



# SPEC<sup>®</sup> CFP2006 Result

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## IBM Corporation

SPECfp<sup>®</sup>2006 = 46.0

### IBM System x3690 X5 (Intel Xeon E7-2850)

SPECfp\_base2006 = 42.3

CPU2006 license: 11

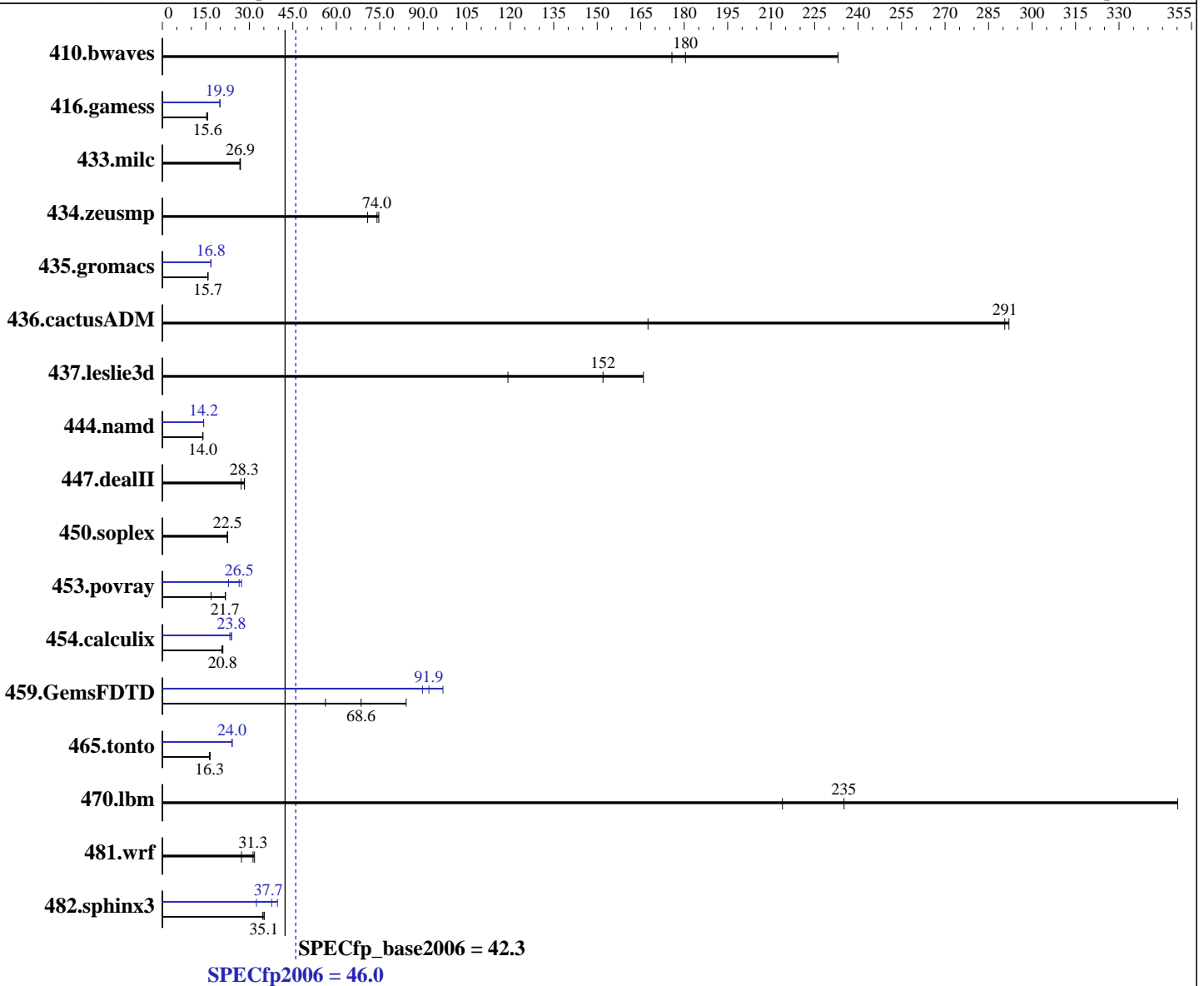
Test sponsor: IBM Corporation

Tested by: IBM Corporation

Test date: May-2011

Hardware Availability: May-2011

Software Availability: Apr-2011



### Hardware

CPU Name: Intel Xeon E7-2850  
 CPU Characteristics: Intel Turbo Boost Technology up to 2.40 GHz  
 CPU MHz: 2000  
 FPU: Integrated  
 CPU(s) enabled: 20 cores, 2 chips, 10 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: 256 GB (32 x 8 GB 4Rx8 PC3-8500R-7, ECC)  
 Disk Subsystem: 1 x 300 GB SAS, 10000 RPM  
 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>75.3</u></b>	<b><u>180</u></b>	77.3	176	58.3	233	<b><u>75.3</u></b>	<b><u>180</u></b>	77.3	176	58.3	233
416.gamess	1283	15.3	1255	15.6	<b><u>1257</u></b>	<b><u>15.6</u></b>	<b><u>985</u></b>	<b><u>19.9</u></b>	987	19.8	984	19.9
433.milc	341	26.9	<b><u>342</u></b>	<b><u>26.9</u></b>	343	26.7	341	26.9	<b><u>342</u></b>	<b><u>26.9</u></b>	343	26.7
434.zeusmp	<b><u>123</u></b>	<b><u>74.0</u></b>	122	74.7	128	70.8	<b><u>123</u></b>	<b><u>74.0</u></b>	122	74.7	128	70.8
435.gromacs	<b><u>454</u></b>	<b><u>15.7</u></b>	453	15.7	455	15.7	425	16.8	426	16.7	<b><u>426</u></b>	<b><u>16.8</u></b>
436.cactusADM	<b><u>41.1</u></b>	<b><u>291</u></b>	40.9	292	71.3	168	<b><u>41.1</u></b>	<b><u>291</u></b>	40.9	292	71.3	168
437.leslie3d	78.9	119	<b><u>61.8</u></b>	<b><u>152</u></b>	56.6	166	78.9	119	<b><u>61.8</u></b>	<b><u>152</u></b>	56.6	166
444.namd	575	13.9	574	14.0	<b><u>574</u></b>	<b><u>14.0</u></b>	<b><u>563</u></b>	<b><u>14.2</u></b>	564	14.2	563	14.2
447.dealII	421	27.2	404	28.3	<b><u>405</u></b>	<b><u>28.3</u></b>	421	27.2	404	28.3	<b><u>405</u></b>	<b><u>28.3</u></b>
