**EDWH DBA ANALYSIS**

|  |  |
| --- | --- |
| **06/08/2021** | **SANJEEB** |
|  |  |

|  |  |
| --- | --- |
| **Name** | **Value** |
| **Database name** | **oltp143** |
| **Database Version** | **12.1.0.2.0** |
| **Database Size** | **~31TB** |
| **Datafiles** | **1634** |
| **Configuration** | **2 Node Cluster with VTE** |
| **Database memory** | **316226468 kB** |
| **CPU** | **32 Genuine Intel** |
| **OS** | **2.6.32-754.39.1.el6.x86\_64** |
|  | **Intel(R) Xeon(R) Platinum 8168 CPU @ 2.70GHz** |

**DB USAGE HISTORY**

|  |  |
| --- | --- |
| **Name** | **Value** |
| logons cumulative | 2,046,023 |
| logons current | 460 |
| user logons cumulative | 87,143 |

|  |  |
| --- | --- |
| SESSIONS\_CURRENT | SESSIONS\_HIGHWATER |
| 362 | 773 |

|  |
| --- |
| Name High Mark |
| Maximum Number of Active Sessions seen in the system 378 |
| Maximum Number of Datafiles 1,634 |
| Maximum Size of the Database (Bytes) 33,283,213,574,144 |
| Number of job runs per day 6,658 |
| Oracle Database instances 2 |
| Maximum Number of Partitions belonging to an User Index 42 |
| Maximum Number of Partitions belonging to an User Table 63 |
| Maximum Query Length 297,208 |
| Size of Largest Segment (Bytes) 3,304,452,128,768 |
| Maximum Number of Concurrent Sessions seen in the database 860 |
| Maximum Number of SQL NCHAR Columns 764 |
| Maximum Number of Tablespaces 262 |
| Number of User Indexes 29,902 |
| Maximum Number of Materialized Views (User) 153 |
| Number of User Tables 32,629 |

* **Recommendation 1**

It seems many queries executed from sql developer which is leading to high amount of resmgr:pq queued Wait taking most of DB time .In past I recommended App team to check and set parameter to fix this wait event . alter system set "\_parallel\_statement\_queuing"=FALSE scope=both sid=’\*’; #This is Dynamic

This has been observed over time and this wait is 15.8% contribution to overall load.

Evidence:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Event** | **Waits** | **Total Wait Time (sec)** | **Wait Avg(ms)** | **% DB time** | **Wait Class** |
| resmgr:pq queued | 12,898 | 1.6M | 120227.7 | 15.8 | Scheduler |

* **Recommendation 2**

Top CPU CONSUMING SQL WHICH DEV TEAM SHOULD LOOK where I see our DBA TEAM in past shared some .

