# SPEC CPU®2017 Floating Point Speed Result

## Hewlett Packard Enterprise

(Test Sponsor: HPE)

**ProLiant DL360 Gen10**

(2.40 GHz, Intel Xeon Gold 6212U)

---

**SPECspeed®2017_fp_base** = 87.8

**SPECspeed®2017_fp_peak** = Not Run

---

### Hardware

- **CPU Name:** Intel Xeon Gold 6212U
- **Max MHz:** 3900
- **Nominal:** 2400
- **Enabled:** 24 cores, 1 chip, 2 threads/core
- **Orderable:** 1 chip
- **Cache L1:**
  - I: 32 KB on chip per core
  - D: 32 KB on chip per core
- **L2:** 1 MB I+D on chip per core
- **L3:** 35.75 MB I+D on chip per chip
- **Memory:** 192 GB (12 x 16 GB 2Rx8 PC4-2666V-R)
- **Storage:** 1 x 400 GB SAS SSD, RAID 0
- **Other:** None

### Software

- **OS:** SUSE Linux Enterprise Server 15 (x86_64)
- **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 U32 02/02/2019 released Apr-2019
- **File System:** xfs
- **System State:** Run level 3 (multi-user)
- **Base Pointers:** 64-bit
- **Peak Pointers:** Not Applicable
- **Other:** None
- **Power Management:** --

---

### Threads

<table>
<thead>
<tr>
<th></th>
<th>SPECspeed®2017_fp_base (87.8)</th>
</tr>
</thead>
<tbody>
<tr>
<td>603.bwaves_s</td>
<td>48</td>
</tr>
<tr>
<td>607.cactuBSSN_s</td>
<td>48</td>
</tr>
<tr>
<td>619.lbm_s</td>
<td>48</td>
</tr>
<tr>
<td>621.wrf_s</td>
<td>48</td>
</tr>
<tr>
<td>627.cam4_s</td>
<td>48</td>
</tr>
<tr>
<td>628.pop2_s</td>
<td>48</td>
</tr>
<tr>
<td>638.imagick_s</td>
<td>48</td>
</tr>
<tr>
<td>644.nab_s</td>
<td>48</td>
</tr>
<tr>
<td>649.fotonik3d_s</td>
<td>48</td>
</tr>
<tr>
<td>654.roms_s</td>
<td>48</td>
</tr>
</tbody>
</table>
## 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>
<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>48</td>
<td>230</td>
<td>257</td>
<td>230</td>
<td>257</td>
<td>230</td>
<td>257</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>607.cactuBSSN_s</td>
<td>48</td>
<td>145</td>
<td>115</td>
<td>144</td>
<td>115</td>
<td>145</td>
<td>115</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>619.lbm_s</td>
<td>48</td>
<td>105</td>
<td>49.7</td>
<td>105</td>
<td>49.8</td>
<td>105</td>
<td>49.8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>621.wrf_s</td>
<td>48</td>
<td>133</td>
<td>99.2</td>
<td>132</td>
<td>99.9</td>
<td>133</td>
<td>100</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>627.cam4_s</td>
<td>48</td>
<td>113</td>
<td>78.6</td>
<td>113</td>
<td>78.3</td>
<td>112</td>
<td>78.7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>628.pop2_s</td>
<td>48</td>
<td>207</td>
<td>57.5</td>
<td>207</td>
<td>57.4</td>
<td>207</td>
<td>57.4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>638.imagick_s</td>
<td>48</td>
<td>194</td>
<td>74.2</td>
<td>194</td>
<td>74.2</td>
<td>194</td>
<td>74.2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>644.nab_s</td>
<td>48</td>
<td>101</td>
<td>173</td>
<td>101</td>
<td>173</td>
<td>101</td>
<td>173</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>649.fotonik3d_s</td>
<td>48</td>
<td>186</td>
<td>49.1</td>
<td>186</td>
<td>49.0</td>
<td>186</td>
<td>49.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>654.roms_s</td>
<td>48</td>
<td>240</td>
<td>65.6</td>
<td>240</td>
<td>65.6</td>
<td>241</td>
<td>65.4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 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.

Submitted_by: "Bucek, James" <james.bucek@hpe.com>
Submitted: Tue Oct 15 17:41:30 EDT 2019
Submission: cpu2017-20190819-16926.sub
Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL360 Gen10
(2.40 GHz, Intel Xeon Gold 6212U)

Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL360 Gen10
(2.40 GHz, Intel Xeon Gold 6212U)

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

SPECSPEED®2017_FP_BASE = 87.8
SPECSPEED®2017_FP_PEAK = Not Run

Platform Notes

BIOS Configuration:
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
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 9bcde8f29999c33d61f64985e45859ea9
running on linux-pe3i Thu Jun 13 03:04:25 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 6212U CPU @ 2.40GHz
  1 "physical id"s (chips)
  48 "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 : 24
siblings : 48
physical 0: cores 0 1 2 3 4 5 6 9 10 11 12 13 16 17 18 19 20 21 24 25 26 27 28 29

