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MIGRACION A MULTITENANT

Abstract:

La nueva arquitectura multitenant a partir de la versión 12c ha mostrado tener numerosas ventajas respecto de la arquitectura tradicional y promete facilitar tareas largas y complejas como parchados y clonaciones de base de datos. El presente documento aborda uno de los casos más comunes y es la migración desde 11g hasta multitenant.

Desarrollo:

El proceso de llevar una base de datos desde una versión anterior a una nueva suele ser extenso y por tanto muy expuesto a errores durante el proceso. En particular llegar a Multitenant implica pasos adicionales que deben ser realizados adecuadamente para alcanzar el resultado esperado. A continuación encontrarán un caso de laboratorio donde he tratado de poner problemas que comúnmente se enfrentarán en este proceso.

UPGRADE DE BD 11G Y CONVERSION A PDB

Para este escenario se instala 11g y se crea la BD nocdb. La misma es luego migrada con el dbua de la siguiente forma:



Database Upgrade Assistant 12.1.0.2.0 - Upgrade Oracle Database - Step 2 of 11

Select Database

Source Database Oracle Home: /u01/app/oracle/product/11.2.0/dbhome_1

Source Database Version: 11.2.0.4.0

Select Database.

Select	Name/SID	Status	Type
<input checked="" type="radio"/>	nocdb	↑ Up	Single Instance

Database Upgrade Assistant 12.1.0.2.0 - Upgrade Oracle Database - Step 3 of 11

Prerequisite Checks

Validation Results

Check Again Fix & Check Again Show Warnings and Errors Show All Containers

Validation	Severity	Fixable
Pre Upgrade Utility Checks		
The database has components which will not be upgraded.	Info	
APEX_UPGRADE_MSG	Info	
EM repository exists	Info	

Database Upgrade Assistant 12.1.0.2.0 - Upgrade Oracle Database - Step 4 of 11

Upgrade Options

Upgrade Options Custom SQL Scripts

Select Upgrade Parallelism: 4

Recompile Invalid Objects During Post Upgrade

Select Recompilation Parallelism: 1

Upgrade Timezone Data

Gather Statistics Before Upgrade

Set User Tablespaces to Read Only During the Upgrade

Diagnostic Destination: /u01/app/oracle Browse...

Audit File Destination: /u01/app/oracle/admin/nocdb/adump Browse...

Database Upgrade Assistant 12.1.0.2.0 - Upgrade Oracle Database - Step 5 of 11

Management Options

ORACLE DATABASE 12^c

Select Operation
 Select Database
 Prerequisite Checks
 Upgrade Options
Management Options
 Move Database Files
 Network Configuration
 Recovery Options
 Summary
 Progress
 Results

Specify the management options for the database.

Configure Enterprise Manager (EM) Database Express
 EM Database Express Port: 5501

Register with Enterprise Manager (EM) Cloud Control

OMS Host:
 OMS Port:
 EM Admin Username:
 EM Admin Password:
 DBSNMP User Password:

Database Upgrade Assistant 12.1.0.2.0 - Upgrade Oracle Database - Step 6 of 11

Move Database Files

ORACLE DATABASE 12^c

Select Operation
 Select Database
 Prerequisite Checks
 Upgrade Options
 Management Options
Move Database Files
 Network Configuration
 Recovery Options
 Summary
 Progress
 Results

Move Database Files as Part of Upgrade
 Storage Type: File System


Use Common Location for All Database Files
 Files Location: /u01/app/oracle/oradata
 Use Oracle Managed Files

Use a Mapping File to Specify Location of Database Files
 Mapping File: /u01/app/oracle/cfgtoollogs/dbua/nocdb/upgrade1/mapfile.txt

Move Fast Recovery Area as Part of Upgrade
 Storage Type: File System
 Fast Recovery Area Location: /u01/app/oracle/fast_recovery_area
 Fast Recovery Area Size: 4320 MB

Database Upgrade Assistant 12.1.0.2.0 - Upgrade Oracle Database - Step 7 of 11

Network Configuration



- [Select Operation](#)
- [Select Database](#)
- [Prerequisite Checks](#)
- [Upgrade Options](#)
- [Management Options](#)
- [Move Database Files](#)
- [Network Configuration](#)**
- [Recovery Options](#)
- [Summary](#)
- [Progress](#)
- [Results](#)

Listener Selection

Select the listeners to which this database needs to be registered. If any of the selected listeners are from source Oracle home, they will be migrated and restarted in target Oracle home.

Select Listeners.

Select	Name	Port	Oracle Home	Status	Migrate

Create a New Listener


Listener Name:

Listener Port:

Target Oracle Home: /u01/app/oracle/product/12.1.0/dbhome_2

Database Upgrade Assistant 12.1.0.2.0 - Upgrade Oracle Database - Step 8 of 11

Recovery Options



- [Select Operation](#)
- [Select Database](#)
- [Prerequisite Checks](#)
- [Upgrade Options](#)
- [Management Options](#)
- [Move Database Files](#)
- [Network Configuration](#)
- [Recovery Options](#)**
- [Summary](#)
- [Progress](#)
- [Results](#)

Select an option to recover the database in case of upgrade failure.

Use RMAN Backup

Create a New Offline RMAN Backup

Backup Location:

Use Latest Available RMAN Backup

Latest RMAN Backup Timestamp: N/A

Use Flashback and Guaranteed Restore Point

Create a New Guaranteed Restore Point

Use Available Guaranteed Restore Point:

I have my own backup and restore strategy

Database Upgrade Assistant 12.1.0.2.0 - Upgrade Oracle Database - Step 9 of 11

ORACLE DATABASE 12^c

Summary

- Select Operation
- Select Database
- Prerequisite Checks
- Upgrade Options
- Management Options
- Move Database Files
- Network Configuration
- Recovery Options
- Summary**
- Progress
- Results

Database Upgrade Summary

- Source Database**
 - Name : nocdb [Edit]
 - Release : 11.2.0.4.0
 - Oracle Home : /u01/app/oracle/product/11.2.0/dbhome_1 [Edit]
- Target Database**
 - Name : nocdb
 - Release : 12.1.0.2.0
 - Oracle Home : /u01/app/oracle/product/12.1.0/dbhome_2
- Pre-Upgrade Checks**
 - Warnings: Database is using an old time zone file version: [Edit]
 - Warnings: The database has components which will not be upgraded: [Edit]
 - Warnings: Oracle Application Express (APEX) can be manually upgraded prior to database up
- Initialization Parameter changes**
 - Name: pga_aggregate_limit; Value: 2147483648: [Edit]
 - Name: processes; Old Value: 150; New Value: 300: [Edit]
 - Name: local_listener; Value: LISTENER_NOCDB: [Edit]

Database Upgrade Assistant 12.1.0.2.0 - Upgrade Oracle Database - Step 10 of 11

ORACLE DATABASE 12^c

Progress

- Select Operation
- Select Database
- Prerequisite Checks
- Upgrade Options
- Management Options
- Move Database Files
- Network Configuration
- Recovery Options
- Summary
- Progress**
- Results

Progress

Upgrade is complete. Click "Upgrade Results" to see the results of the upgrade.

100%

Upgrading database nocdb from Oracle Database release 11.2.0.4.0 (/u01/app/oracle/product/11.2.0/dbhome_1) to Oracle Database release 12.1.0.2.0 (/u01/app/oracle/product/12.1.0/dbhome_2).

