**SPEC® CPU2017 Floating Point Speed Result**

**Hewlett Packard Enterprise**  
(Test Sponsor: HPE)  
Synergy 480 Gen10  
(3.00 GHz, Intel Xeon Gold 6154)

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<tr>
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<td>SPECspeed2017_fp_peak</td>
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**Hardware**

- CPU Name: Intel Xeon Gold 6154
- Max MHz.: 3700
- Nominal: 3000
- Enabled: 36 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: 24.75 MB I+D on chip per chip
- Other: None
- Memory: 384 GB (24 x 16 GB 2Rx8 PC4-2666V-R)
- Storage: 1 x 960 GB SSD SATA, RAID 0
- Other: None

**Software**

- OS: SUSE Linux Enterprise Server 12 (x86_64) SP2
- Compiler: C/C++: Version 18.0.0.128 of Intel C/C++ Compiler for Linux; Fortran: Version 18.0.0.128 of Intel Fortran Compiler for Linux
- Parallel: Yes
- System State: Run level 3 (multi-user)
- Base Pointers: 64-bit
- Peak Pointers: 64-bit
- Other: None
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**Results Table**

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
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<tbody>
<tr>
<td>603.bwaves_s</td>
<td>36</td>
<td>121</td>
<td>488</td>
<td>121</td>
<td>487</td>
<td>121</td>
<td>486</td>
</tr>
<tr>
<td>607.cactuBSSN_s</td>
<td>36</td>
<td>107</td>
<td>155</td>
<td>107</td>
<td>156</td>
<td>107</td>
<td>156</td>
</tr>
<tr>
<td>619.lbm_s</td>
<td>36</td>
<td>122</td>
<td>43.0</td>
<td>121</td>
<td>43.1</td>
<td>122</td>
<td>42.9</td>
</tr>
<tr>
<td>621.wrf_s</td>
<td>36</td>
<td>136</td>
<td>97.0</td>
<td>135</td>
<td>97.8</td>
<td>137</td>
<td>96.8</td>
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<tr>
<td>627.cam4_s</td>
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<td>90.8</td>
<td>97.6</td>
<td>90.5</td>
<td>97.9</td>
<td>90.9</td>
<td>97.5</td>
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<tr>
<td>628.pop2_s</td>
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<td>165</td>
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<td>166</td>
<td>71.4</td>
<td>169</td>
<td>70.1</td>
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<td>638.imagick_s</td>
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<td>124</td>
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<tr>
<td>644.nab_s</td>
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<td>75.1</td>
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<td>74.9</td>
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</tr>
<tr>
<td>649.fotonik3d_s</td>
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<td>113</td>
<td>80.8</td>
<td>112</td>
<td>81.5</td>
<td>112</td>
<td>81.6</td>
</tr>
<tr>
<td>654.roms_s</td>
<td>36</td>
<td>139</td>
<td>113</td>
<td>140</td>
<td>113</td>
<td>140</td>
<td>112</td>
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SPECspeed2017_fp_base = 119
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/lib/ia32/:/home/cpu2017/lib/intel64/:/home/cpu2017/je5.0.1-32"
LD_LIBRARY_PATH = "$LD_LIBRARY_PATH:/home/cpu2017/je5.0.1-64"
OMP_STACKSIZE = "192M"

Binaries compiled on a system with 1x Intel Core i7-4790 CPU + 32GB RAM
memory using Redhat Enterprise Linux 7.4

**Platform Notes**

BIOS Configuration:
Intel Hyperthreading set to Disabled
Thermal Configuration set to Maximum Cooling
Memory Patrol Scrubbing set to Disabled
LLC Prefetcher set to Enabled
LLC Dead Line Allocation set to Disabled
Stale A to S set to Disabled
Workload Profile set to General Peak Frequency Compute

(Continued on next page)
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**CPU2017 License:** 3  
**Test Sponsor:** HPE  
**Tested by:** HPE  
**Test Date:** Oct-2017  
**Hardware Availability:** Oct-2017  
**Software Availability:** Sep-2017

**Platform Notes (Continued)**

- Energy/Performance Bias set to Maximum Performance
- Uncore Frequency Scaling set to Auto
- Workload Profile set to General Peak Frequency Compute
- NUMA Group Size Optimization set to Flat

```
Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r5797 of 2017-06-14 96c45e4568ad54c135fd618bcc091c0f
running on linux-0f29 Thu Oct 26 16:18:52 2017

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 6154 CPU @ 3.00GHz
   2 "physical id"s (chips)
   36 "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 : 18
   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):                36
On-line CPU(s) list:   0-35
Thread(s) per core:    1
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 6154 CPU @ 3.00GHz
Stepping:              4
CPU MHz:               2992.986
BogoMIPS:              5985.97
Virtualization:        VT-x
L1d cache:             32K
L1i cache:             32K
L2 cache:              1024K
L3 cache:              25344K
NUMA node0 CPU(s):     0-17
```

