



# SPEC<sup>®</sup> CINT2006 Result

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Dell Inc.

SPECint<sup>®</sup>\_rate2006 = 41.9

PowerEdge 2970 (AMD Opteron 2218, 2.60 GHz)

SPECint\_rate\_base2006 = 38.2

CPU2006 license: 55

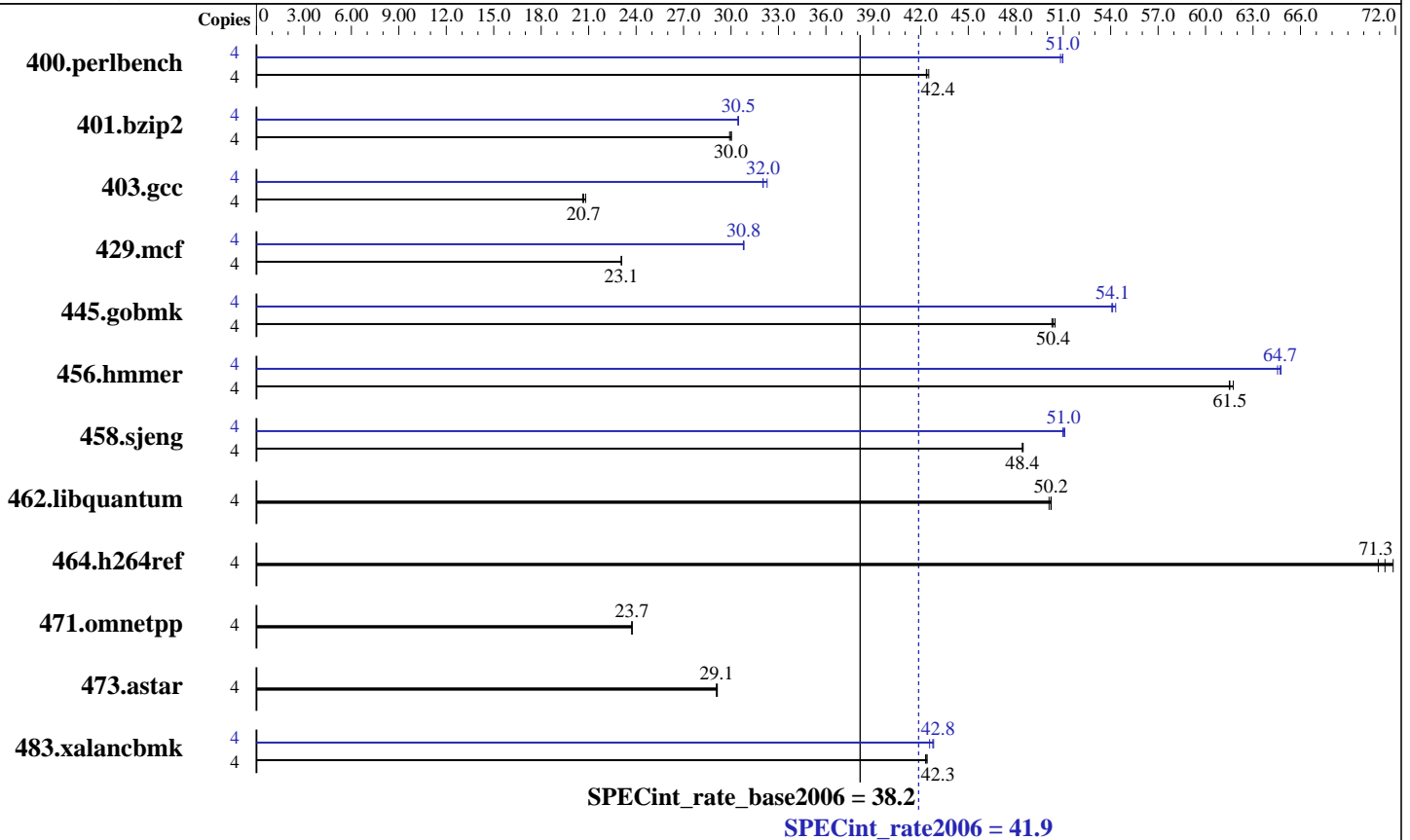
Test date: Nov-2007

Test sponsor: Dell Inc.

Hardware Availability: Sep-2007

Tested by: Dell Inc.

