## SPEC® CPU2017 Floating Point Speed Result

### Hardware

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU Name</td>
<td>Intel Xeon Gold 6234</td>
</tr>
<tr>
<td>Max MHz.</td>
<td>4000</td>
</tr>
<tr>
<td>Nominal</td>
<td>3300</td>
</tr>
<tr>
<td>Enabled</td>
<td>16 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>24.75 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)</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>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>OS</td>
<td>SUSE Linux Enterprise Server 15 (x86_64)</td>
</tr>
<tr>
<td>Kernel</td>
<td>4.12.14-23-default</td>
</tr>
<tr>
<td>Compiler C/C++</td>
<td>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</td>
</tr>
<tr>
<td>Parallel</td>
<td>Yes</td>
</tr>
<tr>
<td>Firmware</td>
<td>HPE BIOS Version I42 02/02/2019 released Apr-2019</td>
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<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>
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</table>

---

SPECSpeed2017_fp_base = 100
SPECSpeed2017_fp_peak = Not Run

**Test Sponsor:** HPE
**Hardware Availability:** Apr-2019
**Software Availability:** Feb-2019

**Test Date:** Apr-2019

---

### Performance Results

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>SPECspeed2017_fp_base</th>
<th>SPECspeed2017_fp_peak</th>
</tr>
</thead>
<tbody>
<tr>
<td>603.bwaves_s</td>
<td>16</td>
<td>95.9</td>
<td>Not Run</td>
</tr>
<tr>
<td>607.cactuBSSN_s</td>
<td>16</td>
<td>80.8</td>
<td>Not Run</td>
</tr>
<tr>
<td>619.lbm_s</td>
<td>16</td>
<td>90.2</td>
<td>Not Run</td>
</tr>
<tr>
<td>621.wrf_s</td>
<td>16</td>
<td>62.1</td>
<td>Not Run</td>
</tr>
<tr>
<td>627.cam4_s</td>
<td>16</td>
<td>64.6</td>
<td>Not Run</td>
</tr>
<tr>
<td>628.pop2_s</td>
<td>16</td>
<td>70.0</td>
<td>Not Run</td>
</tr>
<tr>
<td>638.imagick_s</td>
<td>16</td>
<td>78.9</td>
<td>Not Run</td>
</tr>
<tr>
<td>644.nab_s</td>
<td>16</td>
<td>131</td>
<td>Not Run</td>
</tr>
<tr>
<td>649.fotonik3d_s</td>
<td>16</td>
<td>133</td>
<td>Not Run</td>
</tr>
<tr>
<td>654.roms_s</td>
<td>16</td>
<td>133</td>
<td>Not Run</td>
</tr>
</tbody>
</table>

---

**CPU2017 License:** 3

---

**Test Sponsor:** HPE
**Test Date:** Apr-2019

---

**Hardware Availability:** Apr-2019
**Software Availability:** Feb-2019
**SPEC CPU2017 Floating Point Speed Result**  
Copyright 2017-2019 Standard Performance Evaluation Corporation

Hewlett Packard Enterprise  
(Test Sponsor: HPE)  
Synergy 480 Gen10  
(3.30 GHz, Intel Xeon Gold 6234)

<table>
<thead>
<tr>
<th>CPU2017 License: 3</th>
<th>SPECspeed2017_fp_base = 100</th>
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</thead>
<tbody>
<tr>
<td>Test Sponsor: HPE</td>
<td>SPECspeed2017_fp_peak = Not Run</td>
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<tr>
<td>Tested by: HPE</td>
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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>
<th>Ratio</th>
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<td>603.bwaves_s</td>
<td>16</td>
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<td>459</td>
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<td>457</td>
<td>129</td>
<td>458</td>
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<tr>
<td>607.cactuBSSN_s</td>
<td>16</td>
<td>175</td>
<td>95.1</td>
<td>174</td>
<td>95.9</td>
<td>174</td>
<td>95.9</td>
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<tr>
<td>619.lbm_s</td>
<td>16</td>
<td>64.8</td>
<td><strong>80.8</strong></td>
<td>64.8</td>
<td>80.9</td>
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<td>80.7</td>
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<tr>
<td>621.wrf_s</td>
<td>16</td>
<td>145</td>
<td>91.1</td>
<td><strong>147</strong></td>
<td>90.2</td>
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<td>87.6</td>
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<tr>
<td>627.cam4_s</td>
<td>16</td>
<td>143</td>
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<td>628.pop2_s</td>
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<tr>
<td>638.imagick_s</td>
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<tr>
<td>644.nab_s</td>
<td>16</td>
<td><strong>134</strong></td>
<td><strong>131</strong></td>
<td>134</td>
<td>131</td>
<td>134</td>
<td>131</td>
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<tr>
<td>649.fotonik3d_s</td>
<td>16</td>
<td>116</td>
<td>78.5</td>
<td>115</td>
<td>79.1</td>
<td><strong>116</strong></td>
<td><strong>78.9</strong></td>
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<tr>
<td>654.roms_s</td>
<td>16</td>
<td>141</td>
<td>111</td>
<td><strong>140</strong></td>
<td><strong>113</strong></td>
<td>139</td>
<td>113</td>
</tr>
</tbody>
</table>

