Dell Inc.

PowerEdge C6520 (Intel Xeon Gold 6330N, 2.20 GHz)

SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2021 Standard Performance Evaluation Corporation

SPECrate®2017_fp_base = 332
SPECrate®2017_fp_peak = 349

CPU2017 License: 55
Test Sponsor: Dell Inc.
Tested by: Dell Inc.
Test Date: May-2021
Hardware Availability: Apr-2021
Software Availability: Dec-2020

---

### Hardware

**CPU Name:** Intel Xeon Gold 6330N  
**Max MHz:** 3400  
**Nominal:** 2200  
**Enabled:** 56 cores, 2 chips, 2 threads/core  
**Orderable:** 1,2 chips  
**Cache L1:** 32 KB I + 48 KB D on chip per core  
**Cache L2:** 1.25 MB I+D on chip per core  
**Cache L3:** 42 MB I+D on chip per core  
**Other:** None  
**Memory:** 512 GB (16 x 32 GB 2Rx8 PC4-3200AA-R, running at 2666)  
**Storage:** 125 GB on tmpfs  
**Other:** None

---

### Software

**OS:** Red Hat Enterprise Linux 8.3 (Ootpa)  
**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; 
C/C++: Version 2021.1 of Intel C/C++ Compiler Classic Build 20201112 for Linux  
**Parallel:** No  
**Firmware:** Version 1.1.3 released Apr-2021  
**File System:** tmpfs  
**System State:** Run level 3 (multi-user) 
**Base Pointers:** 64-bit 
**Peak Pointers:** 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.
SPEC CPU®2017 Floating Point Rate Result

Dell Inc. PowerEdge C6520 (Intel Xeon Gold 6330N, 2.20 GHz)

SPECrate®2017_fp_base = 332
SPECrate®2017_fp_peak = 349

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

Test Date: May-2021
Hardware Availability: Apr-2021
Software Availability: Dec-2020

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>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>503.bwaves_r</td>
<td>112</td>
<td>1804</td>
<td>622</td>
<td>1803</td>
<td>623</td>
<td>56</td>
<td>897</td>
<td>626</td>
<td>896</td>
</tr>
<tr>
<td>507.cactuBSSN_r</td>
<td>112</td>
<td>308</td>
<td>461</td>
<td>308</td>
<td>460</td>
<td>112</td>
<td>308</td>
<td>461</td>
<td>308</td>
</tr>
<tr>
<td>508.namd_r</td>
<td>112</td>
<td>397</td>
<td>268</td>
<td>397</td>
<td>268</td>
<td>112</td>
<td>397</td>
<td>268</td>
<td>397</td>
</tr>
<tr>
<td>510.parest_r</td>
<td>112</td>
<td>1693</td>
<td>173</td>
<td>1696</td>
<td>173</td>
<td>56</td>
<td>659</td>
<td>222</td>
<td>662</td>
</tr>
<tr>
<td>511.povray_r</td>
<td>112</td>
<td>668</td>
<td>391</td>
<td>669</td>
<td>391</td>
<td>112</td>
<td>583</td>
<td>448</td>
<td>588</td>
</tr>
<tr>
<td>519.lbm_r</td>
<td>112</td>
<td>525</td>
<td>225</td>
<td>525</td>
<td>225</td>
<td>112</td>
<td>525</td>
<td>225</td>
<td>525</td>
</tr>
<tr>
<td>521.wrf_r</td>
<td>112</td>
<td>858</td>
<td>292</td>
<td>857</td>
<td>293</td>
<td>56</td>
<td>425</td>
<td>295</td>
<td>427</td>
</tr>
<tr>
<td>526.blender_r</td>
<td>112</td>
<td>469</td>
<td>364</td>
<td>468</td>
<td>364</td>
<td>112</td>
<td>469</td>
<td>364</td>
<td>468</td>
</tr>
<tr>
<td>527.cam4_r</td>
<td>112</td>
<td>550</td>
<td>356</td>
<td>552</td>
<td>355</td>
<td>112</td>
<td>550</td>
<td>356</td>
<td>552</td>
</tr>
<tr>
<td>538.imagick_r</td>
<td>112</td>
<td>310</td>
<td>899</td>
<td>309</td>
<td>902</td>
<td>112</td>
<td>310</td>
<td>899</td>
<td>309</td>
</tr>
<tr>
<td>544.nab_r</td>
<td>112</td>
<td>314</td>
<td>599</td>
<td>315</td>
<td>598</td>
<td>112</td>
<td>307</td>
<td>614</td>
<td>308</td>
</tr>
<tr>
<td>549.fotonik3d_r</td>
<td>112</td>
<td>2252</td>
<td>194</td>
<td>2251</td>
<td>194</td>
<td>112</td>
<td>2252</td>
<td>194</td>
<td>2251</td>
</tr>
<tr>
<td>554.roms_r</td>
<td>112</td>
<td>1346</td>
<td>132</td>
<td>1345</td>
<td>132</td>
<td>56</td>
<td>540</td>
<td>165</td>
<td>540</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/cpu2017-1.1.7-ic2021.1/lib/intel64:/mnt/ramdisk/cpu2017-1.1.7-ic2021.1/je5.0.1-64"
MALLOCPool = "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
Dell Inc.
PowerEdge C6520 (Intel Xeon Gold 6330N, 2.20 GHz)

