



SPEC® CFP2006 Result

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IBM Corporation

SPECfp®2006 = 50.3

IBM BladeCenter HX5 (Intel Xeon E7-4830)

SPECfp_base2006 = 45.7

CPU2006 license: 11

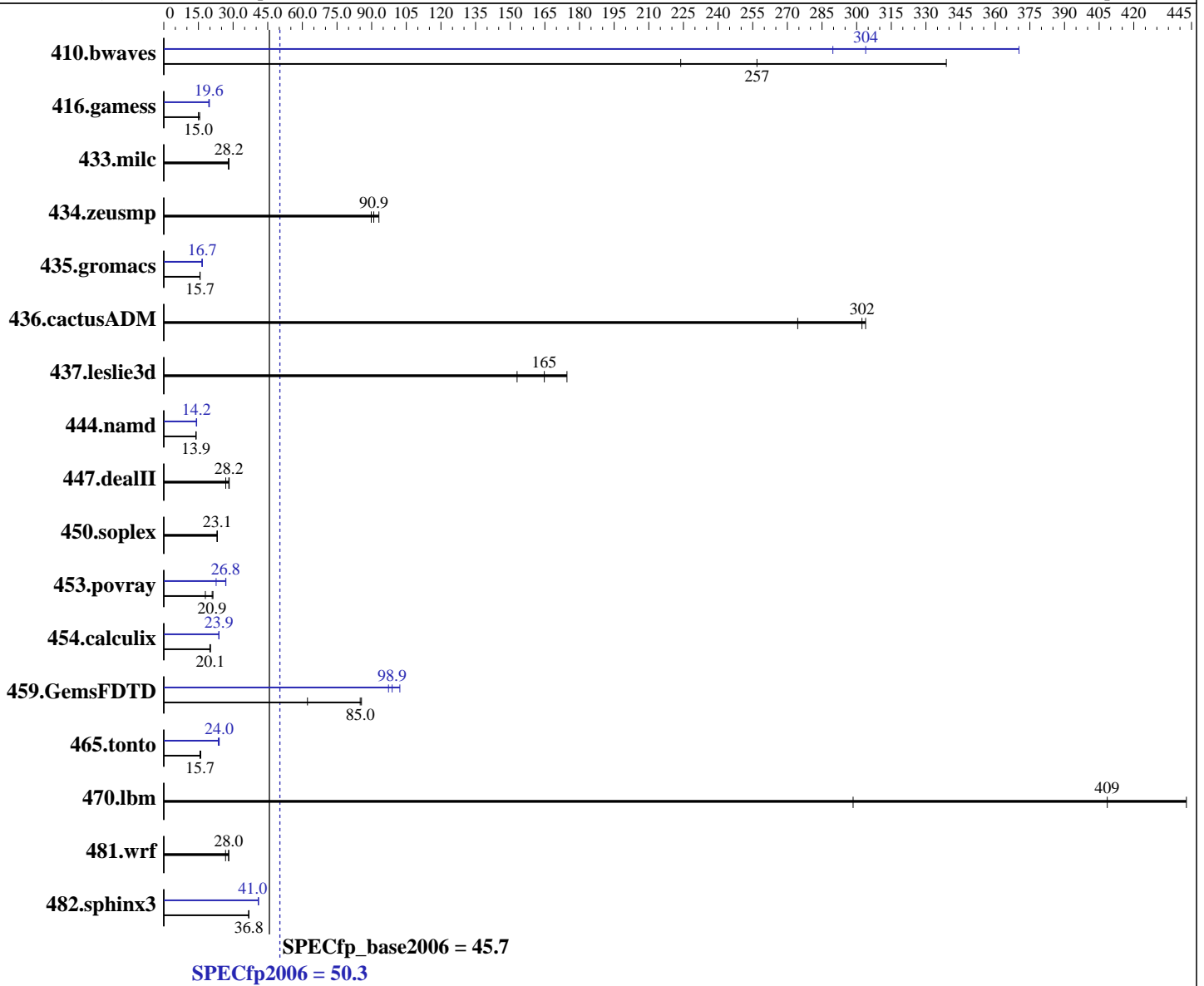
Test sponsor: IBM Corporation

Tested by: IBM Corporation

Test date: Apr-2011

Hardware Availability: May-2011

Software Availability: Apr-2011



Hardware

CPU Name: Intel Xeon E7-4830
 CPU Characteristics: Intel Turbo Boost Technology up to 2.4 GHz
 CPU MHz: 2133
 FPU: Integrated
 CPU(s) enabled: 32 cores, 4 chips, 8 cores/chip, 2 threads/core
 CPU(s) orderable: 1,2,3,4 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: 4 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 | <u>52.9</u> | <u>257</u> | 40.1 | 339 | 60.7 | 224 | <u>44.7</u> | <u>304</u> | 46.9 | 290 | 36.7 | 370 |
| 416.gamess | <u>1302</u> | <u>15.0</u> | 1259 | 15.5 | 1305 | 15.0 | 1004 | 19.5 | <u>1000</u> | <u>19.6</u> | 991 | 19.8 |
| 433.milc | <u>326</u> | <u>28.2</u> | 326 | 28.2 | 328 | 28.0 | <u>326</u> | <u>28.2</u> | 326 | 28.2 | 328 | 28.0 |
| 434.zeusmp | 97.7 | 93.1 | 101 | 89.8 | <u>100</u> | <u>90.9</u> | 97.7 | 93.1 | 101 | 89.8 | <u>100</u> | <u>90.9</u> |
| 435.gromacs | <u>455</u> | <u>15.7</u> | 457 | 15.6 | 455 | 15.7 | 427 | 16.7 | <u>427</u> | <u>16.7</u> | 434 | 16.5 |
| 436.cactusADM | <u>39.5</u> | <u>302</u> | 43.5 | 274 | 39.3 | 304 | <u>39.5</u> | <u>302</u> | 43.5 | 274 | 39.3 | 304 |
| 437.leslie3d | <u>57.1</u> | <u>165</u> | 53.8 | 175 | 61.5 | 153 | <u>57.1</u> | <u>165</u> | 53.8 | 175 | 61.5 | 153 |