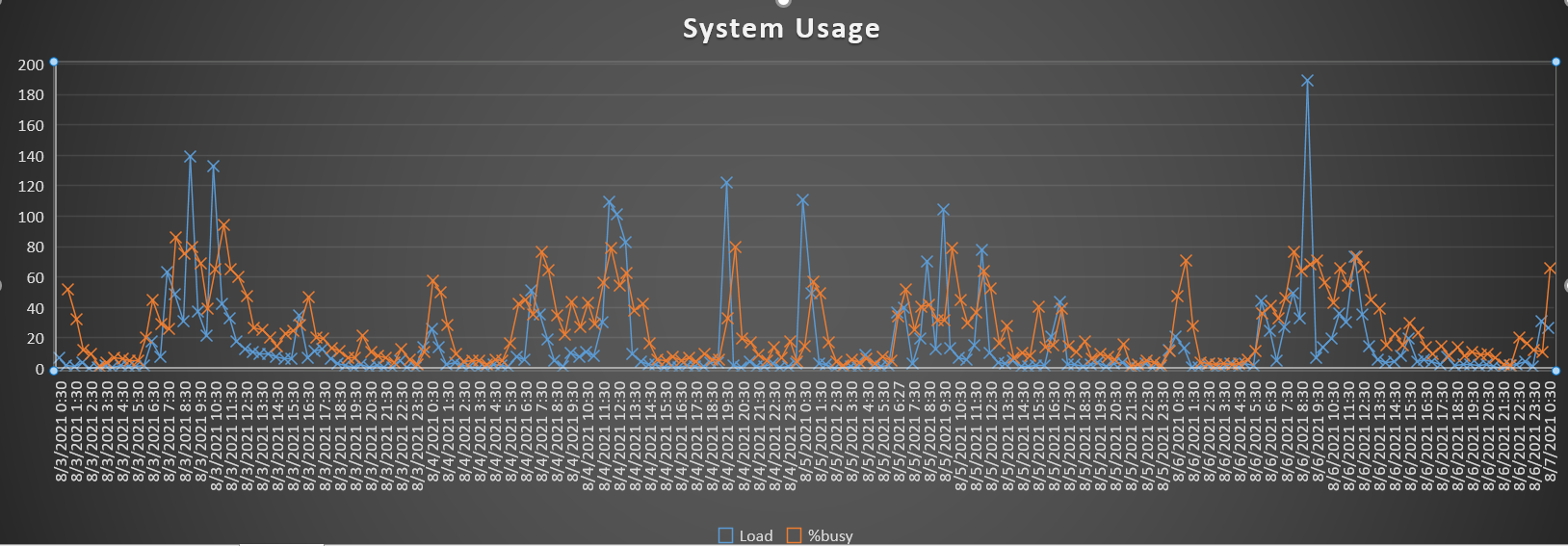
From:gbbed21as230v and infaadmin >

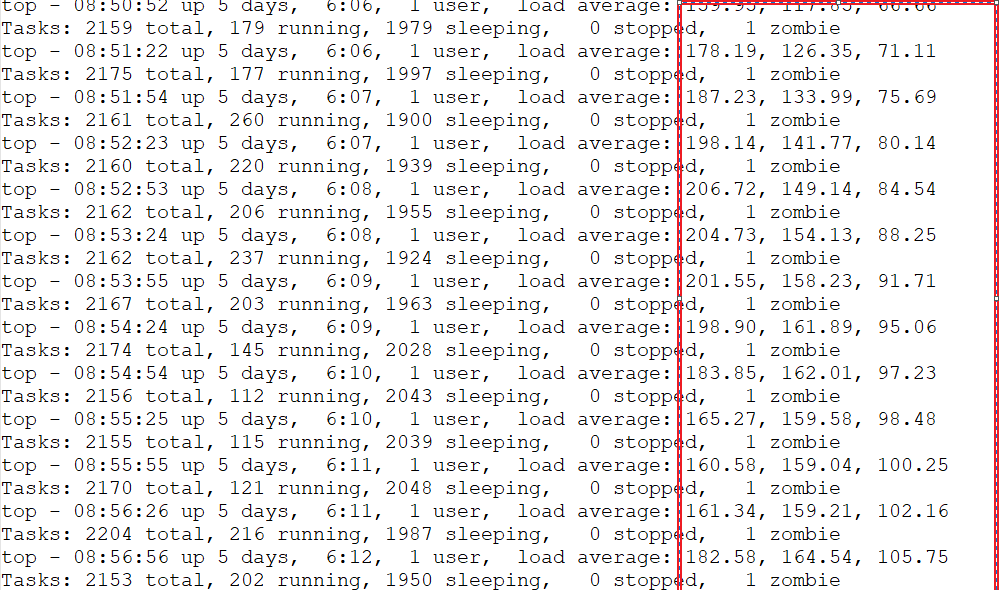
|  |
| --- |
| SQL\_ID USERNAME |
| --------------- --------------- |
| 1qht9n2g8y03s DWHBATCH\_USER |
| 56q9cbxbpm3ju DWHBATCH\_USER |
| 1qht9n2g8y03s DWHBATCH\_USER |
| 56q9cbxbpm3ju DWHBATCH\_USER |
| 56q9cbxbpm3ju DWHBATCH\_USER |
| 1qht9n2g8y03s DWHBATCH\_USER |
| 56q9cbxbpm3ju DWHBATCH\_USER |
| 56q9cbxbpm3ju DWHBATCH\_USER |
| 1qht9n2g8y03s DWHBATCH\_USER |
| 1qht9n2g8y03s DWHBATCH\_USER |
| 56q9cbxbpm3ju DWHBATCH\_USER |
| 1qht9n2g8y03s DWHBATCH\_USER |
| 1qht9n2g8y03s DWHBATCH\_USER |
| 1qht9n2g8y03s DWHBATCH\_USER |
| 1qht9n2g8y03s DWHBATCH\_USER |
| 1qht9n2g8y03s DWHBATCH\_USER |

* **Recommendation 3 <TOP PRIORITY>**

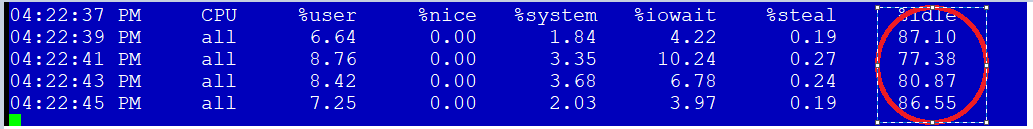
This has been observed around server time 7AM till 9AM every day Utilization goes very high and load average reached beyond control also It has been observed very high resources intensive queries run during that time

**Evidence:**





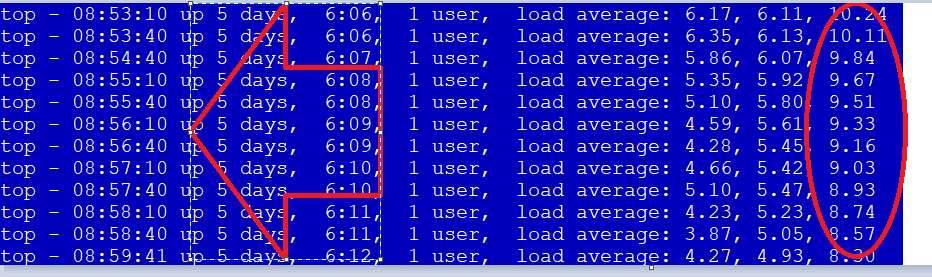
There are very high I/O Intensive Queries executes during same time .DBA team has sent several mails around same .Those queries are either need proper tuning with development expertise or just for that duration EDWH team has to hold breath tight patiently .The Other Solution is to accommodate more CPU for 2 hrs which is obviously not a feasible solution .

For the rest of the DAY CPU utilization is always under control so DBA will not recommend for CPU rather will ask app team to check Queries to optimize with Development team’s help .

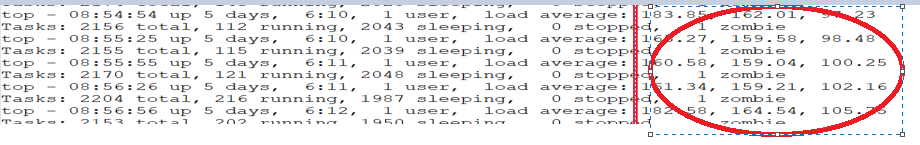
I am sharing some of queries (sqlid) which are majorly cause of high I/O and High buffer gets leads to excessive load on server .I can bet these queries will not able to sustain even if we will increase CPU .

Also, observe that, when these jobs run it just picks one node/one instance , which looks like weird to me as application should be RAC aware and should utilize both Node for this Job.