	Steps	Time	Status
✓	Pre Upgrade Steps	0:0:13	Finished
✓	Database Upgrade Steps	0:47:9	Finished
✓	Post Upgrade Steps	0:5:38	Finished
✓	Generate Summary	0:0:10	Finished

El siguiente paso es convertir la base de datos nocdb a una pdb. Los pasos desarrollados son:
[oracle@ocm1 dbs]\$. oraenv

```
ORACLE_SID = [orcl] ? nocdb
The Oracle base remains unchanged with value /u01/app/oracle
[oracle@ocml dbs]$ echo $ORACLE_HOME
/u01/app/oracle/product/12.1.0/dbhome_2
[oracle@ocml dbs]$ sqlplus / as sysdba
```

SQL*Plus: Release 12.1.0.2.0 Production on Thu Jul 19 13:47:10 2018

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Connected to:
Oracle Database 12c Enterprise Edition Release 12.1.0.2.0 - 64bit Production
With the Partitioning, OLAP, Advanced Analytics and Real Application Testing options

```
SQL> shutdown immediate
Database closed.
Database dismounted.
ORACLE instance shut down.
SQL> startup open read only
ORACLE instance started.
```

```
Total System Global Area 1073741824 bytes
Fixed Size 2932632 bytes
Variable Size 377487464 bytes
Database Buffers 687865856 bytes
Redo Buffers 5455872 bytes
Database mounted.
Database opened.
SQL> exec dbms_pdb.describe('/tmp/nocdb.xml')
```

PL/SQL procedure successfully completed.

```
SQL> shutdown immediate
Database closed.
Database dismounted.
ORACLE instance shut down.
SQL> Disconnected from Oracle Database 12c Enterprise Edition Release 12.1.0.2.0 - 64bit
Production
With the Partitioning, OLAP, Advanced Analytics and Real Application Testing options
[oracle@ocml dbs]$ . oraenv
ORACLE_SID = [nocdb] ? orcl
The Oracle base remains unchanged with value /u01/app/oracle
[oracle@ocml dbs]$ sqlplus / as sysdba
```

SQL*Plus: Release 12.1.0.2.0 Production on Thu Jul 19 13:50:50 2018

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Connected to:
Oracle Database 12c Enterprise Edition Release 12.1.0.2.0 - 64bit Production
With the Partitioning, OLAP, Advanced Analytics and Real Application Testing options

```
SQL> create pluggable database from11g using '/tmp/nocdb.xml';
```

Pluggable database created.

```
SQL> alter session set container=from11g;
```

Session altered.

```
SQL> @?/rdbms/admin/noncdb_to_pdb
...
SQL> DECLARE
2   threads pls_integer := &&1;
3   BEGIN
4   utl_recomp.recomp_parallel(threads);
```

```
5 END;
6 /
DECLARE
*
ERROR at line 1:
ORA-04045: errors during recompilation/revalidation of SYS.DBMS_QOPATCH
ORA-00600: internal error code, arguments: [kql_tab_diana:new dep],
[0x0DF671288], [0x7F45D773D0F8], [1], [2], [], [], [], [], [], [], []
ORA-06512: at "SYS.DBMS_UTILITY", line 1294
ORA-06512: at line 1
```

Este error está documentado con el caso

While Running noncdbtopdb.sql ORA-00600:[kql_tab_diana:new dep]/ORA-04045:SYS.DBMS_QOPATCH (Doc ID 2113187.1)

Aplicando la solución descrita tenemos:

```
[oracle@ocml ~]$ sqlplus / as sysdba

SQL*Plus: Release 12.1.0.2.0 Production on Thu Jul 19 15:38:56 2018

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Connected to:
Oracle Database 12c Enterprise Edition Release 12.1.0.2.0 - 64bit Production
With the Partitioning, OLAP, Advanced Analytics and Real Application Testing options

SQL> Create table backup as select * from SYS.REGISTRY$SQLPATCH;

Table created.

SQL> drop table registry$sqlpatch;

Table dropped.

SQL> @?/rdbms/admin/catsqlreg.sql

Session altered.

Table created.

View created.

Synonym created.

Grant succeeded.

PL/SQL procedure successfully completed.

Grant succeeded.

Synonym created.

Session altered.

SQL> desc SYS.REGISTRY$SQLPATCH
Name                                         Null?    Type
```

```

-----
PATCH_ID                NOT NULL NUMBER
ACTION                   NOT NULL VARCHAR2(15)
ACTION_TIME              NOT NULL TIMESTAMP(6)
DESCRIPTION               VARCHAR2(100)
LOGFILE                  VARCHAR2(500)
STATUS                   VARCHAR2(15)
VERSION                  NOT NULL VARCHAR2(20)
PATCH_UID               NOT NULL NUMBER
FLAGS                    VARCHAR2(10)
BUNDLE_SERIES            VARCHAR2(30)
BUNDLE_ID                NUMBER
BUNDLE_DATA              CLOB

```

```
SQL> SHOW PDBS
```

```

-----
CON_ID CON_NAME          OPEN MODE RESTRICTED
-----
      2 PDB$SEED          READ ONLY NO
      3 PDB1              READ WRITE NO
      4 PDB2              READ WRITE NO
      5 FROM11G          READ WRITE YES

```

```
SQL> alter pluggable database from11g close immediate;
```

Pluggable database altered.

```
SQL> alter pluggable database from11g open;
```

Warning: PDB altered with errors.

Se observa que la base de datos está abierta en modo RESTRICTED. En el alert se observan los siguientes mensajes:

```

alter pluggable database from11g open
Thu Jul 19 19:40:15 2018
Database Characterset for FROM11G is WE8MSWIN1252
*****
WARNING: Pluggable Database FROM11G with pdb id - 5 is
        altered with errors or warnings. Please look into
        PDB_PLUG_IN_VIOLATIONS view for more details.
*****
Opening pdb FROM11G (5) with no Resource Manager plan active
Pluggable database FROM11G opened read write
Completed: alter pluggable database from11g open

```

En la vista PDB_PLUG_IN_VIOLATIONS tenemos:

```
select * from pdb_plug_in_violations;
```

TIME	NAME	CAUSE	TYPE	ERROR_NUMBER	LINE	MESSAGE	STATUS	ACTION
18-JUL-18 08.28.12.444927000	PM PDB1	Parameter	WARNING	0	1	CDR parameter sga_target mismatch: Previous 1G Current 2400M	RESOLVED	Please check the parameter in the cur
18-JUL-18 08.28.12.444927000	PM PDB1	Parameter	WARNING	0	2	CDR parameter db_lost_write_protect mismatch: Previous 'FULL' Current 'NONE'	RESOLVED	Please check the parameter in the cur
18-JUL-18 08.28.12.444927000	PM PDB1	Parameter	WARNING	0	3	CDR parameter db_block_checking mismatch: Previous 'TRUE' Current 'FALSE'	RESOLVED	Please check the parameter in the cur
18-JUL-18 08.28.12.444927000	PM PDB1	Parameter	WARNING	0	4	CDR parameter pga_aggregate_target mismatch: Previous 790M Current 798M	RESOLVED	Please check the parameter in the cur
19-JUL-18 01.55.54.830444000	PM FROM11G	Parameter	WARNING	0	1	CDR parameter sga_target mismatch: Previous 1G Current 2400M	RESOLVED	Please check the parameter in the cur
19-JUL-18 01.55.54.830444000	PM FROM11G	Parameter	WARNING	0	2	CDR parameter compatible mismatch: Previous '11.2.0.4.0' Current '12.1.0.2.0'	RESOLVED	Please check the parameter in the cur
19-JUL-18 03.55.12.576423000	PM FROM11G	Non-CDB to PDB	ERROR	0	1	PDB plugged in is a non-CDB, requires noncdb_to_pdb.sql be run.	RESOLVED	Run noncdb_to_pdb.sql.
19-JUL-18 07.40.15.120323000	PM FROM11G	OPTION	WARNING	0	1	Database option DV mismatch: PDB installed version NULL. CDB installed version 12.1.0.2.0.	PENDING	Fix the database option in the PDB or
19-JUL-18 07.40.15.121138000	PM FROM11G	OPTION	WARNING	0	2	Database option OLS mismatch: PDB installed version NULL. CDB installed version 12.1.0.2.0.	PENDING	Fix the database option in the PDB or
19-JUL-18 07.40.15.186184000	PM FROM11G	SQL Patch	ERROR	0	1	PSU bundle patch 160419 (Database Patch Set Update : 12.1.0.2.160419 (22291127)); Insta...	PENDING	Call datapatch to install in the PDB
19-JUL-18 07.40.15.188704000	PM FROM11G	SQL Patch	ERROR	0	2	SQL patch ID/UID 22674709/20057886 (Database PSU 12.1.0.2.160419, Oracle JavaVM Compone...	PENDING	Call datapatch to install in the PDB

