**SPEC® CPU2017 Floating Point Rate Result**

**Hewlett Packard Enterprise**  
(Test Sponsor: HPE)  
ProLiant DL360 Gen10  
(3.30 GHz, Intel Xeon Gold 6246)

**SPECrate2017_fp_base = 184**  
**SPECrate2017_fp_peak = Not Run**

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

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<tr>
<td>554.roms_r 48</td>
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</tbody>
</table>

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**Hardware**

- **CPU Name:** Intel Xeon Gold 6246  
- **Max MHz.:** 4200  
- **Nominal:** 3300  
- **Enabled:** 24 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:** 24.75 MB I+D on chip per chip  
- **Other:** None  
- **Memory:** 384 GB (24 x 16 GB 2Rx8 PC4-2933Y-R)  
- **Storage:** 1 x 400 GB SAS SSD, RAID 0  
- **Other:** None

**Software**

- **OS:** SUSE Linux Enterprise Server 15 (x86_64)  
- **Kernel:** 4.12.14-23-default  
- **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:** No  
- **Firmware:** HPE BIOS Version U32 05/21/2019 released Apr-2019  
- **File System:** xfs  
- **System State:** Run level 3 (multi-user)  
- **Base Pointers:** 64-bit  
- **Peak Pointers:** Not Applicable  
- **Other:** None
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Hardware Availability: Apr-2019
Software Availability: Feb-2019

Results Table

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Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

Submit Notes

The numactl mechanism was used to bind copies to processors. The config file option 'submit' was used to generate numactl commands to bind each copy to a specific processor. For details, please see the config file.

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
runcpu command invoked through numactl i.e.:
numactl --interleave=all runcpu <etc>

General Notes

Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH = "/home/cpu2017_u2/lib/ia32:/home/cpu2017_u2/lib/intel64"

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.

(Continued on next page)
General Notes (Continued)

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
LLC Prefetch set to Enabled
LLC Dead Line Allocation set to Disabled
Enhanced Processor Performance set to Enabled
Workload Profile set to General Throughput Compute
Workload Profile set to Custom
Energy/Performance Bias set to Balanced Performance

Sysinfo program /home/cpu2017_u2/bin/sysinfo
Rev: r5974 of 2018-05-19 9bcde8f2999c33d61f64985e45859ea9
running on linux-nub3 Wed Jul 17 04:04:17 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 6246 CPU @ 3.30GHz
   2 "physical id"s (chips)
   48 "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 : 12
siblings : 24
physical 0: cores 1 2 4 8 9 10 11 16 17 19 26 27
physical 1: cores 0 2 4 8 9 10 11 17 18 19 25 27

From lscpu:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 48
On-line CPU(s) list: 0-47
Thread(s) per core: 2
Core(s) per socket: 12
Socket(s): 2
NUMA node(s): 4
Vendor ID: GenuineIntel

(Continued on next page)
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**Test Sponsor:** HPE  
**Tested by:** HPE  
**Test Date:** Jul-2019  
**Hardware Availability:** Apr-2019  
**Software Availability:** Feb-2019

---

### Platform Notes (Continued)

- **CPU family:** 6  
- **Model:** 85  
- **Model name:** Intel(R) Xeon(R) Gold 6246 CPU @ 3.30GHz  
- **Stepping:** 7  
- **CPU MHz:** 3300.000  
- **BogoMIPS:** 6600.00  
- **Virtualization:** VT-x  
- **L1d cache:** 32K  
- **L1i cache:** 32K  
- **L2 cache:** 1024K  
- **L3 cache:** 25344K  
- **NUMA node0 CPU(s):** 0-5,24-29  
- **NUMA node1 CPU(s):** 6-11,30-35  
- **NUMA node2 CPU(s):** 12-17,36-41  
- **NUMA node3 CPU(s):** 18-23,42-47  
- **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 rdscop 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 ebpxcatl3 cdp_l3 invpcid_single intel_ppi mba tpr_shadow vmx flexprio ept vpid fs.gsbase tsc_adjust bmi1 hle avx2 smep bmi2  
- **cache size:** 25344 KB  

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 24 25 26 27 28 29  
- **node 0 size:** 96351 MB  
- **node 0 free:** 96111 MB  
- **node 1 cpus:** 6 7 8 9 10 11 30 31 32 33 34 35  
- **node 1 size:** 96765 MB  
- **node 1 free:** 96616 MB  
- **node 2 cpus:** 12 13 14 15 16 17 36 37 38 39 40 41  
- **node 2 size:** 96765 MB  
- **node 2 free:** 96549 MB  
- **node 3 cpus:** 18 19 20 21 22 23 42 43 44 45 46 47  
- **node 3 size:** 96735 MB  
- **node 3 free:** 96564 MB  
- **node distances:**  

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Platform Notes (Continued)

0: 10 21 31 31
1: 21 10 31 31
2: 31 31 10 21
3: 31 31 21 10

From /proc/meminfo
- MemTotal: 395897684 kB
- HugePages_Total: 0
- Hugepagesize: 2048 kB

From /etc/*release* /etc/*version*
- 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-nub3 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 17 04:02

SPEC is set to: /home/cpu2017_u2
- Filesystem Type Size Used Avail Use% Mounted on
- /dev/sda1 xfs 373G 137G 237G 37% /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 SMI BIOS" standard.
- BIOS HPE U32 05/21/2019
- Memory:
- 24x UNKNOWN NOT AVAILABLE 16 GB 2 rank 2933

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

<table>
<thead>
<tr>
<th>Compiler</th>
<th>Notes</th>
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<tbody>
<tr>
<td>CC 519.lbm_r(base) 538.imagick_r(base) 544.nab_r(base)</td>
<td>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.</td>
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<tr>
<td>CXXC 508.namd_r(base) 510.parest_r(base)</td>
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<td>FC 503.bwaves_r(base) 549.fotonik3d_r(base) 554.roms_r(base)</td>
<td>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.</td>
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------------------------------------------------------------------------------
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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.
------------------------------------------------------------------------------

Base Compiler Invocation

C benchmarks:
icc -m64 -std=c11

C++ benchmarks:
icpc -m64

Fortran benchmarks:
ifort -m64

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

Benchmarks using both C and C++:
icpc -m64 icc -m64 -std=c11

Benchmarks using Fortran, C, and C++:
icpc -m64 icc -m64 -std=c11 ifort -m64

Base Portability Flags

503.bwaves_r: -DSPEC_LP64
507.cactuBSSN_r: -DSPEC_LP64
508.namd_r: -DSPEC_LP64
510.parest_r: -DSPEC_LP64
511.povray_r: -DSPEC_LP64
519.lbm_r: -DSPEC_LP64
521.wrf_r: -DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian
526.blender_r: -DSPEC_LP64 -DSPEC_LINUX -funsigned-char

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527.cam4_r: -DSPEC_LP64 -DSPEC_CASE_FLAG
538.imagick_r: -DSPEC_LP64
544.nab_r: -DSPEC_LP64
549.fotonik3d_r: -DSPEC_LP64
554.roms_r: -DSPEC_LP64

Base Optimization Flags

C benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=4

C++ benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=4

Fortran benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=4 -auto -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=4 -auto -nostandard-realloc-lhs
-align array32byte

Benchmarks using both C and C++:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=4

Benchmarks using Fortran, C, and C++:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=4 -auto -nostandard-realloc-lhs
-align array32byte

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

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/Intel-ic18.0-official-linux64.2019-04-03.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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