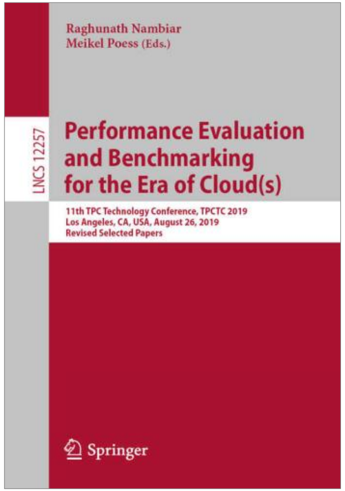
Oracle Configuration and Database Load



Raghunath Nambiar
Meikel Poess (Eds.)

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peakmarks® showcased its software at the 2019 TPC Technology Conference in Los Angeles.

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February 2024

Copyright Information

Agenda

Naming Conventions

Database name	ORA19C / ORA21C / ORA23c	
Instance names	ORA19C / ORA21C / ORA23C	for a single instance
	ORA19C1 / ORA21C1 / ORA23C1	for RAC instance 1
	ORA19C2 / ORA21C2 / ORA23C2	for RAC instance 2
peakmarks® PDB	PMK	
Connect string SYSTEM user	system/manager@SYSAWR	
Connect string peakmarks user	bench/bench@PMK	
peakmarks® base directory	../pmk	

Abbreviations and Metrics

[MBps]	megabyte per second
[GBps]	gigabyte per second
[dbps]	database blocks per second
[rbps]	redo blocks per second
[dbpt]	database blocks per transaction
[s]	seconds
[ms]	milliseconds
[µs]	microseconds
[IOPS]	I/O operations per second

[qps]	queries per second
[rps]	rows per second
[tps]	transactions per second
[kBpt]	kilobyte per transaction
[Mops]	million operations per second
Nodes	number of cluster nodes
Jobs	number of workload processes
BuCache	Database Buffer Cache
FlCache	Database or Exadata Flash Cache

In the following reports, the key performance metrics are marked red.

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Introduction

Introduction

Of course, every peakmarks customer can configure databases according to his needs

However, we would like to share some of our experiences from years of practice in this presentation

We use peakmarks SQL scripts for database and instance monitoring. They are located in the distribution kit ../pmk/sql directory. This directory should be part of the ORACLE_PATH environment variable

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Oracle Database Configuration

Database Configuration

The default database configuration is not well suited for the Oracle platform performance assessment

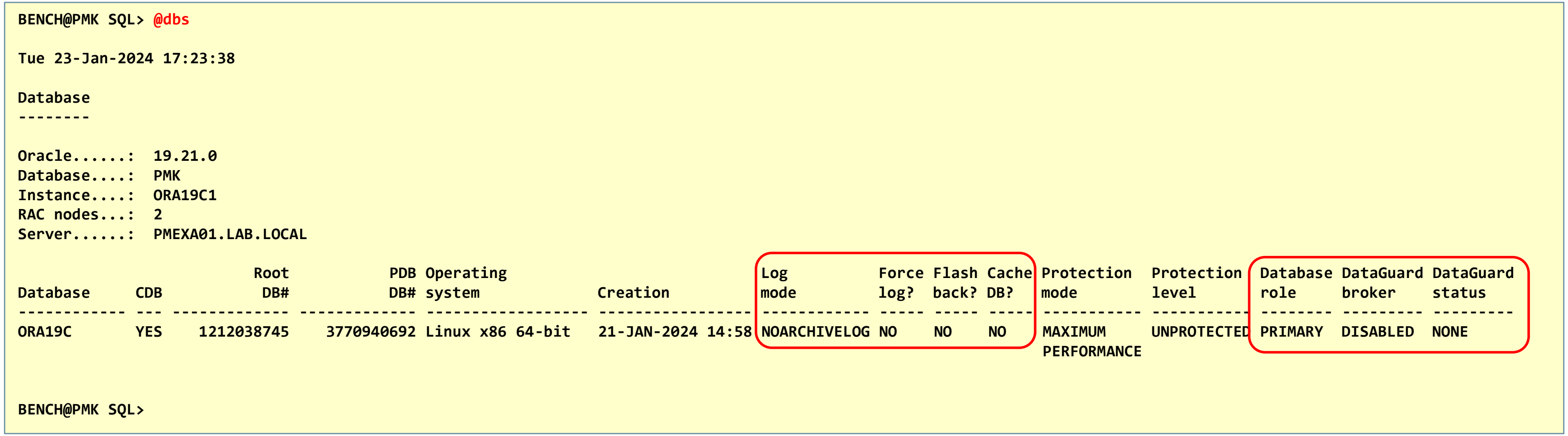
Adjust the database for performance assessment

- ARCHIVELOG mode
- FLASHBACK mode
- FORCE LOGGING mode
- DataGuard protection mode
- REDO log file groups (sizes, multiplexing)
- Block change tracking
- UNDO tablespace space management

Database Configuration

Set the required value for ARCHIVE LOGGING, FORCE LOGGING, FLASHBACK and DataGuard

