PROD GW - 12c to 19c Database upgrade with Data Guard

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Introduction

The document outline steps taken to migrate an 12c Oracle database Standalone to 19c on Oracle Linux. The approach uses Oracle's "AutoUpgrade" which is the **ONLY** recommended way to upgrade databases to 19c.

This utility performs the following steps:-

- System Checks
  - Space Check and Requirements
- Database Pre-Checks
  - preupgrade.jar
  - Auto fixup scripts
- Database Upgrade
  - Command line
- Database Post-Upgrade
  - Stats Refresh
  - TimeZones
  - /etc/oratab
  - srvctl configuration updates

The modes the utility can run in are:-

- -analyze
- -fixups
- -upgrade

OR

- -deploy (All three steps above with Guaranteed Restore Point generated automatically)

NB: On a Data Guard environment, the Broker is not supported.

NB: JDBC connections JDK 7 is NOT certified in Oracle 19c Oracle Support Document 401934.1 (Starting With Oracle JDBC Drivers - Installation, Certification, and More!) can be found at: https://support.oracle.com/epmos/faces/DocumentDisplay?id=401934.1

Which JDBC driver version goes with which JDK version ?

From JDBC FAQ on Oracle Technology Network (OTN), the OCI or Thin JDBC drivers versions support the following Javasoft's JDK versions :

JDBC Version	JDK version	JDBC File Name
21c	8.x 11.x 12.x 13.x 14.x 15.x	ojdbc8.jar ojdbc8.jar, ojdbc11.jar ojdbc8.jar, ojdbc11.jar ojdbc8.jar, ojdbc11.jar ojdbc8.jar, ojdbc11.jar ojdbc8.jar, ojdbc11.jar
19c	8.x 9.x 10.x 11.x	ojdbc8.jar ojdbc8.jar ojdbc10.jar ojdbc10.jar ***
18c	8.x 9.x 10.x 11.x	ojdbc8.jar
12.2.0	8.x	ojdbc8.jar
12.1.0	8.x 7.x 6.x	ojdbc7.jar ojdbc7.jar ojdbc6.jar

Assumptions

- Newest version of AutoUpgrade is installed
- That both 19c and 12c Oracle database home has been installed
- Database is on archivelog mode
- db_recovery_file_dest and db_recovery_file_dest_size are defined
- Tablespaces SYSTEM and SYSAUX are in autoextend ON and have enough available space to be extended.

Server Details

This is the source and target server details for the 12.1.0.2 Oracle Database Home

Attribute	PRIMARY site	STANDBY site
Hostname	ba-pr-gwdb01.bms.gw.prod.gcp.admiral.uk ba-pr-gwdb02.bms.gw.prod.gcp.admiral.uk ba-pr-gwdb03.bms.gw.prod.gcp.admiral.uk	bb-pr-gwdb01.bms.gw.prod.gcp.admiral.uk bb-pr-gwdb02.bms.gw.prod.gcp.admiral.uk bb-pr-gwdb03.bms.gw.prod.gcp.admiral.uk
Oracle Base	/u01/app/oracle	/u01/app/oracle
12c Database Home	/u01/app/oracle/product/12.1.0/db_1	/u01/app/oracle/product/12.1.0/db_1
19c Database Home	/u01/app/oracle/product/19.19.0/db_1	/u01/app/oracle/product/19.19.0/db_1
Database / Instance	APR1SRA	BPR1SRA

NO OUTAGE - Pre 19c Migration Steps

SOURCE PREPARATION - HAPPENING ON THE ON-PREM DB

The following steps are required for the GW8 upgrade and are not part of the 19c upgrade

Notes	Commands

ADD 10 datafiles on each UNDO tablespace UNDOTBS1, UNDOTBS2 & UNDOTBS3	**Execute 10 times:** alter tablespace UNDOTBS1 add datafile '+DATA' size 32G; alter tablespace UNDOTBS2 add datafile '+DATA' size 32G; alter tablespace UNDOTBS3 add datafile '+DATA' size 32G; select file_name, bytes/1024/1024, autoextensible from dba_data_files where tablespace_name like 'UNDOTBS%'; 30 datafiles
Extend the TEMP tablespace by adding 10 tempfiles	**Execute 10 times:** ALTER TABLESPACE "TEMP" ADD TEMPFILE SIZE 32G;
Extend TBS **BC_OP, BC_INDEX, PCSOR_INDEX and PCSOR_OP**	**x20** ALTER TABLESPACE "BC_OP" ADD DATAFILE '+DATA' SIZE 32G; **x20** ALTER TABLESPACE "BC_INDEX" ADD DATAFILE '+DATA' SIZE 32G ; **x20** ALTER TABLESPACE "PCSOR_INDEX" ADD DATAFILE '+DATA' SIZE 32G; **x25** ALTER TABLESPACE "PCSOR_OP" ADD DATAFILE '+DATA' SIZE 32G ;

