



# SPEC® CFP2006 Result

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## IBM Corporation

SPECfp®2006 = 45.7

### IBM BladeCenter HX5 (Intel Xeon E7-2830)

SPECfp\_base2006 = 42.4

CPU2006 license: 11

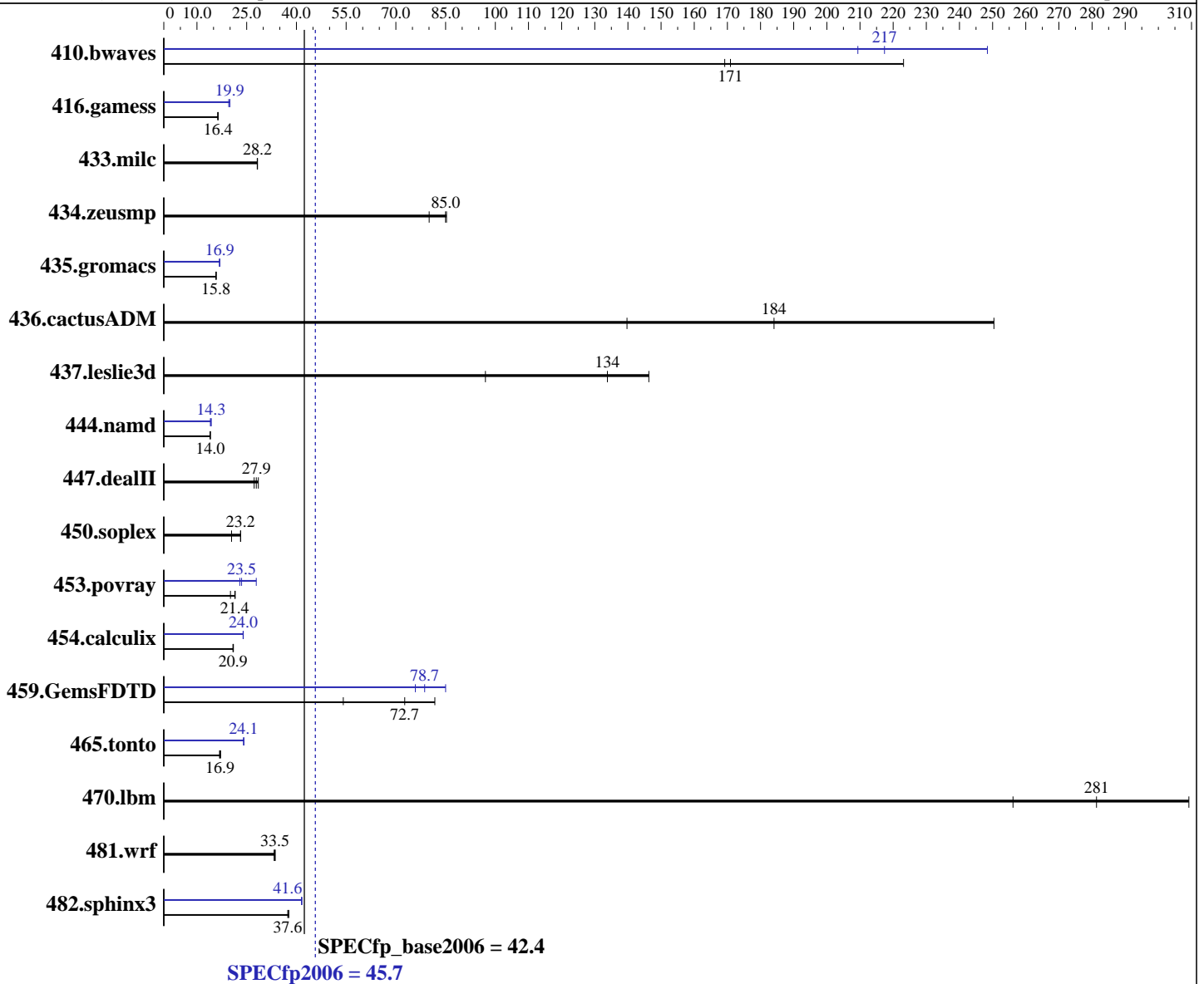
Test date: Apr-2011

Test sponsor: IBM Corporation

Hardware Availability: May-2011

Tested by: IBM Corporation

Software Availability: Apr-2011



### Hardware

CPU Name: Intel Xeon E7-2830  
 CPU Characteristics: Intel Turbo Boost Technology up to 2.4 GHz  
 CPU MHz: 2133  
 FPU: Integrated  
 CPU(s) enabled: 16 cores, 2 chips, 8 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 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: 128 GB (16 x 8 GB 4Rx8 PC3-8500R-7, ECC)  
Disk Subsystem: 2 x 50 GB SSD, 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	<b><u>79.5</u></b>	<b><u>171</u></b>	80.3	169	60.9	223	64.9	209	<b><u>62.5</u></b>	<b><u>217</u></b>	54.7	248
416.gamess	1195	16.4	1204	16.3	<b><u>1196</u></b>	<b><u>16.4</u></b>	1000	19.6	<b><u>984</u></b>	<b><u>19.9</u></b>	983	19.9
433.milc	326	28.2	325	28.3	<b><u>325</u></b>	<b><u>28.2</u></b>	326	28.2	325	28.3	<b><u>325</u></b>	<b><u>28.2</u></b>
434.zeusmp	107	85.3	114	80.0	<b><u>107</u></b>	<b><u>85.0</u></b>	107	85.3	114	80.0	<b><u>107</u></b>	<b><u>85.0</u></b>
435.gromacs	453	15.7	452	15.8	<b><u>453</u></b>	<b><u>15.8</u></b>	<b><u>424</u></b>	<b><u>16.9</u></b>	423	16.9	426	16.8
436.cactusADM	85.5	140	<b><u>64.9</u></b>	<b><u>184</u></b>	47.7	250	85.5	140	<b><u>64.9</u></b>	<b><u>184</u></b>	47.7	250
437.leslie3d	96.9	97.0	<b><u>70.3</u></b>	<b><u>134</u></b>	64.2	146	96.9	97.0	<b><u>70.3</u></b>	<b><u>134</u></b>	64.2	146
444.namd	572	14.0	572	14.0	<b><u>572</u></b>	<b><u>14.0</u></b>	<b><u>562</u></b>	<b><u>14.3</u></b>	571	14.0	562	14.3
