



# SPEC<sup>®</sup> CFP2006 Result

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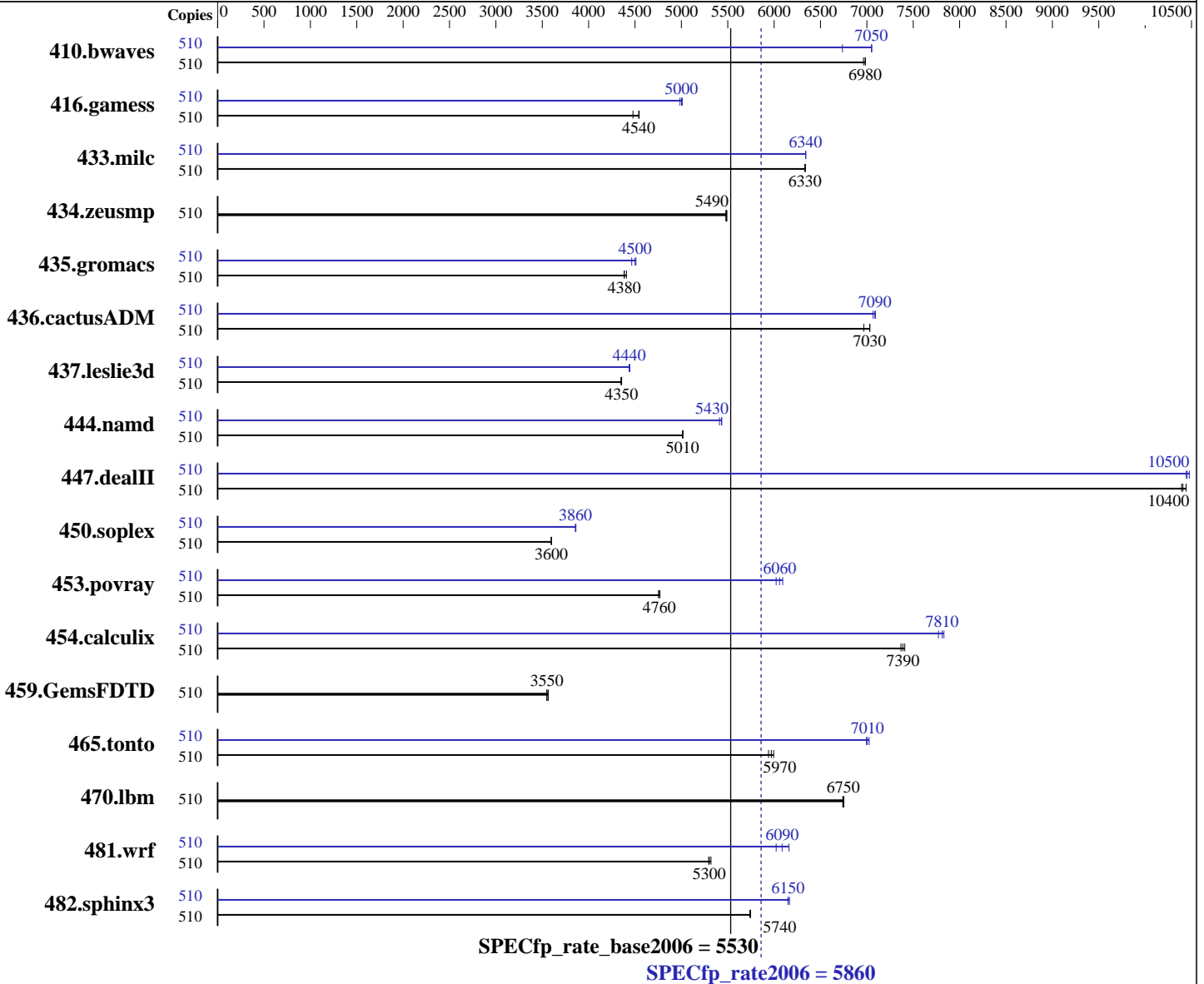
Fujitsu  
Fujitsu SPARC M10-4S

SPECfp<sup>®</sup>\_rate2006 = 5860

SPECfp\_rate\_base2006 = 5530

CPU2006 license: 19  
Test sponsor: Fujitsu  
Tested by: Fujitsu

Test date: Dec-2012  
Hardware Availability: Mar-2013  
Software Availability: Mar-2013



### Hardware

CPU Name: SPARC64 X  
CPU Characteristics:  
CPU MHz: 3000  
FPU: Integrated  
CPU(s) enabled: 256 cores, 16 chips, 16 cores/chip, 2 threads/core  
CPU(s) orderable: 1 to 16 BBs; each BB contains 2 or 4 CPU chips  
Primary Cache: 64 KB I + 64 KB D on chip per core  
Secondary Cache: 24 MB I+D on chip per chip

