Hewlett Packard Enterprise  
(Test Sponsor: HPE)  
ProLiant DL380 Gen10  
(2.10 GHz, Intel Xeon Gold 6230R)

| SPECspeed®2017_fp_base = 147 |
| SPECspeed®2017_fp_peak = 148 |

**Hardware**

CPU Name: Intel Xeon Gold 6230R  
Max MHz: 4000  
Nominal: 2100  
Enabled: 52 cores, 2 chips  
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: 35.75 MB I+D on chip per chip  
Other: None  
Memory: 384 GB (24 x 16 GB 2Rx8 PC4-2933Y-R)  
Storage: 1 x 400 GB SAS SSD  
Other: None

**Software**

OS: SUSE Linux Enterprise Server 15 SP1 (x86_64)  
Kernel 4.12.14-195-default  
Compiler: C/C++: Version 19.0.4.227 of Intel C/C++  
Compiler Build 20190416 for Linux;  
Fortran: Version 19.0.4.227 of Intel Fortran  
Compiler Build 20190416 for Linux  
Parallel: Yes  
Firmware: HPE BIOS Version U30 2.22 (11/13/2019) released Feb-2020  
File System: btrfs  
System State: Run level 3 (multi-user)  
Base Pointers: 64-bit  
Peak Pointers: 64-bit  
Other: None  
Power Management: BIOS set to prefer performance at the cost of additional power usage
## SPEC CPU®2017 Floating Point Speed Result

**Hewlett Packard Enterprise**  
(Test Sponsor: HPE)  
ProLiant DL380 Gen10  
(2.10 GHz, Intel Xeon Gold 6230R)  

### 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>Threads</th>
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<tbody>
<tr>
<td>603.bwaves_s</td>
<td>52</td>
<td>110</td>
<td>535</td>
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<td>538</td>
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<td>111</td>
<td>533</td>
</tr>
<tr>
<td>607.cactuBSSN_s</td>
<td>52</td>
<td>97.2</td>
<td>171</td>
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<td>97.3</td>
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<td>52</td>
<td>97.3</td>
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</tr>
<tr>
<td>619.lbm_s</td>
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<td>49.3</td>
<td>106</td>
<td>49.4</td>
<td>106</td>
<td>49.3</td>
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<td>49.3</td>
<td>106</td>
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<td>106</td>
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<td>621.wrf_s</td>
<td>52</td>
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<td>107</td>
<td>124</td>
<td>52</td>
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<tr>
<td>627.cam4_s</td>
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<td>78.4</td>
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<td>113</td>
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<td>628.pop2_s</td>
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<td>189</td>
<td>62.7</td>
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<td>191</td>
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<tr>
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<td>93.8</td>
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<tr>
<td>649.fotonik3d_s</td>
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<tr>
<td>654.roms_s</td>
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<td>146</td>
<td>104</td>
<td>151</td>
</tr>
</tbody>
</table>

