## SPEC CPU®2017 Floating Point Speed Result

**Hewlett Packard Enterprise**  
*(Test Sponsor: HPE)*  
ProLiant DL360 Gen10 Plus  
*(2.30 GHz, Intel Xeon Platinum 8380)*  

| SPECspeed®2017_fp_base = 230 | SPECspeed®2017_fp_peak = 233 |

**CPU2017 License:** 3  
**Test Date:** May-2021  
**Test Sponsor:** HPE  
**Hardware Availability:** Jun-2021  
**Tested by:** HPE  
**Software Availability:** Jun-2021

<table>
<thead>
<tr>
<th>Threads</th>
<th>SPECspeed®2017_fp_base (230)</th>
<th>SPECspeed®2017_fp_peak (233)</th>
</tr>
</thead>
<tbody>
<tr>
<td>603.bwaves_s 80</td>
<td><img src="chart1" alt="Graph" /></td>
<td><img src="chart2" alt="Graph" /></td>
</tr>
<tr>
<td>607.cactuBSSN_s 80</td>
<td><img src="chart3" alt="Graph" /></td>
<td><img src="chart4" alt="Graph" /></td>
</tr>
<tr>
<td>619.lbm_s 80</td>
<td><img src="chart5" alt="Graph" /></td>
<td><img src="chart6" alt="Graph" /></td>
</tr>
<tr>
<td>621.wrf_s 80</td>
<td><img src="chart7" alt="Graph" /></td>
<td><img src="chart8" alt="Graph" /></td>
</tr>
<tr>
<td>627.cam4_s 80</td>
<td><img src="chart9" alt="Graph" /></td>
<td><img src="chart10" alt="Graph" /></td>
</tr>
<tr>
<td>628.pop2_s 80</td>
<td><img src="chart11" alt="Graph" /></td>
<td><img src="chart12" alt="Graph" /></td>
</tr>
<tr>
<td>638.imagick_s 80</td>
<td><img src="chart13" alt="Graph" /></td>
<td><img src="chart14" alt="Graph" /></td>
</tr>
<tr>
<td>644.nab_s 80</td>
<td><img src="chart15" alt="Graph" /></td>
<td><img src="chart16" alt="Graph" /></td>
</tr>
<tr>
<td>649.fotonik3d_s 80</td>
<td><img src="chart17" alt="Graph" /></td>
<td><img src="chart18" alt="Graph" /></td>
</tr>
<tr>
<td>654.roms_s 80</td>
<td><img src="chart19" alt="Graph" /></td>
<td><img src="chart20" alt="Graph" /></td>
</tr>
</tbody>
</table>

### Hardware

- **CPU Name:** Intel Xeon Platinum 8380  
- **Max MHz:** 3400  
- **Nominal:** 2300  
- **Enabled:** 80 cores, 2 chips  
- **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:** 60 MB I+D on chip per chip  
- **Other:** None  
- **Memory:** 2 TB (32 x 64 GB 2Rx4 PC4-3200AA-R)  
- **Storage:** 1 x 800 GB SAS SSD, RAID 0  
- **Other:** None

### Software

- **OS:** Red Hat Enterprise Linux 8.3 (Ootpa)  
- **Kernel:** 4.18.0-240.el8.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; C/C++: Version 2021.1 of Intel C/C++ Compiler Classic Build 20201112 for Linux  
- **Parallel:** Yes  
- **Firmware:** HPE BIOS Version U46 v1.42 05/16/2021 released Jun-2021  
- **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  
- **Power Management:** BIOS set to prefer performance at the cost of additional power usage
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ProLiant DL360 Gen10 Plus  
(2.30 GHz, Intel Xeon Platinum 8380)

## Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</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>603.bwaves_s</td>
<td>80</td>
<td>81.0</td>
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<td>81.9</td>
<td>721</td>
<td><strong>81.4</strong></td>
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<td>607.cactuBSSN_s</td>
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<td><strong>56.6</strong></td>
<td><strong>294</strong></td>
<td>57.1</td>
<td>292</td>
<td>56.1</td>
<td>297</td>
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<tr>
<td>619.lbm_s</td>
<td>80</td>
<td>37.3</td>
<td>141</td>
<td><strong>35.0</strong></td>
<td><strong>150</strong></td>
<td>34.9</td>
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<tr>
<td>621.wrf_s</td>
<td>80</td>
<td>64.6</td>
<td>205</td>
<td><strong>64.8</strong></td>
<td><strong>204</strong></td>
<td>65.2</td>
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</tr>
<tr>
<td>627.cam4_s</td>
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<td>50.3</td>
<td>176</td>
<td><strong>49.6</strong></td>
<td><strong>179</strong></td>
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<tr>
<td>628.pop2_s</td>
<td>80</td>
<td><strong>125</strong></td>
<td><strong>95.2</strong></td>
<td>126</td>
<td>94.5</td>
<td>124</td>
<td>95.8</td>
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<tr>
<td>638.imagick_s</td>
<td>80</td>
<td><strong>58.7</strong></td>
<td><strong>246</strong></td>
<td>58.7</td>
<td>246</td>
<td>58.7</td>
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<tr>
<td>644.nab_s</td>
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<tr>
<td>649.fotonik3d_s</td>
<td>80</td>
<td>78.5</td>
<td>116</td>
<td>77.9</td>
<td>117</td>
<td><strong>78.1</strong></td>
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<td>55.1</td>
<td>286</td>
<td><strong>56.7</strong></td>
<td><strong>278</strong></td>
<td>57.6</td>
<td>273</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**SPECspeed®2017_fp_base = 230**  
**SPECspeed®2017_fp_peak = 233**

Operating System Notes

Stack size set to unlimited using "ulimit -s unlimited"
Transparent Huge Pages enabled by default
Prior to runcpu invocation
Filesystme 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:
KMP_AFFINITY = "granularity=fine,compact"
LD_LIBRARY_PATH = "/home/cpu2017/lib/intel64:/home/cpu2017/je5.0.1-64"
MALLOC_CONF = "retain:true"
OMP_STACKSIZE = "192M"

General Notes

Binaries compiled on a system with 1x Intel Core i9-7980XE CPU + 64GB RAM  
memory using Redhat Enterprise Linux 8.0
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
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**CPU2017 License:** 3  
**Test Date:** May-2021  
**Test Sponsor:** HPE  
**Hardware Availability:** Jun-2021  
**Tested by:** HPE  
**Software Availability:** Jun-2021

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**General Notes (Continued)**


Submitted by: "Bhatnagar, Prateek" <prateek.bhatnagar@hpe.com>  
Submitted: Mon May 24 12:41:14 EDT 2021  
Submission: cpu2017-20210524-26428.sub

Submitted by: "Bhatnagar, Prateek" <prateek.bhatnagar@hpe.com>  
Submitted: Tue Jun 1 10:16:53 EDT 2021  
Submission: cpu2017-20210524-26428.sub

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**Platform Notes**

The system ROM used for this result contains Intel microcode version 0xd0002a0 for the Intel Xeon Platinum 8380 processor  
**BIOS Configuration:**  
Workload Profile set to General Peak Frequency Compute  
Intel Hyper-Threading set to Disabled  
Thermal Configuration set to Maximum Cooling  
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  
Workload Profile set to Custom  
   Energy/Performance Bias set to Balanced Power  
   DCU Stream Prefetcher set to Disabled  
   Adjacent Sector Prefetch set to Disabled  
   Minimum Processor Idle Power Package C-State set to No Package State  
   Numa Group Size Optimization set to Flat

Sysinfo program /home/cpu2017/bin/sysinfo  
Rev: r6622 of 2021-04-07 982a61eb0915b55891ef0e16eca64d4d  
running on localhost.localdomain Fri May 21 18:48:25 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 8380 CPU @ 2.30GHz  
  2 "physical id"s (chips)  
  80 "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 : 40  
siblings : 40

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(Continued on next page)
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(Test Sponsor: HPE)
ProLiant DL360 Gen10 Plus
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**SPECspeed®2017_fp_base = 230**
**SPECspeed®2017_fp_peak = 233**

**Platform Notes (Continued)**

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 28 29 30 31 32 33 34 35 36 37 38 39
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 28 29 30 31 32 33 34 35 36 37 38 39

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): 80
- On-line CPU(s) list: 0-79
- Thread(s) per core: 1
- Core(s) per socket: 40
- Socket(s): 2
- Vendor ID: GenuineIntel
- CPU family: 6
- Model: 106
- Model name: Intel(R) Xeon(R) Platinum 8380 CPU @ 2.30GHz
- Stepping: 6
- CPU MHz: 800.122
- BogoMIPS: 4600.00
- Virtualization: VT-x
- L1d cache: 48K
- L1i cache: 32K
- L2 cache: 1280K
- L3 cache: 61440K
- NUMA node0 CPU(s): 0-39
- NUMA node1 CPU(s): 40-79

