## SPEC CPU®2017 Floating Point Rate Result

**Dell Inc.**

**PowerEdge R540 (Intel Xeon Silver 4210, 2.20 GHz)**

**SPECrate®2017_fp_base = 116**

**SPECrate®2017_fp_peak = 117**

---

### Hardware

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU Name</td>
<td>Intel Xeon Silver 4210</td>
</tr>
<tr>
<td>Max MHz</td>
<td>3200</td>
</tr>
<tr>
<td>Nominal</td>
<td>2200</td>
</tr>
<tr>
<td>Enabled</td>
<td>20 cores, 2 chips, 2 threads/core</td>
</tr>
<tr>
<td>Orderable</td>
<td>1, 2 chips</td>
</tr>
<tr>
<td>Cache L1</td>
<td>32 KB I + 32 KB D on chip per core</td>
</tr>
<tr>
<td>L2:</td>
<td>1 MB I+D on chip per core</td>
</tr>
<tr>
<td>L3:</td>
<td>13.75 MB I+D on chip per chip</td>
</tr>
<tr>
<td>Other</td>
<td>None</td>
</tr>
<tr>
<td>Memory</td>
<td>384 GB (12 x 32 GB 2Rx4 PC4-2933P-R, running at 2400)</td>
</tr>
<tr>
<td>Storage</td>
<td>480 GB SATA SSD</td>
</tr>
<tr>
<td>Other</td>
<td>None</td>
</tr>
</tbody>
</table>

### Software

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>OS</td>
<td>Ubuntu 18.04.2 LTS</td>
</tr>
<tr>
<td>4.15.0-45-generic</td>
<td></td>
</tr>
<tr>
<td>Compiler</td>
<td>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</td>
</tr>
<tr>
<td>Parallel</td>
<td>No</td>
</tr>
<tr>
<td>Firmware</td>
<td>Version 2.2.11 released Jun-2019</td>
</tr>
<tr>
<td>File System</td>
<td>ext4</td>
</tr>
<tr>
<td>System State</td>
<td>Run level 5 (multi-user)</td>
</tr>
<tr>
<td>Base Pointers</td>
<td>64-bit</td>
</tr>
<tr>
<td>Peak Pointers</td>
<td>64-bit</td>
</tr>
<tr>
<td>Other</td>
<td>None</td>
</tr>
<tr>
<td>Power Management</td>
<td>--</td>
</tr>
</tbody>
</table>

---

### Test Details

- **CPU2017 License:** 55
- **Test Sponsor:** Dell Inc.
- **Tested by:** Dell Inc.
- **Test Date:** Sep-2019
- **Hardware Availability:** Apr-2019
- **Software Availability:** May-2019

---

### Performance

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
<th>SPECrate®2017_fp_base</th>
<th>SPECrate®2017_fp_peak</th>
</tr>
</thead>
<tbody>
<tr>
<td>503.bwaves_r</td>
<td>40</td>
<td>85.5</td>
<td>117</td>
</tr>
<tr>
<td>507.cactuBSSN_r</td>
<td>40</td>
<td>85.9</td>
<td>116</td>
</tr>
<tr>
<td>508.namd_r</td>
<td>40</td>
<td>81.6</td>
<td>116</td>
</tr>
<tr>
<td>510.parest_r</td>
<td>40</td>
<td>67.7</td>
<td>116</td>
</tr>
<tr>
<td>511.povray_r</td>
<td>40</td>
<td>126</td>
<td>134</td>
</tr>
<tr>
<td>519.lbm_r</td>
<td>40</td>
<td>79.8</td>
<td>140</td>
</tr>
<tr>
<td>521.wrf_r</td>
<td>40</td>
<td>99.3</td>
<td>142</td>
</tr>
<tr>
<td>526.blender_r</td>
<td>40</td>
<td>99.4</td>
<td>232</td>
</tr>
<tr>
<td>527.cam4_r</td>
<td>40</td>
<td>118</td>
<td>232</td>
</tr>
<tr>
<td>538.imagick_r</td>
<td>40</td>
<td>61.9</td>
<td>170</td>
</tr>
<tr>
<td>544.nab_r</td>
<td>40</td>
<td>109</td>
<td>172</td>
</tr>
<tr>
<td>549.fotonik3d_r</td>
<td>40</td>
<td>109</td>
<td></td>
</tr>
<tr>
<td>554.roms_r</td>
<td>40</td>
<td>59.7</td>
<td></td>
</tr>
</tbody>
</table>

