.4-13.1.99.x86_64.rpm`

Step 2: Upgrading the Red Hat Enterprise Linux 4 Update 4 x86_64 to Update 5 x86_64

Follow the below mentioned procedure to upgrade from RHEL 4 Update 4 to Update 5:

- Shutdown the Database, Asm, Crs and Nodeapps on all the nodes and unplug the FC cables.
- Follow these steps on each node :
 - Boot through the first RHEL 4 Update 5 CD.
 - Once you boot through the CD you will get an option as mentioned below:
Upgrade an existing installation. Select this option.
 - Selecting this option will check for the existing RPM's installed on the nodes and it will upgrade all the necessary RPM's for RHEL 4 Update 5 from all the os CD's.
 - After upgrade is complete, it will reboot with the new kernel.

Step 3: Upgrading EMC PowerPath

Follow the steps on each node for upgrading EMC PowerPath.

- Stop the EMC PowerPath service on all the nodes:
`service PowerPath stop`
- Download EMC PowerPath RPM for RHEL 4 Update 5 x86_64 (`EMCpower.LINUX-4.5.3-003.rhel.x86_64.rpm`) from <http://powerlink.emc.com>

- Upgrade the existing version of EMC PowerPath as below.
rpm -Uvh EMCpower.LINUX-4.5.3-003.rhel.x86_64.rpm
- After upgrade start the PowerPath service:
service PowerPath start
- Check the raw device entries in */etc/sysconfig/rawdevices*, If the raw device labels have changed (e.g. */dev/emcpowerb1* might have changed to */dev/emcpowerc1*), then make appropriate changes in */etc/sysconfig/rawdevices*.
- Finally restart the rawdevices service:
service rawdevices restart

Step 4: Upgrading ASM

Follow the steps on each node for upgrading ASM:

- Download all the ASM lib, tools and driver RPM's for Red Hat kernel *version kernel-2.6.9-55.EL.x86_64.rpm* from the following link:
<http://www.oracle.com/technology/software/tech/linux/asmlib/rhel4.html>
- Copy all the RPM's to the location */tmp* and run the following command:
rpm -Uvh oracleasm (this will install all the RPM's present in the /tmp)*
- Restart the Oracle ASM service:
service oracleasm restart
- Verify all the ASM disks are listed after upgrade is complete as before:
service oracleasm listdisks

Step 5: Installing the Oracle Database 10g 10.2.0.3 Patchset

Downloading and Extracting the Installation Software

1. On node 1, log in as oracle.
2. Create a folder for the patchset in any free space partition. (e.g. */opt/oracle/patches*.)
3. Login to Oracle Metalink website at <http://metalink.oracle.com> with your Oracle Metalink account.
4. Search for the patch number **5337014** with Linux x86-64 (AMD64/EM64T) as the platform.
5. Download the patch to */opt/oracle/patches* directory.
6. Unzip the downloaded zip file:
unzip p5337014_10203_Linux-x86-64.zip

Patchset installation is done in two steps

Step 1. Upgrading the Clusterware Installation

1. Perform the following steps on all the nodes
 - a. Log in as root and make sure crs is down:
crsctl stop crs

2. Perform the following steps on node 1
 - a. As root type
xhost +
 - b. Then login as oracle.
 - c. Change the home for Clusterware upgrade:
export ORACLE_HOME=/crs/oracle/product/10.2.0/crs
 - d. Start the Oracle Universal Installer:
cd /opt/oracle/patches/Disk1/
./runInstaller
 - e. In the Welcome screen, click Next.
 - f. In the Specify Home Details screen, click Next (Check for crs home).
 - g. In the Summary screen, click Install.
The Oracle Universal Installer scans your system, displays all the patches that are required to be installed, and installs them on your system. When the installation is completed, the End of Installation screen appears.
NOTE: This procedure may take several minutes to complete.
 - h. After the installation is completed a message window appears. Read all the instructions that are displayed in the message window.
NOTE: Do not shut down the Clusterware daemons, as you already performed this procedure in step 1.
 - i. As user root, run the \$ORA_CRS_HOME/install/root102.sh script on each node, beginning with the local node.
Wait for root102.sh to finish running on each node before you run it on the next node.
 - j. After successful completion of scripts on both the nodes, End the Installation window, click Exit and confirm by clicking yes.

