Oracle Database Administration Services

KE – Oracle DB MOFF Performance Slow

Submitted to



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Document Details

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| Customer Contact Information |  |

Version History

(All revisions made to this document must be listed in chronological order. All revisions must be approved. Review and Approval can be done by an internal source or by the customer)

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| Version | Date of Revision | Description | Author | Reviewed By | Approved By |
| 1.0 | 11-05-2017 | Intial Draft | Balaji Ankalle |  | Mahesh Keshatwar |
| 1.1 | **15-05-2017** | **Document Completed** | Balaji Ankalle | Jiten Pansara | **Mahesh Keshatwar** |
| 1.2 | **16-11-2017** | **Updated document to Wipro Standard format with header and footer** | **Abhishek Kansal** | Jiten Pansara | **Yogesh Desai** |
| 1.3 | **30-12-2019** | **Change Account details** | **Sreya Puthukudy** | **Jiten Pansara** | **Santosh Badiger** |
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Oracle DB MOFF Performance Issue

**Problem Description:**

Performance issue reported for MOFF application on the 12c upgraded database.

All the Whale related jobs were running slow.

Database wide perfomance slowness observed including the slowness for one of the critical SQL which takes 16 min in 12c (Server rs277a) while it takes 40-50 min (Server rs282a : 12c) while it gets executed in 7 min in 11g.

**Impact:** Delay in MOFF UAT for 12c upgrade database causing an impact on the actual go live date. This in turn associates to a project closure and financial impact.

**Teams Involved**

Storgae, Unix, DBA and application developer.

**Tools Used for the Problem Analysis**

Database : OEM, AWR Report & 10046 Trace analysis & Oswatcher logs.

**Vendors Involved :**

Oracle Support, IBM & Hitachi

**Detailed Analysis and Steps involved for Resolution** :

1. Slowness reported by application team for all the Whale related jobs
2. DBA team didn’t observe anything wrong on the database side and reverted with the queries that were running for a long period and consuming DB time.
3. Application team tried to correlate if the job slowness observed due to the DB links involved and produced a test case where an SQL having Full table scan without any DB link was causing the performance issue. (Query response time > 1 hrs (post change of optimizer parameter) on 12c (rs282a) compared to 7 min in 11g.
4. DBA team confirmed no change in exeution plan for the SQL in 12c as compared to 11g and verified the SQL response time was unchanged with the change of optimizer settings as well.
5. DBA team tried to collect the updated statistics for the table which ran for 5-6 hours and

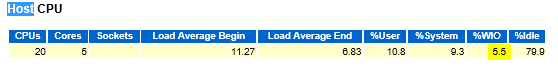
never completed. Restore of the old statistics also didn’t resolev the performane issue.

1. From 10046 trace; direct path read waits were evident in addition to the high I/O read times in AWR report and Oswatcher logs. Relevant Disk information shared with AIX and storage team for further analysis.

