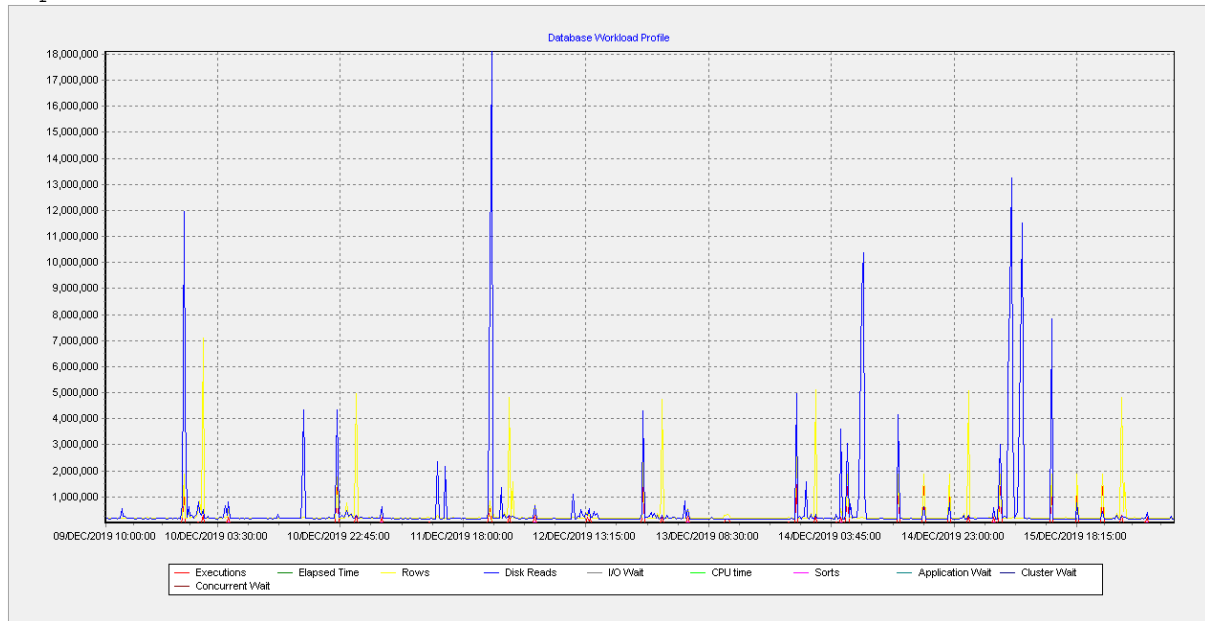


VITALS (Ver 19.12.11) : DB11
Performance Analysis Report
Date: 16/12/2019
Time: 9:48:05 AM

Database Workload Profile

The below database workload profile provides a topology of key performance metrics across the entire database. Metrics with high volumes can be analysed further using the content of this report.



Execution Plan Flip Flops

Execution plan flip flops occur due to underlying statistics of the object. In some cases the optimiser will generate a sub-optimal execution plan resulting in poor performance. Consider improving statistics or look at plan stability options such as SQL baseline \profiles.

SQL ID	Number of plans	Total Elapsed(s)	Total CPU(s)	Total I/O Wait(s)
00jchz9tqxqwg	2	1698.813566	1601.581564	93.00702
0150jz4c61afb	2	114.38207	2.86058	2.801228
01a2gm1xn35hn	5	8.19657	3.897718	4.284604
01brpm0cssasm	52	3557.19669	1783.745098	2282.277686
01xv155rhts3j	2	50.697994	28.537438	20.365128
02bhunw0vvg2j	2	0.021408	0.019182	0.00329
02tpnrqf47g3v	2	6.414528	4.199082	1.839312
04bkb5qx83vpr	5	25.051264	10.072054	14.613424
04jhpqjnsmh5	4	1491.434368	456.680896	1295.28263
05rg49a1857p5	4	84.971804	61.89932	47.769798
06zu28w694waq	2	1.395634	0.755924	0.362608
073wd5gzqs9v3	4	0.35646	0.347568	0.004592
089nkbupj51z6	2	45.720914	37.871932	6.044498
08fd76111gnj3	5	0.767292	0.364834	0.00885
09t5cxrqnd3zx	5	0.839412	0.72301	0.005282

0a5ds6dvuxvs4	2	2.34319	1.352176	0.867292
0axy30nx3zhc9	3	982.882274	309.198862	864.85211
0b33djfx9zfq5	2	171.106886	105.542584	109.205074
0bbwyjrztw3wr	3	911.649004	276.309494	797.012002
0c2s13bz4kvc0	5	2413.47093	1404.007488	1630.856242

Long Operations

Long operations are identified based on the amount of elapsed execution time. Consider tuning the underlying SQL of long operations.

Inst ID	SID	Serial#	OP Name	Done(hh:mm)	Left(hh:mm)
---------	-----	---------	---------	-------------	-------------

Hard Parses

Hard parses result in additional resource consumption as the database accesses the data dictionary to confirm object and sql metadata. Consider investigating ways of reducing hard parsing by use of bind variables.

Inst#	Time	Stat Name	Count
2	16/12/2019 9:30:10 AM	parse count (hard)	10
1	16/12/2019 9:30:10 AM	parse count (hard)	22
2	16/12/2019 9:15:09 AM	parse count (hard)	2
1	16/12/2019 9:15:09 AM	parse count (hard)	4
2	16/12/2019 9:00:09 AM	parse count (hard)	3
1	16/12/2019 9:00:09 AM	parse count (hard)	22
1	16/12/2019 8:45:08 AM	parse count (hard)	34
2	16/12/2019 8:45:08 AM	parse count (hard)	2
1	16/12/2019 8:30:07 AM	parse count (hard)	4
2	16/12/2019 8:30:07 AM	parse count (hard)	2
1	16/12/2019 8:15:06 AM	parse count (hard)	4
2	16/12/2019 8:15:06 AM	parse count (hard)	2
2	16/12/2019 8:00:06 AM	parse count (hard)	21
1	16/12/2019 8:00:06 AM	parse count (hard)	7
2	16/12/2019 7:45:05 AM	parse count (hard)	2
1	16/12/2019 7:45:05 AM	parse count (hard)	4
2	16/12/2019 7:30:04 AM	parse count (hard)	2
1	16/12/2019 7:30:04 AM	parse count (hard)	4
1	16/12/2019 7:15:03 AM	parse count (hard)	4
2	16/12/2019 7:15:03 AM	parse count (hard)	2
2	16/12/2019 7:00:02 AM	parse count (hard)	2
1	16/12/2019 7:00:02 AM	parse count (hard)	4
1	16/12/2019 6:45:02 AM	parse count (hard)	4
2	16/12/2019 6:45:02 AM	parse count (hard)	2
2	16/12/2019 6:30:01 AM	parse count (hard)	2
1	16/12/2019 6:30:01 AM	parse count (hard)	19
1	16/12/2019 6:15:24 AM	parse count (hard)	2
2	16/12/2019 6:15:24 AM	parse count (hard)	4
2	16/12/2019 6:00:23 AM	parse count (hard)	4
1	16/12/2019 6:00:23 AM	parse count (hard)	6
1	16/12/2019 5:45:23 AM	parse count (hard)	2
2	16/12/2019 5:45:23 AM	parse count (hard)	4

2	16/12/2019 5:30:22 AM	parse count (hard)	4
1	16/12/2019 5:30:22 AM	parse count (hard)	17
2	16/12/2019 5:15:21 AM	parse count (hard)	30
1	16/12/2019 5:15:22 AM	parse count (hard)	2
1	16/12/2019 5:00:21 AM	parse count (hard)	74
2	16/12/2019 5:00:21 AM	parse count (hard)	4822
1	16/12/2019 4:45:20 AM	parse count (hard)	7
2	16/12/2019 4:45:20 AM	parse count (hard)	567
2	16/12/2019 4:30:19 AM	parse count (hard)	5
1	16/12/2019 4:30:19 AM	parse count (hard)	3
1	16/12/2019 4:15:19 AM	parse count (hard)	192
2	16/12/2019 4:15:19 AM	parse count (hard)	16
2	16/12/2019 4:00:18 AM	parse count (hard)	4
1	16/12/2019 4:00:18 AM	parse count (hard)	4
2	16/12/2019 3:45:17 AM	parse count (hard)	4
1	16/12/2019 3:45:17 AM	parse count (hard)	2
2	16/12/2019 3:30:16 AM	parse count (hard)	4
1	16/12/2019 3:30:16 AM	parse count (hard)	2

Failed Parses

Failed parses can result from invalid object names in queries. Start off by looking for invalid objects and orphaned synonyms.

Inst#	Time	Stat Name	Count
2	16/12/2019 9:30:10 AM	parse count (failures)	0
1	16/12/2019 9:30:10 AM	parse count (failures)	4
2	16/12/2019 9:15:09 AM	parse count (failures)	0
1	16/12/2019 9:15:09 AM	parse count (failures)	0
2	16/12/2019 9:00:09 AM	parse count (failures)	0
1	16/12/2019 9:00:09 AM	parse count (failures)	0
1	16/12/2019 8:45:08 AM	parse count (failures)	3
2	16/12/2019 8:45:08 AM	parse count (failures)	0
1	16/12/2019 8:30:07 AM	parse count (failures)	0
2	16/12/2019 8:30:07 AM	parse count (failures)	0
1	16/12/2019 8:15:06 AM	parse count (failures)	0
2	16/12/2019 8:15:06 AM	parse count (failures)	0
2	16/12/2019 8:00:06 AM	parse count (failures)	0
1	16/12/2019 8:00:06 AM	parse count (failures)	0
2	16/12/2019 7:45:05 AM	parse count (failures)	0
1	16/12/2019 7:45:05 AM	parse count (failures)	0
2	16/12/2019 7:30:04 AM	parse count (failures)	0
1	16/12/2019 7:30:04 AM	parse count (failures)	0
1	16/12/2019 7:15:03 AM	parse count (failures)	0
2	16/12/2019 7:15:03 AM	parse count (failures)	0
2	16/12/2019 7:00:02 AM	parse count (failures)	0
1	16/12/2019 7:00:02 AM	parse count (failures)	0
1	16/12/2019 6:45:02 AM	parse count (failures)	0
2	16/12/2019 6:45:02 AM	parse count (failures)	0
2	16/12/2019 6:30:01 AM	parse count (failures)	0
1	16/12/2019 6:30:01 AM	parse count (failures)	0

1	16/12/2019 6:15:24 AM	parse count (failures)	0
2	16/12/2019 6:15:24 AM	parse count (failures)	0
2	16/12/2019 6:00:23 AM	parse count (failures)	0
1	16/12/2019 6:00:23 AM	parse count (failures)	0
1	16/12/2019 5:45:23 AM	parse count (failures)	0
2	16/12/2019 5:45:23 AM	parse count (failures)	0
2	16/12/2019 5:30:22 AM	parse count (failures)	0
1	16/12/2019 5:30:22 AM	parse count (failures)	0
2	16/12/2019 5:15:21 AM	parse count (failures)	0
1	16/12/2019 5:15:22 AM	parse count (failures)	0
1	16/12/2019 5:00:21 AM	parse count (failures)	0
2	16/12/2019 5:00:21 AM	parse count (failures)	0
1	16/12/2019 4:45:20 AM	parse count (failures)	0
2	16/12/2019 4:45:20 AM	parse count (failures)	0
2	16/12/2019 4:30:19 AM	parse count (failures)	0
1	16/12/2019 4:30:19 AM	parse count (failures)	0
1	16/12/2019 4:15:19 AM	parse count (failures)	0
2	16/12/2019 4:15:19 AM	parse count (failures)	0
2	16/12/2019 4:00:18 AM	parse count (failures)	0
1	16/12/2019 4:00:18 AM	parse count (failures)	0
2	16/12/2019 3:45:17 AM	parse count (failures)	0
1	16/12/2019 3:45:17 AM	parse count (failures)	0
2	16/12/2019 3:30:16 AM	parse count (failures)	0
1	16/12/2019 3:30:16 AM	parse count (failures)	0

PL/SQL CPU Consumption

Excessive CPU consumption can often result from poorly written PL/SQL. Look at improving PL/SQL code in the event of high CPU consumption from PL/SQL code

Inst#	DB Time	PL/SQL Time	PL/SQL %
1	339934.755664	2001.746658	0.59
2	897692.774201	8269.261274	0.92

Uncommitted Transactions

Uncommitted transactions acquire locking at the row and table level. Failure to commit or rollback transactions in a timely manner may cause subsequent issues for other database processes.

