SPEC CPU®2017 Floating Point Rate Result

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Fujitsu

PRIMERGY TX1320 M4, Intel Xeon E-2134, 3.50GHz

$SPECrate®2017_fp_base = $ **33.7**

$SPECrate®2017_fp_peak = $ Not Run

CPU2017 License: 19

Test Sponsor: Fujitsu

Tested by: Fujitsu

Test Date: Dec-2021

Hardware Availability: Nov-2018

Software Availability: Jun-2021

Copies

Benchmark	Copies	Value
503.bwaves_r	4	71.6
507.cactuBSSN_r	4	52.4
508.namd_r	4	25.1
510.parest_r	4	18.7
511.povray_r	4	37.6
519.lbm_r	4	25.7
521.wrf_r	4	34.3
526.blender_r	4	28.9
527.cam4_r	4	33.4
538.imagick_r	4	94.7
544.nab_r	4	40.7
549.fotonik3d_r	4	21.8
554.roms_r	4	15.2

SPECrate®2017_fp_base (33.7)

Hardware

CPU Name: Intel Xeon E-2134

 Max MHz: 4500

 Nominal: 3500

Enabled: 4 cores, 1 chip

Orderable: 1 chip

Cache L1: 32 KB I + 32 KB D on chip per core

 L2: 256 KB I+D on chip per core

 L3: 8 MB I+D on chip per chip

 Other: None

Memory: 128 GB (4 x 32 GB 2Rx8 PC4-2666V-E)

Storage: 1 x SATA M.2 SSD, 480GB

Other: None

Software

OS: SUSE Linux Enterprise Server 15 SP3
5.3.18-57-default

Compiler: C/C++: Version 2021.1 of Intel oneAPI DPC++/C++ Compiler Build 20201113 for Linux;
Fortran: Version 2021.1 of Intel Fortran Compiler Classic Build 20201112 for Linux;

Parallel: No

Firmware: Fujitsu BIOS Version V5.0.0.13 R1.18.0 for D3673-A1x. Released Jul-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

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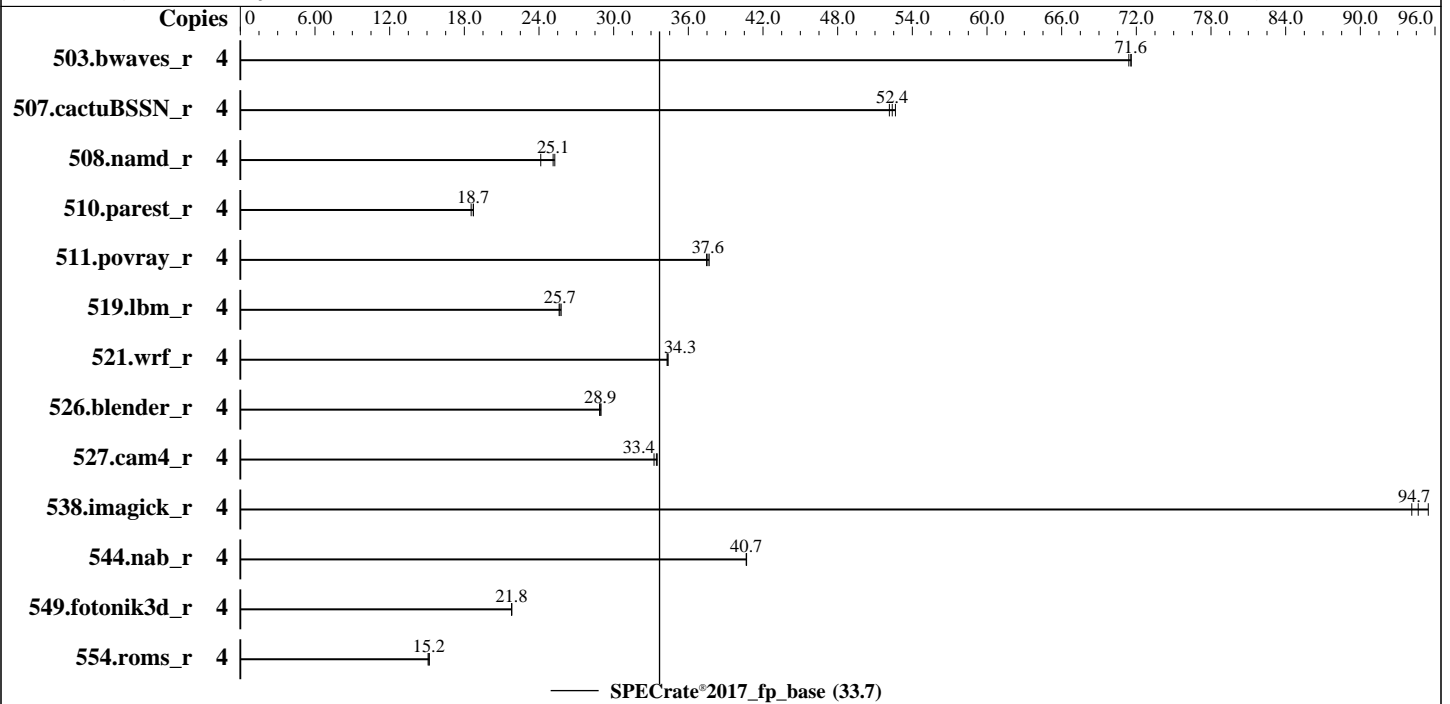SPECrate®2017_fp_peak = Not Run

