



# SPEC® CINT2006 Result

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## Dell Inc.

### SPECint®\_rate2006 = 273

### PowerEdge M905 (AMD Opteron 8393 SE, 3.10 GHz)

### SPECint\_rate\_base2006 = 228

CPU2006 license: 55

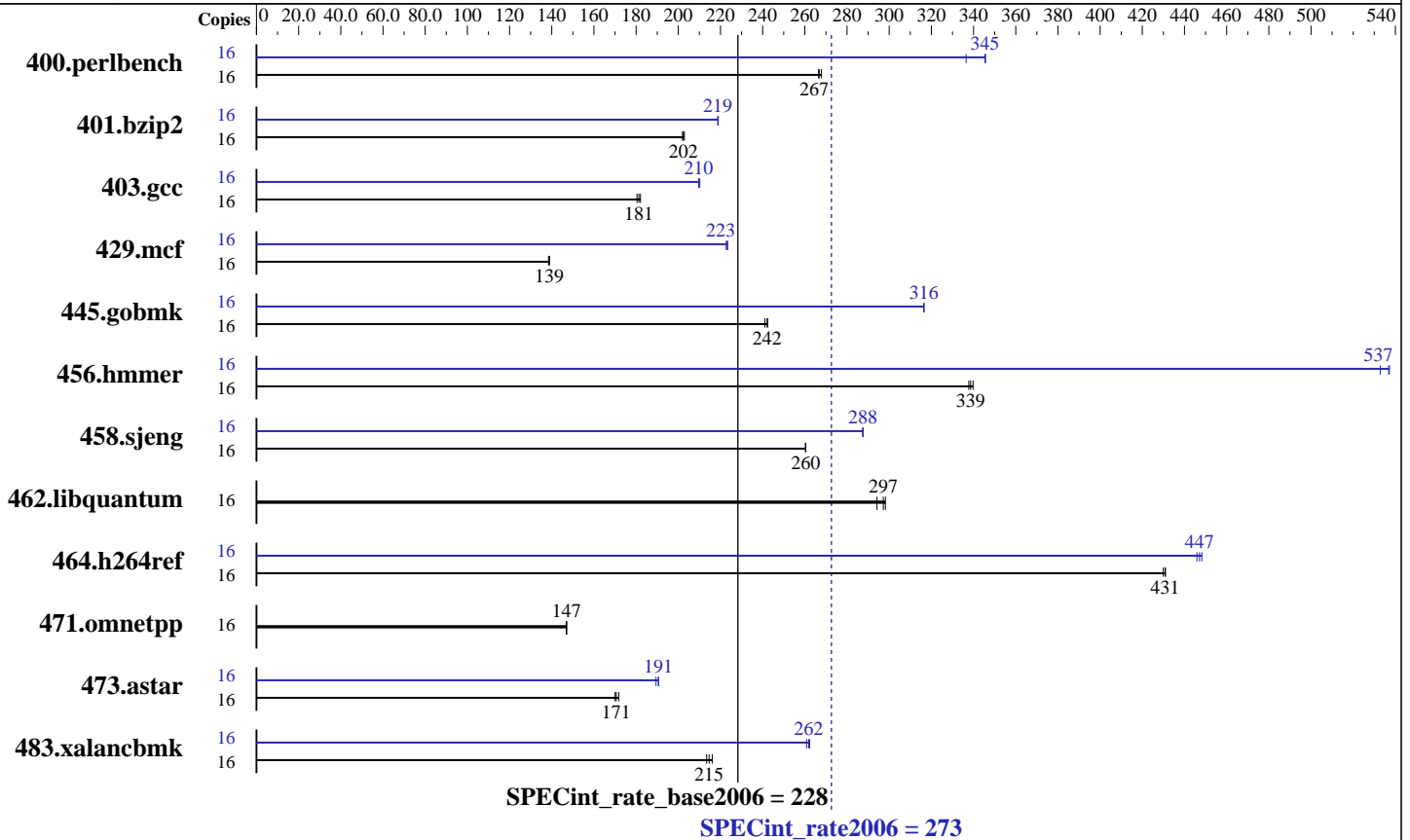
Test date: Apr-2009

Test sponsor: Dell Inc.

Hardware Availability: May-2009

Tested by: Dell Inc.