Evidence: Around same time Load average from **Node 2** for date 6th Aug 2021 is really low ,

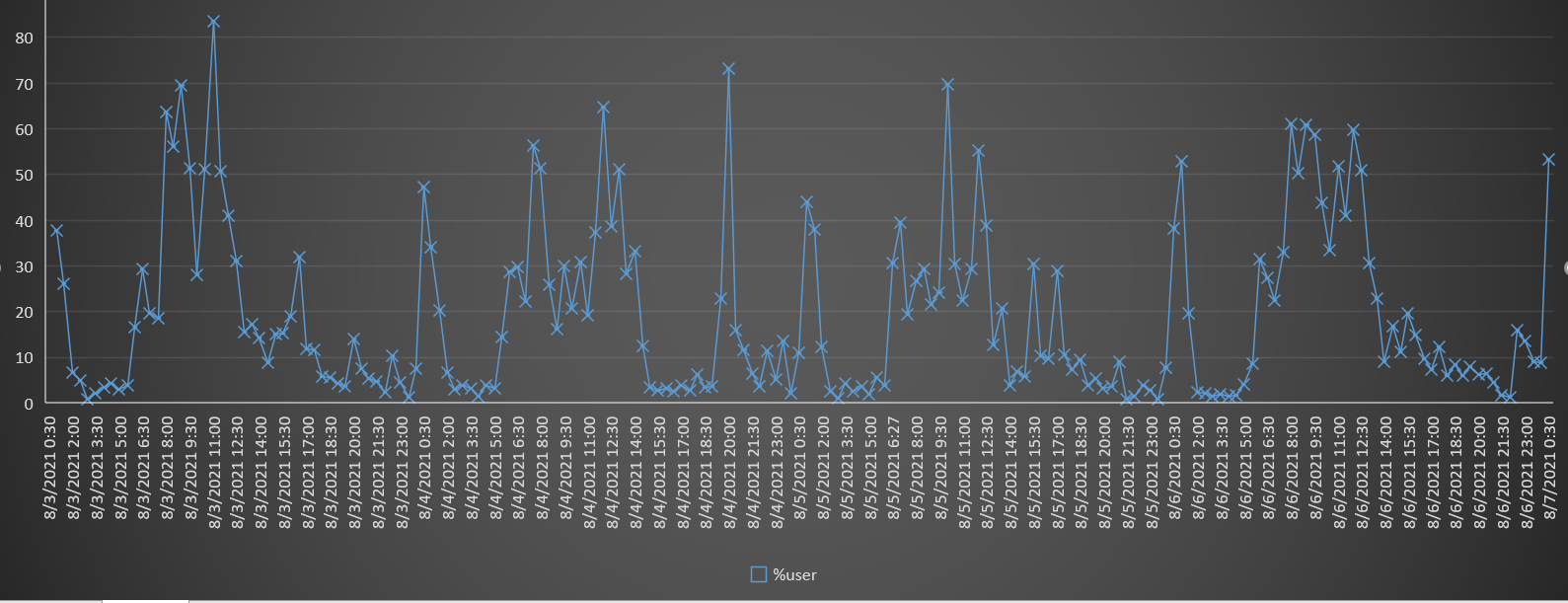


Whereas see same Time Load from Node 1 is very high :average 100+



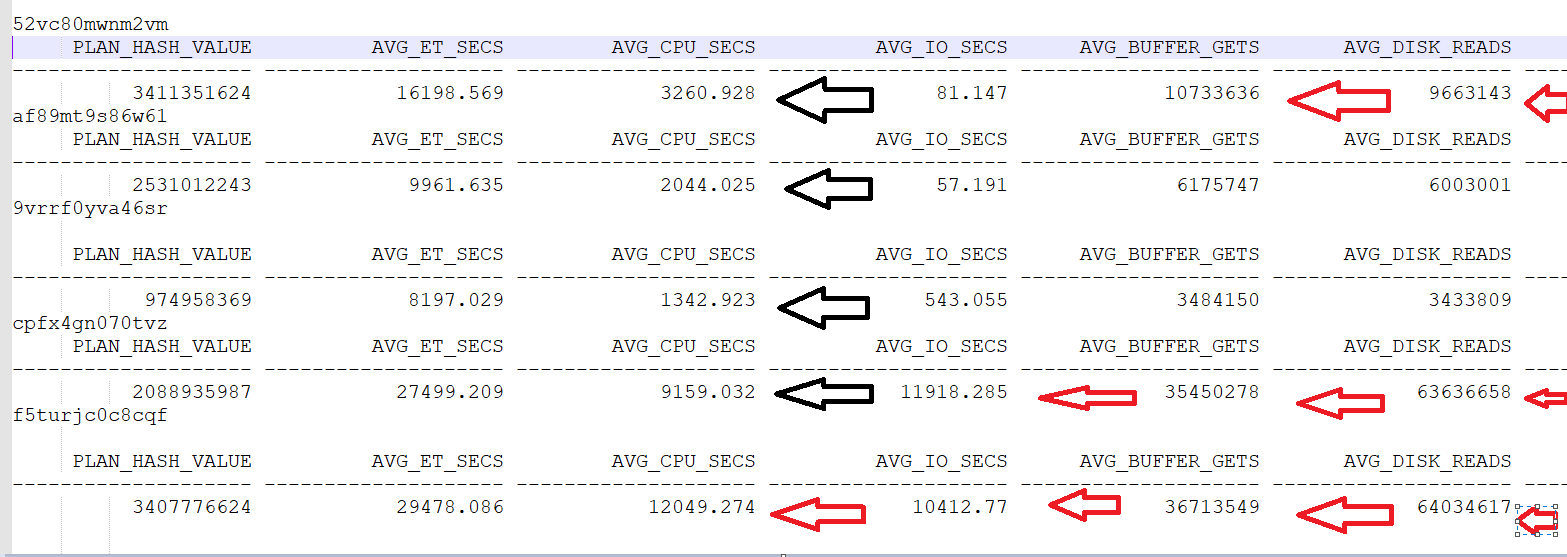
High intensive Oltp143 queries are also impacting other job on **oltp148** as both shared same servers /storage .

