



# SPEC<sup>®</sup> CFP2006 Result

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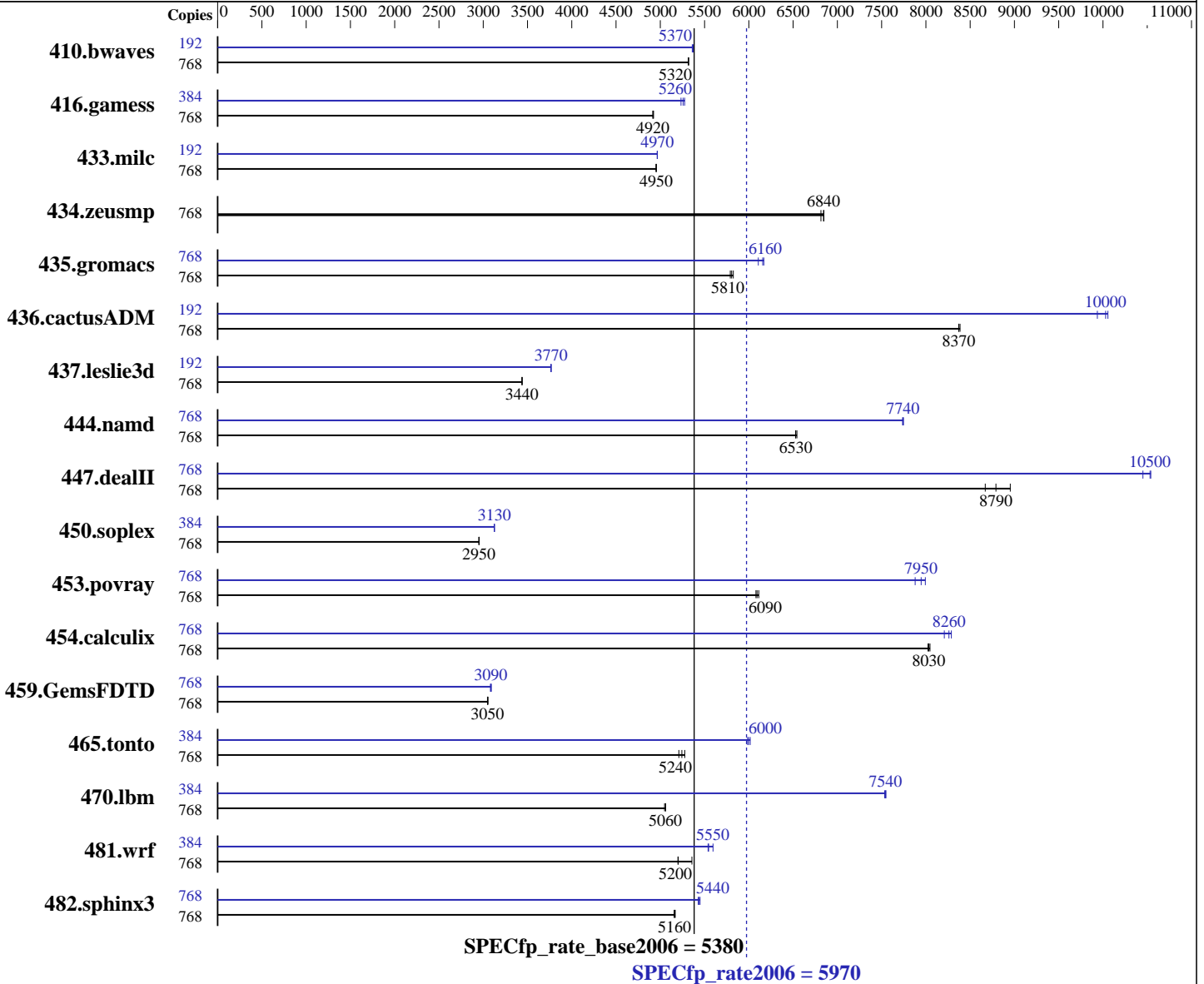
## Fujitsu Fujitsu SPARC M12-2S

SPECfp<sup>®</sup>\_rate2006 = 5970

SPECfp\_rate\_base2006 = 5380

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

Test date: Mar-2017  
Hardware Availability: Apr-2017  
Software Availability: Jul-2017



