



# SPEC<sup>®</sup> CFP2006 Result

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Fujitsu Limited

SPECfp<sup>®</sup>2006 = 23.6

Fujitsu SPARC Enterprise M8000

SPECfp\_base2006 = 20.9

CPU2006 license: 19

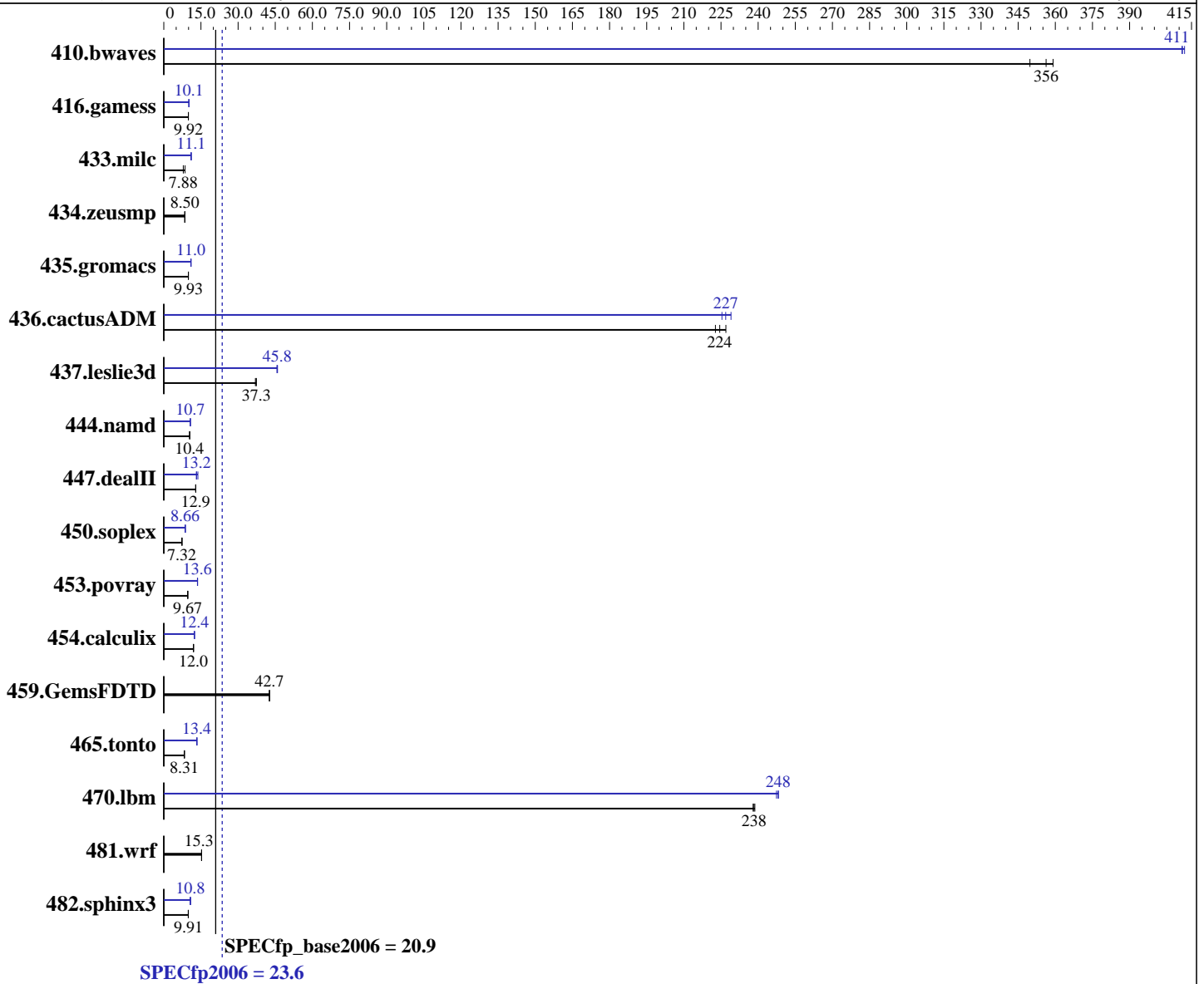
Test date: Mar-2008

Test sponsor: Fujitsu Limited

Hardware Availability: Apr-2007

Tested by: Sun Microsystems

Software Availability: May-2008



### Hardware

CPU Name: SPARC64 VI  
 CPU Characteristics:  
 CPU MHz: 2280  
 FPU: Integrated  
 CPU(s) enabled: 32 cores, 16 chips, 2 cores/chip, 2 threads/core  
 CPU(s) orderable: 1 to 4 CMUs; each CMU contains 2 or 4 chips  
 Primary Cache: 128 KB I + 128 KB D on chip per core  
 Secondary Cache: 5 MB I+D on chip per chip

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### Software

Operating System: Solaris 10 5/08 s10s\_u5wos\_08  
 Compiler: Sun Studio 12, see patch information below  
 Auto Parallel: Yes  
 File System: ufs  
 System State: Default  
 Base Pointers: 32-bit  
 Peak Pointers: 32-bit  
 Other Software: None



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L3 Cache: None  
Other Cache: None  
Memory: 256 GB (128 x 2 GB DIMMs)  
Disk Subsystem: 73 GB 10,000 RPM Fujitsu MAY2073RC SAS  
Other Hardware: None

