Upgrading from Oracle 18c to Oracle 19c
In an Oracle Multitenant Setup

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The purpose of this document is to help the reader to give a comprehensive overview and process flow of a successful Upgrade from SAP perspective!
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1. REFERENCES

SAP Notes:
2799900 - Central Technical Note for Oracle Database 19c
2660017 - Oracle Database Software Installation on Unix
2800001 - Upgrading to Oracle Database 19c (DBUA)
2540847 - SAP Guides for Oracle Database Upgrade

2. SYSTEM ENVIRONMENT

**Operating System:**

```
[oracle@multitenant /installation]$ uname -a
Linux multitenant 3.10.0-327.13.1.el7.x86_64 #1 SMP Thu Mar 31 09:20:07 PDT 2016 x86_64 x86_64
x86_64 GNU/Linux
```

```
[oracle@multitenant /installation]$ cat /etc/oracle-release
Oracle Linux Server release 7.2
```

**Database Setup:**

CDB: TEN

1st PDB: PEN

2nd PDB: JEN

RDBMS Software owner: oracle

**SAP System:**

SAP NW 7.5
3. PRE-UPGRADE STEPS

3.1. Apply SAP notes (Mandatory)

This is a mandatory step even if SQL Macros are not used at all!

2801989 - SQL macros: CDS views with parameters
2850113 - Error for CDS views with parameters with Oracle Version 19.5 in SAP NW 7.50 and higher

3.2. Configure ABAP SSFS

Follow SAP note below:
1639578 - SSFS as password store for primary database connect

3.3. Update SAP Kernel

Follow SAP note below:
19466 - Downloading SAP kernel patches

multitenant:tenadm 51> disp+work
disp+work=>sapparam(1c): No Profile used.
disp+work=>sapparam: SAPSYSTEMNAME neither in Profile nor in Commandline

---------------------------
disp+work information
---------------------------

kernel release            749
kernel make variant       749_REL
compiled on               Linux GNU SLES-11 x86_64 cc4.8.5 use-pr170305 for linuxx86_64
compiled for              64 BIT
compilation mode          UNICODE
compile time              Mar  5 2017 04:40:28

Tue Feb 12 14:46:48 2019
Loading DB library '/usr/sap/TEN/SYS/exe/run/dboraslib.so' ...
Library '/usr/sap/TEN/SYS/exe/run/dboraslib.so' loaded
Version of '/usr/sap/TEN/SYS/exe/run/dboraslib.so' is "749.05", patchlevel (0.200)

update level            0
patch number             200
source id                0.200
RKS compatibility level  0
DW_GUI compatibility level 200

---------------------------
supported environment
---------------------------

database (SAP, table SVERS) 740
                                 750
                                 751
                                 765

operating system
Linux

THE BEST RUN
3.4. Update SAP BR*Tools

Follow SAP notes below:
- *1598594* - BR*Tools configuration for Oracle installation using user "oracle"
- *2333995* - BR*Tools support for Oracle multitenant database
- *2799900* - Central Technical Note for Oracle Database 19c

multitenant:tenadm 52> brtools -V
BR0651I BRTOOLS 7.40 (36)

<table>
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<th>Patch</th>
<th>Date</th>
<th>Info</th>
</tr>
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<tr>
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<td>2013-03-26</td>
<td>Corrections in BR*Tools 7.40 patch 1 (note 1838852)</td>
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<td>Corrections in BR*Tools 7.40 patch 18 (note 2250026)</td>
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<td>2018-11-29</td>
<td>Corrections in BR*Tools 7.40 patch 36 (note 2726436)</td>
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release note 1838850
kernel release 740
patch date 2018-11-29
patch level 36
make platform linuxx86_64
make codeline 749_REL
make mode OCI_112
make date Nov 30 2018
3.5. Update SAPDBA Role

Follow Point 2.4.4 in SAP note below:
2333995 - BR*Tools support for Oracle multitenant database

Run sapdba_role.sql once for the container database and once again for each pluggable database:

[oracle@multitenant /installation] $ sqlplus /nolog @sapdba_role NONE ROOT
[oracle@multitenant /installation] $ sqlplus /nolog @sapdba_role SR3 PEN
[oracle@multitenant /installation] $ sqlplus /nolog @sapdba_role SR3DB JEN

3.6. Update Oracle Instant Client

Follow SAP note below:
819829 - Oracle Instant Client Installation and Configuration on Unix or Linux

multitenant:tenadm 98> pwd
/oracle/client/122
multitenant:tenadm 99> ll
total 20
-rw-rwxr-x 1 tenadm sapsys 319 Apr 11 2018 dbclient.lst
lrwxrwxrwx 1 tenadm sapsys 19 Feb 13 13:25 instantclient -> instantclient_12201
-rwxr-xr-x 2 tenadm sapsys 4096 Apr 11 2018 instantclient_12201
-rwxr-xr-x 1 tenadm sapsys 82 Feb 13 13:24 LABEL.ASC
-rwxr-xr-x 1 tenadm sapsys 4931 Feb 13 13:24 SIGNATURE.SMF

multitenant:tenadm 51> env | grep client
LD_LIBRARY_PATH=/usr/sap/TEN/SYS/exe/run:/usr/sap/TEN/SYS/exe/uc/linuxx86_64:
/oracle/client/122/instantclient

multitenant:tenadm 70> genezi -v
Client Shared Library 64-bit - 12.2.0.1.0

System name:   Linux
Release:       3.10.0-327.13.1.el7.x86_64
Version:       #1 SMP Thu Mar 31 09:20:07 PDT 2016
Machine:       x86_64

Operating in Instant Client mode.

Small timezone file = /oracle/TEN/122/oracore/zoneinfo/timezone_26.dat
Large timezone file = /oracle/TEN/122/oracore/zoneinfo/timezlr_26.dat
multitenant:jenadm 51> env | grep client
LD_LIBRARY_PATH=/usr/sap/JEN/SYS/exe/run:/usr/sap/JEN/SYS/exe/uc/linuxx86_64:/oracle/client/122/instantclient

multitenant:jenadm 55> genezi -v
Client Shared Library 64-bit - 12.2.0.1.0

System name: Linux
Release: 3.10.0-327.13.1.el7.x86_64
Version: #1 SMP Thu Mar 31 09:20:07 PDT 2016
Machine: x86_64

Operating in Instant Client mode.

Small timezone file = /oracle/TEN/122/oracore/zoneinfo/timezone_26.dat
Large timezone file = /oracle/TEN/122/oracore/zoneinfo/timezlrg_26.dat

3.7. Download Oracle Software

Follow SAP note below:
2799900 - Central Technical Note for Oracle Database 19c
3.8. Install Oracle Database 19c Software step-by-step

3.8.1. PREPARE Installation

[oracle@multitenant SAP]$ pwd
installation/db_home/SAP
[oracle@multitenant SAP]$ setenv DB_SID TEN
[oracle@multitenant SAP]$ ./RUNINSTALLER -ohprepare

Oracle Database 19c Software Installation
Copyright (c) Oracle Corporation 2019. All Rights Reserved.
19cinstall.sh 19.0.0.0 (19-011) 2019-05-29 Production

Host : multitenant
Platform : linux_x86_64 (64-bit)
Date : 2019-07-09 10-13-46
User : oracle

INFO - TASK - Prepare Installation and Installation Checks
INFO - 2019-07-09 10-13-47

Performing Pre-Installation Checks ...

INFO - unzip 6.00 or later available.
INFO - There is enough free space in TEMP directory.
INFO - /oracle/TEN/orainstall has 37 GByte free.
INFO - Environment variable <DB_SID> is set to TEN
INFO - Got value for <DB_SID> from environment.
INFO - Got location for Oracle base from environment (ORACLE_BASE).
INFO - Environment variable DISPLAY is set.
INFO - Directory /oracle/TEN exists.
INFO - Oracle base location /oracle/TEN exists.
INFO - oratab file /etc/oratab exists.
INFO - Installation location /oracle/TEN/19.0.0 does not exist.
INFO - Runtime location /oracle/TEN/19 does not exist.
INFO - Inventory pointer file /etc/orainst.loc exists.
INFO - OS group dba is defined.
INFO - OS group oper is defined.
INFO - OS group oper is defined.
INFO - OS group dba is defined.
INFO - OS group dba is defined.
INFO - OS group dba is defined.

INFO - Pre-Installation Checks completed.

