# SPEC® CFP2006 Result

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## Oracle Corporation

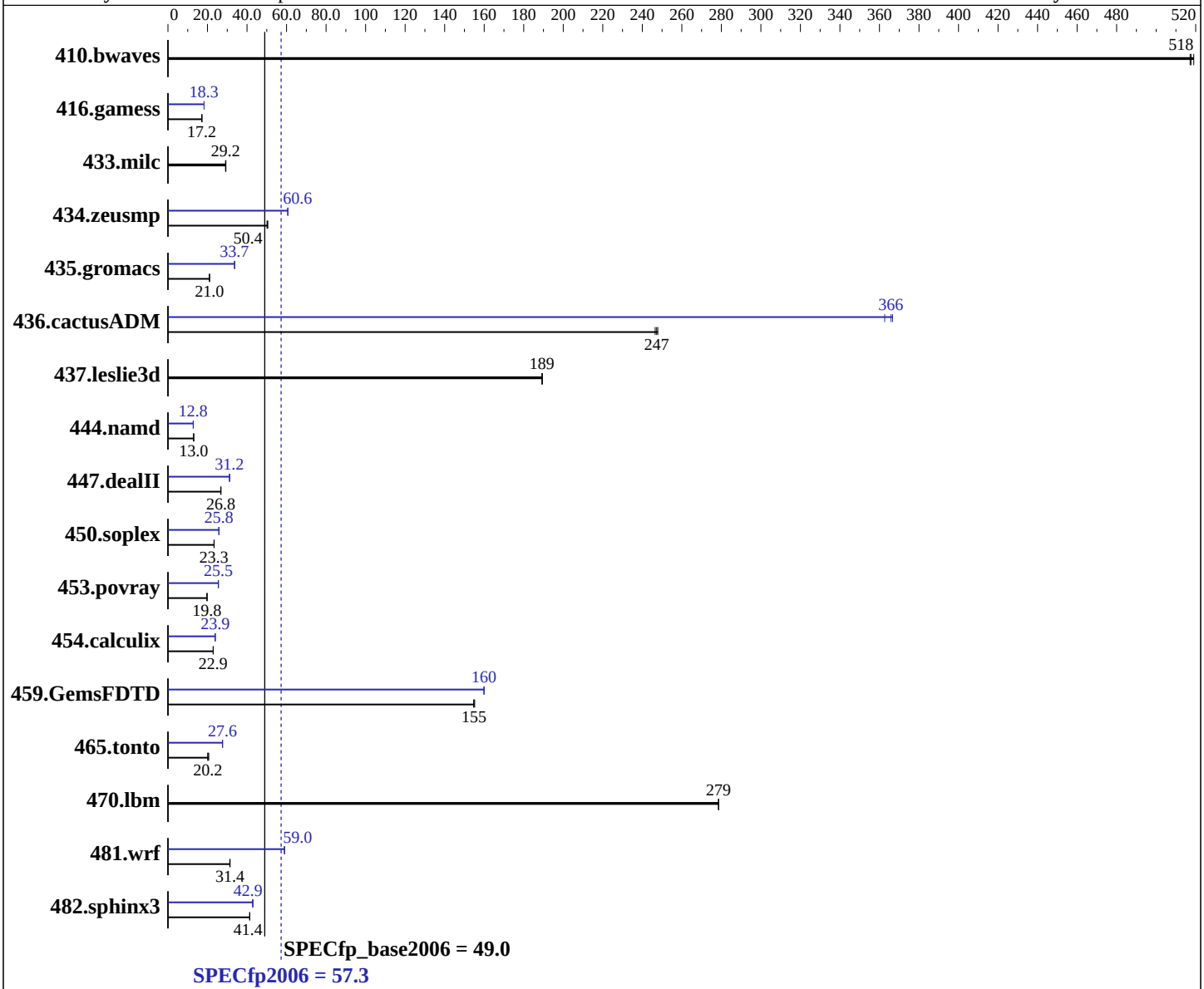
## Sun Fire X4470 (Intel Xeon X7560 2.26GHz)