Inst#	Start Time	SID	Session#	Username	Status	Schma	Logon

Top Wait Events

Top events which are consuming the most database time.

Inst #	Event	Total Events	Time Waited(us)
2	cell single block physical read	118191534	34938211985
1	gcs remote message	78189823	600795138815
2	class slave wait	60970290	2426061796905
1	class slave wait	60919016	2420399679113
2	gc cr disk read	51688342	6073225537

2	ges remote message	23680677	602521491684
2	rdbms ipc message	20063906	21082192225701
1	rdbms ipc message	18694215	21083846313518
1	ASM file metadata operation	15221716	612048014
1	ASM background timer	14083301	602821383043
2	ASM file metadata operation	12653899	587453132
1	ges remote message	12532890	602620692951
2	ges remote message	12460556	602701866583
2	ASM background timer	11469788	602862791113
2	SQL*Net message from client	9564466	14533546973801
2	SQL*Net message to client	9553347	12224123
1	DIAG idle wait	8010908	1204013304083
2	DIAG idle wait	7571470	1204546742120
1	heartbeat redo informer	7226927	602961827152
2	heartbeat redo informer	7223946	602968374630

Buffer Busy Waits (By Object)

Buffer busy waits are due to block contention. Oracles Active Session History has two fields that can be used to identify the reason for Buffer Busy Waits. Review DBA_HIST_ACTIVE_SESS_HISTORY.P3TEXT where DBA_HIST_ACTIVE_SESS_HISTORY.event = "buffer busy waits"

Owner	Object	Sub-Object	Wait Count
SYS	SEQ\$		2750
SYS	SEG\$		704
SYS	UET\$		406
AMH_WB	GTW_REP_PARAM_VAL_ID	AMH_20191214_98	202
AMH_WB	CLU_PHYSICAL_NODE		132
AMH_WB	GTW_REP_PARAM_VAL_ID	AMH_20191210_98	94
AMH_WB	GTW_REP_PARAM_VAL_ID	AMH_20191216_98	72
AMH_WB	GTW_REP_PARAM_VAL_ID	AMH_20191213_98	62
AMH_WB	GTW_REP_PARAM_VAL_ID	AMH_20191212_98	62
AMH_WB	GTW_REP_PARAM_VAL_ID	AMH_20191211_98	52

Row Lock Waits (By Object)

Row lock contention occurs when an update is unable to proceed due to another session update which has not yet been committed. Review application logic to avoid row update contention.

Owner	Object	Sub-Object	Wait Count
SYS	WRH\$_SEG_STAT_OBJ_INDEX		96
SYS	WRH\$_SYSSTAT_PK	WRH\$_SYSSTA_1213419944_35991	56
SYS	WRH\$_FILESTATXS_PK	WRH\$_FILEST_1213419944_35991	48
AMH_WB	GTW_REP_PARAM_VAL_ID	AMH_20191214_98	46
SYS	WRH\$_EVENT_HISTOGRAM_PK	WRH\$_EVENT_1213419944_35991	40
SYS	WRH\$_LATCH_PK	WRH\$_LATCH_1213419944_35991	40
SYS	WRH\$_SQLSTAT_INDEX	WRH\$_SQLSTA_1213419944_35991	36
AMH_WB	GTW_REP_PARAM_VAL_ID	AMH_20191212_98	28
AMH_WB	GTW_REP_PARAM_VAL_ID	AMH_20191210_98	26
AMH_WB	GTW_REP_PARAM_VAL_ID	AMH_20191216_98	26

Transaction Slot Waits (By Object)

Consider increasing INITRANS setting if experiencing high transaction slot waits.

Owner	Object	Sub-Object	Wait Count
SYS	WRH\$_EVENT_HISTOGRAM_PK	WRH\$_EVENT_1213419944_35991	8
SYS	WRH\$_LATCH_PK	WRH\$_LATCH_1213419944_35991	8
SYS	WRH\$_SYSSTAT_PK	WRH\$_SYSSTA_1213419944_35991	4
SYS	WRH\$_BG_EVENT_SUMMARY_PK		2
SYS	WRH\$_SYSTEM_EVENT_PK	WRH\$_SYSTEM_1213419944_35991	2
SYS	CDEF\$		0
SYS	WRI\$_SQLTEXT_REFCOUNT_PK		0
SYS	WRH\$_MUTEX_SLEEP		0
SYS	WRH\$_RESOURCE_LIMIT		0
SYS	WRH\$_SQL_WORKAREA_HISTOGRAM		0

Top Physical I/O (By Object)

Excessive I/O can be reduced by various methods such as indexing, partitioning, KEEP_POOL, RESULT_POOL, SGA sizing.

Owner	Name	Partition	Type	I/O
SYS	OBJ\$		TABLE	33458132
AMH_WB	GTW_TX	AMH_20191203_01	TABLE PARTITION	19442738
SYS	WRI\$_ADV_PARAMETERS		TABLE	14816178
AMH_WB	GTW_TX	AMH_20191104_01	TABLE PARTITION	7370428
AMH_WB	GTW_TX	AMH_20190517_01	TABLE PARTITION	4736536
AMH_WB	GTW_DENORM_HIST	AMH_20190517_01	TABLE PARTITION	3747966
AMH_WB	GTW_TX	AMH_20190816_01	TABLE PARTITION	3394218
AMH_WB	GTW_TX	AMH_20191112_01	TABLE PARTITION	3068220
AMH_WB	GTW_TX	AMH_20191115_01	TABLE PARTITION	3054726
AMH_WB	GTW_TX	AMH_20190507_01	TABLE PARTITION	2972828

Top Logical I/O (By Query)

Excessive I/O can be reduced by various methods such as indexing, partitioning, KEEP_POOL, RESULT_POOL, SGA sizing.

SQLID::Execution Plan	Buffer Gets
ahpp2wqmx515j::2785526356	30402937566
b6usrg82hwsa3::0	30029376740
6mcpb06rctk0x::0	5542991570
74cpnuu24wmx7::2224657969	4841672636
6umxk81y99wrb::0	1280892160
3xjw1ncw5vh27::2462436679	978416188
d1tf5xsbwc77u::624343031	778870232
0kys26uk0vnhg::2621444217	654622148
5c2px151r4jxz::898820528	654619400
3cp9m9gmp047::0	652556510

Top CPU (By Query)

Consider tuning queries using excessive CPU. Review all recommendations from the SQL tuning advisor.

SQLID::Execution Plan	CPU(Secs)
ahpp2wqmx515j::2785526356	426190334956
b6usrg82hwsa3::0	423281503180
d1tf5xsbwc77u::624343031	22791090622
6mcpb06rectk0x::0	10827206802
84cdm4tn4qk66::0	8507056496
74cpnuu24wmx7::2224657969	7244004588
c61djpgyv2pc::1101573852	5029302628
d1tf5xsbwc77u::2477681208	3953107784
cnphq355f5rah::0	3893023710
5nh4nsmqt5su6::0	2748056842

Top Physical I/O (By Query)

Consider tuning queries using excessive I/O. Review all recommendations from the SQL tuning advisor.

SQLID::Execution Plan	Read/Write Bytes
b6usrg82hwsa3::0	797333905408
cnphq355f5rah::0	400243392512
6qyfg4zn7xays::2430997409	244372963328
6mcpb06rectk0x::0	235773034496
apwb6hfcml8p8::3060197406	176453009408
afvbq9uu6scn::494435058	92601384960
8hx4muc05uymh::3102360143	66640740352
276taswfn667g::2123089106	51445366784
8szmwam7fysa3::2976124318	50282954752
a904chcrgbxzp::3272894028	43160043520

Top Sorts (By Query)

Consider tuning queries using excessive sorts. Review all recommendations from the SQL tuning advisor.

SQLID::Execution Plan	Sorts
5j1vwjcutfma6::3673235829	1984530
bk6vdjgj3qw2u::25614614	1049328
gj5r9jj2xad7f::2529664852	315340
a3vfsb1vvtr3s::2700556141	240896
85z4g6z5f4zj6::1639075946	150458
7mgw0vh2rg568::2009915511	101468
dfffkcnqfystw::1233384715	100152
gt78uy9um0mzh::764960900	96880
8zcg87ma2gabz::1607931690	88160
5ms6rbzdnq16t::4032630273	75896

Top Elapsed (By Query)

Consider tuning queries with excessive elapsed time. Review all recommendations from the SQL tuning advisor

SQLID::Execution Plan	Elapsed(Secs)
b6usrg82hwsa3::0	431801992110
ahpp2wqmx515j::2785526356	428240144084
d1tf5xsbwc77u::624343031	65912469938
6mcpb06rctk0x::0	13410932888
d1tf5xsbwc77u::2477681208	11507388278
cnphq355f5rah::0	8559094066
84cdm4tn4qk66::0	8537631604
74cpnuu24wmx7::2224657969	7854200306
c61djpyvk2pc::1101573852	5931397344
6qyfg4zn7xays::2430997409	5116358740

Top Table Scans (By Object)

Full table scans can result in excessive I/O and severely degrade performance. Try to reduce full table I/O scans by use of indexing and/or caching.

Owner	Object	Sub Object	Type	Scans
SYS	I_TABPART_OBJ\$		INDEX	247722148
SYS	WRH\$_ADV_SQLT_PLAN_HASH_01		INDEX	4152
SYS	I_OBJ1		INDEX	1204
SYS	WRH\$_SQLSTAT	WRH\$_SQLSTA_1213419944_35607	TABLE PARTITION	1118
SYS	WRH\$_SQLSTAT	WRH\$_SQLSTA_1213419944_35223	TABLE PARTITION	1110
SYS	WRH\$_SQLSTAT	WRH\$_SQLSTA_1213419944_34839	TABLE PARTITION	1100
SYS	WRH\$_SQLSTAT	WRH\$_SQLSTA_1213419944_34456	TABLE PARTITION	1084
SYS	WRH\$_SQLSTAT	WRH\$_SQLSTA_1213419944_27544	TABLE PARTITION	1070
SYS	WRH\$_SQLSTAT	WRH\$_SQLSTA_1213419944_27927	TABLE PARTITION	1068
SYS	WRH\$_SQLSTAT	WRH\$_SQLSTA_1213419944_34072	TABLE PARTITION	1062

Top Table Scans (By Query)

Full table scans can result in excessive I/O and severely degrade performance. Try to reduce full table I/O scans by use of indexing and/or caching.

SQLID::Execution Plan	Rows Processed
74cpnuu24wmx7::2224657969	3631134
ahpp2wqmx515j::2785526356	2290719
9f0ujt3mt20p4::1624763914	1119119
cduvbuupb4dby::3919303943	772834
0wbfdq0hvf5mg::3086914836	510698
7sx5p1ug5ag12::1097271556	494996
0amsj42k06a01::2723599404	442387
ahxpnugjsq27::3086914836	305243
8kcg0ztkm00kh::3086914836	291686

5ssdpc15abg3z::3046810736

228509

General Alerts

All database alerts should be analysed for the purpose of sustaining database integrity and performance.

Creation Time	Inst Name	Reason	User	Owner	Object	Suggestion
---------------	-----------	--------	------	-------	--------	------------

Database High Water Marks

Peek resource consumption allows us to identify which parts of the database are subject to heavy utilisation. This can resort in resource saturation and may require resource provisioning or tuning in specific areas.

DBID	Version	Name	Description	Last Value	Highest Value
1213419944	12.1.0.2.0	ACTIVE_SESSIONS	Maximum Number of Active Sessions seen in the system	0.715979866666667	29.7566485423955
1213419944	12.1.0.2.0	CPU_COUNT	Maximum Number of CPUs	4	4
1213419944	12.1.0.2.0	DATAFILES	Maximum Number of Datafiles	17	17
1213419944	12.1.0.2.0	DB_SIZE	Maximum Size of the Database (Bytes)	302104182784	302104182784
1213419944	12.1.0.2.0	EXADATA_DISKS	Number of physical disks		
1213419944	12.1.0.2.0	GLOBAL_SERVICES	Number of global services	0	0
1213419944	12.1.0.2.0	HWM_DBMS_SCHEDULER	Number of job runs per day	224	1390
1213419944	12.1.0.2.0	INSTANCES	Oracle Database instances	2	2
1213419944	12.1.0.2.0	PART_INDEXES	Maximum Number of Partitions belonging to an User Index	499	499
1213419944	12.1.0.2.0	PART_TABLES	Maximum Number of Partitions belonging to an User Table	499	499
1213419944	12.1.0.2.0	QUERY_LENGTH	Maximum Query Length	4024	4024
1213419944	12.1.0.2.0	SEGMENT_SIZE	Size of Largest Segment (Bytes)	15452864512	138622795776
1213419944	12.1.0.2.0	SESSIONS	Maximum Number of Concurrent Sessions seen in the database	43	56
1213419944	12.1.0.2.0	SQL_NCHAR_COLUMNS	Maximum Number of SQL NCHAR Columns	108	108
1213419944	12.1.0.2.0	TABLESPACES	Maximum Number of Tablespaces	10	10
1213419944	12.1.0.2.0	USER_INDEXES	Number of User Indexes	7040	13121
1213419944	12.1.0.2.0	USER_MV	Maximum Number of Materialized Views (User)	0	0
1213419944	12.1.0.2.0	USER_TABLES	Number of User Tables	1955	3541

Flashback Mode

Only enable flashback if there is a requirement to flashback to any previous point in time. If there is no requirement flashback will generate unnecessary I/O.

