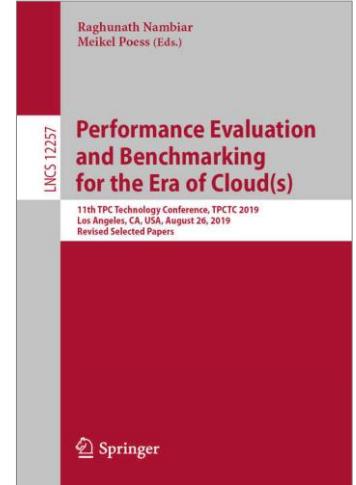# peakmarks® Configuration

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

peakmarks® Version 10.2

February 2024

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Agenda

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

[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.

peakmarks

Simple. Representative. Fast.

Introduction

peakmarks® maintains a central repository with its configuration parameters

peakmarks® stores the actual configuration parameter set for each run

Check actual configuration parameters (run 0) with
- SQL> @show_peakmarks

Some rules apply when changing peakmarks® configuration parameters; therefore
- Increase values in the following sequence: DBSIZE, DBCACHE, CPUCOUNT, and LOADER
- Decrease values in the following sequence: LOADER, CPUCOUNT, DBCACHE, and DBSIZE

```
BENCH@PMK SQL> @show_peakmarks

Tue 23-Jan-2024 17:07:01

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          64                  size of peakmarks database in [GByte]: 64 ... 65536 per instance     23-JAN-2024 17:03
     FLASHCACHE      DEFAULT             database or Exadata flash cache usage: NONE, DEFAULT, KEEP           23-JAN-2024 17:03
     LICENSEKEY      NONE                peakmarks license key                                               23-JAN-2024 17:03
     LOADER          4                   number of peakmarks loader processes: 2 ... 128 per instance        23-JAN-2024 17:03
     PLATFORM        pmexa01.lab.local   platform description, mixed case supported, max. 20 character        23-JAN-2024 17:03
     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>
```

Configuration parameters for peakmarks run 0 show the current values; these values will be used for the next run

As soon as a new peakmarks run is started, all configuration parameters are copied and saved together with the new peakmarks run ID for documentation purposes

Configuration Parameter AWRFORMAT

Purpose

- Defines format of AWR reports

Supported values (default value underlined)

- {NONE, HTML, TEXT, <u>BOTH</u>}

Changing value

- SQL> exec pmk.set_awrformat ('text');
- SQL> exec pmk.set_awrformat ('html');
- SQL> exec pmk.set_awrformat ('both');
- SQL> exec pmk.set_awrformat ('none');

```
BENCH@PMK SQL> exec pmk.set_awrformat ('text');

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

peakmarks command............: pmk.set_awrformat
Parameter AWRFORMAT set.......: TEXT

PL/SQL procedure successfully completed.

BENCH@PMK SQL>
```

```
BENCH@PMK SQL>  exec pmk.set_awrformat ('both');

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

peakmarks command............: pmk.set_awrformat
Parameter AWRFORMAT set.......: BOTH

PL/SQL procedure successfully completed.

BENCH@PMK SQL>
```

Configuration Parameter CPUCOUNT

Purpose

- Controls the number of logical CPUs for the database instance
- Serves as a basis for all process-related Oracle configuration parameters

Supported values

- {1, …, 1024}
- Takes default value from Oracle CPU_COUNT during installation

Changing value

- SQL> exec pmk.set_cpucount (32);

```
BENCH@PMK SQL> exec pmk.set_cpucount (96);

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

peakmarks command...........: pmk.set_cpucount
Parameter CPUCOUNT set......: 96

PL/SQL procedure successfully completed.

BENCH@PMK SQL>
```

Notes

- This parameter becomes effective only after
  - » executing the pmk.set_instance command
  - » executing peakmarks generated scripts to apply new instance configuration parameters
  - » restarting all instances
- peakmarks needs at least 1 GByte database cache for each logical CPU
- Many other process-related parameters are derived from this value

Configuration Parameter DBCACHE

Purpose

- Size of database buffer cache in GByte (Oracle parameter SGA_MAX_SIZE)
- Serves as a basis for all memory-related Oracle configuration parameters

Supported values

- Integer value between 1 and 8192
- Takes 50% of server RAM as default during installation

Changing value

- SQL> exec pmk.set_dbcache (512);

peakmarks® Configuration Parameter DBCACHE

```
BENCH@PMK SQL> exec pmk.set_dbcache (384);

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

peakmarks command............: pmk.set_dbcache
Parameter DBCACHE set.........: 384 GByte

PL/SQL procedure successfully completed.

BENCH@PMK SQL>
```

Notes

- This parameter becomes effective only after
  - » executing the pmk.set_instance command
  - » executing peakmarks generated scripts to apply new instance configuration parameters
  - » restarting all instances
- Many other memory-related parameters are derived from this value

Configuration Parameter DBSIZE

Purpose

- Approximate size of peakmarks® data in [GByte] **per instance**
- Each instance has a local data set to reduce inter-instance communication
- peakmarks ® uses 85% of this capacity for permanent data and 15% of this capacity for temporary data

