ORA-4031 while Creating or Compiling a Materialized View (Doc ID 2267548.1)

In this Document

APPLIES TO:

Oracle Database - Enterprise Edition - Version 11.2.0.4 and later
Oracle Database Cloud Schema Service - Version N/A and later
Oracle Database Exadata Express Cloud Service - Version N/A and later
Oracle Database Exadata Cloud Machine - Version N/A and later
Oracle Cloud Infrastructure - Database Service - Version N/A and later
Information in this document applies to any platform.

SYMPTOMS

Creating or compiling a materialized view (mview) using data from large tables consistently fails with:

```
ORA-04031: unable to allocate 102272 bytes of shared memory ("shared pool","SELECT * FROM (SELECT /*+ FI...","KGLS^dac5c8b5","summary inline view text")
```

-or-

```
ORA-04031: unable to allocate 32 bytes of shared memory ("shared pool","X$KSLWT","KGLS^bdbb1e6a","kglHeapInitialize:temp")
```

The mview definition looks like:

```
create materialized view <MVIEW_NAME> as
with
<VALUE> as (
select
...
```

The compile looks like:

```
ALTER SUMMARY <MVIEW_NAME> COMPILE;
```

4031診断情報（バージョンに応じて関連する非インシデントまたはインシデントトレースファイルに含まれています）によると、
SQLA、KGLS、およびKGLH0ヒープに対して共有プールに多くのメモリが割り当てられており、
"summary inline view text"の割り当て要求に対してORA-4031エラーが発生しています。

The 4031 Diagnostic Information (which is either in the associated non-incident or incident trace file depending on the version) shows a high amount of memory was allocated to the SQLA, KGLS and KGLH0 heaps of the shared pool, leading to ORA-4031 errors for allocation request "summary inline view text":

```
================================
Begin 4031 Diagnostic Information
================================
The following information assists Oracle in diagnosing
causes of ORA-4031 errors. This trace may be disabled
by setting the init.ora _4031_dump_bitvec = 0
================================
Allocation Request Summary Informaton
================================
Current information setting: 04014fff
SGA Heap Dump Interval=3600 seconds
Dump Interval=300 seconds
Last Dump Time=03/09/2017 18:09:15
Dump Count=1
Allocation request for: summary inline view text
Heap: 0x198cfa898, size: 102272

...

=============================================
TOP 10 MEMORY USES FOR SGA HEAP SUB POOL 1
---------------------------------------------
"SQLA " 230 MB 30%
"free memory " 215 MB 28%

...

=============================================
TOP 10 MEMORY USES FOR SGA HEAP SUB POOL 2
---------------------------------------------
"free memory " 486 MB 47%
"SQLA " 263 MB 26%

...

=============================================
TOP 10 MEMORY USES FOR SGA HEAP SUB POOL 3
---------------------------------------------
"free memory " 813 MB 61%
"SQLA " 285 MB 21%
"KGLH0 " 56 MB 4%

...

=============================================
TOP 10 MEMORY USES FOR SGA HEAP SUB POOL 4
---------------------------------------------
"KGLS " 2090 MB 71%
"KGLH0 " 537 MB 18%

...

=============================================
TOP 10 MEMORY USES FOR SGA HEAP SUB POOL 5
---------------------------------------------
"free memory " 574 MB 53%
"SQLA " 250 MB 23%
"KGLH0 " 57 MB 5%

...

=============================================
TOP 10 MEMORY USES FOR SGA HEAP SUB POOL 6
---------------------------------------------
"KGLS " 1929 MB 60%
"KGLH0 " 547 MB 17%
"SQLA " 270 MB 8%
```

```
...

==========================================
TOP 10 MEMORY USES FOR SGA HEAP SUB POOL 7
------------------------------------------
"free memory " 327 MB 39%
"SQLA " 263 MB 32%
"KGLH0 " 56 MB 7%

...


TOTALS ------------------------------------
Total free memory 2808 MB
Total memory alloc. 8392 MB
Grand total 11 GB

...
```

CHANGES

CAUSE

ORA-4031エラーは、クエリ内のエントリのインラインコピーを生成するコードによって報告されます。
基本的な問題は、マテリアライズドビューを作成するために使用されるマテリアライズドビュークエリが非常に複雑であるため、
クエリコンパイル中にキャプチャされる要約情報を保持するのに十分なメモリが不足し、ORA-4031エラーが発生することです。

An ORA-4031 error is reported by the code instantiating the inline copies of the with-query entries. The basic problem is that the mview query is too complex to be used to create a materialized view, resulting in insufficient memory available to hold the summary information being captured during the query compilation leading to the ORA-4031 error.

During create mview / summary mview, the materialized view code attempts to capture information about the query, for example, information which is used when compiling other queries to match the query for rewrite.   The ORA-4031 errors are occurring when allocating structures in which required information is being captured as the size and number of the structures reflects the complexity of the underlying view query.
マテリアライズドビューまたはサマリーマテリアライズドビューを作成する際、マテリアライズドビューコードはクエリに関する情報をキャプチャ
しようとします。たとえば、クエリのリライトに一致させるために他のクエリをコンパイルする際に使用される情報です。
This issue was investigated in: ORA-4031エラーは、必要な情報をキャプチャするための構造体を割り当てる際に発生します。このとき、構造体のサイズや数は、
基となるビュークエリの複雑さを反映しています。
Bug 20334350 - ORA-4031 ("SHARED POOL","X$KSLWT","KGLS'...) CREATING MVIEW

which was closed as Not Feasible to fix as the real problem is in the complexity of the mview.
このバグは、根本的な問題がマテリアライズドビューの複雑さにあるため、修正が不可能としてクローズされました。

SOLUTION

Simplify or restructure the mview query to reduce the number of relationships between the sub-queries.

a. Consider splitting the query. Build several materialized views and use them to build the main one.

-or-

b. Reconsider if it's a well formed query.

REFERENCES

BUG:20334350 - ORA-4031 CREATING MVIEW
NOTE:146599.1 - Diagnosing and Resolving Error ORA-04031 on the Shared Pool or Other Memory Pools [Video]
     Didn't find what you are looking for?

```
...

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