Dell Inc.
PowerEdge C6520 (Intel Xeon Platinum 8352S, 2.20 GHz)

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

Yesterday, 2021-05-27

SPECspeed®2017_fp_base = 207
SPECspeed®2017_fp_peak = 208

<table>
<thead>
<tr>
<th>Software</th>
<th>Hardware</th>
</tr>
</thead>
<tbody>
<tr>
<td>OS: Red Hat Enterprise Linux 8.3 (Ootpa)</td>
<td>CPU Name: Intel Xeon Platinum 8352S</td>
</tr>
<tr>
<td>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;</td>
<td>Max MHz: 3400</td>
</tr>
<tr>
<td>Parallel: Yes</td>
<td>Nominal: 2200</td>
</tr>
<tr>
<td>Firmware: Version 1.1.2 released Apr-2021</td>
<td>Enabled: 64 cores, 2 chips</td>
</tr>
<tr>
<td>File System: tmpfs</td>
<td>Orderable: 1.2 chips</td>
</tr>
<tr>
<td>System State: Run level 3 (multi-user)</td>
<td>Cache L1: 32 KB I + 48 KB D on chip per core</td>
</tr>
<tr>
<td>Base Pointers: 64-bit</td>
<td>L2: 1.25 MB I+D on chip per core</td>
</tr>
<tr>
<td>Peak Pointers: 64-bit</td>
<td>L3: 48 MB I+D on chip per chip</td>
</tr>
<tr>
<td>Other: jemalloc memory allocator V5.0.1</td>
<td>Other: None</td>
</tr>
<tr>
<td>Power Management: BIOS and OS set to prefer performance at the cost of additional power usage.</td>
<td>Memory: 512 GB (16 x 32 GB 2Rx8 PC4-3200AA-R)</td>
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<tr>
<td></td>
<td>Storage: 125 GB on tmpfs</td>
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<tr>
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<tr>
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<td>628.pop2_s 64</td>
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<td>638.imagick_s 64</td>
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<td>644.nab_s 64</td>
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<td>649.fotonik3d_s 64</td>
<td>383</td>
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<tr>
<td>654.roms_s 64</td>
<td>273</td>
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<tr>
<td>SPECspeed®2017_fp_peak (208)</td>
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Results Table

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</tbody>
</table>

SPECspeed\(_{2017\text{-fp_base}}\) = 207
SPECspeed\(_{2017\text{-fp_peak}}\) = 208

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

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:

```
KMP_AFFINITY = "granularity=fine,compact"
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"
MALLOCONF = "retain:true"
OMPSTACKSIZE = "192M"
```

General Notes

Binaries compiled on a system with 1x Intel Core i9-7980XE CPU + 64GB RAM memory using Redhat Enterprise Linux 8.0

