Hard to Import
The saga continues (Expdp/Impdp)

Anibal Garcia
Senior Oracle Database Administration ,Architect , Consultant
Anibal.Garcia@atos.net

Atos

What Is the story behind scenes

Over 20 years of experience in Oracle , started in 1996.
Vice-President Oracle User group in Guatemala since 2014.

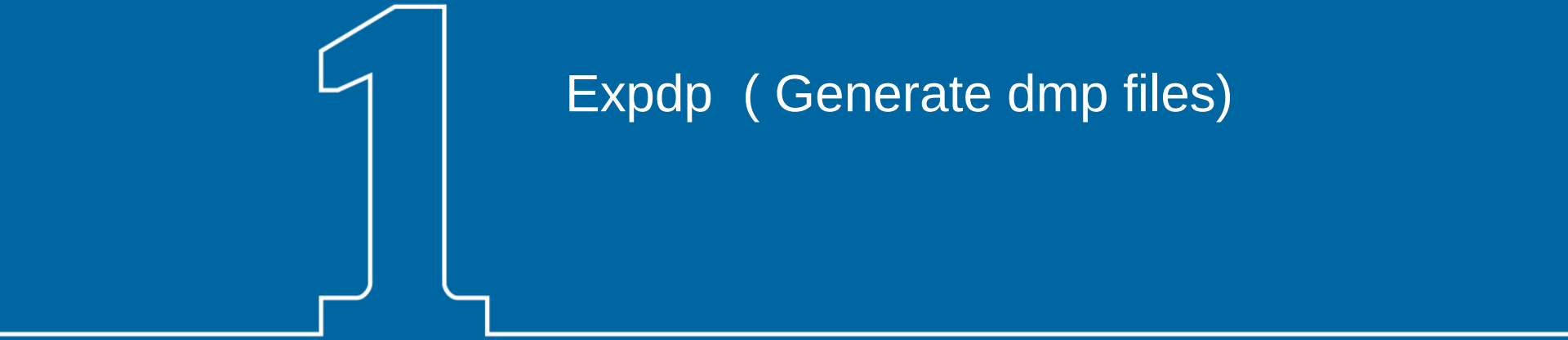
Member of LAOUC (Latin America Oracle User Community) Since 2012
Distinguished Member of
Oracle Hispanic community Latin America
(http://comunidadoraclehispana.ning.com)

Wrote Co-Blog Partner Fernando Garcia –Argentina Oracle Ace
(https://oracleconprecision.wordpress.com/about)

…  ..In summary a self study Person like you

Agenda

- **First round** , tiny space to export and not enough time
  - exclude, compression , distribution, parallel
- **Second Round** , Import data with long column/encryption errors
  - Datapump Concepts
- Tips



Expdp (Generate dmp files)

Expdp in the source
Tiny space to generate .dmp files

Export …

Starting "SYS"."EXP_HUGE_SCHEMA": /******** AS SYSDBA parfile=exp_HugeSchema_Wekend12FEb2012.par
Estimate in progress using BLOCKS method...
Processing object type SCHEMA_EXPORT/TABLE/TABLE_DATA

Total estimation using BLOCKS method: 57.81 GB ← Estimation

df -h | grep work
/dev/mapper/datavg-worklv
60G 35G 25G 59% /work ← Available

Scenario ❶

COMPRESSION=ALL -- Max compression around more than 50%
compression_algorithm=medium or High (Oracle 12c)

FILE=EXPDATA.DMP
LOG=EXPDAT.LOG
exclude=statistics

FLASHBACK_SCN=#####

Expdp in the source
Tiny space to generate .dmp files

If you need to check the detail how much space is used by object

EXPDP ESTIMATE_ONLY =Y

```
Estimate in progress using BLOCKS method...
Processing object type SCHEMA_EXPORT/TABLE/TABLE_DATA
. estimated "KIDAP12"."A"                    9 MB
. estimated "KIDAP12"."DEPT"                 64 KB .
 Total estimation using BLOCKS method: 9.17 MB
```

Restrictions

If the Data Pump export job involves compressed tables, the default size estimation given for the compressed table is inaccurate when ESTIMATE=BLOCKS is used.