Check database configuration with SQL> @dbs



```
BENCH@PMK SQL> @dbs

Tue 23-Jan-2024 17:23:38

Database
--------

Oracle......:  19.21.0
Database....:  PMK
Instance....:  ORA19C1
RAC nodes...:  2
Server......:  PMEXA01.LAB.LOCAL

                          Root           PDB Operating                            Log          Force Flash Cache Protection  Protection  Database DataGuard DataGuard
Database     CDB           DB#           DB# system             Creation          mode         log?  back? DB?   mode        level       role     broker    status
------------ --- ------------- ------------- ------------------ ----------------- ------------ ----- ----- ----- ----------- ----------- -------- --------- ---------
ORA19C       YES    1212038745    3770940692 Linux x86 64-bit   21-JAN-2024 14:58 NOARCHIVELOG NO    NO    NO    MAXIMUM     UNPROTECTED PRIMARY  DISABLED  NONE
                                                                                                                 PERFORMANCE


BENCH@PMK SQL>
```

Database Configuration

Set proper value for REDO log file size

Small REDO log files force Oracle to a high frequency of log switches and checkpoints

We recommend deriving REDO log file size depending on the number of concurrent processes, but at least 2, 4, or 8 Gbyte dependent on platform size

Check the capacity for recovery files

```
BENCH@PMK SQL> show parameter recovery

Parameter                                    Type         Value
-------------------------------------------- ------------ --------------------------------------------
db_recovery_file_dest                        string       +RECO
db_recovery_file_dest_size                   big integer  36346000M
recovery_parallelism                         integer      0
remote_recovery_file_dest                    string

BENCH@PMK SQL>
```

Database Configuration

Set proper value for REDO log file size – default values are too small

- Check REDO log group configuration with SQL> @rlg

```
BENCH@PMK SQL> @rlg

Tue 23-Jan-2024 17:24:59

Redo Log Groups
---------------

Oracle......:  19.21.0
Database....:  PMK
Instance....:  ORA19C1
RAC nodes...:  2
Server......:  PMEXA01.LAB.LOCAL

                    Block size File size
Thread Group    Seq     [Byte]   [MByte] Members Archived Status   First Access
------ ----- ------ ---------- --------- ------- -------- -------- -----------------
     1     1    878        512     4,096       1 NO       CURRENT  23-JAN-2024 16:00
     1     2    876        512     4,096       1 NO       INACTIVE 23-JAN-2024 12:54
     1     5    877        512     4,096       1 NO       INACTIVE 23-JAN-2024 13:04
     1     6    875        512     4,096       1 NO       INACTIVE 23-JAN-2024 12:42

                    Block size File size
Thread Group    Seq     [Byte]   [MByte] Members Archived Status   First Access
------ ----- ------ ---------- --------- ------- -------- -------- -----------------
     2     3    243        512     4,096       1 NO       INACTIVE 22-JAN-2024 21:05
     2     4    241        512     4,096       1 NO       INACTIVE 22-JAN-2024 21:05
     2     7    242        512     4,096       1 NO       INACTIVE 22-JAN-2024 21:05
     2     8    244        512     4,096       1 NO       CURRENT  23-JAN-2024 15:39

8 rows selected.

BENCH@PMK SQL>
```

Database Configuration

SMALLFILE UNDO Tablespace Management

Some database installations still use small file UNDO tablespaces

peakmarks® automatically extends SMALLFILE UNDO tablespaces based on the number of concurrent peakmarks processes to avoid side effects due to Oracle space management during a performance test

Database Configuration

UNDO Tablespace Management

Check tablespace configuration with SQL> @tbs

```
BENCH@PMK SQL> @tbs

Tue 23-Jan-2024 17:25:39

Tablespace(s)
-------------

Oracle......:  19.21.0
Database....:  PMK
Instance....:  ORA19C1
RAC nodes...:  2
Server......:  PMEXA01.LAB.LOCAL

                                                            Block                     Extent    Next Segment              Min
                                REDO      Force                size Extent     Alloc      size  extent space       Min ext Size              Max      Predic
Con# Tablespace   BIG Contents  log       log?  Status    [KByte] mgmt       type    [MByte] [MByte] mgmt    extents  [MByte]          extents Enc? eval
---- ------------ --- --------- --------- ----- --------- ------- ---------- ------- ------- ------- ------- ------- -------- ---------------- ---- -------
   4 SYSAUX       YES PERMANENT LOGGING   YES   ONLINE          8 LOCAL      SYSTEM        0         AUTO          1        0    2,147,483,645 NO   STORAGE
   4 SYSTEM       YES PERMANENT LOGGING   YES   ONLINE          8 LOCAL      SYSTEM        0         MANUAL        1        0    2,147,483,645 NO   STORAGE
   4 TEMP         NO  TEMPORARY NOLOGGING NO    ONLINE          8 LOCAL      UNIFORM       2       2 MANUAL        1        2                  NO   STORAGE
   4 UNDOTBS1     YES UNDO      LOGGING   NO    ONLINE          8 LOCAL      SYSTEM        0         MANUAL        1        0    2,147,483,645 NO   STORAGE
   4 UNDO_2       YES UNDO      LOGGING   NO    ONLINE          8 LOCAL      SYSTEM        0         MANUAL        1        0    2,147,483,645 NO   STORAGE
   4 USERS        NO  PERMANENT LOGGING   NO    ONLINE          8 LOCAL      SYSTEM        0         AUTO          1        0    2,147,483,645 NO   STORAGE

6 rows selected.

BENCH@PMK SQL>
```

