**SPEC® CPU2017 Integer Rate Result**

**Hewlett Packard Enterprise**
(Test Sponsor: HPE)
ProLiant DL560 Gen10
(2.50 GHz, Intel Xeon Gold 5215L)

<table>
<thead>
<tr>
<th>SpecRate2017_int_base</th>
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<tbody>
<tr>
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**CPU2017 License:** 3
**Test Sponsor:** HPE
**Tested by:** HPE

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### Hardware

**CPU Name:** Intel Xeon Gold 5215L
**Max MHz.:** 3400
**Nominal:** 2500
**Enabled:** 40 cores, 4 chips, 2 threads/core
**Orderable:** 1, 2, 4 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:** 13.75 MB I+D on chip per chip
**Other:** None
**Memory:** 1536 GB (48 x 32 GB 2Rx4 PC4-2666V-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 U34 02/02/2019 released Apr-2019
**File System:** btrfs
**System State:** Run level 3 (multi-user)
**Base Pointers:** 64-bit
**Peak Pointers:** Not Applicable
**Other:** None

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<tr>
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Hewlett Packard Enterprise  
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### Results Table

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### 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
Files system 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.
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)
Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL560 Gen10
(2.50 GHz, Intel Xeon Gold 5215L)

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SPECrate2017_int_peak = Not Run

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

Test Date: Apr-2019
Hardware Availability: Apr-2019
Software Availability: Feb-2019

General Notes (Continued)
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
- Advanced Memory Protection set to Advanced ECC

Sysinfo program /home/cpu2017_u2/bin/sysinfo
Rev: r5974 of 2018-05-19 9bcede8f2999c33d61f64985e45859ea9
running on linux-x8dm Tue Apr 16 11:26:56 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 5215L CPU @ 2.50GHz
- 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: 10
  - siblings: 20
  - physical 0: cores 0 1 2 3 4 8 9 10 11 12
  - physical 1: cores 0 1 2 3 4 8 9 10 11 12
  - physical 2: cores 0 1 2 3 4 8 9 10 11 12
  - physical 3: cores 0 1 2 3 4 8 9 10 11 12

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: 2
- Core(s) per socket: 10
- Socket(s): 4
- NUMA node(s): 4
- Vendor ID: GenuineIntel

(Continued on next page)
Platform Notes (Continued)

CPU family:         6
Model:              85
Model name:         Intel(R) Xeon(R) Gold 5215L CPU @ 2.50GHz
Stepping:           6
CPU MHz:            2500.000
BogoMIPS:           5000.00
Virtualization:     VT-x
L1d cache:          32K
L1i cache:          32K
L2 cache:           1024K
L3 cache:           14080K
NUMA node0 CPU(s):  0-9,40-49
NUMA node1 CPU(s):  10-19,50-59
NUMA node2 CPU(s):  20-29,60-69
NUMA node3 CPU(s):  30-39,70-79
Flags:              fpuc 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 xtrr pdcm pclid dca sse4_1 sse4_2
                    x2apic movbe popcnt tsc_deadline_timer aes xsave avx f16c rdrand lahf_lm
                    abm 3dnowprefetch cpuid_fault epb cat_l3 cdp_l3 invpcid_single intel_ppin
                    mba tpr_shadow vmx flexpriority ept vpid fsgsbase tsc_adjust bm1 hle avx2
                    smep bmi2 erms invpcid rtm cqm mpx rdt_a avx512f avx512dq rdseed adx
                    smap clflushopt clwb intel_pt avx512cd avx512bw avx512vl xsaveopt xsavec
                    xsaves cqm_llc cqm_occup_llc cqm_mbm_total cqm_mbm_local ibpb ibrs stibp
dtib dtherm ida arat pln pts pkup ospe avx512_vnni arch_capabilities ssbd

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 40 41 42 43 44 45 46 47 48 49
node 0 size: 386653 MB
node 0 free: 386282 MB
node 1 cpus: 10 11 12 13 14 15 16 17 18 19 50 51 52 53 54 55 56 57 58 59
node 1 size: 387067 MB
node 1 free: 386632 MB
node 2 cpus: 20 21 22 23 24 25 26 27 28 29 60 61 62 63 64 65 66 67 68 69
node 2 size: 387039 MB
node 2 free: 386800 MB
node 3 cpus: 30 31 32 33 34 35 36 37 38 39 70 71 72 73 74 75 76 77 78 79
node 3 size: 387066 MB
node 3 free: 386848 MB
node distances:
node 0 1 2 3
## SPEC CPU2017 Integer Rate Result

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**SPECrate2017_int_base** = 235

**SPECrate2017_int_peak** = Not Run

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### Platform Notes (Continued)

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

From `/proc/meminfo`

- MemTotal: 1584975108 kB  
- HugePages_Total: 0  
- Hugepagesize: 2048 kB

From `/usr/bin/lsb_release -d`

SUSE Linux Enterprise Server 15

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-x8dm 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 Apr 16 11:25

SPEC is set to: /home/cpu2017_u2

- Filesystem  
  - Type  
  - Size  
  - Used  
  - Avail  
  - Use%  
  - Mounted on

- /dev/sda2  
  - btrfs  
  - 371G  
  - 141G  
  - 229G  
  - 39%  
  - /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:

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(Continued on next page)
Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL560 Gen10
(2.50 GHz, Intel Xeon Gold 5215L)

SPECrate2017_int_base = 235
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Platform Notes (Continued)

5x HPE 840758-091 32 GB 2 rank 2666
43x UNKNOWN NOT AVAILABLE 32 GB 2 rank 2666

(End of data from sysinfo program)

Compiler Version Notes

==============================================================================
CC  500.perlbench_r(base) 502.gcc_r(base) 505.mcf_r(base) 525.x264_r(base)
   557.xz_r(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.
------------------------------------------------------------------------------
==============================================================================
CXXC 520.omnetpp_r(base) 523.xalancbmk_r(base) 531.deepsjeng_r(base)
   541.leela_r(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  548.exchange2_r(base)
------------------------------------------------------------------------------
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.
------------------------------------------------------------------------------

Base Compiler Invocation

C benchmarks:
icc -m64 -std=c11

C++ benchmarks:
icpc -m64

Fortran benchmarks:
ifort -m64
# SPEC CPU2017 Integer Rate Result

## Hewlett Packard Enterprise

**Test Sponsor:** HPE  
**Hardware Availability:** Apr-2019  
**Software Availability:** Feb-2019

### ProLiant DL560 Gen10

**Processor:** 2.50 GHz, Intel Xeon Gold 5215L

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### Base Portability Flags

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### Base Optimization Flags

**C benchmarks:**

- `-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div`  
- `-qopt-mem-layout-trans=4`  
- `-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.1.144/linux/compiler/lib/intel64 -lqkmalloc`

**C++ benchmarks:**

- `-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div`  
- `-qopt-mem-layout-trans=4`  
- `-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.1.144/linux/compiler/lib/intel64 -lqkmalloc`

**Fortran benchmarks:**

- `-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div`  
- `-qopt-mem-layout-trans=4 -nostandard-realloc-lhs -align array32byte`  
- `-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.1.144/linux/compiler/lib/intel64 -lqkmalloc`

---

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](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](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 2019-04-16 01:56:56-0400.  