# SPEC® CFP2006 Result

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## SGI

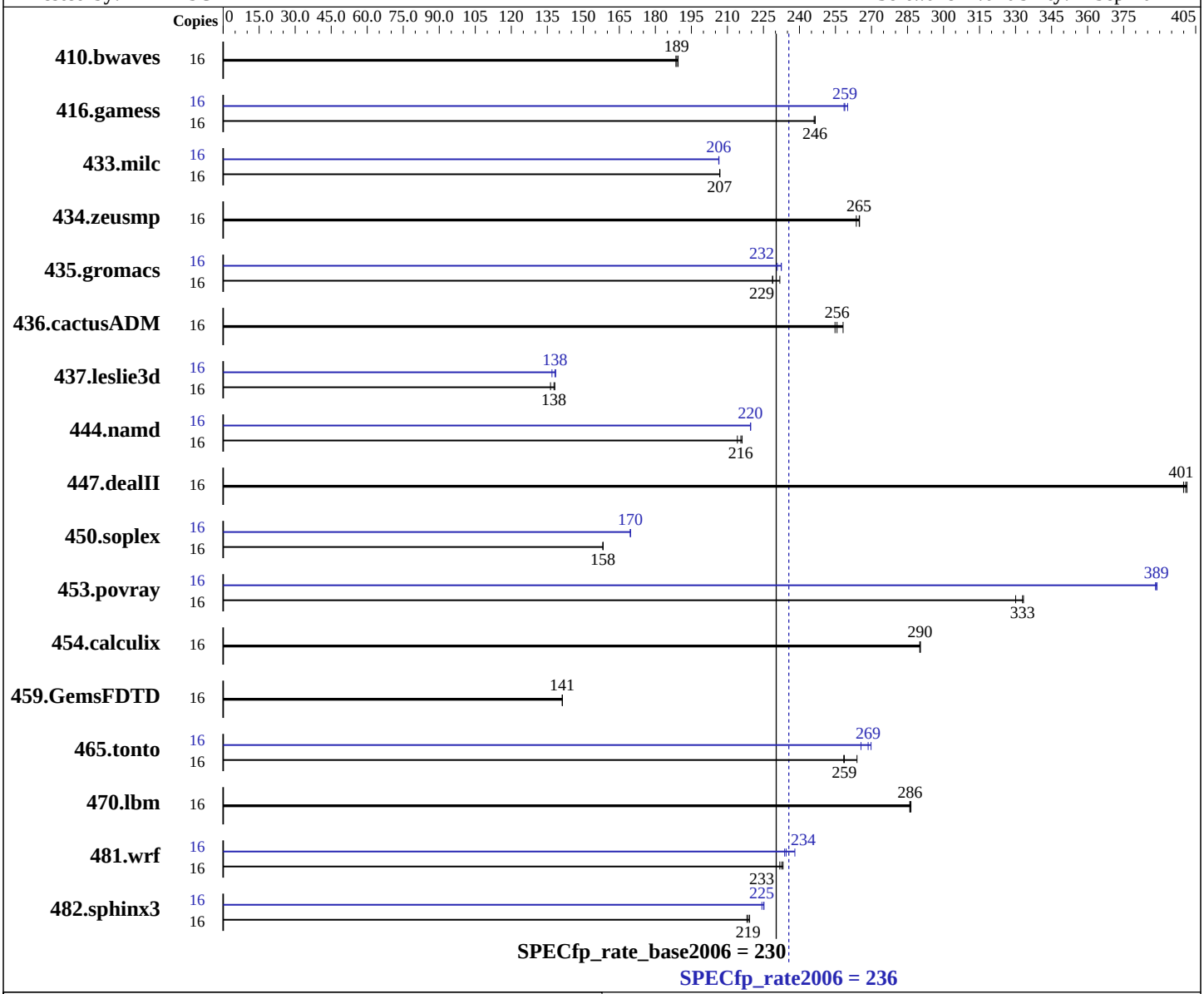
SGI Rackable C2005-TY3 (Intel Xeon X5687, 3.60 GHz)