Database Configuration

Capacity of Tablespaces SYSTEM and SYSAUX

Check the capacity of tablespaces SYSTEM, SYSAUX, and USERS

- peakmarks® needs additional space because each workload creates 2 AWR snapshots

Set the following tablespace capacities

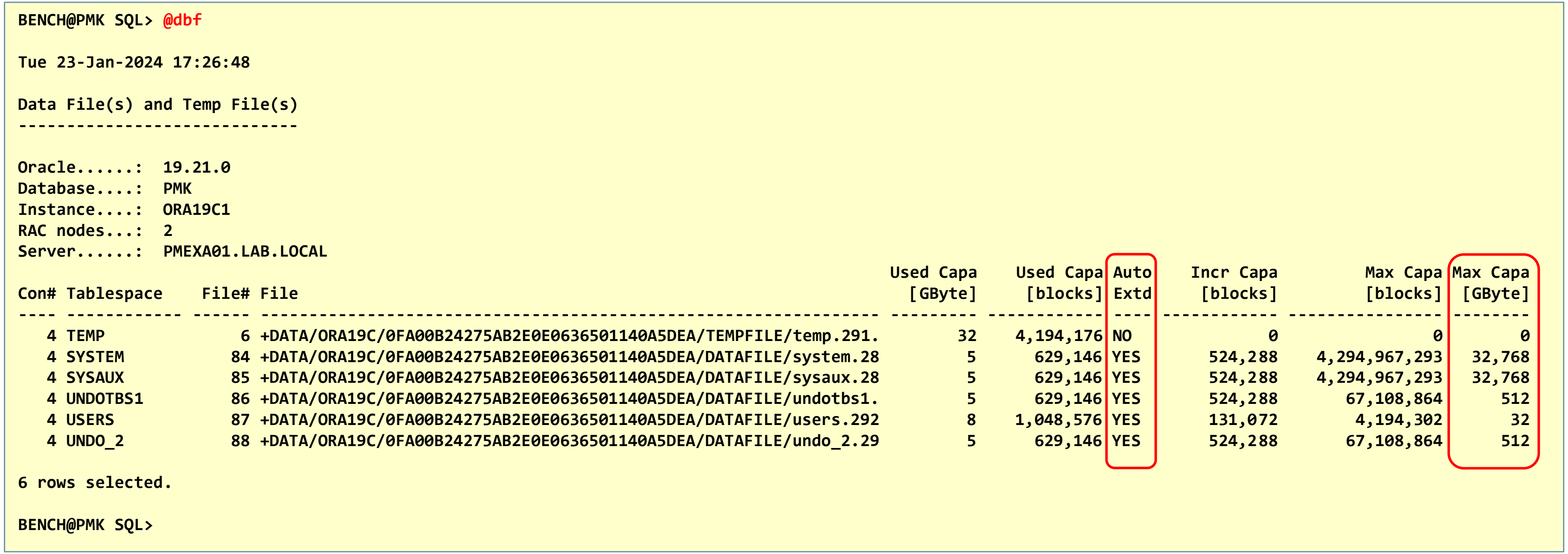
- SYSTEM tablespace, min 4 GByte
- SYSAUX tablespace, min 4 GByte
- USERS tablespace, min 8 GByte

Add datafiles or use the AUTOEXTEND feature of datafiles for SMALLFILE TABLESPACES; use the AUTOEXTEND feature for BIGFILE TABLESPACES

Database Configuration

Capacity of Tablespaces SYSTEM and SYSAUX

Check AUTOEXTEND feature of data files with SQL> @dbf



```
BENCH@PMK SQL> @dbf

Tue 23-Jan-2024 17:26:48

Data File(s) and Temp File(s)
-----------------------------

Oracle......:  19.21.0
Database....:  PMK
Instance....:  ORA19C1
RAC nodes...:  2
Server......:  PMEXA01.LAB.LOCAL
                                                                                          Used Capa    Used Capa Auto    Incr Capa        Max Capa Max Capa
Con# Tablespace    File# File                                                               [GByte]     [blocks] Extd     [blocks]         [blocks]  [GByte]
---- ------------ ------ ---------------------------------------------------------------- --------- ------------ ---- ------------ ---------------- --------
   4 TEMP              6 +DATA/ORA19C/0FA00B24275AB2E0E0636501140A5DEA/TEMPFILE/temp.291.        32    4,194,176 NO              0                0        0
   4 SYSTEM           84 +DATA/ORA19C/0FA00B24275AB2E0E0636501140A5DEA/DATAFILE/system.28         5      629,146 YES       524,288    4,294,967,293   32,768
   4 SYSAUX           85 +DATA/ORA19C/0FA00B24275AB2E0E0636501140A5DEA/DATAFILE/sysaux.28         5      629,146 YES       524,288    4,294,967,293   32,768
   4 UNDOTBS1         86 +DATA/ORA19C/0FA00B24275AB2E0E0636501140A5DEA/DATAFILE/undotbs1.         5      629,146 YES       524,288       67,108,864      512
   4 USERS            87 +DATA/ORA19C/0FA00B24275AB2E0E0636501140A5DEA/DATAFILE/users.292         8    1,048,576 YES       131,072        4,194,302       32
   4 UNDO_2           88 +DATA/ORA19C/0FA00B24275AB2E0E0636501140A5DEA/DATAFILE/undo_2.29         5      629,146 YES       524,288       67,108,864      512

6 rows selected.

BENCH@PMK SQL>
```