Software Availability: Oct-2007



## Hardware

CPU Name: AMD Opteron 2218  
 CPU Characteristics:  
 CPU MHz: 2600  
 FPU: Integrated  
 CPU(s) enabled: 4 cores, 2 chips, 2 cores/chip  
 CPU(s) orderable: 1,2 chips  
 Primary Cache: 64 KB I + 64 KB D on chip per core  
 Secondary Cache: 1 MB I+D on chip per core  
 L3 Cache: None  
 Other Cache: None  
 Memory: 16 GB (8x2GB, DDR2-667 CL5 ECC Dual Rank)  
 Disk Subsystem: 1 x 73 GB SAS 10k RPM  
 Other Hardware: None

## Software

Operating System: SUSE Linux Enterprise Server 10 (x86\_64) SP1, Kernel 2.6.16.46-0.12-smp  
 Compiler: The Portland Group (PGI)  
 PGI pgcc 7.1-0 C Compiler  
 PGI pgCC 7.1-0 C++ Compiler  
 Auto Parallel: No  
 File System: ReiserFS  
 System State: Multi-user, run level 3  
 Base Pointers: 32/64-bit  
 Peak Pointers: 32/64-bit  
 Other Software: SmartHeap 8.0 32-bit Library for Linux



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## Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
400.perlbench	4	<u>922</u>	<u>42.4</u>	923	42.3	920	42.5	4	767	51.0	769	50.8	<u>767</u>	<u>51.0</u>
401.bzip2	4	1286	30.0	<u>1286</u>	<u>30.0</u>	1291	29.9	4	1268	30.4	<u>1267</u>	<u>30.5</u>	1266	30.5
403.gcc	4	<u>1557</u>	<u>20.7</u>	1561	20.6	1547	20.8	4	<u>1005</u>	<u>32.0</u>	1006	32.0	997	32.3
429.mcf	4	1581	23.1	<u>1581</u>	<u>23.1</u>	1581	23.1	4	1184	30.8	<u>1185</u>	<u>30.8</u>	1185	30.8
445.gobmk	4	831	50.5	834	50.3	<u>833</u>	<u>50.4</u>	4	<u>775</u>	<u>54.1</u>	776	54.1	772	54.3
456.hmmer	4	<u>606</u>	<u>61.5</u>	604	61.8	607	61.5	4	576	64.8	<u>577</u>	<u>64.7</u>	578	64.6
458.sjeng	4	999	48.5	1000	48.4	<u>999</u>	<u>48.4</u>	4	949	51.0	947	51.1	<u>949</u>	<u>51.0</u>
462.libquantum	4	1650	50.2	1654	50.1	<u>1650</u>	<u>50.2</u>	4	1650	50.2	1654	50.1	<u>1650</u>	<u>50.2</u>
464.h264ref	4	1232	71.9	1248	70.9	<u>1241</u>	<u>71.3</u>	4	1232	71.9	1248	70.9	<u>1241</u>	<u>71.3</u>
471.omnetpp	4	1053	23.7	1053	23.8	<u>1053</u>	<u>23.7</u>	4	1053	23.7	1053	23.8	<u>1053</u>	<u>23.7</u>
473.astar	4	965	29.1	<u>965</u>	<u>29.1</u>	964	29.1	4	965	29.1	<u>965</u>	<u>29.1</u>	964	29.1
483.xalancbmk	4	<u>652</u>	<u>42.3</u>	651	42.4	652	42.3	4	649	42.6	645	42.8	<u>646</u>	<u>42.8</u>

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

## General Notes

```
'ulimit -s unlimited' was used to set environment stack size
'ulimit -l 2457600' was used to set environment locked pages in memory quantity
'numactl' was used to bind one copy per core, and memory to a local NUMA node
Set vm/nr_hugepages=1200 in /etc/sysctl.conf
mount -t hugetlbfs nodev /mnt/hugepages
Environment variable PGI_HUGE_PAGES set to 150
```

## Base Compiler Invocation

C benchmarks:  
pgcc

C++ benchmarks:  
pgcpp

## Base Portability Flags

```
400.perlbench: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX_X64
401.bzip2: -DSPEC_CPU_LP64
403.gcc: -DSPEC_CPU_LP64
429.mcf: -DSPEC_CPU_LP64
445.gobmk: -DSPEC_CPU_LP64
456.hmmer: -DSPEC_CPU_LP64
```

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## Base Portability Flags (Continued)