This is because the size estimate does not reflect that the data was stored in a compressed form. To get a more accurate size estimate for compressed tables, use EXPDP ESTIMATE=STATISTICS ESTIMATE_ONLY=Y

Expdp in the source
Tiny space to generate .dmp files

The parfile for export look like this

Scenario ❷

```
COMPRESSION=ALL
DUMPFILE=DIR1:expdata%U.dmp, DIR2:expdata%U.dmp , DIR3:expdata%U.dmp ,
DIR4:expdata%U.dmp
LOG=EXPDAT.LOG
exclude=statistics
FILESIZE=2048M
FLASHBACK_SCN=#####
```

(Distribution in Several Directories)

Expdp in the source
Tiny space to generate .dmp files

Run out of space ,you can specify additional data pump locations on the fly.

Export> Add_file= Dir##:Another_dump_file##.dmp

Expdp in the source
Tiny space to generate .dmp files

Scenario ❸

COMPRESSION=ALL
FILE=EXPDATA_%U.DMP
LOG=EXPDAT.LOG
exclude=statistics

FILESIZE=2048M -- Create 2 files at the same time with maxsize 2GB

PARALLEL=2

FLASHBACK_SCN=#####

After create the file 3 and 4, check md5sum on the first two files.

md5sum EXDATA01.dmp
e941f3fd52eda24753ed8988c713a41d EXDATA01.dmp

md5sum EXDATA02.dmp
e5b3857671e4804580e16f306067fb15 EXDATA02.dmp

check if the md5sum don't change means you can proceed to move the .dmp to another location or ftp to destination.