450.soplex	370	22.5	373	22.4	<b><u>370</u></b>	<b><u>22.5</u></b>	370	22.5	373	22.4	<b><u>370</u></b>	<b><u>22.5</u></b>
453.povray	316	16.8	244	21.8	<b><u>245</u></b>	<b><u>21.7</u></b>	195	27.3	233	22.8	<b><u>201</u></b>	<b><u>26.5</u></b>
454.calculix	<b><u>397</u></b>	<b><u>20.8</u></b>	395	20.9	402	20.5	346	23.9	<b><u>346</u></b>	<b><u>23.8</u></b>	354	23.3
459.GemsFDTD	189	56.3	126	84.1	<b><u>155</u></b>	<b><u>68.6</u></b>	<b><u>115</u></b>	<b><u>91.9</u></b>	110	96.8	118	89.8
465.tonto	<b><u>603</u></b>	<b><u>16.3</u></b>	598	16.5	605	16.3	409	24.1	<b><u>409</u></b>	<b><u>24.0</u></b>	409	24.0
470.lbm	39.2	350	<b><u>58.4</u></b>	<b><u>235</u></b>	64.2	214	39.2	350	<b><u>58.4</u></b>	<b><u>235</u></b>	64.2	214
481.wrf	351	31.8	409	27.3	<b><u>357</u></b>	<b><u>31.3</u></b>	351	31.8	409	27.3	<b><u>357</u></b>	<b><u>31.3</u></b>
482.sphinx3	555	35.1	563	34.6	<b><u>556</u></b>	<b><u>35.1</u></b>	601	32.4	491	39.7	<b><u>517</u></b>	<b><u>37.7</u></b>

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
'nudev /mnt/hugepages hugetlbfs defaults 0 0' added to /etc/fstab
echo 900 > /proc/sys/vm/nr_hugepages
export HUGETLB_MORECORE=yes
export LD_PRELOAD=/usr/lib64/libhugetlbfs.so
```

## Platform Notes

Load Default BIOS Settings and then change the following  
 Turbo Boost Power Optimization set to Traditional



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## General Notes

OMP\_NUM\_THREADS set to number of cores  
Binaries compiled on RHEL 5.5

## 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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## 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: basepeak = yes

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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