458.sjeng: -DSPEC\_CPU\_LP64  
462.libquantum: -DSPEC\_CPU\_LP64 -DSPEC\_CPU\_LINUX  
464.h264ref: -DSPEC\_CPU\_LP64  
483.xalancbmk: -DSPEC\_CPU\_LINUX

## Base Optimization Flags

C benchmarks:

-fast -Mipa=fast -Mipa=inline -Mipa=noarg -Mfprelaxed  
-Msmartalloc=huge:64 -tp k8-64 -Bstatic\_pgi

C++ benchmarks:

-fastsse -Mipa=fast -Mipa=inline -Mfprelaxed -Msmartalloc --zc\_eh  
-tp k8-32 -Bstatic\_pgi -lsmartheap

## Base Other Flags

C benchmarks:

-w

C++ benchmarks:

-w -L/proj/qa/smartheap/SmartHeap\_8/lib

## Peak Compiler Invocation

C benchmarks:

pgcc

C++ benchmarks:

pgcpp

## Peak Portability Flags

400.perlbench: -DSPEC\_CPU\_LP64 -DSPEC\_CPU\_LINUX\_X64  
401.bzip2: -DSPEC\_CPU\_LP64  
445.gobmk: -DSPEC\_CPU\_LP64  
456.hmmer: -DSPEC\_CPU\_LP64  
458.sjeng: -DSPEC\_CPU\_LP64  
462.libquantum: -DSPEC\_CPU\_LP64 -DSPEC\_CPU\_LINUX  
464.h264ref: -DSPEC\_CPU\_LP64  
483.xalancbmk: -DSPEC\_CPU\_LINUX



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## Peak Optimization Flags

C benchmarks:

400.perlbench: -Mpfi(pass 1) -Mpfo(pass 2) -Mipa=inline(pass 2) -fast  
-O4 -Mfp relaxed -Msmartalloc=huge:8 -Mnounroll -tp k8-64  
-Bstatic\_pgi

401.bzip2: -Mpfi(pass 1) -Mpfo(pass 2) -fast -O4  
-Msmartalloc=huge:64 -tp k8-64 -Bstatic\_pgi

403.gcc: -fastsse -Mfp relaxed -Msmartalloc=huge:32 -Mipa=fast  
-Mipa=inline -tp k8-32 -Bstatic\_pgi

429.mcf: -fastsse -Mipa=fast -Mipa=inline -Msmartalloc=huge:16  
-tp k8-32 -Bstatic\_pgi

445.gobmk: -Mpfi(pass 1) -Mpfo(pass 2) -Mipa=fast(pass 2) -fast -O4  
-Msmartalloc=huge:32 -Mfp relaxed -Mnovect -tp k8-64  
-Bstatic\_pgi

456.hmmer: -fast -Msmartalloc=huge:32 -Mfp relaxed -Msafeptr  
-Mipa=const -Mipa=ptr -Mipa=arg -tp k8-64 -Bstatic\_pgi

458.sjeng: -Mpfi(pass 1) -Mipa=fast(pass 2) -Mipa=inline(pass 2)  
-Mipa=noarg(pass 2) -Mpfo(pass 2) -fast  
-Msmartalloc=huge:32 -Mfp relaxed -tp k8-64 -Bstatic\_pgi

462.libquantum: basepeak = yes

464.h264ref: basepeak = yes

C++ benchmarks:

471.omnetpp: basepeak = yes

473.astar: basepeak = yes

483.xalancbmk: -fastsse -O4 -Mipa=fast -Mipa=inline -Mfp relaxed  
-Msmartalloc --zc\_eh -tp k8-32 -Bstatic\_pgi -lsmartheap

## Peak Other Flags

C benchmarks:

-w

C++ benchmarks:

-w -L/proj/qa/smartheap/SmartHeap\_8/lib



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The flags file that was used to format this result can be browsed at

[http://www.spec.org/cpu2006/flags/pgi710\\_flags.20090714.html](http://www.spec.org/cpu2006/flags/pgi710_flags.20090714.html)

You can also download the XML flags source by saving the following link:

[http://www.spec.org/cpu2006/flags/pgi710\\_flags.20090714.xml](http://www.spec.org/cpu2006/flags/pgi710_flags.20090714.xml)

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For other inquiries, please contact [webmaster@spec.org](mailto:webmaster@spec.org).

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