INFO - SAP RUNINSTALLER: you find the log file at /oracle/TEN/orainstall/19cinstall2019-07-09_10-13-46.log
INFO - Task completed with SUCCESS: Prepare Installation and Installation Checks
INFO - SAP RUNINSTALLER: Completed with SUCCESS.
INFO - SAP RUNINSTALLER: Exiting with exit code 0.
INFO - 2019-07-09 10-13-47
### 3.7.2 VERIFY Installation Settings

```bash
[oracle@multitenant SAP]$ ./RUNINSTALLER -ohverify

Oracle Database 19c Software Installation
Copyright (c) Oracle Corporation 2019. All Rights Reserved.
19cinstall.sh 19.0.0 (19-011) 2019-05-29 Production

Host : multitenant
Platform : linux_x86_64 (64-bit)
Date : 2019-07-09 10-20-06
User : oracle

(Task - TASK - Prepare Installation and Installation Checks)
(Task - 2019-07-09 10-20-06)

Performing Pre-Installation Checks ...

(OK) - unzip 6.00 or later available.
(OK) - There is enough free space in TEMP directory.
(OK) - /oracle/TEN/orainstall has 37 GByte free.
(OK) - Environment variable <DB_SID> is set to TEN
(OK) - Got value for <DB_SID> from environment.
(OK) - Got location for Oracle base from environment (ORACLE_BASE).
(OK) - Environment variable DISPLAY is set.
(OK) - Directory /oracle/TEN exists.
(OK) - Oracle base location /oracle/TEN exists.
(OK) - oratab file /etc/oratab exists.
(OK) - Installation location /oracle/TEN/19.0.0 does not exist.
(OK) - Runtime location /oracle/TEN/19 does not exist.
(OK) - Inventory pointer file /etc/orainst.loc exists.
(OK) - OS group dba is defined.
(OK) - OS group oper is defined.
(OK) - OS group oper is defined.
(OK) - OS group dba is defined.
(OK) - OS group dba is defined.
(OK) - OS group dba is defined.
(OK) - OS group oinstall is defined.
(OK) - New response file /oracle/TEN/orainstall/.19cinstall.rsp created.

Pre-Installation Checks completed.

(Task - TASK - Verify Installation Settings)
(Task - 2019-07-09 10-20-06)

Starting point:

- Started from DVD : yes
- Oracle home image file : /installation/db_home/LINUX.X64_193000_db_home.zip
- Checksum has been verified? : no
- Checksum is ok? : not set

Environment Variables:

- DB_SID : TEN
- DISPLAY : 0
- ORACLE_BASE : /oracle/TEN
- ORACLE_HOME : /oracle/TEN/18

Installation Task:

THE BEST RUN SAP
Preparing the Installation: yes
Verifying Install Settings: yes
Extracting Oracle Home: no
Checking Prerequisites: no
Registering Oracle Home: no
Configuring for SAP: no

Installation Status:
Oracle Home is extracted: no
Oracle Home is registered: no
OHRDBMS is configured for SAP: no
Oracle Home Version: not set
root.sh already executed?: no

Installation Settings:
Image file extraction: unzip <image file> (-xprogress)
UnZip tool path: /usr/bin/unzip
UnZip tool banner: UnZip 6.00 of 20 April 2009, by Info-ZIP. Maintained by C. Spieler. Send
Oracle Database Release: 19.0.0.0.0
ORACLE_BASE: /oracle/TEN
ORACLE_HOME IHRDBMS (install): /oracle/TEN/19.0.0
ORACLE_HOME OHRDBMS (runtime): /oracle/TEN/19
ORACLE_HOME_NAME: not specified
oratab: /etc/oratab
oratab new entry: TEN:/oracle/TEN/19:N

Oracle Home Administrative OS Groups:
Inventory group: oinstall
OSDBA group (SYSDBA): dba
OSOPER group (SYSOPER): oper
OSBACKUPDBA group (SYSBACKUP): oper
OSDDBA group (SYSDG): dba
OSKMDBA group (SYSKM): dba
OSRACDBA group (SYSRAC): dba

Oracle Database 19c Installer Settings:
Installer location: not set
Version (oraparam.ini): 0.0.0.0.0
Temporary directory: /oracle/TEN/orainstall/.19cinstall.tmp
Temporary error file: /oracle/TEN/orainstall/.19cinstall.tmp/sap_runinstaller.err
Available disk space: 37 GByte
Response file: /oracle/TEN/orainstall/.19cinstall.rsp
RSA Root Script Automation: -
Use response file: yes
Output log file: /oracle/TEN/orainstall/.19cinstall.oui
Options: waitForCompletion
invPtrLoc option: not set
inventory location: #INVENTORY_LOCATION=
Ignore prereq check warnings: FALSE (/)

Post Installation Settings:
Create symbolic link: yes
relative/absolute path: relative
OHRDBMS -> IHRDBMS /oracle/TEN/19 -> 19.0.0
Configure orabasetab : yes
Clean up temp. files : yes

Installation Log File Settings:

Installation Log Directory : /oracle/TEN/orainstall
Installation Log File : /oracle/TEN/orainstall/19cinstall2019-07-09_10-20-06.log
Installation Summary Log File: /oracle/TEN/orainstall/19cinstall.log

(INFO ) - SAP RUNINSTALLER: you find the log file at /oracle/TEN/orainstall/19cinstall2019-07-09_10-20-06.log
(INFO ) - Task completed with SUCCESS: Prepare Installation and Installation Checks
(INFO ) - Task completed with SUCCESS: Verify Installation Settings
(INFO ) - SAP RUNINSTALLER: Completed with SUCCESS.
(INFO ) - SAP RUNINSTALLER: Exiting with exit code 0.
(INFO ) - 2019-07-09 10-20-06
Oracle Database 19c Software Installation
Copyright (c) Oracle Corporation 2019. All Rights Reserved.
19cinstall.sh 19.0.0 (19-011) 2019-05-29 Production

Host : multitenant
Platform : linux_x86_64 (64-bit)
Date : 2019-07-09 10-24-55
User : oracle

Performing Pre-Installation Checks ...

- unzip 6.00 or later available.
- There is enough free space in TEMP directory.
- /oracle/TEN/orainstall has 37 GByte free.
- Environment variable <DB_SID> is set to TEN
- Got value for <DB_SID> from environment.
- Got location for Oracle base from environment (ORACLE_BASE).
- Environment variable DISPLAY is set.
- Directory /oracle/TEN exists.
- Oracle base location /oracle/TEN exists.
- oratab file /etc/oratab exists.
- Installation location /oracle/TEN/19.0.0 does not exist.
- Runtime location /oracle/TEN/19 does not exist.
- Inventory pointer file /etc/oraInst.loc exists.
- OS group dba is defined.
- OS group oper is defined.
- OS group dba is defined.
- OS group dba is defined.
- OS group dba is defined.
- OS group dba is defined.
- OS group oinstall is defined.

Pre-Installation Checks completed.

Starting point:

- Started from DVD : yes
- Oracle home image file : /installation/db_home/LINUX.X64_193000_db_home.zip
- Checksum has been verified? : no
- Checksum is ok? : not set

Environment Variables:

- DB_SID : TEN
- DISPLAY : 0
- ORACLE_BASE : /oracle/TEN
- ORACLE_HOME : /oracle/TEN/18

Installation Task:
Preparing the Installation: yes
Verifying Install Settings: yes
Extracting Oracle Home: yes
Checking Prerequisites: no
Registering Oracle Home: no
Configuring for SAP: no

Installation Status:
Oracle Home is extracted: no
Oracle Home is registered: no
OHRDBMS is configured for SAP: no
Oracle Home Version: not set
root.sh already executed?: no

Installation Settings:
Image file extraction: unzip <image file> (-xprogress)
UnZip tool path: /usr/bin/unzip
UnZip tool banner: UnZip 6.00 of 20 April 2009, by Info-ZIP. Maintained by C. Spieler. Send
Oracle Database Release: 19.0.0.0.0
ORACLE_BASE: /oracle/TEN
ORACLE_HOME IHRDBMS (install): /oracle/TEN/19.0.0
ORACLE_HOME OHRDBMS (runtime): /oracle/TEN/19
ORACLE_HOME_NAME: not specified
oratab: /etc/oratab
oratab new entry: TEN:/oracle/TEN/19:N

Oracle Home Administrative OS Groups:
Inventory group: oinstall
OSDBA group (SYSDBA): dba
OSOPER group (SYSOPER): oper
OSBACKUPDBA group (SYSBACKUP): oper
OSDGDBA group (SYSDG): dba
OSKMDBA group (SYSKM): dba
OSRACDBA group (SYSRAC): dba

Oracle Database 19c Installer Settings:
Installer location: not set
Version (oraparam.ini): 0.0.0.0.0
Temporary directory: /oracle/TEN/orainstall/.19cinstall.tmp
Temporary error file: /oracle/TEN/orainstall/.19cinstall.tmp/sap_runinstaller.err
Available disk space: 37 GByte
Response file: /oracle/TEN/orainstall/.19cinstall.rsp
RSA Root Script Automation: -
Use response file: yes
Output log file: /oracle/TEN/orainstall/.19cinstall.oui
Options: -waitForCompletion
InvPtrLoc option: not set
Inventory location: #INVENTORY_LOCATION=
Ignore prereq check warnings: FALSE (/)

Post Installation Settings:
Create symbolic link: yes
relative/absolute path: relative
Configure orabasetab: yes
Clean up temp. files: yes

Installation Log File Settings:

Installation Log Directory: /oracle/TEN/orainstall
Installation Log File: /oracle/TEN/orainstall/19cinstall2019-07-09_10-24-55.log
Installation Summary Log File: /oracle/TEN/orainstall/19cinstall.log

 INFO - TASK - Extract Oracle Home Image File (unzip)
 INFO - 2019-07-09 10:24:56
 INFO - Creating Oracle home directory /oracle/TEN/19.0.0
 INFO - Oracle home directory created.
 INFO - Oracle home directory is empty.
 INFO - Extracting Oracle home image file
 INFO - This step can take a while, please wait ...
 unizip /installation/db_home/LINUX.X64_193000_db_home.zip -d /oracle/TEN/19.0.0
2> /oracle/TEN/orainstall/.19cinstall.tmp/sap_runinstaller.err
 Number of files to extract: ~ 45000 (can vary, depending on platform)
 ........................................  4000 files extracted (  9 %)
 ........................................  8000 files extracted ( 18 %)
 ........................................ 12000 files extracted ( 27 %)
 ........................................ 16000 files extracted ( 36 %)
 ........................................ 20000 files extracted ( 44 %)
 ........................................ 24000 files extracted ( 53 %)
 ........................................ 28000 files extracted ( 62 %)
 ........................................ 32000 files extracted ( 71 %)
 ........................................ 36000 files extracted ( 80 %)
 ........................................ 40000 files extracted ( 89 %)
 ........................................ 41878 files extracted (100 %)
 INFO - Extracting Oracle home image file finished successfully.
 INFO - Copying SAP RUNINSTALLER into Oracle home directory /oracle/TEN/19.0.0
 INFO - Copying SAP RUNINSTALLER finished successfully.

 INFO - SAP RUNINSTALLER: you find the log file at /oracle/TEN/orainstall/19cinstall2019-07-09_10-24-55.log
 INFO - Task completed with SUCCESS: Prepare Installation and Installation Checks
 INFO - Task completed with SUCCESS: Verify Installation Settings
 INFO - Task completed with SUCCESS: Extract Oracle Home Image File (unzip)
 INFO - SAP RUNINSTALLER: Completed with SUCCESS.
 INFO - SAP RUNINSTALLER: Exiting with exit code 0.
 INFO - 2019-07-09 10:30:41
3.7.4.CHECK

[oracle@multitenant SAP]$ ./RUNINSTALLER -ohcheck

Oracle Database 19c Software Installation
Copyright (c) Oracle Corporation 2019. All Rights Reserved.
19cinstall.sh 19.0.0 (19-011) 2019-05-29 Production

Host : multitenant
Platform : linux_x86_64 (64-bit)
Date : 2019-07-09 10-35-37
User : oracle

(Task ) - TASK - Prepare Installation and Installation Checks
(Task ) - 2019-07-09 10-35-37

Performing Pre-Installation Checks ...

(OK ) - unzip 6.00 or later available.
(OK ) - There is enough free space in TEMP directory.
(OK ) - oracle/TEN/orainstall has 30 GByte free.
(OK ) - Environment variable <DB_SID> is set to TEN.
(OK ) - Got value for <DB_SID> from environment.
(OK ) - Got location for Oracle base from environment (ORACLE_BASE).
(OK ) - Environment variable DISPLAY is set.
(OK ) - Directory /oracle/TEN exists.
(OK ) - Oracle base location /oracle/TEN exists.
(OK ) - oratab file /etc/oratab exists.
(WARN ) - Installation location /oracle/TEN/19.0.0 already exists.
(WARN ) - Installation location /oracle/TEN/19.0.0 is not empty.
(OK ) - Runtime location /oracle/TEN/19 does not exist.
(OK ) - Inventory pointer file /etc/oraInst.loc exists.
(OK ) - OS group dba is defined.
(OK ) - OS group oper is defined.
(OK ) - OS group oper is defined.
(OK ) - OS group dba is defined.
(OK ) - OS group dba is defined.
(OK ) - OS group dba is defined.
(OK ) - OS group oinstall is defined.
(OK ) - Oracle home image file is already extracted.
(OK ) - Version of Oracle runInstaller is valid (12.2.0.7.0).
(OK ) - New response file /oracle/TEN/orainstall/.19cinstall.rsp created.

Pre-Installation Checks completed.

(Task ) - TASK - Verify Installation Settings
(Task ) - 2019-07-09 10-35-37

Starting point:

Started from DVD : yes
Oracle home image file : /installation/db_home/LINUX.X64_193000_db_home.zip
Checksum has been verified? : no
Checksum is ok? : not set
Oracle runInstaller location : /oracle/TEN/19.0.0/runInstaller

Environment Variables:

DB_SID : TEN
DISPLAY : 0
Installation Task:

- Preparing the Installation: yes
- Verifying Install Settings: yes
- Extracting Oracle Home: no
- Checking Prerequisites: yes
- Registering Oracle Home: no
- Configuring for SAP: no

Installation Status:

- Oracle Home is extracted: yes
- Oracle Home is registered: no
- OHRDBMS is configured for SAP: no

Oracle Home Version: 19.3.0.0.0 Release_Update
root.sh already executed?: no

Installation Settings:

- Image file extraction: unzip <image file> (-xprogress)
- UnZip tool path: /usr/bin/unzip
- UnZip tool banner: UnZip 6.00 of 20 April 2009, by Info-ZIP. Maintained by C. Spieler. Send
- Oracle Database Release: 19.0.0.0.0
- ORACLE_BASE: /oracle/TEN
- ORACLE_HOME IHRDBMS (install): /oracle/TEN/19.0.0
- ORACLE_HOME OHRDBMS (runtime): /oracle/TEN/19
- ORACLE_HOME_NAME: not specified
- oratab: /etc/oratab
- oratab new entry: TEN:/oracle/TEN/19:N

Oracle Home Administrative OS Groups:

- Inventory group: oinstall
- OSDBA group (SYSDBA): dba
- OSOPER group (SYSOPER): oper
- OSBACKUPUPDBA group (SYSSBACKUP): oper
- OSDGDBA group (SYSDG): dba
- OSMKMDBA group (SYSMK): dba
- OSRACDBA group (SYSSRAC): dba

Oracle Database 19c Installer Settings:

- Installer location: /oracle/TEN/19.0.0/runInstaller
- Version (oraparam.ini): 12.2.0.7.0
- Temporary directory: /oracle/TEN/orainstall/.19cinstall.tmp
- Temporary error file: /oracle/TEN/orainstall/.19cinstall.tmp/sap_runinstaller.err
- Available disk space: 30 GByte
- Response file: /oracle/TEN/orainstall/.19cinstall.rsp
- RSA Root Script Automation: -
- Use response file: yes
- Output log file: /oracle/TEN/orainstall/.19cinstall.oui
- Options: -waitForCompletion
- invPtrLoc option: not set
- inventory location: #INVENTORY_LOCATION=
- Ignore prereq check warnings: FALSE ( / )
Post Installation Settings:

- Create symbolic link: yes
- relative/absolute path: relative
- ORHDBMS -> IHRDBMS /oracle/TEN/19 -> 19.0.0
- Configure orabasetab: yes
- Clean up temp. files: yes

Installation Log File Settings:

- Installation Log Directory: /oracle/TEN/orainstall
- Installation Summary Log File: /oracle/TEN/orainstall/19cinstall.log

(task not selected)

Starting Oracle Database 19c Installer ...
Starting Oracle Database Setup Wizard...
Oracle Database 19c Installer finished.
Oracle Database 19c Installer (runInstaller) finished with return code 6.

Oracle Database 19c Installer (runInstaller) finished with warnings or errors. Check log file for more information and search for term 'VERIFICATION_FAILED'.

SAP RUNINSTALLER: you find the log file at /oracle/TEN/orainstall/19cinstall2019-07-09_10-35-37.log
Task completed with WARNING(S): Prepare Installation and Installation Checks
Task completed with SUCCESS: Verify Installation Settings
(INFO) - Task completed with WARNING(S): Check Installation Prerequisites (runInstaller)
(INFO) - SAP RUNINSTALLER: Completed with SUCCESS.
(INFO) - SAP RUNINSTALLER: Exiting with exit code 0.
(INFO) - 2019-07-09 10-50-36
3.7.5.REGISTER

[oracle@multitenant SAP]$ ./RUNINSTALLER -ohregister

. Oracle Database 19c Software Installation
. Copyright (c) Oracle Corporation 2019. All Rights Reserved.
. 19cinstall.sh 19.0.0 (19-011) 2019-05-29 Production

. Host : multitenant
. Platform : linux_x86_64 (64-bit)
. Date : 2019-07-09 10-51-30
. User : oracle

. (INFO ) - TASK - Prepare Installation and Installation Checks
. (INFO ) - 2019-07-09 10-51-30

. Performing Pre-Installation Checks ...

. (OK ) - unzip 6.00 or later available.
. (OK ) - There is enough free space in TEMP directory.
. (OK ) - /oracle/TEN/orainstall has 30 GByte free.
. (OK ) - Environment variable <DB_SID> is set to TEN
. (OK ) - Got value for <DB_SID> from environment.
. (OK ) - Got location for Oracle base from environment (ORACLE_BASE).
. (OK ) - Environment variable DISPLAY is set.
. (OK ) - Directory /oracle/TEN exists.
. (OK ) - Oracle base location /oracle/TEN exists.
. (OK ) - oratab file /etc/oratab exists.
. (WARN ) - Installation location /oracle/TEN/19.0.0 already exists.
. (WARN ) - Installation location /oracle/TEN/19.0.0 is not empty.
. (OK ) - Runtime location /oracle/TEN/19 does not exist.
. (OK ) - Inventory pointer file /etc/oraInst.loc exists.
. (OK ) - OS group dba is defined.
. (OK ) - OS group oper is defined.
. (OK ) - OS group oper is defined.
. (OK ) - OS group dba is defined.
. (OK ) - OS group dba is defined.
. (OK ) - OS group dba is defined.
. (OK ) - OS group dba is defined.
. (OK ) - Oracle home image file is already extracted.
. (OK ) - Version of Oracle runInstaller is valid (12.2.0.7.0).
. (OK ) - New response file /oracle/TEN/orainstall/.19cinstall.rsp created.

. Pre-Installation Checks completed.

. (INFO ) - TASK - Verify Installation Settings
. (INFO ) - 2019-07-09 10-51-30

. Starting point:

. Started from DVD : yes
. Oracle home image file : /installation/db_home/LINUX.X64_193000_db_home.zip
. Checksum has been verified? : no
. Checksum is ok? : not set
. Oracle runInstaller location : /oracle/TEN/19.0.0/runInstaller

. Environment Variables:

. DB_SID : TEN
. DISPLAY : 0
ORACLE_BASE : /oracle/TEN
ORACLE_HOME : /oracle/TEN/18

Installation Task:

Preparing the Installation : yes
Verifying Install Settings : yes
Extracting Oracle Home : no
Checking Prerequisites : no
Registering Oracle Home : yes
Configuring for SAP : no

Installation Status:

Oracle Home is extracted : yes
Oracle Home is registered : no
OHRDBMS is configured for SAP : no

Oracle Home Version : 19.3.0.0.0 Release_Update
root.sh already executed? : no

Installation Settings:

Image file extraction : unzip <image file> (-xprogress)
UnZip tool path : /usr/bin/unzip
UnZip tool banner : UnZip 6.00 of 20 April 2009, by Info-ZIP. Maintained by C. Spieler. Send
Oracle Database Release : 19.0.0.0.0
ORACLE_BASE : /oracle/TEN
ORACLE_HOME IHRDBMS (install) : /oracle/TEN/19.0.0
ORACLE_HOME OHRDBMS (runtime) : /oracle/TEN/19
ORACLE_HOME_NAME : not specified
oratab : /etc/oratab
oratab new entry : TEN:/oracle/TEN/19:N

Oracle Home Administrative OS Groups:

Inventory group : oinstall
OSDBA group (SYSDBA) : dba
OSOPER group (SYSOPER) : oper
OSBACKUPDBA group (SYSSBACKUP) : oper
OSDGDBA group (SYSDG) : dba
OSKMDBA group (SYSKM) : dba
OSRACDBA group (SYSRAC) : dba

Oracle Database 19c Installer Settings:

Installer location : /oracle/TEN/19.0.0/runInstaller
Version (oraparam.ini) : 12.2.0.7.0
Temporary directory : /oracle/TEN/orainstall/.19cinstall.tmp
Temporary error file : /oracle/TEN/orainstall/.19cinstall.tmp/sap_runinstaller.err
Available disk space: 30 GByte
Response file : /oracle/TEN/orainstall/.19cinstall.rsp
RSA Root Script Automation : -
Use response file : yes
Output log file : /oracle/TEN/orainstall/.19cinstall.oui
Options : -waitForCompletion
invPtrLoc option : not set
inventory location : #INVENTORY_LOCATION=
Ignore prereq check warnings : FALSE (/ )
Post Installation Settings:

- Create symbolic link: yes
- relative/absolute path: relative
- OHRDBMS -> IHRDBMS /oracle/TEN/19 -> 19.0.0
- Configure orabasetab: yes
- Clean up temp. files: yes

Installation Log File Settings:

- Installation Log Directory: /oracle/TEN/orainstall
- Installation Summary Log File: /oracle/TEN/orainstall/19cinstall.log

INFO TASK - Extract Oracle Home Image File (unzip) - task not selected
INFO TASK - Check Installation Prerequisites (runInstaller) - task not selected
INFO TASK - Register Oracle Home (runInstaller) - 2019-07-09 10-51-30
Oracle Database 19c Installer command line:

INFO Starting Oracle Database 19c Installer (runInstaller) in interactive mode - please wait ...
INFOOracle Database 19c Installer started ...
INFO Launching Oracle Database Setup Wizard...

The Best Run SAP
NOTE: Make sure the missing or updated packages gets installed/updated!
In this test system this prerequisite got ignored due to different reasons.
Performing root user operation.

The following environment variables are set as:

- `ORACLE_OWNER= oracle`
- `ORACLE_HOME= /oracle/TEN/19.0.0`

Enter the full pathname of the local bin directory: `/usr/local/bin`:

The contents of "dbhome" have not changed. No need to overwrite.
The contents of "oraenv" have not changed. No need to overwrite.
The contents of "coraenv" have not changed. No need to overwrite.

Entries will be added to the /etc/oratab file as needed by
Database Configuration Assistant when a database is created
Finished running generic part of root script.
Now product-specific root actions will be performed.
Oracle Trace File Analyzer (TFA - Standalone Mode) is available at:
/oel/oracle/TEN/19.0.0/bin/tfactl

Note:
1. tfactl will use TFA Service if that service is running and user has been granted access
2. tfactl will configure TFA Standalone Mode only if user has no access to TFA Service or TFA is not installed
The response file for this session can be found at:
/oracle/TEN/19.0.0/install/response/db_2019-07-09_10-51-31AM.rsp

You can find the log of this install session at:

. (INFO ) - ###############################################
. (INFO ) - Oracle Database 19c Installer finished.
. (INFO ) - ###############################################
. (INFO ) - Oracle Database 19c Installer (runInstaller) finished.
. (INFO ) - OUI install session log file is /oracle/oraInventory/logs/InstallActions2019-07-09_10-51-31AM/installActions2019-07-09_10-51-31AM.log
. (INFO ) - Oracle Database 19c Installer (runInstaller) finished with exit code '6'
. (INFO ) - Installation was successful: /oracle/TEN/19.0.0/bin/oracle > 0
. (INFO ) - /oracle/TEN/19.0.0/root.sh was executed.
. (INFO ) - Registration of Oracle Home finished successfully.

. (INFO ) - Oracle Database 19c Installer: you find the log file at
. (INFO ) - SAP RUNINSTALLER: you find the log file at /oracle/TEN/orainstall/19cinstall2019-07-09_10-51-30.log
. (INFO ) - Task completed with WARNING(S): Prepare Installation and Installation Checks
. (INFO ) - Task completed with SUCCESS: Verify Installation Settings
. (INFO ) - Task completed with SUCCESS: Register Oracle Home (runInstaller)
. (INFO ) - SAP RUNINSTALLER: Completed with SUCCESS.
. (INFO ) - SAP RUNINSTALLER: Exiting with exit code 0.
. (INFO ) - 2019-07-09 11-27-26
[oracle@multitenant SAP]$ ./RUNINSTALLER -ohsapcfg

Oracle Database 19c Software Installation
Copyright (c) Oracle Corporation 2019. All Rights Reserved.
19cinstall.sh 19.0.0 (19-011) 2019-05-29 Production

Host : multitenant
Platform : linux_x86_64 (64-bit)
Date : 2019-07-09 11-28-25
User : oracle

INFO ) - TASK - Prepare Installation and Installation Checks
INFO ) - 2019-07-09 11-28-25

Performing Pre-Installation Checks ...

INFO ) - unzip 6.00 or later available.
INFO ) - There is enough free space in TEMP directory.
INFO ) - /oracle/TEN/orainstall has 30 GByte free.
INFO ) - Environment variable <DB_SID> is set to TEN
INFO ) - Got value for <DB_SID> from environment.
INFO ) - Got location for Oracle base from environment (ORACLE_BASE).
INFO ) - Environmen

WARN ) - Installation location /oracle/TEN/19.0.0 already exists.
WARN ) - Installation location /oracle/TEN/19.0.0 is not empty.
INFO ) - Runtime location /oracle/TEN/19 does not exist.
INFO ) - Inventory pointer file /etc/oraInst.loc exists.
INFO ) - OS group dba is defined.
INFO ) - OS group oper is defined.
INFO ) - OS group oper is defined.
INFO ) - OS group dba is defined.
INFO ) - OS group dba is defined.
INFO ) - OS group dba is defined.
INFO ) - OS group oinstall is defined.
INFO ) - Oracle home image file is already extracted.
INFO ) - Version of Oracle runInstaller is valid (12.2.0.7.0).
INFO ) - Oracle home is already registered.
INFO ) - New response file /oracle/TEN/orainstall/.19cinstall.rsp created.

Pre-Installation Checks completed.

INFO ) - TASK - Verify Installation Settings
INFO ) - 2019-07-09 11-28-26

Starting point:

INFO ) - Started from DVD : yes
INFO ) - Oracle home image file : /installation/db_home/LINUX.X64_193000_db_home.zip
INFO ) - Checksum has been verified? : no
INFO ) - Checksum is ok? : not set
INFO ) - Oracle runInstaller location : /oracle/TEN/19.0.0/runInstaller

Environment Variables:

INFO ) - DB_SID : TEN
Installation Task:

- Preparing the Installation: yes
- Verifying Install Settings: yes
- Extracting Oracle Home: no
- Checking Prerequisites: no
- Registering Oracle Home: no
- Configuring for SAP: yes

Installation Status:

- Oracle Home is extracted: yes
- Oracle Home is registered: yes
- OHRDBMS is configured for SAP: no

Oracle Home Version: 19.3.0.0.0 Release_Update
root.sh already executed?: yes

Installation Settings:

- Image file extraction: unzip <image file> (-xprogress)
- UnZip tool path: /usr/bin/unzip
- UnZip tool banner: UnZip 6.00 of 20 April 2009, by Info-ZIP. Maintained by C. Spieler. Send
- Oracle Database Release: 19.0.0.0.0
- ORACLE_BASE: /oracle/TEN
- ORACLE_HOME IHRDBMS (install): /oracle/TEN/19.0.0
- ORACLE_HOME OHRDBMS (runtime): /oracle/TEN/19
- ORACLE_HOME_NAME: not specified
- oratab: /etc/oratab
- oratab new entry: TEN:/oracle/TEN/19:N

Oracle Home Administrative OS Groups:

- Inventory group: oinstall
- OSDBA group (SYSDBA): dba
- OSOPER group (SYSPROC): oper
- OSBACKUPDBA group (SYSPDUMP): oper
- OSDGDBA group (SYSGA): dba
- OSKMDBA group (SYSSYS): dba
- OSRACDBA group (SYSSYS): dba

Oracle Database 19c Installer Settings:

- Installer location: /oracle/TEN/19.0.0/runInstaller
- Version (oraparam.ini): 12.2.0.7.0
- Temporary directory: /oracle/TEN/orainstall/.19install.tmp
- Temporary error file: /oracle/TEN/orainstall/.19install.tmp/sap_runinstaller.err
- Available disk space: 30 GByte
- Response file: /oracle/TEN/orainstall/.19install.rsp
- RSA Root Script Automation: -
- Use response file: yes
- Output log file: /oracle/TEN/orainstall/.19install.oui
- Options: -waitForCompletion
- invPtrLoc option: not set
- inventory location: #INVENTORY_LOCATION=
- Ignore prereq check warnings: FALSE ( / )
Post Installation Settings:

Create symbolic link : yes
relative/absolute path : relative
OHRDBMS -> IHRDBMS : /oracle/TEN/19 -> 19.0.0
Configure orabasetab : yes
Clean up temp. files : yes

Installation Log File Settings:

Installation Log Directory : /oracle/TEN/orainstall
Installation Summary Log File: /oracle/TEN/orainstall/19cinstall.log

Performing post-installation tasks ...

Symbolic link /oracle/TEN/19 -> 19.0.0 successfully created.
ora$btab: entry for database TEN added to /etc/oratab.
orabasetab: added new entry /oracle/TEN/19:/oracle/TEN:OraDB19Home1:N:
orabasetab: file /oracle/TEN/19.0.0/install/orabasetab modified successfully.
Checking file permissions of Oracle base and Oracle home...
oracle/TEN (ORACLE_BASE): owned by oracle:oinstall
/oracle/TEN/19.0.0 (ORACLE_HOME): owned by oracle:oinstall
Next step: Install SAP Bundle Patch (SBP) into the new installed Oracle home.
Post-installation steps finished successfully.
Post-installation tasks completed.

SAP RUNINSTALLER: you find the log file at /oracle/TEN/orainstall/19cinstall2019-07-09_11-28-25.log
Task completed with WARNING(S): Prepare Installation and Installation Checks
Task completed with SUCCESS: Verify Installation Settings
Task completed with SUCCESS: Configure Runtime Oracle Home for SAP
SAP RUNINSTALLER: Completed with WARNING(S).
SAP RUNINSTALLER: Exiting with exit code 1.
2019-07-09 11-28-26

3.8. Install Patches on 19c Oracle Software

For more information, see SBP README.

Check if TFA process is running, with below command:
[root@multitenant bin]# /oracle/TEN/19/bin/tfactl status
WARNING - TFA Software is older than 180 days. Please consider upgrading TFA to the latest version.
TFA-00002 Oracle Trace File Analyzer (TFA) is not running

In case of active TFA (Trace File Analyzer) process, stop it.
[root@multitenant bin]# /oracle/TEN/19/bin/tfactl stop
3.9. Create Oracle Upgrade Working Directory

[oracle@multitenant SAP]$ id;pwd
uid=1003(oracle) gid=1005(install)
groups=1005(install),1003(dba),1004(oper),1006(asmoper),1007(asmadmin),1008(asmdba)
/installation/db_home/SAP

[oracle@multitenant ~]$ setenv SAPDATA_HOME /oracle/TEN

[oracle@multitenant ~]$ setenv ORA_UPGRADE_WORK_DIR $SAPDATA_HOME/oraupgrade.19c

[oracle@multitenant ~]$ echo ORA_UPGRADE_WORK_DIR=$ORA_UPGRADE_WORK_DIR
ORA_UPGRADE_WORK_DIR=/oracle/TEN/oraupgrade.19c

[oracle@multitenant ~]$ mkdir -p $ORA_UPGRADE_WORK_DIR

[oracle@multitenant ~]$ cd $ORA_UPGRADE_WORK_DIR

[oracle@multitenant oraupgrade.19c]$ pwd
/oracle/TEN/oraupgrade.19c

3.10. Run Pre-Upgrade Information Tool

[oracle@multitenant oraupgrade.19c]$ sqlplus

SQL*Plus: Release 18.0.0.0.0 - Production on Tue Jul 9 15:30:07 2019
Version 18.5.0.0.0
Copyright (c) 1982, 2018, Oracle.  All rights reserved.

Enter user-name: /as sysdba
Connected to an idle instance.

SQL> startup
ORACLE instance started.
Total System Global Area 2667576200 bytes
Fixed Size 8899464 bytes
Variable Size 1912602624 bytes
Database Buffers 738197504 bytes
Redo Buffers 7876608 bytes
Database mounted.

Database opened.
SQL> alter pluggable database all open;
Pluggable database altered.

SQL> show pdbs;

<table>
<thead>
<tr>
<th>CON_ID</th>
<th>CON_NAME</th>
<th>OPEN MODE</th>
<th>RESTRICTED</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>PDB$SEED</td>
<td>READ ONLY</td>
<td>NO</td>
</tr>
<tr>
<td>3</td>
<td>PEN</td>
<td>READ WRITE</td>
<td>NO</td>
</tr>
<tr>
<td>4</td>
<td>JEN</td>
<td>READ WRITE</td>
<td>NO</td>
</tr>
</tbody>
</table>

[oracle@multitenant pre_upgrade_utility]$ pwd
/oracle/TEN/19.0.0/sap/ora_upgrade/pre_upgrade_utility
$ORACLE_HOME/jdk/bin/java -jar /oracle/TEN/19/sap/ora_upgrade/pre_upgrade_utility/preupgrade.jar DIR

==================
PREUPGRADE SUMMARY
==================
/oracle/TEN/oraupgrade.19c/preupgrade.log
/oracle/TEN/oraupgrade.19c/preupgrade_fixups.sql
/oracle/TEN/oraupgrade.19c/postupgrade_fixups.sql

Execute fixup scripts across the entire CDB:

Before upgrade:

1. Execute preupgrade fixups with the below command
   $ORACLE_HOME/perl/bin/perl -I$ORACLE_HOME/perl/lib -I$ORACLE_HOME/rdbms/admin $ORACLE_HOME/rdbms/admin/catcon.pl -l /oracle/TEN/oraupgrade.19c/ -b preup_TEN /oracle/TEN/oraupgrade.19c/preupgrade_fixups.sql

2. Review logs under /oracle/TEN/oraupgrade.19c/

After the upgrade:

1. Execute postupgrade fixups with the below command
   $ORACLE_HOME/perl/bin/perl -I$ORACLE_HOME/perl/lib -I$ORACLE_HOME/rdbms/admin $ORACLE_HOME/rdbms/admin/catcon.pl -l /oracle/TEN/oraupgrade.19c/ -b postup_TEN /oracle/TEN/oraupgrade.19c/postupgrade_fixups.sql

2. Review logs under /oracle/TEN/oraupgrade.19c/

Preupgrade complete: 2019-07-17T12:28:42

3.11. Set Environment ORACLE_PATH

[oracle@multitenant pre_upgrade_utility]$ setenv ORACLE_HOME_NEW /oracle/TEN/19
[oracle@multitenant ]$ setenv ORACLE_PATH $ORACLE_HOME_NEW/sap/ora_upgrade/pre_upgrade:$ORACLE_HOME_NEW/sap/ora_upgrade/post_upgrade

[oracle@multitenant post_upgrade]$ echo $ORACLE_PATH
/oracle/TEN/19/sap/ora_upgrade/pre_upgrade:/oracle/TEN/19/sap/ora_upgrade/post_upgrade
[oracle@multitenant post_upgrade]$ echo $ORACLE_HOME_NEW
/oracle/TEN/19


May not be necessary, as this will be executed in the next point 3.13!!

multitenant:tenadm 52> brconnect -u // -c -f stats -t oradict_stats
3.13. Run SAP-Specific Pre-Upgrade Scripts

[oracle@multitenant /]$ cd $ORA_UPGRADE_WORK_DIR/
[oracle@multitenant oraupgrade.19c]$ sqlplus / as sysdba

SQL*Plus: Release 18.0.0.0.0 - Production on Wed Jul 17 13:02:17 2019
Version 18.5.0.0.0

Copyright (c) 1982, 2018, Oracle. All rights reserved.

Enter user-name: /as sysdba
\Connected to:
Oracle Database 18c Enterprise Edition Release 18.0.0.0.0 - Production
Version 18.5.0.0.0
SQL> spool pre_upgrade_tasks.log

SQL> @pre_upgrade_tasks.sql

===========================================================================
ORACLE DATABASE 19C PRE-UPGRADE TASK: START
===========================================================================

Date Time
-------- --------
2019-07-17 12:37:05

===========================================================================
ORACLE DATABASE 19C PRE-UPGRADE TASK: GATHERING ORACLE DICTIONARY STATISTICS
===========================================================================

SQL> EXECUTE dbms_stats.gather_dictionary_stats;

PL/SQL procedure successfully completed.

SQL> SET ECHO OFF

===========================================================================
ORACLE DATABASE 19C PRE-UPGRADE TASK: RECOMPILING INVALID OBJECTS
===========================================================================

Session altered.

TIMESTAMP
---------
COMP_TIMESTAMP UTLRP_BGN 2019-07-17 12:47:32

DOC> The following PL/SQL block invokes UTL_RECOMP to recompile invalid
DOC> objects in the database. Recompilation time is proportional to the
DOC> number of invalid objects in the database, so this command may take
DOC> a long time to execute on a database with a large number of invalid
DOC> objects.
DOC> Use the following queries to track recompilation progress:
DOC> 1. Query returning the number of invalid objects remaining. This
DOC> number should decrease with time.
DOC> SELECT COUNT(*) FROM obj$ WHERE status IN (4, 5, 6);
DOC> 2. Query returning the number of objects compiled so far. This number
should increase with time.

This script automatically chooses serial or parallel recompilation based on the number of CPUs available (parameter cpu_count) multiplied by the number of threads per CPU (parameter parallel_threads_per_cpu). On RAC, this number is added across all RAC nodes.

UTL_RECOMP uses DBMS_SCHEDULER to create jobs for parallel recompilation. Jobs are created without instance affinity so that they can migrate across RAC nodes. Use the following queries to verify whether UTL_RECOMP jobs are being created and run correctly:

1. Query showing jobs created by UTL_RECOMP
   ```sql
   SELECT job_name FROM dba_scheduler_jobs
   WHERE job_name like 'UTL_RECOMP_SLAVE_%';
   ```

2. Query showing UTL_RECOMP jobs that are running
   ```sql
   SELECT job_name FROM dba_scheduler_running_jobs
   WHERE job_name like 'UTL_RECOMP_SLAVE_%';
   ```

The following query reports the number of invalid objects.

If the number is higher than expected, please examine the error messages reported with each object (using SHOW ERRORS) to see if they point to system misconfiguration or resource constraints that must be fixed before attempting to recompile these objects.

The following query reports the number of exceptions caught during recompilation. If this number is non-zero, please query the error messages in the table UTL_RECOMP_ERRORS to see if any of these errors are due to misconfiguration or resource constraints that must be fixed before objects can compile successfully. Note: Typical compilation errors (due to coding errors) are not logged into this table: they go into DBA_ERRORS instead.

Function created.
Function dropped.

PL/SQL procedure successfully completed.

-------------------------------------------------------------------
ORACLE DATABASE 19C PRE-UPGRADE TASK: PURGING DATABASE RECYCLEBIN
-------------------------------------------------------------------
SQL> PURGE DBA_RECYCLEBIN;

DBA Recyclebin purged.

SQL> SET ECHO OFF

-------------------------------------------------------------------
ORACLE DATABASE 19C PRE-UPGRADE TASK: FINISHED
-------------------------------------------------------------------

Date    Time
-------  -------
2019-07-17 12:48:20

SQL> spool off
SQL> spool pre_upgrade_checks.log
SQL> @pre_upgrade_checks.sql

********************************************************************************
Oracle Database Pre-Upgrade Information Utility for SAP
********************************************************************************

Date                   : 2019-07-17 12:56:15
Script Version         : 19c
Script Revision        : 19-002
Script Date            : 2019-05-27
Supported Releases     : 11.2.0.4, 12.1.0.2, 12.2.0.1, 18c

********************************************************************************

Database Information
********************************************************************************

--> Host Name         : multitenant
--> Host Platform     : Linux x86 64-bit (Platform ID: 13)
--> Platform type     : Unix
--> Instance Name (Status) : TEN (OPEN)
--> Database Name     : TEN
--> Database Version  : 18.0.0.0.0

--> Database Configuration
--> Database Character Set : UTF8
--> National Character Set : UTF8
--> Database Log Mode   : ARCHIVELOG
--> Database Flashback Mode : NO
--> AWR Retention      : 8

--> Database Parameter
--> COMPATIBLE        : 18.0.0
--> REMOTE_OS_AUTHENT : FALSE

--> Database Timezone
--> Timezone File Version : V31
--> Database Timezone   : +02:00
---> Session Timezone : +02:00

---> Oracle RAC System : FALSE
---> Oracle DV System : FALSE
---> SAP BW/DW/BI System : FALSE
---> SAP Unicode System : TRUE
---> SAP ABAP Stack/Java Stack : FALSE/TRUE

---> Database Security Configuration
---> User Profile SAPUPROF : FALSE
---> DEFAULT.FAILED_LOGIN_ATTEMPTS: 10
---> DEFAULT.PASSWORD_LIFE_TIME : 180

---> Database Key Values
---> Current max(dba_objects.object_id): 70706 (0 %)
---> Current max(obj$.dataobj#) : 70711 (0 %)

---> Fast Recovery Area (FRA) Configuration
---> FRA Destination : /oracle/TEN/oraflash
---> FRA Size : 30000 M
---> FRA Space Limit : 30000 M
---> FRA Space Used : 40 M / .13 %

Database Restore Points
**********************************************************************
There are no restore points defined.

Database Components
**********************************************************************
The following database components are installed:

<table>
<thead>
<tr>
<th>Component ID</th>
<th>Version</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>CATALOG</td>
<td>18.0.0.0.0</td>
<td>VALID</td>
</tr>
<tr>
<td>CATPROC</td>
<td>18.0.0.0.0</td>
<td>VALID</td>
</tr>
<tr>
<td>XDB</td>
<td>18.0.0.0.0</td>
<td>VALID</td>
</tr>
<tr>
<td>RAC</td>
<td>18.0.0.0.0</td>
<td>OPTION OFF</td>
</tr>
</tbody>
</table>

Underscore (hidden) parameters
**********************************************************************
The following underscore parameters are set:

_use_single_log_writer
_securefiles_concurrency_estimate
_spacebg_sync_segblocks
_suppress_identifiers_on_dupkey
_mutex_wait_time
_mutex_wait_scheme
_kolfuseslf
_fix_control
_optimizer_extended_cursor_sharing_rel
_optimizer_adaptive_cursor_sharing
_optim.peek_user_binds
_optimizer.use_feedback
The following events are set:

10027
10028
10142
10183
10191
10995 level 2
38068 level 100
38085
38087
44951 level 1024
60025

The following trace events are set:

Database Maintenance Jobs

<table>
<thead>
<tr>
<th>JOB_NAME</th>
<th>Owner</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>MGMT_CONFIG_JOB</td>
<td>ORACLE_OCM</td>
<td>FALSE</td>
</tr>
<tr>
<td>MGMT_STATS_CONFIG_JOB</td>
<td>ORACLE_OCM</td>
<td>FALSE</td>
</tr>
<tr>
<td>FGRSAUTOPURGE_JOB</td>
<td>SYS</td>
<td>FALSE</td>
</tr>
<tr>
<td>HM_CREATE_OFFLINE_DICTIONARY</td>
<td>SYS</td>
<td>FALSE</td>
</tr>
<tr>
<td>LOAD_OPATCH_INVENTORY</td>
<td>SYS</td>
<td>FALSE</td>
</tr>
<tr>
<td>ORA$PREPLUGIN_BACKUP_JOB</td>
<td>SYS</td>
<td>FALSE</td>
</tr>
<tr>
<td>XMLDB_NFS_CLEANUP_JOB</td>
<td>SYS</td>
<td>FALSE</td>
</tr>
<tr>
<td>BSLN_MAINTAIN_STATS_JOB</td>
<td>SYS</td>
<td>TRUE</td>
</tr>
<tr>
<td>CLEANUP_NON_EXIST_OBJ</td>
<td>SYS</td>
<td>TRUE</td>
</tr>
<tr>
<td>CLEANUP_ONLINE_IND_BUILD</td>
<td>SYS</td>
<td>TRUE</td>
</tr>
<tr>
<td>CLEANUP_ONLINE_PMO</td>
<td>SYS</td>
<td>TRUE</td>
</tr>
<tr>
<td>CLEANUP_TAB_IOT_PMO</td>
<td>SYS</td>
<td>TRUE</td>
</tr>
<tr>
<td>CLEANUP_TRANSIENT_PKG</td>
<td>SYS</td>
<td>TRUE</td>
</tr>
<tr>
<td>CLEANUP_TRANSIENT_TYPE</td>
<td>SYS</td>
<td>TRUE</td>
</tr>
<tr>
<td>DRA_REEVALUATE_OPEN_FAILURES</td>
<td>SYS</td>
<td>TRUE</td>
</tr>
<tr>
<td>FILE_SIZE_UPD</td>
<td>SYS</td>
<td>TRUE</td>
</tr>
<tr>
<td>ORA$AUTOTASK_CLEAN</td>
<td>SYS</td>
<td>TRUE</td>
</tr>
<tr>
<td>PMO_DEFERRED_GIDX_MAINT_JOB</td>
<td>SYS</td>
<td>TRUE</td>
</tr>
<tr>
<td>PURGE_LOG</td>
<td>SYS</td>
<td>TRUE</td>
</tr>
<tr>
<td>RSE$CLEAN_RECOVERABLE_SCRIPT</td>
<td>SYS</td>
<td>TRUE</td>
</tr>
<tr>
<td>SM$CLEAN_AUTO_SPLIT_MERGE</td>
<td>SYS</td>
<td>TRUE</td>
</tr>
</tbody>
</table>

Invalid Objects

Number of invalid objects based on SYS.DBA_OBJECTS
Number of invalid objects (SYS): 0
Number of invalid objects (SAP): 0
Number of invalid objects (all): 0

No invalid objects found.

*********************************************************************
*                                                                 
Generic Pre-Upgrade Warnings                                       
*********************************************************************

*********************************************************************
SAP-Specific Pre-Upgrade Warnings                                 
*********************************************************************

WARNING: ----> NO_SAPCONN_ROLE
THE FOLLOWING WARNING APPLIES TO NON-CDBs AND PDBs ONLY.
Database role SAPCONN is not defined.
Run sapconn_role.sql to create this database role.
For more information see SAP Note 834917.

WARNING: ----> NO_SAPDBA_ROLE
THE FOLLOWING WARNING APPLIES TO NON-CDBs AND PDBs ONLY.
Database role SAPDBA is not defined.
Run sapdba_role.sql to create this database role.
For more information see SAP Note 134592.

WARNING: ----> NO_SAPUPROF_PROFILE
THE FOLLOWING WARNING APPLIES TO NON-CDBs AND PDBs ONLY.
User profile SAPUPROF is not configured.
For more information see SAP Note 1519872.

WARNING: ----> WRONG_AWR_RETENTION
The retention time for the Automatic Workload Repository (AWR)
is not configured as recommended.
Current AWR retention is set to 8 days.
Recommended AWR retention is 42 days or longer.
See SAP Note 1326067.

*********************************************************************
FINISHED - Oracle Database Pre-Upgrade Information Utility for SAP
*********************************************************************

PL/SQL procedure successfully completed.

SQL> spool off
3.14. Run Database Object ID checker

[oracle@multitenant ]$ cd $ORA_UPGRADE_WORK_DIR/
[oracle@multitenant oraupgrade.19c]$ sqlplus / as sysdba

SQL*Plus: Release 18.0.0.0.0 - Production on Wed Jul 17 13:02:17 2019
Version 18.5.0.0.0

Copyright (c) 1982, 2018, Oracle. All rights reserved.

Enter user-name: /as sysdba

\ Connected to:
Oracle Database 18c Enterprise Edition Release 18.0.0.0.0 - Production
Version 18.5.0.0.0
SQL> spool objidchk.log
SQL> @objidchk.sql

*******************************************************************
*** Oracle Database Object ID Checker for SAP  ***
*******************************************************************

DATABASE NAME : TEN
DATABASE CREATION TIME : 2017-JUN-23 07:52:17
DATABASE AGE : 2 years 24 days

DATAOBJ# (current max.) : 70711
OBJECT ID (current max.) : 70706
OBJECT ID (system limit) : 4254950911
OBJECT ID (check limit ) : 3221225472

Checking whether object id is above critical value of 3221225472

*******************************************************************
*** OK  ***
*******************************************************************

Object ID numbers are not critical.

For further information see SAP Note 2137109

PL/SQL procedure successfully completed.

SQL> spool off

3.15. Run PUBLIC Role Check

Follow SAP note below:
2553347 - Oracle Database Role PUBLIC
3.16. Drop SAP DBACockpit Database Views

[oracle@multitenant oraupgrade.19c]$ cd
/installation/db_home/ora.sap.19.1.0/ora.patches.other_scripts/706927/
[oracle@multitenant 706927]$ ls -al | grep dba
-rw-r-r-- 1 oracle oinstall 11262 Jul  8 06:17 dbac_drop.sql
-rw-r-r-- 1 oracle oinstall 13957 Jul  8 06:17 dbac_install.sql

[oracle@multitenant 706927]$ sqlplus / as sysdba

SQL*Plus: Release 18.0.0.0.0 - Production on Wed Jul 17 13:07:29 2019
Version 18.5.0.0.0

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Connected to:
Oracle Database 18c Enterprise Edition Release 18.0.0.0.0 - Production
Version 18.5.0.0.0
SQL> select count(*) from dba_objects where status != 'VALID';

COUNT(*)
----------
    0
SQL> REM Drop DBACockpit Views
SQL> REM
SQL> @dbac_drop.sql
Connected.
**************
SAP DBACockpit: dropping public synonyms and S$-views on existing X$ tables
**************
SQL execution: TRUE
...
... currently spooling to DBACockpit_drop.log

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
Check for Error Messages in the following spool file:
DBACockpit_drop.log
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

SQL> REM
SQL> REM Recompile invalid objects
SQL> REM
SQL> @?/rdbms/admin/utlrp.sql
...
...
Session altered.

TIMESTAMP
--------------------------------------------------------------------------------
COMP_TIMESTAMP UTLRP_BGN 2019-07-17 13:44:17
The following PL/SQL block invokes UTL_RECOMP to recompile invalid objects in the database. Recompilation time is proportional to the number of invalid objects in the database, so this command may take a long time to execute on a database with a large number of invalid objects.

Use the following queries to track recompilation progress:

1. Query returning the number of invalid objects remaining. This number should decrease with time.
   ```sql
   SELECT COUNT(*) FROM obj$ WHERE status IN (4, 5, 6);
   ```

2. Query returning the number of objects compiled so far. This number should increase with time.
   ```sql
   SELECT COUNT(*) FROM UTL_RECOMP_COMPILED;
   ```

This script automatically chooses serial or parallel recompilation based on the number of CPUs available (parameter cpu_count) multiplied by the number of threads per CPU (parameter parallel_threads_per_cpu). On RAC, this number is added across all RAC nodes.

UTL_RECOMP uses DBMS_SCHEDULER to create jobs for parallel recompilation. Jobs are created without instance affinity so that they can migrate across RAC nodes. Use the following queries to verify whether UTL_RECOMP jobs are being created and run correctly:

1. Query showing jobs created by UTL_RECOMP
   ```sql
   SELECT job_name FROM dba_scheduler_jobs WHERE job_name like 'UTL_RECOMP_SLAVE_%';
   ```

2. Query showing UTL_RECOMP jobs that are running
   ```sql
   SELECT job_name FROM dba_scheduler_running_jobs WHERE job_name like 'UTL_RECOMP_SLAVE_%';
   ```

PL/SQL procedure successfully completed.

---

**TIMESTAMP**