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Oracle Instance Configuration

Instance Configuration

The default instance configuration is not well suited for Oracle platform performance assessments

Adjust the instance for performance assessment

- Check memory-related configuration parameter
- Check process-related configuration parameter
- Switch off functionality like RECYCLEBIN, resource manager, administrative tasks, etc.
- Use only those Oracle configuration parameters that are essential
- Avoid underscore parameter if possible

Instance Configuration

Following parameters are important

- SGA_MAX_SIZE, SGA_TARGET for driving buffer pool allocation
- CPU_COUNT for driving number of processes, job queue processes, parallel server processes and other dependent parameters like sessions, transactions and locks

Instance Configuration

peakmarks® provides several init.ora templates for different SGA sizes:

SGA target size in [GByte]	8	16	32	64	128	192
Template available ../pmk/cfg	init_8G.ora	init_16G.ora	init_32G.ora	init_64G.ora	init_128G.ora	init_192G.ora

SGA target size in [GByte]	256	384	512	768G	1’024	2’048
Template available ../pmk/cfg	init_256G.ora	init_384.ora	init_512G.ora	init_768G.ora	init_1024G.ora	Init_2048G.ora

Instance Configuration

Recommendations for memory allocation

60% of RAM huge pages	
50% of RAM capacity for SGA	sga_max_size, sga_target

Recommendations for buffer pool allocation

5% of SGA for recycle buffer pool	db_recycle_cache_size
5% of SGA for memopt tables	memoptimize_pool_size (optional)
2% of SGA for column store	inmemory_size

Instance Configuration

Recommendations for process configuration

PROCESSES	:=	cpu_count x 24, min 384
JOB_QUEUE_PROCESSES	:=	cpu_count x 8 min 64
PARALLEL_MAX_SERVERS	:=	cpu_count x 8, min 128
DML_LOCKS	:=	cpu_count x 36, min 1024

All other process-related parameters should use default values

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Example init.ora

Example init.ora

Oracle instance configuration files for different systems can be found in the ../pmk/cfg directory

The following slides show an init.ora configuration file for a server system with

- CPU_COUNT = 256
- SGA_MAX_SIZE = 1024G

Example init.ora

Server with CPU_COUNT = 256 and SGA_MAX_SIZE = 1024G

```
# ----------------------------------------------------------------------------------------------
#   Copyright © 2016 - 2024, peakmarks Ltd. All rights reserved.          support@peakmarks.com
# ----------------------------------------------------------------------------------------------
#
#   Config File....:    init_1024G.ora template for Oracle 19c
#
#   Release........:    15-Feb-2024, MDR
#
#   Description....:    Oracle configuration parameter template file for CDB database
#                       with Oracle SGA size of 1024 GByte
#
#   Notes..........:    . two parameters are important for setting up the instance and determine
#                         many other parameters in this script
#
#                         CPU_COUNT     = 256
#                         SGA_MAX_SIZE = 1024G
#
#                       . use at least 4 GByte SGA per cpu (thread) for optimal results
#                       . use following command to reset a configuration parameter to its default
#                         value
#
#                         SQL>  ALTER SYSTEM RESET <parameter> SCOPE=SPILE SID='*';
#
#                       . to get the maximum number of data files from CREATE DATABASE command,
#                         check with following SQL statement
#
#                         SQL>  SELECT records_total
#                           2     FROM v$controlfile_record_section
#                           3    WHERE type = 'DATAFILE'
#
#                       . the usage of up to three user-created pluggable database is free
#                       . the usage of up to 16 GByte in-memory column store per CDB is free
#                         since 19.8 when setting INMEMORY_FORCE = BASE_LEVEL
#
```

Example init.ora

Server with CPU_COUNT = 256 and SGA_MAX_SIZE = 1024G

```
# ----------------------------------------------------------------------------------------------
#   section 1:  basic database parameters
# ----------------------------------------------------------------------------------------------

db_name                         =   ORA19C            # max 8 characters
db_block_size                   =   8192              # database block size in [Byte]

recyclebin                      =   off
#_exadata_feature_on            =   true              # enables memory-optimized tables on non-Exadata systems

global_names                    =   false

# ----------------------------------------------------------------------------------------------
#   section 2:  process configuration
#
#               Oracle process parameter need resources and may become a bottleneck in very large
#               configurations (> 512 threads); therefore we try to use as low parameters as
#               possible
#
#               the peakmarks recommendations for process configuration are
#
#               . processes                 (cpu_count x 24), min  384
#               . job_queue_processes       (cpu_count x  8), min   64
#               . parallel_max_servers      (cpu_count x  8), min  128
#               . dml_locks                 (cpu_count x 36), min 1024
# ----------------------------------------------------------------------------------------------

cpu_count                       =   256

processes                       =   6144
job_queue_processes             =   2048
parallel_min_servers            =   0
parallel_max_servers            =   2048
dml_locks                       =   9216
```