Expdp in the source
Tiny space to generate .dmp files

▶ Scenario ❹

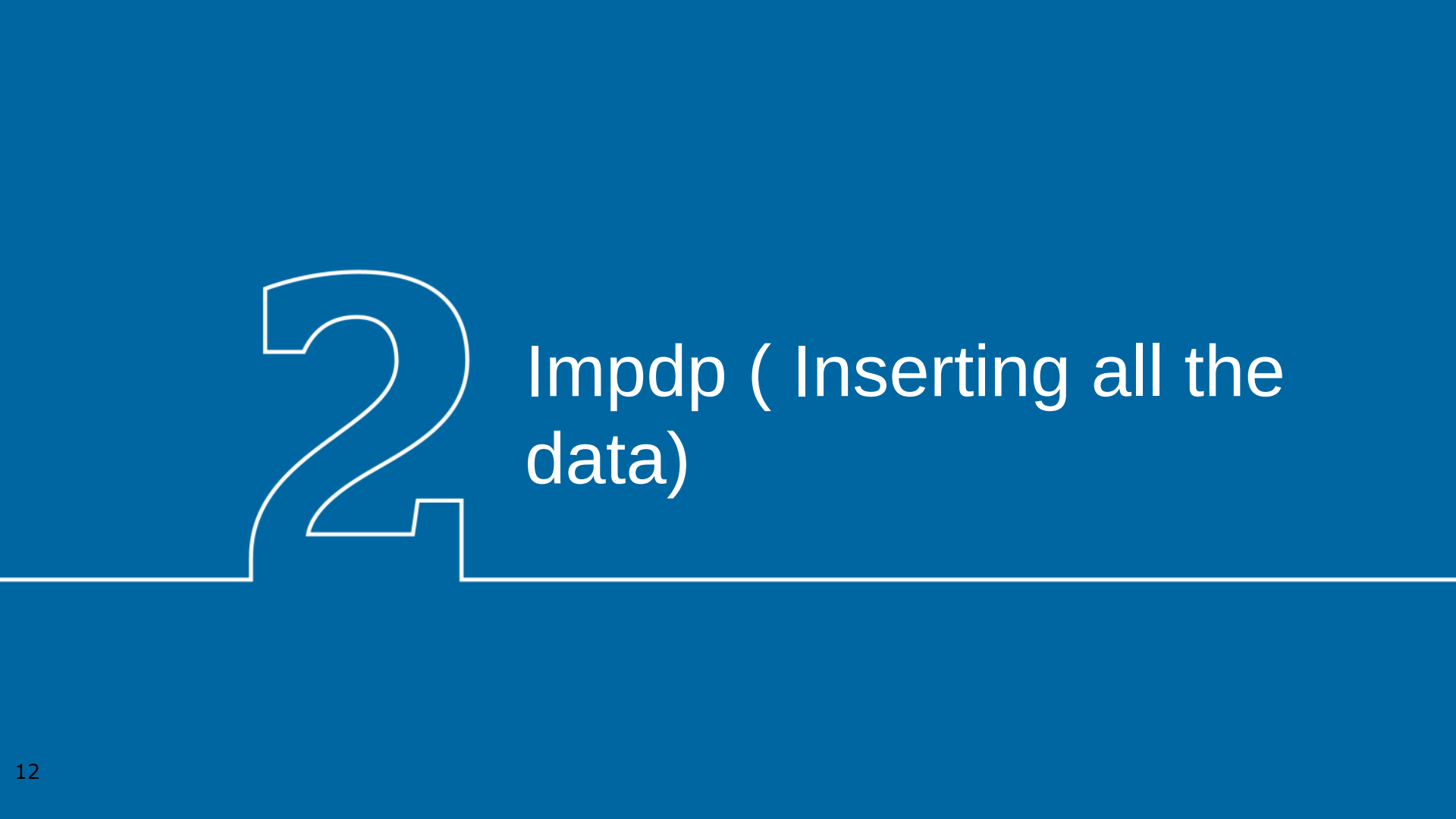
parallel=2

INCLUDE=TABLE:"IN (select object_name from dba_objects where owner='KID12' and (object_name like'TRS_%' or object_name like 'ARC_%') and object_type='TABLE')"

EXCLUDE=GRANT constraint ref_constraint user index function package procedure

FLASHBACK_SCN= ####

Choose portion of objects of the source in several dmp files , when use this dmp files need to recreate manually in order all the objects.


2
Impdp (Inserting all the data)

Impdp in the target
recreate schemas in less time

<SQL> create directory Dirxx as '/work/dmps/prodution/xx';
Directory created.
<SQL> create directory Diryy as '/work/dmps/prodution/yy';
Directory created.
<SQL> create directory Dirzz as '/work/dmps/prodution/zz';
Directory created.

The par file for the impdp looks like this :

```
dumpfile=Dirxx:exp_DB_%u.dmp, Diryy:exp_DB_%U.dmp, Dirzz:exp_DB_%u.dmp
job_name=imp_db_production_dr
logfile=Dirxx:imp_db_production_dr.log
full=y
```

Step :Processing object type SCHEMA_EXPORT/TABLE/INDEX/INDEX

Impdp> parallel=16 <- Use the max cpu

Impdp in the target
recreate schemas in less time

IMP-00017: following statement failed with ORACLE error 959:
IMP-00003: ORACLE error 959 encountered

Impdp in the target

recreate schemas in less time (Long Columns/Encrypt)

ORA-31693: Table data object *"OWNER"."TABLE"* failed to load/unload and is being skipped due to error:

1. Import only DDL of the table (Use metada package)
2. alter table MAIN.ORG_EXT modify fieldcolumn_type_Long decrypt;
3. List all the fields belong to the table , with type long

```
select index_name,UNIQUENESS from DBA_indexes
where table_name in ('ORG_EXT') and owner='MAIN'
and UNIQUENESS='UNIQUE';
```