Esta vista muestra todo desde el primer plugin. Hay que centrarse en ver particularmente lo de la BD FROM11G y cuyo *status* sea PENDING. En este caso se identifican 4 problemas:

- Database Vault no esta en FROM11G.
- Label Security no esta en FROM11G.
- Los parches que se instalaron en el 2do HOME hay que aplicarlos a la PDB.

Solucionando uno a la vez tenemos:

- **CASOS DATABASE VAULT & LABEL SECURITY NO ESTAN EN FROM11G.**
Estos dos casos pueden ser ignorados. En TYPE justo se muestra como WARNING y es normal que una PDB tenga opciones distintas que la CDB. Lo contrario no es posible. La CDB debe tener todas la opciones que tengan las PDBs.
- **CASO DE PARCHES NO INSTALADOS EN PDB.**

Estos casos se muestran como ERROR y por tanto no pueden ser ignorados. Se requiere ejecutar el datapatch. Los pasos dados son:

```
[oracle@ocm1 dmu]$ /u01/app/oracle/product/12.1.0/dbhome_2/OPatch/datapatch -verbose
SQL Patching tool version 12.1.0.2.0 on Thu Jul 19 22:15:35 2018
Copyright (c) 2015, Oracle. All rights reserved.
```

Log file for this invocation:

```
/u01/app/oracle/cfgtoollogs/sqlpatch/sqlpatch_10515_2018_07_19_22_15_35/sqlpatch_invocation.log
```

Connecting to database...OK

Note: Datapatch will only apply or rollback SQL fixes for PDBs that are in an open state, no patches will be applied to closed PDBs. Please refer to Note: Datapatch: Database 12c Post Patch SQL Automation (Doc ID 1585822.1)

Bootstrapping registry and package to current versions...done
Determining current state...done

Current state of SQL patches:

Patch 22674709 (Database PSU 12.1.0.2.160419, Oracle JavaVM Component (Apr2016)):

Installed in binary and FROM11G

Bundle series PSU:

ID 160419 in the binary registry and ID 160419 in PDB FROM11G

Adding patches to installation queue and performing prereq checks...

Installation queue:

For the following PDBs: CDB\$ROOT PDB\$SEED PDB1 PDB2

Nothing to roll back

The following patches will be applied:

22674709 (Database PSU 12.1.0.2.160419, Oracle JavaVM Component (Apr2016))

22291127 (Database Patch Set Update : 12.1.0.2.160419 (22291127))

For the following PDBs: FROM11G

Nothing to roll back

Nothing to apply

Error: prereq checks failed!

**patch 22674709: The pluggable databases that need to be patched must be in upgrade mode
Prereq check failed, exiting without installing any patches.**

Please refer to MOS Note 1609718.1 and/or the invocation log

```
/u01/app/oracle/cfgtoollogs/sqlpatch/sqlpatch_10515_2018_07_19_22_15_35/sqlpatch_invocation.log
```

for information on how to resolve the above errors.

SQL Patching tool complete on Thu Jul 19 22:16:30 2018

El error generado por datapatch indica que la base de datos debe estar en modo upgrade, lo que se hace a continuación:

```
[oracle@ocm1 dmu]$ sqlplus / as sysdba
```

```
SQL*Plus: Release 12.1.0.2.0 Production on Thu Jul 19 22:20:42 2018
```

```
Copyright (c) 1982, 2014, Oracle. All rights reserved.
```

Connected to:

Oracle Database 12c Enterprise Edition Release 12.1.0.2.0 - 64bit Production
With the Partitioning, OLAP, Advanced Analytics and Real Application Testing options

```
SQL> shutdown immediate
```

```
Database closed.
Database dismounted.
ORACLE instance shut down.
SQL> startup upgrade
ORACLE instance started.
```

```
Total System Global Area 2516582400 bytes
Fixed Size                  2927528 bytes
Variable Size               671089752 bytes
Database Buffers           1828716544 bytes
Redo Buffers                13848576 bytes
Database mounted.
Database opened.
SQL> show pdbs
```

CON_ID	CON_NAME	OPEN MODE	RESTRICTED
2	PDB\$SEED	MIGRATE	YES
3	PDB1	MOUNTED	
4	PDB2	MOUNTED	
5	FROM11G	MOUNTED	

```
SQL> alter pluggable database all open upgrade;
```

```
Pluggable database altered.
```

```
SQL> show pdbs
```

