# SPEC® CFP2006 Result

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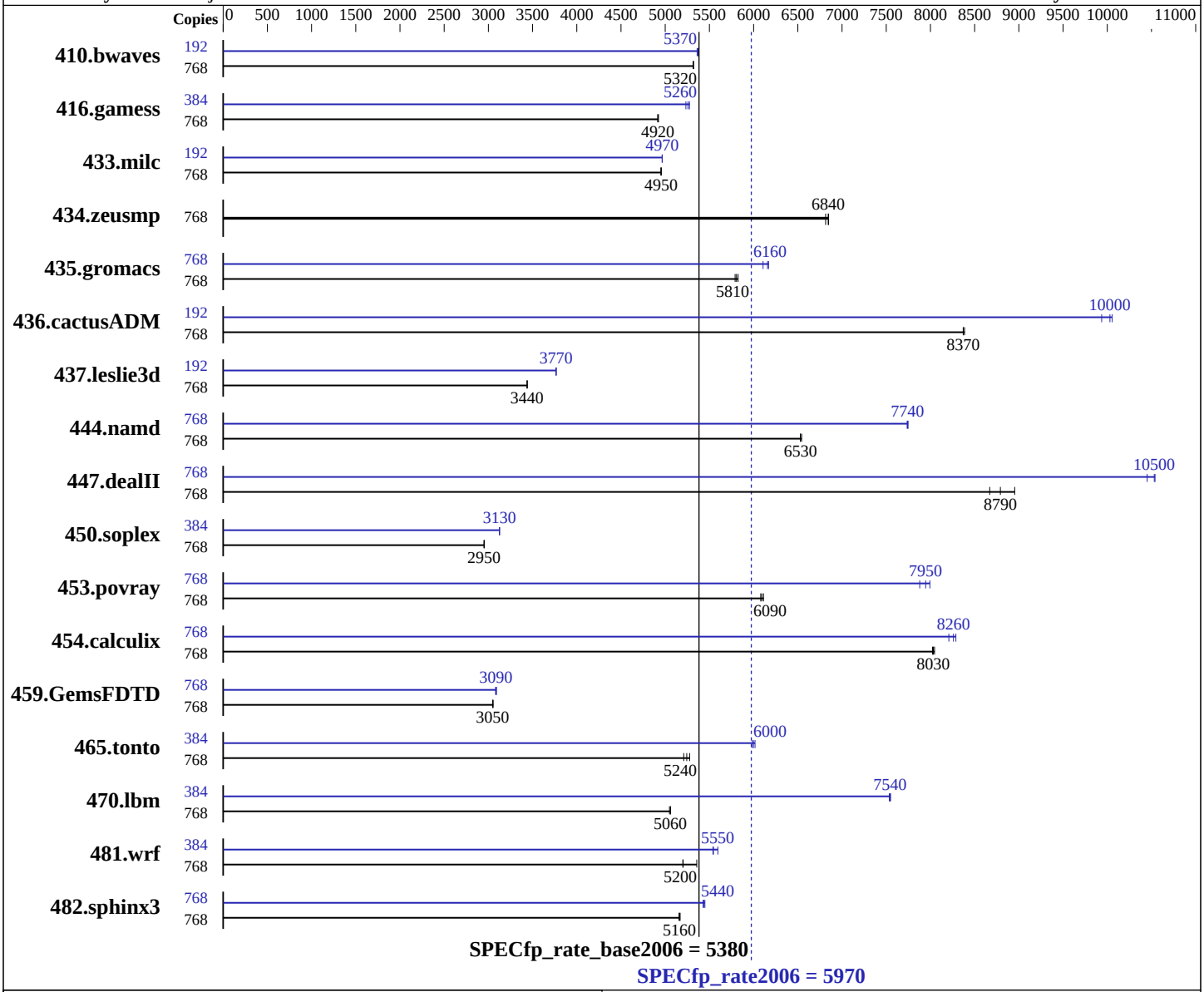
## Fujitsu
## Fujitsu SPARC M12-2S

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

Continued on next page

## 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.dealII: `-DBOOST_NO_COMPILER_CONFIG`

## 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

## 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-rsqrta=2 -Wc,-Qiselect-rsqrta1x=2
-qoption cg -Qicache-chbab=1 -qoption cg -Qiselect-rsqrta=2
-qoption cg -Qiselect-rsqrta1x=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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