Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL580 Gen10
(2.10 GHz, Intel Xeon Gold 6230)

| SPECspeed2017_fp_base = | 174 |
| SPECspeed2017_fp_peak = | Not Run |

CPU2017 License: 3 Test Sponsor: HPE
Tested by: HPE Software Availability: Feb-2019

| Test Date: | Jun-2019 |
| Hardware Availability: | Apr-2019 |

<table>
<thead>
<tr>
<th>Hardware</th>
<th>Software</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU Name: Intel Xeon Gold 6230</td>
<td>OS: SUSE Linux Enterprise Server 15 (x86_64)</td>
</tr>
<tr>
<td>Max MHz.: 3900</td>
<td>Kernel 4.12.14-23-default</td>
</tr>
<tr>
<td>Nominal: 2100</td>
<td>Compiler: C/C++: Version 19.0.2.187 of Intel C/C++</td>
</tr>
<tr>
<td>Enabled: 80 cores, 4 chips</td>
<td>Compiler Build 20190117 for Linux;</td>
</tr>
<tr>
<td>Orderable: 1, 2, 3, 4 chip(s)</td>
<td>Fortran: Version 19.0.2.187 of Intel Fortran</td>
</tr>
<tr>
<td>Cache L1: 32 KB I + 32 KB D on chip per core</td>
<td>Compiler Build 20190117 for Linux</td>
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<tr>
<td>L2: 1 MB I+D on chip per core</td>
<td>Parallel: Yes</td>
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<tr>
<td>L3: 27.5 MB I+D on chip per chip</td>
<td>Firmware: HPE BIOS Version U34 02/02/2019 released Apr-2019</td>
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<tr>
<td>Other: None</td>
<td>File System: xfs</td>
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<tr>
<td>Memory: 768 GB (24 x 32 GB 2Rx4 PC4-2666V-R)</td>
<td>System State: Run level 3 (multi-user)</td>
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<tr>
<td>Storage: 1 x 400 GB SAS SSD, RAID 0</td>
<td>Base Pointers: 64-bit</td>
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<tr>
<td>Other: None</td>
<td>Peak Pointers: Not Applicable</td>
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| Software Availability: | Feb-2019 |
| Other: None |

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<tr>
<th>Threads</th>
<th>SPECspeed2017_fp_base (174)</th>
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<tbody>
<tr>
<td>603.bwaves_s</td>
<td>80</td>
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<tr>
<td>607.cactuBSSN_s</td>
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<tr>
<td>619.lbm_s</td>
<td>80</td>
</tr>
<tr>
<td>621.wrf_s</td>
<td>80</td>
</tr>
<tr>
<td>627.cam4_s</td>
<td>80</td>
</tr>
<tr>
<td>628.pop2_s</td>
<td>80</td>
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<tr>
<td>638.imagick_s</td>
<td>80</td>
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<tr>
<td>644.nab_s</td>
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<tr>
<td>649.fotonik3d_s</td>
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<td>654.roms_s</td>
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| SPECspeed2017_fp_base | 174 |
| SPECspeed2017_fp_peak | Not Run |
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Test Sponsor: HPE
Tested by: HPE

SPECspeed2017_fp_base = 174
SPECspeed2017_fp_peak = Not Run

Results Table

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</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:
    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)
SPEC CPU2017 Floating Point Speed Result
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Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL580 Gen10
(2.10 GHz, Intel Xeon Gold 6230)

SPECspeed2017_fp_base = 174
SPECspeed2017_fp_peak = Not Run

CPU2017 License: 3
Test Date: Jun-2019
Test Sponsor: HPE
Hardware Availability: Apr-2019
Tested by: HPE
Software Availability: Feb-2019

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 9bcedef2999c33d61f64985e45859ea9
running on linux-sypg Thu Jul 26 23:34:19 2018