From lscpu:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 48
On-line CPU(s) list: 0-47
Thread(s) per core: 2
Core(s) per socket: 24
Socket(s): 1
NUMA node(s): 1
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Gold 6212U CPU @ 2.40GHz
Stepping: 6
CPU MHz: 2400.000
BogoMIPS: 4800.00
Virtualization: VT-x

(Continued on next page)
Hewlett Packard Enterprise
ProLiant DL360 Gen10
(2.40 GHz, Intel Xeon Gold 6212U)

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

SPECspeed®2017_fp_base = 87.8
SPECspeed®2017_fp_peak = Not Run

Platform Notes (Continued)

L1d cache:  32K
L1i cache:  32K
L2 cache:  1024K
L3 cache:  36608K
NUMA node0 CPU(s):  0-47
Flags: fpu vme de pse tsc msr pae mce 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
aperfmonitor tsc_known_freq pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3
sdmb fma cx16 xtpr pdcm pcid dca sse4_1 sse4_2 x2apic movb popcnt
tsc_deadline_timer aes xsave avx f16c rdrand lahf_lm abm 3nowprefetch cpuid_fault
epb cat l3 cd l3 invpcid single intel_patin mba tpr_shadow vmmi flexpriority ept
vpid fsgsbase tsc_adjust bni hle avx2 smep bmi2 erms invpcid rtm cmq mpx rdts a
avx512f avx512dq rdseed adx smap clflushopt clwb intel_pt avx512cd avx512bw avx512vl
xsaveopt xsaves xgetbv1 xsaves cqm llc cqm_occup_llc cqm_mbm_total cqm_mbm_local
ibpb ibrs stibp dtherm ida arat pim pts pku ospke avx512_vnni arch_capabilities ssbd

warning: a numactl 'node' might or might not correspond to a physical chip.

Warning: A numactl 'node' might or might not correspond to a physical chip.

From /proc/cpuinfo cache data
  cache size : 36608 KB

From numactl --hardware

/proc/meminfo
MemTotal: 197717396 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

From /etc/*release*/etc/*version*/
NAME="SLES"
VERSION="15"
PRETTY_NAME="SUSE Linux Enterprise Server 15"
ID="sles"
ID_LIKE="suse"
ANSI_COLOR="0;/32"
CPE_NAME="cpe:/o:suse:sles:15"

(Continued on next page)
Platform Notes (Continued)

uname -a:
    Linux linux-pe3i 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 13 03:01

SPEC is set to: /home/cpu2017_u2
    Filesystem     Type  Size  Used Avail Use% Mounted on
/dev/sda3      xfs  476G   55G  422G  12%  /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 U32 02/02/2019
    Memory:
        12x UNKNOWN NOT AVAILABLE
        12x UNKNOWN NOT AVAILABLE 16 GB 2 rank 2666

(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 19.0.2.187 Build 20190117
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 19.0.2.187 Build 20190117
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

(Continued on next page)
Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL360 Gen10
(2.40 GHz, Intel Xeon Gold 6212U)

SPECSpeed®2017_fp_base = 87.8
SPECSpeed®2017_fp_peak = Not Run

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

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

Compiler Version Notes (Continued)

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.

Fortran, C

C benchmarks:
icc -m64 -std=c11

Fortran benchmarks:
ifort -m64

Base Compiler Invocation

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

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

Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL360 Gen10
(2.40 GHz, Intel Xeon Gold 6212U)

SPECspeed®2017_fp_base = 87.8
SPECspeed®2017_fp_peak = Not Run

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

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

Base Portability Flags (Continued)

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 -03 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP

Fortran benchmarks:
-DSPEC_OPENMP -xCORE-AVX512 -ipo -03 -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 -03 -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 -03 -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-ic19.0u1-flags-linux64-revB.html
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-ic19.0u1-flags-linux64-revB.xml
http://www.spec.org/cpu2017/flags/HPE-Platform-Flags-Intel-V1.2-CLX-revB.xml
<table>
<thead>
<tr>
<th>SPEC CPU®2017 Floating Point Speed Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hewlett Packard Enterprise</td>
</tr>
<tr>
<td>(Test Sponsor: HPE)</td>
</tr>
<tr>
<td>ProLiant DL360 Gen10</td>
</tr>
<tr>
<td>(2.40 GHz, Intel Xeon Gold 6212U)</td>
</tr>
<tr>
<td>SPECsusetm®2017_fp_base = 87.8</td>
</tr>
<tr>
<td>SPECsusetm®2017_fp_peak = Not Run</td>
</tr>
<tr>
<td>CPU2017 License: 3</td>
</tr>
<tr>
<td>Test Sponsor: HPE</td>
</tr>
<tr>
<td>Tested by: HPE</td>
</tr>
<tr>
<td>Test Date: Jun-2019</td>
</tr>
<tr>
<td>Hardware Availability: Apr-2019</td>
</tr>
<tr>
<td>Software Availability: Feb-2019</td>
</tr>
</tbody>
</table>

SPEC CPU and SPECsusetm are registered trademarks of the Standard Performance Evaluation Corporation. All other brand and product names appearing in this result are trademarks or registered trademarks of their respective holders.

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

Tested with SPEC CPU®2017 v1.0.5 on 2019-06-13 03:04:25-0400.
Originally published on 2019-11-04.