## Results Table

Benchmark	Base						Peak					
	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	38.9	350	<b><u>38.1</u></b>	<b><u>356</u></b>	37.8	359	33.1	411	<b><u>33.0</u></b>	<b><u>411</u></b>	33.0	412
416.gamess	1974	9.92	1973	9.92	<b><u>1973</u></b>	<b><u>9.92</u></b>	<b><u>1932</u></b>	<b><u>10.1</u></b>	1932	10.1	1931	10.1
433.milc	<b><u>1165</u></b>	<b><u>7.88</u></b>	1166	7.88	1069	8.58	828	11.1	<b><u>828</u></b>	<b><u>11.1</u></b>	838	11.0
434.zeusmp	<b><u>1071</u></b>	<b><u>8.50</u></b>	1071	8.50	1070	8.50	<b><u>1071</u></b>	<b><u>8.50</u></b>	1071	8.50	1070	8.50
435.gromacs	719	9.93	<b><u>719</u></b>	<b><u>9.93</u></b>	720	9.92	650	11.0	<b><u>651</u></b>	<b><u>11.0</u></b>	652	11.0
436.cactusADM	52.6	227	53.6	223	<b><u>53.2</u></b>	<b><u>224</u></b>	<b><u>52.7</u></b>	<b><u>227</u></b>	53.0	225	52.2	229
437.leslie3d	252	37.3	254	37.0	<b><u>252</u></b>	<b><u>37.3</u></b>	<b><u>205</u></b>	<b><u>45.8</u></b>	206	45.7	205	45.9
444.namd	768	10.4	767	10.4	<b><u>767</u></b>	<b><u>10.4</u></b>	748	10.7	<b><u>748</u></b>	<b><u>10.7</u></b>	748	10.7
447.dealII	885	12.9	889	12.9	<b><u>887</u></b>	<b><u>12.9</u></b>	<b><u>864</u></b>	<b><u>13.2</u></b>	831	13.8	870	13.2
450.soplex	1137	7.34	1139	7.32	<b><u>1139</u></b>	<b><u>7.32</u></b>	968	8.61	<b><u>963</u></b>	<b><u>8.66</u></b>	955	8.74
453.povray	551	9.65	549	9.70	<b><u>550</u></b>	<b><u>9.67</u></b>	392	13.6	389	13.7	<b><u>391</u></b>	<b><u>13.6</u></b>
454.calculix	689	12.0	<b><u>688</u></b>	<b><u>12.0</u></b>	687	12.0	669	12.3	<b><u>666</u></b>	<b><u>12.4</u></b>	665	12.4
459.GemsFDTD	249	42.6	<b><u>249</u></b>	<b><u>42.7</u></b>	248	42.7	249	42.6	<b><u>249</u></b>	<b><u>42.7</u></b>	248	42.7
465.tonto	1185	8.30	1183	8.32	<b><u>1184</u></b>	<b><u>8.31</u></b>	736	13.4	<b><u>736</u></b>	<b><u>13.4</u></b>	736	13.4
470.lbm	57.6	239	57.7	238	<b><u>57.7</u></b>	<b><u>238</u></b>	55.4	248	<b><u>55.4</u></b>	<b><u>248</u></b>	55.5	247
481.wrf	731	15.3	<b><u>731</u></b>	<b><u>15.3</u></b>	734	15.2	731	15.3	<b><u>731</u></b>	<b><u>15.3</u></b>	734	15.2
482.sphinx3	<b><u>1966</u></b>	<b><u>9.91</u></b>	1965	9.92	1977	9.86	1832	10.6	<b><u>1810</u></b>	<b><u>10.8</u></b>	1802	10.8

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](http://developers.sun.com/sunstudio/downloads/patches/ss12_patches.jsp)  
The tested configuration included patch 124867-02, 127000-02,  
124863-02, 124861-04

## Operating System Notes

Stack size set to unlimited with "ulimit -s unlimited"

Program threads were bound to processors with:  
SUNW\_MP\_PROCBIND="1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37  
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## Operating System Notes (Continued)

39 41 43 45 47 49 51 53 55 57 59 61 63"

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.

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

OMP\_NUM\_THREADS=32

System Tunables:

(/etc/system parameters)

maxphys=4194304

Defines the maximum size of I/O requests, in bytes.

maxpgio=1024

Defines the maximum number of page I/O requests that can be queued by the paging system.

tune\_t\_fsflushr=4

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

autoup=60

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=1

Set maximum percent memory for file system cache

## Platform Notes

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.

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

## Base Compiler Invocation

C benchmarks:

cc

C++ benchmarks:

CC

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## Base Compiler Invocation (Continued)

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: -xprofile=collect:./feedback(pass 1)
-xprofile=use:./feedback(pass 2) -fast -xipo=2 -fma=fused
-xpagesize=4M -xprefetch=latx:2 -xalias_level=std
-xprefetch_level=3 -xprefetch_auto_type=indirect_array_access
-xarch=v8plusb -xprefetch_level=2 -xautopar -xreduction
```

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

C++ benchmarks:

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

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

```
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
```

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## Peak Optimization Flags (Continued)

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:

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: -fast -xipo=2 -xautopar -xreduction -fma=fused  
-xprefetch\_level=2 -xprefetch=latx:8.0

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

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## Peak Other Flags (Continued)

Fortran benchmarks:  
-xjobs=64

Benchmarks using both Fortran and C:  
-xjobs=64

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.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.xml>

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For other inquiries, please contact [webmaster@spec.org](mailto:webmaster@spec.org).

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