



SPEC[®] CFP2006 Result

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IBM Corporation

SPECfp[®]_rate2006 = 47.5

IBM System x3655 (AMD Opteron 2220)

SPECfp_rate_base2006 = 45.0

CPU2006 license: 11

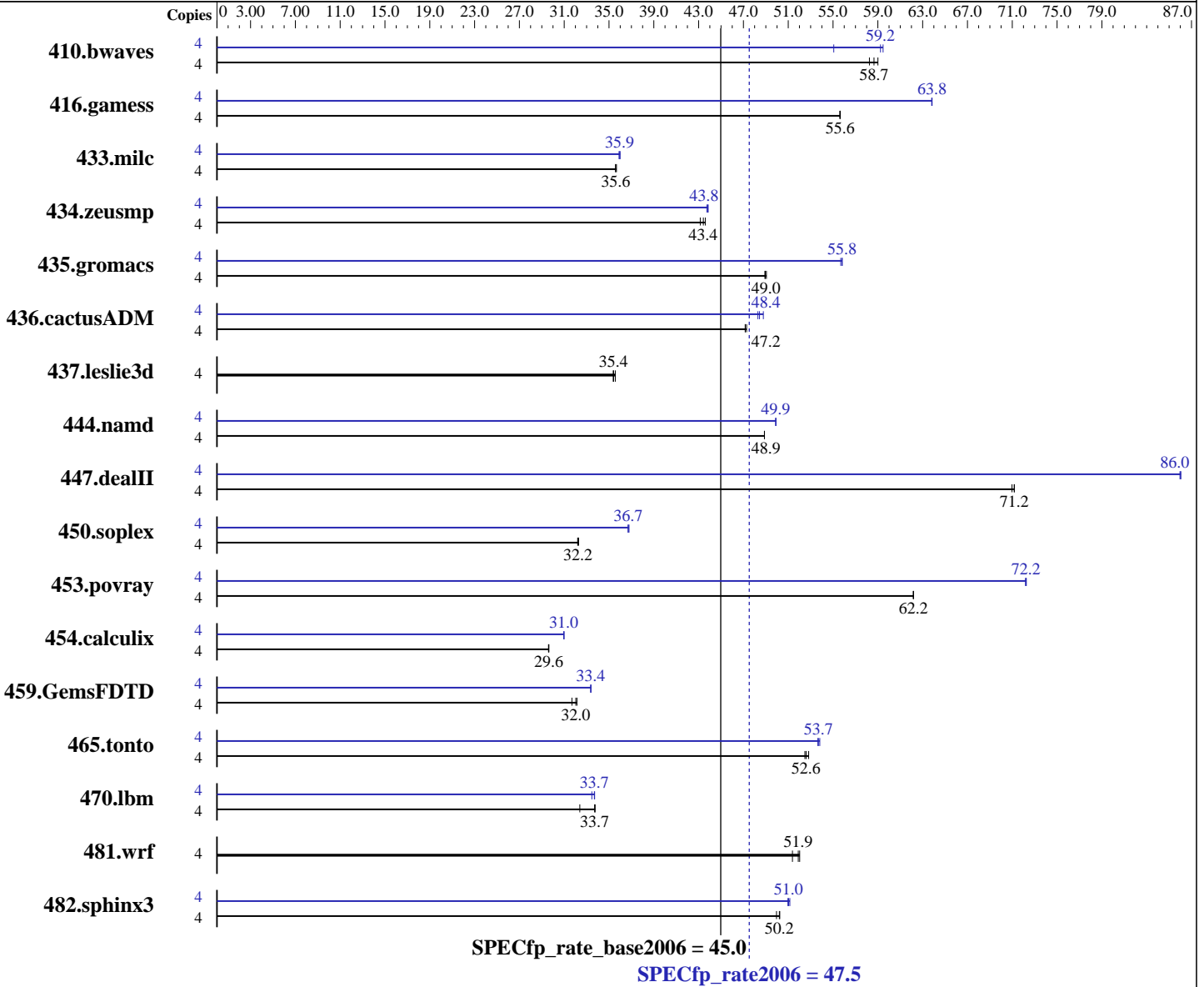
Test date: Feb-2007

Test sponsor: IBM Corporation

Hardware Availability: Apr-2007

Tested by: IBM Corporation

Software Availability: Aug-2006



Hardware

CPU Name: AMD Opteron 2220
 CPU Characteristics: 2800
 CPU MHz: 2800
 FPU: Integrated
 CPU(s) enabled: 4 cores, 2 chips, 2 cores/chip
 CPU(s) orderable: 1, 2 chips
 Primary Cache: 64 KB I + 64 KB D on chip per core
 Secondary Cache: 1 MB I+D on chip per core

