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How to apply CPU patch in RAC environment using rolling upgrade

"The term rolling upgrade refers to upgrading different databases or different instances of the same database (in a Real Application Clusters environment) one at a time, without stopping the database.

The advantage of a RAC rolling upgrade is that it enables at least some instances of the RAC installation to be available during the scheduled outage required for patch upgrades. Only the RAC instance that is currently being patched needs to be brought down. The other instances can continue to remain available. This means that the impact on the application downtime required for such scheduled outages is further minimized. Oracle's opatch utility enables the user to apply the patch successively to the different instances of the RAC installation.

Rolling upgrade is available only for patches that have been certified by Oracle to be eligible for rolling upgrades. Typically, patches that can be installed in a rolling upgrade include:

- Patches that do not affect the contents of the database such as the data dictionary
- Patches not related to RAC internode communication
- Patches related to client-side tools such as SQL*PLUS, Oracle utilities, development libraries, and Oracle Net
- Patches that do not change shared database resources such as datafile headers, control files, and common header definitions of kernel modules
- Rolling upgrade of patches is currently available for one-off patches only. It is not available for patch sets.

Rolling patch upgrades are not available for deployments where the Oracle Database software is shared across the different nodes. This is the case where the Oracle home is on Cluster File System (CFS) or on shared volumes provided by file servers or NFS-mounted drives. The feature is only available where each node has its own copy of the Oracle Database software."

Lets apply Patch 8576156 using Rolling upgrade

OPatch Utility Information

You must use the OPatch 10.2 version 10.2.0.4.7 or later to apply this patch. Oracle recommends that you use the latest released OPatch 10.2, which is available for download from My Oracle Support patch 6880880 by selecting the 10.2.0.0.0 release.

```
rac1-> crs_stat -t
Name           Type           Target    State     Host
------------------------------------------------------------
ora....VICE.cs application    ONLINE    ONLINE    rac2
ora....db1.srv application    ONLINE    ONLINE    rac1
ora....db2.srv application    ONLINE    ONLINE    rac2
ora.devdb.db   application    ONLINE    ONLINE    rac2
ora....b1.inst application    ONLINE    ONLINE    rac1
ora....b2.inst application    ONLINE    ONLINE    rac2
ora....SM1.asm application    ONLINE    ONLINE    rac1
ora....C1.lsnr application    ONLINE    ONLINE    rac1
ora....C1.lsnr application    ONLINE    ONLINE    rac1
ora.rac1.gsd   application    ONLINE    ONLINE    rac1
ora.rac1.ons   application    ONLINE    ONLINE    rac1
ora.rac1.vip   application    ONLINE    ONLINE    rac1
ora....SM2.asm application    ONLINE    ONLINE    rac2
ora....C2.lsnr application    ONLINE    ONLINE    rac2
ora....C2.lsnr application    ONLINE    ONLINE    rac2
ora.rac2.gsd   application    ONLINE    ONLINE    rac2
ora.rac2.ons   application    ONLINE    ONLINE    rac2
ora.rac2.vip   application    ONLINE    ONLINE    rac2
```

rac1-> cd /u01/app/oracle/product/10.2.0/db_1/OPatch/

rac1-> ./opatch version

Invoking OPatch 10.2.0.4.2

OPatch Version: 10.2.0.4.2

OPatch succeeded.

Download 6880880

cd /u01/app/oracle/product/10.2.0/db_1

rac1-> mv OPatch old_Opatch

rac1-> ls p6880880_112000_LINUX.zip

p6880880_112000_LINUX.zip

rac1-> unzip p6880880_112000_LINUX.zip

rac1-> cd OPatch/

rac1-> ./opatch version

Invoking OPatch 11.2.0.1.2

OPatch Version: 11.2.0.1.2

OPatch succeeded.

Patch Installation Instructions for a RAC Environment

Follow these steps:

1. Ensure that your Oracle Database installation is the same release for which you are applying this patch
2. Shut down the instance on one node.
3. Shut down all `nodeapps` services on the node in step 1:
4. `srvctl stop nodeapps -n <node-name>`
5. Apply the patch on the node in step 1.

   Set your current directory to the directory where the patch is located and then run the OPatch utility by entering the following commands:

```
unzip p8576156_10204_Linux-x86.zip
cd 8576156
opatch apply
```

6. Start the instance on the node in step 1.
7. Start all `nodeapps` services on the node in step 1:
8. `srvctl start nodeapps -n <node-name>`

