Dell Inc.

PowerEdge MX750c (Intel Xeon Gold 6330, 2.00 GHz)

SPECrate®2017_int_base = 361
SPECrate®2017_int_peak = 374

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

Hardware

CPU Name: Intel Xeon Gold 6330
Max MHz: 3100
Nominal: 2000
Enabled: 56 cores, 2 chips, 2 threads/core
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: 42 MB I+D on chip per chip
Other: None
Memory: 512 GB (16 x 32 GB 2Rx8 PC4-3200AA-R, running at 2933)
Storage: 125 GB on tmpfs
Other: None

Software

OS: Red Hat Enterprise Linux 8.3 (Ootpa)
Kernel: 4.18.0-240.e18.x86_64
Compiler: C/C++: Version 2021.1 of Intel oneAPI DPC++/C++
Fortran: Version 2021.1 of Intel Fortran Compiler
C/C++: Version 2021.1 of Intel C/C++ Compiler
Parallel: No
Firmware: Version 1.1.2 released Apr-2021
File System: tmpfs
System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: 32/64-bit
Other: jemalloc memory allocator V5.0.1
Power Management: BIOS and OS set to prefer performance at the cost of additional power usage.
Dell Inc.

PowerEdge MX750c (Intel Xeon Gold 6330, 2.00 GHz)

SPEC CPU®2017 Integer Rate Result

Copyright 2017-2021 Standard Performance Evaluation Corporation

**SPECrates®2017_int_base = 361**

**SPECrates®2017_int_peak = 374**

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
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<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
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<tbody>
<tr>
<td>500.perlbench_r</td>
<td>112</td>
<td>713</td>
<td>250</td>
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<td>751</td>
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<tr>
<td>548.exchange2_r</td>
<td>112</td>
<td>401</td>
<td>732</td>
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<td>557.xz_r</td>
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<td>594</td>
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**SPECrates®2017_int_base = 361**

**SPECrates®2017_int_peak = 374**

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

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 = 

"/mnt/ramdisk/cpu2017-1.1.7-ic2021.1/lib/intel64:/mnt/ramdisk/cpu2017-1.1.7-ic2021.1/lib/ia32:/mnt/ramdisk/cpu2017-1.1.7-ic2021.1/je5.0.1-32"

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

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)
SPEC CPU®2017 Integer Rate Result

Dell Inc. PowerEdge MX750c (Intel Xeon Gold 6330, 2.00 GHz)

SPECrate®2017_int_base = 361
SPECrate®2017_int_peak = 374

General Notes (Continued)

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

Benchmark run from a 125 GB ramdisk created with the cmd: "mount -t tmpfs -o size=125G tmpfs /mnt/ramdisk"

Platform Notes

BIOS Settings:
   Sub NUMA Cluster : 2-Way Clustering
   Virtualization Technology : Disabled

   System Profile : Custom
   CPU Power Management : Maximum Performance
       C1E : Disabled
       C States : Autonomous
   Memory Patrol Scrub : Disabled
   Energy Efficiency Policy : Performance

CPU Interconnect Bus Link
   Power Management : Disabled

Sysinfo program /mnt/ramdisk/cpu2017-1.1.7-ic2021.1/bin/sysinfo
Rev: r6538 of 2020-09-24 e8664e66d2d7080afeaa89d4b38e2f1c
running on localhost.localdomain Sat Apr 24 03:37:45 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) Gold 6330 CPU @ 2.00GHz
        2 "physical id"s (chips)
       112 "processors"
   cores, siblings (Caution: counting these is hw and system dependent. The following

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

**Dell Inc.**

PowerEdge MX750c (Intel Xeon Gold 6330, 2.00 GHz)

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**Test Sponsor:** Dell Inc.

