SPEC® CPU2017 Floating Point Rate Result

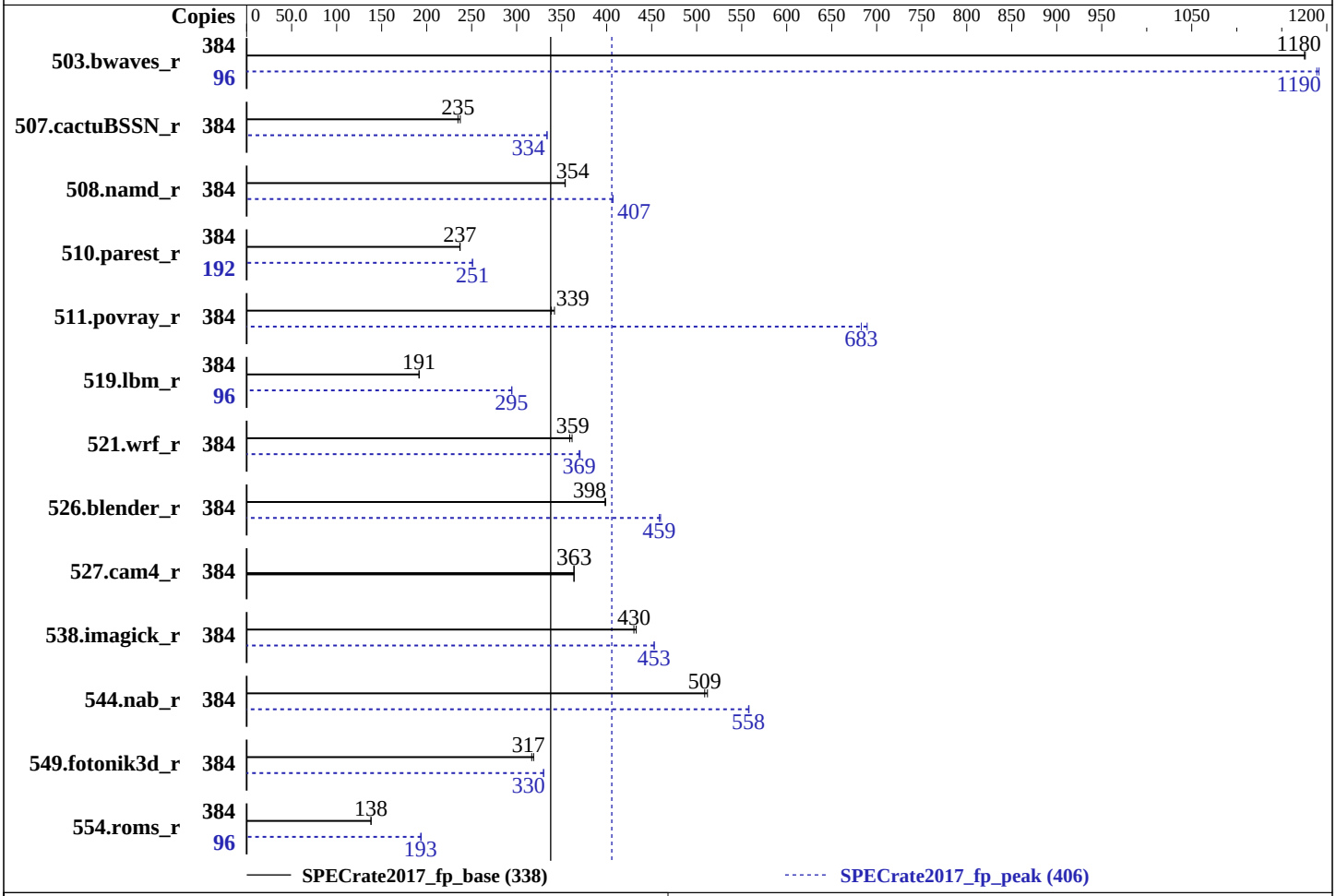
Fujitsu
Fujitsu SPARC M12-2S

SPECrate2017_fp_base = 338

SPECrate2017_fp_peak = 406

CPU2017 License: 19
Test Sponsor: Fujitsu
Tested by: Fujitsu

Test Date: Nov-2017
Hardware Availability: Apr-2017
Software Availability: Jul-2017