SPECrate®2017_fp_base = 332
SPECrate®2017_fp_peak = 349

<table>
<thead>
<tr>
<th>CPU2017 License:</th>
<th>55</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Sponsor:</td>
<td>Dell Inc.</td>
</tr>
<tr>
<td>Tested by:</td>
<td>Dell Inc.</td>
</tr>
<tr>
<td>Test Date:</td>
<td>May-2021</td>
</tr>
<tr>
<td>Hardware Availability:</td>
<td>Apr-2021</td>
</tr>
<tr>
<td>Software Availability:</td>
<td>Dec-2020</td>
</tr>
</tbody>
</table>

**General Notes (Continued)**

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
```

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 Mon May 24 13:43:46 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 6330N CPU @ 2.20GHz
2 "physical id"s (chips)
```

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

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 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 6330N CPU @ 2.20GHz
- Stepping: 6
- CPU MHz: 2600.000
- BogoMIPS: 4400.00
- 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 cmovpat pse36 cli flush dts 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 aperfmperf pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16 xtrm pcid cdca sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave avx f16c rdrand lahf_lm abm 3dnowprefetch cpuid_fault epb cat_l3 invpcid_single intel_pin ssbd mba ibrs ibpb stibp ibrs_enhanced fsqsbse tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid cmtd dt_a avx512f avx512dq rdseed adx smap avx512sfma clflushopt clwb intel_pt avx512cd sha ni avx512bw avx512vl xsaveopt xsaves xgetbv1 xsaves cqm llc cqm_occup llc cqm_mbb_total cqm_mbb_local split_lock_detect wbnoinvd dtherm ida arat plm pts avx512vbmi umip pku ospke avx512_vbmi2 gfn i vaes vpclmulqdq
Dell Inc.  

PowerEdge C6520 (Intel Xeon Gold 6330N, 2.20 GHz)  

SPECrate®2017_fp_base = 332  
SPECrate®2017_fp_peak = 349

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

Platform Notes (Continued)

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 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: 125372 MB
  node 0 free: 104268 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
81 82 83
  node 1 size: 125878 MB
  node 1 free: 118090 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
95 96 97
  node 2 size: 126307 MB
  node 2 free: 118260 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
106 107 108 109 110 111
  node 3 size: 126325 MB
  node 3 free: 118311 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: 527795128 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"

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

Dell Inc.
PowerEdge C6520 (Intel Xeon Gold 6330N, 2.20 GHz)

SPECratenocroppercxmldata=
SPECratenocroppercxmldata=

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

Test Date: May-2021
Hardware Availability: Apr-2021
Software Availability: Dec-2020

Platform Notes (Continued)

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.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): Mitigation: Speculative Store Bypass disabled via prctl and seccomp
CVE-2018-3639 (Speculative Store Bypass): Mitigation: usercopy/swapgs barriers and __user pointer sanitization
CVE-2017-5753 (Spectre variant 1): Mitigation: Enhanced IBRS, IBPB conditional, RSB filling
CVE-2017-5715 (Spectre variant 2): Not affected
CVE-2020-0543 (Special Register Buffer Data Sampling): Not affected
CVE-2019-11135 (TSX Asynchronous Abort): Not affected

run-level 3 May 24 07:44

SPEC is set to: /mnt/ramdisk/cpu2017-1.1.7-ic2021.1
Filesystem Type Size Used Avail Use% Mounted on
tmpfs tmpfs 125G 50G 76G 40% /mnt/ramdisk

From /sys/devices/virtual/dmi/id
Vendor: Dell Inc.
Product: PowerEdge C6520
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:
6x 002C00B3002C 18ASF4G72PD2-3G2E1 32 GB 2 rank 3200, configured at 2666
10x 00AD063200AD HMAA4GR7AJR8N-XN 32 GB 2 rank 3200, configured at 2666

BIOS:

(Continued on next page)
Dell Inc. PowerEdge C6520 (Intel Xeon Gold 6330N, 2.20 GHz)

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

<table>
<thead>
<tr>
<th>CPU2017 License: 55</th>
<th>Test Date: May-2021</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Sponsor: Dell Inc.</td>
<td>Hardware Availability: Apr-2021</td>
</tr>
<tr>
<td>Tested by: Dell Inc.</td>
<td>Software Availability: Dec-2020</td>
</tr>
</tbody>
</table>

**SPECrate®2017_fp_base = 332**

**SPECrate®2017_fp_peak = 349**

**Platform Notes (Continued)**

<table>
<thead>
<tr>
<th>BIOS Vendor: Dell Inc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOS Version: 1.1.3</td>
</tr>
<tr>
<td>BIOS Date: 04/27/2021</td>
</tr>
<tr>
<td>BIOS Revision: 1.1</td>
</tr>
</tbody>
</table>

(End of data from sysinfo program)

