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| **Database Engineering Patch Release**  Released on: 2022-30-05 | scb-logo |
| **Synopsis** |  |
| The Apr 2022 RU update contains 5 new security patches for the Oracle Database Server. none of these vulnerabilities may be remotely exploitable without authentication, i.e., may be exploited over a network without requiring user credentials.  None of these patches are applicable to client-only installations, i.e., installations that do not have the Oracle Database Server installed.   1. Patch 33803476 - GI Apr 2022 Release Update 19.15.0.0.220419 2. Patch 33806152 - Database Apr 2022 Release Update 19.15.0.0.220419 3. Patch 33808367 - Oracle JavaVM Component Release Update 19.15.0.0.0. This patch is now Oracle RAC Rolling installable. To use the Oracle RAC Rolling approach, out-of-place patching of the Oracle home is mandatory, This patch is not Data Guard Standby First Installable 4. Patch 33810130 - JDK BUNDLE PATCH 19.0.0.0.220118 5. Patch 33912872 - UPDATE PERL IN 19C DATABASE ORACLE HOME TO V5.32-1   **Change to Bundle Patch Numbering**  As of November 2015, the version numbering for new Bundle Patches, Patch Set Updates, and Security Patch Updates for Oracle Database, Enterprise Manager and Middleware products have a new format. This new format replaces the numeric 5th digit of the bundle version with a release date in the form YYMMDD:  YY is the last 2 digits of the year  MM is the numeric month (2 digits)  DD is the numeric day of the month (2 digits)  Note that the release date is the release date of the main bundle, PSU, or SPU.  Some bundles may continue to use a numeric 5th digit in the short term, but they will transition to the new format over time.  This new version format makes it easier to see which bundle patches are from which time frame, and in particular, which patches are from the same Critical Patch Update release. For examples and more information, see My Oracle Support [Note 2061926.1](https://support.oracle.com/epmos/faces/DocumentDisplay?parent=DOCUMENT&sourceId=2074802.1&id=2061926.1), Oracle Database, Enterprise Manager and Middleware - Change to Patch Numbering from Nov 2015 onwards. | |
| **Description** | |
| The security vulnerabilities are documented in detail on the Oracle support site <https://support.oracle.com>  A brief description of the CVE vulnerabilities which may be applicable to our environment  CVE-2022-21410  Vulnerability in the Oracle Database - Enterprise Edition Sharding component of Oracle Database Server. The supported version that is affected is 19c. Easily exploitable vulnerability allows high privileged attacker having Create Any Procedure privilege with network access via Oracle Net to compromise Oracle Database - Enterprise Edition Sharding. Successful attacks of this vulnerability can result in takeover of Oracle Database - Enterprise Edition Sharding..  CVE-2022-21498  Vulnerability in the Java VM component of Oracle Database Server. Supported versions that are affected are 12.1.0.2, 19c and 21c. Easily exploitable vulnerability allows low privileged attacker having Create Procedure privilege with network access via multiple protocols to compromise Java VM. Successful attacks of this vulnerability can result in unauthorized creation, deletion or modification access to critical data or all Java VM accessible data.  CVE-2021-41165  Vulnerability in the Oracle WebCenter Portal product of Oracle Fusion Middleware (component: Security Framework (CKEditor)). Supported versions that are affected are 12.2.1.3.0 and 12.2.1.4.0. Easily exploitable vulnerability allows low privileged attacker with network access via HTTP to compromise Oracle WebCenter Portal. Successful attacks require human interaction from a person other than the attacker and while the vulnerability is in Oracle WebCenter Portal, attacks may significantly impact additional products (scope change). Successful attacks of this vulnerability can result in unauthorized update, insert or delete access to some of Oracle WebCenter Portal accessible data as well as unauthorized read access to a subset of Oracle WebCenter Portal accessible data.  CVE-2022-21411  Vulnerability in the RDBMS Gateway / Generic ODBC Connectivity component of Oracle Database Server. Supported versions that are affected are 12.1.0.2, 19c and 21c. Easily exploitable vulnerability allows low privileged attacker having Create Session privilege with network access via Oracle Net to compromise RDBMS Gateway / Generic ODBC Connectivity. Successful attacks of this vulnerability can result in unauthorized update, insert or delete access to some of RDBMS Gateway / Generic ODBC Connectivity accessible data as well as unauthorized read access to a subset of RDBMS Gateway / Generic ODBC Connectivity accessible data.  CVE-2021-22569  Vulnerability in the Oracle Spatial and Graph MapViewer (protobuf-java) component of Oracle Database Server. Supported versions that are affected are 19c and 21c. Easily exploitable vulnerability allows low privileged attacker having Local Logon privilege with logon to the infrastructure where Oracle Spatial and Graph MapViewer (protobuf-java) executes to compromise Oracle Spatial and Graph MapViewer (protobuf-java). Successful attacks require human interaction from a person other than the attacker. Successful attacks of this vulnerability can result in unauthorized ability to cause a partial denial of service (partial DOS) of Oracle Spatial and Graph MapViewer (protobuf-java).  **SCB Specific Installation Instructions**  Refer to following link for tested apply steps | |
| If you have any questions this patch release, please contact [*Database Engineering*](mailto:TD-InfraEng&Delivery-DB-ENG-GBL@sc.com) | |
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**Combo OJVM Release Update 19.15.0.0.220419 and GI Release Update 19.15.0.0.220419 - 33859214**

