SPEC CPU®2017 Floating Point Speed Result

Dell Inc.

$SPECspeed^®2017\_fp\_base = 26.2$

PowerEdge T140 (Intel Xeon E-2236, 3.40 GHz)

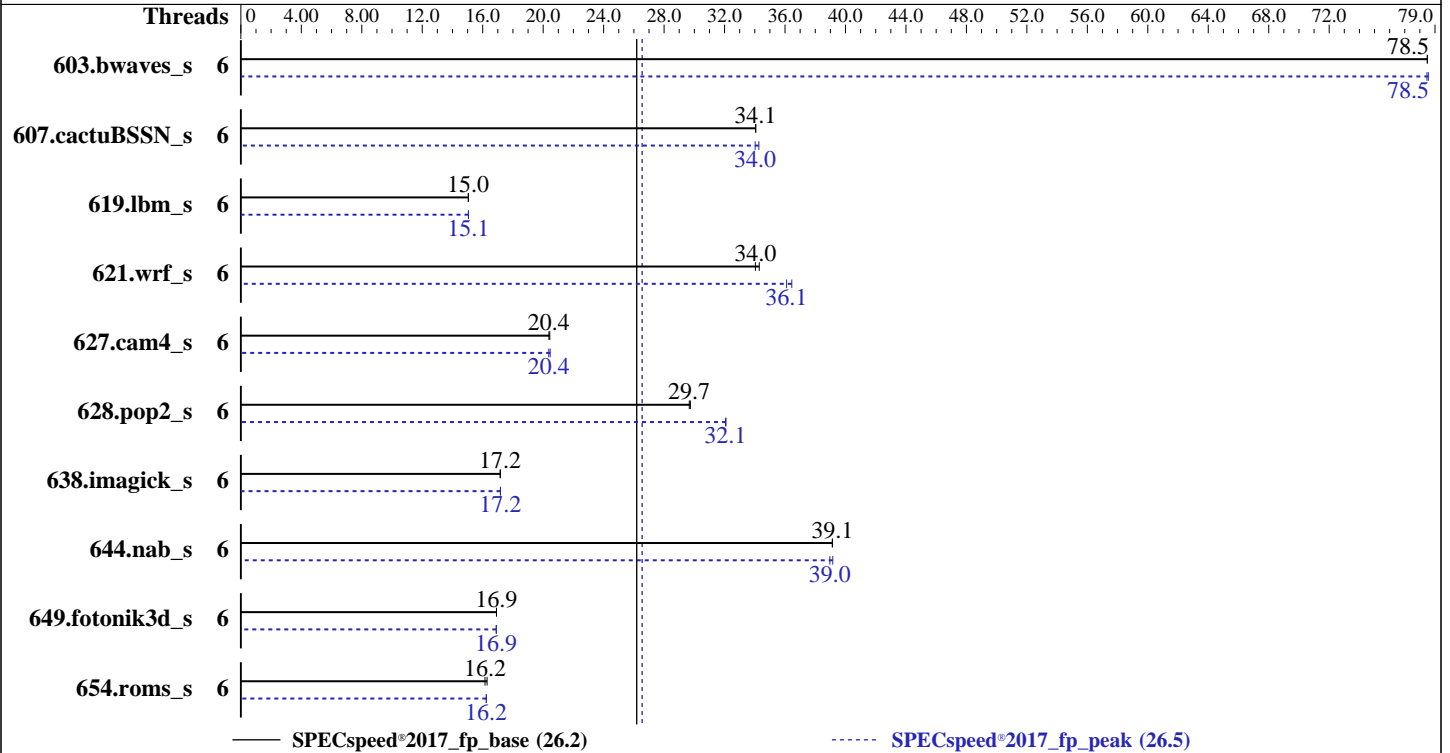$SPECspeed^®2017\_fp\_peak = 26.5$

CPU2017 License: 55
Test Sponsor: Dell Inc.
Tested by: Dell Inc.

