## SPEC CPU® 2017 Floating Point Rate Result

### Hewlett Packard Enterprise

**Test Sponsor:** HPE  
**ProLiant DL360 Gen10 Plus**  
**(2.10 GHz, Intel Xeon Gold 5318S)**  

| Test Date: | Jul-2021  
| Hardware Availability: | Jun-2021  
| Software Availability: | Dec-2020  

### SPECrate® 2017_fp_base = 327  
### SPECrate® 2017_fp_peak = 341

| Test Sponsor: | HPE  
| Hardware Availability: | Jun-2021  
| Software Availability: | Dec-2020  

| Copies | 0 | 40.0 | 80.0 | 120 | 160 | 200 | 240 | 280 | 320 | 360 | 400 | 440 | 480 | 520 | 560 | 600 | 640 | 680 | 720 | 760 | 800 |
|--------|---|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 503.bwaves_r | 96 | 667 |     |     |     |     |     | 462 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 507.cactuBSSN_r | 96 | 233 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 508.namd_r | 96 | 179 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 510.parest_r | 96 | 353 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 511.povray_r | 96 | 244 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 519.lbm_r | 96 | 308 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 521.wrf_r | 96 | 327 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 526.blender_r | 96 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 527.cam4_r | 96 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 538.imagick_r | 96 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 544.nab_r | 96 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 549.fotonik3d_r | 96 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 554.roms_r | 96 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |

### Hardware

- **CPU Name:** Intel Xeon Gold 5318S  
- **Max MHz:** 3400  
- **Nominal:** 2100  
- **Enabled:** 48 cores, 2 chips, 2 threads/core  
- **Orderable:** 1, 2 chip(s)  
- **Cache L1:** 32 KB I + 48 KB D on chip per core  
- **L2:** 1.25 MB I+D on chip per core  
- **L3:** 36 MB I+D on chip per chip  
- **Other:** None  
- **Memory:** 2 TB (32 x 64 GB 2Rx4 PC4-3200AA-R, running at 2933)  
- **Storage:** 1 x 800 GB SAS SSD, RAID 0  
- **Other:** None

### Software

- **OS:** Red Hat Enterprise Linux 8.3 (Ootpa)  
- **Compiler:** C/C++: Version 2021.1 of Intel oneAPI DPC++/C++  
- **Parallel:** No  
- **File System:** xfs  
- **System State:** Run level 3 (multi-user)  
- **Base Pointers:** 64-bit  
- **Peak Pointers:** 64-bit  
- **Other:** jemalloc memory allocator V5.0.1

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

Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL360 Gen10 Plus
(2.10 GHz, Intel Xeon Gold 5318S)

