



SPEC® CFP2006 Result

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Sun Microsystems

SPECfp®_rate2006 = 68.5

Sun SPARC Enterprise T5120

SPECfp_rate_base2006 = 64.1

CPU2006 license: 6

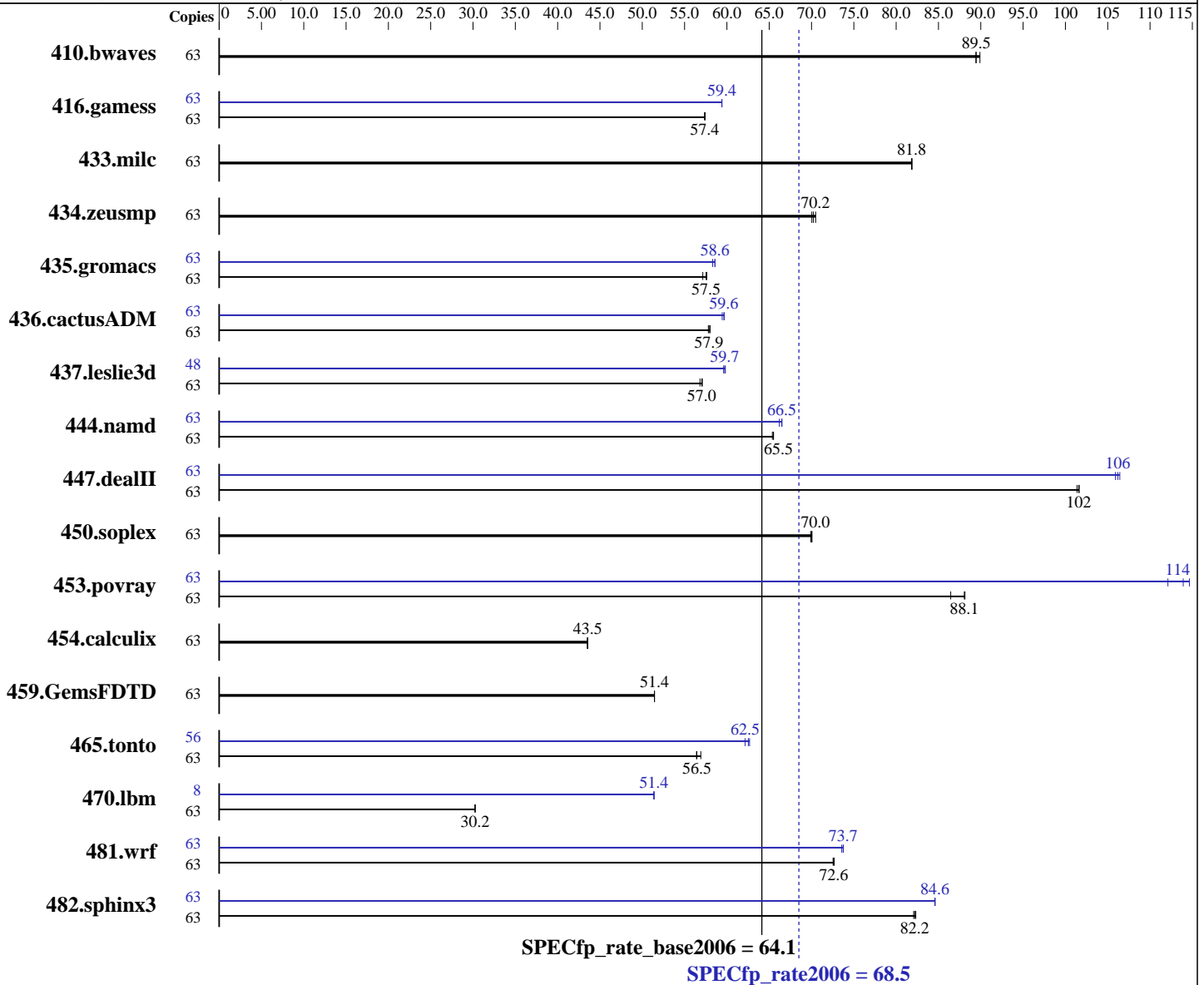
Test sponsor: Sun Microsystems

Tested by: Sun Microsystems

Test date: Jan-2009

Hardware Availability: Jul-2009

Software Availability: Nov-2008



Hardware

CPU Name: UltraSPARC T2
 CPU Characteristics:
 CPU MHz: 1582
 FPU: Integrated
 CPU(s) enabled: 8 cores, 1 chip, 8 cores/chip, 8 threads/core
 CPU(s) orderable: 1 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 10/08
 Compiler: Sun Studio 12 and gccfs V4.2.1
 (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: 64 GB (16 x 4 GB)
Disk Subsystem: 142 GB Solaris Volume Manager RAID 0
on 4x 72 GB Sun 10K RPM SAS
block size 384 KB
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	63	9523	89.9	9574	89.4	<u>9571</u>	<u>89.5</u>	63	9523	89.9	9574	89.4	<u>9571</u>	<u>89.5</u>		
416.gamess	63	21500	57.4	21484	57.4	<u>21495</u>	<u>57.4</u>	63	20761	59.4	<u>20765</u>	<u>59.4</u>	20767	59.4		
433.milc	63	<u>7066</u>	<u>81.8</u>	7067	81.8	7064	81.9	63	<u>7066</u>	<u>81.8</u>	7067	81.8	7064	81.9		
434.zeusmp	63	8186	70.0	8133	70.5	<u>8164</u>	<u>70.2</u>	63	8186	70.0	8133	70.5	<u>8164</u>	<u>70.2</u>		
435.gromacs	63	7806	57.6	<u>7818</u>	<u>57.5</u>	7871	57.1	63	<u>7679</u>	<u>58.6</u>	7677	58.6	7713	58.3		
436.cactusADM	63	12977	58.0	13023	57.8	<u>13005</u>	<u>57.9</u>	63	12664	59.4	<u>12622</u>	<u>59.6</u>	12614	59.7		
437.leslie3d	63	10422	56.8	<u>10384</u>	<u>57.0</u>	10372	57.1	48	7569	59.6	<u>7553</u>	<u>59.7</u>	7543	59.8		
444.namd	63	7729	65.4	7713	65.5	<u>7714</u>	<u>65.5</u>	63	<u>7598</u>	<u>66.5</u>	7633	66.2	7598	66.5		
447.dealII	63	<u>7096</u>	<u>102</u>	7110	101	7091	102	63	6805	106	<u>6787</u>	<u>106</u>	6772	106		
450.soplex	63	7515	69.9	7500	70.1	<u>7506</u>	<u>70.0</u>	63	7515	69.9	7500	70.1	<u>7506</u>	<u>70.0</u>		
453.povray	63	3877	86.4	3803	88.1	<u>3806</u>	<u>88.1</u>	63	2989	112	<u>2942</u>	<u>114</u>	2923	115		
454.calculix	63	11931	43.6	11950	43.5	<u>11936</u>	<u>43.5</u>	63	11931	43.6	11950	43.5	<u>11936</u>	<u>43.5</u>		
459.GemsFDTD	63	12996	51.4	12993	51.4	<u>12994</u>	<u>51.4</u>	63	12996	51.4	12993	51.4	<u>12994</u>	<u>51.4</u>		