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:
```bash
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)
Hewlett Packard Enterprise
(Test Sponsor: HPE)
Synergy 480 Gen10
(3.30 GHz, Intel Xeon Gold 6234)

SPECsm2017_fp_base = 100
SPECsm2017_fp_peak = Not Run

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

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 9bcde8f29999c33d61f64985e45859ea9
running on sy480g10-2 Fri Apr 26 02:49:08 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 6234 CPU @ 3.30GHz
  2 "physical id"s (chips)
  16 "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 : 8
siblings : 8
physical 0: cores 3 4 11 16 17 24 25 27
physical 1: cores 1 2 4 11 17 24 26 27

From lscpu:
Architecture:       x86_64
CPU op-mode(s):     32-bit, 64-bit
Byte Order:         Little Endian
CPU(s):             16
On-line CPU(s) list: 0-15
Thread(s) per core: 1
Core(s) per socket: 8
Socket(s):          2
NUMA node(s):       2
Vendor ID:          GenuineIntel
CPU family:         6
Model:              85
Model name:         Intel(R) Xeon(R) Gold 6234 CPU @ 3.30GHz
Stepping:           7
CPU MHz:            3300.000
BogoMIPS:           6600.00
Virtualization:     VT-x
L1d cache:          32K

(Continued on next page)
Platform Notes (Continued)

L1i cache: 32K
L2 cache: 1024K
L3 cache: 25344K
NUMA node0 CPU(s): 0-7
NUMA node1 CPU(s): 8-15
Flags: fpu vme de pse tsc msr pae mca cmov
pat pse36 clflush dts ept msr eptius non-stop tsc cpuid
aperf perf tsc_known_freq pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 sse3
sdbg fma cx16 xtrm 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 cdpl kvmid_single intel_ppin mba tpr_shadow vmlinux xonpriority ept
vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rdt_a
avx512f avx512dq rdseed adx smap clflushopt clwb intel_pt avx512cd avx512bw avx512vl
xsaveopt xsave xgetbv1 xsavees cmu llc cmq_occup llc cmq_mbb_total cmq_mbb_local
ibpb ibrs stibp dtherm ida arat ptx pts pku ospke avx512_vnni arch_capabilities ssbd

From /proc/cpuinfo cache data
  cache size : 25344 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
  node 0 size: 193048 MB
  node 0 free: 192508 MB
  node 1 cpus: 8 9 10 11 12 13 14 15
  node 1 size: 193307 MB
  node 1 free: 193105 MB
  node distances:
    node 0 1
    0: 10 21
    1: 21 10

From /proc/meminfo
  MemTotal: 395629068 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_LINUX="suse"

(Continued on next page)
Hewlett Packard Enterprise
(Test Sponsor: HPE)
Synergy 480 Gen10
(3.30 GHz, Intel Xeon Gold 6234)

SPECspeed2017_fp_base = 100
SPECspeed2017_fp_peak = Not Run

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

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

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 Apr 26 02:46
SPEC is set to: /home/cpu2017_u2
   Filesystem Type Size Used Avail Use% Mounted on
   /dev/sdb2 btrfs 371G 89G 282G 24% /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 02/02/2019
   Memory:
      24x UNKNOWN NOT AVAILABLE 16 GB 2 rank 2933
(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
(3.30 GHz, Intel Xeon Gold 6234)

SPEC2017_fp_base = 100
SPEC2017_fp_peak = Not Run

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
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.

==============================================================================
FC  603.bwaves_s(base) 649.fotonik3d_s(base) 654.roms_s(base)
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Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R)
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CC  621.wrf_s(base) 627.cam4_s(base) 628.pop2_s(base)
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Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R)
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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.

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  
(3.30 GHz, Intel Xeon Gold 6234)

<table>
<thead>
<tr>
<th>SPECspeed2017_fp_base</th>
<th>100</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

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

### Base Portability Flags

- 603.bwaves_s: -DSPEC_LP64
- 607.cactuBSSN_s: -DSPEC_LP64
- 619.hm_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 byteincl
- 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
- -qopt-prefetch-issue-excl-hint -ansi-alias -complex-limited-range

**Fortran benchmarks:**
- -DSPEC_OPENMP -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
- -ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp
- -qopt-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 -qopt-prefetch
- -ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP
- -qopt-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 -qopt-prefetch
- -ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP
- -qopt-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-Platform-Flags-Intel-V1.2-CLX-revA.html](http://www.spec.org/cpu2017/flags/HPE-Platform-Flags-Intel-V1.2-CLX-revA.html)
- [http://www.spec.org/cpu2017/flags/HPE-ic19.0u1-flags-linux64.2019-04-03.00.html](http://www.spec.org/cpu2017/flags/HPE-ic19.0u1-flags-linux64.2019-04-03.00.html)
### SPEC CPU2017 Floating Point Speed Result

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(Test Sponsor: HPE)  
**Synergy 480 Gen10**  
(3.30 GHz, Intel Xeon Gold 6234)

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<td>100</td>
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**CPU2017 License:** 3  
**Test Sponsor:** HPE  
**Tested by:** HPE  

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

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-revA.xml](http://www.spec.org/cpu2017/flags/HPE-Platform-Flags-Intel-V1.2-CLX-revA.xml)
- [http://www.spec.org/cpu2017/flags/HPE-ic19.0u1-flags-linux64.2019-04-03.00.xml](http://www.spec.org/cpu2017/flags/HPE-ic19.0u1-flags-linux64.2019-04-03.00.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 2019-04-26 03:49:07-0400.  