---

**SPECrate®2017_fp_base** = 116

**SPECrate®2017_fp_peak** = 117
Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>503.bwaves_r</td>
<td>40</td>
<td>1166</td>
<td>344</td>
<td>1163</td>
<td>345</td>
<td>1162</td>
<td>345</td>
</tr>
<tr>
<td>507.cactuBSSN_r</td>
<td>40</td>
<td>590</td>
<td>85.8</td>
<td>592</td>
<td>85.5</td>
<td>590</td>
<td>85.9</td>
</tr>
<tr>
<td>508.namd_r</td>
<td>40</td>
<td>467</td>
<td>81.3</td>
<td>469</td>
<td>81.1</td>
<td>465</td>
<td>81.6</td>
</tr>
<tr>
<td>510.parest_r</td>
<td>40</td>
<td>1545</td>
<td>67.7</td>
<td>1546</td>
<td>67.7</td>
<td>1546</td>
<td>67.7</td>
</tr>
<tr>
<td>511.povray_r</td>
<td>40</td>
<td>743</td>
<td>126</td>
<td>742</td>
<td>126</td>
<td>742</td>
<td>126</td>
</tr>
<tr>
<td>519.lbm_r</td>
<td>40</td>
<td>528</td>
<td>79.8</td>
<td>528</td>
<td>79.9</td>
<td>524</td>
<td>80.5</td>
</tr>
<tr>
<td>521.wrf_r</td>
<td>40</td>
<td>635</td>
<td>141</td>
<td>638</td>
<td>140</td>
<td>628</td>
<td>143</td>
</tr>
<tr>
<td>526.blender_r</td>
<td>40</td>
<td>614</td>
<td>99.3</td>
<td>612</td>
<td>99.5</td>
<td>613</td>
<td>99.4</td>
</tr>
<tr>
<td>527.cam4_r</td>
<td>40</td>
<td>593</td>
<td>118</td>
<td>595</td>
<td>118</td>
<td>584</td>
<td>120</td>
</tr>
<tr>
<td>538.imagick_r</td>
<td>40</td>
<td>425</td>
<td>234</td>
<td>428</td>
<td>232</td>
<td>429</td>
<td>232</td>
</tr>
<tr>
<td>544.nab_r</td>
<td>40</td>
<td>394</td>
<td>171</td>
<td>395</td>
<td>170</td>
<td>391</td>
<td>172</td>
</tr>
<tr>
<td>549.fotonik3d_r</td>
<td>40</td>
<td>1435</td>
<td>109</td>
<td>1427</td>
<td>109</td>
<td>1433</td>
<td>109</td>
</tr>
<tr>
<td>554.roms_r</td>
<td>40</td>
<td>1061</td>
<td>59.9</td>
<td>1064</td>
<td>59.7</td>
<td>1055</td>
<td>60.2</td>
</tr>
</tbody>
</table>

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"

General Notes

Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH = "/home/cpu2017/lib/intel64"

Binaries compiled on a system with 1x Intel Core i9-799X CPU + 32GB RAM memory using Redhat Enterprise Linux 7.5
Transparent Huge Pages enabled by default
Prior to runcpu invocation
Filesystsem 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>
NA: The test sponsor attests, as of date of publication, that CVE-2017-5754 (Meltdown) is mitigated in the system as tested and documented.

(Continued on next page)
## General Notes (Continued)

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.

## Platform Notes

BIOS settings:
- ADDDC setting disabled
- Sub NUMA Cluster disabled
- 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/bin/sysinfo

Rev: r5974 of 2018-05-19 9bcde8f2999c33d61f64985e45859ea9
running on intel-sut Wed Sep 25 23:22:16 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) Silver 4210 CPU @ 2.20GHz
- **2 "physical id"s (chips)**
- **40 "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**: 10
- **siblings**: 20
- **physical 0**: cores 0 1 2 3 4 8 9 10 11 12
- **physical 1**: cores 0 1 2 3 4 8 9 10 11 12

From `lscpu`:  
- **Architecture**: x86_64  
- **CPU op-mode(s)**: 32-bit, 64-bit  
- **Byte Order**: Little Endian  
- **CPU(s)**: 40

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

Dell Inc.
PowerEdge R540 (Intel Xeon Silver 4210, 2.20 GHz)

SPECrate®2017_fp_base = 116
SPECrate®2017_fp_peak = 117

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

Test Date: Sep-2019
Hardware Availability: Apr-2019
Software Availability: May-2019

Platform Notes (Continued)