### Hardware

CPU Name: SPARC64 XII  
 CPU Characteristics: High Speed Mode up to 4.35 GHz  
 CPU MHz: 4250  
 FPU: Integrated  
 CPU(s) enabled: 96 cores, 8 chips, 12 cores/chip, 8 threads/core  
 CPU(s) orderable: 1 to 16 BBs; each BB contains 1 or 2 CPU chips; the number of orderable total cores is 2, 3, 4, .. 384  
 Primary Cache: 64 KB I + 64 KB D on chip per core

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### Software

Operating System: Oracle Solaris 11.3 (with June 2017 SRU)  
 Compiler: C/C++/Fortran: Version 12.6 of Oracle Developer Studio  
 Auto Parallel: No  
 File System: tmpfs  
 System State: Default  
 Base Pointers: 32-bit  
 Peak Pointers: 32-bit  
 Other Software: None



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Secondary Cache: 512 KB I+D on chip per core  
L3 Cache: 32 MB I+D on chip per chip  
Other Cache: None  
Memory: 4 TB (128 x 32 GB 2Rx4 PC4-2400T-R)  
Disk Subsystem: 1 x 600 GB 10K RPM SAS (for system disk)  
Other Hardware: None

## Results Table

| Benchmark     | Base   |             |             |             |             |             | Peak        |        |             |              |             |             |             |             |
|---------------|--------|-------------|-------------|-------------|-------------|-------------|-------------|--------|-------------|--------------|-------------|-------------|-------------|-------------|
|               | Copies | Seconds     | Ratio       | Seconds     | Ratio       | Seconds     | Ratio       | Copies | Seconds     | Ratio        | Seconds     | Ratio       | Seconds     | Ratio       |
| 410.bwaves    | 768    | 1962        | 5320        | <b>1962</b> | <b>5320</b> | 1963        | 5320        | 192    | <b>486</b>  | <b>5370</b>  | 486         | 5370        | 487         | 5360        |
| 416.gamess    | 768    | 3054        | 4920        | 3059        | 4920        | <b>3058</b> | <b>4920</b> | 384    | 1425        | 5270         | 1437        | 5230        | <b>1430</b> | <b>5260</b> |
| 433.milc      | 768    | <b>1423</b> | <b>4950</b> | 1423        | 4960        | 1424        | 4950        | 192    | 355         | 4960         | <b>355</b>  | <b>4970</b> | 355         | 4970        |
| 434.zeusmp    | 768    | <b>1021</b> | <b>6840</b> | 1026        | 6810        | 1021        | 6850        | 768    | <b>1021</b> | <b>6840</b>  | 1026        | 6810        | 1021        | 6850        |
| 435.gromacs   | 768    | 947         | 5790        | <b>945</b>  | <b>5810</b> | 941         | 5820        | 768    | 898         | 6110         | 889         | 6170        | <b>891</b>  | <b>6160</b> |
| 436.cactusADM | 768    | <b>1096</b> | <b>8370</b> | 1096        | 8370        | 1094        | 8390        | 192    | <b>229</b>  | <b>10000</b> | 231         | 9940        | 228         | 10100       |
| 437.leslie3d  | 768    | 2099        | 3440        | 2100        | 3440        | <b>2100</b> | <b>3440</b> | 192    | <b>479</b>  | <b>3770</b>  | 480         | 3760        | 479         | 3770        |
| 444.namd      | 768    | 941         | 6540        | 943         | 6530        | <b>943</b>  | <b>6530</b> | 768    | 796         | 7740         | 795         | 7750        | <b>796</b>  | <b>7740</b> |
| 447.dealII    | 768    | 981         | 8950        | 1013        | 8670        | <b>999</b>  | <b>8790</b> | 768    | <b>834</b>  | <b>10500</b> | 841         | 10500       | 834         | 10500       |
| 450.soplex    | 768    | <b>2170</b> | <b>2950</b> | 2171        | 2950        | 2168        | 2950        | 384    | 1025        | 3120         | 1024        | 3130        | <b>1025</b> | <b>3130</b> |
| 453.povray    | 768    | <b>671</b>  | <b>6090</b> | 672         | 6080        | 668         | 6110        | 768    | 519         | 7880         | <b>514</b>  | <b>7950</b> | 511         | 7990        |
| 454.calculix  | 768    | 790         | 8020        | <b>789</b>  | <b>8030</b> | 787         | 8050        | 768    | 772         | 8210         | 765         | 8290        | <b>767</b>  | <b>8260</b> |
| 459.GemsFDTD  | 768    | 2674        | 3050        | 2668        | 3050        | <b>2673</b> | <b>3050</b> | 768    | 2644        | 3080         | <b>2640</b> | <b>3090</b> | 2636        | 3090        |
| 465.tonto     | 768    | 1432        | 5280        | 1451        | 5210        | <b>1441</b> | <b>5240</b> | 384    | 628         | 6020         | <b>630</b>  | <b>6000</b> | 631         | 5990        |
| 470.lbm       | 768    | 2085        | 5060        | <b>2086</b> | <b>5060</b> | 2090        | 5050        | 384    | 700         | 7530         | 699         | 7550        | <b>699</b>  | <b>7540</b> |
| 481.wrf       | 768    | 1601        | 5360        | 1650        | 5200        | <b>1649</b> | <b>5200</b> | 384    | 774         | 5540         | 767         | 5600        | <b>773</b>  | <b>5550</b> |
| 482.sphinx3   | 768    | 2903        | 5160        | <b>2900</b> | <b>5160</b> | 2896        | 5170        | 768    | 2757        | 5430         | <b>2752</b> | <b>5440</b> | 2747        | 5450        |