SPECfp®2006 = 57.3

SPECfp_base2006 = 49.0

**CPU2006 license:** 6
**Test sponsor:** Oracle Corporation
**Tested by:** Oracle Corporation

**Test date:** Jun-2010
**Hardware Availability:** Aug-2010
**Software Availability:** Jun-2010




### Hardware

| | |
|---|---|
| CPU Name: | Intel Xeon X7560 |
| CPU Characteristics: | Intel Turbo Boost Technology up to 2.67 GHz |
| CPU MHz: | 2266 |
| FPU: | Integrated |
| CPU(s) enabled: | 32 cores, 4 chips, 8 cores/chip, 2 threads/core |
| CPU(s) orderable: | 2,4 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: | Oracle Solaris 10 10/09 |
| Compiler: | Oracle Solaris Studio Express 6/10 |
| Auto Parallel: | Yes |
| File System: | zfs |
| System State: | Default |
| Base Pointers: | 64-bit |
| Peak Pointers: | 32/64-bit |
| Other Software: | Apache C++ Standard Library V4.2.1 |

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L3 Cache: 24 MB I+D on chip per chip
Other Cache: None
Memory: 256 GB (64x4GB, DDR3-1066 CL7 dual-rank ECC Reg)
Disk Subsystem: 1 x 500 GB, SATA, 7200 RPM
Other Hardware: None

## Results Table

| Benchmark | Base | | | | | | Peak | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio |
| 410.bwaves | 26.3 | 517 | 26.2 | 519 | **26.3** | **518** | 26.3 | 517 | 26.2 | 519 | **26.3** | **518** |
| 416.gamess | **1142** | **17.2** | 1142 | 17.1 | 1142 | 17.2 | 1071 | 18.3 | **1070** | **18.3** | 1070 | 18.3 |
| 433.milc | 313 | 29.3 | **315** | **29.2** | 315 | 29.2 | 313 | 29.3 | **315** | **29.2** | 315 | 29.2 |
| 434.zeusmp | 180 | 50.5 | 182 | 50.1 | **180** | **50.4** | 150 | 60.6 | 150 | 60.7 | **150** | **60.6** |
| 435.gromacs | **340** | **21.0** | 341 | 21.0 | 339 | 21.1 | **212** | **33.7** | 212 | 33.7 | 212 | 33.7 |
| 436.cactusADM | 48.5 | 247 | 48.2 | 248 | **48.3** | **247** | **32.7** | **366** | 33.0 | 363 | 32.6 | 367 |
| 437.leslie3d | **49.7** | **189** | 49.6 | 189 | 49.7 | 189 | **49.7** | **189** | 49.6 | 189 | 49.7 | 189 |
| 444.namd | 617 | 13.0 | 617 | 13.0 | **617** | **13.0** | 627 | 12.8 | 627 | 12.8 | **627** | **12.8** |
| 447.dealII | 427 | 26.8 | **427** | **26.8** | 428 | 26.7 | 368 | 31.1 | 367 | 31.2 | **367** | **31.2** |
| 450.soplex | 358 | 23.3 | 357 | 23.4 | **358** | **23.3** | 324 | 25.8 | 323 | 25.8 | **324** | **25.8** |
| 453.povray | 269 | 19.8 | **269** | **19.8** | 269 | 19.8 | 208 | 25.6 | 209 | 25.4 | **209** | **25.5** |
| 454.calculix | **360** | **22.9** | 360 | 22.9 | 361 | 22.9 | 345 | 23.9 | 345 | 23.9 | **345** | **23.9** |
| 459.GemsFDTD | **68.5** | **155** | 68.4 | 155 | 68.6 | 155 | **66.3** | **160** | 66.3 | 160 | 66.4 | 160 |
| 465.tonto | 489 | 20.1 | **486** | **20.2** | 477 | 20.6 | 356 | 27.6 | 357 | 27.6 | **356** | **27.6** |
| 470.lbm | 49.3 | 279 | **49.3** | **279** | 49.3 | 279 | 49.3 | 279 | **49.3** | **279** | 49.3 | 279 |
| 481.wrf | **356** | **31.4** | 356 | 31.4 | 357 | 31.3 | 189 | 59.0 | **189** | **59.0** | 190 | 58.9 |
| 482.sphinx3 | 471 | 41.4 | 471 | 41.3 | **471** | **41.4** | **454** | **42.9** | 454 | 43.0 | 455 | 42.9 |