```
COMP_TIMESTAMP UTLRP_END 2019-07-17 13:44:18
```
logged into this table: they go into DBA_ERRORS instead.

ERRORS DURING RECOMPILATION

0

Function created.

PL/SQL procedure successfully completed.

Function dropped.

PL/SQL procedure successfully completed.

3.17. Check oratab entries

[oracle@multitenant 706927]$ cat /etc/oratab
#

# This file is used by ORACLE utilities. It is created by root.sh
# and updated by either Database Configuration Assistant while creating
# a database or ASM Configuration Assistant while creating ASM instance.
#
# A colon, ':', is used as the field terminator. A new line terminates
# the entry. Lines beginning with a pound sign, '#', are comments.
#
# Entries are of the form:
#   $ORACLE_SID:$ORACLE_HOME:<N|Y>:
#
# The first and second fields are the system identifier and home
# directory of the database respectively. The third field indicates
# to the dbstart utility that the database should, "Y", or should not,
# "N", be brought up at system boot time.
#
# Multiple entries with the same $ORACLE_SID are not allowed.
#
#
# TEN:/oracle/TEN/121:N # added by SAP RUNINSTALLED 2017_06_23-07-41-26
# added by SWPM
# TEN:/oracle/TEN/122:N # added by SAP RUNINSTALLED 2017_11_08-11-54-06
# TEN:/oracle/TEN/12201:N # Janos entry: added by DBUA, needed to change this as below
TEN:/oracle/TEN/18:N
# TEN:/oracle/TEN/19:N # uncomment this line after upgrade - added by SAP RUNINSTALLED 2019-07-09_11-28-25
3.18. Migrate Listener Manually

**NOTE:** Take special attention of `$TNS_ADMIN` variable. In case the Listener gets started as `<sid>adm` user, all the changes regarding the `ORACLE_HOME` entries needs to be changed here too!