Test Date: Dec-2019
Hardware Availability: Dec-2019
Software Availability: Jun-2019

Threads			Value base	Value peak
603.bwaves_s	6			78.5
				78.5
607.cactuBSSN_s	6		34.1	
				34.0
619.lbm_s	6		15.0	
				15.1
621.wrf_s	6		34.0	
				36.1
627.cam4_s	6		20.4	
				20.4
628.pop2_s	6		29.7	
				32.1
638.imagick_s	6		17.2	
				17.2
644.nab_s	6		39.1	
				39.0
649.fotonik3d_s	6		16.9	
				16.9
654.roms_s	6		16.2	
				16.2

────── SPECspeed®2017_fp_base (26.2)   ------ SPECspeed®2017_fp_peak (26.5)

Hardware

CPU Name: Intel Xeon E-2236
 Max MHz: 4800
 Nominal: 3400
Enabled: 12 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: 12 MB I+D on chip per chip
 Other: None
Memory: 64 GB (4 x 16 GB 2Rx8 PC4-2666V-R)
Storage: 1 x 960 GB SATA SSD
Other: None

Software

OS: Suse Linux Enterprise Server 15 SP1
  kernel 4.12.14-195-default
Compiler: C/C++: Version 19.0.4.227 of Intel C/C++
  Compiler Build 20190416 for Linux;
  Fortran: Version 19.0.4.227 of Intel Fortran
  Compiler Build 20190416 for Linux
Parallel: Yes
Firmware: Version 2.1.6 released Nov-2019
File System: xfs
System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: 64-bit
Other: None
Power Management: BIOS set to prefer performance at the cost of additional power usage.

SPEC CPU®2017 Floating Point Speed Result
Copyright 2017-2019 Standard Performance Evaluation Corporation

Dell Inc.

PowerEdge T140 (Intel Xeon E-2236, 3.40 GHz)

SPECspeed®2017_fp_base = 26.2

SPECspeed®2017_fp_peak = 26.5

CPU2017 License: 55
Test Sponsor: Dell Inc.
Tested by: Dell Inc.

Test Date: Dec-2019
Hardware Availability: Dec-2019
Software Availability: Jun-2019

Results Table

Benchmark	Base Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Peak Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
603.bwaves_s	6	752	78.5	**752**	**78.5**			6	751	78.6	**752**	**78.5**		
607.cactuBSSN_s	6	**489**	**34.1**	489	34.1			6	486	34.3	**490**	**34.0**		
619.lbm_s	6	**348**	**15.0**	348	15.0			6	348	15.1	**348**	**15.1**		
621.wrf_s	6	**389**	**34.0**	386	34.3			6	363	36.4	**366**	**36.1**		
627.cam4_s	6	**435**	**20.4**	434	20.4			6	**435**	**20.4**	433	20.5		
628.pop2_s	6	399	29.7	**400**	**29.7**			6	**370**	**32.1**	370	32.1		
638.imagick_s	6	841	17.2	**841**	**17.2**			6	840	17.2	**840**	**17.2**		
644.nab_s	6	446	39.1	**446**	**39.1**			6	**448**	**39.0**	446	39.2		
649.fotonik3d_s	6	539	16.9	**539**	**16.9**			6	539	16.9	**540**	**16.9**		
654.roms_s	6	967	16.3	**975**	**16.2**			6	**970**	**16.2**	970	16.2		

SPECspeed®2017_fp_base = **26.2**

SPECspeed®2017_fp_peak = **26.5**

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

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:
KMP_AFFINITY = "granularity=fine,compact"
LD_LIBRARY_PATH = "/home/cpu2017/ODM-SPECcpu2017-194/cpu2017/lib/intel64"
OMP_STACKSIZE = "192M"

General Notes

Binaries compiled on a system with 1x Intel Core i9-799X CPU + 32GB RAM
memory using Redhat Enterprise Linux 7.5
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.
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

SPEC CPU®2017 Floating Point Speed Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

Dell Inc.

