# SPEC CPU®2017 Floating Point Rate Result

**Dell Inc.**

**PowerEdge R750 xa (Intel Xeon Gold 6348, 2.60 GHz)**

<table>
<thead>
<tr>
<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>112</td>
<td>36</td>
</tr>
<tr>
<td>507.cactusBSSN_r</td>
<td>112</td>
<td>318</td>
</tr>
<tr>
<td>508.namd_r</td>
<td>112</td>
<td>199</td>
</tr>
<tr>
<td>510.parest_r</td>
<td>112</td>
<td>253</td>
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<tr>
<td>511.povray_r</td>
<td>112</td>
<td>330</td>
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<tr>
<td>519.lbm_r</td>
<td>112</td>
<td>257</td>
</tr>
<tr>
<td>521.wrf_r</td>
<td>112</td>
<td>332</td>
</tr>
<tr>
<td>526.blender_r</td>
<td>112</td>
<td>218</td>
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<tr>
<td>527.cam4_r</td>
<td>112</td>
<td>183</td>
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<tr>
<td>538.imagick_r</td>
<td>112</td>
<td>318</td>
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<tr>
<td>544.nab_r</td>
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<td>257</td>
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<tr>
<td>549.fotonik3d_r</td>
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<td>465</td>
</tr>
<tr>
<td>554.roms_r</td>
<td>112</td>
<td>183</td>
</tr>
</tbody>
</table>

**Hardware**

- CPU Name: Intel Xeon Gold 6348
- Max MHz: 3500
- Nominal: 2600
- 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)
- Storage: 225 GB on tmpfs
- Other: None

**Software**

- OS: Red Hat Enterprise Linux 8.3 (Ootpa) 4.18.0-240.15.1.el8_3.x86_64
- Compiler: C/C++, Version 2021.1 of Intel oneAPI DPC++/C++ Compiler Build 20201113 for Linux;
- Fortran: Version 2021.1 of Intel Fortran Compiler Classic Build 20201112 for Linux;
- Parallel: No
- Firmware: Version 1.1.2 released Apr-2021
- File System: tmpfs
- System State: Run level 5 (graphical multi-user)
- Base Pointers: 64-bit
- Peak Pointers: 64-bit
- Other: None
- Jemalloc memory allocator V5.0.1

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

Dell Inc.
PowerEdge R750 xa (Intel Xeon Gold 6348, 2.60 GHz)

SPECrater®2017_fp_base = 386
SPECrater®2017_fp_peak = 405

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

Software (Continued)

Power Management: BIOS and OS set to prefer performance at the cost of additional power usage.

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
<th>Seconds</th>
<th>Ratio</th>
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<th>Ratio</th>
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<td>562</td>
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<td>532</td>
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<td>538.imagick_r</td>
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<td>56</td>
<td>485</td>
<td>184</td>
<td>485</td>
<td>183</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 = "/mnt/ramdisk/cpu2017-1.1.5-ic2021.1/lib/intel64:/mnt/ramdisk/cpu2017-1.1.5-ic2021.1/je5.0.1-64"
MALLOCM_CONF = "retain:true"
<table>
<thead>
<tr>
<th>General Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Binaries compiled on a system with 1x Intel Core i9-7980XE CPU + 64GB RAM memory using Red Hat Enterprise Linux 8.1</td>
</tr>
<tr>
<td>Transparent Huge Pages enabled by default</td>
</tr>
<tr>
<td>Prior to runcpu invocation</td>
</tr>
<tr>
<td>Filesystem page cache synced and cleared with: sync; echo 3&gt;   /proc/sys/vm/drop_caches</td>
</tr>
<tr>
<td>runcpu command invoked through numactl i.e.: numactl --interleave=all runcpu &lt;etc&gt;</td>
</tr>
<tr>
<td>NA: The test sponsor attests, as of date of publication, that CVE-2017-5754 (Meltdown) is mitigated in the system as tested and documented.</td>
</tr>
<tr>
<td>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.</td>
</tr>
<tr>
<td>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.</td>
</tr>
<tr>
<td>Benchmark run from a 225 GB ramdisk created with the cmd: &quot;mount -t tmpfs -o size=225G tmpfs /mnt/ramdisk&quot;</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Platform Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOS Settings:</td>
</tr>
<tr>
<td>Sub NUMA Cluster : 2-Way Clustering</td>
</tr>
<tr>
<td>Virtualization Technology : Disabled</td>
</tr>
<tr>
<td>System Profile : Custom</td>
</tr>
<tr>
<td>CPU Power Management : Maximum Performance</td>
</tr>
<tr>
<td>C1E : Disabled</td>
</tr>
<tr>
<td>C States : Autonomous</td>
</tr>
<tr>
<td>Memory Patrol Scrub : Disabled</td>
</tr>
<tr>
<td>Energy Efficiency Policy : Performance</td>
</tr>
<tr>
<td>CPU Interconnect Bus Link Power Management : Disabled</td>
</tr>
<tr>
<td>Sysinfo program /mnt/ramdisk/cpu2017-1.1.5-ic2021.1/bin/sysinfo</td>
</tr>
<tr>
<td>Rev: r6538 of 2020-09-24 e8664e66d2d7080afeaa89d4b38e2f1c</td>
</tr>
<tr>
<td>running on localhost.localdomain Thu Apr 22 20:37:05 2021</td>
</tr>
<tr>
<td>SUT (System Under Test) info as seen by some common utilities. For more information on this section, see <a href="https://www.spec.org/cpu2017/Docs/config.html#sysinfo">https://www.spec.org/cpu2017/Docs/config.html#sysinfo</a></td>
</tr>
</tbody>
</table>

