SPEC CPU®2017 Floating Point Speed Result

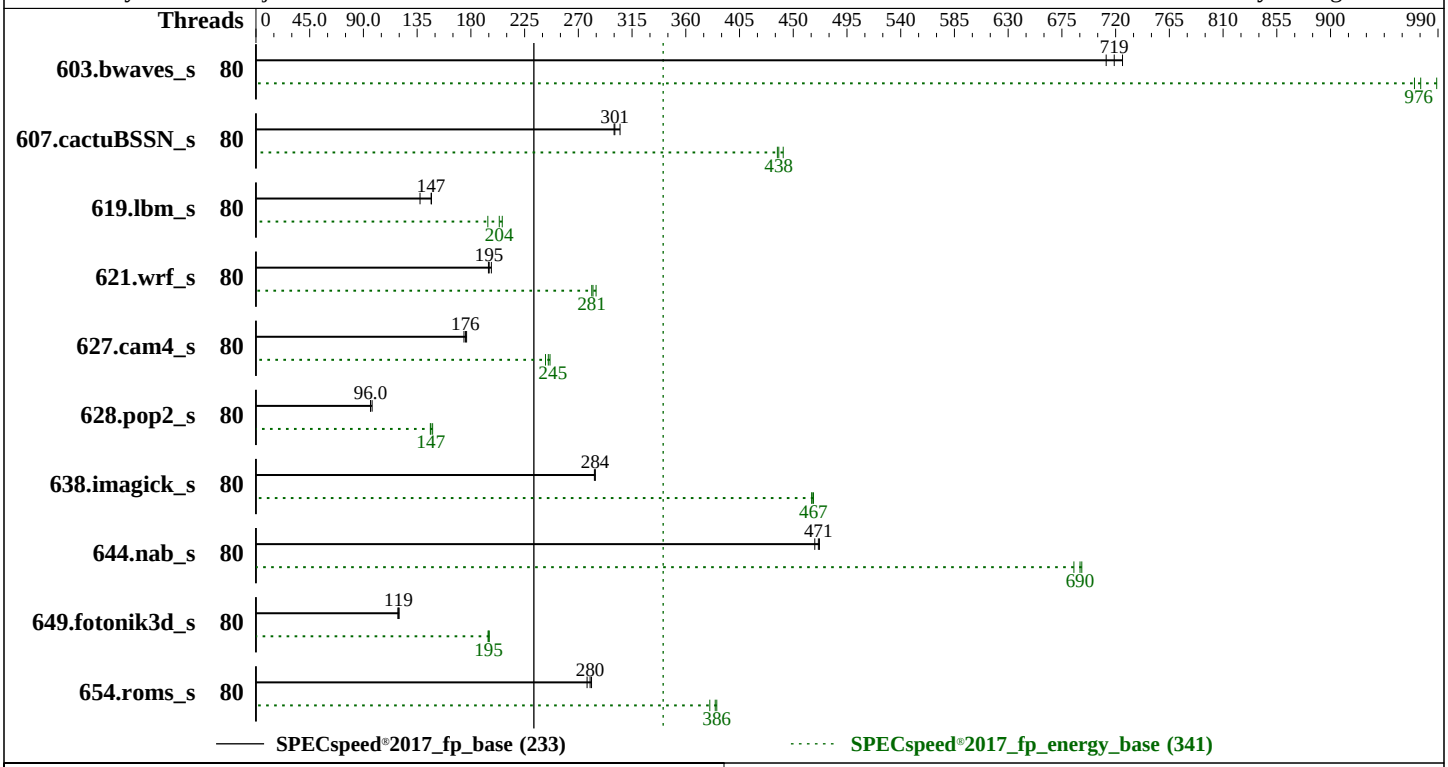
Fujitsu

PRIMERGY RX2540 M6, Intel Xeon Platinum 8380, 2.30GHz

SPECspeed®2017_fp_base =	233
SPECspeed®2017_fp_energy_base =	341
SPECspeed®2017_fp_peak =	Not Run
SPECspeed®2017_fp_energy_peak =	Not Run

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

Test Date: Apr-2021
Hardware Availability: May-2021
Software Availability: Aug-2020



Hardware

CPU Name:	Intel Xeon Platinum 8380
Max MHz:	3400
Nominal:	2300
Enabled:	80 cores, 2 chips
Orderable:	1,2 chips
Cache L1:	32 KB I + 48 KB D on chip per core
L2:	1.25 MB I+D on chip per core
L3:	60 MB I+D on chip per chip
Other:	None
Memory:	1 TB (32 x 32 GB 2Rx4 PC4-3200AA-R)
Storage:	1 x SATA M.2 SSD, 480GB
Other:	None