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Results Table

Benchmark	Base Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Peak Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
503.bwaves_r	4	562	71.4	**561**	**71.6**	560	71.6							
507.cactuBSSN_r	4	96.2	52.6	97.1	52.2	**96.7**	**52.4**							
508.namd_r	4	**151**	**25.1**	157	24.1	150	25.3							
510.parest_r	4	**559**	**18.7**	559	18.7	564	18.5							
511.povray_r	4	249	37.5	**249**	**37.6**	248	37.7							
519.lbm_r	4	165	25.6	164	25.8	**164**	**25.7**							
521.wrf_r	4	261	34.3	261	34.4	**261**	**34.3**							
526.blender_r	4	211	28.9	**211**	**28.9**	210	29.0							
527.cam4_r	4	**209**	**33.4**	209	33.5	210	33.2							
538.imagick_r	4	**105**	**94.7**	106	94.1	104	95.5							
544.nab_r	4	165	40.7	166	40.7	**166**	**40.7**							
549.fotonik3d_r	4	**715**	**21.8**	715	21.8	715	21.8							
554.roms_r	4	421	15.1	**419**	**15.2**	419	15.2							
SPECrate®2017_fp_base =		**33.7**												
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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"

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"

General Notes

Binaries compiled on a system with 1x Intel Core i9-7980XE CPU + 64GB RAM
memory using Red Hat Enterprise Linux 8.1
Transparent Huge Pages enabled by default
Prior to runcpu invocation

(Continued on next page)

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https://www.spec.org/

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General Notes (Continued)

```
 Filesystem page cache synced and cleared with:
 sync; echo 3>        /proc/sys/vm/drop_caches
Yes: 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
 Fan Control = Full
 Race To Halt (RTH) = Disabled
 Energy Efficient Turbo = Disabled
 Package C-State Un-demotion = Enabled
 DMI Link ASPM Control = Disabled
 Native PCIE Enable = Disabled


 Sysinfo program /home/benchmark/speccpu/bin/sysinfo
 Rev: r6622 of 2021-04-07 982a61ec0915b55891ef0e16acafc64d
 running on localhost Mon Dec 20 19:23:56 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) E-2134 CPU @ 3.50GHz
       1  "physical id"s (chips)
       4 "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  : 4
       physical 0: cores 0 1 2 3

 From lscpu from util-linux 2.36.2:
    Architecture:                 x86_64
    CPU op-mode(s):               32-bit, 64-bit
    Byte Order:                   Little Endian
    Address sizes:                39 bits physical, 48 bits virtual
```

