



# SPEC® CFP2006 Result

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## IBM Corporation

SPECfp®2006 = **63.4**

## IBM System x3500 M3 (Intel Xeon X5690)

SPECfp\_base2006 = **59.6**

CPU2006 license: 11

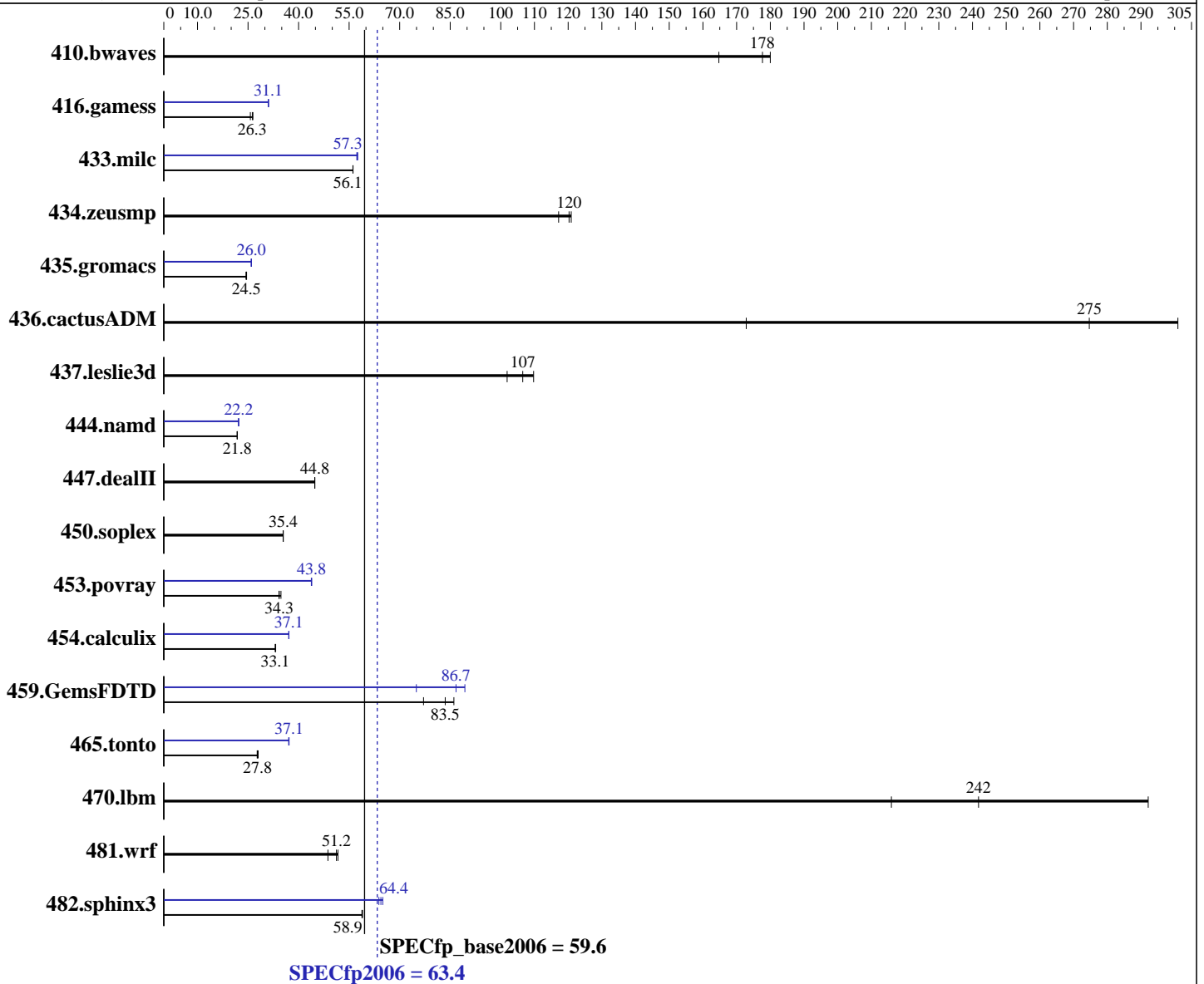
Test sponsor: IBM Corporation

Tested by: IBM Corporation

Test date: Feb-2011

Hardware Availability: Feb-2011

Software Availability: Apr-2011



### Hardware

CPU Name: Intel Xeon X5690  
 CPU Characteristics: Intel Turbo Boost Technology up to 3.73 GHz  
 CPU MHz: 3467  
 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

