



SPEC® CFP2006 Result

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IBM Corporation

SPECfp®2006 = 55.4

IBM System x3850 X5 (Intel Xeon E7-4870)

SPECfp_base2006 = 51.0

CPU2006 license: 11

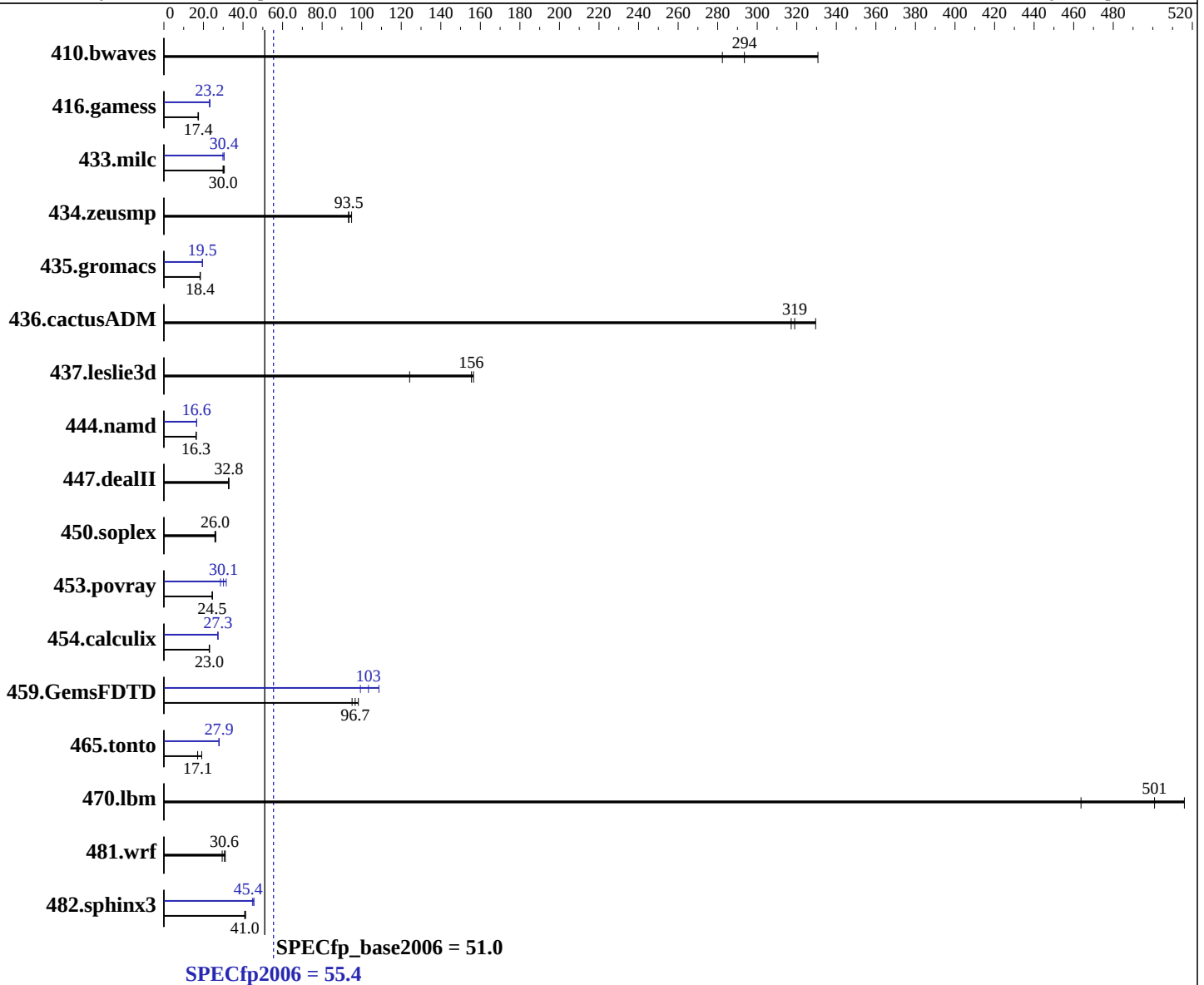
Test sponsor: IBM Corporation

Tested by: IBM Corporation

Test date: Mar-2011

Hardware Availability: May-2011

Software Availability: Apr-2011



Hardware

CPU Name: Intel Xeon E7-4870
CPU Characteristics: Intel Turbo Boost Technology up to 2.80 GHz
CPU MHz: 2400
FPU: Integrated
CPU(s) enabled: 40 cores, 4 chips, 10 cores/chip, 2 threads/core
CPU(s) orderable: 1,2,3,4 chips
Primary Cache: 32 KB I + 32 KB D on chip per core
Secondary Cache: 256 KB I+D on chip per core