**Evidence High Usage for a particular Time**



**Some Evidence with SQL IDS causing stress to system: on** Oltp143

App team Need to fix /Check and re write These Queries: DBA has no application knowledge so would not be able to help.



Most of them are coming from:

|  |
| --- |
| pmdtm@gbbed21as230v (TNS V1-V3) |
| pmdtm@gbbed21as230v (TNS V1-V3) |
| pmdtm@gbbed21as230v (TNS V1-V3) |
| pmdtm@gbbed21as230v (TNS V1-V3) |
| pmdtm@gbbed21as230v (TNS V1-V3) |

* **Recommendation 3(co:))**

We Have scope to increase SGA allocation as % used is not that high so I have recommendation to set to 95G .This needs downtime so should be accommodate with a CO

Memory Statistics

Host Mem (MB): 308,814.9 308,814.9

SGA use (MB): 69,632.0 69,632.0

PGA use (MB): 16,630.7 7,033.1

% Host Mem used for SGA+PGA: 27.93 24.83 >We have Scope to increase SGA even Though We have AMM we should set this or not set at all .I noticed traditionally this has been set (with current value to 68G ).

I have bumped up only will be reflected post DB restart .This will reduce potential latching observed in database due to memory usage and also will increase memory read and reduce physical Read .

SQL> alter system set sga\_max\_size=95G scope=spfile sid='\*';

System altered.

SQL> alter system set sga\_target=95G scope=spfile sid='\*';

System altered.

* **Recommendation 4**

It has been observed cursor Usage is high so have recommendation to increase to 4000 and monitor the usage.

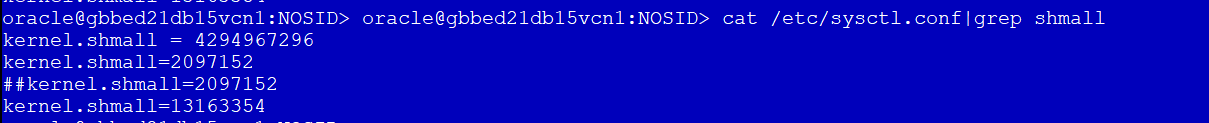
PARAMETER VALUE USAGE

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session\_cached\_cursors 50 ####% >This means usage is very high and not able to determine the current usage .

* **Recommendation 5**

Found some Duplicate kernel value need to remove and keep as recommended below



**Increase Memlock at OS level:<Unix Task > This is very important for high end database server to set proper value**

New Value should be:

oracle    soft     memlock  201326592

oracle    hard     memlock  201326592

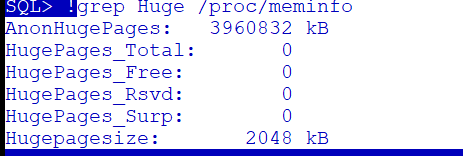
|  |
| --- |
| kernel.shmall=77748736 |
| kernel.shmmax = 100719476736 |

Server: gbbed21db15vcn1/2

**Need Downtime**

* **Recommendation 6**

HugePages is crucial for faster Oracle database performance on Linux if you have a large RAM and SGA. If your combined database SGAs is large, you will need HugePages configured.



The default page size is 4 KB and we would suggest implementing the Huge Pages on the system to improve the performance. Page size is set 2MB instead of 4KB There are couple of important benefits of Huge Pages:

• Memory used by Huge Pages is locked and cannot be paged out.

• Example: With the page size of 2MB, 12GB SGA will have only 6144 pages as compared to 3.1 million pages without Huge Pages setup.

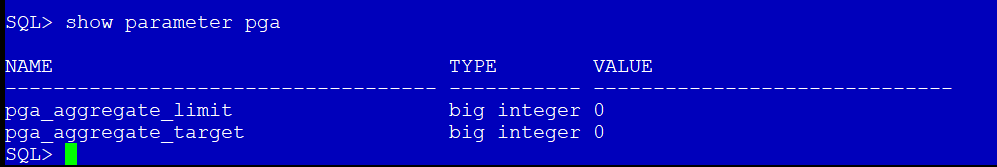
This will drastically reduce the page table size. Also, Huge Table memory is locked and so SGA can’t be swapped out. The working set of buffers for the paging/swapping daemon will be smaller

Recommendation: We suggest implementing the huge pages on linux to improve the performance. This can be parked for now and go with lower priority.

**Need Unix+DBA team with downtime**

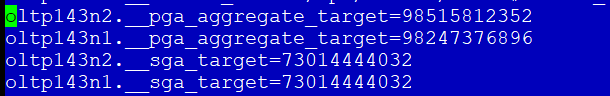
* **Recommendation 7**

PGA is core component for Oracle instance performance for performing efficient sort operations and hash joins during the query processing. Findings: The PGA is  configured with underscore parameter 95GB memory allocation for PGA with AMM. Pga\_aggregate\_limit value is set to zero which makes to PGA to grow unlimited based on the physical RAM availability. Recommendation: we recommend setting the pga\_aggregate\_target value from 0 to 50 GB in all the RAC nodes. Also remove the underscore  pga\_aggregate\_limit parameter and its default value is double the pga\_aggregate\_target value.