**GRID INFRASTURCTURE & DATABASE RU 19.15.0.0.220419 (Apr 2022) PATCH INSTALLATION INSTRUCTIONS FOR 19c GOLD BUILD (ENGG DATABASE) - 33803476**

| **Patch Number** | **Description** | **Applicable Homes** |
| --- | --- | --- |
| 33806152 | Database Apr 2022 Release Update 19.15.0.0.220419 | Only DB Home for non-Oracle RAC setup. Both DB Home and Grid Home for Oracle RAC setup. |
| 33815596 | OCW Apr 2022 Release Update 19.15.0.0.220419 | Both DB Home and Grid Home |
| 33815607 | ACFS Apr 2022 Release Update 19.15.0.0.220419 | Only Grid Home |
| 33575402 | DBWLM Release Update 19.0.0.0.0 | Only Grid Home |
| 33911149 | Tomcat Release Update 19.0.0.0.0 | Only Grid Home |
| 33808367 | Oracle JavaVM Release Update 19.15.0.0.0 | Only DB Homes |
| 33810130 | JDK BUNDLE PATCH 19.15.0.0.220419 | Both DB Homes and Grid Home |
| 33912872 | UPDATE PERL IN 19C DATABASE ORACLE HOME TO V5.32 | Both DB Home and Grid Home |
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Patch **<OJVM Patch>** OJVM PSU 19c for the DB\_HOME and requires downtime for the database. Please review the [Appendix-](#Appendix7)2 regarding OJVM Patches before attempting to apply this patch.

**One-Off bug patches FOR 19c GOLD BUILD (ENGG DATABASE)**

| **Patch Number** | **Description** | **Applicable Homes** |
| --- | --- | --- |
| 29613245 | ORA-31684 ORA-39112 WITH FIX 28539085 AND VERSION=11.2 | Only DB HOME |
| 30664385 | ENQ: TX - ROW LOCK CONTENTION' FOR SYS.WRI$\_OPTSTAT\_SYNOPSIS\_HEAD$ DURING DATAPUMP IMPORT | Only DB HOME |
| 31335037 | RDBMS - DSTV35 UPDATE - TZDATA2020A | Only DB HOME |
| 31429809 | SR21.1PX\_FORCE - TRC - QERGHRELEASE - ORA-7445 [\_\_INTEL\_SSSE3\_REP\_MEMMOVE()] | Only DB HOME |
| 32455516 | MAKE FIX FOR BUG 31877391/31741039/29652040 RAC ROLLING | Only DB HOME |
| 34044565 | DIAGNOSTIC TXN FOR BUG 34020891 | Only DB HOME |
| 34083677 | MERGE ON DATABASE RU 19.15.0.0.0 OF 34070233 | Only DB HOME |