Flashback On
YES

Force Logging Mode

FORCE LOGGING forces data changes to generate REDO regardless of any database objects declared as NOLOGGING. FORCE LOGGING is encouraged to guarantee all changes are synchronised between primary and standby when dataguard is in use.

Force Logging
YES

Cluster Balance

The equal ratio\distribution of workload across all nodes in a cluster will help prevent resource depletion on any single node. Try and balance the workload across all nodes in the cluster.

Inst ID	Executions	Elapsed	Rows	Reads	IO Wait	CPU	Sorts	App Wait	Cluster Wait	Conc Wait	Buffer Gets
1	4987538	16141.2426	19301968	15933119	1606.4478	12477.8303	1367498	46.0342	585.0743	228.884	1864102760
2	22760653	512645.5385	169322018	283031543	43360.3133	465501.591	1112900	76.3858	8713.5279	322.7997	38994987807

Cluster Balance

There should be no errors with cluster communications. Any cluster errors need to be investigated from the database stack right through to the infrastructure\network stack.

Inst ID	Block Corrupt	Blocks Lost	Claim Blocks Lost	R/W Failures	R/W Timeouts
AMHV22	0	0	0	0	1
AMHV21	0	0	0	0	3

Cluster Balance

Low latency communication between nodes in a cluster is important for performance. All average cluster latency between nodes should be less than 1 millisecond.

Source:Target	Count(500B)	Wait(500B)	Count(8K)	Wait(8K)	Avg Ping(500B)	Avg Ping(8K)
1:1	71.356184798807749627421758569	9.934637853949329359165424739	71.356184798807749627421758569	9.215488822652757078986587183	0.139226023391813	0.129147723475355
1:2	71.356184798807749627421758569	11.241898658718330849478390461	71.356184798807749627421758569	13.526962742175856929955290611	0.157546240601504	0.189569590643275
2:1	71.356184798807749627421758569	12.057338301043219076005961251	71.356184798807749627421758569	14.204359165424739195230998509	0.168973976608187	0.19906276106934
2:2	71.356184798807749627421758569	11.974150521609538002980625931	71.356184798807749627421758569	11.529359165424739195230998509	0.167808166248956	0.161574770258981

Invisible Indexes

Invisible indexes incur normal data maintenance during data manipulation but are not used for query operations. If the index is unintentionally marked as invisible either drop it or make it visible.

Owner	Index	Type
-------	-------	------

Tables (More than 5 Indexes)

Tables with more than 5 indexes will require more overhead than normal when data and associated indexes are updated. Try and reduce the number of indexes required on a table.

Owner	Table	IDX Count
AMH_WB	ADDRBOOK_GEN_ADDR_FLD	6
AMH_WB	ADDRBOOK_GEN_ADDR_FLD_AUDIT	6
AMH_WB	ADDRBOOK_PTY_INFO	6
AMH_WB	ADDRBOOK_SERVICE	6
AMH_WB	ADUP_CHK_SEL	6
AMH_WB	ASEC_MSG_PERM	6
AMH_WB	BLK_JOB	6
AMH_WB	BLK_SER_CFG	6
AMH_WB	CFG_CFG_EXP	6
AMH_WB	CFG_CHANGE_SET	6
AMH_WB	CFG_MODEL	6
AMH_WB	CFG_STAG_RU	6
AMH_WB	CLU_LOGICAL_NODE	6
AMH_WB	FIN_CONN	6
AMH_WB	FIN_SYN_SIGNER	6
AMH_WB	GTW_BE_CHNNL_ASSIGN	6
AMH_WB	GTW_BLACK_CONFIG_TABLE	6
AMH_WB	GTW_BLK_PROF_CONF	6
AMH_WB	GTW_COMM_STAT_EVT_SEL	6
AMH_WB	GTW_CONF_MAIL_NOTIF	6

Tables (With No Indexes)

Tables with no indexes are subject to full table scanning and excessive I/O. Investigate if the table and its usage will benefit from indexing.

Owner	Table
AMH_WB	DATA_VALUE_HISTORY
AMH_WB	PROCINST_LINK
AMH_WB	SRCH_SEARCH_PROF_IDX_FLD_TMP
AMH_WB	STRING_DATA_MODEL_BACKUP
AMH_WB	TMP_GTW_TX_COUNT_MVE
AMH_WB	TMP_GTW_WFL_EX_COUNT_MVE
APPQOSSYS	WLM_CLASSIFIER_PLAN
APPQOSSYS	WLM_METRICS_STREAM
APPQOSSYS	WLM_MPA_STREAM
APPQOSSYS	WLM_VIOLATION_STREAM
CTXSYS	DR\$ACTIVELOGS
CTXSYS	DR\$INDEX_ERROR
CTXSYS	DR\$NUMBER_SEQUENCE
CTXSYS	DR\$POLICY_TAB

CTXSYS	SYS_IOT_OVER_77457
CTXSYS	SYS_IOT_OVER_77509
DBSNMP	MGMT_BASELINE
DBSNMP	MGMT_BASELINE_SQL
DBSNMP	MGMT_CAPTURE
DBSNMP	MGMT_CAPTURE_SQL

Index Usage (Indexes not used in 60 days)

Indexes which are not used represent a performance overhead with data manipulation. Consider dropping indexes which are not used. Note that some indexes which are not used may be required to enforce data integrity rules (I.E: Primary keys).

Owner	Name
AMH_WB	ACTIVITY_IDX1
AMH_WB	ACTIVITY_IDX2
AMH_WB	ACTIVITY_INST_IDX1
AMH_WB	ACTIVITY_INST_IDX5
AMH_WB	ACTIVITY_INST_IDX7
AMH_WB	ACT_INST_HISTORY_IDX3
AMH_WB	ACT_INST_HIST_IDX1
AMH_WB	ACT_INST_PRP_IDX1
AMH_WB	ACT_INST_PRP_IDX2
AMH_WB	ACT_INST_PRP_IDX3
AMH_WB	ACT_INST_PRP_IDX4
AMH_WB	ADDRBOOK_ADDR_TYP_AUDIT_ID
AMH_WB	ADDRBOOK_ADDR_TYP_ID
AMH_WB	ADDRBOOK_ADDR_TYP_SUP_ADT_ID
AMH_WB	ADDRBOOK_ADDR_TYP_SUP_ID
AMH_WB	ADDRBOOK_AUDIT_UNIQ_IDT_IDX
AMH_WB	ADDRBOOK_BUS_ADDR_DELETED_IDX
AMH_WB	ADDRBOOK_BUS_ADDR_ID
AMH_WB	ADDRBOOK_BUS_ADDR_SRC_ADDR_ID
AMH_WB	ADDRBOOK_BUS_ADDR_SRC_ID
AMH_WB	ADDRBOOK_CCY_AUDIT_ID
AMH_WB	ADDRBOOK_CCY_ID
AMH_WB	ADDRBOOK_CCY_SRC_ID
AMH_WB	ADDRBOOK_DISTR_LST_AUDIT_ID
AMH_WB	ADDRBOOK_DISTR_LST_ID
AMH_WB	ADDRBOOK_EXT_LST_AUDIT_ID
AMH_WB	ADDRBOOK_EXT_LST_ID
AMH_WB	ADDRBOOK_GEN_ADDR_FLD_AUDIT_ID
AMH_WB	ADDRBOOK_GEN_ADDR_FLD_ID
AMH_WB	ADDRBOOK_GEN_STRUCT_AUDIT_ID
AMH_WB	ADDRBOOK_GEN_STRUCT_ID
AMH_WB	ADDRBOOK_INTERNAL_TYP_ID
AMH_WB	ADDRBOOK_MSG_PLTFM_AUDIT_ID
AMH_WB	ADDRBOOK_MSG_PLTFM_ID
AMH_WB	ADDRBOOK_PTY_INFO_AUDIT_ID
AMH_WB	ADDRBOOK_PTY_SRC_ID
AMH_WB	ADDRBOOK_PTY_SRC_PTY_ID

AMH_WB	ADDRBOOK_SERVICE_AUDIT_ID
AMH_WB	ADDRBOOK_SERVICE_ID
AMH_WB	ADUP_CHK_SEL_AUDIT_ID
AMH_WB	ADUP_CHK_SEL_CRIT_AUDIT_ID
AMH_WB	ADUP_CHK_SEL_CRIT_ID
AMH_WB	ADUP_CHK_SEL_ID
AMH_WB	ADUP_FIELDS_AUDIT_ID
AMH_WB	ADUP_FIELDS_ID
AMH_WB	ADUP_FIELD_ASSGN_AUDIT_ID
AMH_WB	ADUP_FIELD_ASSGN_ID
AMH_WB	ADUP_HANDL_PROF_AUDIT_ID
AMH_WB	ADUP_HANDL_PROF_ID
AMH_WB	ADUP_PROFI_AUDIT_ID

Log Buffer Waits

Increase the size of the REDO log buffer if the average log buffer wait is less than 5000. There should next to no log buffer space waits.

Inst ID	REDO Entry(Count)	Wait on REDO Entry(Count)	Avg Log Buffer Wait(Count)
1	185890379	404	460124.7
2	195156934	805	242430.97

Log Buffer Latching

All miss ratios should be <= 1%. If greater than 1% then redo latch tuning is required.

Inst ID	Latch Name	Get(Will Wait)	Misses(Will Wait)	Gets(Wont Wait)	Misses(Wont Wait)	Miss Ratio(Will Wait)	Miss Ratio(Wont Wait)
1	redo allocation	16990810	65104	185851959	133232	0.38	0.07
1	redo copy	7428	1	185899136	405787	0.01	0.21
1	redo on-disk SCN	0	0	0	0	0	0
1	redo transport task latch	50843	1	0	0	0	0
1	redo writing	21974281	43477	0	0	0.19	0
2	redo allocation	17076742	62862	195121963	126070	0.36	0.06
2	redo copy	7426	0	195166780	496826	0	0.25
2	redo on-disk SCN	0	0	0	0	0	0
2	redo transport task latch	50804	0	0	0	0	0
2	redo writing	19612911	8009	0	0	0.04	0

Log Wait Times

If excessive AVG_WAIT_TIME review the log buffer size.

Inst ID	Event	Total Waits	Total Timeouts	Average Wait(cs)	Time Waited(us)	FG-Total Waits	FG-Total Timeouts	FG-Average Wait(cs)	FG-Time Waited(us)	Wait Class
1	log buffer space	7	0	2.41	168751	1	0	0.4	4036	Configuration

1	log file parallel write	3892933	0	0.04	1369752881	0	0	0	0	System I/O
1	log file sequential read	43381	0	0.7	303679483	7173	0	0.7	49920279	System I/O
1	log file single write	1467	0	0.03	486042	0	0	0	0	System I/O
1	log file switch (checkpoint incomplete)	1	0	4.72	47202	1	0	4.72	47202	Configuration
1	log file switch completion	62	0	8.56	5309985	59	0	7.91	4669548	Configuration
1	log file sync	597511	0	0.26	1555860970	587977	0	0.25	1479163103	Commit
1	log switch/archive	437	130	515.65	2253396913	437	130	515.65	2253396913	Other
2	log buffer space	4	0	9.71	388516	0	0	0	0	Configuration
2	log file parallel write	4045315	0	0.04	1416278353	0	0	0	0	System I/O
2	log file sequential read	46612	0	0.71	332937795	3683	0	0.62	22792456	System I/O
2	log file single write	1472	0	0.03	471443	1	0	0.07	702	System I/O
2	log file switch completion	68	0	12.85	8741192	62	0	13.15	8154978	Configuration
2	log file sync	476736	0	0.16	783652954	463479	0	0.16	756183916	Commit
2	log switch/archive	368	8	331.15	1218617594	368	8	331.15	1218617594	Other

Log Switch Frequency (> 1 per 5 minutes)

If excessive log switching then consider increasing the REDO log size. There should not be more than 1 log switch every 5 minutes

Inst ID	Date/Time	Per Hour	Per Minute
---------	-----------	----------	------------

Unusable Indexes

Unusable indexes are flagged as invalid and will not be picked by the optimiser resulting in sub-optimal execution plans. Unusable indexes should be rebuilt.