CON_ID	CON_NAME	OPEN MODE	RESTRICTED
2	PDB\$SEED	MIGRATE	YES
3	PDB1	MIGRATE	YES
4	PDB2	MIGRATE	YES
5	FROM11G	MIGRATE	YES

```
SQL> Disconnected from Oracle Database 12c Enterprise Edition Release 12.1.0.2.0 -
64bit Production
```

```
With the Partitioning, OLAP, Advanced Analytics and Real Application Testing options
```

```
[oracle@ocml dmu]$ /u01/app/oracle/product/12.1.0/dbhome_2/OPatch/datapatch -verbose
```

```
SQL Patching tool version 12.1.0.2.0 on Thu Jul 19 22:21:54 2018
```

```
Copyright (c) 2015, Oracle. All rights reserved.
```

```
Log file for this invocation:
```

```
/u01/app/oracle/cfgtoollogs/sqlpatch/sqlpatch_13121_2018_07_19_22_21_54/sqlpatch_invoca
tion.log
```

```
Connecting to database...OK
```

```
Note: Datapatch will only apply or rollback SQL fixes for PDBs
```

```
that are in an open state, no patches will be applied to closed PDBs.
```

```
Please refer to Note: Datapatch: Database 12c Post Patch SQL Automation
```

```
(Doc ID 1585822.1)
```

```
Bootstrapping registry and package to current versions...done
```

```
Determining current state...done
```

```
Current state of SQL patches:
```

```
Patch 22674709 (Database PSU 12.1.0.2.160419, Oracle JavaVM Component (Apr2016)):
```

```
Installed in binary and FROM11G
```

```
Bundle series PSU:
```

```
ID 160419 in the binary registry and ID 160419 in PDB FROM11G
```

```
Adding patches to installation queue and performing prereq checks...
```

```
Installation queue:
```

```
For the following PDBs: CDB$ROOT PDB$SEED PDB1 PDB2
```

```
Nothing to roll back
```

```
The following patches will be applied:
```

```
22674709 (Database PSU 12.1.0.2.160419, Oracle JavaVM Component (Apr2016))
```

```
22291127 (Database Patch Set Update : 12.1.0.2.160419 (22291127))
```

```
For the following PDBs: FROM11G
```

```
Nothing to roll back
```

```
Nothing to apply
```

```
Installing patches...
Patch installation complete. Total patches installed: 8

Validating logfiles...
Patch 22674709 apply (pdb CDB$ROOT): SUCCESS
logfile:
/u01/app/oracle/cfgtoollogs/sqlpatch/22674709/20057886/22674709_apply_ORCL_CDBROOT_2018
Jul19_22_22_46.log (no errors)
Patch 22291127 apply (pdb CDB$ROOT): SUCCESS
logfile:
/u01/app/oracle/cfgtoollogs/sqlpatch/22291127/19694308/22291127_apply_ORCL_CDBROOT_2018
Jul19_22_22_47.log (no errors)
Patch 22674709 apply (pdb PDB$SEED): SUCCESS
logfile:
/u01/app/oracle/cfgtoollogs/sqlpatch/22674709/20057886/22674709_apply_ORCL_PDBSEED_2018
Jul19_22_23_02.log (no errors)
Patch 22291127 apply (pdb PDB$SEED): SUCCESS
logfile:
/u01/app/oracle/cfgtoollogs/sqlpatch/22291127/19694308/22291127_apply_ORCL_PDBSEED_2018
Jul19_22_23_04.log (no errors)
Patch 22674709 apply (pdb PDB1): SUCCESS
logfile:
/u01/app/oracle/cfgtoollogs/sqlpatch/22674709/20057886/22674709_apply_ORCL_PDB1_2018Jul
19_22_23_02.log (no errors)
Patch 22291127 apply (pdb PDB1): SUCCESS
logfile:
/u01/app/oracle/cfgtoollogs/sqlpatch/22291127/19694308/22291127_apply_ORCL_PDB1_2018Jul
19_22_23_05.log (no errors)
Patch 22674709 apply (pdb PDB2): SUCCESS
logfile:
/u01/app/oracle/cfgtoollogs/sqlpatch/22674709/20057886/22674709_apply_ORCL_PDB2_2018Jul
19_22_23_02.log (no errors)
Patch 22291127 apply (pdb PDB2): SUCCESS
logfile:
/u01/app/oracle/cfgtoollogs/sqlpatch/22291127/19694308/22291127_apply_ORCL_PDB2_2018Jul
19_22_23_04.log (no errors)
SQL Patching tool complete on Thu Jul 19 22:23:16 2018
[oracle@ocml dmuj]$ sqlplus / as sysdba

SQL*Plus: Release 12.1.0.2.0 Production on Thu Jul 19 22:23:35 2018

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Connected to:
Oracle Database 12c Enterprise Edition Release 12.1.0.2.0 - 64bit Production
With the Partitioning, OLAP, Advanced Analytics and Real Application Testing options

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

Total System Global Area 2516582400 bytes
Fixed Size 2927528 bytes
Variable Size 704644184 bytes
Database Buffers 1795162112 bytes
Redo Buffers 13848576 bytes
Database mounted.
Database opened.
SQL> alter pluggable database all open;

Pluggable database altered.

SQL> show pdbs
```

CON_ID	CON_NAME	OPEN	MODE	RESTRICTED
2	PDB\$SEED	READ	ONLY	NO
3	PDB1	READ	WRITE	NO
4	PDB2	READ	WRITE	NO
5	FROM11G	READ	WRITE	NO

Desarrollados los pasos anteriores la información en PDB_PLUG_IN_VIOLATIONS cambia a:

```
select * from pdb_plug_in_violations;
```

Query Result x

SQL | All Rows Fetched: 11 in 0.015 seconds

TIME	NAME	CAUSE	TYPE	ERROR_NUMBER	LINE	MESSAGE	STATUS
18-JUL-18 08.28.12.444927000	PM PDB1	Parameter	WARNING	0	1	CDB parameter sga_target mismatch: Previous 1G Current 2400M	RESOLVED F
18-JUL-18 08.28.12.444927000	PM PDB1	Parameter	WARNING	0	2	CDB parameter db_lost_write_protect mismatch: Previous 'FULL' Current 'NONE'	RESOLVED F
18-JUL-18 08.28.12.444927000	PM PDB1	Parameter	WARNING	0	3	CDB parameter db_block_checking mismatch: Previous 'TRUE' Current 'FALSE'	RESOLVED F
18-JUL-18 08.28.12.444927000	PM PDB1	Parameter	WARNING	0	4	CDB parameter pga_aggregate_target mismatch: Previous 790M Current 798M	RESOLVED F
19-JUL-18 01.55.54.830444000	PM FROM11G	Parameter	WARNING	0	1	CDB parameter sga_target mismatch: Previous 1G Current 2400M	RESOLVED F
19-JUL-18 01.55.54.830444000	PM FROM11G	Parameter	WARNING	0	2	CDB parameter compatible mismatch: Previous '11.2.0.4.0' Current '12.1.0.2.0'	RESOLVED F
19-JUL-18 03.55.12.576423000	PM FROM11G	Non-CDB to PDB	ERROR	0	1	PDB plugged in is a non-CDB, requires noncdb_to_pdb.sql be run.	RESOLVED F
19-JUL-18 09.55.42.177250000	PM FROM11G	OPTION	WARNING	0	1	Database option DV mismatch: PDB installed version NULL. CDB installed version 12.1.0.2.0.	RESOLVED F
19-JUL-18 09.55.42.177250000	PM FROM11G	OPTION	WARNING	0	2	Database option OLS mismatch: PDB installed version NULL. CDB installed version 12.1.0.2.0.	RESOLVED F
19-JUL-18 10.15.28.964453000	PM FROM11G	SQL Patch	ERROR	0	1	PSU bundle patch 160419 (Database Patch Set Update : 12.1.0.2.160419 (22291127)): Insta...	RESOLVED C
19-JUL-18 10.15.28.964453000	PM FROM11G	SQL Patch	ERROR	0	2	SQL patch ID/UID 22674709/20057886 (Database PSU 12.1.0.2.160419, Oracle JavaVM Compone...	RESOLVED C

Se observa que también se resolvió el Warning acerca de DV y OLS. Para ellos se ejecutaron los scripts de instalación correspondientes:

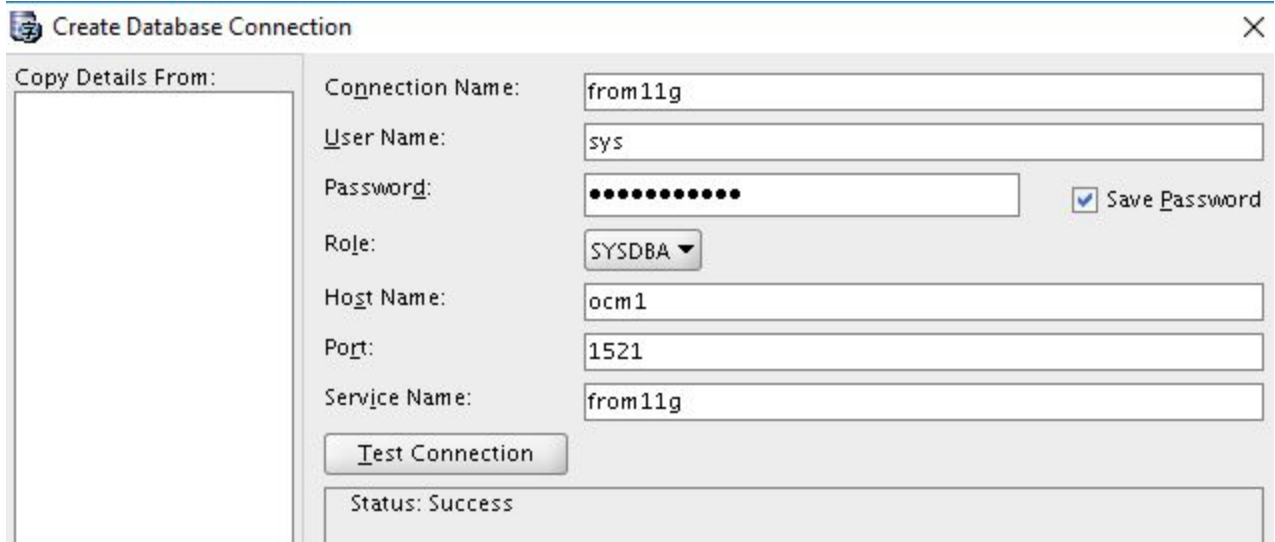
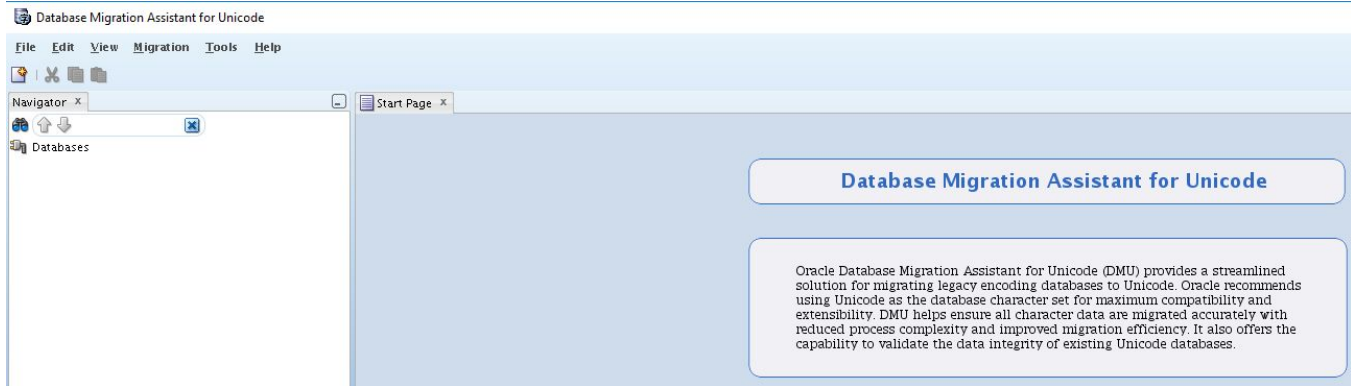
- OLS: @/rdbms/admin/catols.sql
- DV: @/rdbms/admin/catmac.sql (en los parametros puse 1=USERS, 2=TEMP, 3=NULL)

CASO 7 - MIGRACION DE CHARACTER SET

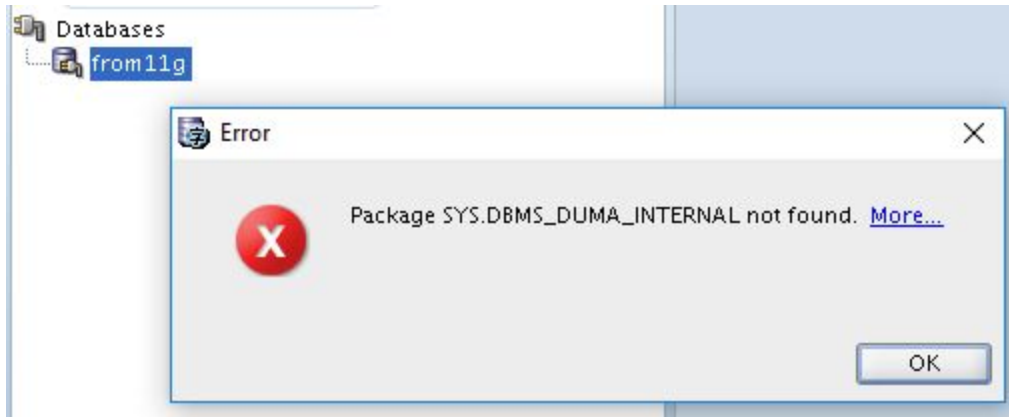
Para esto se usa el Data Migration Utility DMU:

```
[oracle@ocm1 ~]$ . oraenv
ORACLE_SID = [oracle] ? orcl
The Oracle base has been set to /u01/app/oracle
[oracle@ocm1 ~]$ cd $ORACLE_HOME/dmu
[oracle@ocm1 dmU]$ ls
dmu          dmU64.exe  dmUW32.exe  ide         modules     timingframework
dmU32.exe    dmU.sh     dmUW64.exe  jlib        sleepycat
[oracle@ocm1 dmU]$ sh dmU.sh
```

Database Migration Assistant for Unicode
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Al conectarse da el siguiente error:



Click en *more* muestra:

DMU-00004

The SYS.DBMS_DUMA_INTERNAL package is not installed in the connected database.

The script that creates this package is available in \$ORACLE_HOME/rdbms/admin/prvtdumi.plb. (%ORACLE_HOME%\rdbms\admin\prvtdumi.plb on Microsoft Windows). Run the script using SQL*Plus on the database server machine while connected as SYSYDBA:

```
SQL> connect / as sysdba
SQL> @?/rdbms/admin/prvtdumi.plb
```

Se aplica la solución mostrada:

```
SQL> alter session set container=from11g;
```

Session altered.

```
SQL> @?/rdbms/admin/prvtdumi.plb
```

Library created.

Package created.

No errors.

Package body created.

No errors.

De nuevo al conectar muestra:

Repository Configuration Wizard – Select Task

<ul style="list-style-type: none">Select TaskTask DetailsSelect Tablespace	<p>The database character set is WE8MSWIN1252.</p> <p>There is no DMU repository in the database.</p> <p>Select the task you want to perform:</p> <ul style="list-style-type: none"><input checked="" type="radio"/> Install the repository in migration mode<input type="radio"/> Install the repository in validation mode<input type="radio"/> Uninstall the repository
---	--

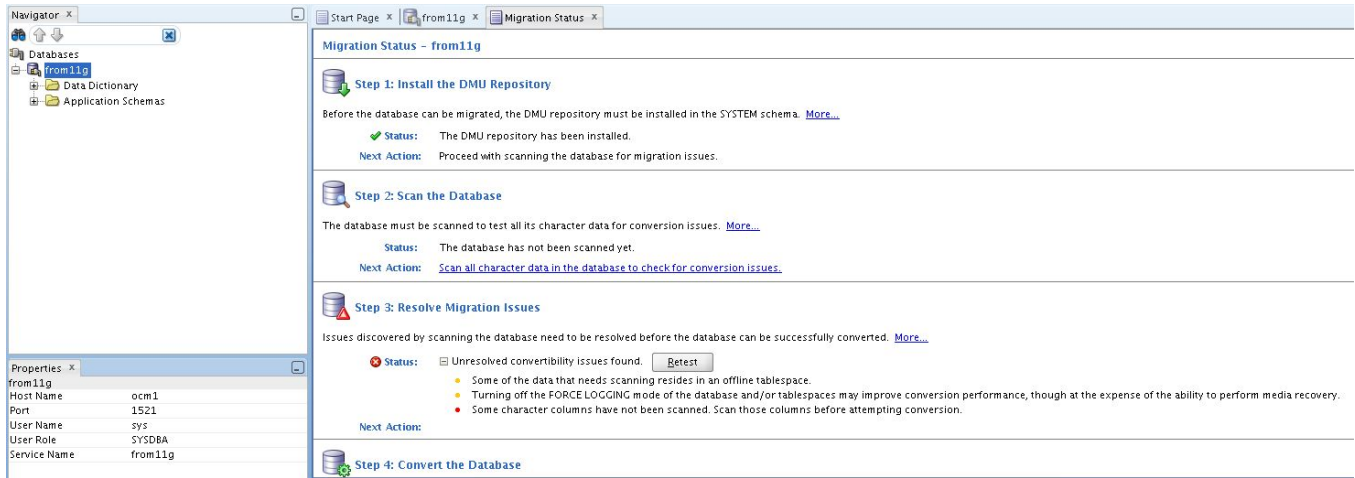
Repository Configuration Wizard – Task Details

