Hewlett Packard Enterprise  
ProLiant DL360 Gen10  
(2.50 GHz, Intel Xeon Gold 5215L)  

**SPEC® CPU2017 Floating Point Speed Result**

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<tr>
<th>SPECspeed2017_fp_base</th>
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**CPU2017 License:** 3  
**Test Sponsor:** HPE  
**Tested by:** HPE  
**Test Date:** Jun-2019  
**Hardware Availability:** Apr-2019  
**Software Availability:** Feb-2019

| Threads | 0 | 15.0 | 30.0 | 45.0 | 60.0 | 75.0 | 90.0 | 105.0 | 120.0 | 135.0 | 150.0 | 165.0 | 180.0 | 195.0 | 210.0 | 225.0 | 240.0 | 255.0 | 270.0 | 285.0 | 300.0 | 315.0 | 330.0 | 335.0 |
|---------|---|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|
| 603.bwaves_s | 40 | | | | | | | | | | | | | | | | | | | | | | | | |
| 607.cactuBSSN_s | 40 | | | | | | | | | | | | | | | | | | | | | | | | |
| 619.lbm_s | 40 | | | | | | | | | | | | | | | | | | | | | | | | 96.3 |
| 621.wrf_s | 40 | | | | | | | | | | | | | | | | | | | | | | | | 62.3 |
| 627.cam4_s | 40 | | | | | | | | | | | | | | | | | | | | | | | | 67.2 |
| 628.pop2_s | 40 | | | | | | | | | | | | | | | | | | | | | | | | 48.7 |
| 638.imagick_s | 40 | | | | | | | | | | | | | | | | | | | | | | | | 61.3 |
| 644.nab_s | 40 | | | | | | | | | | | | | | | | | | | | | | | | 68.1 |
| 649.fotonik3d_s | 40 | | | | | | | | | | | | | | | | | | | | | | | | 73.2 |
| 654.roms_s | 40 | | | | | | | | | | | | | | | | | | | | | | | | |

**Hardware**

- **CPU Name:** Intel Xeon Gold 5215L  
- **Max MHz.:** 3400  
- **Nominal:** 2500  
- **Enabled:** 20 cores, 2 chips, 2 threads/core  
- **Orderable:** 1, 2 chip(s)  
- **Cache L1:** 32 KB I+D on chip per core  
- **L2:** 1 MB I+D on chip per core  
- **L3:** 13.75 MB I+D on chip per chip  
- **Other:** None  
- **Memory:** 384 GB (24 x 16 GB 2Rx8 PC4-2666V-R)  
- **Storage:** 1 x 400 GB SAS SSD, RAID 0  
- **Other:** None

**Software**

- **OS:** SUSE Linux Enterprise Server 15 (x86_64)  
- **Kernel:** 4.12.14-23-default  
- **Compiler:** C/C++: Version 19.0.2.187 of Intel C/C++  
- **Compiler Build:** 20190117 for Linux; Fortran: Version 19.0.2.187 of Intel Fortran  
- **Compiler Build:** 20190117 for Linux  
- **Parallel:** Yes  
- **Firmware:** HPE BIOS Version U32 02/02/2019 released Apr-2019  
- **File System:** xfs  
- **System State:** Run level 3 (multi-user)  
- **Base Pointers:** 64-bit  
- **Peak Pointers:** Not Applicable  
- **Other:** None
SPEC CPU2017 Floating Point Speed Result

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HPE

SPECspeed2017_fp_base =  87.0
SPECspeed2017_fp_peak =  Not Run

Results Table

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</table>

SPECspeed2017_fp_base =  87.0
SPECspeed2017_fp_peak =  Not Run

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"
- 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

General Notes

- Environment variables set by runcpu before the start of the run:
  KMP_AFFINITY = "granularity=core,compact"
  LD_LIBRARY_PATH = "/home/cpu2017_u2/lib/ia32:/home/cpu2017_u2/lib/intel64"
  OMP_STACKSIZE = "192M"

- Binaries compiled on a system with 1x Intel Core i9-7900X CPU + 32GB RAM
- memory using Redhat Enterprise Linux 7.5

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.

Platform Notes

- BIOS Configuration:
  - Thermal Configuration set to Maximum Cooling
  - Memory Patrol Scrubbing set to Disabled

(Continued on next page)
SPEC CPU2017 Floating Point Speed Result

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CPU2017 License: 3
Test Sponsor: HPE
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Platform Notes (Continued)

LLC Prefetch set to Enabled
LLC Dead Line Allocation set to Disabled
Enhanced Processor Performance set to Enabled
Workload Profile set to General Peak Frequency Compute
Energy/Performance Bias set to Balanced Power
Workload Profile set to Custom
Numa Group Size Optimization set to Flat
Intel UPI Link Power Management set to Enabled
Sysinfo program /home/cpu2017_u2/bin/sysinfo
Rev: r5974 of 2018-05-19 9bced8f2999c33d61f64985e45859ea9
running on linux-pe3i Mon Jun 3 10:27:48 2019

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 5215L CPU @ 2.50GHz
2 "physical id"s (chips)
40 "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 : 10
siblings : 20
physical 0: cores 0 1 2 3 4 8 9 10 11 12
physical 1: cores 0 1 2 3 4 8 9 10 11 12

From lscpu:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 40
On-line CPU(s) list: 0-39
Thread(s) per core: 2
Core(s) per socket: 10
Socket(s): 2
NUMA node(s): 2
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Gold 5215L CPU @ 2.50GHz
Stepping: 6
CPU MHz: 2500.000
BogoMIPS: 5000.00
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K

(Continued on next page)
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Tested by: HPE

