SPEC CPU®2017 Floating Point Rate Result

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Fujitsu

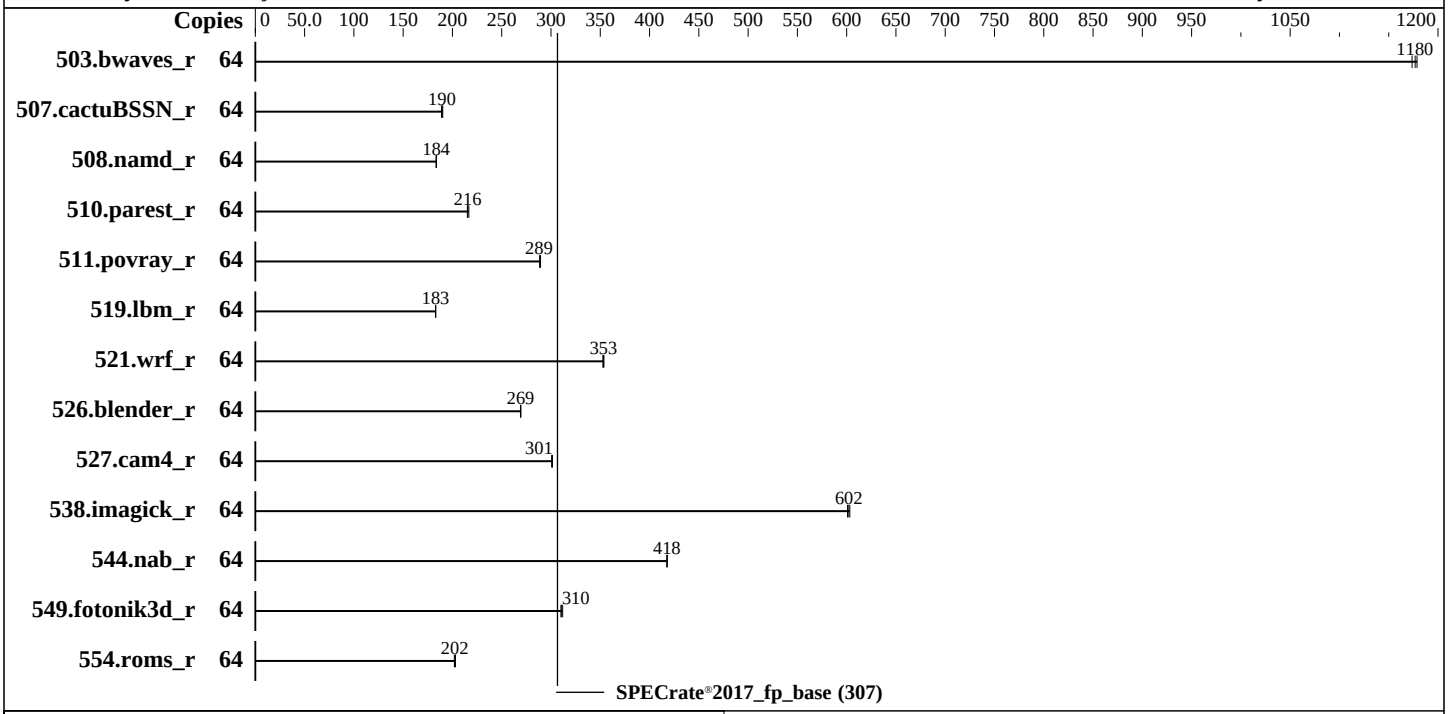
PRIMEQUEST 3800E2, Intel Xeon Platinum 8256, 3.80GHz

SPECrate®2017_fp_base = 307

SPECrate®2017_fp_peak = Not Run

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

Test Date: Jul-2019
Hardware Availability: Apr-2019
Software Availability: Feb-2019



Hardware

CPU Name:	Intel Xeon Platinum 8256
Max MHz:	3900
Nominal:	3800
Enabled:	32 cores, 8 chips, 2 threads/core
Orderable:	2,4,6,8 chips
Cache L1:	32 KB I + 32 KB D on chip per core
L2:	1 MB I+D on chip per core
L3:	16.5 MB I+D on chip per chip
Other:	None
Memory:	3 TB (96 x 32 GB 2Rx4 PC4-2933Y-R)
Storage:	1 x SAS HDD, 600GB, 10.5K RPM, SAS HDD
Other:	None

