



# SPEC® CFP2006 Result

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## IBM Corporation

**SPECfp®2006 = 52.1**

### IBM System x3400 M3 (Intel Xeon E5649)

**SPECfp\_base2006 = 48.7**

CPU2006 license: 11

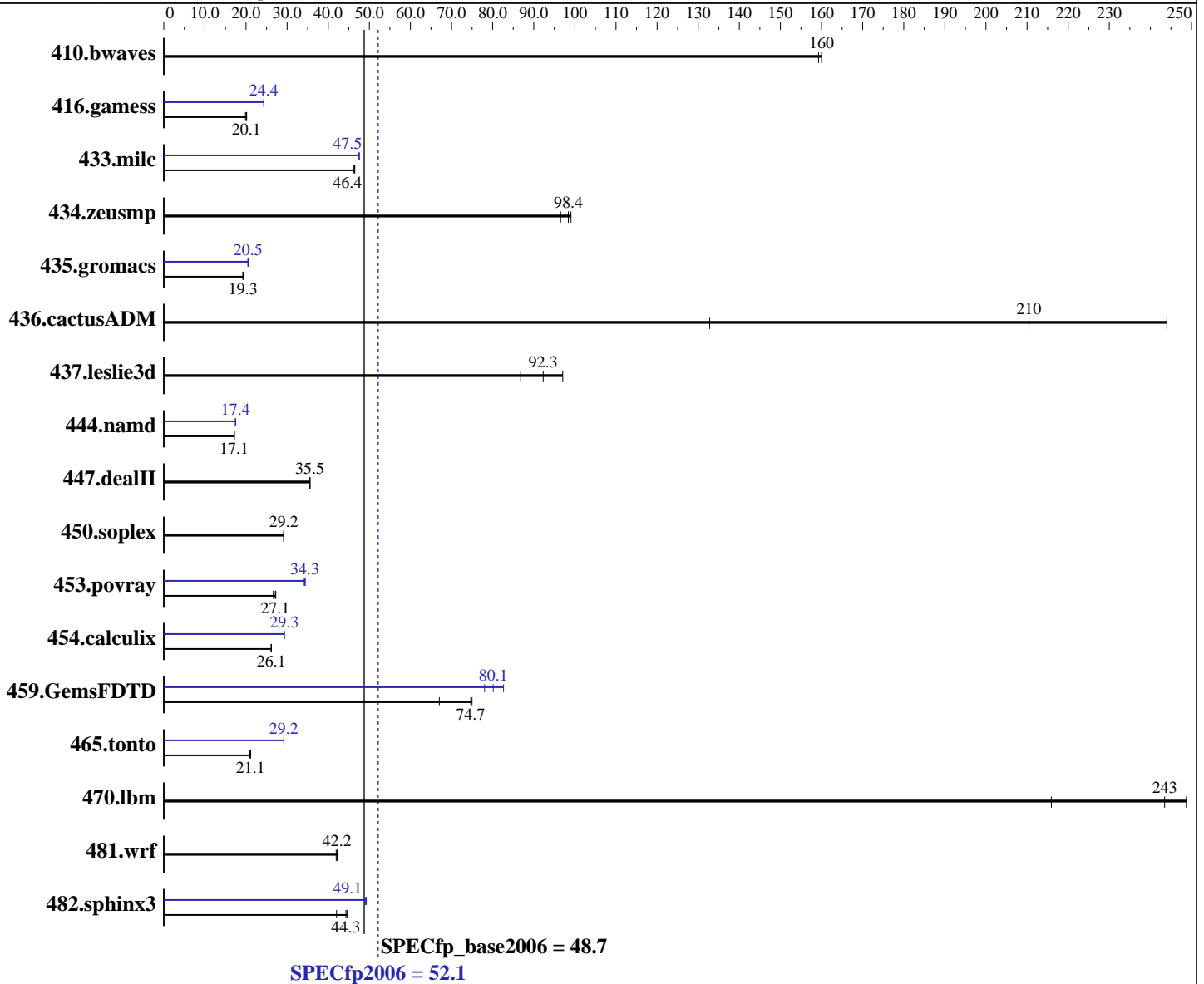
Test date: Mar-2011

Test sponsor: IBM Corporation

Hardware Availability: Feb-2011

Tested by: IBM Corporation

Software Availability: Jan-2011



### Hardware

CPU Name: Intel Xeon E5649  
 CPU Characteristics: Intel Turbo Boost Technology up to 2.93 GHz  
 CPU MHz: 2533  
 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	84.9	160	<b>84.9</b>	<b>160</b>	85.3	159	84.9	160	<b>84.9</b>	<b>160</b>	85.3	159
416.gamess	985	19.9	971	20.2	<b>975</b>	<b>20.1</b>	803	24.4	<b>804</b>	<b>24.4</b>	805	24.3
433.milc	198	46.2	198	46.4	<b>198</b>	<b>46.4</b>	193	47.5	193	47.5	<b>193</b>	<b>47.5</b>
434.zeusmp	94.3	96.5	<b>92.5</b>	<b>98.4</b>	91.9	99.0	94.3	96.5	<b>92.5</b>	<b>98.4</b>	91.9	99.0
435.gromacs	370	19.3	371	19.3	<b>370</b>	<b>19.3</b>	<b>348</b>	<b>20.5</b>	349	20.5	348	20.5
436.cactusADM	<b>56.8</b>	<b>210</b>	90.0	133	49.0	244	<b>56.8</b>	<b>210</b>	90.0	133	49.0	244
437.leslie3d	108	86.8	96.9	97.0	<b>102</b>	<b>92.3</b>	108	86.8	96.9	97.0	<b>102</b>	<b>92.3</b>
444.namd	<b>468</b>	<b>17.1</b>	468	17.1	468	17.1	460	17.4	459	17.5	<b>460</b>	<b>17.4</b>
447.dealII	322	35.6	322	35.5	<b>322</b>	<b>35.5</b>	322	35.6	322	35.5	<b>322</b>	<b>35.5</b>
450.soplex	286	29.2	286	29.2	<b>286</b>	<b>29.2</b>	286	29.2	286	29.2	<b>286</b>	<b>29.2</b>
453.povray	195	27.2	200	26.6	<b>196</b>	<b>27.1</b>	156	34.2	<b>155</b>	<b>34.3</b>	155	34.4
454.calculix	<b>316</b>	<b>26.1</b>	315	26.2	316	26.1	<b>282</b>	<b>29.3</b>	281	29.3	282	29.3
459.GemsFDTD	<b>142</b>	<b>74.7</b>	158	67.0	141	75.0	136	78.0	128	82.6	<b>132</b>	<b>80.1</b>
465.tonto	<b>467</b>	<b>21.1</b>	466	21.1	470	20.9	337	29.2	337	29.2	<b>337</b>	<b>29.2</b>
470.lbm	63.6	216	55.2	249	<b>56.4</b>	<b>243</b>	63.6	216	55.2	249	<b>56.4</b>	<b>243</b>
481.wrf	264	42.3	266	41.9	<b>265</b>	<b>42.2</b>	264	42.3	266	41.9	<b>265</b>	<b>42.2</b>
482.sphinx3	437	44.6	<b>440</b>	<b>44.3</b>	464	42.0	<b>397</b>	<b>49.1</b>	398	48.9	396	49.3

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.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.20110420.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.20110420.xml>



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