```
[oracle@multitenant 706927]$ cd /oracle/TEN/18/network/admin/
[oracle@multitenant admin]$ cp listener.ora sqlnet.ora tnsnames.ora /oracle/TEN/19/network/admin
[oracle@multitenant admin]$ ls -al /oracle/TEN/19/network/admin/
```

```
total 28
drwxr-xr-x 3 oracle oinstall 4096 Jul 17 14:04 .
drwxr-xr-x 10 oracle oinstall 4096 Apr 17 12:45 ..
-rw-r----- 1 oracle oinstall 847 Jul 17 14:04 listener.ora
-rw-r----- 2 oracle oinstall 4096 Apr 17 12:43 samples
-rw-r-- 1 oracle oinstall 1536 Feb 14 2018 shrept.lst
-rw-r----- 1 oracle oinstall 621 Jul 17 14:04 sqlnet.ora
-rw-r----- 1 oracle oinstall 776 Jul 17 14:04 tnsnames.ora
```

```
[oracle@multitenant admin]$ cd /oracle/TEN/19/network/admin/
```

```
Edit all SQL*Net configuration files in /oracle/TEN/19/network/admin/*.ora and adapt/replace all ORACLE_HOME references with the NEW_ORACLE_HOME!
```

```
[oracle@multitenant oracle]$ echo $ORACLE_HOME
/oracle/TEN/18
[oracle@multitenant oracle]$ lsnrctl stop listener
```

```
LSNRCTL for Linux: Version 18.0.0.0.0 - Production on 17-Jul-2019 14:24:25
```

Copyright (c) 1991, 2018, Oracle. All rights reserved.

```
Connecting to (ADDRESS=(PROTOCOL=IPC)(KEY=TEN.WORLD))
TNS-12541: TNS:no listener
TNS-12560: TNS:protocol adapter error
TNS-00511: No listener
Linux Error: 2: No such file or directory
```

```
Connecting to (ADDRESS=(PROTOCOL=IPC)(KEY=TEN))
TNS-12541: TNS:no listener
TNS-12560: TNS:protocol adapter error
TNS-00511: No listener
Linux Error: 2: No such file or directory
```

```
Connecting to (ADDRESS=(COMMUNITY=SAP.WORLD)(PROTOCOL=TCP)(HOST=multitenant)(PORT=1521))
TNS-12541: TNS:no listener
TNS-12560: TNS:protocol adapter error
TNS-00511: No listener
Linux Error: 111: Connection refused
```

```
[oracle@multitenant oracle]$ setenv ORACLE_HOME /oracle/TEN/19
[oracle@multitenant oracle]$ echo $ORACLE_HOME
/oracle/TEN/19
```

```
[oracle@multitenant oracle]$ lsnrctl start listener
```

```
LSNRCTL for Linux: Version 18.0.0.0.0 - Production on 17-Jul-2019 14:25:58
```

Copyright (c) 1991, 2018, Oracle. All rights reserved.

