



# SPEC<sup>®</sup> CFP2006 Result

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## IBM Corporation

SPECfp<sup>®</sup>2006 = 30.3

## IBM System x3690 X5 (Intel Xeon E7530)

SPECfp\_base2006 = 28.4

CPU2006 license: 11

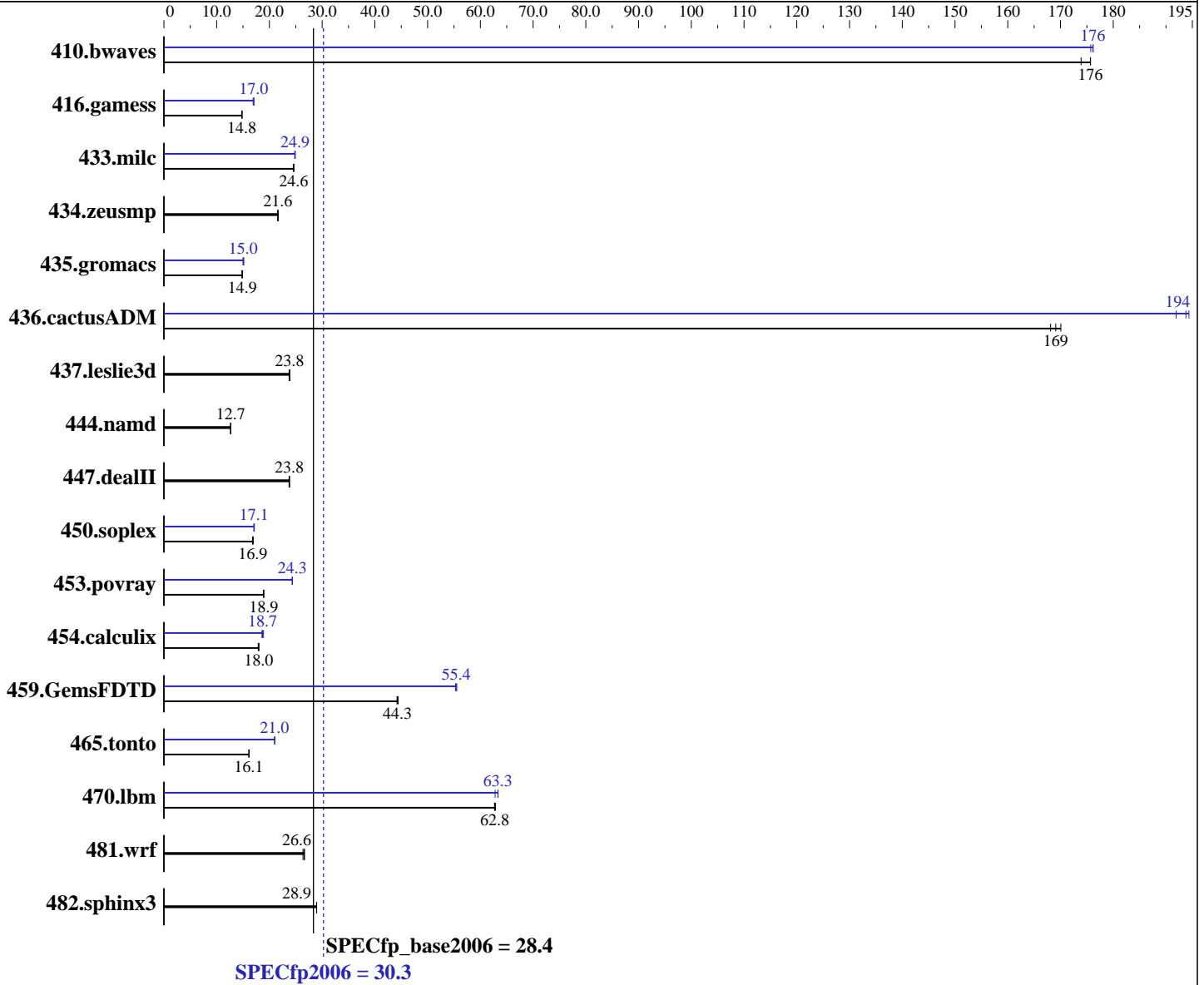
Test sponsor: IBM Corporation

Tested by: IBM Corporation

Test date: Jul-2010

Hardware Availability: Aug-2010

Software Availability: Jan-2010



### Hardware

CPU Name: Intel Xeon E7530  
 CPU Characteristics: Intel Turbo Boost Technology up to 2.13 GHz  
 CPU MHz: 1867  
 FPU: Integrated  
 CPU(s) enabled: 12 cores, 2 chips, 6 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