4. If you have indexes on this fields , remove all the indexes

```
drop index Main.indice1;
```

5.Import again the data in the tabla

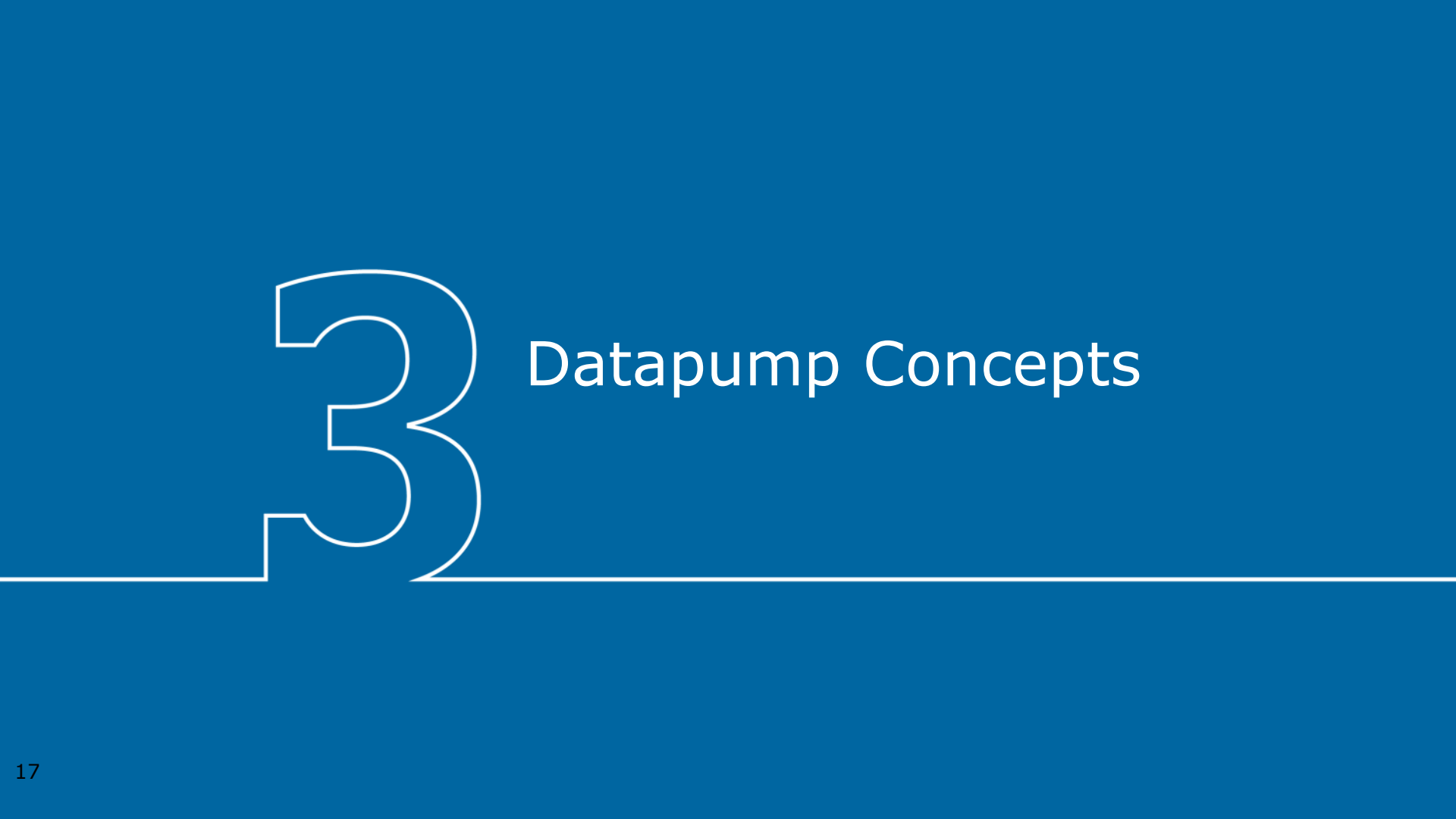
```
TABLE_EXISTS_ACTION=truncate
INCLUDE=table:"in('ORG_EXT','TABLA2')
```

6. recreate the index on the field

```
CREATE UNIQUE INDEX MAIN.INDICE1  ON MAIN.ORG_EXT(...).....
```

Impdp in the target
recreate schemas in less time

Check all Constraints
Check all Invalid Objects
Check Database links (Tnsnames.ora entries)
Refresh the Statistics
Compare the number of objects source and target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Datapump Concepts

DATAPUMP = JOB PROCESS
Interactive Mode

Export> stop_job …… (KILL_JOB)
Are you sure you wish to stop this job ([yes]/no): y

```
expdp attach=sys_export_schema_01
  Parameter Name      Parameter Value:
   Client_command       test/******** directory=…..
  State: IDLING

  Worker 1 Status:
  Process Name: DW00
  State: UNDEFINED
Export> start_job

Export> status
Job: sys_export_schema_01
  Operation: export
  Mode: schema
  State: executing
```

Data Pump jobs, unlike DBMS jobs, are merely server processes that process the data on behalf of the main process.

The main process, known as a master control process, coordinates this effort via Advanced Queuing; it does so through a special table created at runtime known as a **master table**

DATAPUMP = JOB PROCESS
Interactive Mode

```
Export> stop_job …… (KILL_JOB)
Are you sure you wish to stop this job ([yes]/no): y

E:\dp>expdp attach=sys_export_schema_01
  Parameter Name      Parameter Value:
   Client_command       test/******** directory=…..
  State: IDLING

  Worker 1 Status:
  Process Name: DW00
  State: UNDEFINED
Export> start_job

Export> status
Job: sys_export_schema_01
  Operation: export
  Mode: schema
  State: executing
```

The master table is created in the schema of the current user performing the export or import operation.