Software

OS:	Red Hat Enterprise Linux release 8.2 (Ootpa) 4.18.0-193.el8.x86_64
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:	Yes
Firmware:	Fujitsu BIOS Version V1.0.0.0 R1.4.0 for D3891-A1x. Released May-2021 tested as V1.0.0.0 R1.2.0 for D3891-A1x Apr-2021
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

Power

Max. Power (W):	877.0
Idle Power (W):	366.34
Min. Temperature (C):	25.63

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Power (Continued)

Elevation (m): 11
Line Standard: 200 V / 50 Hz / 1 phase / 2 wires
Provisioning: Line-powered

Power Settings

Management FW: Version 3.20i for D3891-A1x of Fujitsu BMC Firmware
Memory Mode: Normal

Power-Relevant Hardware

Power Supply: 1 x 1600 W (non-redundant)
Details: Standard power supply part of base unit S26113-E630-V50-1
Backplane: 24 x 2.5inch HDD back plan
Other Storage: Embedded SATA Controller
Storage Model #s: S26361-F5706
NICs Installed: 1 x Intel I350-T4 @ 1 Gb
NICs Enabled (FW/OS): 4 / 4
NICs Connected/Speed: 1 @ 1 Gb
Other HW Model #s: None

Power Analyzer

Power Analyzer: 10.26.120.153:8888
Hardware Vendor: Hioki
Model: Hioki PW3336:1-Channel
Serial Number: 170213562
Input Connection: USB via USB-Serial CH340
Metrology Institute: NICT
Calibration By: HIOKI E.E. CORPORATION
Calibration Label: H06400088
Calibration Date: 25-Jun-2020
PTDaemon® Version: 1.9.1 (a2d19f26; 2019-07-17)
Setup Description: Connected to PSU 1
Current Ranges Used: 5A
Voltage Range Used: 300V

Temperature Meter

Temperature Meter: 10.26.120.153:8889
Hardware Vendor: Digi International Inc.
Model: DigiWATCHPORT_H
Serial Number: W 613 66209
Input Connection: USB
PTDaemon Version: 1.9.1 (a2d19f26; 2019-07-17)
Setup Description: 5 mm in front of SUT main air intake

Base Results Table

Benchmark	Threads	Seconds	Ratio	Energy (kJ)	Energy Ratio	Average Power	Maximum Power	Seconds	Ratio	Energy (kJ)	Energy Ratio	Average Power	Maximum Power	Seconds	Ratio	Energy (kJ)	Energy Ratio	Average Power	Maximum Power
603.bwaves_s	80	81.3	726	65.1	989	801	818	**82.1**	**719**	**66.0**	**976**	**804**	**817**	82.9	712	66.3	970	801	817
607.cactuBSSN_s	80	**55.5**	**301**	**41.6**	**438**	**751**	**779**	55.6	300	41.8	437	751	780	54.7	305	41.3	442	755	783
619.lbm_s	80	35.6	147	28.8	206	810	845	38.1	137	30.6	194	804	841	**35.7**	**147**	**29.2**	**204**	**818**	**877**
621.wrf_s	80	67.9	195	51.2	282	753	768	**67.7**	**195**	**51.4**	**281**	**759**	**771**	67.1	197	50.7	285	756	775
627.cam4_s	80	50.9	174	39.8	243	782	836	**50.5**	**176**	**39.4**	**245**	**780**	**812**	50.2	176	39.2	246	779	816
628.pop2_s	80	**124**	**96.0**	**89.0**	**147**	**720**	**734**	124	95.9	89.3	146	722	732	122	97.3	88.2	148	723	733
638.imagick_s	80	50.8	284	33.8	465	665	825	**50.8**	**284**	**33.7**	**467**	**663**	**823**	50.9	283	33.8	466	663	826
644.nab_s	80	37.3	468	27.7	685	743	792	**37.1**	**471**	**27.5**	**690**	**743**	**793**	37.0	472	27.5	692	742	795
649.fotonik3d_s	80	76.0	120	52.4	195	689	795	**76.3**	**119**	**52.5**	**195**	**688**	**796**	76.7	119	52.7	194	687	795
654.roms_s	80	**56.3**	**280**	**45.6**	**386**	**811**	**848**	56.0	281	45.8	385	817	849	56.8	277	46.3	380	816	852