Notes	Commands
Ensure that the source SPFILE is on ASM	SELECT DECODE(value, NULL, 'PFILE', 'SPFILE') "Init File Type" from sys.v_$parameter where name='spfile';
The source database must be in archivelog mode.	select log_mode from v$database;
The current version of the autoupgrade cannot interact with the Data Guard Broker. Disabling the broker will occur later on.	select count(*) from v$archive_dest_status where type!='LOCAL'; 0 = NO STANDBY 1 = STANDBY 2 = PRIMARY
Check the catalog. No invalid objects is expected. If not run the utlrp.sql in order to recompile the catalog	set linesize 200 col object_name for a40 col object_type for a20 col owner for a10 select object_name, object_type, owner, status from dba_objects where status!='VALID' and owner='SYS';
Take a backup of the SPFILE	cd /home/oracle/upgrade create pfile='/home/oracle/upgrade/initAPR1SRA.ora_save' from spfile; create pfile='/home/oracle/upgrade/initBPR1SRA.ora_save' from spfile;;

Check SPACE in SYSTEM and SYSAUX tablespaces
 	
Then add datafile or increase MAXSIZE
	Check allocated SPACE
	select tablespace_name, sum(bytes)/1024/1024 from dba_data_files where tablespace_name in ('SYSTEM','SYSAUX') group by tablespace_name;
	
	Check used SPACE
	select tablespace_name, sum(bytes)/1024/1024 from dba_segments where tablespace_name in ('SYSTEM','SYSAUX') group by tablespace_name;
	
	Depending of the result, you can add a new datafile or increase the MAXSIZE as below:
	
	set line 200
	set long 200
	select 'alter database datafile '''||file_name||''' autoextend on next 128M maxsize '|| case when floor(maxbytes/1024/1024)+2048>32767 then 32767 else floor(maxbytes/1024/1024)+2048 end||'M;'
	from dba_data_files
	where tablespace_name in ('SYSTEM','SYSAUX');
	-- And execute the result

Check the value of sec_case_sensitive_logon	If this parameter is set to FALSE, the upgrade process will update it to TRUE. If, for application purpose it has to be set to FALSE, the change has to be made after the upgrade See section Post Migration Steps (Immediate)
~~Purge recyclebin~~ Completed on GW8 on prem	~~purge recyclebin;~~ ~~purge dba_recyclebin;~~
~~Login as **oracle** and into database as SYSDBA. Ensure dictionary stats have been gathered to speed up the upgrade~~ Completed on GW on Prem following GW & Aggs Gather Dictionary Statistics On Premise - DBA - Confluence (admiral.uk)	~~sqlplus / as sysdba~~ ~~set linesize 200~~ ~~select to_char(max(end_time),'DD-MON-YY hh24:mi:ss') LATEST, operation from DBA_OPTSTAT_OPERATIONS where operation in ('gather_dictionary_stats', 'gather_fixed_objects_stats') group by operation;~~ ~~EXEC DBMS_STATS.GATHER_DICTIONARY_STATS;~~ ~~EXEC DBMS_STATS.GATHER_FIXED_OBJECTS_STATS ;~~ ~~select to_char(max(end_time),'DD-MON-YY hh24:mi:ss') LATEST, operation from DBA_OPTSTAT_OPERATIONS where operation in ('gather_dictionary_stats', 'gather_fixed_objects_stats') group by operation;~~
~~Additional gather stats which may also help improve upgrade performance (Bug 25286819 : CLUSTER INDEX STATS NOT GATHERED WHEN STALE TABLE OR DICTIONARY STATS ARE GATHER)~~	~~exec dbms_stats.gather_schema_stats('SYS');~~ ~~exec dbms_stats.gather_index_stats('SYS','I_OBJ#');~~ ~~exec dbms_stats.gather_index_stats('SYS','I_FILE#_BLOCK#');~~ ~~exec dbms_stats.gather_index_stats('SYS','I_TS#');~~ ~~exec dbms_stats.gather_index_stats('SYS','I_USER#');~~ ~~exec dbms_stats.gather_index_stats('SYS','I_TOID_VERSION#');~~ ~~exec dbms_stats.gather_index_stats('SYS','I_MLOG#');~~ ~~exec dbms_stats.gather_index_stats('SYS','I_RG#');~~
As **oracle** Login to MOS and download latest version of AutoUpgrade from this note https://support.oracle.com/epmos/faces/DocumentDisplay?id=2485457.1 The file downloads as "txt" but this a "jar" file. Check version and move this to the 12c and 19c "rdbms/admin" directories	export ORACLE_HOME_19c=/u01/app/oracle/product/19.19.0/db_1 export ORACLE_HOME_12c=/u01/app/oracle/product/12.1.0/db_1 export PATH=$ORACLE_HOME_19c/jdk/bin/:$PATH java -jar /home/oracle/upgrade/autoupgrade.jar -version mv $ORACLE_HOME_19c/rdbms/admin/autoupgrade.jar $ORACLE_HOME_19c/rdbms/admin/autoupgrade.jar.old cp /home/oracle/upgrade/autoupgrade.jar $ORACLE_HOME_19c/rdbms/admin/autoupgrade.jar cp /home/oracle/upgrade/autoupgrade.jar $ORACLE_HOME_12c/rdbms/admin/autoupgrade.jar
On **PRIMARY** create and sample configuration file	java -jar $ORACLE_HOME_12c/rdbms/admin/autoupgrade.jar -create_sample_file config

