Dell Inc.  

PowerEdge T140 (Intel Xeon E-2244G, 3.80 GHz)  

SPECrate®2017_fp_base = 32.1  
SPECrate®2017_fp_peak = 33.8

| Hardware | OS: SUSE Linux Enterprise Server 15 SP1  
<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>CPU Name:</td>
<td>kernel 4.12.14-195-default</td>
</tr>
<tr>
<td>Max MHz:</td>
<td>C/C++: Version 19.0.4.227 of Intel C/C++</td>
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<tr>
<td>Nominal:</td>
<td>Compiler Build 20190416 for Linux;</td>
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<td>Enabled:</td>
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<td>Orderable:</td>
<td>Compiler Build 20190416 for Linux</td>
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<td>Cache L1:</td>
<td>Parallel: No</td>
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<td>L2:</td>
<td>Firmware: Version 2.1.3 released Nov-2019</td>
</tr>
<tr>
<td>L3:</td>
<td>File System: xfs</td>
</tr>
<tr>
<td>Other:</td>
<td>System State: Run level 3 (multi-user)</td>
</tr>
<tr>
<td>Memory:</td>
<td>Base Pointers: 64-bit</td>
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<tr>
<td>Storage:</td>
<td>Peak Pointers: 64-bit</td>
</tr>
<tr>
<td>Other:</td>
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<td>Power Management: --</td>
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CPU2017 License: 55  
Test Sponsor: Dell Inc.  
Tested by: Dell Inc.  
Test Date: Oct-2019  
Hardware Availability: Dec-2019  
Software Availability: Jun-2019

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<td>503.bwaves_r</td>
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<tr>
<td>507.cactuBSSN_r</td>
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<tr>
<td>508.namd_r</td>
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<tr>
<td>510.parest_r</td>
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<td>526.blender_r</td>
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<td>527.cam4_r</td>
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<td>538.imagick_r</td>
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<tr>
<td>544.nab_r</td>
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<td>549.fotonik3d_r</td>
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<td>554.roms_r</td>
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</table>
# SPEC CPU®2017 Floating Point Rate Result

## Dell Inc.

**PowerEdge T140 (Intel Xeon E-2244G, 3.80 GHz)**

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
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<td>8</td>
<td>1089</td>
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<tr>
<td>507.cactuBSSN_r</td>
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<tr>
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<td>303</td>
<td>25.1</td>
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<td>25.2</td>
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## Results Table

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<tbody>
<tr>
<td>Base</td>
<td></td>
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<td>SPECrate®2017_fp_base = 32.1</td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

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 = "/home/cpu2017/ODM-SPECcpu2017-194/cpu2017/lib/intel64"

## 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.

(Continued on next page)
Dell Inc. PowerEdge T140 (Intel Xeon E-2244G, 3.80 GHz) SPECrate®2017_fp_base = 32.1
SPECrate®2017_fp_peak = 33.8

General Notes (Continued)

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>

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
Logical Processor enabled
CPU Interconnect Bus Link Power Management disabled
PCI ASPM L1 Link Power Management disabled

Sysinfo program /home/cpu2017/ODM-SPECcpu2017-194/cpu2017/bin/sysinfo
Rev: r6365 of 2019-08-21 295195f888a3d7ed1e6e46a485a0011
running on linux-g3ob Tue Oct 29 11:53:55 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-2244G CPU @ 3.80GHz
  1 "physical id"s (chips)
  8 "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 : 8
    physical 0: cores 0 1 2 3

From lscpu:
  Architecture: x86_64
  CPU op-mode(s): 32-bit, 64-bit

(Continued on next page)
Platform Notes (Continued)

Byte Order:          Little Endian  
Address sizes:       39 bits physical, 48 bits virtual  
CPU(s):              8  
On-line CPU(s) list: 0-7  
Thread(s) per core:  2  
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-2244G CPU @ 3.80GHz  
Stepping:            10  
CPU MHz:             3800.000  
BogoMIPS:            7584.00  
Virtualization:      VT-x  
L1d cache:           32K  
L1i cache:           32K  
L2 cache:            256K  
L3 cache:            8192K  
NUMA node0 CPU(s):   0-7  
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 dtsscp  
                       lm constant_tsc art arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc cpuid  
                       aperfmpref perf_tsc_know_freq pni pclmulqdq dtex64 monitor ds_cpl vmx smx est tm2 ssse3  
                       sbd fma cx16 xpr pdcem pcid sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer  
                       aes xsave avx f16c rdrand lahf_lm abm 3nowprefetch cpuid_fault epb invpcid_single  
                       pti ssbd ibrs ibp bxb tpr shadow vmni flexpriority ept vpid fsgsbase tsc_adjust  
                       bmi1 hle avx2 smep bmi2 erna invpvid rtm mpx rdseed adx smap clflushopt intel_pt  
                       xsaveopt xsave xgetbv1 xsaves dtherm ida arat pln pts md_clear flush_l1d

/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 4 5 6 7  
    node 0 size: 64258 MB  
    node 0 free: 62769 MB  
    node distances:
      node 0
        0: 10

From /proc/meminfo
  MemTotal: 65800812 kB
  HugePages_Total: 0

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

**Dell Inc.**

PowerEdge T140 (Intel Xeon E-2244G, 3.80 GHz)  

**SPECrate®2017_fp_base = 32.1**  
**SPECrate®2017_fp_peak = 33.8**

<table>
<thead>
<tr>
<th>CPU2017 License: 55</th>
<th>Test Date: Oct-2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Sponsor: Dell Inc.</td>
<td>Hardware Availability: Dec-2019</td>
</tr>
<tr>
<td>Tested by: Dell Inc.</td>
<td>Software Availability: Jun-2019</td>
</tr>
</tbody>
</table>

---

**Platform Notes (Continued)**

- **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"

- `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; VMX: conditional cache flushes, SMT vulnerable
  - 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 Oct 29 04:55 last=5`

- `SPEC is set to: /home/cpu2017/ODM-SPECcpu2017-194/cpu2017`
  - Filesystem Type Size Used Avail Use% Mounted on
  - /dev/sda2 xfs 440G 28G 413G 7% /

- From /sys/devices/virtual/dmi/id
  - BIOS: Dell Inc. 2.1.3 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:
SPEC CPU®2017 Floating Point Rate Result
Copyright 2017-2019 Standard Performance Evaluation Corporation

Dell Inc.

