



SPEC® CFP2006 Result

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Dell Inc.

SPECfp®_rate2006 = 162

PowerEdge R905 (AMD Opteron 8358 SE, 2.40 GHz)

SPECfp_rate_base2006 = 147

CPU2006 license: 55

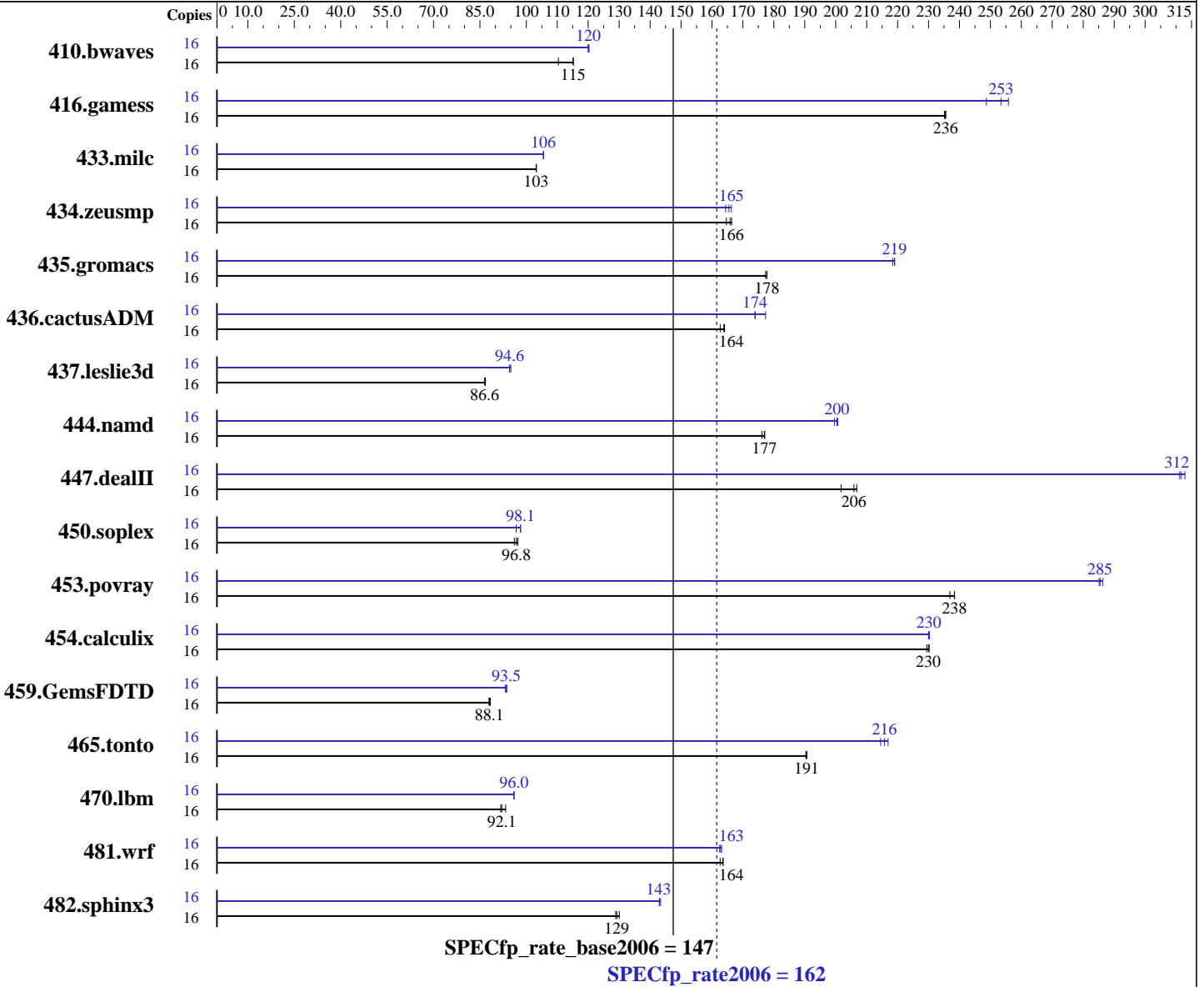
Test date: May-2008

Test sponsor: Dell Inc.

Hardware Availability: Jun-2008

Tested by: Dell Inc.