Owner	Name	Partition	Status
-------	------	-----------	--------

Invalid Objects

Invalid objects result in SQL execution failure and also contribute to failed parsing. Rebuild\recompile all invalid objects.

State	Object Type	Owner	Name
-------	-------------	-------	------

Disabled Constraints

Disabled constraints may allow data inserts to jeopardise data integrity. Enabled all constraints to enforce data integrity rules.

Owner	Const Name	Const Type	Table Name
-------	------------	------------	------------

Non SYS/SYSTEM Objects in System Tablespace

Storing non SYS/SYSTEM objects in system tablespaces can impact data dictionary operations and overall performance. Make sure all non SYS/SYSTEM objects are not stored in system tablespaces.

Owner	Segment Name	Segment Type
-------	--------------	--------------

Missing Statistics

Missing statistics can severely impact system performance. Collect statistics appropriately to ensure the optimizer has the best information available to choose the optimum execution plan.

Type	Owner	Name	Partition
Index	AMH_WB	SYS_IL0000577287C00030\$\$	
Index	AMH_WB	SYS_IL0000165692C00020\$\$	
Index	AMH_WB	SYS_IL0000165653C00012\$\$	
Index	AMH_WB	SYS_IL0000165653C00013\$\$	
Index	AMH_WB	SYS_IL0000165633C00012\$\$	
Index	AMH_WB	SYS_IL0000165343C00015\$\$	
Index	AMH_WB	SYS_IL0000165318C00009\$\$	
Index	AMH_WB	SYS_IL0000165318C00010\$\$	
Index	AMH_WB	SYS_IL0000165129C00031\$\$	
Index	AMH_WB	SYS_IL0000164992C00010\$\$	
Index	AMH_WB	SYS_IL0000164992C00011\$\$	
Index	AMH_WB	SYS_IL0000164856C00038\$\$	
Index	AMH_WB	SYS_IL0000164856C00056\$\$	
Index	AMH_WB	SYS_IL0000164856C00078\$\$	
Index	AMH_WB	SYS_IL0000164856C00095\$\$	
Index	AMH_WB	SYS_IL0000164856C00100\$\$	
Index	AMH_WB	SYS_IL0000164856C00106\$\$	
Index	AMH_WB	SYS_IL0000164856C00111\$\$	
Index	AMH_WB	SYS_IL0000164856C00140\$\$	
Index	AMH_WB	SYS_IL0000164856C00141\$\$	

Stale Statistics

Stale statistics can severely impact system performance. Collect statistics appropriately to ensure the optimizer has the best information available to choose the optimum execution plan.

Owner	Name	Partition	Inserts	Updates	Deletes
AMH_WB	GTW_DENORM_HIST	AMH_20191203_01	1227375	0	0
AMH_WB	STG_DOCUMENT	AMH_20191203_01	965513	0	0
AMH_WB	GTW_DENORM_HIST	AMH_20191115_01	776820	0	0
AMH_WB	GTW_DENORM_HIST	AMH_20191112_01	729009	0	0
AMH_WB	GTW_DENORM_HIST	AMH_20191114_01	624281	0	0
AMH_WB	GTW_DENORM_HIST	AMH_20191129_01	622268	0	0
AMH_WB	GTW_DENORM_HIST	AMH_20191104_01	544154	0	0
AMH_WB	STG_DOCUMENT	AMH_20191129_01	529746	0	0
AMH_WB	STG_DOCUMENT	AMH_20191114_01	490879	0	0
AMH_WB	GTW_DENORM_HIST	AMH_20191111_01	477297	0	0

AMH_WB	STG_DOCUMENT	AMH_20191115_01	475554	0	0
AMH_WB	STG_DOCUMENT	AMH_20191112_01	472467	0	0
AMH_WB	STG_DOCUMENT	AMH_20191104_01	427748	217	0
AMH_WB	MSG_COMM	AMH_20191203_01	405351	405351	0
AMH_WB	GTW_TX	AMH_20191203_01	376143	27018	0
AMH_WB	STG_DOCUMENT	AMH_20191111_01	371994	0	0
AMH_WB	MSG_COMM	AMH_20191129_01	247078	247079	0
AMH_WB	MSG_COMM	AMH_20191114_01	208709	208718	0
AMH_WB	MSG_COMM	AMH_20191115_01	200508	200526	0
AMH_WB	MSG_COMM	AMH_20191112_01	197578	197612	0

Chained Rows

Chained rows can impact I/O operation performance. Consider reviewing block PCT settings and block size to reduce chained rows.

Owner	Name	PCT Free	PCT Used	AVG Row Len	Num Rows	Chain Cnt	PCT Chained
-------	------	----------	----------	-------------	----------	-----------	-------------

Orphaned Synonyms

Orphaned synonyms result in SQL execution failure and also contribute to failed parsing. Correct or remove orphaned synonyms.

Owner	Synonym	Table Owner	Table Name
PUBLIC	G_CONTEXT	DBMS_PRIVILEGE_CAPTURE	G_CONTEXT
PUBLIC	G_DATABASE	DBMS_PRIVILEGE_CAPTURE	G_DATABASE
PUBLIC	G_ROLE	DBMS_PRIVILEGE_CAPTURE	G_ROLE
PUBLIC	G_ROLE_AND_CONTEXT	DBMS_PRIVILEGE_CAPTURE	G_ROLE_AND_CONTEXT

Not Null Columns

Columns should be declared as NOT NULL where possible. This causes different behaviour with the optimiser resulting in more optimum plans.

Owner	# of columns
AMH_WB	9108
RMAN	1
OUTLN	42
AUDSYS	14
GSMADMIN_INTERNAL	82
OJVMSYS	24
WBC_RMAN	6
APPQOSSYS	16

Locked Statistics

Locked statistics will force the optimiser to choose the same execution plan. Only use locked statistics if you are 100% sure the current execution plans are appropriate.

Type	Owner	Name	Partition
INDEX	GSMADMIN_INTERNAL	SYS_C004932	
INDEX	GSMADMIN_INTERNAL	SYS_IL0000019773C00036\$\$	
INDEX	WMSYS	SYS_C004968	

INDEX	WMSYS	SYS_C004969	
INDEX	WMSYS	SYS_IL0000019987C00036\$\$	
PARTITION	AMH_WB	ADDRBOOK_BUS_ADDR_SRC	AMH_20191216_01
PARTITION	AMH_WB	ADDRBOOK_BUS_ADDR_SRC	AMH_20191216_94
PARTITION	AMH_WB	ADDRBOOK_BUS_ADDR_SRC	AMH_20191216_95
PARTITION	AMH_WB	ADDRBOOK_BUS_ADDR_SRC	AMH_20191216_97
PARTITION	AMH_WB	ADDRBOOK_BUS_ADDR_SRC	AMH_20191216_98
PARTITION	AMH_WB	ADDRBOOK_BUS_ADDR_SRC	AMH_20191217_01
PARTITION	AMH_WB	ADDRBOOK_BUS_ADDR_SRC	AMH_20191217_94
PARTITION	AMH_WB	ADDRBOOK_BUS_ADDR_SRC	AMH_20191217_95
PARTITION	AMH_WB	ADDRBOOK_BUS_ADDR_SRC	AMH_20191217_97
PARTITION	AMH_WB	ADDRBOOK_BUS_ADDR_SRC	AMH_20191217_98
PARTITION	AMH_WB	ADDRBOOK_BUS_ADDR_SRC	AMH_20191218_01
PARTITION	AMH_WB	ADDRBOOK_BUS_ADDR_SRC	AMH_20191218_94
PARTITION	AMH_WB	ADDRBOOK_BUS_ADDR_SRC	AMH_20191218_95
PARTITION	AMH_WB	ADDRBOOK_BUS_ADDR_SRC	AMH_20191218_97
PARTITION	AMH_WB	ADDRBOOK_BUS_ADDR_SRC	AMH_20191218_98

Locked Objects

Locked objects may prevent other operations. Whilst locking is normal careful review should be taken on objects which are locked for extended periods of time.

Inst ID	Session ID	Serial #	User	Owner	Object	Lock Mode	O/S User
---------	------------	----------	------	-------	--------	-----------	----------

NUMBERS With No Precision

Large floating point values stored in NUMBER datatypes with no precision can consume more storage than normal and possibly impact performance.

Owner	Table	Column	Avg Col Len
INDEX	GSMADMIN_INTERNAL	SYS_C004932	
INDEX	GSMADMIN_INTERNAL	SYS_IL0000019773C00036\$\$	
INDEX	WMSYS	SYS_C004968	
INDEX	WMSYS	SYS_C004969	
INDEX	WMSYS	SYS_IL0000019987C00036\$\$	
PARTITION	AMH_WB	ADDRBOOK_BUS_ADDR_SRC	AMH_20191216_01
PARTITION	AMH_WB	ADDRBOOK_BUS_ADDR_SRC	AMH_20191216_94
PARTITION	AMH_WB	ADDRBOOK_BUS_ADDR_SRC	AMH_20191216_95
PARTITION	AMH_WB	ADDRBOOK_BUS_ADDR_SRC	AMH_20191216_97
PARTITION	AMH_WB	ADDRBOOK_BUS_ADDR_SRC	AMH_20191216_98
PARTITION	AMH_WB	ADDRBOOK_BUS_ADDR_SRC	AMH_20191217_01
PARTITION	AMH_WB	ADDRBOOK_BUS_ADDR_SRC	AMH_20191217_94
PARTITION	AMH_WB	ADDRBOOK_BUS_ADDR_SRC	AMH_20191217_95
PARTITION	AMH_WB	ADDRBOOK_BUS_ADDR_SRC	AMH_20191217_97
PARTITION	AMH_WB	ADDRBOOK_BUS_ADDR_SRC	AMH_20191217_98
PARTITION	AMH_WB	ADDRBOOK_BUS_ADDR_SRC	AMH_20191218_01
PARTITION	AMH_WB	ADDRBOOK_BUS_ADDR_SRC	AMH_20191218_94
PARTITION	AMH_WB	ADDRBOOK_BUS_ADDR_SRC	AMH_20191218_95
PARTITION	AMH_WB	ADDRBOOK_BUS_ADDR_SRC	AMH_20191218_97
PARTITION	AMH_WB	ADDRBOOK_BUS_ADDR_SRC	AMH_20191218_98

Tablespace Free (Less that 15%)

To avoid tablespace depletion consider adding more space to tablespaces that have less than 15% free space

Tablespace	Used	Free	Total	%Free
SYSTEM	1217	123	1340	9
AMH_DATA	227565	20243	247808	8
AMH_INDEX	10043	591	10634	6
SYSAUX	24913	1365	26278	5

Extent Free (Less that 15%)

To avoid space depletion consider adding more extents to objects that have less than 15% free space.

Owner	Name	Partition	Extents	Max Ext	%Free
-------	------	-----------	---------	---------	-------

Orphaned Tablespaces

Tablespaces with no default user may represent orphaned data and unnecessary space consumption.

Tablespace
AMH_INDEX
UNDOTBS1

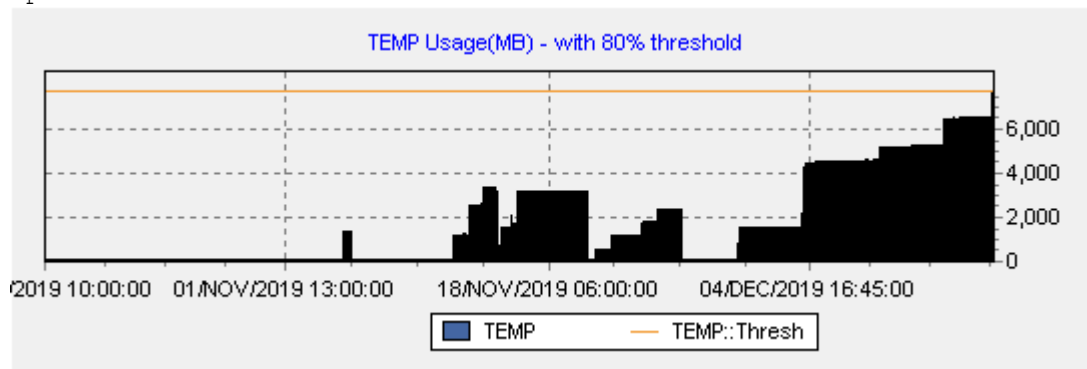
Active Restore Points

Active restore points retain archive log files which has the potential to fill up archive log space and freeze the database. Active restore points should be removed as soon as possible.