NB:This Has been implemented post DBA suggestion

* **Recommendation 8**



With AMM, oracle will try to tune both SGA and PGA and with current settings, we observed PGA is set to 95GB with underscore parameters. These settings are causing 95GB to be reserved for PGA and remaining is allotted to SGA with auto tuning which is from total Memory allocated .Which could be the reason frequent flush of good execution plan .

memory\_max\_target                    big integer 160G

memory\_target                        big integer 160G

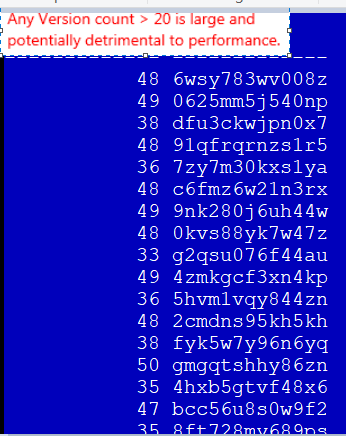
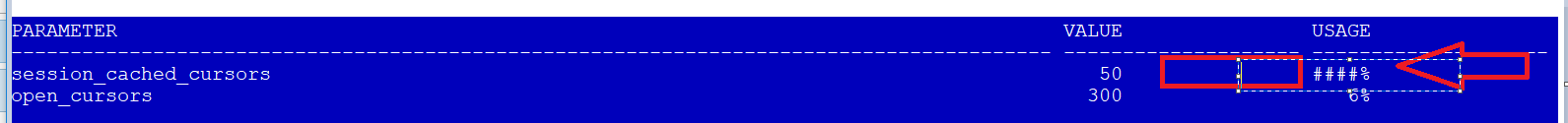
Remove all underscore parameter with Downtime .

* **Recommendation 9**

I was reviewing oltp148  it seems like this database is having high version count  and this is not good for any database  though list of sqlids having high version count is huge but am just keeping some fyi . I have 1 immediate suggestions we should increase session\_cached\_cursors to 1500 from current value 50.(NB:We should look at those queries from app side ) for **oltp148**

Usage % is not determined due to low value .Evidence below “ARROW FOR USAGE”

<**This Change Need downtime one Node at a time** >



NB:OLTP148 is not highly utilized system but this is on same server as oltp143 so anything running between 6AM till 9AM server time are impacted due to oltp143 ‘s high intensive queries.

* **Recommendation 10**

I noticed there are 2 queries executed from pmdtm@gbbed21as230v which takes 18 mins and 10 mins each with High /IO are good scope of improvement and give some space for other queries .

Recommended to check on lower environment and create index on DWH\_DDL\_DATAMART.NARRATIVE\_BRIDGE\_NAB("ROW\_INSERT\_BATCH\_NR") and DWH\_DDL\_DATAMART.WORKFLOW\_BRIDGE\_WOB("ROW\_INSERT\_BATCH\_NR");

This will improve performance also reduce execution which out stressing on I/O .

**NB:Create Index If these are regular expected queries and not just one time**

SELECT COUNT(\*) FROM WORKFLOW\_BRIDGE\_WOB WHERE ROW\_INSERT\_BATCH\_NR= :1

select count(\*) from DWH\_DDL\_DATAMART.WORKFLOW\_BRIDGE\_WOB;

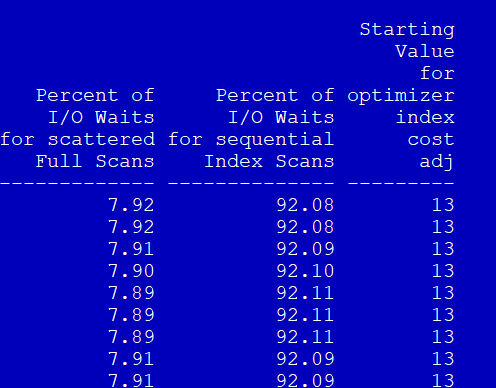
* **Recommendation 11**

I see optimizer\_index\_cost\_adj set to default value 100 and I would recommend this to set to 30 after proper testing on UAT

The *optimizer\_index\_cost\_adj* parameter was created to allow use to change the relative costs of full-scan versus index operations. Re-setting this parameter to a smaller value (between 10- to 30) may result in huge performance gain for OLTP143 I see if we will reduce, we may gain some performance.

NB: This need proper testing on UAT and is Dynamic no downtime needed.

This Recommendation is applicable for OLTP148 also along with



* **Recommendation 12**

**Some repetitive**

**Cursor intensive queries good to review and rewrite:**

* **Recommendation 13**

**JUNE TICKETS AND DBA’S RESPONSE:**

**Inference: There are many Queries, which need a good developer to look and work so that they can be rewrite to use proper Filter/Join.**

