SPEC® CFP2006 Result
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Sun Microsystems
Sun Fire X2200 M2

$SPECfp®\_rate2006 =$ 47.9
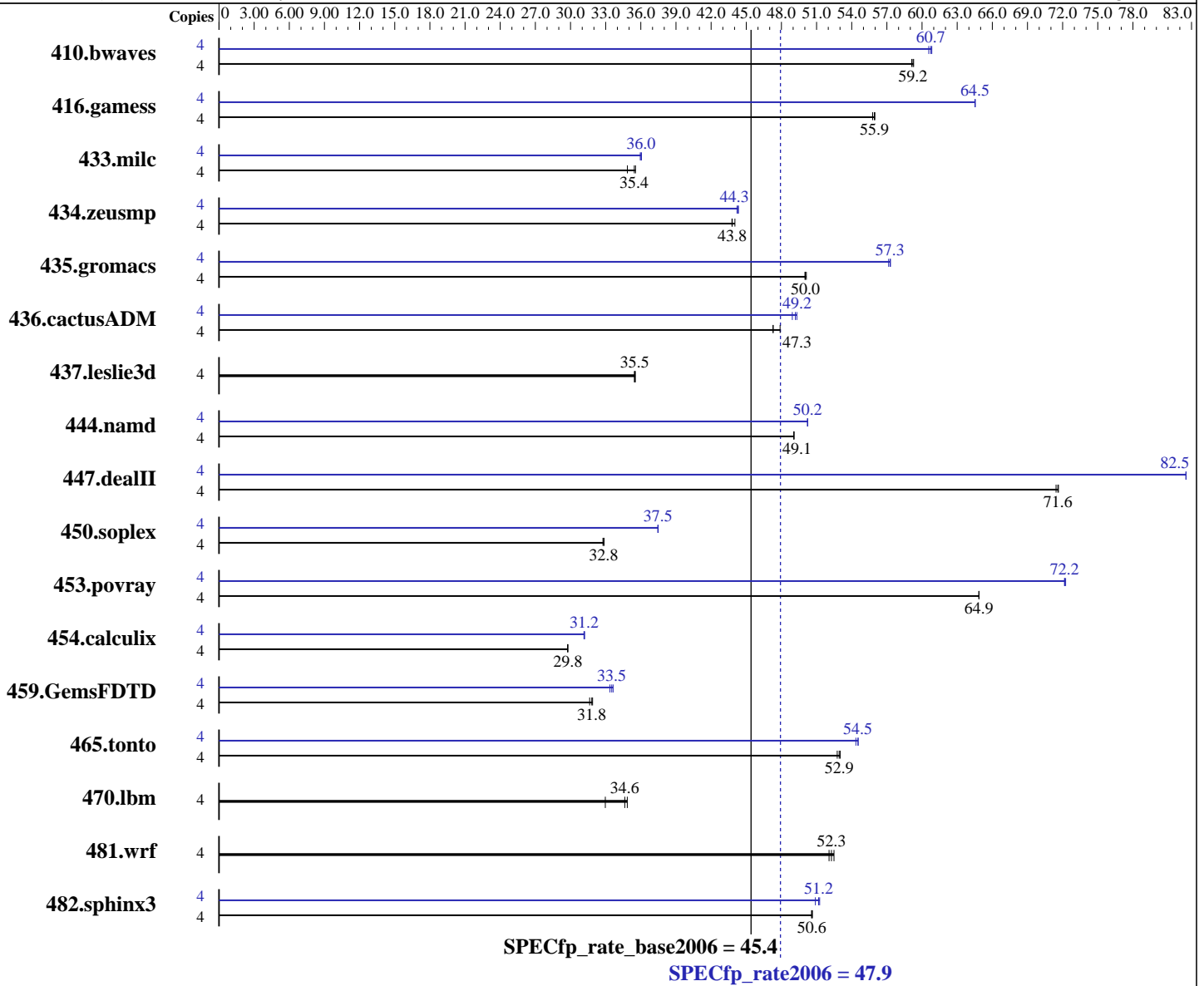
SPECfp_rate_base2006 = 45.4

