



SPEC[®] CFP2006 Result

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Fujitsu Limited

SPECfp[®]_rate2006 = 230

Fujitsu SPARC Enterprise T5440

SPECfp_rate_base2006 = 212

CPU2006 license: 19

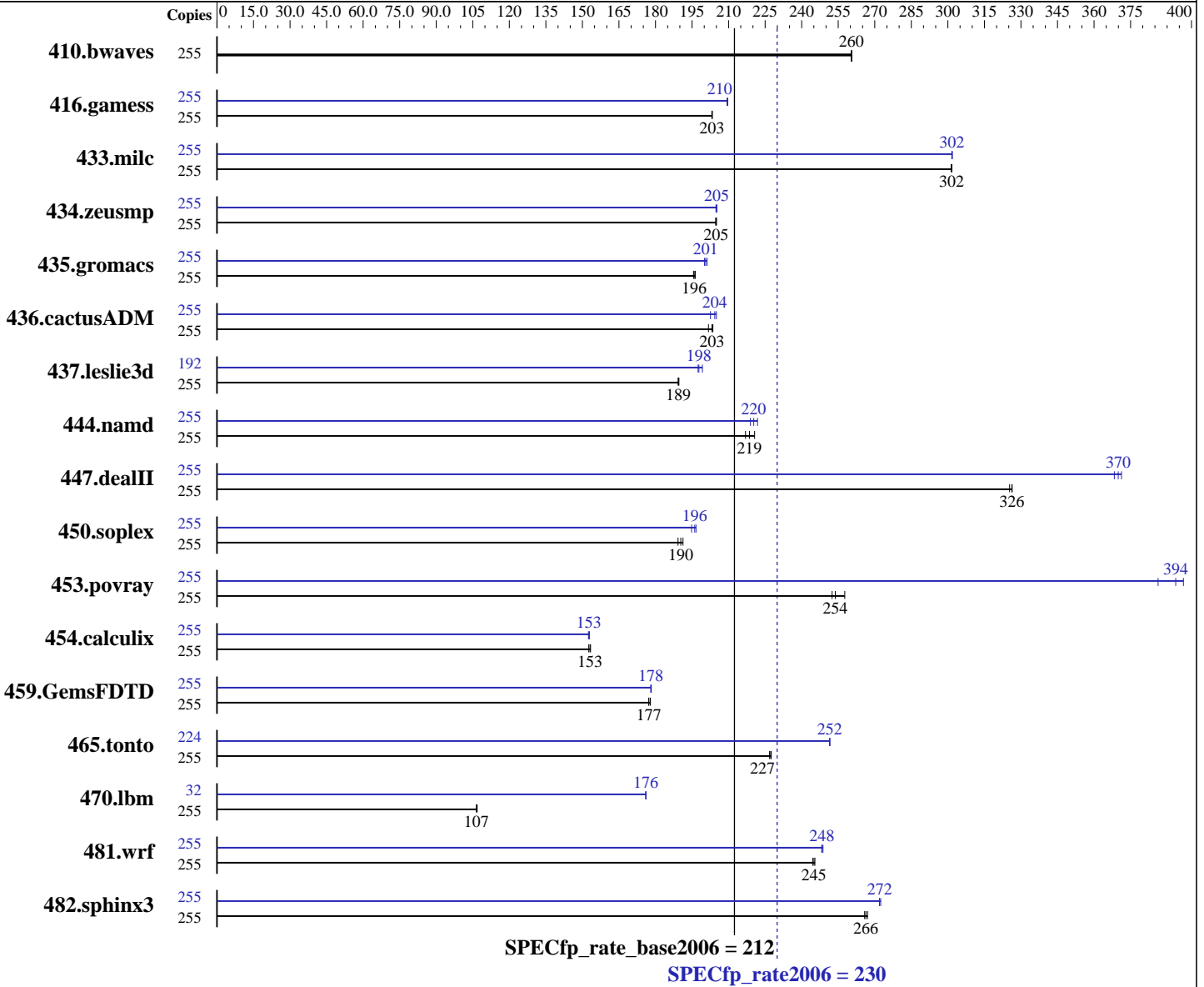
Test sponsor: Fujitsu Limited

Tested by: Sun Microsystems

Test date: Jun-2008

Hardware Availability: Oct-2008

Software Availability: Jul-2008



Hardware

CPU Name: UltraSPARC T2 Plus
 CPU Characteristics:
 CPU MHz: 1414
 FPU: Integrated
 CPU(s) enabled: 32 cores, 4 chips, 8 cores/chip, 8 threads/core
 CPU(s) orderable: 1 to 4 chips
 Primary Cache: 16 KB I + 8 KB D on chip per core
 Secondary Cache: 4 MB I+D on chip per chip

Continued on next page

Software

Operating System: Solaris 10 5/08 + patch 137111-03
 Compiler: Sun Studio 12 and gccfs V4.2.0
 (see additional detail below)
 Auto Parallel: No
 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 (64 x 4 GB)
 Disk Subsystem: 975 GB RAID 5 using Sun StoreEdge
 6140 with 12x 300 GB 10K RPM disks
 2 Gbps Fibre Channel
 Other Hardware: None

