



SPEC® CINT2006 Result

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Dell Inc.

SPECint®_rate2006 = 375

PowerEdge R815 (AMD Opteron 6172, 2.10 GHz)

SPECint_rate_base2006 = 297

CPU2006 license: 55

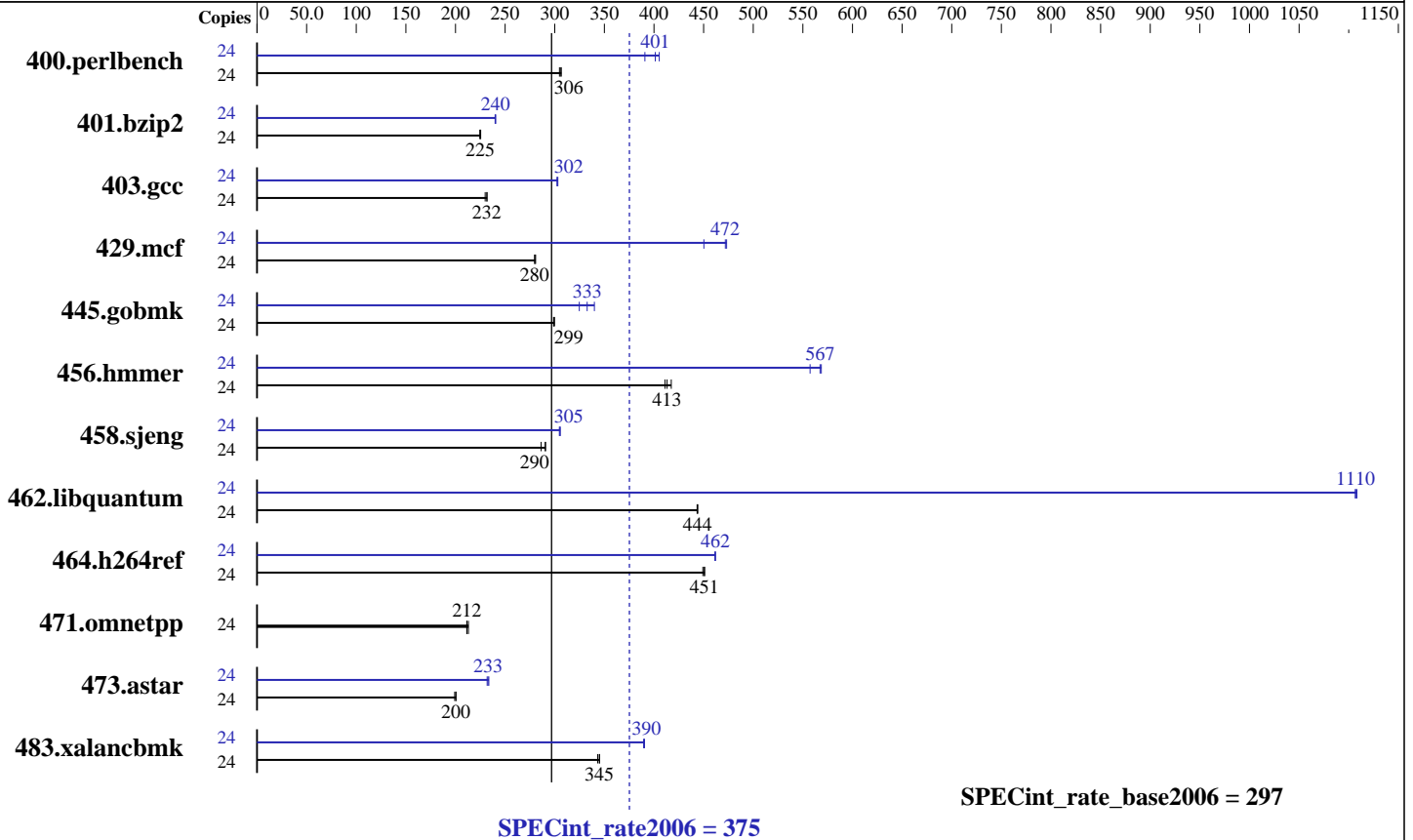
Test date: Apr-2010

Test sponsor: Dell Inc.

Hardware Availability: Mar-2010

Tested by: Dell Inc.