(Continued on next page)
Platform Notes (Continued)

NUMA node1 CPU(s): 18-35

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 art arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc aperfmperf eagerfpu pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16 xtpm pcid dca sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave avx f16c rdrand lahf_lm abm 3dnowprefetch ida arat epb pln pts dtherm intel_pt tpr_shadow vnmi flexpriority vpd fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2  erts invpcid rtm cqm mpx avx512f avx512dq rdseed adx smap clflushopt clwb avx512cd avx512bw avx512vl xsaveopt xsaves xgetbv1 cqm_llc cqm_occup_llc

`/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 8 9 10 11 12 13 14 15 16 17
- node 0 size: 193116 MB
- node 0 free: 189602 MB
- node 1 cpus: 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35
- node 1 size: 193532 MB
- node 1 free: 191633 MB
- node distances:
  - node 0 1
  - 0: 10 21
  - 1: 21 10

From `/proc/meminfo`

- MemTotal: 395928244 kB
- HugePages_Total: 0
- Hugepagesize: 2048 kB

From `/usr/bin/lsb_release -d`

- SUSE Linux Enterprise Server 12 SP2

From `/etc/*release*` /`etc/*version*`

- SuSE-release:
  - SUSE Linux Enterprise Server 12 (x86_64)
  - VERSION = 12
  - PATCHLEVEL = 2
  - # This file is deprecated and will be removed in a future service pack or release.
  - # Please check `/etc/os-release` for details about this release.
- os-release:
  - NAME="SLES"
  - VERSION="12-SP2"
  - VERSION_ID="12.2"

(Continued on next page)
Platform Notes (Continued)

PRETTY_NAME="SUSE Linux Enterprise Server 12 SP2"
ID="sles"
ANSI_COLOR="0;32"
CPE_NAME="cpe:/o:suse:sles:12:sp2"

uname -a:
    Linux linux-0f29 4.4.21-69-default #1 SMP Tue Oct 25 10:58:20 UTC 2016 (9464f67)
    x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Oct 26 13:36

SPEC is set to: /home/cpu2017
Filesystem Type Size Used Avail Use% Mounted on
/dev/sda4 xfs 852G 15G 837G 2% /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 I42 08/19/2017
    Memory:
    24x UNKNOWN NOT AVAILABLE 16 GB 2 rank 2666

(End of data from sysinfo program)
**Compiler Version Notes (Continued)**

```plaintext
FC  603.bwaves_s(base) 649.fotonik3d_s(base) 654.roms_s(base)
    ifort (IFORT) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.

CC  621.wrf_s(base) 627.cam4_s(base) 628.pop2_s(base)
    ifort (IFORT) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
iccc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
```

---

**Base Compiler Invocation**

- **C benchmarks:** icc
- **Fortran benchmarks:** ifort
- **Benchmarks using both Fortran and C:** ifort icc
- **Benchmarks using Fortran, C, and C++:** icpc icc ifort

---

**Base Portability Flags**

```plaintext
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
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**Base Optimization Flags**

**C benchmarks:**
- -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
- -qopt-mem-layout-trans=3 -qopenmp -DSPEC_OPENMP

**Fortran benchmarks:**
- -DSPEC_OPENMP -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch
- -ffinite-math-only -qopt-mem-layout-trans=3 -qopenmp
- -nostandard-realloc-lhs -align array32byte

**Benchmarks using both Fortran and C:**
- -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
- -qopt-mem-layout-trans=3 -qopenmp -DSPEC_OPENMP
- -nostandard-realloc-lhs -align array32byte

**Benchmarks using Fortran, C, and C++:**
- -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
- -qopt-mem-layout-trans=3 -qopenmp -DSPEC_OPENMP
- -nostandard-realloc-lhs -align array32byte

**Base Other Flags**

**C benchmarks:**
- -m64 -std=c11

**Fortran benchmarks:**
- -m64

**Benchmarks using both Fortran and C:**
- -m64 -std=c11

**Benchmarks using Fortran, C, and C++:**
- -m64 -std=c11

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-SKX-revD.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-SKX-revD.xml
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| Test Date:          | Oct-2017 |
| Hardware Availability: | Oct-2017 |
| Software Availability: | Sep-2017 |

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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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