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| **Unable To Start ASM (ORA-00838 ORA-04031) On 11.2.0.3/11.2.0.4 If OS CPUs # > 64. (Doc ID 1416083.1)** | [To Bottom](https://support.oracle.com/epmos/faces/DocumentDisplay?_afrLoop=446195134780044&id=1416083.1&_adf.ctrl-state=t21nlel23_160%20\o%20To%20Bottom) |  |





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| **In this Document**   |  |  | | --- | --- | |  | [Symptoms](https://support.oracle.com/epmos/faces/DocumentDisplay?_afrLoop=446195134780044&id=1416083.1&_adf.ctrl-state=t21nlel23_160%20\l%20SYMPTOM) | |  | [Cause](https://support.oracle.com/epmos/faces/DocumentDisplay?_afrLoop=446195134780044&id=1416083.1&_adf.ctrl-state=t21nlel23_160%20\l%20CAUSE) |  |  |  | | --- | --- | |  | [Solution](https://support.oracle.com/epmos/faces/DocumentDisplay?_afrLoop=446195134780044&id=1416083.1&_adf.ctrl-state=t21nlel23_160%20\l%20FIX) | |  | [Community Discussions](https://support.oracle.com/epmos/faces/DocumentDisplay?_afrLoop=446195134780044&id=1416083.1&_adf.ctrl-state=t21nlel23_160%20\l%20aref_section31) |  |  |  | | --- | --- | |  | [References](https://support.oracle.com/epmos/faces/DocumentDisplay?_afrLoop=446195134780044&id=1416083.1&_adf.ctrl-state=t21nlel23_160%20\l%20REF) |     **APPLIES TO:**  Oracle Database - Enterprise Edition - Version 11.2.0.1 to 12.1.0.2 [Release 11.2 to 12.1]  Information in this document applies to any platform.  **SYMPTOMS**  1) ASM 11.2.0.3/11.2.0.4 configuration on Solaris SPARC T4-4 Server with 128 CPUs & RAM = 128 GB.    2) If the 128 CPUs are enabled, then ASM instance is unable to start due to the next errors:    **ORA-00838: Specified value of MEMORY\_TARGET is too small, needs to be at least 1328M**  **ORA-01078: failure in processing system parameters**    [main] [ 2012-01-21 18:26:28.986 COT ] [UsmcaLogger.logException:174] **ORA-04031: unable to allocate 32 bytes of shared memory ("shared pool","SELECT DECODE(null,'','Total...","SQLA","tmp")**    3) But if only 64 CPUs are enabled, then ASM instance starts without problems.  4) On release 11.2, ASM uses Automatic Memory Management (**AMM**) by default,  therefore **MEMORY\_MAX\_TARGET** & **MEMORY\_TARGET** have the default values = 272 MB (in the ASM instance):    MEMORY\_MAX\_TARGET = 272M  MEMORY\_TARGET = 272M    5) And so, the SGA in the ASM instance has the same value (900 MB):  SQL> show sga  Total System Global Area  283930624 bytes  Fixed Size                  2227664 bytes  Variable Size             256537136 bytes  ASM Cache                  25165824 bytes    **CAUSE**  In 11.2.0.3/11.2.0.4, the "**PROCESSES**" parameter will be default to "available CPU cores \* 80 + 40" (in the ASM spfile).  As the default value for "**MEMORY\_TARGET**" is based on "**PROCESSES**", it can be insufficient if there is a large number of CPU cores or large number of diskgroups which could cause issues (i.e. Grid Infrastructure stack fails to stop with **ORA-04031** etc) per [Bug:13605735](https://support.oracle.com/epmos/faces/BugDisplay?parent=DOCUMENT&sourceId=1416083.1&id=13605735%20\t%20_blank) & [Bug:12885278](https://support.oracle.com/epmos/faces/BugDisplay?parent=DOCUMENT&sourceId=1416083.1&id=12885278%20\t%20_blank), it is recommended to increase the value of **MEMORY\_MAX\_TARGET** & **MEMORY\_TARGET** before upgrading/installing to 11.2.0.3/11.2.0.4 (does not apply to 10g ASM).  **SOLUTION**  1) Connect to the ASM instance(s) and increase the **MEMORY\_MAX\_TARGET** &  as follow (3GB or 4GB will be enough):    SQL> alter system set MEMORY\_MAX\_TARGET=4096m scope=spfile  SID='\*';  SQL> alter system set MEMORY\_TARGET=3072m scope=spfile  SID='\*';    Note: The number 1536m has proven to be sufficient for most environment, the change will not be effective until next restart.    2) Restart the ASM instances to apply the changes.  3) Then enable all the CPUs (e.g. total = 128) in your system:  bash-3.00# prtdiag -v|grep SPARC-T4 | grep on-line | wc -l  **128**      **Important Note 1**:    In 11.2.0.3/11.2.0.4, we increase the default PROCESSES based on the number of CPU cores, and the default MEMORY\_TARGET is based on PROCESSES.   If in 11.2.0.2, customers explicitly set MEMORY\_TARGET to some value that may not be big enough for 11.2.0.3/11.2.0.4, when they upgrade to 11.2.0.3/11.2.0.4, ASM will fail to start with error "memory\_target is too small".    We should add additional check for MEMORY\_TARGET during the upgrade prerequisite check.  You can unset MEMORY\_TARGET so that ASM can use the default value, but if MEMORY\_TARGET is explicitly set, please make sure it's large enough, following the next rules:  **1) If PROCESSES parameter is explicitly set**:  The MEMORY\_TARGET should be set to no less than:        256M + PROCESSES  \* 132K (64bit)   or        256M + PROCESSES  \* 120K (32bit)  **2) If PROCESSES parameter is not set**:    The MEMORY\_TARGET should be set to no less than:        256M + (available\_cpu\_cores \* 80 + 40) \* 132K  (64bit)  or        256M + (available\_cpu\_cores \* 80 + 40) \* 120K  (32bit)      **Important Note 2**:    If this problem (ORA-4031 error) is occurring during a brand new ASM (11.2.0.3 or 11.2.0.4)  installation/configuration (e.g. when running root.sh to start the ASM instance) and  many CPUs/Cores are enabled (above 4), then temporally disable most of them and leave just few enabled (about 2 or 4), as the following example (64 CPUs are present and enabled):  1) Ask your SA to disable 62 CPUs and leave enable only 2 of 64.  2) Verify only 2 CPUs were/are enabled using the next commands:  #  kstat cpu\_info | grep core\_id | awk '{ print $2}' | uniq | wc -l  # prtdiag -v|grep SPARC-T4 | grep on-line | wc -l    3) Run root.sh again to start the ASM services/instances and complete the installation.  4) Once the ASM instances are created and running, then increase the SGA (AMM) in the ASM instances as follows (exact same values below):  SQL> alter system set MEMORY\_MAX\_TARGET=4096m scope=spfile;  SQL> alter system set MEMORY\_TARGET=1536m scope=spfile;  5) Restart the ASM instances and check the AMM values:  SQL> show parameter MEMORY\_MAX\_TARGET  SQL> show parameter MEMORY\_TARGET  6) Ask your SA to enable back the other 62 CPUs.  7) Restart CRS or HAS and make sure the ASM instances start. |