



# SPEC<sup>®</sup> CFP2006 Result

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## IBM Corporation

SPECfp<sup>®</sup>2006 = **60.8**

### IBM System x3850 X5 (Intel Xeon E7-8837)

SPECfp\_base2006 = **56.6**

CPU2006 license: 11

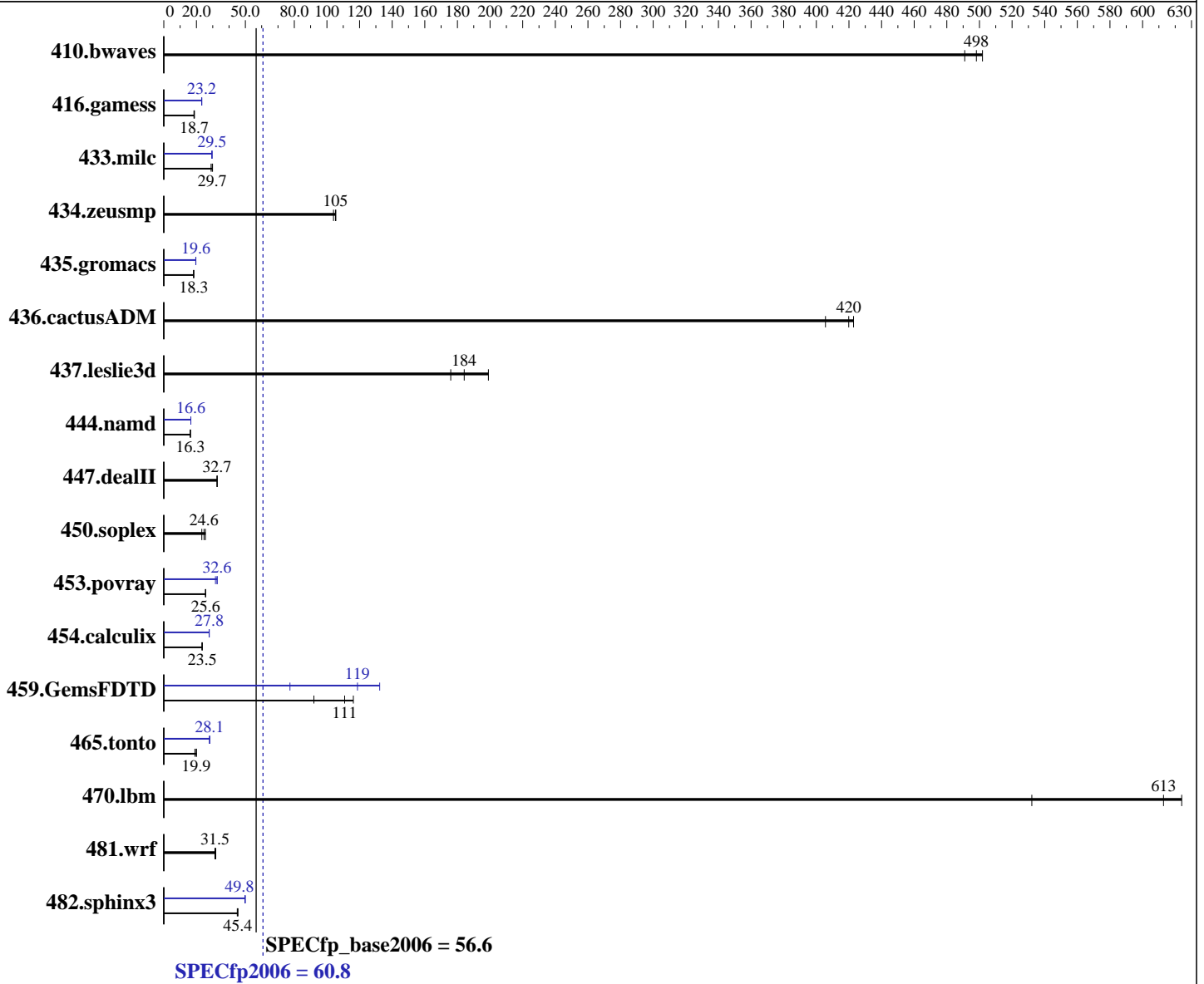
Test date: Apr-2011

Test sponsor: IBM Corporation

Hardware Availability: May-2011

Tested by: IBM Corporation

Software Availability: Apr-2011



#### Hardware

CPU Name: Intel Xeon E7-8837  
 CPU Characteristics: Intel Turbo Boost Technology up to 2.8 GHz  
 CPU MHz: 2667  
 FPU: Integrated  
 CPU(s) enabled: 32 cores, 4 chips, 8 cores/chip  
 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: 24 MB I+D on chip per chip  
Other Cache: None  
Memory: 512 GB (64 x 8 GB 4Rx8 PC3-8500R-7, ECC)  
Disk Subsystem: 2 x 147 GB 15k RPM SAS, 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	27.1	502	<b>27.3</b>	<b>498</b>	27.7	491	27.1	502	<b>27.3</b>	<b>498</b>	27.7	491
416.gamess	<b>1050</b>	<b>18.7</b>	1044	18.8	1059	18.5	842	23.3	<b>843</b>	<b>23.2</b>	843	23.2
433.milc	317	29.0	<b>309</b>	<b>29.7</b>	307	29.9	<b>311</b>	<b>29.5</b>	311	29.5	311	29.5
434.zeusmp	<b>86.5</b>	<b>105</b>	86.3	105	87.5	104	<b>86.5</b>	<b>105</b>	86.3	105	87.5	104
435.gromacs	389	18.4	392	18.2	<b>389</b>	<b>18.3</b>	364	19.6	<b>363</b>	<b>19.6</b>	363	19.6
