



SPEC CPU®2017 Floating Point Rate Result

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Fujitsu

PRIMERGY RX4770 M6, Intel Xeon Platinum 8380HL,
2.90GHz

SPECrate®2017_fp_base = 650

SPECrate®2017_fp_peak = Not Run

CPU2017 License: 19

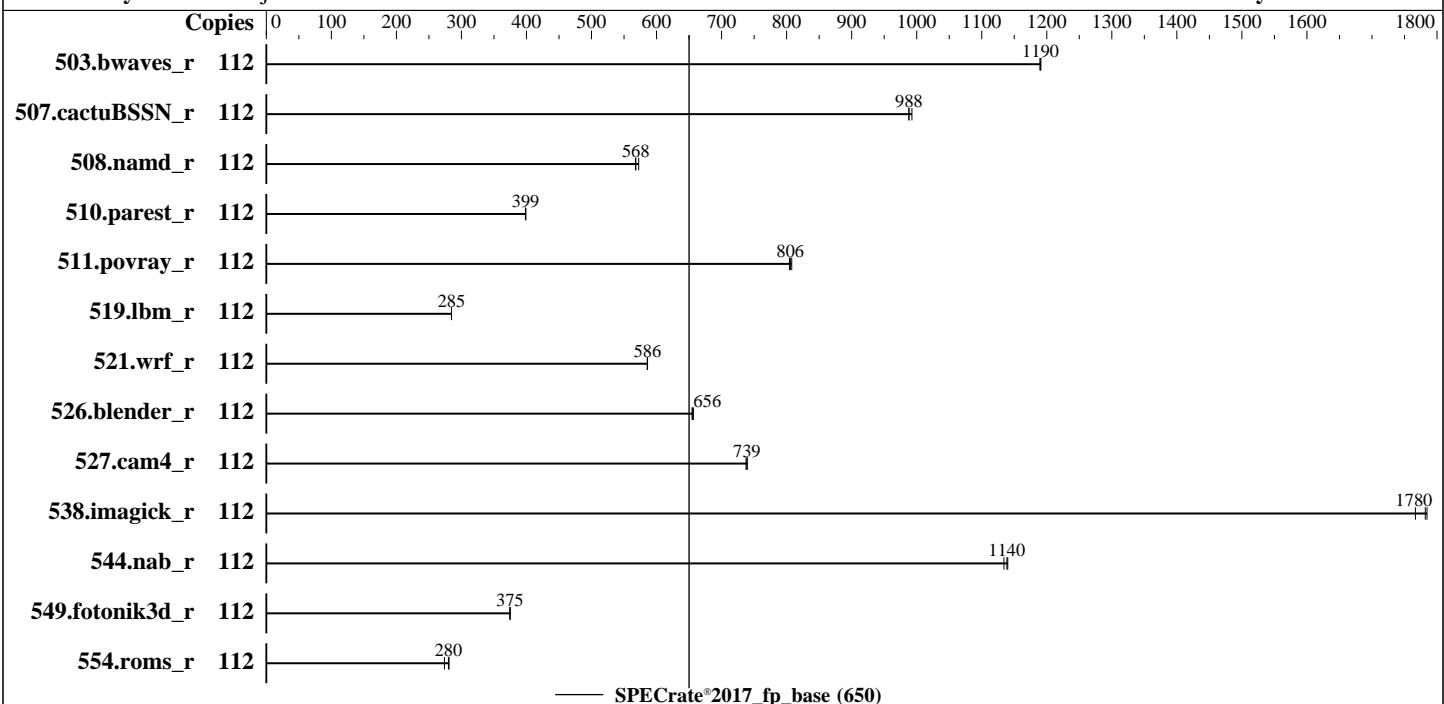
Test Sponsor: Fujitsu

Tested by: Fujitsu

Test Date: Oct-2020

Hardware Availability: Nov-2020

Software Availability: Jul-2020



Hardware

CPU Name: Intel Xeon Platinum 8380HL
 Max MHz: 4300
 Nominal: 2900
 Enabled: 112 cores, 4 chips
 Orderable: 2,4 chips
 Cache L1: 32 KB I + 32 KB D on chip per core
 L2: 1 MB I+D on chip per core
 L3: 38.5 MB I+D on chip per chip
 Other: None
 Memory: 1536 GB (48 x 32 GB 2Rx4 PC4-3200AA-R)
 Storage: 1 x SATA M.2 SSD, 480GB
 Other: None