On **PRIMARY** edit the config file setting the ORACLE_SID to the name of the database that requires upgrading to from 12c to 19c	export RESP_FILE=$ORACLE_HOME/rdbms/admin/config_ **APR1SRA** .cfg
	
	vi $RESP_FILE
	
	global.autoupg_log_dir=/u01/app/oracle/upgrade/logs/CPP1INDBS # Create a new folder for each database
	#
	upg1.log_dir=/u01/app/oracle/upgrade/logs/APR1SRA # Ensure the directory is created
	upg1.sid= **APR1SRA1** # Source First instance name
	upg1.dbname= **APR1SRA**
	upg1.source_home=/u01/app/oracle/product/**12.1.0/db_1** # Path of the source ORACLE_HOME
	upg1.target_home=/u01/app/oracle/product/19.19.0/db_1 # Path of the target ORACLE_HOME
	upg1.start_time=NOW
	upg1.upgrade_node=localhost
	upg1.source_tns_admin_dir=/u01/app/oracle/product/**12.1.0/db_1**
	upg1.target_tns_admin_dir=/u01/app/oracle/product/19.19.0/db_1
	upg1.run_utlrp= **yes**
	upg1.timezone_upg= **yes** # No, in case of a downgrade

AUTOUPGRADE Fixup Processing Mode

Run AutoUpgrade Fixup Processing Mode On the PRIMARY	export ORACLE_BASE=<Oracle Base> java -jar $ORACLE_HOME_12c/rdbms/admin/autoupgrade.jar -config $RESP_FILE -mode fixups -noconsole Verify the status.log file In case of previous failure: java -jar $ORACLE_HOME_12c/rdbms/admin/autoupgrade.jar -config $RESP_FILE -clear_recovery_data
(AUTOFIXUP) Remove initialization parameters that Oracle has obsoleted or removed. This action may be done now or when starting the database in upgrade mode using the target ORACLE HOME. Obsolete Parameter ---------- _optimizer_adaptive_plans If parameters that are obsolete or removed from the target release are present in the pfile/spfile, the Oracle database may not start, or it may start with an ORA- error.	APR1SRA, BPR1SRA alter system reset "_optimizer_adaptive_plans" scope=spfile;

