



SPEC[®] CFP2006 Result

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Fujitsu Limited

SPECfp[®]2006 = 28.8

Fujitsu SPARC Enterprise M8000

SPECfp_base2006 = 25.0

CPU2006 license: 19

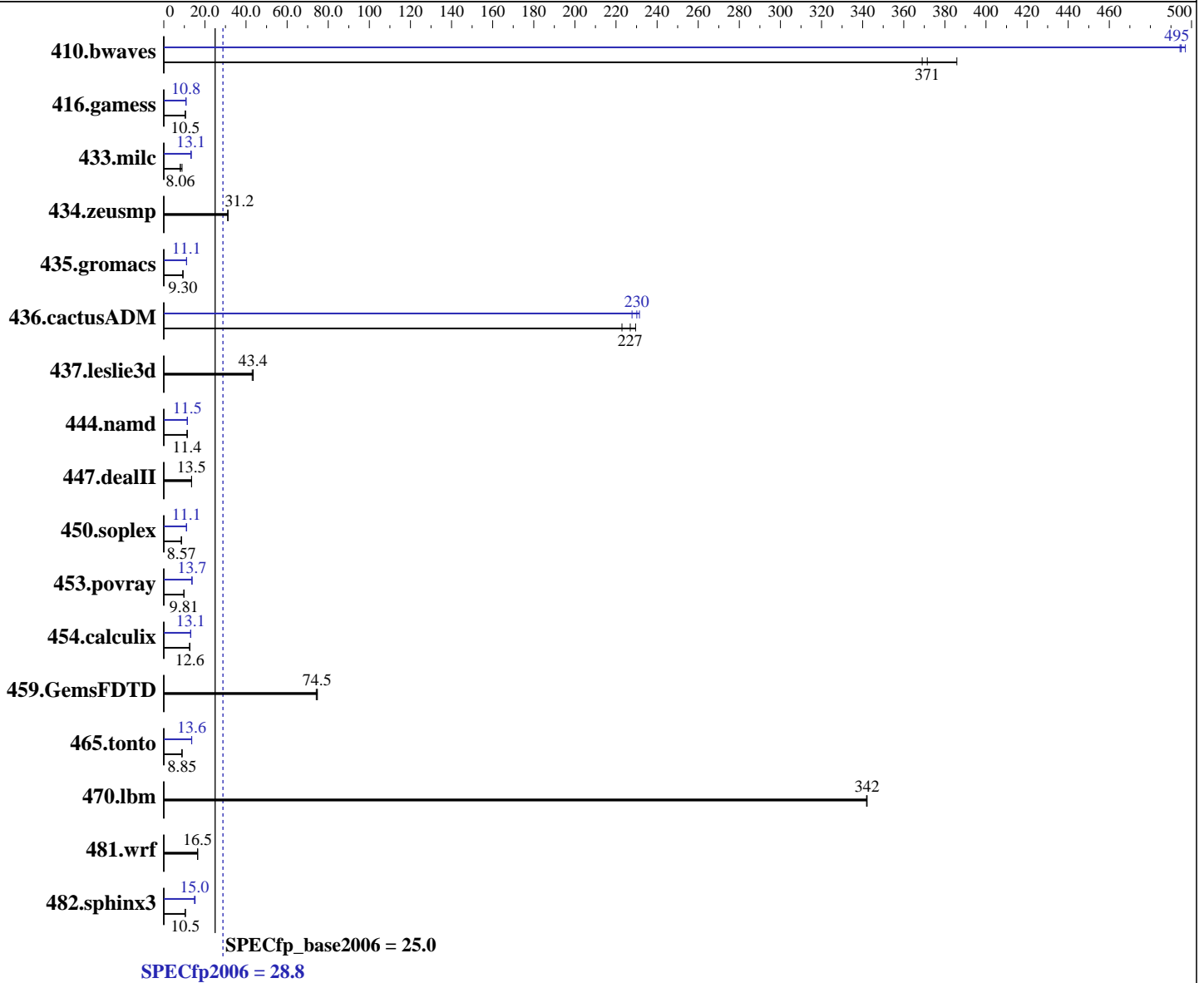
Test date: Jun-2008

Test sponsor: Fujitsu Limited

Hardware Availability: Jul-2008

Tested by: Sun Microsystems

Software Availability: Jul-2008



Hardware

CPU Name: SPARC64 VII
 CPU Characteristics:
 CPU MHz: 2520
 FPU: Integrated
 CPU(s) enabled: 64 cores, 16 chips, 4 cores/chip, 2 threads/core
 CPU(s) orderable: 1 to 4 CMUs; each CMU contains 2 or 4 chips
 Primary Cache: 64 KB I + 64 KB D on chip per core
 Secondary Cache: 6 MB I+D on chip per chip

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Software

Operating System: Solaris 10 5/08 with Patch 137111-03
 Compiler: Sun Studio 12 with patches
 124867-06, 124861-07, 124863-05, 127000-05
 (see patch information below)
 Auto Parallel: Yes
 File System: ufs
 System State: Default
 Base Pointers: 32-bit
 Peak Pointers: 32-bit

