



SPEC[®] CFP2006 Result

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Dell Inc.

SPECfp[®]_rate2006 = 269

PowerEdge R715 (AMD Opteron 6164 HE, 1.70 GHz)

SPECfp_rate_base2006 = 247

CPU2006 license: 55

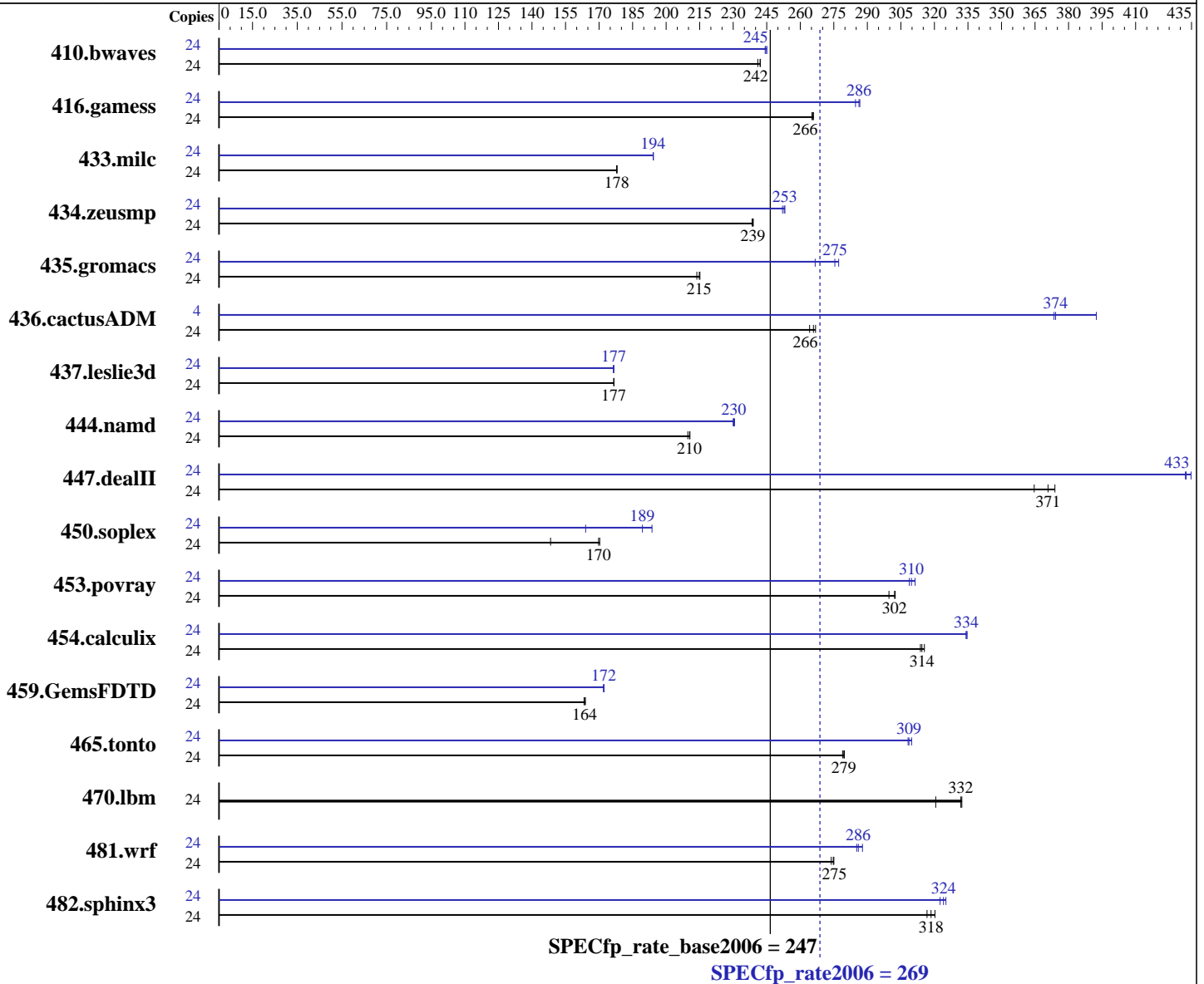
Test sponsor: Dell Inc.

Tested by: Dell Inc.