Time	Name	Guarantee
------	------	-----------

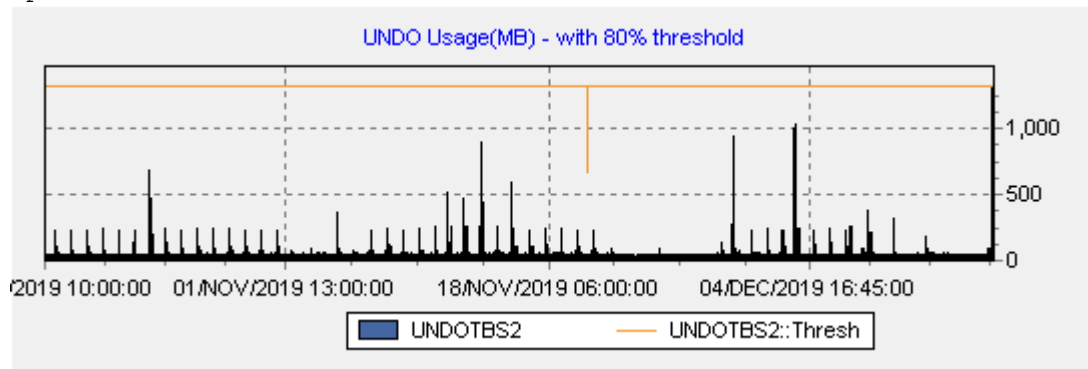
Temp Usage

Consider adding more space to the TEMP tablespace if there is any evidence of more than 80% consumption. Alternatively identify and tune queries responsible for consuming excessive TEMP space.



Undo Usage

Consider adding more space to the UNDO tablespace if there is any evidence of more than 80% consumption. Alternatively identify and tune queries responsible for consuming excessive UNDO space.



Database File Count

Insufficient slots for new datafiles can result in problems with database file creation. Increase the DB_FILES parameter if the number of existing files is approaching the DB_FILES value.

Current	Maximum
17	200

Data Dictionary

The data dictionary cache hit ratio should be > 90% and misses should be < 15%. If not within these thresholds consider increasing the SHARED_POOL_SIZE.

Inst #	Gets	Misses	Gets%	Misses%
1	81560506	857399	98.94	1.05
2	198473191	1370860	99.3	0.69

Library Cache (Summary)

The library cache hit ratio should be > 90% and misses should be < 1%. If not within these thresholds consider increasing the SHARED_POOL_SIZE.

Inst #	Pins	Reloads	PinHit%	Reloads%
1	76192227	100473	99.86	0
2	109241950	151624	99.86	0

Library Cache (Detail)

GETHITRATIO and PINHITRATIO should be more than 90%.

Inst #	Namespace	Hit%	PinHit%	Reloads	Invalidations
1	ACCOUNT_STATUS	99	100	0	0
1	APP CONTEXT	85	85	1	0
1	AUDIT POLICY	99	99	0	0
1	BODY	99	99	90	1
1	CLUSTER	99	99	16	0
1	DBINSTANCE	0	100	0	0
1	DBLINK	99	100	0	0

1	DIRECTORY	66	66	0	0
1	EDITION	99	99	0	0
1	HINTSET OBJECT	88	77	0	0
1	INDEX	99	97	10217	0
1	LOCATION	79	77	4	0
1	OBJECT ID	0	100	0	0
1	PCINDX	53	50	0	0
1	PCTABL	52	35	0	0
1	PDB	50	100	0	0
1	QUEUE	99	99	5	0
1	RULESET	50	90	1	0
1	SCHEMA	99	100	0	0
1	SQL AREA	95	99	60821	68877
1	SQL AREA BUILD	38	100	0	0
1	SQL AREA STATS	39	39	0	0
1	SUBSCRIPTION	61	74	10	0
1	TABLE/PROCEDURE	99	99	27316	0
1	TEMPORARY INDEX	53	0	378	0
1	TEMPORARY TABLE	85	0	1612	0
1	TRANSFORMATION	99	99	0	0
1	TRIGGER	99	99	3	0
1	USER PRIVILEGE	0	66	0	0
2	ACCOUNT_STATUS	99	100	0	0
2	APP CONTEXT	92	88	2	0
2	AUDIT POLICY	99	99	0	0
2	BODY	99	99	119	1
2	CLUSTER	99	99	11	0
2	DBINSTANCE	0	100	0	0
2	DBLINK	99	100	0	0
2	DIRECTORY	66	66	0	0
2	EDITION	99	99	0	0
2	INDEX	99	97	6867	0
2	LOCATION	77	76	2	0
2	OBJECT ID	0	100	0	0
2	PCINDX	51	46	0	0
2	PCTABL	51	28	0	0
2	PDB	50	100	0	0
2	QUEUE	99	99	4	0
2	RULESET	0	87	1	0
2	SCHEMA	99	100	0	0
2	SQL AREA	95	99	107246	108038
2	SQL AREA BUILD	34	100	0	0
2	SQL AREA STATS	44	44	0	0
2	SUBSCRIPTION	40	67	7	0
2	TABLE/PROCEDURE	99	99	32612	0
2	TEMPORARY INDEX	50	0	790	0
2	TEMPORARY TABLE	86	0	3959	0
2	TRANSFORMATION	0	0	0	0
2	TRIGGER	99	99	5	2

Shared Pool

%FREE should be > 0.5. REQUEST_FAILURES, REQUEST_MISSES should be 0 or near 0. If not within these thresholds consider increasing SHARED_POOL_RESERVED_SIZE and SHARED_POOL_SIZE.

Inst #	Name	Free Space	Total Space	Used%	Requests	Misses
1	shared_pool_reserved_size	131223712	169449881	77	19921	0
2	shared_pool_reserved_size	146130768	169449881	86	14	0

Buffer Cache

The buffer cache hit ratio should be >90%. If not within this threshold consider increasing DB_CACHE_SIZE.

Inst #	Hit%
1	98
2	98

PGA Effectiveness

If Onepass or Multipass > 0 then increase PGA_AGG_TARGET. If excessive optimal executions then decrease PGA_AGG_TARGET.

Inst#	Name	Value
1	workarea executions - multipass	0
1	workarea executions - onepass	5
1	workarea executions - optimal	2503609
2	workarea executions - multipass	0
2	workarea executions - onepass	17
2	workarea executions - optimal	3960679

Disk Sorts

Try to avoid sorts to disk. Identify top query sorts through the Speedway SQL topology and tune accordingly.

Inst#	Name	Value
1	sorts (disk)	3
1	sorts (memory)	6370703
1	sorts (rows)	1206413611
2	sorts (disk)	3
2	sorts (memory)	6369935
2	sorts (rows)	2185478794

Top Latches

Excessive latching can cause unnecessary CPU consumption and performance degradation. Look at tuning the top 5 latch events.

Latch#	Name	Gets	Misses	Sleeps	Immediate Gets	Immediate Misses	Spin Gets
228	cache buffers chains	44846136490	2464576	13249	553006924	45426	2450883
142	ges resource hash list	253316479	304607	11532	1630548	8376	293174
411	row cache objects	249630056	273768	1415	36255	133	272358

34	messages	170343613	221039	329	0	0	220715
384	space background task latch	3220465	176803	46840	1488210	2	129970
276	gc element	460348226	166612	1826	1664690	323	164817
145	ges enqueue table freelist	133784415	132530	150	0	0	132380
176	gcs resource hash	940051357	97305	510	389	2	96829
223	cache buffers lru chain	88093565	77571	1304	386607587	322925	76277
36	enqueue hash chains	230909700	73243	180	1727	1	73063
178	gcs resource freelist	134142067	66309	23	0	0	66286
268	redo allocation	16991496	65118	748	185892622	133252	64372
266	redo writing	21975263	43479	56	0	0	43424
172	KJCT flow control latch	99226133	43304	262	0	0	43045
243	object queue header operation	732521395	35117	98	18920239	21	35019
69	channel operations parent latch	53153827	25221	351	681	3	24870
453	shared pool	97387123	24113	812	0	0	23475
226	active checkpoint queue latch	11284582	23519	86	2	0	23434
467	resmgr:resource group CPU method	65525	7335	6	0	0	7329
163	KJC message pool free list	12018949	6901	227	2400344	505	6674

Memory Resize Operations

Excessive memory resizing has an additional overhead. Avoid excessive memory resizing operations by maintaining tighter controls over SGA_MAX and SGA_TARGET parameters.

Inst#	Start	End	Component	Operation	Par	Init(MB)	Target(MB)	Final(MB)	Status
1	20/11/2019 4:19:07 PM	20/11/2019 4:19:07 PM	DEFAULT 32K buffer cache	STATIC	db_32k_cache_size	0	0	0	COMPLETE
1	20/11/2019 4:19:07 PM	20/11/2019 4:19:07 PM	DEFAULT buffer cache	INITIALIZING	db_cache_size	95	95	95	COMPLETE
1	20/11/2019 4:19:07 PM	20/11/2019 4:19:07 PM	DEFAULT 8K buffer cache	STATIC	db_8k_cache_size	0	0	0	COMPLETE
1	20/11/2019 4:19:07 PM	20/11/2019 4:19:07 PM	DEFAULT 4K buffer cache	STATIC	db_4k_cache_size	0	435	435	COMPLETE
1	20/11/2019 4:19:07 PM	20/11/2019 4:19:07 PM	DEFAULT 2K buffer cache	STATIC	db_2k_cache_size	0	0	0	COMPLETE
1	20/11/2019 4:19:07 PM	20/11/2019 4:19:07 PM	RECYCLE buffer cache	STATIC	db_recycle_cache_size	0	0	0	COMPLETE
1	20/11/2019 4:19:07 PM	20/11/2019 4:19:07 PM	KEEP buffer cache	STATIC	db_keep_cache_size	0	0	0	COMPLETE
1	20/11/2019 4:19:07 PM	20/11/2019 4:19:07 PM	DEFAULT buffer cache	STATIC	db_cache_size	0	95	95	COMPLETE
1	20/11/2019 4:19:07 PM	20/11/2019 4:19:07 PM	SGA Target	STATIC	sga_target	0	3484	3484	COMPLETE
1	20/11/2019 4:19:07 PM	20/11/2019 4:19:07 PM	streams pool	STATIC	streams_pool_size	0	0	0	COMPLETE

1	20/11/2019 4:19:07 PM	20/11/2019 4:19:07 PM	java pool	STATIC	java_pool_size	0	14	14	COMPLETE
1	20/11/2019 4:19:07 PM	20/11/2019 4:19:07 PM	large pool	STATIC	large_pool_size	0	14	14	COMPLETE
1	20/11/2019 4:19:07 PM	20/11/2019 4:19:07 PM	shared pool	STATIC	shared_pool_size	0	2749	2749	COMPLETE
1	20/11/2019 4:19:07 PM	20/11/2019 4:19:07 PM	In-Memory Area	STATIC	inmemory_size	0	0	0	COMPLETE
1	20/11/2019 4:19:07 PM	20/11/2019 4:19:07 PM	PGA Target	STATIC	pga_aggregate_target	0	1742	1742	COMPLETE
1	20/11/2019 4:19:07 PM	20/11/2019 4:19:07 PM	ASM Buffer Cache	STATIC	db_cache_size	0	0	0	COMPLETE
1	20/11/2019 4:19:07 PM	20/11/2019 4:19:07 PM	DEFAULT 16K buffer cache	STATIC	db_16k_cache_size	0	0	0	COMPLETE
1	20/11/2019 4:19:07 PM	20/11/2019 4:19:07 PM	DEFAULT 4K buffer cache	INITIALIZING	db_4k_cache_size	435	435	435	COMPLETE
1	20/11/2019 10:01:34 PM	20/11/2019 10:01:34 PM	DEFAULT buffer cache	GROW	db_cache_size	95	163	163	COMPLETE
1	20/11/2019 10:01:34 PM	20/11/2019 10:01:34 PM	shared pool	SHRINK	shared_pool_size	2749	2681	2681	COMPLETE
1	20/11/2019 10:07:04 PM	20/11/2019 10:07:04 PM	DEFAULT buffer cache	GROW	db_cache_size	163	231	231	COMPLETE
1	20/11/2019 10:07:04 PM	20/11/2019 10:07:04 PM	shared pool	SHRINK	shared_pool_size	2681	2613	2613	COMPLETE
1	10/12/2019 4:55:02 PM	10/12/2019 4:55:02 PM	shared pool	SHRINK	shared_pool_size	2613	2545	2545	COMPLETE
1	10/12/2019 4:55:02 PM	10/12/2019 4:55:02 PM	DEFAULT buffer cache	GROW	db_cache_size	231	299	299	COMPLETE
2	20/11/2019 4:19:10 PM	20/11/2019 4:19:10 PM	DEFAULT 4K buffer cache	INITIALIZING	db_4k_cache_size	435	435	435	COMPLETE
2	20/11/2019 4:19:10 PM	20/11/2019 4:19:10 PM	ASM Buffer Cache	STATIC	db_cache_size	0	0	0	COMPLETE
2	20/11/2019 4:19:10 PM	20/11/2019 4:19:10 PM	PGA Target	STATIC	pga_aggregate_target	0	1742	1742	COMPLETE
2	20/11/2019 4:19:10 PM	20/11/2019 4:19:10 PM	In-Memory Area	STATIC	inmemory_size	0	0	0	COMPLETE
2	20/11/2019 4:19:10 PM	20/11/2019 4:19:10 PM	DEFAULT 32K buffer cache	STATIC	db_32k_cache_size	0	0	0	COMPLETE
2	20/11/2019 4:19:10 PM	20/11/2019 4:19:10 PM	DEFAULT 16K buffer cache	STATIC	db_16k_cache_size	0	0	0	COMPLETE
2	20/11/2019 4:19:10 PM	20/11/2019 4:19:10 PM	DEFAULT 8K buffer cache	STATIC	db_8k_cache_size	0	0	0	COMPLETE