Example init.ora

Server with CPU_COUNT = 256 and SGA_MAX_SIZE = 1024G

```
# ----------------------------------------------------------------------------------------------
#   section 3:  buffer cache configuration
#
#               the peakmarks recommendations for buffer cache configuration are
#               in percentage of SGA_MAX_SIZE; Oracle does not shrink or increase
#               memoptimize_pool_size automatically, its fixed
#
#               . db_recycle_cache_size   min  5.0%
#               . memoptimize_pool_size   min  5.0%, min 820 MByte, all MTABs must fit into pool
#               . inmemory_size           min  2.0%, min 192 MByte
#               . log_buffer              min  1.0%, max 512 MByte
# ----------------------------------------------------------------------------------------------

sga_max_size                    =   1024G
sga_target                      =   1024G

db_recycle_cache_size           =   52429M
#memoptimize_pool_size          =   52429M            # on Exadata only
inmemory_size                   =   20971M
inmemory_optimized_arithmetic   =   enable            # not all cpus support this feature

log_buffer                      =   512M

use_large_pages                 =   only              # not necessarily available
                                                      # on virtual servers

# ----------------------------------------------------------------------------------------------
#   section 4:  parallel sql processing
# ----------------------------------------------------------------------------------------------

parallel_degree_policy          =   manual            # switch off auto DOP
parallel_force_local            =   true              # use local instance only
parallel_min_percent            =   100
```

Example init.ora

Server with CPU_COUNT = 256 and SGA_MAX_SIZE = 1024G

```
# ----------------------------------------------------------------------------------------------
#   section 5:  enable fast-starting checkpointing to eliminate i/o spikes
# ----------------------------------------------------------------------------------------------

log_checkpoint_timeout          =   0
fast_start_mttr_target          =   60

# ----------------------------------------------------------------------------------------------
#   section 6:  file management
# ----------------------------------------------------------------------------------------------

filesystemio_options            =   setall            # direct + async I/O for file systems

db_create_file_dest             =   +DATA
db_create_online_log_dest_1     =   +RECO

# ----------------------------------------------------------------------------------------------
#   section 7:  REDO and UNDO
# ----------------------------------------------------------------------------------------------

undo_tablespace                 =   undotbs1
undo_retention                  =   0
temp_undo_enabled               =   true

# ----------------------------------------------------------------------------------------------
#   section 8:  auditing and resource manager
# ----------------------------------------------------------------------------------------------

audit_trail                     =   none
audit_sys_operations            =   false

resource_limit                  =   false
resource_manager_plan           =   'FORCE:'
```

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peakmarks® Command pmk.set_instance

peakmarks® Command pmk.set_instance

The manual configuration of Oracle init.ora parameters can be a time-consuming and error-prone task

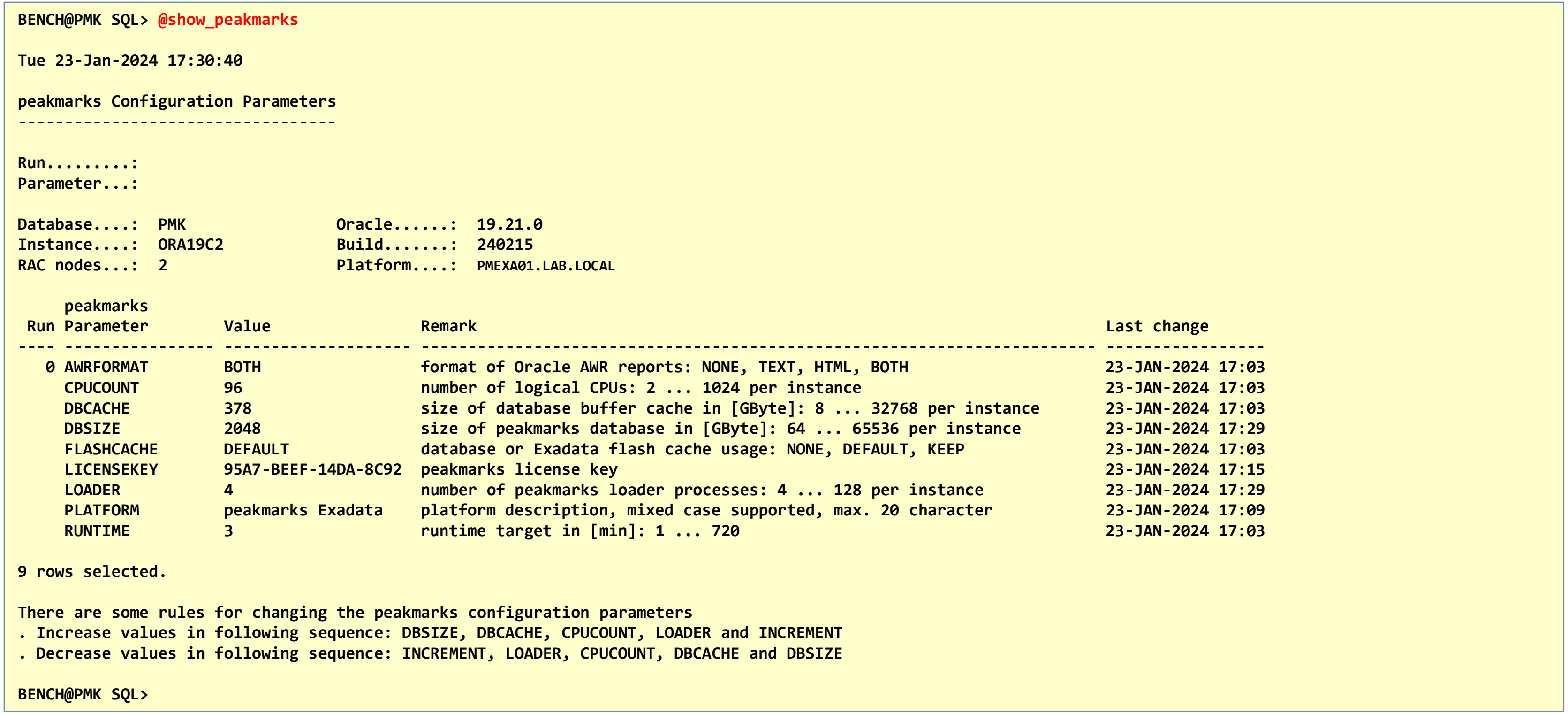
peakmarks offers a command that optimizes all necessary Oracle instance configuration parameters for a performance assessment; based on the peakmarks configuration parameters CPUCOUNT and DBCACHE