STANDBY PREPARATION

Ensure standby has no transport gaps or lags.	DGMGRL> show database 'BPR1SRA' Database - BPR1SRA Role: PHYSICAL STANDBY Intended State: APPLY-ON Transport Lag: 0 seconds (computed 1 second ago) Apply Lag: 0 seconds (computed 1 second ago) Average Apply Rate: 61.00 KByte/s Real Time Query: ON Instance(s): BPR1SRA1 BPR1SRA2 (apply instance) BPR1SRA3 Database Status: SUCCESS SET LINESIZE 200 COL VALUE FOR A30 SELECT NAME,VALUE,TIME_COMPUTED,DATUM_TIME FROM V$DATAGUARD_STATS WHERE NAME LIKE '%lag'; NAME VALUE TIME_COMPUTED DATUM_TIME ---------- ---------- ---------- ---------- transport lag +00 00:00:00 03/31/2023 13:42:02 03/31/2023 13:42:01 apply lag +00 00:00:00 03/31/2023 13:42:02 03/31/2023 13:42:01
Verify that the primary is ready to switch to standby	SQL> select open_mode, SWITCHOVER_STATUS,DATABASE_ROLE from v$database; OPEN_MODE SWITCHOVER_STATUS DATABASE_ROLE ---------- ---------- ---------- READ WRITE TO STANDBY PRIMARY
Disable the BROKER	On the PRIMARY DGMGRL> DISABLE CONFIGURATION; On both sides: ALTER SYSTEM SET DG_BROKER_START=FALSE scope=both;
Cancel Redo Apply on the Standby	ALTER DATABASE RECOVER MANAGED STANDBY DATABASE CANCEL;

Ensure Standby Database is in READ ONLY or MOUNTED mode	select open_mode, SWITCHOVER_STATUS,DATABASE_ROLE from v$database; OPEN_MODE SWITCHOVER_STATUS DATABASE_ROLE ---------- ---------- ---------- READ ONLY NOT ALLOWED PHYSICAL STANDBY
Create GRP on Standby and Validate	create restore point BEFORE_UPG_STBY guarantee flashback database; SQL> SELECT name,scn FROM V$RESTORE_POINT where name = 'BEFORE_UPG_STBY'; NAME SCN ---------- ---------- BEFORE_UPG_STBY 299259588736
Enable Redo Apply on the Standby	ALTER DATABASE RECOVER MANAGED STANDBY DATABASE DISCONNECT FROM SESSION;
Check the Standby LAG... AGAIN	SET LINESIZE 200 COL VALUE FOR A30 SELECT NAME,VALUE,TIME_COMPUTED,DATUM_TIME FROM V$DATAGUARD_STATS WHERE NAME LIKE '%lag'; NAME VALUE TIME_COMPUTED DATUM_TIME ---------- ---------- ---------- ---------- transport lag +00 00:00:00 03/31/2023 13:57:34 03/31/2023 13:57:33 apply lag +00 00:00:00 03/31/2023 13:57:34 03/31/2023 13:57:33

GET THE STANDBY READY FOR UPGRADE

Move the Standby Database from 12c ORACLE_HOME to the 19c ORACLE HOME
Perform these steps only if there is a physical standby database associated with the database being upgraded

The following must be true:

The standby database is running in real-time apply mode.
The value of the LOG_ARCHIVE_DEST_n database initialization parameter on the primary database that corresponds to the standby database must contain the DB_UNIQUE_NAME attribute, and the value of that attribute must match the DB_UNIQUE_NAME of the standby database.

IN CASE Disable Fast-Start Failover on the primary or the standby only if it was set	DGMGRL> disable fast_start failover;
Shutdown the standby database and restart it in the 19c database home	srvctl stop database -d BPR1SRA
If password and/or init.ora files are stored outside ASM, copy the files from the Source Oracle Home to the Target Oracle Home.	cp /u01/app/oracle/product/12.1.0/db_1/dbs/orapwSPP1BSB /u01/app/oracle/product/19.19.0/db_1/dbs/ The SPFILE and Password file are both in the ASM in this case.
Edit the standby database entry in /etc/oratab to point to the new 19c home.	BPR1SRA:/u01/app/oracle/product/19.19.0/db_1:N BPR1SRA1:/u01/app/oracle/product/19.19.0/db_1:N
Tnsnames.ora entries are available on both ORACLE_HOME If using the default location for tnsnames.ora, $ORACLE_HOME/network/admin, then copy tnsnames.ora from the Source Oracle Home to the Target Oracle Home.	cp $ORACLE_HOME_12c/network/admin/tnsnames.ora $ORACLE_HOME_19c/network/admin/tnsnames.ora

