SPEC® CFP2006 Result
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Sun Microsystems

Sun Fire X2270 (Intel Xeon X5570 2.93GHz)

$SPECfp^{®}2006 =$ 48.3

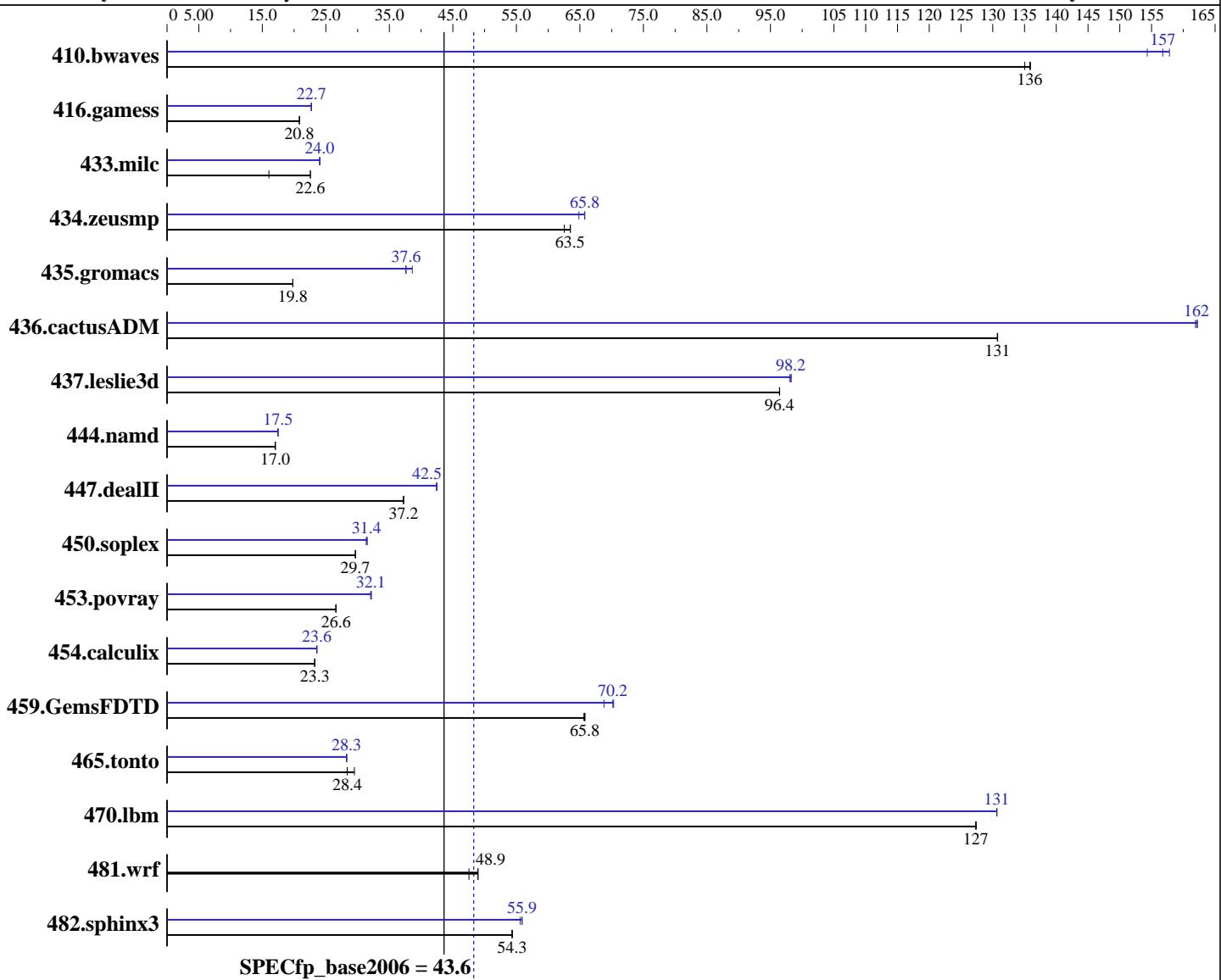$SPECfp\_base2006 =$ 43.6

CPU2006 license: 6
Test sponsor: Sun Microsystems
Tested by: Sun Microsystems

Test date: Mar-2009
Hardware Availability: Apr-2009
Software Availability: Jun-2009

Benchmark	Peak	Base
410.bwaves	157	136
416.gamess	22.7	20.8
433.milc	24.0	22.6
434.zeusmp	65.8	63.5
435.gromacs	37.6	19.8
436.cactusADM	162	131
437.leslie3d	98.2	96.4
444.namd	17.5	17.0
447.dealII	42.5	37.2
450.soplex	31.4	29.7
453.povray	32.1	26.6
454.calculix	23.6	23.3
459.GemsFDTD	70.2	65.8
465.tonto	28.3	28.4
470.lbm	131	127
481.wrf		48.9
482.sphinx3	55.9	54.3