The commands to change the configuration are stored in the scripts in the ../pmk/tmp directory

alter_cdb.sql	to change the root CDB configuration parameter
alter_pdb.sql	to change the PDB peakmarks database configuration parameter

peakmarks® Command pmk.set_instance

Check current peakmarks configuration parameter



```
BENCH@PMK SQL> @show_peakmarks

Tue 23-Jan-2024 17:30:40

peakmarks Configuration Parameters
----------------------------------

Run.........:
Parameter...:

Database....:  PMK                Oracle......:  19.21.0
Instance....:  ORA19C2            Build.......:  240215
RAC nodes...:  2                  Platform....:  PMEXA01.LAB.LOCAL

     peakmarks
 Run Parameter        Value                Remark                                                                   Last change
---- ---------------- -------------------- ------------------------------------------------------------------------ -----------------
   0 AWRFORMAT        BOTH                 format of Oracle AWR reports: NONE, TEXT, HTML, BOTH                     23-JAN-2024 17:03
     CPUCOUNT         96                   number of logical CPUs: 2 ... 1024 per instance                          23-JAN-2024 17:03
     DBCACHE          378                  size of database buffer cache in [GByte]: 8 ... 32768 per instance       23-JAN-2024 17:03
     DBSIZE           2048                 size of peakmarks database in [GByte]: 64 ... 65536 per instance         23-JAN-2024 17:29
     FLASHCACHE       DEFAULT              database or Exadata flash cache usage: NONE, DEFAULT, KEEP               23-JAN-2024 17:03
     LICENSEKEY       95A7-BEEF-14DA-8C92  peakmarks license key                                                    23-JAN-2024 17:15
     LOADER           4                    number of peakmarks loader processes: 4 ... 128 per instance             23-JAN-2024 17:29
     PLATFORM         peakmarks Exadata    platform description, mixed case supported, max. 20 character            23-JAN-2024 17:09
     RUNTIME          3                    runtime target in [min]: 1 ... 720                                       23-JAN-2024 17:03

9 rows selected.

There are some rules for changing the peakmarks configuration parameters
. Increase values in following sequence: DBSIZE, DBCACHE, CPUCOUNT, LOADER and INCREMENT
. Decrease values in following sequence: INCREMENT, LOADER, CPUCOUNT, DBCACHE and DBSIZE

BENCH@PMK SQL>
```

peakmarks® Command pmk.set_instance

Executing the pmk.set_instance command

```
BENCH@PMK SQL> exec pmk.set_instance;

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--------------------------------------------------------------------------------
Release.......................: 10.2
Build.........................: 240215

peakmarks command.............: pmk.set_instance

../tmp/alter_cdb.sql script...: completed.
../tmp/alter_pdb.sql script...: completed.

PL/SQL procedure successfully completed.

BENCH@PMK SQL>
```

peakmarks® Command pmk.set_instance

Contents of the scripts

alter_cdb.sql

```
CREATE PFILE = '/acfs01/pmk/tmp/init.ora' FROM SPFILE;
SET ECHO ON;
ALTER SYSTEM SET noncdb_compatible = true SCOPE = spfile SID = '*';
ALTER SYSTEM SET global_names = false SCOPE = spfile SID = '*';
ALTER SYSTEM SET parallel_degree_policy = manual SCOPE = spfile SID = '*';
ALTER SYSTEM SET parallel_force_local = true SCOPE = spfile SID = '*';
ALTER SYSTEM SET parallel_min_percent = 100 SCOPE = spfile SID = '*';
ALTER SYSTEM SET log_checkpoint_timeout = 0 SCOPE = spfile SID = '*';
ALTER SYSTEM SET fast_start_mttr_target = 60 SCOPE = spfile SID = '*';
ALTER SYSTEM SET filesystemio_options = setall SCOPE = spfile SID = '*';
. . .
```

alter_pdb.sql

```
SET ECHO ON;
ALTER SYSTEM SET plsql_code_type = native SCOPE = spfile SID = '*';
ALTER SYSTEM SET global_names = false SCOPE = spfile SID = '*';
ALTER SYSTEM SET parallel_degree_policy = manual SCOPE = spfile SID = '*';
ALTER SYSTEM SET parallel_force_local = true SCOPE = spfile SID = '*';
ALTER SYSTEM SET undo_retention = 0 SCOPE = spfile SID = '*';
ALTER SYSTEM SET recyclebin = off SCOPE = spfile SID = '*';
ALTER SYSTEM SET resource_limit = false SCOPE = spfile SID = '*';
ALTER SYSTEM SET resource_manager_plan = 'force:' SCOPE = spfile SID = '*’;
. . .
```

