# SPEC® CPU2017 Floating Point Speed Result

**Hewlett Packard Enterprise**  
(Test Sponsor: HPE)  
**Synergy 480 Gen10**  
(3.60 GHz, Intel Xeon Platinum 8156)

| SPECspeed2017_fp_base = | 53.8 |
| SPECspeed2017_fp_peak = | Not Run |

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

**Threads**

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>SPECspeed</th>
</tr>
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<tbody>
<tr>
<td>603.bwaves_s</td>
<td>8</td>
<td>52.6</td>
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<td>8</td>
<td>34.1</td>
</tr>
<tr>
<td>619.lbm_s</td>
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<td>47.6</td>
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<tr>
<td>621.wrf_s</td>
<td>8</td>
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<tr>
<td>627.cam4_s</td>
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<td>43.4</td>
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<tr>
<td>628.pop2_s</td>
<td>8</td>
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</tr>
<tr>
<td>638.imagick_s</td>
<td>8</td>
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<tr>
<td>644.nab_s</td>
<td>8</td>
<td>62.0</td>
</tr>
<tr>
<td>649.fotonik3d_s</td>
<td>8</td>
<td>55.5</td>
</tr>
</tbody>
</table>

**Hardware**

- **CPU Name**: Intel Xeon Platinum 8156  
- **Max MHz.**: 3700  
- **Nominal**: 3600  
- **Enabled**: 8 cores, 2 chips  
- **Orderable**: 1, 2 chip(s)  
- **Cache L1**: 32 KB I + 32 KB D on chip per core  
- **Cache L2**: 1 MB I+D on chip per core  
- **Cache L3**: 16.5 MB I+D on chip per chip  
- **Other**: None  
- **Memory**: 384 GB (24 x 16 GB 2Rx8 PC4-2666V-R)  
- **Storage**: 1 x 480 GB SATA SSD, RAID 0  
- **Other**: None

**Software**

- **OS**: Red Hat Enterprise Linux Server release 7.3 (Maipo)  
- **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  
- **Firmware**: HPE BIOS Version I42 released Nov-2017 (tested with I42 11/14/2017)  
- **File System**: xfs  
- **System State**: Run level 3 (multi-user)  
- **Base Pointers**: 64-bit  
- **Peak Pointers**: Not Applicable  
- **Other**: None
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SPECspeed2017_fp_base = 53.8
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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>
<th>Base</th>
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<th>Seconds</th>
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<th>Peak</th>
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</tr>
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</table>

SPECspeed2017_fp_base = 53.8
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
Filesystem page cache cleared with:
shell invocation of 'sync; echo 3 > /proc/sys/vm/drop_caches' prior to run
irqbalance disabled with "systemctl stop irqbalance"
tuned profile set with "tuned-adm profile throughput-performance"

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:/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

Intel Hyperthreading set to Disabled
Thermal Configuration set to Maximum Cooling
LLC Prefetch set to Enabled
LLC Dead Line Allocation set to Disabled
Memory Patrol Scrubbing set to Disabled
Workload Profile set to General Peak Frequency Compute
Energy/Performance Bias set to Maximum Performance

(Continued on next page)
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CPU2017 License: 3
Test Sponsor: HPE
Tested by: HPE

Test Date: Dec-2017
Hardware Availability: Nov-2017
Software Availability: Sep-2017

Platform Notes (Continued)

Workload Profile set to Custom
NUMA Group Size Optimization set to Flat
Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r5797 of 2017-06-14 96c45e4568ad54c135fd618bcc091c0f
running on SY480_M3_RHEL Sat Dec 2 04:08:07 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) Platinum 8156 CPU @ 3.60GHz
  2 "physical id"s (chips)
  8 "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 : 4
siblings : 4
physical 0: cores 1 2 5 11
physical 1: cores 1 5 9 13
```

From lscpu:

```
Architecture:          x86_64
CPU op-mode(s):        32-bit, 64-bit
Byte Order:            Little Endian
CPU(s):                8
On-line CPU(s) list:   0-7
Thread(s) per core:    1
Core(s) per socket:    4
Socket(s):             2
NUMA node(s):          2
Vendor ID:             GenuineIntel
CPU family:            6
Model:                 85
Model name:            Intel(R) Xeon(R) Platinum 8156 CPU @ 3.60GHz
Stepping:              4
CPU MHz:               3600.000
BogoMIPS:              7207.36
Virtualization:        VT-x
L1d cache:             32K
L1i cache:             32K
L2 cache:              1024K
L3 cache:              16896K
NUMA node0 CPU(s):     0-3
NUMA node1 CPU(s):     4-7
```

/proc/cpuinfo cache data

(Continued on next page)
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<tr>
<td>3</td>
<td>Dec-2017</td>
<td>HPE</td>
<td>Nov-2017</td>
<td>HPE</td>
<td>Sep-2017</td>
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Platform Notes (Continued)

cache size : 16896 KB

From numactl --hardware WARNING: a numactl 'node' might or might not correspond to a physical chip.

From /proc/meminfo
MemTotal: 395933564 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

From /etc/*release* /etc/*version*
os-release:
   NAME="Red Hat Enterprise Linux Server"
   VERSION="7.3 (Maipo)"
   ID="rhel"
   ID_LIKE="fedora"
   VERSION_ID="7.3"
   PRETTY_NAME="Red Hat Enterprise Linux Server 7.3 (Maipo)"
   ANSI_COLOR="0;31"
   CPE_NAME="cpe:/o:redhat:enterprise_linux:7.3:GA:server"
   redhat-release: Red Hat Enterprise Linux Server release 7.3 (Maipo)
   system-release: Red Hat Enterprise Linux Server release 7.3 (Maipo)

uname -a:
Linux SY480_M3_RHEL 3.10.0-514.el7.x86_64 #1 SMP Wed Oct 19 11:24:13 EDT 2016 x86_64 x86_64 GNU/Linux

run-level 3 Dec 2 04:03

SPEC is set to: /home/cpu2017
Filesystem  Type Size Used Avail Use% Mounted on
/dev/mapper/rhel-home xfs 392G 25G 368G 7% /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 SM BIOS" standard.

BIOS HPE I42 11/14/2017
Memory:
   24x UNKNOWN NOT AVAILABLE 16 GB 2 rank 2666

(End of data from sysinfo program)
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### Compiler Version Notes

```plaintext
==============================================================================
CC  619.lbm_s(base) 638.imagick_s(base) 644.nab_s(base)
-------------------------------------------------------------------------------------------------
icc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
-------------------------------------------------------------------------------------------------
FC  607.cactuBSSN_s(base)
-------------------------------------------------------------------------------------------------
icpc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
icc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
ifort (IFORT) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
-------------------------------------------------------------------------------------------------
FC  603.bwaves_s(base) 649.fotonik3d_s(base) 654.roms_s(base)
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ifort (IFORT) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
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icc (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

(Continued on next page)
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Base Compiler Invocation (Continued)

Benchmarks using Fortran, C, and C++:
icpc icc ifort

Base Portability Flags

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

Base Optimization Flags

C benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qpopt-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
-qpopt-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
-qpopt-mem-layout-trans=3 -qopenmp -DSPEC_OPENMP
-nostandard-realloc-lhs -align array32byte
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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-revH.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-revH.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 v1.0.2 on 2017-12-01 17:38:07-0500.