PowerEdge T140 (Intel Xeon E-2236, 3.40 GHz)

SPECspeed®2017_fp_base = 26.2

SPECspeed®2017_fp_peak = 26.5

CPU2017 License: 55　　　　　　　　　　　　　　　　　　　　**Test Date:** Dec-2019
Test Sponsor: Dell Inc.　　　　　　　　　　　　　　　**Hardware Availability:** Dec-2019
Tested by: Dell Inc.　　　　　　　　　　　　　　　　**Software Availability:** Jun-2019

Platform Notes

```
BIOS settings:
Virtualization Technology disabled
DCU Streamer Prefetcher disabled
System Profile set to Custom
CPU Performance set to Maximum Performance
C States set to Autonomous
C1E disabled
Uncore Frequency set to Dynamic
Energy Efficiency Policy set to Performance
Memory Patrol Scrub disabled
PCI ASPM L1 Link Power Management disabled
Logical Processor disabled


Sysinfo program /home/cpu2017/ODM-SPECcpu2017-194/cpu2017/bin/sysinfo
Rev: r6365 of 2019-08-21 295195f888a3d7edb1e6e46a485a0011
running on linux-g3ob Fri Dec  6 12:09:26 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) E-2236 CPU @ 3.40GHz
      1  "physical id"s (chips)
      12 "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 : 6
      siblings  : 12
      physical 0: cores 0 1 2 3 4 5

From lscpu:
      Architecture:        x86_64
      CPU op-mode(s):      32-bit, 64-bit
      Byte Order:          Little Endian
      Address sizes:       39 bits physical, 48 bits virtual
      CPU(s):              12
      On-line CPU(s) list: 0-11
      Thread(s) per core:  2
      Core(s) per socket:  6
      Socket(s):           1
      NUMA node(s):        1
      Vendor ID:           GenuineIntel
      CPU family:          6
      Model:               158
      Model name:          Intel(R) Xeon(R) E-2236 CPU @ 3.40GHz
      Stepping:            10
```

(Continued on next page)

SPEC CPU®2017 Floating Point Speed Result
Copyright 2017-2019 Standard Performance Evaluation Corporation

Dell Inc.

PowerEdge T140 (Intel Xeon E-2236, 3.40 GHz)

SPECspeed®2017_fp_base = 26.2

SPECspeed®2017_fp_peak = 26.5

CPU2017 License: 55   **Test Date:**   Dec-2019
Test Sponsor: Dell Inc.   **Hardware Availability:** Dec-2019
Tested by: Dell Inc.   **Software Availability:** Jun-2019

Platform Notes (Continued)

```
       CPU MHz:                3400.000
       BogoMIPS:               6816.00
       Virtualization:         VT-x
       L1d cache:              32K
       L1i cache:              32K
       L2 cache:               256K
       L3 cache:               12288K
       NUMA node0 CPU(s):      0-11
       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 tsc_known_freq 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 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 md_clear flush_l1d

 /proc/cpuinfo cache data
    cache size : 12288 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 4 5 6 7 8 9 10 11
    node 0 size: 64257 MB
    node 0 free: 56452 MB
    node distances:
    node   0
      0:  10

 From /proc/meminfo
    MemTotal:        65800056 kB
    HugePages_Total:        0
    Hugepagesize:        2048 kB

 From /etc/*release* /etc/*version*
    os-release:
      NAME="SLES"
      VERSION="15-SP1"
      VERSION_ID="15.1"
      PRETTY_NAME="SUSE Linux Enterprise Server 15 SP1"
      ID="sles"
      ID_LIKE="suse"
      ANSI_COLOR="0;32"
      CPE_NAME="cpe:/o:suse:sles:15:sp1"
```

(Continued on next page)

Dell Inc.

PowerEdge T140 (Intel Xeon E-2236, 3.40 GHz)

$SPECspeed^{®}2017\_fp\_base = 26.2$

$SPECspeed^{®}2017\_fp\_peak = 26.5$

CPU2017 License: 55
Test Sponsor: Dell Inc.
Tested by: Dell Inc.

