






Oracle DB patching the right way (out of place)

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30+ years with Oracle technology

- Database 6.x – 23c
- Oracle Financials 7, E-Business Suite R11, R12.1, R12.2

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Industries including

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- financial
- marketing
- healthcare,
- utilities
- government

Member of the Quest IOUG Database & Technology Community, serving on the advisory board



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Viscosity's Oracle ACEs



The Oracle ACE Program



The Oracle ACE Program recognizes and rewards individuals for their contributions to the Oracle community.



Charles Kim
CEO | Co-Founder

 @racdba
 ACE Director



Rich Niemiec
Chief Innovation Officer

 @richniemiec
 ACE Director



Craig Shallahamer
Applied AI Scientist

 @orapub
 ACE Director



Sean Scott
Principal Consultalt

 @oraclesean
 ACE Director



Gary Gordhamer
Principal Consultalt

 @ggordham
 ACE Pro

Shane

Shane AI: The Oracle Tuning AI Assistant

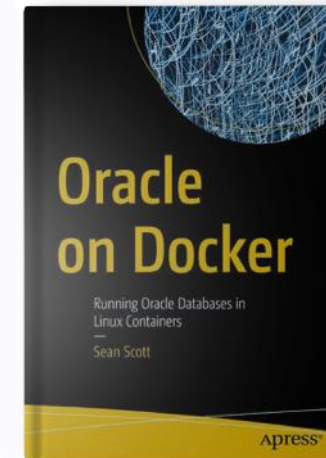
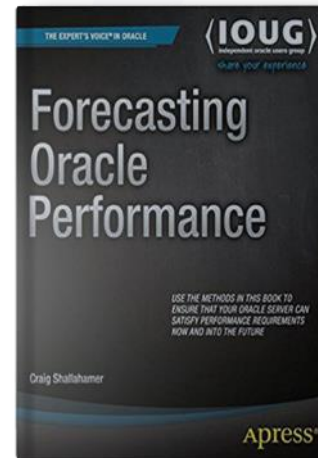
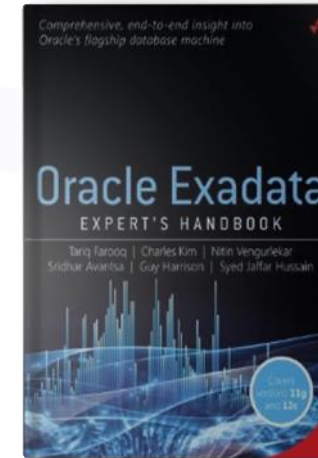
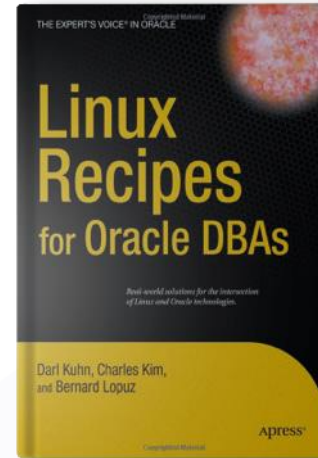
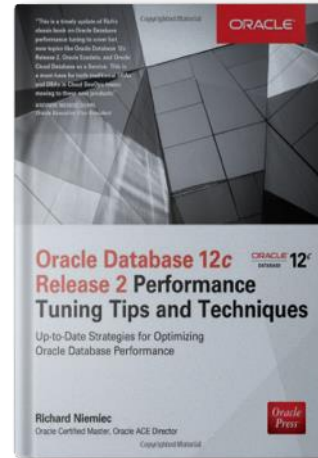
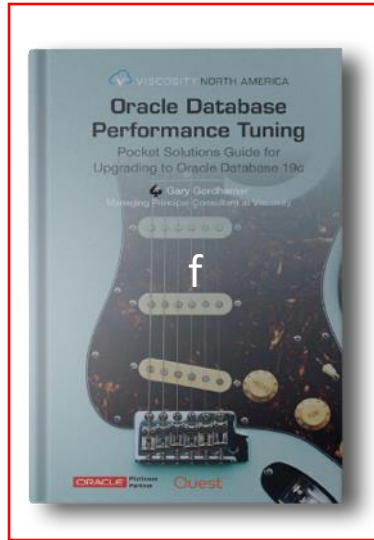
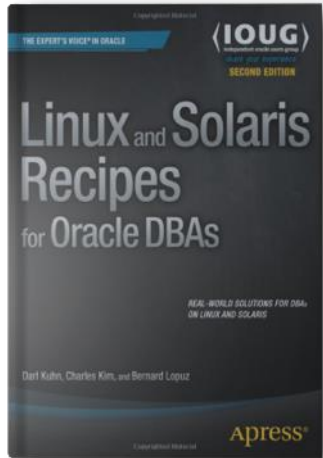
Leveraging **Oracle Cloud Infrastructure**, AI Shane is a **conversational AI** assistant with a vast curated knowledge base of **all things Oracle performance**. Shane also has a very distinct stereotypic **surfer persona**. His objective is to help anyone **improve** their **Oracle system performance** optimization skills.

AI Shane leverages the Oracle Generative AI services within Oracle Cloud Infrastructure (OCI).

This includes LLMs, vector and traditional capabilities within Oracle Databases.

Specifically, AI Shane can use the Oracle Vector Store, Oracle GenAI Services, Oracle Autonomous DB, Oracle MySQL, Oracle MySQL Heatwave and OCI Compute.

We've written the Books!