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| Test Hosts | uklpddpoc04a, uklpddpoc05a |
| OJVM Patch Source Location | https://artifactory.global.standardchartered.com/artifactory/generic-production/DBENG/Oracle/Build/ |
| OJVM Patch staging location | /u01/app/oracle/local/software/Apr2022RU/p33808367\_190000\_Linux-x86-64.zip |
| OJVM\_Grid Patch source location | https://artifactory.global.standardchartered.com/artifactory/generic-production/DBENG/Oracle/Build/ |
| OJVM\_Grid Patch Staging Location | /u01/app/oracle/local/software/Apr2022RU/p33859214\_190000\_Linux-x86-64.zip |
| DB PSU source location | https://artifactory.global.standardchartered.com/artifactory/generic-production/DBENG/Oracle/Build/ |
| DB Patch staging location | /u01/app/oracle/local/software/Apr2022RU/[p33806152\_190000\_Linux-x86-64.zip](https://updates.oracle.com/Orion/Services/download/p31771877_190000_Linux-x86-64.zip?aru=23869227&patch_file=p31771877_190000_Linux-x86-64.zip) |
| 6880880 Patch source location | https://artifactory.global.standardchartered.com/artifactory/generic-production/DBENG/Oracle/Build/ |
| 6880880 Patch staging area | /u01/app/oracle/local/software/Apr2022RU/p6880880\_190000\_Linux-x86-64\_Apr2022.zip |
| Patch Implementation Log location | /u01/app/oracle/local/software/Apr2022RU/log |
| One off Patch source location | https://artifactory.global.standardchartered.com/artifactory/generic-production/DBENG/Oracle/Build/ |
| One off staging location | /u01/app/oracle/local/software/Apr2022RU |
| GRID\_HOME | /u01/app/grid/product/19c |
| ORACLE\_HOME | /u01/app/oracle/product/db/19c |
| Full Oracle Patch Documentation |  |
| Approximate Install Time | 60 minutes per host |
| Data Guard Consideration |  |

**PATCH APPLY STEPS**

**BEFORE PATCH APPLY**: Repeat steps 1-9 on all database hosts, one node at a time. pic1

1. Blackout OEM for all database hosts involved in patching

## Run as **oracle**

## Configure the agent environment and create the blackout

oracle@uklpddpoc04a:/home/oracle [DUK31BLD1]

> which agenthome

agenthome='export ORACLE\_HOME=$AGENT\_HOME;export LD\_LIBRARY\_PATH=$ORACLE\_HOME/lib;export PATH=$ORACLE\_HOME/bin:$PATH'

oracle@uklpddpoc04a:/home/oracle [DUK31BLD1]

> env | grep -i agent

AGENT\_HOME/u01/app/oracle/product/agent/agent13c/agent\_inst

oracle@uklpddpoc04a:/u01/app/oracle/local/patch/log [DUK31BLD1]

> cd $AGENT\_HOME/bin

oracle@uklpddpoc04a: /u01/app/oracle/product/agent/agent13c/agent\_inst/bin [DUK31BLD1]

> emctl start blackout psuApr2022

Oracle Enterprise Manager Cloud Control 13c Release 5

Copyright (c) 1996, 2015 Oracle Corporation. All rights reserved.

Blackout psuApr2022 added successfully

EMD reload completed successfully

oracle@uklpddpoc04a: /u01/app/oracle/product/agent/agent13c/agent\_inst/bin [DUK31BLD1]

1. Install the latest opatch from p6880880\_190000\_Linux-x86-64\_Apr2022.zip in to the DB\_HOME

* This step is mandatory; PSU application will fail without the latest opatch
* You can skip this step if the opatch version is already at 12.2.0.1.29 or later
* If prompted select option A to overwrite all existing files

## Run as **oracle**

## Install the latest opatch into the DB\_HOME/GI HOME (minimum version of 12.2.0.1.29 is required)

cd $ORACLE\_HOME

rm -rf OPatch/\*

unzip /u01/app/oracle/local/software/Apr2022RU/p6880880\_190000\_Linux-x86-64\_Apr2022.zip -d /u01/app/oracle/product/db/19c

oracle@uklpddpoc04a:/u01/app/oracle/product/db/19c [DUK31BLD1]

> opatch version

OPatch Version: 12.2.0.1.30

OPatch succeeded.

oracle@uklpddpoc04a:/u01/app/oracle/product/db/19c [DUK31BLD1]

1. Install the latest opatch from p6880880\_190000\_Linux-x86-64\_Apr2022.zip in to the GRID\_HOME

* This step is mandatory; PSU application will fail without the latest opatch
* You can skip this step if the opatch version is already at 12.2.0.1.29 or later
* If prompted select option A to overwrite all existing files

## Run as **grid**

## Install the latest opatch into the GRID\_HOME (minimum version of 12.2.0.1.29 is required)

gridhome

cd $GRID\_HOME

rm -rf OPatch/\*

unzip /u01/app/oracle/local/software/Apr2022RU/p6880880\_190000\_Linux-x86-64\_Apr2022.zip -d /u01/app/grid/product/19c

grid@uklpddpoc04a:/home/grid [+ASM1]

> opatch version

OPatch Version: 12.2.0.1.30

OPatch succeeded.

