## SPEC CPU®2017 Integer Rate Result

**Test Sponsor:** Dell Inc  
**Test Date:** Sep-2020  
**Hardware Availability:** Apr-2020  
**Software Availability:** Apr-2020

### Hardware
- **CPU Name:** Intel Xeon Gold 6258R  
- **Max MHz:** 4000  
- **Nominal:** 2700  
- **Enabled:** 56 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:** 38.5 MB I+D on chip per chip  
- **Other:** None  
- **Memory:** 768 GB (24 x 32 GB 2Rx4 PC4-2933Y-R)  
- **Storage:** 1 x 960 GB SATA SSD  
- **Power Management:** BIOS set to prefer performance at the cost of additional power usage

### Software
- **OS:** Red Hat Enterprise Linux 8.2  
- **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 2.9.1 released Aug-2020  
- **System State:** Run level 3 (multi-user)  
- **File System:** tmpfs  
- **Base Pointers:** 64-bit  
- **Peak Pointers:** 32/64-bit  
- **Other:** jemalloc memory allocator V5.0.1

### Test Results

<table>
<thead>
<tr>
<th>SPECrate®2017_int_base</th>
<th>SPECrate®2017_int_peak</th>
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</thead>
<tbody>
<tr>
<td>352</td>
<td>367</td>
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### Benchmarks

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<td>exchange2_r</td>
<td>548.exchange2_r</td>
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<tr>
<td>xz_r</td>
<td>557.xz_r</td>
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</tbody>
</table>
SPEC CPU®2017 Integer Rate Result

Dell Inc.  
(Test Sponsor: Dell Inc)  
PowerEdge MX740c (Intel Xeon Gold 6258R, 2.70 GHz)

Dell Inc.

Copyright 2017-2020 Standard Performance Evaluation Corporation

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

Results Table

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SPECrate®2017_int_base = 352  
SPECrate®2017_int_peak = 367

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

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/lib/ia32:/dev/shm/cpu2017-ic19.1u1/je5.0.1-32"  
MALLOC_CONF = "retain:true"
SPEC CPU®2017 Integer Rate Result

Dell Inc.  
(Test Sponsor: Dell Inc)  
PowerEdge MX740c (Intel Xeon Gold 6258R, 2.70 GHz)

SPECrate®2017_int_base = 352  
SPECrate®2017_int_peak = 367

CPU2017 License: 55  
Test Sponsor: Dell Inc  
Test Date: Sep-2020

Tested by: Dell Inc.  
Hardware Availability: Apr-2020

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 295195f888a3d7edbl6e646a485a0011
running on localhost.localdomain Sat Sep 5 12:57:24 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 Integer Rate Result**

**Dell Inc.**  
(Test Sponsor: Dell Inc)  
PowerEdge MX740c (Intel Xeon Gold 6258R, 2.70 GHz)

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<td>Tested by: Dell Inc.</td>
<td>Software Availability: Apr-2020</td>
</tr>
</tbody>
</table>

**Platform Notes (Continued)**

From /proc/cpuinfo

```
model name : Intel(R) Xeon(R) Gold 6258R CPU @ 2.70GHz
  2 "physical id"s (chips)
  112 "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 : 28
siblings : 56
physical 0: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24 25 26 27
  28 29 30
physical 1: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24 25 26 27
  28 29 30
```

From lscpu:

```
Architecture:        x86_64
CPU op-mode(s):      32-bit, 64-bit
Byte Order:          Little Endian
CPU(s):              112
On-line CPU(s) list: 0-111
Thread(s) per core:  2
Core(s) per socket:  28
Socket(s):           2
NUMA node(s):        4
Vendor ID:           GenuineIntel
CPU family:          6
Model:               85
Model name:          Intel(R) Xeon(R) Gold 6258R CPU @ 2.70GHz
Stepping:            7
CPU MHz:             2359.121
CPU max MHz:         4000.0000
CPU min MHz:         1000.0000
BogoMIPS:            5400.00
Virtualization:      VT-x
L1d cache:           32K
L1i cache:           32K
L2 cache:            1024K
L3 cache:            39424K
NUMA node0 CPU(s):   0,4,8,12,16,20,24,28,32,36,40,44,48,52,56,60,64,68,72,76,80,84,88,92,96,100,104,108
NUMA node1 CPU(s):   1,5,9,13,17,21,25,29,33,37,41,45,49,53,57,61,65,69,73,77,81,85,89,93,97,101,105,109
NUMA node2 CPU(s):   2,6,10,14,18,22,26,30,34,38,42,46,50,54,58,62,66,70,74,78,82,86,90,94,98,102,106,110
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
```

(Continued on next page)
Platform Notes (Continued)