```
Starting /oracle/TEN/19/bin/tnslsnr: please wait...
```

**TNSLSNR for Linux: Version 19.0.0.0.0 - Production**

System parameter file is /oracle/TEN/19/network/admin/listener.ora

Log messages written to /oracle/TEN/saptrace/diag/tnslnsr/multitenant/listener/alert/log.xml
Connecting to (ADDRESS=(PROTOCOL=IPC)(KEY=TEN.WORLD))
STATUS of the LISTENER

------------------------
Alias                     listener
Version                   TNSLSNR for Linux: Version 19.0.0.0.0 - Production
Start Date                17-JUL-2019 14:26:00
Uptime                    0 days 0 hr. 0 min. 1 sec
Trace Level               off
Security                  ON: Local OS Authentication
SNMP                      OFF
Listener Parameter File   /oracle/TEN/19/network/admin/listener.ora
Listener Log File         /oracle/TEN/saptrace/diag/tnslsnr/multitenant/listener/alert/log.xml
Listening Endpoints Summary...
  (DESCRIPTION=(ADDRESS=(PROTOCOL=ipc)(KEY=TEN.WORLD)))
  (DESCRIPTION=(ADDRESS=(PROTOCOL=ipc)(KEY=TEN)))
  (DESCRIPTION=(ADDRESS=(PROTOCOL=tcp)(HOST=multitenant.dhcp.budl.sap.corp)(PORT=1521)))
Services Summary...
  Service "TEN" has 1 instance(s).
    Instance "TEN", status UNKNOWN, has 1 handler(s) for this service...
The command completed successfully.

$ setenv ORACLE_HOME /oracle/TEN/19
$ env | grep ORACLE_HOME
ORACLE_HOME=/oracle/TEN/19
ORACLE_HOME_NEW=/oracle/TEN/19
4. UPGRADE STEPS

4.1. Backup the Database

[multitenant:tenadm 70]$ brbackup -u // -t offline -m all

4.2. Stop the SAP System

Run "stopsap -r3" as <sid>adm.

4.3. Start Database Instance

Make sure CDB and all PDBs are started and opened!

SQL> COLUMN NAME FORMAT A15;
SQL> COLUMN RESTRICTED FORMAT A10;
SQL> COLUMN OPEN_TIME FORMAT A35;

SQL> SELECT name, open_mode, restricted, open_time from v$pdb

<table>
<thead>
<tr>
<th>NAME</th>
<th>OPEN_MODE</th>
<th>RESTRICTED</th>
<th>OPEN_TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>PDB$SEED</td>
<td>READ ONLY</td>
<td>NO</td>
<td>17-JUL-19 12.28.681 PM +02:00</td>
</tr>
<tr>
<td>PEN</td>
<td>READ WRITE</td>
<td>NO</td>
<td>17-JUL-19 11.29.069 AM +02:00</td>
</tr>
<tr>
<td>JEN</td>
<td>READ WRITE</td>
<td>NO</td>
<td>17-JUL-19 11.29.059 AM +02:00</td>
</tr>
</tbody>
</table>

SQL> select INSTANCE_NUMBER,INSTANCE_NAME,VERSION,STATUS,CON_ID,DATABASE_TYPE from v$instance;

<table>
<thead>
<tr>
<th>INSTANCE_NUMBER</th>
<th>INSTANCE_NAME</th>
<th>VERSION</th>
<th>STATUS</th>
<th>CON_ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>TEN</td>
<td>18.0.0.0.0</td>
<td>OPEN</td>
<td>0</td>
</tr>
</tbody>
</table>

SINGLE

SQL> select DBID,NAME,OPEN_MODE,DB_UNIQUE_NAME,CDB,CON_ID,CON_DBID from v$database;

<table>
<thead>
<tr>
<th>DBID</th>
<th>NAME</th>
<th>OPEN_MODE</th>
<th>DB_UNIQUE_NAME</th>
<th>CDB</th>
<th>CON_ID</th>
<th>CON_DBID</th>
</tr>
</thead>
<tbody>
<tr>
<td>3182824753</td>
<td>TEN</td>
<td>READ WRITE</td>
<td>TEN</td>
<td>YES</td>
<td>0</td>
<td>3182824753</td>
</tr>
</tbody>
</table>

4.4. Backup of PFILE/SPFILE

SQL> create pfile='/oracle/TEN/oraupgrade.19c/initTEN.ora.before_upgrade' from spfile;

File created.

SQL> !ls -al /oracle/TEN/oraupgrade.19c/initTEN.ora.before_upgrade
-rw-r--r-- 1 oracle oinstall 3776 Jul 17 15:02 /oracle/TEN/oraupgrade.19c/initTEN.ora.before_upgrade
4.5. Create Guaranteed Restore Point (GRP) – optional

In case database runs with NOARCHIVELOG mode, enable ARCHIVELOG Mode!

[oracle@multitenant oracle]$ cd $ORA_UPGRADE_WORK_DIR/
[oracle@multitenant oraupgrade.19c]$ sqlplus / as sysdba

SQL*Plus: Release 18.0.0.0.0 - Production on Wed Jul 17 15:03:56 2019
Version 18.5.0.0.0

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Connected to:
Oracle Database 18c Enterprise Edition Release 18.0.0.0.0 - Production
Version 18.5.0.0.0
SQL> spool grp_create.log
SQL> @grp_create_restore_point.sql

Creating guaranteed restore point GRP_BEFORE_UPGRADE_19

SQL> @grp_list_restore_point.sql

<table>
<thead>
<tr>
<th>Restore Point Name</th>
<th>Guaranteed?</th>
<th>GRP Creation Time</th>
<th>Storage Size [Mb]</th>
</tr>
</thead>
<tbody>
<tr>
<td>GRP_BEFORE_UPGRADE_19</td>
<td>YES</td>
<td>2019-JUL-17 15:05:00</td>
<td>200 1</td>
</tr>
</tbody>
</table>

SQL> quit
Disconnected from Oracle Database 18c Enterprise Edition Release 18.0.0.0.0 - Production
Version 18.5.0.0.0
4.6. Run Pre-Upgrade fixups

[oracle@multitenant oraupgrade.19c]$ pwd
/oracle/TEN/oraupgrade.19c
[oracle@multitenant oraupgrade.19c]$ ls -al | grep preupgrade_fixups
-rw-r--r-- 1 oracle oinstall 11278 Jul 17 12:24 preupgrade_fixups_CDB_ROOT.sql
-rw-r--r-- 1 oracle oinstall 8250 Jul 17 12:28 preupgrade_fixups_JEN.sql
-rw-r--r-- 1 oracle oinstall 8270 Jul 17 12:27 preupgrade_fixups_PDB_SEED.sql
-rw-r--r-- 1 oracle oinstall 8109 Jul 17 12:27 preupgrade_fixups_PEN.sql
-rw-r--r-- 1 oracle oinstall 30738 Jul 17 12:28 preupgrade_fixups.sql

4.6.1. CDB$ROOT

[oracle@multitenant oraupgrade.19c]$ sqlplus / as sysdba

SQL*Plus: Release 18.0.0.0.0 - Production on Thu Jul 18 08:58:19 2019
Version 18.5.0.0.0

Copyright (c) 1982, 2018, Oracle. All rights reserved.

Connected to:
Oracle Database 18c Enterprise Edition Release 18.0.0.0.0 - Production
Version 18.5.0.0.0

SQL> SELECT dbms_preup.get_con_name FROM sys.dual;

GET_CON_NAME
------------------------
CDB$ROOT

SQL> @preupgrade_fixups.sql

Executing Oracle PRE-Upgrade Fixup Script

Auto-Generated by: Oracle Preupgrade Script
  Version: 19.0.0.0.0 Build: 2
Generated on: 2019-07-17 12:24:36

For Source Database: TEN
Source Database Version: 18.0.0.0.0
For Upgrade to Version: 19.0.0.0.0

Executing in container: CDB$ROOT

<table>
<thead>
<tr>
<th>Preup Action Number</th>
<th>Preupgrade Issue Is</th>
<th>Remedied</th>
<th>Further DBA Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>hidden_params</td>
<td>NO</td>
<td>Informational only. Further action is optional.</td>
<td></td>
</tr>
<tr>
<td>underscore_events</td>
<td>NO</td>
<td>Informational only. Further action is optional.</td>
<td></td>
</tr>
<tr>
<td>dictionary_stats</td>
<td>YES</td>
<td>None.</td>
<td></td>
</tr>
<tr>
<td>tablespaces_info</td>
<td>NO</td>
<td>Informational only. Further action is optional.</td>
<td></td>
</tr>
<tr>
<td>min_archive_dest_size</td>
<td>NO</td>
<td>Informational only. Further action is optional.</td>
<td></td>
</tr>
<tr>
<td>cycle_number</td>
<td>NO</td>
<td>Informational only. Further action is optional.</td>
<td></td>
</tr>
</tbody>
</table>
7. rman_recovery_version NO Informational only. Further action is optional.

The fixup scripts have been run and resolved what they can. However, there are still issues originally identified by the preupgrade that have not been remedied and are still present in the database. Depending on the severity of the specific issue, and the nature of the issue itself, that could mean that your database is not ready for upgrade. To resolve the outstanding issues, start by reviewing the preupgrade_fixups.sql and searching it for the name of the failed CHECK NAME or Preupgrade Action Number listed above. There you will find the original corresponding diagnostic message from the preupgrade which explains in more detail what still needs to be done.

PL/SQL procedure successfully completed.

Session altered.
4.6.2. PDB$SEED

SQL> alter session set container=PDB$SEED;
Session altered.

SQL> SELECT dbms_preup.get_con_name FROM sys.dual;
GET_CON_NAME
-----------
PDB$SEED

SQL> @preupgrade_fixups.sql
Executing Oracle PRE-Upgrade Fixup Script

Auto-Generated by: Oracle Preupgrade Script
Version: 19.0.0.0.0 Build: 2
Generated on: 2019-07-17 12:24:36

For Source Database: TEN
Source Database Version: 18.0.0.0.0
For Upgrade to Version: 19.0.0.0.0

Executing in container: PDB$SEED

Preup Action Preupgrade Issue Is Preupgrade Check Name Remedied Further DBA Action
Action Number Issue
------ ------------------------ ---------- --------------------------------
1.  hidden_params             NO         Informational only. Further action is optional.
2.  underscore_events         NO         Informational only. Further action is optional.
3.  dictionary_stats          NO         Unexpected failure. Fixup routine was run, but was unable to resolve the issue. Manual DBA action required.
4.  tablespaces_info          NO         Informational only. Further action is optional.

The fixup scripts have been run and resolved what they can. However, there are still issues originally identified by the preupgrade that have not been remedied and are still present in the database. Depending on the severity of the specific issue, and the nature of the issue itself, that could mean that your database is not ready for upgrade. To resolve the outstanding issues, start by reviewing the preupgrade_fixups.sql and searching it for the name of the failed CHECK NAME or Preupgrade Action Number listed above. There you will find the original corresponding diagnostic message from the preupgrade which explains in more detail what still needs to be done.

PL/SQL procedure successfully completed.

Session altered.
4.6.3.PEN

SQL> alter session set container=pen;
Session altered.

SQL> SELECT dbms_preup.get_con_name FROM sys.dual;
GET_CON_NAME
-------------------------
PEN

SQL> @preupgrade_fixups.sql
Executing Oracle PRE-Upgrade Fixup Script

Auto-Generated by: Oracle Preupgrade Script
Version: 19.0.0.0.0 Build: 2
Generated on: 2019-07-17 12:24:36

For Source Database: TEN
Source Database Version: 18.0.0.0.0
For Upgrade to Version: 19.0.0.0.0

Executing in container: PEN

Preup Action Number  Preupgrade Check Name Issue Is Remedied Further DBA Action
------ ------------------------  ---------- ---------- -------------------------------
1. dir_symlinks_exist    NO         Manual fixup recommended.
2. hidden_params         NO         Informational only.
                            Further action is optional.
3. underscore_events     NO         Informational only.
                            Further action is optional.
4. dictionary_stats      YES        None.

The fixup scripts have been run and resolved what they can. However, there are still issues originally identified by the preupgrade that have not been remedied and are still present in the database. Depending on the severity of the specific issue, and the nature of the issue itself, that could mean that your database is not ready for upgrade. To resolve the outstanding issues, start by reviewing the preupgrade_fixups.sql and searching it for the name of the failed CHECK NAME or Preupgrade Action Number listed above. There you will find the original corresponding diagnostic message from the preupgrade which explains in more detail what still needs to be done.

PL/SQL procedure successfully completed.

Session altered.
4.6.4. JEN

SQL> alter session set container=jen;
Session altered.

SQL> SELECT dbms_preup.get_con_name FROM sys.dual;

GET_CON_NAME
-------------------------
JEN

SQL> @preupgrade_fixups.sql
Executing Oracle PRE-Upgrade Fixup Script

Auto-Generated by: Oracle Preupgrade Script
Version: 19.0.0.0.0 Build: 2
Generated on: 2019-07-17 12:24:36

For Source Database: TEN
Source Database Version: 18.0.0.0.0
For Upgrade to Version: 19.0.0.0.0

Executing in container: JEN

<table>
<thead>
<tr>
<th>Preup Action Number</th>
<th>Preupgrade Check Name</th>
<th>Issue Is</th>
<th>Remedied</th>
<th>Further DBA Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. hidden_params</td>
<td>NO</td>
<td>Informational only. Further action is optional.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. underscore_events</td>
<td>NO</td>
<td>Informational only. Further action is optional.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. dictionary_stats</td>
<td>YES</td>
<td>None.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. tablespaces_info</td>
<td>NO</td>
<td>Informational only. Further action is optional.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The fixup scripts have been run and resolved what they can. However, there are still issues originally identified by the preupgrade that have not been remedied and are still present in the database. Depending on the severity of the specific issue, and the nature of the issue itself, that could mean that your database is not ready for upgrade. To resolve the outstanding issues, start by reviewing the preupgrade_fixups.sql and searching it for the name of the failed CHECK NAME or Preupgrade Action Number listed above. There you will find the original corresponding diagnostic message from the preupgrade which explains in more detail what still needs to be done.

PL/SQL procedure successfully completed.

Session altered.
4.7. Run DBUA

4.7.1. Set additional Env. variables

```bash
[oracle@multitenant oraupgrade.19c]$ setenv DB_SID TEN
[oracle@multitenant oraupgrade.19c]$ setenv ORACLE_HOME_SRC /oracle/TEN/18
[oracle@multitenant oraupgrade.19c]$ setenv ORACLE_HOME_TGT /oracle/TEN/19.0.0
[oracle@multitenant oraupgrade.19c]$ echo $TNS_ADMIN
TNS_ADMIN: Undefined variable.
[oracle@multitenant oraupgrade.19c]$ cd $ORACLE_HOME_TGT/sap/ora_upgrade/post_upgrade
```

4.7.2. Start DBUA in query mode

```bash
[oracle@multitenant post_upgrade]$ ./dbua.sap.sh -q
```

---

**Oracle Database Upgrade**

- Version 19-021 Release Date 2019-05-21
- Copyright (c) Oracle Corporation 2019. All Rights Reserved.
- SAP note NN <tbd>
- Oracle Database Release: 19c

- Host : multitenant
- Platform : linux_x86_64 (64-bit)
- Date : 2019_07_18 09:44:35
- User : oracle
- Log file : /home/oracle/19cupgrade-19.0.0-TEN.log
- History log : /home/oracle/19cupgrade-19.0.0-TEN_hist.log

- Checking environment ...
- Environment checked.

- Performing Pre-Upgrade checks ...

  - STEP: >>> Checking Source Oracle Home
    - (OK) - Source Oracle home directory /oracle/TEN/18 exists.
  - STEP: >>> Checking Target Oracle Home
    - (OK) - Target Oracle home directory /oracle/TEN/19.0.0 exists.
  - STEP: >>> Checking Source Release and Target Release
    - (OK) - Source Release checked: 18.0.0.0.0
    - (OK) - Target Release checked: 19.0.0.0.0
    - (OK) - Target version checked: 19.3.0.0.0
  - STEP: >>> Checking Timezone File Version Upgrade
    - (OK) - Timezone file version will be upgraded.
  - STEP: >>> Checking write permissions for ORACLE_BASE /oracle/TEN
    - (OK) - You have write permissions for ORACLE_BASE /oracle/TEN
  - STEP: >>> Checking oratab
    - (OK) - /etc/oratab exists.
    - (OK) - You have write permissions for /etc/oratab.
  - STEP: >>> Checking existence of TDE encryption wallets
    - (OK) - No ewallet.p12 in /oracle/TEN/18/dbs.
    - (OK) - No cwallet.sso in /oracle/TEN/18/dbs.
  - STEP: >>> Checking custom post-upgrade scripts
  - STEP: >>> Checking/Copying TDE encryption wallets
  - STEP: >>> Checking CRS Registration (Only for RAC or ASM)

- Pre-Upgrade checks completed.
Building DBUA command ...

DBUA command complete.

dbua.sap.sh Settings

Script log file : /home/oracle/19cupgrade-19.0.0-TEN.log
Script command line : -q
Query mode : enabled

Environment Settings

ORACLE_HOME_SRC : /oracle/TEN/18
ORACLE_HOME_TGT : /oracle/TEN/19.0.0
ORACLE_BASE : /oracle/TEN

DB_SID : TEN
ORACLE_SID : TEN

DISPLAY : :0

Directory Settings

Current directory : /oracle/TEN/19/sap/ora_upgrade/post_upgrade
Upgrade scripts : /oracle/TEN/19/sap/ora_upgrade/post_upgrade

Database information

Database Name : TEN
Database type : Single instance
Database Instance : TEN

Upgrade Settings

Upgrade from 18.0.0.0.0 to 19.0.0.0.0

Source Oracle home : /oracle/TEN/18
Source Release (from SQL*Plus) : 18.0.0.0.0

Target Oracle home : /oracle/TEN/19.0.0
Target Release (from SQL*Plus) : 19.0.0.0.0
Target Version (from SQL*Plus) : 19.3.0.0.0

DBUA Settings

DBUA silent mode : disabled
DBUA timezone upgrade: enabled
Use of custom scripts: enabled
EM Configuration : disabled

DBUA Custom Scripts

Script directory : /oracle/TEN/19/sap/ora_upgrade/post_upgrade
post_upgrade_tasks.sql
set_compatible.sql

DBUA Command line

THE BEST RUN  SAP
. /oracle/TEN/19.0.0/bin/dbua -dbName TEN -oracleHome /oracle/TEN/18 -recompile_invalid_objects true
-emConfiguration NONE -upgradeTimezone true -postUpgradeScripts
/oracle/TEN/19/sap/ora_upgrade/post_upgrade/post_upgrade_tasks.sql,/oracle/TEN/19/sap/ora_upgrade/post_upgrade/set_compatible.sql | tee /home/oracle/.19cupgrade_19.0.0.dbua
.
.
Post-Upgrade Settings
.
.
The log file of dbua.sap.sh is /home/oracle/19cupgrade-19.0.0-TEN.log
Exiting because dbua.sap.sh was started in query mode.
(EXIT) - (0)
4.7.3. Start DBUA

[oracle@multitenant post_upgrade]$ ./dbua.sap.sh

Oracle Database Upgrade
Version 19-021 Release Date 2019-05-21
Copyright (c) Oracle Corporation 2019. All Rights Reserved.
SAP note NN <tbd>
Oracle Database Release: 19c

Host: multitenant
Platform: linux_x86_64 (64-bit)
Date: 2019_07_18 09:47:08
User: oracle
Log file: /home/oracle/19cupgrade-19.0.0-TEN.log
History log: /home/oracle/19cupgrade-19.0.0-TEN_hist.log

Checking environment ...
Environment checked.

Performing Pre-Upgrade checks ...

STEP: >>> Checking Source Oracle Home
(OK) - Source Oracle home directory /oracle/TEN/18 exists.
STEP: >>> Checking Target Oracle Home
(OK) - Target Oracle home directory /oracle/TEN/19.0.0 exists.
STEP: >>> Checking Source Release and Target Release
(OK) - Source Release checked: 18.0.0.0.0
(OK) - Target Release checked: 19.0.0.0.0
(OK) - Target version checked: 19.3.0.0.0
STEP: >>> Checking Timezone File Version Upgrade
(OK) - Timezone file version will be upgraded.
STEP: >>> Checking write permissions for ORACLE_BASE /oracle/TEN
(OK) - You have write permissions for ORACLE_BASE /oracle/TEN
STEP: >>> Checking oratab
(OK) - /etc/oratab exists.
(OK) - You have write permissions for /etc/oratab.
STEP: >>> Checking existence of TDE encryption wallets
(OK) - No ewallet.p12 in /oracle/TEN/18/dbs.
(OK) - No cwallet.sso in /oracle/TEN/18/dbs.
STEP: >>> Checking custom post-upgrade scripts
STEP: >>> Checking/Copying TDE encryption wallets
STEP: >>> Checking CRS Registration (Only for RAC or ASM)

Pre-Upgrade checks completed.

Building DBUA command ...

DBUA command complete.

dbua.sap.sh Settings

Script log file: /home/oracle/19cupgrade-19.0.0-TEN.log
Script command line:

Environment Settings

THE BEST RUN SAP
Oracle Home Source: /oracle/TEN/18
Oracle Home Target: /oracle/TEN/19.0.0.0
Oracle Base: /oracle/TEN
DB SID: TEN
Oracle SID: TEN
Display: :0

Directory Settings
Current directory: /oracle/TEN/19/sap/ora_upgrade/post_upgrade
Upgrade scripts: /oracle/TEN/19/sap/ora_upgrade/post_upgrade

Database Information
Database Name: TEN
Database Type: Single instance
Database Instance: TEN

Upgrade Settings
Upgrade from 18.0.0.0.0 to 19.0.0.0.0
Source Oracle Home: /oracle/TEN/18
Source Release (from SQL*Plus): 18.0.0.0.0
Target Oracle Home: /oracle/TEN/19.0.0
Target Release (from SQL*Plus): 19.0.0.0.0
Target Version (from SQL*Plus): 19.3.0.0.0

DBUA Settings
DBUA silent mode: disabled
DBUA timezone upgrade: enabled
Use of custom scripts: enabled
EM Configuration: disabled

DBUA Custom Scripts
Script directory: /oracle/TEN/19/sap/ora_upgrade/post_upgrade
post_upgrade_tasks.sql
set_compatible.sql

DBUA Command line
/oracle/TEN/19.0.0.0/bin/dbua -dbName TEN -oracleHome /oracle/TEN/18 -recompile_invalid_objects true -emConfiguration NONE -upgradeTimezone true -postUpgradeScripts
/oracle/TEN/19/sap/ora_upgrade/post_upgrade/post_upgrade_tasks.sql,/oracle/TEN/19/sap/ora_upgrade/post_upgrade/set_compatible.sql | tee /home/oracle/.19cupgrade_19.0.0.dbua

Post-Upgrade Settings

Starting Database Upgrade Assistant in interactive mode ...

THE BEST RUN SAP
Starting in Release 18c, symbolic links are not allowed in directory object path names used with BFILE data types, the UTL_FILE package, or external tables. [More details]
### Prerequisite Checks

<table>
<thead>
<tr>
<th>Validation</th>
<th>Severity</th>
<th>Fixable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Checks to be fixed...</td>
<td>Warning</td>
<td>Manual</td>
</tr>
<tr>
<td>Starting in Release 18c, symbolic links are not allowed in directory object path names used with BFILE data types, the UTL_FILE package, or external tables.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Select a prerequisite check from the above table to view the details here.
Select Upgrade Options

- Enable Parallel Upgrade
- Recompile Invalid Objects During Post Upgrade
- Upgrade Timezone Data

Specify the Custom SQL Scripts to be executed:

**Before Upgrade:**

**After Upgrade:**
/oracle/TEN/19/sap/ora_upgrade/post_upgrade/post_upgrade_tasks.sql,
/oracle/TEN/19/sap/ora_upgrade/post_upgrade/set_compatible.sql

Select Recovery Options

- Use Flashback and Guaranteed Restore Point
- Use Available Guaranteed Restore Point
- Use RMAN Backup
  - Create a New Offline RMAN Backup
  - Create a New Partial Offline RMAN Backup with User Tablespace
- Use Latest Available Full RMAN Backup
- I have my own backup and restore strategy

In case GRP got created in Point 4.5
Database upgrade has been completed successfully, and the database is ready to use.

Database Upgrade Assistant finished with return code 0.

Post-Upgrade

Upgrade Results

(INFO) - DBUA finished with return code 0.

The log file of dbua.sap.sh is /home/oracle/19cupgrade-19.0.0-TEN.log

(EXIT) - (0)
5. POST-UPGRADE STEPS

5.1. Check and Correct oratab

**BEFORE**

# TEN:/oracle/TEN/121:N # added by SAP RUNINSTALLER 2017_06_23-07-41-26
# added by SWPM
# TEN:/oracle/TEN/122:N # added by SAP RUNINSTALLER 2017_11_08-11-54-06
# TEN:/oracle/TEN/12201:N # Janos entry: added by DBUA, needed to change this as below
# TEN:/oracle/TEN/19:N # uncomment this line after upgrade - added by SAP RUNINSTALLER 2019-07-09_11-28-25
TEN:/oracle/TEN/19.0.0:N

**AFTER**

# TEN:/oracle/TEN/121:N # added by SAP RUNINSTALLER 2017_06_23-07-41-26
# added by SWPM
# TEN:/oracle/TEN/122:N # added by SAP RUNINSTALLER 2017_11_08-11-54-06
# TEN:/oracle/TEN/12201:N # Janos entry: added by DBUA, needed to change this as below
# TEN:/oracle/TEN/19:N # uncomment this line after upgrade - added by SAP RUNINSTALLER 2019-07-09_11-28-25
#TEN:/oracle/TEN/19.0.0:N Janos, <IHRDBMS> added by DBUA
TEN:/oracle/TEN/19:N
5.2. Update Oracle Environment

Update SAP-specific environment configuration scripts `.dbenv*` for OS users `ora<dbsid>` and `<sapsid>adm`: Replace occurrences of `<ORACLE_HOME_OLD>` with `<ORACLE_HOME_NEW>`. Execute the same steps for all users!

