



# SPEC® CFP2006 Result

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## IBM Corporation

SPECfp®2006 = 40.2

IBM System x iDataPlex dx360 M2 (Intel Xeon X5570)

SPECfp\_base2006 = 37.8

CPU2006 license: 11

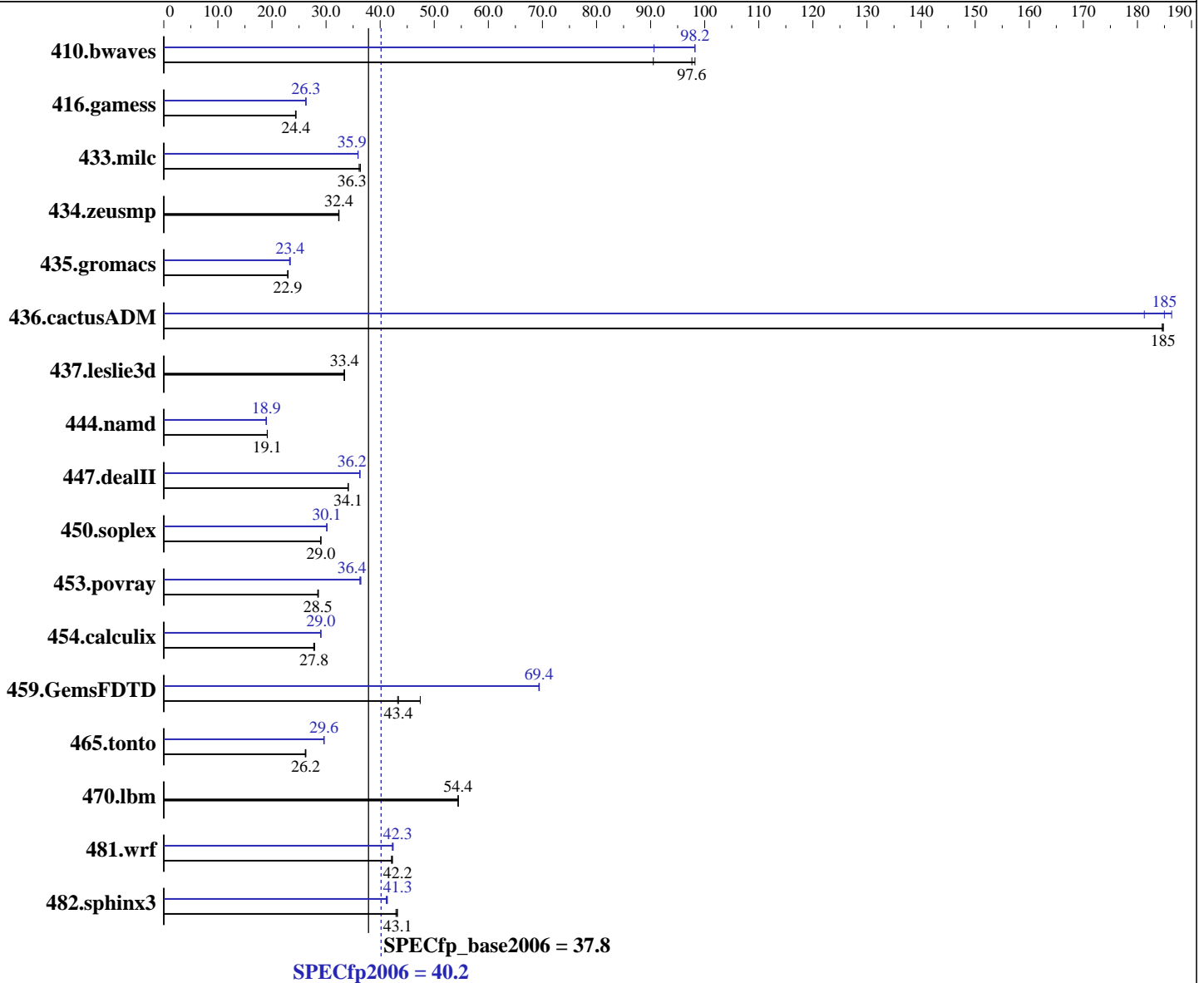
Test date: Mar-2009

Test sponsor: IBM Corporation

Hardware Availability: Apr-2009

Tested by: IBM Corporation

Software Availability: Feb-2009



### Hardware

CPU Name: Intel Xeon X5570  
 CPU Characteristics: Intel Turbo Boost Technology up to 3.33 GHz  
 CPU MHz: 2933  
 FPU: Integrated  
 CPU(s) enabled: 8 cores, 2 chips, 4 cores/chip, 2 threads/core  
 CPU(s) orderable: 1,2 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 10 (x86\_64) SP2, Kernel 2.6.16.60-0.21-smpp  
 Compiler: Intel C++ and Fortran Compiler 11.0 for Linux Build 20090131 Package ID: l\_cprof\_p\_11.0.080, l\_cprof\_p\_11.0.080  
 Auto Parallel: Yes  
 File System: ReiserFS  
 System State: Run level 3 (multi-user)  
 Base Pointers: 64-bit

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L3 Cache: 8 MB I+D on chip per chip  
Other Cache: None  
Memory: 12 GB (6 x 2 GB PC3-10600R)  
Disk Subsystem: 1 x 250 GB SATA, 7200 RPM  
Other Hardware: None

