



SPEC[®] CFP2006 Result

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Sun Microsystems

SPECfp[®]_rate2006 = 119

Sun SPARC Enterprise T5240

SPECfp_rate_base2006 = 111

CPU2006 license: 6

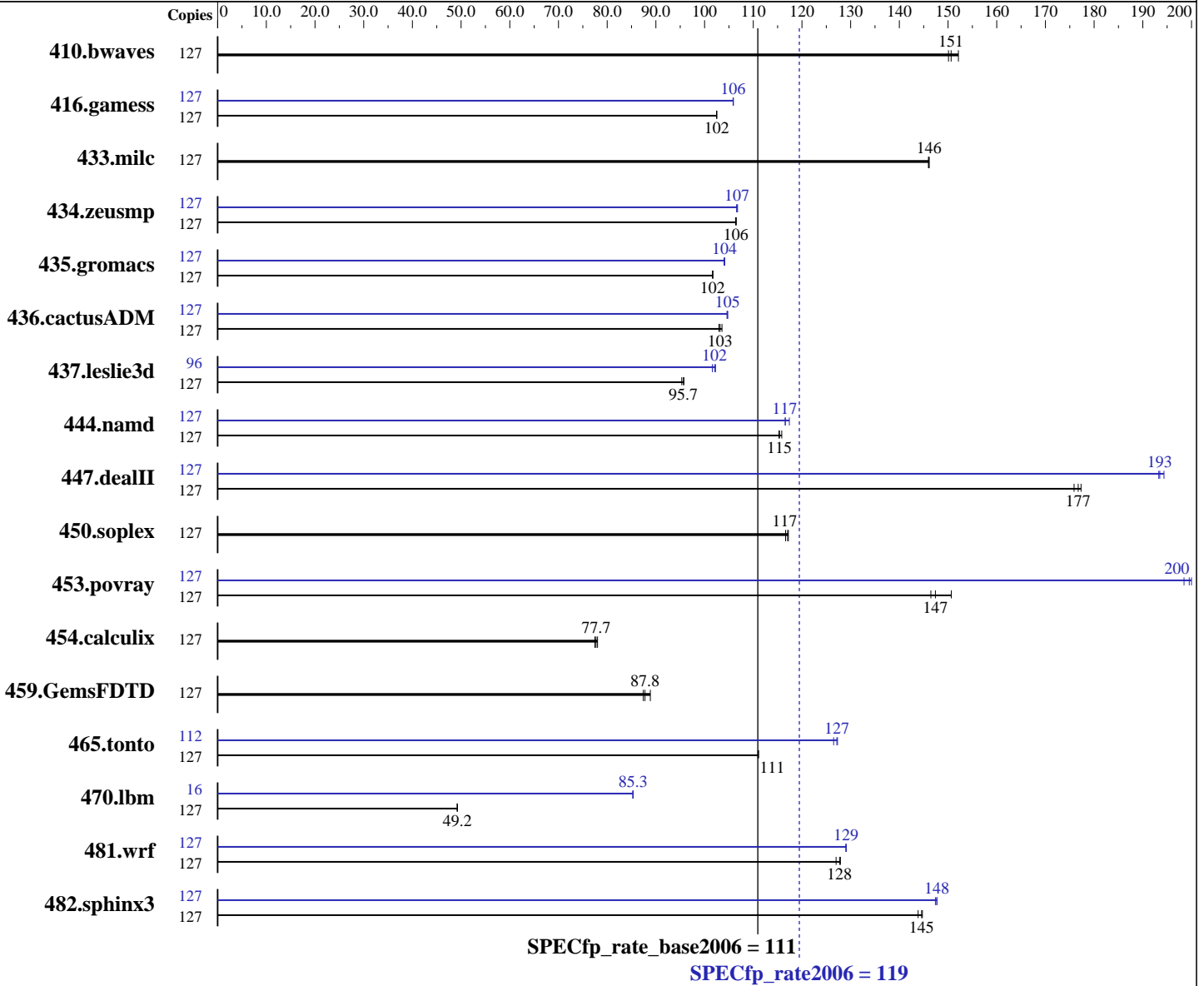
Test date: Mar-2008

Test sponsor: Sun Microsystems

Hardware Availability: May-2008

Tested by: Sun Microsystems

Software Availability: Feb-2008



Hardware

CPU Name: UltraSPARC T2 Plus
 CPU Characteristics:
 CPU MHz: 1415
 FPU: Integrated
 CPU(s) enabled: 16 cores, 2 chips, 8 cores/chip, 8 threads/core
 CPU(s) orderable: 2 chips
 Primary Cache: 16 KB I + 8 KB D on chip per core
 Secondary Cache: 4 MB I+D on chip per chip

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Software

Operating System: Solaris 10 8/07 + patch 127111-08
 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: 128 GB (32 x 4 GB)
Disk Subsystem: 737 GB RAID 5 using Sun StoreEdge
6120 with 12x 73 GB 10K RPM disks
(Seagate ST373307
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	127	11499	150	11345	152	11458	151	127	11499	150	11345	152	11458	151		
416.gamess	127	24264	102	24264	102	24261	102	127	23493	106	23483	106	23478	106		
433.milc	127	7980	146	7979	146	7987	146	127	7980	146	7979	146	7987	146		
434.zeusmp	127	10866	106	10851	107	10856	106	127	10834	107	10824	107	10843	107		
435.gromacs	127	8920	102	8916	102	8919	102	127	8719	104	8712	104	8706	104		
436.cactusADM	127	14707	103	14652	104	14742	103	127	14509	105	14492	105	14491	105		
437.leslie3d	127	12480	95.7	12525	95.3	12468	95.8	96	8882	102	8825	102	8842	102		
444.namd	127	8827	115	8836	115	8792	116	127	8736	117	8739	117	8675	117		
447.dealII	127	8194	177	8261	176	8221	177	127	7476	194	7509	193	7517	193		
450.soplex	127	9081	117	9037	117	9049	117	127	9081	117	9037	117	9049	117		
453.povray	127	4584	147	4484	151	4613	146	127	3378	200	3386	200	3404	198		
454.calculix	127	13523	77.5	13482	77.7	13430	78.0	127	13523	77.5	13482	77.7	13430	78.0		
459.GemsFDTD	127	15163	88.9	15354	87.8	15416	87.4	127	15163	88.9	15354	87.8	15416	87.4		
465.tonto	127	11250	111	11262	111	11253	111	112	8657	127	8712	127	8667	127		