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### Software

Operating System: Oracle Solaris 11.1  
Compiler: C/C++/Fortran: Version 12.3 of Oracle Solaris Studio, 1/13 Platform Specific Enhancement  
Auto Parallel: No  
File System: zfs and tmpfs  
System State: Default  
Base Pointers: 32-bit  
Peak Pointers: 32-bit

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L3 Cache: None  
Other Cache: None  
Memory: 2 TB (128 x 16 GB 2Rx4 PC3L-12800R-11, ECC, running at 1600 MHz)  
Disk Subsystem: 1 x 600 GB SAS, 10025 RPM Toshiba MBF2600RC  
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	510	995	6960	<b>993</b>	<b>6980</b>	992	6980	510	1029	6740	983	7050	<b>983</b>	<b>7050</b>		
416.gamess	510	<b>2200</b>	<b>4540</b>	2230	4480	2197	4550	510	1993	5010	<b>1996</b>	<b>5000</b>	2003	4990		
433.milc	510	<b>739</b>	<b>6330</b>	739	6340	739	6330	510	738	6340	738	6340	<b>738</b>	<b>6340</b>		
434.zeusmp	510	<b>846</b>	<b>5490</b>	845	5490	847	5480	510	<b>846</b>	<b>5490</b>	845	5490	847	5480		
435.gromacs	510	831	4380	<b>831</b>	<b>4380</b>	826	4410	510	816	4460	<b>809</b>	<b>4500</b>	807	4510		
436.cactusADM	510	867	7030	<b>867</b>	<b>7030</b>	875	6970	510	859	7090	862	7070	<b>860</b>	<b>7090</b>		
437.leslie3d	510	1103	4350	<b>1101</b>	<b>4350</b>	1101	4360	510	1079	4440	1080	4440	<b>1080</b>	<b>4440</b>		
444.namd	510	815	5020	<b>816</b>	<b>5010</b>	816	5010	510	756	5410	<b>753</b>	<b>5430</b>	752	5440		
447.dealII	510	561	10400	<b>561</b>	<b>10400</b>	559	10400	510	<b>558</b>	<b>10500</b>	559	10400	557	10500		
450.soplex	510	<b>1182</b>	<b>3600</b>	1182	3600	1182	3600	510	1102	3860	1101	3860	<b>1102</b>	<b>3860</b>		
453.povray	510	<b>570</b>	<b>4760</b>	569	4770	571	4750	510	451	6020	<b>448</b>	<b>6060</b>	445	6090		
454.calculix	510	<b>570</b>	<b>7390</b>	571	7370	568	7410	510	541	7770	<b>539</b>	<b>7810</b>	537	7830		
459.GemsFDTD	510	1518	3560	1524	3550	<b>1524</b>	<b>3550</b>	510	1518	3560	1524	3550	<b>1524</b>	<b>3550</b>		
465.tonto	510	845	5940	837	5990	<b>841</b>	<b>5970</b>	510	714	7030	<b>716</b>	<b>7010</b>	717	7000		
470.lbm	510	<b>1039</b>	<b>6750</b>	1040	6740	1038	6750	510	<b>1039</b>	<b>6750</b>	1040	6740	1038	6750		
481.wrf	510	1076	5290	<b>1074</b>	<b>5300</b>	1071	5320	510	<b>936</b>	<b>6090</b>	925	6160	946	6020		
482.sphinx3	510	1732	5740	<b>1731</b>	<b>5740</b>	1730	5750	510	1616	6150	<b>1616</b>	<b>6150</b>	1612	6170		

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

## Compiler Invocation Notes

The Apache C++ Standard Library V4.2.1 was installed from <http://stdcxx.apache.org/download.html> using:  
alias gmake=specmake  
gmake BUILDTYPE=8d CONFIG=sunpro.config

## Submit Notes

Processes were assigned to specific processors using 'pbind' commands. The config file option 'submit' was used, along with a list of processors in the 'BIND' variable, to generate the pbind commands. (For details, please see the config file.)



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## Operating System Notes

### Shell Environments:

ulimit -s 131072 was used to limit the space consumed by the stack (and therefore make more space available to the heap).

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

### System Tunables:

(/etc/system parameters)

lpg\_alloc\_prefer=1

Indicates that extra effort should be taken to ensure that pages are created in the nearby lgroup (NUMA location).