(Continued on next page)
Dell Inc.
PowerEdge R750 xa (Intel Xeon Gold 6348, 2.60 GHz)

SPEC CPU®2017 Floating Point Rate Result
Copyright 2017-2021 Standard Performance Evaluation Corporation

SPECrates®2017_fp_base = 386
SPECrates®2017_fp_peak = 405

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

Platform Notes (Continued)

From /proc/cpuinfo

```
model name : Intel(R) Xeon(R) Gold 6348 CPU @ 2.60GHz
  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 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 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 6348 CPU @ 2.60GHz
Stepping:            6
CPU MHz:             3381.506
BogoMIPS:            5200.00
Virtualization:      VT-x
L1d cache:           48K
L1i cache:           32K
L2 cache:            1280K
L3 cache:            43008K
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):
  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
NUMA node2 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 node3 CPU(s):
Flags:               fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov
pat pse36 clflush dtsc acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx pdpe1gb rdtsscp
lm constant_tsc arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc cpuid
aperfmpref pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16
xtrr pdcm pcid dca sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave

(Continued on next page)
### Dell Inc. PowerEdge R750 xa (Intel Xeon Gold 6348, 2.60 GHz)

<table>
<thead>
<tr>
<th>CPU2017 License:</th>
<th>55</th>
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<tbody>
<tr>
<td>Test Sponsor:</td>
<td>Dell Inc.</td>
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<tr>
<td>Tested by:</td>
<td>Dell Inc.</td>
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<tr>
<td>Test Date:</td>
<td>Apr-2021</td>
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<tr>
<td>Hardware Availability:</td>
<td>May-2021</td>
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<tr>
<td>Software Availability:</td>
<td>Feb-2021</td>
</tr>
</tbody>
</table>

#### SPECrate®2017_fp_base = 386

**SPECrate®2017_fp_peak = 405**

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**Platform Notes (Continued)**

avx f16c rdrand lahf_lm abm 3dnowprefetch cpuid_fault epb cat_l3 invpcid_single intel_pinn 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_xni avx512bw avx512vl xsaveopt xsaves xsavec cqm_llc cqm_occup_llc cqm_mbm_total cqm_mbm_local split_lock_detect wbnoinvd dtherm ida arat pln pts avx512vbmi umip pku ospke avx512_vbmi2 gfni vaes vpclmulqdq avx512_vnni avx512_bitalg tme avx512_vpopcntdq la57 rdpid md_clear pconfig flush_l1d arch_capabilities

```
/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 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: 124866 MB
   node 0 free: 121714 MB
   node 1 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 1 size: 125555 MB
   node 1 free: 127907 MB
   node 2 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 2 size: 125619 MB
   node 2 free: 128048 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: 125813 MB
   node 3 free: 119602 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:  527797436 kB
   HugePages_Total:       0
   Hugepagesize:  2048 kB
```

/sbin/tuned-adm active

