SPEC CPU®2017 Floating Point Rate Result

Dell Inc.
(Test Sponsor: Dell Inc)

PowerEdge MX740c (Intel Xeon Gold 6240R, 2.40 GHz)

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

| SPECrate®2017_fp_base = 256 |
| SPECrate®2017_fp_peak = 272 |

| Test Date: | Jun-2020 |
| Hardware Availability: | Apr-2020 |
| Software Availability: | Apr-2020 |

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<tr>
<td>554.roms_r</td>
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</tbody>
</table>

**Hardware**

- **CPU Name:** Intel Xeon Gold 6240R
- **Max MHz:** 4000
- **Nominal:** 2400
- **Enabled:** 48 cores, 2 chips, 2 threads/core
- **Orderable:** 1,2 chips
- **Cache L1:** 32 KB I + 32 KB D on chip per core
- **L2:** 1 MB I+D on chip per core
- **L3:** 35.75 MB I+D on chip per chip
- **Memory:** 768 GB (24 x 32 GB 2Rx4 PC4-2933Y-R)
- **Storage:** 1 x 480 GB SATA SSD
- **Other:** None

**Software**

- **OS:** Red Hat Enterprise Linux 8.1
- **Compiler:** C/C++: Version 19.1.1.217 of Intel C/C++ Compiler for Linux;
  Fortran: Version 19.1.1.217 of Intel Fortran Compiler for Linux
- **Parallel:** No
- **Firmware:** Version 2.7.1 released Feb-2020
- **File System:** tmpfs
- **System State:** Run level 3 (multi-user)
- **Base Pointers:** 64-bit
- **Peak Pointers:** 64-bit
- **Other:** jemalloc memory allocator V5.0.1
- **Power Management:** BIOS set to prefer performance at the cost of additional power usage
**SPEC CPU®2017 Floating Point Rate Result**

Dell Inc.  
(Test Sponsor: Dell Inc)

PowerEdge MX740c (Intel Xeon Gold 6240R, 2.40 GHz)

**SPECrate®2017_fp_base = 256**  
**SPECrate®2017_fp_peak = 272**

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

---

**Results Table**

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**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 19.1.1.217 Build 20200306 Compiler for Linux. The correct version of Fortran compiler is: Version 19.1.1.217 Build 20200306 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"

**Environment Variables Notes**

Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH = 
  
"/dev/shm/cpu2017-ic19.1u1/lib/intel64:/dev/shm/cpu2017-ic19.1u1/je5.0.1
  -64"

MALLOC_CONF = "retain:true"
SPEC CPU®2017 Floating Point Rate Result

Dell Inc.  (Test Sponsor: Dell Inc)
PowerEdge MX740c (Intel Xeon Gold 6240R, 2.40 GHz)

SPECrate®2017_fp_base = 256
SPECrate®2017_fp_peak = 272

CPU2017 License: 55  Test Date: Jun-2020
Test Sponsor: Dell Inc  Hardware Availability: Apr-2020
Tested by: Dell Inc.  Software Availability: Apr-2020

General Notes

Binaries compiled on a system with 1x Intel Core i9-7980XE CPU + 64GB RAM
memory using Redhat Enterprise Linux 8.0
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.
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>
jemalloc, a general purpose malloc implementation
built with the RedHat Enterprise 7.5, and the system compiler gcc 4.8.5

Platform Notes

BIOS settings:
Sub NUMA Cluster enabled
Virtualization Technology 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 set to standard
Logical Processor enabled
CPU Interconnect Bus Link Power Management disabled
PCI ASPM L1 Link Power Management disabled
UPI Prefetch enabled
LLC Prefetch disabled
Dead Line LLC Alloc enabled
Directory AtoS disabled
Sysinfo program /dev/shm/cpu2017-ic19.1u1/bin/sysinfo
Rev: r6365 of 2019-08-21 295195f888a3d7edbe6e46a485a0011
running on localhost.localdomain Sat Jun 13 18:32:15 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