Continued on next page

### 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)

Continued on next page



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L3 Cache: 12 MB I+D on chip per chip  
Other Cache: None  
Memory: 128 GB (32 x 4 GB PC3-8500R CL7, Quad Rank, running at 978 MHz)  
Disk Subsystem: 1 x 146 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	78.1	174	77.3	176	<b><u>77.4</u></b>	<b><u>176</u></b>	77.1	176	77.3	176	<b><u>77.1</u></b>	<b><u>176</u></b>
416.gamess	1321	14.8	1326	14.8	<b><u>1323</u></b>	<b><u>14.8</u></b>	1147	17.1	1158	16.9	<b><u>1149</u></b>	<b><u>17.0</u></b>
433.milc	<b><u>373</u></b>	<b><u>24.6</u></b>	374	24.5	372	24.7	<b><u>369</u></b>	<b><u>24.9</u></b>	369	24.9	370	24.8
434.zeusmp	422	21.6	420	21.7	<b><u>421</u></b>	<b><u>21.6</u></b>	422	21.6	420	21.7	<b><u>421</u></b>	<b><u>21.6</u></b>
435.gromacs	<b><u>480</u></b>	<b><u>14.9</u></b>	479	14.9	483	14.8	<b><u>475</u></b>	<b><u>15.0</u></b>	476	15.0	471	15.2
436.cactusADM	71.1	168	<b><u>70.7</u></b>	<b><u>169</u></b>	70.3	170	62.3	192	61.5	194	<b><u>61.7</u></b>	<b><u>194</u></b>
437.leslie3d	<b><u>394</u></b>	<b><u>23.8</u></b>	396	23.7	394	23.9	<b><u>394</u></b>	<b><u>23.8</u></b>	396	23.7	394	23.9
444.namd	633	12.7	635	12.6	<b><u>634</u></b>	<b><u>12.7</u></b>	633	12.7	635	12.6	<b><u>634</u></b>	<b><u>12.7</u></b>
447.dealII	<b><u>481</u></b>	<b><u>23.8</u></b>	482	23.7	480	23.8	<b><u>481</u></b>	<b><u>23.8</u></b>	482	23.7	480	23.8
450.soplex	<b><u>495</u></b>	<b><u>16.9</u></b>	496	16.8	493	16.9	489	17.0	486	17.1	<b><u>488</u></b>	<b><u>17.1</u></b>
453.povray	281	19.0	<b><u>281</u></b>	<b><u>18.9</u></b>	282	18.9	<b><u>219</u></b>	<b><u>24.3</u></b>	218	24.4	219	24.3
454.calculix	<b><u>459</u></b>	<b><u>18.0</u></b>	461	17.9	458	18.0	444	18.6	<b><u>441</u></b>	<b><u>18.7</u></b>	437	18.9
459.GemsFDTD	<b><u>240</u></b>	<b><u>44.3</u></b>	240	44.2	239	44.4	191	55.5	<b><u>191</u></b>	<b><u>55.4</u></b>	192	55.3
465.tonto	611	16.1	<b><u>611</u></b>	<b><u>16.1</u></b>	608	16.2	468	21.0	<b><u>469</u></b>	<b><u>21.0</u></b>	469	21.0
470.lbm	219	62.9	219	62.7	<b><u>219</u></b>	<b><u>62.8</u></b>	219	62.8	217	63.4	<b><u>217</u></b>	<b><u>63.3</u></b>
481.wrf	424	26.4	419	26.7	<b><u>420</u></b>	<b><u>26.6</u></b>	424	26.4	419	26.7	<b><u>420</u></b>	<b><u>26.6</u></b>
482.sphinx3	688	28.3	673	29.0	<b><u>674</u></b>	<b><u>28.9</u></b>	688	28.3	673	29.0	<b><u>674</u></b>	<b><u>28.9</u></b>

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

## Operating System Notes

```
echo 1 > /proc/sys/vm/zone_reclaim_mode
```

## Platform Notes

Turbo Boost set to Traditional

## General Notes

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

Continued on next page



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## General Notes (Continued)

KMP\_STACKSIZE set to 200M

## 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

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

Continued on next page



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## Base Optimization Flags (Continued)

Benchmarks using both Fortran and C:

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

## 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: `basepeak = yes`

C++ benchmarks:

444.namd: `basepeak = yes`

447.dealIII: `basepeak = yes`

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: basepeak = yes

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.20100603.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.20100603.xml>



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