Agenda

- Why patch / benefits of Out of Place patching
- High level process
- Grid patching walkthrough
- DB patching walkthrough
- Questions

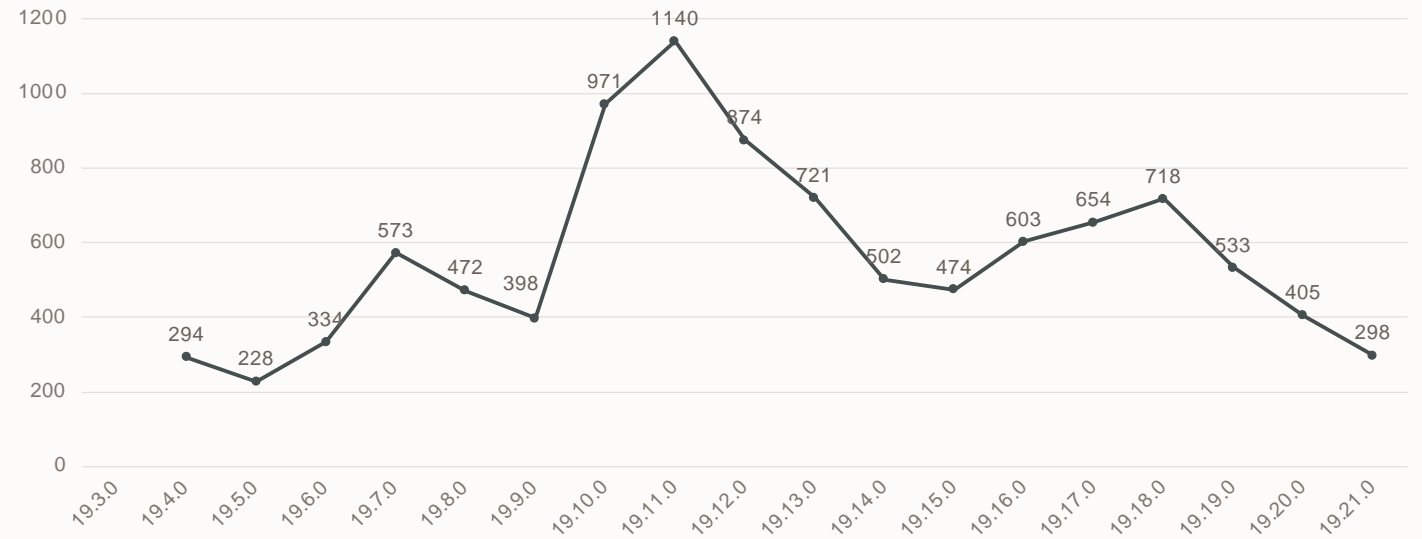
Additional items

- Rollback steps
- Additional runInstaller and gridSetup options
- References

Why patch?

- Security updates
- Fixes
- New features (Linux 8 support)
- Perl (19.18)
- Java updates
- Timezone updates

Release Update Contents



[Database 19 Release Updates and Revisions Bugs Fixed Lists \(Doc ID 2523220.1\)](#)

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Always review critical one-off patch [MOS note 555.1](#)

Patching Process – Traditional

1. Unzip patches
2. Backup ORACLE_HOME
3. Bring down databases
4. OPATCH – Rollback patches on ORACLE_HOME
5. OPATCH - Apply patches to ORACLE_HOME
6. Bring up databases
7. DATAPATCH - Apply SQL & PL/SQL changes (*can be open for use*)
8. Open databases for use
9. OPATCH – cleanup ORACLE_HOME

Outage

ISSUES: Long time, risk of issues, rollback difficult

Patching Process – Out of place

1. UNZIP Patches + ORACLE_HOME
2. RUNINSTALLER - Install / patch new ORACLE_HOME
3. AUTOUPGRADE – Switch homes
4. Database open for use

Outage

Benefits:

- **Busy work done ahead of time (software patching)**
- No rollback of patches
- Easier to rollback
- AUTOUPGRADE – does pre checks, and keeps things consistent
- Binary patching is faster on a “new” home
- Less space:

19.20 fresh install – **9.6GB** (patch storage 2.3GB) 19.20 patched multiple times – **22GB** (patch storage 13GB)

What AUTOUPGRADE can't do (for now)

- No Windows support – coming soon
- RAC Rolling patching
- Dataguard standby first patching – coming soon
 - Still can use “out of place” DB homes
 - Manually switch homes
 - Manually apply SQL changes after all sites are binary patched

Listen to the experts

Fernando Simon
Senior Database and Cloud Specialist (ACE Director)
Banque Internationale à Luxembourg (BIL)

Daniel Overby Hansen
Senior Principal Product Manager
Oracle

Mario Barduchi
Senior Database Systems Engineer
Oracle

Roy Swonger
Vice President
Oracle

Mike Dietrich
Senior Director Product Management
Oracle

Franky Weber Faust
DBA Team Lead (ACE PRO)
Pythian



Rodrigo Jorge
Product Manager
Oracle

Few additional patch notes

- Data Pump bundle patch – can be applied ONLINE
 - If you have not applied this, apply prior to patching to improve patch performance.
 - Be sure to apply the latest patch with each RU you apply
- OJVM patch
 - If you don't need this – consider disabling or removing
 - In 19c requires a small “outage” during install
 - Consider the “Mitigation Patch” if you can take no downtime
- OCW patch
 - Required for RAC DB home and recommended for HAS home
 - See later slide

High level process

Out of place patching – HAS – pt 1+2

Server: svr01

Running ASM 19.20

Database SID mydb

DB running 19.20 also

Steps:

1. Install grid_2 home with 19.23
2. Install dbhome_2 with 19.22 + one off patches
3. Switch ASM / HAS to grid_2 home
4. Switch DB to dbhome_2

Note: steps 3 and 4 can be done at the same time or at different times.

svr01

LISTENER

ohasd.bin

ora_pmon_+ASM

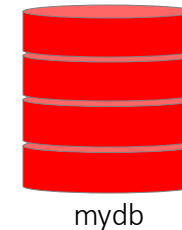
/u01/app/19/grid_1
19.20.0 RU

ora_pmon_mydb

Wallet

TNS Files

SPFILE /
INIT.ORA



/u01/app/oracle/product/19/dbhome_1
19.20.0 RU + one off patches

/u01/app/19/grid_2
19.23.0 RU

/u01/app/oracle/product/19/dbhome_2
19.23.0 RU + one off patches

Out of place patching – HAS – pt 3

Server: svr01

Running ASM 19.23

Database SID mydb

DB running 19.20 also

Steps:

1. Install grid_2 home with 19.23
2. Install dbhome_2 with 19.22 + one off patches
3. Switch ASM / HAS to grid_2 home
4. Switch DB to dbhome_2

Note: steps 3 and 4 can be done at the same time or at different times.

svr01

ora_pmon_mydb

Wallet

TNS Files

SPFILE /
INIT.ORA



mydb

/u01/app/19/grid_1
19.20.0 RU

/u01/app/oracle/product/19/dbhome_1
19.20.0 RU + one off patches

LISTENER

ohasd.bin

ora_pmon_+ASM

/u01/app/19/grid_2
19.23.0 RU

/u01/app/oracle/product/19/dbhome_2
19.23.0 RU + one off patches

Out of place patching – HAS – pt 4

svr01

Server: svr01

Running ASM 19.23

Database SID mydb

DB running 19.23

Steps:

1. Install grid_2 home with 19.23
2. Install dbhome_2 with 19.22 + one off patches
3. Switch ASM / HAS to grid_2 home
4. Switch DB to dbhome_2

Outage

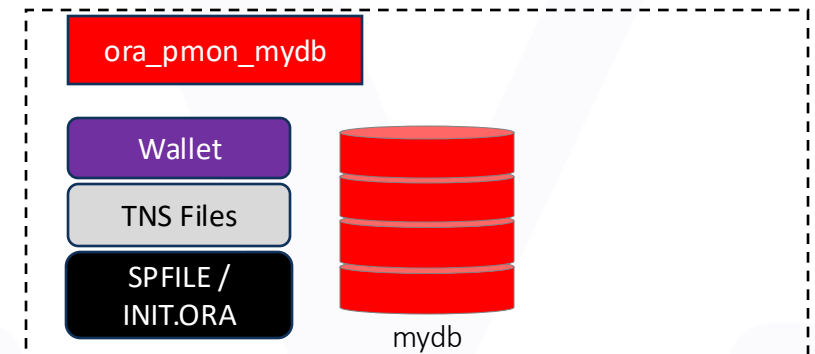
Note: steps 3 and 4 can be done at the same time or at different times.

/u01/app/19/grid_1
19.20.0 RU



/u01/app/19/grid_2
19.23.0 RU

/u01/app/oracle/product/19/dbhome_1
19.20.0 RU + one off patches

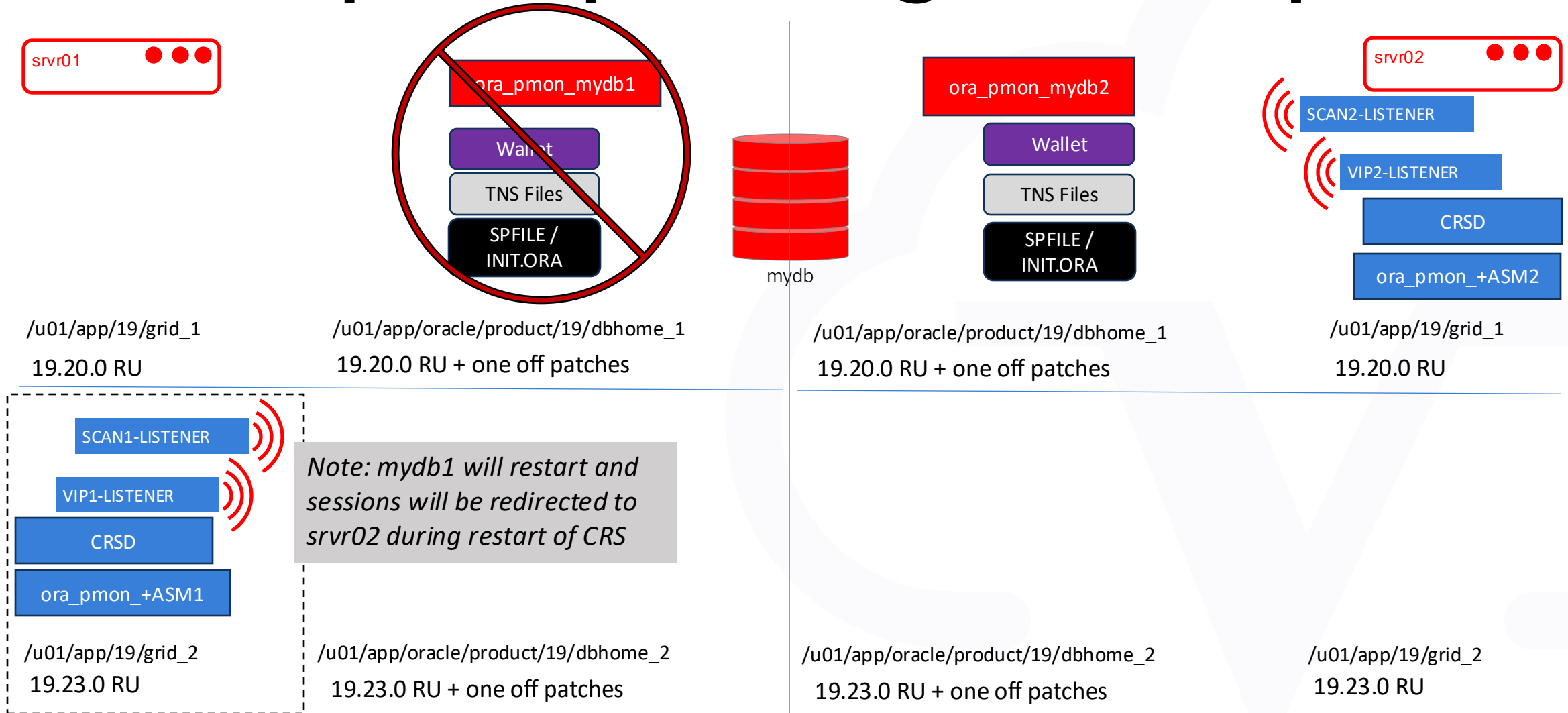


/u01/app/oracle/product/19/dbhome_2
19.23.0 RU + one off patches

Out of place patching – RAC – pt 1+2



Out of place patching – RAC – pt 3



Out of place patching – RAC – pt 3

svr01

ora_pmon_mydb1

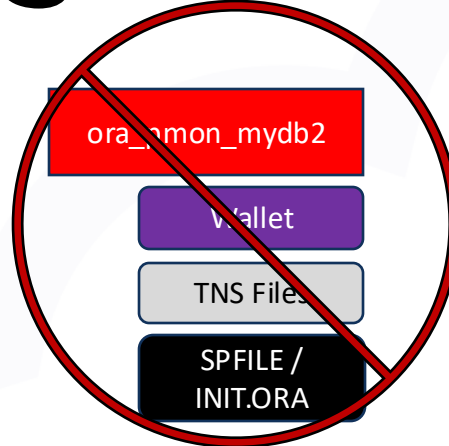
Wallet

TNS Files

SPFILE /
INIT.ORA



mydb



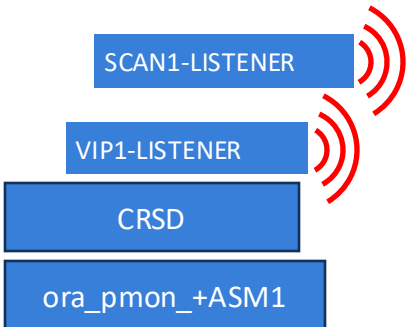
svr02

/u01/app/19/grid_1
19.20.0 RU

/u01/app/oracle/product/19/dbhome_1
19.20.0 RU + one off patches

/u01/app/oracle/product/19/dbhome_1
19.20.0 RU + one off patches

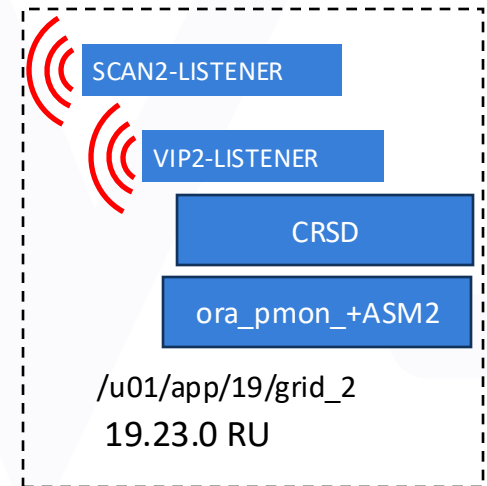
/u01/app/19/grid_1
19.20.0 RU



/u01/app/19/grid_2
19.23.0 RU

/u01/app/oracle/product/19/dbhome_2
19.23.0 RU + one off patches

