Hewlett Packard Enterprise  
(Test Sponsor: HPE)  
ProLiant DL380 Gen10  
(2.50 GHz, Intel Xeon Gold 5215M)

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

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### Hardware

**CPU Name:** Intel Xeon Gold 5215M  
**Max MHz.:** 3400  
**Nominal:** 2500  
**Enabled:** 20 cores, 2 chips, 2 threads/core  
**Orderable:** 1, 2 chip(s)  
**Cache L1:** 32 KB I + 32 KB 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 960 GB SATA 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 U30 04/18/2019 released Apr-2019  
**File System:** btrfs  
**System State:** Run level 3 (multi-user)  
**Base Pointers:** 64-bit  
**Peak Pointers:** Not Applicable  
**Other:** None

---

**SPECspeed2017_fp_base = 88.0**  
**SPECspeed2017_fp_peak = Not Run**

---

**Test Date:** May-2019  
**Hardware Availability:** Apr-2019  
**Software Availability:** Feb-2019

---

### Thread Results

<table>
<thead>
<tr>
<th>Threads</th>
<th>SPECspeed2017_fp_base (88.0)</th>
</tr>
</thead>
<tbody>
<tr>
<td>603.bwaves_s</td>
<td>40</td>
</tr>
<tr>
<td>607.cactuBSSN_s</td>
<td>40</td>
</tr>
<tr>
<td>619.lbm_s</td>
<td>40</td>
</tr>
<tr>
<td>621.wrf_s</td>
<td>40</td>
</tr>
<tr>
<td>627.cam4_s</td>
<td>40</td>
</tr>
<tr>
<td>628.pop2_s</td>
<td>40</td>
</tr>
<tr>
<td>638.imagick_s</td>
<td>40</td>
</tr>
<tr>
<td>644.nab_s</td>
<td>40</td>
</tr>
<tr>
<td>649.fotonik3d_s</td>
<td>40</td>
</tr>
<tr>
<td>654.roms_s</td>
<td>40</td>
</tr>
</tbody>
</table>

---

**603.bwaves_s**

### Results

- **Threads:** 40
- **Spec Result:** 97.5

---

**607.cactuBSSN_s**

### Results

- **Threads:** 40
- **Spec Result:** 62.5

---

**619.lbm_s**

### Results

- **Threads:** 40
- **Spec Result:** 61.6

---

**621.wrf_s**

### Results

- **Threads:** 40
- **Spec Result:** 76.0

---

**627.cam4_s**

### Results

- **Threads:** 40
- **Spec Result:** 49.1

---

**628.pop2_s**

### Results

- **Threads:** 40
- **Spec Result:** 61.2

---

**638.imagick_s**

### Results

- **Threads:** 40
- **Spec Result:** 138

---

**644.nab_s**

### Results

- **Threads:** 40
- **Spec Result:** 68.0

---

**649.fotonik3d_s**

### Results

- **Threads:** 40
- **Spec Result:** 70.2

---

**654.roms_s**

### Results

- **Threads:** 40
- **Spec Result:** 332
SPEC CPU2017 Floating Point Speed Result

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SPECspeed2017_fp_base = 88.0
SPECspeed2017_fp_peak = Not Run

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>
</tr>
</thead>
<tbody>
<tr>
<td>603.bwaves_s</td>
<td>40</td>
<td>176</td>
<td>336</td>
<td>178</td>
<td>332</td>
<td>178</td>
<td>331</td>
</tr>
<tr>
<td>607.cactuBSSN_s</td>
<td>40</td>
<td>171</td>
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<td>172</td>
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<tr>
<td>619.lbm_s</td>
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<td>62.4</td>
<td>83.8</td>
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<td>62.5</td>
</tr>
<tr>
<td>621.wrf_s</td>
<td>40</td>
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<td>145</td>
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<td>144</td>
<td>92.0</td>
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<tr>
<td>627.cam4_s</td>
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<tr>
<td>628.pop2_s</td>
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<td>61.2</td>
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<td>61.2</td>
<td>237</td>
<td>61.0</td>
</tr>
<tr>
<td>644.nab_s</td>
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<td>127</td>
<td>138</td>
<td>127</td>
<td>138</td>
<td>127</td>
<td>138</td>
</tr>
<tr>
<td>649.fotonik3d_s</td>
<td>40</td>
<td>134</td>
<td>68.0</td>
<td>134</td>
<td>68.0</td>
<td>134</td>
<td>68.0</td>
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<tr>
<td>654.roms_s</td>
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<td>224</td>
<td>70.2</td>
<td>224</td>
<td>70.3</td>
<td>225</td>
<td>70.0</td>
</tr>
</tbody>
</table>