Step 2. Upgrading the Database Installation

1. Perform the following steps on all the nodes
 - a. As root user make sure all the Clusterware node applications on all nodes are down:
\$ORACLE_HOME/bin/srvctl stop nodeapps -n <nodename>
NOTE: Ignore any warning messages that may appear.
NOTE: <nodename> corresponds to the node name of that given node.
2. Perform the following steps on node 1 only
NOTE: Run the Oracle Universal Installer from the same node that you upgraded the Oracle Clusterware software.
 - a. As root type
xhost +
 - b. Then log in as oracle.
 - c. Change the oracle home, where the database software installation is done previously
export ORACLE_HOME=/opt/oracle/product/10.2.0/db_1
 - d. Start the Oracle Universal Installer:
cd /opt/oracle/patches/Disk1/
./runInstaller
 - e. In the Welcome screen, click Next.
 - f. In the Specify Home Details screen, check for database software installation home path.
 - g. In the Specify Hardware Cluster Installation Mode screen, click next.
 - h. In the Summary screen, click Install.
The Oracle Universal Installer scans your system, displays all the patches that are required to be installed, and installs them on your system. When the installation is complete, the End of Installation screen appears.
Next, a message window appears, prompting you to run root.sh as user root.
 - i. As user root, run root.sh script on first node, where the installation is happening.
Wait for root.sh to finish and complete the same on other nodes.
 - j. After completion, end the Installation by click Exit and confirm by clicking yes.

3. After the installation is Performed on node1 (The node where you applied the patchset)
 - a. As oracle user, copy /opt/oracle/product/10.2.0/db_1/rdbms/lib/libknlopt.a to all the other nodes in the cluster.
 - e.g. to copy it from node 1 to node 2 use the following method:
r`cp /opt/oracle/product/10.2.0/db_1/rdbms/lib/libknlopt.a`
node2:/opt/oracle/product/10.2.0/db_1/rdbms/lib/libknlopt.a
 - NOTE: Do not perform this step as root.**
 - b. Remake the Oracle binary on all the nodes by issuing the following commands on each node as user oracle:
cd /opt/oracle/product/10.2.0/db_1/rdbms/lib
make -f ins_rdbms.mk ioracle
4. After Complete installation of software:
 - Log in as root and start the applications:
sv`ctl start nodeapps -n <nodename is the public host name of the nodes >`
cr`sctl stop crs`

Step 6: Upgrade the Database

Upgrading Oracle Database 10g Release 10.2.0.2 to Oracle Database 10g Release 10.2.0.3

Set the SHARED_POOL_SIZE and JAVA_POOL_SIZE Initialization Parameters

Set the value of the SHARED_POOL_SIZE and the JAVA_POOL_SIZE initialization parameters as follows:

1. Start the database:

```
SQL> STARTUP NOMOUNT
```

2. If necessary, determine whether the system uses an initialization parameter file (initsid.ora) or a server parameter file (spfiledbname.ora):

```
SQL> SHOW PARAMETER PFILE;
```

This command displays the name and location of the server parameter file or the initialization parameter file.

3. Determine the current values of these parameters:

```
SQL> SHOW PARAMETER SHARED_POOL_SIZE  
SQL> SHOW PARAMETER JAVA_POOL_SIZE
```

4. If the system is using a server parameter file:
 - a. Set the value of the SHARED_POOL_SIZE initialization parameter to at least 150 MB (If it is less than 150MB):

```
SQL> ALTER SYSTEM SET SHARED_POOL_SIZE='150M' SCOPE=spfile;
```

- b. Set the value of the JAVA_POOL_SIZE initialization parameter to at least 150 MB (If it is less than 150MB):

```
SQL> ALTER SYSTEM SET JAVA_POOL_SIZE='150M' SCOPE=spfile;
```

5. In the system using an initialization parameter file, the above parameters can be changed by editing the `init sid .ora` file manually and starting the database. Change the values of the `SHARED_POOL_SIZE` and the `JAVA_POOL_SIZE` initialization parameters to at least 150 MB (If they are less than 150MB each).
6. If Database is handled in Automatic Shared Memory Management, Then ensure that the value of the `SGA_TARGET` initialization parameter size is at least 50 MB greater than the sum of the values of the `SHARED_POOL_SIZE` and the `JAVA_POOL_SIZE` initialization parameters (If comes lower then increase it to atleast 150MB).