Flags: fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov pat pse36 clflush dts acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx pdpe1gb rdtsdp 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 pdcm pcid dca 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 ssbd mba ibrs ibpb stibp ibrs_enhanced tpr_shadow vnmi flexpriority ept vpid ept_ad fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erva invpcid cqg rdt_a avx512f avx512dq rdseed adx smap avx512ifma clflushopt clwb intel_pt avx512cd sha_ni avx512bw avx512vl xsaveopt xsavevc xgetbv1 xsaves cmq_llc cmq_occcp_llc cmq_mbb_total cmq_mbb_local split_lock_detect wbnoinvd dtherm ida arat pln pts avx512vbmi umip pku ospk axxv512_vmm2 gfnf vaes vpcmllqdq avx512_vnni avx512_bitalg tme avx512_vpopcntdq la57 rdpid md_clear pconfig flush_lld arch_capabilities

From numactl --hardware

/proc/cpuinfo cache data
  cache size : 61440 KB

(Continued on next page)
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SPECspeed®2017_fp_base = 230
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CPU2017 License: 3
Test Sponsor: HPE
Tested by: HPE

Platform Notes (Continued)

WARNING: a numactl 'node' might or might not correspond to a physical chip.
available: 2 nodes (0-1)
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 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39
node 0 size: 969706 MB
node 0 free: 1024697 MB
node 1 cpus: 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79
node 1 size: 964891 MB
node 1 free: 1030925 MB
node distances:
node   0   1
0:  10  20
1:  20  10

From /proc/meminfo
MemTotal: 2113485380 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

(Continued on next page)
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Platform Notes (Continued)

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 3 May 21 14:47

SPEC is set to: /home/cpu2017
Filesyste Type Size Used Avail Use% Mounted on
/dev/mapper/rhel00-home xfs 670G 115G 556G 18% /home

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

BIOS:
BIOS Vendor: HPE
BIOS Version: U46
BIOS Date: 05/16/2021
BIOS Revision: 1.42
Firmware Revision: 2.40

(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)
Compiler Version Notes (Continued)

64, Version 2021.1 Build 20201112_000000
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

*******************************************************************************
C                | 644.nab_s(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                | 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.

*******************************************************************************
C                | 644.nab_s(peak)
*******************************************************************************
Intel(R) oneAPI DPC+/C++ Compiler for applications running on Intel(R) 64,
    Version 2021.1 Build 20201113
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*******************************************************************************
C++, C, Fortran  | 607.cactuBSSN_s(base, 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.
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           | 603.bwaves_s(base, peak) 649.fotonik3d_s(base, peak)
                     | 654.roms_s(base, peak)
*******************************************************************************
(Continued on next page)
Compiler Version Notes (Continued)

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.

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

(Continued on next page)
## Base Portability Flags (Continued)

654.roms_s: -DSPEC_LP64

---

### 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):

```bash
icc
```

```bash
644.nab_s: icx
```

Fortran benchmarks:

```bash
ifort
```

Benchmarks using both Fortran and C:

```bash
ifort icc
```
### Peak Compiler Invocation (Continued)