Test Date: Dec-2019
Hardware Availability: Dec-2019
Software Availability: Jun-2019

Platform Notes (Continued)

```
 uname -a:
    Linux linux-g3ob 4.12.14-195-default #1 SMP Tue May 7 10:55:11 UTC 2019 (8fba516)
    x86_64 x86_64 x86_64 GNU/Linux

 Kernel self-reported vulnerability status:

 CVE-2018-3620 (L1 Terminal Fault):         Mitigation: PTE Inversion
 Microarchitectural Data Sampling:          Mitigation: Clear CPU buffers; SMT vulnerable
 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: __user pointer sanitization
 CVE-2017-5715 (Spectre variant 2):         Mitigation: Indirect Branch Restricted
                                           Speculation, IBPB: conditional, IBRS_FW, STIBP:
                                            conditional, RSB filling


 run-level 3 Dec 6 08:20 last=5

 SPEC is set to: /home/cpu2017/ODM-SPECcpu2017-194/cpu2017
    Filesystem      Type  Size  Used Avail Use% Mounted on
    /dev/sda2       xfs   440G   42G  399G  10% /

 From /sys/devices/virtual/dmi/id
     BIOS:    Dell Inc. 2.1.6 09/27/2018
     Vendor:  Dell Inc.
     Product: PowerEdge T140
     Product Family: PowerEdge

 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:
     2x 00AD00000A02 HMA82GU7CJR8N-VK 16 GB 2 rank 2666
     2x 00AD00000A07 HMA82GU7CJR8N-VK 16 GB 2 rank 2666

 (End of data from sysinfo program)
```

Compiler Version Notes

```
==============================================================================
C                  | 619.lbm_s(base, peak) 638.imagick_s(base, peak)
                   | 644.nab_s(base, peak)
------------------------------------------------------------------------------
Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64,
  Version 19.0.4.227 Build 20190416
```

(Continued on next page)

SPEC CPU®2017 Floating Point Speed Result

Dell Inc.

PowerEdge T140 (Intel Xeon E-2236, 3.40 GHz)

$SPECspeed®2017\_fp\_base = 26.2$

$SPECspeed®2017\_fp\_peak = 26.5$

CPU2017 License: 55
Test Sponsor: Dell Inc.
Tested by: Dell Inc.

Test Date: Dec-2019
Hardware Availability: Dec-2019
Software Availability: Jun-2019

Compiler Version Notes (Continued)

```
Copyright (C) 1985-2019 Intel Corporation.  All rights reserved.
--------------------------------------------------------------------------------


================================================================================
C++, C, Fortran | 607.cactuBSSN_s(base, peak)
--------------------------------------------------------------------------------
Intel(R) C++ Intel(R) 64 Compiler for applications running on Intel(R) 64,
  Version 19.0.4.227 Build 20190416
Copyright (C) 1985-2019 Intel Corporation.  All rights reserved.
Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64,
  Version 19.0.4.227 Build 20190416
Copyright (C) 1985-2019 Intel Corporation.  All rights reserved.
Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R)
  64, Version 19.0.4.227 Build 20190416
Copyright (C) 1985-2019 Intel Corporation.  All rights reserved.
--------------------------------------------------------------------------------


================================================================================
Fortran         | 603.bwaves_s(base, peak) 649.fotonik3d_s(base, peak)
                | 654.roms_s(base, peak)
--------------------------------------------------------------------------------
Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R)
  64, Version 19.0.4.227 Build 20190416
Copyright (C) 1985-2019 Intel Corporation.  All rights reserved.
--------------------------------------------------------------------------------


================================================================================
Fortran, C      | 621.wrf_s(base, peak) 627.cam4_s(base, peak)
                | 628.pop2_s(base, peak)
--------------------------------------------------------------------------------
Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R)
  64, Version 19.0.4.227 Build 20190416
Copyright (C) 1985-2019 Intel Corporation.  All rights reserved.
Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64,
  Version 19.0.4.227 Build 20190416
Copyright (C) 1985-2019 Intel Corporation.  All rights reserved.
--------------------------------------------------------------------------------
```

Base Compiler Invocation

C benchmarks:
```
icc -m64 -std=c11
```

Fortran benchmarks:
```
ifort -m64
```

(Continued on next page)

Standard Performance Evaluation Corporation (info@spec.org) https://www.spec.org/

Dell Inc.