SPECfp_base2006 = 43.6

SPECfp2006 = 48.3

Hardware

CPU Name: Intel Xeon X5570
CPU Characteristics: Intel Turbo Boost Technology up to 3.33 GHz
CPU MHz: 2933
FPU: Integrated
CPU(s) enabled: 8 cores, 2 chips, 4 cores/chip, 2 threads/core
CPU(s) orderable: 1 or 2 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: OpenSolaris 2008.11
Compiler: Sun Studio 12 Update 1 (backend build 20090309)
Auto Parallel: Yes
File System: zfs
System State: Default
Base Pointers: 64-bit
Peak Pointers: 32/64-bit
Continued on next page

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L3 Cache:	8 MB I+D on chip per chip
Other Cache:	None
Memory:	24 GB (6 x 4 GB DDR3-1333)
Disk Subsystem:	1 x 1 TB, SATA, 7200 RPM
Other Hardware:	None

Other Software: MicroQuill SmartHeap Library 9.01 for x64 Apache C++ Standard Library V4.2.1

Results Table

Benchmark	Base						Peak					
	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	101	135	100	136	**100**	**136**	**86.7**	**157**	88.1	154	86.1	158
416.gamess	**939**	**20.8**	939	20.8	939	20.8	863	22.7	861	22.7	**861**	**22.7**
433.milc	572	16.0	407	22.6	**407**	**22.6**	381	24.1	382	24.0	**382**	**24.0**
434.zeusmp	143	63.5	146	62.5	**143**	**63.5**	**138**	**65.8**	138	65.8	140	64.8
435.gromacs	**360**	**19.8**	360	19.8	360	19.8	190	37.6	185	38.6	**190**	**37.6**
436.cactusADM	91.4	131	91.4	131	**91.4**	**131**	73.7	162	**73.7**	**162**	73.8	162
437.leslie3d	97.5	96.5	**97.5**	**96.4**	97.5	96.4	95.9	98.0	**95.7**	**98.2**	95.7	98.3
444.namd	471	17.0	**470**	**17.0**	470	17.0	459	17.5	459	17.5	**459**	**17.5**
447.dealII	307	37.2	**307**	**37.2**	308	37.2	270	42.4	269	42.5	**269**	**42.5**
450.soplex	281	29.6	**281**	**29.7**	281	29.7	266	31.4	265	31.5	**266**	**31.4**
453.povray	**200**	**26.6**	200	26.6	200	26.6	**166**	**32.1**	165	32.2	166	32.1
454.calculix	**355**	**23.3**	355	23.3	355	23.3	**350**	**23.6**	350	23.6	350	23.6
459.GemsFDTD	161	65.8	**161**	**65.8**	162	65.6	**151**	**70.2**	154	68.8	151	70.3
465.tonto	347	28.4	**347**	**28.4**	334	29.5	**348**	**28.3**	348	28.3	348	28.3
470.lbm	**108**	**127**	108	127	108	127	105	131	105	131	**105**	**131**
481.wrf	**228**	**48.9**	235	47.5	228	49.0	**228**	**48.9**	235	47.5	228	49.0
482.sphinx3	359	54.3	**359**	**54.3**	359	54.4	351	55.6	349	55.9	**349**	**55.9**

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 131072  (shell): increases stack
/etc/system parameters
   tune_t_fsflushr=10
   autoup=900
   set lpg_alloc_prefer=1
   set zfs:zfs_arc_max = 0x10000000
```

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Platform Notes

    Default BIOS settings used except:
    Intel VT-d: Disabled. VT-d, if enabled, supports
    remapping of I/O DMA transfers for virtualization.

General Notes

    Environment variables set by runspec before the start of the run:
    OMP_NUM_THREADS = "8"
    SUNW_MP_PROCBIND = "true"
    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:
    /data1/20090309_ceres_x86/bin/cc

C++ benchmarks:
    /data1/20090309_ceres_x86/bin/CC

Fortran benchmarks:
    /data1/20090309_ceres_x86/bin/f90

Benchmarks using both Fortran and C:
    /data1/20090309_ceres_x86/bin/cc /data1/20090309_ceres_x86/bin/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
       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

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Base Optimization Flags

C benchmarks:
```
-fast -xipo=2 -m64 -xvector=simd -xautopar
```

C++ benchmarks:
```
-fast -xipo=2 -m64 -xvector=simd -library=no%Cstd
-I/data2c/stdcxx-4.2.1/include -I/data2c/stdcxx-4.2.1/build/include
-L/data2c/stdcxx-4.2.1/build/lib -R/data2c/stdcxx-4.2.1/build/lib
-lstd8D
```

Fortran benchmarks:
```
-fast -xipo=2 -m64 -xvector=simd -xautopar
```

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

Base Other Flags

C benchmarks:
```
-V -# -xjobs=16
```

C++ benchmarks:
```
-verbose=diags,version -xjobs=16
```

Fortran benchmarks:
```
-V -v -xjobs=16
```

Benchmarks using both Fortran and C:
```
-V -# -xjobs=16 -v
```

Peak Compiler Invocation

C benchmarks:
```
/data1/20090309_ceres_x86/bin/cc
```

C++ benchmarks:
```
/data1/20090309_ceres_x86/bin/CC
```

Fortran benchmarks:
```
/data1/20090309_ceres_x86/bin/f90
```

Benchmarks using both Fortran and C:
```
/data1/20090309_ceres_x86/bin/cc /data1/20090309_ceres_x86/bin/f90
```

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Peak Portability Flags