Test date: Jun-2010

Hardware Availability: May-2010

Software Availability: Feb-2010



Hardware

CPU Name: AMD Opteron 6164 HE
 CPU Characteristics:
 CPU MHz: 1700
 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

Continued on next page

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: Yes
 File System: ext3
 System State: Run level 3 (Full multiuser with network)
 Base Pointers: 64-bit
 Peak Pointers: 32/64-bit
 Other Software: None



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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

Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	24	1353	241	1347	242	<u>1348</u>	<u>242</u>	24	1335	244	<u>1334</u>	<u>245</u>	1331	245
416.gamess	24	1767	266	1772	265	<u>1769</u>	<u>266</u>	24	<u>1642</u>	<u>286</u>	1651	285	1639	287
433.milc	24	1238	178	<u>1238</u>	<u>178</u>	1239	178	24	1134	194	<u>1134</u>	<u>194</u>	1134	194
434.zeusmp	24	914	239	916	238	<u>914</u>	<u>239</u>	24	863	253	<u>864</u>	<u>253</u>	866	252
435.gromacs	24	<u>798</u>	<u>215</u>	797	215	802	214	24	<u>622</u>	<u>275</u>	618	277	643	267
436.cactusADM	24	1075	267	<u>1079</u>	<u>266</u>	1086	264	4	<u>128</u>	<u>374</u>	122	392	128	374
437.leslie3d	24	<u>1277</u>	<u>177</u>	1278	177	1277	177	24	<u>1278</u>	<u>177</u>	1279	176	1278	177
444.namd	24	918	210	<u>915</u>	<u>210</u>	914	211	24	837	230	<u>836</u>	<u>230</u>	835	231
447.dealII	24	753	365	<u>740</u>	<u>371</u>	734	374	24	635	432	631	435	<u>635</u>	<u>433</u>
450.soplex	24	1350	148	<u>1179</u>	<u>170</u>	1175	170	24	1221	164	<u>1057</u>	<u>189</u>	1033	194
453.povray	24	426	300	<u>423</u>	<u>302</u>	422	302	24	<u>412</u>	<u>310</u>	414	309	410	311
454.calculix	24	628	316	631	314	<u>630</u>	<u>314</u>	24	592	335	<u>592</u>	<u>334</u>	593	334
459.GemsFDTD	24	1554	164	1559	163	<u>1557</u>	<u>164</u>	24	1481	172	<u>1480</u>	<u>172</u>	1478	172
465.tonto	24	<u>845</u>	<u>279</u>	844	280	847	279	24	766	308	762	310	<u>765</u>	<u>309</u>
470.lbm	24	1029	321	992	332	<u>994</u>	<u>332</u>	24	1029	321	992	332	<u>994</u>	<u>332</u>
481.wrf	24	979	274	975	275	<u>976</u>	<u>275</u>	24	931	288	940	285	<u>937</u>	<u>286</u>
482.sphinx3	24	1477	317	1461	320	<u>1469</u>	<u>318</u>	24	1450	323	1439	325	<u>1443</u>	<u>324</u>

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



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General Notes

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

HUGETLB_LIMIT = "450"

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

OMP_NUM_THREADS = "6"

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

Base Compiler Invocation

C benchmarks:

opencc

C++ benchmarks:

openCC

Fortran benchmarks:

openf95

Benchmarks using both Fortran and C:

opencc openf95

Base Portability Flags

410.bwaves: -DSPEC_CPU_LP64
 416.gamess: -DSPEC_CPU_LP64
 433.milc: -DSPEC_CPU_LP64
 434.zeusmp: -DSPEC_CPU_LP64
 435.gromacs: -DSPEC_CPU_LP64
 436.cactusADM: -DSPEC_CPU_LP64 -fno-second-underscore
 437.leslie3d: -DSPEC_CPU_LP64
 444.namd: -DSPEC_CPU_LP64
 447.dealII: -DSPEC_CPU_LP64
 450.soplex: -DSPEC_CPU_LP64
 453.povray: -DSPEC_CPU_LP64
 454.calculix: -DSPEC_CPU_LP64
 459.GemsFDTD: -DSPEC_CPU_LP64
 465.tonto: -DSPEC_CPU_LP64
 470.lbm: -DSPEC_CPU_LP64
 481.wrf: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX -DSPEC_CPU_CASE_FLAG
 -fno-second-underscore
 482.sphinx3: -DSPEC_CPU_LP64



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Base Optimization Flags

C benchmarks:

-march=barcelona -mso -Ofast -OPT:malloc_alg=1 -HP:bdt=2m

C++ benchmarks:

-march=barcelona -mso -Ofast -static -INLINE:aggressive=on
-OPT:malloc_alg=1 -HP:bdt=2m

Fortran benchmarks:

-march=barcelona -mso -Ofast -HP

Benchmarks using both Fortran and C:

-march=barcelona -mso -Ofast -OPT:malloc_alg=1 -HP:bdt=2m -HP

Peak Compiler Invocation

C benchmarks:

opencc

C++ benchmarks:

openCC

Fortran benchmarks:

openf95

Benchmarks using both Fortran and C:

opencc openf95

Peak Portability Flags

410.bwaves: -DSPEC_CPU_LP64
416.gamess: -DSPEC_CPU_LP64
433.milc: -DSPEC_CPU_LP64
434.zeusmp: -DSPEC_CPU_LP64
435.gromacs: -DSPEC_CPU_LP64
436.cactusADM: -DSPEC_CPU_LP64 -fno-second-underscore
437.leslie3d: -DSPEC_CPU_LP64
444.namd: -DSPEC_CPU_LP64
453.povray: -DSPEC_CPU_LP64
454.calculix: -DSPEC_CPU_LP64
459.GemsFDTD: -DSPEC_CPU_LP64
465.tonto: -DSPEC_CPU_LP64
470.lbm: -DSPEC_CPU_LP64
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Peak Optimization Flags