Note: The value of the `SGA_TARGET` parameter depends on your environment. If you receive a system error when you restart the database, increase the value of the `SGA_TARGET` parameter to the value specified in the error.

7. Shut down the database:

```
SQL> SHUTDOWN
```

Upgrade the database to Release 10.2.0.3

After you install the patchset, you must perform the following steps on every database associated with the upgraded Oracle home:

Note: If you do not run the `catupgrd.sql` script as described in this section and you start up a database for normal operation, then ORA-01092: ORACLE instance terminated. Disconnection forced errors will occur and the error ORA-39700: database must be opened with UPGRADE option will be in the alert log.

1. Log in as the Oracle software owner user (`oracle`).
2. For RAC installations, start listener on each node of the cluster as follows:

```
$ srvctl start listener -n nodename
```

3. If you are using ASM, start the ASM instance.
4. For single-instance installations, start the listener as follows:

```
$ lsnrctl start
```

Note: If you are using the Oracle OLAP option, make sure that the listener is running.

5. For single-instance installations, use SQL*Plus to log in to the database as the SYS user with `SYSDBA` privileges:

```
$ sqlplus /nolog
SQL> CONNECT / AS SYSDBA
```

6. For RAC installations:
 - a. Use SQL*Plus to log in to the database as the SYS user with `SYSDBA` privileges:

```
$ sqlplus /nolog
SQL> CONNECT / AS SYSDBA
SQL> STARTUP NOMOUNT
```

- b. Set the `CLUSTER_DATABASE` initialization parameter to `FALSE`:

```
SQL> ALTER SYSTEM SET CLUSTER_DATABASE=FALSE SCOPE=spfile;
```

c. Shutdown the database:
SQL> SHUTDOWN

7. Enter the following SQL*Plus commands:

```
SQL> STARTUP UPGRADE
SQL> SPOOL patch.log
SQL> @?/rdbms/admin/catupgrd.sql
SQL> SPOOL OFF
```

8. Review the patch.log file for errors and inspect the list of components that is displayed at the end of catupgrd.sql script.

This list provides the version and status of each SERVER component in the database.

9. Rerun the catupgrd.sql script after correcting any problems.

10. Restart the database:

```
SQL> SHUTDOWN
SQL> STARTUP
```

11. Run the utlrlp.sql script to recompile all invalid PL/SQL packages now instead of when the packages are accessed for the first time. This step is optional but recommended.

```
SQL> @?/rdbms/admin/utlrlp.sql
```

Note:

When the 10.2.0.2 patch set is applied to an Oracle Database 10g Standard Edition database or Standard Edition One database, there may be 42 invalid objects after the utlrlp.sql script runs. These objects belong to the unsupported components and do not affect the database operation.

Ignore any messages indicating that the database contains invalid recycle bin objects similar to the following:

```
BIN$4IzIjWIt9gfgMFeM2hVSoA==$0
```

12. If you are using the Oracle Recovery Manager catalog, enter the following command:

```
$ rman catalog username/password@alias
RMAN> UPGRADE CATALOG;
```

13. For RAC installations:

a. Set the CLUSTER_DATABASE initialization parameter to TRUE:

```
SQL> ALTER SYSTEM SET CLUSTER_DATABASE=TRUE SCOPE=spfile;
```

b. Restart the database:

```
SQL> SHUTDOWN
SQL> STARTUP
```

c. Start any processes that you want to use:

```
$ srvctl start service -d db_name -s service_name
```

Running changePerm.sh script on an Oracle database server home

Important:

Oracle recommends using the most restrictive file permissions possible for your given implementation. Perform these *optional* steps only after considering all security ramifications and only if you need to share this installation.

During patchset installation, all new files and directories are created with restricted access, by default. Users or third party applications with a different group identifier from that of the database, which try to access client-side utilities or libraries in the database home, will see permission errors when trying to access these files or directories. Perform the following steps to change the permissions:

1. Change your directory to:
 \$ cd \$ORACLE_HOME/install
2. Run changePerm.sh and specify the patched server Oracle home location, before accessing client-side utilities or libraries in the database home.

Note:

If you are patching RAC home, then you will need to run this script on all the nodes.

Note:

For more information regarding the 10.2.0.2 patchset installation, refer the README for the patch number **4547817** with Linux x86-64 (AMD64/EM64T) as the platform in Oracle Metalink site