Note: if a permission denied error is seen then group write permission needs to be granted to the GRID\_HOME as the root user with the command

chmod g+w /u01/app/grid/product/19c and then unzip again.

1. Stop resources running on DB HOME

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| ## Run as **oracle**  ## Capture resource state before patching  crsctl stat res -t > /u01/app/oracle/local/patch/log/crsctl\_stat\_before\_`hostname`.log  ## Stop Database Instance – Use the correct instance name running on the node  srvctl stop instance -d DUK31BLD -i DUK31BLD1 -o immediate |

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| ## Verification run as **oracle**  ## Above step will stop DB and its instance running on $ORACLE\_HOME  ## Below command should show NO output  ps -ef | grep pmon | grep -v ASM | grep -v grep |

1. Stop EM Agent Processes Prior to Patching on all nodes

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| ## Run as **oracle**  /u01/app/oracle/product/agent/agent13c/agent\_inst/bin/emctl stop agent |

1. Check if there are any one off patch conflicts and enough space on both RDBMS Home and GI Home.

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| ## Run as **grid** (Ensure binaries are unzipped as grid user)  sudo su – grid  export PATH=$ORACLE\_HOME/OPatch:$PATH  export PATCH\_LOC=”/u01/app/oracle/local/software/Apr2022RU”  --DB PSU  $ORACLE\_HOME/OPatch/opatch prereq CheckConflictAgainstOHWithDetail -phBaseDir ${PATCH\_LOC}/33859214/32895426/33806152  --OCW  $ORACLE\_HOME/OPatch/opatch prereq CheckConflictAgainstOHWithDetail -phBaseDir ${PATCH\_LOC}/33859214/32895426/33815596  --ACFS  $ORACLE\_HOME/OPatch/opatch prereq CheckConflictAgainstOHWithDetail -phBaseDir ${PATCH\_LOC}/33859214/32895426/33815607  --DBWLM  $ORACLE\_HOME/OPatch/opatch prereq CheckConflictAgainstOHWithDetail -phBaseDir ${PATCH\_LOC}/33859214/32895426/33575402  --Tomcat  $ORACLE\_HOME/OPatch/opatch prereq CheckConflictAgainstOHWithDetail -phBaseDir ${PATCH\_LOC}/33859214/32895426/33911149  ## Conflicting patches should be rolled back before attempting to apply the PSU  Add below entries in /u01/app/oracle/local/software/Apr2022RU/log/patch\_list\_gihome.txt  /u01/app/oracle/local/software/Apr2022RU/33859214/32895426/33806152  /u01/app/oracle/local/software/Apr2022RU/33859214/32895426/33815596  /u01/app/oracle/local/software/Apr2022RU/33859214/32895426/33815607  /u01/app/oracle/local/software/Apr2022RU/33859214/32895426/33575402  /u01/app/oracle/local/software/Apr2022RU/33859214/32895426/33911149  $ORACLE\_HOME/OPatch/opatch prereq CheckSystemSpace -phBaseFile /u01/app/oracle/local/software/Apr2022RU/log/patch\_list\_gihome.txt  ## Run as **oracle (Ensure binaries are unzipped as Oracle user)**  export PATH=$ORACLE\_HOME/OPatch:$PATH  export PATCH\_LOC=/u01/app/oracle/local/software/Apr2022RU  --OCW  $ORACLE\_HOME/OPatch/opatch prereq CheckConflictAgainstOHWithDetail -phBaseDir ${PATCH\_LOC}/33859214/32895426/33815596  --DB PSU  $ORACLE\_HOME/OPatch/opatch prereq CheckConflictAgainstOHWithDetail -phBaseDir ${PATCH\_LOC}/33859214/32895426/33806152  ## Conflicting patches should be rolled back before attempting to apply the PSU  Add below entries in /u01/app/oracle/local/software/Apr2022RU/log/patch\_list\_dbhome.txt  /u01/app/oracle/local/software/Apr2022RU/33859214/33803476/33815596  /u01/app/oracle/local/software/Apr2022RU/33859214/33803476/33806152  $ORACLE\_HOME/OPatch/opatch prereq CheckSystemSpace -phBaseFile /u01/app/oracle/local/software/Apr2022RU/log/patch\_list\_dbhome.txt |
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1. Rollback the conflicting patches