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L3 Cache: None
Other Cache: None
Memory: 256 GB (128 x 2 GB)
Disk Subsystem: Fujitsu 73 GB 10000 RPM SAS
Other Hardware: None

Other Software: None

Results Table

Benchmark	Base						Peak					
	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	35.2	386	36.8	369	<u>36.6</u>	<u>371</u>	27.5	494	<u>27.5</u>	<u>495</u>	27.3	497
416.gamess	1868	10.5	<u>1869</u>	<u>10.5</u>	1869	10.5	<u>1814</u>	<u>10.8</u>	1816	10.8	1811	10.8
433.milc	1032	8.89	1141	8.05	<u>1139</u>	<u>8.06</u>	699	13.1	684	13.4	<u>698</u>	<u>13.1</u>
434.zeusmp	292	31.2	292	31.1	<u>292</u>	<u>31.2</u>	292	31.2	292	31.1	<u>292</u>	<u>31.2</u>
435.gromacs	<u>768</u>	<u>9.30</u>	767	9.30	768	9.30	<u>644</u>	<u>11.1</u>	644	11.1	644	11.1
436.cactusADM	53.6	223	52.1	230	<u>52.7</u>	<u>227</u>	52.5	228	<u>51.9</u>	<u>230</u>	51.6	231
437.leslie3d	216	43.5	219	43.0	<u>216</u>	<u>43.4</u>	216	43.5	219	43.0	<u>216</u>	<u>43.4</u>
444.namd	704	11.4	<u>704</u>	<u>11.4</u>	706	11.4	<u>699</u>	<u>11.5</u>	699	11.5	701	11.4
447.dealII	846	13.5	<u>846</u>	<u>13.5</u>	845	13.5	846	13.5	<u>846</u>	<u>13.5</u>	845	13.5
450.soplex	973	8.57	<u>973</u>	<u>8.57</u>	972	8.58	756	11.0	754	11.1	<u>755</u>	<u>11.1</u>
453.povray	543	9.79	542	9.82	<u>542</u>	<u>9.81</u>	389	13.7	<u>388</u>	<u>13.7</u>	388	13.7
454.calculix	<u>654</u>	<u>12.6</u>	654	12.6	654	12.6	<u>630</u>	<u>13.1</u>	631	13.1	630	13.1
459.GemsFDTD	143	74.2	142	74.7	<u>142</u>	<u>74.5</u>	143	74.2	142	74.7	<u>142</u>	<u>74.5</u>
465.tonto	1111	8.85	<u>1112</u>	<u>8.85</u>	1112	8.85	<u>725</u>	<u>13.6</u>	724	13.6	728	13.5
470.lbm	40.2	342	40.2	342	<u>40.2</u>	<u>342</u>	40.2	342	40.2	342	<u>40.2</u>	<u>342</u>
481.wrf	679	16.5	<u>679</u>	<u>16.5</u>	679	16.5	679	16.5	<u>679</u>	<u>16.5</u>	679	16.5
482.sphinx3	<u>1862</u>	<u>10.5</u>	1862	10.5	1871	10.4	<u>1299</u>	<u>15.0</u>	1278	15.3	1301	15.0

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

Compiler Invocation Notes

Sun Studio compiler patches are available at
http://developers.sun.com/sunstudio/downloads/patches/ss12_patches.jsp

Operating System Notes

Environment Variable Settings:

The maximum number of threads a program can create was set with:
OMP_NUM_THREADS=64

Program threads were bound to processors with:
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Operating System Notes (Continued)

```
SUNW_MP_PROCBIND=" 1 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34
                   36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66 68 70
                   72 74 76 78 80 82 84 86 88 90 92 94 96 98 100 102 104
                   104 106 108 110 112 114 116 118 120 122 124 126 "
```

Behavior of parallel threads was set with:

SUNW_MP_THR_IDLE=SPIN

SPIN specifies that an idle thread should spin while waiting at barrier or waiting for new parallel regions to work on.

System Tunables (/etc/system parameters):

tune_t_fsflushr=10

Controls how many seconds elapse between runs of the page flush daemon, fsflush.

autoup=300

Causes pages older than the listed number of seconds to be written by fsflush.

bufhwm=3000

Memory byte limit for caching I/O buffers

segmap_percent=3

Set maximum percent memory for file system cache

lpg_alloc_prefer=1

Set lgroup page allocation to strongly prefer local pages

Other System Settings:

The webconsole service was turned off using
svcadm disable webconsole

Platform Notes

Memory is 8-way interleaved by filling all slots with the same capacity DIMMs.

This result is measured on a Sun SPARC Enterprise M8000 Server.

Note that the Sun SPARC Enterprise M8000 and Fujitsu SPARC Enterprise M8000 are electrically equivalent.