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Platform Notes (Continued)

```
        CPU(s):                         4
        On-line CPU(s) list:            0-3
        Thread(s) per core:             1
        Core(s) per socket:             4
        Socket(s):                      1
        NUMA node(s):                   1
        Vendor ID:                      GenuineIntel
        CPU family:                     6
        Model:                          158
        Model name:                     Intel(R) Xeon(R) E-2134 CPU @ 3.50GHz
        Stepping:                       10
        CPU MHz:                        3528.284
        CPU max MHz:                    4500.0000
        CPU min MHz:                    800.0000
        BogoMIPS:                       6999.82
        Virtualization:                 VT-x
        L1d cache:                      128 KiB
        L1i cache:                      128 KiB
        L2 cache:                       1 MiB
        L3 cache:                       8 MiB
        NUMA node0 CPU(s):              0-3
        Vulnerability Itlb multihit:    KVM: Mitigation: VMX disabled
        Vulnerability L1tf:             Mitigation; PTE Inversion; VMX conditional cache
        flushes, SMT disabled
        Vulnerability Mds:              Mitigation; Clear CPU buffers; SMT disabled
        Vulnerability Meltdown:         Mitigation; PTI
        Vulnerability Spec store bypass: Mitigation; Speculative Store Bypass disabled via
        prctl and seccomp
        Vulnerability Spectre v1:       Mitigation; usercopy/swapgs barriers and __user
        pointer sanitization
        Vulnerability Spectre v2:       Mitigation; Full generic retpoline, IBPB
        conditional, IBRS_FW, RSB filling
        Vulnerability Srbds:            Mitigation; Microcode
        Vulnerability Tsx async abort:  Mitigation; Clear CPU buffers; SMT disabled
        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 sse4_1 sse4_2 x2apic movbe popcnt
        tsc_deadline_timer aes xsave avx f16c rdrand lahf_lm abm 3dnowprefetch cpuid_fault
        epb invpcid_single pti ssbd ibrs ibpb stibp tpr_shadow vnmi flexpriority ept vpid
        ept_ad fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rtm mpx rdseed adx
        smap clflushopt intel_pt xsaveopt xsavec xgetbv1 xsaves dtherm ida arat pln pts hwp
        hwp_notify hwp_act_window hwp_epp md_clear flush_l1d

     From lscpu --cache:
        NAME ONE-SIZE ALL-SIZE WAYS TYPE         LEVEL SETS PHY-LINE COHERENCY-SIZE
```

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Platform Notes (Continued)

```
     L1d        32K      128K    8 Data          1   64       1            64
     L1i        32K      128K    8 Instruction   1   64       1            64
     L2        256K       1M     4 Unified       2 1024       1            64
     L3          8M       8M    16 Unified       3 8192       1            64


 /proc/cpuinfo cache data
    cache size : 8192 KB


 From numactl --hardware
 WARNING: a numactl 'node' might or might not correspond to a physical chip.
   available: 1 nodes (0)
   node 0 cpus: 0 1 2 3
   node 0 size: 128304 MB
   node 0 free: 127640 MB
   node distances:
   node   0
     0:  10


 From /proc/meminfo
    MemTotal:       131383968 kB
    HugePages_Total:        0
    Hugepagesize:        2048 kB


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


 From /etc/*release* /etc/*version*
    os-release:
       NAME="SLES"
       VERSION="15-SP3"
       VERSION_ID="15.3"
       PRETTY_NAME="SUSE Linux Enterprise Server 15 SP3"
       ID="sles"
       ID_LIKE="suse"
       ANSI_COLOR="0;32"
       CPE_NAME="cpe:/o:suse:sles:15:sp3"


 uname -a:
    Linux localhost 5.3.18-57-default #1 SMP Wed Apr 28 10:54:41 UTC 2021
    (ba3c2e9/lp-5d9e8aa) x86_64 x86_64 x86_64 GNU/Linux


 Kernel self-reported vulnerability status:

 CVE-2018-12207 (iTLB Multihit):             KVM: Mitigation: VMX disabled
 CVE-2018-3620 (L1 Terminal Fault):          Mitigation: PTE Inversion; VMX:
                                             conditional cache flushes, SMT
                                             disabled
```

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Platform Notes (Continued)

```
Microarchitectural Data Sampling:                   Mitigation: Clear CPU buffers; SMT
                                                     disabled
CVE-2017-5754 (Meltdown):                           Mitigation: PTI
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: Full generic
                                                     retpoline, IBPB: conditional,
                                                     IBRS_FW, RSB filling
CVE-2020-0543 (Special Register Buffer Data Sampling): Mitigation: Microcode
CVE-2019-11135 (TSX Asynchronous Abort):            Mitigation: Clear CPU buffers; SMT
                                                     disabled


run-level 3 Dec 20 19:13

SPEC is set to: /home/benchmark/speccpu
   Filesystem      Type  Size  Used Avail Use% Mounted on
   /dev/sda8       xfs   121G   19G  103G  16% /home

From /sys/devices/virtual/dmi/id
     Vendor:         FUJITSU
     Product:        PRIMERGY TX1320 M4
     Product Family: SERVER
     Serial:         YMJKXXXXXX

Additional information from dmidecode 3.2 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:
     4x Samsung M391A4G43MB1-CTD 32 GB 2 rank 2667

BIOS:
   BIOS Vendor:     FUJITSU // American Megatrends Inc.
   BIOS Version:    V5.0.0.13 R1.18.0 for D3673-A1x
   BIOS Date:       07/12/2021
   BIOS Revision:   1.18

(End of data from sysinfo program)
```

