

Solaris10 (SPARC) Kernel & TCP Settings Prescribed for the SAP Oracle Environment

(Part 3C of Series)

Sun Project Number:	Internal
Sun Document Reference:	1.0
Version Number:	1.0
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Purpose:	Technical Brief
Document Date:	August 1, 2006

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Introduction

The topic of this report is pretty self-explanatory. The purpose of this report is to provide a set of general-purpose and preferred Solaris parameters for preparing the servers to host/support the SAP/Oracle environment.

The guidelines in this report are a combination of applying the latest options with the available technology. The contents in this report is not necessarily original, but is intended to provide a 'clearer picture' of compiling & applying what our group has recommended and will continue to recommend to our SAP customers preparing their configuration for the best combination of management and performance.

NOTE: This report should be considered as one component in addressing the 'total solution' for implementing the storage/Solaris/volume/filesystem/Oracle configuration layers preparing for SAP. Because each type and combination of storage subsystem needs to be addressed in its own way, please refer to the individual report for the storage subsystem of interest that should be combined with the contents in this report and the others.

The recommended strategy is this report has been applied in SAP environments up to and including WAS6.40 for Oracle up to and including 9i; 32-bit and 64-bit inclusive. Any modifications for adapting to the future releases of either SAP WAS (7.X) or Oracle (10g) software is not expected.

This report is the third in a series; new revision for Solaris10 with an additional section for TCP related settings. A third section has also been provided that compiles the recommended settings specific to the T2000 servers. The release of the remaining reports in this series are available as well.

(1) Solaris10 (SPARC) Kernel Settings

The kernel settings listed below are intended to provide for the most popular choices of support tools integrated with Solaris (i.e. Veritas). Many of the parameters involved are simply meant to help 'open the flood gates' regarding I/O throughput beyond the vanilla/default values. It is expected that the database server configuration supporting the SAP environment will have a minimum of 4-8CPUs and 8-10GB RAM (with emphasis on the RAM component). The server configuration for which these settings have been applied are, in many cases, much larger than this minimum (40+ CPUs, 40+GB RAM) to suit our largest customers.

NOTES: (1) What is not present below are (1) settings specific to supporting a particular storage subsystem (i.e. any of the `sd_*` or `ssd_*` parameters). These settings vary by the particular type of storage subsystem supported and therefore should be analyzed & added as a separate task.

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(2) Settings related to the Veritas toolset are mainly for supporting the database server domain, but can be applied to the application server domains for standardization purposes. The latest versions of VxVM software have updated most or all of the settings below as default. But they are included to be sure.

```
*
set maxphys=8388608
*
* The following parameter is normally focusing on the
* server/domain supporting the database and is subject to being
* increased as more amounts of RAM is made available.
*
set autoup=Y (where 'Y' is the maximum of (30, 4*amount of RAM in GB))
*
*
* Volume manager layer
*
set vxio:vol_maxio=16384
set vxio:vol_maxkiocount=4096
set vxio:vol_maxioctl=131072
set vxio:vol_maxspecialio=10240
set vxio:vol_default_iodelay=5
set vxio:voliomem_maxpool_sz=67108864
*
* Vxfs buffering
*
set ncsize=36000
set vxfs:vxfs_ninode=45000
set vxfs:vx_bc_bufhwm=65536
*
* Set the UFS throttles
*
set ufs:ufs_LW=16777216
set ufs:ufs_HW=67108864
*
* Network interface (ce) optimization settings
*
set ce:ce_tx_ring_size=8192
set ce:ce_cpu_threshold=1
set ce:ce_srv_fifo_depth=16384
*
* Miscellaneous
```

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```
*
set rpcmod:svc_default_stksize=0x6000
set lwp_default_stksize=0x6000
*
*The following is a set of IPC-related /etc/system parameters meant to support a nonsmall
*(64-bit) Oracle/SAP environment. The following parameters are also capable of being
* applied via S10 dynamic resource mgmt. (i.e. project and process based settings).
* But they are being included here in their static form. If present at boot time, the kernel
* will translate these into global resource controls.
*
set shmsys:shminfo_shmmax=0xffffffffffff
set shmsys:shminfo_shmmni=256

set semsys:seminfo_semmni=4096
set semsys:seminfo_semmsl=2048
set semsys:seminfo_semopm=100

set msgsys:msginfo_msgmnb=16384
set msgsys:msginfo_msgmni=50
set msgsys:msginfo_msgtql=2048
```

(2) Recommended TCP-based Performance Settings

The following settings are mainly to address high volumes of network traffic between application servers and database servers associated with any physical 3-tier SAP architecture.

NOTE: The following ndd TCP & UDP tunings can be placed in the standard /etc/rc2.d/S68net-tune location

```
/usr/sbin/ndd -set /dev/tcp tcp_rcv_hiwat 524288
/usr/sbin/ndd -set /dev/tcp tcp_xmit_hiwat 524288
/usr/sbin/ndd -set /dev/tcp tcp_conn_req_max_q 16384
/usr/sbin/ndd -set /dev/tcp tcp_conn_req_max_q0 16384
/usr/sbin/ndd -set /dev/tcp tcp_naglim_def 1
/usr/sbin/ndd -set /dev/tcp tcp_max_buf 10485760
/usr/sbin/ndd -set /dev/tcp tcp_deferred_acks_max 8
/usr/sbin/ndd -set /dev/tcp tcp_wscale_always 1
```

Solaris10 (SPARC) Kernel & TCP Settings for the SAP Oracle Environment**(3) T2000-Related Solaris10 Kernel Parameters**

```
*  
* NOTE: consistent_coloring is now set to 2 by default (since rev-01)  
*  
set ip:ip_queue_bind = 0  
set ip:ip_queue_fanout = 1  
set ipge:ipge_tx_syncq=1  
set ipge:ipge_taskq_disable = 0  
set ipge:ipge_tx_ring_size = 2048  
set ipge:ipge_srv_fifo_depth = 2048  
set ipge:ipge_bcopy_thresh = 1536  
set ipge:ipge_dvma_thresh = 1535  
set ipge:ipge_reclaim_pending = 32
```

Final Thoughts

This strategy has provided a good foundation for the customers who have implemented it (per the recommendations). In general, I have found it very difficult to provide recommendations that will work successfully 'across the board' regarding SAP/Oracle database configurations (or I think that there are many less than most have expected). But the guidelines laid out in this report (and in the others of this series) are as close as what can be provided.