SPEC® CFP2006 Result
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Sun Microsystems

Sun Fire X4450 (Intel Xeon X7460 2.66GHz)

$SPECfp^{®}2006 =$ 23.6
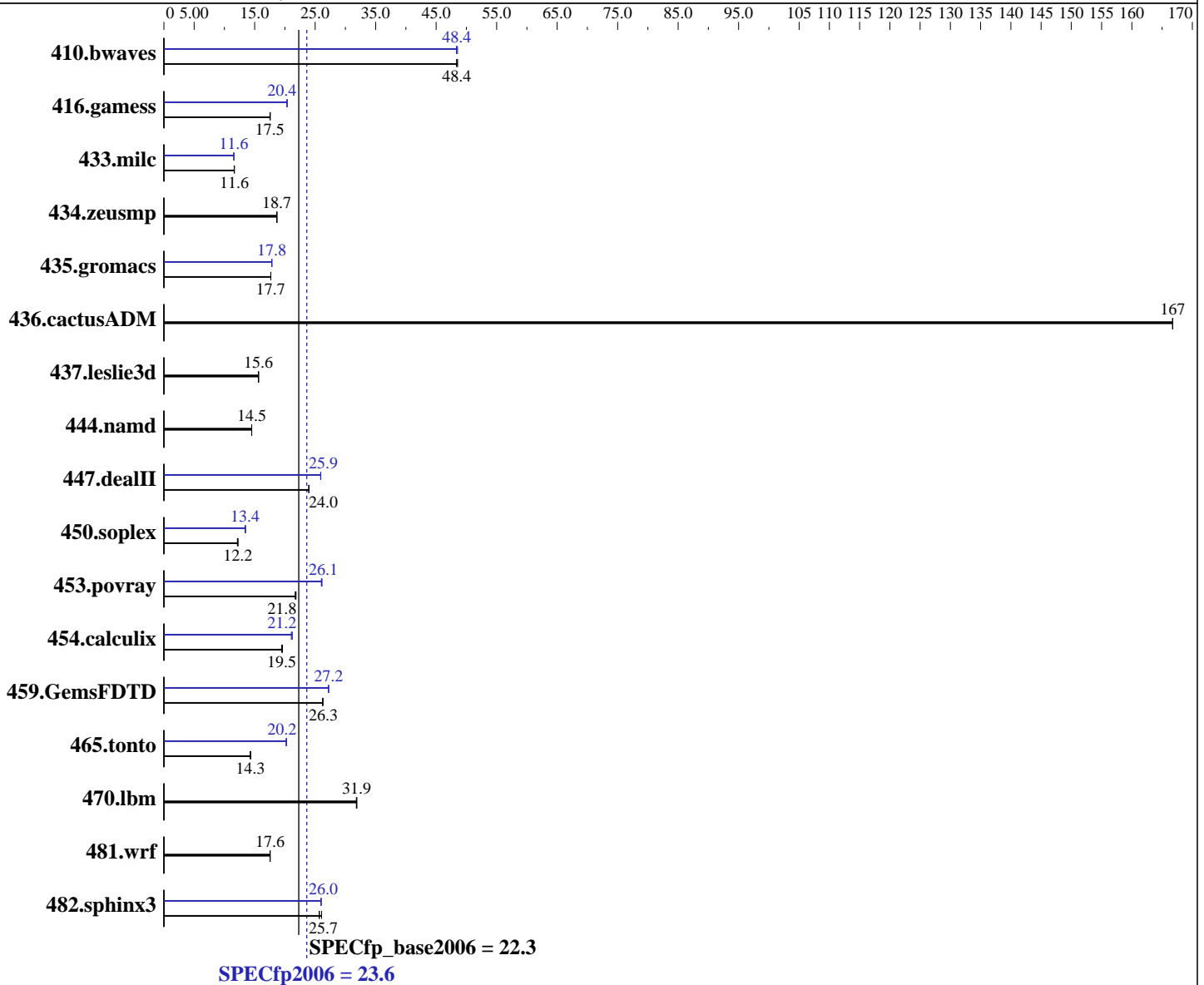
$SPECfp\_base2006 =$ 22.3

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

Test date: Sep-2008
Hardware Availability: Sep-2008
Software Availability: Nov-2008

