



# SPEC® CFP2006 Result

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## IBM Corporation

SPECfp®2006 = **42.6**

## IBM System x3650 M3 (Intel Xeon X5650)

SPECfp\_base2006 = **39.8**

CPU2006 license: 11

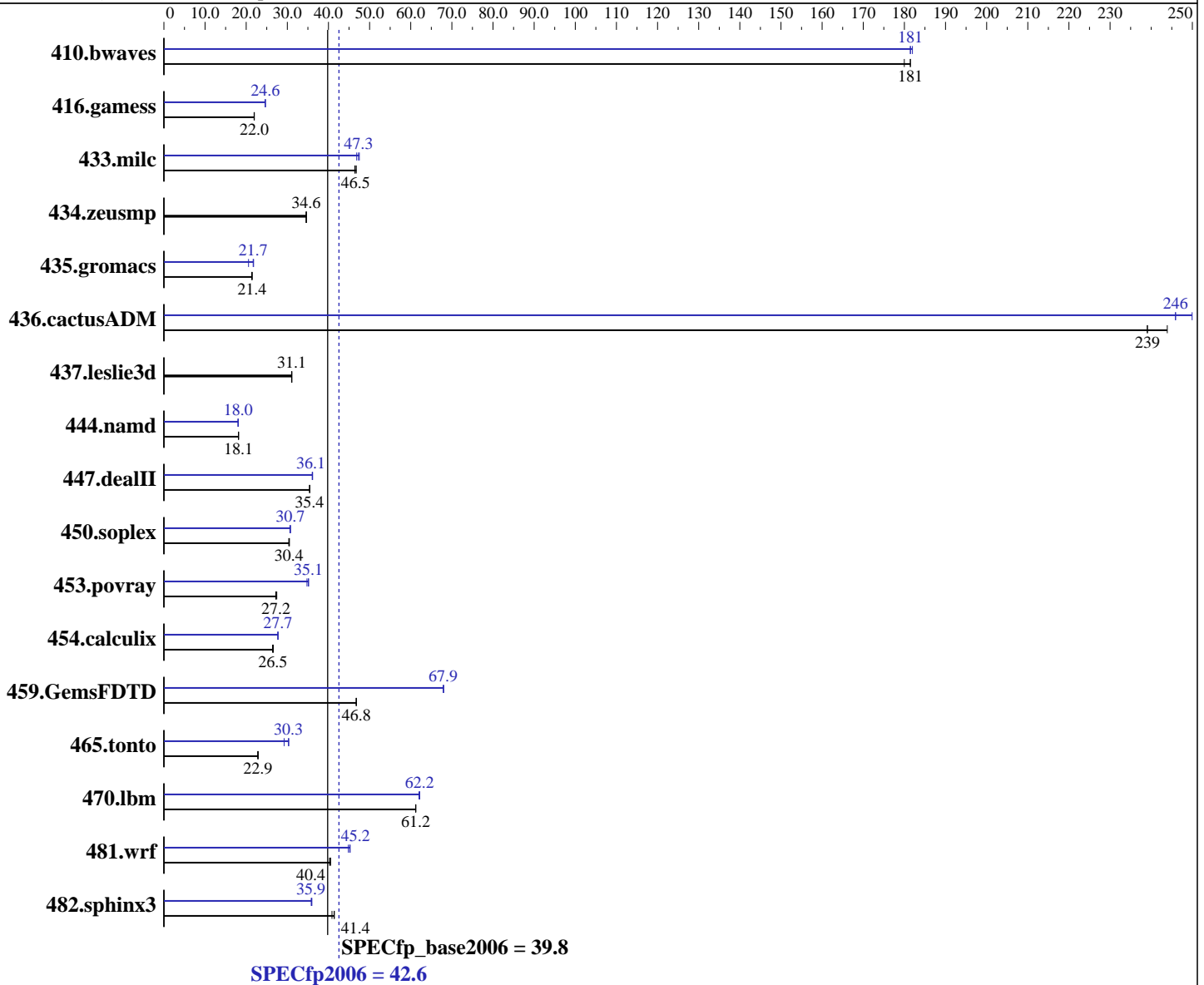
Test date: May-2010

Test sponsor: IBM Corporation

Hardware Availability: Jun-2010

Tested by: IBM Corporation

Software Availability: Jan-2010



### Hardware

CPU Name: Intel Xeon X5650  
 CPU Characteristics: Intel Turbo Boost Technology up to 3.06 GHz  
 CPU MHz: 2667  
 FPU: Integrated  
 CPU(s) enabled: 12 cores, 2 chips, 6 cores/chip, 2 threads/core  
 CPU(s) orderable: 1,2 chip  
 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 (x86\_64)  
 Kernel 2.6.27.19-5-default  
 Compiler: Intel C++ and Fortran Professional Compiler for IA32 and Intel 64, Version 11.1  
 Build 20091130 Package ID: l\_cproc\_p\_11.1.064, l\_cprof\_p\_11.1.064  
 Auto Parallel: Yes  
 File System: ext3  
 System State: Run level 3 (multi-user)

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L3 Cache: 12 MB I+D on chip per chip  
 Other Cache: None  
 Memory: 48 GB (12 x 4 GB PC3-10600R-ECC, CL9)  
 Disk Subsystem: 1 x 73 GB SAS, 15000RPM  
 Other Hardware: None