**10046 Trace**



**AWR report**



|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Tablespace** | **Filename** | **Reads** | **Av Rds/s** | **Av Rd(ms)** | **Av Blks/Rd** | **PDB Name** |
| MOFFICE\_DATA | /oracle/MOFFP/data01/moffice\_data25.dbf | 3384 | 2 | 76.48 | 97.91 | MOFFP |
| MOFFICE\_DATA | /oracle/MOFFP/data01/moffice\_data27.dbf | 2235 | 1 | 75.21 | 96.3 | MOFFP |
| MOFFICE\_DATA | /oracle/MOFFP/data02/moffice\_data26.dbf | 3433 | 2 | 68.83 | 93.33 | MOFFP |
| REPORTING\_INDEXES | /oracle/MOFFP/data03/reporting\_indexes17.dbf | 24 | 0 | 58.75 | 1 | MOFFP |
| PERFSTAT | /oracle/MOFFP/data01/perfstat01.dbf | 24 | 0 | 57.5 | 1 | MOFFP |
| QUEST\_DATA | /oracle/MOFFP/data01/quest\_data01.dbf | 24 | 0 | 57.5 | 1 | MOFFP |
| GENF\_DATA | /oracle/MOFFP/data04/genf\_data69.dbf | 15 | 0 | 46.67 | 68.47 | MOFFP |
| MOFFICE\_DATA | /oracle/MOFFP/data02/moffice\_data24.dbf | 4576 | 2 | 46.18 | 71.35 | MOFFP |
| MOFFICE\_DATA | /oracle/MOFFP/data02/moffice\_data31.dbf | 1936 | 1 | 44.19 | 60.76 | MOFFP |
| MOFFICE\_DATA | /oracle/MOFFP/data01/moffice\_data28.dbf | 2317 | 1 | 40.95 | 58.59 | MOFFP |
| MOFFICE\_DATA | /oracle/MOFFP/data02/moffice\_data33.dbf | 1343 | 1 | 40.45 | 44.31 | MOFFP |
| MOFFICE\_DATA | /oracle/MOFFP/data01/moffice\_data29.dbf | 1990 | 1 | 39.81 | 63.31 | MOFFP |
| MOFFICE\_DATA | /oracle/MOFFP/data02/moffice\_data32.dbf | 2010 | 1 | 39.78 | 46.39 | MOFFP |
| REPORTING\_DATA | /oracle/MOFFP/data01/reporting\_data19.dbf | 40 | 0 | 39.75 | 51.6 | MOFFP |
| APEX | /oracle/MOFFP/data01/apex\_data01.dbf | 36 | 0 | 39.44 | 1.11 | MOFFP |
| REPORTING\_DATA | /oracle/MOFFP/data01/reporting\_data05.dbf | 85 | 0 | 36.12 | 80.02 | MOFFP |
| MOFFICE\_DATA | /oracle/MOFFP/data01/moffice\_data30.dbf | 2231 | 1 | 35.82 | 52.76 | MOFFP |
| REPORTING\_DATA | /oracle/MOFFP/data01/reporting\_data24.dbf | 64 | 0 | 34.69 | 72.09 | MOFFP |
| REPORTING\_DATA | /oracle/MOFFP/data01/reporting\_data14.dbf | 53 | 0 | 33.96 | 65.36 | MOFFP |

1. Oracle Support advised to change the fsfastpath parameter at AIX level; this change didn’t help to resolve the issue; so it was revered back.
2. A decision was taken to clone the database from rs282a to rs277a to identify whether the issue is at database end or Server/storage end.
3. The database been cloned from rs282a to rs277a. Post cloning of the database; it was observed that the response time of the same SQL on rs277a was initially 12 min and the consistent throughput was for 16-18 mins.
4. Meantime, HDS came up with two major suggestions :

To increase queue depth value for the data disks from 2 to 4 or 8 &

Num cmd elements to be increased.

1. Storage path errors were rectified for rs282a and additional ports been provided to provide the better read throughput.
2. Queue depth value changed to 16 and the SQL response time on rs282a reduced to 30-35 min which was still way above the expected response time.

Even on rs277a; the response time was twice the current 11g database on the same system indicating additional analysis required on DB end too.

1. With the use of parallel hint for the SQL as well; response time on 11g database was well below the response time for 12c dataabses on both rs277a and rs282a.
2. DB\_FILE\_MULTIBLOCK\_READ\_COUNT was changed from the current default value of 128 to 32 to provide the response time of the SQL in accordance with 11g. Post multiple iterations of testing ; the respose time for the SQL between 6-7 min was confirmed on all 12c enviornments.

DB\_FILE\_MULTIBLOCK\_READ\_COUNT is one of the parameters you can use to minimize I/O during table scans. It specifies the maximum number of blocks read in one I/O operation during a sequential scan. The total number of I/Os needed to perform a full table scan depends on such factors as the size of the table, the multiblock read count, and whether parallel execution is being utilized for the operation.

| Property | Description |
| --- | --- |
| Parameter type | Integer |
| Default value | The default value corresponds to the maximum I/O size that can be efficiently performed and is platform-dependent |
| Modifiable | ALTER SESSION, ALTER SYSTEM |
| Range of values | Operating system-dependent |
| Basic | No |

**Lessons Learned :**

1. Request for a similar system confirguation for all database migration/upgrade projects in terms of Operating system and strage related configurations to provide an appropriate performance analysis comparision across the database versions.
2. Involve AIX. Storage team in case of any Major IO related wait events at DB end and ask them to compare the configurations with an existing working system.
3. Queue depth value plays an important role for current RWE systems involving AIX & Hitachi platform in terms of I/O response time
4. DB\_FILE\_MULTIBLOCK\_READ\_COUNT is an important parameter to look for when it comes to direct path read wait events (especially for SQL’s with Full Table Scan)
5. Review the default parameter values in case of performance issues post the database upgrade. (e.g we had to change the default value for db\_file\_multiblock\_read\_count)