## SPEC® CPU2017 Floating Point Speed Result

### Hewlett Packard Enterprise
**(Test Sponsor: HPE)**
Synergy 480 Gen10
**(2.50 GHz, Intel Xeon Gold 5215M)**

<table>
<thead>
<tr>
<th>SPECspeed2017_fp_base</th>
<th>90.8</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECspeed2017_fp_peak</td>
<td>Not Run</td>
</tr>
</tbody>
</table>

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

### Threads

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>SPECspeed2017_fp_base</th>
</tr>
</thead>
<tbody>
<tr>
<td>603.bwaves_s</td>
<td>20</td>
<td>96.8</td>
</tr>
<tr>
<td>607.cactuBSSN_s</td>
<td>20</td>
<td>76.3</td>
</tr>
<tr>
<td>619.lbm_s</td>
<td>20</td>
<td>84.4</td>
</tr>
<tr>
<td>621.wrf_s</td>
<td>20</td>
<td>59.2</td>
</tr>
<tr>
<td>627.cam4_s</td>
<td>20</td>
<td>62.5</td>
</tr>
<tr>
<td>628.pop2_s</td>
<td>20</td>
<td>65.9</td>
</tr>
<tr>
<td>638.imagick_s</td>
<td>20</td>
<td>122</td>
</tr>
<tr>
<td>644.nab_s</td>
<td>20</td>
<td>69.1</td>
</tr>
<tr>
<td>649.fotonik3d_s</td>
<td>20</td>
<td>59.1</td>
</tr>
<tr>
<td>654.roms_s</td>
<td>20</td>
<td>81.4</td>
</tr>
</tbody>
</table>

### Hardware

<table>
<thead>
<tr>
<th>CPU Name</th>
<th>Intel Xeon Gold 5215M</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max MHz.</td>
<td>3400</td>
</tr>
<tr>
<td>Nominal</td>
<td>2500</td>
</tr>
<tr>
<td>Enabled</td>
<td>20 cores, 2 chips</td>
</tr>
<tr>
<td>Orderable</td>
<td>1, 2 chip(s)</td>
</tr>
<tr>
<td>Cache L1</td>
<td>32 KB I + 32 KB D on chip per core</td>
</tr>
<tr>
<td>L2:</td>
<td>1 MB I+D on chip per core</td>
</tr>
<tr>
<td>L3:</td>
<td>13.75 MB I+D on chip per chip</td>
</tr>
<tr>
<td>Other:</td>
<td>None</td>
</tr>
<tr>
<td>Memory:</td>
<td>384 GB (24 x 16 GB 2Rx8 PC4-2933Y-R, running at 2666)</td>
</tr>
<tr>
<td>Storage:</td>
<td>1 x 400 GB SAS SSD, RAID 0</td>
</tr>
<tr>
<td>Other:</td>
<td>None</td>
</tr>
</tbody>
</table>

### Software

<table>
<thead>
<tr>
<th>OS</th>
<th>SUSE Linux Enterprise Server 15 (x86_64)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compiler</td>
<td>C/C++: Version 19.0.2.187 of Intel C/C++</td>
</tr>
<tr>
<td></td>
<td>Compiler Build 20190117 for Linux;</td>
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<tr>
<td></td>
<td>Fortran: Version 19.0.2.187 of Intel Fortran</td>
</tr>
<tr>
<td></td>
<td>Compiler Build 20190117 for Linux</td>
</tr>
<tr>
<td>Parallel</td>
<td>Yes</td>
</tr>
<tr>
<td>Firmware</td>
<td>HPE BIOS Version I42 05/22/2019 released May-2019</td>
</tr>
<tr>
<td>File System</td>
<td>btrfs</td>
</tr>
<tr>
<td>System State</td>
<td>Run level 3 (multi-user)</td>
</tr>
<tr>
<td>Base Pointers</td>
<td>64-bit</td>
</tr>
<tr>
<td>Peak Pointers</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Other:</td>
<td>None</td>
</tr>
</tbody>
</table>

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**Hewlett Packard Enterprise**

**Test Sponsor:** HPE

**Hardware:** CPU Name: Intel Xeon Gold 5215M  
Max MHz.: 3400  
Nominal: 2500  
Enabled: 20 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: 13.75 MB I+D on chip per chip  
Other: None  
Memory: 384 GB (24 x 16 GB 2Rx8 PC4-2933Y-R, running at 2666)  
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 I42 05/22/2019 released May-2019  
File System: btrfs  
System State: Run level 3 (multi-user)  
Base Pointers: 64-bit  
Peak Pointers: Not Applicable  
Other: None
## Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
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<th>Seconds</th>
<th>Ratio</th>
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<th>Ratio</th>
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<tbody>
<tr>
<td>603.bwaves_s</td>
<td>20</td>
<td>162</td>
<td>365</td>
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<td>607.cactuBSSN_s</td>
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</tr>
</tbody>
</table>

**SPECspeed2017_fp_base = 90.8**

**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:

- Hyper-Threading set to Disabled
- Thermal Configuration set to Maximum Cooling

(Continued on next page)
Platform Notes (Continued)