(Continued on next page)
SPEC CPU®2017 Floating Point Rate Result

Dell Inc.
(Test Sponsor: Dell Inc)

PowerEdge MX740c (Intel Xeon Gold 6240R, 2.40 GHz)

<table>
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<th>CPU2017 License:</th>
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<td>Tested by:</td>
<td>Dell Inc</td>
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</table>

SPECrate®2017_fp_base = 256
SPECrate®2017_fp_peak = 272

Platform Notes (Continued)

From /proc/cpuinfo
- model name: Intel(R) Xeon(R) Gold 6240R CPU @ 2.40GHz
  - 2 "physical id"s (chips)
  - 96 "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: 24
  - siblings: 48
- physical 0: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 16 17 18 19 20 21 25 26 27 28 29
- physical 1: cores 0 1 2 3 4 5 6 9 10 11 12 13 16 17 18 19 20 21 24 25 26 27 28 29

From lscpu:
- Architecture: x86_64
- CPU op-mode(s): 32-bit, 64-bit
- Byte Order: Little Endian
- CPU(s): 96
- On-line CPU(s) list: 0-95
- Thread(s) per core: 2
- Core(s) per socket: 24
- Socket(s): 2
- NUMA node(s): 4
- Vendor ID: GenuineIntel
- CPU family: 6
- Model: 85
- Model name: Intel(R) Xeon(R) Gold 6240R CPU @ 2.40GHz
- Stepping: 7
- CPU MHz: 3273.830
- CPU max MHz: 4000.0000
- CPU min MHz: 1000.0000
- BogoMIPS: 4800.00
- Virtualization: VT-x
- L1d cache: 32K
- L1i cache: 32K
- L2 cache: 1024K
- L3 cache: 36608K
- NUMA node0 CPU(s): 0,4,8,12,16,20,24,28,32,36,40,44,48,52,56,60,64,68,72,76,80,84,88,92
- NUMA node1 CPU(s): 1,5,9,13,17,21,25,29,33,37,41,45,49,53,57,61,65,69,73,77,81,85,89,93
- NUMA node2 CPU(s): 2,6,10,14,18,22,26,30,34,38,42,46,50,54,58,62,66,70,74,78,82,86,90,94
- Flags: fpu vme de pse tsc msr pae mce cmovpat pse36 clflush dts acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx pdpe1gb rdtscp lm constant_tsc 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

(Continued on next page)
Platform Notes (Continued)

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 cdp_l3
invpcid_single intel_ppin ssbd mba ibrs ibpb stibp ibrs_enhanced tpr_shadow vnmi
flexpriority ept vpid fsqsgbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rtm
cqm mpx rdt_a avx512f avx512dq rdseed adx smap clflushopt clwb intel_pt avx512cd
avx512bw avx512vl xsaveopt xsaves xsavec xgetbv1 xsmavers cqm_llc cqm_occq_llc cqm_mbm_total
cqm_mbm_local dtherm ida arat pln pts pku ospke avx512_vnni md_clear flush_l1d
arch_capabilities

/proc/cpuinfo cache data
  cache size : 36608 KB

From numactl --hardware WARNING: a numactl 'node' might or might not correspond to a
physical chip.
  available: 4 nodes (0-3)
    node 0 cpus: 0 4 8 12 16 20 24 28 32 36 40 44 48 52 56 60 64 68 72 76 80 84 88 92
    node 0 size: 192070 MB
    node 0 free: 191295 MB
    node 1 cpus: 1 5 9 13 17 21 25 29 33 37 41 45 49 53 57 61 65 69 73 77 81 85 89 93
    node 1 size: 193531 MB
    node 1 free: 193193 MB
    node 2 cpus: 2 6 10 14 18 22 26 30 34 38 42 46 50 54 58 62 66 70 74 78 82 86 90 94
    node 2 size: 193531 MB
    node 2 free: 183477 MB
    node 3 cpus: 3 7 11 15 19 23 27 31 35 39 43 47 51 55 59 63 67 71 75 79 83 87 91 95
    node 3 size: 193505 MB
    node 3 free: 193207 MB
  node distances:
    node 0  1  2  3
      0:  10 21 11 21
      1:  21 10 21 11
      2:  11 21 10 21
      3:  21 11 21 10

