Exadata Performance Configuration best practice

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The simplest way: Choose the right template

- Create the database using the template with X2-2(OLTP or DW)

- It will change the sp parameter and some other thing(such as redo log size) right

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Block size consideration

- Choose 8KB block size as standard
  - Most in R&D
  - HCC Compress ration is not so related to blocksize
  - 1MB is the max IO size in OS level, bigger blocksize will no help with right MBRC set

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If you want manually set parameter

参数	推荐	优先级	备注
通用类型			
DB_Block_Size	8192	1	Check that db_block_size=8192. 8192 blocksize is generally recommended for Oracle applications unless a different block size is proven more efficient
DB_FILE_MULTIBLOCK_READ_COUNT	1MB/DB_block_size	1	
log_buffer	134217728	1	Check this is not less than 128M. Ensures adequate buffer space for new LGWR transport
parallel_adaptive_multi_user	FALSE	1	Performance impact: PQ degree will be reduced for some queries especially with concurrent workloads.
parallel_execution_message_size	16384 *	1	Improves PQ performance
Parallel_threads_per_cpu	1	1	Check that this value is at 1. Setting this to account for hyper threading
filesystemio_options	Setall	2	Ensures both async and direct IO are used when accessing filesystems. This improves performance for filesystem I/O (ex: data loads). This does not affect database IO for Exadata because the database is stored in ASM.
use_large_pages	X2-2 :TRUE X2-8: Only	2	This ensures the entire SGA is stored in hugepage for Linux based systems only. Benefits: Memory savings and reduce paging and swapping Prerequisites: Operating system hugepages setting need to be correctly configured and need to be adjusted whenever another database instance is added or dropped or whenever the sga sizes change. Refer to MOS 401749.1 and 361323.1 to configure HugePages.
_enable_NUMA_support	FALSE * for X2-2 TRUE * for X2-8	2	Enable NUMA support on X2-8 only

其他参数考虑

OLTP DB			
parallel_max_servers	240 for X2-2 1280 for X2-8	1	Check to ensure not more than the recommended value. Setting this higher than this recommended value can deplete memory and impact performance.*
parallel_min_servers	0	1	Check that it is 0. For OLTP, we don't want wasted resources that won't be use.
sga_target	24G for X2-2 128G for X2-8	1	Check to ensure not higher than the recommended value.* For X2-2, the recommended value is for a single database. For X2-8, this number is based on a small set of databases (< 5) Enabling Automatic Shared Memory Management by setting SGA_TARGET and disabling Automatic Memory Management by setting MEMORY_TARGET=0 is generic database practice for any database server with 4 GB or more physical memory.
pga_aggregate_target	16G for X2-2 64G for X2-8	1	Check to ensure not higher than the recommended value.* For X2-2, the recommended value is for a single database. For X2-8, this number is based on a small set of databases (< 5)

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其他参数考虑

DW DB				
parallel_max_servers	240 for X2-2 1280 for X2-8		1	Check to ensure not more than the recommended value. Setting this higher than this recommended value can deplete memory and impact performance.
parallel_min_servers	96 for X2-2 512 for X2-8		1	Reduce overhead of allocating and deallocating parallel servers unncessarily.
parallel_degree_policy	Manual		2	Evaluate workload management before deploying; otherwise set to manual by default.
parallel_degree_limit	16 for X2-2 24 for X2-8		2	Check that this is less than parallel_servers_target.
parallel_servers_target	128 for X2-2 512 for X2-8		2	Check to ensure not higher than parallel_max_servers. Setting this higher than this recommended value can deplete memory and impact performance.
sga_target	16G for X2-2 128G for X2-8		1	Check to ensure not higher than the recommended value. * Note these values are for a single database and Exadata's default settings. Enabling Automatic Shared Memory Management by setting SGA_TARGET and disabling Automatic Memory Management by setting MEMORY_TARGET=0 is generic database practice for any database server with 4 GB or more physical memory.
pga_aggregate_target	16G for X2-2 256G for X2-8		1	Check to ensure not higher than the recommended value. Note these values are for a single database and Exadata's default settings.

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Other Memory Consideration

- Huge will be OS considered as used since it can only used for Oracle's SGA

- AMM is not compatible with Huge page

- Begin from 11.2.0.3, SGA can automatically mixed use huge page and normal page, but still suggest only use huge page

- X2-2 can expand its memory use 16GB DIMM up to 288GB
  - For ½ expand to 192GB need no more than 150K RMB

- Avoid swap and node evict
  - OLTP: sga_target + pga_aggregate_target<75-80% physical ram
  - DW: sga_target + pga_aggregate_target*3<75-80% physical ram
  - Using RM active session can also help limit PGA

Tablespace choosing

- Mostly using auto allocation
- But for high workload DW with may truncate/CTAS/IAS, should consider using uniform 8M/4M
  - No fragments cause can not allocate extent
  - No file head hot block cause GC related wait event

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Data staging area

- DBFS is the simplest way
  - Using as external table to load
  - DBFS is very not suite for small write ,Do NOT put bad file/log file on it, will slow down
- ZFS
  - External table loading, no small write problem
  - Additional CAPEX
- SQLLDR
  - No need for shared filesytem, manually split source file
  - Can concurrent load into one table, suite for 3rd ETL tools（datastage/informatica)
  - Parallel load will cause index invalid

Gather stats

- Strongly not recommend set estimate_percent manually
- It will cause all SQLs run by it with sample(n)
  - disable cell smart table scan to cell multi block read
  - Performance downgrade 3-6x

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Enable WBFC

- In Hongkong, most user should enable WBFC to get better performance

- Only with very good written OLAP no need WBFC
  - Almost no update/delete/merge
  - Only Direct path read/write
  - No flash back database enable

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