2	20/11/2019 4:19:10 PM	20/11/2019 4:19:10 PM	DEFAULT 4K buffer cache	STATIC	db_4k_cache_size	0	435	435	COMPLETE
2	20/11/2019 4:19:10 PM	20/11/2019 4:19:10 PM	DEFAULT 2K buffer cache	STATIC	db_2k_cache_size	0	0	0	COMPLETE
2	20/11/2019 4:19:10 PM	20/11/2019 4:19:10 PM	RECYCLE buffer cache	STATIC	db_recycle_cache_size	0	0	0	COMPLETE
2	20/11/2019 4:19:10 PM	20/11/2019 4:19:10 PM	KEEP buffer cache	STATIC	db_keep_cache_size	0	0	0	COMPLETE
2	20/11/2019 4:19:10 PM	20/11/2019 4:19:10 PM	DEFAULT buffer cache	STATIC	db_cache_size	0	27	27	COMPLETE
2	20/11/2019 4:19:10 PM	20/11/2019 4:19:10 PM	SGA Target	STATIC	sga_target	0	3484	3484	COMPLETE
2	20/11/2019 4:19:10 PM	20/11/2019 4:19:10 PM	streams pool	STATIC	streams_pool_size	0	0	0	COMPLETE
2	20/11/2019 4:19:10 PM	20/11/2019 4:19:10 PM	java pool	STATIC	java_pool_size	0	14	14	COMPLETE
2	20/11/2019 4:19:10 PM	20/11/2019 4:19:10 PM	shared pool	STATIC	shared_pool_size	0	2817	2817	COMPLETE
2	20/11/2019 4:19:10 PM	20/11/2019 4:19:10 PM	large pool	STATIC	large_pool_size	0	14	14	COMPLETE
2	20/11/2019 4:20:29 PM	20/11/2019 4:20:29 PM	DEFAULT buffer cache	GROW	db_cache_size	27	68	68	COMPLETE
2	20/11/2019 4:20:29 PM	20/11/2019 4:20:29 PM	shared pool	SHRINK	shared_pool_size	2817	2776	2776	COMPLETE
2	22/11/2019 10:02:09 PM	22/11/2019 10:02:09 PM	DEFAULT buffer cache	GROW	db_cache_size	68	136	136	COMPLETE
2	22/11/2019 10:02:09 PM	22/11/2019 10:02:09 PM	shared pool	SHRINK	shared_pool_size	2776	2708	2708	COMPLETE
2	26/11/2019 10:16:10 PM	26/11/2019 10:16:10 PM	DEFAULT buffer cache	GROW	db_cache_size	136	204	204	COMPLETE
2	26/11/2019 10:16:10 PM	26/11/2019 10:16:10 PM	shared pool	SHRINK	shared_pool_size	2708	2640	2640	COMPLETE
2	11/12/2019 10:15:07 PM	11/12/2019 10:15:07 PM	shared pool	SHRINK	shared_pool_size	2640	2572	2572	COMPLETE
2	11/12/2019 10:15:07 PM	11/12/2019 10:15:07 PM	DEFAULT buffer cache	GROW	db_cache_size	204	272	272	COMPLETE
2	15/12/2019 7:44:17 AM	15/12/2019 7:44:17 AM	shared pool	SHRINK	shared_pool_size	2572	2504	2504	COMPLETE

Result Cache Stats

Consider only including data sets in the results cache that are not subject to a lot of data manipulation.

Inst#	ID	Name	Value
-------	----	------	-------

1	1	Block Size (Bytes)	1024
1	2	Block Count Maximum	20992
1	3	Block Count Current	8768
1	4	Result Size Maximum (Blocks)	1049
1	5	Create Count Success	9083
1	6	Create Count Failure	0
1	7	Find Count	11835
1	8	Invalidation Count	1
1	9	Delete Count Invalid	327
1	10	Delete Count Valid	0
1	11	Hash Chain Length	1-3
1	12	Find Copy Count	4556
1	13	Global Hit Count	12
1	14	Global Miss Count	0
1	15	Latch (Share)	0
2	1	Block Size (Bytes)	1024
2	2	Block Count Maximum	20992
2	3	Block Count Current	3616
2	4	Result Size Maximum (Blocks)	1049
2	5	Create Count Success	3939
2	6	Create Count Failure	0
2	7	Find Count	9485
2	8	Invalidation Count	1
2	9	Delete Count Invalid	327
2	10	Delete Count Valid	0
2	11	Hash Chain Length	0-2
2	12	Find Copy Count	3685
2	13	Global Hit Count	16
2	14	Global Miss Count	1
2	15	Latch (Share)	0

PGA Consumption(Past 24 hours)

Consider tuning specific SQL which are consuming the most PGA. PGA consumption is a result of join operations and sorting during a query.

SQL ID	PGA(MB)	Percent
74cpnuu24wmx7	688.1	32.598799381185370511558361769
0kys26uk0vnhg	519.1	24.589739224409128255993841462
5c2px151r4jxz	398.4	18.875326617171365759417307564
	105.1	4.9808656002723968703968259842
d1tf5xsbwc77u	99.5	4.7136501920842061629791927281
3xjw1ncw5vh27	96.3	4.5596867435990436501180633174
ahpp2wqmx515j	63.1	2.987483067721711066863068758
ftj2wf452amy0	27.4	1.2968459699327150121764361902
5q8ku5czvaz9j	19.8	0.9385848686499330110957312153
d4hrjykd60f	17.9	0.8497598022161854075220027091

PGA Advice

The memory advisors should be reviewed to determine the benefit of resizing

a certain memory region. Look at the size factor and estimated benefit% to weigh up the benefit.

Inst ID	PGA Target for Est	PGA Target Factor	Advice Status	Bytes Processed	Est Extra Bytes	Est PGA Cache Hit %	Est Overall Count
1	268435456	0.125	ON	975483074560	152749179904	86	4475
1	536870912	0.25	ON	975483074560	152704033792	86	4471
1	1073741824	0.5	ON	975483074560	2290417664	100	197
1	1610612736	0.75	ON	975483074560	461175808	100	5
1	2147483648	1	ON	975483074560	461175808	100	0
1	2576979968	1.2	ON	975483074560	264129536	100	0
1	3006476288	1.4	ON	975483074560	264129536	100	0
1	3435973632	1.6	ON	975483074560	264129536	100	0
1	3865469952	1.8	ON	975483074560	264129536	100	0
1	4294967296	2	ON	975483074560	264129536	100	0
1	6442450944	3	ON	975483074560	264129536	100	0
1	8589934592	4	ON	975483074560	264129536	100	0
1	12884901888	6	ON	975483074560	264129536	100	0
1	17179869184	8	ON	975483074560	264129536	100	0
2	268435456	0.125	ON	2018586919936	792716065792	72	15622
2	536870912	0.25	ON	2018586919936	788758947840	72	15554
2	1073741824	0.5	ON	2018586919936	9332132864	100	142
2	1610612736	0.75	ON	2018586919936	2740455424	100	0
2	2147483648	1	ON	2018586919936	2425857024	100	0
2	2576979968	1.2	ON	2018586919936	2087913472	100	0
2	3006476288	1.4	ON	2018586919936	2087913472	100	0
2	3435973632	1.6	ON	2018586919936	2087913472	100	0
2	3865469952	1.8	ON	2018586919936	2087913472	100	0
2	4294967296	2	ON	2018586919936	2087913472	100	0
2	6442450944	3	ON	2018586919936	2087913472	100	0
2	8589934592	4	ON	2018586919936	2087913472	100	0
2	12884901888	6	ON	2018586919936	2087913472	100	0
2	17179869184	8	ON	2018586919936	2087913472	100	0

DB Cache Advice

The memory advisors should be reviewed to determine the benefit of resizing a certain memory region. Look at the size factor and estimated benefit% to weigh up the benefit.

Inst ID	ID	Name	Block Size	Advice Status	Size for Est	Size Factor	Buffers for Est	Est Phys Read Factor	Est Phys Reads	Est Phys Read Time	Est % of Read Time	Est Cluster Reads	Est Cluster Read Time
1	3	DEFAULT	8192	ON	32	0.0909	3768	1.7858	585989671	95781	28.2	10443969	3167
1	3	DEFAULT	8192	ON	64	0.1818	7536	1.4823	486401167	78031	23	8669025	2629
1	3	DEFAULT	8192	ON	96	0.2727	11304	1.3227	434023105	68696	20.2	7735502	2346
1	3	DEFAULT	8192	ON	128	0.3636	15072	1.2238	401574205	62913	18.5	7157172	2170
1	3	DEFAULT	8192	ON	160	0.4545	18840	1.1604	380755271	59202	17.4	6786120	2058
1	3	DEFAULT	8192	ON	192	0.5455	22608	1.1257	369391266	57177	16.8	6583582	1996
1	3	DEFAULT	8192	ON	224	0.6364	26376	1.1031	361959988	55852	16.4	6451136	1956
1	3	DEFAULT	8192	ON	256	0.7273	30144	1.091	358007489	55148	16.2	6380691	1935
1	3	DEFAULT	8192	ON	288	0.8182	33912	1.0785	353897146	54415	16	6307433	1913
1	3	DEFAULT	8192	ON	320	0.9091	37680	1.0417	341811491	52261	15.4	6092034	1847