From /proc/meminfo
  MemTotal:    791181552 kB
  HugePages_Total:       0
  Hugepagesize:       2048 kB

From /etc/*release* /etc/*version*
  os-release:
    NAME="Red Hat Enterprise Linux"
    VERSION="8.1 (Ootpa)"
    ID="rhel"
    ID_LIKE="fedora"
    VERSION_ID="8.1"
    PLATFORM_ID="platform:el8"

(Continued on next page)
SPEC CPU®2017 Floating Point Rate Result

Dell Inc.
(Test Sponsor: Dell Inc)

PowerEdge MX740c (Intel Xeon Gold 6240R, 2.40 GHz)

SPECrated®2017_fp_base = 256
SPECrated®2017_fp_peak = 272

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

Platform Notes (Continued)

PRETTY_NAME="Red Hat Enterprise Linux 8.1 (Ootpa)"
ANSI_COLOR="0;31"
redhat-release: Red Hat Enterprise Linux release 8.1 (Ootpa)
system-release: Red Hat Enterprise Linux release 8.1 (Ootpa)
system-release-cpe: cpe:/o:redhat:enterprise_linux:8.1:ga

uname -a:
Linux localhost.localdomain 4.18.0-147.el8.x86_64 #1 SMP Thu Sep 26 15:52:44 UTC 2019
x86_64 x86_64 x86_64 GNU/Linux

Kernel self-reported vulnerability status:

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

run-level 3 Jun 13 12:39

SPEC is set to: /dev/shm/cpu2017-ic19.1u1
Filesystem Type Size Used Avail Use% Mounted on
tmpfs tmpfs 378G 4.2G 374G 2% /dev/shm

From /sys/devices/virtual/dmi/id
BIOS: Dell Inc. 2.7.1 02/14/2020
Vendor: Dell Inc.
Product: PowerEdge MX740c
Product Family: PowerEdge
Serial: 1234567

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:
21x 00AD00B300AD HMA84GR7CJR4N-WM 32 GB 2 rank 2933
1x 00AD063200AD HMA84GR7CJR4N-WM 32 GB 2 rank 2933
2x 00AD069D00AD HMA84GR7CJR4N-WM 32 GB 2 rank 2933

(End of data from sysinfo program)
Compiler Version Notes

=================================================================================
C               | 519.lbm_r(base, peak) 538.imagick_r(base, peak)  
                 | 544.nab_r(base, peak)  
-----------------------------------------------------------------------------
Intel(R) C Compiler for applications running on Intel(R) 64, Version 2021.1
NextGen Build 20200304
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
-----------------------------------------------------------------------------

=================================================================================
C++             | 508.namd_r(base, peak) 510.parest_r(base, peak)  
-----------------------------------------------------------------------------
Intel(R) C++ Compiler for applications running on Intel(R) 64, Version 2021.1
NextGen Build 20200304
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
-----------------------------------------------------------------------------

=================================================================================
C++, C          | 511.povray_r(base) 526.blender_r(base, peak)  
-----------------------------------------------------------------------------
Intel(R) C++ Compiler for applications running on Intel(R) 64, Version 2021.1
NextGen Build 20200304
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
Intel(R) C Compiler for applications running on Intel(R) 64, Version 2021.1
NextGen Build 20200304
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
-----------------------------------------------------------------------------

=================================================================================
C++, C          | 511.povray_r(peak)  
-----------------------------------------------------------------------------
Intel(R) C++ Intel(R) 64 Compiler for applications running on Intel(R) 64,
Version 19.1.1.217 Build 20200306
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64,
Version 19.1.1.217 Build 20200306
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
-----------------------------------------------------------------------------

