# SPEC® CPU2017 Floating Point Speed Result

**Hewlett Packard Enterprise**

(Test Sponsor: HPE)  
ProLiant DL380 Gen10  
(2.60 GHz, Intel Xeon Gold 6240M)

<table>
<thead>
<tr>
<th>SPECspeed2017_fp_base</th>
<th>130</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECspeed2017_fp_peak</td>
<td>Not Run</td>
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</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Threads</th>
<th>SPECspeed2017_fp_base (130)</th>
</tr>
</thead>
<tbody>
<tr>
<td>603.bwaves_s 72</td>
<td></td>
</tr>
<tr>
<td>607.cactuBSSN_s 72</td>
<td></td>
</tr>
<tr>
<td>619.lbm_s 72</td>
<td></td>
</tr>
<tr>
<td>621.wrf_s 72</td>
<td></td>
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<tr>
<td>627.cam4_s 72</td>
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<tr>
<td>628.pop2_s 72</td>
<td></td>
</tr>
<tr>
<td>638.imagick_s 72</td>
<td></td>
</tr>
<tr>
<td>644.nab_s 72</td>
<td></td>
</tr>
<tr>
<td>649.fotonik3d_s 72</td>
<td></td>
</tr>
<tr>
<td>654.roms_s 72</td>
<td></td>
</tr>
</tbody>
</table>

**Hardware**

- **CPU Name:** Intel Xeon Gold 6240M  
- **Max MHz.:** 3900
- **Nominal:** 2600
- **Enabled:** 36 cores, 2 chips, 2 threads/core  
- **Orderable:** 1, 2 chip(s)
- **Cache L1:** 32 KB I+ 32 KB D on chip per core  
- **L1:** 2 MB I+D on chip per core  
- **L3:** 24.75 MB I+D on chip per chip  
- **Other:** None  
- **Memory:** 384 GB (24 x 16 GB 2Rx8 PC4-2933Y-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 19.0.1.144 of Intel C/C++  
- **Compiler Build:** 20181018 for Linux  
- **Fortran:** Version 19.0.1.144 of Intel Fortran  
- **Compiler Build:** 20181018 for Linux  
- **Parallel:** Yes  
- **Firmware:** HPE BIOS Version U30 05/21/2019 released May-2019  
- **File System:** btrfs  
- **System State:** Run level 3 (multi-user)  
- **Base Pointers:** 64-bit  
- **Peak Pointers:** Not Applicable  
- **Other:** None
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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>
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<td>458</td>
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<td>627.cam4_s</td>
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</tr>
</tbody>
</table>

SPECspeed2017_fp_base = 130
SPECspeed2017_fp_peak = Not Run

RESULTS TABLE

<table>
<thead>
<tr>
<th>Operating System Notes</th>
</tr>
</thead>
</table>
| 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_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.

<table>
<thead>
<tr>
<th>Platform Notes</th>
</tr>
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</table>
| BIOS Configuration:
| Thermal Configuration set to Maximum Cooling
| Memory Patrol Scrubbing set to Disabled

(Continued on next page)
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Test Date: Jul-2019
Hardware Availability: Apr-2019
Software Availability: Nov-2018

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-9mbf Tue Jul 2 18:09:12 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 6240M CPU @ 2.60GHz
  2 "physical id"s (chips)
  72 "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 : 18
    siblings : 36
    physical 0: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
    physical 1: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27

From lscpu:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 72
On-line CPU(s) list: 0-71
Thread(s) per core: 2
Core(s) per socket: 18
Socket(s): 2
NUMA node(s): 2
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Gold 6240M CPU @ 2.60GHz
Stepping: 7
CPU MHz: 2600.000
BogoMIPS: 5200.00
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K

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Platform Notes (Continued)

L3 cache: 25344K
NUMA node0 CPU(s): 0-17,36-53
NUMA node1 CPU(s): 18-35,54-71
Flags: fpu vme de pse tsc msr pae mca cmov
pat apic mce pse36 clflush dts mda cmov
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From numactl --hardware WARN: 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 36 37 38 39 40 41 42 43 44 45
    node 0 size: 193014 MB
    node 0 free: 192333 MB
    node 1 cpus: 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 54 55 56 57 58 59 60
    node 1 size: 193330 MB
    node 1 free: 193119 MB
    node distances:
    node 0 1
    0: 10 21
    1: 21 10

From /proc/meminfo
    MemTotal: 395617492 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”

(Continued on next page)
Platform Notes (Continued)

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

uname -a:
    Linux linux-9mbf 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 Jul 2 18:07

SPEC is set to: /home/cpu2017_fpSpeed
Filesystem Type Size Used Avail Use% Mounted on
/dev/sdb4 xfs 436G 340G 97G 78% /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 05/21/2019
Memory:
    24x UNKNOWN NOT AVAILABLE 16 GB 2 rank 2933

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 19.0.1.144 Build 20181018
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
-----------------------------------------------------------------------------

==============================================================================
FC  607.cactuBSSN_s(base)
-----------------------------------------------------------------------------
Intel(R) C++ Intel(R) 64 Compiler for applications running on Intel(R) 64,
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**Compiler Version Notes (Continued)**

Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64,  
Version 19.0.1.144 Build 20181018  
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.  

Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R)  
64, Version 19.0.1.144 Build 20181018  
Copyright (C) 1985-2018 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.hm9_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-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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