Software Availability: May-2008



Hardware

CPU Name: AMD Opteron 8358 SE
 CPU Characteristics:
 CPU MHz: 2400
 FPU: Integrated
 CPU(s) enabled: 16 cores, 4 chips, 4 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

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Software

Operating System: SuSE Linux Enterprise Server 10 (x86_64) SP1, Kernel 2.6.16.46-0.12-smp
 Compiler: PGI Server Complete Version 7.2 PathScale Compiler Suite Version 3.1
 Auto Parallel: No
 File System: ReiserFS
 System State: Run level 3 (multi-user)
 Base Pointers: 64-bit
 Peak Pointers: 32/64-bit

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L3 Cache: 2 MB I+D on chip per chip
Other Cache: None
Memory: 32 GB (8x4GB, DDR2-667, CL5, Reg, Dual Rank)
Disk Subsystem: 1 x 73 GB SAS, 10000 RPM
Other Hardware: None

Other Software: None

Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	16	1970	110	1888	115	<u>1888</u>	<u>115</u>	16	1808	120	1812	120	<u>1811</u>	<u>120</u>
416.gamess	16	1330	236	1332	235	<u>1330</u>	<u>236</u>	16	1225	256	<u>1236</u>	<u>253</u>	1260	249
433.milc	16	<u>1423</u>	<u>103</u>	1424	103	1423	103	16	<u>1391</u>	<u>106</u>	1391	106	1392	105
434.zeusmp	16	875	166	<u>878</u>	<u>166</u>	884	165	16	<u>880</u>	<u>165</u>	886	164	876	166
435.gromacs	16	644	177	<u>643</u>	<u>178</u>	643	178	16	523	218	<u>522</u>	<u>219</u>	521	219
436.cactusADM	16	1175	163	<u>1167</u>	<u>164</u>	1165	164	16	1078	177	<u>1099</u>	<u>174</u>	1099	174
437.leslie3d	16	<u>1737</u>	<u>86.6</u>	1733	86.8	1738	86.6	16	<u>1590</u>	<u>94.6</u>	1583	95.0	1590	94.6
444.namd	16	728	176	<u>725</u>	<u>177</u>	725	177	16	643	200	<u>640</u>	<u>200</u>	639	201
447.dealII	16	885	207	907	202	<u>889</u>	<u>206</u>	16	585	313	588	311	<u>587</u>	<u>312</u>
450.soplex	16	1388	96.1	1372	97.3	<u>1378</u>	<u>96.8</u>	16	1380	96.7	<u>1360</u>	<u>98.1</u>	1360	98.1
453.povray	16	359	237	357	238	<u>357</u>	<u>238</u>	16	<u>298</u>	<u>285</u>	299	285	297	286
454.calculix	16	573	230	575	229	<u>574</u>	<u>230</u>	16	573	230	574	230	<u>574</u>	<u>230</u>
459.GemsFDTD	16	1921	88.3	1931	87.9	<u>1927</u>	<u>88.1</u>	16	1812	93.7	<u>1815</u>	<u>93.5</u>	1822	93.2
465.tonto	16	826	191	<u>826</u>	<u>191</u>	827	190	16	<u>730</u>	<u>216</u>	734	215	726	217
470.lbm	16	2396	91.7	2355	93.3	<u>2388</u>	<u>92.1</u>	16	2290	96.0	<u>2290</u>	<u>96.0</u>	2290	96.0
481.wrf	16	1099	163	<u>1093</u>	<u>164</u>	1092	164	16	1100	162	1096	163	<u>1098</u>	<u>163</u>
482.sphinx3	16	<u>2413</u>	<u>129</u>	2420	129	2398	130	16	<u>2180</u>	<u>143</u>	2181	143	2174	143

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

Operating System Notes

'numactl' was used to bind copies to the cores
Environment variable PGI_HUGE_PAGES set to 150
'ulimit -s unlimited' was used to set environment stack size
'ulimit -l 4915200' was used to set environment locked pages in memory quantity
Set vm/nr_hugepages=2400 in /etc/sysctl.conf
mount -t hugetlbfs nodev /mnt/hugepages

Base Compiler Invocation

C benchmarks:
pgcc

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Base Compiler Invocation (Continued)

C++ benchmarks:

pgcpp

Fortran benchmarks:

pgf95

Benchmarks using both Fortran and C:

pgcc pgf95

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 -Mnomain
436.cactusADM: -DSPEC_CPU_LP64 -Mnomain
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 -Mnomain
459.GemsFDTD: -DSPEC_CPU_LP64
465.tonto: -DSPEC_CPU_LP64
470.lbm: -DSPEC_CPU_LP64
481.wrf: -DSPEC_CPU_LP64 -DSPEC_CPU_CASE_FLAG -DSPEC_CPU_LINUX
482.sphinx3: -DSPEC_CPU_LP64

Base Optimization Flags

C benchmarks:

-fast -Mipa=jobs:4 -Mipa=fast -Mipa=inline -Mfprelaxed
-Msmartalloc=huge:150 -tp barcelona-64 -Bstatic_pgi

C++ benchmarks:

-fast -Mipa=jobs:4 -Mipa=fast -Mipa=inline -Mfprelaxed
-Msmartalloc=huge:150 --zc_eh -tp barcelona-64 -Bstatic_pgi

Fortran benchmarks:

-fast -Mipa=jobs:4 -Mipa=fast -Mipa=inline -Mfprelaxed
-Msmartalloc=huge:150 -tp barcelona-64 -Bstatic_pgi

Benchmarks using both Fortran and C:

-fast -Mipa=jobs:4 -Mipa=fast -Mipa=inline -Mfprelaxed
-Msmartalloc=huge:150 -tp barcelona-64 -Bstatic_pgi



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Base Other Flags

C benchmarks:

-w

C++ benchmarks:

-w

Fortran benchmarks:

-w

Benchmarks using both Fortran and C:

-w

Peak Compiler Invocation

C benchmarks (except as noted below):

pathcc

433.milc: pgcc

C++ benchmarks (except as noted below):

pathCC

444.namd: pgcpp

Fortran benchmarks (except as noted below):

pathf95

410.bwaves: pgf95

434.zeusmp: pgf95

Benchmarks using both Fortran and C (except as noted below):

pgcc pgf95

436.cactusADM: pathcc pathf95

481.wrf: pathcc pathf95

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 -Mnomain

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Peak Portability Flags (Continued)

```

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 -Mnomain
459.GemsFDTD: -DSPEC_CPU_LP64
465.tonto: -DSPEC_CPU_LP64
470.lbm: -DSPEC_CPU_LP64
481.wrf: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX -fno-second-underscore
482.sphinx3: -DSPEC_CPU_LP64

```

Peak Optimization Flags

C benchmarks:

```

433.milc: -fastsse -Msmartalloc=huge:150 -Msafeptr -Mfprelaxed
-Mipa=jobs:4 -Mipa=inline -Mipa=arg -Mipa=const -Mipa=ptr
-Mipa=shape -tp barcelona-64 -Bstatic_pgi

```

```

470.lbm: -march=barcelona -Ofast -m3dnow

```

```

482.sphinx3: -march=barcelona -Ofast

```

C++ benchmarks:

```

444.namd: -Mphi(pass 1) -Mipa=jobs:4(pass 2) -Mipa=fast(pass 2)
-Mipa=inline(pass 2) -Mpfo(pass 2) -fast -Mfprelaxed
-Msmartalloc=huge:150 --zc_eh -Mnodepchk -Munroll=n:4
-Munroll=m:8 -tp barcelona-64 -Bstatic_pgi

```

```

447.deallI: -march=barcelona -Ofast -static -INLINE:aggressive=on
-OPT:malloc_alg=1 -m32 -fno-exceptions

```

```

450.soplex: -march=barcelona -fb_create fbdata(pass 1)
-fb_opt fbdata(pass 2) -m32 -O3 -TENV:frame_pointer=off
-LNO:prefetch=1

```

```

453.povray: -march=barcelona -fb_create fbdata(pass 1)
-fb_opt fbdata(pass 2) -Ofast -CG:load_exe=0

```

Fortran benchmarks:

```

410.bwaves: -Mphi(pass 1) -Mipa=jobs:4(pass 2) -Mipa=fast(pass 2)
-Mipa=inline(pass 2) -Mpfo(pass 2) -fastsse -Mfprelaxed
-Msmartalloc -Mprefetch=distance:12 -Mprefetch=nta
-tp barcelona-64 -Bstatic_pgi

```

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Peak Optimization Flags (Continued)

416.gamess: -march=barcelona -fb_create fbdata(pass 1)
-fb_opt fbdata(pass 2) -O2 -OPT:Ofast -OPT:ro=3
-OPT:unroll_size=256

434.zeusmp: -fastsse -Mfprelaxed -Msmartalloc=huge:150 -Mipa=jobs:4
-Mipa=fast -Mipa=inline -tp barcelona-64 -Bstatic_pgi

437.leslie3d: -march=barcelona -Ofast -m3dnow -OPT:unroll_size=256
-CG:load_exe=0 -OPT:malloc_alg=1

459.GemsFDTD: -march=barcelona -Ofast -LNO:fission=2 -LNO:simd=2
-OPT:malloc_alg=1

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

Benchmarks using both Fortran and C:

435.gromacs: -fast -Mfpapprox=rsqrt -Mipa=jobs:4 -Mipa=fast
-Mipa=inline -Mfprelaxed -Msmartalloc=huge:150
-tp barcelona-64 -Bstatic_pgi

436.cactusADM: -march=barcelona -fb_create fbdata(pass 1)
-fb_opt fbdata(pass 2) -Ofast -WOPT:aggstr=0

454.calculix: -fastsse -Mfprelaxed -Msmartalloc=huge:150 -Mipa=jobs:4
-Mipa=fast -Mipa=inline -tp barcelona-64 -Bstatic_pgi

481.wrf: -march=barcelona -Ofast -LNO:blocking=off
-LNO:prefetch_ahead=10 -OPT:malloc_alg=1 -m3dnow
-LANG:copyinout=off -IPA:callee_limit=5000

Peak Other Flags

C benchmarks:

433.milc: -w

C++ benchmarks:

444.namd: -w

Fortran benchmarks:

410.bwaves: -w

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Peak Other Flags (Continued)

434.zeusmp: -w

Benchmarks using both Fortran and C:

435.gromacs: -w

454.calculix: -w

The flags file that was used to format this result can be browsed at

<http://www.spec.org/cpu2006/flags/amd123GH-flags.20090713.02.html>

You can also download the XML flags source by saving the following link:

<http://www.spec.org/cpu2006/flags/amd123GH-flags.20090713.02.xml>

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