**Test Date:** Apr-2021

**CPU2017 License:** 55

**Tested by:** Dell Inc.

**Hardware Availability:** Apr-2021

**Software Availability:** Feb-2021

---

**Platform Notes (Continued)**

excerpts from /proc/cpuinfo might not be reliable. Use with caution."

```bash
cpu cores : 28
siblings : 56
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
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

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: 106
Model name: Intel(R) Xeon(R) Gold 6330 CPU @ 2.00GHz
Stepping: 6
CPU MHz: 1602.419
BogoMIPS: 4000.00
Virtualization: VT-x
L1d cache: 48K
L1i cache: 32K
L2 cache: 1280K
L3 cache: 43008K
NUMA node0 CPU(s): 0-13, 56-69
NUMA node1 CPU(s): 14-27, 70-83
NUMA node2 CPU(s): 28-41, 84-97
NUMA node3 CPU(s): 42-55, 98-111
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
xtrn pdcm pcid dca sse4_1 sse4_2 x2apic movbe popcnt override tsc_deadline_timer aes
xsave avx f16c rdrand lahf_lm abm 3dnowprefetch cpuid_fault epb cat_l3 invpcid_single
intel_pmin ssbd mba ibrs ibpb stibp ibrs_enhanced fsgsbase tsc_adjust bmi1 hle avx2
smep bmi2 erms invpcid cqm rdt_a avx512f avx512dq rdseed adx smap avx512ifma
clflushopt clwb intel_pt avx512cd sha_ha_avx512bw avx512vl xsaves xsaveopt xsaves xsavec
xgetbv1 xsaves cgq_llc cgq_occu llc cgq_mbb_total cgq_mbb_local split_lock_detect
wbnoinv
x dtherm ida arat pln pts avx512vbmi umip pku ospke avx512_vbmi2 gfn vaes xclmuqdq
avx512_vsni avx512_bigalg tme avx512_vpopcntdq la57 rdpid md_clear pconfig flush_lid
arch_capabilities
```

(Continued on next page)
Dell Inc.

PowerEdge MX750c (Intel Xeon Gold 6330, 2.00 GHz)

CPU2017 License: 55
Test Sponsor: Dell Inc.
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SPEC CPU® 2017 Integer Rate Result

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SPECrate® 2017_int_base = 361
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Platform Notes (Continued)

/proc/cpuinfo cache data
  cache size : 43008 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 1 2 3 4 5 6 7 8 9 10 11 12 13 56 57 58 59 60 61 62 63 64 65 66 67 68 69
  node 0 size: 125489 MB
  node 0 free: 127901 MB
  node 1 cpus: 14 15 16 17 18 19 20 21 22 23 24 25 26 27 70 71 72 73 74 75 76 77 78 79 80
  node 1 size: 126169 MB
  node 1 free: 128729 MB
  node 2 cpus: 28 29 30 31 32 33 34 35 36 37 38 39 40 41 84 85 86 87 88 89 90 91 92 93 94
  node 2 size: 125959 MB
  node 2 free: 128781 MB
  node 3 cpus: 42 43 44 45 46 47 48 49 50 51 52 53 54 55 98 99 100 101 102 103 104 105
  node 3 size: 125819 MB
  node 3 free: 119469 MB
  node distances:
    node 0 1 2 3
    0: 10 11 20 20
    1: 11 10 20 20
    2: 20 20 10 11
    3: 20 20 11 10

From /proc/meminfo
  MemTotal:       527796136 kB
  HugePages_Total:       0
  Hugepagesize:       2048 kB

/sbin/tuned-adm active
  Current active profile: throughput-performance

From /etc/*release* /etc/*version*
  os-release:
    NAME="Red Hat Enterprise Linux"
    VERSION="8.3 (Ootpa)"
    ID="rhel"
    ID_LIKE="fedora"
    VERSION_ID="8.3"
    PLATFORM_ID="platform:el8"
    PRETTY_NAME="Red Hat Enterprise Linux 8.3 (Ootpa)"
    ANSI_COLOR="0;31"

(Continued on next page)
### Dell Inc. PowerEdge MX750c (Intel Xeon Gold 6330, 2.00 GHz)