On-line CPU(s) list: 0–39
Thread(s) per core: 2
Core(s) per socket: 10
Socket(s): 2
NUMA node(s): 2
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Silver 4210 CPU @ 2.20GHz
Stepping: 6
CPU MHz: 2794.820
BogoMIPS: 4400.00
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 14080K
NUMA node0 CPU(s): 0,2,4,6,8,10,12,14,16,18,20,22,24,26,28,30,32,34,36,38
NUMA node1 CPU(s): 1,3,5,7,9,11,13,15,17,19,21,23,25,27,29,31,33,35,37,39
Flags:
  fpu  vme  de  pse  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 xtpr pdcm pcid
  dca  sse4_1  sse4_2  x2apic  movbe  popcnt  aes  xsave  avx f16c
  rdrand  lahf_lm abm 3dnowprefetch cpuid_fault epb cat13 cdp_l3 invpcid_single
  intel_pinn ssbd mba ibrs ibp sb ibrs_enhanced tpr_shadow vnmi flexpriority
  ept vpid
  fsgsbase 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 xsavesopt xsavec xgetbv1 xsaves cqmllc
  cqm_occision llc cqm_mbm_total cqm_mbm_local dtherm ida arat pln
  pts pku ospke avx512_vnni flush_lid arch_capabilities

From numactl --hardware
WARNING: a numactl 'node' might or might not correspond to a physical chip.
  available: 2 nodes (0-1)
  node 0 cpus: 0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38
  node 0 size: 191914 MB
  node 0 free: 191091 MB
  node 1 cpus: 1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39
  node 1 size: 193510 MB
  node 1 free: 192708 MB
  node distances:
  node 0 1
  0: 10 21
  1: 21 10

(Continued on next page)
Dell Inc.

PowerEdge R540 (Intel Xeon Silver 4210, 2.20 GHz)

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

SPECrater 2017_fp_base = 116
SPECrater 2017_fp_peak = 117

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

Test Date: Sep-2019
Hardware Availability: Apr-2019
Software Availability: May-2019

Platform Notes (Continued)

From /proc/meminfo
MemTotal: 394675192 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

/usr/bin/lsb_release -d
Ubuntu 18.04.2 LTS

From /etc/*release* /etc/*version*
debian_version: buster/sid
os-release:
NAME="Ubuntu"
VERSION="18.04.2 LTS (Bionic Beaver)"
ID=ubuntu
ID_LIKE=debian
PRETTY_NAME="Ubuntu 18.04.2 LTS"
VERSION_ID="18.04"
HOME_URL="https://www.ubuntu.com/
SUPPORT_URL="https://help.ubuntu.com/

uname -a:
Linux intel-sut 4.15.0-45-generic #48-Ubuntu SMP Tue Jan 29 16:28:13 UTC 2019 x86_64
x86_64 x86_64 GNU/Linux

Kernel self-reported vulnerability status:
CVE-2017-5754 (Meltdown): Not affected
CVE-2017-5753 (Spectre variant 1): Mitigation: __user pointer sanitization
CVE-2017-5715 (Spectre variant 2): Mitigation: Enhanced IBRS, IBPB

run-level 5 Sep 25 17:09
SPEC is set to: /home/cpu2017

Filesystem Type Size Used Avail Use% Mounted on
/dev/sda2 ext4 439G 21G 396G 5% /

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.

BIOS Dell Inc. 2.2.11 06/14/2019
Memory:
12x 00AD063200AD HMA84GR7CJR4N-WM 32 GB 2 rank 2933, configured at 2400
4x Not Specified Not Specified

