SPEC® CPU2017 Floating Point Rate Result

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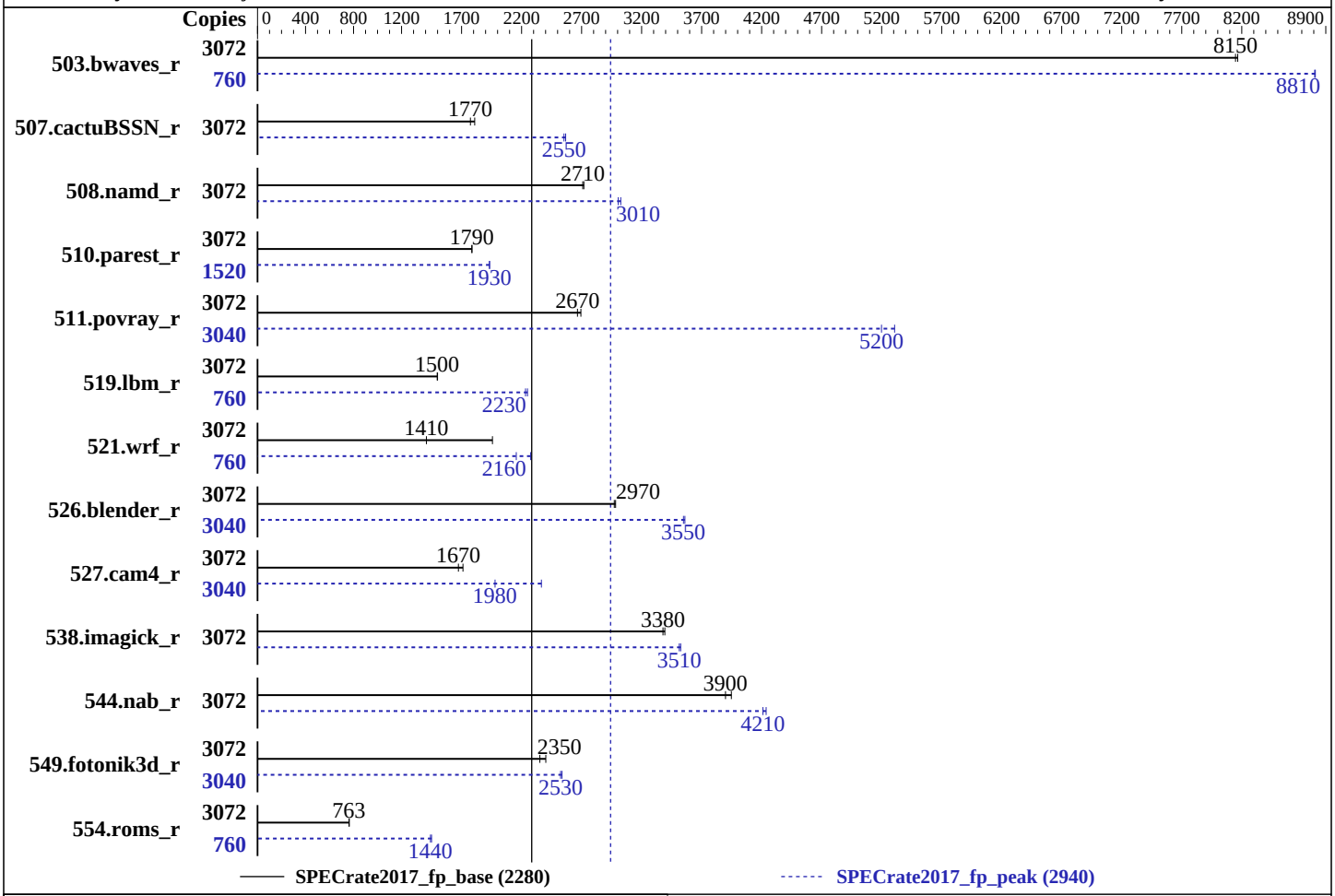
Fujitsu
Fujitsu SPARC M12-2S