| SPECspeed®2017_fp_base | = 147 |
| SPECspeed®2017_fp_peak | = 148 |

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
  ```

### Environment Variables Notes

- Environment variables set by runcpu before the start of the run:
  ```
  KMP_AFFINITY = "granularity=core,compact"
  LD_LIBRARY_PATH = "/home/cpu2017/lib/intel64"
  OMP_STACKSIZE = "192M"
  ```

### General Notes

- 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.
Hewlett Packard Enterprise  
(Test Sponsor: HPE)  
ProLiant DL380 Gen10  
(2.10 GHz, Intel Xeon Gold 6230R)  

SPECspeed®2017_fp_peak = 148  
SPECspeed®2017_fp_base = 147

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

Test Date: Feb-2020  
Hardware Availability: Feb-2020  
Software Availability: Jun-2019

Platform Notes

BIOS Configuration:  
Hyper-Threading set to Disabled  
Thermal Configuration set to Maximum Cooling  
Memory Patrol Scrubbing set to Disabled  
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  
Workload Profile set to Custom  
Energy/Performance Bias set to Balanced Power  
Minimum Processor Idle Power Core C-State set to C1E State  
Numa Group Size Optimization set to Flat  
XPT Prefetcher set to Disabled

Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r6365 of 2019-08-21 295195f888a3d7edble6e46a485a0011
running on linux-r6ge Thu Feb 27 05:32:43 2020

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 6230R CPU @ 2.10GHz
  2 "physical id"s (chips)
  52 "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 : 26
    siblings : 26
    physical 0: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 16 17 18 19 20 21 22 24 25 26 27 28 29
    physical 1: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 16 17 18 19 20 21 22 24 25 26 27 28 29

From lscpu:
  Architecture:  x86_64
  CPU op-mode(s): 32-bit, 64-bit
  Byte Order: Little Endian
  Address sizes: 46 bits physical, 48 bits virtual
  CPU(s): 52
  On-line CPU(s) list: 0-51
  Thread(s) per core: 1
  Core(s) per socket: 26
  Socket(s): 2
  NUMA node(s): 2
  Vendor ID: GenuineIntel

(Continued on next page)
Hewlett Packard Enterprise
ProLiant DL380 Gen10
(2.10 GHz, Intel Xeon Gold 6230R)

SPECspeed®2017_fp_base = 147
SPECspeed®2017_fp_peak = 148

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

Platform Notes (Continued)

CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Gold 6230R CPU @ 2.10GHz
Stepping: 7
CPU MHz: 2100.000
BogoMIPS: 4200.00
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 36608K
NUMA node0 CPU(s): 0-25
NUMA node1 CPU(s): 26-51

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 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 lahfl_lm abm 3dnowprefetch cpuid_fault epb cat_l3 cdp_l3 invpcid_single intel_pplin ssbd mba ibrs ibpb stibp ibrs_enhanced tpr_shadow vnmi flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rtm cqm mpx rdt_a avx512f avx512dq rdseed adx smap clflushopt clwb intel_pt avx512cd avx512bw avx512vl xsaveopt xsavec xsavec xgetbv1 xsavevs cqm_llc cqm_occum_llc cqm_mbb_total cqm_mbb_local dtherm ida arat pln pts pku ospke avx512_vnni md_clear flush_lld arch_capabilities

/proc/cpuinfo cache data
  cache size: 36608 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 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25
  node 0 size: 193125 MB
  node 0 free: 190626 MB
  node 1 cpus: 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51
  node 1 size: 193500 MB
  node 1 free: 193176 MB
  node distances:
    node 0 1
    0: 10 21
    1: 21 10

From /proc/meminfo
  MemTotal: 395904960 kB
  HugePages_Total: 0

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

**Hewlett Packard Enterprise**
(Test Sponsor: HPE)
ProLiant DL380 Gen10
(2.10 GHz, Intel Xeon Gold 6230R)

<table>
<thead>
<tr>
<th>SPECspeed®2017_fp_base = 147</th>
</tr>
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<tbody>
<tr>
<td>SPECspeed®2017_fp_peak = 148</td>
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</tbody>
</table>

**CPU2017 License:** 3  
**Test Sponsor:** HPE  
**Tested by:** HPE  
**Test Date:** Feb-2020  
**Hardware Availability:** Feb-2020  
**Software Availability:** Jun-2019  

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**Platform Notes (Continued)**

- Hugepagesize: 2048 kB
- From `/etc/*release* /etc/*version*`:
  - `os-release`:
    - NAME="SLES"  
    - VERSION="15-SP1"  
    - VERSION_ID="15.1"  
    - PRETTY_NAME="SUSE Linux Enterprise Server 15 SP1"  
    - ID="sles"  
    - ID_LIKE="suse"  
    - ANSI_COLOR="0;32"  
    - CPE_NAME="cpe:/o:suse:sles:15:sp1"
- `uname -a`:
  - `Linux linux-r6ge 4.12.14-195-default #1 SMP Tue May 7 10:55:11 UTC 2019 (8fba516)`  
  - `x86_64 x86_64 x86_64 GNU/Linux`
- Kernel self-reported vulnerability status:
  - 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: __user pointer sanitization  
  - CVE-2017-5715 (Spectre variant 2): Mitigation: Enhanced IBRS, IBPB: conditional, RSB filling
- run-level 3 Feb 27 05:30
- SPEC is set to: `/home/cpu2017`
  - Filesystem Type Size Used Avail Use% Mounted on  
    - `/dev/sda2 btrfs 371G 140G 231G 38% /home`
- From `/sys/devices/virtual/dmi/id`:
  - BIOS: HPE U30 11/13/2019  
  - Vendor: HPE  
  - Product: ProLiant DL380 Gen10  
  - Product Family: ProLiant  
  - Serial: 2M294204YX

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:  
  - 24x UNKNOWN NOT AVAILABLE 16 GB 2 rank 2933

(Continued on next page)
Hewlett Packard Enterprise  
(Test Sponsor: HPE)  
ProLiant DL380 Gen10  