9. Shut down the instance on the next node.
10. Repeat steps 1-6 on all the nodes in the cluster.

```
srvctl stop nodeapps –n rac1
```

srvctl stop instance -d devdb -i devdb1

srvctl stop asm -n rac1

```
rac1-> crs_stat -t
Name           Type           Target    State     Host
------------------------------------------------------------
ora....VICE.cs application    ONLINE    ONLINE    rac2
ora....db1.srv application    ONLINE    OFFLINE
ora....db2.srv application    ONLINE    ONLINE    rac2
ora.devdb.db   application    ONLINE    ONLINE    rac2
ora....b1.inst application    OFFLINE   OFFLINE
ora....b2.inst application    ONLINE    ONLINE    rac2
ora....SM1.asm application    OFFLINE   OFFLINE
ora....C1.lsnr application    OFFLINE   OFFLINE
ora....C1.lsnr application    OFFLINE   OFFLINE
ora.rac1.gsd   application    OFFLINE   OFFLINE
ora.rac1.ons   application    OFFLINE   OFFLINE
ora.rac1.vip   application    OFFLINE   OFFLINE
ora....SM2.asm application    ONLINE    ONLINE    rac2
ora....C2.lsnr application    ONLINE    ONLINE    rac2
ora....C2.lsnr application    ONLINE    ONLINE    rac2
ora.rac2.gsd   application    ONLINE    ONLINE    rac2
ora.rac2.ons   application    ONLINE    ONLINE    rac2
ora.rac2.vip   application    ONLINE    ONLINE    rac2
rac1->
```

ps -ef |grep smon

oracle 6097 4987 0 14:30 pts/1 00:00:00 grep smon

- Check that no oracle process is running on rac1

Verify whether there is any conflicts

unzip p8576156_10204_Linux-x86.zip

/u01/app/oracle/product/10.2.0/db_1/OPatch/opatch prereq CheckConflictAga instOHWithDetail -phBaseDir ./8576156

--- Apply the patch

cd 8576156

/u01/app/oracle/product/10.2.0/db_1/OPatch/opatch apply

- Check whether the patch is applied or not
- $ORACLE_HOME/OPatch lsinventory

```
rac1-> $ORACLE_HOME/OPatch/opatch lsinventory
Invoking OPatch 11.2.0.1.2

Oracle Interim Patch Installer version 11.2.0.1.2
Copyright (c) 2010, Oracle Corporation.  All rights reserved.


Oracle Home       : /u01/app/oracle/product/10.2.0/db_1
Central Inventory : /u01/app/oracle/oraInventory
   from           : /etc/oraInst.loc
OPatch version    : 11.2.0.1.2
OUI version       : 10.2.0.4.0
OUI location      : /u01/app/oracle/product/10.2.0/db_1/oui
Log file location : /u01/app/oracle/product/10.2.0/db_1/cfgtoollogs/opatch/opatch2010-05-29_14-37-01PM.log

Patch history file: /u01/app/oracle/product/10.2.0/db_1/cfgtoollogs/opatch/opatch_history.txt

Lsinventory Output file location : /u01/app/oracle/product/10.2.0/db_1/cfgtoollogs/opatch/lsinv/lsinventory2010-05-29_14-37-01PM.txt

--------------------------------------------------------------------------------
Installed Top-level Products (2):

Oracle Database 10g                                          10.2.0.1.0
Oracle Database 10g Release 2 Patch Set 3                    10.2.0.4.0
There are 2 products installed in this Oracle Home.


Interim patches (1) :

Patch  8576156      : applied on Sat May 29 11:42:31 IST 2010
```

Start the services

srvctl start asm -n rac1

srvctl start instance -d devdb -i devdb1

```
srvctl start nodeapps –n rac1
```

```
rac1-> crs_stat -t
Name           Type           Target    State     Host
------------------------------------------------------------
ora....VICE.cs application    ONLINE    ONLINE    rac2
ora....db1.srv application    ONLINE    ONLINE    rac1
ora....db2.srv application    ONLINE    ONLINE    rac2
ora.devdb.db   application    ONLINE    ONLINE    rac2
ora....b1.inst application    ONLINE    ONLINE    rac1
ora....b2.inst application    ONLINE    ONLINE    rac2
ora....SM1.asm application    ONLINE    ONLINE    rac1
ora....C1.lsnr application    ONLINE    ONLINE    rac1
ora....C1.lsnr application    ONLINE    ONLINE    rac1
ora.rac1.gsd   application    ONLINE    ONLINE    rac1
ora.rac1.ons   application    ONLINE    ONLINE    rac1
ora.rac1.vip   application    ONLINE    ONLINE    rac1
ora....SM2.asm application    ONLINE    ONLINE    rac2
ora....C2.lsnr application    ONLINE    ONLINE    rac2
ora....C2.lsnr application    ONLINE    ONLINE    rac2
ora.rac2.gsd   application    ONLINE    ONLINE    rac2
ora.rac2.ons   application    ONLINE    ONLINE    rac2
ora.rac2.vip   application    ONLINE    ONLINE    rac2
```