/u01/app/oracle/product/19/dbhome_2
19.23.0 RU + one off patches



Note: mydb2 will restart and sessions will be redirected to svr02 during restart of CRS

Out of place patching – RAC – pt 4

svr01

svr02

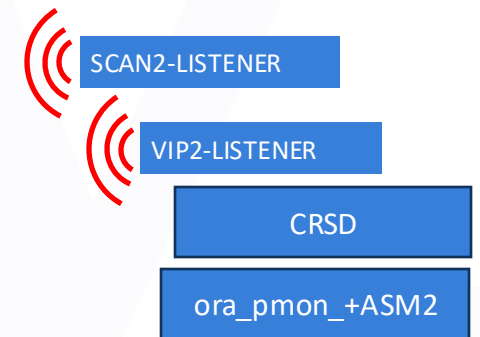
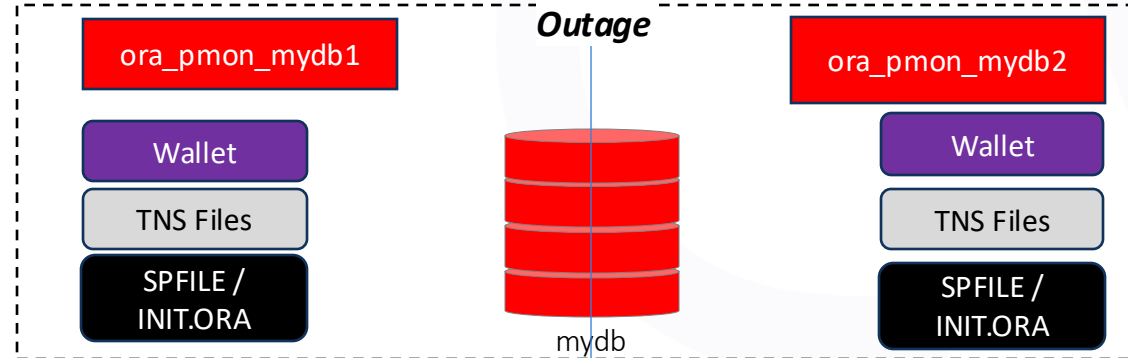
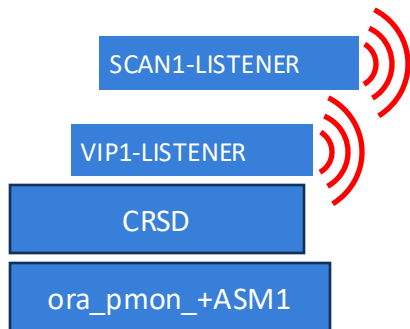
*Note: pre Autoupgrade 24.1 the DB would be put in upgrade mode (single instance), this is no longer true
You can make the previous versions upgrade in NORMAL mode using “patch_in_upgrade_mode=no”*

/u01/app/19/grid_1
19.20.0 RU

/u01/app/oracle/product/19/dbhome_1
19.20.0 RU + one off patches

/u01/app/oracle/product/19/dbhome_1
19.20.0 RU + one off patches

/u01/app/19/grid_1
19.20.0 RU



/u01/app/19/grid_2
19.23.0 RU

/u01/app/oracle/product/19/dbhome_2
19.23.0 RU + one off patches

/u01/app/oracle/product/19/dbhome_2
19.23.0 RU + one off patches

/u01/app/19/grid_2
19.23.0 RU

Out of place patching – Cleanup

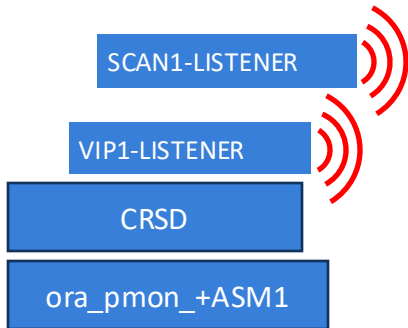
svr01

svr02

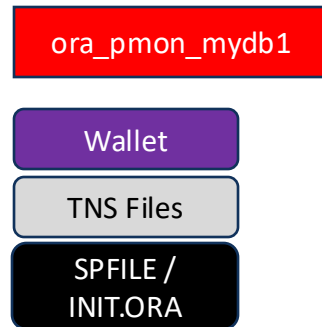
*Note:
for stand alone HAS or RAC
deinstall the old homes once they are no longer used*