Base Pointers: 64-bit  
 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	75.5	180	74.9	181	<b><u>74.9</u></b>	<b><u>181</u></b>	74.7	182	<b><u>74.9</u></b>	<b><u>181</u></b>	74.9	181
416.gamess	<b><u>892</u></b>	<b><u>22.0</u></b>	891	22.0	893	21.9	794	24.7	795	24.6	<b><u>794</u></b>	<b><u>24.6</u></b>
433.milc	196	46.8	198	46.4	<b><u>197</u></b>	<b><u>46.5</u></b>	193	47.5	196	46.9	<b><u>194</u></b>	<b><u>47.3</u></b>
434.zeusmp	263	34.6	<b><u>263</u></b>	<b><u>34.6</u></b>	263	34.6	263	34.6	<b><u>263</u></b>	<b><u>34.6</u></b>	263	34.6
435.gromacs	333	21.4	<b><u>333</u></b>	<b><u>21.4</u></b>	335	21.3	<b><u>329</u></b>	<b><u>21.7</u></b>	347	20.6	328	21.8
436.cactusADM	<b><u>50.0</u></b>	<b><u>239</u></b>	49.0	244	50.0	239	<b><u>48.6</u></b>	<b><u>246</u></b>	48.6	246	47.8	250
437.leslie3d	303	31.0	<b><u>303</u></b>	<b><u>31.1</u></b>	302	31.1	303	31.0	<b><u>303</u></b>	<b><u>31.1</u></b>	302	31.1
444.namd	<b><u>442</u></b>	<b><u>18.1</u></b>	442	18.1	442	18.1	444	18.1	445	18.0	<b><u>444</u></b>	<b><u>18.0</u></b>
447.dealII	323	35.4	323	35.4	<b><u>323</u></b>	<b><u>35.4</u></b>	<b><u>317</u></b>	<b><u>36.1</u></b>	317	36.1	317	36.0
450.soplex	275	30.4	273	30.5	<b><u>274</u></b>	<b><u>30.4</u></b>	272	30.6	271	30.8	<b><u>271</u></b>	<b><u>30.7</u></b>
453.povray	<b><u>195</u></b>	<b><u>27.2</u></b>	196	27.2	194	27.4	151	35.2	153	34.8	<b><u>151</u></b>	<b><u>35.1</u></b>
454.calculix	312	26.4	310	26.6	<b><u>311</u></b>	<b><u>26.5</u></b>	<b><u>298</u></b>	<b><u>27.7</u></b>	298	27.7	298	27.7
459.GemsFDTD	227	46.8	227	46.7	<b><u>227</u></b>	<b><u>46.8</u></b>	<b><u>156</u></b>	<b><u>67.9</u></b>	156	67.9	156	68.0
465.tonto	432	22.8	<b><u>430</u></b>	<b><u>22.9</u></b>	429	22.9	337	29.2	324	30.4	<b><u>325</u></b>	<b><u>30.3</u></b>
470.lbm	224	61.2	<b><u>224</u></b>	<b><u>61.2</u></b>	225	61.2	<b><u>221</u></b>	<b><u>62.2</u></b>	221	62.2	222	62.0
481.wrf	276	40.5	<b><u>276</u></b>	<b><u>40.4</u></b>	277	40.3	247	45.3	<b><u>247</u></b>	<b><u>45.2</u></b>	249	44.8
482.sphinx3	477	40.9	470	41.4	<b><u>471</u></b>	<b><u>41.4</u></b>	544	35.8	<b><u>543</u></b>	<b><u>35.9</u></b>	542	36.0

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

## Platform Notes

Turbo Mode Enable  
 Turbo Boost set to Traditional  
 CPU C State Enable  
 Data Reuse Disable

## General Notes

Binaries were compiled on SLES 10 with Binutils 2.18.50.0.7.20080502  
 'ulimit -s unlimited' was used to set the stack size to unlimited prior to run  
 OMP\_NUM\_THREADS set to number of cores  
 KMP\_AFFINITY set to granularity=fine,scatter  
 KMP\_STACKSIZE set to 200M



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## 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.lelie3d: -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

C++ benchmarks:

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

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



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## 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) -static(pass 2) -prof-use(pass 2)  
-ansi-alias

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

482.sphinx3: -xSSE4.2 -ipo -O3 -no-prec-div -static -auto-ilp32  
-unroll2

C++ benchmarks:

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

447.dealII: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)  
-no-prec-div(pass 2) -static(pass 2) -prof-use(pass 2)  
-unroll2 -ansi-alias -scalar-rep- -auto-ilp32

450.soplex: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)  
-no-prec-div(pass 2) -static(pass 2) -prof-use(pass 2)  
-opt-malloc-options=3 -auto-ilp32

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## Peak Optimization Flags (Continued)

453.povray: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)  
-no-prec-div(pass 2) -static(pass 2) -prof-use(pass 2)  
-unroll4 -ansi-alias

Fortran benchmarks:

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

416.gamess: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)  
-no-prec-div(pass 2) -static(pass 2) -prof-use(pass 2)  
-unroll2 -Ob0 -ansi-alias -scalar-rep-

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) -static(pass 2) -prof-use(pass 2)  
-unroll2 -Ob0 -opt-prefetch -parallel

465.tonto: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)  
-no-prec-div(pass 2) -static(pass 2) -prof-use(pass 2)  
-inline-calloc -opt-malloc-options=3 -auto -unroll4

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) -static(pass 2) -prof-use(pass 2)  
-opt-prefetch -auto-ilp32

436.cactusADM: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)  
-no-prec-div(pass 2) -static(pass 2) -prof-use(pass 2)  
-unroll2 -opt-prefetch -parallel -auto-ilp32

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

481.wrf: Same as 454.calculix

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

<http://www.spec.org/cpu2006/flags/Intel-ic11.1-linux64-revE.20100601.html>

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

<http://www.spec.org/cpu2006/flags/Intel-ic11.1-linux64-revE.20100601.xml>



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