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

## Compiler Invocation Notes

```
The Apache C++ Standard Library V4.2.1 was installed from
http://stdcxx.apache.org/download.html using:
    alias gmake=specmake
    gmake BUILDTYPE=8D CONFIG=sunpro.config
```

## Operating System Notes

```
ulimit -s unlimited  (shell)

/etc/system parameters
   tune_t_fsflushr=10
   autoup=900
   zfs:zfs_arc_max = 0x10000000
   lpg_alloc_prefer=1
```

## Platform Notes

```
    Default BIOS settings used.
```

## General Notes

```
Environment variables set by runspec before the start of the run:
OMP_NUM_THREADS = "32"
SUNW_MP_PROCBIND = "0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17
    18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37
    38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57
    58 59 60 61 62 63"
SUNW_MP_THR_IDLE = "SPIN"

447.dealII (peak): "apache_stdcxx_4_2_1" src.alt was used.

447.dealII (base): "apache_stdcxx_4_2_1" src.alt was used.
```

# Base Compiler Invocation

C benchmarks:
`cc`

C++ benchmarks:
`CC`

Fortran benchmarks:
`f90`

Benchmarks using both Fortran and C:
`cc f90`

# 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
436.cactusADM: -DSPEC_CPU_LP64
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

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## Base Portability Flags (Continued)

454.calculix: -DSPEC_CPU_LP64
459.GemsFDTD: -DSPEC_CPU_LP64
465.tonto: -DSPEC_CPU_LP64
470.lbm: -DSPEC_CPU_LP64
481.wrf: -DSPEC_CPU_LP64 -DSPEC_CPU_WORDS_LITTLEENDIAN
482.sphinx3: -DSPEC_CPU_LP64

## Base Optimization Flags

C benchmarks:
-fast -xipo=2 -m64 -xreduction -xautopar

C++ benchmarks:
-fast -xipo=2 -m64 -library=no%Cstd -I/data1/stdcxx-4.2.1/include
-I/data1/stdcxx-4.2.1/build/include -L/data1/stdcxx-4.2.1/build/lib
-R/data1/stdcxx-4.2.1/build/lib -lstd8D

Fortran benchmarks:
-fast -xipo=2 -m64 -xreduction -xautopar

Benchmarks using both Fortran and C:
-fast(cc) -xipo=2 -m64 -xreduction -xautopar -fast(f90)

## Base Other Flags

C benchmarks:
-V -# -xjobs=64

C++ benchmarks:
-verbose=diags,version -xjobs=64

Fortran benchmarks:
-V -v -xjobs=64

Benchmarks using both Fortran and C:
-V -# -xjobs=64 -v

## Peak Compiler Invocation

C benchmarks:
cc

C++ benchmarks:
CC

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## Peak Compiler Invocation (Continued)

Fortran benchmarks:
f90

Benchmarks using both Fortran and C:
cc f90

## Peak Portability Flags

410.bwaves: -DSPEC_CPU_LP64
433.milc: -DSPEC_CPU_LP64
436.cactusADM: -DSPEC_CPU_LP64
437.leslie3d: -DSPEC_CPU_LP64
470.lbm: -DSPEC_CPU_LP64
481.wrf: -DSPEC_CPU_WORDS_LITTLEENDIAN

## Peak Optimization Flags

C benchmarks:

433.milc: basepeak = yes

470.lbm: basepeak = yes

482.sphinx3: -fast -xipo=2 -m64 -xpagesize=2M -xalias_level=std
-xrestrict -xprefetch=no%auto -xautopar -xreduction