PowerEdge T140 (Intel Xeon E-2236, 3.40 GHz)

SPECspeed®2017_fp_base = 26.2

SPECspeed®2017_fp_peak = 26.5

CPU2017 License: 55
Test Sponsor: Dell Inc.
Tested by: Dell Inc.

Test Date: Dec-2019
Hardware Availability: Dec-2019
Software Availability: Jun-2019

Base Compiler Invocation (Continued)

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

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

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:
```
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP
```

Fortran benchmarks:
```
-DSPEC_OPENMP -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp
-nostandard-realloc-lhs
```

Benchmarks using both Fortran and C:
```
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP
-nostandard-realloc-lhs
```

Benchmarks using Fortran, C, and C++:
```
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP
-nostandard-realloc-lhs
```

SPEC CPU®2017 Floating Point Speed Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

Dell Inc.

PowerEdge T140 (Intel Xeon E-2236, 3.40 GHz)

SPECspeed®2017_fp_base = 26.2

SPECspeed®2017_fp_peak = 26.5

CPU2017 License: 55
Test Sponsor: Dell Inc.
Tested by: Dell Inc.

Test Date: Dec-2019
Hardware Availability: Dec-2019
Software Availability: Jun-2019

Peak Compiler Invocation

C benchmarks:
```
icc -m64 -std=c11
```

Fortran benchmarks:
```
ifort -m64
```

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

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

Peak Portability Flags

```
Same as Base Portability Flags
```

Peak Optimization Flags

C benchmarks:
```
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP
```

Fortran benchmarks:

603.bwaves_s: -prof-gen(pass 1) -prof-use(pass 2) -DSPEC_SUPPRESS_OPENMP
```
-DSPEC_OPENMP -O2 -xCORE-AVX2 -qopt-prefetch -ipo -O3
-ffinite-math-only -no-prec-div -qopt-mem-layout-trans=4
-qopenmp -nostandard-realloc-lhs
```

649.fotonik3d_s: Same as 603.bwaves_s

654.roms_s: -DSPEC_OPENMP -xCORE-AVX2 -ipo -O3 -no-prec-div
```
-qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=4
-qopenmp -nostandard-realloc-lhs
```

Benchmarks using both Fortran and C:

621.wrf_s: -prof-gen(pass 1) -prof-use(pass 2) -O2 -xCORE-AVX2
```
-qopt-prefetch -ipo -O3 -ffinite-math-only -no-prec-div
-qopt-mem-layout-trans=4 -DSPEC_SUPPRESS_OPENMP -qopenmp
-DSPEC_OPENMP -nostandard-realloc-lhs
```

(Continued on next page)

Standard Performance Evaluation Corporation (info@spec.org)

https://www.spec.org/

Dell Inc.

PowerEdge T140 (Intel Xeon E-2236, 3.40 GHz)

SPECspeed®2017_fp_base = 26.2

SPECspeed®2017_fp_peak = 26.5

CPU2017 License: 55
Test Sponsor: Dell Inc.
Tested by: Dell Inc.

Test Date: Dec-2019
Hardware Availability: Dec-2019
Software Availability: Jun-2019

Peak Optimization Flags (Continued)

627.cam4_s: `-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP -nostandard-realloc-lhs`

628.pop2_s: `Same as 621.wrf_s`

Benchmarks using Fortran, C, and C++:
`-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP -nostandard-realloc-lhs`

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

`http://www.spec.org/cpu2017/flags/Intel-ic19.0u1-official-linux64.2019-07-09.html`
`http://www.spec.org/cpu2017/flags/Dell-Platform-Flags-PowerEdge-revE7.html`

You can also download the XML flags sources by saving the following links:
`http://www.spec.org/cpu2017/flags/Intel-ic19.0u1-official-linux64.2019-07-09.xml`
`http://www.spec.org/cpu2017/flags/Dell-Platform-Flags-PowerEdge-revE7.xml`

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

Tested with SPEC CPU®2017 v1.1.0 on 2019-12-06 13:09:26-0500.
Report generated on 2019-12-26 11:37:30 by CPU2017 PDF formatter v6255.
Originally published on 2019-12-24.