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
```


(Continued on next page)
Dell Inc.
PowerEdge C6520 (Intel Xeon Platinum 8352S, 2.20 GHz)   SPECspeed®2017_fp_base = 207
SPECspeed®2017_fp_peak = 208

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

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

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.

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

Platform Notes

BIOS Settings:
Logical Processor : Disabled
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 Tue May  4 08:20:04 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) Platinum 8352S CPU @ 2.20GHz
  2 "physical id"s (chips)
  64 "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 : 32
siblings : 32
physical 0: cores 0 1 2 3 4 5 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
physical 1: cores 0 1 2 3 4 5 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31

(Continued on next page)
From lscpu:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 64
On-line CPU(s) list: 0-63
Thread(s) per core: 1
Core(s) per socket: 32
Socket(s): 2
NUMA node(s): 2
Vendor ID: GenuineIntel
CPU family: 6
Model: 106
Model name: Intel(R) Xeon(R) Platinum 8352S CPU @ 2.20GHz
Stepping: 6
CPU MHz: 1222.373
BogoMIPS: 4400.00
Virtualization: VT-x
L1d cache: 48K
L1i cache: 32K
L2 cache: 1280K
L3 cache: 49152K
NUMA node0 CPU(s):
0,2,4,6,8,10,12,14,16,18,20,22,24,26,28,30,32,34,36,38,40,42,44,46,48,50,52,54,56,58,
60,62
NUMA node1 CPU(s):
1,3,5,7,9,11,13,15,17,19,21,23,25,27,29,31,33,35,37,39,41,43,45,47,49,51,53,55,57,59,
61,63
Flags:
  fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov
  pat pse36 clflush dts ept ds long mask cx8ppic movbe popcnt clflushopt clwb intel_pni
  ssbd ibrs ibpb stibp ibrsenhanced fsgsbaseseless bts rep_good nopl xtopology nonstop_tsc
  clflushopt clwb intel_pni mca ibrs ibpb stibp ibrsenhanced fsgsbaseseless bts rep_good
  nopl xtopology nonstop_tsc clflushopt clwb intel_pni mca ibrs ibpb stibp ibrsenhanced
  fsgsbaseseless bts rep_good nopl xtopology nonstop_tsc clflushopt clwb intel_pni mca
  ibrs ibpb stibp ibrsenhanced fsgsbaseseless bts rep_good nopl xtopology nonstop_tsc
  intelep pi sxed sse3 sse3d sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes
  xsave avx f16c rdrand lahf_lm abm 3dnowprefetch cpuid_fault epb cat_13 invpcid_single
  intel_pni ssbd ibrs ibpb stibp ibrsenhanced fsgsbaseseless bts rep_good nopl xtopology
  nonstop_tsc clflushopt clwb intel_pni mca ibrs ibpb stibp ibrsenhanced fsgsbaseseless
  bts rep_good nopl xtopology nonstop_tsc clflushopt clwb intel_pni mca ibrs ibpb stibp
  ibrsenhanced fsgsbaseseless bts rep_good nopl xtopology nonstop_tsc clflushopt clwb
  intel_pni mca ibrs ibpb stibp ibrsenhanced fsgsbaseseless bts rep_good nopl xtopology
  nonstop_tsc clflushopt clwb intel_pni mca ibrs ibpb stibp ibrsenhanced fsgsbaseseless
  bts rep_good nopl xtopology nonstop_tsc clflushopt clwb intel_pni mca ibrs ibpb stibp
  ibrsenhanced fsgsbaseseless bts rep_good nopl xtopology nonstop_tsc clflushopt clwb
  intel_pni mca ibrs ibpb stibp ibrsenhanced fsgsbaseseless bts rep_good nopl xtopology
  nonstop_tsc clflushopt clwb intel_pni mca ibrs ibpb stibp ibrsenhanced fsgsbaseseless
  bts rep_good nopl xtopology nonstop_tsc clflushopt clwb intel_pni mca ibrs ibpb stibp
  ibrsenhanced fsgsbaseseless bts rep_good nopl xtopology nonstop_tsc clflushopt clwb
  intel_pni mca ibrs ibpb stibp ibrsenhanced fsgsbaseseless bts rep_good nopl xtopology
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  bts rep_good nopl xtopology nonstop_tsc clflushopt clwb intel_pni mca ibrs ibpb stibp
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  intel_pni mca ibrs ibpb stibp ibrsenhanced fsgsbaseseless bts rep_good nopl xtopology
  nonstop_tsc clflushopt clwb intel_pni mca ibrs ibpb stibp ibrsenhanced fsgsbaseseless
  bts rep_good nopl xtopology nonstop_tsc clflushopt clwb intel_pni mca ibrs ibpb stibp
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  nonstop_tsc clflushopt clwb intel_pni mca ibrs ibpb stibp ibrsenhanced fsgsbaseseless
  bts rep_good nopl xtopology nonstop_tsc clflushopt clwb intel_pni mca ibrs ibpb
From numactl --hardware WARNING: a numactl 'node' might or might not correspond to a physical chip.

(Continued on next page)
Dell Inc.
PowerEdge C6520 (Intel Xeon Platinum 8352S, 2.20 GHz)

SPECspeed®2017_fp_base = 207
SPECspeed®2017_fp_peak = 208

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

Platform Notes (Continued)

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 40 42 44 46 48 50
52 54 56 58 60 62
node 0 size: 243401 MB
node 0 free: 245348 MB
node 1 cpus: 1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39 41 43 45 47 49 51
53 55 57 59 61 63
node 1 size: 244856 MB
node 1 free: 253722 MB
node distances:
node 0 1
0: 10 20
1: 20 10

From /proc/meminfo
MemTotal: 527806188 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"
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): Not affected
CVE-2018-3639 (Speculative Store Bypass): Mitigation: Speculative Store

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

<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>CVE-2020-0543 (Special Register Buffer Data Sampling):</td>
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run-level 3 May 4 05:35

SPEC is set to: /mnt/ramdisk/cpu2017-1.1.7-ic2021.1

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<th>Size</th>
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<th>Avail</th>
<th>Use%</th>
<th>Mounted on</th>
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<tr>
<td>tmpfs</td>
<td>tmpfs</td>
<td>125G</td>
<td>11G</td>
<td>115G</td>
<td>9%</td>
<td>/mnt/ramdisk</td>
</tr>
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</table>

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 00AD063200AD HMA84GR7CJR4N-XN 32 GB 2 rank 3200
