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| **Maximum SHMMAX values for Linux x86 and x86-64 (Doc ID 567506.1)** | [IMG_256](https://support.oracle.com/epmos/faces/DocumentDisplay?_afrLoop=333381196118979%26id=567506.1%26_adf.ctrl-state=p099y4rdg_321%20/o%20To%20Bottom)  [To Bottom](https://support.oracle.com/epmos/faces/DocumentDisplay?_afrLoop=333381196118979&id=567506.1&_adf.ctrl-state=p099y4rdg_321 \\o To Bottom) | IMG_257 |

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| **In this Document**   |  |  | | --- | --- | |  | [Goal](https://support.oracle.com/epmos/faces/DocumentDisplay?_afrLoop=333381196118979&id=567506.1&_adf.ctrl-state=p099y4rdg_321 \\l GOAL) |  |  |  | | --- | --- | |  | [Solution](https://support.oracle.com/epmos/faces/DocumentDisplay?_afrLoop=333381196118979&id=567506.1&_adf.ctrl-state=p099y4rdg_321 \\l FIX) |  |  |  | | --- | --- | |  | [References](https://support.oracle.com/epmos/faces/DocumentDisplay?_afrLoop=333381196118979&id=567506.1&_adf.ctrl-state=p099y4rdg_321 \\l REF) |   IMG_260  **APPLIES TO:**  Oracle Database - Enterprise Edition - Version 9.2.0.1 to 12.1.0.1 [Release 9.2 to 12.1]  Obsolete Linux Intel (64-bit)  Red Hat Enterprise Linux Advanced Server x86-64 (AMD Opteron Architecture)  Linux x86  Generic Linux  Linux x86-64  IBM: Linux on System z    **GOAL**  QUESTION 1  ===========  What is the maximum value of SHMMAX for a 32-bit (x86) Linux system?    QUESTION 2  ===========  What is the maximum value of SHMMAX for a 64-bit (x86-64) Linux system?  **SOLUTION**  ANSWER 1  ============  Oracle Global Customer Support officially recommends a " maximum" for SHMMAX of just less than 4Gb, or 4294967295.  The maximum size of a shared memory segment is limited by the size of the available user address space. On 32-bit systems, this is a theoretical 4GB. The maximum possible value for SHMMAX is just less than 4Gb, or 4294967295. Setting SHMMAX to 4GB exactly will give you 0 bytes as max, as this value is interpreted as a 32-bit number and it wraps around.    ANSWER 2  ===========  Oracle Global Customer Support officially recommends a " maximum" for SHMMAX of "1/2 of physical RAM".  The maximum size of a shared memory segment is limited by the size of the available user address space. On 64-bit systems, this is a theoretical 2^64bytes. So the "theoretical limit" for SHMMAX is the amount of physical RAM that you have.  However, to actually attempt to use such a value could potentially lead to a situation where no system memory is available for anything else.  Therefore a more realistic "physical limit" for SHMMAX would probably be "physical RAM - 2Gb".  In an Oracle RDBMS application, this "physical limit" still leaves inadequate system memory for other necessary functions. Therefore, the common "Oracle maximum" for SHMMAX that you will often see is "1/2 of physical RAM". Many Oracle customers chose a higher fraction, at their discretion.  Occasionally, Customers may erroneously think that that setting the SHMMAX as recommended in this NOTE limits the total SGA.   That is not true.  Setting the SHMMAX as recommended only causes a few more "shared memory segments" to be used for whatever total SGA that you subsequently configure in Oracle. For additional detail, please see  [Document 15566.1](https://support.oracle.com/epmos/faces/DocumentDisplay?parent=DOCUMENT&sourceId=567506.1&id=15566.1), "SGA, SHMMAX, Semaphores and Shared Memory Explained"  Also to be taken into consideration for memory configuration is the kernel parameter for kernel.shmall which is the total amount of shared memory, in pages, that the system can use at one time.  Review:  [Document 301830.1](https://support.oracle.com/epmos/faces/DocumentDisplay?parent=DOCUMENT&sourceId=567506.1&id=301830.1) Upon startup of Linux database get ORA-27102: out of memory Linux-X86\_64 Error: 28: No space left on device    **Note:** It is observed lower value of SHMMAX might lead to ORA-600  [SKGMINVALID]          **REFERENCES**  [NOTE:169706.1](https://support.oracle.com/epmos/faces/DocumentDisplay?parent=DOCUMENT&sourceId=567506.1&id=169706.1) - Oracle Database (RDBMS) on Unix AIX,HP-UX,Linux,Mac OS X,Solaris,Tru64 Unix Operating Systems Installation and Configuration Requirements Quick Reference (8.0.5 to 11.2)  [NOTE:1527109.1](https://support.oracle.com/epmos/faces/DocumentDisplay?parent=DOCUMENT&sourceId=567506.1&id=1527109.1) - Relationship Between SGA\_TARGET and SHMMAX  [NOTE:15566.1](https://support.oracle.com/epmos/faces/DocumentDisplay?parent=DOCUMENT&sourceId=567506.1&id=15566.1) - TECH: Unix Semaphores and Shared Memory Explained |