



Migration from Oracle[®] 10g (10.2.0.1) on Red Hat[®] Enterprise Linux[®] 4 Update 2 x86_64 to Oracle 10g (10.2.0.2) on Red Hat Enterprise Linux 4 Update 3 x86_64

The purpose of this document is to provide a procedure for upgrading a cluster running Oracle 10g (10.2.0.1) on Red Hat Enterprise Linux AS 4 Update 2 x86_64 to Oracle 10g (10.2.0.2) on Red Hat Enterprise Linux AS 4 Update 3 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 2 and Oracle 10g (10.2.0.1) 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>

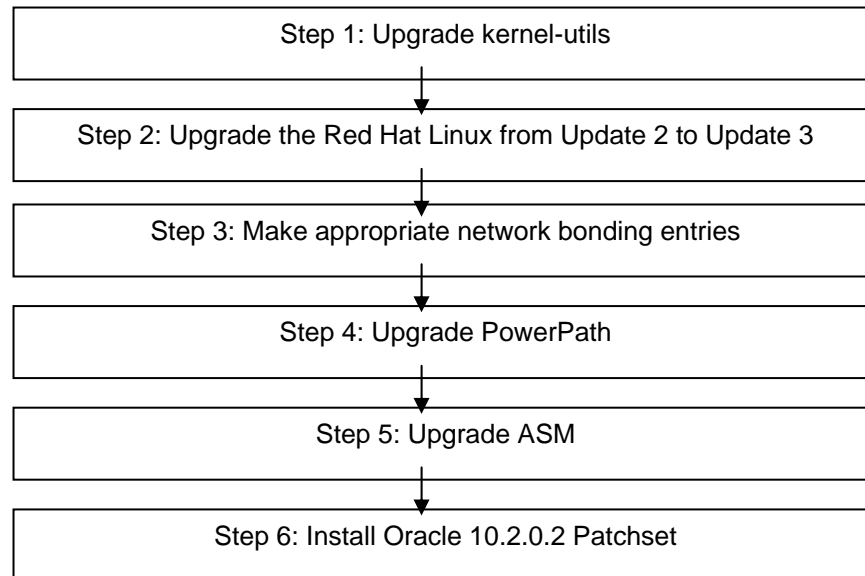
Requirements

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

1. Red Hat Enterprise Linux 4 Update 3 AS x86_64 CD's.
2. EMC[®] PowerPath[®] RPM for RHEL 4 Update 3 x86_64.
3. ASMLib RPM's for RHEL 4 Update 3 x86_64.
4. Oracle 10g 10.2.0.2 Patchset.

Migration Path:

Migration will be performed in the following 6 steps:



Step 1: Upgrading kernel-utils

Follow the steps on each node:

- Mount the 2nd RHEL 4 Update 3 x86_64 CD.
- Locate kernel-utils-2.4-13.1.80.x86_64.rpm RPM.
- Type the following command:
rpm -Uvh kernel-utils-2.4-13.1.80.x86_64.rpm

Step 2: Upgrading the Red Hat Enterprise Linux 4 Update 2 x86_64 to Update 3

Follow the below mentioned procedure to upgrade from RHEL 4 Update 2 to Update 3:

- Shutdown all the nodes and unplug all the FC cables.
- Perform the following steps on each node :
 - Boot through the first RHEL 4 Update 3 CD.
 - Once you boot through the CD you will get an option as mentioned below:
Upgrade an existing installation. Select the option.
 - Once you select the option it will check for the existing RPM's installed on the nodes and it will ask for the remaining RHEL 4 Update 3 CD's.
 - It will then upgrade to the latest RPM's automatically.
 - After upgrade it will reboot and boot with the new kernel.

Step 3: Make appropriate network bonding entries

Follow the steps on each node:

- Log in as root.
- Add the following line to the /etc/modprobe.conf file:
alias bond0 bonding

- For high availability, edit the `/etc/modprobe.conf` file and set the option for link monitoring. The default value for `miimon` is 0, which disables link monitoring. Change the value to 100 milliseconds initially, and adjust it as needed to improve performance as shown in the following example.

Type:

```
options bonding miimon=100 mode=1
```

Step 4: Upgrading EMC PowerPath

Follow the steps on each node for upgrading PowerPath.