Apply the patch on the second node

```
srvctl stop nodeapps -n rac2
```

srvctl stop instance -d devdb -i devdb2

srvctl stop asm -n rac2

```
rac2-> crs_stat -t
Name           Type           Target    State     Host
------------------------------------------------------------
ora....VICE.cs application    ONLINE    ONLINE    rac2
ora....db1.srv application    ONLINE    ONLINE    rac1
ora....db2.srv application    ONLINE    OFFLINE
ora.devdb.db   application    ONLINE    ONLINE    rac2
ora....b1.inst application    ONLINE    ONLINE    rac1
ora....b2.inst application    OFFLINE   OFFLINE
ora....SM1.asm application    ONLINE    ONLINE    rac1
ora....C1.lsnr application    ONLINE    ONLINE    rac1
ora....C1.lsnr application    ONLINE    ONLINE    rac1
ora.rac1.gsd   application    ONLINE    ONLINE    rac1
ora.rac1.ons   application    ONLINE    ONLINE    rac1
ora.rac1.vip   application    ONLINE    ONLINE    rac1
ora....SM2.asm application    OFFLINE   OFFLINE
ora....C2.lsnr application    OFFLINE   OFFLINE
ora....C2.lsnr application    OFFLINE   OFFLINE
ora.rac2.gsd   application    OFFLINE   OFFLINE
ora.rac2.ons   application    OFFLINE   OFFLINE
ora.rac2.vip   application    OFFLINE   OFFLINE
```

Allocate the DB connection to rac1

crs_relocate ora.devdb.db

```
rac2-> crs_stat -t
Name           Type           Target    State     Host
------------------------------------------------------------
ora....VICE.cs application    OFFLINE   OFFLINE
ora....db1.srv application    OFFLINE   OFFLINE
ora....db2.srv application    OFFLINE   OFFLINE
ora.devdb.db   application    ONLINE    ONLINE    rac1
ora....b1.inst application    ONLINE    ONLINE    rac1
ora....b2.inst application    OFFLINE   OFFLINE
ora....SM1.asm application    ONLINE    ONLINE    rac1
ora....C1.lsnr application    ONLINE    ONLINE    rac1
ora....C1.lsnr application    ONLINE    ONLINE    rac1
ora.rac1.gsd   application    ONLINE    ONLINE    rac1
ora.rac1.ons   application    ONLINE    ONLINE    rac1
ora.rac1.vip   application    ONLINE    ONLINE    rac1
ora....SM2.asm application    OFFLINE   OFFLINE
ora....C2.lsnr application    OFFLINE   OFFLINE
ora....C2.lsnr application    OFFLINE   OFFLINE
ora.rac2.gsd   application    OFFLINE   OFFLINE
ora.rac2.ons   application    OFFLINE   OFFLINE
ora.rac2.vip   application    OFFLINE   OFFLINE
```

rac2-> cd 8576156/

rac2-> /u01/app/oracle/product/10.2.0/db_1/OPatch/opatch apply

This node is part of an Oracle Real Application Cluster.

Remote nodes: 'rac1'

Local node: 'rac2'

Please shutdown Oracle instances running out of this ORACLE_HOME on the local system.

(Oracle Home = '/u01/app/oracle/product/10.2.0/db_1')

Is the local system ready for patching? [y|n]

y

User Responded with: Y

srvctl start asm -n rac2

srvctl start instance -d devdb -i devdb2

```
srvctl start nodeapps –n rac2
```

2.3.3 Post Installation Instructions

2.3.3.1 Loading Modified .sql Files into the Database

The following steps load modified .sql files into the database. For a RAC environment, perform these steps on *only one node*.

(Note that if there is a database in the Oracle home that you are patching, this will involve starting all database instances running from this Oracle home.)

1. For each database instance running on the Oracle home being patched, connect to the database using SQL*Plus. Connect as SYSDBA and run the `catbundle.sql` script as follows:

```
cd $ORACLE_HOME/rdbms/admin
sqlplus /nolog
SQL> CONNECT / AS SYSDBA
SQL> STARTUP
SQL> @catbundle.sql psu apply
SQL> QUIT
```

Check the following log files in `$ORACLE_HOME/cfgtoollogs/catbundle` any errors:

```
catbundle_PSU_<database SID>_APPLY_<TIMESTAMP>.log
catbundle_PSU_<database SID>_GENERATE_<TIMESTAMP>.log
```

2.3.3.2 Recompiling Views in the Database

1. If the database *is* in a RAC environment, run the view recompilation script as follows. Note that this script is run with the database in upgrade mode, which restricts connections as SYSDBA. Stop all instances except the one where the view recompilation is being executed.

```
srvctl stop database -d devdb

cd $ORACLE_HOME/cpu/view_recompile
sqlplus /nolog
SQL> CONNECT / AS SYSDBA
SQL> STARTUP NOMOUNT
SQL> ALTER SYSTEM SET CLUSTER_DATABASE=FALSE SCOPE=spfile;
SQL> SHUTDOWN
SQL> STARTUP UPGRADE
SQL> @view_recompile_jan2008cpu.sql
SQL> SHUTDOWN;
SQL> STARTUP NOMOUNT;

Set the CLUSTER_DATABASE initialization parameter to TRUE:

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

Restart the database:

SQL> QUIT
cd $CRS_HOME/bin
srvctl start database -d <database-name>
```

If any invalid objects were reported, run the `utlrp.sql` script as follows:

```
cd $ORACLE_HOME/rdbms/admin
sqlplus /nolog
SQL> CONNECT / AS SYSDBA
SQL> @utlrp.sql

Ref:
```

http://www.oracle.com/technology/deploy/availability/pdf/oow06/S281209_To.pdf

http://jarneil.wordpress.com/2008/01/31/upgrading-to-oracle-11g-clusterware/