For RAC deinstall will remove from all nodes at once for you

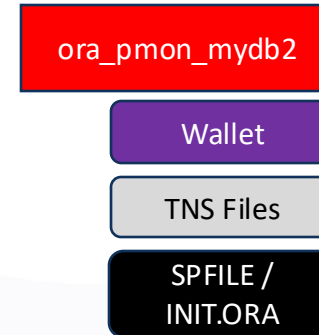
/u01/app/19/grid_1 19.20.0 RU	/u01/app/oracle/product/19/dbhome_1 19.20.0 RU + one off patches	/u01/app/oracle/product/19/dbhome_1 19.20.0 RU + one off patches	/u01/app/19/grid_1 19.20.0 RU
----------------------------------	---	---	----------------------------------



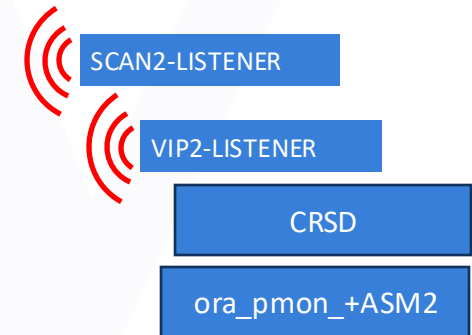
/u01/app/19/grid_2
19.23.0 RU



/u01/app/oracle/product/19/dbhome_2
19.23.0 RU + one off patches



/u01/app/oracle/product/19/dbhome_2
19.23.0 RU + one off patches



/u01/app/19/grid_2
19.23.0 RU

Note on Listeners

If you are not using HAS / GRID you need to manually move the listener from one home to another.

EG.

- Copy network config files from old home to new home (or verify they are correct)
- Set environment to old home
- Stop the listener
- Set environment to new home
- Start the listener

Tools

Grid out of place patching is taken care of using **gridsetup.sh**

Database out of place patching is done using **AUTOUPGRADE**

- Make sure you have the latest version
- Supports 19.3 and up
- RAC rolling upgrade of database is not supported
- Target ORACLE_HOME must already be patched

What does AUTOUPGRADE take care of?

AUTOUPGRADE contains 200+ prechecks

During my testing it performed 65 of those prior to patching

Additional items AUTOUPGRADE takes care of when switching homes

- DATAPATCH – puts database in upgrade mode (disable RAC / re-enable after run)
- CRS / HAS – database home definition
- /etc/oratab – database home
- \$ORACLE_HOME/network/admin – TNS files - **Includes wallet files**
- \$ORACLE_HOME/dbs – init.ora / spfile / password file
- @?/rdbms/admin/utlfixdirs.sql – fix directory objects based on ORACLE_HOME
- @?/rdbms/admin/utlrp.sql – recompile invalid objects
- ORANFSTAB
- Messaging Gateway configuration
- Database Gateway for DRDA
- CTX files
- External PROC and ODBC settings
- Fixed object and Dictionary statistics (as needed)
- Optionally: create guaranteed restore point (GRP)

Grid patching walkthrough

GRID Steps Walkthrough

1. Unzip install media, RU patch, one off patches, OPatch
2. "install" home and apply patches (1 step)
3. Start outage
4. Switch GRID homes
5. Deinstall old home (when ready)

Unzip GRID software / patches

```
$ mkdir -p /u01/app/19/grid_2  
  
$ unzip -q -o LINUX.X64_193000_grid_home.zip -d /u01/app/19/grid_2  
$ rm -Rf /u01/app/19/grid_2/OPatch  
$ unzip -q -o p6880880_190000_Linux-x86-64.zip -d /u01/app/19/grid_2  
  
$ unzip -q -o p35642822_190000_Linux-x86-64.zip -d /u01/app/grid/stage/patch
```

Note: 19.21 RU is shown for example only

grid_2 is assumed empty / new home

Install / patch new GRID home

```
$ export CV_ASSUME_DISTID=OEL7.8

$ /u01/app/19/grid_2/gridSetup.sh -silent -ignoreprereqfailure \
  -applyRU /u01/app/grid/stage/patch/35642822 \
  oracle.install.option=CRS_SWONLY \
  INVENTORY_LOCATION=/u01/app/oraInventory \
  ORACLE_BASE=/u01/app/grid \
  oracle.install.crs.config.clusterNodes=srvr01,srvr02 \
  oracle.install.asm.OSASM=asmadmin \
  oracle.install.asm.OSDBA=asmdba \
  oracle.install.asm.OSOPER=asmoper \
  oracle.install.crs.rootconfig.executeRootScript=false
```

*Note: adjust RU patch location, paths, cluster nodes and group names as needed.
Password less SSSH needs to be configured for install on all nodes
CV_ASSUME_DISTID=OEL7.8 is required for Linux 8
For stand alone HAS just list the single node in clusterNodes*

*This will generate a root.sh script, run this as the **ROOT** user on each node of the cluster
If something goes wrong during this step, remove the home (rm -r /u01/app/19/grid_2) and start over*

Switch GRID homes (RAC)

Outage starts here

```
$ export CV_ASSUME_DISTID=OEL7.8  
  
$ export ORACLE_HOME=/u01/app/19/grid_2  
  
$ $ORACLE_HOME/gridSetup.sh -silent -switchGridHome \  
oracle.install.crs.config.clusterNodes=$( /usr/bin/hostname -s )
```

*This will generate a root.sh script, run this as the **ROOT** user to switch the homes*

Running the root.sh will shutdown the cluster on that node and restart it on the new home

After the root.sh script is run, you will need to add the ASM instance back to the /etc/oratab file

These steps need to be repeated on each node of the cluster, one at a time.

Switch GRID homes (HAS)

Prior to the outage run the following command to stage config files to the new home (TNS etc)

This command needs to be run as ROOT user

```
$ /u01/app/19/grid_2/crs/install/roothas.sh -prepatch -dstcrshome /u01/app/19/grid_2
```

Outage starts here: run this command to switch homes / upgrade HAS

This command needs to be run as ROOT user

```
$ /u01/app/19/grid_2/crs/install/roothas.sh -postpatch -dstcrshome /u01/app/19/grid_2
```

After the update, you will need to update the central inventory information

```
$ export CV_ASSUME_DISTID=OEL7.8  
$ /u01/app/19/grid_2/oui/bin/runInstaller -updateNOdeList ORACLE_HOME=/u01/app/19/grid_2 CRS=TRUE  
$ /u01/app/19/grid_1/oui/bin/runInstaller -updateNOdeList ORACLE_HOME=/u01/app/19/grid_1 CRS=FALSE
```

Note: in this example grid_2 is the upgraded home and grid_1 is the older version

CV_ASSUME_DISTID=OEL7.8 is required for Linux 8

Verify CRS version

```
$ crsctl query crs releasepatch
```

```
Oracle Clusterware release patch level is [2204791795] and the complete list of patches [33575402 35553096 35643107 35652062 35655527 ] have been applied on the local node. The release patch string is [19.21.0.0.0].
```

Run this command from the GRID home, this will work for both RAC and HAS

Clean up old GRID home

```
$ /u01/app/19/grid_1/deinstall/deinstall
```

*This script will pause and ask you to run a unlock command on the CRS home, the command will be provided and needs to be run as the **ROOT** user in a different window. Once the unlock is run, the main deinstall script will continue.*

Note this step should be run after the patching has been deemed successful.