| 444.namd | 574 | 14.0 | <u>575</u> | <u>13.9</u> | 577 | 13.9 | 563 | 14.2 | 571 | 14.1 | <u>564</u> | <u>14.2</u> |
| 447.dealII | <u>406</u> | <u>28.2</u> | 426 | 26.8 | 404 | 28.3 | <u>406</u> | <u>28.2</u> | 426 | 26.8 | 404 | 28.3 |
| 450.soplex | 360 | 23.2 | 362 | 23.1 | <u>361</u> | <u>23.1</u> | 360 | 23.2 | 362 | 23.1 | <u>361</u> | <u>23.1</u> |
| 453.povray | <u>254</u> | <u>20.9</u> | 250 | 21.3 | 296 | 18.0 | <u>199</u> | <u>26.8</u> | 235 | 22.7 | 198 | 26.9 |
| 454.calculix | 413 | 20.0 | 408 | 20.2 | <u>410</u> | <u>20.1</u> | <u>346</u> | <u>23.9</u> | 346 | 23.9 | 345 | 23.9 |
| 459.GemsFDTD | 124 | 85.6 | <u>125</u> | <u>85.0</u> | 171 | 62.2 | <u>107</u> | <u>98.9</u> | 109 | 97.3 | 104 | 102 |
| 465.tonto | 628 | 15.7 | 614 | 16.0 | <u>626</u> | <u>15.7</u> | <u>411</u> | <u>24.0</u> | 417 | 23.6 | 410 | 24.0 |
| 470.lbm | 31.0 | 443 | <u>33.6</u> | <u>409</u> | 46.0 | 298 | 31.0 | 443 | <u>33.6</u> | <u>409</u> | 46.0 | 298 |
| 481.wrf | 397 | 28.2 | 418 | 26.7 | <u>399</u> | <u>28.0</u> | 397 | 28.2 | 418 | 26.7 | <u>399</u> | <u>28.0</u> |
| 482.sphinx3 | 530 | 36.7 | <u>529</u> | <u>36.8</u> | 529 | 36.8 | 476 | 40.9 | 476 | 41.0 | <u>476</u> | <u>41.0</u> |

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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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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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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