## Platform Notes

Sysinfo program /export/cpu2006-v1.2/config/sysinfo.rev6818

\$Rev: 6818 \$ \$Date:: 2012-07-17 #\$ e86d102572650a6e4d596a3cee98f191

running on 4S-710-D0 Sun Dec 23 06:23:44 2012

This section contains SUT (System Under Test) info as seen by some common utilities. To remove or add to this section, see:

<http://www.spec.org/cpu2006/Docs/config.html#sysinfo>

From /usr/sbin/psrinfo

```
SPARC64-X (chipid 0, clock 3000 MHz)
SPARC64-X (chipid 1, clock 3000 MHz)
SPARC64-X (chipid 10, clock 3000 MHz)
SPARC64-X (chipid 11, clock 3000 MHz)
SPARC64-X (chipid 12, clock 3000 MHz)
SPARC64-X (chipid 13, clock 3000 MHz)
SPARC64-X (chipid 14, clock 3000 MHz)
SPARC64-X (chipid 15, clock 3000 MHz)
SPARC64-X (chipid 2, clock 3000 MHz)
SPARC64-X (chipid 3, clock 3000 MHz)
SPARC64-X (chipid 4, clock 3000 MHz)
SPARC64-X (chipid 5, clock 3000 MHz)
SPARC64-X (chipid 6, clock 3000 MHz)
SPARC64-X (chipid 7, clock 3000 MHz)
SPARC64-X (chipid 8, clock 3000 MHz)
SPARC64-X (chipid 9, clock 3000 MHz)
```

16 chips  
512 threads  
3000 MHz

From kstat: 256 cores

From prtconf: 2091520 Megabytes

/etc/release:

Oracle Solaris 11.1 SPARC

uname -a:

SunOS 4S-710-D0 5.11 11.1 sun4v sparc sun4v

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## Platform Notes (Continued)

```

disk: df -h $SPEC
Filesystem      Size  Used  Available Capacity  Mounted on
rpool/export    547G  4.9G   466G         2%    /export

```

(End of data from sysinfo program)

## General Notes

output\_root was used to put run directories in /tmp/cpu2006 (tmpfs).

## 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:

```

-fast -xtarget=sparc64x -fma=fused -xpagesize=4M -xlinkopt -xvector
-xipo=2 -xalias_level=std -xprefetch_level=3 -xunroll=4 -lbsdmalloc
-M /usr/lib/ld/map.bssalign

```

C++ benchmarks:

```

-fast -xtarget=sparc64x -fma=fused -xpagesize=4M -xlinkopt -xvector
-xipo=2 -xalias_level=compatible -xprefetch_level=2
-library=no%Cstd,no%stlport4 -I/export/cpu2006-v1.2/stdcxx-4.2.1/include
-I/export/cpu2006-v1.2/stdcxx-4.2.1/build/include
-L/export/cpu2006-v1.2/stdcxx-4.2.1/build/lib
-R/export/cpu2006-v1.2/stdcxx-4.2.1/build/lib -lstd8d
-M /usr/lib/ld/map.bssalign

```

Fortran benchmarks:

```

-fast -xtarget=sparc64x -fma=fused -xpagesize=4M -xlinkopt -xvector
-xipo=2 -xprefetch_auto_type=indirect_array_access -xprefetch_level=3
-M /usr/lib/ld/map.bssalign

```

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## Base Optimization Flags (Continued)

Benchmarks using both Fortran and C:

```
-fast(cc) -fast(f90) -xtarget=sparc64x -fma=fused -xpagesize=4M
-xlinkopt -xvector -xipo=2 -xalias_level=std -xprefetch_level=3
-xunroll=4 -xprefetch_auto_type=indirect_array_access
-M /usr/lib/ld/map.bssalign
```