Software Availability: Oct-2008



#### Hardware

CPU Name: AMD Opteron 8393 SE  
 CPU Characteristics: 3100  
 CPU MHz: Integrated  
 FPU: 16 cores, 4 chips, 4 cores/chip  
 CPU(s) enabled: 4 chips  
 CPU(s) orderable: 64 KB I + 64 KB D on chip per core  
 Primary Cache: 512 KB I+D on chip per core  
 Secondary Cache: 6 MB I+D on chip per chip  
 L3 Cache: None  
 Other Cache: 64 GB (16 x 4 GB DDR2-800)  
 Memory: 1 x 73 GB 15000 RPM SAS  
 Disk Subsystem: None  
 Other Hardware:

#### Software

Operating System: Red Hat Enterprise Linux Server release 5.3, Kernel 2.6.18-128.el5  
 Compiler: PGI Server Complete Version 7.2 PathScale Compiler Suite Version 3.2  
 Auto Parallel: No  
 File System: ext3  
 System State: Run level 3 (multi-user)  
 Base Pointers: 32/64-bit  
 Peak Pointers: 32/64-bit  
 Other Software: binutils 2.18 32-bit and 64-bit libhugetlbfs libraries SmartHeap 8.1 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	16	586	267	<b>586</b>	<b>267</b>	584	268	16	452	346	465	336	<b>453</b>	<b>345</b>
401.bzip2	16	<b>763</b>	<b>202</b>	761	203	764	202	16	706	219	705	219	<b>706</b>	<b>219</b>
403.gcc	16	<b>710</b>	<b>181</b>	707	182	714	180	16	613	210	<b>614</b>	<b>210</b>	614	210
429.mcf	16	1050	139	1054	138	<b>1051</b>	<b>139</b>	16	655	223	<b>654</b>	<b>223</b>	653	223
445.gobmk	16	693	242	696	241	<b>693</b>	<b>242</b>	16	<b>530</b>	<b>316</b>	531	316	530	316
456.hammer	16	<b>441</b>	<b>339</b>	442	338	439	340	16	278	537	280	533	<b>278</b>	<b>537</b>
458.sjeng	16	<b>743</b>	<b>260</b>	743	260	744	260	16	<b>673</b>	<b>288</b>	673	288	673	287
462.libquantum	16	1112	298	<b>1115</b>	<b>297</b>	1127	294	16	1112	298	<b>1115</b>	<b>297</b>	1127	294
464.h264ref	16	824	430	822	431	<b>822</b>	<b>431</b>	16	790	448	<b>792</b>	<b>447</b>	794	446
471.omnetpp	16	681	147	680	147	<b>680</b>	<b>147</b>	16	681	147	680	147	<b>680</b>	<b>147</b>
473.astar	16	654	172	661	170	<b>658</b>	<b>171</b>	16	589	191	593	189	<b>589</b>	<b>191</b>
483.xalancbmk	16	517	213	511	216	<b>514</b>	<b>215</b>	16	423	261	421	262	<b>422</b>	<b>262</b>

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

## Submit Notes

The config file option 'submit' was used.  
'numactl' was used to bind copies to the cores

## Operating System Notes

The libhugetlbfs libraries were installed using the installation RPMs that came with the distribution.

'ulimit -s unlimited' was used to set environment stack size  
'ulimit -l 2097152' was used to set environment locked pages in memory limit

Set vm/nr\_hugepages=14336 in /etc/sysctl.conf  
mount -t hugetlbfs nodev /mnt/hugepages

## General Notes

Environment variables set by runspec before the start of the run:  
HUGETLB\_MORECORE = "yes"  
LD\_LIBRARY\_PATH = "/root/cpu2006-1.1/amd909gh-libs/64:/root/cpu2006-1.1/amd909gh-libs/32"



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## 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  
 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:

-Mvect=cachesize:6291456 -fastsse -Msmartalloc=huge -Mfprelaxed  
-Mipa=fast -Mipa=inline -tp barcelona-64 -Bstatic\_pgi

C++ benchmarks:

-Mvect=cachesize:6291456 -fastsse -Msmartalloc=huge -Mfprelaxed  
--zc\_eh -Mipa=fast -Mipa=inline:10 -tp barcelona-32 -Bstatic\_pgi

## Base Other Flags

C benchmarks:

-Mipa=jobs:4

C++ benchmarks:

-Mipa=jobs:4

## Peak Compiler Invocation

C benchmarks (except as noted below):

pathcc

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## Peak Compiler Invocation (Continued)

456.hmmcr: pgcc

462.libquantum: pgcc

C++ benchmarks (except as noted below):

pgcpp

483.xalancbmk: pathCC

## Peak Portability Flags

400.perlbench: -DSPEC\_CPU\_LP64 -DSPEC\_CPU\_LINUX\_X64  
 401.bzip2: -DSPEC\_CPU\_LP64  
 445.gobmk: -DSPEC\_CPU\_LP64  
 456.hmmcr: -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

## Peak Optimization Flags

C benchmarks:

400.perlbench: -march=barcelona -fb\_create fbdata(pass 1)  
 -fb\_opt fbdata(pass 2)  
 -Wl,-T/usr/share/libhugetlbfs/ldscripts/elf\_x86\_64.xBDT(pass 2)  
 -L/usr/lib64 -lhugetlbfs(pass 2) -Ofast -IPA:plimit=20000  
 -IPA:field\_reorder=on -LNO:opt=0 -WOPT:if\_conv=0  
 -CG:local\_sched\_alg=1