470.lbm	127	35440	49.2	35485	49.2	35417	49.3	16	2579	85.3	2577	85.3	2576	85.3		
481.wrf	127	11107	128	11092	128	11169	127	127	10989	129	10994	129	10993	129		
482.sphinx3	127	17207	144	17102	145	17121	145	127	16757	148	16792	147	16759	148		

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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Operating System Notes

Processes were bound to cores using "submit" and "pbind".
A processor set was created using
psrset -c 1-127
and the runspec process was placed into the set using
psrset -e 1

These shell commands request use of local 4MB pages:

```
export LD_PRELOAD=madv.so.1:mpss.so.1
export MPSSHEAP=4MB
export MPSSSTACK=4MB
export MADV=access_lwp
```

'access_lwp' means that the next light weight process to touch the specified address range will access it the most heavily.

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.

The open file limit was set to 1300 with ulimit -n

/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 144 GB of swap space.

Platform Notes

This result was measured on a Sun SPARC Enterprise T5240.
The Sun SPARC Enterprise T5240 and the Fujitsu SPARC Enterprise T5240 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.dealIII: g++

Fortran benchmarks:

f90

Benchmarks using both Fortran and C:

cc f90

Peak Optimization Flags

C benchmarks:

433.milc: basepeak = yes

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.dealIII: -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

450.soplex: basepeak = yes

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

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Peak Optimization Flags (Continued)

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: basepeak = yes

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

454.calculix: basepeak = yes

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 -#

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Peak Other Flags (Continued)

C++ benchmarks (except as noted below):

-xjobs=32 -verbose=diags,version

447.dealII: -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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