Base Compiler Invocation

C benchmarks:

cc

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Base Compiler Invocation (Continued)

C++ benchmarks:
cc

Fortran benchmarks:
f90

Benchmarks using both Fortran and C:
cc f90

Base Optimization Flags

C benchmarks:
-fast -xipo=2 -fma=fused -xpagesize=4M -xprefetch=latx:2 -xautopar
-xreduction -xprefetch_level=3
-xprefetch_auto_type=indirect_array_access

C++ benchmarks:
-library=stlport4 -fast -xipo=2 -fma=fused -xpagesize=4M
-xprefetch=latx:2 -xautopar -xreduction -xprefetch_level=2
-xalias_level=compatible

Fortran benchmarks:
-fast -xipo=2 -fma=fused -xpagesize=4M -xprefetch=latx:2 -xautopar
-xreduction -xprefetch_level=2

Benchmarks using both Fortran and C:
-fast(cc) -fast(f90) -xipo=2 -fma=fused -xpagesize=4M
-xprefetch=latx:2 -xautopar -xreduction -xprefetch_level=3
-xprefetch_auto_type=indirect_array_access -xprefetch_level=2

Base Other Flags

C benchmarks:
-xjobs=64

C++ benchmarks:
-xjobs=64

Fortran benchmarks:
-xjobs=64

Benchmarks using both Fortran and C:
-xjobs=64



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Peak Compiler Invocation

C benchmarks:

cc

C++ benchmarks:

CC

Fortran benchmarks:

f90

Benchmarks using both Fortran and C:

cc f90

Peak Optimization Flags

C benchmarks:

```
433.milc: -fast -xipo=2 -fma=fused -xpagesize=4M -xprefetch=latx:2
          -xalias_level=std -xprefetch_level=3
          -xprefetch_auto_type=indirect_array_access
          -xalias_level=strong -xprefetch_level=2
```

```
470.lbm: basepeak = yes
```

```
482.sphinx3: -xprofile=collect:./feedback(pass 1)
             -xprofile=use:./feedback(pass 2) -fast -xipo=2 -fma=fused
             -xalias_level=std -xautopar -xreduction
```

C++ benchmarks:

```
444.namd: -library=stlport4 -fast -xipo=2 -fma=fused -xpagesize=4M
          -xprefetch=latx:2 -xalias_level=compatible -xdepend
```

```
447.dealIII: basepeak = yes
```

```
450.soplex: -library=stlport4 -fast -xipo=2 -fma=fused -xpagesize=4M
            -xprefetch=latx:2 -xdepend -xprefetch_level=2
            -xprefetch_auto_type=indirect_array_access
            -Qoption cg -Qlp-ol=1 -Qoption cg -Qlp-it=3
            -Qoption cg -Qlp-imb=1 -Qoption iropt -Apf:pdl=3
```

```
453.povray: -library=stlport4 -xprofile=collect:./feedback(pass 1)
            -xprofile=use:./feedback(pass 2) -fast -xipo=2 -fma=fused
            -xpagesize=4M -xprefetch=latx:2 -xalias_level=compatible
            -xdepend -xrestrict -xprefetch=latx:4.5
```

Fortran benchmarks:

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Peak Optimization Flags (Continued)

410.bwaves: -fast -xipo=2 -fma=fused -xpagesize=512K -xprefetch=latx:2
-xprefetch_level=2 -xautopar -xreduction

416.gamess: -fast -xipo=2 -fma=fused -xpagesize=4M -xprefetch=latx:2
-xprefetch_level=2

434.zeusmp: basepeak = yes

437.leslie3d: basepeak = yes

459.GemsFDTD: basepeak = yes

465.tonto: -xprofile=collect:./feedback(pass 1)
-xprofile=use:./feedback(pass 2) -fast -xipo=2 -fma=fused
-xpagesize=4M -xprefetch=latx:2 -xarch=v8plusa
-xprefetch=latx:12 -lfast

Benchmarks using both Fortran and C:

435.gromacs: -xprofile=collect:./feedback(pass 1)
-xprofile=use:./feedback(pass 2) -fast(cc) -fast(f90)
-xipo=2 -fma=fused -xalias_level=std

436.cactusADM: -fast(cc) -fast(f90) -xipo=2 -fma=fused -xpagesize=4M
-xprefetch=latx:2 -xalias_level=std -xprefetch_level=3
-xprefetch_auto_type=indirect_array_access -xautopar
-xreduction

454.calculix: -fast(cc) -fast(f90) -xipo=2 -fma=fused -xalias_level=std

481.wrf: basepeak = yes

Peak Other Flags

C benchmarks:

-xjobs=64

C++ benchmarks:

-xjobs=64

Fortran benchmarks:

-xjobs=64

Benchmarks using both Fortran and C:

-xjobs=64



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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-Solaris-Studio12-and-gccfss4.2.20090713.html>

You can also download the XML flags source by saving the following link:

<http://www.spec.org/cpu2006/flags/Sun-Solaris-Studio12-and-gccfss4.2.20090713.xml>

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