SPECfp®_rate2006 = 236

SPECfp_rate_base2006 = 230

**CPU2006 license:** 4
**Test sponsor:** SGI
**Tested by:** SGI

**Test date:** Aug-2011
**Hardware Availability:** Feb-2011
**Software Availability:** Sep-2011




## Hardware

| | |
|---|---|
| CPU Name: | Intel Xeon X5687 |
| CPU Characteristics: | Intel Turbo Boost Technology up to 3.86 GHz |
| CPU MHz: | 3600 |
| FPU: | Integrated |
| CPU(s) enabled: | 8 cores, 2 chips, 4 cores/chip, 2 threads/core |
| CPU(s) orderable: | 1,2 chip |
| 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 (x86_64) SP1, kernel 2.6.32.36-0.5-default |
| Compiler: | Intel C++ and Fortran Compiler XE for applications running on IA32 and Intel 64 12.1.0.225 Build 20110803 |
| Auto Parallel: | No |
| File System: | xfs |
| 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: 48 GB (6 x 8 GB 2Rx4 PC3-10600R-9, ECC)
Disk Subsystem: 876 GB RAID 5
6 x 146 GB SAS, 15000 RPM
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 | 16 | 1148 | 189 | **1151** | **189** | 1153 | 189 | 16 | 1148 | 189 | **1151** | **189** | 1153 | 189 |
| 416.gamess | 16 | 1271 | 247 | **1271** | **246** | 1273 | 246 | 16 | 1205 | 260 | **1210** | **259** | 1212 | 259 |
| 433.milc | 16 | 710 | 207 | 710 | 207 | **710** | **207** | 16 | **712** | **206** | 711 | 206 | 712 | 206 |
| 434.zeusmp | 16 | 549 | 265 | **550** | **265** | 552 | 264 | 16 | 549 | 265 | **550** | **265** | 552 | 264 |
| 435.gromacs | 16 | 499 | 229 | 493 | 232 | **499** | **229** | 16 | 491 | 232 | 495 | 231 | **492** | **232** |
| 436.cactusADM | 16 | 750 | 255 | **748** | **256** | 741 | 258 | 16 | 750 | 255 | **748** | **256** | 741 | 258 |
| 437.leslie3d | 16 | **1092** | **138** | 1103 | 136 | 1089 | 138 | 16 | 1098 | 137 | **1088** | **138** | 1086 | 138 |
| 444.namd | 16 | **595** | **216** | 599 | 214 | 594 | 216 | 16 | 584 | 220 | **584** | **220** | 584 | 220 |
| 447.dealII | 16 | **457** | **401** | 458 | 400 | 456 | 401 | 16 | **457** | **401** | 458 | 400 | 456 | 401 |
| 450.soplex | 16 | 843 | 158 | **844** | **158** | 844 | 158 | 16 | 787 | 170 | **787** | **170** | 787 | 170 |
| 453.povray | 16 | **256** | **333** | 258 | 330 | 255 | 333 | 16 | 219 | 388 | **219** | **389** | 219 | 389 |
| 454.calculix | 16 | 455 | 290 | **455** | **290** | 455 | 290 | 16 | 455 | 290 | **455** | **290** | 455 | 290 |
| 459.GemsFDTD | 16 | 1202 | 141 | **1202** | **141** | 1202 | 141 | 16 | 1202 | 141 | **1202** | **141** | 1202 | 141 |
| 465.tonto | 16 | **609** | **259** | 609 | 258 | 596 | 264 | 16 | **586** | **269** | 584 | 270 | 593 | 266 |
| 470.lbm | 16 | 768 | 286 | **769** | **286** | 769 | 286 | 16 | 768 | 286 | **769** | **286** | 769 | 286 |
| 481.wrf | 16 | 766 | 233 | **768** | **233** | 771 | 232 | 16 | 764 | 234 | 751 | 238 | **762** | **234** |
| 482.sphinx3 | 16 | 1430 | 218 | 1422 | 219 | **1426** | **219** | 16 | **1385** | **225** | 1385 | 225 | 1390 | 224 |

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
```

## General Notes

```
Environment variables set by runspec before the start of the run:
LD_LIBRARY_PATH = "/scratch/cma/cpu2006-1.1/smartheap:/scratch/cma/cpu2006-1.1/ic12.1-libs/ia32/:/scratch/cma/cpu2006-1.1/ic12.1-libs/intel64"

 Binaries compiled on a system with 1x Core i7-860 CPU + 8GB
 memory using RHEL5.5 with binutils-2.17.50.0.6-14.el5
 Stack size set to unlimited using "ulimit -s unlimited"
 runspec command invoked through numactl i.e.:
 numactl --interleave=all runspec <etc>
```

## 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 -opt-prefetch -auto-p32
-ansi-alias -opt-mem-layout-trans=3

C++ benchmarks:
-xSSE4.2 -ipo -O3 -no-prec-div -static -opt-prefetch -auto-p32
-ansi-alias -opt-mem-layout-trans=3

Fortran benchmarks:
-xSSE4.2 -ipo -O3 -no-prec-div -static -opt-prefetch

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## Base Optimization Flags (Continued)

Benchmarks using both Fortran and C:
`-xSSE4.2 -ipo -O3 -no-prec-div -static -opt-prefetch -auto-p32 -ansi-alias -opt-mem-layout-trans=3`

## 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.dealII: `-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`

## Peak Optimization Flags

C benchmarks:

Continued on next page

## Peak Optimization Flags (Continued)

433.milc: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -opt-mem-layout-trans=3(pass 2) -prof-use(pass 2) -static -auto-ilp32

470.lbm: basepeak = yes

482.sphinx3: -xSSE4.2 -ipo -O3 -no-prec-div -opt-mem-layout-trans=3 -unroll2

C++ benchmarks:

444.namd: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -opt-mem-layout-trans=3(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) -opt-mem-layout-trans=3(pass 2) -prof-use(pass 2) -opt-malloc-options=3

453.povray: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -opt-mem-layout-trans=3(pass 2) -prof-use(pass 2) -unroll4 -ansi-alias

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: -xSSE4.2 -ipo -O3 -no-prec-div -static -opt-prefetch

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

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) -opt-mem-layout-trans=3(pass 2) -prof-use(pass 2) -opt-prefetch -static -auto-ilp32

Continued on next page

## Peak Optimization Flags (Continued)

436.cactusADM: `basepeak = yes`

454.calculix: `basepeak = yes`

481.wrf: `-xSSE4.2 -ipo -O3 -no-prec-div -static -auto-ilp32`

The flags files that were used to format this result can be browsed at
`http://www.spec.org/cpu2006/flags/Intel-ic12.1-linux64.html`
`http://www.spec.org/cpu2006/flags/platform.html`

You can also download the XML flags sources by saving the following links:
`http://www.spec.org/cpu2006/flags/Intel-ic12.1-linux64.xml`
`http://www.spec.org/cpu2006/flags/platform.xml`


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