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</tbody>
</table>

#### Platform Notes (Continued)

- **redhat-release:** Red Hat Enterprise Linux release 8.3 (Ootpa)
- **system-release:** Red Hat Enterprise Linux release 8.3 (Ootpa)
- **system-release-cpe:** cpe:/o:redhat:enterprise_linux:8.3:ga

```plaintext
uname -a:
Linux localhost.localdomain 4.18.0-240.el8.x86_64 #1 SMP Wed Sep 23 05:13:10 EDT 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):** Not affected
- **CVE-2019-11135 (TSX Asynchronous Abort):** Not affected

- **run-level 3 Apr 24 03:33**

#### FS Table

<table>
<thead>
<tr>
<th>Filesystem</th>
<th>Type</th>
<th>Size</th>
<th>Used</th>
<th>Avail</th>
<th>Use% Mounted on</th>
</tr>
</thead>
<tbody>
<tr>
<td>tmpfs</td>
<td>tmpfs</td>
<td>125G</td>
<td>4.4G</td>
<td>121G</td>
<td>4% /mnt/ramdisk</td>
</tr>
</tbody>
</table>

#### 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:**
  - 16x 002C0632002C 18ASF4G72PDZ-3G2E1 32 GB 2 rank 3200, configured at 2933
  - 16x Not Specified Not Specified

- **BIOS:**
  - BIOS Vendor: Dell Inc.
Dell Inc.

PowerEdge MX750c (Intel Xeon Gold 6330, 2.00 GHz)

| SPECrate®2017_int_base = 361 |
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CPU2017 License: 55
Test Sponsor: Dell Inc.
Tested by: Dell Inc.

Test Date: Apr-2021
Hardware Availability: Apr-2021
Software Availability: Feb-2021

Platform Notes (Continued)

BIOS Version: 1.1.2
BIOS Date: 04/09/2021
BIOS Revision: 1.1

(End of data from sysinfo program)

Compiler Version Notes

-------------------------------------------------------------------------------
| C       | 500.perlbench_r(peak) 557.xz_r(peak) |
-------------------------------------------------------------------------------
Intel(R) C 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.
-------------------------------------------------------------------------------

-------------------------------------------------------------------------------
| C       | 502.gcc_r(peak) |
-------------------------------------------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler for applications running on IA-32, Version 2021.1 Build 20201113
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) 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       | 500.perlbench_r(peak) 557.xz_r(peak) |
-------------------------------------------------------------------------------
Intel(R) C 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.
-------------------------------------------------------------------------------

-------------------------------------------------------------------------------
| C       | 502.gcc_r(peak) |
-------------------------------------------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler for applications running on IA-32, Version 2021.1 Build 20201113
(Continued on next page)
## Compiler Version Notes (Continued)

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<table>
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Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2021.1 Build 20201113
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Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2021.1 Build 20201113
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Dell Inc.  

PowerEdge MX750c (Intel Xeon Gold 6330, 2.00 GHz)  

SPEC CPU®2017 Integer Rate Result

Copyright 2017-2021 Standard Performance Evaluation Corporation

Dell Inc.  

CPU2017 License: 55  
Test Sponsor: Dell Inc.  
Tested by: Dell Inc.  
Test Date: Apr-2021  
Hardware Availability: Apr-2021  
Software Availability: Feb-2021

SPECrater®2017_int_base = 361  
SPECrater®2017_int_peak = 374

Compiler Version Notes (Continued)

Fortran | 548.exchange2_r (base, peak)
---------------------------------------------------------------------
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.
---------------------------------------------------------------------