=================================================================================
C++, C          | 511.povray_r(base) 526.blender_r(base, peak)  
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Intel(R) C++ Compiler for applications running on Intel(R) 64, Version 2021.1
NextGen Build 20200304
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
Intel(R) C Compiler for applications running on Intel(R) 64, Version 2021.1
NextGen Build 20200304

(Continued on next page)
Compiler Version Notes (Continued)

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----------------------------------------
C++, C  |  511.povray_r(peak)
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Intel(R) C++ Intel(R) 64 Compiler for applications running on Intel(R) 64,
        Version 19.1.1.217 Build 20200306
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64,
        Version 19.1.1.217 Build 20200306
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
----------------------------------------
C++, C, Fortran | 507.cactuBSSN_r(base, peak)
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Intel(R) C++ Compiler for applications running on Intel(R) 64, Version 2021.1
        NextGen Build 20200304
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
Intel(R) C Compiler for applications running on Intel(R) 64, Version 2021.1
        NextGen Build 20200304
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R)
4       64, Version 19.1.1.217 Build 20200306
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
----------------------------------------
Fortran | 503.bwaves_r(base, peak) 549.fotonik3d_r(base, peak)
        | 554.roms_r(base, peak)
----------------------------------------
Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R)
4       64, Version 19.1.1.217 Build 20200306
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
----------------------------------------
Fortran, C | 521.wrf_r(base) 527.cam4_r(base, peak)
----------------------------------------
Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R)
4       64, Version 19.1.1.217 Build 20200306
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Intel(R) C Compiler for applications running on Intel(R) 64, Version 2021.1
        NextGen Build 20200304
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

(Continued on next page)
Compiler Version Notes (Continued)

==============================================================================
Fortran, C      | 521.wrf_r(peak)
==============================================================================
Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R) 64, Version 19.1.1.217 Build 20200306
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64, Version 19.1.1.217 Build 20200306
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
==============================================================================
Fortran, C      | 521.wrf_r(base) 527.cam4_r(base, peak)
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Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R) 64, Version 19.1.1.217 Build 20200306
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
Intel(R) C Compiler for applications running on Intel(R) 64, Version 2021.1 NextGen Build 20200304
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
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Fortran, C      | 521.wrf_r(peak)
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Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R) 64, Version 19.1.1.217 Build 20200306
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Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64, Version 19.1.1.217 Build 20200306
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

Base Compiler Invocation

C benchmarks:
icc

C++ benchmarks:
icpc

Fortran benchmarks:
ifort

(Continued on next page)
Dell Inc.  
(Test Sponsor: Dell Inc)

PowerEdge MX740c (Intel Xeon Gold 6240R, 2.40 GHz)

**SPECrates**
- **SPECrate®2017_fp_base = 256**
- **SPECrate®2017_fp_peak = 272**

| CPU2017 License: 55 | Test Date:  
|---------------------|-----------
| Test Sponsor: Dell Inc | Jun-2020  
| Tested by: Dell Inc. | Hardware Availability: Apr-2020  
| Software Availability: Apr-2020 |  

### Base Compiler Invocation (Continued)

- **Benchmarks using both Fortran and C:**
  - ifort icc

- **Benchmarks using both C and C++:**
  - icpc icc

- **Benchmarks using Fortran, C, and C++:**
  - icpc icc 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
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-branhes-within-32B-boundaries` `-Wl,-z,muldefs`
- `-fuse-ld=gold` `-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-branhes-within-32B-boundaries`
- `-Wl,-z,muldefs` `-fuse-ld=gold` `-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-branhes-within-32B-boundaries` `-Wl,-z,muldefs`

(Continued on next page)
Dell Inc. (Test Sponsor: Dell Inc)

PowerEdge MX740c (Intel Xeon Gold 6240R, 2.40 GHz)

SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2020 Standard Performance Evaluation Corporation

SPECCrate®2017_fp_base = 256
SPECCrate®2017_fp_peak = 272

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

Test Date: Jun-2020
Hardware Availability: Apr-2020
Software Availability: Apr-2020

Base Optimization Flags (Continued)

