



# SPEC® CFP2006 Result

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## IBM Corporation

SPECfp®2006 = 35.8

## IBM System x3400 M3 (Intel Xeon E5530)

SPECfp\_base2006 = 33.3

CPU2006 license: 11

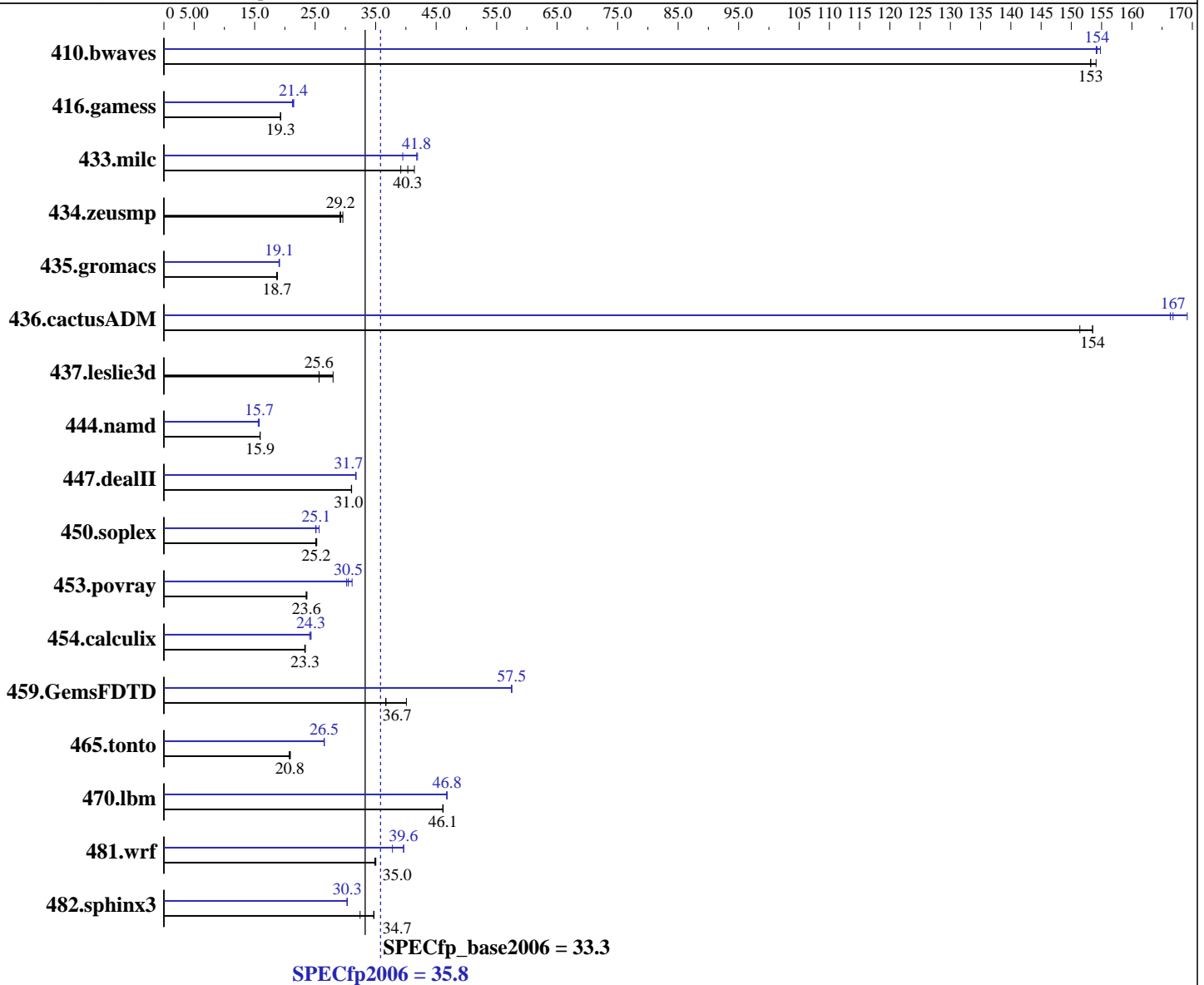
Test date: Jun-2010

Test sponsor: IBM Corporation

Hardware Availability: Jun-2010

Tested by: IBM Corporation

Software Availability: Jan-2010



### Hardware

CPU Name: Intel Xeon E5530  
 CPU Characteristics: Intel Turbo Boost Technology up to 2.66 GHz  
 CPU MHz: 2400  
 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 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: 8 MB I+D on chip per chip  
Other Cache: None  
Memory: 48 GB (12 x 4 GB PC3-10600R CL9, 2 Rank)  
Disk Subsystem: 1 x 73 GB SAS, 15000 RPM  
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    | <b>88.7</b> | <b>153</b>  | 88.7       | 153         | 88.2        | 154         | <b>88.1</b> | <b>154</b>  | 87.8        | 155         | 88.2       | 154         |
| 416.gamess    | <b>1015</b> | <b>19.3</b> | 1014       | 19.3        | 1016        | 19.3        | 913         | 21.5        | 922         | 21.2        | <b>914</b> | <b>21.4</b> |
| 433.milc      | 234         | 39.2        | 222        | 41.4        | <b>228</b>  | <b>40.3</b> | 219         | 41.9        | 233         | 39.5        | <b>220</b> | <b>41.8</b> |
| 434.zeusmp    | <b>312</b>  | <b>29.2</b> | 312        | 29.1        | 308         | 29.6        | <b>312</b>  | <b>29.2</b> | 312         | 29.1        | 308        | 29.6        |
| 435.gromacs   | 381         | 18.8        | <b>382</b> | <b>18.7</b> | 383         | 18.6        | 374         | 19.1        | 375         | 19.0        | <b>374</b> | <b>19.1</b> |
| 436.cactusADM | 77.8        | 154         | 78.9       | 151         | <b>77.8</b> | <b>154</b>  | 70.6        | 169         | <b>71.6</b> | <b>167</b>  | 71.8       | 166         |
| 437.leslie3d  | <b>366</b>  | <b>25.6</b> | 367        | 25.6        | 336         | 28.0        | <b>366</b>  | <b>25.6</b> | 367         | 25.6        | 336        | 28.0        |
