## SPEC® CPU2017 Integer Rate Result

### Hewlett Packard Enterprise

(Test Sponsor: HPE)

Synergy 660 Gen10

(3.00 GHz, Intel Xeon Gold 5217)

<table>
<thead>
<tr>
<th>CPU2017 License:</th>
<th>3</th>
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<tbody>
<tr>
<td>Test Sponsor:</td>
<td>HPE</td>
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<td>Tested by:</td>
<td>HPE</td>
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#### Test Date: June-2019

#### Hardware Availability: Apr-2019

#### Software Availability: Feb-2019

<table>
<thead>
<tr>
<th>Copies</th>
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<tr>
<td>500.perlbench_r 64</td>
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<td>502.gcc_r 64</td>
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<tr>
<td>505.mcf_r 64</td>
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<tr>
<td>520.omnetpp_r 64</td>
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<tr>
<td>523.xalancbmk_r 64</td>
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<tr>
<td>525.x264_r 64</td>
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<tr>
<td>531.deepsjeng_r 64</td>
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<tr>
<td>541.leela_r 64</td>
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<tr>
<td>548.exchange2_r 64</td>
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<tr>
<td>557.xz_r 64</td>
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<table>
<thead>
<tr>
<th>SPECrate2017_int_base = 212</th>
</tr>
</thead>
</table>

**SPECrate2017_int_peak = Not Run**

<table>
<thead>
<tr>
<th>Hardware</th>
<th>Software</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CPU Name:</strong> Intel Xeon Gold 5217</td>
<td><strong>OS:</strong> SUSE Linux Enterprise Server 15 (x86_64)</td>
</tr>
<tr>
<td><strong>Max MHz.:</strong> 3700</td>
<td><strong>Kernel:</strong> 4.12.14-23-default</td>
</tr>
<tr>
<td><strong>Nominal:</strong> 3000</td>
<td><strong>Compiler:</strong> C/C++: Version 19.0.2.187 of Intel C/C++</td>
</tr>
<tr>
<td><strong>Enabled:</strong> 32 cores, 4 chips, 2 threads/core</td>
<td><strong>Compiler Build 20190117 for Linux:</strong></td>
</tr>
<tr>
<td><strong>Orderable:</strong> 2, 4 chip(s)</td>
<td><strong>Fortran:</strong> Version 19.0.2.187 of Intel Fortran</td>
</tr>
<tr>
<td><strong>Cache L1:</strong> 32 KB I + 32 KB D on chip per core</td>
<td><strong>Compiler Build 20190117 for Linux:</strong></td>
</tr>
<tr>
<td><strong>Cache L2:</strong> 1 MB I-D on chip per core</td>
<td><strong>Parallel:</strong> No</td>
</tr>
<tr>
<td><strong>Cache L3:</strong> 11 MB I+D on chip per chip</td>
<td><strong>Firmware:</strong> HPE BIOS Version I43 04/18/2019 released Apr-2019</td>
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<tr>
<td><strong>Orderable:</strong> 2, 4 chip(s)</td>
<td><strong>File System:</strong> btrfs</td>
</tr>
<tr>
<td><strong>Memory:</strong> 768 GB (24 x 32 GB 2Rx4 PC4-2933Y-R, running at 2666)</td>
<td><strong>System State:</strong> Run level 3 (multi-user)</td>
</tr>
<tr>
<td><strong>Storage:</strong> 1 x 480 GB SATA SSD, RAID 0</td>
<td><strong>Base Pointers:</strong> 64-bit</td>
</tr>
<tr>
<td><strong>Other:</strong> None</td>
<td><strong>Peak Pointers:</strong> Not Applicable</td>
</tr>
<tr>
<td><strong>Other:</strong> None</td>
<td><strong>Other:</strong> None</td>
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</tbody>
</table>

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Page 1  
Standard Performance Evaluation Corporation (info@spec.org)  
https://www.spec.org/
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[Test Sponsor: HPE]  
Synergy 660 Gen10  
(3.00 GHz, Intel Xeon Gold 5217)  

**SPECrate2017_int_base = 212**  
**SPECrate2017_int_peak = Not Run**

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</table>

**Results Table**

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.  
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)
SPEC CPU2017 Integer Rate Result

Hewlett Packard Enterprise
(Test Sponsor: HPE)
Synergy 660 Gen10
(3.00 GHz, Intel Xeon Gold 5217)

