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# Customer X Oracle Benchmark E25K Vs. HP rx8640

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*This is a censored version of a presentation highlighting results of an Oracle benchmark comparing*

*Sun E25K vs. HP rx8640*



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# Engagement Goals

- Customer X is currently running Oracle on Sun E25K server and was interested benchmarking the application on HP rx8640, comparing application throughput on both platforms.
- Run the benchmark on a HP rx8640 server and tune system and database parameters for best performance.
- Maklee committed to double the performance of the current Sun environment.



# Requirements

- Customer X has provided the following requirements and constraints:
  - Benchmark has to run on a 8-core system
    - Limits HP to a single cell in the rx8640 system.
    - On the E25K server, Customer X currently uses 8 cores for Oracle and 56 cores for Java application feeding the database.
  - The total number of Java threads feeding the benchmark should not exceed 16.
  - Transactions per second (tps) is the measurement indicator.



# Best Results



	<b>HP (rx8640)</b> 8 core	<b>Sun (E25K)</b> 64 core
Total number of transactions	104,280	104,280
Total Milliseconds	6,356,634	13,323,183
Transactions Per Second	16.4	7.8
Elapsed time	113 min	?



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210% performance increase vs. Sun

# Unused Tuning Opportunities

- Given technical freedom, Maklee could assist Customer X in increasing the performance of the environment by order of magnitudes.
- The following tuning opportunities were not pursued, as it violated the rules of the benchmark:
  - Native compilation of key PL/SQL procedures
  - Moving hot indexes and tables to larger/smaller tablespaces
  - Adding indexes to speed up top SQL statements
  - Tuning top SQL statements
  - Tuning Java environment





# *Technical Slides*



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# System Configuration

- Hardware
  - HP rx8640 Server Itanium
  - Intel Itanium 2 9000 series processors (1.6 GHz, 24 MB)
  - 1 cell, 8 cores
  - 64 GB physical memory
- Operating System
  - HP-UX 11i (B.11.31)
  - 4 KB pagesize
- Storage
  - HP (HSV450 controllers)
  - Veritas Filesystem



# Veritas Filesystem

- Use the following mount options for best performance
  - mincache=direct ! bypass file system cache during read
  - convosync=direct ! force direct I/O for DB writers
  - nodatainlog
  - delaylog
- Enable Quick I/O (qio)
- Use Veritas ODM (Oracle Disk Manager)



## Veritas Filesystem (cont'd)

- The default disk blocksize for vxfs file systems on HP-UX is too small (only 1024 bytes).
- Oracle database blocksize is usually 8K.
- Use 'fstyp' to verify the disk blocksize of a logical volume
  - f\_frsize is the blocksize used by vxfs
  - # fstyp -v /dev/vg03/lvol4
- Maklee would have preferred that all Oracle related volumes use a disk blocksize of 8K (instead of 1K), but this would require a backup, re-create the filesystem and restore of the data.



# Kernel Parameters

- Double the timeslice value
  - # kmtune timeslice=20
- Disable hyperthreading
  - # setboot -m off
  - # kmtune lcpu\_attr=0
- The preferred way to run an Oracle database server on a 8 core system would be to enable hyperthreads.
  - A single cell nPar with 8 cores would then have 16 logical CPUs.
- However on this particular benchmark, Java runs better with hyperthreads disabled.



# Oracle Parameters



- LOCK\_SGA TRUE
- SGA\_TARGET 0
- SGA\_MAX\_SIZE 18G
- DB\_CACHE\_SIZE 5G
- DB\_16K\_CACHE\_SIZE 3G
- DB\_32K\_CACHE\_SIZE 3G
- DB\_KEEP\_CACHE\_SIZE 3G
- SHARED\_POOL\_SIZE 3G
- LARGE\_POOL\_SIZE 112M
- JAVA\_POOL\_SIZE 208M
- STREAMS\_POOL\_SIZE 128M
- PGA\_AGGREGATE\_TARGET 900M



## Oracle Parameters (cont'd)

- DISK\_ASYNC\_IO TRUE
- FILESYSTEMIO\_OPTIONS SETALL
- COMPATIBLE '10.2.0.4.0'
- LOG\_BUFFER 300000000
- DB\_BLOCK\_SIZE 8192
- DB\_FILE\_MULTIBLOCK\_READ\_COUNT 16
- OPEN\_CURSORS 3200
- SESSION\_CACHED\_CURSORS 3200
- RECYCLEBIN OFF
- LOG\_CHECKPOINT\_INTERVAL 0



## Oracle Parameters (cont'd)

- QUERY\_REWRITE\_ENABLED FALSE
- CURSOR\_SPACE\_FOR\_TIME TRUE
- \_SPIN\_COUNT 10000
- \_COLLECT\_UNDO\_STATS FALSE
- \_TWO\_PASS FALSE
- \_UNDO\_AUTOTUNE FALSE



# Benchmark CPU Utilization