Update the listener.ora file Note that the ORACLE_HOME has been updated.	PRIMARY: SID_LIST_LISTENER= (SID_LIST= (SID_DESC= (GLOBAL_DBNAME=APR1SRA) (SID_NAME=APR1SRA) (ORACLE_HOME=/u01/app/oracle/product/19.19.0/db_1)) (SID_DESC = (GLOBAL_DBNAME = APR1SRA_DGMGRL) (SID_NAME = APR1SRA) (ORACLE_HOME=/u01/app/oracle/product/19.19.0/db_1))) STANDBY: SID_LIST_LISTENER= (SID_LIST= (SID_DESC= (GLOBAL_DBNAME=BPR1SRA) (SID_NAME=BPR1SRA) (ORACLE_HOME=/u01/app/oracle/product/19.19.0/db_1)) (SID_DESC = (GLOBAL_DBNAME = BPR1SRA_DGMGRL) (SID_NAME = BPR1SRA) (ORACLE_HOME=/u01/app/oracle/product/19.19.0/db_1)))
Update the OCR configuration for the standby database	export ORACLE_HOME=/u01/app/oracle/product/19.19.0/db_1 export PATH=${ORACLE_HOME}/bin:$PATH srvctl upgrade database -db BPR1SRA -oraclehome /u01/app/oracle/product/19.19.0/db_1
Start the standby in MOUNT mode using the binaries of the 19c	srvctl start instance -db BPR1SRA -i BPR1SRA1 -startoption mount ALTER DATABASE RECOVER MANAGED STANDBY DATABASE DISCONNECT FROM SESSION;
Check the Standby LAG... AGAIN	SET LINESIZE 200 COL VALUE FOR A30 SELECT NAME,VALUE,TIME_COMPUTED,DATUM_TIME FROM V$DATAGUARD_STATS WHERE NAME LIKE '%lag';

AUTOUPGRADE ANALYZE

Run the upgrade utility on **Node 1** in analyse mode, the job can be monitored by following commands You might need to add the option -clear_recovery_data	java -jar $ORACLE_HOME_12c/rdbms/admin/autoupgrade.jar -config $RESP_FILE -mode analyze upg> lsj upg> status
Review status and job logs and fix any " REQUIRED ACTIONS" that AUTOFIXUP cannot manage (e.g. archive log mode)	/u01/app/oracle/upgrade/logs/APR1SRA/**APR1SRA/102** /prechecks
Download and run latest hcheck script from this note https://support.oracle.com/epmos/faces/DocumentDisplay?id=136697.1 to chack for problems in the data dictionary	@hcheck

OUTAGE - Migration Steps

Notes	Commands

RUN the autoupgrade on the PRIMARY database Monitor it by using status and lsj commands (see Appendix for sample outputs) NOTE: For Data Guard environments, you can safely ignore errors ORA-16607,ORA-16797, ORA-16664,ORA-12514 in the alert.log because AutoUpgrade uses a PFILE to start the database during upgrade. These errors will stop after the upgrade completes.	java -jar $ORACLE_HOME_12c/rdbms/admin /autoupgrade.jar -config $RESP_FILE -mode deploy
During the upgrade follow the alert log on both PRIMARY and STANDBY	Logshipping is on, So logs should reach the standby and the MRP should continue applying them.
Review the upgrade summary file once complete	view /u01/app/oracle/upgrade/logs/APR1SRA/**APR1SRA/102** /dbupgrade/upg_summary.log
Check the status of the registry post upgrade, all components should be VALID	As the database has now been moved onto 19c, the /etc/oratab has also been been updated accordingly. . oraenv APR1SRA sqlplus / as sysdba col COMP_NAME form a50 col status form a20 select comp_name,STATUS from dba_registry; select * from registry$error; select owner, count(*) from dba_objects where status !='VALID' group by owner;
Check the Standby LAG	SET LINESIZE 200 COL VALUE FOR A30 SELECT NAME,VALUE,TIME_COMPUTED, DATUM_TIME FROM V$DATAGUARD_STATS WHERE NAME LIKE '%lag'; NAME VALUE TIME _COMPUTED DATUM_TIME ---------- ---------- ---------- ---------- transport lag +00 00:00:00 03 /31/2023 15:36:23 03/31/2023 15:36:23 apply lag +00 00:00:00 03/31 /2023 15:36:23 03/31/2023 15:36:23
Enable BROKER Configuration	On both sides: SQL> alter system set dg_broker_start=TRUE scope=both; Then from the PRIMARY DGMGRL> enable configuration
Enable Fast-Start Failover Only if needed	DGMGRL> enable fast_start failover
In case of ACTIVE DATAGUARD, Open the Standby database to READ ONLY	alter database open; select open_mode, SWITCHOVER_STATUS, DATABASE_ROLE from v$database;
Gather STATS - on the PRIMARY	EXECUTE DBMS_STATS. GATHER_DICTIONARY_STATS;