Software

OS:	SUSE Linux Enterprise Server 15 4.12.14-25.28-default
Compiler:	C/C++: Version 19.0.0.117 of Intel C/C++ Compiler for Linux; Fortran: Version 19.0.0.117 of Intel Fortran Compiler for Linux
Parallel:	No
Firmware:	PRIMEQUEST 3800E2 Unified Firmware Version PB19043, Released Jun-2019
File System:	xfs
System State:	Run level 3 (multi-user)
Base Pointers:	64-bit
Peak Pointers:	Not Applicable
Other:	None
Power Management:	--

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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	64	544	1180	547	1170	**545**	**1180**							
507.cactuBSSN_r	64	426	190	**428**	**190**	429	189							
508.namd_r	64	331	183	**331**	**184**	331	184							
510.parest_r	64	773	217	**777**	**216**	778	215							
511.povray_r	64	516	289	**517**	**289**	518	288							
519.lbm_r	64	369	183	**369**	**183**	369	183							
521.wrf_r	64	407	353	**406**	**353**	405	354							
526.blender_r	64	362	269	362	269	**362**	**269**							
527.cam4_r	64	372	301	**372**	**301**	371	301							
538.imagick_r	64	264	603	265	601	**264**	**602**							
544.nab_r	64	258	418	**258**	**418**	258	418							
549.fotonik3d_r	64	800	312	804	310	**803**	**310**							
554.roms_r	64	504	202	501	203	**503**	**202**							

SPECrate®2017_fp_base = 307

SPECrate®2017_fp_peak = Not Run

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

Submit Notes

```
The numactl mechanism was used to bind copies to processors. The config file option 'submit'
was used to generate numactl commands to bind each copy to a specific processor.
For details, please see the config file.
```

Operating System Notes

```
Stack size set to unlimited using "ulimit -s unlimited"
Kernel Boot Parameter set with : nohz_full=1-63
```

General Notes

```
Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH = "/home/Benchmark/speccpu2017-fp/lib/intel64"

 Binaries compiled on a system with 1x Intel Core i9-799X CPU + 32GB RAM
 memory using Redhat Enterprise Linux 7.5
 Transparent Huge Pages enabled by default
 Prior to runcpu invocation
 Filesystem page cache synced and cleared with:
 sync; echo 3>       /proc/sys/vm/drop_caches
 runcpu command invoked through numactl i.e.:
 numactl --interleave=all runcpu <etc>
NA: The test sponsor attests, as of date of publication, that CVE-2017-5754 (Meltdown)
```

(Continued on next page)

General Notes (Continued)

```
is mitigated in the system as tested and documented.
Yes: The test sponsor attests, as of date of publication, that CVE-2017-5753 (Spectre variant 1)
is mitigated in the system as tested and documented.
Yes: The test sponsor attests, as of date of publication, that CVE-2017-5715 (Spectre variant 2)
is mitigated in the system as tested and documented.
```

Platform Notes

```
 BIOS configuration:
 DCU Streamer Prefetcher = Disabled
 DDR4 Write Data CRC Protection = Disabled
 LLC Dead Line Alloc = Enabled
 Sub Numa Clustering = Enabled
 Uncore Frequency Scaling = Disabled
 UPI Link L0p = Disabled
 Fan Control = Full
 Sysinfo program /home/Benchmark/speccpu2017-fp/bin/sysinfo
 Rev: r5974 of 2018-05-19 9bcde8f2999c33d61f64985e45859ea9
 running on linux-8r5c Mon Jul  8 23:51:07 2019

 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 /proc/cpuinfo
    model name : Intel(R) Xeon(R) Platinum 8256 CPU @ 3.80GHz
       8  "physical id"s (chips)
       64 "processors"
    cores, siblings (Caution: counting these is hw and system dependent. The following
    excerpts from /proc/cpuinfo might not be reliable.  Use with caution.)
       cpu cores : 4
       siblings  : 8
       physical 0: cores 1 2 4 13
       physical 1: cores 4 8 9 13
       physical 2: cores 1 2 5 13
       physical 3: cores 1 2 5 13
       physical 4: cores 1 2 4 13
       physical 5: cores 2 9 12 13
       physical 6: cores 1 2 5 13
       physical 7: cores 3 8 9 13

 From lscpu:
      Architecture:        x86_64
      CPU op-mode(s):      32-bit, 64-bit
      Byte Order:          Little Endian
      CPU(s):              64
```

