



SPEC[®] CFP2006 Result

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Dell Inc.

SPECfp[®]_rate2006 = 139

PowerEdge R415 (AMD Opteron 4164 EE, 1.80 GHz)

SPECfp_rate_base2006 = 128

CPU2006 license: 55

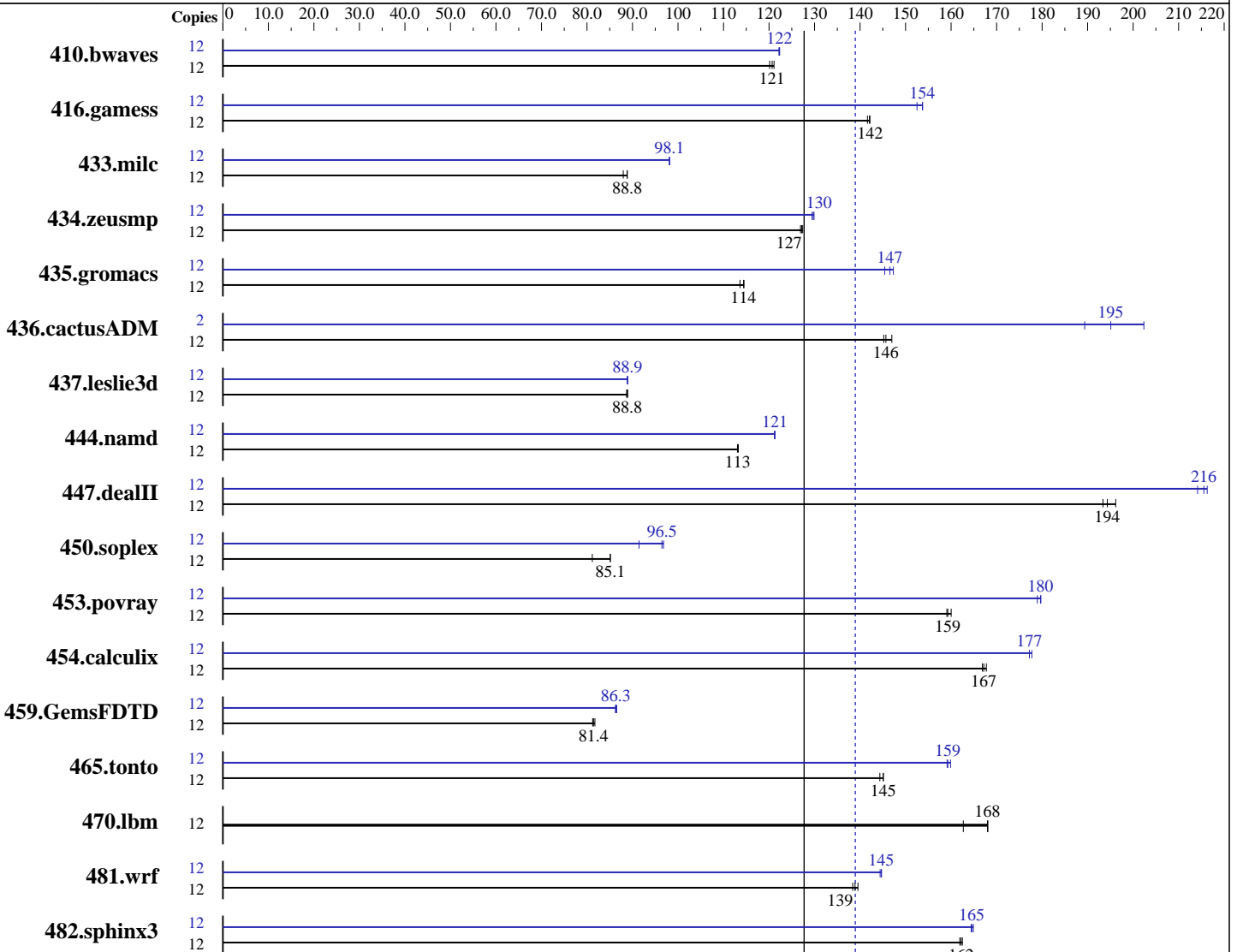
Test date: Jul-2010

Test sponsor: Dell Inc.