Therefore, that user must have the **CREATE TABLE** system privilege and a sufficient tablespace quota for creation of the master table.

The name of the master table is the same as the name of the job that created it.

Therefore, you cannot explicitly give a Data Pump job the same name as a preexisting table or view

DATAPUMP = JOB PROCESS
Interactive Mode

state associated with each phase of a job, as follows:

STATUS	DEFINITION
Undefined	Before a handle is created
Defining	When the handle is first created
Executing	When the DBMS_DATAPUMP.START_JOB procedure is executed
Completing	When the job is completing
Completed	When the job is completed
Stop Pending	When an orderly job shutdown has been requested
Stopping	When the job is stopping
Stopped	When DBMS_DATAPUMP.STOP_JOB is performed against an executing job
Idling	For a restarted job, the period before a START_JOB is executed
Not Running	When a master table exists for a job that is not running (has no Data Pump processes associated with it)

DATAPUMP = JOB PROCESS
Header Information (4k)

SQL> SET serveroutput on SIZE 1000000
SQL> **exec show_dumpfile_info(p_dir=> 'my_directiry', p_file=> 'expdp_full_kid12.dmp')**

```
------------------------------------------------------------------------------
Purpose..: Obtain details about export dumpfile.       Version: 18-DEC-2013
Required.: RDBMS version: 10.2.0.1.0 or higher
.          Export dumpfile version: 7.3.4.0.0 or higher
.          Export Data Pump dumpfile version: 10.1.0.1.0 or higher
Usage....: execute show_dumfile_info('DIRECTORY', 'DUMPFILE');
Example..: exec show_dumfile_info('MY_DIR', 'expdp_s.dmp')
------------------------------------------------------------------------------
Filename.: expdp_f.dmp
Directory: my_dir
Disk Path: /bugmnt1/em/celclnx14/SR3.7997287101/user/expdp
Filetype.: 1 (Export Data Pump dumpfile)
------------------------------------------------------------------------------
...Database Job Version.....: 12.01.00.00.00
...Internal Dump File Version....: 4.1 (Oracle12c Release 1: 12.1.0.x)
...Creation Date.....: Wed May 28 07:57:24 2014
...File Number (in dump file set): 1
...Master Present in dump file...: 1 (Yes)
```

Compatibility Matrix
Header File

Version Data Pump Dumpfile Set	Written by database with compatibility	Can be imported into Target: 10gR1 10.1.0.x	10gR2 10.2.0.x	11gR1 11.1.0.x	11gR2 11.2.0.x	12cR1 12.1.0.x
0.1	10.1.x	supported	supported	supported	supported	supported
1.1	10.2.x	no	supported	supported	supported	supported
2.1	11.1.x	no	no	supported	supported	supported
3.1	11.2.x	no	no	no	supported	supported
4.1	12.1.x	no	no	no	no	supported

DATAPUMP = JOB PROCESS
Without interactive mode

```
declare
 handle number;

begin
 handle := dbms_datapump.open('EXPORT','SCHEMA');
 dbms_datapump.add_file(handle,`KIDAP123.DMP','DUMPDIR');
  dbms_datapump.set_parallel(handle,4);
 dbms_datapump.start_job(handle);
 dbms_datapump.detach(handle);
end;
```

TIPS

Best Practices
Datapump Jobs

Inspect before expdp / Impdp the follow parameters in both environments

- show parameter compatible
- show parameter NLS
- show parameter cursor_sharing (FORCE = BAD)
- Linux/Aix Parameters (fs.aio_max_nr=3145728)
- AMM before release 12.1.0.2 streams_pool_size=300M

Best Practices
Datapump Jobs

Monitoring when is running

```
SQL> SELECT owner_name, job_name, operation, job_mode,
state, attached_sessions
FROM dba_datapump_jobs
WHERE job_name NOT LIKE 'BIN$%'
ORDER BY 1,2;
```

Debuging the process

```
ALTER SYSTEM SET events '10046 trace name context forever, level 12';

-- run import/ export

ALTER SYSTEM SET events '10046 trace name context off';
```