(Continued on next page)

Platform Notes (Continued)

```
On-line CPU(s) list: 0-63
Thread(s) per core:  2
Core(s) per socket:  4
Socket(s):           8
NUMA node(s):        16
Vendor ID:           GenuineIntel
CPU family:          6
Model:               85
Model name:          Intel(R) Xeon(R) Platinum 8256 CPU @ 3.80GHz
Stepping:            6
CPU MHz:             3800.000
CPU max MHz:         3900.0000
CPU min MHz:         1200.0000
BogoMIPS:            7600.00
Virtualization:      VT-x
L1d cache:           32K
L1i cache:           32K
L2 cache:            1024K
L3 cache:            16896K
NUMA node0 CPU(s):   0,1,32,33
NUMA node1 CPU(s):   2,3,34,35
NUMA node2 CPU(s):   4,7,36,39
NUMA node3 CPU(s):   5,6,37,38
NUMA node4 CPU(s):   8,9,40,41
NUMA node5 CPU(s):   10,11,42,43
NUMA node6 CPU(s):   12,13,44,45
NUMA node7 CPU(s):   14,15,46,47
NUMA node8 CPU(s):   16,17,48,49
NUMA node9 CPU(s):   18,19,50,51
NUMA node10 CPU(s):  20,21,52,53
NUMA node11 CPU(s):  22,23,54,55
NUMA node12 CPU(s):  24,25,56,57
NUMA node13 CPU(s):  26,27,58,59
NUMA node14 CPU(s):  28,31,60,63
NUMA node15 CPU(s):  29,30,61,62
Flags:               fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov
pat pse36 clflush dts acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx pdpe1gb rdtscp
lm constant_tsc art arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc cpuid
aperfmperf pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16
xtpr pdcm pcid dca sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave
avx f16c rdrand lahf_lm abm 3dnowprefetch cpuid_fault epb cat_l3 cdp_l3
invpcid_single intel_ppin ssbd mba ibrs ibpb stibp ibrs_enhanced tpr_shadow vnmi
flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rtm
cqm mpx rdt_a avx512f avx512dq rdseed adx smap clflushopt clwb intel_pt avx512cd
avx512bw avx512vl xsaveopt xsavec xgetbv1 xsaves cqm_llc cqm_occup_llc cqm_mbm_total
cqm_mbm_local dtherm ida arat pln pts hwp hwp_act_window hwp_epp hwp_pkg_req pku
ospke avx512_vnni flush_l1d arch_capabilities
```

(Continued on next page)

Platform Notes (Continued)

```
 /proc/cpuinfo cache data
    cache size : 16896 KB

 From numactl --hardware  WARNING: a numactl 'node' might or might not correspond to a
 physical chip.
   available: 16 nodes (0-15)
   node 0 cpus: 0 1 32 33
   node 0 size: 192271 MB
   node 0 free: 192075 MB
   node 1 cpus: 2 3 34 35
   node 1 size: 193532 MB
   node 1 free: 193378 MB
   node 2 cpus: 4 7 36 39
   node 2 size: 193532 MB
   node 2 free: 193375 MB
   node 3 cpus: 5 6 37 38
   node 3 size: 193532 MB
   node 3 free: 193383 MB
   node 4 cpus: 8 9 40 41
   node 4 size: 193532 MB
   node 4 free: 193401 MB
   node 5 cpus: 10 11 42 43
   node 5 size: 193532 MB
   node 5 free: 193390 MB
   node 6 cpus: 12 13 44 45
   node 6 size: 193532 MB
   node 6 free: 193394 MB
   node 7 cpus: 14 15 46 47
   node 7 size: 193532 MB
   node 7 free: 193395 MB
   node 8 cpus: 16 17 48 49
   node 8 size: 193532 MB
   node 8 free: 193398 MB
   node 9 cpus: 18 19 50 51
   node 9 size: 193532 MB
   node 9 free: 193406 MB
   node 10 cpus: 20 21 52 53
   node 10 size: 193532 MB
   node 10 free: 193127 MB
   node 11 cpus: 22 23 54 55
   node 11 size: 193503 MB
   node 11 free: 193252 MB
   node 12 cpus: 24 25 56 57
   node 12 size: 193532 MB
   node 12 free: 193402 MB
   node 13 cpus: 26 27 58 59
```