Fortran benchmarks (continued):
-fuse-ld=gold -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-boundsaries
-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
-fuse-ld=gold -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-boundsaries
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

Benchmarks using both C and C++:
-m64 -qnextgen -std=c11
-Wl,-plugin-opt=-x86-branches-within-32B-boundaries -Wl,-z,muldefs
-fuse-ld=gold -xCORE-AVX512 -Ofast -ffast-math -flto -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
-fuse-ld=gold -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-boundsaries
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

Peak Compiler Invocation

C benchmarks:
icc

C++ benchmarks:
icpc

Fortran benchmarks:
ifort

(Continued on next page)
Peak Compiler Invocation (Continued)

Benchmarks using both Fortran and C:
ifort icc

Benchmarks using both C and C++:
icpc icc

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

Peak Portability Flags

Same as Base Portability Flags

Peak Optimization Flags

C benchmarks:
519.lbm_r: basepeak = yes
538.imagick_r: basepeak = yes
544.nab_r: basepeak = yes

C++ benchmarks:
508.namd_r: basepeak = yes
510.parest_r: -m64 -qnextgen
-Wl,-plugin-opt=-x86-branches-within-32B-boundaries
-Wl,-z,muldefs -fuse-ld=gold -xCORE-AVX512 -Ofast
-ffast-math -fto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -L/usr/local/jemalloc64-5.0.1/lib
-ljemalloc

Fortran benchmarks:
503.bwaves_r -m64 -Wl,-plugin-opt=-x86-branches-within-32B-boundaries
-Wl,-z,muldefs -fuse-ld=gold -xCORE-AVX512 -O3 -ipo
-no-prec-div -qopt-prefetch =ffinite-math-only
-qopt-multiple-gather-scatter-by-shuffles

(Continued on next page)
## Peak Optimization Flags (Continued)

503.bwaves_r (continued):
-`-qopt-mem-layout-trans=4` `-nostandard-realloc-lhs`
-`-align array32byte -auto -mbranches-within-32B-boundaries`
-`-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc`

549.fotonik3d_r: basepeak = yes

554.roms_r: Same as 503.bwaves_r

**Benchmarks using both Fortran and C:**

521.wrf_r: `-prof-gen(pass 1)` `-prof-use(pass 2)` `-xCORE-AVX512` `-O3`
-`-ipo -no-prec-div -qopt-prefetch -ffinite-math-only`
-`-qopt-multiple-gather-scatter-by-shuffles`
-`-qopt-mem-layout-trans=4 -mbranches-within-32B-boundaries`
-`-nostandard-realloc-lhs -align array32byte -auto`
-`-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc`

527.cam4_r: basepeak = yes

**Benchmarks using both C and C++:**

511.povray_r: `-prof-gen(pass 1)` `-prof-use(pass 2)` `-xCORE-AVX512` `-O3`
-`-ipo -no-prec-div -qopt-prefetch -ffinite-math-only`
-`-qopt-multiple-gather-scatter-by-shuffles`
-`-qopt-mem-layout-trans=4 -mbranches-within-32B-boundaries`
-`-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc`

526.blender_r: basepeak = yes

**Benchmarks using Fortran, C, and C++:**

507.cactuBSSN_r: basepeak = yes

---

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


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


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<thead>
<tr>
<th>CPU2017 License: 55</th>
<th>Test Date:</th>
<th>Jun-2020</th>
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<tbody>
<tr>
<td>Test Sponsor: Dell Inc</td>
<td>Hardware Availability:</td>
<td>Apr-2020</td>
</tr>
<tr>
<td>Tested by: Dell Inc.</td>
<td>Software Availability:</td>
<td>Apr-2020</td>
</tr>
</tbody>
</table>

spec

SPEC CPU®2017 Floating Point Rate Result

Dell Inc.
(Test Sponsor: Dell Inc)

PowerEdge MX740c (Intel Xeon Gold 6240R, 2.40 GHz)

SPECrate®2017_fp_base = 256
SPECrate®2017_fp_peak = 272

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