**Compiler Version Notes**

```
C                          | 519.libr(base, peak) 538.imagick_r(base, peak)
| 544.nabr(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.namr(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.povrayr(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.

___________________________

C++, C                     | 511.povrayr(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.
```

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

<table>
<thead>
<tr>
<th>Language</th>
<th>Test Case (Peak), (Base)</th>
</tr>
</thead>
<tbody>
<tr>
<td>C++, C</td>
<td>511.povray_r(peak)</td>
</tr>
<tr>
<td>Intel(R) C++</td>
<td>Intel(R) 64 Compiler Classic for applications running on Intel(R) 64, Version 2021.1 Build 20201112_000000</td>
</tr>
<tr>
<td>Intel(R) C</td>
<td>Intel(R) 64 Compiler Classic for applications running on Intel(R) 64, Version 2021.1 Build 20201112_000000</td>
</tr>
</tbody>
</table>

| 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. |

| 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 | Copyright (C) 1985-2020 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 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 C6520 (Intel Xeon Gold 6330N, 2.20 GHz)

SPEC CPU®2017 Floating Point Rate Result

SPECRate®2017_fp_base = 332
SPECRate®2017_fp_peak = 349

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

Test Date: May-2021
Hardware Availability: Apr-2021
Software Availability: Dec-2020

Compiler Version Notes (Continued)

Fortran, C     | 521.wrf_r(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.
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.

Fortran, C     | 521.wrf_r(base) 527.cam4_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.
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.

Fortran, C     | 521.wrf_r(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.
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.

Fortran, C     | 521.wrf_r(base) 527.cam4_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.
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.
SPEC CPU®2017 Floating Point Rate Result

Dell Inc.
PowerEdge C6520 (Intel Xeon Gold 6330N, 2.20 GHz)

SPECrate®2017_fp_base = 332
SPECrate®2017_fp_peak = 349

CPU2017 License: 55
Test Sponsor: Dell Inc.
Test Date: May-2021
Tested by: Dell Inc.
Hardware Availability: Apr-2021
Software Availability: Dec-2020

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.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:
-w -std=c11 -m64 -Wl,-z,muldefs -xCORE-AVX512 -Ofast -ffast-math
-flto -mfpmath=sse -funroll-loops -gopt-mem-layout-trans=4
-mbranches-within-32B-boundaries -ljemalloc
-L/usr/local/jemalloc64-5.0.1/lib
Base Optimization Flags (Continued)

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 -O3 -ipo
  -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 -O3
  -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

Peak Compiler Invocation

C benchmarks:
  icx

C++ benchmarks:
  icpx

(Continued on next page)
Dell Inc.  
PowerEdge C6520 (Intel Xeon Gold 6330N, 2.20 GHz)  

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

<table>
<thead>
<tr>
<th>SPECrate®2017_fp_base</th>
<th>SPECrate®2017_fp_peak</th>
</tr>
</thead>
<tbody>
<tr>
<td>332</td>
<td>349</td>
</tr>
</tbody>
</table>

**CPU2017 License:** 55  
**Test Sponsor:** Dell Inc.  
**Test Date:** May-2021  
**Hardware Availability:** Apr-2021  
**Tested by:** Dell Inc.  
**Software Availability:** Dec-2020

---

**Peak Compiler Invocation (Continued)**

Fortran benchmarks:  
ifort

Benchmarks using both Fortran and C:  
521.wrf: ifort icc  
527.cam4: ifort icx

Benchmarks using both C and C++:  
511.povray: icpc icc  
526.blender: 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: basepeak = yes  
538.imagick: basepeak = yes  

C++ benchmarks:  
508.namd: basepeak = yes  
510.parest: -w -m64 -Wl,-z,muldefs -xCORE-AVX512 -Ofast -ffast-math -flto -mfpmath=sse -funroll-loops

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

510.parest_r (continued):
-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 -Wl,-z,muldefs -xCORE-AVX512 -03 -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 -03
-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 -03
-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++:

507.cactuBSSN_r: basepeak = yes

The flags files that were used to format this result can be browsed at
### SPEC CPU®2017 Floating Point Rate Result

**Dell Inc.**  
**PowerEdge C6520 (Intel Xeon Gold 6330N, 2.20 GHz)**  

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECrate®2017_fp_base</td>
<td>332</td>
</tr>
<tr>
<td>SPECrate®2017_fp_peak</td>
<td>349</td>
</tr>
</tbody>
</table>

**CPU2017 License:** 55  
**Test Sponsor:** Dell Inc.  
**Tested by:** Dell Inc.  
**Test Date:** May-2021  
**Hardware Availability:** Apr-2021  
**Software Availability:** Dec-2020

You can also download the XML flags sources by saving the following links:

- [Intel-ic2021-official-linux64_revA.xml](http://www.spec.org/cpu2017/flags/Intel-ic2021-official-linux64_revA.xml)
- [Dell-Platform-Flags-PowerEdge-Intel-ICX-rev1.1.xml](http://www.spec.org/cpu2017/flags/Dell-Platform-Flags-PowerEdge-Intel-ICX-rev1.1.xml)

---

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 v1.1.7 on 2021-05-24 14:43:46-0400.  
Originally published on 2021-07-06.