<ul style="list-style-type: none">Select TaskTask DetailsSelect Tablespace	<p>The wizard will install the DMU repository in migration mode.</p> <p>Select the target character set for migration:</p> <ul style="list-style-type: none"><input checked="" type="radio"/> AL32UTF8 (recommended)<input type="radio"/> UTF8 (for compatibility only)
---	--

Repository Configuration Wizard – Select Tablespace

<ul style="list-style-type: none">Select TaskTask DetailsSelect Tablespace	<p>The repository will be installed in the SYSTEM schema.</p> <p>It is recommended to install the repository in a tablespace with large free space and the autoextend mode turned on.</p> <p>Select the tablespace in which the repository will be installed:</p> <p><input type="text" value="SYSAUX"/></p> <table><tr><td>Allocated:</td><td>790MB</td></tr><tr><td>Used:</td><td>744MB</td></tr><tr><td>Free:</td><td>45MB</td></tr><tr><td>Block Size:</td><td>8KB</td></tr><tr><td>Autoextend Mode:</td><td>On</td></tr></table>	Allocated:	790MB	Used:	744MB	Free:	45MB	Block Size:	8KB	Autoextend Mode:	On
Allocated:	790MB										
Used:	744MB										
Free:	45MB										
Block Size:	8KB										
Autoextend Mode:	On										

Esto crea el repositorio de forma exitosa y muestra el estado del proceso a desarrollar:



Migration Status - from11g

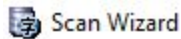
Step 1: Install the DMU Repository
 Before the database can be migrated, the DMU repository must be installed in the SYSTEM schema. [More...](#)
 Status: The DMU repository has been installed.
 Next Action: Proceed with scanning the database for migration issues.

Step 2: Scan the Database
 The database must be scanned to test all its character data for conversion issues. [More...](#)
 Status: The database has not been scanned yet.
 Next Action: [Scan all character data in the database to check for conversion issues.](#)

Step 3: Resolve Migration Issues
 Issues discovered by scanning the database need to be resolved before the database can be successfully converted. [More...](#)
 Status: Unresolved convertibility issues found.
 • Some of the data that needs scanning resides in an offline tablespace.
 • Turning off the FORCELOGGING mode of the database and/or tablespaces may improve conversion performance, though at the expense of the ability to perform media recovery.
 • Some character columns have not been scanned. Scan those columns before attempting conversion.
 Next Action:

Step 4: Convert the Database

El siguiente paso es entonces hacer un SCAN de la base por datos que requieren ser migrados:



Scan Wizard - Welcome

Welcome

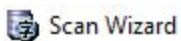
[Scan Parameters](#)

[Objects Selection](#)

[Scan Details](#)

Welcome to the scan wizard.

The wizard allows you to scan character data in the database. The data is searched for issues that could affect the conversion from the current database character set WE8MSWIN1252 to AL32UTF8.



Scan Wizard - Set Parameters

[Welcome](#)

Scan Parameters

[Objects Selection](#)

[Scan Details](#)

Specify the global parameters for database scanning.

The number of scanning processes controls the number of worker threads created by the DMU Client for scanning. Each worker thread establishes a connection to the database and performs a table scan.

The scan buffer size is the byte size of a server-side buffer that each worker thread will allocate for a table scan.

Number of Scanning Processes:

Scan Buffer Size: bytes

Collect rowids only according to 'Rowids to Collect' table property

Collect also rowids for Update Convertible Rows conversion method

Do not collect rowids

The rowid collection setting may be overridden for individual tables on the Scan Details page.

Scan Wizard ✕

Scan Wizard – Select Scan Objects

- Welcome
- [Scan Parameters](#)
- [Objects Selection](#)**
- [Scan Details](#)

Databases

- from11g
 - Data Dictionary
 - Application Schemas
 - APEX_030200
 - APEX_040200
 - APPQOSSYS
 - FLOWS_FILES
 - GSMADMIN_INTERNAL
 - OJVMSYS
 - OLAPSYS
 - ORDDATA
 - OWBSYS
 - SCOTT

Exclude objects with valid scan results and necessary log information: Exclude Scanned

Help < Back Next > Finish Cancel

Scan Wizard ✕

Scan Wizard – Scan Details

- [Welcome](#)
- [Scan Parameters](#)
- [Objects Selection](#)
- [Scan Details](#)**

Table Name	Table Size	Rowids to Collect	Split
SCOTT.DEPT	64 KB	With Issues ▼	
SCOTT.EMP	64 KB	With Issues ▼	
SCOTT.BONUS	0 B	With Issues ▼	

Database Migration Assistant for Unicode

File Edit View Migration Tools Help

Navigator x

- Databases
 - from11g
 - Data Dictionary
 - Application Schemas

Properties x

from11g

Host Name ocm1

Port 1521

User Name sys

User Role SYSDBA

Service Name from11g

Start Page x from11g x Migration Status x Scan Progress x

Scan Progress - from11g

Name	Split	Size	Min ROWID	Max ROWID	Threa...	Start Time	End Time	100%
✓ Total		128.0 KB	--	--	--	2018-07-19 1...	2018-07-19 1...	100%
✓ SCOTT.DEPT		64 KB	--	--	1	2018-07-19 1...	2018-07-19 1...	100%
✓ SCOTT.EMP		64 KB	--	--	1	2018-07-19 1...	2018-07-19 1...	100%
✓ SCOTT.BONUS		0 B	--	--	1	2018-07-19 1...	2018-07-19 1...	100%

Scan Database

The scan is complete, elapsed time: 00:00:01.431. Please see the scan report for details.