SPECrate2017_fp_base = 2280

SPECrate2017_fp_peak = 2940

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:	384 cores, 32 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:	16896 GB (256 x 32 GB 2Rx4 PC4-2400T-R, 136 x 64 GB 4Rx4 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	3072	3772	8170	**3781**	**8150**			760	**865**	**8810**	865	8810		
507.cactuBSSN_r	3072	**2193**	**1770**	2149	1810			3072	**1523**	**2550**	1515	2570		
508.namd_r	3072	1073	2720	**1077**	**2710**			3072	964	3030	**971**	**3010**		
510.parest_r	3072	4498	1790	**4500**	**1790**			1520	**2059**	**1930**	2056	1930		
511.povray_r	3072	2663	2690	**2691**	**2670**			3040	1337	5310	**1365**	**5200**		
519.lbm_r	3072	2159	1500	**2163**	**1500**			760	356	2250	**359**	**2230**		
521.wrf_r	3072	3516	1960	**4890**	**1410**			760	**790**	**2160**	748	2280		
526.blender_r	3072	**1574**	**2970**	1568	2980			3040	**1305**	**3550**	1300	3560		
527.cam4_r	3072	3139	1710	**3210**	**1670**			3040	**2687**	**1980**	2248	2370		
538.imagick_r	3072	2251	3390	**2262**	**3380**			3072	2167	3530	**2174**	**3510**		
544.nab_r	3072	**1326**	**3900**	1310	3950			3072	1220	4240	**1228**	**4210**		
549.fotonik3d_r	3072	4985	2400	**5089**	**2350**			3040	**4692**	**2530**	4670	2540		
554.roms_r	3072	6389	764	**6400**	**763**			760	**838**	**1440**	833	1450		

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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 Wed Nov 29 04:33:31 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 10, clock 4250 MHz)
   SPARC64-XII (chipid 11, clock 4250 MHz)
   SPARC64-XII (chipid 12, clock 4250 MHz)
   SPARC64-XII (chipid 13, clock 4250 MHz)
   SPARC64-XII (chipid 14, clock 4250 MHz)
   SPARC64-XII (chipid 15, clock 4250 MHz)
   SPARC64-XII (chipid 16, clock 4250 MHz)
   SPARC64-XII (chipid 17, clock 4250 MHz)
   SPARC64-XII (chipid 18, clock 4250 MHz)
   SPARC64-XII (chipid 19, clock 4250 MHz)
   SPARC64-XII (chipid 2, clock 4250 MHz)
   SPARC64-XII (chipid 20, clock 4250 MHz)
   SPARC64-XII (chipid 21, clock 4250 MHz)
   SPARC64-XII (chipid 22, clock 4250 MHz)
   SPARC64-XII (chipid 23, clock 4250 MHz)
   SPARC64-XII (chipid 24, clock 4250 MHz)
   SPARC64-XII (chipid 25, clock 4250 MHz)
   SPARC64-XII (chipid 26, clock 4250 MHz)
   SPARC64-XII (chipid 27, clock 4250 MHz)
```

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Platform Notes (Continued)

```
    SPARC64-XII (chipid 28, clock 4250 MHz)
    SPARC64-XII (chipid 29, clock 4250 MHz)
    SPARC64-XII (chipid 3, clock 4250 MHz)
    SPARC64-XII (chipid 30, clock 4250 MHz)
    SPARC64-XII (chipid 31, 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)
    SPARC64-XII (chipid 8, clock 4250 MHz)
    SPARC64-XII (chipid 9, clock 4250 MHz)
    32 chips
    3072 threads
    4250 MHz

 From kstat:      384 cores

 From prtconf: 17275904 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

 (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)
```

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Compiler Version Notes (Continued)

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

==============================================================================
 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
------------------------------------------------------------------------------

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

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Compiler Version Notes (Continued)

```
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

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

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Base Portability Flags (Continued)

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

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`

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`

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Peak Portability Flags (Continued)

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: -DSPEC_LP64
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

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

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Peak Optimization Flags (Continued)

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: -xprofile=collect:./feedback -xprofile=use:./feedback -m32
-fast(cc) -fast(f95) -xtarget=sparc64xii -xipo=2
-xpagesize=256M -xsegment_align=256M -xthroughput -m64
-Wc,-Qiselect-rcpa=2 -Wc,-Qiselect-rsqrta=2
-Wc,-Qiselect-rsqrta1x=2

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

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Peak Optimization Flags (Continued)

511.povray_r (continued):
-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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