SPECspeed®2017_fp_base = 233

SPECspeed®2017_fp_energy_base = 341

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

Submit Notes

```
The taskset mechanism was used to bind copies to processors. The config file option 'submit'
was used to generate taskset 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"
echo 16000000 > /proc/sys/kernel/sched_latency_ns
```

Environment Variables Notes

```
Environment variables set by runcpu before the start of the run:
KMP_AFFINITY = "granularity=fine,compact"
LD_LIBRARY_PATH =
     "/home/PVT/speccpu-1.1.5/lib/intel64:/home/PVT/speccpu-1.1.5/je5.0.1-64"
MALLOC_CONF = "retain:true"
OMP_STACKSIZE = "192M"
```

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
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
DCU Streamer Prefetcher = Disabled
```

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Platform Notes (Continued)

```
Override OS Energy Performance = Enabled
Energy Performance = Performance

Sysinfo program /home/PVT/speccpu-1.1.5/bin/sysinfo
Rev: r6538 of 2020-09-24 e8664e66d2d7080afeaa89d4b38e2f1c
running on localhost.localdomain Wed Apr  7 18:32:04 2021

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 8380 CPU @ 2.30GHz
      2  "physical id"s (chips)
      80 "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 : 40
      siblings  : 40
      physical 0: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
      25 26 27 28 29 30 31 32 33 34 35 36 37 38 39
      physical 1: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
      25 26 27 28 29 30 31 32 33 34 35 36 37 38 39

From lscpu:
     Architecture:        x86_64
     CPU op-mode(s):      32-bit, 64-bit
     Byte Order:          Little Endian
     CPU(s):              80
     On-line CPU(s) list: 0-79
     Thread(s) per core:  1
     Core(s) per socket:  40
     Socket(s):           2
     NUMA node(s):        2
     Vendor ID:           GenuineIntel
     CPU family:          6
     Model:               106
     Model name:          Intel(R) Xeon(R) Platinum 8380 CPU @ 2.30GHz
     Stepping:            6
     CPU MHz:             3298.383
     CPU max MHz:         3400.0000
     CPU min MHz:         800.0000
     BogoMIPS:            4600.00
     Virtualization:      VT-x
     L1d cache:           48K
```

(Continued on next page)

Platform Notes (Continued)

```
      L1i cache:             32K
      L2 cache:              1280K
      L3 cache:              61440K
      NUMA node0 CPU(s):     0-39
      NUMA node1 CPU(s):     40-79
      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 invpcid_single 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 rdt_a avx512f avx512dq
      rdseed adx smap avx512ifma clflushopt clwb intel_pt avx512cd sha_ni avx512bw
      avx512vl xsaveopt xsavec xgetbv1 xsaves cqm_llc cqm_occup_llc cqm_mbm_total
      cqm_mbm_local wbnoinvd dtherm ida arat pln pts hwp hwp_act_window hwp_epp
      hwp_pkg_req avx512vbmi umip pku ospke avx512_vbmi2 gfni vaes vpclmulqdq avx512_vnni
      avx512_bitalg tme avx512_vpopcntdq la57 rdpid md_clear pconfig flush_l1d
      arch_capabilities

/proc/cpuinfo cache data
   cache size : 61440 KB

From numactl --hardware  WARNING: a numactl 'node' might or might not correspond to a
physical chip.
  available: 2 nodes (0-1)
  node 0 cpus: 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27
  28 29 30 31 32 33 34 35 36 37 38 39
  node 0 size: 515507 MB
  node 0 free: 514444 MB
  node 1 cpus: 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64
  65 66 67 68 69 70 71 72 73 74 75 76 77 78 79
  node 1 size: 516057 MB
  node 1 free: 515723 MB
  node distances:
  node   0   1
    0:  10  20
    1:  20  10

From /proc/meminfo
   MemTotal:       1056322344 kB
   HugePages_Total:       0
   Hugepagesize:       2048 kB

/sbin/tuned-adm active
```

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Platform Notes (Continued)

```
     Current active profile: throughput-performance

 /sys/devices/system/cpu/cpu*/cpufreq/scaling_governor has
    performance

 From /etc/*release* /etc/*version*
    os-release:
       NAME="Red Hat Enterprise Linux"
       VERSION="8.2 (Ootpa)"
       ID="rhel"
       ID_LIKE="fedora"
       VERSION_ID="8.2"
       PLATFORM_ID="platform:el8"
       PRETTY_NAME="Red Hat Enterprise Linux 8.2 (Ootpa)"
       ANSI_COLOR="0;31"
    redhat-release: Red Hat Enterprise Linux release 8.2 (Ootpa)
    system-release: Red Hat Enterprise Linux release 8.2 (Ootpa)
    system-release-cpe: cpe:/o:redhat:enterprise_linux:8.2:ga

 uname -a:
    Linux localhost.localdomain 4.18.0-193.el8.x86_64 #1 SMP Fri Mar 27 14:35:58 UTC 2020
    x86_64 x86_64 x86_64 GNU/Linux