Software

OS: SUSE Linux Enterprise Server 15 SP2 5.3.18-22-default
 Compiler: C/C++: Version 19.1.2.275 of Intel C/C++ Compiler for Linux;
 Fortran: Version 19.1.2.275 of Intel Fortran Compiler for Linux
 Parallel: No
 Firmware: Fujitsu BIOS Version V1.0.0.0 R1.8.0 for D3892-A1x. Released Jan-2021 tested as V1.0.0.0 R1.1.1 for D3892-A1x Sep-2020
 File System: xfs
 System State: Run level 3 (multi-user)
 Base Pointers: 64-bit
 Peak Pointers: Not Applicable
 Other: jemalloc memory allocator V5.0.1
 Power Management: BIOS set to prefer performance at the cost of additional power usage



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Results Table

Benchmark	Base								Peak							
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
503.bwaves_r	112	944	1190	943	1190	943	1190									
507.cactusBSSN_r	112	143	993	143	988	144	988									
508.namd_r	112	187	568	186	573	187	568									
510.parest_r	112	734	399	735	398	735	399									
511.povray_r	112	325	804	324	808	325	806									
519.lbm_r	112	415	285	415	285	415	285									
521.wrf_r	112	428	586	428	586	428	586									
526.blender_r	112	260	656	261	655	260	657									
527.cam4_r	112	266	738	265	739	265	739									
538.imagick_r	112	156	1780	156	1780	158	1770									
544.nab_r	112	166	1140	165	1140	166	1130									
549.fotonik3d_r	112	1165	375	1164	375	1165	374									
554.roms_r	112	650	274	633	281	636	280									

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

Compiler Notes

The inconsistent Compiler version information under Compiler Version section is due to a discrepancy in Intel Compiler.
The correct version of C/C++ compiler is: Version 19.1.2.275 Build 20200623 Compiler for Linux
The correct version of Fortran compiler is: Version 19.1.2.275 Build 20200623 Compiler for Linux

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=1-111
Irqbalance disabled with "systemctl stop irqbalance"

Environment Variables Notes

Environment variables set by runcpu before the start of the run:

```
LD_LIBRARY_PATH =
    "/home/Benchmark/speccpu/lib/intel64:/home/Benchmark/speccpu/je5.0.1-64"
MALLOC_CONF = "retain:true"
```



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General Notes

Binaries compiled on a system with 1x Intel Core i9-7980XE CPU + 64GB RAM
memory using Redhat Enterprise Linux 8.0
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)
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.
jemalloc, a general purpose malloc implementation
built with the RedHat Enterprise 7.5, and the system compiler gcc 4.8.5
sources available from jemalloc.net or <https://github.com/jemalloc/jemalloc/releases>

Platform Notes

BIOS configuration:

Hyper Threading = Disabled
Utilization Profile = Unbalanced
Stale AtoS = Enabled
LLC Deadline Alloc = Disabled
SNC = Enabled
FAN Control = Full

Sysinfo program /home/Benchmark/speccpu/bin/sysinfo
Rev: r6365 of 2019-08-21 295195f888a3d7edble6e46a485a0011
running on localhost Sat Oct 31 04:06:22 2020

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 8380HL CPU @ 2.90GHz
        4 "physical id"s (chips)
        112 "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 : 28
        siblings   : 28
        physical 0: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24 25 26 27
        28 29 30
```

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Platform Notes (Continued)

```
physical 1: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24 25 26 27  
28 29 30  
physical 2: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24 25 26 27  
28 29 30  
physical 3: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24 25 26 27  
28 29 30
```

From lscpu:

```
Architecture: x86_64  
CPU op-mode(s): 32-bit, 64-bit  
Byte Order: Little Endian  
Address sizes: 46 bits physical, 48 bits virtual  
CPU(s): 112  
On-line CPU(s) list: 0-111  
Thread(s) per core: 1  
Core(s) per socket: 28  
Socket(s): 4  
NUMA node(s): 8  
Vendor ID: GenuineIntel  
CPU family: 6  
Model: 85  
Model name: Intel(R) Xeon(R) Platinum 8380HL CPU @ 2.90GHz  
Stepping: 11  
CPU MHz: 999.983  
CPU max MHz: 4300.0000  
CPU min MHz: 1000.0000  
BogoMIPS: 5800.00  
Virtualization: VT-x  
L1d cache: 32K  
L1i cache: 32K  
L2 cache: 1024K  
L3 cache: 39424K  
NUMA node0 CPU(s): 0-3,7-9,14-17,21-23  
NUMA node1 CPU(s): 4-6,10-13,18-20,24-27  
NUMA node2 CPU(s): 28-31,35-37,42-45,49-51  
NUMA node3 CPU(s): 32-34,38-41,46-48,52-55  
NUMA node4 CPU(s): 56-59,63-65,70-73,77-79  
NUMA node5 CPU(s): 60-62,66-69,74-76,80-83  
NUMA node6 CPU(s): 84-87,91-93,98-101,105-107  
NUMA node7 CPU(s): 88-90,94-97,102-104,108-111  
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_13 cdp_13  
invpcid_single intel_ppin ssbd mba ibrs ibpb stibp ibrs_enhanced tpr_shadow vnmi
```

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Platform Notes (Continued)