Base Compiler Invocation

C benchmarks:  
icx

C++ benchmarks:  
icpx

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:  
-w -std=c11 -m64 -Wl,-z,muldefs -xCORE-AVX512 -O3 -ffast-math  
-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4  
-mbranches-within-32B-boundaries  
-L/opt/intel/oneapi/compiler/2021.1.1/linux/compiler/lib/intel64_lin  
-lqkmalloc

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

**Dell Inc.**

PowerEdge MX750c (Intel Xeon Gold 6330, 2.00 GHz)

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</table>

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

### Base Optimization Flags (Continued)

**C++ benchmarks:**

- `-w` `-m64` `-Wl,-z,muldefs` `-xCORE-AVX512` `-O3` `-ffast-math` `-flto`
- `-mfpmath=sse` `-funroll-loops` `-gopt-mem-layout-trans=4`
- `-mbranches-within-32B-boundaries`
- `-L/opt/intel/oneapi/compiler/2021.1.1/linux/compiler/lib/intel64_lin`
- `-lqkmalloc`

**Fortran benchmarks:**

- `-w` `-m64` `-Wl,-z,muldefs` `-xCORE-AVX512` `-O3` `-ipo` `-no-prec-div`
- `-gopt-mem-layout-trans=4` `-nostandard-realloc-lhs` `-align array32byte`
- `-auto` `-mbranches-within-32B-boundaries`
- `-L/opt/intel/oneapi/compiler/2021.1.1/linux/compiler/lib/intel64_lin`
- `-lqkmalloc`

### Peak Compiler Invocation

**C benchmarks (except as noted below):**

- `icx`
- `500.perlbench_r: icc`
- `557.xz_r: icc`

**C++ benchmarks:**

- `icpx`

**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`
Dell Inc.

PowerEdge MX750c (Intel Xeon Gold 6330, 2.00 GHz)

**SPEC CPU®2017 Integer Rate Result**

**SPECrate®2017_int_base = 361**

**SPECrate®2017_int_peak = 374**

**CPU2017 License:** 55  
**Test Sponsor:** Dell Inc.

**Tested by:** Dell Inc.

**CPU2017 License:** 55
**Test Date:** Apr-2021
**Hardware Availability:** Apr-2021
**Software Availability:** Feb-2021

### 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/opt/intel/oneapi/compiler/2021.1.1/linux/compiler/lib/intel64_lin  
-lqkmalloc

502.gcc_r:  
-L/opt/intel/oneapi/compiler/2021.1.1/linux/compiler/lib/ia32_lin  
-std=gnu89 -Wl, -z, muldefs -fprofile-generate(pass 1)  
-fprofile-use=default.profdata(pass 2) -xCORE-AVX512 -flto  
-Ofast(pass 1) -O3 -ffast-math -qopt-mem-layout-trans=4  
-mbranches-within-32B-boundaries  
-L/usr/local/jemalloc32-5.0.1/lib -ljemalloc

505.mcf_r: basepeak = yes

525.x264_r:  
-w -std=c11 -m64 -Wl, -z, muldefs -xCORE-AVX512 -flto  
-O3 -ffast-math -qopt-mem-layout-trans=4 -fno-alias  
-mbranches-within-32B-boundaries  
-L/opt/intel/oneapi/compiler/2021.1.1/linux/compiler/lib/intel64_lin  
-lqkmalloc

557.xz_r:  
-Wl, -z, muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div  
-qopt-mem-layout-trans=4 -mbranches-within-32B-boundaries  
-L/opt/intel/oneapi/compiler/2021.1.1/linux/compiler/lib/intel64_lin  
-lqkmalloc

**C++ benchmarks:**

520.omnetpp_r: basepeak = yes

523.xalancbmk_r: basepeak = yes

531.deepsjeng_r: basepeak = yes

541.leela_r: basepeak = yes

**Fortran benchmarks:**

548.exchange2_r: basepeak = yes
# SPEC CPU®2017 Integer Rate Result

## Dell Inc.

**PowerEdge MX750c (Intel Xeon Gold 6330, 2.00 GHz)**

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<tr>
<th>CPU2017 License:</th>
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<th>Test Date:</th>
<th>Apr-2021</th>
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<td>Hardware Availability:</td>
<td>Apr-2021</td>
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<tr>
<td>Tested by:</td>
<td>Dell Inc.</td>
<td>Software Availability:</td>
<td>Feb-2021</td>
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**SPECrate®2017 int_base = 361**

**SPECrate®2017 int_peak = 374**

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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Tested with SPEC CPU®2017 v1.1.7 on 2021-04-24 03:37:44-0400.


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