(End of data from sysinfo program)
## Compiler Version Notes

<table>
<thead>
<tr>
<th>C</th>
<th>519.lbm_r(base, peak) 538.imagick_r(base, peak) 544.nab_r(base, peak)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64,</td>
</tr>
<tr>
<td></td>
<td>Version 19.0.4.227 Build 20190416</td>
</tr>
<tr>
<td></td>
<td>Copyright (C) 1985-2019 Intel Corporation. All rights reserved.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>C++</th>
<th>508.namd_r(base, peak) 510.parest_r(base, peak)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Intel(R) C++ Intel(R) 64 Compiler for applications running on Intel(R) 64,</td>
</tr>
<tr>
<td></td>
<td>Version 19.0.4.227 Build 20190416</td>
</tr>
<tr>
<td></td>
<td>Copyright (C) 1985-2019 Intel Corporation. All rights reserved.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>C++, C</th>
<th>511.povray_r(base, peak) 526.blender_r(base, peak)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Intel(R) C++ Intel(R) 64 Compiler for applications running on Intel(R) 64,</td>
</tr>
<tr>
<td></td>
<td>Version 19.0.4.227 Build 20190416</td>
</tr>
<tr>
<td></td>
<td>Copyright (C) 1985-2019 Intel Corporation. All rights reserved.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>C++, C, Fortran</th>
<th>507.cactusBSSN_r(base, peak)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Intel(R) C++ Intel(R) 64 Compiler for applications running on Intel(R) 64,</td>
</tr>
<tr>
<td></td>
<td>Version 19.0.4.227 Build 20190416</td>
</tr>
<tr>
<td></td>
<td>Copyright (C) 1985-2019 Intel Corporation. All rights reserved.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>C++, C, Fortran</th>
<th>503.bwaves_r(base, peak) 549.fotonik3d_r(base, peak) 554.roms_r(base, peak)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R) 64,</td>
</tr>
<tr>
<td></td>
<td>Version 19.0.4.227 Build 20190416</td>
</tr>
<tr>
<td></td>
<td>Copyright (C) 1985-2019 Intel Corporation. All rights reserved.</td>
</tr>
</tbody>
</table>

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

Dell Inc.

PowerEdge R540 (Intel Xeon Silver 4210, 2.20 GHz)

SPECrate®2017_fp_base = 116
SPECrate®2017_fp_peak = 117

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

Test Date: Sep-2019
Hardware Availability: Apr-2019
Software Availability: May-2019

Compiler Version Notes (Continued)

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)

---------------------------------------------------------------------

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

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

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

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

Dell Inc.
PowerEdge R540 (Intel Xeon Silver 4210, 2.20 GHz)

SPECrate®2017_fp_base = 116
SPECrate®2017_fp_peak = 117

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

Test Date: Sep-2019
Hardware Availability: Apr-2019
Software Availability: May-2019

Base Portability Flags (Continued)

- 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-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
- -ffinite-math-only -qopt-mem-layout-trans=4

C++ benchmarks:
- -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
- -ffinite-math-only -qopt-mem-layout-trans=4

Fortran benchmarks:
- -xCORE-AVX512 -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-AVX512 -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-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
- -ffinite-math-only -qopt-mem-layout-trans=4

Benchmarks using Fortran, C, and C++:
- -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
- -ffinite-math-only -qopt-mem-layout-trans=4 -auto
- -nostandard-realloc-lhs -align array32byte

Peak Compiler Invocation

C benchmarks:
icc -m64 -std=c11

(Continued on next page)
Dell Inc. PowerEdge R540 (Intel Xeon Silver 4210, 2.20 GHz)  

<table>
<thead>
<tr>
<th>SPECrate®2017_fp_base = 116</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECrate®2017_fp_peak = 117</td>
</tr>
</tbody>
</table>

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

Test Date: Sep-2019  
Hardware Availability: Apr-2019  
Software Availability: May-2019

---

Peak Compiler Invocation (Continued)

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-AVX512 -O3 -no-prec-div -qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=4

538.imagick_r: -xCORE-AVX512 -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-AVX512 -O3 -no-prec-div -qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=4

510.parest_r: -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=4

(Continued on next page)
Dell Inc.

PowerEdge R540 (Intel Xeon Silver 4210, 2.20 GHz)

SPECrates®

- **SPECrates®2017_fp_base = 116**
- **SPECrates®2017_fp_peak = 117**

**CPU2017 License:** 55  
**Test Sponsor:** Dell Inc.  
**Tested by:** Dell Inc.  
**Test Date:** Sep-2019  
**Hardware Availability:** Apr-2019  
**Software Availability:** May-2019

### Peak Optimization Flags (Continued)

**Fortran benchmarks:**

- `503.bwaves_r`: `-xCORE-AVX512 -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-AVX512 -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-AVX512 -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-AVX512 -O3 -no-prec-div -qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=4`

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

- `-xCORE-AVX512 -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:

Dell Inc.

PowerEdge R540 (Intel Xeon Silver 4210, 2.20 GHz)

SPECrate®2017_fp_base = 116
SPECrate®2017_fp_peak = 117

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

Test Date: Sep-2019
Hardware Availability: Apr-2019
Software Availability: May-2019

SPEC CPU and SPECrate are registered trademarks of the Standard Performance Evaluation Corporation. All other brand and product names appearing in this result are trademarks or registered trademarks of their respective holders.

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

Tested with SPEC CPU®2017 v1.0.5 on 2019-09-25 19:22:16-0400.