# SPEC CPU®2017 Floating Point Speed Result

**Hewlett Packard Enterprise**  
(Test Sponsor: HPE)  
ProLiant DL380 Gen10  
(2.70 GHz, Intel Xeon Gold 6258R)

<table>
<thead>
<tr>
<th>Test Sponsor:</th>
<th>HPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tested by:</td>
<td>HPE</td>
</tr>
<tr>
<td>Test Date:</td>
<td>Jan-2020</td>
</tr>
<tr>
<td>Hardware Availability:</td>
<td>Feb-2020</td>
</tr>
<tr>
<td>Software Availability:</td>
<td>Jun-2019</td>
</tr>
</tbody>
</table>

| SPECspeed®2017_fp_base = | 154 |  
| SPECspeed®2017_fp_peak = | Not Run |  

## Software

| OS:       | SUSE Linux Enterprise Server 15 SP1 (x86_64)  
|-----------|--------------------------------------|  
| 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 Dec-2019 |  
| File System: | btrfs |  
| System State: | Run level 3 (multi-user) |  
| Base Pointers: | 64-bit |  
| Peak Pointers: | Not Applicable |  
| Other: | None |  

## Hardware

| CPU Name: | Intel Xeon Gold 6258R |  
| Max MHz:  | 4000 |  
| Nominal:  | 2700 |  
| Enabled:  | 56 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:       | 38.5 MB I+D on chip per chip |  
| Other:    | None |  
| Memory:   | 768 GB (24 x 32 GB 2Rx4 PC4-2933Y-R) |  
| Storage:  | 1 x 400 GB SAS SSD |  
| Other:    | None |  

**Power Management:** BIOS set to prefer performance at the cost of additional power usage

---

**Threads**

| 603.bwaves_s | 56 |  
| 607.cactuBSSN_s | 56 |  
| 619.lbm_s | 56 |  
| 621.wrf_s | 56 |  
| 627.cam4_s | 56 |  
| 628.pop2_s | 56 |  
| 638.imagick_s | 56 |  
| 644.nab_s | 56 |  
| 649.fotonik3d_s | 56 |  
| 654.roms_s | 56 |  

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**SPECspeed®2017_fp_base (154)**
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---

**SPECspeed®2017_fp_base = 154**

**SPECspeed®2017_fp_peak = Not Run**

---

<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>
<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>56</td>
<td>116</td>
<td>510</td>
<td>115</td>
<td>515</td>
<td>115</td>
<td>514</td>
<td>607.cactuBSSN_s</td>
<td>56</td>
<td>89.5</td>
<td>186</td>
<td>90.0</td>
<td>185</td>
<td>90.5</td>
</tr>
<tr>
<td>619.lbm_s</td>
<td>56</td>
<td>49.7</td>
<td>105</td>
<td>49.9</td>
<td>105</td>
<td>49.8</td>
<td>105</td>
<td>621.wrf_s</td>
<td>56</td>
<td>101</td>
<td>131</td>
<td>102</td>
<td>130</td>
<td>101</td>
</tr>
<tr>
<td>627.cam4_s</td>
<td>56</td>
<td>73.0</td>
<td>121</td>
<td>72.7</td>
<td>122</td>
<td>72.3</td>
<td>123</td>
<td>628.pop2_s</td>
<td>56</td>
<td>191</td>
<td>62.2</td>
<td>188</td>
<td>63.1</td>
<td>194</td>
</tr>
<tr>
<td>638.imagick_s</td>
<td>56</td>
<td>84.3</td>
<td>171</td>
<td>83.3</td>
<td>173</td>
<td>86.1</td>
<td>167</td>
<td>644.nab_s</td>
<td>56</td>
<td>53.4</td>
<td>327</td>
<td>53.3</td>
<td>328</td>
<td>53.3</td>
</tr>
<tr>
<td>649.fotonik3d_s</td>
<td>56</td>
<td>107</td>
<td>85.2</td>
<td>108</td>
<td>84.5</td>
<td>107</td>
<td>85.0</td>
<td>654.roms_s</td>
<td>56</td>
<td>97.6</td>
<td>161</td>
<td>99.9</td>
<td>158</td>
<td>99.7</td>
</tr>
</tbody>
</table>