## Run as **Oracle**

## log the output

## Based on the opatch prereq output (Refer [Appendix -1](#Appendix1)) – 1 patch were conflicting

## We will later apply the 12.2.0.1 180116 version of these patch to RDBMS Home only as

## These are applicable only to RDBMS Home

script /u01/app/oracle/local/patch/log/oracle\_step8\_`date '+%Y%m%d%H%M%S'`.log

## Stop all database instances running from this $ORACLE\_HOME

/u01/app/oracle/product/db/12cR2/bin/srvctl stop home -o /u01/app/oracle/product/db/11gR2 -s /u01/app/oracle/local/patch/120201/psu\_180116/log/`hostname`.dbhome -n `hostname`

## Rollback 17805316

export PATH=$ORACLE\_HOME/OPatch:$PATH

opatch rollback -id 17805316 -local

## exit from script logging command

exit

1. Stop ACFS – unlock the Grid binaries and then rollback the conflicting patches from GI Home.

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| ## The commands are provided below BUT this was not run as there were no conflicting patches in GI for this PSU.  ## GI PSU apply will anyway unlock the GRID binaries and lock them after applying the patch  ## Run as **root**  ## log the output  script /u01/app/oracle/local/patch/log/root\_step9a\_`date '+%Y%m%d%H%M%S'`.log  ## Use the command below to list the ACFS file systems that need to be stopped (databases already stopped)  oracle@uklpddpoc04a:/u01/app/oracle/local/patch/log [DUK31BLD1]  > sudo /sbin/acfsutil info fs | grep "primary volume" | cut -f2 -d":"  /dev/asm/ora\_global-305  /dev/asm/ora\_fra-134  /dev/asm/oggdata-134  ## Prior to stopping ACFS make sure to stop the related processes using these file systems  ## stop acfs – change the commands based on the output above  . ~grid/.profile  # $GRID\_HOME/bin/srvctl stop filesystem –d /dev/asm/ora\_dump-361 -n `hostname`  # $GRID\_HOME/bin/srvctl stop filesystem –d /dev/asm/ora\_ggsdata-361 -n `hostname`  # $GRID\_HOME/bin/srvctl stop filesystem –d /dev/asm/ora\_oggbin-361 -n `hostname`  # $GRID\_HOME/bin/srvctl stop filesystem –d /dev/asm/ora\_ggsbin-361 -n `hostname`  $GRID\_HOME/bin/srvctl stop filesystem –d /dev/asm/ora\_fra-134 -n `hostname`  $GRID\_HOME/bin/srvctl stop filesystem –d /dev/asm/ora\_global-305 -n `hostname`  $GRID\_HOME/bin/srvctl stop filesystem –d /dev/asm/oggdata-134 -n `hostname`  ## Verify if the file systems are unmounted  ## Verification run as **root**  ## Above step will stop all ACFS dir  ## Below command should show “acfsutil info fs: ACFS-03036: no mounted ACFS file systems”  /sbin/acfsutil info fs  > /sbin/acfsutil info fs  acfsutil info fs: ACFS-03036: no mounted ACFS file systems  ## Unlock the Grid binaries to rollback conflicting patches  $GRID\_HOME/crs/install/rootcrs.sh -prepatch  ## exit 8  Exit |

**PATCH STEPS FOR GI AND DB RU (RU 19.15.0.0.220419)**

**PATCH APPLY**: Repeat steps 10-14 on all database hosts, one node at a time

1. Apply DB and GI PSU Apr 2022 patch to the GI and DB home using opatch command

## Run as grid user

## log the output

script /u01/app/oracle/local/patch/log/grid\_step10\_`date '+%Y%m%d%H%M%S'`.log

export PATCH\_LOC=/u01/app/oracle/local/software/Apr2022RU

## source the grid profile and extend the path with opatch

export PATH=$ORACLE\_HOME/OPatch:$PATH

--OCW

$ORACLE\_HOME/OPatch/opatch apply ${PATCH\_LOC}/33859214/33803476/33815596 –oh ${GRID\_HOME} -local

--ACFS

$ORACLE\_HOME/OPatch/opatch apply ${PATCH\_LOC}/33859214/33803476/33815607 –oh ${GRID\_HOME} -local