CPU2017 License: 3
Test Sponsor: HPE
Tested by: HPE

SPECrate®2017_fp_base = 327
SPECrate®2017_fp_peak = 341

Test Date: Jul-2021
Hardware Availability: Jun-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>Copies</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>503.bwaves_r</td>
<td>96</td>
<td>1449</td>
<td>665</td>
<td>1448</td>
<td>665</td>
<td>1448</td>
<td>665</td>
<td>48</td>
<td>722</td>
<td>667</td>
<td>722</td>
<td>667</td>
</tr>
<tr>
<td>507.cactuBSSN_r</td>
<td>96</td>
<td>264</td>
<td>461</td>
<td>263</td>
<td>462</td>
<td>262</td>
<td>463</td>
<td>96</td>
<td>264</td>
<td>461</td>
<td>263</td>
<td>462</td>
</tr>
<tr>
<td>508.namd_r</td>
<td>96</td>
<td>390</td>
<td>234</td>
<td>391</td>
<td>233</td>
<td>391</td>
<td>233</td>
<td>96</td>
<td>390</td>
<td>234</td>
<td>391</td>
<td>233</td>
</tr>
<tr>
<td>510.parest_r</td>
<td>96</td>
<td>1400</td>
<td>179</td>
<td>1397</td>
<td>180</td>
<td>1405</td>
<td>179</td>
<td>48</td>
<td>578</td>
<td>217</td>
<td>579</td>
<td>217</td>
</tr>
<tr>
<td>511.povray_r</td>
<td>96</td>
<td>634</td>
<td>353</td>
<td>634</td>
<td>353</td>
<td>633</td>
<td>353</td>
<td>96</td>
<td>551</td>
<td>402</td>
<td>579</td>
<td>402</td>
</tr>
<tr>
<td>519.lbm_r</td>
<td>96</td>
<td>415</td>
<td>244</td>
<td>414</td>
<td>244</td>
<td>414</td>
<td>244</td>
<td>96</td>
<td>415</td>
<td>244</td>
<td>414</td>
<td>244</td>
</tr>
<tr>
<td>521.wrf_r</td>
<td>96</td>
<td>699</td>
<td>308</td>
<td>697</td>
<td>309</td>
<td>698</td>
<td>308</td>
<td>96</td>
<td>699</td>
<td>308</td>
<td>697</td>
<td>309</td>
</tr>
<tr>
<td>526.blender_r</td>
<td>96</td>
<td>446</td>
<td>327</td>
<td>446</td>
<td>327</td>
<td>446</td>
<td>328</td>
<td>96</td>
<td>446</td>
<td>327</td>
<td>446</td>
<td>327</td>
</tr>
<tr>
<td>527.cam4_r</td>
<td>96</td>
<td>483</td>
<td>348</td>
<td>482</td>
<td>348</td>
<td>483</td>
<td>348</td>
<td>96</td>
<td>483</td>
<td>348</td>
<td>482</td>
<td>348</td>
</tr>
<tr>
<td>538.imagick_r</td>
<td>96</td>
<td>293</td>
<td>814</td>
<td>293</td>
<td>814</td>
<td>292</td>
<td>817</td>
<td>96</td>
<td>293</td>
<td>814</td>
<td>293</td>
<td>814</td>
</tr>
<tr>
<td>544.nab_r</td>
<td>96</td>
<td>298</td>
<td>542</td>
<td>298</td>
<td>542</td>
<td>297</td>
<td>543</td>
<td>96</td>
<td>295</td>
<td>548</td>
<td>295</td>
<td>548</td>
</tr>
<tr>
<td>549.fotonik3d_r</td>
<td>96</td>
<td>1796</td>
<td>208</td>
<td>1794</td>
<td>208</td>
<td>1796</td>
<td>208</td>
<td>96</td>
<td>1796</td>
<td>208</td>
<td>1794</td>
<td>208</td>
</tr>
<tr>
<td>554.roms_r</td>
<td>96</td>
<td>1097</td>
<td>139</td>
<td>1094</td>
<td>139</td>
<td>1095</td>
<td>139</td>
<td>48</td>
<td>461</td>
<td>166</td>
<td>459</td>
<td>166</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"
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

Environment Variables Notes

Environment variables set by runcpu before the start of the run:
  LD_LIBRARY_PATH = "/home/cpu2017/lib/intel64:/home/cpu2017/je5.0.1-64"
  MALLOC_CONF = "retain:true"
SPEC CPU®2017 Floating Point Rate Result

Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL360 Gen10 Plus
(2.10 GHz, Intel Xeon Gold 5318S)

SPECrate®2017_fp_base = 327
SPECrate®2017_fp_peak = 341

CPU2017 License: 3
Test Sponsor: HPE
Tested by: HPE

General Notes

Binaries compiled on a system with 1x Intel Core i9-7980XE CPU + 64GB RAM
memory using Red Hat Enterprise Linux 8.1
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.
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.
jemalloc, a general purpose malloc implementation
built with the RedHat Enterprise 7.5, and the system compiler gcc 4.8.5

Submitted_by: "Bhatnagar, Prateek" <prateek.bhatnagar@hpe.com>
Submitted: Mon Jul 19 06:05:05 EDT 2021
Submission: cpu2017-20210719-28176.sub

Platform Notes

The system ROM used for this result contains Intel microcode version 0xd0002a0 for
the Intel Xeon Gold 5318S processor.
BIOS Configuration:
Workload Profile set to General Throughput Compute
Memory Patrol Scrubbing set to Disabled
Advanced Memory Protection set to Advanced ECC
Last Level Cache (LLC) Prefetch set to Enabled
Last Level Cache (LLC) Dead Line Allocation set to Disabled
Enhanced Processor Performance set to Enabled
Enhanced Processor Performance Profile set to Aggressive
Thermal Configuration set to Maximum Cooling
Workload Profile set to Custom
DCU Stream Prefetcher set to Disabled
XPT Remote Prefetcher set to Enabled
Energy/Performance Bias set to Balanced Performance

Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r6622 of 2021-04-07 982a61ec0915b55891ef0e16aca64d6
running on localhost.localdomain Wed Jul 7 05:48:55 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 5318S CPU @ 2.10GHz

(Continued on next page)
Hewlett Packard Enterprise

SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2021 Standard Performance Evaluation Corporation

Test Sponsor: HPE
Hewlett Packard Enterprise
ProLiant DL360 Gen10 Plus
(2.10 GHz, Intel Xeon Gold 5318S)

SPECraten®2017_fp_base = 327
SPECraten®2017_fp_peak = 341

CPU2017 License: 3
Test Sponsor:  HPE
Tested by:  HPE

Platform Notes (Continued)

2 "physical id"s (chips)
96 "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 : 24
siblings : 48
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
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

From lscpu from util-linux 2.32.1:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 96
On-line CPU(s) list: 0-95
Thread(s) per core: 2
Core(s) per socket: 24
Socket(s): 2
NUMA node(s): 4
Vendor ID: GenuineIntel
CPU family: 6
Model: 106
Model name: Intel(R) Xeon(R) Gold 5318S CPU @ 2.10GHz
Stepping: 6
CPU MHz: 851.689
BogoMIPS: 4200.00
Virtualization: VT-x
L1d cache: 48K
L1i cache: 32K
L2 cache: 1280K
L3 cache: 36864K
NUMA node0 CPU(s): 0-11,48-59
NUMA node1 CPU(s): 12-23,60-71
NUMA node2 CPU(s): 24-35,72-83
NUMA node3 CPU(s): 36-47,84-95

Flags: fpu vme de pse tsc msr pae mce cmov pat pse36 clflush dtscache clflushopt pdflush pdm pse36clflush on kamo fdiv_bug pht fpu_apic idxisbury intel noteworthy

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

Hewlett Packard Enterprise
(Test Sponsor: HPE)  
ProLiant DL360 Gen10 Plus  
(2.10 GHz, Intel Xeon Gold 5318S)  
SPECrater®2017_fp_base = 327  
SPECrater®2017_fp_peak = 341

<table>
<thead>
<tr>
<th>CPU2017 License: 3</th>
<th>Test Date: Jul-2021</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Sponsor: HPE</td>
<td>Hardware Availability: Jun-2021</td>
</tr>
<tr>
<td>Tested by: HPE</td>
<td>Software Availability: Dec-2020</td>
</tr>
</tbody>
</table>

**Platform Notes (Continued)**

```
avx512_vpopcntdq la57 rdpid md_clear pconfig flush_l1d arch_capabilities
```

/proc/cpuinfo cache data
```
  cache size : 36864 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 14 15 16 17 18 19 20 21 22 23 60 61 62 63 64 65 66 67 68 69 70 71
node 0 size: 504216 MB
node 0 free: 515198 MB
node 1 cpus: 12 13 14 15 16 17 18 19 20 21 22 23 60 61 62 63 64 65 66 67 68 69 70 71
node 1 size: 505930 MB
node 1 free: 515726 MB
node 2 cpus: 24 25 26 27 28 29 30 31 32 33 34 35 72 73 74 75 76 77 78 79 80 81 82 83
node 2 size: 504472 MB
node 2 free: 515766 MB
node 3 cpus: 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59
node 3 size: 504561 MB
node 3 free: 515752 MB
node distances:
node 0 1 2 3
0: 10 20 30 30
1: 20 10 30 30
2: 30 30 10 20
3: 30 30 20 10
```

From `/proc/meminfo`
```
MemTotal: 2113481272 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)
```

(Continued on next page)
Hewlett Packard Enterprise
ProLiant DL360 Gen10 Plus
(2.10 GHz, Intel Xeon Gold 5318S)

**SPECrate®2017_fp_base** = 327
**SPECrate®2017_fp_peak** = 341

<table>
<thead>
<tr>
<th>CPU2017 License: 3</th>
<th>Test Date: Jul-2021</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Sponsor: HPE</td>
<td>Hardware Availability: Jun-2021</td>
</tr>
<tr>
<td>Tested by: HPE</td>
<td>Software Availability: Dec-2020</td>
</tr>
</tbody>
</table>