PowerEdge T140 (Intel Xeon E-2244G, 3.80 GHz)

**SPECrate®2017_fp_base = 32.1**
**SPECrate®2017_fp_peak = 33.8**

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

### Platform Notes (Continued)

- 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

<table>
<thead>
<tr>
<th>Compiler</th>
<th>Base Benchmark</th>
<th>Peak Benchmark</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>519.lbm_r(base, peak) 538.imagick_r(base, peak) 544.nab_r(base, peak)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>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.</td>
<td></td>
</tr>
<tr>
<td>C++</td>
<td>508.namd_r(base, peak) 510.parest_r(base, peak)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>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.</td>
<td></td>
</tr>
<tr>
<td>C++, C</td>
<td>511.povray_r(base, peak) 526.blender_r(base, peak)</td>
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</tr>
<tr>
<td></td>
<td>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.</td>
<td></td>
</tr>
<tr>
<td>C++, C, Fortran</td>
<td>507.cactuBSSN_r(base, peak)</td>
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<td>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</td>
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## Dell Inc.

**PowerEdge T140 (Intel Xeon E-2244G, 3.80 GHz)**

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**SPECrate®2017_fp_base = 32.1**

**SPECrate®2017_fp_peak = 33.8**

---

### Compiler Version Notes (Continued)

Copyright (C) 1985-2019 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)
64, Version 19.0.4.227 Build 20190416
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.
==============================================================================
Fortran, C      | 521.wrf_r(base, peak) 527.cam4_r(base, peak)
```

---

### Base Compiler Invocation

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

C++ benchmarks:
```
icpc -m64
```

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

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

Benchmarks using both C and C++:
```
icpc -m64 icc -m64 -std=c11
```

Benchmarks using Fortran, C, and C++:
```
icpc -m64 icc -m64 -std=c11 ifort -m64
```
Dell Inc. PowerEdge T140 (Intel Xeon E-2244G, 3.80 GHz)

SPECrate®2017_fp_base = 32.1
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CPU2017 License: 55
Test Sponsor: Dell Inc.
Tested by: Dell Inc.

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

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

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

Fortran benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=4 -auto -nostandard-realloc-lhs
-align array32byte

Benchmarks using both Fortran and C:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=4 -auto -nostandard-realloc-lhs
-align array32byte

Benchmarks using both C and C++:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=4

Benchmarks using Fortran, C, and C++:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=4 -auto -nostandard-realloc-lhs
-align array32byte
Dell Inc.
PowerEdge T140 (Intel Xeon E-2244G, 3.80 GHz)

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

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

Peak Compiler Invocation

C benchmarks:
icc -m64 -std=c11

C++ benchmarks:
icpc -m64

Fortran benchmarks:
ifort -m64

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

Benchmarks using both C and C++:
icpc -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:
519.lbm_r: -prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX2 -O3
-no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=4

538.imagick_r: -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=4

544.nab_r: Same as 538.imagick_r

C++ benchmarks:
508.namd_r: -prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX2 -O3
-no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=4

(Continued on next page)
Dell Inc.

PowerEdge T140 (Intel Xeon E-2244G, 3.80 GHz)  

SPECrater2017_fp_base = 32.1  
SPECrater2017_fp_peak = 33.8

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Peak Optimization Flags (Continued)

510.parest_r: -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch  
-ffinite-math-only -qopt-mem-layout-trans=4

Fortran benchmarks:

503.bwaves_r: -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch  
-ffinite-math-only -qopt-mem-layout-trans=4 -auto  
-nostandard-realloc-lhs -align array32byte

549.fotonik3d_r: Same as 503.bwaves_r

554.roms_r: -prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX2 -O3  
-no-prec-div -qopt-prefetch -ffinite-math-only  
-qopt-mem-layout-trans=4 -auto -nostandard-realloc-lhs  
-align array32byte

Benchmarks using both Fortran and C:

-prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX2 -O3  
-no-prec-div -qopt-prefetch -ffinite-math-only  
-qopt-mem-layout-trans=4 -auto -nostandard-realloc-lhs  
-align array32byte

Benchmarks using both C and C++:

511.povray_r: -prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX2 -O3  
-no-prec-div -qopt-prefetch -ffinite-math-only  
-qopt-mem-layout-trans=4

526.blender_r: -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch  
-ffinite-math-only -qopt-mem-layout-trans=4

Benchmarks using Fortran, C, and C++:

-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only  
-qopt-mem-layout-trans=4 -auto -nostandard-realloc-lhs  
-align array32byte

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:  
### SPEC CPU®2017 Floating Point Rate Result

**Dell Inc.**

PowerEdge T140 (Intel Xeon E-2244G, 3.80 GHz)  

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<th>SPECrate®2017 fp_peak</th>
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**Test Sponsor:** Dell Inc.  
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</tbody>
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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 2019-10-29 11:53:54-0400.  