--DB PSU

$ORACLE\_HOME/OPatch/opatch apply ${PATCH\_LOC}/33859214/33803476/33806152 –oh ${GRID\_HOME} -local

--DBWLM

$ORACLE\_HOME/OPatch/opatch apply ${PATCH\_LOC}/33859214/33803476/33575402 –oh ${GRID\_HOME} -local

--Tomcat

$ORACLE\_HOME/OPatch/opatch apply ${PATCH\_LOC}/33859214/33803476/33911149 –oh ${GRID\_HOME} -local

--Jdk

$ORACLE\_HOME/OPatch/opatch apply ${PATCH\_LOC}/33810130 –oh ${GRID\_HOME} -local

--perl

$ORACLE\_HOME/OPatch/opatch apply ${PATCH\_LOC}/33912872 –oh ${GRID\_HOME} -local

Apply GI HOME one-off

NA

As oracle user – (Prepatch for Oracle Home)

export PATH=$ORACLE\_HOME/OPatch:$PATH

/u01/app/oracle/local/software/Apr2022RU/33859214/33803476/33815596/custom/scripts/prepatch.sh -dbhome /u01/app/oracle/product/db/19c

As Oracle user

export PATH=$ORACLE\_HOME/OPatch:$PATH

export PATCH\_LOC=/u01/app/oracle/local/software/Apr2022RU

opatch apply ${PATCH\_LOC}/33859214/33803476/33815596 -oh ${ORACLE\_HOME} -local

opatch apply ${PATCH\_LOC}/33859214/33803476/33806152 -oh ${ORACLE\_HOME} -local

/u01/app/oracle/local/software/Apr2022RU/33859214/33803476/33815596/custom/scripts/postpatch.sh -dbhome /u01/app/oracle/product/db/19c

--Jdk

$ORACLE\_HOME/OPatch/opatch apply ${PATCH\_LOC}/33810130 –oh ${ORACLE\_HOME} -local

--perl

$ORACLE\_HOME/OPatch/opatch apply ${PATCH\_LOC}/33912872 –oh ${ORACLE\_HOME} -local

sudo /u01/app/grid/product/19c/rdbms/install/rootadd\_rdbms.sh

sudo /u01/app/grid/product/19c/crs/install/rootcrs.sh -postpatch

## exit from script logging command

exit

1. Start ACFS  
     
   Note: The correct device names can be found using ‘ls –l /dev/asm’ adjust the paths below as necessary

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| ## Run as **root**  ## log the output  script /u01/app/oracle/local/patch/log/root\_step12\_`date '+%Y%m%d%H%M%S'`.log  ## start acfs as root user  . ~grid/.profile  $GRID\_HOME/bin/srvctl stop filesystem –d /dev/asm/ora\_fra-134 -n `hostname`  $GRID\_HOME/bin/srvctl stop filesystem –d /dev/asm/ora\_global-305 -n `hostname`  $GRID\_HOME/bin/srvctl stop filesystem –d /dev/asm/ora\_oggdata-134 -n `hostname`  ## exit from script logging command  Exit |

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| ## Verification run as **oracle**  ## Above step will start all ACFS dir  df -h | grep "/dev/asm"  ## Above command should list mount points for ASM Filesystems e.g. |

1. Apply the one-off (interim) patches to the DB home

##Run as Oracle

NA

## log the output

script /u01/app/oracle/local/patch/log/oracle\_step12\_`date '+%Y%m%d%H%M%S'`.log

## one off patches to be applied

NA

export PATH=$PATH:$ORACLE\_HOME/OPatch:.

cd /u01/app/oracle/local/software/Apr2022RU/<patch\_id>

opatch prereq CheckConflictAgainstOHWithDetail -ph ./

/u01/app/oracle/product/db/19c/OPatch/opatch apply -oh /u01/app/oracle/product/db/19c -local -silent