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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	<b><u>76.5</u></b>	<b><u>178</u></b>	82.5	165	75.5	180	<b><u>76.5</u></b>	<b><u>178</u></b>	82.5	165	75.5	180
416.gamess	740	26.4	762	25.7	<b><u>745</u></b>	<b><u>26.3</u></b>	<b><u>631</u></b>	<b><u>31.1</u></b>	631	31.0	630	31.1
433.milc	163	56.2	164	56.1	<b><u>164</u></b>	<b><u>56.1</u></b>	160	57.3	<b><u>160</u></b>	<b><u>57.3</u></b>	159	57.6
434.zeusmp	<b><u>75.7</u></b>	<b><u>120</u></b>	75.3	121	77.7	117	<b><u>75.7</u></b>	<b><u>120</u></b>	75.3	121	77.7	117
435.gromacs	293	24.4	291	24.6	<b><u>291</u></b>	<b><u>24.5</u></b>	275	26.0	275	25.9	<b><u>275</u></b>	<b><u>26.0</u></b>
436.cactusADM	<b><u>43.5</u></b>	<b><u>275</u></b>	69.1	173	39.7	301	<b><u>43.5</u></b>	<b><u>275</u></b>	69.1	173	39.7	301
437.leslie3d	92.3	102	85.6	110	<b><u>88.2</u></b>	<b><u>107</u></b>	92.3	102	85.6	110	<b><u>88.2</u></b>	<b><u>107</u></b>
444.namd	368	21.8	369	21.8	<b><u>368</u></b>	<b><u>21.8</u></b>	362	22.2	<b><u>361</u></b>	<b><u>22.2</u></b>	361	22.2
447.dealII	<b><u>255</u></b>	<b><u>44.8</u></b>	255	44.8	255	44.8	<b><u>255</u></b>	<b><u>44.8</u></b>	255	44.8	255	44.8
450.soplex	<b><u>235</u></b>	<b><u>35.4</u></b>	235	35.4	235	35.4	<b><u>235</u></b>	<b><u>35.4</u></b>	235	35.4	235	35.4
453.povray	156	34.2	153	34.8	<b><u>155</u></b>	<b><u>34.3</u></b>	<b><u>121</u></b>	<b><u>43.8</u></b>	121	43.9	122	43.8
454.calculix	249	33.1	248	33.2	<b><u>249</u></b>	<b><u>33.1</u></b>	<b><u>222</u></b>	<b><u>37.1</u></b>	223	37.1	222	37.1
459.GemsFDTD	123	86.1	<b><u>127</u></b>	<b><u>83.5</u></b>	138	77.1	<b><u>122</u></b>	<b><u>86.7</u></b>	119	89.4	142	75.0
465.tonto	355	27.7	351	28.0	<b><u>354</u></b>	<b><u>27.8</u></b>	<b><u>265</u></b>	<b><u>37.1</u></b>	266	37.1	265	37.2
470.lbm	<b><u>56.8</u></b>	<b><u>242</u></b>	47.0	292	63.6	216	<b><u>56.8</u></b>	<b><u>242</u></b>	47.0	292	63.6	216
481.wrf	<b><u>218</u></b>	<b><u>51.2</u></b>	216	51.7	229	48.7	<b><u>218</u></b>	<b><u>51.2</u></b>	216	51.7	229	48.7
482.sphinx3	330	59.0	<b><u>331</u></b>	<b><u>58.9</u></b>	331	58.8	<b><u>302</u></b>	<b><u>64.4</u></b>	300	65.0	305	63.8

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  
 CPU 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.dealll: 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: 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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