C benchmarks:

433.milc: -march=barcelona -mso -Ofast -CG:movnti=1
-CG:local_sched_alg=1 -CG:locs_shallow_depth=1
-HP:bdt=2m:heap=2m -LNO:prefetch=3

470.lbm: basepeak = yes

482.sphinx3: -march=barcelona -mso -fb_create fbdata(pass 1)
-fb_opt fbdata(pass 2) -Ofast -OPT:malloc_alg=2
-CG:sse_cse_regs=0 -CG:locs_shallow_depth=1 -CG:cmp_peep=on
-CG:local_sched_alg=1 -INLINE:aggressive=on

C++ benchmarks:

444.namd: -march=barcelona -mso -fb_create fbdata(pass 1)
-fb_opt fbdata(pass 2) -Ofast -LNO:ignore_feedback=off
-CG:local_sched_alg=2 -CG:load_exe=0 -CG:compute_to=on
-OPT:unroll_size=256 -fno-exceptions -HP:bdt=2m:heap=2m

447.deallI: -march=barcelona -mso -Ofast -static -INLINE:aggressive=on
-LNO:opt=0 -fno-emit-exceptions -m32
-OPT:unroll_times_max=8 -OPT:unroll_size=256
-OPT:unroll_level=2 -HP:bdt=2m:heap=2m -GRA:unspill=on
-CG:cmp_peep=on -TENV:frame_pointer=off

450.soplex: -march=barcelona -mso -fb_create fbdata(pass 1)
-fb_opt fbdata(pass 2) -O3 -INLINE:aggressive=on
-OPT:IEEE_arith=3 -OPT:IEEE_NaN_Inf=off
-OPT:fold_unsigned_relops=on -OPT:malloc_alg=1
-CG:load_exe=0 -fno-exceptions -m32 -HP:bdt=2m

453.povray: -march=barcelona -mso -fb_create fbdata(pass 1)
-fb_opt fbdata(pass 2) -Ofast -INLINE:aggressive=on

Fortran benchmarks:

410.bwaves: -march=barcelona -mso -O3 -OPT:Ofast -OPT:treeheight=on
-LNO:blocking=off -LNO:prefetch_ahead=5
-LNO:ignore_feedback=off -WOPT:aggstr=0 -HP:bdt=2m:heap=2m
-CG:cmp_peep=on

416.gamess: -march=barcelona -mso -fb_create fbdata(pass 1)
-fb_opt fbdata(pass 2) -O3 -LNO:fu=6 -LNO:blocking=0
-LNO:prefetch=0 -OPT:Ofast -OPT:ro=3 -OPT:unroll_size=256
-HP:bdt=2m:heap=2m

434.zeusmp: -march=barcelona -mso -Ofast -LNO:blocking=off
-LNO:interchange=off -OPT:treeheight=on -OPT:unroll_size=256
-CG:cmp_peep=on -GRA:prioritize_by_density=on -HP

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Peak Optimization Flags (Continued)

437.leslie3d: -march=barcelona -mso -Ofast -HP:bdt=2m:heap=2m

459.GemsFDTD: -march=barcelona -mso -Ofast -LNO:fission=2
-LNO:prefetch_ahead=1 -CG:load_exe=0 -CG:local_sched_alg=1
-HP

465.tonto: -march=barcelona -mso -Ofast
-OPT:alias=no_f90_pointer_alias -LNO:blocking=off
-CG:load_exe=1 -IPA:plimit=525 -HP

Benchmarks using both Fortran and C:

435.gromacs: -march=barcelona -mso -Ofast -OPT:rsqrt=2
-HP:bdt=2m:heap=2m

436.cactusADM: -march=barcelona -mso -fb_create fbdata(pass 1)
-fb_opt fbdata(pass 2) -Ofast -apo -LNO:prefetch_ahead=1
-HP:bdt=2m:heap=2m -LANG:heap_allocation_threshold=100

454.calculix: -march=barcelona -mso -Ofast -CG:load_exe=0
-CG:ptr_load_use=0 -CG:local_sched_alg=2 -CG:compute_to=on
-LNO:prefetch_ahead=30 -WOPT:unroll=2
-GRA:optimize_boundary=on -HP:bdt=2m:heap=2m

481.wrf: -march=barcelona -mso -Ofast -LNO:blocking=off
-LNO:prefetch_ahead=10 -LANG:copyinout=off
-IPA:callee_limit=5000 -GRA:prioritize_by_density=on -m3dnow
-HP

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.20100721.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.20100721.xml>

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

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For other inquiries, please contact webmaster@spec.org.

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