OK

Stop

Messages - Log x

```
19:16:28:13:942;P037;I:00001 Disconnected successfully from
jdbc:oracle:thin:@(DESCRIPTION=(ADDRESS=(PROTOCOL=TCP)(HOST=ocm1)(PORT=1521))(CONNECT_DATA=(UR=A)(SERVICE_NAME=from11g))).
```


CASO 8 - CLONACIÓN DE PDB DESDE PDB REMOTO CON DBLINK

La base de datos a clonar es FROM11G. Para ello se realiza la siguiente configuración previo a la clonación:

```
SQL> alter session set container=from11g;
```

Session altered.

```
SQL> create user admin identified by itcabarique;
```

User created.

```
SQL> grant connect, create pluggable database to admin;
```

Grant succeeded.

```
SQL> Disconnected from Oracle Database 12c Enterprise Edition Release 12.1.0.2.0 - 64bit  
Production
```

```
With the Partitioning, OLAP, Advanced Analytics and Real Application Testing options
```

```
[oracle@ocml dmu]$ . oraenv
```

```
ORACLE_SID = [orcl] ? cdb
```

```
The Oracle base remains unchanged with value /u01/app/oracle
```

```
[oracle@ocml dmu]$ tnsping from11g
```

```
TNS Ping Utility for Linux: Version 12.1.0.2.0 - Production on 19-JUL-2018 22:51:44
```

```
Copyright (c) 1997, 2014, Oracle. All rights reserved.
```

```
Used parameter files:
```

```
Used TNSNAMES adapter to resolve the alias
```

```
Attempting to contact (DESCRIPTION = (ADDRESS_LIST = (ADDRESS = (PROTOCOL = TCP) (HOST =
```

```
ocml) (PORT = 1521))) (CONNECT_DATA = (SERVICE_NAME = from11g)))
```

```
OK (10 msec)
```

```
[oracle@ocml dmu]$ sqlplus / as sysdba
```

```
SQL*Plus: Release 12.1.0.2.0 Production on Thu Jul 19 22:51:49 2018
```

```
Copyright (c) 1982, 2014, Oracle. All rights reserved.
```

```
Connected to:
```

```
Oracle Database 12c Enterprise Edition Release 12.1.0.2.0 - 64bit Production
```

```
With the Partitioning, OLAP, Advanced Analytics and Real Application Testing options
```

```
SQL> create database link clonedb connect to admin identified by itcabarique using 'FROM11G';
```

Database link created.

```
SQL> select * from dual@clonedb;
```

```
D
```

```
-
```

```
X
```

Luego se clona así:

```
SQL> create pluggable database pdb1 from from11g@clonedb;
```

Pluggable database created.

```
SQL> show pdba
```

CON_ID	CON_NAME	OPEN	MODE	RESTRICTED
2	PDB\$SEED	READ	ONLY	NO

```

3 PDB1
MOUNTED
SQL> alter pluggable database pdb1 open;

```

Warning: PDB altered with errors.

```
SQL> show pdbs
```

CON_ID	CON_NAME	OPEN	MODE	RESTRICTED
2	PDB\$SEED	READ ONLY		NO
3	PDB1	READ WRITE		YES

El error mostrado es el mismo de antes por causa de falta del parche, esta vez sobre la CDB pues recién se creo para este laboratorio:

```
select * from pdb_plug_in_violations;
```

TIME	NAME	CAUSE	TYPE	ERROR_NUMBER	LINE	MESSAGE
19-JUL-18 10.59.38.346112000	PM PDB1	Parameter	WARNING	0	1	CDB parameter sga_target mismatch: Previous 2400M Current 1G
19-JUL-18 10.59.38.346112000	PM PDB1	Parameter	WARNING	0	2	CDB parameter pga_aggregate_target mismatch: Previous 798M Current 790M
19-JUL-18 10.59.38.424312000	PM PDB1	SQL Patch	ERROR	0	1	PSU bundle patch 160419 (Database Patch Set Update : 12.1.0.2.160419 (22291127)): Installed in the PDB but not in
19-JUL-18 10.59.38.426258000	PM PDB1	SQL Patch	ERROR	0	2	SQL patch ID/UID 22674709/20057886 (Database PSU 12.1.0.2.160419, Oracle JavaVM Component (Apr2016)): Installed in

Dado que es un ERROR, este no puede ser ignorado. Se resuelve igualmente con el datapatch:

```
SQL> show pdbs
```

CON_ID	CON_NAME	OPEN	MODE	RESTRICTED
2	PDB\$SEED	READ ONLY		NO
3	PDB1	READ WRITE		YES

```
SQL> shutdown immediate
```

Database closed.

Database dismounted.

ORACLE instance shut down.

```
SQL> startup upgrade
```

ORACLE instance started.

Total System Global Area 1073741824 bytes

Fixed Size 2932632 bytes

Variable Size 377487464 bytes

Database Buffers 687865856 bytes

Redo Buffers 5455872 bytes

Database mounted.

Database opened.

```
SQL> alter pluggable database all open upgrade;
```

Pluggable database altered.

```
SQL> show pdbs
```

CON_ID	CON_NAME	OPEN	MODE	RESTRICTED
2	PDB\$SEED	MIGRATE		YES
3	PDB1	MIGRATE		YES

```
SQL> Disconnected from Oracle Database 12c Enterprise Edition Release 12.1.0.2.0 - 64bit
Production
```

With the Partitioning, OLAP, Advanced Analytics and Real Application Testing options

```
[oracle@ocml dmu]$ /u01/app/oracle/product/12.1.0/dbhome_2/OPatch/datapatch -verbose
```

```
SQL Patching tool version 12.1.0.2.0 on Thu Jul 19 23:04:49 2018
```

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

Log file for this invocation:

```
/u01/app/oracle/cfgtoollogs/sqlpatch/sqlpatch_18356_2018_07_19_23_04_49/sqlpatch_invocation.log
```

Connecting to database...OK

Note: Datapatch will only apply or rollback SQL fixes for PDBs

that are in an open state, no patches will be applied to closed PDBs.

```
Please refer to Note: Datapatch: Database 12c Post Patch SQL Automation
(Doc ID 1585822.1)
Bootstrapping registry and package to current versions...done
Determining current state...done
```

```
Current state of SQL patches:
Patch 22674709 (Database PSU 12.1.0.2.160419, Oracle JavaVM Component (Apr2016)):
  Installed in binary and PDB1
Bundle series PSU:
  ID 160419 in the binary registry and ID 160419 in PDB PDB1
```

```
Adding patches to installation queue and performing prereq checks...
```

```
Installation queue:
```

```
For the following PDBs: CDB$ROOT PDB$SEED
```

```
Nothing to roll back
```

```
The following patches will be applied:
```

```
22674709 (Database PSU 12.1.0.2.160419, Oracle JavaVM Component (Apr2016))
```

```
22291127 (Database Patch Set Update : 12.1.0.2.160419 (22291127))
```

```
For the following PDBs: PDB1
```

```
Nothing to roll back
```

```
Nothing to apply
```

```
Installing patches...
```

```
Patch installation complete. Total patches installed: 4
```

```
Validating logfiles...
```

```
Patch 22674709 apply (pdb CDB$ROOT): SUCCESS
```

```
logfile:
```

```
/u01/app/oracle/cfgtoollogs/sqlpatch/22674709/20057886/22674709_apply_CDB_CDBROOT_2018Jul19_23_05_42.log (no errors)
```

```
Patch 22291127 apply (pdb CDB$ROOT): SUCCESS
```

```
logfile:
```

```
/u01/app/oracle/cfgtoollogs/sqlpatch/22291127/19694308/22291127_apply_CDB_CDBROOT_2018Jul19_23_05_43.log (no errors)
```

```
Patch 22674709 apply (pdb PDB$SEED): SUCCESS
```

```
logfile:
```

```
/u01/app/oracle/cfgtoollogs/sqlpatch/22674709/20057886/22674709_apply_CDB_PDBSEED_2018Jul19_23_05_56.log (no errors)
```

```
Patch 22291127 apply (pdb PDB$SEED): SUCCESS
```

```
logfile:
```

```
/u01/app/oracle/cfgtoollogs/sqlpatch/22291127/19694308/22291127_apply_CDB_PDBSEED_2018Jul19_23_05_57.log (no errors)
```

```
SQL Patching tool complete on Thu Jul 19 23:06:01 2018
```

```
[oracle@ocml dmu]$ sqlplus / as sysdba
```

```
SQL*Plus: Release 12.1.0.2.0 Production on Thu Jul 19 23:07:05 2018
```

```
Copyright (c) 1982, 2014, Oracle. All rights reserved.
```

```
Connected to:
```

```
Oracle Database 12c Enterprise Edition Release 12.1.0.2.0 - 64bit Production
```

```
With the Partitioning, OLAP, Advanced Analytics and Real Application Testing options
```

```
SQL> shutdown immediate
```

```
Database closed.
```

```
Database dismounted.
```

```
ORACLE instance shut down.
```

```
SQL> startup
```

```
ORACLE instance started.
```

```
Total System Global Area 1073741824 bytes
```

```
Fixed Size 2932632 bytes
```

```
Variable Size 398458984 bytes
```

```
Database Buffers 666894336 bytes
```

```
Redo Buffers 5455872 bytes
```

```
Database mounted.
```

```
Database opened.
```

SQL> **show pdbs**

CON_ID	CON_NAME	OPEN MODE	RESTRICTED
2	PDB\$SEED	READ ONLY	NO
3	PDB1	MOUNTED	

SQL> **alter pluggable database pdb1 open;**

Pluggable database altered.