SPECrate2017_int_base = 212
SPECrate2017_int_peak = Not Run

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

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
Sysinfo program /home/cpu2017_u2/bin/sysinfo
Rev: r5974 of 2018-05-19 9bcde8f2999c33d61f64985e45859ea9
running on sy660-gen10 Tue Jun 25 08:36:21 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 5217 CPU @ 3.00GHz
   4 "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 : 8
   siblings : 16
   physical 0: cores 0 1 2 3 4 5 6 7
   physical 1: cores 0 1 2 3 4 5 6 7
   physical 2: cores 0 1 2 3 4 5 6 7
   physical 3: cores 0 1 2 3 4 5 6 7

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: 8
Socket(s): 4
NUMA node(s): 4
Vendor ID: GenuineIntel
CPU family: 6

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

**SPECrate2017_int_base** = 212

**SPECrate2017_int_peak** = Not Run

### Platform Notes (Continued)

| Model: | 85 |
| Model name: | Intel(R) Xeon(R) Gold 5217 CPU @ 3.00GHz |
| Stepping: | 6 |
| CPU MHz: | 3000.000 |
| BogoMIPS: | 6000.00 |
| Virtualization: | VT-x |
| L1d cache: | 32K |
| L1i cache: | 32K |
| L2 cache: | 1024K |
| L3 cache: | 11264K |
| NUMA node0 CPU(s): | 0-7,32-39 |
| NUMA node1 CPU(s): | 8-15,40-47 |
| NUMA node2 CPU(s): | 16-23,48-55 |
| NUMA node3 CPU(s): | 24-31,56-63 |

**Flags:**
fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov pat pse36 clflush dtsc acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx pdel1gb rdtscp lm constant_tsc art arch_perfmon pebs bts rep_good nop1 xtopology nonstop_tsc cpuid aperfmpref tsc_known_freq pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16 xtrm pdcm pcm1 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_pppin mba tpr_shadow vnmi flexpriority ept vpid fssgsbase tsc_adjust bmi1 hle avx2 smm bmi2 3ms invpcid rtm cqm mpx rdt_a avx512f avx512dq rdseed adx smap clflushopt clwb intel_pt avx512cd avx512bw avx512vl xsaveopt xsavec xsaves cqm_llc cqm_occp llc cqm_mbm_total cqm_mbm_local ibpb ibrs stibp dtherm ida arat pln pts pku ospke avx512_vnni arch_capabilities ssbd

/proc/cpuinfo cache data
cache size : 11264 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 6 7 32 33 34 35 36 37 38 39 |
| node 0 size: | 193047 MB |
| node 0 free: | 192749 MB |
| node 1 cpus: | 8 9 10 11 12 13 14 15 40 41 42 43 44 45 46 47 |
| node 1 size: | 193503 MB |
| node 1 free: | 193105 MB |
| node 2 cpus: | 16 17 18 19 20 21 22 23 48 49 50 51 52 53 54 55 |
| node 2 size: | 193532 MB |
| node 2 free: | 193299 MB |
| node 3 cpus: | 24 25 26 27 28 29 30 31 56 57 58 59 60 61 62 63 |
| node 3 size: | 193323 MB |
| node 3 free: | 193092 MB |
| node distances: |
| node 0 1 2 3 |
| 0: 10 21 21 21 |

(Continued on next page)
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<table>
<thead>
<tr>
<th>SPECrate2017_int_base</th>
<th>212</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECrate2017_int_peak</td>
<td>Not Run</td>
</tr>
</tbody>
</table>

CPU2017 License: 3
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Platform Notes (Continued)

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

From /proc/meminfo
MemTotal: 791969860 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 sy660-gen10 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 Jun 25 08:35

SPEC is set to: /home/cpu2017_u2
Filesystem Type Size Used Avail Use% Mounted on
/dev/sdb2 btrfs 445G 125G 321G 28% /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 I43 04/18/2019
Memory:
24x UNKNOWN NOT AVAILABLE
24x UNKNOWN NOT AVAILABLE 32 GB 2 rank 2933, configured at 2666

(End of data from sysinfo program)
Hewlett Packard Enterprise

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SPECrate2017_int_peak = Not Run

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

Base Portability Flags

500.perlbench_r: -DSPEC_LP64 -DSPEC_LINUX_X64
502.gcc_r: -DSPEC_LP64
505.mcf_r: -DSPEC_LP64
520.omnetpp_r: -DSPEC_LP64
(Continued on next page)
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Base Portability Flags (Continued)

523.xalancbmk_r: -DSPEC_LP64 -DSPEC_LINUX
525.x264_r: -DSPEC_LP64
531.deepsjeng_r: -DSPEC_LP64
541.leela_r: -DSPEC_LP64
548.exchange2_r: -DSPEC_LP64
557.xz_r: -DSPEC_LP64

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-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

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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 2019-06-25 09:36:21-0400.