10x 00AD063200AD HMAA4GR7A JR8N-XN 32 GB 2 rank 3200

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 |
---|
619.lbm_s(base, peak) 638.imagick_s(base, peak)
644.nab_s(base)

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.
Compiler Version Notes (Continued)

==============================================================================
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<td>Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64,</td>
<td></td>
</tr>
<tr>
<td>Version 2021.1 Build 20201113</td>
<td></td>
</tr>
<tr>
<td>Copyright (C) 1985-2020 Intel Corporation. All rights reserved.</td>
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</tbody>
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|                           | 619.lbm_s(base, peak) 638.imagick_s(base, peak) |
|                           | 644.nab_s(base)                          |
| 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.     |

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<td>Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64,</td>
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|                           | 603.bwaves_s(base, peak) 649.fotonik3d_s(base, peak) |
|                           | 654.roms_s(base, peak)                          |
| Intel(R) Fortran Intel(R) 64 Compiler Classic for applications running on |
| Intel(R) 64, Version 2021.1 Build 20201112_000000                      |

(Continued on next page)
Dell Inc.  
PowerEdge C6520 (Intel Xeon Platinum 8352S, 2.20 GHz)

**SPEC CPU 2017 Floating Point Speed Result**

<table>
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<tr>
<th>SPECspeed®2017_fp_base</th>
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CPU2017 License: 55  
Test Sponsor: Dell Inc.  
Tested by: Dell Inc.

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**Compiler Version Notes (Continued)**

Copyright (C) 1985-2020 Intel Corporation. All rights reserved.  
------------------------------------------------------------------------------
Fortran, C  
621.wrf_s(base, peak) 627.cam4_s(base, peak)  
628.pop2_s(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) 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.  
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**Base Compiler Invocation**

C benchmarks:  
`icc`

Fortran benchmarks:  
`ifort`

Benchmarks using both Fortran and C:  
`ifort icc`

Benchmarks using Fortran, C, and C++:  
`icpc icc ifort`

---

**Base Portability Flags**

603.bwaves_s: -DSPEC_LP64  
607.cactuBSSN_s: -DSPEC_LP64  
619.lbm_s: -DSPEC_LP64  
621.wrf_s: -DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian  
627.cam4_s: -DSPEC_LP64 -DSPEC_CASE_FLAG  
628.pop2_s: -DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian  
-assume byterecl  
638.imagick_s: -DSPEC_LP64  
644.nab_s: -DSPEC_LP64  
649.fotonik3d_s: -DSPEC_LP64  
654.roms_s: -DSPEC_LP64
Dell Inc.
PowerEdge C6520 (Intel Xeon Platinum 8352S, 2.20 GHz)

SPECspeed®2017_fp_base = 207
SPECspeed®2017_fp_peak = 208

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

Base Optimization Flags

C benchmarks:
-`-m64 -std=c11 -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP
-mbranches-within-32B-boundaries`

Fortran benchmarks:
-`-m64 -Wl,-z,muldefs -DSPEC_OPENMP -xCORE-AVX512 -ipo -O3
-no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=4 -qopenmp -nostandard-realloc-lhs
-mbranches-within-32B-boundaries -L/usr/local/jemalloc64-5.0.1/lib
-ljemalloc`

Benchmarks using both Fortran and C:
-`-m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp
-DSPEC_OPENMP -mbranches-within-32B-boundaries -nostandard-realloc-lhs
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc`

Benchmarks using Fortran, C, and C++:
-`-m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp
-DSPEC_OPENMP -mbranches-within-32B-boundaries -nostandard-realloc-lhs
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc`

Peak Compiler Invocation

C benchmarks (except as noted below):
`icc
644.nab_s: icx`

Fortran benchmarks:
`ifort`

Benchmarks using both Fortran and C:
`ifort icc`

Benchmarks using Fortran, C, and C++:
`icpc icc ifort`
## SPEC CPU®2017 Floating Point Speed Result

### Dell Inc.

PowerEdge C6520 (Intel Xeon Platinum 8352S, 2.20 GHz)

<table>
<thead>
<tr>
<th>SPECspeed®2017_fp_base</th>
<th>SPECspeed®2017_fp_peak</th>
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<tbody>
<tr>
<td>207</td>
<td>208</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

### Peak Portability Flags

Same as Base Portability Flags

### Peak Optimization Flags

#### C benchmarks:

- `619.lbm_s`: `basepeak = yes`
- `638.imagick_s`: `basepeak = yes`

#### Fortran benchmarks:

- `603.bwaves_s`: `-m64 -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -DSPEC_SUPPRESS_OPENMP -DSPEC_OPENMP -ipo -xCORE-AVX512 -O3 -no-prec-div -qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp -nostandard-realloc-lhs -mbranches-within-32B-boundaries -L/usr/local/jemalloc64-5.0.1/lib -ljemalloc`

- `649.fotonik3d_s`: Same as `603.bwaves_s`

- `654.roms_s`: `basepeak = yes`

#### Benchmarks using both Fortran and C:

- `621.wrf_s`: `-m64 -std=c11 -Wl,-z,muldefs -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 -DSPEC_SUPPRESS_OPENMP -qopenmp -DSPEC_OPENMP -mbranches-within-32B-boundaries -nostandard-realloc-lhs -L/usr/local/jemalloc64-5.0.1/lib -ljemalloc`

- `627.cam4_s`: `basepeak = yes`

- `628.pop2_s`: `basepeak = yes`

(Continued on next page)
Dell Inc.
PowerEdge C6520 (Intel Xeon Platinum 8352S, 2.20 GHz)

SPECspeed®2017 fp_base = 207
SPECspeed®2017 fp_peak = 208

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

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

Peak Optimization Flags (Continued)

Benchmarks using Fortran, C, and C++:

607.cactuBSSN_s: 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