Apply DB HOME oneoff

opatch apply ${PATCH\_LOC}/29613245 -oh ${ORACLE\_HOME} -local

opatch apply ${PATCH\_LOC}/30664385 -oh ${ORACLE\_HOME} -local

opatch apply ${PATCH\_LOC}/31335037 -oh ${ORACLE\_HOME} -local

opatch apply ${PATCH\_LOC}/31429809 -oh ${ORACLE\_HOME} -local

opatch apply ${PATCH\_LOC}/32455516 -oh ${ORACLE\_HOME} -local

opatch apply ${PATCH\_LOC}/34044565 -oh ${ORACLE\_HOME} -local

opatch apply ${PATCH\_LOC}/34083677 -oh ${ORACLE\_HOME} -local

## exit from script logging command

exit

1. Apply the OJVM PSU for the RDBMS Home – Do the opatch apply on all on database nodes one at a time.

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| *## Run as* ***Oracle*** *and apply the patch on all nodes.*  *script /u01/app/oracle/local/patch/log/oracle\_step16\_`date '+%Y%m%d%H%M%S'`.log*  *## Apply OJVM PSU Patch*  *export PATCH\_LOC=/u01/app/oracle/local/software/Apr2022RU*  *cd /u01/app/oracle/product/db/19c/OPatch*  *opatch apply $PATCH\_LOC/*33808367 *-oh $ORACLE\_HOME -local* |

1. Start resources running from DB HOME

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| ## Run as **oracle**  ## Start Database  srvctl start instance -d DUK31BLD -i DUK31BLD1  ## Capture resource state after patching  crsctl stat res -t > /u01/app/oracle/local/patch/log/crsctl\_stat\_after\_`hostname`.log |

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| ## Verification run as **oracle**  ## Above step will start Databases running on $ORACLE\_HOME  ## Below command should show pmon process for all DB instances  ps -ef | grep pmon | grep -v ASM | grep -v grep  ## Below sqlplus command should show database in OPEN mode  sqlplus / as sysdba  select open\_mode from v$database;  STATUS  ------------  READ WRITE  SQL> show pdbs;  CON\_ID CON\_NAME OPEN MODE RESTRICTED  ---------- ------------------------------ ---------- ----------  2 PDB$SEED READ ONLY NO  4 PDB\_ENGG MOUNTED  SQL> alter pluggable database PDB\_ENGG open instances=all; |

1. Start EM Agent Processes after applying the patch on both RDBMS Home and GI Home

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| ## Run as **oracle**  /u01/app/oracle/product/agent/agent13c/agent\_inst/bin/emctl start agent  Oracle Enterprise Manager Cloud Control 13c Release 5  Copyright (c) 1996, 2015 Oracle Corporation. All rights reserved.  Starting agent .............................................. started.  **\*Repeat the steps 1 to 14 for each node in the cluster before moving to next step** |

**AFTER PATCH APPLY**: Execute Step 15 on one node only after patching the binaries on all nodes (including application of the interim patches)

1. Run the datapatch into the database.

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| ## Run as **oracle**  cd $ORACLE\_HOME/rdbms/admin  sqlplus /nolog  SQL> CONNECT / AS SYSDBA  SQL> startup  SQL> QUIT  Note: Datapatch will not get applied to offline pdbs, hence its strongly suggested to bring the pdbs online before starting datapatch.    cd $ORACLE\_HOME/rdbms/admin  $ORACLE\_HOME/perl/bin/perl catcon.pl -e -l /tmp/mtest -b disable\_llsts -- --x"alter trigger sys.llsts\_grant disable"  $ORACLE\_HOME/perl/bin/perl catcon.pl -e -l /tmp/mtest -b disable\_RESTRICT\_CREATE\_USER -- --x"alter trigger sys.RESTRICT\_CREATE\_USER disable"  cd $ORACLE\_HOME/OPatch  ./datapatch -verbose  cd $ORACLE\_HOME/rdbms/admin  $ORACLE\_HOME/perl/bin/perl catcon.pl -e -l /tmp/mtest -b disable\_llsts -- --x"alter trigger sys.llsts\_grant enable"  $ORACLE\_HOME/perl/bin/perl catcon.pl -e -l /tmp/mtest -b disable\_RESTRICT\_CREATE\_USER -- --x"alter trigger sys.RESTRICT\_CREATE\_USER enable"  ## use .oraenv to switch to any remaining DB instances and run the datapatch  Recreate DATA\_PUMP\_DIR directory path to its original location. ( It should not be in ORACLE\_HOME path).  Col owner for a30  Col directory\_name for a30  Col directory\_path for a120  select \* from dba\_directories where DIRECTORY\_NAME='DATA\_PUMP\_DIR';  create or replace directory DATA\_PUMP\_DIR as 'original path'; |