 Kernel self-reported vulnerability status:

 CVE-2018-12207 (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
 CVE-2020-0543 (Special Register Buffer Data Sampling): No status reported
 CVE-2019-11135 (TSX Asynchronous Abort):                 Not affected


 SPEC is set to: /home/PVT/speccpu-1.1.5
    Filesystem     Type  Size  Used Avail Use% Mounted on
    /dev/sda3      xfs   330G   88G  243G  27% /home
```

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Platform Notes (Continued)

```
From /sys/devices/virtual/dmi/id
    Vendor:          FUJITSU
    Product:         PRIMERGY RX2540 M6
    Product Family: SERVER
    Serial:          EWAAxxxxxx

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:
    32x Samsung M393A4K40DB3-CWE 32 GB 2 rank 3200

BIOS:
   BIOS Vendor:       FUJITSU
   BIOS Version:      V1.0.0.0 R1.2.0 for D3891-A1x
   BIOS Date:         04/01/2021
   BIOS Revision:     1.2
   Firmware Revision: 3.20

(End of data from sysinfo program)
```

Power Settings Notes

```
PTDaemon to measure power and temperature was run on a PRIMERGY RX2530 M5 as a controller
with 2x Intel Xeon Platinum 8280 CPU and 768 GB of memory using Windows Server 2012 R2.
Power management in the BIOS was default except for any settings mentioned in BIOS Configuration.
No power management settings were set in the management firmware.
The optional optical drive was not installed.
The run was started and observed through the management firmware.
```

Compiler Version Notes

```
==============================================================================
C               | 619.lbm_s(base) 638.imagick_s(base) 644.nab_s(base)
------------------------------------------------------------------------------
Intel(R) C 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.
------------------------------------------------------------------------------

==============================================================================
C++, C, Fortran | 607.cactuBSSN_s(base)
```

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Compiler Version Notes (Continued)

```
------------------------------------------------------------------------------
Intel(R) C++ 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 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) 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.
------------------------------------------------------------------------------

==============================================================================
Fortran         | 603.bwaves_s(base) 649.fotonik3d_s(base) 654.roms_s(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.
------------------------------------------------------------------------------

==============================================================================
Fortran, C      | 621.wrf_s(base) 627.cam4_s(base) 628.pop2_s(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 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.
------------------------------------------------------------------------------
```

Base Compiler Invocation

C benchmarks:
icc

Fortran benchmarks:
ifort

Benchmarks using both Fortran and C:
ifort icc

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Base Compiler Invocation (Continued)

Benchmarks using Fortran, C, and C++:
icpc icc ifort

Base Portability Flags

603.bwaves_s: -DSPEC_LP64
607.cactuBSSN_s: -DSPEC_LP64
619.lbm_s: -DSPEC_LP64
621.wrf_s: -DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian
627.cam4_s: -DSPEC_LP64 -DSPEC_CASE_FLAG
628.pop2_s: -DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian
-assume byterecl
638.imagick_s: -DSPEC_LP64
644.nab_s: -DSPEC_LP64
649.fotonik3d_s: -DSPEC_LP64
654.roms_s: -DSPEC_LP64

Base Optimization Flags

C benchmarks:
-m64 -std=c11 -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP
-mbranches-within-32B-boundaries

Fortran benchmarks:
-m64 -Wl,-z,muldefs -DSPEC_OPENMP -xCORE-AVX2 -ipo -O3 -no-prec-div
-qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp
-nostandard-realloc-lhs -mbranches-within-32B-boundaries
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

Benchmarks using both Fortran and C:
-m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div
-qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp
-DSPEC_OPENMP -mbranches-within-32B-boundaries -nostandard-realloc-lhs
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

Benchmarks using Fortran, C, and C++:
-m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div
-qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp

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Base Optimization Flags (Continued)

Benchmarks using Fortran, C, and C++ (continued):
-DSPEC_OPENMP -mbranches-within-32B-boundaries -nostandard-realloc-lhs
-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-ICL-RevA.html
http://www.spec.org/cpu2017/flags/Intel-ic19.1u1-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-ICL-RevA.xml
http://www.spec.org/cpu2017/flags/Intel-ic19.1u1-official-linux64_revA.xml

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

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