Software Availability: Feb-2010



Hardware

CPU Name: AMD Opteron 6172
 CPU Characteristics:
 CPU MHz: 2100
 FPU: Integrated
 CPU(s) enabled: 24 cores, 2 chips, 12 cores/chip
 CPU(s) orderable: 2,4 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: 12 MB I+D on chip per chip, 6 MB shared / 6 cores
 Other Cache: None
 Memory: 64 GB (16 x 4 GB DDR3-1333 DR RDIMM, CL9, ECC)
 Disk Subsystem: 1 x 148 GB 10000 RPM SAS
 Other Hardware: None

Software

Operating System: SUSE Linux Enterprise Server 11 (x86_64), Kernel 2.6.27.19-5-smp
 Compiler: x86 Open64 4.2.3 Compiler Suite (from AMD)
 Auto Parallel: No
 File System: ext3
 System State: Run level 3 (Full multiuser with network)
 Base Pointers: 32/64-bit
 Peak Pointers: 32/64-bit
 Other Software: 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 | 24 | <u>767</u> | <u>306</u> | 769 | 305 | 765 | 307 | 24 | 600 | 391 | <u>584</u> | <u>401</u> | 579 | 405 |
| 401.bzip2 | 24 | 1028 | 225 | 1032 | 225 | <u>1030</u> | <u>225</u> | 24 | 965 | 240 | 963 | 240 | <u>964</u> | <u>240</u> |
| 403.gcc | 24 | <u>835</u> | <u>232</u> | 840 | 230 | 833 | 232 | 24 | 639 | 302 | <u>639</u> | <u>302</u> | 637 | 303 |
| 429.mcf | 24 | 780 | 281 | <u>782</u> | <u>280</u> | 782 | 280 | 24 | 463 | 473 | <u>464</u> | <u>472</u> | 486 | 450 |
| 445.gobmk | 24 | <u>842</u> | <u>299</u> | 842 | 299 | 840 | 300 | 24 | 775 | 325 | 741 | 340 | <u>757</u> | <u>333</u> |
| 456.hammer | 24 | <u>542</u> | <u>413</u> | 536 | 417 | 545 | 411 | 24 | 394 | 569 | 402 | 557 | <u>395</u> | <u>567</u> |
| 458.sjeng | 24 | 999 | 291 | <u>1000</u> | <u>290</u> | 1015 | 286 | 24 | <u>951</u> | <u>305</u> | 953 | 305 | 951 | 305 |
| 462.libquantum | 24 | <u>1120</u> | <u>444</u> | 1120 | 444 | 1121 | 443 | 24 | <u>449</u> | <u>1110</u> | 449 | 1110 | 449 | 1110 |
| 464.h264ref | 24 | <u>1179</u> | <u>451</u> | 1177 | 451 | 1182 | 449 | 24 | <u>1150</u> | <u>462</u> | 1150 | 462 | 1151 | 461 |
| 471.omnetpp | 24 | <u>709</u> | <u>212</u> | 704 | 213 | 710 | 211 | 24 | <u>709</u> | <u>212</u> | 704 | 213 | 710 | 211 |
| 473.astar | 24 | 846 | 199 | <u>841</u> | <u>200</u> | 841 | 200 | 24 | <u>724</u> | <u>233</u> | 727 | 232 | 721 | 234 |
| 483.xalancbmk | 24 | 480 | 345 | <u>480</u> | <u>345</u> | 482 | 343 | 24 | 425 | 390 | <u>425</u> | <u>390</u> | 424 | 390 |

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.
See the configuration file for details.

Operating System Notes

'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=10800 in /etc/sysctl.conf
mount -t hugetlbfs nodev /mnt/hugepages

General Notes

Environment variables set by runspec before the start of the run:

HUGETLB_LIMIT = "450"

LD_LIBRARY_PATH = "/root/cpu2006-1.1/amd1002mc-rate-revA-libs/64:/root/cpu2006-1.1/amd1002mc-rate-revA-libs/32"

The x86 Open64 Compiler Suite is only available from (and supported by) AMD at
<http://developer.amd.com/cpu/open64>

Binaries were compiled on SLES10 SP2 with binutils 2.18



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Base Compiler Invocation

C benchmarks:
opencc

C++ benchmarks:
openCC

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:
-march=barcelona -mso -Ofast -CG:local_sched_alg=1 -HP:bdt=2m:heap=2m

C++ benchmarks:
-march=barcelona -mso -Ofast -m32 -INLINE:aggressive=on
-CG:cmp_peep=on -L/root/work/libraries/SmartHeap-8.1/lib -lsmarheap

Peak Compiler Invocation

C benchmarks:
opencc

C++ benchmarks:
openCC

Peak Portability Flags

400.perlbench: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX_X64
401.bzip2: -DSPEC_CPU_LP64
445.gobmk: -DSPEC_CPU_LP64

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Peak Portability Flags (Continued)