(2.10 GHz, Intel Xeon Gold 6230R)  

SPECspeed®2017_fp_base = 147  
SPECspeed®2017_fp_peak = 148

Platform Notes (Continued)

(End of data from sysinfo program)

Compiler Version Notes

==============================================================================
|                             | 619.lbm_s(base, peak) 638.imagick_s(base, peak) 644.nab_s(base, peak) |
------------------------------------------------------------------------------
| Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64,  |
| Version 19.0.4.227 Build 20190416                                        |
| Copyright (C) 1985-2019 Intel Corporation. All rights reserved.            |
------------------------------------------------------------------------------

==============================================================================
|                             | 607.cactuBSSN_s(base, peak) |
------------------------------------------------------------------------------
| Intel(R) C++ Intel(R) 64 Compiler for applications running on Intel(R) 64,  |
| Version 19.0.4.227 Build 20190416                                        |
| Copyright (C) 1985-2019 Intel Corporation. All rights reserved.            |
| Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64,  |
| Version 19.0.4.227 Build 20190416                                        |
| Copyright (C) 1985-2019 Intel Corporation. All rights reserved.            |
| Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R) |
| 64, Version 19.0.4.227 Build 20190416                                    |
| Copyright (C) 1985-2019 Intel Corporation. All rights reserved.            |
------------------------------------------------------------------------------

==============================================================================
|                             | 603.bwaves_s(base, peak) 649.fotonik3d_s(base, peak) 654.roms_s(base, peak) |
------------------------------------------------------------------------------
| Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R) |
| 64, Version 19.0.4.227 Build 20190416                                    |
| Copyright (C) 1985-2019 Intel Corporation. All rights reserved.            |
------------------------------------------------------------------------------

==============================================================================
|                             | 621.wrf_s(base, peak) 627.cam4_s(base, peak) 628.pop2_s(base, peak) |
------------------------------------------------------------------------------
| Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R) |
| 64, Version 19.0.4.227 Build 20190416                                    |
| Copyright (C) 1985-2019 Intel Corporation. All rights reserved.            |
------------------------------------------------------------------------------

(Continued on next page)
Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL380 Gen10
(2.10 GHz, Intel Xeon Gold 6230R)

SPECspeed®2017_fp_base = 147
SPECspeed®2017_fp_peak = 148

CPU2017 License: 3
Test Sponsor: HPE
Test Date: Feb-2020
Tested by: HPE
Hardware Availability: Feb-2020
Software Availability: Jun-2019

Compiler Version Notes (Continued)
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

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

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

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Hewlett Packard Enterprise  
(Test Sponsor: HPE)  
ProLiant DL380 Gen10  
(2.10 GHz, Intel Xeon Gold 6230R)  
SPECspeed®2017_fp_base = 147  
SPECspeed®2017_fp_peak = 148

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

Base Optimization Flags (Continued)

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

Peak 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

Peak Portability Flags

Same as Base Portability Flags

Peak 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:
603.bwaves_s: -prof-gen(pass 1) -prof-use(pass 2) -DSPEC_SUPPRESS_OPENMP
-DSPEC_OPENMP -O2 -xCORE-AVX512 -qopt-prefetch -ipo -O3
Hewlett Packard Enterprise  
(Test Sponsor: HPE)  
ProLiant DL380 Gen10  
(2.10 GHz, Intel Xeon Gold 6230R)  

**SPECspeed**

- SPECspeed®2017_fp_base = 147  
- SPECspeed®2017_fp_peak = 148

**CPU2017 License:** 3  
**Test Date:** Feb-2020  
**Test Sponsor:** HPE  
**Hardware Availability:** Feb-2020  
**Tested by:** HPE  
**Software Availability:** Jun-2019

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**Peak Optimization Flags (Continued)**

603.bwaves_s (continued):
-ffinite-math-only -no-prec-div -qopt-mem-layout-trans=4  
-qopenmp -nostandard-realloc-lhs

649.fotonik3d_s: Same as 603.bwaves_s

654.roms_s: -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:**

621.wrf_s: -prof-gen(pass 1) -prof-use(pass 2) -O2 -xCORE-AVX512  
-qopt-prefetch -ipo -O3 -ffinite-math-only -no-prec-div  
-qopt-mem-layout-trans=4 -DSPEC_SUPPRESS_OPENMP -qopenmp  
-DSPEC_OPENMP -nostandard-realloc-lhs

627.cam4_s: -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch  
-ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp  
-DSPEC_OPENMP -nostandard-realloc-lhs

628.pop2_s: Same as 621.wrf_s

**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-revB.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-revB.xml  

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For questions about this result, please contact the tester. For other inquiries, please contact info@spec.org.

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