**Platform Notes (Continued)**

```plaintext
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 Bypass disabled via prctl and seccomp
CVE-2017-5753 (Spectre variant 1):
    Mitigation: userscopy/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 3 Jul 7 05:48

SPEC is set to: /home/cpu2017

<table>
<thead>
<tr>
<th>Filesystem</th>
<th>Type</th>
<th>Size</th>
<th>Used</th>
<th>Avail</th>
<th>Use%</th>
<th>Mounted on</th>
</tr>
</thead>
<tbody>
<tr>
<td>/dev/mapper/rhel-home</td>
<td>xfs</td>
<td>670G</td>
<td>108G</td>
<td>563G</td>
<td>16%</td>
<td>/home</td>
</tr>
</tbody>
</table>

From /sys/devices/virtual/dmi/id
Vendor: HPE
Product: ProLiant DL360 Gen10 Plus
Product Family: ProLiant
Serial: CN7013030H

Additional information from dmidecode 3.2 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:
    32x Micron 36ASF8G72PZ-3G2B2 64 GB 2 rank 3200, configured at 2933

BIOS:
    BIOS Vendor: HPE
    BIOS Version: U46
    BIOS Date: 05/26/2021
    BIOS Revision: 1.42

(Continued on next page)
Platform Notes (Continued)

Firmware Revision: 2.42

(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.

=======================================
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.

=======================================
(Continued on next page)
Hewlett Packard Enterprise
ProLiant DL360 Gen10 Plus
(2.10 GHz, Intel Xeon Gold 5318S)

SPECrate®2017_fp_base = 327
SPECrate®2017_fp_peak = 341

CPU2017 License: 3
Test Sponsor: HPE
Tested by: HPE

Test Date: Jul-2021
Hardware Availability: Jun-2021
Software Availability: Dec-2020

Compiler Version Notes (Continued)

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.

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.

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.
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.

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(base, peak) 527.cam4_r(base, peak)
----------------
(Continued on next page)
**BASECOMPILER INVOCACTIONS**

- 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 -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 -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`
Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL360 Gen10 Plus
(2.10 GHz, Intel Xeon Gold 5318S)

SPECrate®2017_fp_base = 327
SPECrate®2017_fp_peak = 341

CPU2017 License: 3
Test Sponsor: HPE
Tested by: HPE

Test Date: Jul-2021
Hardware Availability: Jun-2021
Software Availability: Dec-2020

Peak 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++:
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
544.nab_r: -w -std=c11 -m64 -Wl,-z,muldefs -xCORE-AVX512 -flto
-Ofast -gopt-mem-layout-trans=4
-fimf-accuracy-bits=14:sqrt
-mbranches-within-32B-boundaries -ljemalloc
-L/usr/local/jemalloc64-5.0.1/lib

C++ benchmarks:

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

508.namd_r: basepeak = yes

510.parest_r: -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:

503.bwaves_r: -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

549.fotonik3d_r: basepeak = yes

554.roms_r: Same as 503.bwaves_r

Benchmarks using both Fortran and C:

521.wrf_r: basepeak = yes

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++:

507.cactuBSSN_r: basepeak = yes

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2017/flags/HPE-Platform-Flags-Intel-V1.0-ICX-revE.html
<table>
<thead>
<tr>
<th>SPEC CPU®2017 Floating Point Rate Result</th>
</tr>
</thead>
</table>

**Hewlett Packard Enterprise**  
(Test Sponsor: HPE)  
ProLiant DL360 Gen10 Plus  
(2.10 GHz, Intel Xeon Gold 5318S)  

<table>
<thead>
<tr>
<th>SPECrate®2017_fp_base = 327</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECrate®2017_fp_peak = 341</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CPU2017 License</th>
<th>Test Sponsor</th>
<th>Tested by</th>
<th>Test Date</th>
<th>Hardware Availability</th>
<th>Software Availability</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>HPE</td>
<td>HPE</td>
<td>Jul-2021</td>
<td>Jun-2021</td>
<td>Dec-2020</td>
</tr>
</tbody>
</table>

You can also download the XML flags sources by saving the following links:
- http://www.spec.org/cpu2017/flags/HPE-Platform-Flags-Intel-V1.0-ICX-revE.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 v1.1.8 on 2021-07-07 05:48:55-0400.  
Originally published on 2021-08-03.