(Continued on next page)

Platform Notes (Continued)

```
   node 13 size: 193532 MB
   node 13 free: 193406 MB
   node 14 cpus: 28 31 60 63
   node 14 size: 193331 MB
   node 14 free: 193214 MB
   node 15 cpus: 29 30 61 62
   node 15 size: 193532 MB
   node 15 free: 193408 MB
   node distances:
   node   0   1   2   3   4   5   6   7   8   9  10  11  12  13  14  15
     0:  10  11  20  20  20  20  28  28  28  28  28  28  20  20  28  28
     1:  11  10  20  20  20  20  28  28  28  28  28  28  20  20  28  28
     2:  20  20  10  11  28  28  20  20  28  28  20  20  28  28  28  28
     3:  20  20  11  10  28  28  20  20  28  28  20  20  28  28  28  28
     4:  20  20  28  28  10  11  20  20  20  20  28  28  28  28  28  28
     5:  20  20  28  28  11  10  20  20  20  20  28  28  28  28  28  28
     6:  28  28  20  20  20  20  10  11  28  28  28  28  28  28  20  20
     7:  28  28  20  20  20  20  11  10  28  28  28  28  28  28  20  20
     8:  28  28  28  28  20  20  28  28  10  11  20  20  20  20  28  28
     9:  28  28  28  28  20  20  28  28  11  10  20  20  20  20  28  28
    10:  28  28  20  20  28  28  28  28  20  20  10  11  28  28  20  20
    11:  28  28  20  20  28  28  28  28  20  20  11  10  28  28  20  20
    12:  20  20  28  28  28  28  28  28  20  20  28  28  10  11  20  20
    13:  20  20  28  28  28  28  28  28  20  20  28  28  11  10  20  20
    14:  28  28  28  28  28  28  20  20  28  28  20  20  20  20  10  11
    15:  28  28  28  28  28  28  20  20  28  28  20  20  20  20  11  10

  From /proc/meminfo
     MemTotal:       3169313696 kB
     HugePages_Total:       0
     Hugepagesize:       2048 kB

  From /etc/*release* /etc/*version*
     os-release:
        NAME="SLES"
        VERSION="15"
        VERSION_ID="15"
        PRETTY_NAME="SUSE Linux Enterprise Server 15"
        ID="sles"
        ID_LIKE="suse"
        ANSI_COLOR="0;32"
        CPE_NAME="cpe:/o:suse:sles:15"

  uname -a:
     Linux linux-8r5c 4.12.14-25.28-default #1 SMP Wed Jan 16 20:00:47 UTC 2019 (dd6077c)
     x86_64 x86_64 x86_64 GNU/Linux
```


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Platform Notes (Continued)

```
 Kernel self-reported vulnerability status:

 CVE-2017-5754 (Meltdown):          Not affected
 CVE-2017-5753 (Spectre variant 1): Mitigation: __user pointer sanitization
 CVE-2017-5715 (Spectre variant 2): Mitigation: Enhanced IBRS, IBPB: conditional, RSB
 filling

 run-level 3 Jul 8 23:49

 SPEC is set to: /home/Benchmark/speccpu2017-fp
    Filesystem     Type  Size  Used Avail Use% Mounted on
    /dev/sda3      xfs   142G   35G  107G  25% /home

 Additional information from dmidecode follows.  WARNING: Use caution when you interpret
 this section. The 'dmidecode' program reads system data which is "intended to allow
 hardware to be accurately determined", but the intent may not be met, as there are
 frequent changes to hardware, firmware, and the "DMTF SMBIOS" standard.
   BIOS FUJITSU V1.0.0.0 R1.16.0 for D3858-B1x            04/24/2019
   Memory:
    68x Micron 36ASF4G72PZ-2G9E2 32 GB 2 rank 2933
    28x Samsung M393A4K40CB2-CVF 32 GB 2 rank 2933

 (End of data from sysinfo program)
```