```
flexpriority ept vpid ept_ad fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms
invpcid rtm cqmq mpx rdt_a avx512f avx512dq rdseed adx smap clflushopt clwb intel_pt
avx512cd avx512bw avx512vl xsavemt xsavec xgetbv1 xsaves cqmq_llc cqmq_occup_llc
cqmq_mbm_total cqmq_mbm_local avx512_bf16 dtherm ida arat pln pts hwp hwp_act_window
hwp_epp hwp_pkg_req pku ospke avx512_vnni md_clear flush_lld arch_capabilities
```

```
/proc/cpuinfo cache data
cache size : 39424 KB
```

From numactl --hardware WARNING: a numactl 'node' might or might not correspond to a physical chip.

```
available: 8 nodes (0-7)
node 0 cpus: 0 1 2 3 7 8 9 14 15 16 17 21 22 23
node 0 size: 192129 MB
node 0 free: 191714 MB
node 1 cpus: 4 5 6 10 11 12 13 18 19 20 24 25 26 27
node 1 size: 193532 MB
node 1 free: 193324 MB
node 2 cpus: 28 29 30 31 35 36 37 42 43 44 45 49 50 51
node 2 size: 193532 MB
node 2 free: 193379 MB
node 3 cpus: 32 33 34 38 39 40 41 46 47 48 52 53 54 55
node 3 size: 193532 MB
node 3 free: 193383 MB
node 4 cpus: 56 57 58 59 63 64 65 70 71 72 73 77 78 79
node 4 size: 193532 MB
node 4 free: 193381 MB
node 5 cpus: 60 61 62 66 67 68 69 74 75 76 80 81 82 83
node 5 size: 193532 MB
node 5 free: 193373 MB
node 6 cpus: 84 85 86 87 91 92 93 98 99 100 101 105 106 107
node 6 size: 193532 MB
node 6 free: 193380 MB
node 7 cpus: 88 89 90 94 95 96 97 102 103 104 108 109 110 111
node 7 size: 193272 MB
node 7 free: 193098 MB
node distances:
node 0 1 2 3 4 5 6 7
 0: 10 11 20 20 20 20 20 20
 1: 11 10 20 20 20 20 20 20
 2: 20 20 10 11 20 20 20 20
 3: 20 20 11 10 20 20 20 20
 4: 20 20 20 20 10 11 20 20
 5: 20 20 20 20 11 10 20 20
 6: 20 20 20 20 20 20 10 11
 7: 20 20 20 20 20 20 11 10
```

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Platform Notes (Continued)

From /proc/meminfo

```
MemTotal:      1583714912 kB
HugePages_Total:       0
Hugepagesize:     2048 kB
```

From /etc/*release* /etc/*version*

```
os-release:
  NAME="SLES"
  VERSION="15-SP2"
  VERSION_ID="15.2"
  PRETTY_NAME="SUSE Linux Enterprise Server 15 SP2"
  ID="sles"
  ID_LIKE="suse"
  ANSI_COLOR="0;32"
  CPE_NAME="cpe:/o:suse:sles:15:sp2"
```

uname -a:

```
Linux localhost 5.3.18-22-default #1 SMP Wed Jun 3 12:16:43 UTC 2020 (720aeба) x86_64
x86_64 x86_64 GNU/Linux
```

Kernel self-reported vulnerability status:

itlb_multihit:	Not affected
CVE-2018-3620 (L1 Terminal Fault):	Not affected
Microarchitectural Data Sampling:	Not affected
CVE-2017-5754 (Meltdown):	Not affected
CVE-2018-3639 (Speculative Store Bypass):	Mitigation: Speculative Store Bypass disabled via prctl and seccomp
CVE-2017-5753 (Spectre variant 1):	Mitigation: usercopy/swapgs barriers and __user pointer sanitization
CVE-2017-5715 (Spectre variant 2):	Mitigation: Enhanced IBRS, IBPB: conditional, RSB filling
srbd:	Not affected
tsx_async_abort:	Not affected

run-level 3 Oct 31 04:05

SPEC is set to: /home/Benchmark/speccpu

Filesystem	Type	Size	Used	Avail	Use%	Mounted on
/dev/sdb3	xfs	376G	62G	315G	17%	/home

From /sys/devices/virtual/dmi/id