**There is scope to use analytical function in much SQL script, which Development team should look and fix.**

**Whole Lists are Attached some Sample where dev team needs to look .**

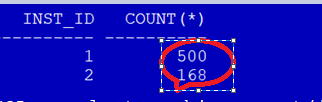
* **Recommendation 14**

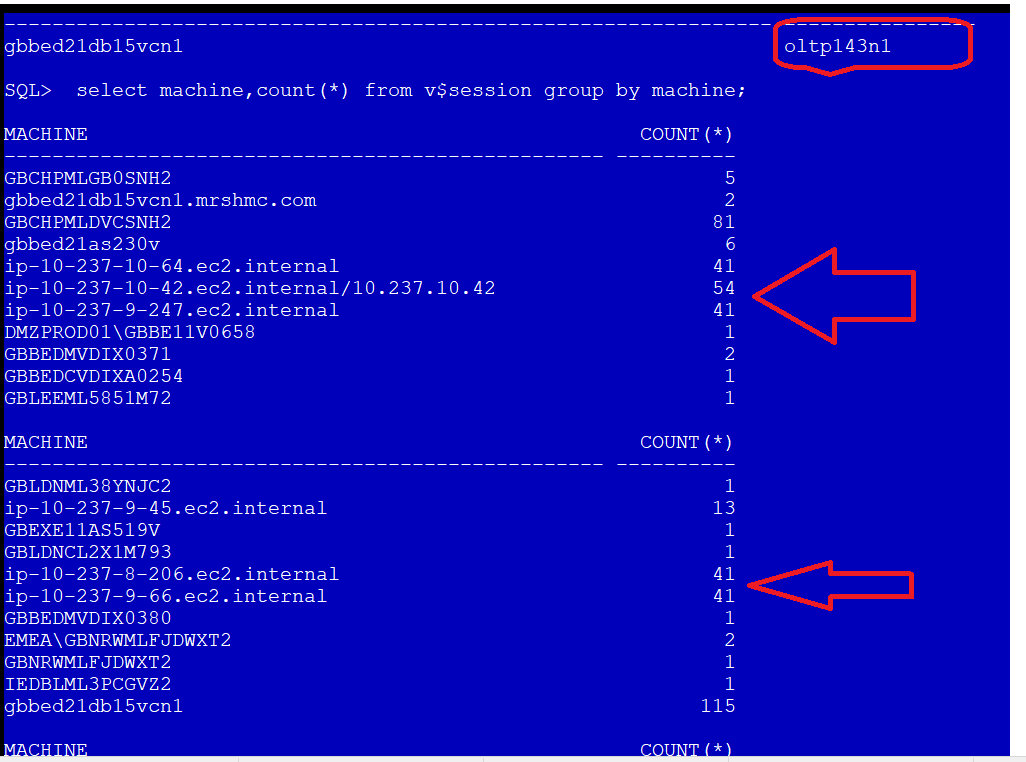
It has been observed there are many application connect to one node only contributing to high count to a particular Node ,which mean they are not RAC aware or not using RAC features to connect Database .Which leads to uneven connections/load to a particular node .

Please check application:

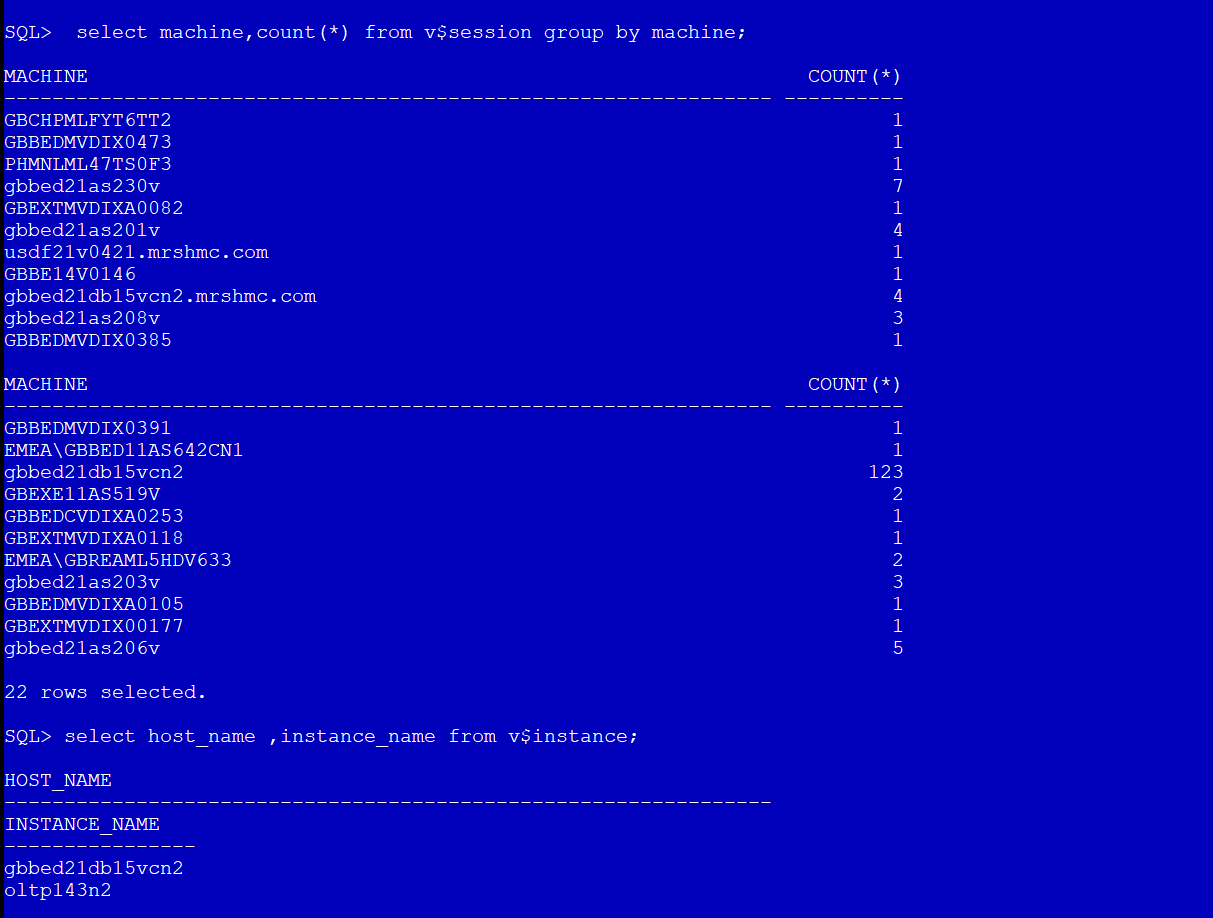
Evidence:







In Node 2:



* **Recommendation 15**

There are many sqls which are facing enq - SQ contention/row cache locks waits where sequence cache size needs to be increased, app team needs to work on it..