**POST PATCH**

1. Remove OEM blackout for all database hosts involved on patching.

## Run as **oracle**

## Configure the agent environment and stop the blackout

agenthome

emctl stop blackout psuApr2022

**INVENTORY VERIFICTION**

## Run as **grid**

$ORACLE\_HOME/OPatch/opatch lsinv

## Run as **oracle**

$ORACLE\_HOME/OPatch/opatch lsinv

**PATCH ROLLBACK STEPS FOR GI AND DB PSU**

Blackout OEM for all database hosts involved on patching

**PATCH ROLLBACK:**

1. Stop resources running on DB HOME

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| ## Run as **oracle**  ## Stop Database  srvctl stop database -d DUK31BLD -o immediate  ## Run as grid  ## stop crs in rollback mode  sudo /u01/app/grid/product/19c/crs/install/rootcrs.sh -prepatch -rollback |

1. Stop EM Agent Processes prior to de-install the patches on all nodes

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| ## Run as **oracle**  /u01/app/oracle/product/agent/agent13c/agent\_inst/bin/emctl stop agent |

1. Rollback patch from GI and DB home – Do this step on all database hosts - This step not required when merge patch applied

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| ##Run as **oracle**  . ~oracle/.profile  export PATH=$ORACLE\_HOME/OPatch:$PATH  export PATCH\_LOC=/u01/app/oracle/local/software/Apr2022RU  $ <UNZIPPED\_PATCH\_LOCATION>/%BUGNO%/%OCW TRACKING BUG%/custom/scripts/prepatch.sh -dbhome <ORACLE\_HOME>  $ <ORACLE\_HOME>/OPatch/opatch nrollback -local -id %OCW TRACKING BUG%,%DBRU TRACKING BUG% -oh <ORACLE\_HOME>  $ <UNZIPPED\_PATCH\_LOCATION>/%BUGNO%/%OCW TRACKING BUG%/custom/scripts/postpatch.sh -dbhome <ORACLE\_HOME>  cd /u01/app/oracle/product/db/19c/OPatch/  /u01/app/oracle/local/software/Apr2022RU/33859214/33803476/33815596/custom/scripts/prepatch.sh -dbhome /u01/app/oracle/product/db/19c  /u01/app/oracle/product/db/19c/OPatch/opatch nrollback -local -id 33815596, 33806152 -oh /u01/app/oracle/product/db/19c  /u01/app/oracle/local/software/Apr2022RU/33859214/33803476/33815596/custom/scripts/postpatch.sh -dbhome /u01/app/oracle/product/db/19c  ## rollback OJVM  opatch rollback -local -id 31668882    ## rollback JDK  opatch rollback -local -id 31743771  ## Run as grid  ## source the grid profile and extend the path with opatch  . ~grid/.profile  export PATH=$ORACLE\_HOME/OPatch:$PATH  export PATCH\_LOC=/u01/app/oracle/local/software/Apr2022RU  opatch rollback -id –local (<patchid>…)  opatch rollback -id –local 33806152, 33815596, 33815607, 33911149, 31743771  sudo /u01/app/grid/product/19c/rdbms/install/rootadd\_rdbms.sh  sudo /u01/app/grid/product/19c/crs/install/rootcrs.sh -postpatch -rollback  Repeat Step 1 to 3 on all nodes  ## exit from script logging command  Exit |

1. Start Resources running from DB HOME

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| ## Run as **oracle**  ## On the last node, bring up the database on all nodes.  srvctl start database -d DUK31BLD |

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| ## Verification run as **oracle**  ## Above step will start DB instance running on $ORACLE\_HOME  ## Below command should show pmon process for all DB instances  ps -ef | grep pmon | grep -v ASM | grep -v grep  ## Below sqlplus command should show db instances in OPEN mode  sqlplus / as sysdba  select open\_mode from v$database;  STATUS  ------------  READ WRITE |

1. Run post de-installation scripts

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| ## Run as **oracle (Only on One Node)**  If no OJVM installed follow the below step  cd $ORACLE\_HOME/rdbms/admin  sqlplus /nolog  SQL> CONNECT / AS SYSDBA  SQL>startup  ./datapatch -verbose |

1. Start EM Agent Processes after patching on all nodes

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| ## Run as **oracle**  /u01/app/oracle/product/agent/agent13c/agent\_inst/bin/emctl start agent |

Remove OEM blackout for all database hosts involved on patching