Best Practices
Datapump Jobs

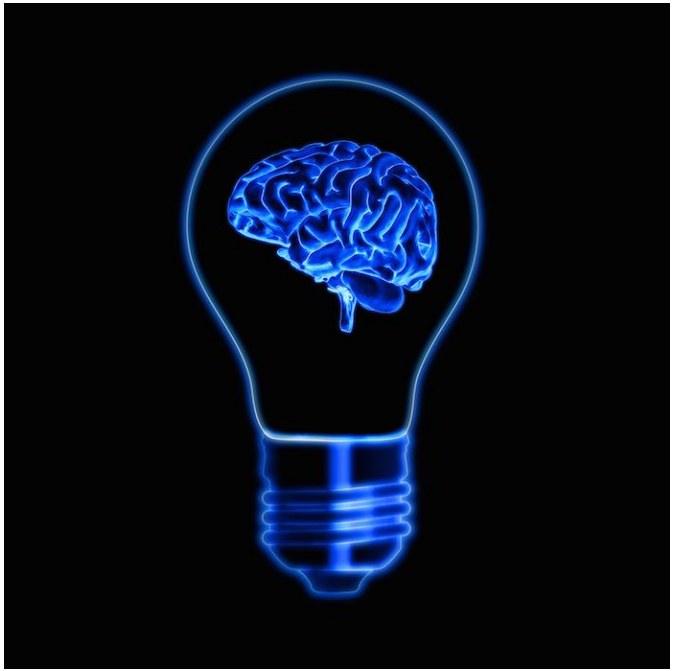
```
$ tkprof ORCL_dw00_11613.trc ORCL_dw00_11613_exe.out waits=y sort=exeela
```

showing:

```
...
Elapsed times include waiting on following events:
   Event waited on                             Times   Max. Wait  Total Waited
  ----------------------------------------   Waited  ----------  ------------
  wait for unread message on broadcast channel
                                                415        1.00        404.95
  Streams AQ: enqueue blocked on low memory
                                                 12       60.00        720.10
  db file scattered read                          1        0.01          0.01
  Disk file operations I/O                       27        0.04          0.16
  direct path read                               12        0.00          0.01
  db file sequential read                        64        0.01          0.10
  control file sequential read                   35        0.00          0.04
  library cache: mutex X                          1        0.00          0.00
  direct path write                            1931        0.51         17.58
  KSV master wait                                 1        0.00          0.00
```

Best Practices
Datapump Jobs

- EXPDP METADATA_ONLY=Y (is the best way to restore pl/sql from the past)



Overview of Data Pump dumpfile compatibility.

```
    Export             Use Export Data Pump parameter VERSION=...
      From                if dumpfile needs to be imported into a
    Source              Target Database with compatibility level
  Database       (value of init.ora/spfile parameter COMPATIBLE):
      With
COMPATIBLE     9.2.0.x.y    10.1.0.x.y    10.2.0.x.y    11.1.0.x.y    11.2.0.x.y    12.1.0.x.y
---------- ------------- ------------- ------------- ------------- ------------- -------------
10.1.0.x.y   VERSION=9.2             -             -             -             -             -
---------- ------------- ------------- ------------- ------------- ------------- -------------
10.2.0.x.y   VERSION=9.2  VERSION=10.1             -             -             -             -
---------- ------------- ------------- ------------- ------------- ------------- -------------
11.1.0.x.y   VERSION=9.2  VERSION=10.1  VERSION=10.2             -             -             -
---------- ------------- ------------- ------------- ------------- ------------- -------------
11.2.0.x.y   VERSION=9.2  VERSION=10.1  VERSION=10.2  VERSION=11.1             -             -
---------- ------------- ------------- ------------- ------------- ------------- -------------
12.1.0.x.y   VERSION=9.2  VERSION=10.1  VERSION=10.2  VERSION=11.1  VERSION=11.2             -
---------- ------------- ------------- ------------- ------------- ------------- -------------
```

Overview of Data Pump client/server compatibility.

```
Data Pump client compatibility.
===============================

   expdp and  Connecting to Database version
impdp client     10gR1      10gR2      11gR1      11gR2      12cR1
     version  10.1.0.x   10.2.0.x   11.1.0.x   11.2.0.x   12.1.0.x
---------- ---------- ---------- ---------- ---------- ----------
   10.1.0.x  supported  supported  supported  supported  supported
   10.2.0.x         no  supported  supported  supported  supported
   11.1.0.x         no         no  supported  supported  supported
   11.2.0.x         no         no         no  supported  supported
   12.1.0.x         no         no         no         no  supported
```

Thanks

For more information please contact:
(502) 59512355

anibal.garcia@atos.net

@AgarciaDBA

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