Supported values (default value underlined)

- Integer value between <u>64</u> and 65536 (64 TByte)

Changing value

- SQL> exec pmk.set_dbsize (8192);

```
BENCH@PMK SQL> exec pmk.set_dbsize (4096);

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

peakmarks command.............: pmk.set_dbsize
Parameter DBSIZE set..........: 4,096 GByte

PL/SQL procedure successfully completed.

BENCH@PMK SQL>
```

Notes

- Changing this value requires a new database load

Recommendations

- Smaller values like 64, 128, and 256 are usually used on smaller test systems
- For representative testing, use the size of production databases; the most common values for DBSIZE are 2048, 4096, 8192, and 16384
- To avoid high storage system cache hit rates, the database should be larger than the storage system cache

Configuration Parameter FLASHCACHE

Purpose

- Controls usage of database flash cache or Exadata flash cache for peakmarks® data

Supported values (default value underlined)

- {KEEP, <u>DEFAULT</u>, NONE}

Changing value

- SQL> exec pmk.set_flashcache ('default');
- SQL> exec pmk.set_flashcache ('keep');
- SQL> exec pmk.set_flashcache ('none');

```
BENCH@PMK SQL> exec pmk.set_flashcache ('keep');

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

peakmarks command...........: pmk.set_flashcache
Parameter FLASHCACHE set.....: KEEP

PL/SQL procedure successfully completed.

BENCH@PMK SQL>
```

```
BENCH@PMK SQL> exec pmk.set_flashcache ('default');

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

peakmarks command...........: pmk.set_flashcache
Parameter FLASHCACHE set.....: DEFAULT

PL/SQL procedure successfully completed.

BENCH@PMK SQL>
```

Notes

- The database flash cache feature is only available on Solaris and Oracle Linux platforms with server internal flash storage

- The Exadata flash cache feature is only available on Oracle Exadata Engineered Systems

- Changing this value requires a new data load

Configuration Parameter LOADER

Purpose

- Controls the number of processes to load the peakmarks database per instance
- Each loader generates and loads its own tablespace to avoid contention - peakmarks features a very efficient and scalable load architecture

Supported values (default value underlined)

- Integer {4, ..., 128}
- The max value depends on the parameter DBSIZE

Changing value

- SQL> exec pmk.set_loader (6);

```
BENCH@PMK SQL> exec pmk.set_loader(16);

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

peakmarks command.............: pmk.set_loader
Parameter LOADER set..........: 16

PL/SQL procedure successfully completed.

BENCH@PMK SQL>
```

Notes

- This parameter has an impact on the load times of the peakmarks database
- For smaller databases, there is a threshold, which reduces the maximum number of loader processes
- The optimal value depends on several factors, like
  - » Number of cores
  - » Database buffer cache size
  - » Number of log writer and database writer processes
  - » Storage performance

Configuration Parameter PLATFORM

Purpose

- Platform name is used for documentation purposes

Supported values

- Any text string (decimal ascii code between 32 and 125), max 20 char
- Default is hostname

Changing value

- SQL> exec pmk.set_platform ('peakmarks Lab Exa72')

```
BENCH@PMK SQL> exec pmk.set_platform ('peakmarks Exadata');

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

peakmarks command............: pmk.set_platform
Parameter PLATFORM set........: peakmarks Exadata

PL/SQL procedure successfully completed.

BENCH@PMK SQL>
```

Configuration Parameter RUNTIME

Purpose

- Approximate runtime target of each single performance test in [minutes]

Supported values

- Integer value between 0 and 720 (adaptive load control is not used for 0)
- Default value 3

Changing value

- SQL> exec pmk.set_runtime (3);

```
BENCH@PMK SQL> exec pmk.set_runtime (10);

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

peakmarks command...........: pmk.set_runtime
Parameter RUNTIME set........: 10 min

PL/SQL procedure successfully completed.

BENCH@PMK SQL>
```

Notes

- Longer runtimes lead to more reliable and consistent outcomes (dependent on workload)

Recommendations

- Choose 3 minutes for short tests
- Choose 5, 10, or 15 minutes for official performance reports
- The maximum value of 720 (12 hours) is used by some customers for flash storage pre-conditioning (with workload STO-PRECON)

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Summary of Scripts and Commands

Scripts to monitor peakmarks parameter

SQL> @show_peakmarks

Scripts to monitor the Oracle platform

SQL> @show_database
SQL> @show_instance
SQL> @show_storage
SQL> @show_server

SQL> @show_all

Commands to change peakmarks parameter

SQL> exec pmk.set_awrformat
SQL> exec pmk.set_cpucount
SQL> exec pmk.set_dbcache
SQL> exec pmk.set_dbsize
SQL> exec pmk.set_flashcache
SQL> exec pmk.set_licensekey
SQL> exec pmk.set_loader
SQL> exec pmk.set_platform
SQL> exec pmk.set_runtime

peakmarks Mission

Identify Key Performance Metrics for Oracle Database Platforms.

On-Premises and in the Cloud.

For Quality Assurance, Evaluations, and Capacity Planning.