1	3	DEFAULT	8192	ON	352	1	41448	1	328133113	49823	14.7	5848247	1773
1	3	DEFAULT	8192	ON	384	1.0909	45216	0.9584	314495308	47393	13.9	5605183	1700
1	3	DEFAULT	8192	ON	416	1.1818	48984	0.9169	300864426	44963	13.2	5362243	1626
1	3	DEFAULT	8192	ON	448	1.2727	52752	0.8754	287246478	42536	12.5	5119533	1552
1	3	DEFAULT	8192	ON	480	1.3636	56520	0.8339	273626873	40109	11.8	4876794	1479
1	3	DEFAULT	8192	ON	512	1.4545	60288	0.7924	260003361	37681	11.1	4633985	1405
1	3	DEFAULT	8192	ON	544	1.5455	64056	0.7506	246300443	35239	10.4	4389760	1331
1	3	DEFAULT	8192	ON	576	1.6364	67824	0.709	232662065	32808	9.7	4146686	1257
1	3	DEFAULT	8192	ON	608	1.7273	71592	0.6676	219049394	30382	8.9	3904070	1184
1	3	DEFAULT	8192	ON	640	1.8182	75360	0.6259	205394908	27948	8.2	3660710	1110
1	5	DEFAULT	4096	ON	48	0.0938	10482	3.5223	16994839	4543	1.3	8452787	2647
1	5	DEFAULT	4096	ON	96	0.1875	20964	2.8232	13622112	3539	1	6775281	2121
1	5	DEFAULT	4096	ON	144	0.2813	31446	2.5921	12506625	3207	0.9	6220467	1947
1	5	DEFAULT	4096	ON	192	0.375	41928	2.4091	11623658	2944	0.9	5781302	1810
1	5	DEFAULT	4096	ON	240	0.4688	52410	1.9899	9601384	2342	0.7	4775476	1495
1	5	DEFAULT	4096	ON	288	0.5625	62892	1.5078	7275197	1649	0.5	3618492	1133
1	5	DEFAULT	4096	ON	336	0.6563	73374	1.3047	6295158	1357	0.4	3131046	980
1	5	DEFAULT	4096	ON	384	0.75	83856	1.1298	5451093	1106	0.3	2711231	849
1	5	DEFAULT	4096	ON	432	0.8438	94338	1.0714	5169604	1022	0.3	2571225	805
1	5	DEFAULT	4096	ON	480	0.9375	104820	1.0326	4982337	967	0.3	2478084	776
1	5	DEFAULT	4096	ON	512	1	111808	1	4824991	920	0.3	2399824	751
1	5	DEFAULT	4096	ON	528	1.0313	115302	0.9731	4695180	881	0.3	2335259	731
1	5	DEFAULT	4096	ON	576	1.125	125784	0.9167	4422859	800	0.2	2199814	688
1	5	DEFAULT	4096	ON	624	1.2188	136266	0.876	4226889	742	0.2	2102343	658
1	5	DEFAULT	4096	ON	672	1.3125	146748	0.8551	4125760	712	0.2	2052044	642
1	5	DEFAULT	4096	ON	720	1.4063	157230	0.8321	4014688	678	0.2	1996800	625
1	5	DEFAULT	4096	ON	768	1.5	167712	0.8116	3915789	649	0.2	1947610	609
1	5	DEFAULT	4096	ON	816	1.5938	178194	0.7907	3815124	619	0.2	1897542	594
1	5	DEFAULT	4096	ON	864	1.6875	188676	0.7801	3763956	604	0.2	1872093	586
1	5	DEFAULT	4096	ON	912	1.7813	199158	0.7578	3656508	572	0.2	1818651	569
1	5	DEFAULT	4096	ON	960	1.875	209640	0.7289	3516878	530	0.2	1749203	547
2	3	DEFAULT	8192	ON	32	0.08	3768	2.5026	1431615341	331171	36.9	47737632	15292
2	3	DEFAULT	8192	ON	64	0.16	7536	1.7952	1026922387	232140	25.9	34243028	10969
2	3	DEFAULT	8192	ON	96	0.24	11304	1.4467	827584376	183361	20.4	27596044	8840
2	3	DEFAULT	8192	ON	128	0.32	15072	1.3127	750911632	164599	18.3	25039370	8021
2	3	DEFAULT	8192	ON	160	0.4	18840	1.2167	695993072	151160	16.8	23208092	7434
2	3	DEFAULT	8192	ON	192	0.48	22608	1.1535	659849001	142315	15.9	22002858	7048
2	3	DEFAULT	8192	ON	224	0.56	26376	1.1291	645921322	138907	15.5	21538436	6899
2	3	DEFAULT	8192	ON	256	0.64	30144	1.1079	633771516	135934	15.1	21133298	6770
2	3	DEFAULT	8192	ON	288	0.72	33912	1.0917	624522861	133671	14.9	20824898	6671
2	3	DEFAULT	8192	ON	320	0.8	37680	1.0687	611357541	130449	14.5	20385896	6530
2	3	DEFAULT	8192	ON	352	0.88	41448	1.0408	595407761	126546	14.1	19854046	6360
2	3	DEFAULT	8192	ON	384	0.96	45216	1.0135	579749469	122715	13.7	19331916	6192
2	3	DEFAULT	8192	ON	400	1	47100	1	572042590	120829	13.5	19074928	6110
2	3	DEFAULT	8192	ON	416	1.04	48984	0.9865	564329761	118941	13.2	18817740	6028
2	3	DEFAULT	8192	ON	448	1.12	52752	0.9592	548727958	115123	12.8	18297496	5861
2	3	DEFAULT	8192	ON	480	1.2	56520	0.932	533121679	111304	12.4	17777098	5694
2	3	DEFAULT	8192	ON	512	1.28	60288	0.9046	517472327	107475	12	17255266	5527
2	3	DEFAULT	8192	ON	544	1.36	64056	0.8777	502066063	103705	11.6	16741541	5363
2	3	DEFAULT	8192	ON	576	1.44	67824	0.8512	486923383	99999	11.1	16236602	5201

2	3	DEFAULT	8192	ON	608	1.52	71592	0.8246	471718888	96279	10.7	15729605	5038
2	3	DEFAULT	8192	ON	640	1.6	75360	0.7981	456570730	92572	10.3	15224484	4877
2	5	DEFAULT	4096	ON	48	0.0938	10482	11.9766	1348066467	376161	41.9	56532060	16709
2	5	DEFAULT	4096	ON	96	0.1875	20964	11.6518	1311507833	365950	40.8	54998944	16256
2	5	DEFAULT	4096	ON	144	0.2813	31446	11.2312	1264168568	352727	39.3	53013744	15669
2	5	DEFAULT	4096	ON	192	0.375	41928	10.8253	1218478061	339966	37.9	51097684	15102
2	5	DEFAULT	4096	ON	240	0.4688	52410	9.9337	1118119204	311934	34.7	46889068	13858
2	5	DEFAULT	4096	ON	288	0.5625	62892	8.7623	986267787	275107	30.6	41359792	12224
2	5	DEFAULT	4096	ON	336	0.6563	73374	7.37	829559472	231337	25.8	34788124	10282
2	5	DEFAULT	4096	ON	384	0.75	83856	4.4115	496547456	138324	15.4	20823046	6154
2	5	DEFAULT	4096	ON	432	0.8438	94338	3.8026	428013517	119182	13.3	17949030	5305
2	5	DEFAULT	4096	ON	480	0.9375	104820	1.2397	139542229	38609	4.3	5851795	1729
2	5	DEFAULT	4096	ON	512	1	111808	1	112558355	31073	3.5	4720209	1395
2	5	DEFAULT	4096	ON	528	1.0313	115302	0.9793	110232517	30423	3.4	4622673	1366
2	5	DEFAULT	4096	ON	576	1.125	125784	0.2496	28094235	7481	0.8	1178150	348
2	5	DEFAULT	4096	ON	624	1.2188	136266	0.2277	25629822	6793	0.8	1074803	317
2	5	DEFAULT	4096	ON	672	1.3125	146748	0.2098	23615693	6230	0.7	990339	292
2	5	DEFAULT	4096	ON	720	1.4063	157230	0.1952	21972236	5771	0.6	921420	272
2	5	DEFAULT	4096	ON	768	1.5	167712	0.1743	19622879	5115	0.6	822898	243
2	5	DEFAULT	4096	ON	816	1.5938	178194	0.1635	18399120	4773	0.5	771579	228
2	5	DEFAULT	4096	ON	864	1.6875	188676	0.1497	16851064	4341	0.5	706660	208
2	5	DEFAULT	4096	ON	912	1.7813	199158	0.139	15644309	4004	0.4	656054	193
2	5	DEFAULT	4096	ON	960	1.875	209640	0.1215	13676114	3454	0.4	573516	169

Java Pool Advice

The memory advisors should be reviewed to determine the benefit of resizing a certain memory region. Look at the size factor and estimated benefit% to weigh up the benefit.

Inst ID	Size Est	Size Factor	Est LC Size	Est LC Mem Objects	Est LC Time Saved	Est LC Time Factor Saved	Est LC Load Time	Est LC Load Time Factor	Est LC Mem Object Hits
1	16	1	0	0	0		14659	1	0
1	32	2	0	0	0		14659	1	0
1	48	3	0	0	0		14659	1	0
1	64	4	0	0	0		14659	1	0
1	80	5	0	0	0		14659	1	0
1	96	6	0	0	0		14659	1	0
1	112	7	0	0	0		14659	1	0
1	128	8	0	0	0		14659	1	0
1	144	9	0	0	0		14659	1	0
1	160	10	0	0	0		14659	1	0
2	16	1	0	0	0		12240	1	0
2	32	2	0	0	0		12240	1	0
2	48	3	0	0	0		12240	1	0
2	64	4	0	0	0		12240	1	0
2	80	5	0	0	0		12240	1	0
2	96	6	0	0	0		12240	1	0
2	112	7	0	0	0		12240	1	0
2	128	8	0	0	0		12240	1	0
2	144	9	0	0	0		12240	1	0

2	160	10	0	0	0		12240	1	0
---	-----	----	---	---	---	--	-------	---	---

Shared Pool Advice

The memory advisors should be reviewed to determine the benefit of resizing a certain memory region. Look at the size factor and estimated benefit% to weigh up the benefit.

Inst ID	Size Est	Size Factor	Est LC Size	Est LC Mem Objects	Est LC Time Saved	Est LC Time Factor Saved	Est LC Load Time	EST LC Load Time Factor	Est LC Mem Object Hits
1	2080	0.6952	150	7308	1544445	0.1618	8014682	546.7414	38008509
1	2384	0.7968	453	14924	4179121	0.4379	5380006	367.0104	45087333
1	2688	0.8984	756	22857	6852359	0.7179	2706768	184.6489	52435011
1	2832	0.9465	899	25906	8128459	0.8516	1430668	97.5966	55966571
1	2848	0.9519	915	26364	8269953	0.8665	1289174	87.9442	56359706
1	2864	0.9572	931	26822	8411649	0.8813	1147478	78.2781	56752090
1	2880	0.9626	947	27280	8553097	0.8961	1006030	68.6288	57144676
1	2896	0.9679	963	27738	8694736	0.911	864391	58.9666	57536502
1	2912	0.9733	979	28196	8836201	0.9258	722926	49.3162	57928977
1	2928	0.9786	995	28654	8978002	0.9406	581125	39.6429	58320898
1	2944	0.984	1011	29112	9119369	0.9555	439758	29.9992	58713172
1	2960	0.9893	1026	29639	9261346	0.9703	297781	20.3139	59104998
1	2976	0.9947	1042	30176	9402601	0.9851	156526	10.6778	59497014
1	2992	1	1058	30713	9544468	1	14659	1	59891936
1	3008	1.0053	1074	31250	9544471	1	14656	0.9998	59892234
1	3024	1.0107	1090	31787	9544477	1	14650	0.9994	59892578
1	3040	1.016	1106	32285	9544487	1	14640	0.9987	59892915
1	3056	1.0214	1122	32709	9544490	1	14637	0.9985	59893267
1	3072	1.0267	1138	33133	9544511	1	14616	0.9971	59900286
1	3088	1.0321	1154	33557	9544511	1	14616	0.9971	59900406
1	3104	1.0374	1170	33981	9544512	1	14615	0.997	59900542
1	3120	1.0428	1186	34405	9544514	1	14613	0.9969	59900675
1	3136	1.0481	1202	34842	9544515	1	14612	0.9968	59900802
1	3296	1.1016	1362	39741	9544531	1	14596	0.9957	59901917
1	3600	1.2032	1666	49049	9544557	1	14570	0.9939	59903860
1	3904	1.3048	1970	58357	9544580	1	14547	0.9924	59905795
1	4208	1.4064	2274	67665	9544622	1	14505	0.9895	59907782
1	4512	1.508	2578	76973	9544637	1	14490	0.9885	59908764
1	4816	1.6096	2882	86281	9544667	1	14460	0.9864	59909367
1	5120	1.7112	3186	95589	9544669	1	14458	0.9863	59909710
1	5424	1.8128	3383	101629	9544669	1	14458	0.9863	59909724
1	5728	1.9144	3383	101629	9544669	1	14458	0.9863	59909724
1	6032	2.016	3383	101629	9544669	1	14458	0.9863	59909724
2	2032	0.6902	65	7060	1029455	0.1609	5380575	439.5895	67419103
2	2336	0.7935	368	17564	2507291	0.3919	3902739	318.8512	76600254
2	2640	0.8967	671	23113	4432265	0.6928	1977765	161.5821	87100383
2	2784	0.9457	814	25928	5344787	0.8354	1065243	87.0297	92182984
2	2800	0.9511	830	26385	5446604	0.8513	963426	78.7113	92748715
2	2816	0.9565	846	26847	5551776	0.8678	858254	70.1188	93317812
2	2832	0.962	862	27293	5657514	0.8843	752516	61.4801	93887797
2	2848	0.9674	877	28012	5762595	0.9007	647435	52.895	94455528