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
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 9bcde8f2999c33d6f64985e45859ea9
running on sy480g10-2 Wed Jun 26 17:58:40 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)
  20 "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 : 10
  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): 20
On-line CPU(s) list: 0-19
Thread(s) per core: 1
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
BogoMIPS: 5000.00
Virtualization: VT-x
L1d cache: 32K

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

**SPEC CPU2017 Floating Point Speed Result**

**Hewlett Packard Enterprise**  
(Test Sponsor: HPE)  
Synergy 480 Gen10  
(2.50 GHz, Intel Xeon Gold 5215M)

---

**SPECspeed2017_fp_base** = **90.8**

**SPECspeed2017_fp_peak** = **Not Run**

---

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

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**Platform Notes (Continued)**

<table>
<thead>
<tr>
<th>L1i cache:</th>
<th>32K</th>
</tr>
</thead>
<tbody>
<tr>
<td>L2 cache:</td>
<td>1024K</td>
</tr>
<tr>
<td>L3 cache:</td>
<td>14080K</td>
</tr>
<tr>
<td>NUMA node0 CPU(s):</td>
<td>0-9</td>
</tr>
<tr>
<td>NUMA node1 CPU(s):</td>
<td>10-19</td>
</tr>
<tr>
<td>Flags:</td>
<td>fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov pat pse36 cl flush dts acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx pdpe1gb rd tscp lm constant_time 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 sse3 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 cd p _13 invpcid_single intel_ppin mba tpr_shadow vmmi f lexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erss invpcid rtm cqm mpx rdt a avx512f avx512dq rdseed adx smap clflushopt clwb intel_pt avx512cd avx512bw avx512vl xsaveopt xsave xgetbv1 xsaves cqm_llc cqm_occup_llc cqm_mbm_total cqm_mbm_local ibpb ibrs stibp dtherm ida arat p in pts pku ospke avx512 vnni arch_capabilities ssbd</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

```
From /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  
node 0 size: 193048 MB  
node 0 free: 192573 MB  
node 1 cpus: 10 11 12 13 14 15 16 17 18 19  
node 1 size: 193307 MB  
node 1 free: 193015 MB  
node distances:  
node 0 1  
  0: 10 21  
  1: 21 10
```

```
From /proc/meminfo  
MemTotal: 395628828 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 sy480g10-2 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 26 17:56

SPEC is set to: /home/cpu2017_u2
Filesystem     Type   Size  Used Avail Use% Mounted on
/dev/sdb2      btrfs  371G   93G  278G  25% /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 142 05/22/2019
Memory:
24x UNKNOWN NOT AVAILABLE 16 GB 2 rank 2933, configured at 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.

(Continued on next page)
Hewlett Packard Enterprise
(Test Sponsor: HPE)
Synergy 480 Gen10
(2.50 GHz, Intel Xeon Gold 5215M)

SPECspeed2017_fp_base = 90.8
SPECspeed2017_fp_peak = Not Run

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

Compiler Version Notes (Continued)

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
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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)
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
**SPEC CPU2017 Floating Point Speed Result**

**Hewlett Packard Enterprise**
(Test Sponsor: HPE)
Synergy 480 Gen10
(2.50 GHz, Intel Xeon Gold 5215M)

SPECspeed2017_fp_base = 90.8
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<tbody>
<tr>
<td>Test Sponsor: HPE</td>
<td>Hardware Availability: May-2019</td>
</tr>
<tr>
<td>Tested by: HPE</td>
<td>Software Availability: Feb-2019</td>
</tr>
</tbody>
</table>

**Base Portability Flags**

603.bwaves_s: -DSPEC_LP64
607.cactuBSSN_s: -DSPEC_LP64
619.hm_b: -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 -gopt-prefetch
    -ffinite-math-only -gopt-mem-layout-trans=4 -gopenmp -DSPEC_OPENMP
    -gopt-prefetch-issue-excl-hint -ansi-alias -complex-limited-range

Fortran benchmarks:
-DSPEC_OPENMP -xCORE-AVX512 -ipo -O3 -no-prec-div -gopt-prefetch
    -ffinite-math-only -gopt-mem-layout-trans=4 -gopenmp
    -gopt-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 -gopt-prefetch
    -ffinite-math-only -gopt-mem-layout-trans=4 -gopenmp -DSPEC_OPENMP
    -gopt-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 -gopt-prefetch
    -ffinite-math-only -gopt-mem-layout-trans=4 -gopenmp -DSPEC_OPENMP
    -gopt-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
# SPEC CPU2017 Floating Point Speed Result

**Hewlett Packard Enterprise**  
(Test Sponsor: HPE)  
Synergy 480 Gen10  
(2.50 GHz, Intel Xeon Gold 5215M)  

| SPECspeed2017_fp_base = 90.8 | SPECspeed2017_fp_peak = Not Run |

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

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-ic19.0u1-flags-linux64.xml)
- [http://www.spec.org/cpu2017/flags/HPE-Platform-Flags-Intel-V1.2-CLX-revB.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 2019-06-26 18:58:40-0400.  