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Software

Operating System: SLES9 SP3 for AMD64/EM64T
 Compiler: QLogic PathScale Compiler Suite 2.5
 Auto Parallel: No
 File System: ext3
 System State: Multi-user, run level 3
 Base Pointers: 64-bit
 Peak Pointers: 32/64-bit
 Other Software: None



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L3 Cache: None
Other Cache: None
Memory: 16 GB (8 x 2GB DDR2-5300 ECC)
Disk Subsystem: 1 x 74 GB SAS, 15000 RPM
Other Hardware: None

Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	4	921	59.0	<u>927</u>	<u>58.7</u>	933	58.2	4	914	59.5	987	55.1	<u>918</u>	<u>59.2</u>
416.gamess	4	1408	55.6	<u>1408</u>	<u>55.6</u>	1407	55.6	4	1227	63.8	<u>1227</u>	<u>63.8</u>	1227	63.8
433.milc	4	<u>1032</u>	<u>35.6</u>	1030	35.7	1032	35.6	4	1023	35.9	1020	36.0	<u>1021</u>	<u>35.9</u>
434.zeusmp	4	835	43.6	<u>838</u>	<u>43.4</u>	844	43.1	4	<u>831</u>	<u>43.8</u>	830	43.9	832	43.7
435.gromacs	4	584	48.9	<u>583</u>	<u>49.0</u>	582	49.1	4	<u>512</u>	<u>55.8</u>	513	55.7	512	55.8
436.cactusADM	4	1014	47.2	1011	47.3	<u>1013</u>	<u>47.2</u>	4	990	48.3	980	48.8	<u>987</u>	<u>48.4</u>
437.leslie3d	4	1057	35.6	<u>1062</u>	<u>35.4</u>	1063	35.4	4	1057	35.6	<u>1062</u>	<u>35.4</u>	1063	35.4
444.namd	4	656	48.9	<u>656</u>	<u>48.9</u>	656	48.9	4	<u>643</u>	<u>49.9</u>	643	49.9	643	49.9
447.dealII	4	<u>643</u>	<u>71.2</u>	643	71.2	645	71.0	4	532	86.0	532	86.0	<u>532</u>	<u>86.0</u>
450.soplex	4	1036	32.2	1033	32.3	<u>1035</u>	<u>32.2</u>	4	909	36.7	907	36.8	<u>908</u>	<u>36.7</u>
453.povray	4	<u>342</u>	<u>62.2</u>	342	62.2	342	62.2	4	295	72.2	295	72.3	<u>295</u>	<u>72.2</u>
454.calculix	4	1114	29.6	1115	29.6	<u>1114</u>	<u>29.6</u>	4	<u>1065</u>	<u>31.0</u>	1066	31.0	1065	31.0
459.GemsFDTD	4	<u>1325</u>	<u>32.0</u>	1321	32.1	1339	31.7	4	1272	33.4	<u>1271</u>	<u>33.4</u>	1271	33.4
465.tonto	4	745	52.8	<u>748</u>	<u>52.6</u>	750	52.5	4	734	53.6	731	53.8	<u>733</u>	<u>53.7</u>
470.lbm	4	1697	32.4	1628	33.8	<u>1630</u>	<u>33.7</u>	4	<u>1631</u>	<u>33.7</u>	1630	33.7	1642	33.5
481.wrf	4	859	52.0	870	51.4	<u>861</u>	<u>51.9</u>	4	859	52.0	870	51.4	<u>861</u>	<u>51.9</u>
482.sphinx3	4	1561	50.0	<u>1553</u>	<u>50.2</u>	1552	50.2	4	1530	51.0	1524	51.1	<u>1528</u>	<u>51.0</u>

