## SPEC® CPU2017 Floating Point Speed Result

**Hewlett Packard Enterprise**  
(Test Sponsor: HPE)  
ProLiant DL360 Gen10  
(2.70 GHz, Intel Xeon Gold 6150)  

<table>
<thead>
<tr>
<th>SPECspeed2017_fp_base</th>
<th>115</th>
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<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:** Oct-2017  
**Hardware Availability:** Oct-2017  
**Software Availability:** Sep-2017

### Threads

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>603.bwaves_s</td>
<td>36</td>
<td>1352</td>
</tr>
<tr>
<td>607.cactuBSSN_s</td>
<td>36</td>
<td>427</td>
</tr>
<tr>
<td>619.lbm_s</td>
<td>36</td>
<td>92.9</td>
</tr>
<tr>
<td>621.wrf_s</td>
<td>36</td>
<td>83.2</td>
</tr>
<tr>
<td>627.cam4_s</td>
<td>36</td>
<td>93.3</td>
</tr>
<tr>
<td>628.pop2_s</td>
<td>36</td>
<td>92.9</td>
</tr>
<tr>
<td>638.imagick_s</td>
<td>36</td>
<td>111</td>
</tr>
<tr>
<td>644.nab_s</td>
<td>36</td>
<td>208</td>
</tr>
<tr>
<td>649.fotonik3d_s</td>
<td>36</td>
<td>111</td>
</tr>
<tr>
<td>654.roms_s</td>
<td>36</td>
<td>208</td>
</tr>
</tbody>
</table>

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### Hardware

**CPU Name:** Intel Xeon Gold 6150  
**Max MHz.:** 3700  
**Nominal:** 2700  
**Enabled:** 36 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:** 24.75 MB I+D on chip per chip  
**Memory:** 192 GB (24 x 8 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),  
**Kernel:** 3.10.0-514.el7.x86_64  
**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:** Compiler for Linux  
**Parallel:** Yes  
**Firmware:** HPE BIOS Version U32 released Oct-2017 (tested with U32 9/29/2017)  
**File System:** xfs  
**System State:** Run level 3 (multi-user)  
**Base Pointers:** 64-bit  
**Peak Pointers:** Not Applicable  
**Other:** None
## SPEC CPU2017 Floating Point Speed Result

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### Hewlett Packard Enterprise
**Test Sponsor:** HPE  
**ProLiant DL360 Gen10**  
**(2.70 GHz, Intel Xeon Gold 6150)**

| SPECspeed2017_fp_base | 115 |
| SPECspeed2017_fp_peak | Not Run |

#### 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>
</tr>
</thead>
<tbody>
<tr>
<td>603.bwaves_s</td>
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<tr>
<td>607.cactuBSSN_s</td>
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<td>109</td>
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<tr>
<td>619.lbm_s</td>
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<tr>
<td>621.wrf_s</td>
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<td>93.0</td>
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<td>92.9</td>
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<tr>
<td>627.cam4_s</td>
<td>36</td>
<td>95.2</td>
<td>93.1</td>
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<td>93.3</td>
<td>95.0</td>
<td>93.3</td>
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<tr>
<td>628.pop2_s</td>
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<td>171</td>
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<td>70.0</td>
<td>172</td>
<td>69.2</td>
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</tr>
<tr>
<td>638.imagick_s</td>
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<td>126</td>
<td>114</td>
<td>114</td>
<td>126</td>
<td>114</td>
<td></td>
</tr>
<tr>
<td>644.nab_s</td>
<td>36</td>
<td>83.8</td>
<td>208</td>
<td>83.9</td>
<td>208</td>
<td>84.0</td>
<td>208</td>
</tr>
<tr>
<td>649.fotonik3d_s</td>
<td>36</td>
<td>109</td>
<td>83.4</td>
<td>83.2</td>
<td>110</td>
<td>83.1</td>
<td></td>
</tr>
<tr>
<td>654.roms_s</td>
<td>36</td>
<td>141</td>
<td>111</td>
<td>111</td>
<td>142</td>
<td>111</td>
<td></td>
</tr>
</tbody>
</table>

#### 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 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/specuser/cpu2017/lib/ia32:/home/specuser/cpu2017/lib/intel64"  
LD_LIBRARY_PATH = "$LD_LIBRARY_PATH:/home/specuser/cpu2017/je5.0.1-32:/home/specuser/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  
Workload Profile set to General Peak Frequency Compute

(Continued on next page)
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**SPECspeed2017_fp_base = 115**

**SPECspeed2017_fp_peak = Not Run**

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**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/specuser/cpu2017/bin/sysinfo
Rev: r5797 of 2017-06-14 96c45e4568ad54c135fd618bcc091c0f
running on dl360Gen10rhei73Unit2 Sun Oct 15 12:53:10 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 6150 CPU @ 2.70GHz
- 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: LittleEndian
- 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 6150 CPU @ 2.70GHz
- Stepping: 4
- CPU MHz: 2700.000
- BogoMIPS: 5405.50
- 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)
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Hewlett Packard Enterprise (Test Sponsor: HPE)
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Platform Notes (Continued)

NUMA node1 CPU(s): 18–35

/proc/cpuinfo cache data
  cache size : 25344 KB

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

From /proc/meminfo
  MemTotal: 197571680 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 dl360Gen10rhel73Unit2 3.10.0-514.el7.x86_64 #1 SMP Wed Oct 19 11:24:13 EDT 2016
  x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Oct 13 13:15

SPEC is set to: /home/specuser/cpu2017

Filesystem Type Size Used Avail Use% Mounted on
/dev/mapper/rhel-home xfs 392G 36G 357G 10% /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 09/29/2017
  Memory:
    24x UNKNOWN NOT AVAILABLE 8 GB 2 rank 2666

(End of data from sysinfo program)
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Compiler Version Notes

==============================================================================
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.
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FC  603.bwaves_s(base) 649.fotonik3d_s(base) 654.roms_s(base)
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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)
Base Compiler Invocation (Continued)

Benmarks 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
-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
Hewlett Packard Enterprise
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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-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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For questions about this result, please contact the tester. For other inquiries, please contact info@spec.org.

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