



SPEC® CFP2006 Result

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IBM Corporation

SPECfp®_rate2006 = 317

IBM BladeCenter HX5 (Intel Xeon E7-2850)

SPECfp_rate_base2006 = 305

CPU2006 license: 11

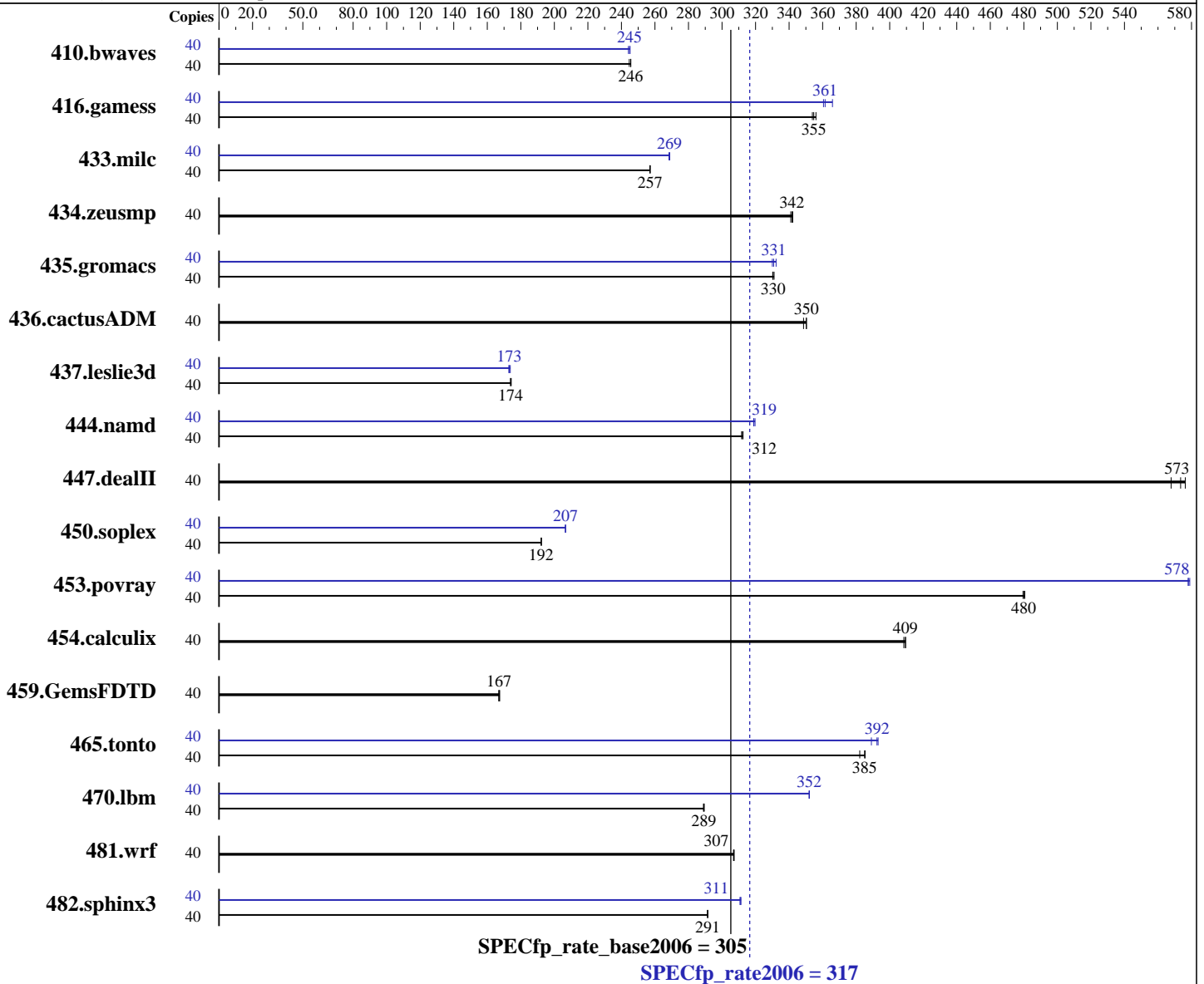
Test date: Jun-2011

Test sponsor: IBM Corporation

Hardware Availability: May-2011

Tested by: IBM Corporation

Software Availability: Jan-2011



Hardware

CPU Name: Intel Xeon E7-2850
 CPU Characteristics: Intel Turbo Boost Technology up to 2.4 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 12.0.1.116 Build 20101116
 Auto Parallel: No
 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: 128 GB (16 x 8 GB 4Rx8 PC3-8500R-7, ECC)
Disk Subsystem: 2 x 50 GB SSD, RAID 0
Other Hardware: None