Benchmark	Value
410.bwaves	48.4 / 48.4
416.gamess	20.4 / 17.5
433.milc	11.6 / 11.6
434.zeusmp	18.7
435.gromacs	17.8 / 17.7
436.cactusADM	167
437.leslie3d	15.6
444.namd	14.5
447.dealII	25.9 / 24.0
450.soplex	13.4 / 12.2
453.povray	26.1 / 21.8
454.calculix	21.2 / 19.5
459.GemsFDTD	27.2 / 26.3
465.tonto	20.2 / 14.3
470.lbm	31.9
481.wrf	17.6
482.sphinx3	26.0 / 25.7

SPECfp_base2006 = 22.3

SPECfp2006 = 23.6

Hardware

CPU Name: Intel Xeon X7460
CPU Characteristics:
CPU MHz: 2667
FPU: Integrated
CPU(s) enabled: 24 cores, 4 chips, 6 cores/chip
CPU(s) orderable: 2,4 chips
Primary Cache: 32 KB I + 32 KB D on chip per core
Secondary Cache: 9 MB I+D on chip per chip, 3 MB shared / 2 cores

Continued on next page

Software

Operating System: SUSE Linux Enterprise Server 10 (x86_64) SP1, Kernel 2.6.16.46-0.12-smp
Compiler: Intel C++ and Fortran Compiler 11.0 for Linux Build 20080730 Package ID: l_cproc_b_11.0.042, l_fproc_b_11.0.042
Auto Parallel: Yes
File System: ReiserFS
System State: Multi-user, run level 3
Base Pointers: 64-bit

Continued on next page

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L3 Cache:	16 MB I+D on chip per chip
Other Cache:	None
Memory:	32 GB (16x2 GB PC2-5300F, 2 rank, CL5-5-5, ECC)
Disk Subsystem:	1xSAS, 72 GB, 10K RPM
Other Hardware:	None

Peak Pointers:	32/64-bit
Other Software:	Binutils 2.18.50.0.7.20080502

Results Table

Benchmark	Base						Peak					
	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	**281**	**48.4**	281	48.4	280	48.6	280	48.5	**281**	**48.4**	281	48.4
416.gamess	1113	17.6	**1117**	**17.5**	1117	17.5	963	20.3	**962**	**20.4**	961	20.4
433.milc	788	11.7	790	11.6	**789**	**11.6**	795	11.5	**794**	**11.6**	793	11.6
434.zeusmp	487	18.7	**487**	**18.7**	487	18.7	487	18.7	**487**	**18.7**	487	18.7
435.gromacs	404	17.7	**404**	**17.7**	404	17.7	**400**	**17.8**	400	17.8	400	17.8
436.cactusADM	71.7	167	**71.7**	**167**	71.7	167	71.7	167	**71.7**	**167**	71.7	167
437.leslie3d	600	15.7	**602**	**15.6**	602	15.6	600	15.7	**602**	**15.6**	602	15.6
444.namd	**553**	**14.5**	552	14.5	553	14.5	**553**	**14.5**	552	14.5	553	14.5
447.dealII	478	23.9	**477**	**24.0**	477	24.0	441	25.9	442	25.9	**441**	**25.9**
450.soplex	681	12.2	**682**	**12.2**	686	12.1	**622**	**13.4**	617	13.5	622	13.4
453.povray	**244**	**21.8**	245	21.7	244	21.8	**204**	**26.1**	204	26.0	204	26.1
454.calculix	421	19.6	424	19.5	**423**	**19.5**	389	21.2	392	21.1	**389**	**21.2**
459.GemsFDTD	**404**	**26.3**	403	26.3	405	26.2	390	27.2	390	27.2	**390**	**27.2**
465.tonto	685	14.4	690	14.3	**689**	**14.3**	485	20.3	**486**	**20.2**	487	20.2
470.lbm	432	31.8	**431**	**31.9**	431	31.9	432	31.8	**431**	**31.9**	431	31.9
481.wrf	637	17.5	636	17.6	**636**	**17.6**	637	17.5	636	17.6	**636**	**17.6**
482.sphinx3	**758**	**25.7**	760	25.7	748	26.1	751	26.0	**750**	**26.0**	750	26.0

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

Operating System Notes

```
'ulimit -s unlimited' was used to set the stacksize to unlimited
OMP_NUM_THREADS set to number of cores.
KMP_STACKSIZE set to 200M
KMP_AFFINITY set to physical,0
```

Platform Notes

```
BIOS configuration:
Hardware Prefetch = Enable; Adjacent Sector Prefetch = Enable
```

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CPU2006 license:	6	**Test date:**	Sep-2008
Test sponsor:	Sun Microsystems	**Hardware Availability:**	Sep-2008
Tested by:	Sun Microsystems	**Software Availability:**	Nov-2008