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

Operating System Notes

taskset utility used to bind CPU(s) to processes

Base Compiler Invocation

C benchmarks:
pathcc

C++ benchmarks:
pathCC

Fortran benchmarks:
pathf95

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Base Compiler Invocation (Continued)

Benchmarks using both Fortran and C:
pathcc pathf95

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 -DSPEC_CPU_TABLE_WORKAROUND
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 -fno-second-underscore
482.sphinx3: -DSPEC_CPU_LP64

```

Base Optimization Flags

C benchmarks:
-march=auto -Ofast

C++ benchmarks:
-march=auto -Ofast

Fortran benchmarks:
-march=auto -Ofast

Benchmarks using both Fortran and C:
-march=auto -Ofast

Base Other Flags

C benchmarks:
-IPA:max_jobs=2

C++ benchmarks:
-IPA:max_jobs=2

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Base Other Flags (Continued)

Fortran benchmarks:

-IPA:max_jobs=2

Benchmarks using both Fortran and C:

-IPA:max_jobs=2

Peak Compiler Invocation

C benchmarks:

pathcc

C++ benchmarks:

pathCC

Fortran benchmarks:

pathf95

Benchmarks using both Fortran and C:

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
 436.cactusADM: -DSPEC_CPU_LP64 -fno-second-underscore
 437.lelie3d: -DSPEC_CPU_LP64
 444.namd: -DSPEC_CPU_LP64
 447.dealII: -DSPEC_CPU_TABLE_WORKAROUND
 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 -fno-second-underscore
 482.sphinx3: -DSPEC_CPU_LP64

Peak Optimization Flags

C benchmarks:

-march=auto -fb_create fbdata(pass 1) -fb_opt fbdata(pass 2) -Ofast

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Peak Optimization Flags (Continued)

C++ benchmarks:

444.namd: -march=auto -fb_create fbdata(pass 1) -fb_opt fbdata(pass 2)
-Ofast

447.dealII: -march=auto -Ofast -m32 -fno-exceptions

450.soplex: -march=auto -fb_create fbdata(pass 1) -fb_opt fbdata(pass 2)
-m32 -O3 -OPT:IEEE_arith=3 -CG:load_exe=0 -CG:movnti=1
-LNO:minvariant=off -fno-exceptions

453.povray: -march=auto -fb_create fbdata(pass 1) -fb_opt fbdata(pass 2)
-Ofast -fno-fast-math

Fortran benchmarks:

410.bwaves: -march=auto -fb_create fbdata(pass 1) -fb_opt fbdata(pass 2)
-O3 -OPT:Ofast -OPT:IEEE_arith=3 -LNO:blocking=off
-LNO:ignore_feedback=off

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

434.zeusmp: -march=auto -Ofast -CG:local_fwd_sched=on -LNO:blocking=off
-LNO:interchange=off -LNO:fu=10 -LNO:full_unroll_outer=on

437.leslie3d: basepeak = yes

459.GemsFDTD: -march=auto -Ofast -LNO:fission=2 -LNO:prefetch=0

465.tonto: -march=auto -Ofast -CG:local_fwd_sched=on -IPA:plimit=525

Benchmarks using both Fortran and C:

435.gromacs: -march=auto -O3 -OPT:rsqrt=2 -OPT:ro=3

436.cactusADM: -march=auto -fb_create fbdata(pass 1) -fb_opt fbdata(pass 2)
-O3 -LNO:prefetch_ahead=5 -LNO:ou_prod_max=10
-LNO:full_unroll=5 -ipa

454.calculix: -march=auto -Ofast -CG:prefetch=off -LNO:simd=0
-OPT:unroll_times_max=8 -WOPT:mem_opnds=on

481.wrf: basepeak = yes



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Peak Other Flags

C benchmarks:

-IPA:max_jobs=2

C++ benchmarks:

-IPA:max_jobs=2

Fortran benchmarks:

-IPA:max_jobs=2

Benchmarks using both Fortran and C:

-IPA:max_jobs=2

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

http://www.spec.org/cpu2006/flags/CPU2006_flags.20090714.17.html

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

http://www.spec.org/cpu2006/flags/CPU2006_flags.20090714.17.xml

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