Peak Pointers: 32/64-bit
Other Software: None

Results Table

| Benchmark | Base | | | | | | | Peak | | | | | | |
|---------------|--------|-------------|------------|-------------|------------|-------------|------------|--------|-------------|------------|-------------|------------|-------------|------------|
| | Copies | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Copies | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio |
| 410.bwaves | 40 | 2213 | 246 | <u>2214</u> | <u>246</u> | 2222 | 245 | 40 | 2226 | 244 | 2217 | 245 | <u>2220</u> | <u>245</u> |
| 416.gamess | 40 | <u>2208</u> | <u>355</u> | 2213 | 354 | 2200 | 356 | 40 | 2172 | 361 | <u>2167</u> | <u>361</u> | 2141 | 366 |
| 433.milc | 40 | 1428 | 257 | <u>1428</u> | <u>257</u> | 1429 | 257 | 40 | <u>1367</u> | <u>269</u> | 1366 | 269 | 1368 | 268 |
| 434.zeusmp | 40 | <u>1065</u> | <u>342</u> | 1067 | 341 | 1064 | 342 | 40 | <u>1065</u> | <u>342</u> | 1067 | 341 | 1064 | 342 |
| 435.gromacs | 40 | 865 | 330 | <u>864</u> | <u>330</u> | 863 | 331 | 40 | 860 | 332 | <u>863</u> | <u>331</u> | 865 | 330 |
| 436.cactusADM | 40 | 1371 | 349 | <u>1365</u> | <u>350</u> | 1364 | 350 | 40 | 1371 | 349 | <u>1365</u> | <u>350</u> | 1364 | 350 |
| 437.leslie3d | 40 | <u>2161</u> | <u>174</u> | 2157 | 174 | 2163 | 174 | 40 | 2164 | 174 | 2175 | 173 | <u>2171</u> | <u>173</u> |
| 444.namd | 40 | 1029 | 312 | 1026 | 313 | <u>1028</u> | <u>312</u> | 40 | <u>1006</u> | <u>319</u> | 1003 | 320 | 1006 | 319 |
| 447.dealII | 40 | 806 | 568 | <u>798</u> | <u>573</u> | 794 | 576 | 40 | 806 | 568 | <u>798</u> | <u>573</u> | 794 | 576 |
| 450.soplex | 40 | <u>1736</u> | <u>192</u> | 1735 | 192 | 1736 | 192 | 40 | 1614 | 207 | 1615 | 207 | <u>1614</u> | <u>207</u> |
| 453.povray | 40 | 444 | 480 | 443 | 481 | <u>443</u> | <u>480</u> | 40 | 368 | 578 | <u>368</u> | <u>578</u> | 368 | 579 |
| 454.calculix | 40 | <u>806</u> | <u>409</u> | 806 | 409 | 808 | 408 | 40 | <u>806</u> | <u>409</u> | 806 | 409 | 808 | 408 |
| 459.GemsFDTD | 40 | <u>2540</u> | <u>167</u> | 2544 | 167 | 2535 | 167 | 40 | <u>2540</u> | <u>167</u> | 2544 | 167 | 2535 | 167 |
| 465.tonto | 40 | 1030 | 382 | 1021 | 385 | <u>1022</u> | <u>385</u> | 40 | 1001 | 393 | 1012 | 389 | <u>1003</u> | <u>392</u> |
| 470.lbm | 40 | 1899 | 289 | <u>1901</u> | <u>289</u> | 1902 | 289 | 40 | 1562 | 352 | 1561 | 352 | <u>1561</u> | <u>352</u> |
| 481.wrf | 40 | 1454 | 307 | 1456 | 307 | <u>1456</u> | <u>307</u> | 40 | 1454 | 307 | 1456 | 307 | <u>1456</u> | <u>307</u> |
| 482.sphinx3 | 40 | 2676 | 291 | 2674 | 292 | <u>2675</u> | <u>291</u> | 40 | 2504 | 311 | 2508 | 311 | <u>2508</u> | <u>311</u> |

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

Submit Notes

The config file option 'submit' was used.
numactl was used to bind copies to the cores

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 18000 > /proc/sys/vm/nr_hugepages
export HUGETLB_MORECORE=yes
export LD_PRELOAD=/usr/lib64/libhugetlbfs.so
```



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Platform Notes

BIOS Settings:
Turbo Boost Power Optimization set to Traditional

General Notes

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 -ansi-alias

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Base Optimization Flags (Continued)

C++ benchmarks:

-xSSE4.2 -ipo -O3 -no-prec-div -static -ansi-alias

Fortran benchmarks:

-xSSE4.2 -ipo -O3 -no-prec-div -static

Benchmarks using both Fortran and C:

-xSSE4.2 -ipo -O3 -no-prec-div -static -ansi-alias

Peak Compiler Invocation

C benchmarks (except as noted below):

icc -m64

482.sphinx3: icc -m32

C++ benchmarks (except as noted below):

icpc -m64

450.soplex: icpc -m32

Fortran benchmarks:

ifort -m64

Benchmarks using both Fortran and C:

icc -m64 ifort -m64

Peak 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.deallI: -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



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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

470.lbm: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
-no-prec-div(pass 2) -prof-use(pass 2) -opt-malloc-options=3
-ansi-alias -opt-prefetch -static -auto-ilp32

482.sphinx3: -xSSE4.2 -ipo -O3 -no-prec-div -unroll2

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.dealII: basepeak = yes

450.soplex: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
-no-prec-div(pass 2) -prof-use(pass 2) -opt-malloc-options=3
-B /usr/share/libhugetlbfs/ -Wl,-hugetlbfs-link=BDT

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(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
-no-prec-div(pass 2) -prof-use(pass 2) -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: -xSSE4.2 -ipo -O3 -no-prec-div
-B /usr/share/libhugetlbfs/ -Wl,-melf_x86_64 -Wl,-hugetlbfs-link=BDT

459.GemsFDTD: basepeak = yes

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) -unroll4 -auto
-inline-calloc -opt-malloc-options=3
-B /usr/share/libhugetlbfs/ -Wl,-melf_x86_64 -Wl,-hugetlbfs-link=BDT

Benchmarks using both Fortran and C:

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Peak Optimization Flags (Continued)

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) -opt-prefetch
-static -auto-ilp32

436.cactusADM: basepeak = yes

454.calculix: basepeak = yes

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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For other inquiries, please contact webmaster@spec.org.

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