**Results appear in the order in which they were run.** Bold underlined text indicates a median measurement.

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## 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:

```
KMP_AFFINITY = "granularity=fine,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)

(Continued on next page)
Hewlett Packard Enterprise
ProLiant DL380 Gen10
(2.70 GHz, Intel Xeon Gold 6258R)

SPECspeed®2017_fp_base = 154
SPECspeed®2017_fp_peak = Not Run

Test Sponsor: HPE
Test Date: Jan-2020
Hardware Availability: Feb-2020
Software Availability: Jun-2019

GENERAL NOTES
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:
  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
  Energy/Performance Bias set to Balanced Power
  Advanced Memory Protection set to Advanced ECC

Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r6365 of 2019-08-21 295195f888a3d7edbl6e646a485a0011
running on linux-r6ge Sat Jan 18 14:03:28 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 6258R CPU @ 2.70GHz
  2 "physical id"s (chips)
  56 "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 : 28
  siblings : 28
  physical 0: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24 25 26 27 28 29 30
  physical 1: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24 25 26 27 28 29 30

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): 56

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Platform Notes (Continued)

On-line CPU(s) list: 0-55
Thread(s) per core: 1
Core(s) per socket: 28
Socket(s): 2
NUMA node(s): 2
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Gold 6258R CPU @ 2.70GHz
Stepping: 7
CPU MHz: 2700.000
BogoMIPS: 5400.00
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 3942K
NUMA node0 CPU(s): 0-27
NUMA node1 CPU(s): 28-55
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
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 abm 3dnowprefetch cpuid_fault epb cat_l3 cdp_l3
invpcid_single intel_pni ssbd mba ibrs ibpb stibp ibrs_enabled tpr_shadow vmi
flexpriority etpt 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 xsaveprec xsaves xsavec xgetbv1 xsaaves cqm_llc cqm_occip_llc
cqm_mbm_total cqm_mbm_local dtherm ida arat pln pts pku ospke avx512_vnni md_clear flush_lld
arch_capabilities

/proc/cpuinfo cache data
cache size : 39424 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 26 27
node 0 size: 386631 MB
node 0 free: 383990 MB
node 1 cpus: 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52
53 54 55
node 1 size: 387065 MB
node 1 free: 386634 MB
node distances:
node 0 1

(Continued on next page)

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Platform Notes (Continued)

0:  10  21
1:  21  10

From /proc/meminfo
   MemTotal:       792265708 kB
   HugePages_Total:       0
   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 Jan 18 14:01

SPEC is set to: /home/cpu2017
   Filesystem Type Size Used Avail Use% Mounted on
   /dev/sda2 btrfs 371G 66G 305G 18% /home

From /sys/devices/virtual/dmi/id
   BIOS:      HPE U30 11/13/2019
   Vendor:    HPE
   Product:  ProLiant DL380 Gen10
   Product Family:  ProLiant
   Serial:  2M294204XY

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CPU2017 License: 3
Test Sponsor: HPE
Tested by: HPE
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Platform Notes (Continued)
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 32 GB 2 rank 2933

(End of data from sysinfo program)

Compiler Version Notes

==============================================================================
C               | 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 19.0.4.227 Build 20190416
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------

==============================================================================
C++, C, Fortran | 607.cactuBSSN_s(base)
------------------------------------------------------------------------------
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.
------------------------------------------------------------------------------

==============================================================================
Fortran         | 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 19.0.4.227 Build 20190416
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------

==============================================================================
Fortran, C      | 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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Intel (R) C Intel® 64 Compiler for applications running on Intel® 64,
Version 19.0.4.227 Build 20190416
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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
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

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

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-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