Example assumes grid_1 is the previous home / patched version.

You can use the -local option if you want to deinstall one node at a time in RAC.

Verify the home is removed by looking at inventory file:

```
$ grep grid_1 /u01/app/oraInventory/ContentsXML/inventory.xml
```

```
<HOME NAME="OraGI19Home1" LOC="/u01/app/19/grid_1" TYPE="O" IDX="1" REMOVED="T"/>
```

The entry for the grid_1 home should show REMOVED="T"

DB patching walkthrough

DB Steps Walkthrough

1. Unzip install media, RU patch, one off patches, OPatch
2. "install" home and apply patches (1 step)
3. Update AUTOUPGRADE
4. Create config file
5. Run AUTOUPGRADE analyze
6. Start outage
7. Run AUTOUPGRADE deploy
8. Check logs / end outage
9. Deinstall old home (when ready)

DB software on RAC + Linux 8 issue

Linux 8 introduces an updated version of SSHD

Even with password less SSH setup correctly you can get an error when running install on DB version 19.6 or earlier.

You **MUST** apply the OCW patch for the RU you are using during the runInstaller.sh to resolve this.

The OCW patch is included in the RU for the GI (GRID) home.

Download the GRID RU patch and add the OCW patch to the oneOffs command line

Example in following slides

Note the DB RU is also in the GI RU!



Patch 36233126: GI RELEASE UPDATE 19.23.0.0.0

Last Updated Apr 16, 2024 6:07 AM (1+ month ago)

Product	Oracle Database - Enterprise Edition (More...)	Size	3.2 GB
Release	Oracle Database 19.0.0.0.0	Download Access	Software
Platform	Linux x86-64	Classification	Security
		Patch Tag	All Database

System Patch Contents

The following patches are included. Disabled items are included in the system patch and cannot be downloaded independently. Some patches may not apply to your configuration. Use [Configuration Manager](#) for a detailed applicability analysis.

36233263	DATABASE RELEASE UPDATE 19.23.0.0.0	(Oracle Database)
36233263	DATABASE RELEASE UPDATE 19.23.0.0.0	(Oracle Database)
36240578	OCW RELEASE UPDATE 19.23.0.0.0	(Oracle Database)
36240578	OCW RELEASE UPDATE 19.23.0.0.0	(Oracle Database)
36233263	DATABASE RELEASE UPDATE 19.23.0.0.0	(Oracle Database)
36233263	DATABASE RELEASE UPDATE 19.23.0.0.0	(Oracle Database)
36233263	DATABASE RELEASE UPDATE 19.23.0.0.0	(Oracle Database)
36233263	DATABASE RELEASE UPDATE 19.23.0.0.0	(Oracle Database)
36233263	DATABASE RELEASE UPDATE 19.23.0.0.0	(Oracle Database)
36233263	DATABASE RELEASE UPDATE 19.23.0.0.0	(Oracle Database)

Unzip DB software / patches

```
$ mkdir -p /u01/app/oracle/product/19/dbhome_2  
  
$ unzip -q -o LINUX.X64_193000_db_home.zip -d /u01/app/oracle/product/19/dbhome_2  
  
$ rm -Rf /u01/app/oracle/product/19/dbhome_2/OPatch  
$ unzip -q -o p6880880_190000_Linux-x86-64.zip -d /u01/app/oracle/product/19/dbhome_2  
  
$ unzip -q -o p35642822_190000_Linux-x86-64.zip -d /u01/app/oracle/stage/patch  
$ unzip -q -o p35787077_190000_Linux-x86-64.zip -d /u01/app/oracle/stage/patch  
$ unzip -q -o p35648110_190000_Linux-x86-64.zip -d /u01/app/oracle/stage/patch
```

Note: 19.21 GI RU is shown for example only

*Additional patches include DataPump bundle patch and OJVM
dbhome_2 is assumed empty / new home*

Install / patch new DB home

```
$ export CV_ASSUME_DISTID=OEL7.8
```

```
$ /u01/app/oracle/product/19/dbhome_2/runInstaller \
```

```
-silent -ignoreprereqfailure \
```

```
-applyRU /u01/app/oracle/stage/patch/35642822/35643107 \
```

```
-applyOneOffs
```

```
/u01/app/oracle/stage/patch/35642822/35655527,/u01/app/oracle/stage/patch/35787077,/u01/app/oracle/stage/patch/35648110 \
```

```
oracle.install.db.InstallEdition=EE \
```

```
oracle.install.option=INSTALL_DB_SWONLY \
```

```
INVENTORY_LOCATION=/u01/app/oraInventory \
```

```
ORACLE_BASE=/u01/app/oracle \
```

```
UNIX_GROUP_NAME=oinstall \
```

```
oracle.install.db.CLUSTER_NODES=srvr01,srvr02 \
```

```
oracle.install.db.OSDBA_GROUP=dba \
```

```
oracle.install.db.OSOPER_GROUP=oper \
```

```
oracle.install.db.OSBACKUPDBA_GROUP=backupdba \
```

```
oracle.install.db.OSDGDBA_GROUP=dgdba \
```

```
oracle.install.db.OSKMDBA_GROUP=kmdba \
```

```
oracle.install.db.OSRACDBA_GROUP=racdba
```

35642822/35643107 - RU

35642822/35655527 - OCW

35787077 - DataPump bundle patch

35648110 - OJVM

Note: applyOneOffs with patch list is all one line

For single node non-ASM exclude option: oracle.install.db.CLUSTER_NODES and exclude OSRACDBA

Install / patch new DB home - Notes

Note: adjust RU patch location, one off patches, paths, cluster nodes and group names as needed.