Software Availability: Feb-2019
Hardware Availability: Apr-2019
Test Date: Jun-2019

Platform Notes (Continued)

L2 cache: 1024K
L3 cache: 14080K
NUMA node0 CPU(s): 0-9,20-29
NUMA node1 CPU(s): 10-19,30-39
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 rdtscp
lm constant_tsc arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc cpuid
aperfmpref tsc_known_freq pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3
sdbg fma cx16 xtpr 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_13 cdp_13 invpcid_single intel_pmm mba tpr_shadow vmi flexpriority ept
vpid fsbgbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rtm cqm mpx rdtd_a
avx512f avx512dq rdseed adx smap clflushopt clwb intel_pt avx512cd avx512bw avx512vl
xsaves xsaveopt xsave vgetbv1 xsavec cqmm_llc cqmm_occup_llc cqmm_mbm_total cqmm_mbm_local
ibpb ibrs stibp dtherm ida arat pinn pts pkus ospke avx512_vnni arch_capabilities ssbd

/proc/cpuinfo cache data
  cache size: 14080 KB

From numactl --hardware 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 20 21 22 23 24 25 26 27 28 29
    node 0 size: 193118 MB
    node 0 free: 192670 MB
    node 1 cpus: 10 11 12 13 14 15 16 17 18 19 30 31 32 33 34 35 36 37 38 39
    node 1 size: 193502 MB
    node 1 free: 193173 MB
    node distances:
      node 0 1
        0: 10 21
        1: 21 10

From /proc/meminfo
  MemTotal: 395900000 kB
  HugePages_Total: 0
  Hugepagesize: 2048 KB

From /etc/*release* /etc/*version*
  os-release:
    NAME="SLES"
    VERSION="15"
    VERSION_ID="15"
    PRETTY_NAME="SUSE Linux Enterprise Server 15"
    ID="sles"
    ID_LIKE="suse"
    ANSI_COLOR="0;32"

(Continued on next page)
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CPU2017 License: 3
Test Sponsor: HPE
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Platform Notes (Continued)

uname -a:
Linux linux-pe3i 4.12.14-23-default #1 SMP Tue May 29 21:04:44 UTC 2018 (cd0437b)
x86_64 x86_64 x86_64 GNU/Linux

Kernel self-reported vulnerability status:

CVE-2017-5754 (Meltdown): Not affected
CVE-2017-5753 (Spectre variant 1): Mitigation: __user pointer sanitization
CVE-2017-5715 (Spectre variant 2): Mitigation: Indirect Branch Restricted Speculation, IBPB, IBRS_FW

run-level 3 Jun 3 10:25

SPEC is set to: /home/cpu2017_u2

Filesystem Type Size Used Avail Use% Mounted on
/dev/sda3 xfs 476G 42G 435G 9% /home

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.

BIOS HPE U32 02/02/2019
Memory:
24x UNKNOWN NOT AVAILABLE 16 GB 2 rank 2666

(End of data from sysinfo program)

Compiler Version Notes

==============================================================================
CC  619.lbm_s(base) 638.imagick_s(base) 644.nab_s(base)
==============================================================================
Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64,
Version 19.0.2.187 Build 20190117
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.
==============================================================================

FC  607.cactuBSSN_s(base)
==============================================================================
Intel(R) C++ Intel(R) 64 Compiler for applications running on Intel(R) 64,
Version 19.0.2.187 Build 20190117
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.
Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64,
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### Compiler Version Notes (Continued)

Version 19.0.2.187 Build 20190117  
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Intel (R) Fortran Intel (R) 64 Compiler for applications running on Intel (R)  
64, Version 19.0.2.187 Build 20190117  
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FC 603.bwaves_s(base) 649.fotonik3d_s(base) 654.roms_s(base)

Intel (R) Fortran Intel (R) 64 Compiler for applications running on Intel (R)  
64, Version 19.0.2.187 Build 20190117  
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.

-------------

CC 621.wrf_s(base) 627.cam4_s(base) 628.pop2_s(base)

Intel (R) Fortran Intel (R) 64 Compiler for applications running on Intel (R)  
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-------------

### Base Compiler Invocation

C benchmarks:
- icc -m64 -std=c11

Fortran benchmarks:
- ifort -m64

Benchmarks using both Fortran and C:
- ifort -m64 icc -m64 -std=c11

Benchmarks using Fortran, C, and C++:
- icpc -m64 icc -m64 -std=c11 ifort -m64

### Base Portability Flags

603.bwaves_s: -DSPEC_LP64

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

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

**Base Optimization Flags**

C benchmarks:  
-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch  
-ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP

Fortran benchmarks:  
-DSPEC_OPENMP -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch  
-ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp  
-nostandard-realloc-lhs

Benchmarks using both Fortran and C:  
-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch  
-ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP  
-nostandard-realloc-lhs

Benchmarks using Fortran, C, and C++:  
-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch  
-ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP  
-nostandard-realloc-lhs

The flags files that were used to format this result can be browsed at  
http://www.spec.org/cpu2017/flags/HPE-Platform-Flags-Intel-V1.2-CLX-revA.html  
http://www.spec.org/cpu2017/flags/HPE-ic19.0u1-flags-linux64.html

You can also download the XML flags sources by saving the following links:  
http://www.spec.org/cpu2017/flags/HPE-Platform-Flags-Intel-V1.2-CLX-revA.xml  
http://www.spec.org/cpu2017/flags/HPE-ic19.0u1-flags-linux64.xml
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For questions about this result, please contact the tester. For other inquiries, please contact info@spec.org.

Tested with SPEC CPU2017 v1.0.5 on 2019-06-03 10:27:48-0400.
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