```
   Current active profile: throughput-performance
```

From /etc/*release* /etc/*version*

(Continued on next page)
Dell Inc. PowerEdge R750 xa (Intel Xeon Gold 6348, 2.60 GHz)

SPECrated®2017_fp_base = 386  SPECrated®2017_fp_peak = 405

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

Platform Notes (Continued)

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"
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

uname -a:
Linux localhost.localdomain 4.18.0-240.15.1.el8_3.x86_64 #1 SMP Wed Feb 3 03:12:15 EST 2021 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 5 Apr 22 15:38

SPEC is set to: /mnt/ramdisk/cpu2017-1.1.5-ic2021.1
Filesystem Type Size Used Avail Use% Mounted on
tmpfs tmpfs 225G 6.9G 219G 4% /mnt/ramdisk

From /sys/devices/virtual/dmi/id
Vendor:  Dell Inc.
Product:  PowerEdge R750 xa
Product Family:  PowerEdge
Serial:  1234567

Additional information from dmidecode follows.  WARNING: Use caution when you interpret

(Continued on next page)
Platform Notes (Continued)

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 002C069D002C 18ASF4G72PDZ-3G2E1 32 GB 2 rank 3200
- 16x Not Specified Not Specified

BIOS:
- BIOS Vendor: Dell Inc.
- BIOS Version: 1.1.2
- BIOS Date: 04/09/2021
- BIOS Revision: 1.1

(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) 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++              | 508.namd_r(base, peak) 510.parest_r(base, peak)                         |
==============================================================================
| 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++, C           | 511.povray_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.          |
| 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.          |
==============================================================================

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

Dell Inc. PowerEdge R750 xa (Intel Xeon Gold 6348, 2.60 GHz)

SPECrater®2017_fp_base = 386
SPECrater®2017_fp_peak = 405

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

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

Compiler Version Notes (Continued)

C++, C | 511.povray_r(base) 526.blender_r(base, peak)

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.

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.

Compiler Version Notes (Continued)

C++, C | 511.povray_r(peak)

Intel(R) C++ Compiler 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.

Intel(R) C Intel(R) 64 Compiler Classic for applications running on Intel(R)
64, Version 2021.1 Build 20201112_000000
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Compiler Version Notes (Continued)

C++, C | 511.povray_r(base) 526.blender_r(base, peak)

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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.

Compiler Version Notes (Continued)

C++, C, Fortran | 507.cactuBSSN_r(base, peak)

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
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

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.

(Continued on next page)
Dell Inc. PowerEdge R750 xa (Intel Xeon Gold 6348, 2.60 GHz)

SPECrater®2017_fp_base = 386
SPECrater®2017_fp_peak = 405

Compiler Version Notes (Continued)

Fortran | 503.bwaves_r(base, peak) 549.fotonik3d_r(base, peak)
      | 554.roms_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.

Fortran, C | 521.wrf_r(peak)

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Fortran, C | 521.wrf_r(base) 527.cam4_r(base, peak)

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Fortran, C | 521.wrf_r(peak)

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Fortran, C | 521.wrf_r(base) 527.cam4_r(base, peak)

Intel(R) Fortran Intel(R) 64 Compiler Classic for applications running on
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(Continued on next page)
Dell Inc. PowerEdge R750 xa (Intel Xeon Gold 6348, 2.60 GHz)  

<table>
<thead>
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<th>CPU2017 License: 55</th>
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**Compiler Version Notes (Continued)**

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.

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**Base Compiler Invocation**

C benchmarks:  
icx

C++ benchmarks:  
icpx