Password less SSSH needs to be configured for install on all nodes

CV_ASSUME_DISTID=OEL7.8 is required for Linux 8

For stand alone HAS just exclude oracle.install.db.CLUSTER_NODES parameter

*This will generate a root.sh script, run this as the **ROOT** user on each node of the cluster*

Update AUTOUPGRADE

Download the latest version from My Oracle Support (MOS):
AutoUpgrade Tool (Doc ID 2485457.1)

Copy autoupgrade.jar to \$ORACLE_HOME/rdbms/admin

Verify version by running:

```
$ $ORACLE_HOME/jdk/bin/java -jar $ORACLE_HOME/rdbms/admin/autoupgrade.jar -version
```

```
build.version 24.4.240426  
build.date 2024/04/26 12:55:56 -0400  
build.hash 5845ff020  
build.hash_date 2024/04/26 12:49:16 -0400  
build.supported_target_versions 12.2,18,19,21,23  
build.type production  
build.label (HEAD, tag: v24.4, origin/stable_devel, stable_devel)  
build.MOS_NOTE 2485457.1  
build.MOS_LINK https://support.oracle.com/epmos/faces/DocumentDisplay?id=2485457.1
```


Create a configuration file

```
# orcl_auto_patch.cfg

global.autoupg_log_dir=/u01/app/oracle/admin/upg_logs
global.timezone_upg=no
global.restoration=no

upg1.source_home=/u01/app/oracle/product/19/dbhome_1
upg1.target_home=/u01/app/oracle/product/19/dbhome_2
upg1.sid=orcl
```

Notes:

- *LOG_DIR* must be empty for each upgrade
- *TIMEZONE* if you want the timzone updates run in the database
- *RESTORATION* if you want a GRP taken
- *SID* for RAC use the *SID* of the local instance

*You can list multiple database in one config (EG. upg1, upg2, upg3)
See AUTOUPGRADE manual for more information*

Notes on AUTOUPGRADE

When you run AUTOUPGRADE

The activity is run in the background

- You will get a `upg>` prompt
- The prompt will remain until the job completes
- Use the `lsj` or `status` commands to see what is happening
- You can also tail the logs from a second window

Run AUTOUPGRADE analyze

Set your ORACLE_HOME

Run the analyze option

```
$ $ORACLE_HOME/jdk/bin/java -jar $ORACLE_HOME/rdbms/admin/autoupgrade.jar \  
-config ~/orcl_auto_patch.cfg -mode analyze
```

Type 'help' to list console commands

upg> Job 100 completed

----- Final Summary -----

Number of databases [1]

Jobs finished [1]

Jobs failed [0]

Please check the summary report at:

/u01/app/oracle/admin/upg_logs/cfgtoollogs/upgrade/auto/status/status.html

/u01/app/oracle/admin/upg_logs/cfgtoollogs/upgrade/auto/status/status.log

Analyze status log example

```
=====
Autoupgrade Summary Report
=====
[Date]      Fri May 31 20:00:53 UTC 2024
[Number of Jobs] 1
=====
[Job ID] 100
=====
[DB Name]      orcl
[Version Before Upgrade] 19.20.0.0.0
[Version After Upgrade] 19.23.0.0.0
-----
[Stage Name]  PRECHECKS
[Status]      SUCCESS
[Start Time]  2024-05-31 20:00:14
[Duration]
[Log Directory] /u01/app/oracle/admin/upg_logs/orcl1/100/prechecks
[Detail]      /u01/app/oracle/admin/upg_logs/orcl1/100/prechecks/orcl_preupgrade.log
Check passed and no manual intervention needed
-----
```

When ready – Outage / patch

Full DB outage needed for AUTOUPGRADE (minimal)

- Even for RAC
- AUTOUPGRADE will take care of all the steps EG:
 - Take DB out of RAC mode
 - Run DATAPATCH
 - Copy over wallets, SQLNET files, etc.
 - Put DB back in RAC mode
- The DB should be up and running on all nodes when starting AUTOUPGRADE
- Deploy (changing homes) will take a minute(s)
- The database will be OPEN when datapatch step is run
 - datapatch & OJVM updates are done on-line:
Note standard "caution" during this time.

Run AUTOUPGRADE deploy

Set your ORACLE_HOME

Run the deploy option

```
$ $ORACLE_HOME/jdk/bin/java -jar $ORACLE_HOME/rdbms/admin/autoupgrade.jar \  
-config ~/orcl_auto_patch.cfg -mode analyze
```

Type 'help' to list console commands

upg> lsj

```
+-----+-----+-----+-----+-----+-----+-----+-----+  
|Job#|DB_NAME|  STAGE|OPERATION| STATUS|START_TIME|UPDATED|          MESSAGE |  
+-----+-----+-----+-----+-----+-----+-----+-----+  
| 101|  orcl|PRECHECKS|EXECUTING|RUNNING| 20:04:58| 0s ago|Loading database info |  
+-----+-----+-----+-----+-----+-----+-----+-----+
```

Total jobs 1

Stages: [SETUP, PREUPGRADE, PRECHECKS, PREFIXUPS, DRAIN, DBUPGRADE, POSTCHECKS, POSTFIXUPS, POSTUPGRADE, SYSUPDATES]

AUTOUPGRADE status

Type 'help' to list console commands

upg> status

Config

User configuration file [/home/oracle/orcl_auto_patch.cfg]

General logs location [/u01/app/oracle/admin/upg_logs/cfgtoollogs/upgrade/auto]

Mode [DEPLOY]

Jobs Summary

Total databases in configuration file [1]

Total Non-CDB being processed [1]

Total Containers being processed [0]

Jobs finished successfully [0]

Jobs finished/aborted [0]

Jobs in progress [1]

Progress

```
+---+-----+
|Job|                Progress|
+---+-----+
|101|[|||||||||]      ] 27 %|
+---+-----+
```

AUTOUPGRADE status

```
upg> Job 101 completed
```

```
----- Final Summary -----
```

```
Number of databases      [ 1 ]
```

```
Jobs finished           [1]
```

```
Jobs failed             [0]
```

```
Jobs restored           [0]
```

```
Jobs pending            [0]
```

```
Please check the summary report at:
```

```
/u01/app/oracle/admin/upg_logs/cfgtoollogs/upgrade/auto/status/status.html
```

```
/u01/app/oracle/admin/upg_logs/cfgtoollogs/upgrade/auto/status/status.log
```

