### SPEC CPU®2017 Floating Point Speed Result

**Hewlett Packard Enterprise**
(Test Sponsor: HPE)
ProLiant DL360 Gen10
(2.30 GHz, Intel Xeon Gold 5218B)

| SPECspeed®2017_fp_base = | 114 |
| SPECspeed®2017_fp_peak = | Not Run |

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

**Threads**

<table>
<thead>
<tr>
<th>SPECspeed®2017_fp_base (114)</th>
</tr>
</thead>
<tbody>
<tr>
<td>603.bwaves_s 64</td>
</tr>
<tr>
<td>607.cactuBSSN_s 64</td>
</tr>
<tr>
<td>619.lbm_s 64</td>
</tr>
<tr>
<td>621.wrf_s 64</td>
</tr>
<tr>
<td>627.cam4_s 64</td>
</tr>
<tr>
<td>628.pop2_s 64</td>
</tr>
<tr>
<td>638.imagick_s 64</td>
</tr>
<tr>
<td>644.nab_s 64</td>
</tr>
<tr>
<td>649.fotonik3d_s 64</td>
</tr>
<tr>
<td>654.roms_s 64</td>
</tr>
</tbody>
</table>

**Hardware**

| CPU Name: | Intel Xeon Gold 5218B |
| Max MHz: | 3900 |
| Nominal: | 2300 |
| Enabled: | 32 cores, 2 chips, 2 threads/core |
| 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: | 22 MB I+D on chip per chip |
| Other: | None |
| Memory: | 384 GB (24 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 05/21/2019 released Apr-2019 |
| System State: | Run level 3 (multi-user) |
| Base Pointers: | 64-bit |
| Peak Pointers: | Not Applicable |
| Other: | None |
| Power Management: | -- |
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Test Date: Jul-2019
Hardware Availability: Apr-2019
Software Availability: Feb-2019

Results Table

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</table>

SPECspeed®2017_fp_base = 114
SPECspeed®2017_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
Filesyste 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.

Platform Notes

BIOS Configuration:
Thermal Configuration set to Maximum Cooling
Memory Patrol Scrubbing set to Disabled

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

Platform Notes (Continued)

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 9bce8f2999c33d61f64985e45859ea9
running on linux-pe3i Thu Jul 11 15:37:56 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 5218 CPU @ 2.30GHz
    2 "physical id"s (chips)
    64 "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 : 16
        siblings : 32
        physical 0: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
        physical 1: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

From lscpu:
    Architecture: x86_64
    CPU op-mode(s): 32-bit, 64-bit
    Byte Order: Little Endian
    CPU(s): 64
    On-line CPU(s) list: 0-63
    Thread(s) per core: 2
    Core(s) per socket: 16
    Socket(s): 2
    NUMA node(s): 2
    Vendor ID: GenuineIntel
    CPU family: 6
    Model: 85
    Model name: Intel(R) Xeon(R) Gold 5218 CPU @ 2.30GHz
    Stepping: 6
    CPU MHz: 2300.000
    BogoMIPS: 4600.00
    Virtualization: VT-x
    L1d cache: 32K
    L1i cache: 32K

(Continued on next page)
Platform Notes (Continued)

L2 cache: 1024K
L3 cache: 22528K
NUMA node0 CPU(s): 0-15,32-47
NUMA node1 CPU(s): 16-31,48-63
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 cpuid
aperfmperf tsc_known_freq pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3
sdbg fma cx16 xtpr 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_i3 cd_p3 invpcid_single intel_ppin mba tpr_shadow vmm vfnl flexpriority ept
vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erva invpcl cdqm rtm cqm mpx rdt_a
avx512f avx512dq rdseed adx smap clflushopt clwb intel_pt avx512cd avx512bw avx512vl
xsaveopt xsave xgetbv1 xsavec qm llc qm_occupy llc qm_mb_total qm_mb_local
ibpb ibrs stibp dtherm ida arat pln pts pkup ospace avx512_vnni arch_capabilities ssbd

/proc/cpuinfo cache data
    cache size: 22528 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 32 33 34 35 36 37 38 39 40 41 42 43
    44 45 46 47
    node 0 size: 193087 MB
    node 0 free: 192365 MB
    node 1 cpus: 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 48 49 50 51 52 53 54 55 56
    57 58 59 60 61 62 63
    node 1 size: 193528 MB
    node 1 free: 193331 MB
    node distances:
    node  0  1
    0: 10 21
    1: 21 10

From /proc/meminfo
    MemTotal: 395895480 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"

(Continued on next page)
Platform Notes (Continued)

ID_LIKE="suse"
ANSI_COLOR="0;32"
CPE_NAME="cpe:/o:suse:sles:15"

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 Jul 11 15:35
SPEC is set to: /home/cpu2017_u2
  Filesystem Type  Size  Used Avail Use% Mounted on
  /dev/sda3      xfs   476G   59G  418G  13% /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 05/21/2019
Memory:
    24x UNKNOWN NOT AVAILABLE 16 GB 2 rank 2666

(End of data from sysinfo program)
The marketing name for the processor in this result, which appears in the CPU name and hardware model areas, is different from sysinfo because a pre-production processor was used. The pre-production processor differs from the production processor in name only.

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

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) 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.

Fortran, C

---
Fortran, C      | 603.bwaves_s(base) 649.fotonik3d_s(base) 654.roms_s(base)
---
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.

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
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Software Availability: Feb-2019

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-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP

Fortran benchmarks:
-DSPEC_OPENMP -xCORE-AVX512 -ipo -O3 -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 -O3 -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 -O3 -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-Platform-Flags-Intel-V1.2-CLX-revB.html
http://www.spec.org/cpu2017/flags/HPE-ic19.0u1-flags-linux64.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-CLX-revB.xml
http://www.spec.org/cpu2017/flags/HPE-ic19.0u1-flags-linux64.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 CPU®2017 v1.0.5 on 2019-07-11 15:37:55-0400.  
Originally published on 2019-11-04.