Post Migration Steps (Immediate)

Notes	Commands

Copy the password file in the new ORACLE_HOME (If not done in a previous step)	cp /u01/app/oracle/product/12.1.0/db_1/dbs/orapwBPR1SRA /u01/app/oracle/product/19.19.0/db_1/dbs/ cp /u01/app/oracle/product/12.1.0/db_1/dbs/orapwSPP1WQB /u01/app/oracle/product/19.19.0/db_1/dbs/
Make sure that the the case sensitive parameter remains unchanged. If the parameter was set to FALSE, after the upgrade it will be set to TRUE. In that case, we need to put it back to FALSE	alter system set sec_case_sensitive_logon=FALSE scope=both sid='*';
Migrate backups to new 19c	
Ensure OEM agent is working correctly	
Drop Guaranteed Restore Point on Standby and Primary. Do not execute this step until you are committed to stay in Oracle Database 19c.	On the PRIMARY SELECT name,scn FROM V$RESTORE_POINT where name like 'AUTOUPGRADE%'; drop restore point <grp_name>; On the STANDBY Delete the previously created restore point drop restore point 'BEFORE_UPG_STBY';
Any other scripts	

Post Migration Steps (7 days or later)

Notes	Commands
Consider following best practice post upgrade activities	
Update compatible parameter on **BOTH PRIMARY and STANDBY**	alter system set compatible='19.0.0' scope=spfile; And then restart the database.

Gather Fixed objects STATS - After a week	GATHER FIXED OBJECTS STATS for SYS by creating the following job which will be executed after 7 days
	
	`BEGIN`
	`  DBMS_SCHEDULER.CREATE_JOB (`
	`  job_name => '"SYS"."GATHER_FIXED_OBJECTS_STATS_ONE_TIME"',`
	`  job_type => 'PLSQL_BLOCK',`
	`  job_action => 'BEGIN DBMS_STATS.`
	`GATHER_FIXED_OBJECTS_STATS; END;',`
	`  start_date => SYSDATE+7,`
	`  auto_drop => TRUE,`
	`  comments => 'Gather fixed objects stats after upgrade -`
	`one time'`
	`  );`
	`  DBMS_SCHEDULER.ENABLE (`
	`  name => '"SYS"."GATHER_FIXED_OBJECTS_STATS_ONE_TIME"'`
	`  );`
	`END;`
	`/`

The following steps are required for the GW8 upgrade and are not part of the 19c upgrade

Notes	Commands
Set the param parallel_degree_policy to AUTO	alter system set parallel_degree_policy=AUTO scope=both;
Check the remote listener value on PHY & STB	alter system set remote_listener='ba-pr-gwdb-scan.bms.gw.preprod.gcp.admiral.uk:1531' scope=both sid='*'; alter system set remote_listener='bb-pr-gwdb-scan.bms.gw.prod.gcp.admiral.uk:1531' scope=both sid='*';

Create the TRIGGER	-- check if SET_GW_SESSION ON-LOGON trigger exists
	select owner, trigger_name, trigger_type, triggering_event, when_clause, trigger_body from dba_triggers where trigger_name='SET_GW_SESSION';
	
	-- Create the SET_GW_SESSION ON-LOGON trigger
	CREATE OR REPLACE TRIGGER set_gw_session
	AFTER LOGON ON DATABASE
	WHEN (user IN ('PCSOR', 'BC','PCAGG'))
	DECLARE
	  v_username VARCHAR2(20) := SYS_CONTEXT('USERENV', 'CURRENT_USER');
	BEGIN
	  dbms_application_info.set_module(v_username, NULL);
	  EXECUTE IMMEDIATE 'ALTER SESSION SET NLS_COMP = BINARY';
	  EXECUTE IMMEDIATE 'ALTER SESSION SET NLS_SORT = BINARY_CI';
	  EXECUTE IMMEDIATE 'ALTER SESSION SET CURSOR_SHARING = EXACT';
	END;
	/