- Uninstall the existing version of EMC PowerPath.

```
rpm -e EMCpower.LINUX
```
- Get the EMC PowerPath RPM for RHEL 4 Update 3 x86_64 (EMCpower.LINUX-4.5.1-022.rhel_64.rpm) from <http://powerlink.emc.com>
- Install the new PowerPath for the RHEL 4 Update3 x86_64 using the following command:

```
rpm -ivh EMCpower.LINUX-4.5.1-022.rhel_64.rpm
```
- Type the following to start the PowerPath service:

```
service PowerPath start
```
- Execute the command `fdisk -l` and check the corresponding raw device entries in `/etc/sysconfig/rawdevices`. If the raw device labels have changed (e.g. `/dev/emcpowerb1` might have changed to `/dev/emcpowerc1`), make appropriate changes in `/etc/sysconfig/rawdevices`.
- To restart the rawdevices service, type

```
service rawdevices restart
```

Step 5: 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 2.6.9-34* x86_64 version 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 execute the following command:

```
rpm -Uvh oracleasm*
```
- Restart the Oracle ASM service using the following command:

```
service oracleasm restart
```
- Verify that all the ASM disks are listed on issuing the following command:

```
service oracleasm listdisks
```
- Start the CRS service using the following command:

```
crsctl start crs
```

Step 6: Installing the Oracle Database 10g 10.2.0.2 Patchset

Downloading and Extracting the Installation Software

1. On node 1, log in as oracle.
2. Create a folder for the patches and utilities at /opt/oracle/patches.
3. Open a web browser and navigate to the Oracle Support website at <http://metalink.oracle.com>.
4. Log in to your Oracle Metalink account.
5. Search for the patch number **4547817** with Linux x86-64 (AMD64/EM64T) as the platform.
6. Download the patch to the /opt/oracle/patches directory.
7. To unzip the downloaded zip file, type the following in a terminal window
`unzip p4547817_10202_LINUX-x86-64.zip`

Upgrading the Clusterware Installation

1. Perform the following steps on all the nodes
 - a. Log in as root.
 - b. Shut down the Clusterware. To do so, type the following in the terminal window
`crsctl stop crs`
2. Perform the following steps on node 1
 - a. Log in as root and type
`xhost +`
 - b. Log in as oracle.
 - c. In the terminal window, type the following and press <Enter>:
`export ORACLE_HOME=/crs/oracle/product/10.2.0/crs`
 - d. Start the Oracle Universal Installer. To do so, type the following in the terminal window
`cd /opt/oracle/patches/Disk1/
./runInstaller`
 - e. In the Welcome screen, click Next.
 - f. In the Specify Home Details screen, click Next.
 - 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 completed, the End of Installation screen appears.
NOTE: This procedure may take several minutes to complete.
 - i. 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.
 - j. Open a terminal window. 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.
 - k. On node 1, in the End of Installation window, click Exit and confirm by clicking Yes.

Upgrading the Database Installation

1. Perform the following steps on all the nodes
 - a. Log in as oracle.
 - b. Shut down the Clusterware node applications on all nodes. In the terminal window, type the following and press <Enter>
`$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 installed the Oracle Database software.
 - a. Log in as root and type
xhost +
 - b. Log in as oracle.
 - c. Open a terminal window. Type the following
export ORACLE_HOME=/opt/oracle/product/10.2.0/db_1
 - d. Start the Oracle Universal Installer. To do so, type the following in the terminal window,
cd /opt/oracle/patches/Disk1/
./runInstaller
 - e. In the Welcome screen, click Next.
 - f. In the Specify Home Details screen, click Next.
 - 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. Open a terminal window. As user root, run root.sh script on each node, beginning with the local node.
Wait for root.sh to finish running on each node before you run it on the next node.
 - j. On node 1, in the End of Installation window, click Exit and confirm by clicking Yes.
 - k. Open a terminal window.
 - l. Log in as oracle.
 - m. Type the following:
srvctl start nodeapps -n <nodename>
Where <nodename> is the public host name of the node.
 3. Perform the following steps on all the remaining nodes
 - a. Log in as root and shut down CRS by issuing the following command:
crsctl stop crs
 4. Perform the following steps on node 1 (the node where you applied the patchset)
 - a. As the user oracle, copy /opt/oracle/product/10.2.0/db_1/rdbms/lib/libknlopt.a to all the other nodes in the cluster.
For example, to copy it from node 1 to node 2, type the following:
rcp /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.
 5. 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

Upgrading Oracle Database 10g Release 10.2.0.1 to Oracle Database 10g Release 10.2.0.2

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, enter the following command to 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. If necessary, set the value of the SHARED_POOL_SIZE initialization parameter to at least 150 MB:

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

- b. If necessary, set the value of the JAVA_POOL_SIZE initialization parameter to at least 150 MB:

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

5. If the system uses an initialization parameter file, if necessary change the values of the SHARED_POOL_SIZE and the JAVA_POOL_SIZE initialization parameters to at least 150 MB in the initialization parameter file (*initsid.ora*).
6. If you use Automatic Shared Memory Management, 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.

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 Release 10.2 Database

After you install the patch set, 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.
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. If necessary, rerun the catupgrd.sql script after correcting any problems.

10. Restart the database:

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

11. Run the utlrp.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/utlrp.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 utlrp.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$4lzljWIt9gfgMFeM2hVSoA==$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.

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