## Base Other Flags

C benchmarks:  
-xjobs=16

C++ benchmarks:  
-xjobs=16

Fortran benchmarks:  
-xjobs=16

Benchmarks using both Fortran and C:  
-xjobs=16

## 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 -xtarget=sparc64x -fma=fused -xpagesize=4M -xipo=2
-xalias_level=std -fsimple=1 -W2,-Ainline:rs=400
-xprefetch=no%auto -M /usr/lib/ld/map.bssalign
```

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

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## Peak Optimization Flags (Continued)

482.sphinx3: -xprofile=collect:./feedback(pass 1)  
-xprofile=use:./feedback(pass 2) -fast -xtarget=sparc64x  
-fma=fused -xpagesize=4M -xtarget=sparc64vii -xipo=2  
-xlinkopt -xvector -xalias\_level=std -xunroll=4  
-xprefetch=no%auto -Qoption iropt -Ainline:rs=1000  
-Qoption iropt -Ainline:cs=500 -Qoption iropt -Ainline:inc=60  
-lbsdmalloc

### C++ benchmarks:

444.namd: -xprofile=collect:./feedback(pass 1)  
-xprofile=use:./feedback(pass 2) -fast -xtarget=sparc64x  
-fma=fused -xpagesize=4M -xalias\_level=any  
-xprefetch=no%auto -xunroll=2 -Qoption cg -Qms\_pipe+alldoall  
-xchip=generic -library=stlport4

447.dealII: -xprofile=collect:./feedback(pass 1)  
-xprofile=use:./feedback(pass 2) -fast -xtarget=sparc64x  
-fma=fused -xpagesize=4M -xtarget=sparc64vii -xipo=1  
-xalias\_level=compatible -xrestrict -xprefetch=no%auto  
-library=no%Cstd,no%stlport4  
-I/export/cpu2006-v1.2/stdcxx-4.2.1/include  
-I/export/cpu2006-v1.2/stdcxx-4.2.1/build/include  
-L/export/cpu2006-v1.2/stdcxx-4.2.1/build/lib  
-R/export/cpu2006-v1.2/stdcxx-4.2.1/build/lib -lstd8d

450.soplex: -xprofile=collect:./feedback(pass 1)  
-xprofile=use:./feedback(pass 2) -fast -xtarget=sparc64x  
-fma=fused -xpagesize=4M -xtarget=sparc64vii  
-library=stlport4 -xalias\_level=simple -xO3 -xunroll=10  
-xrestrict -xprefetch=no%auto -lbsdmalloc

453.povray: -xprofile=collect:./feedback(pass 1)  
-xprofile=use:./feedback(pass 2) -fast -xtarget=sparc64x  
-fma=fused -xpagesize=4M -xipo=2 -xalias\_level=compatible  
-xunroll=3 -xprefetch=no%auto  
-Qoption iropt -Ainline:rs=1024  
-Qoption iropt -Ainline:cs=1024  
-Qoption iropt -Ainline:inc=900 -xchip=generic  
-library=stlport4 -lfast

### Fortran benchmarks:

410.bwaves: -xprofile=collect:./feedback(pass 1)  
-xprofile=use:./feedback(pass 2) -fast -xtarget=sparc64x  
-fma=fused -xpagesize=4M -xipo=2 -xlinkopt -xunroll=4  
-xprefetch=no%auto

416.gamess: -fast -xtarget=sparc64x -fma=fused -xpagesize=4M  
-xtarget=sparc64vii -xlinkopt -xprefetch=no%auto -xunroll=6  
-M /usr/lib/ld/map.bssalign

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## Peak Optimization Flags (Continued)

434.zeusmp: basepeak = yes

437.leslie3d: -fast -xtarget=sparc64x -fma=fused -xpagesize=4M  
-xtarget=sparc64vii -xprefetch=latx:1.2  
-Qoption cg -Qms\_pipe+alldoall -M /usr/lib/ld/map.bssalign

459.GemsFDTD: basepeak = yes

465.tonto: -xprofile=collect:./feedback(pass 1)  
-xprofile=use:./feedback(pass 2) -fast -xtarget=sparc64x  
-fma=fused -xpagesize=4M -xipo=1 -xO4 -xunroll=3  
-xprefetch=no%auto -lbsdmalloc

Benchmarks using both Fortran and C:

435.gromacs: -xprofile=collect:./feedback(pass 1)  
-xprofile=use:./feedback(pass 2) -fast(cc) -fast(f90)  
-xtarget=sparc64x -fma=fused -xpagesize=4M  
-xtarget=sparc64vii -fsimple=0 -xunroll=4  
-xprefetch\_auto\_type=indirect\_array\_access

436.cactusADM: -fast(cc) -fast(f90) -xtarget=sparc64x -fma=fused  
-xpagesize=4M -xlinkopt -xvector -xalias\_level=std  
-xprefetch\_level=3 -xunroll=4 -xprefetch=latx:2.0  
-xprefetch\_auto\_type=indirect\_array\_access  
-M /usr/lib/ld/map.bssalign

454.calculix: -xprofile=collect:./feedback(pass 1)  
-xprofile=use:./feedback(pass 2) -fast(cc) -fast(f90)  
-xtarget=sparc64x -fma=fused -xpagesize=4M -xipo=1  
-xalias\_level=std -xprefetch\_level=3 -xprefetch=latx:2.0

481.wrf: -fast(cc) -fast(f90) -xtarget=sparc64x -fma=fused  
-xpagesize=4M -xalias\_level=std -xunroll=5  
-Qoption iropt -Rujam -xchip=generic -xprefetch=no%auto  
-M /usr/lib/ld/map.bssalign

## Peak Other Flags

C benchmarks:  
-xjobs=16

C++ benchmarks:  
-xjobs=16

Continued on next page



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## Peak Other Flags (Continued)

Fortran benchmarks:  
-xjobs=16

Benchmarks using both Fortran and C:  
-xjobs=16

The flags file that was used to format this result can be browsed at

<http://www.spec.org/cpu2006/flags/Oracle-Solaris-Studio12.3-SPARC64X.20130409.html>

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

<http://www.spec.org/cpu2006/flags/Oracle-Solaris-Studio12.3-SPARC64X.20130409.xml>

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

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