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

## 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.)

## 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 "Logical Domains Manager" service was turned off using the command "svcadm disable ldmd".

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## Operating System Notes (Continued)

### System Tunables:

(/etc/system parameters)

autoup = 86400

Causes pages older than the listed number of seconds to be written by fsflush.

doiflush = 0

Controls whether file system metadata syncs will be executed during fsflush invocations.

dopageflush = 0

Controls whether memory is examined for modified pages during fsflush invocations.

zfs:zfs\_arc\_max=1073741824

Determines the maximum size of the ZFS Adaptive Replacement Cache (ARC).

## Platform Notes

### Firmware Settings:

(XSCF operations)

Set High Speed Mode via XSCF command "sethsmode -s on".

Sysinfo program /export/cpu2006/config/sysinfo

Revision 6993 of 2015-11-06 (c9426fd40261140bb4c02f7d35768596)

running on H2S-257-D0 Tue Mar 14 10:10:12 2017

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-XII (chipid 0, clock 4250 MHz)

SPARC64-XII (chipid 1, clock 4250 MHz)

SPARC64-XII (chipid 2, clock 4250 MHz)

SPARC64-XII (chipid 3, clock 4250 MHz)

SPARC64-XII (chipid 4, clock 4250 MHz)

SPARC64-XII (chipid 5, clock 4250 MHz)

SPARC64-XII (chipid 6, clock 4250 MHz)

SPARC64-XII (chipid 7, clock 4250 MHz)

8 chips

768 threads

4250 MHz

From kstat: 96 cores

From prtconf: 4187136 Megabytes

/etc/release:

Oracle Solaris 11.3 SPARC

uname -a:

SunOS H2S-257-D0 5.11 11.3 sun4v sparc sun4v

SPEC is set to: /export/cpu2006

disk: df -h /export/cpu2006

Filesystem Size Used Available Capacity Mounted on

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## Platform Notes (Continued)

rpool/export 547G 26G 243G 10% /export

(End of data from sysinfo program)

## General Notes

The Building Block (BB) is just a Fujitsu SPARC M12-2S that is the basic unit to be expanded as if stacking up children's blocks.

File System:

tmpfs: output\_root was used to put run directories in /tmp/cpu2006  
zfs: operating system

SPEC CPU2006 benchmark:

Updated with runspec --update

## Base Compiler Invocation

C benchmarks:

cc

C++ benchmarks:

CC

Fortran benchmarks:

f90

Benchmarks using both Fortran and C:

cc f90

## Base Portability Flags

447.dealII: -DBOOST\_NO\_COMPILER\_CONFIG

## Base Optimization Flags

C benchmarks:

-std=c99 -m32 -fast -xtarget=sparc64xii -xipo=2 -xpagesize=4M  
-xsegment\_align=4M -xthroughput -xalias\_level=std -xprefetch\_level=2

C++ benchmarks:

-m32 -fast -xtarget=sparc64xii -xipo=2 -xpagesize=4M  
-xsegment\_align=4M -xthroughput -xalias\_level=compatible  
-library=stlport4

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## Base Optimization Flags (Continued)

Fortran benchmarks:

-m32 -fast -xtarget=sparc64xii -xipo=2 -xpagesize=4M  
-xsegment\_align=4M -xthroughput -xvector=no%lib

Benchmarks using both Fortran and C:

-std=c99 -m32 -fast(cc) -fast(f95) -xtarget=sparc64xii -xipo=2  
-xpagesize=4M -xsegment\_align=4M -xthroughput -xalias\_level=std  
-xprefetch\_level=2 -xvector=no%lib

## Base Other Flags

C benchmarks:  
-xjobs=8

C++ benchmarks:  
-xjobs=8

Fortran benchmarks:  
-xjobs=8

Benchmarks using both Fortran and C:  
-xjobs=8

## Peak Compiler Invocation

C benchmarks:  
cc

C++ benchmarks:  
CC

Fortran benchmarks:  
f90

Benchmarks using both Fortran and C:  
cc f90

## Peak Portability Flags

447.dealIII: -DBOOST\_NO\_COMPILER\_CONFIG



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## Peak Optimization Flags

### C benchmarks:

433.milc: -std=c99 -m32 -fast -xtarget=sparc64xii -xpagesize=4M  
 -xsegment\_align=4M -xthroughput -xipo=2 -xalias\_level=std  
 -fsimple=1 -W2,-Ainline:rs=400  
 -Qoption cg -Qms\_pipe+alldoall -W2,-Asac -xthroughput=no

470.lbm: -std=c99 -m32 -fast -xtarget=sparc64xii -xpagesize=4M  
 -xsegment\_align=4M -xthroughput -xipo=2 -xalias\_level=std  
 -xprefetch\_level=2 -xpagesize=256M -xsegment\_align=256M  
 -xthroughput=no -lbsdmalloc

482.sphinx3: -std=c99 -xprofile=collect:./feedback(pass 1)  
 -xprofile=use:./feedback(pass 2) -m32 -fast  
 -xtarget=sparc64xii -xpagesize=4M -xsegment\_align=4M  
 -xthroughput -xO4 -xipo=2 -xprefetch=latx:0.6  
 -xinline\_param=level:1 -xprefetch=no%auto -lbsdmalloc

### C++ benchmarks:

444.namd: -xprofile=collect:./feedback(pass 1)  
 -xprofile=use:./feedback(pass 2) -m32 -fast  
 -xtarget=sparc64xii -xpagesize=4M -xsegment\_align=4M  
 -xthroughput -xalias\_level=compatible -xprefetch=no%auto  
 -Wc,-Qms\_pipe+alldoall

447.dealII: -xprofile=collect:./feedback(pass 1)  
 -xprofile=use:./feedback(pass 2) -m32 -fast  
 -xtarget=sparc64xii -xpagesize=4M -xsegment\_align=4M  
 -xthroughput -xtarget=sparc64xplus -xipo=1  
 -xalias\_level=compatible -xrestrict -xprefetch=no%auto  
 -Qoption cg -Qiselect-funcalign=64 -xthroughput=yes  
 -library=stdcxx4 -template=extdef

450.soplex: -xprofile=collect:./feedback(pass 1)  
 -xprofile=use:./feedback(pass 2) -m32 -fast  
 -xtarget=sparc64xii -xpagesize=4M -xsegment\_align=4M  
 -xthroughput -xipo=2 -Wc,-Qlp=0

453.povray: -xprofile=collect:./feedback(pass 1)  
 -xprofile=use:./feedback(pass 2) -m32 -fast  
 -xtarget=sparc64xii -xpagesize=4M -xsegment\_align=4M  
 -xthroughput -xO4 -xtarget=sparc64xplus -xipo=2  
 -xalias\_level=compatible -xlinkopt=2 -xprefetch=no%auto  
 -xunroll=7 -Qoption iropt -Ainline:rs=1024  
 -Qoption iropt -Ainline:cs=1024  
 -Qoption iropt -Ainline:inc=900 -lfast

### Fortran benchmarks:

Continued on next page



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## Peak Optimization Flags (Continued)

