

2800138 - Out of Memory with Allocation Failure Type OPERATING_SYSTEM_LIMIT

Version	7	Type	SAP Knowledge Base Article
Language	English	Master Language	English
Release Status	Released to Customer	Category	Problem
Component	HAN-DB-ENG (SAP HANA DB Engines)	Released On	04.12.2020

Please find the original document at <https://launchpad.support.sap.com/#/notes/2800138>

Symptom

- An out of memory event happened in the HANA database and an oom trace file was created containing the information below:

```
[MEMORY_OOM] Information about current out of memory situation: (<timestamp>)
OUT OF MEMORY occurred.
Host: <hostname>
Executable: <servicename>
PID: <pid>
Failed to allocate <memoryvalue>
Allocation failure type: OPERATING_SYSTEM_LIMIT
```

- The oom trace file also contains the messages below:

```
Could not return Xb to operating system.
This is a configuration problem of your operating system:
Please increase /proc/sys/vm/max_map_count
At most one OOM dump is written in approximately Xs.
```

```
/proc/sys/vm/max_map_count:
65530 <--- this is far too low
```

- You also see the following messages in the traces of the HANA service that reported the out of memory event:

```
<timestamp> e Memory MallocProxy.cpp(02006) : mmap(<...>) failed.12 (Cannot allocate memory)
<timestamp> e Memory Precharge.cpp(00162) : memAllocSystemPages failed with rc=12, 12 (Cannot allocate memory)
```

- You could also get an error similar to:

```
SQL submitted to ODBC data source <HANA SID> resulted in error <[SAP AG][LIBODBC] [HDBODBC] General error;2048 column store error: search table error: [9] Memory allocation failed;exception 1000002: Allocation failed ; $size$=25315874691; $name$=Pool/JoinEvaluator; $type$=pool; $inuse_count$=16; $allocated_size$=27891692375; $alignment$=8; $failure_type$=OPERATING_SYSTEM_LIMIT;
```

- The OOM dump files:

```
<service>_<host>.<port>.rtedump.<timestamp>.oom.trc
<service>_<host>.<port>.rtedump.<timestamp>.oom_memory_release.trc
```

show that the sum of U (used memory) is significantly smaller than the total allocation limit under AB (allocated bytes) for that specific service. For example the indexserver nodes of a HANA system here :

[13] PID=149687 (state=S), SId=121674146, compactors active, alive, process name: hdbindexserver
AB=72.48gb (77832671232b), UA=0b, **U=8.61gb** (9252275735b), FSL=1.12gb (1207959552b),
 FMC=512mb (536870912b), SMAS=101.21gb (108682178560b), SMDS=28.56gb (30676598784b),
 PAL=2.21tb (2439313883136b), TPAL=72.59gb (77949612032b), W=100

[15] PID=596823 (state=R), SId=121674148, compactors active, alive, process name:
 hdbindexserver
AB=1.10tb (1220820975616b), UA=0b, **U=574.47gb** (616837124628b), FSL=0b, FMC=0b,
 SMAS=10.27tb (11296726528000b), SMDS=9.16tb (10075732643840b), PAL=2.21tb
 (2439313883136b), TPAL=2.18tb (2402562605056b), W=100

- BW DSO activation fails with below errors:

```
"Message text transaction rolled back by an internal error: failed to activate dso with
persisted changelog: [410 02] column store error and "Message text Serious error occurred:
column store error: search table error: [2999] general error (no further information
available) at ptim"
```

Environment

SAP HANA, platform edition

Cause

- Linux kernel parameter `/proc/sys/vm/max_map_count` is not properly set;
- In case the parameter is already set as recommended, check whether:
 - You have more systems/services consuming memory in the same server and preventing SAP HANA from allocating memory up to the Global allocation limit;
 - If there are two or more SAP HANA systems in the same host, it is possible that you ran into the issue described in KBA [2946571](#) Indexserver terminated simultaneously in different SAP HANA systems on the same host;

Resolution

1. Refer to the solution on SAP Note [1980196](#) Setting Linux Kernel Parameter `/proc/sys/vm/max_map_count` on SAP HANA Systems.
2. If the parameter is already set, investigate the memory utilization by other services/programs running in the server. Make sure to limit their memory utilization.
3. To limit the overall SAP HANA memory utilization, refer to KBA [2926166](#) How to limit the overall SAP HANA memory allocation.

See Also

- KBA [1999997](#) FAQ: SAP HANA Memory, in the following points:
 - 9. Which options exist to reduce the risk of SAP HANA memory issues?
 - 30. Can there be fragmentation in the heap memory?
 - 31. Which indications exist that an OOM situation is triggered by the operating system?
- KBA [2467292](#) memAllocSystemPages failed with rc=12 - Cannot allocate memory

Keywords

SAP HANA, platform edition, sap_hana, database, db, saphana, oom, out-of-memory, out-memory, out memory, operating_system_limit, rc=12, hdbindexserver, hdbscriptserver, hdbnameserver, hdbcompileserver, allocationlimit, global_allocation_limit, memorymanager

Products

SAP HANA, platform edition all versions

This document refers to

SAP Note/KBA	Title
2946571	Indexserver terminated simultaneously in different SAP HANA systems on the same host
2926166	How to limit the overall SAP HANA memory allocation
2467292	memAllocSystemPages failed with rc=12 - Cannot allocate memory
1999997	FAQ: SAP HANA Memory
1980196	Setting Linux Kernel Parameter /proc/sys/vm/max_map_count on SAP HANA Systems

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