# SPEC CPU®2017 Floating Point Speed Result



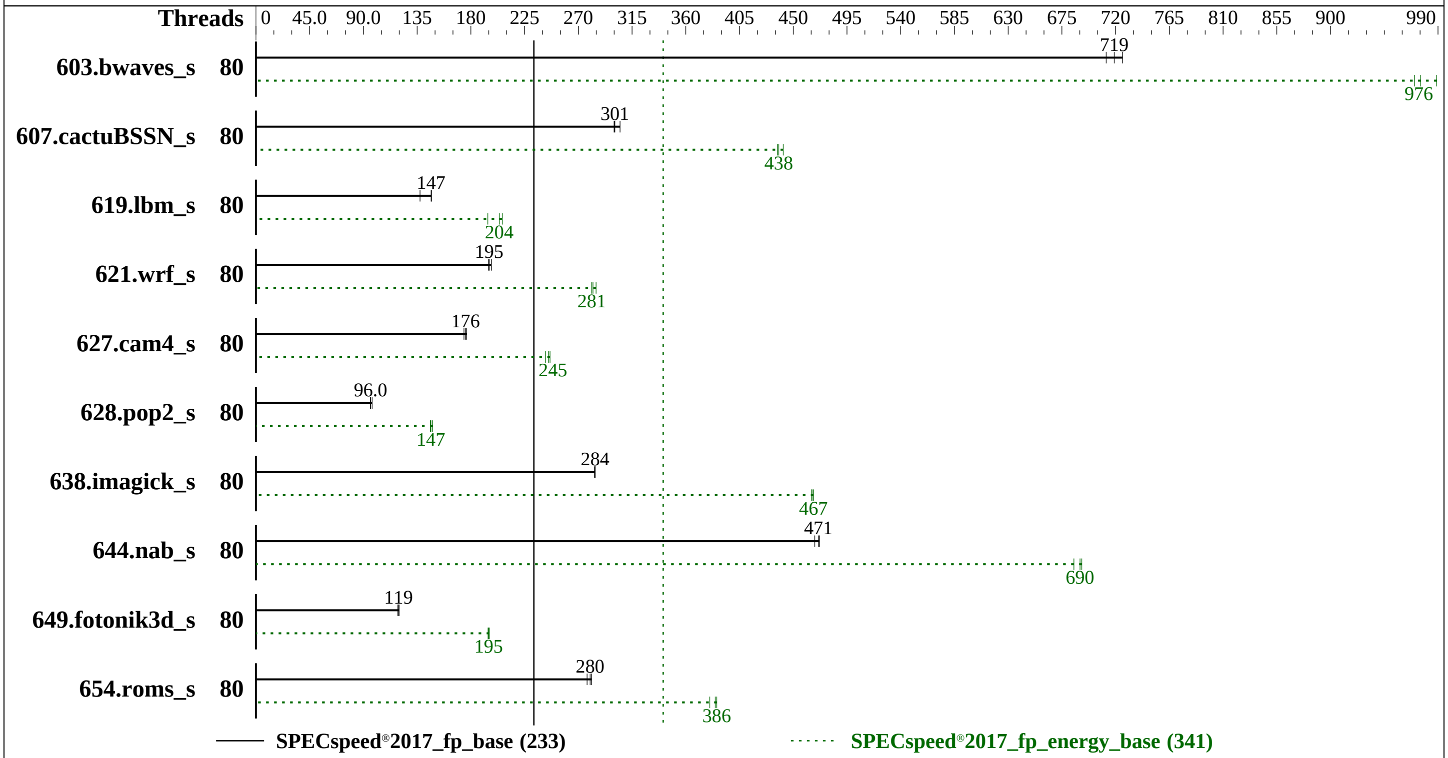
## Fujitsu

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
```

**(Continued on next page)**

## 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
```

(Continued on next page)

## 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
```

(Continued on next page)

## 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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**Tested by:** Fujitsu
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**Hardware Availability:** May-2021
**Software Availability:** Aug-2020

## 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`

**(Continued on next page)**

## 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.


Tested with SPEC CPU®2017 v1.1.5 on 2021-04-07 18:32:03-0400.
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