



# SPEC® CINT2006 Result

Copyright 2006-2014 Standard Performance Evaluation Corporation

Dell Inc.

SPECint®2006 = 21.0

PowerEdge M905 (AMD Opteron 8389, 2.90 GHz)

SPECint\_base2006 = 17.3

CPU2006 license: 55

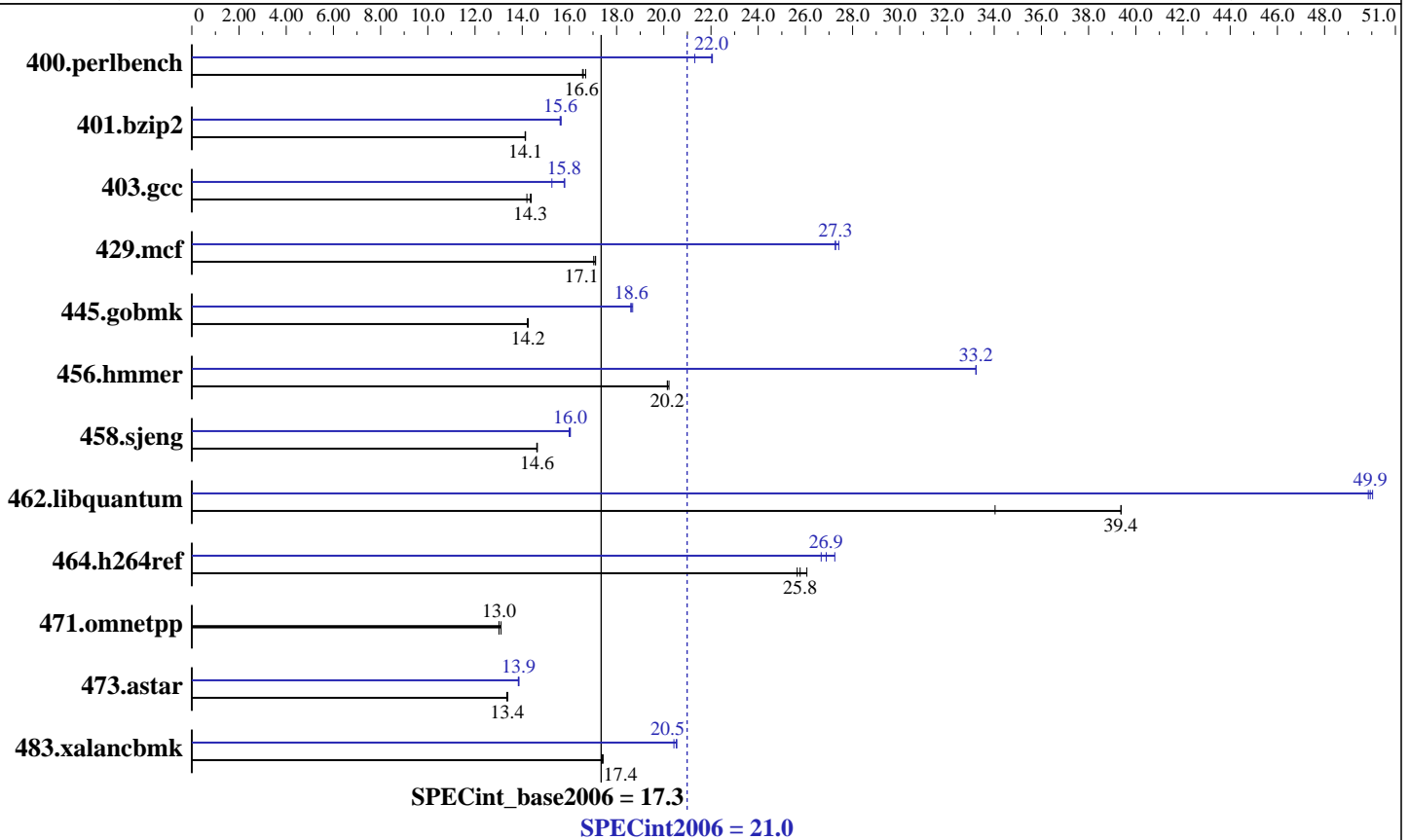
Test date: May-2009

Test sponsor: Dell Inc.

Hardware Availability: May-2009

Tested by: Dell Inc.

Software Availability: Jun-2008



### Hardware

CPU Name: AMD Opteron 8389  
 CPU Characteristics:  
 CPU MHz: 2900  
 FPU: Integrated  
 CPU(s) enabled: 16 cores, 4 chips, 4 cores/chip  
 CPU(s) orderable: 4 chips  
 Primary Cache: 64 KB I + 64 KB D on chip per core  
 Secondary Cache: 512 KB I+D on chip per core  
 L3 Cache: 6 MB I+D on chip per chip  
 Other Cache: None  
 Memory: 64 GB (16 x 4 GB DDR2-800)  
 Disk Subsystem: 1 x 73 GB 15000 RPM SAS  
 Other Hardware: None

### 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					
	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
400.perlbench	<b>589</b>	<b>16.6</b>	590	16.6	585	16.7	458	21.3	<b>444</b>	<b>22.0</b>	443	22.1
401.bzip2	682	14.1	683	14.1	<b>683</b>	<b>14.1</b>	618	15.6	<b>618</b>	<b>15.6</b>	617	15.6
403.gcc	<b>561</b>	<b>14.3</b>	567	14.2	560	14.4	528	15.3	509	15.8	<b>510</b>	<b>15.8</b>
429.mcf	533	17.1	536	17.0	<b>534</b>	<b>17.1</b>	334	27.3	<b>334</b>	<b>27.3</b>	333	27.4
445.gobmk	<b>736</b>	<b>14.2</b>	736	14.3	738	14.2	<b>563</b>	<b>18.6</b>	562	18.7	564	18.6
456.hammer	<b>463</b>	<b>20.2</b>	461	20.2	463	20.1	281	33.2	281	33.2	<b>281</b>	<b>33.2</b>
458.sjeng	828	14.6	<b>827</b>	<b>14.6</b>	826	14.6	754	16.0	757	16.0	<b>755</b>	<b>16.0</b>
462.libquantum	<b>526</b>	<b>39.4</b>	609	34.0	526	39.4	<b>415</b>	<b>49.9</b>	416	49.9	414	50.0
464.h264ref	863	25.7	849	26.1	<b>859</b>	<b>25.8</b>	812	27.2	<b>823</b>	<b>26.9</b>	830	26.7
471.omnetpp	480	13.0	<b>480</b>	<b>13.0</b>	477	13.1	480	13.0	<b>480</b>	<b>13.0</b>	477	13.1
473.astar	<b>525</b>	<b>13.4</b>	526	13.3	524	13.4	<b>507</b>	<b>13.9</b>	507	13.9	507	13.8
483.xalancbmk	396	17.4	<b>396</b>	<b>17.4</b>	397	17.4	336	20.6	338	20.4	<b>336</b>	<b>20.5</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

## Platform Notes

HyperTransport Technology = HT 1 (Default = HT 3)

## 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.hmmcr: -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: -Mvect=cachesize:6291456 -fastsse -Munroll=m:8  
 -Msmartalloc=huge -Mprefetch=distance:4 -Mfprelaxed  
 -Mipa=fast -Mipa=inline -Mipa=noarg -tp barcelona-64  
 -Bstatic\_pgi

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 -lsmarheap

## Peak Other Flags

C benchmarks:

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## Peak Other Flags (Continued)

456.hmmer: -Mipa=jobs:4

462.libquantum: -Mipa=jobs:4

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.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.xml>

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

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