Hardware

CPU Name:	SPARC64 XII
Max MHz.:	4350
Nominal:	4250
Enabled:	48 cores, 4 chips, 8 threads/core
Orderable:	1 to 16 BBs; each BB contains 1 or 2 CPU chips; 2, 3, 4, .. 384 cores
Cache L1:	64 KB I + 64 KB D on chip per core
L2:	512 KB I+D on chip per core
L3:	32 MB I+D on chip per chip
Other:	None
Memory:	2 TB (64 x 32 GB 2Rx4 PC4-2400T-R)
Storage:	1 x 600 GB 10K RPM SAS (for system disk)
Other:	None

Software

OS:	Oracle Solaris 11.3 SRU 24.4
Compiler:	C/C++/Fortran: Version 12.6 of Oracle Developer Studio
Parallel:	No
Firmware:	Fujitsu HCP Version 3040 released Oct-2017
File System:	tmpfs
System State:	Default
Base Pointers:	32-bit
Peak Pointers:	32/64-bit
Other:	None

Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
503.bwaves_r	384	**3277**	**1180**	3274	1180			96	**810**	**1190**	808	1190		
507.cactuBSSN_r	384	2048	237	**2071**	**235**			384	**1457**	**334**	1456	334		
508.namd_r	384	1030	354	**1032**	**354**			384	**897**	**407**	896	407		
510.parest_r	384	**4240**	**237**	4235	237			192	**2003**	**251**	2001	251		
511.povray_r	384	2622	342	**2648**	**339**			384	**1313**	**683**	1301	689		
519.lbm_r	384	**2114**	**191**	2111	192			96	343	295	**344**	**295**		
521.wrf_r	384	**2397**	**359**	2379	362			384	2322	370	**2329**	**369**		
526.blender_r	384	1466	399	**1469**	**398**			384	**1275**	**459**	1272	460		
527.cam4_r	384	1846	364	**1848**	**363**			384	1846	364	**1848**	**363**		
538.imagick_r	384	**2220**	**430**	2206	433			384	**2110**	**453**	2109	453		
544.nab_r	384	**1270**	**509**	1262	512			384	1158	558	**1159**	**558**		
549.fotonik3d_r	384	**4725**	**317**	4693	319			384	4535	330	**4538**	**330**		
554.roms_r	384	4414	138	**4418**	**138**			96	**789**	**193**	786	194		

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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".

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).
```

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/cpu2017
 zfs: operating system

Binaries were compiled on a system with 2x SPARC64 XII CPU + 1TB Memory using Oracle Solaris 11.3 SRU 24.4
```

Platform Notes

```
Firmware Settings:
(XSCF operations)
   Set High Speed Mode via XSCF command "sethsmode -s on".

Sysinfo program /export/cpu2017/bin/sysinfo
Rev: r5797 of 2017-06-14 96c45e4568ad54c135fd618bcc091c0f
running on H2S-230-D0 Thu Nov 30 20:05:27 2017

SUT (System Under Test) info as seen by some common utilities.
For more information on this section, see
   https://www.spec.org/cpu2017/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)
   4 chips
   384 threads
   4250 MHz

From kstat:       48 cores

From prtconf: 2093056 Megabytes

/etc/release:
     Oracle Solaris 11.3 SPARC
uname -a:
   SunOS H2S-230-D0 5.11 11.3 sun4v sparc sun4v

disk: df -h /export/cpu2017
Filesystem             Size   Used  Available Capacity  Mounted on
rpool/export           547G   136G        87G    61%    /export
```

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Platform Notes (Continued)

```
(End of data from sysinfo program)
```