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Software

Operating System: SUSE Linux Enterprise Server 11 SP1 (x86_64), Kernel 2.6.32.12-0.7-default
Compiler: Intel C++ and Fortran Intel 64 Compiler XE for applications running on Intel 64 Version 12.0 Update 3
Auto Parallel: Yes
File System: ext3
System State: Run level 3 (multi-user)
Base Pointers: 64-bit

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L3 Cache: 30 MB I+D on chip per chip
 Other Cache: None
 Memory: 512 GB (64 x 8 GB 4Rx8 PC3L-8500R-7, ECC)
 Disk Subsystem: 2 x 146 GB SAS, 15000 RPM, RAID 0
 Other Hardware: None

Peak Pointers: 32/64-bit
 Other Software: None

Results Table

Benchmark	Base						Peak					
	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	<u>46.3</u>	<u>294</u>	48.1	282	41.1	331	<u>46.3</u>	<u>294</u>	48.1	282	41.1	331
416.gamess	1119	17.5	<u>1126</u>	<u>17.4</u>	1134	17.3	843	23.2	850	23.0	<u>845</u>	<u>23.2</u>
433.milc	307	29.9	300	30.6	<u>305</u>	<u>30.0</u>	308	29.8	<u>302</u>	<u>30.4</u>	302	30.4
434.zeusmp	<u>97.3</u>	<u>93.5</u>	95.9	94.9	97.5	93.3	<u>97.3</u>	<u>93.5</u>	95.9	94.9	97.5	93.3
435.gromacs	391	18.3	388	18.4	<u>389</u>	<u>18.4</u>	365	19.5	<u>366</u>	<u>19.5</u>	368	19.4
436.cactusADM	<u>37.5</u>	<u>319</u>	37.7	317	36.3	330	<u>37.5</u>	<u>319</u>	37.7	317	36.3	330
437.leslie3d	75.7	124	60.0	157	<u>60.4</u>	<u>156</u>	75.7	124	60.0	157	<u>60.4</u>	<u>156</u>
444.namd	491	16.3	493	16.3	<u>492</u>	<u>16.3</u>	485	16.5	484	16.6	<u>484</u>	<u>16.6</u>
447.dealII	350	32.6	<u>348</u>	<u>32.8</u>	348	32.8	350	32.6	<u>348</u>	<u>32.8</u>	348	32.8
450.soplex	323	25.8	318	26.2	<u>321</u>	<u>26.0</u>	323	25.8	318	26.2	<u>321</u>	<u>26.0</u>
453.povray	<u>218</u>	<u>24.5</u>	218	24.4	217	24.6	<u>177</u>	<u>30.1</u>	169	31.5	186	28.6
454.calculix	360	22.9	<u>359</u>	<u>23.0</u>	357	23.1	302	27.3	302	27.3	<u>302</u>	<u>27.3</u>
459.GemsFDTD	<u>110</u>	<u>96.7</u>	112	95.1	108	98.3	97.6	109	<u>103</u>	<u>103</u>	107	99.4
465.tonto	515	19.1	578	17.0	<u>576</u>	<u>17.1</u>	353	27.9	354	27.8	<u>353</u>	<u>27.9</u>
470.lbm	26.6	516	29.6	464	<u>27.4</u>	<u>501</u>	26.6	516	29.6	464	<u>27.4</u>	<u>501</u>
481.wrf	360	31.0	<u>365</u>	<u>30.6</u>	379	29.5	360	31.0	<u>365</u>	<u>30.6</u>	379	29.5
482.sphinx3	472	41.3	<u>476</u>	<u>41.0</u>	477	40.9	429	45.5	<u>429</u>	<u>45.4</u>	435	44.8