Peak Pointers: 32/64-bit  
Other Software: Binutils 2.18.50.0.7.20080502

## Results Table

Benchmark	Base						Peak					
	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	150	90.5	<b><u>139</u></b>	<b><u>97.6</u></b>	138	98.2	150	90.6	<b><u>138</u></b>	<b><u>98.2</u></b>	138	98.2
416.gamess	804	24.3	<b><u>802</u></b>	<b><u>24.4</u></b>	801	24.4	745	26.3	<b><u>745</u></b>	<b><u>26.3</u></b>	745	26.3
433.milc	254	36.1	<b><u>253</u></b>	<b><u>36.3</u></b>	253	36.4	<b><u>256</u></b>	<b><u>35.9</u></b>	256	35.9	256	35.9
434.zeusmp	282	32.3	281	32.4	<b><u>281</u></b>	<b><u>32.4</u></b>	282	32.3	281	32.4	<b><u>281</u></b>	<b><u>32.4</u></b>
435.gromacs	311	23.0	312	22.9	<b><u>311</u></b>	<b><u>22.9</u></b>	<b><u>306</u></b>	<b><u>23.4</u></b>	307	23.3	306	23.4
436.cactusADM	64.7	185	<b><u>64.7</u></b>	<b><u>185</u></b>	64.7	185	65.9	181	64.1	186	<b><u>64.6</u></b>	<b><u>185</u></b>
437.leslie3d	282	33.3	<b><u>281</u></b>	<b><u>33.4</u></b>	281	33.4	282	33.3	<b><u>281</u></b>	<b><u>33.4</u></b>	281	33.4
444.namd	<b><u>419</u></b>	<b><u>19.1</u></b>	419	19.1	419	19.1	<b><u>423</u></b>	<b><u>18.9</u></b>	423	19.0	424	18.9
447.dealII	336	34.1	335	34.1	<b><u>336</u></b>	<b><u>34.1</u></b>	<b><u>316</u></b>	<b><u>36.2</u></b>	316	36.2	315	36.3
450.soplex	288	29.0	287	29.1	<b><u>287</u></b>	<b><u>29.0</u></b>	277	30.2	277	30.1	<b><u>277</u></b>	<b><u>30.1</u></b>
453.povray	<b><u>187</u></b>	<b><u>28.5</u></b>	186	28.6	187	28.5	146	36.4	147	36.2	<b><u>146</u></b>	<b><u>36.4</u></b>
454.calculix	<b><u>297</u></b>	<b><u>27.8</u></b>	296	27.9	298	27.7	<b><u>284</u></b>	<b><u>29.0</u></b>	284	29.0	284	29.0
459.GemsFDTD	224	47.4	245	43.2	<b><u>245</u></b>	<b><u>43.4</u></b>	153	69.4	153	69.3	<b><u>153</u></b>	<b><u>69.4</u></b>
465.tonto	<b><u>375</u></b>	<b><u>26.2</u></b>	375	26.3	376	26.2	333	29.6	332	29.6	<b><u>332</u></b>	<b><u>29.6</u></b>
470.lbm	<b><u>252</u></b>	<b><u>54.4</u></b>	253	54.4	252	54.4	<b><u>252</u></b>	<b><u>54.4</u></b>	253	54.4	252	54.4
481.wrf	264	42.3	265	42.1	<b><u>265</u></b>	<b><u>42.2</u></b>	263	42.4	<b><u>264</u></b>	<b><u>42.3</u></b>	264	42.3
482.sphinx3	<b><u>452</u></b>	<b><u>43.1</u></b>	451	43.2	454	42.9	472	41.3	474	41.1	<b><u>472</u></b>	<b><u>41.3</u></b>

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

## General Notes

Processor CPU C-States Enabled  
Memory set to Max Speed  
Operation Mode set to "Performance Mode"  
OMP\_NUM\_THREADS set to number of cores  
KMP\_AFFINITY set to granularity=fine,scatter  
KMP\_STACKSIZE set to 200M

## Base Compiler Invocation

C benchmarks:  
icc

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## Base Compiler Invocation (Continued)

C++ benchmarks:  
icpc

Fortran benchmarks:  
ifort

Benchmarks using both Fortran and C:  
icc ifort

## 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

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 (except as noted below):

icc

482.sphinx3: icc -m32

C++ benchmarks (except as noted below):

icpc

450.soplex: icpc -m32

Fortran benchmarks:

ifort

Benchmarks using both Fortran and C:

icc ifort

## 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 -nofor\_main  
 436.cactusADM: -DSPEC\_CPU\_LP64 -nofor\_main  
 437.leslie3d: -DSPEC\_CPU\_LP64  
 444.namd: -DSPEC\_CPU\_LP64  
 447.dealII: -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

## 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)  
 -fno-alias

470.lbm: basepeak = yes

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

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## Peak Optimization Flags (Continued)

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.dealIII: -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- -opt-prefetch

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

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)  
-unroll4 -auto

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

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

481.wrf: -xSSE4.2 -ipo -O3 -no-prec-div -static -opt-prefetch  
-parallel -auto-ilp32

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

<http://www.spec.org/cpu2006/flags/Intel-ic11.0-fp-linux64-revA.20090710.10.html>

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

<http://www.spec.org/cpu2006/flags/Intel-ic11.0-fp-linux64-revA.20090710.10.xml>

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For questions about this result, please contact the tester.  
For other inquiries, please contact [webmaster@spec.org](mailto:webmaster@spec.org).

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