2	2864	0.9728	893	28663	5868290	0.9172	541740	44.2598	95023611
2	2880	0.9783	909	29142	5973333	0.9337	436697	35.6779	95590881
2	2896	0.9837	925	29529	6078992	0.9502	331038	27.0456	96160558
2	2912	0.9891	941	29894	6185101	0.9668	224929	18.3766	96736930
2	2928	0.9946	957	30259	6291711	0.9834	118319	9.6666	97313572
2	2944	1	973	30624	6397790	1	12240	1	97895036
2	2960	1.0054	988	31265	6397831	1	12199	0.9967	97897401
2	2976	1.0109	1004	31955	6397846	1	12184	0.9954	97899396
2	2992	1.0163	1020	32645	6397854	1	12176	0.9948	97900911
2	3008	1.0217	1036	33335	6397881	1	12149	0.9926	97902383
2	3024	1.0272	1052	34025	6397955	1	12075	0.9865	97923485
2	3040	1.0326	1068	34715	6397972	1	12058	0.9851	97924445
2	3056	1.038	1084	35412	6397981	1	12049	0.9844	97925368
2	3072	1.0435	1100	36143	6397992	1	12038	0.9835	97926368
2	3088	1.0489	1116	36874	6398005	1	12025	0.9824	97927204
2	3248	1.1033	1276	42397	6398106	1	11924	0.9742	98097699
2	3552	1.2065	1579	51285	6398169	1.0001	11861	0.969	98116066
2	3856	1.3098	1882	58643	6398231	1.0001	11799	0.964	98119429
2	4160	1.413	2185	68899	6398282	1.0001	11748	0.9598	98121788
2	4464	1.5163	2489	79862	6398292	1.0001	11738	0.959	98123528
2	4768	1.6196	2793	90825	6398309	1.0001	11721	0.9576	98125069
2	5072	1.7228	3097	101788	6398315	1.0001	11715	0.9571	98126125
2	5376	1.8261	3401	112751	6398329	1.0001	11701	0.956	98126981
2	5680	1.9293	3705	123714	6398336	1.0001	11694	0.9554	98127482
2	5984	2.0326	4009	134677	6398337	1.0001	11693	0.9553	98127714

Streams Pool Advice

The memory advisors should be reviewed to determine the benefit of resizing a certain memory region. Look at the size factor and estimated benefit% to weigh up the benefit.

Inst ID	Size Est	Size Factor	Est Spill Count	Est Spill Time	Est Unspill Count	Est Unspill Time
---------	----------	-------------	-----------------	----------------	-------------------	------------------

CTRL File Multiplexing

Ensure control files are multiplexed.

Control file count	Recommendation
1	Only 1 controlfile detected. Multiplexing is recommended.

CTRL File Retention

Ensure sufficient control file retention.

Control file retention recommendations
control_file_record_keep_time=7. Recommend at least 30.

REDO Log Multiplexing

Ensure REDO log files are multiplexed.

Group #	Members	Recommendation
---------	---------	----------------

1	1	1 member found. Recommend REDO log multiplexing.
2	1	1 member found. Recommend REDO log multiplexing.
3	1	1 member found. Recommend REDO log multiplexing.
4	1	1 member found. Recommend REDO log multiplexing.
5	1	1 member found. Recommend REDO log multiplexing.
6	1	1 member found. Recommend REDO log multiplexing.
7	1	1 member found. Recommend REDO log multiplexing.
8	1	1 member found. Recommend REDO log multiplexing.

UNDO Activity

In the event of excessive UNDO time investigate the following areas:

DATA BLOCK: Check for SQL statements using unselective indexes.

UNDO HEADER: Consider using automatic segment-space management or add more rollback segments.

UNDO BLOCK: Consider using automatic segment-space management or make rollback segment sizes larger.

SEGMENT HEDER: Look for the offending segment and consider increasing free-lists.

Inst #	Wait/Get%
1	Average rollback segment(Waits to Gets): .02%
2	Average rollback segment(Waits to Gets): .01%

ASM Diskgroup Statistics

Investigate storage layer performance issues if average speeds > 10ms.

Inst#	Diskgroup Name	Size(GB)	Disks	Avg Read(ms)	Avg Write(ms)
1	DATA1	349920	60	3.72	311138.19
1	DBFS_DG	1690	50	0.35	2400.76
1	RECO1	87484	60	24.79	115296.05
2	DATA1	349920	60	3.37	5.06
2	DBFS_DG	1690	50	0.36	2.24
2	RECO1	87484	60	12.83	10.28

Files in Backup Mode

Any datafile left in backup mode will not be modified. Instead changes are logged to the REDO stream. Make sure no datafiles are inadvertently left in backup mode.

Filename	Status	Time

Media Recovery

Any file in need of media recovery is inaccessible for general use. The file will will need to set offline or recovered.

File#	Online	Status	Error	Change#	Time	Con ID

Dataguard Gap Analysis

Dataguard is responsible for shipping transaction logs between the primary

and standby database. Investigate the reason for any transaction gaps between the primary and standby database.

Thread	PR Archived	SBY Archived	SBY Applied	Ship Gap	Apply Gap
1	15542	15542	15542	0	0
2	15992	15992	15991	0	1

Parameter changed by user since startup

List of all parameter changes made by users since database startup. These can be system wide or isolated to session level. Ensure parameter changes are conducted with the correct intent and are not causing a negative impact.

Inst ID	Name	Is Modified	Current Value
1	_backup_disk_bufcnt	SYSTEM_MOD	0
1	_backup_disk_bufsz	SYSTEM_MOD	0
1	log_archive_dest_state_2	SYSTEM_MOD	ENABLE
1	log_archive_trace	SYSTEM_MOD	0
1	nls_calendar	MODIFIED	GREGORIAN
1	nls_comp	MODIFIED	BINARY
1	nls_currency	MODIFIED	\$
1	nls_date_format	MODIFIED	YYYY-MM-DD HH24:MI:SS
1	nls_date_language	MODIFIED	AMERICAN
1	nls_dual_currency	MODIFIED	\$
1	nls_iso_currency	MODIFIED	AMERICA
1	nls_language	MODIFIED	AMERICAN
1	nls_numeric_characters	MODIFIED	..
1	nls_sort	MODIFIED	BINARY
1	nls_territory	MODIFIED	AMERICA
1	nls_time_format	MODIFIED	HH.MI.SSXXFF AM
1	nls_time_tz_format	MODIFIED	HH.MI.SSXXFF AM TZR
1	nls_timestamp_format	MODIFIED	DD-MON-RR HH.MI.SSXXFF AM
1	nls_timestamp_tz_format	MODIFIED	DD-MON-RR HH.MI.SSXXFF AM TZR
1	remote_listener	SYSTEM_MOD	ohcw2201-scan:1201
2	_backup_disk_bufcnt	SYSTEM_MOD	0
2	_backup_disk_bufsz	SYSTEM_MOD	0
2	log_archive_dest_state_2	SYSTEM_MOD	ENABLE
2	log_archive_trace	SYSTEM_MOD	0
2	nls_calendar	MODIFIED	GREGORIAN
2	nls_comp	MODIFIED	BINARY
2	nls_currency	MODIFIED	\$
2	nls_date_format	MODIFIED	YYYY-MM-DD HH24:MI:SS
2	nls_date_language	MODIFIED	AMERICAN
2	nls_dual_currency	MODIFIED	\$
2	nls_iso_currency	MODIFIED	AMERICA
2	nls_language	MODIFIED	AMERICAN
2	nls_numeric_characters	MODIFIED	..
2	nls_sort	MODIFIED	BINARY
2	nls_territory	MODIFIED	AMERICA
2	nls_time_format	MODIFIED	HH.MI.SSXXFF AM
2	nls_time_tz_format	MODIFIED	HH.MI.SSXXFF AM TZR
2	nls_timestamp_format	MODIFIED	DD-MON-RR HH.MI.SSXXFF AM

2	nls_timestamp_tz_format	MODIFIED	DD-MON-RR HH.MI.SSXFF AM TZR
2	remote_listener	SYSTEM_MOD	ohcw2201-scan:1201

Parameter changed by system since startup

List of all parameter changes made by the system since database startup. Investigate why the database is automatically changing these parameters to avoid and negative impact.

Inst ID	Name	Is Default	Current Value	Adjusted
---------	------	------------	---------------	----------

Deprecated Parameters in use

Deprecated parameters are no longer supported but are still provided for backward compatibility. Try and avoid the use of deprecated parameters.

Inst ID	Name	Is Default	Current Value
---------	------	------------	---------------

Parameter Check

Certain parameters can have a big impact on database performance as follows:

AUDIT_TRAIL:

Auditing comes with a small overhead. Only enable if required

BACKUP_TAPE_IO_SLAVES:

Simulates asynchronous I/O for backup and recovery operations on platforms that do not support asynchronous I/O. Consider setting this parameter in such a situation.

COMPATIBLE:

Setting to a lower database version may inhibit database features.

DB_FILE_MULTIBLOCK_READ_COUNT:

Full table scans will benefit from this setting by reading multiple blocks in a single read operation.

CURSOR_SHARING:

Using this parameter appropriately can reduce the amount of parsing performed when literal values are encountered in SQL.

DB_CACHE_ADVICE:

Make sure this parameter is ON so information on caches usage is automatically collected and analysed.

DB_KEEP_CACHE_SIZE:

The KEEP cache is useful for pinning objects which incur regular I/O. Consider sizing the KEEP cache so it can hold objects subject to regular I/O.

DB_ULTRA_SAFE:

Only set this parameter to off if you are aware of the implications around block and corruption detection.

DB_WRITER_PROCESSES:

The DBWR process can be stressed in high I/O systems. Consider increasing this value if you see a high number of "free buffer waits" wait events

DBWR_IO_SLAVES:

Typically used to simulate asynchronous I/O on platforms that do not support asynchronous I/O. Consider setting this parameter in such a situation.

DEFERRED_SEGMENT_CREATION:

Setting to TRUE prevents segment creation when an object is created. This saves on disk overhead if an object will not have any data in it.

DISK_ASYNC_IO:

Make sure enabled to take advantage of asynchronous I/O provided the operating system allows for it.

LOCK_SGA:

It is advisable to set this parameter to TRUE to prevent the SGA paging to disk.

NLS_SORT:

If not set to BINARY will cause a full table scan when an "ORDER BY" clause is used.

OPTIMIZER_DYNAMIC_SAMPLING:

Usually the default of 2 is OK. Too high may cause statistics collection overhead.

PARALLEL_MIN_SERVERS:

Try to set the parallel min servers to the expected number of parallel servers to be used. Invoking parallel servers when a query starts comes with an overhead

PARALLEL_MAX_SERVERS:

Setting to many parallel max servers can exhaust system resource. Do not over allocate.

SKIP_UNUSABLE_INDEXES:

A default of TRUE may cause some unusable indexes to go undetected

STATISTICS_LEVEL:

The default value of typical will not capture all statistics. Increase the level to capture plan execution statistics and/or timed O/S statistic

TAPE_ASYNC_IO:

Set to True to enable parallel I/O activity during backup and restore operations.

USE_LARGE_PAGES:

Applicable only to Linux and increases SGA performance. A setting of FALSE is not recommended. Setting to ONLY will ensure the database only uses large pages.

Name	Inst ID	Current Value
audit_trail	1	DB
audit_trail	2	DB
backup_tape_io_slaves	1	FALSE
backup_tape_io_slaves	2	FALSE
compatible	1	12.1.0.2.0
compatible	2	12.1.0.2.0
cursor_sharing	1	EXACT
cursor_sharing	2	EXACT
db_cache_advice	1	ON
db_cache_advice	2	ON
db_file_multiblock_read_count	1	128
db_file_multiblock_read_count	2	128
db_keep_cache_size	1	0
db_keep_cache_size	2	0
db_ultra_safe	1	OFF
db_ultra_safe	2	OFF
db_writer_processes	1	2
db_writer_processes	2	2
dbwr_io_slaves	1	0
dbwr_io_slaves	2	0
deferred_segment_creation	1	TRUE
deferred_segment_creation	2	TRUE
disk_async_io	1	TRUE
disk_async_io	2	TRUE
lock_sga	1	FALSE
lock_sga	2	FALSE

nls_sort	1	BINARY
nls_sort	2	BINARY
optimizer_dynamic_sampling	1	2
optimizer_dynamic_sampling	2	2
parallel_max_servers	1	64
parallel_max_servers	2	64
parallel_min_servers	1	4
parallel_min_servers	2	4
skip_unusable_indexes	1	TRUE
skip_unusable_indexes	2	TRUE
statistics_level	1	TYPICAL
statistics_level	2	TYPICAL
tape_asynch_io	1	TRUE
tape_asynch_io	2	TRUE
use_large_pages	1	ONLY
use_large_pages	2	ONLY