Note: this will create a new status directory

The previous status directory will be renamed with a date / timestamp

Review the log file / HTML for details

The database will be UP after the job is completed

AUTOUPGRADE status.log example

```
=====
Autoupgrade Summary Report
=====
[Date]      Fri May 31 20:10:39 UTC 2024
[Number of Jobs] 1
=====
[Job ID] 101
=====
[DB Name]      orcl
[Version Before Upgrade] 19.20.0.0.0
[Version After Upgrade] 19.23.0.0.0
-----
```

Note: this is just the first part, there are at least nine sections to check, example one section:

```
[Stage Name]  POSTFIXUPS
[Status]      SUCCESS
[Start Time]  2024-05-31 20:09:46
[Duration]    0:00:46
[Log Directory] /u01/app/oracle/admin/upg_logs/orcl1/101/postfixups
[Detail]      /u01/app/oracle/admin/upg_logs/orcl1/101/postfixups/postfixups.html
```

Cleanup old home – make room

```
$ export CV_ASSUME_DISTID=OEL7.8
```

```
$ /u01/app/oracle/product/19/dbhome_1/deinstall/deinstall
```

Use comma as separator when specifying list of values as input

Specify the list of database names that are configured in this Oracle home []:
Database Check Configuration END

Do you want to continue (y - yes, n - no)? [n]: y

Oracle Universal Installer cleanup was successful.

Review the permissions and contents of '/u01/app/oracle' on nodes(s) 'srvr01,srvr02'.
If there are no Oracle home(s) associated with '/u01/app/oracle', manually delete '/u01/app/oracle' and its contents.
Oracle deinstall tool successfully cleaned up temporary directories.

#####

Notes: output abbreviated

Questions



Database – rollback steps

1. Shutdown the database
2. RAC / HAS – update CRS DB home

```
$ srvctl modify database -d orcl -oraclehome /u01/app/oracle/product/19/dbhome_1
```

3. Update /etc/oratab file
4. Reset your environment to old home (oraenv)
5. Bring DB up in upgrade mode (RAC single node)
6. Run datapatch (\$ORACLE_HOME/OPatch/datapatch)
7. Bring DB back up in normal mode

Grid – rollback steps

Run the same GRID switch homes steps, just point to the old home as the destination

```
$ export CV_ASSUME_DISTID=OEL7.8
```

```
$ export ORACLE_HOME=/u01/app/19/grid_1
```

```
$ $ORACLE_HOME/gridSetup.sh -silent -switchGridHome \  
oracle.install.crs.config.clusterNodes=$( /usr/bin/hostname -s )
```

If you receive an error such as:

OUI-10166:The permissions 0755 cannot be set for the file

Unlock the previous GRID_HOME running this command as the root user:

```
sudo /u01/app/19/grid_1/crs/install/rootcrs.sh -unlock -crshome /u01/app/19/grid_1
```

Be sure to finish all steps including running the root.sh script

Note: more runInstaller.sh options

To see more options for runInstaller.sh look at RSP file:

```
$ORACLE_HOME/install/response/db_install.rsp
```

For GRID gridSetup.sh look at RSP file:

```
$GRID_HOME/install/response/gridsetup.rsp
```

References

- Oracle 19c manual: “Database Upgrade Guide” , Chapter 3 “Using AutoUpgrade for Oracle Database Upgrades”
- “AutoUpgrade Patching” <https://docs.oracle.com/en/database/oracle/oracle-database/19/upgrd/autoupgrade-oracle-database-config-options.html#GUID-20D02F58-2A55-4FC6-B726-113AB44FDCB7>
- Assistant: Download Reference for Oracle Database/GI Update, Revision, PSU, SPU(CPU), Bundle Patches, Patchsets and Base Releases (Doc ID 2118136.2)
- Primary Note for Database Proactive Patch Program (Doc ID 888.1)
- How To Download And Install The Latest OPatch(6880880) Version (Doc ID 274526.1)
- Oracle Database 19c Important Recommended One-off Patches (Doc ID 555.1)
- Database PSU/BP/Update/Revision - Known Issues Primary Note (Doc ID 1227443.1)
- Data Pump Recommended Proactive Patches For 19.10 and Above (Doc ID 2819284.1)
- AutoUpgrade Tool (Doc ID 2485457.1)
- How to use Autoupgrade Tool to perform Out of place DB Patching ? (Doc ID 2888431.1)
- Upgrade your Database – NOW! “Patching to Oracle 19.19.0 out-of-place with additional patches” <https://mikedietrichde.com/2023/05/23/patching-to-oracle-19-19-0-out-of-place-with-additional-patches/>
- Upgrade your Database – NOW! “Simple database installation with applyRU and applyOneOffs” <https://mikedietrichde.com/2022/05/17/simple-database-installation-with-applyru-and-applyoneoffs/>
- Live Lab – Patch me if you can! – walks through patching steps in a hands on lab <https://apexapps.oracle.com/pls/apex/r/dbpm/livelabs/view-workshop?wid=3740>

References

- Oracle Patch Assurance - Data Guard Standby-First Patch Apply (Doc ID 1265700.1)
- Rolling Patch - OPatch Support for RAC (Doc ID 244241.1)
- Datapatch: Database 12c or later Post Patch SQL Automation (Doc ID 1585822.1)
- Datapatch User Guide (Doc ID 2680521.1)
- Primary Note For OPatch (Doc ID 293369.1)
- Virtual Classroom #16: Oracle Database Release and Patching Strategy for 19c and 23ai
<https://youtu.be/sF-rmD78zlo?si=oOtfoZhFMbe3T5Dc>
- RAC Rolling Install Process for the "Oracle JavaVM Component Database PSU/RU" (OJVM PSU/RU) Patches (Doc ID 2217053.1)
- Oracle Recommended Patches -- "Oracle JavaVM Component Database PSU and Update" (OJVM PSU and OJVM Update) Patches (Doc ID 1929745.1) To BottomTo Bottom
- INS-06006 GI RunInstaller Fails If OpenSSH Is Upgraded to 8.x (Doc ID 2555697.1)
Bug 30159782 - Remote Copy Fails if using openssh-7.2. 7.4, etc. (Doc ID 30159782.8)
GI runInstaller Fails with INS-6006 despite fixing Bug 30159782 (Doc ID 2921432.1)

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