436.cactusADM	29.5	406	<b>28.5</b>	<b>420</b>	28.3	423	29.5	406	<b>28.5</b>	<b>420</b>	28.3	423
437.leslie3d	47.2	199	53.4	176	<b>51.0</b>	<b>184</b>	47.2	199	53.4	176	<b>51.0</b>	<b>184</b>
444.namd	493	16.3	492	16.3	<b>492</b>	<b>16.3</b>	484	16.6	<b>484</b>	<b>16.6</b>	484	16.6
447.dealII	350	32.7	350	32.7	<b>350</b>	<b>32.7</b>	350	32.7	350	32.7	<b>350</b>	<b>32.7</b>
450.soplex	<b>338</b>	<b>24.6</b>	358	23.3	327	25.5	<b>338</b>	<b>24.6</b>	358	23.3	327	25.5
453.povray	208	25.5	<b>207</b>	<b>25.6</b>	207	25.7	162	32.7	<b>163</b>	<b>32.6</b>	168	31.7
454.calculix	<b>351</b>	<b>23.5</b>	353	23.4	350	23.6	296	27.8	297	27.8	<b>297</b>	<b>27.8</b>
459.GemsFDTD	91.3	116	<b>95.7</b>	<b>111</b>	115	92.0	<b>89.4</b>	<b>119</b>	80.2	132	137	77.3
465.tonto	<b>494</b>	<b>19.9</b>	492	20.0	516	19.1	350	28.1	<b>350</b>	<b>28.1</b>	350	28.1
470.lbm	22.0	624	<b>22.4</b>	<b>613</b>	25.8	532	22.0	624	<b>22.4</b>	<b>613</b>	25.8	532
481.wrf	356	31.3	351	31.9	<b>354</b>	<b>31.5</b>	356	31.3	351	31.9	<b>354</b>	<b>31.5</b>
482.sphinx3	<b>430</b>	<b>45.4</b>	433	45.0	429	45.4	390	49.9	392	49.8	<b>391</b>	<b>49.8</b>

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

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

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



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