Recommendation from Girish:

**Sample sequences:**

SEQUENCE\_OWNER                 SEQUENCE\_NAME                  CACHE\_SIZE

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

SPDMS\_SRVC\_OWNER               AMR\_ID\_S                                0

SPDMS\_SRVC\_OWNER               CLNT\_ID\_S                               0

SPDMS\_SRVC\_OWNER               GCS\_ID\_S                                0

DWH\_DIL\_DMSTG                  SEQ\_ACT                               200

DWH\_DIL\_DMSTG                  SEQ\_ADD                               200

DWH\_DIL\_DMSTG                  SEQ\_CAM                               200

DWH\_DIL\_DMSTG                  SEQ\_CEP                               200

DWH\_DIL\_DMSTG                  SEQ\_CEX                               200

DWH\_DIL\_DMSTG                  SEQ\_CSP                               200

DWH\_DIL\_DMSTG                  SEQ\_CSU                               200

DWH\_DIL\_DMSTG                  SEQ\_CTY                               200

DWH\_DIL\_DMSTG                  SEQ\_CUR                               200

DWH\_DIL\_DMSTG                  SEQ\_DAT                               200

DWH\_DIL\_DMSTG                  SEQ\_GPD                               200

DWH\_DIL\_DMSTG                  SEQ\_GUQ                               200

DWH\_DIL\_DMSTG                  SEQ\_LAN                               200

DWH\_DIL\_DMSTG                  SEQ\_LOC                               200

DWH\_DIL\_DMSTG                  SEQ\_LOH                               200

DWH\_DIL\_DMSTG                  SEQ\_LOP                               200

DWH\_DIL\_DMSTG                  SEQ\_LOS                               200

DWH\_DIL\_DMSTG                  SEQ\_NAD                               200

DWH\_DIL\_DMSTG                  SEQ\_PDN                               200

DWH\_DIL\_DMSTG                  SEQ\_PRD                               200

DWH\_DIL\_DMSTG                  SEQ\_PRS                               200

DWH\_DIL\_DMSTG                  SEQ\_PTY                               200

DWH\_DIL\_DMSTG                  SEQ\_ROB                               200

DWH\_DIL\_DMSTG                  SEQ\_RSD                               200

DWH\_DIL\_DMSTG                  SEQ\_RSK                               200

DWH\_DIL\_DMSTG                  SEQ\_SSD                               200

DWH\_DIL\_DMSTG                  SEQ\_SSR                               200

DWH\_DIL\_DMSTG                  SEQ\_SUR                               200

DWH\_DIL\_DMSTG                  SEQ\_TID                               200

DWH\_DIL\_DMSTG                  SEQ\_TJN                               200

DWH\_DIL\_DMSTG                  SEQ\_TMZ                               200

DWH\_DIL\_DMSTG                  SEQ\_TWG                               200

DWH\_DIL\_DMSTG                  SEQ\_TYP                               200

DWH\_DIL\_DMSTG                  SEQ\_USM                               200

SPDMS\_SRVC\_OWNER               SAMA\_SEQ\_1                              0

SPDMS\_SRVC\_OWNER               SDT\_ID\_S                                0

SPDMS\_SRVC\_OWNER               SES\_ID\_S                                0

SPDMS\_SRVC\_OWNER               SJE\_ID\_S                                0

SPDMS\_SRVC\_OWNER               SMFR\_ID\_S                               0

META\_DIL\_DATA                  LOAD\_ID\_SEQ                            20

META\_DIL\_DATA                  BATCH\_ID\_SEQ                            0

SYS                            WRP$\_REPORT\_ID\_SEQ                      0

DBO                            ACE\_SEQ                                20

DBO                            ACP\_SEQ                                20

DBO                            ACR\_SEQ                                20

DBO                            AGP\_SEQ                                20

DBO                            AOC\_SEQ                                 0

DBO                            ASC\_SEQ                                20

DBO                            ATC\_SEQ                                 0

DBO                            BAC\_SEQ                                 0

DBO                            BAL\_SEQ                                20

DBO                            ETM\_SEQ                                20

DBO                            FBN\_SEQ                                20

DBO                            FII\_SEQ                                20

DBO                            GUY\_CARP\_TRANSFER\_SEQ                  20

DBO                            HIST\_STAT\_SEQ                           0

DBO                            HUNDREDSECONDS#S                       20

DBO                            HUNSECS                                20

DBO                            MAU\_SEQ                                 0

DBO                            SEC\_SEQ                                20

DBO                            SET\_SEQ                                20

DBO                            SQUN\_QUERY\_NAMES\_SEQ                   20

DBO                            SSE\_SEQ                                20

DBO                            STD\_PARAGRAPH\_SEQ                      20

DBO                            SUC\_SEQ                                20

DBO                            SVP\_SEQ                                20

DBO                            TAR\_SEQ                                 0

DBO                            VAD\_SEQ                                20

DBO                            TER\_SEQ                                 0

DBO                            TRA\_SEQ                                20

DBO                            OMA\_SEQ                                20

DBO                            OMH\_SEQ                                20

DBO                            ONC\_SEQ                                20

DBO                            OPL\_SEQ                                20

DBO                            DIB\_SEQ                                20

DBO                            DOI\_SEQ                                20

DBO                            DRF\_SEQ                                20

DBO                            DTR\_SEQ                                20

DBO                            E3P\_SEQ                                20