Compiler Version Notes

```
==============================================================================
 CXXC 508.namd_r(base) 510.parest_r(base)
------------------------------------------------------------------------------
CC: Studio 12.6 Sun C++ 5.15 SunOS_sparc 2017/05/30
------------------------------------------------------------------------------

==============================================================================
CXXC 508.namd_r(peak) 510.parest_r(peak)
------------------------------------------------------------------------------
CC: Studio 12.6 Sun C++ 5.15 SunOS_sparc 2017/05/30
------------------------------------------------------------------------------

==============================================================================
 CC  511.povray_r(base) 526.blender_r(base)
------------------------------------------------------------------------------
CC: Studio 12.6 Sun C++ 5.15 SunOS_sparc 2017/05/30
cc: Studio 12.6 Sun C 5.15 SunOS_sparc 2017/05/30
------------------------------------------------------------------------------

==============================================================================
CC   511.povray_r(peak) 526.blender_r(peak)
------------------------------------------------------------------------------
CC: Studio 12.6 Sun C++ 5.15 SunOS_sparc 2017/05/30
cc: Studio 12.6 Sun C 5.15 SunOS_sparc 2017/05/30
------------------------------------------------------------------------------

==============================================================================
 FC  507.cactuBSSN_r(base)
------------------------------------------------------------------------------
CC: Studio 12.6 Sun C++ 5.15 SunOS_sparc 2017/05/30
cc: Studio 12.6 Sun C 5.15 SunOS_sparc 2017/05/30
f90: Studio 12.6 Fortran 95 8.8 SunOS_sparc 2017/05/30
------------------------------------------------------------------------------

==============================================================================
FC   507.cactuBSSN_r(peak)
------------------------------------------------------------------------------
CC: Studio 12.6 Sun C++ 5.15 SunOS_sparc 2017/05/30
cc: Studio 12.6 Sun C 5.15 SunOS_sparc 2017/05/30
f90: Studio 12.6 Fortran 95 8.8 SunOS_sparc 2017/05/30
------------------------------------------------------------------------------
```

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Compiler Version Notes (Continued)

```
==============================================================================
 CC  519.lbm_r(base) 538.imagick_r(base) 544.nab_r(base)
------------------------------------------------------------------------------
cc: Studio 12.6 Sun C 5.15 SunOS_sparc 2017/05/30
------------------------------------------------------------------------------

==============================================================================
CC   519.lbm_r(peak) 538.imagick_r(peak) 544.nab_r(peak)
------------------------------------------------------------------------------
cc: Studio 12.6 Sun C 5.15 SunOS_sparc 2017/05/30
------------------------------------------------------------------------------

==============================================================================
 FC  503.bwaves_r(base) 549.fotonik3d_r(base) 554.roms_r(base)
------------------------------------------------------------------------------
f90: Studio 12.6 Fortran 95 8.8 SunOS_sparc 2017/05/30
------------------------------------------------------------------------------

==============================================================================
FC   503.bwaves_r(peak) 549.fotonik3d_r(peak) 554.roms_r(peak)
------------------------------------------------------------------------------
f90: Studio 12.6 Fortran 95 8.8 SunOS_sparc 2017/05/30
------------------------------------------------------------------------------

==============================================================================
 CC  521.wrf_r(base) 527.cam4_r(base)
------------------------------------------------------------------------------
f90: Studio 12.6 Fortran 95 8.8 SunOS_sparc 2017/05/30
cc: Studio 12.6 Sun C 5.15 SunOS_sparc 2017/05/30
------------------------------------------------------------------------------

==============================================================================
CC   521.wrf_r(peak) 527.cam4_r(peak)
------------------------------------------------------------------------------
f90: Studio 12.6 Fortran 95 8.8 SunOS_sparc 2017/05/30
cc: Studio 12.6 Sun C 5.15 SunOS_sparc 2017/05/30
------------------------------------------------------------------------------
```

Base Compiler Invocation

C benchmarks:
cc

C++ benchmarks:
CC

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Base Compiler Invocation (Continued)

Fortran benchmarks:
f90

Benchmarks using both Fortran and C:
f90 cc

Benchmarks using both C and C++:
CC cc

Benchmarks using Fortran, C, and C++:
CC cc f90

Base Portability Flags

503.bwaves_r: -D_FILE_OFFSET_BITS=64
507.cactuBSSN_r: -DSPEC_NO_C99_MATH_IN_CXX -D_FILE_OFFSET_BITS=64
508.namd_r: -D_FILE_OFFSET_BITS=64
510.parest_r: -D_FILE_OFFSET_BITS=64
511.povray_r: -D_FILE_OFFSET_BITS=64
519.lbm_r: -D_FILE_OFFSET_BITS=64
521.wrf_r: -D_FILE_OFFSET_BITS=64
526.blender_r: -DSPEC_NO_ISFINITE -xchar=u -D_FILE_OFFSET_BITS=64
527.cam4_r: -D_FILE_OFFSET_BITS=64
538.imagick_r: -D_FILE_OFFSET_BITS=64
544.nab_r: -D_FILE_OFFSET_BITS=64
549.fotonik3d_r: -D_FILE_OFFSET_BITS=64
554.roms_r: -D_FILE_OFFSET_BITS=64