Flashback ON - on the **Standby**	Stop the database, the restart one instance in mount mode srvctl stop database -d BPR1SRA srvctl start instance -d BPR1SRA -i BPR1SRA1 -o mount SQL> ALTER DATABASE RECOVER MANAGED STANDBY DATABASE CANCEL; SQL> alter database flashback on; SQL> ALTER DATABASE RECOVER MANAGED STANDBY DATABASE DISCONNECT FROM SESSION; SQL> shutdown immediate; srvctl start database -d BPR1SRA
Flashback ON - on the **PRIMARY**	Stop the database, the restart one instance in mount mode srvctl stop database -d APR1SRA srvctl start instance -d APR1SRA1 -o mount SQL> alter database flashback on; SQL> shutdown immediate; srvctl start database -d APR1SRA
Create a new GRP on the **STANDBY**	ALTER DATABASE RECOVER MANAGED STANDBY DATABASE CANCEL; select open_mode, SWITCHOVER_STATUS,DATABASE_ROLE from v$database; OPEN_MODE SWITCHOVER_STATUS DATABASE_ROLE ---------- ---------- ---------- READ ONLY NOT ALLOWED PHYSICAL STANDBY **create restore point POST19cUPG_STBY guarantee flashback database;** SQL> col scn for 999999999999999 SQL> SELECT name,scn FROM V$RESTORE_POINT where name = 'BEFORE_UPG_STBY'; NAME SCN ---------- ---------- BEFORE_UPG_STBY 143035183099 ALTER DATABASE RECOVER MANAGED STANDBY DATABASE DISCONNECT FROM SESSION; SET LINESIZE 200 COL VALUE FOR A30 SELECT NAME,VALUE,TIME_COMPUTED,DATUM_TIME FROM V$DATAGUARD_STATS WHERE NAME LIKE '%lag'; NAME VALUE TIME_COMPUTED DATUM_TIME ---------- ---------- ---------- ---------- transport lag +00 00:00:00 03/31/2023 13:57:34 03/31/2023 13:57:33 apply lag +00 00:00:00 03/31/2023 13:57:34 03/31/2023 13:57:33
Create a new GRP on the **PRIMARY**	**create restore point POST19cUPG_PRY guarantee flashback database;**

References

19c Grid Infrastructure and Database Upgrade steps for Exadata Database Machine running on Oracle Linux [2542082.1]

Oracle Support Document 2485457.1 (AutoUpgrade Tool) can be found at: https://support.oracle.com/epmos/faces/DocumentDisplay?id=2485457.1

Oracle Support Document 136697.1 (hcheck.sql - Script to Check for Known Problems in Oracle8i, Oracle9i, Oracle10g, Oracle 11g and Oracle 12c and Above) can be found at: https://support.oracle.com/epmos/faces/DocumentDisplay?id=136697.1

Oracle Support Document 2543981.1 (Oracle 19c - Complete Checklist for upgrading Oracle 12c, 18c Container Database (CDB) to Oracle 19c Release using DBUA) can be found at: https://support.oracle.com/epmos/faces/DocumentDisplay?id=2543981.1

https://www.doag.org/formes/pubfiles/11336512/2019-NN-Roy_Swonger-How_to_Diagnose_Oracle_Database_Upgrade_Issues-Praesentation.pdf

https://videohub.oracle.com/media/Webinar2_Upgrade+to+Oracle+Database+19c+using+AutoUpgrade_EMEA/1_05tfzpzc