DBO                            EAH\_SEQ                                20

DBO                            EDR\_SEQ                                20

DBO                            EES\_SEQ                                20

DBO                            EFC\_SEQ                                 0

DBO                            EMB\_SEQ                                 0

DBO                            EMP\_SEQ                                20

DBO                            ENA\_SEQ                                20

DBO                            ENP\_SEQ                                20

DBO                            IND\_SEQ                                 0

DBO                            IRIS\_CLIENT\_ALT\_KEY\_SEQ                20

DBO                            IRIS\_TRANSACTION\_ALT\_KEY\_SEQ           20

DBO                            PEC\_SEQ                                 0

DBO                            PLA\_SEQ                                20

DBO                            PMA\_SEQ                                20

DBO                            PML\_SEQ                                 0

DBO                            PMR\_SEQ                                20

DBO                            PMS\_SEQ                                 0

DBO                            PRM\_SEQ                                20

DBO                            PRODOFF\_SEQ                             0

DBO                            PRO\_SEQ                                 0

DBO                            PRT\_SEQ                                 0

DBO                            PSA\_ID\_SEQ                             20

DBO                            PSL\_ID\_SEQ                             20

DBO                            PTD\_SEQ                                20

DBO                            PTR\_SEQ                                20

DBO                            RIC\_SEQ                                 0

DBO                            RISK\_HIST\_SEQ                           0

DBO                            RSC\_SEQ                                20

DBO                            TXN\_SEQ\_1                              20

DBO                            LIC\_SEQ                                 0

DBO                            LIN\_SEQ                                20

DBO                            LLE\_SEQ                                20

DBO                            LNR\_SEQ                                20

DBO                            LSD\_SEQ                                20

DBO                            LSL\_SEQ                                20

DBO                            THP\_SEQ                                 0

DBO                            CAC\_SEQ                                20

DBO                            CCC\_SEQ                                20

DBO                            CCL\_SEQ                                20

DBO                            CLO\_SEQ                                20

DBO                            COC\_SEQ                                 0

DBO                            WOP\_SEQ                                20

DBO                            WPA\_SEQ                                 0

DBO                            WPS\_SEQ                                20

DBO                            WTC\_SEQ                                20

DBO                            WTM\_SEQ                                20

DBO                            XIS\_SEQ                                20

GIDS\_LOCAL\_OWNER               GIDRL\_S                                20

META\_DIL\_DATA                  ETL\_FRAMEWORK\_SEQ                      20

META\_DIL\_DATA                  ETL\_SURROGATE\_SEQ                      20

ARCH\_LAC\_DIL\_PSTG              ISEQ$$\_3280113                         20

DWH\_DDL\_DATAMART\_INDQ          SQ\_WORKFLOW\_ACT\_RULE\_FACT\_WAR          20

DWH\_DDL\_DATAMART\_INDQ          SQ\_WORKFLOW\_EVENT\_DIM\_WER              20

**Sample sqls which are facing enq – SQ contention:**

==================================================

SQL\_ID          COUNT(1)

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

5qf1p7t4buzv6       1615

ds0pb3wtz8x64       1470

165atrdx1qq0j       1326

0kwsv6m209yk0       1280

3q1y7f12yzdza       1036

d82k36xjg0v0w        768

4pua7r2g4wh12        710

                     661

6jscfqjypcwaq        651

cbjw5hpaa8m4x        620

75jhmcfvuzgaw        575

5q801n655hj1v        569

56768k8a3j39b        565

8a0z1uvjud9tv        561

da7snazk4y078        554

ghpcvcj4tbhpq        508

6j8n3j80fpt8z        497

a3k9gm1yu97az        484

4t55ty8u9wkkg        473

ctpav412s0cmq        466

3h3tb7gs48rnt        459

7k04ww5z90p5g        456

1x9jc7xxu1amm        437

f758zwvr3amha        432

df97fuc23cy6v        426

15w04jcd00n9t        417

g6mdpabfpq2pt        414

3udfr9fgpxw2v        408

8xb73b0dsycw9        399

dp0dm8096d7tk        363

g6b82zct335w0        335

927h160by5ssd        327

a6k6bfqj42qsx        324

7c05dn40n6sam        303

14j3rchvu1b60        295

4725d150208d7        293

17c1wjw1yy9j4        293

0mzd14d3d1kqb        289

0n85c1dp6d3pd        286

5509dj3asbg25        280

cjbndvnhqza3k        272

g0nv6cp7fha5y        264

3mq9mryd420qk        263

0a3xuftqr7t5r        256

ddu1qrkt2qdnh        256

887vd8nrus9n0        254

cqbzgvbx1638b        250

0jy38xd4087kf        248

6ypymk6vdt70y        245

avs2ddph5w23p        243

4z8wzbgfjf7jg        241

5fkdtd0469j31        240

6y8zxnnhjb68d        231

27b7f112nzda1        225

610rx2g7n2brp        221

atyk7m54b8506        220

b4d783xf27420        220

6yys049zmvgka        219

574jwwwgsfa3z        210

0rgx4rxcf0dtb        209

4gv6jsya1zkru        209

a3wbuzgkp7wb7        205

5rbagk7c30wk5        204

c8ch589fcx7zx        203

dfzspkv776140        201

3x57wzbcxj3jr        200

f2zdvtztyc4cf        198

akqvncxchvz62        198

7bu8s5sst4w91        197

f6zm47vjdzs7n        197

9567zu2kbuguu        197

6za4gbg0p5vsw        194

7jkrg4fhg2zzn        191

fx8454vuhdb4c        188

67yfsdqab87s5        184

d0q5kmftv7jpw        181

amxskbtyrjk25        181

5njvhumtg79b6        180

8rqq0yznkun4h        180

dhp6uj6q2r20r        177

93gtd8t8h1ay1        177

4d5m0bqdutqp2        176

cq5fjs2udqvpz        171

f5zaa37bfrg3m        168

8hzqr49jvdzyh        166

4wbcx6uv055qc        162

25m7w8zcqa88s        162

**Recommendation 16:**

