SPEC® CFP2006 Result
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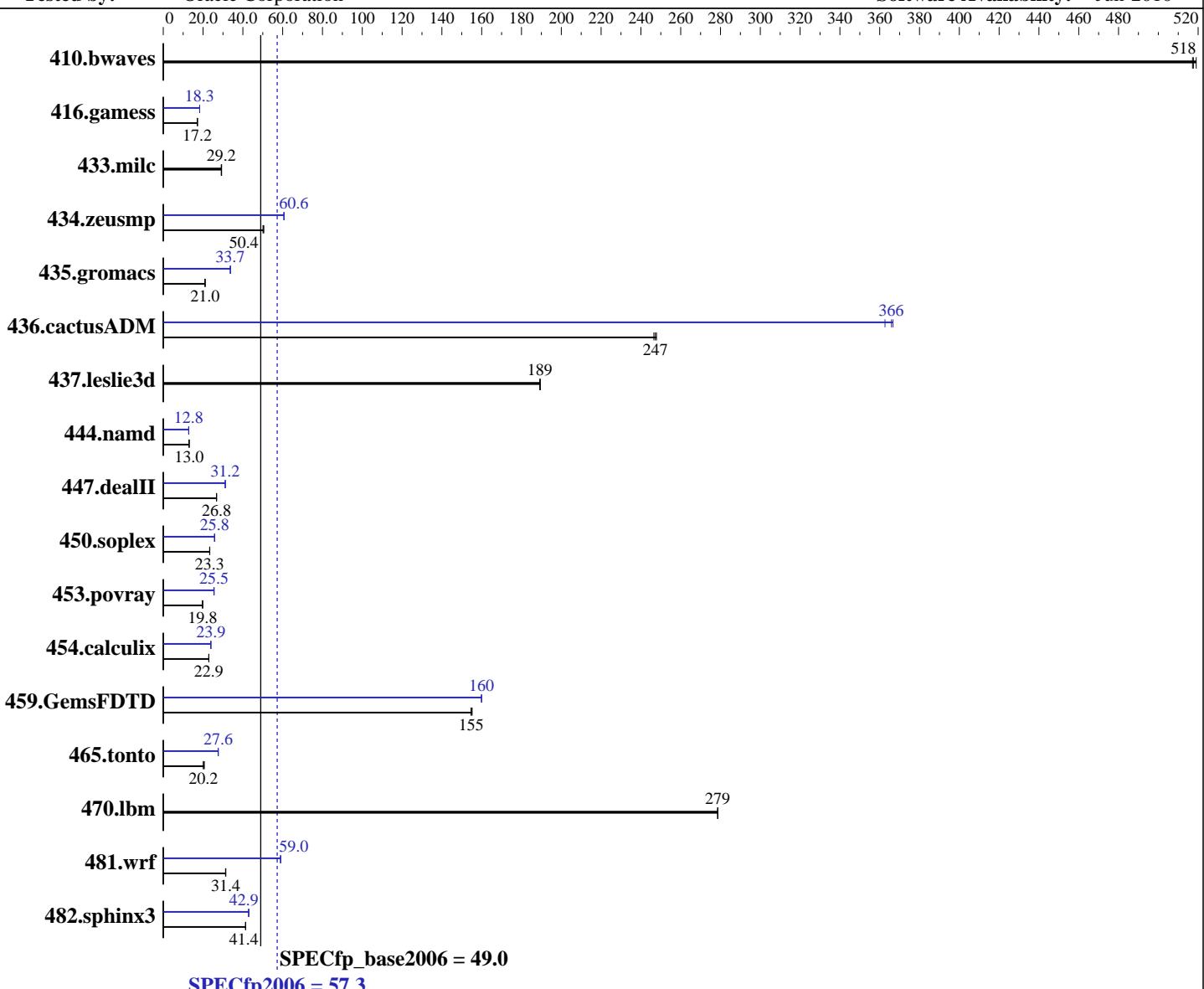
Oracle Corporation

Sun Fire X4470 (Intel Xeon X7560 2.26GHz)

$SPECfp^®2006 =$ 57.3

$SPECfp\_base2006 =$ 49.0

CPU2006 license: 6	**Test date:** Jun-2010
Test sponsor: Oracle Corporation	**Hardware Availability:** Aug-2010
Tested by: Oracle Corporation	**Software Availability:** Jun-2010

SPECfp_base2006 = 49.0

SPECfp2006 = 57.3

Results chart values:

- 410.bwaves: 518
- 416.gamess: 18.3 / 17.2
- 433.milc: 29.2
- 434.zeusmp: 60.6 / 50.4
- 435.gromacs: 33.7 / 21.0
- 436.cactusADM: 366 / 247
- 437.leslie3d: 189
- 444.namd: 12.8 / 13.0
- 447.dealII: 31.2 / 26.8
- 450.soplex: 25.8 / 23.3
- 453.povray: 25.5 / 19.8
- 454.calculix: 23.9 / 22.9
- 459.GemsFDTD: 160 / 155
- 465.tonto: 27.6 / 20.2
- 470.lbm: 279
- 481.wrf: 59.0 / 31.4
- 482.sphinx3: 42.9 / 41.4

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

Continued on next page

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

	Base						Peak					
Benchmark	**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
```

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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`

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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

For questions about this result, please contact the tester.
For other inquiries, please contact webmaster@spec.org.

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