```
multitenant:tenadm 34> cd $HOME
multitenant:tenadm 36> mkdir dbenv.18
multitenant:tenadm 37> mkdir dbenv.19
multitenant:tenadm 38> cp -p .dbenv* dbenv.18
multitenant:tenadm 39> cp -p .dbenv* dbenv.19
3 files to edit
multitenant:tenadm 42> ls -al dbenv.19/ | grep dbenv
-rw-r----- 1 tenadm sapsys 6623 Jul 18 15:48 .dbenv.csh
-rw-r----- 1 tenadm sapsys 6623 Jul 18 15:49 .dbenv_multitenant.csh
-rw-r----- 1 tenadm sapsys 6236 Jul 18 15:50 .dbenv_multitenant.sh
-rw-r----- 1 tenadm sapsys 6238 Jul 18 15:51 .dbenv.sh
multitenant:tenadm 48> cd; cp dbenv.19/.dbenv*sh .
multitenant:tenadm 50> exit
logout
[oracle@multitenant ora_upgrade]$ su - tenadm
Password:
Last login: Wed Jul 17 11:27:13 CEST 2019 on pts/1
multitenant:tenadm 42> env | grep ORA ; env | grep PATH
dbms_type=ORA
ORACLE_SID=TEN
ORACLE_HOME=/oracle/TEN/19
ORA_PDB_NAME=PEN
ORACLE_BASE=/oracle/TEN
PATH=/usr/local/bin:/bin:/usr/local/sbin:/usr/sbin:/usr/sap/TEN/SYS/exe/uc/linuxx86_64:/usr/sap/TEN/SYS/exe/run:/home/tenadm:/
RSEC_SSFS_DATAPATH=/usr/sap/TEN/SYS/global/security/rsecssfs/data
RSEC_SSFS_KEYPATH=/usr/sap/TEN/SYS/global/security/rsecssfs/key
LD_LIBRARY_PATH=/usr/sap/TEN/SYS/exe/run:/usr/sap/TEN/SYS/exe/uc/linuxx86_64:/oracle/client/122/instantclient

IMPORTANT: Remove $ORACLE_HOME/bin from PATH of <sid>adm users’ environment!
```
5.3. Start Database Listener

This is required only if the listener was not started with the new environment before!

[oracle@multitenant post_upgrade]$ lsnrctl stop

LSNRCTL for Linux: Version 18.0.0.0.0 - Production on 18-JUL-2019 18:07:25
Copyright (c) 1991, 2018, Oracle. All rights reserved.
Connecting to (ADDRESS=(PROTOCOL=IPC)(KEY=TEN.WORLD))
The command completed successfully

[oracle@multitenant ~/Desktop]$ lsnrctl start

LSNRCTL for Linux: Version 19.0.0.0.0 - Production on 18-JUL-2019 18:08:44
Copyright (c) 1991, 2019, Oracle. All rights reserved.
Starting /oracle/TEN/19/bin/tnslsnr: please wait...

TNSLSNR for Linux: Version 19.0.0.0.0 - Production
System parameter file is /oracle/TEN/19/network/admin/listener.ora
Log messages written to /oracle/TEN/saptrace/diag/tnslsnr/multitenant/listener/alert/log.xml
Listening on: (DESCRIPTION=(ADDRESS=(PROTOCOL=ipc)(KEY=TEN.WORLD)))
Listening on: (DESCRIPTION=(ADDRESS=(PROTOCOL=ipc)(KEY=TEN)))
Listening on: (DESCRIPTION=(ADDRESS=(PROTOCOL=tcp)(HOST=multitenant.dhcp.budl.sap.corp)(PORT=1521)))

Connecting to (ADDRESS=(PROTOCOL=IPC)(KEY=TEN.WORLD))
STATUS of the LISTENER

------------------------
<table>
<thead>
<tr>
<th>Alias</th>
<th>LISTENER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Version</td>
<td>TNSLSNR for Linux: Version 19.0.0.0.0 - Production</td>
</tr>
<tr>
<td>Start Date</td>
<td>18-JUL-2019 18:08:44</td>
</tr>
<tr>
<td>Uptime</td>
<td>0 days 0 hr. 0 min. 0 sec</td>
</tr>
<tr>
<td>Trace Level</td>
<td>off</td>
</tr>
<tr>
<td>Security</td>
<td>ON: Local OS Authentication</td>
</tr>
<tr>
<td>SNMP</td>
<td>OFF</td>
</tr>
<tr>
<td>Listener Parameter File</td>
<td>/oracle/TEN/19/network/admin/listener.ora</td>
</tr>
<tr>
<td>Listener Log File</td>
<td>/oracle/TEN/saptrace/diag/tnslsnr/multitenant/listener/alert/log.xml</td>
</tr>
<tr>
<td>Listening Endpoints Summary...</td>
<td></td>
</tr>
<tr>
<td>(DESCRIPTION=(ADDRESS=(PROTOCOL=ipc)(KEY=TEN.WORLD)))</td>
<td></td>
</tr>
<tr>
<td>(DESCRIPTION=(ADDRESS=(PROTOCOL=ipc)(KEY=TEN)))</td>
<td></td>
</tr>
<tr>
<td>(DESCRIPTION=(ADDRESS=(PROTOCOL=tcp)(HOST=multitenant.dhcp.budl.sap.corp)(PORT=1521)))</td>
<td></td>
</tr>
<tr>
<td>Services Summary...</td>
<td></td>
</tr>
<tr>
<td>Service &quot;TEN&quot; has 1 instance(s).</td>
<td></td>
</tr>
<tr>
<td>Instance &quot;TEN&quot;, status UNKNOWN, has 1 handler(s) for this service...</td>
<td></td>
</tr>
<tr>
<td>The command completed successfully</td>
<td></td>
</tr>
</tbody>
</table>
5.4. RE-Start Database Instance

5.4.1. Stop Instance

```
[oracle@multitenant /etc]$ setenv IHRDBMS /oracle/TEN/19.0.0
[oracle@multitenant /etc]$ setenv ORACLE_HOME $IHRDBMS
[oracle@multitenant /etc]$ sqlplus / as sysdba
SQL*Plus: Release 18.0.0.0.0 - Production on Thu Jul 18 18:24:20 2019
Version 18.5.0.0.0
Connected to:
Oracle Database 19c Enterprise Edition Release 19.0.0.0.0 - Production
Version 19.3.0.0.0
SQL> shutdown immediate;
Database closed.
Database dismounted.
ORACLE instance shut down.
SQL> quit
Disconnected from Oracle Database 19c Enterprise Edition Release 19.0.0.0.0 - Production
Version 19.3.0.0.0
[oracle@multitenant /etc]$ exit
```

5.4.2. Start Instance

```
[oracle@multitenant ~/Desktop]$ setenv OHRDBMS /oracle/TEN/19
[oracle@multitenant ~/Desktop]$ setenv ORACLE_HOME $OHRDBMS
[oracle@multitenant ~/Desktop]$ sqlplus / as sysdba
SQL*Plus: Release 19.0.0.0.0 - Production on Thu Jul 18 18:29:08 2019
Version 19.3.0.0.0
Copyright (c) 1982, 2019, Oracle. All rights reserved.
Connected to an idle instance.
SQL> startup;
ORACLE instance started.
Total System Global Area 2617245688 bytes
Fixed Size 9138168 bytes
Variable Size 1912602624 bytes
Database Buffers 687885856 bytes
Redo Buffers 7639040 bytes
Database mounted.
Database opened.
SQL> alter pluggable database all open;
Pluggable database altered.
```
```
SQL> show pdbs;