465.tonto	63	10891	56.9	<u>10981</u>	<u>56.5</u>	10990	56.4	56	8791	62.7	<u>8812</u>	<u>62.5</u>	8867	62.1		
470.lbm	63	<u>28620</u>	<u>30.2</u>	28613	30.3	28627	30.2	8	<u>2139</u>	<u>51.4</u>	2139	51.4	2140	51.4		
481.wrf	63	<u>9690</u>	<u>72.6</u>	9700	72.5	9682	72.7	63	9540	73.8	9566	73.6	<u>9544</u>	<u>73.7</u>		
482.sphinx3	63	14916	82.3	<u>14940</u>	<u>82.2</u>	14961	82.1	63	<u>14518</u>	<u>84.6</u>	14512	84.6	14518	84.6		

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 124867-08, 124861-09,
124863-08, 127000-06

Peak also uses "GCC for SPARC Systems 4.2.1", 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

A processor set was created using
psrset -c 1-63
and the runspec process was placed into the set using
psrset -e 1
The config file option 'submit' was used to select specific
processors within the set, along with the pbind command.

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.

/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 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 75 GB of swap space.

Platform Notes

This result was measured on a Sun SPARC Enterprise
T5220. All of these are electronically equivalent:

- Sun SPARC Enterprise T5120
- Sun SPARC Enterprise T5220
- Fujitsu SPARC Enterprise T5120
- Fujitsu SPARC Enterprise T5220

A SPARC Enterprise 5120 can hold up to 4 disks, and a
5220 can hold up to 8. This system was tested with 4
disks; therefore, this result applies to both the 5120
and the 5220.



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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: basepeak = yes

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 -#

C++ benchmarks (except as noted below):

-xjobs=32 -verbose=diags,version

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Peak Other Flags (Continued)

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-Studio12-12u1-and-gccfss4.2.r3.html>

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

<http://www.spec.org/cpu2006/flags/Sun-Solaris-Studio12-12u1-and-gccfss4.2.r3.xml>

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Tested with SPEC CPU2006 v1.1.

Report generated on Wed Jul 23 03:11:41 2014 by SPEC CPU2006 PS/PDF formatter v6932.

Originally published on 5 August 2009.