Other Software: None

Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	255	13301	261	13310	260	13305	260	255	13301	261	13310	260	13305	260
416.gamess	255	24570	203	24580	203	24556	203	255	23816	210	23818	210	23848	209
433.milc	255	7761	302	7761	302	7768	301	255	7755	302	7761	302	7759	302
434.zeusmp	255	11324	205	11337	205	11318	205	255	11330	205	11308	205	11313	205
435.gromacs	255	9308	196	9272	196	9294	196	255	9098	200	9076	201	9050	201
436.cactusADM	255	14970	204	14999	203	15104	202	255	14864	205	15044	203	14913	204
437.leslie3d	255	12656	189	12661	189	12641	190	192	9139	197	9058	199	9124	198
444.namd	255	9267	221	9427	217	9357	219	255	9282	220	9217	222	9339	219
447.dealII	255	8941	326	8938	326	8967	325	255	7858	371	7920	368	7886	370
450.soplex	255	11237	189	11117	191	11170	190	255	10917	195	10815	197	10845	196
453.povray	255	5373	252	5345	254	5264	258	255	3512	386	3420	397	3447	394
454.calculix	255	13719	153	13741	153	13786	153	255	13779	153	13796	152	13760	153
459.GemsFDTD	255	15265	177	15261	177	15210	178	255	15194	178	15187	178	15175	178
465.tonto	255	11041	227	11028	228	11063	227	224	8764	252	8765	251	8761	252
470.lbm	255	32877	107	32805	107	32892	107	32	2498	176	2497	176	2498	176
481.wrf	255	11623	245	11606	245	11649	245	255	11474	248	11471	248	11450	249
482.sphinx3	255	18611	267	18696	266	18659	266	255	18242	272	18278	272	18273	272

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
 The tested configuration included patch 124867-02, 124861-04,
 124863-01, 127000-01

Peak also uses "GCC for SPARC Systems", which combines gcc
 with the Sun Code Generator for SPARC systems. It is invoked
 as "gcc", and accepts source code compatible with GCC 4.2.
 For more information, including support, see
<http://cooltools.sunsource.net/gcc/>



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Submit Notes

The config file option 'submit' was used. Processes were bound to cores using "submit" and "pbind".

A processor set was created using

```
psrset -c 1-255
```

and the runspec process was placed into the set using

```
psrset -e 1
```

Operating System Notes

ulimit -s 131072 was used to allow the stack to grow up to 131072 KB (aka 128 MB). Note that saying "131072" is preferable to "unlimited", because there is a tradeoff between space for the stack vs. space for the heap.

ulimit -n 1300, set the open file limit

/etc/system parameters

```
autoup=600
```

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

```
tune_t_fsflushr=10
```

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

```
tsb_rss_factor=128
```

Suggests that the the size of the TSB (Translation Storage Buffer) may be increased if it is more than 25% (128/512) full. Doing so may reduce TSB traps, at the cost of additional kernel memory.

The "webconsole" service was turned off using
svcadm disable webconsole

The system had 409 GB of swap space.

Platform Notes

This result is measured on a Sun SPARC Enterprise T5440 Server. Note that the Sun SPARC Enterprise T5440 and Fujitsu SPARC Enterprise T5440 are electrically equivalent.



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Base Compiler Invocation

C benchmarks:

cc

C++ benchmarks:

CC

Fortran benchmarks:

f90

Benchmarks using both Fortran and C:

cc f90

Base Optimization Flags

C benchmarks:

-g -fast -xipo=2 -xpagesize=4M -xprefetch_level=2 -xalias_level=std
-xprefetch_level=3 -xprefetch_auto_type=indirect_array_access
-M /usr/lib/ld/map.bssalign

C++ benchmarks:

-g0 -library=stlport4 -fast -xipo=2 -xpagesize=4M -xprefetch_level=2
-xdepend -xalias_level=compatible -M /usr/lib/ld/map.bssalign

Fortran benchmarks:

-g -fast -xipo=2 -xpagesize=4M -xprefetch_level=2
-M /usr/lib/ld/map.bssalign

Benchmarks using both Fortran and C:

-g -fast(cc) -fast(f90) -xipo=2 -xpagesize=4M -xprefetch_level=2
-xalias_level=std -xprefetch_level=3
-xprefetch_auto_type=indirect_array_access -M /usr/lib/ld/map.bssalign

Base Other Flags

C benchmarks:

-xjobs=32 -V -#

C++ benchmarks:

-xjobs=32 -verbose=diags,version

Fortran benchmarks:

-xjobs=32 -V -v

Benchmarks using both Fortran and C:

-xjobs=32 -V -# -v



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Peak Compiler Invocation

C benchmarks:

cc

C++ benchmarks (except as noted below):