CPU2006 license: 6

Test sponsor: Sun Microsystems

Tested by: Sun Microsystems

Test date: Apr-2007

Hardware Availability: Feb-2007

Software Availability: Aug-2006

Copies

Benchmark	Copies	Base	Peak
410.bwaves	4	59.2	60.7
416.gamess	4	55.9	64.5
433.milc	4	35.4	36.0
434.zeusmp	4	43.8	44.3
435.gromacs	4	50.0	57.3
436.cactusADM	4	47.3	49.2
437.leslie3d	4	35.5	
444.namd	4	49.1	50.2
447.dealII	4	71.6	82.5
450.soplex	4	32.8	37.5
453.povray	4	64.9	72.2
454.calculix	4	29.8	31.2
459.GemsFDTD	4	31.8	33.5
465.tonto	4	52.9	54.5
470.lbm	4	34.6	
481.wrf	4	52.3	
482.sphinx3	4	50.6	51.2

SPECfp_rate_base2006 = 45.4

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Hardware

CPU Name:	AMD Opteron 2220
CPU Characteristics:	
CPU MHz:	2800
FPU:	Integrated
CPU(s) enabled:	4 cores, 2 chips, 2 cores/chip
CPU(s) orderable:	1,2 chips
Primary Cache:	64 KB I + 64 KB D on chip per core
Secondary Cache:	1 MB I+D on chip per core

Continued on next page

Software

Operating System:	Red Hat Enterprise Linux AS release 4 Update 5
Compiler:	QLogic PathScale Compiler Suite, Release 2.5
Auto Parallel:	No
File System:	ext3
System State:	Multi-user, run level 3
Base Pointers:	64-bit

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L3 Cache:	None
Other Cache:	None
Memory:	16 GB (8x2GB, DDR2-667 CL5 ECC Reg Dual Rank)
Disk Subsystem:	SATA, 250 GB,7200 RPM
Other Hardware:	None

Peak Pointers:	32/64-bit
Other Software:	None

Results Table

Benchmark	Base Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Peak Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	4	920	59.1	**918**	**59.2**	917	59.3	4	897	60.6	894	60.8	**895**	**60.7**
416.gamess	4	**1400**	**55.9**	1404	55.8	1399	56.0	4	1214	64.5	**1214**	**64.5**	1214	64.5
433.milc	4	1054	34.9	**1036**	**35.4**	1033	35.5	4	1018	36.1	1021	36.0	**1020**	**36.0**
434.zeusmp	4	827	44.0	831	43.8	**831**	**43.8**	4	821	44.3	823	44.2	**822**	**44.3**
435.gromacs	4	571	50.0	**571**	**50.0**	570	50.1	4	**499**	**57.3**	500	57.1	498	57.3
436.cactusADM	4	**1011**	**47.3**	998	47.9	1011	47.3	4	969	49.3	977	48.9	**972**	**49.2**
437.leslie3d	4	**1060**	**35.5**	1061	35.5	1058	35.5	4	**1060**	**35.5**	1061	35.5	1058	35.5
444.namd	4	654	49.1	**654**	**49.1**	654	49.1	4	**639**	**50.2**	639	50.2	639	50.2
447.dealII	4	639	71.6	641	71.4	**639**	**71.6**	4	**554**	**82.5**	554	82.5	554	82.5
450.soplex	4	1015	32.9	**1016**	**32.8**	1018	32.8	4	890	37.5	**890**	**37.5**	891	37.4
453.povray	4	**328**	**64.9**	328	64.9	328	64.9	4	295	72.2	295	72.3	**295**	**72.2**
454.calculix	4	**1109**	**29.8**	1108	29.8	1109	29.7	4	1058	31.2	1059	31.1	**1059**	**31.2**
459.GemsFDTD	4	**1334**	**31.8**	1342	31.6	1331	31.9	4	**1266**	**33.5**	1262	33.6	1272	33.4
465.tonto	4	742	53.0	**744**	**52.9**	746	52.8	4	722	54.6	724	54.4	**722**	**54.5**
470.lbm	4	1667	33.0	1577	34.8	**1587**	**34.6**	4	1667	33.0	1577	34.8	**1587**	**34.6**
481.wrf	4	851	52.5	**855**	**52.3**	858	52.1	4	851	52.5	**855**	**52.3**	858	52.1
482.sphinx3	4	1539	50.6	**1541**	**50.6**	1542	50.6	4	1521	51.3	**1523**	**51.2**	1532	50.9

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

General Notes

    taskset utility used to bind CPU(s) to processes
    Default BIOS settings was used.