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

### Peak Portability Flags

Same as Base Portability Flags

### Peak Optimization Flags

#### C benchmarks:
- 619.lbm_s: basepeak = yes
- 638.imagick_s: basepeak = yes
- 644.nab_s: -m64 -Wl,-z,muldefs -xCORE-AVX512 -Ofast -ffast-math -flto -mfpmath=sse -funroll-loops -fopenmp -DSPEC_OPENMP -m64 -Wl,-z,muldefs -flto -mfpmath=sse -funroll-loops -fopenmp -DSPEC_OPENMP -m64 -Wl,-z,muldefs -flto -mfpmath=sse -funroll-loops -fopenmp -DSPEC_OPENMP -m64 -Wl,-z,muldefs -flto -mfpmath=sse -funroll-loops -fopenmp -DSPEC_OPENMP -m64 -Wl,-z,muldefs -flto -mfpmath=sse -funroll-loops -fopenmp -DSPEC_OPENMP -m64 -Wl,-z,muldefs -flto -mfpmath=sse -funroll-loops -fopenmp -DSPEC_OPENMP -m64 -Wl,-z,muldefs -flto -mfpmath=sse -funroll-loops -fopenmp -DSPEC_OPENMP -m64 -Wl,-z,muldefs -flto -mfpmath=sse -funroll-loops -fopenmp -DSPEC_OPENMP -m64 -Wl,-z,muldefs -flto -mfpmath=sse -funroll-loops -fopenmp -DSPEC_OPENMP -m64 -Wl,-z,muldefs -flto -mfpmath=sse -funroll-loops -fopenmp -DSPEC_OPENMP -m64 -Wl,-z,muldefs -flto -mfpmath=sse -funroll-loops -fopenmp -DSPEC_OPENMP -m64 -Wl,-z,muldefs -flto -mfpmath=sse -funroll-loops -fopenmp -DSPEC_OPENMP -m64 -Wl,-z,muldefs -flto -mfpmath=sse -funroll-loops -fopenmp -DSPEC_OPENMP -m64 -Wl,-z,muldefs -flto -mfpmath=sse -funroll-loops -fopenmp -DSPEC_OPENMP -m64 -Wl,-z,muldefs -flto -mfpmath=sse -funroll-loops -fopenmp -DSPEC_OPENMP -m64 -Wl,-z,muldefs -flto -mfpmath=sse -funroll-loops -fopenmp -DSPEC_OPENMP -m64 -Wl,-z,muldefs -flto -mfpmath=sse -funroll-loops -fopenmp -DSPEC_OPENMP -m64 -Wl,-z,muldefs -flto -mfpmath=sse -funroll-loops -fopenmp -DSPEC_OPENMP -m64 -Wl,-z,muldefs -flto -mfpmath=sse -funroll-loops -fopenmp -DSPEC_OPENMP -m64 -Wl,-z,muldefs -flto -mfpmath=sse -funroll-loops -fopenmp -DSPEC_OPENMP -m64 -Wl,-z,muldefs -flto -mfpmath=sse -funroll-loops -fopenmp -DSPEC_OPENMP -m64 -Wl,-z,muldefs -flto -mfpmath=sse -funroll-loops -fopenmp -DSPEC_OPENMP -m64 -Wl,-z,muldefs -flto -mfpmath=sse -funroll-loops -fopenmp -DSPEC_OPENMP -m64 -Wl,-z,muldefs -flto -mfpmath=sse -funroll-loops -fopenmp -DSPEC_OPENMP -m64 -Wl,-z,muldefs -flto -mfpmath=sse -funroll-loops -fopenmp -DSPEC_OPENMP -m64 -Wl,-z,muldefs -flto -mfpmath=sse -funroll-loops -fopenmp -DSPEC_OPENMP -m64 -Wl,-z,muldefs -flto -mfpmath=sse -funroll-loops -fopenmp -DSPEC_OPENMP -m64 -Wl,-z,muldefs -flto -mfpmath=sse -funroll-loops -fopenmp -DSPEC_OPENMP -m64 -Wl,-z,muldefs -flto -mfpmath=sse -funroll-loops -fopenmp -DSPEC_OPENMP -m64 -Wl,-z,muldefs -flto -mfpmath=sse -funroll-loops -fopenmp -DSPEC_OPENMP -m64 -Wl,-z,muldef...  
- Fortran benchmarks:
- 603.bwaves_s: basepeak = yes
- 649.fotonik3d_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 -gopenmp -nostandard-realloc-lhs -mbranches-within-32B-boundaries -L/usr/local/jemalloc64-5.0.1/lib -ljemalloc
- 654.roms_s: basepeak = yes

Benchmarks using both Fortran and C:
- 621.wrf_s: basepeak = yes
- 627.cam4_s: basepeak = yes

(Continued on next page)
**Hewlett Packard Enterprise**  
(Test Sponsor: HPE)  
ProLiant DL360 Gen10 Plus  
(2.30 GHz, Intel Xeon Platinum 8380)

**SPECspeed®2017_fp_peak = 233**  
**SPECspeed®2017_fp_base = 230**

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<tr>
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<td>Software Availability: Jun-2021</td>
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**Peak Optimization Flags (Continued)**

628.pop2_s: basepeak = yes

Benchmarks using Fortran, C, and C++:

607.cactuBSSN_s: basepeak = yes

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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-revC.html

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

http://www.spec.org/cpu2017/flags/HPE-Platform-Flags-Intel-V1.0-ICX-revC.xml

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