CC

447.dealII: g++

Fortran benchmarks:

f90

Benchmarks using both Fortran and C:

cc f90

Peak Optimization Flags

C benchmarks:

```
433.milc: -g -xprofile=collect:./feedback(pass 1)
-xprofile=use:./feedback(pass 2) -fast -xpagesize=4M
-M /usr/lib/ld/map.bssalign -xipo=2 -xprefetch_level=2
-xprefetch_auto_type=indirect_array_access -xalias_level=std
-fsimple=1
```

```
470.lbm: -g -xprofile=collect:./feedback(pass 1)
-xprofile=use:./feedback(pass 2) -fast -xpagesize=4M
-M /usr/lib/ld/map.bssalign -xprefetch_level=3 -xipo=2
-xrestrict
```

```
482.sphinx3: -g -xprofile=collect:./feedback(pass 1)
-xprofile=use:./feedback(pass 2) -fast -xpagesize=4M
-M /usr/lib/ld/map.bssalign -xinline= -xprefetch_level=2
-Wc,-Qlp-ol=1 -xrestrict -xalias_level=strong -fsimple=1
-xlinkopt=2 -lfast
```

C++ benchmarks:

```
444.namd: -g0 -library=stlport4 -xprofile=collect:./feedback(pass 1)
-xprofile=use:./feedback(pass 2) -fast -xpagesize=4M
-xdepend -xalias_level=compatible
-M /usr/lib/ld/map.bssalign -xprefetch_level=1 -xlinkopt=2
```

```
447.dealII: -xprofile=collect:./feedback(pass 1)
-xprofile=use:./feedback(pass 2) -fast -xpagesize=4M
-xdepend -Wl,-M,/usr/lib/ld/map.bssalign -xipo=2 -xrestrict
-xalias_level=std
```

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Peak Optimization Flags (Continued)

```
450.soplex: -g0 -library=stlport4 -xprofile=collect:./feedback(pass 1)
-xprofile=use:./feedback(pass 2) -fast -xpagesize=4M
-xdepend -xalias_level=compatible
-M /usr/lib/ld/map.bssalign -xipo=2 -xprefetch_level=2
-fsimple=0 -xrestrict
-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: -g0 -library=stlport4 -xprofile=collect:./feedback(pass 1)
-xprofile=use:./feedback(pass 2) -fast -xpagesize=64K
-xdepend -xalias_level=compatible -xipo=2 -xrestrict
-xlinkopt=2
```

Fortran benchmarks:

410.bwaves: basepeak = yes

```
416.gamess: -g -xprofile=collect:./feedback(pass 1)
-xprofile=use:./feedback(pass 2) -fast -xpagesize=4M
-M /usr/lib/ld/map.bssalign -xlinkopt=2
```

```
434.zeusmp: -g -fast -xpagesize=4M -M /usr/lib/ld/map.bssalign -xipo=1
-qoption cg -Qeps:enabled=1 -qoption cg -Qeps:ws=8 -lmopt
```

```
437.leslie3d: -g -fast -xpagesize_heap=4M -xpagesize_stack=64K
-M /usr/lib/ld/map.bssalign -xprefetch_level=3
-xprefetch=latx:1.6 -qoption cg -Qlp=1 -qoption cg -Qlp-fa=0
-qoption cg -Qlp-fl=1 -qoption cg -Qlp-av=448
-qoption cg -Qlp-t=4
```

```
459.GemsFDTD: -g -fast -xpagesize=4M -M /usr/lib/ld/map.bssalign
-fsimple=1
```

```
465.tonto: -g -fast -xpagesize=4M -M /usr/lib/ld/map.bssalign -xipo=2
-lfast
```

Benchmarks using both Fortran and C:

```
435.gromacs: -g -xprofile=collect:./feedback(pass 1)
-xprofile=use:./feedback(pass 2) -fast(cc) -fast(f90)
-xpagesize=4M -M /usr/lib/ld/map.bssalign -xipo=1 -xinline=
-xarch-generic -xchip-generic -fsimple=0
```

```
436.cactusADM: -g -xprofile=collect:./feedback(pass 1)
-xprofile=use:./feedback(pass 2) -fast(cc) -fast(f90)
-xpagesize=4M -M /usr/lib/ld/map.bssalign -xipo=2
-fsimple=1 -xlinkopt=2
```

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Peak Optimization Flags (Continued)

454.calculix: -g -fast(cc) -fast(f90) -xpagesize=4M
-M /usr/lib/ld/map.bssalign -xipo=2 -xvector
-xprefetch_level=1

481.wrf: -g -xprofile=collect:./feedback(pass 1)
-xprofile=use:./feedback(pass 2) -fast(cc) -fast(f90)
-xpagesize=4M -M /usr/lib/ld/map.bssalign -xlinkopt=2

Peak Other Flags

C benchmarks:
-xjobs=32 -V -#

C++ benchmarks (except as noted below):
-xjobs=32 -verbose=diags,version

447.dealIII: -v

Fortran benchmarks:
-xjobs=32 -V -v

Benchmarks using both Fortran and C:
-xjobs=32 -V -# -v

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.

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