410.bwaves: -xprofile=collect:./feedback(pass 1)  
-xprofile=use:./feedback(pass 2) -m32 -fast  
-xtarget=sparc64xii -xpagesize=4M -xsegment\_align=4M  
-xthroughput -xipo=2 -xunroll=4 -xvector=%none  
-xprefetch=no%auto

416.gamess: -m32 -fast -xtarget=sparc64xii -xpagesize=4M  
-xsegment\_align=4M -xthroughput -xvector=no%simd  
-xprefetch=latx:0.1

434.zeusmp: basepeak = yes

437.leslie3d: -m32 -fast -xtarget=sparc64xii -xpagesize=4M  
-xsegment\_align=4M -xthroughput -xunroll=2 -xvector=%none  
-xprefetch=latx:0.8 -Qoption cg -Qms\_pipe+alldoall  
-xinline\_param=level:1 -xthroughput=no

459.GemsFDTD: -xprofile=collect:./feedback(pass 1)  
-xprofile=use:./feedback(pass 2) -m32 -fast  
-xtarget=sparc64xii -xpagesize=4M -xsegment\_align=4M  
-xthroughput -xunroll=9 -xprefetch=latx:0.2  
-xprefetch\_level=3 -Qoption cg -Qlp-av=128  
-Qoption iropt -Rujam

465.tonto: -xprofile=collect:./feedback(pass 1)  
-xprofile=use:./feedback(pass 2) -m32 -fast  
-xtarget=sparc64xii -xpagesize=4M -xsegment\_align=4M  
-xthroughput -xipo=1 -xO4 -xunroll=3 -xprefetch=no%auto  
-xthroughput=no -lbsdmalloc

Benchmarks using both Fortran and C:

435.gromacs: -std=c99 -xprofile=collect:./feedback(pass 1)  
-xprofile=use:./feedback(pass 2) -m32 -fast(cc) -fast(f95)  
-xtarget=sparc64xii -xpagesize=4M -xsegment\_align=4M  
-xthroughput -xalias\_level=strong -Wc,-Qicache-chbab=1  
-Wc,-Qiselect-rsqrrta=2 -Wc,-Qiselect-rsqrrtalx=2  
-qoption cg -Qicache-chbab=1 -qoption cg -Qiselect-rsqrrta=2  
-qoption cg -Qiselect-rsqrrtalx=2

436.cactusADM: -std=c99 -m32 -fast(cc) -fast(f95) -xtarget=sparc64xii  
-xpagesize=4M -xsegment\_align=4M -xthroughput  
-xtarget=sparc64xplus -xunroll=10 -xprefetch=latx:2.0  
-xpagesize=256M -xsegment\_align=256M -xthroughput=no  
-lbsdmalloc

454.calculix: -std=c99 -xprofile=collect:./feedback(pass 1)  
-xprofile=use:./feedback(pass 2) -m32 -fast(cc) -fast(f95)  
-xtarget=sparc64xii -xpagesize=4M -xsegment\_align=4M  
-xthroughput -xtarget=sparc64xplus -xipo=1  
-Wc,-Qiselect-funcalign=64 -xinline\_param=level:3

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## Peak Optimization Flags (Continued)

454.calculix (continued):

-Qoption cg -Qiselect-funcalign=64

481.wrf: -std=c99 -m32 -fast(cc) -fast(f95) -xtarget=sparc64xii  
-xpagesize=4M -xsegment\_align=4M -xthroughput -xunroll=9  
-xprefetch=latx:0.4 -Qoption iropt -Rujam -xO4  
-xthroughput=no

## Peak Other Flags

C benchmarks:  
-xjobs=8

C++ benchmarks:  
-xjobs=8

Fortran benchmarks:  
-xjobs=8

Benchmarks using both Fortran and C:  
-xjobs=8

The flags files that were used to format this result can be browsed at

<http://www.spec.org/cpu2006/flags/Oracle-Developer-Studio12.6.html>  
<http://www.spec.org/cpu2006/flags/Fujitsu-M12-2S.html>

You can also download the XML flags sources by saving the following links:

<http://www.spec.org/cpu2006/flags/Oracle-Developer-Studio12.6.xml>  
<http://www.spec.org/cpu2006/flags/Fujitsu-M12-2S.xml>

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

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