```
436.cactusADM: -DSPEC_CPU_LP64
     481.wrf: -DSPEC_CPU_LP64 -DSPEC_CPU_WORDS_LITTLEENDIAN
```

Peak Optimization Flags

C benchmarks:

```
433.milc: -xprofile=collect:./feedback(pass 1)
          -xprofile=use:./feedback(pass 2) -fast -xipo=2
          -xpagesize=2M

470.lbm: -fast -xipo=2 -m64 -xvector=simd -xautopar -xreduction
         -L/data1/SmartHeap_9/lib -R/data1/SmartHeap_9/lib -lsmartheap_mt64
         -lmvec

482.sphinx3: -fast -xipo=2 -m64 -xpagesize=2M -xvector=simd
             -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 -xunroll=8 -library=stlport4

447.dealII: -fast -xipo=2 -m64 -xpagesize=2M -xalias_level=compatible
            -xdepend -library=no%Cstd -I/data2c/stdcxx-4.2.1/include
            -I/data2c/stdcxx-4.2.1/build/include
            -L/data2c/stdcxx-4.2.1/build/lib
            -R/data2c/stdcxx-4.2.1/build/lib -lstd8D

450.soplex: -fast -xipo=2 -xpagesize=2M -xrestrict
            -xalias_level=simple -xdepend -xprefetch=no%auto
            -library=stlport4

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

Fortran benchmarks:

```
410.bwaves: -xprofile=collect:./feedback(pass 1)
            -xprofile=use:./feedback(pass 2) -fast -xipo=2 -m64
            -xpagesize=2M -xprefetch=no%auto -xautopar -xreduction

416.gamess: -xprofile=collect:./feedback(pass 1)
            -xprofile=use:./feedback(pass 2) -fast -xipo=2 -m64
            -xpagesize=2M -xunroll=1 -qoption iropt -Ainline:cp=19
            -qoption iropt -Ainline:rs=50 -qoption iropt -Ainline:irs=30
```

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Peak Optimization Flags (Continued)

```
        434.zeusmp: -fast -xipo=2 -m64 -xvector=simd -xautopar -xreduction

       437.leslie3d: -xprofile=collect:./feedback(pass 1)
                     -xprofile=use:./feedback(pass 2) -fast -xipo=2 -m64
                     -xvector=simd -xautopar -xreduction -lumem

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

          465.tonto: -fast -xipo=2 -m64 -xpagesize=2M -xautopar -stackvar
                     -xreduction -xprefetch=no%auto -xvector=lib -xalias
                     -xdepend
```

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 -fsimple=2
                     -Qoption ube -fsimple=3 -xprefetch=no%auto -xautopar
                     -xreduction

     436.cactusADM: -xprofile=collect:./feedback(pass 1)
                     -xprofile=use:./feedback(pass 2) -fast(cc) -fast(f90)
                     -xipo=2 -m64 -xvector=simd -xautopar
                     -W2,-Aparallel:nthreads=16
                     -Qoption iropt -Aparallel:nthreads=16

        454.calculix: -fast(cc) -fast(f90) -xipo=2 -m64 -xpagesize=2M
                     -xvector=simd

            481.wrf: basepeak = yes
```

Peak Other Flags

C benchmarks:
```
      -V -# -xjobs=16
```

C++ benchmarks:
```
      -verbose=diags,version -xjobs=16
```

Fortran benchmarks:
```
      -V -v -xjobs=16
```

Benchmarks using both Fortran and C:
```
      -V -# -xjobs=16 -v
```

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The flags file that was used to format this result can be browsed at
`http://www.spec.org/cpu2006/flags/Sun-OpenSolaris-Studio-x86_64.20090710.00.html`

You can also download the XML flags source by saving the following link:
`http://www.spec.org/cpu2006/flags/Sun-OpenSolaris-Studio-x86_64.20090710.00.xml`

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

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