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

Operating System Notes

```
'ulimit -s unlimited' was used to set the stacksize to unlimited prior to run
echo 1 > /proc/sys/vm/zone_reclaim_mode
'mount -t hugetlbfs nodev /mnt/hugepages' was used to enable large pages
echo 900 > /proc/sys/vm/nr_hugepages
export HUGETLB_MORECORE=yes
export LD_PRELOAD=/usr/lib64/libhugetlbfs.so
```

Platform Notes

BIOS Settings:
 Turbo Boost Power Optimization set to Traditional



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General Notes

OMP_NUM_THREADS set to number of cores
Binaries were compiled on RHEL5.5

Base Compiler Invocation

C benchmarks:
icc -m64

C++ benchmarks:
icpc -m64

Fortran benchmarks:
ifort -m64

Benchmarks using both Fortran and C:
icc -m64 ifort -m64

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 -nofor_main
436.cactusADM: -DSPEC_CPU_LP64 -nofor_main
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 -nofor_main
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:
-xSSE4.2 -ipo -O3 -no-prec-div -static -parallel -opt-prefetch
-ansi-alias

C++ benchmarks:
-xSSE4.2 -ipo -O3 -no-prec-div -static -opt-prefetch -ansi-alias

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Base Optimization Flags (Continued)

Fortran benchmarks:

-xSSE4.2 -ipo -O3 -no-prec-div -static -parallel -opt-prefetch

Benchmarks using both Fortran and C:

-xSSE4.2 -ipo -O3 -no-prec-div -static -parallel -opt-prefetch
-ansi-alias

Peak Compiler Invocation

C benchmarks:

icc -m64

C++ benchmarks:

icpc -m64

Fortran benchmarks:

ifort -m64

Benchmarks using both Fortran and C:

icc -m64 ifort -m64

Peak Portability Flags

Same as Base Portability Flags

Peak Optimization Flags

C benchmarks:

433.milc: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
-no-prec-div(pass 2) -prof-use(pass 2) -static -auto-ilp32
-ansi-alias

470.lbm: basepeak = yes

482.sphinx3: -xSSE4.2 -ipo -O3 -no-prec-div -unroll2 -ansi-alias
-parallel

C++ benchmarks:

444.namd: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
-no-prec-div(pass 2) -prof-use(pass 2) -fno-alias
-auto-ilp32

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Peak Optimization Flags (Continued)

447.dealIII: basepeak = yes

450.soplex: basepeak = yes

453.povray: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
-no-prec-div(pass 2) -prof-use(pass 2) -unroll4 -ansi-alias
-B /usr/share/libhugetlbfs/ -Wl,-melf_x86_64 -Wl,-hugetlbfs-link=BDT

Fortran benchmarks:

410.bwaves: basepeak = yes

416.gamess: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
-no-prec-div(pass 2) -prof-use(pass 2) -unroll2
-inline-level=0 -scalar-rep- -static

434.zeusmp: basepeak = yes

437.leslie3d: basepeak = yes

459.GemsFDTD: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
-no-prec-div(pass 2) -prof-use(pass 2) -unroll2
-inline-level=0 -opt-prefetch -parallel
-B /usr/share/libhugetlbfs/ -Wl,-melf_x86_64 -Wl,-hugetlbfs-link=BDT

465.tonto: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
-no-prec-div(pass 2) -prof-use(pass 2) -inline-calloc
-opt-malloc-options=3 -auto -unroll4
-B /usr/share/libhugetlbfs/ -Wl,-melf_x86_64 -Wl,-hugetlbfs-link=BDT

Benchmarks using both Fortran and C:

435.gromacs: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
-no-prec-div(pass 2) -prof-use(pass 2) -static -auto-ilp32
-ansi-alias

436.cactusADM: basepeak = yes

454.calculix: -xSSE4.2 -ipo -O3 -no-prec-div -auto-ilp32 -ansi-alias

481.wrf: basepeak = yes

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

<http://www.spec.org/cpu2006/flags/IBM-platform-linux64-revA.html>
<http://www.spec.org/cpu2006/flags/Intel-ic12.0-linux64-revB.html>

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

<http://www.spec.org/cpu2006/flags/IBM-platform-linux64-revA.xml>
<http://www.spec.org/cpu2006/flags/Intel-ic12.0-linux64-revB.xml>



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