401.bzip2: -march=barcelona -O3 -OPT:alias=disjoint -OPT:Ofast  
 -OPT:goto=off -INLINE:aggressive=on -CG:local\_sched\_alg=1  
 -m3dnow  
 -Wl,-T/usr/share/libhugetlbfs/ldscripts/elf\_x86\_64.xBDT  
 -L/usr/lib64 -lhugetlbfs

403.gcc: -march=barcelona -fb\_create fbdata(pass 1)  
 -fb\_opt fbdata(pass 2) -Ofast -OPT:malloc\_alg=1  
 -LNO:trip\_count=256 -LNO:prefetch\_ahead=10  
 -CG:prefer\_lru\_reg=off -m32

429.mcf: -march=barcelona -O3 -ipa -INLINE:aggressive=on  
 -CG:gcm=off -GRA:prioritize\_by\_density=on -m32  
 -L/usr/lib -lhugetlbfs

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## Peak Optimization Flags (Continued)

445.gobmk: -march=barcelona -fb\_create fbdata(pass 1)  
 -fb\_opt fbdata(pass 2)  
 -Wl,-T/usr/share/libhugetlbfs/ldscripts/elf\_x86\_64.xBDT(pass 2)  
 -L/usr/lib64 -lhugetlbfs(pass 2) -O3 -OPT:alias=restrict  
 -LNO:prefetch=1 -LNO:ignore\_feedback=off -CG:p2align=on

456.hmmer: -Mvect=cachesize:6291456 -fastsse -Mvect=partial  
 -Munroll=n:8 -Msmartalloc=huge -Msafeptr -Mprefetch=t0  
 -Mfprelaxed -Mipa=const -Mipa=ptr -Mipa=arg -Mipa=inline  
 -tp barcelona-64 -Bstatic\_pgi

458.sjeng: -march=barcelona -fb\_create fbdata(pass 1)  
 -fb\_opt fbdata(pass 2)  
 -Wl,-T/usr/share/libhugetlbfs/ldscripts/elf\_x86\_64.xBDT(pass 2)  
 -L/usr/lib64 -lhugetlbfs(pass 2) -O3 -ipa  
 -LNO:ignore\_feedback=off -LNO:full\_unroll=10 -LNO:fusion=0  
 -LNO:fission=2 -IPA:pu\_reorder=2 -CG:ptr\_load\_use=0  
 -OPT:unroll\_times\_max=8 -INLINE:aggressive=on

462.libquantum: basepeak = yes

464.h264ref: -march=barcelona -fb\_create fbdata(pass 1)  
 -fb\_opt fbdata(pass 2)  
 -Wl,-T/usr/share/libhugetlbfs/ldscripts/elf\_x86\_64.xBDT(pass 2)  
 -L/usr/lib64 -lhugetlbfs(pass 2) -O3 -IPA:plimit=20000  
 -OPT:alias=disjoint -LNO:prefetch=0 -CG:ptr\_load\_use=0  
 -CG:push\_pop\_int\_saved\_regs=off -CG:prefer\_lru\_reg=off

C++ benchmarks:

471.omnetpp: basepeak = yes

473.astar: -Mpfi(pass 1) -Mpfo(pass 2) -Mipa=fast(pass 2)  
 -Mipa=inline:6(pass 2) -Mvect=cachesize:6291456 -fastsse  
 -O4 -Msmartalloc=huge -Msafeptr=global -Mfprelaxed  
 --zc\_eh -tp barcelona-32 -Bstatic\_pgi

483.xalancbmk: -march=barcelona -Ofast -INLINE:aggressive=on -m32  
 -L/root/work/libraries/SmartHeap\_8.1/lib -lsmartheap

## Peak Other Flags

C benchmarks:

456.hmmer: -Mipa=jobs:4

462.libquantum: -Mipa=jobs:4

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## Peak Other Flags (Continued)

C++ benchmarks (except as noted below):  
-Mipa=jobs:4(pass 2)

483.xalancbmk: No flags used

The flags files that were used to format this result can be browsed at

[http://www.spec.org/cpu2006/flags/pgi72\\_linux\\_flags.20090710.html](http://www.spec.org/cpu2006/flags/pgi72_linux_flags.20090710.html)  
<http://www.spec.org/cpu2006/flags/pathscale32-flags.html>  
<http://www.spec.org/cpu2006/flags/amd-platform-amd909gh.html>

You can also download the XML flags sources by saving the following links:

[http://www.spec.org/cpu2006/flags/pgi72\\_linux\\_flags.20090710.xml](http://www.spec.org/cpu2006/flags/pgi72_linux_flags.20090710.xml)  
<http://www.spec.org/cpu2006/flags/pathscale32-flags.xml>  
<http://www.spec.org/cpu2006/flags/amd-platform-amd909gh.xml>

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

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