Base Compiler Invocation

C benchmarks:
    pathcc

C++ benchmarks:
    pathCC

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Base Compiler Invocation (Continued)

Fortran benchmarks:
    pathf95

Benchmarks using both Fortran and C:
    pathcc pathf95

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  -fno-second-underscore
437.leslie3d: -DSPEC_CPU_LP64
  444.namd: -DSPEC_CPU_LP64
  447.dealII: -DSPEC_CPU_LP64  -DSPEC_CPU_TABLE_WORKAROUND
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_LINUX -fno-second-underscore
482.sphinx3: -DSPEC_CPU_LP64
```

Base Optimization Flags

C benchmarks:
    -Ofast

C++ benchmarks:
    -Ofast

Fortran benchmarks:
    -Ofast

Benchmarks using both Fortran and C:
    -Ofast

Base Other Flags

C benchmarks:
    -IPA:max_jobs=4

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Base Other Flags (Continued)

C++ benchmarks:
```
-IPA:max_jobs=4
```

Fortran benchmarks:
```
-IPA:max_jobs=4
```

Benchmarks using both Fortran and C:
```
-IPA:max_jobs=4
```

Peak Compiler Invocation

C benchmarks:
```
pathcc
```

C++ benchmarks:
```
pathCC
```

Fortran benchmarks:
```
pathf95
```

Benchmarks using both Fortran and C:
```
pathcc pathf95
```

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
    436.cactusADM: -DSPEC_CPU_LP64 -fno-second-underscore
     437.leslie3d: -DSPEC_CPU_LP64
        444.namd: -DSPEC_CPU_LP64
      447.dealII: -DSPEC_CPU_TABLE_WORKAROUND
      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_LINUX -fno-second-underscore
     482.sphinx3: -DSPEC_CPU_LP64
```

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Peak Optimization Flags

C benchmarks:

> 433.milc: `-fb_create fbdata(pass 1) -fb_opt fbdata(pass 2) -Ofast`

> 470.lbm: `basepeak = yes`

> 482.sphinx3: `Same as 433.milc`

C++ benchmarks:

> 444.namd: `-fb_create fbdata(pass 1) -fb_opt fbdata(pass 2) -Ofast`

> 447.dealII: `-Ofast -m32 -fno-exceptions`

> 450.soplex: `-fb_create fbdata(pass 1) -fb_opt fbdata(pass 2) -m32 -O3`
> `-OPT:IEEE_arith=3 -CG:load_exe=0 -CG:movnti=1`
> `-LNO:minvariant=off -fno-exceptions`

> 453.povray: `-fb_create fbdata(pass 1) -fb_opt fbdata(pass 2) -Ofast`
> `-fno-fast-math`

Fortran benchmarks:

> 410.bwaves: `-fb_create fbdata(pass 1) -fb_opt fbdata(pass 2) -O3`
> `-OPT:Ofast -OPT:IEEE_arith=3 -LNO:blocking=off`
> `-LNO:ignore_feedback=off`

> 416.gamess: `-fb_create fbdata(pass 1) -fb_opt fbdata(pass 2) -O2`
> `-OPT:Ofast -OPT:ro=3 -OPT:unroll_size=256`

> 434.zeusmp: `-Ofast -CG:local_fwd_sched=on -LNO:blocking=off`
> `-LNO:interchange=off -LNO:fu=10 -LNO:full_unroll_outer=on`

> 437.leslie3d: `basepeak = yes`

> 459.GemsFDTD: `-Ofast -LNO:fission=2 -LNO:prefetch=0`

> 465.tonto: `-Ofast -CG:local_fwd_sched=on -IPA:plimit=525`

Benchmarks using both Fortran and C:

> 435.gromacs: `-O3 -OPT:rsqrt=2 -OPT:ro=3`

> 436.cactusADM: `-fb_create fbdata(pass 1) -fb_opt fbdata(pass 2) -O3`
> `-LNO:prefetch_ahead=5 -LNO:ou_prod_max=10 -LNO:full_unroll=5`
> `-ipa`

> 454.calculix: `-Ofast -CG:prefetch=off -LNO:simd=0 -OPT:unroll_times_max=8`
> `-WOPT:mem_opnds=on`

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Peak Optimization Flags (Continued)

```
481.wrf: basepeak = yes
```

Peak Other Flags

C benchmarks:
```
-IPA:max_jobs=4
```

C++ benchmarks:
```
-IPA:max_jobs=4
```

Fortran benchmarks:
```
-IPA:max_jobs=4
```

Benchmarks using both Fortran and C:
```
-IPA:max_jobs=4
```

The flags file that was used to format this result can be browsed at
http://www.spec.org/cpu2006/flags/CPU2006_flags.20090714.30.html

You can also download the XML flags source by saving the following link:
http://www.spec.org/cpu2006/flags/CPU2006_flags.20090714.30.xml

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

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