C++ benchmarks:

444.namd: -xprofile=collect:./feedback(pass 1)
-xprofile=use:./feedback(pass 2) -fast -xipo=2 -m64
-xpagesize=2M -xalias_level=compatible -library=stlport4

447.dealII: -fast -xipo=2 -m64 -xpagesize=2M -xalias_level=compatible
-library=no%Cstd -I/data1/stdcxx-4.2.1/include
-I/data1/stdcxx-4.2.1/build/include
-L/data1/stdcxx-4.2.1/build/lib
-R/data1/stdcxx-4.2.1/build/lib -lstd8D

450.soplex: -xprofile=collect:./feedback(pass 1)
-xprofile=use:./feedback(pass 2) -fast -xipo=2
-xpagesize=2M -xalias_level=compatible -library=stlport4
-m64

453.povray: -xprofile=collect:./feedback(pass 1)
-xprofile=use:./feedback(pass 2) -fast -xipo=2 -m64
-xpagesize=2M -xvector=no%simd -xalias_level=compatible
-library=stlport4 -qoption iropt -Atile:skewp

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## Peak Optimization Flags (Continued)

453.povray (continued):
-qoption iropt -Ainline:cs=700

Fortran benchmarks:

410.bwaves: basepeak = yes

416.gamess: -fast -xipo=2 -m64 -xpagesize=2M -xunroll=1
-xvector=no%simd

434.zeusmp: -xprofile=collect:./feedback(pass 1)
-xprofile=use:./feedback(pass 2) -fast -xipo=2 -m64
-xautopar -xreduction

437.leslie3d: basepeak = yes

459.GemsFDTD: -xprofile=collect:./feedback(pass 1)
-xprofile=use:./feedback(pass 2) -fast -xtarget=nehalem
-xipo=2 -m64 -xpagesize=2M -xautopar -xreduction

465.tonto: -xprofile=collect:./feedback(pass 1)
-xprofile=use:./feedback(pass 2) -fast -xipo=2 -m64
-xpagesize=2M -xautopar -xreduction -xprefetch=no%auto
-stackvar -xalias -Qoption iropt -Aparallel:nthreads=8
-lumem

Benchmarks using both Fortran and C:

435.gromacs: -xprofile=collect:./feedback(pass 1)
-xprofile=use:./feedback(pass 2) -fast(cc) -fast(f90)
-xipo=2 -m64 -xpagesize=2M -Qoption ube -fsimple=3
-Qoption iropt -Aparallel:nthreads=8 -xautopar -xreduction

436.cactusADM: -xprofile=collect:./feedback(pass 1)
-xprofile=use:./feedback(pass 2) -m64 -fast(cc) -fast(f90)
-xipo=0 -xpagesize=2M -xprefetch_level=2
-W2,-Aparallel:nthreads=64
-Qoption iropt -Aparallel:nthreads=64 -xautopar -xreduction
-lumem -lmvec

454.calculix: -fast(cc) -fast(f90) -xipo=2 -m64 -xpagesize=2M
-xunroll=3 -xprefetch_level=2
-xprefetch_auto_type=indirect_array_access

481.wrf: -xprofile=collect:./feedback(pass 1)
-xprofile=use:./feedback(pass 2) -fast(cc) -fast(f90)
-xipo=2 -m64 -xautopar -xreduction
-Qoption iropt -Aparallel:nthreads=8

## Peak Other Flags

C benchmarks:
```
-V -# -xjobs=64
```

C++ benchmarks:
```
-verbose=diags,version -xjobs=64
```

Fortran benchmarks:
```
-V -v -xjobs=64
```

Benchmarks using both Fortran and C:
```
-V -# -xjobs=64 -v
```

The flags file that was used to format this result can be browsed at
http://www.spec.org/cpu2006/flags/Oracle-Solaris-Studio-x86_64.html

You can also download the XML flags source by saving the following link:
http://www.spec.org/cpu2006/flags/Oracle-Solaris-Studio-x86_64.xml


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