peakmarks® Command pmk.set_instance

Applying the script alter_cdb.sql

```
$ sqlplus / as sysdba

SQL*Plus: Release 19.0.0.0.0 - Production on Tue Jan 23 17:32:01 2024
Version 19.21.0.0.0

Copyright (c) 1982, 2022, Oracle.  All rights reserved.

Connected to:
Oracle Database 19c Enterprise Edition Release 19.0.0.0.0 - Production
Version 19.21.0.0.0

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-----------------------------------------

SYS@ORA19C1 SQL> @alter_cdb

File created.

SYS@ORA19C1 SQL> ALTER SYSTEM SET noncdb_compatible = true SCOPE = spfile SID = '*';

System altered.

SYS@ORA19C1 SQL> ALTER SYSTEM SET global_names = false SCOPE = spfile SID = '*’;

. . .
```

peakmarks® Command pmk.set_instance

Applying the script alter_pdb.sql

```
$ sqlplus bench/bench@PMK

SQL*Plus: Release 19.0.0.0.0 - Production on Tue Jan 23 17:33:49 2024
Version 19.21.0.0.0

Copyright (c) 1982, 2022, Oracle.  All rights reserved.

Last Successful login time: Tue Jan 23 2024 17:31:42 +01:00

Connected to:
Oracle Database 19c Enterprise Edition Release 19.0.0.0.0 - Production
Version 19.21.0.0.0

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BENCH@PMK SQL> @alter_pdb

BENCH@PMK SQL> ALTER SYSTEM SET plsql_code_type = native SCOPE = spfile SID = '*';

System altered.

. . .
```

peakmarks® Command pmk.set_instance

Restart all instances to make all changes effective

```
$ srvctl stop database -db ORA19C
$ srvctl start database -db ORA19C
```

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peakmarks® Command pmk.load_pdb

peakmarks® Command pmk.load_pdb

The peakmarks command **pmk.load_pdb** starts several processes in parallel (peakmarks configuration parameter LOADER) to generate and load all data of the peakmarks database (pdb)

The database load process is highly scalable and achieves a load rate of more than 10 TByte per hour on high-performance systems

☛ If a crash occurs during a peakmarks **database load**, for whatever reason, you must purge the peakmarks database (exec pmk.purge_pdb) and reload it

☛ If a crash occurs during a **peakmarks run**, for whatever reason, the peakmarks data model remains consistent and recovers itself without any delay

peakmarks® Command pmk.load_pdb

Check actual peakmarks configuration parameter (run = 0)

```
BENCH@PMK SQL> @show_peakmarks

Thu 25-Jan-2024 10:51:02

peakmarks Configuration Parameters
----------------------------------

Run.........:  0
Parameter...:

Database....:  PMK                Oracle......:  19.21.0
Instance....:  ORA19C1            Build.......:  240215
RAC nodes...:  2                  Platform....:  PMEXA01.LAB.LOCAL
     peakmarks
 Run Parameter        Value                Remark                                                                  Last change
---- ---------------- -------------------- ------------------------------------------------------------------------ -----------------
   0 AWRFORMAT        BOTH                 format of Oracle AWR reports: NONE, TEXT, HTML, BOTH                    24-JAN-2024 16:01
     CPUCOUNT         96                   number of logical CPUs: 2 ... 1024 per instance                         24-JAN-2024 16:01
     DBCACHE          378                  size of database buffer cache in [GByte]: 8 ... 32768 per instance      24-JAN-2024 16:01
     DBSIZE           2048                 size of peakmarks database in [GByte]: 64 ... 65536 per instance        24-JAN-2024 17:48
     FLASHCACHE       KEEP                 database or Exadata flash cache usage: NONE, DEFAULT, KEEP              24-JAN-2024 16:01
     LICENSEKEY       NONE                 peakmarks license key                                                   24-JAN-2024 16:01
     LOADER           32                   number of peakmarks loader processes: 4 ... 128 per instance            24-JAN-2024 21:02
     PLATFORM         PMEXA01.LAB.LOCAL    platform description, mixed case supported, max. 20 character           25-JAN-2024 10:48
     RUNTIME          3                    runtime target in [min]: 1 ... 720                                      24-JAN-2024 16:01

9 rows selected.

There are some rules for changing the peakmarks configuration parameters
. Increase values in following sequence: DBSIZE, DBCACHE, CPUCOUNT, LOADER and INCREMENT
. Decrease values in following sequence: INCREMENT, LOADER, CPUCOUNT, DBCACHE and DBSIZE

BENCH@PMK SQL>
```

peakmarks® Command pmk.load_pdb

Executing the pmk.load_pdb command

```
BENCH@PMK SQL> exec pmk.load_pdb

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---------------------------------------------------------------------------------
Release.......................: 10.2
Build.........................: 240215

peakmarks command.............: pmk.load_pdb

Size of db buffer cache(s)....:     307.000 GByte
Size of all CTAB tables.......:      19.500 GByte
Size of all DTAB tables.......:     857.031 GByte
Size of column store(s).......:       8.000 GByte
Size of all ITAB.C04 columns..:       0.358 GByte
Size of mem opt pool(s).......:      19.000 GByte
Size of all MTAB tables.......:       8.250 GByte

Load peakmarks data...........: completed with 0 Oracle errors; 0 peakmarks errors; 28.22 min elapsed time.

PL/SQL procedure successfully completed.

BENCH@PMK SQL>
```

