SPEC® CFP2006 Result

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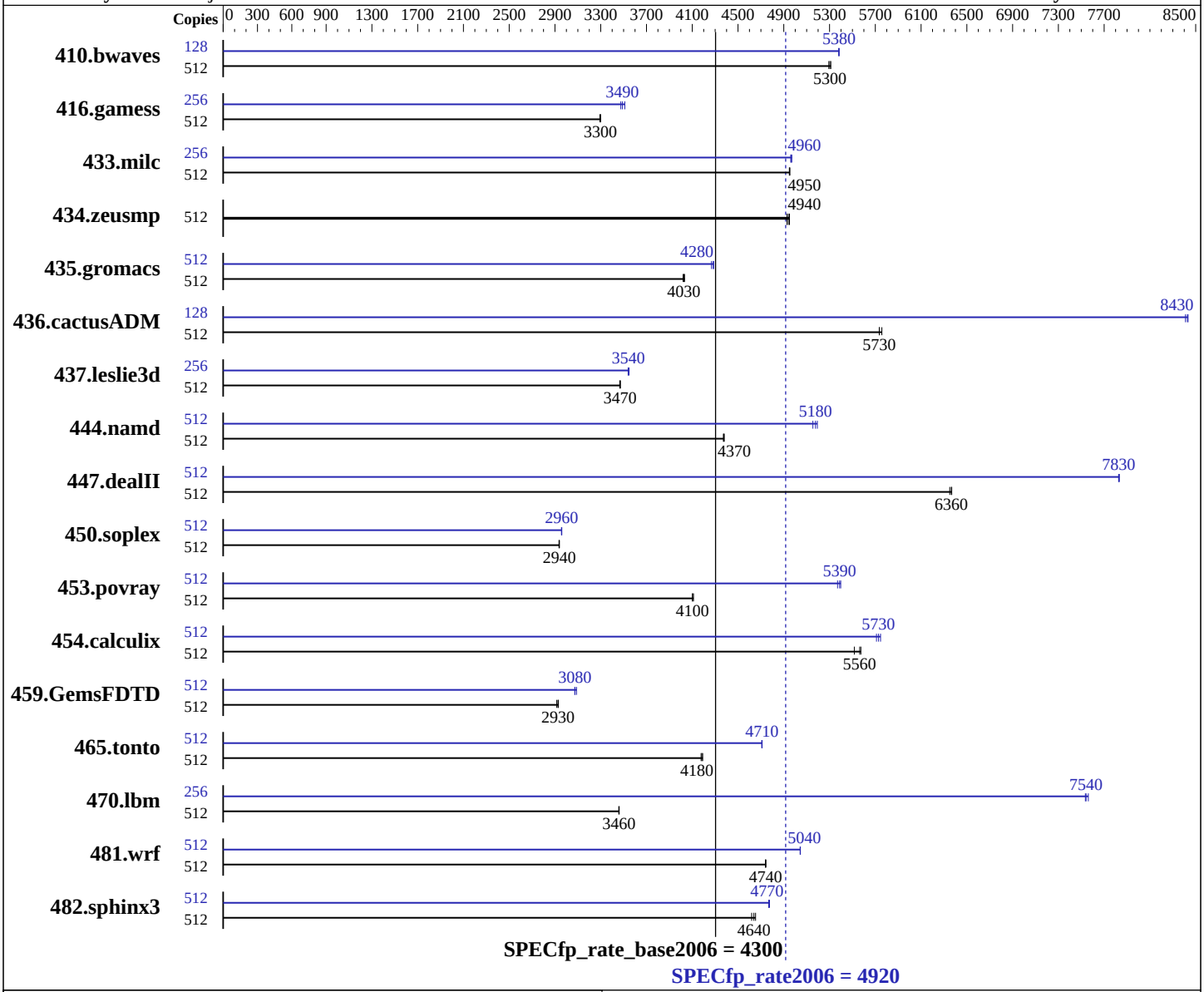
Fujitsu
Fujitsu SPARC M12-2S

SPECfp®_rate2006 = 4920

SPECfp_rate_base2006 = 4300

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:	64 cores, 8 chips, 8 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	512	1314	5290	**1312**	**5300**	1310	5310	128	323	5380	323	5380	**323**	**5380**
416.gamess	512	**3041**	**3300**	3045	3290	3039	3300	256	1428	3510	**1436**	**3490**	1442	3480
433.milc	512	**949**	**4950**	949	4950	950	4950	256	473	4970	**474**	**4960**	474	4960
434.zeusmp	512	941	4950	**943**	**4940**	945	4930	512	941	4950	**943**	**4940**	945	4930
435.gromacs	512	909	4020	906	4030	**908**	**4030**	512	853	4290	**854**	**4280**	856	4270
436.cactusADM	512	1063	5760	**1067**	**5730**	1067	5730	128	182	8410	**182**	**8430**	181	8430
437.leslie3d	512	1388	3470	**1387**	**3470**	1386	3470	256	**679**	**3540**	680	3540	678	3550
444.namd	512	939	4370	938	4380	**939**	**4370**	512	791	5190	**793**	**5180**	797	5150
447.dealII	512	922	6350	**920**	**6360**	920	6370	512	748	7830	748	7830	**748**	**7830**
450.soplex	512	**1453**	**2940**	1455	2940	1453	2940	512	1444	2960	1443	2960	**1443**	**2960**
453.povray	512	**664**	**4100**	664	4100	663	4110	512	505	5400	507	5370	**506**	**5390**
454.calculix	512	**759**	**5560**	766	5520	758	5570	512	735	5750	740	5710	**737**	**5730**
459.GemsFDTD	512	1854	2930	1863	2920	**1856**	**2930**	512	**1766**	**3080**	1759	3090	1768	3070
465.tonto	512	1202	4190	**1204**	**4180**	1206	4180	512	1069	4710	1070	4710	**1070**	**4710**
470.lbm	512	2032	3460	**2033**	**3460**	2034	3460	256	467	7540	**466**	**7540**	465	7560
481.wrf	512	1207	4740	1205	4740	**1206**	**4740**	512	1134	5040	**1134**	**5040**	1134	5050
482.sphinx3	512	2144	4650	2160	4620	**2151**	**4640**	512	2093	4770	**2092**	**4770**	2090	4780

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".
```

Continued on next page

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 Sat Mar 11 18:16:13 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
    512 threads
    4250 MHz

 From kstat:       64 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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