456.hmmr: -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 -mso -fb_create fbdata(pass 1)
 -fb_opt fbdata(pass 2) -Ofast -IPA:plimit=20000 -LNO:opt=0
 -OPT:unroll_times_max=8 -OPT:unroll_size=256
 -OPT:unroll_level=2 -OPT:keep_ext=on -WOPT:if_conv=0
 -CG:local_sched_alg=1 -CG:unroll_fb_req=on
 -HP:bdt=2m:heap=2m

401.bzip2: -march=barcelona -mso -fb_create fbdata(pass 1)
 -fb_opt fbdata(pass 2) -O3 -OPT:alias=disjoint
 -OPT:goto=off -CG:local_sched_alg=1 -HP:bdt=2m:heap=2m

403.gcc: -march=barcelona -mso -fb_create fbdata(pass 1)
 -fb_opt fbdata(pass 2) -Ofast -LNO:trip_count=256
 -LNO:prefetch_ahead=10 -CG:cmp_peep=on -m32
 -HP:bdt=2m:heap=2m -GRA:unspill=on -IPA:small_pu=200

429.mcf: -march=barcelona -mso -O3 -ipa -INLINE:aggressive=on
 -CG:gcm=off -GRA:prioritize_by_density=on -m32
 -HP:bdt=2m:heap=2m

445.gobmk: -march=barcelona -mso -fb_create fbdata(pass 1)
 -fb_opt fbdata(pass 2) -O3 -OPT:alias=restrict
 -OPT:unroll_times_max=8 -OPT:unroll_size=256
 -OPT:unroll_level=2 -OPT:keep_ext=on -ipa -IPA:plimit=750
 -IPA:min_hotness=300 -IPA:pu_reorder=1 -LNO:prefetch=1
 -LNO:ignore_feedback=off -CG:p2align=on
 -CG:unroll_fb_req=on -HP:bdt=2m:heap=2m

456.hmmr: -march=barcelona -mso -fb_create fbdata(pass 1)
 -fb_opt fbdata(pass 2) -Ofast -LNO:prefetch=0
 -OPT:alias=disjoint -OPT:unroll_times_max=8
 -OPT:unroll_size=256 -OPT:unroll_level=2 -OPT:keep_ext=on
 -CG:local_sched_alg=1 -CG:cflow=0
 -CG:push_pop_int_saved_regs=off -CG:cmp_peep=on
 -HP:bdt=2m:heap=2m

458.sjeng: -march=barcelona -mso -fb_create fbdata(pass 1)
 -fb_opt fbdata(pass 2) -O3 -ipa -LNO:ignore_feedback=off
 -LNO:full_unroll=10 -LNO:fusion=0 -LNO:fission=2

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Peak Optimization Flags (Continued)

458.sjeng (continued):

-IPA:pu_reorder=2 -CG:ptr_load_use=0
-OPT:unroll_times_max=8 -INLINE:aggressive=on

462.libquantum:

-march=barcelona -mso -Ofast -LNO:pf2=0 -CG:gcm=off
-CG:use_prefetchnta=on -CG:cmp_peep=on -WOPT:aggstr=0
-HP:bdt=2m:heap=2m -OPT:alias=disjoint
-INLINE:aggressive=on -IPA:space=1000 -IPA:plimit=20000

464.h264ref:

-march=barcelona -mso -fb_create fbdata(pass 1)
-fb_opt fbdata(pass 2) -O3 -IPA:plimit=20000
-OPT:alias=disjoint -LNO:prefetch=0 -CG:ptr_load_use=0
-CG:push_pop_int_saved_regs=off

C++ benchmarks:

471.omnetpp: basepeak = yes

473.astar:

-march=barcelona -mso -fb_create fbdata(pass 1)
-fb_opt fbdata(pass 2) -Ofast -TENV:frame_pointer=off
-WOPT:if_conv=0 -GRA:optimize_boundary=on
-OPT:alias=disjoint -INLINE:aggressive=on
-IPA:small_pu=3000 -IPA:plimit=3000 -m32
-HP:bdt=2m:heap=2m

483.xalancbmk:

-march=barcelona -mso -Ofast -INLINE:aggressive=on -m32
-CG:cmp_peep=on -GRA:unspill=on -TENV:frame_pointer=off
-fno-emit-exceptions
-L/root/work/libraries/SmartHeap-8.1/lib -lsmartheap

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

<http://www.spec.org/cpu2006/flags/x86-open64-4.2.3-flags-revA.html>

<http://www.spec.org/cpu2006/flags/amd-platform-revA.html>

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

<http://www.spec.org/cpu2006/flags/x86-open64-4.2.3-flags-revA.xml>

<http://www.spec.org/cpu2006/flags/amd-platform-revA.xml>

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For questions about this result, please contact the tester.
For other inquiries, please contact webmaster@spec.org.

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<http://www.spec.org/>