Appendix

Sample Outputs From Auto upgrade

```
upg> lsj
+----+--------+-----+---------+-------+--------------+--------+-------+
|Job#| DB_NAME|STAGE|OPERATION| STATUS|    START_TIME| UPDATED|MESSAGE|
+----+--------+-----+---------+-------+--------------+--------+-------+
| 105|SPT1AGC1|DRAIN|PREPARING|RUNNING|21/02/09 13:45|13:46:25|       |
+----+--------+-----+---------+-------+--------------+--------+-------+
```

```
upg> lsj
+----+--------+-----+---------+-------+--------------+--------+----------------------+
|Job#| DB_NAME|STAGE|OPERATION| STATUS|    START_TIME| UPDATED|               MESSAGE|
+----+--------+-----+---------+-------+--------------+--------+----------------------+
| 105|SPT1AGC1|DRAIN|EXECUTING|RUNNING|21/02/09 13:45|13:47:22|Shutting down database|
+----+--------+-----+---------+-------+--------------+--------+----------------------+
```

```
upg> lsj
+----+--------+---------+---------+-------+--------------+--------+-----------+
|Job#| DB_NAME|    STAGE|OPERATION| STATUS|    START_TIME| UPDATED|    MESSAGE|
+----+--------+---------+---------+-------+--------------+--------+-----------+
| 105|SPT1AGC1|DBUPGRADE|EXECUTING|RUNNING|21/02/09 13:45|13:52:02|6%Upgraded |
+----+--------+---------+---------+-------+--------------+--------+-----------+
Total jobs 1
```

```
upg> lsj
+----+--------+---------+---------+-------+--------------+--------+------------+
|Job#| DB_NAME|    STAGE|OPERATION| STATUS|    START_TIME| UPDATED|     MESSAGE|
+----+--------+---------+---------+-------+--------------+--------+------------+
| 105|SPT1AGC1|DBUPGRADE|EXECUTING|RUNNING|21/02/09 13:45|14:16:07|70%Upgraded |
+----+--------+---------+---------+-------+--------------+--------+------------+
```

```
+----+--------+----------+---------+-------+--------------+--------+-------------+
|Job#| DB_NAME|     STAGE|OPERATION| STATUS|    START_TIME| UPDATED|      MESSAGE|
+----+--------+----------+---------+-------+--------------+--------+-------------+
| 105|SPT1AGC1|POSTFIXUPS|EXECUTING|RUNNING|21/02/09 13:45|14:34:46|Remaining 4/4|
+----+--------+----------+---------+-------+--------------+--------+-------------+
```

```
upg> status
--------------- Config -----------------
User configuration file    [/u01/app/oracle/product/12.1.0/db_1/rdbms/admin/sample_config_SPT1AGC1.cfg]
General logs location      [/u01/app/oracle/cfgtoollogs/autoupgrade/cfgtoollogs/upgrade/auto]
Mode                       [DEPLOY]
DB upg fatal errors        ORA-00600,ORA-07445
DB Post upgrade abort time [60] minutes
DB upg abort time          [1440] minutes
DB restore abort time      [120] minutes
DB GRP abort time          [3] minutes
----------------------- Jobs -----------------------
Total databases in configuration file [1]
Total Non-CDB being processed         [1]
Total CDB being processed             [0]
Jobs finished successfully            [0]
Jobs finished/aborted                 [0]
Jobs in progress                      [1]
Jobs stage summary
    Job ID: 105
    DB name: SPT1AGC1
        SETUP            <1 min
        GRP              <1 min
        PREUPGRADE       <1 min
        PRECHECKS        <1 min
        PREFIXUPS        <1 min
        DRAIN            2 min
        DBUPGRADE        45 min
        POSTCHECKS       <1 min
        POSTFIXUPS       1 min (IN PROGRESS)
------------ Resources ----------------
Threads in use                    [63]
JVM used memory                   [246] MB
CPU in use                        [13%]
Processes in use                  [18]
```

```
upg> lsj
+----+--------+----------+---------+-------+--------------+--------+-------------+
|Job#| DB_NAME|     STAGE|OPERATION| STATUS|    START_TIME| UPDATED|      MESSAGE|
+----+--------+----------+---------+-------+--------------+--------+-------------+
| 105|SPT1AGC1|POSTFIXUPS|EXECUTING|RUNNING|21/02/09 13:45|14:38:53|Remaining 1/4|
+----+--------+----------+---------+-------+--------------+--------+-------------+
```

```
upg> Job 105 completed
-------------------- Final Summary --------------------
Number of databases           [ 1 ]

Jobs finished                 [1]
Jobs failed                   [0]
Jobs pending                  [0]

---- Drop GRP at your convenience once you consider it is no longer needed ----
Drop GRP from SPT1AGC1: drop restore point AUTOUPGRADE_9212_SPT1AGC1121020


Please check the summary report at:
/u01/app/oracle/cfgtoollogs/autoupgrade/cfgtoollogs/upgrade/auto/status/status.html
/u01/app/oracle/cfgtoollogs/autoupgrade/cfgtoollogs/upgrade/auto/status/status.log
```