From /proc/cpuinfo

model name : Intel(R) Xeon(R) Gold 6230 CPU @ 2.10GHz
  4 "physical id"s (chips)
  80 "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 : 20
siblings : 20
physical 0: cores 0 1 2 3 4 8 9 10 11 12 16 17 18 19 20 24 25 26 27 28
physical 1: cores 0 1 2 3 4 8 9 10 11 12 16 17 18 19 20 24 25 26 27 28
physical 2: cores 0 1 2 3 4 8 9 10 11 12 16 17 18 19 20 24 25 26 27 28
physical 3: cores 0 1 2 3 4 8 9 10 11 12 16 17 18 19 20 24 25 26 27 28

From lscpu:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 80
On-line CPU(s) list: 0-79
Thread(s) per core: 1
Core(s) per socket: 20
Socket(s): 4
NUMA node(s): 4
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Gold 6230 CPU @ 2.10GHz
Stepping: 7
CPU MHz: 2100.000
BogoMIPS: 4200.00

(Continued on next page)
Hewlett Packard Enterprise
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Sigma

SPECspeed2017_fp_base = 174
SPECspeed2017_fp_peak = Not Run

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

CPU2017 License: 3
Test Date: Jun-2019
Hardware Availability: Apr-2019
Software Availability: Feb-2019

Platform Notes (Continued)

Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 28160K
NUMA node0 CPU(s): 0-19
NUMA node1 CPU(s): 20-39
NUMA node2 CPU(s): 40-59
NUMA node3 CPU(s): 60-79
Flags: fpu vme de pse tsc msr pae mce cmov 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 xtpdr 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_13 cdp_13 invpcid_single intel_pmap mca tpr_shadow vmx est tm2 ssse3 ssdbg fma cx16 xtpdr 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_13 cdp_13 invpcid_single intel_pmap mca tpr_shadow vmx est tm2 ssse3

/proc/cpuinfo cache data

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

available: 4 nodes (0-3)
node 0 cpus: 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19
node 0 size: 193117 MB
node 0 free: 192573 MB
node 1 cpus: 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39
node 1 size: 193503 MB
node 1 free: 193339 MB
node 2 cpus: 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59
node 2 size: 193532 MB
node 2 free: 193155 MB
node 3 cpus: 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79
node 3 size: 193530 MB
node 3 free: 193360 MB
node distances:
node distances:
node 0 1 2 3
0: 10 21 21 21
1: 21 10 21 21
2: 21 21 10 21
3: 21 21 21 10

From /proc/meminfo

(Continued on next page)
Platform Notes (Continued)

MemTotal:       792251496 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_LIKE="suse"
    ANSI_COLOR="0;32"
    CPE_NAME="cpe:/o:suse:sles:15"

uname -a:
  Linux linux-sypg 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 26 23:32

SPEC is set to: /home/cpu2017_u2
  Filesystem     Type  Size  Used Avail Use% Mounted on
  /dev/sda1      xfs   894G   68G  827G   8% /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 U34 02/02/2019
  Memory:
    24x UNKNOWN NOT AVAILABLE
    24x UNKNOWN NOT AVAILABLE 32 GB 2 rank 2666

(End of data from sysinfo program)
SPEC CPU2017 Floating Point Speed Result

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Test Date: Jun-2019
Hardware Availability: Apr-2019
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SPECspeed2017_fp_base = 174
SPECspeed2017_fp_peak = Not Run

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.
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
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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
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Base Compiler Invocation

C benchmarks:
icc -m64 -std=c11

(Continued on next page)
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| Test Sponsor: | HPE |
| Tested by: | HPE |

**Base Compiler Invocation (Continued)**

```plaintext
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
```

**Base Portability Flags**

- `603.bwaves_s: -DSPEC_LP64`
- `607.caesar: -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 -03 -no-prec-div -qopt-prefetch`
- `-ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP`

Fortran benchmarks:
- `-DSPEC_OPENMP -xCORE-AVX512 -ipo -03 -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 -03 -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 -03 -no-prec-div -qopt-prefetch`
- `-ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP`

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

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</tr>
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</table>

### Base Optimization Flags (Continued)

Benchmarks using Fortran, C, and C++ (continued):
- -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

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

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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 2018-07-26 23:34:18-0400.  
Originally published on 2019-06-25.