



# SPEC<sup>®</sup> CFP2006 Result

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## IBM Corporation

**SPECfp<sup>®</sup>2006 = 61.8**

### IBM System x3630 M3 (Intel Xeon X5675)

**SPECfp\_base2006 = 57.4**

CPU2006 license: 11

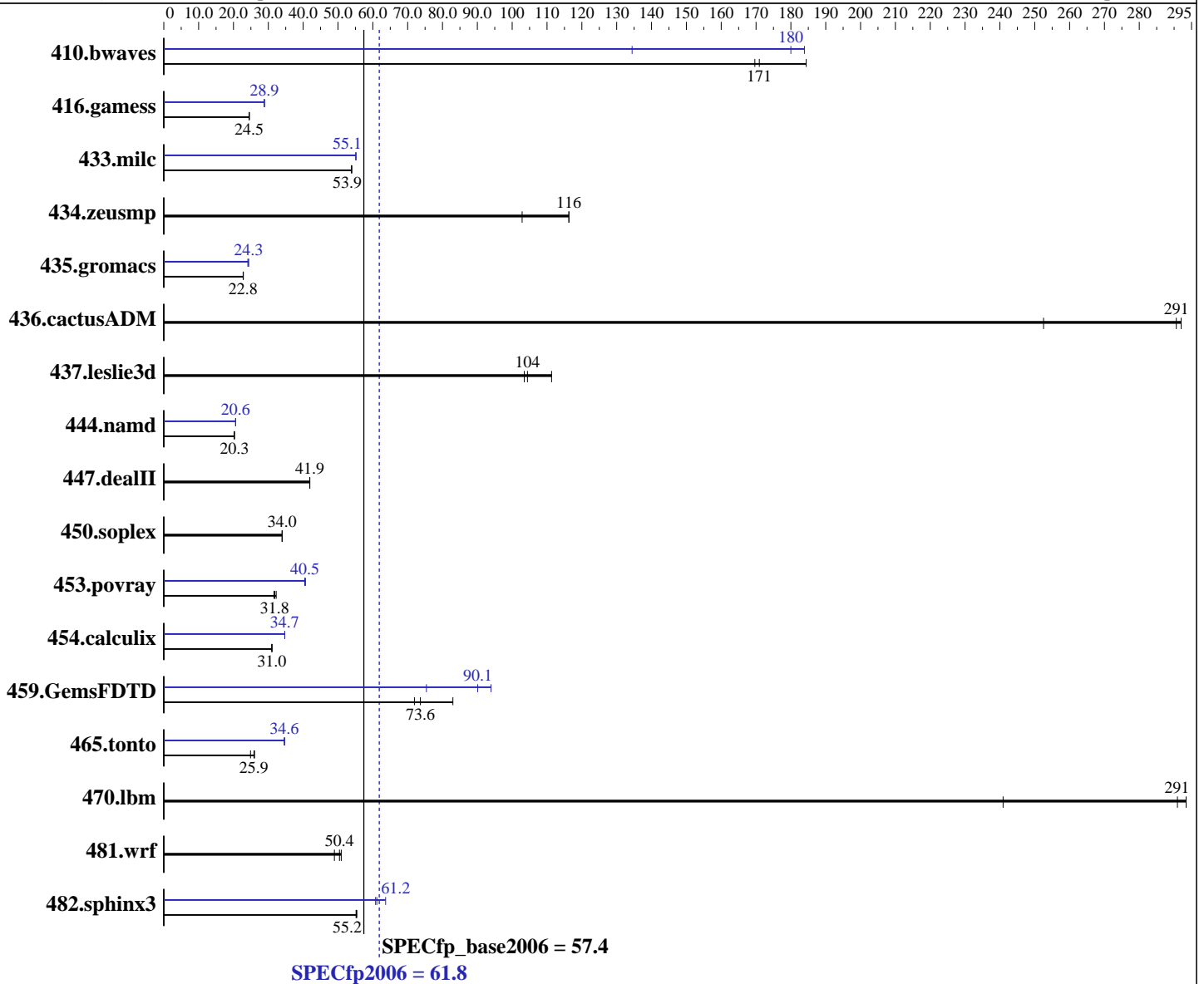
Test date: Feb-2011

Test sponsor: IBM Corporation

Hardware Availability: Feb-2011

Tested by: IBM Corporation

Software Availability: Apr-2011



### Hardware

CPU Name: Intel Xeon X5675  
 CPU Characteristics: Intel Turbo Boost Technology up to 3.46 GHz  
 CPU MHz: 3067  
 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