peakmarks® Command pmk.load_pdb

Performance of single instance database load – the impact of the number of loader processes

```
BENCH@PMK SQL> @kpm_pdb

Thu 25-Jan-2024 10:53:59

Load Performance of peakmarks Database
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Run.........:
DB size.....:

Database....:  PMK                Oracle......:  19.21.0
Instance....:  ORA19C1            Build.......:  240215
RAC nodes...:  1                  Platform....:  PMEXA01.LAB.LOCAL

     Database              CPU  CPU  CPU  CPU  CPU            Completed Phys reads Phys writes     REDO BuCache FlCache FlCache  Elapsed
         size             busy user  sys idle  iow #prc #prc      check      total       total     data    read    read   write     time
 Run  [GByte] Nodes  Jobs  [%]  [%]  [%]  [%]  [%] DBWR LGWR     points     [MBps]      [MBps]   [MBps]     [%]     [%]     [%]    [min]
---- -------- ----- ----- ---- ---- ---- ---- ---- ---- ---- ---------- ---------- ----------- -------- ------- ------- ------- --------
   6    2,048     1    12   14   13    1   86    0   12    9        247        322       2,254      305   99.22   99.91   43.11       47
   7    2,048     1    16   18   16    1   82    0   12    9        236        405       2,827      383   99.34   99.91   42.56       38
   8    2,048     1    20   22   20    2   78    0   12    9        240        476       3,341      451   99.60   99.92   42.14       32
   9    2,048     1    24   28   24    2   72    0   12    9        246        545       3,800      516   99.98   99.91   42.08       28
  10    2,048     1    28   34   28    3   66    0   12    9        231        593       4,144      560   99.97   99.91   41.51       26
  11    2,048     1    32   37   31    4   63    0   12    9        232        631       4,556      596   99.95   99.92   40.11       24

6 rows selected.

BENCH@PMK SQL>
```

peakmarks® Command pmk.load_pdb

Performance of 2-node database load – the impact of the database size

```
BENCH@PMK SQL> @kpm_pdb

Thu 25-Jan-2024 11:03:58

Load Performance of peakmarks Database
--------------------------------------

Run.........:
DB size.....:

Database....:  PMK                 Oracle......:  19.21.0
Instance....:  ORA19C1             Build.......:  240215
RAC nodes...:  2                   Platform....:  PMEXA01.LAB.LOCAL

     Database              CPU  CPU  CPU  CPU  CPU            Completed Phys reads Phys writes     REDO BuCache FlCache FlCache  Elapsed
         size             busy user  sys idle  iow #prc #prc      check      total       total     data    read    read   write     time
 Run  [GByte] Nodes  Jobs  [%]  [%]  [%]  [%]  [%] DBWR LGWR     points     [MBps]      [MBps]   [MBps]     [%]     [%]     [%]    [min]
---- -------- ----- ----- ---- ---- ---- ---- ---- ---- ---- ---------- ---------- ----------- -------- ------- ------- ------- --------
  11    2,048     1    32   37   31    4   63    0   12    9        232        631       4,556      596   99.95   99.92   40.11       24
  13    4,096     1    24   26   22    2   74    0   12    9        487      1,200       3,256      326   98.77   99.99   35.66       87
  14    8,192     1    24   25   22    2   75    0   12    9        967      1,260       3,425      337   99.99   99.99   36.62      169
  15   12,288     1    24   27   23    2   73    0   12    9      1,429      1,302       3,493      346   99.99  100.00   36.21      249
  16   16,384     1    24   26   23    2   74    0   12    9      1,908      1,270       3,414      336   99.99  100.00   36.21      338

6 rows selected.

BENCH@PMK SQL>
```

peakmarks

Simple. Representative. Fast.

peakmarks® Command pmk.purge_pdb

peakmarks® Command pmk.purge_pdb

The peakmarks command **pmk.purge_pdb** purges data of the peakmarks database (pdb)

Only the tablespaces with the peakmarks data will be deleted

All other information in the peakmarks repository remains

peakmarks® Command pmk.purge_pdb

Executing the pmk.purge_pdb command

```
BENCH@PMK SQL> exec pmk.purge_pdb


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Release.......................: 10.2
Build.........................: 240215

peakmarks command.............: pmk.purge_pdb
Purge peakmarks data..........: completed.

PL/SQL procedure successfully completed.

BENCH@PMK SQL>
```

peakmarks

Simple. Representative. Fast.

Summary of Scripts and Commands

Summary of scripts and commands

Scripts to setup peakmarks database

```
SQL> exec pmk.set_instance
SQL> exec pmk.load_pdb
SQL> exec pmk.purge_pdb
```

Scripts to monitor the performance of peakmarks database load

```
SQL> @kpm_pdb
```

Scripts to monitor database and instance configuration

```
SQL> @dbs.sql
SQL> @dbf.sql
SQL> @rlg.sql
SQL> @rlf.sql
SQL> @tbs.sql
SQL> @tbs_capa.sql
```

peakmarks Mission

Identify Key Performance Metrics for Oracle Database Platforms.

On-Premises and in the Cloud.

For Quality Assurance, Evaluations, and Capacity Planning.