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 xtrr pdm 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_pinn ssbd mba ibrs ibpb stibp ibrs_enhanced tpr_shadow vmni flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rtm cmp mpx rdt_a avx512f avx512dq rdseed adx smap clflushopt clwb intel_pt avx512cd avx512bw avx512vl xsaveopt xsavec xgetbv1 xsaveas cgx_lcc cgx_occup_llc cgx_mbb_total cgx_mbb_local dtherm ida arat pln pts pku ospke avx512_vnni md_clear flush_l1d arch_capabilities

/proc/cpuinfo cache data
cache size : 39424 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 96
   100 104 108
node 0 size: 192069 MB
node 0 free: 191676 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 97
   101 105 109
node 1 size: 193502 MB
node 1 free: 193280 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 98
   102 106 110
node 2 size: 193529 MB
node 2 free: 193278 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 99
   103 107 111
node 3 size: 193529 MB
node 3 free: 183667 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:    791173672 kB
HugePages_Total:      0
Hugepagesize:    2048 kB

From /etc/*release*/etc/*version*/
os-release:

(Continued on next page)
Dell Inc.
(Test Sponsor: Dell Inc)
PowerEdge MX740c (Intel Xeon Gold 6258R, 2.70 GHz)

SPEC CPU®2017 Integer Rate Result
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SPECrate®2017_int_base = 352
SPECrate®2017_int_peak = 367

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

Platform Notes (Continued)

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"

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:

itlb_multihit: KVM: Vulnerable
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
tsx_async_abort:
Mitigation: Clear CPU buffers; SMT vulnerable

run-level 3 Sep 5 12:55

SPEC is set to: /dev/shm/cpu2017-ic19.1u1
Filesystem Type Size Used Avail Use% Mounted on
tmpfs tmpfs 378G 4.3G 374G 2% /dev/shm

From /sys/devices/virtual/dmi/id
BIOS: Dell Inc. 2.9.1 08/09/2020
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.

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

Dell Inc.
(Test Sponsor: Dell Inc)
PowerEdge MX740c (Intel Xeon Gold 6258R, 2.70 GHz)

SPECrate®2017_int_base = 352
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CPU2017 License: 55
Test Sponsor: Dell Inc
Tested by: Dell Inc.

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

Platform Notes (Continued)

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 | 502.gcc_r(peak)

Intel(R) C Compiler for applications running on IA-32, Version 2021.1 NextGen Build 20200304
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

C | 500.perlbench_r(base) 502.gcc_r(base) 505.mcf_r(base, peak) 525.x264_r(base, peak) 557.xz_r(base)

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 | 500.perlbench_r(peak) 557.xz_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.

C | 502.gcc_r(peak)

Intel(R) C Compiler for applications running on IA-32, Version 2021.1 NextGen Build 20200304
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

C | 500.perlbench_r(base) 502.gcc_r(base) 505.mcf_r(base, peak) 525.x264_r(base, peak) 557.xz_r(base)

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

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       | 500.perlbench_r(peak) 557.xz_r(peak)
```

Intel(R) C 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       | 502.gcc_r(peak)
```

Intel(R) C Compiler for applications running on IA-32, Version 2021.1 NextGen Build 20200304
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

```
C       | 500.perlbench_r(base) 502.gcc_r(base) 505.mcf_r(base, peak)
        | 525.x264_r(base, peak) 557.xz_r(base)
```