| 444.namd      | 505         | 15.9        | 504        | 15.9        | <b>504</b>  | <b>15.9</b> | 514         | 15.6        | 509         | 15.8        | <b>509</b> | <b>15.7</b> |
| 447.dealII    | 369         | 31.0        | 369        | 31.0        | <b>369</b>  | <b>31.0</b> | 360         | 31.8        | 361         | 31.7        | <b>361</b> | <b>31.7</b> |
| 450.soplex    | <b>331</b>  | <b>25.2</b> | 332        | 25.1        | 330         | 25.3        | 332         | 25.1        | 325         | 25.7        | <b>332</b> | <b>25.1</b> |
| 453.povray    | 225         | 23.6        | <b>226</b> | <b>23.6</b> | 226         | 23.5        | 176         | 30.2        | <b>175</b>  | <b>30.5</b> | 171        | 31.1        |
| 454.calculix  | <b>354</b>  | <b>23.3</b> | 353        | 23.4        | 354         | 23.3        | 342         | 24.1        | <b>340</b>  | <b>24.3</b> | 339        | 24.3        |
| 459.GemsFDTD  | 289         | 36.7        | 265        | 40.1        | <b>289</b>  | <b>36.7</b> | 185         | 57.5        | <b>185</b>  | <b>57.5</b> | 185        | 57.5        |
| 465.tonto     | 471         | 20.9        | <b>473</b> | <b>20.8</b> | 475         | 20.7        | 371         | 26.5        | 371         | 26.5        | <b>371</b> | <b>26.5</b> |
| 470.lbm       | 298         | 46.1        | <b>298</b> | <b>46.1</b> | 298         | 46.2        | 294         | 46.7        | 294         | 46.8        | <b>294</b> | <b>46.8</b> |
| 481.wrf       | 320         | 34.9        | 319        | 35.0        | <b>320</b>  | <b>35.0</b> | 282         | 39.7        | <b>282</b>  | <b>39.6</b> | 296        | 37.8        |
| 482.sphinx3   | <b>562</b>  | <b>34.7</b> | 561        | 34.7        | 601         | 32.4        | 644         | 30.3        | <b>643</b>  | <b>30.3</b> | 643        | 30.3        |

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

## 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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