<table>
<thead>
<tr>
<th>CON_ID</th>
<th>CON_NAME</th>
<th>OPEN MODE</th>
<th>RESTRICTED</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>PDB$SEED</td>
<td>READ ONLY</td>
<td>NO</td>
</tr>
<tr>
<td>3</td>
<td>PEN</td>
<td>READ WRITE</td>
<td>NO</td>
</tr>
<tr>
<td>4</td>
<td>JEN</td>
<td>READ WRITE</td>
<td>NO</td>
</tr>
</tbody>
</table>
```
5.5. Run Post-Upgrade fixups

[oracle@multitenant ~/Desktop]$ cd $ORA_UPGRADE_WORK_DIR
[oracle@multitenant oraupgrade.19c]$ pwd
/oracle/TEN/oraupgrade.19c
[oracle@multitenant oraupgrade.19c]$ ls -al | grep post
-rw-r--r-- 1 oracle oinstall 8196 Jul 17 12:24 postupgrade_fixups_CDB_ROOT.sql
-rw-r--r-- 1 oracle oinstall 8175 Jul 17 12:28 postupgrade_fixups_JEN.sql
-rw-r--r-- 1 oracle oinstall 8157 Jul 17 12:27 postupgrade_fixups_PDB_SEED.sql
-rw-r--r-- 1 oracle oinstall 23283 Jul 17 12:28 postupgrade_fixups.sql

5.5.1. CDB$ROOT

SQL> alter session set container=CDB$ROOT;
Session altered.

SQL> SELECT dbms_preup.get_con_name FROM sys.dual;
GET_CON_NAME
-------------------------
CDB$ROOT

SQL> @postupgrade_fixups.sql
Session altered.

PL/SQL procedure successfully completed.

Commit complete.

Session altered.

PL/SQL procedure successfully completed.

PL/SQL procedure successfully completed.

Package created.

No errors.

Package body created.

PL/SQL procedure successfully completed.

No errors.
Package created.

No errors.

Package body created.

No errors.

Executing Oracle POST-Upgrade Fixup Script

Auto-Generated by: Oracle Preupgrade Script
Version: 19.0.0.0.0 Build: 2
Generated on: 2019-07-17 12:24:40

For Source Database: TEN
Source Database Version: 18.0.0.0.0
For Upgrade to Version: 19.0.0.0.0

Executing in container: CDB$ROOT

<table>
<thead>
<tr>
<th>Preupgrade Action Number</th>
<th>Preupgrade Check Name</th>
<th>Remedied</th>
<th>Further DBA Action</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>old_time_zones_exist</td>
<td>YES</td>
<td>None.</td>
</tr>
<tr>
<td></td>
<td>post_dictionary</td>
<td>YES</td>
<td>None.</td>
</tr>
<tr>
<td></td>
<td>post_fixed_objects</td>
<td>NO</td>
<td>Informational only.</td>
</tr>
</tbody>
</table>

Further action is optional.

The fixup scripts have been run and resolved what they can. However, there are still issues originally identified by the preupgrade that have not been remedied and are still present in the database. Depending on the severity of the specific issue, and the nature of the issue itself, that could mean that your database upgrade is not fully complete. To resolve the outstanding issues, start by reviewing the postupgrade_fixups.sql and searching it for the name of the failed CHECK NAME or Preupgrade Action Number listed above. There you will find the original corresponding diagnostic message from the preupgrade which explains in more detail what still needs to be done.

PL/SQL procedure successfully completed.

Session altered.
5.5.2.PDB$SEED

SQL> alter session set container=PDB$SEED;
Session altered.

SQL> SELECT dbms_preup.get_con_name FROM sys.dual;

GET_CON_NAME
-------------------------
PDB$SEED

SQL> @postupgrade_fixups.sql

Session altered.

PL/SQL procedure successfully completed.

Commit complete.

Session altered.

DECLARE
*

ERROR at line 1:
ORA-16000: database or pluggable database open for read-only access
ORA-06512: at line 9

PL/SQL procedure successfully completed.

Package created.
No errors.

Package body created.

PL/SQL procedure successfully completed.
No errors.

Package created.
No errors.

Package body created.
No errors.
Executing Oracle POST-Upgrade Fixup Script

Auto-Generated by: Oracle Preupgrade Script
Version: 19.0.0.0.0 Build: 2
Generated on: 2019-07-17 12:24:40

For Source Database: TEN
Source Database Version: 18.0.0.0.0
For Upgrade to Version: 19.0.0.0.0

Executing in container: PDB$SEED

<table>
<thead>
<tr>
<th>Preup Action Number</th>
<th>Preupgrade Issue Is</th>
<th>Remedied</th>
<th>Further DBA Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>old_time_zones_exist</td>
<td>NO</td>
<td>Manual fixup recommended.</td>
<td></td>
</tr>
<tr>
<td>post_dictionary</td>
<td>NO</td>
<td>Unexpected failure. Fixup routine was run, but was unable to resolve the issue. Manual DBA action required.</td>
<td></td>
</tr>
<tr>
<td>post_fixed_objects</td>
<td>NO</td>
<td>Informational only. Further action is optional.</td>
<td></td>
</tr>
</tbody>
</table>

The fixup scripts have been run and resolved what they can. However, there are still issues originally identified by the preupgrade that have not been remedied and are still present in the database. Depending on the severity of the specific issue, and the nature of the issue itself, that could mean that your database upgrade is not fully complete. To resolve the outstanding issues, start by reviewing the postupgrade_fixups.sql and searching it for the name of the failed CHECK NAME or Preupgrade Action Number listed above. There you will find the original corresponding diagnostic message from the preupgrade which explains in more detail what still needs to be done.

PL/SQL procedure successfully completed.

Session altered.
5.5.3.PEN

SQL> alter session set container=PEN;
Session altered.

SQL> SELECT dbms_preup.get_con_name FROM sys.dual;
GET_CON_NAME
------------
PEN

SQL> @postupgrade_fixups.sql
Session altered.

PL/SQL procedure successfully completed.
Commit complete.

Session altered.

PL/SQL procedure successfully completed.

PL/SQL procedure successfully completed.

Package created.
No errors.
Package body created.

PL/SQL procedure successfully completed.
No errors.

Package created.
No errors.
Package body created.

No errors.
Executing Oracle POST-Upgrade Fixup Script
Auto-Generated by: Oracle Preupgrade Script
Version: 19.0.0.0.0 Build: 2
For Source Database: TEN
Source Database Version: 18.0.0.0.0
For Upgrade to Version: 19.0.0.0.0
Executing in container: PEN

<table>
<thead>
<tr>
<th>Preup Action Number</th>
<th>Preupgrade Check Name</th>
<th>Issue Is</th>
<th>Remedied</th>
<th>Further DBA Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>5. old_time_zones_exist</td>
<td>YES</td>
<td>None.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. post_dictionary</td>
<td>YES</td>
<td>None.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. post_fixed_objects</td>
<td>NO</td>
<td>Informational only</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The fixup scripts have been run and resolved what they can. However, there are still issues originally identified by the preupgrade that have not been remedied and are still present in the database. Depending on the severity of the specific issue, and the nature of the issue itself, that could mean that your database upgrade is not fully complete. To resolve the outstanding issues, start by reviewing the postupgrade_fixups.sql and searching it for the name of the failed CHECK NAME or Preupgrade Action Number listed above. There you will find the original corresponding diagnostic message from the preupgrade which explains in more detail what still needs to be done.

PL/SQL procedure successfully completed.

Session altered.
5.5.4.JEN

SQL> alter session set container=JEN;
Session altered.

SQL> SELECT dbms_preup.get_con_name FROM sys.dual;

GET_CON_NAME
-------------------------
JEN

SQL> @postupgrade_fixups.sql
Session altered.

PL/SQL procedure successfully completed.

Commit complete.

Session altered.

PL/SQL procedure successfully completed.

PL/SQL procedure successfully completed.

Package created.
No errors.

Package body created.

PL/SQL procedure successfully completed.
No errors.

Package created.
No errors.

Package body created.
No errors.

Executing Oracle POST-Upgrade Fixup Script

Auto-Generated by: Oracle Preupgrade Script
Version: 19.0.0.0.0 Build: 2
The fixup scripts have been run and resolved what they can. However, there are still issues originally identified by the preupgrade that have not been remedied and are still present in the database. Depending on the severity of the specific issue, and the nature of the issue itself, that could mean that your database upgrade is not fully complete. To resolve the outstanding issues, start by reviewing the postupgrade_fixups.sql and searching it for the name of the failed CHECK NAME or Preupgrade Action Number listed above. There you will find the original corresponding diagnostic message from the preupgrade which explains in more detail what still needs to be done.

PL/SQL procedure successfully completed.

Session altered.
5.6. Run SAP-Specific Post-Upgrade Scripts

[oracle@multitenant ]$ cd $ORA_UPGRADE_WORK_DIR
[oracle@multitenant oraupgrade.19c]$ sqlplus / as sysdba

SQL*Plus: Release 19.0.0.0.0 - Production on Fri Jul 19 09:27:06 2019
Version 19.3.0.0.0

Copyright (c) 1982, 2019, Oracle.  All rights reserved.

Connected to:
Oracle Database 19c Enterprise Edition Release 19.0.0.0.0 - Production
Version 19.3.0.0.0

SQL> spool post_upgrade_tasks.log
SQL> @post_upgrade_tasks.sql

Oracle Database Post-Upgrade Tasks Tool for SAP

>> STARTED <<<

Date : 2019-07-19 09:27:28
Script Version : 19.0.0
Script Revision : 001
Script Date : 2019-05-20
Parameter Settings : SAP note 2470718

==================================================================================================

TASK: Configuring Scheduler Jobs (SAP note 974781)
==================================================================================================

Job ORACLE_OCM.MGMT_CONFIG_JOB has been disabled.
Job ORACLE_OCM.MGMT_STATS_CONFIG_JOB has been disabled.

==================================================================================================

TASK: Configuring Auto Tasks (SAP note 974781)
==================================================================================================

SQL> execute DBMS_AUTO_TASK_ADMIN.DISABLE;

SQL> execute DBMS_AUTO_TASK_ADMIN.DISABLE('AUTO OPTIMIZER STATS COLLECTION',NULL,NULL);

SQL> execute DBMS_AUTO_TASK_ADMIN.DISABLE('AUTO SPACE ADVISOR',NULL,NULL);

SQL> execute DBMSAUTO_TASK_ADMIN.DISABLE('SQL TUNING ADVISOR',NULL,NULL);

Autotasks have been disabled.

==================================================================================================

TASK: Validating SAP_$KSLEI / SAP$KSLEI (SAP note 706927)
==================================================================================================
TARGET: Recreating PLAN_TABLE in SAP schema(s)

List of PLAN_TABLEs in SAP schema(s)

TARGET: Performing clean up for SAP note 519448

Description:
Dropping obsolete SAP-specific synonyms/views that (might) have been implemented as workaround in release 9.2 according to SAP note 519448

Checking private synonyms from SAP note 519448 ...
Checking views from SAP note 519448 ...
Dropping private synonyms from SAP note 519448 ...
Dropping database views from SAP note 519448 ...

TARGET: Resetting Database Parameters (remove from SPFILE)

SQL> ALTER SYSTEM RESET "event" SCOPE = SPFILE

TARGET: Removing obsolete database parameter from SPFILE

SQL> ALTER SYSTEM RESET "_optimizer_batch_table_access_by_rowid" SCOPE = SPFILE

SQL> ALTER SYSTEM RESET "_optimizer_reduce_groupby_key" SCOPE = SPFILE

SQL> ALTER SYSTEM RESET "_rowsets_enabled" SCOPE = SPFILE

SQL> ALTER SYSTEM RESET "_use_single_log_writer" SCOPE = SPFILE

TARGET: Setting Underscore Parameters(SAP Note 2470718)

SQL> ALTER SYSTEM SET "_disable_directory_link_check" = TRUE COMMENT
SQL> ALTER SYSTEM SET "_kolfuseslfl" = TRUE COMMENT = 'SAP RECOMMENDED SETTINGS - SAP NOTE 2470718 - SET BY POST_UPGRADE_TASKS.SQL' SCOPE=SPFILE
.
.
SQL> ALTER SYSTEM SET "_LOG_SEGMENT_DUMP_PARAMETER" = FALSE COMMENT = 'SAP RECOMMENDED SETTINGS - SAP NOTE 2470718 - SET BY POST_UPGRADE_TASKS.SQL' SCOPE=SPFILE
.
.
SQL> ALTER SYSTEM SET "_LOG_SEGMENT_DUMP_PATCH" = FALSE COMMENT = 'SAP RECOMMENDED SETTINGS - SAP NOTE 2470718 - SET BY POST_UPGRADE_TASKS.SQL' SCOPE=SPFILE
.
.
SQL> ALTER SYSTEM SET "_MUTEX_WAIT_SCHEME" = 1 COMMENT = 'SAP RECOMMENDED SETTINGS - SAP NOTE 2470718 - SET BY POST_UPGRADE_TASKS.SQL' SCOPE=SPFILE
.
.
SQL> ALTER SYSTEM SET "_MUTEX_WAIT_TIME" = 10 COMMENT = 'SAP RECOMMENDED SETTINGS - SAP NOTE 2470718 - SET BY POST_UPGRADE_TASKS.SQL' SCOPE=SPFILE
.
.
SQL> ALTER SYSTEM SET "_OPTIM_PEEK_USER_BINDS" = FALSE COMMENT = 'SAP RECOMMENDED SETTINGS - SAP NOTE 2470718 - SET BY POST_UPGRADE_TASKS.SQL' SCOPE=SPFILE
.
.
SQL> ALTER SYSTEM SET "_OPTIMIZER_ADAPTIVE_CURSOR_SHARING" = FALSE COMMENT = 'SAP RECOMMENDED SETTINGS - SAP NOTE 2470718 - SET BY POST_UPGRADE_TASKS.SQL' SCOPE=SPFILE
.
.
SQL> ALTER SYSTEM SET "_OPTIMIZER_BATCH_TABLE_ACCESS_BY_ROWID" = FALSE COMMENT = 'SAP RECOMMENDED SETTINGS - SAP NOTE 2470718 - SET BY POST_UPGRADE_TASKS.SQL' SCOPE=SPFILE
.
.
SQL> ALTER SYSTEM SET "_OPTIMIZER_EXTENDED_CURSOR_SHARING_REL" = NONE COMMENT = 'SAP RECOMMENDED SETTINGS - SAP NOTE 2470718 - SET BY POST_UPGRADE_TASKS.SQL' SCOPE=SPFILE
.
.
SQL> ALTER SYSTEM SET "_OPTIMIZER_REDUCE_GROUPBY_KEY" = FALSE COMMENT = 'SAP RECOMMENDED SETTINGS - SAP NOTE 2470718 - SET BY POST_UPGRADE_TASKS.SQL' SCOPE=SPFILE
.
.
SQL> ALTER SYSTEM SET "_OPTIMIZER_USE_FEEDBACK" = FALSE COMMENT = 'SAP RECOMMENDED SETTINGS - SAP NOTE 2470718 - SET BY POST_UPGRADE_TASKS.SQL' SCOPE=SPFILE
.
.
THE BEST RUN SAP
SQL> ALTER SYSTEM SET "_ROWSETS_ENABLED" = FALSE COMMENT = 'SAP RECOMMENDED SETTINGS - SAP NOTE 2470718 - SET BY POST_UPGRADE_TASKS.SQL' SCOPE=SPFILE

SQL> ALTER SYSTEM SET "_SECUREFILES_CONCURRENCY_ESTIMATE" = 50 COMMENT = 'SAP RECOMMENDED SETTINGS - SAP NOTE 2470718 - SET BY POST_UPGRADE_TASKS.SQL' SCOPE=SPFILE

SQL> ALTER SYSTEM SET "_SPACEBG_SYNC_SEGBLOCKS" = TRUE COMMENT = 'SAP RECOMMENDED SETTINGS - SAP NOTE 2470718 - SET BY POST_UPGRADE_TASKS.SQL' SCOPE=SPFILE

SQL> ALTER SYSTEM SET "_SUPPRESS_IDENTIFIERS_ON_DUPKEY" = TRUE COMMENT = 'SAP RECOMMENDED SETTINGS - SAP NOTE 2470718 - SET BY POST_UPGRADE_TASKS.SQL' SCOPE=SPFILE

SQL> ALTER SYSTEM SET "_USE_SINGLE_LOG_WRITER" = TRUE COMMENT = 'SAP RECOMMENDED SETTINGS - SAP NOTE 2470718 - SET BY POST_UPGRADE_TASKS.SQL' SCOPE=SPFILE

================================================================

Current FIX_CONTROL Status

<table>
<thead>
<tr>
<th>Bug#</th>
<th>Value</th>
<th>Default</th>
</tr>
</thead>
<tbody>
<tr>
<td>5099019</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>6055658</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>6120483</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>6399597</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>6430500</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>6972291</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>7324224</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>8932139</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>8937971</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>9196440</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>9495669</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>13627489</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>14255600</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>14595273</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>18405517</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>20355502</td>
<td>10</td>
<td>0</td>
</tr>
<tr>
<td>20636003</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>22540411</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>25643889</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>26536320</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>27321179</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>27466597</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

Check for which bug(s) fix_control can be set ...
Setting _FIX_CONTROL
Setting _FIX_CONTROL for 22 bug IDs.

```
```

========================================================
TASK: Setting Database Parameter EVENT (SAP Note 2470718)
========================================================