447.dealII	<b><u>410</u></b>	<b><u>27.9</u></b>	401	28.5	420	27.3	<b><u>410</u></b>	<b><u>27.9</u></b>	401	28.5	420	27.3
450.soplex	408	20.4	360	23.2	<b><u>360</u></b>	<b><u>23.2</u></b>	408	20.4	360	23.2	<b><u>360</u></b>	<b><u>23.2</u></b>
453.povray	<b><u>248</u></b>	<b><u>21.4</u></b>	247	21.5	265	20.1	191	27.9	232	22.9	<b><u>227</u></b>	<b><u>23.5</u></b>
454.calculix	393	21.0	395	20.9	<b><u>395</u></b>	<b><u>20.9</u></b>	344	24.0	345	23.9	<b><u>344</u></b>	<b><u>24.0</u></b>
459.GemsFDTD	130	81.8	196	54.1	<b><u>146</u></b>	<b><u>72.7</u></b>	<b><u>135</u></b>	<b><u>78.7</u></b>	125	85.0	140	75.9
465.tonto	585	16.8	<b><u>581</u></b>	<b><u>16.9</u></b>	574	17.1	408	24.1	<b><u>408</u></b>	<b><u>24.1</u></b>	408	24.1
470.lbm	<b><u>48.8</u></b>	<b><u>281</u></b>	53.6	256	44.4	309	<b><u>48.8</u></b>	<b><u>281</u></b>	53.6	256	44.4	309
481.wrf	<b><u>333</u></b>	<b><u>33.5</u></b>	336	33.3	333	33.6	<b><u>333</u></b>	<b><u>33.5</u></b>	336	33.3	333	33.6
482.sphinx3	521	37.4	517	37.7	<b><u>518</u></b>	<b><u>37.6</u></b>	469	41.6	<b><u>469</u></b>	<b><u>41.6</u></b>	468	41.6

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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Software Availability: Apr-2011

## 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: basepeak = yes

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

447.dealIII: basepeak = yes

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<b>Test sponsor:</b> IBM Corporation	<b>Hardware Availability:</b> May-2011
<b>Tested by:</b> IBM Corporation	<b>Software Availability:</b> Apr-2011

## Peak Optimization Flags (Continued)

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

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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