```
BIOS: FUJITSU V1.0.0.0 R1.1.1 for D3892-A1x
Vendor: FUJITSU
Product: PRIMERGY RX4770 M6
Product Family: SERVER
Serial: MABTxxxxxx
```

09/25/2020

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Platform Notes (Continued)

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.

Memory:

48x Samsung M393A4K40DB3-CWE 32 GB 2 rank 3200

(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 Compiler for applications running on Intel(R) 64, Version
19.1.2.275 Build 20200604

Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

=====

C++ | 508.namd_r(base) 510.parest_r(base)

=====

Intel(R) C++ Compiler for applications running on Intel(R) 64, Version
19.1.2.275 Build 20200604

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=====

C++, C | 511.povray_r(base) 526.blender_r(base)

=====

Intel(R) C++ Compiler for applications running on Intel(R) 64, Version
19.1.2.275 Build 20200604

Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

Intel(R) C Compiler for applications running on Intel(R) 64, Version
19.1.2.275 Build 20200604

Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

=====

C++, C, Fortran | 507.cactusBSSN_r(base)

=====

Intel(R) C++ Compiler for applications running on Intel(R) 64, Version
19.1.2.275 Build 20200604

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Intel(R) C Compiler for applications running on Intel(R) 64, Version

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Compiler Version Notes (Continued)

19.1.2.275 Build 20200604

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Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R)

64, Version 19.1.2.275 Build 20200623

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=====

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 19.1.2.275 Build 20200623

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=====

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 19.1.2.275 Build 20200623

Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

Intel(R) C Compiler for applications running on Intel(R) 64, Version
19.1.2.275 Build 20200604

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Base Compiler Invocation

C benchmarks:

icc

C++ benchmarks:

icpc

Fortran benchmarks:

ifort

Benchmarks using both Fortran and C:

ifort icc

Benchmarks using both C and C++:

icpcicc

Benchmarks using Fortran, C, and C++:

icpcicc ifort



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Base Portability Flags

```
503.bwaves_r: -DSPEC_LP64
507.cactusBSSN_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:

```
-m64 -qnextgen -std=c11
-Wl,-plugin-opt=-x86-branches-within-32B-boundaries -Wl,-z,muldefs
-xCORE-AVX512 -Ofast -ffast-math -flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -L/usr/local/jemalloc64-5.0.1/lib -ljemalloc
```

C++ benchmarks:

```
-m64 -qnextgen -Wl,-plugin-opt=-x86-branches-within-32B-boundaries
-Wl,-z,muldefs -xCORE-AVX512 -Ofast -ffast-math -flto -mfpmath=sse
-funroll-loops -qopt-mem-layout-trans=4
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc
```

Fortran benchmarks:

```
-m64 -Wl,-plugin-opt=-x86-branches-within-32B-boundaries -Wl,-z,muldefs
-xCORE-AVX512 -O3 -ipo -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-multiple-gather-scatter-by-shuffles
-qopt-mem-layout-trans=4 -nostandard-realloc-lhs -align array32byte
-auto -mbranches-within-32B-boundaries
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc
```

Benchmarks using both Fortran and C:

```
-m64 -qnextgen -std=c11
-Wl,-plugin-opt=-x86-branches-within-32B-boundaries -Wl,-z,muldefs
-xCORE-AVX512 -Ofast -ffast-math -flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -O3 -ipo -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-multiple-gather-scatter-by-shuffles
-nostandard-realloc-lhs -align array32byte -auto
-mbranches-within-32B-boundaries -L/usr/local/jemalloc64-5.0.1/lib
```

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Base Optimization Flags (Continued)

Benchmarks using both Fortran and C (continued):

-ljemalloc

Benchmarks using both C and C++:

```
-m64 -qnextgen -std=c11
-Wl,-plugin-opt=-x86-branches-within-32B-boundaries -Wl,-z,muldefs
-xCORE-AVX512 -Ofast -ffast-math -futo -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -L/usr/local/jemalloc64-5.0.1/lib -ljemalloc
```

Benchmarks using Fortran, C, and C++:

```
-m64 -qnextgen -std=c11
-Wl,-plugin-opt=-x86-branches-within-32B-boundaries -Wl,-z,muldefs
-xCORE-AVX512 -Ofast -ffast-math -futo -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -O3 -ipo -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-multiple-gather-scatter-by-shuffles
-nostandard-realloc-lhs -align array32byte -auto
-mbranches-within-32B-boundaries -L/usr/local/jemalloc64-5.0.1/lib
-ljemalloc
```

The flags files that were used to format this result can be browsed at

<http://www.spec.org/cpu2017/flags/Fujitsu-Platform-Settings-V1.0-CPL-RevA.html>
http://www.spec.org/cpu2017/flags/Intel-ic19.lul-official-linux64_revA.html

You can also download the XML flags sources by saving the following links:

<http://www.spec.org/cpu2017/flags/Fujitsu-Platform-Settings-V1.0-CPL-RevA.xml>
http://www.spec.org/cpu2017/flags/Intel-ic19.lul-official-linux64_revA.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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