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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

Continued on next page



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L3 Cache: 12 MB I+D on chip per chip  
 Other Cache: None  
 Memory: 96 GB (12 x 8 GB 2Rx4 PC3-10600R-9, ECC)  
 Disk Subsystem: 1 x 146 GB SAS, 15000 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	73.7	184	80.1	170	<b>79.5</b>	<b>171</b>	<b>75.5</b>	<b>180</b>	73.9	184	101	134
416.gamess	800	24.5	<b>798</b>	<b>24.5</b>	798	24.5	678	28.9	<b>679</b>	<b>28.9</b>	679	28.8
433.milc	170	53.9	<b>170</b>	<b>53.9</b>	170	53.9	167	55.1	<b>167</b>	<b>55.1</b>	166	55.1
434.zeusmp	78.3	116	88.5	103	<b>78.3</b>	<b>116</b>	78.3	116	88.5	103	<b>78.3</b>	<b>116</b>
435.gromacs	313	22.8	<b>313</b>	<b>22.8</b>	313	22.8	<b>294</b>	<b>24.3</b>	293	24.3	296	24.1
436.cactusADM	40.9	292	47.3	253	<b>41.1</b>	<b>291</b>	40.9	292	47.3	253	<b>41.1</b>	<b>291</b>
437.leslie3d	<b>90.1</b>	<b>104</b>	84.4	111	90.8	103	<b>90.1</b>	<b>104</b>	84.4	111	90.8	103
444.namd	396	20.3	397	20.2	<b>396</b>	<b>20.3</b>	389	20.6	<b>389</b>	<b>20.6</b>	389	20.6
447.dealII	273	41.9	<b>273</b>	<b>41.9</b>	273	41.9	273	41.9	<b>273</b>	<b>41.9</b>	273	41.9
450.soplex	246	34.0	245	34.0	<b>245</b>	<b>34.0</b>	246	34.0	245	34.0	<b>245</b>	<b>34.0</b>
453.povray	168	31.6	165	32.3	<b>167</b>	<b>31.8</b>	131	40.5	<b>131</b>	<b>40.5</b>	131	40.7
454.calculix	266	31.0	266	31.0	<b>266</b>	<b>31.0</b>	<b>238</b>	<b>34.7</b>	238	34.7	238	34.7
459.GemsFDTD	<b>144</b>	<b>73.6</b>	147	71.9	128	83.0	<b>118</b>	<b>90.1</b>	113	93.9	141	75.4
465.tonto	<b>380</b>	<b>25.9</b>	395	24.9	378	26.1	284	34.7	<b>284</b>	<b>34.6</b>	284	34.6
470.lbm	46.8	293	<b>47.2</b>	<b>291</b>	57.0	241	46.8	293	<b>47.2</b>	<b>291</b>	57.0	241
481.wrf	228	49.0	219	50.9	<b>222</b>	<b>50.4</b>	228	49.0	219	50.9	<b>222</b>	<b>50.4</b>
482.sphinx3	353	55.2	<b>353</b>	<b>55.2</b>	352	55.4	306	63.7	<b>319</b>	<b>61.2</b>	321	60.8

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
'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

Turbo Mode enabled in BIOS  
 Turbo Boost set to Traditional in BIOS  
 Power C-State enabled in BIOS  
 Data Reuse disabled in BIOS  
 Demand Scrub disabled in BIOS



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## General Notes

OMP\_NUM\_THREADS set to number of cores  
Binaries 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: -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

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

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## Peak Optimization Flags (Continued)

447.deallI: basepeak = yes

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>  
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