Compiler Version Notes

```
==============================================================================
C               | 519.lbm_r(base) 538.imagick_r(base) 544.nab_r(base)
------------------------------------------------------------------------------
Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64,
  Version 19.0.0.117 Build 20180804
Copyright (C) 1985-2018 Intel Corporation.  All rights reserved.
------------------------------------------------------------------------------

==============================================================================
C++             | 508.namd_r(base) 510.parest_r(base)
------------------------------------------------------------------------------
Intel(R) C++ Intel(R) 64 Compiler for applications running on Intel(R) 64,
  Version 19.0.0.117 Build 20180804
Copyright (C) 1985-2018 Intel Corporation.  All rights reserved.
------------------------------------------------------------------------------

==============================================================================
C++, C          | 511.povray_r(base) 526.blender_r(base)
------------------------------------------------------------------------------
Intel(R) C++ Intel(R) 64 Compiler for applications running on Intel(R) 64,
```

(Continued on next page)

Compiler Version Notes (Continued)

```
  Version 19.0.0.117 Build 20180804
Copyright (C) 1985-2018 Intel Corporation.  All rights reserved.
Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64,
  Version 19.0.0.117 Build 20180804
Copyright (C) 1985-2018 Intel Corporation.  All rights reserved.
------------------------------------------------------------------------------

==============================================================================
C++, C, Fortran | 507.cactuBSSN_r(base)
------------------------------------------------------------------------------
Intel(R) C++ Intel(R) 64 Compiler for applications running on Intel(R) 64,
  Version 19.0.0.117 Build 20180804
Copyright (C) 1985-2018 Intel Corporation.  All rights reserved.
Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64,
  Version 19.0.0.117 Build 20180804
Copyright (C) 1985-2018 Intel Corporation.  All rights reserved.
Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R)
  64, Version 19.0.0.117 Build 20180804
Copyright (C) 1985-2018 Intel Corporation.  All rights reserved.
------------------------------------------------------------------------------

==============================================================================
Fortran         | 503.bwaves_r(base) 549.fotonik3d_r(base) 554.roms_r(base)
------------------------------------------------------------------------------
Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R)
  64, Version 19.0.0.117 Build 20180804
Copyright (C) 1985-2018 Intel Corporation.  All rights reserved.
------------------------------------------------------------------------------

==============================================================================
Fortran, C      | 521.wrf_r(base) 527.cam4_r(base)
------------------------------------------------------------------------------
Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R)
  64, Version 19.0.0.117 Build 20180804
Copyright (C) 1985-2018 Intel Corporation.  All rights reserved.
Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64,
  Version 19.0.0.117 Build 20180804
Copyright (C) 1985-2018 Intel Corporation.  All rights reserved.
------------------------------------------------------------------------------
```

Base Compiler Invocation

C benchmarks:

```
icc -m64 -std=c11
```

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Base Compiler Invocation (Continued)

C++ benchmarks:
icpc -m64

Fortran benchmarks:
ifort -m64

Benchmarks using both Fortran and C:
ifort -m64 icc -m64 -std=c11

Benchmarks using both C and C++:
icpc -m64 icc -m64 -std=c11

Benchmarks using Fortran, C, and C++:
icpc -m64 icc -m64 -std=c11 ifort -m64

Base Portability Flags

503.bwaves_r: -DSPEC_LP64
507.cactuBSSN_r: -DSPEC_LP64
508.namd_r: -DSPEC_LP64
510.parest_r: -DSPEC_LP64
511.povray_r: -DSPEC_LP64
519.lbm_r: -DSPEC_LP64
521.wrf_r: -DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian
526.blender_r: -DSPEC_LP64 -DSPEC_LINUX -funsigned-char
527.cam4_r: -DSPEC_LP64 -DSPEC_CASE_FLAG
538.imagick_r: -DSPEC_LP64
544.nab_r: -DSPEC_LP64
549.fotonik3d_r: -DSPEC_LP64
554.roms_r: -DSPEC_LP64

Base Optimization Flags

C benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3

C++ benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3

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Base Optimization Flags (Continued)

Fortran benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3 -auto -nostandard-realloc-lhs
-align array32byte

Benchmarks using both Fortran and C:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3 -auto -nostandard-realloc-lhs
-align array32byte

Benchmarks using both C and C++:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3

Benchmarks using Fortran, C, and C++:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3 -auto -nostandard-realloc-lhs
-align array32byte

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2017/flags/Intel-ic19.0-official-linux64.2019-01-15.html
http://www.spec.org/cpu2017/flags/Fujitsu-Platform-Settings-V1.0-CSL-RevE.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2017/flags/Intel-ic19.0-official-linux64.2019-01-15.xml
http://www.spec.org/cpu2017/flags/Fujitsu-Platform-Settings-V1.0-CSL-RevE.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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