Hardware Availability: Jul-2010

Tested by: Dell Inc.

Software Availability: Jul-2010



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Hardware

CPU Name: AMD Opteron 4164 EE
 CPU Characteristics: 1800
 CPU MHz: Integrated
 FPU: 12 cores, 2 chips, 6 cores/chip
 CPU(s) enabled: 1,2 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:

Software

Operating System: SUSE Linux Enterprise Server 11 (x86_64)
 Kernel 2.6.27.19-5-default
 Compiler: x86 Open64 4.2.4 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: 6 MB I+D on chip per chip
 Other Cache: None
 Memory: 32 GB (8 x 4 GB 2Rx4 PC3-10600R-9, ECC)
 Disk Subsystem: 1 x 146 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	12	1347	121	1357	120	<u>1351</u>	<u>121</u>	12	1335	122	<u>1334</u>	<u>122</u>	1333	122
416.gamess	12	1653	142	1659	142	<u>1654</u>	<u>142</u>	12	1528	154	1541	153	<u>1529</u>	<u>154</u>
433.milc	12	1252	88.0	1240	88.9	<u>1240</u>	<u>88.8</u>	12	1122	98.2	1123	98.1	<u>1123</u>	<u>98.1</u>
434.zeusmp	12	857	127	<u>859</u>	<u>127</u>	860	127	12	843	129	<u>842</u>	<u>130</u>	841	130
435.gromacs	12	<u>749</u>	<u>114</u>	748	114	754	114	12	582	147	589	145	<u>585</u>	<u>147</u>
436.cactusADM	12	988	145	976	147	<u>984</u>	<u>146</u>	2	<u>123</u>	<u>195</u>	118	202	126	189
437.leslie3d	12	<u>1270</u>	<u>88.8</u>	1268	88.9	1272	88.7	12	1268	89.0	<u>1269</u>	<u>88.9</u>	1269	88.9
444.namd	12	851	113	<u>851</u>	<u>113</u>	850	113	12	794	121	<u>794</u>	<u>121</u>	793	121
447.dealII	12	<u>706</u>	<u>194</u>	700	196	710	193	12	641	214	635	216	<u>637</u>	<u>216</u>
450.soplex	12	1233	81.2	<u>1176</u>	<u>85.1</u>	1176	85.1	12	1094	91.4	<u>1037</u>	<u>96.5</u>	1034	96.8
453.povray	12	<u>401</u>	<u>159</u>	401	159	399	160	12	<u>355</u>	<u>180</u>	355	180	357	179
454.calculix	12	590	168	593	167	<u>592</u>	<u>167</u>	12	557	178	559	177	<u>559</u>	<u>177</u>
459.GemsFDTD	12	<u>1563</u>	<u>81.4</u>	1558	81.7	1567	81.2	12	1476	86.2	<u>1475</u>	<u>86.3</u>	1471	86.5
465.tonto	12	814	145	<u>814</u>	<u>145</u>	818	144	12	742	159	<u>741</u>	<u>159</u>	739	160
470.lbm	12	<u>981</u>	<u>168</u>	1013	163	981	168	12	<u>981</u>	<u>168</u>	1013	163	981	168
481.wrf	12	<u>965</u>	<u>139</u>	961	140	969	138	12	<u>927</u>	<u>145</u>	928	144	926	145
482.sphinx3	12	<u>1442</u>	<u>162</u>	1445	162	1439	162	12	1423	164	1418	165	<u>1421</u>	<u>165</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=5400 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/amd1002-rate-libs-revC/64:/cpu2006/amd1002-rate-libs-revC/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-open64-424-flags-rate-revC.20100901.html>
<http://www.spec.org/cpu2006/flags/amd-platform-rate-revC.html>

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

<http://www.spec.org/cpu2006/flags/x86-open64-424-flags-rate-revC.20100901.xml>
<http://www.spec.org/cpu2006/flags/amd-platform-rate-revC.xml>

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

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