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Compiler Version Notes

```
==============================================================================
C                  | 519.lbm_r(base) 538.imagick_r(base) 544.nab_r(base)
------------------------------------------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64,
  Version 2021.1 Build 20201113
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------


==============================================================================
C++                | 508.namd_r(base) 510.parest_r(base)
------------------------------------------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64,
  Version 2021.1 Build 20201113
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------


==============================================================================
C++, C             | 511.povray_r(base) 526.blender_r(base)
------------------------------------------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64,
  Version 2021.1 Build 20201113
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64,
  Version 2021.1 Build 20201113
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------


==============================================================================
C++, C, Fortran | 507.cactuBSSN_r(base)
------------------------------------------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64,
  Version 2021.1 Build 20201113
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64,
  Version 2021.1 Build 20201113
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
Intel(R) Fortran Intel(R) 64 Compiler Classic for applications running on
  Intel(R) 64, Version 2021.1 Build 20201112_000000
Copyright (C) 1985-2020 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 Classic for applications running on
  Intel(R) 64, Version 2021.1 Build 20201112_000000
Copyright (C) 1985-2020 Intel Corporation.  All rights reserved.
```

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Compiler Version Notes (Continued)

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

==========================================================================
Fortran, C      | 521.wrf_r(base) 527.cam4_r(base)
--------------------------------------------------------------------------
Intel(R) Fortran Intel(R) 64 Compiler Classic for applications running on
  Intel(R) 64, Version 2021.1 Build 20201112_000000
Copyright (C) 1985-2020 Intel Corporation.  All rights reserved.
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64,
  Version 2021.1 Build 20201113
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
--------------------------------------------------------------------------
```

Base Compiler Invocation

C benchmarks:
icx

C++ benchmarks:
icpx

Fortran benchmarks:
ifort

Benchmarks using both Fortran and C:
ifort icx

Benchmarks using both C and C++:
icpx icx

Benchmarks using Fortran, C, and C++:
icpx icx ifort

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

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Base Portability Flags (Continued)

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:
-w -std=c11 -m64 -Wl,-z,muldefs -xCORE-AVX2 -Ofast -ffast-math
-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-mbranches-within-32B-boundaries -ljemalloc
-L/usr/local/jemalloc64-5.0.1/lib

C++ benchmarks:
-w -m64 -Wl,-z,muldefs -xCORE-AVX2 -Ofast -ffast-math -flto
-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-mbranches-within-32B-boundaries -ljemalloc
-L/usr/local/jemalloc64-5.0.1/lib

Fortran benchmarks:
-w -m64 -Wl,-z,muldefs -xCORE-AVX2 -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 -ljemalloc
-L/usr/local/jemalloc64-5.0.1/lib

Benchmarks using both Fortran and C:
-w -m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX2 -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
-mbranches-within-32B-boundaries -nostandard-realloc-lhs
-align array32byte -auto -ljemalloc -L/usr/local/jemalloc64-5.0.1/lib

Benchmarks using both C and C++:
-w -m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX2 -Ofast -ffast-math
-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-mbranches-within-32B-boundaries -ljemalloc
-L/usr/local/jemalloc64-5.0.1/lib

Benchmarks using Fortran, C, and C++:
-w -m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX2 -Ofast -ffast-math

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Base Optimization Flags (Continued)

Benchmarks using Fortran, C, and C++ (continued):

```
-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4 -O3
-no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-multiple-gather-scatter-by-shuffles
-mbranches-within-32B-boundaries -nostandard-realloc-lhs
-align array32byte -auto -ljemalloc -L/usr/local/jemalloc64-5.0.1/lib
```

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

http://www.spec.org/cpu2017/flags/Intel-ic2021-official-linux64_revA.html
http://www.spec.org/cpu2017/flags/Fujitsu-Platform-Settings-V1.0.2-CFL-RevD.html

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

http://www.spec.org/cpu2017/flags/Intel-ic2021-official-linux64_revA.xml
http://www.spec.org/cpu2017/flags/Fujitsu-Platform-Settings-V1.0.2-CFL-RevD.xml

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

Tested with SPEC CPU®2017 v1.1.8 on 2021-12-20 05:23:56-0500.
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