SPECspeed2017_fp_base = 88.0
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=fine,compact"
    LD_LIBRARY_PATH = "/home/cpu2017_fpspeed/lib/ia32:/home/cpu2017_fpspeed/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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Test Date: May-2019
Hardware Availability: Apr-2019
Software Availability: Feb-2019

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
Sysinfo program /home/cpu2017_fpspeed/bin/sysinfo
Rev: r5974 of 2018-05-19 9bcde8f2999c33d61f64985e45859ea9
running on linux-ab7y Mon May 27 20:43:31 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 5215M 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 5215M CPU @ 2.50GHz
Stepping: 6
CPU MHz: 2500.000
CPU max MHz: 3400.0000
CPU min MHz: 1000.0000
BogoMIPS: 5000.00
Virtualization: VT-x
L1d cache: 32K

(Continued on next page)
Platform Notes (Continued)

L1i cache: 32K
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 mca cmov
pat pse36 clflush dts acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx pdpe1gb rdtscp
lm constant_tsc art arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc cpuid
aperfmperf 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_l3 cdp_l3 invpcid_single intel_pmap tpr_shadow vnni flexpriority ept
vpid fsgsb base tsc_adjust bmi1 hle avx2 smep bmi2 erva invpdc rtm cqm mpx rdts a
avx512f avx512dq rdseed adx clflushopt clwb intel_pt avx512cd avx512bw avx512vl
xsaveopt xsaves xsavec xsaveopt xsaveopt xsaveopt xsaveopt xsaveopt xsaveopt
/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: 193046 MB
  node 0 free: 190291 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: 193306 MB
  node 1 free: 189121 MB
  node distances:
    node 0  1
    0: 10 21
    1: 21 10

From /proc/meminfo
  MemTotal: 395624768 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"

(Continued on next page)
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Platform Notes (Continued)

ID_LIKE="suse"
ANSI_COLOR="0;32"
CPE_NAME="cpe:/o:suse:sles:15"

uname -a:
    Linux linux-ab7y 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 May 27 17:55

SPEC is set to: /home/cpu2017_fpspeed
    Filesystem   Type  Size  Used Avail Use% Mounted on
    /dev/sda5    xfs   475G   35G  441G   8% /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 U30 04/18/2019
    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

(Continued on next page)
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CPU2017 License: 3
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Test Date: May-2019
Hardware Availability: Apr-2019
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Compiler Version Notes (Continued)

Copyright (C) 1985-2019 Intel Corporation. All rights reserved.
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) 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.

Compiler Version Notes (Continued)

 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)
64, Version 19.0.2.187 Build 20190117
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.

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
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Base Portability Flags

603.bwaves_s: -DSPEC_LP64
607.cactuBSSN_s: -DSPEC_LP64
619.blm_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 byte_recl
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
-qopt-prefetch-issue-excl-hint -ansi-alias -complex-limited-range

Fortran benchmarks:
-DSPEC_OPENMP -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp
-qopt-prefetch-issue-excl-hint -ansi-alias -complex-limited-range
-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
-qopt-prefetch-issue-excl-hint -ansi-alias -complex-limited-range
-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
-qopt-prefetch-issue-excl-hint -ansi-alias -complex-limited-range
-nostandard-realloc-lhs

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2017/flags/HPE-ic19.0u1-flags-linux64.html
http://www.spec.org/cpu2017/flags/HPE-Platform-Flags-Intel-V1.2-CLX-revB.html
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You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2017/flags/HPE-ic19.0u1-flags-linux64.xml
http://www.spec.org/cpu2017/flags/HPE-Platform-Flags-Intel-V1.2-CLX-revB.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 2019-05-27 20:43:30-0400.