SQL> **show pdbs**

CON_ID	CON_NAME	OPEN MODE	RESTRICTED
2	PDB\$SEED	READ ONLY	NO
3	PDB1	READ WRITE	NO

select * from pdb_plug_in_violations;

TIME	NAME	CAUSE	TYPE	ERROR_NUMBER	LINE	MESSAGE	STATUS
19-JUL-18 10.59.38.346112000 PM	PDB1	Parameter	WARNING	0	1	CDB parameter sga_target mismatch: Previous 2400M Current 1G	RESOLVED
19-JUL-18 10.59.38.346112000 PM	PDB1	Parameter	WARNING	0	2	CDB parameter pga_aggregate_target mismatch: Previous 798M Cu...	RESOLVED
19-JUL-18 11.04.31.465690000 PM	PDB1	SQL Patch	ERROR	0	1	PSU bundle patch 160419 (Database Patch Set Update : 12.1.0.2...	RESOLVED
19-JUL-18 11.04.31.465690000 PM	PDB1	SQL Patch	ERROR	0	2	SQL patch ID/UID 22674709/20057886 (Database PSU 12.1.0.2.160...	RESOLVED

El status cambio a RESOLVED.

CASO 9 - CREACIÓN DE BD CON DBCA SILENT

```

[oracle@ocm1 dmuj]$ dbca -createDatabase -help
Create a database by specifying the following parameters:
  -createDatabase
      -templateName <name of an existing template in default
location or the complete template path>
      [-cloneTemplate]
      -gdbName <global database name>
      [-ignorePreReqs] <ignore prerequisite checks for current
operation>
      [-sid <database system identifier>]
      [-createAsContainerDatabase <true|false>]
      [-numberOfPDBs <Number of Pluggable databases to be
created, default is 0>]
      [-pdbName <New Pluggable Database Name>]
      [-pdbAdminPassword <PDB Administrator user Password,
required only when creating new PDB>]
      [-sysPassword <SYS user password>]
      [-systemPassword <SYSTEM user password>]
      [-emConfiguration <DBEXPRESS|CENTRAL|BOTH|NONE>]
      -dbsnmpPassword <DBSNMP user password>
      [-omsHost <EM management server host name>]
      -omsPort <EM management server port number>
      -emUser <EM Admin username to add or modify
targets>
      -emPassword <EM Admin user password>
      -emExpressPort <EM Database Express port number>]]
      [-dvConfiguration <true | false Specify "true" to configure
and enable Database Vault
name>
      -dvUserName <Specify Database Vault Owner user
password>
      -dvAccountManagerName <Specify separate Database
Vault Account Manager >
      -dvAccountManagerPassword <Specify Database Vault
Account Manager password>]
      [-olsConfiguration <true | false Specify "true" to configure
and enable Oracle Label Security >]
      [-datafileDestination <destination directory for all database
files.> |
      -datafileNames <a text file containing database objects such as controlfiles,
tablespaces, redo log files and spfile to their corresponding raw device file
names mappings in name=value format.>]
      [-redoLogFileSize <size of each redo log file in megabytes>]
      [-recoveryAreaDestination <destination directory for all
recovery files. Specify "NONE" for disabling Fast Recovery Area.>]
      [-datafileJarLocation <location of the data file jar, used
only for clone database creation>]
      [-storageType < FS | ASM >]
      [-asmsnmpPassword <ASMSNMP password for ASM
monitoring>]
      -diskGroupName <database area disk group name>
      -recoveryGroupName <recovery area disk group
name>
      [-characterSet <character set for the database>]
      [-nationalCharacterSet <national character set for the
database>]
      [-registerWithDirService <true | false>]
      -dirServiceUserName <user name for directory
service>
      -dirServicePassword <password for directory service
>
      -walletPassword <password for database wallet >]
      [-listeners <list of listeners to configure the database
with>]
      [-variablesFile <file name for the variable-value pair for
variables in the template>]]

```



```
[-variables <comma separated list of name=value pairs>]
[-initParams <comma separated list of name=value pairs>]
[-sampleSchema <true | false> ]
[-memoryPercentage <percentage of physical memory for Oracle>]
[-automaticMemoryManagement <true | false> ]
[-totalMemory <memory allocated for Oracle in MB>]
[-databaseType <MULTIPURPOSE|DATA_WAREHOUSING|OLTP>]]
```

```
[oracle@ocml dmu]$ dbca -silent -createDatabase -gdbName silent -databaseType
MULTIPURPOSE -totalMemory 1500 -storageType FS -characterSet we8iso8859p15
-datafileDestination /u01/app/oracle/oradata/silent -recoveryAreaDestination
/u01/app/oracle/fast_recovery_area -sysPassword itcabarique -systemPassword
itcabarique -createAsContainerDatabase true -sid silent -nationalCharacterSet
al32utf8 -automaticMemoryManagement true -redoLogFileSize 100 -templateName
General_Purpose.dbc
Copying database files
1% complete
3% complete
11% complete
18% complete
26% complete
37% complete
Creating and starting Oracle instance
40% complete
45% complete
46% complete
47% complete
52% complete
57% complete
58% complete
59% complete
62% complete
Completing Database Creation
66% complete
70% complete
74% complete
85% complete
96% complete
100% complete
Look at the log file "/u01/app/oracle/cfgtoollogs/dbca/silent/silent.log" for
further details.
```

También se pueden generar los scripts para luego modificarlos. Un ejemplo es:

```
[oracle@ocml dmu]$ dbca -generateScripts -templateName General_Purpose.dbc
-scriptDest /u01/app/oracle/aux -gdbName test -silent
Database creation script generation
1% complete
3% complete
37% complete
40% complete
45% complete
50% complete
55% complete
56% complete
60% complete
62% complete
66% complete
77% complete
88% complete
100% complete
```

Los scripts generados son:

```
[oracle@ocml ~]$ ls /u01/app/oracle/aux/
cloneDBCreation.sql      lockAccount.sql          test.log
CloneRmanRestore.sql    ORCL                      test.sh
EDWK_PITR_PDB1_ORCL     postDBCreation.sql       test.sql
init.ora                 postScripts.sql          YXEG_PITR_PDB1_ORCL
inittestTempOMF.ora     rmanRestoreDatafiles.sql
```

inittestTemp.ora

tempControl.ctl

ARTICULOS DE INTERES

Clonación de PDB locales y remotas

<https://oracle-base.com/articles/12c/multitenant-clone-remote-pdb-or-non-cdb-12cr1>