Fortran benchmarks:  
ifort

Benchmarks using both Fortran and C:  
ifort icx

Benchmarks using both C and C++:  
icpx icx

Benchmarks using Fortran, C, and C++:  
icpx icx ifort

**Base Portability Flags**

503.bwaves_r: -DSPEC_LP64  
507.cactusBSSN_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  

**SPEC CPU®2017 Floating Point Rate Result**

SPECrater®2017_fp_base = 386  
SPECrater®2017_fp_peak = 405
**SPEC CPU®2017 Floating Point Rate Result**

Dell Inc.

PowerEdge R750 xa (Intel Xeon Gold 6348, 2.60 GHz)

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

### Base Optimization Flags

**C benchmarks:**
- `-w`  
- `-std=c11`  
- `-m64`  
- `-Wl,-z,muldefs`  
- `-xCORE-AVX512`  
- `-Ofast`  
- `-ffast-math`  
- `-flto`  
- `-mfpmath=sse`  
- `-funroll-loops`  
- `-qopt-mem-layout-trans=4`  
- `-mbranches-within-32B-boundaries`  
- `-ljemalloc`  
- `-L/usr/local/jemalloc64-5.0.1/lib`

**C++ benchmarks:**
- `-w`  
- `-m64`  
- `-Wl,-z,muldefs`  
- `-xCORE-AVX512`  
- `-Ofast`  
- `-ffast-math`  
- `-flto`  
- `-mfpmath=sse`  
- `-funroll-loops`  
- `-qopt-mem-layout-trans=4`  
- `-mbranches-within-32B-boundaries`  
- `-ljemalloc`  
- `-L/usr/local/jemalloc64-5.0.1/lib`

**Fortran benchmarks:**
- `-w`  
- `-m64`  
- `-Wl,-z,muldefs`  
- `-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-boundaries`  
- `-ljemalloc`  
- `-L/usr/local/jemalloc64-5.0.1/lib`

**Benchmarks using both Fortran and C:**
- `-w`  
- `-m64`  
- `-std=c11`  
- `-Wl,-z,muldefs`  
- `-xCORE-AVX512`  
- `-Ofast`  
- `-ffast-math`  
- `-flto`  
- `-mfpmath=sse`  
- `-funroll-loops`  
- `-qopt-mem-layout-trans=4`  
- `-no-prec-div`  
- `-qopt-prefetch`  
- `-ffinite-math-only`  
- `-qopt-multiple-gather-scatter-by-shuffles`  
- `-mbranches-within-32B-boundaries`  
- `-nostandard-realloc-lhs`  
- `-align array32byte`  
- `-auto`  
- `-ljemalloc`  
- `-L/usr/local/jemalloc64-5.0.1/lib`

**Benchmarks using both C and C++:**
- `-w`  
- `-m64`  
- `-std=c11`  
- `-Wl,-z,muldefs`  
- `-xCORE-AVX512`  
- `-Ofast`  
- `-ffast-math`  
- `-flto`  
- `-mfpmath=sse`  
- `-funroll-loops`  
- `-qopt-mem-layout-trans=4`  
- `-mbranches-within-32B-boundaries`  
- `-ljemalloc`  
- `-L/usr/local/jemalloc64-5.0.1/lib`

**Benchmarks using Fortran, C, and C++:**
- `-w`  
- `-m64`  
- `-std=c11`  
- `-Wl,-z,muldefs`  
- `-xCORE-AVX512`  
- `-Ofast`  
- `-ffast-math`  
- `-flto`  
- `-mfpmath=sse`  
- `-funroll-loops`  
- `-qopt-mem-layout-trans=4`  
- `-no-prec-div`  
- `-qopt-prefetch`  
- `-ffinite-math-only`  
- `-qopt-multiple-gather-scatter-by-shuffles`  
- `-mbranches-within-32B-boundaries`  
- `-nostandard-realloc-lhs`  
- `-align array32byte`  
- `-auto`  
- `-ljemalloc`  
- `-L/usr/local/jemalloc64-5.0.1/lib`
Dell Inc.
PowerEdge R750 xa (Intel Xeon Gold 6348, 2.60 GHz)

Dell Inc. SPECrate®2017_fp_base = 386
SPECrate®2017_fp_peak = 405

CPU2017 License: 55
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Peak Compiler Invocation

C benchmarks:
  icx

C++ benchmarks:
  icpx

Fortran benchmarks:
  ifort

Benchmarks using both Fortran and C:
  521.wrf_r ifort icc
  527.cam4_r ifort icx

Benchmarks using both C and C++:
  511.povray_r icpc icc
  526.blender_r icpx icx

Benchmarks using Fortran, C, and C++:
  icpx icx ifort

Peak Portability Flags

Same as Base Portability Flags

Peak Optimization Flags

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

C++ benchmarks:

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

C++ benchmarks:

508.namd_r: basepeak = yes

510.parest_r: -w -m64 -W1,-z,muldefs -xCORE-AVX512 -Ofast -ffast-math
-flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -mbranches-within-32B-boundaries
-ljemalloc -L/usr/local/jemalloc64-5.0.1/lib

Fortran benchmarks:

503.bwaves_r: -w -m64 -W1,-z,muldefs -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-boundaries
-ljemalloc -L/usr/local/jemalloc64-5.0.1/lib

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++:
Dell Inc.  
PowerEdge R750 xa (Intel Xeon Gold 6348, 2.60 GHz)  

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**Peak Optimization Flags (Continued)**

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:

http://www.spec.org/cpu2017/flags/Intel-ic2021-official-linux64_revA.xml

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

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