General Notes

```
All benchmarks compiled in 64-bit mode except 450.soplex
and 482.sphinx3, at peak, are compiled in 32-bit mode
```

Base Compiler Invocation

C benchmarks:
    icc

C++ benchmarks:
    icpc

Fortran benchmarks:
    ifort

Benchmarks using both Fortran and C:
    icc ifort

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:
    -xSSE4.1 -ipo -O3 -no-prec-div -static -parallel -opt-prefetch

C++ benchmarks:
    -xSSE4.1 -ipo -O3 -no-prec-div -static -parallel -opt-prefetch

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CPU2006 license: 6		**Test date:**	Sep-2008
Test sponsor:	Sun Microsystems	**Hardware Availability:**	Sep-2008
Tested by:	Sun Microsystems	**Software Availability:**	Nov-2008

Base Optimization Flags (Continued)

Fortran benchmarks:
```
-xSSE4.1 -ipo -O3 -no-prec-div -static -parallel -opt-prefetch
```

Benchmarks using both Fortran and C:
```
-xSSE4.1 -ipo -O3 -no-prec-div -static -parallel -opt-prefetch
```

Peak Compiler Invocation

C benchmarks (except as noted below):
```
icc
```

```
482.sphinx3: /opt/intel/Compiler/11.0/042/bin/ia32/icc
        -L/opt/intel/Compiler/11.0/042/ipp/ia32/lib
        -I/opt/intel/Compiler/11.0/042/ipp/ia32/include
```

C++ benchmarks (except as noted below):
```
icpc
```

```
450.soplex: /opt/intel/Compiler/11.0/042/bin/ia32/icpc
        -L/opt/intel/Compiler/11.0/042/ipp/ia32/lib
        -I/opt/intel/Compiler/11.0/042/ipp/ia32/include
```

Fortran benchmarks:
```
ifort
```

Benchmarks using both Fortran and C:
```
icc ifort
```

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
```

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Peak Optimization Flags

C benchmarks:

> 433.milc: `-prof-gen(pass 1) -prof-use(pass 2) -xSSE4.1 -ipo -O3 -no-prec-div -static -fno-alias`

> 470.lbm: basepeak = yes

> 482.sphinx3: `-xSSE4.1 -ipo -O3 -no-prec-div -static -unroll2`

C++ benchmarks:

> 444.namd: basepeak = yes

> 447.dealII: `-prof-gen(pass 1) -prof-use(pass 2) -xSSE4.1 -ipo -O3 -no-prec-div -static -unroll2 -ansi-alias -scalar-rep- -opt-prefetch`

> 450.soplex: `-prof-gen(pass 1) -prof-use(pass 2) -xSSE4.1 -ipo -O3 -no-prec-div -static -opt-malloc-options=3`

> 453.povray: `-prof-gen(pass 1) -prof-use(pass 2) -xSSE4.1 -ipo -O3 -no-prec-div -static -unroll4 -ansi-alias`

Fortran benchmarks:

> 410.bwaves: `-xSSE4.1 -ipo -O3 -no-prec-div -static -opt-prefetch -parallel`

> 416.gamess: `-prof-gen(pass 1) -prof-use(pass 2) -xSSE4.1 -ipo -O3 -no-prec-div -static -unroll2 -Ob0 -ansi-alias -scalar-rep-`

> 434.zeusmp: basepeak = yes

> 437.leslie3d: basepeak = yes

> 459.GemsFDTD: `-prof-gen(pass 1) -prof-use(pass 2) -xSSE4.1 -ipo -O3 -no-prec-div -static -unroll2 -Ob0 -opt-prefetch -parallel`

> 465.tonto: `-prof-gen(pass 1) -prof-use(pass 2) -xSSE4.1 -ipo -O3 -no-prec-div -static -unroll4 -auto`

Benchmarks using both Fortran and C:

> 435.gromacs: `-prof-gen(pass 1) -prof-use(pass 2) -xSSE4.1 -ipo -O3 -no-prec-div -static -opt-prefetch -auto-ilp32`

> 436.cactusADM: basepeak = yes

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Peak Optimization Flags (Continued)

454.calculix: `-xSSE4.1 -ipo -O3 -no-prec-div -static -auto-ilp32`

481.wrf: `basepeak = yes`

The flags file that was used to format this result can be browsed at
`http://www.spec.org/cpu2006/flags/Intel-ic11.0-fp-linux64-revA.20090713.10.html`

You can also download the XML flags source by saving the following link:
`http://www.spec.org/cpu2006/flags/Intel-ic11.0-fp-linux64-revA.20090713.10.xml`

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