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       | 500.perlbench_r(peak) 557.xz_r(peak)
```

Intel(R) C 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++     | 520.omnetpp_r(base, peak) 523.xalancbmk_r(base, peak)
        | 531.deepsjeng_r(base, peak) 541.leela_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.
SPEC CPU®2017 Integer Rate Result

Dell Inc.
(Test Sponsor: Dell Inc)
PowerEdge MX740c (Intel Xeon Gold 6258R, 2.70 GHz)

SPECrate®2017_int_base = 352
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CPU2017 License: 55
Test Sponsor: Dell Inc
Tested by: Dell Inc.

Compiler Version Notes (Continued)

Fortran | 548.exchange2_r(base, 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.

Base Compiler Invocation

C benchmarks:
iccc

C++ benchmarks:
icpc

Fortran benchmarks:
ifort

Base Portability Flags

500.perlbench_r: -DSPEC_LP64 -DSPEC_LINUX_X64
502.gcc_r: -DSPEC_LP64
505.mcf_r: -DSPEC_LP64
520.omnetpp_r: -DSPEC_LP64
523.xalancbmk_r: -DSPEC_LP64 -DSPEC_LINUX
525.x264_r: -DSPEC_LP64
531.deepsjeng_r: -DSPEC_LP64
541.leela_r: -DSPEC_LP64
548.exchange2_r: -DSPEC_LP64
557.xz_r: -DSPEC_LP64

Base Optimization Flags

C benchmarks:
-m64 -qnextgen -std=c11
-W1, -plugin-opt=-x86-branches-within-32B-boundaries -W1, -z,muldefs
-xCORE-AVX512 -O3 -ffast-math -flto -mfpmath=sse -funroll-loops
-fuse-ld=gold -qopt-mem-layout-trans=4
-L/usr/local/IntelCompiler19/compilers_and_libraries_2020.1.217/linux/compiler/lib/intel64_lin
-lqkmalloc

(Continued on next page)
### Dell Inc.

*(Test Sponsor: Dell Inc)*  
**PowerEdge MX740c (Intel Xeon Gold 6258R, 2.70 GHz)*

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#### CPU2017 License: 55
- **Test Sponsor:** Dell Inc
- **Tested by:** Dell Inc.

#### Test Date: Sep-2020
- **Hardware Availability:** Apr-2020
- **Software Availability:** Apr-2020

### Base Optimization Flags (Continued)

**C++ benchmarks:**
- `-m64 -qnextgen -Wl,-plugin-opt=-x86-branches-within-32B-boundaries`
- `-Wl,-z,muldefs -xCORE-AVX512 -O3 -ffast-math -flto -mfpmath=sse`
- `-funroll-loops -fuse-ld=gold -qopt-mem-layout-trans=4`
- `-L/usr/local/IntelCompiler19/compilers_and_libraries_2020.1.217/linux/compiler/lib/intel64_lin`
- `-lqkmalloc`

**Fortran benchmarks:**
- `-m64 -Wl,-plugin-opt=-x86-branches-within-32B-boundaries -Wl,-z,muldefs`
- `-xCORE-AVX512 -O3 -ipo -no-prec-div -qopt-mem-layout-trans=4`
- `-nostandard-realloc-lhs -align array32byte -auto`
- `-mbranches-within-32B-boundaries`
- `-L/usr/local/IntelCompiler19/compilers_and_libraries_2020.1.217/linux/compiler/lib/intel64_lin`
- `-lqkmalloc`

### Peak Compiler Invocation

**C benchmarks:**
- `icc`

**C++ benchmarks:**
- `icpc`

**Fortran benchmarks:**
- `ifort`

### Peak Portability Flags

500.perlbench_r: `-DSPEC_LP64 -DSPEC_LINUX_X64`
502.gcc_r: `-D_FILE_OFFSET_BITS=64`
505.mcf_r: `-DSPEC_LP64`
520.omnetpp_r: `-DSPEC_LP64`
523.xalancbmk_r: `-DSPEC_LP64 -DSPEC_LINUX`
525.x264_r: `-DSPEC_LP64`
531.deepsjeng_r: `-DSPEC_LP64`
541.leela_r: `-DSPEC_LP64`
548.exchange2_r: `-DSPEC_LP64`
557.xz_r: `-DSPEC_LP64`
Peak Optimization Flags

C benchmarks:

500.perlbench_r: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2)
-xCORE-AVX512 -ipo -o3 -no-prec-div
-qopt-mem-layout-trans=4 -fno-strict-overflow
-mbranches-within-32B-boundaries
-L/usr/local/IntelCompiler19/compilers_and_libraries_2020.1.217/linux/compiler/lib/intel64_lin
-lqkmalloc

502.gcc_r: -m32
-L/usr/local/IntelCompiler19/compilers_and_libraries_2020.1.217/linux/compiler/lib/ia32_lin
-std=gnu89
-Wl,-plugin-opt=-x86-branches-within-32B-boundaries
-Wl,-z,muldefs -fprofile-generate(pass 1)
-fprofile-use=default.profdata(pass 2) -xCORE-AVX512 -flto
-Ofast(pass 1) -O3 -ffast-math -qnextgen -fuse-ld=gold
-qopt-mem-layout-trans=4 -L/usr/local/jemalloc32-5.0.1/lib
-ljemalloc

505.mcf_r: basepeak = yes

525.x264_r: -m64 -qnextgen -std=c11
-Wl,-plugin-opt=-x86-branches-within-32B-boundaries
-Wl,-z,muldefs -xCORE-AVX512 -flto -O3 -ffast-math
-flto -mbranches-within-32B-boundaries
-L/usr/local/IntelCompiler19/compilers_and_libraries_2020.1.217/linux/compiler/lib/intel64_lin
-ljemalloc

557.xz_r: -Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4 -mbranches-within-32B-boundaries
-L/usr/local/IntelCompiler19/compilers_and_libraries_2020.1.217/linux/compiler/lib/intel64_lin
-ljemalloc

C++ benchmarks:

520.omnetpp_r: basepeak = yes

523.xalancbmk_r: basepeak = yes

531.deepsjeng_r: basepeak = yes

541.leela_r: basepeak = yes

Fortran benchmarks:

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

Dell Inc.
(Test Sponsor: Dell Inc)
PowerEdge MX740c (Intel Xeon Gold 6258R, 2.70 GHz)

<table>
<thead>
<tr>
<th>SPECrate®2017_int_base</th>
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<tbody>
<tr>
<td>SPECrate®2017_int_peak</td>
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</tbody>
</table>

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

Peak Optimization Flags (Continued)

548.exchange2_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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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 2020-09-05 12:57:23-0400.
Originally published on 2020-09-29.