```
SQL> ALTER SYSTEM SET EVENT = '10027','10028','10142','10183','10191','10995 level 2','38068 level 100','38085','38087','44951 level 1024','60025' COMMENT = 'SAP RECOMMENDED SETTINGS - SAP NOTE 2470718 - SET BY POST_UPGRADE_TASKS.SQL' SCOPE=SPFILE
```

***************************************************
***************
Oracle Database Post-Upgrade Tasks Tool for SAP
**********************************************************************

>>> FINISHED <<<

PL/SQL procedure successfully completed.

SQL> spool off
Oracle Database Post-Upgrade Information Utility for SAP

Date : 2019-07-19 09:30:33
Script Version : 19.0.0
Script Revision : 19-002
Script Date : 2019-05-27

Database Information

--> Host Name : multitenant
--> Host Platform : Linux x86 64-bit (Platform ID: 13)
--> Platform type : Unix
--> Instance Name (Status) : TEN (OPEN)
--> Database Name : TEN
--> Database Version : 19.0.0.0.0

--> Database Configuration
--> Database Character Set : UTF8
--> National Character Set : UTF8
--> Database Log Mode : ARCHIVELOG
--> Database Flashback Mode : RESTORE POINT ONLY
--> AWR Retention : 8

--> Database Parameter
--> COMPATIBLE : 18.0.0
--> REMOTE_OS_AUTHENT : FALSE

--> Database Timezone
--> Timezone File Version : V32
--> Database Timezone : +02:00
--> Session Timezone : +02:00

--> Oracle RAC System : FALSE
--> Oracle DV System : FALSE
--> SAP BW/DW/BI System : FALSE
--> SAP Unicode System : TRUE
--> SAP ABAP Stack/Java Stack : FALSE/FALSE

--> Database Security Configuration
--> User Profile SAPUPROF : FALSE
--> DEFAULT.FAILED_LOGIN_ATTEMPTS : 10
--> DEFAULT.PASSWORD_LIFE_TIME : 180

--> Fast Recovery Area (FRA) Configuration
--> FRA Destination : /oracle/TEN/oraflash
--> FRA Size : 30000 M
--> FRA Space Limit : 30000 M
--> FRA Space Used : 1840 M / 6.13 %

Database Restore Points

The following restore points are defined:
Guaranteed Time

Name

---------- ---- ----
YES 2019-07-17 15:05:00 GRP_BEFORE_UPGRADE_19

Database Components

The following database components are installed:

<table>
<thead>
<tr>
<th>Component ID</th>
<th>Version</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>CATALOG</td>
<td>19.0.0.0.0</td>
<td>VALID</td>
</tr>
<tr>
<td>CATPROC</td>
<td>19.0.0.0.0</td>
<td>VALID</td>
</tr>
<tr>
<td>XDB</td>
<td>19.0.0.0.0</td>
<td>VALID</td>
</tr>
<tr>
<td>RAC</td>
<td>19.0.0.0.0</td>
<td>OPTION OFF</td>
</tr>
</tbody>
</table>

Underscore (hidden) parameters

The following underscore parameters are set:

_ use_single_log_writer
_ securefiles_concurrency_estimate
_ spacebg_sync_segblocks
_ suppress_identifiers_on_dupkey
_ mutex_wait_time
_ mutex_wait_scheme
_ kolfusesIf
_ fix_control
_ optimizer_extended_cursor_sharing_rel
_ optimizer_adaptive_cursor_sharing
_ optim_peek_user_binds
_ optimizer_use_feedback
_ optimizer_batch_table_access_by_rowid
_ disable_directory_link_check
_ rowsets_enabled
_ optimizer_reduce_groupby_key
_ log_segment_dump_parameter
_ log_segment_dump_patch

Events and Trace Events

The following events are set:

10027
10028
10142
10183
10191
10995 level 2
38068 level 100
38085
38087
44951 level 1024
60025
The following trace events are set:

Database Maintenance Jobs

<table>
<thead>
<tr>
<th>JOB_NAME</th>
<th>Owner</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>MGMT_CONFIG_JOB</td>
<td>ORACLE_OCM</td>
<td>FALSE</td>
</tr>
<tr>
<td>MGMT_STATS_CONFIG_JOB</td>
<td>ORACLE_OCM</td>
<td>FALSE</td>
</tr>
<tr>
<td>FGR$AUTOPURGE_JOB</td>
<td>SYS</td>
<td>FALSE</td>
</tr>
<tr>
<td>FILE_WATCHER</td>
<td>SYS</td>
<td>FALSE</td>
</tr>
<tr>
<td>HM_CREATE_OFFLINE_DICTIONARY</td>
<td>SYS</td>
<td>FALSE</td>
</tr>
<tr>
<td>LOAD_OPATCH_INVENTORY</td>
<td>SYS</td>
<td>FALSE</td>
</tr>
<tr>
<td>ORA$PREPLUGIN_BACKUP_JOB</td>
<td>SYS</td>
<td>FALSE</td>
</tr>
<tr>
<td>XMLDB_NFS_CLEANUP_JOB</td>
<td>SYS</td>
<td>FALSE</td>
</tr>
<tr>
<td>BSLN_MAINTAIN_STATS_JOB</td>
<td>SYS</td>
<td>TRUE</td>
</tr>
<tr>
<td>CLEANUP_NON_EXIST_OBJ</td>
<td>SYS</td>
<td>TRUE</td>
</tr>
<tr>
<td>CLEANUP_ONLINE_IND_BUILD</td>
<td>SYS</td>
<td>TRUE</td>
</tr>
<tr>
<td>CLEANUP_ONLINE_PKG</td>
<td>SYS</td>
<td>TRUE</td>
</tr>
<tr>
<td>CLEANUP_TRANSIENT_PMO</td>
<td>SYS</td>
<td>TRUE</td>
</tr>
<tr>
<td>CLEANUP_TRANSIENT_TYPE</td>
<td>SYS</td>
<td>TRUE</td>
</tr>
<tr>
<td>DRA_REEVALUATE_OPEN_FAILURES</td>
<td>SYS</td>
<td>TRUE</td>
</tr>
<tr>
<td>FILE_SIZE_UPD</td>
<td>SYS</td>
<td>TRUE</td>
</tr>
<tr>
<td>ORA$AUTOTASK_CLEAN</td>
<td>SYS</td>
<td>TRUE</td>
</tr>
<tr>
<td>PMO_DEFERRED_GIDX_MAINT_JOB</td>
<td>SYS</td>
<td>TRUE</td>
</tr>
<tr>
<td>PURGE_LOG</td>
<td>SYS</td>
<td>TRUE</td>
</tr>
<tr>
<td>RSE$CLEAN_RECOVERABLE_SCRIPT</td>
<td>SYS</td>
<td>TRUE</td>
</tr>
<tr>
<td>SM$CLEAN_AUTO_SPLIT_MERGE</td>
<td>SYS</td>
<td>TRUE</td>
</tr>
</tbody>
</table>

Operation Name                  Status
----------------------------------------
auto optimizer stats job            DISABLED
auto space advisor job              DISABLED
automatic sql tuning task           DISABLED

Invalid Objects

Number of invalid objects (SYS): 0
Number of invalid objects (SAP): 0
Number of invalid objects (all): 0

No invalid objects found.

WARNING: ----> Database role SAPCONN is not defined.
            Run sapconn_role.sql to create this database role.
            See SAP note 834917.
WARNING: ----> Database role SAPDBA is not defined.
             Run sapdba_role.sql to create this database role.
             See SAP note 134592.

WARNING: ----> User profile SAPUPROF is not configured.
             This user profile should be configured as of release 11.2.
             See SAP note 1519872.

WARNING: ----> The retention time for the Automatic Workload Repository (AWR) is not configured as recommended.
             Current AWR retention is set to 8 days.
             Recommended AWR retention is 42 or more days.
             See SAP note 1326067.

WARNING: ----> Check recommendation for database parameter COMPATIBLE.
             Current setting: COMPATIBLE=18.0.0
             Recommended setting: COMPATIBLE=19.0.0
             See SAP note 1739274.

WARNING: ----> FAILED_LOGIN_ATTEMPTS <> UNLIMITED in DEFAULT USER PROFILE.
             See SAP note 951167.
             Recommendation: Configure user profile SAPUPROF
             See SAP note 1519872.

WARNING: ----> PASSWORD_LIFE_TIME <> UNLIMITED in DEFAULT PROFILE.
             Recommendation: Configure user profile SAPUPROF
             See SAP note 1519872.

**********************************************************************
FINISHED - Oracle Database Post-Upgrade Information Utility for SAP
**********************************************************************

PL/SQL procedure successfully completed.

SQL> spool off
SQL> quit
5.7. Drop Guaranteed Restore Point (from before the Upgrade)

SQL> spool grp_drop.log
SQL> @grp_list_restore_point.sql

<table>
<thead>
<tr>
<th>Restore Point Name</th>
<th>Guaranteed?</th>
<th>GRP Creation Time</th>
<th>Storage Size [Mb]</th>
</tr>
</thead>
<tbody>
<tr>
<td>GRP_BEFORE_UPGRADE_19</td>
<td>YES</td>
<td>2019-JUL-17 15:05:00</td>
<td>1600</td>
</tr>
</tbody>
</table>

SQL> @grp_drop_restore_point.sql

Listing restore points before dropping restore point GRP_BEFORE_UPGRADE_19

<table>
<thead>
<tr>
<th>NAME</th>
<th>GUARANTEE_FLASH</th>
</tr>
</thead>
<tbody>
<tr>
<td>GRP_BEFORE_UPGRADE_19</td>
<td>YES</td>
</tr>
</tbody>
</table>

Dropping guaranteed restore point GRP_BEFORE_UPGRADE_19

Restore point dropped.

Listing restore points after dropping restore point GRP_BEFORE_UPGRADE_19

no rows selected

SQL> quit

5.8. Check and Set COMPATIBLE parameter

[oracle@multitenant /]$ cd $ORA_UPGRADE_WORK_DIR
[oracle@multitenant oraupgrade.19c]$ sqlplus / as sysdba

SQL*Plus: Release 19.0.0.0.0 - Production on Fri Jul 19 09:36:53 2019
Version 19.3.0.0.0

Copyright (c) 1982, 2019, Oracle. All rights reserved.

Connected to:
Oracle Database 19c Enterprise Edition Release 19.0.0.0.0 - Production
Version 19.3.0.0.0

SQL> show parameter compatible

<table>
<thead>
<tr>
<th>NAME</th>
<th>TYPE</th>
<th>VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>compatible</td>
<td>string</td>
<td>18.0.0</td>
</tr>
<tr>
<td>noncdb_compatible</td>
<td>boolean</td>
<td>FALSE</td>
</tr>
</tbody>
</table>

SQL> select value "compatible" from v$parameter where name = 'compatible';

compatible

18.0.0
alter system set compatible = '19.0.0' COMMENT = 'SAP recommendation for Oracle Database 19c' scope=spfile;
System altered.

SELECT version_full FROM v$instance;

1 row selected.

shutdown immediate;
Database closed.
Database dismounted.
ORACLE instance shut down.
startup
ORACLE instance started.

Total System Global Area 2617245688 bytes
Fixed Size 9138168 bytes
Variable Size 1912602624 bytes
Database Buffers 687865856 bytes
Redo Buffers 7639040 bytes
Database mounted.
Database opened.
alter pluggable database all open;
Pluggable database altered.

show parameter compatible;

<table>
<thead>
<tr>
<th>NAME</th>
<th>TYPE</th>
<th>VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>compatible</td>
<td>string</td>
<td>19.0.0</td>
</tr>
<tr>
<td>noncdb_compatible</td>
<td>boolean</td>
<td>FALSE</td>
</tr>
</tbody>
</table>

5.9. Finish SAP Bundle Patch Post-Installation
For more information, see SBP README.

5.10. Check for Invalid Objects

alter session set container=pen;
Session altered.

select owner, object_name, object_type from dba_objects where status = 'INVALID';
no rows selected
alter session set container=jen;
Session altered.

select owner, object_name, object_type from dba_objects where status = 'INVALID';
no rows selected

SQL> alter session set container=pdb$seed;
Session altered.

SQL> select owner, object_name, object_type from dba_objects where status = 'INVALID';
no rows selected

SQL> alter session set container=cdb$root;
Session altered.

SQL> select owner, object_name, object_type from dba_objects where status = 'INVALID';
no rows selected
5.11. Check OS\_AUTHENT\_PREFIX

SQL> alter session set container=cdb$root;
Session altered.

SQL> show parameter os_authent_prefix

+-----------------+--------+----------+
| NAME             | TYPE   | VALUE    |
+-----------------+--------+----------+
| os_authent_prefix | string | C        |
+-----------------+--------+----------+

SQL> alter system set os_authent_prefix='C##OPS$' scope=spfile;
System altered.

SQL> shutdown immediate;
Database closed.
Database dismounted.
ORACLE instance shut down.

SQL> startup
ORACLE instance started.
Total System Global Area 2617245688 bytes
Fixed Size 9138168 bytes
Variable Size 1912602624 bytes
Database Buffers 687865856 bytes
Redo Buffers 7639040 bytes
Database mounted.
Database opened.

SQL> alter pluggable database all open;
Pluggable database altered.

SQL> show parameter os_authent_prefix

+-----------------+--------+----------+
| NAME             | TYPE   | VALUE    |
+-----------------+--------+----------+
| os_authent_prefix | string | C##OPS$  |
+-----------------+--------+----------+

5.12. Update Database Statistics

multitenant:tenadm 52> brconnect -u / -c -f stats -t system_stats
multitenant:tenadm 53> brconnect -u / -c -f stats -t oradict_stats
multitenant:tenadm 54> brconnect -u / -c -f stats -t all -f collect -p 4
5.13. Reinstall DBACockpit Views
The scripts are still not adjusted to Multitenant!

5.14. Backup Database

*Use Admin Tool of your choice.*
5.15. Configure a link to SPFILE

[oracle@multitenant oraupgrade.19c]$ setenv DB_SID TEN
[oracle@multitenant ~]$ cd; pwd; sqlplus /nolog
/home/oracle

SQL*Plus: Release 19.0.0.0.0 - Production on Fri Jul 19 11:11:18 2019
Version 19.3.0.0.0

Copyright (c) 1982, 2019, Oracle. All rights reserved.

SQL> conn / as sysdba
Connected.
SQL> show parameter spfile;
NAME                   TYPE           VALUE
------------------------------------ ----------- -------------------------------
spfile                  string        /oracle/TEN/19/dbs/spfileTEN.ora

SQL> set verify off
SQL> set echo off
SQL> set heading off
SQL> set feedback off
SQL> host echo DB_SID=$DB_SID
DB_SID=TEN

SQL> host echo Creating init$DB_SID.ora
Creating initTEN.ora

SQL> spool init$DB_SID.ora
SQL> select 'spfile=(' || value || ') from v$parameter where name = 'spfile';

SQL> spool off
SQL> host ls -l init$DB_SID.ora
-rw-r--r-- 1 oracle oinstall 176 Jul 19 11:12 initTEN.ora

SQL> host cat init$DB_SID.ora
SQL> select 'spfile=(' || value || ') from v$parameter where name = 'spfile';

SQL> spool off
SQL> host cp init$DB_SID.ora init$DB_SID.raw

SQL> host cat init$DB_SID.raw | sed '/^SQL>/d' | sed '/^$/d' > init$DB_SID.ora

SQL> host cp init$DB_SID.ora $ORACLE_HOME/dbs

SQL> quit
[oracle@multitenant ~]$ cat $ORACLE_HOME/dbs/initTEN.ora
spfile=(/oracle/TEN/19/dbs/spfileTEN.ora)
5.16. Update JDBC Driver

See SAP Guide.

5.17. Deinstall Old Oracle Software

[oracle@multitenant deinstall]$ pwd
/oracle/TEN/18.0.0/deinstall
[oracle@multitenant deinstall]$ ./deinstall -checkonly
Checking for required files and bootstrapping ...
Please wait ...
Location of logs /oracle/oraInventory/logs/

############################ ORACLE DECONFIG TOOL START ############################

####################################################################################################################
## [START] Install check configuration ##
Checking for existence of the Oracle home location /oracle/TEN/18.0.0
Oracle Home type selected for deinstall is: Oracle Single Instance Database
Oracle Base selected for deinstall is: /oracle/TEN
Checking for existence of central inventory location /oracle/oraInventory

## [END] Install check configuration ##

Network Configuration check config START
Network de-configuration trace file location: /oracle/oraInventory/logs/netdc_check2019-07-19_02-39-23PM.log
Specify all Single Instance listeners that are to be de-configured. Enter .(dot) to deselect all. [LISTENER]:

Network Configuration check config END

Database Check Configuration START
Database de-configuration trace file location: /oracle/oraInventory/logs/databasedc_check2019-07-19_02-39-23PM.log
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

####################################################################################################################
## [START] Install check configuration ##
Checking for existence of the Oracle home location /oracle/TEN/18.0.0
Oracle Home type selected for deinstall is: Oracle Single Instance Database
Oracle Base selected for deinstall is: /oracle/TEN
Checking for existence of central inventory location /oracle/oraInventory

## [END] Install check configuration ##

Network Configuration check config START
Network de-configuration trace file location: /oracle/oraInventory/logs/netdc_check2019-07-19_02-39-23PM.log
Specify all Single Instance listeners that are to be de-configured. Enter .(dot) to deselect all. [LISTENER]:

Network Configuration check config END

Database Check Configuration START
Database de-configuration trace file location: /oracle/oraInventory/logs/databasedc_check2019-07-19_02-39-23PM.log
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

####################################################################################################################
## [START] Install check configuration ##
Checking for existence of the Oracle home location /oracle/TEN/18.0.0
Oracle Home type selected for deinstall is: Oracle Single Instance Database
Oracle Base selected for deinstall is: /oracle/TEN
Checking for existence of central inventory location /oracle/oraInventory

## [END] Install check configuration ##

Network Configuration check config START
Network de-configuration trace file location: /oracle/oraInventory/logs/netdc_check2019-07-19_02-39-23PM.log
Specify all Single Instance listeners that are to be de-configured. Enter .(dot) to deselect all. [LISTENER]:

Network Configuration check config END

Database Check Configuration START
Database de-configuration trace file location: /oracle/oraInventory/logs/databasedc_check2019-07-19_02-39-23PM.log
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

####################################################################################################################
Any error messages from this session will be written to: '/oracle/oraInventory/logs/deinstall_deconfig2019-07-19_02-39-16-PM.err'

################ ORACLE DECONFIG TOOL END ##############
[oracle@multitenant deinstall]$ ./deinstall
Checking for required files and bootstrapping ...
Please wait ...
Location of logs /oracle/oraInventory/logs/

################# ORACLE DECONFIG TOOL START #################

###################################################################
# [START] Install check configuration #
Checking for existence of the Oracle home location /oracle/TEN/18.0.0
Oracle Home type selected for deinstall is: Oracle Single Instance Database
Oracle Base selected for deinstall is: /oracle/TEN
Checking for existence of central inventory location /oracle/oraInventory
# [END] Install check configuration #

Network Configuration check config START
Network de-configuration trace file location: /oracle/oraInventory/logs/netdc_check2019-07-19_02-41-19PM.log
Specify all Single Instance listeners that are to be de-configured. Enter .(dot) to deselect all [LISTENER]:
Network Configuration check config END

Database Check Configuration START
Database de-configuration trace file location: /oracle/oraInventory/logs/databasedc_check2019-07-19_02-41-19PM.log
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

###################################################################
# DECONFIG CHECK OPERATION END ###################################

###################################################################
# DECONFIG CHECK OPERATION SUMMARY ################################
Oracle Home selected for deinstall is: /oracle/TEN/18.0.0
Inventory Location where the Oracle home registered is: /oracle/oraInventory
Following Single Instance listener(s) will be de-configured: LISTENER
Do you want to continue (y - yes, n - no)? [n]: y
A log of this session will be written to: '/oracle/oraInventory/logs/deinstall_deconfig2019-07-19_02-41-15-PM.out'
Any error messages from this session will be written to: '/oracle/oraInventory/logs/deinstall_deconfig2019-07-19_02-41-15-PM.err'

###################################################################
# DECONFIG CLEAN OPERATION START ##################################
Database de-configuration trace file location: /oracle/oraInventory/logs/databasedc_clean2019-07-19_02-41-19PM.log

Network Configuration clean config START
Network de-configuration trace file location: /oracle/oraInventory/logs/netdc_clean2019-07-19_02-41-19PM.log
De-configuring Single Instance listener(s): LISTENER

De-configuring listener: LISTENER
Stopping listener: LISTENER
Listener stopped successfully.
Deleting listener: LISTENER
Listener deleted successfully.
Listener de-configured successfully.

De-configuring Listener configuration file...
Listener configuration file de-configured successfully.

De-configuring Naming Methods configuration file...
Naming Methods configuration file de-configured successfully.

De-configuring Local Net Service Names configuration file...
Local Net Service Names configuration file de-configured successfully.

De-configuring backup files...
Backup files de-configured successfully.

The network configuration has been cleaned up successfully.

Network Configuration clean config END

##########################################################################
# DECONFIG CLEAN OPERATION END #
##########################################################################

##########################################################################
# DECONFIG CLEAN OPERATION SUMMARY #
##########################################################################
Following Single Instance listener(s) were de-configured successfully: LISTENER
##########################################################################

##########################################################################
# ORACLE DECONFIG TOOL END #
##########################################################################

Location of logs /oracle/oraInventory/logs/

##########################################################################
# ORACLE DEINSTALL TOOL START #
##########################################################################

##########################################################################
# DEINSTALL CHECK OPERATION SUMMARY #
##########################################################################
A log of this session will be written to: '/oracle/oraInventory/logs/deinstall_deconfig2019-07-19_02-41-15-PM.out'
Any error messages from this session will be written to: '/oracle/oraInventory/logs/deinstall_deconfig2019-07-19_02-41-15-PM.err'

##########################################################################
# DEINSTALL CLEAN OPERATION START #
##########################################################################

### START Preparing for Deinstall ###
Setting LOCAL_NODE to multitenant
Setting CRS_HOME to false
Setting oracle.installer.invPtrLoc to /tmp/deinstall2019-07-19_02-40-56PM/oraInst.loc
Setting oracle.installer.local to false
Preparing for Deinstall

Setting the force flag to false
Setting the force flag to cleanup the Oracle Base
Oracle Universal Installer clean START

Detach Oracle home '/oracle/TEN/18.0.0' from the central inventory on the local node : Done

Delete directory '/oracle/TEN/18.0.0' on the local node : Done

The Oracle Base directory '/oracle/TEN' will not be removed on local node. The directory is in use by Oracle Home '/oracle/TEN/19.0.0'.

Oracle Universal Installer cleanup was successful.
Oracle Universal Installer clean END

Oracle install clean START
Oracle install clean END

DEINSTALL CLEAN OPERATION END

DEINSTALL CLEAN OPERATION SUMMARY

Run '/oracle/TEN/tfa/multitenant/tfa_home/bin/tfactl uninstall' as root to uninstall tfa.
Successfully detached Oracle home '/oracle/TEN/18.0.0' from the central inventory on the local node.
Successfully deleted directory '/oracle/TEN/18.0.0' on the local node.
Oracle Universal Installer cleanup was successful.

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

DEINSTALL CLEAN OPERATION SUMMARY

ORACLE DEINSTALL TOOL END

5.18. Remove Link to Old Oracle Home

```
[oracle@multitenant TEN]$ pwd
/oracle/TEN
[oracle@multitenant TEN]$ ls -al | grep 18.0.0
lrwxrwxrwx 1 oracle oinstall 6 Feb 15 10:28 18 -> 18.0.0
[oracle@multitenant TEN]$ rm 18
```

5.19. Start SAP System

```
multitenant:tenadm 80> startsap -r3
```