SPEC® CPU2017 Floating Point Rate Result

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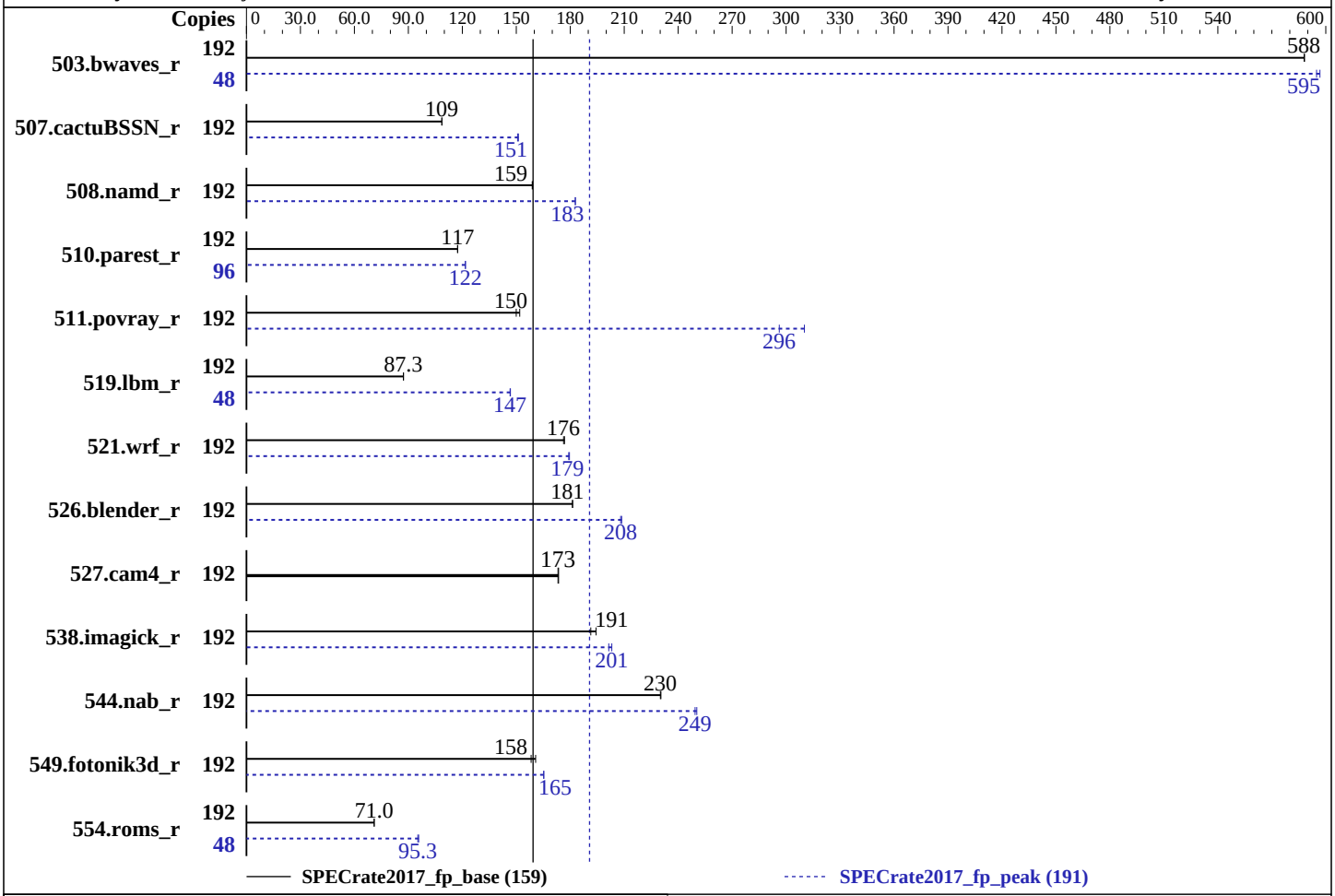
Fujitsu
Fujitsu SPARC M12-2

SPECrate2017_fp_base = 159

SPECrate2017_fp_peak = 191

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.:	3900
Nominal:	3900
Enabled:	24 cores, 2 chips, 8 threads/core
Orderable:	1 or 2 CPU chips; 2, 3, 4, .. 24 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:	1 TB (32 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

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Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
503.bwaves_r	192	**3275**	**588**	3273	588			48	**809**	**595**	807	597		
507.cactuBSSN_r	192	2237	109	**2238**	**109**			192	**1613**	**151**	1608	151		
508.namd_r	192	**1148**	**159**	1148	159			192	998	183	**998**	**183**		
510.parest_r	192	4279	117	**4279**	**117**			96	2063	122	**2064**	**122**		
511.povray_r	192	2951	152	**2989**	**150**			192	**1514**	**296**	1446	310		
519.lbm_r	192	2318	87.3	**2319**	**87.3**			48	**345**	**147**	345	147		
521.wrf_r	192	**2440**	**176**	2432	177			192	2395	180	**2401**	**179**		
526.blender_r	192	**1614**	**181**	1612	181			192	1402	209	**1406**	**208**		
527.cam4_r	192	**1939**	**173**	1935	174			192	**1939**	**173**	1935	174		
538.imagick_r	192	**2495**	**191**	2457	194			192	2351	203	**2371**	**201**		
544.nab_r	192	**1404**	**230**	1402	230			192	1291	250	**1296**	**249**		
549.fotonik3d_r	192	4655	161	**4729**	**158**			192	**4527**	**165**	4527	165		
554.roms_r	192	**4299**	**71.0**	4295	71.0			48	797	95.7	**801**	**95.3**		

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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

```
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

```
Sysinfo program /export/cpu2017/bin/sysinfo
Rev: r5797 of 2017-06-14 96c45e4568ad54c135fd618bcc091c0f
running on loaner Thu Nov 30 07:17:42 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 3900 MHz)
   SPARC64-XII (chipid 1, clock 3900 MHz)
   2 chips
   192 threads
   3900 MHz

From kstat:       24 cores

From prtconf: 1046016 Megabytes

/etc/release:
     Oracle Solaris 11.3 SPARC
uname -a:
   SunOS loaner 5.11 11.3 sun4v sparc sun4v

disk: df -h /export/cpu2017
Filesystem             Size   Used  Available Capacity  Mounted on
rpool/export           547G   3.8G       401G     1%    /export

(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
------------------------------------------------------------------------------
```

(Continued on next page)

Compiler Version Notes (Continued)

```
==============================================================================
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
------------------------------------------------------------------------------

==============================================================================
 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
```

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Compiler Version Notes (Continued)

```
------------------------------------------------------------------------------

==============================================================================
 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

Fortran benchmarks:
f90

Benchmarks using both Fortran and C:
f90 cc

Benchmarks using both C and C++:
CC cc

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Base Compiler Invocation (Continued)

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

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

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Base Optimization Flags (Continued)

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`

C++ benchmarks:
`CC`

Fortran benchmarks:
`f90`

Benchmarks using both Fortran and C:
`f90 cc`

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Peak Compiler Invocation (Continued)

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

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

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Peak Optimization Flags (Continued)

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

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

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Peak Optimization Flags (Continued)

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

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

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

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