Base Optimization Flags

C benchmarks:
-m32 -fast -xtarget=sparc64xii -xipo=2 -xpagesize=4M
-xsegment_align=4M -xthroughput -xalias_level=std

C++ benchmarks:
-m32 -fast -xtarget=sparc64xii -xipo=2 -xpagesize=4M
-xsegment_align=4M -xthroughput -xalias_level=compatible -std=c++03
-lfast

Fortran benchmarks:
-m32 -fast -xtarget=sparc64xii -xipo=2 -xpagesize=4M
-xsegment_align=4M -xthroughput

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Base Optimization Flags (Continued)

Benchmarks using both Fortran and C:
-m32 -fast(cc) -fast(f95) -xtarget=sparc64xii -xipo=2 -xpagesize=4M
-xsegment_align=4M -xthroughput -xalias_level=std

Benchmarks using both C and C++:
-m32 -fast(CC) -fast(cc) -xtarget=sparc64xii -xipo=2 -xpagesize=4M
-xsegment_align=4M -xthroughput -xalias_level=std
-xalias_level=compatible -std=c++03 -lfast

Benchmarks using Fortran, C, and C++:
-m32 -fast(CC) -fast(cc) -fast(f95) -xtarget=sparc64xii -xipo=2
-xpagesize=4M -xsegment_align=4M -xthroughput -xalias_level=std
-xalias_level=compatible -std=c++03 -lfast

Base Other Flags

C benchmarks:
-xjobs=8

C++ benchmarks:
-xjobs=8

Fortran benchmarks:
-xjobs=8

Benchmarks using both Fortran and C:
-xjobs=8

Benchmarks using both C and C++:
-xjobs=8

Benchmarks using Fortran, C, and C++:
-xjobs=8

Peak Compiler Invocation

C benchmarks:
cc

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Peak Compiler Invocation (Continued)

C++ benchmarks:
CC

Fortran benchmarks:
f90

Benchmarks using both Fortran and C:
f90 cc

Benchmarks using both C and C++:
CC cc

Benchmarks using Fortran, C, and C++:
CC cc f90

Peak Portability Flags

503.bwaves_r: -D_FILE_OFFSET_BITS=64
507.cactuBSSN_r: -DSPEC_NO_C99_MATH_IN_CXX -DSPEC_LP64
508.namd_r: -D_FILE_OFFSET_BITS=64
510.parest_r: -D_FILE_OFFSET_BITS=64
511.povray_r: -D_FILE_OFFSET_BITS=64
519.lbm_r: -D_FILE_OFFSET_BITS=64
521.wrf_r: -D_FILE_OFFSET_BITS=64
526.blender_r: -DSPEC_NO_ISFINITE -xchar=u -D_FILE_OFFSET_BITS=64
527.cam4_r: -D_FILE_OFFSET_BITS=64
538.imagick_r: -DSPEC_LP64
544.nab_r: -D_FILE_OFFSET_BITS=64
549.fotonik3d_r: -D_FILE_OFFSET_BITS=64
554.roms_r: -D_FILE_OFFSET_BITS=64

Peak Optimization Flags

C benchmarks:

519.lbm_r: -xprofile=collect:./feedback -xprofile=use:./feedback -m32
-fast -xtarget=sparc64xii -xipo=2 -xpagesize=256M
-xsegment_align=256M -xthroughput -xO4
-xtarget=sparc64xplus -xprefetch=latx:0.9
-xprefetch_auto_type=indirect_array_access -xunroll=2
-W2,-Afully_unroll:always=on -Wc,-Qiselect-funcalign=64

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Peak Optimization Flags (Continued)

538.imagick_r: -xprofile=collect:./feedback -xprofile=use:./feedback -m32
-fast -xtarget=sparc64xii -xipo=2 -xpagesize=256M
-xsegment_align=256M -xthroughput -xO4 -m64
-xtarget=sparc64xplus -xinline_param=level:3
-xprefetch=latx:0.7
-xprefetch_auto_type=indirect_array_access -xunroll=4
-Wc,-Qiselect-funcalign=4

544.nab_r: -xprofile=collect:./feedback -xprofile=use:./feedback -m32
-fast -xtarget=sparc64xii -xipo=2 -xpagesize=256M
-xsegment_align=256M -xthroughput -xO4 -xunroll=3

C++ benchmarks:

508.namd_r: -xprofile=collect:./feedback -xprofile=use:./feedback -m32
-fast -xtarget=sparc64xii -xipo=2 -xpagesize=256M
-xsegment_align=256M -xthroughput -xtarget=sparc64xplus
-xalias_level=compatible -Wc,-Qms_pipe+alldoall -std=c++03

510.parest_r: -xprofile=collect:./feedback -xprofile=use:./feedback -m32
-fast -xtarget=sparc64xii -xipo=2 -xpagesize=256M
-xsegment_align=256M -xthroughput -xtarget=sparc64xplus
-xalias_level=compatible -xthroughput=no
-xprefetch=no%auto -std=c++03

Fortran benchmarks:

503.bwaves_r: -xprofile=collect:./feedback -xprofile=use:./feedback -m32
-fast -xtarget=sparc64xii -xipo=2 -xpagesize=256M
-xsegment_align=256M -xthroughput -xinline_param=level:1
-xprefetch=latx:0.5

549.fotonik3d_r: -xprofile=collect:./feedback -xprofile=use:./feedback -m32
-fast -xtarget=sparc64xii -xipo=2 -xpagesize=256M
-xsegment_align=256M -xthroughput -xthroughput=no
-xprefetch=latx:0.8
-xprefetch_auto_type=indirect_array_access -W2,-Rujam

554.roms_r: -xprofile=collect:./feedback -xprofile=use:./feedback -m32
-fast -xtarget=sparc64xii -xipo=2 -xpagesize=256M
-xsegment_align=256M -xthroughput -xtarget=sparc64xplus
-xthroughput=no -xprefetch_auto_type=indirect_array_access
-xunroll=3 -W2,-Rujam -Wc,-Qiselect-rcpa=2
-Wc,-Qiselect-rsqrta=2 -Wc,-Qiselect-rsqrta1x=2

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Peak Optimization Flags (Continued)

Benchmarks using both Fortran and C:

521.wrf_r: -xprofile=collect:./feedback -xprofile=use:./feedback -m32
-fast(cc) -fast(f95) -xtarget=sparc64xii -xipo=2
-xpagesize=256M -xsegment_align=256M -xthroughput
-xtarget=sparc64xplus

527.cam4_r: basepeak = yes

Benchmarks using both C and C++:

511.povray_r: -xprofile=collect:./feedback -xprofile=use:./feedback -m32
-fast(CC) -fast(cc) -xtarget=sparc64xii -xipo=2
-xpagesize=256M -xsegment_align=256M -xthroughput
-xtarget=sparc64xplus -xipo=1 -xalias_level=std
-xthroughput=no -xinline_param=level:3
-Wc,-Qiselect-rcpa=2 -W2,-Afully_unroll:always=on
-xalias_level=compatible -features=no%except
-features=no%rtti -Qoption iropt -Afully_unroll:always=on
-library=stlport4 -lfast

526.blender_r: -xprofile=collect:./feedback -xprofile=use:./feedback -m32
-fast(CC) -fast(cc) -xtarget=sparc64xii -xipo=2
-xpagesize=256M -xsegment_align=256M -xthroughput
-library=stlport4

Benchmarks using Fortran, C, and C++:
-xprofile=collect:./feedback -xprofile=use:./feedback -m32 -fast(CC)
-fast(cc) -fast(f95) -xtarget=sparc64xii -xipo=2 -xpagesize=256M
-xsegment_align=256M -xthroughput -m64 -Wc,-Qiselect-funcalign=4
-Qoption cg -Qiselect-funcalign=4 -library=stlport4

Peak Other Flags

C benchmarks:
-xjobs=8

C++ benchmarks:
-xjobs=8

Fortran benchmarks:
-xjobs=8

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Peak Other Flags (Continued)

Benchmarks using both Fortran and C:
`-xjobs=8`

Benchmarks using both C and C++:
`-xjobs=8`

Benchmarks using Fortran, C, and C++:
`-xjobs=8`

The flags files that were used to format this result can be browsed at
`http://www.spec.org/cpu2017/flags/Oracle-Developer-Studio12.6.html`
`http://www.spec.org/cpu2017/flags/Fujitsu-M12-2S.html`

You can also download the XML flags sources by saving the following links:
`http://www.spec.org/cpu2017/flags/Oracle-Developer-Studio12.6.xml`
`http://www.spec.org/cpu2017/flags/Fujitsu-M12-2S.xml`

For questions about this result, please contact the tester. For other inquiries, please contact info@spec.org.

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