## SPEC CPU®2017 Integer Rate Result

**Test Sponsor:** HPE  
**ProLiant DL580 Gen10  
(3.00 GHz, Intel Xeon Gold 5217)**

<table>
<thead>
<tr>
<th>SPECrate®2017_int_base =</th>
<th>212</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECrate®2017_int_peak =</td>
<td>Not Run</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Test Date:</th>
<th>Jun-2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hardware Availability:</td>
<td>Apr-2019</td>
</tr>
<tr>
<td>Software Availability:</td>
<td>Feb-2019</td>
</tr>
</tbody>
</table>

### Hardware

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

### Software

<table>
<thead>
<tr>
<th>Spec</th>
<th>Description</th>
</tr>
</thead>
</table>
| 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 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 |
| Power Management: -- |

**CPU Name:** Intel Xeon Gold 5217  
**Max MHz:** 3700  
**Nominal:** 3000  
**Enabled:** 32 cores, 4 chips, 2 threads/core  
**Orderable:** 1, 2, 3, 4 chip(s)  
**Cache L1:** 32 KB I+D on chip per core  
**Cache L2:** 1 MB I+D on chip per core  
**Cache L3:** 11 MB I+D on chip per chip  
**Other:** None  
**Memory:** 768 GB (24 x 32 GB 2Rx4 PC4-2666V-R)  
**Storage:** 1 x 960 GB SAS SSD, RAID 0  
**Other:** None
**SPEC CPU®2017 Integer Rate Result**

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Hewlett Packard Enterprise  
(Test Sponsor: HPE)  
ProLiant DL580 Gen10  
(3.00 GHz, Intel Xeon Gold 5217)  
SPECrate®2017_int_base = 212  
SPECrate®2017_int_peak = Not Run

**Results Table**

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
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</thead>
<tbody>
<tr>
<td>perlbench_r</td>
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<td>618</td>
<td>165</td>
<td>622</td>
<td>164</td>
<td>626</td>
<td>163</td>
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<tr>
<td>gcc_r</td>
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<td>559</td>
<td>162</td>
<td>569</td>
<td>159</td>
<td>563</td>
<td>161</td>
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<tr>
<td>mcf_r</td>
<td>64</td>
<td>353</td>
<td>293</td>
<td>352</td>
<td>293</td>
<td>354</td>
<td>292</td>
</tr>
<tr>
<td>omnetpp_r</td>
<td>64</td>
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<td>136</td>
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<td>136</td>
<td>616</td>
<td>136</td>
</tr>
<tr>
<td>xalanbmk_r</td>
<td>64</td>
<td>272</td>
<td>249</td>
<td>271</td>
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<td>271</td>
<td>249</td>
</tr>
<tr>
<td>x264_r</td>
<td>64</td>
<td>263</td>
<td>426</td>
<td>263</td>
<td>427</td>
<td>263</td>
<td>426</td>
</tr>
<tr>
<td>deepsjeng_r</td>
<td>64</td>
<td>404</td>
<td>182</td>
<td>403</td>
<td>182</td>
<td>404</td>
<td>181</td>
</tr>
<tr>
<td>leela_r</td>
<td>64</td>
<td>623</td>
<td>170</td>
<td>632</td>
<td>168</td>
<td>623</td>
<td>170</td>
</tr>
<tr>
<td>exchange2_r</td>
<td>64</td>
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<td>387</td>
<td>433</td>
<td>387</td>
<td>433</td>
<td>387</td>
</tr>
<tr>
<td>xz_r</td>
<td>64</td>
<td>501</td>
<td>138</td>
<td>501</td>
<td>138</td>
<td>501</td>
<td>138</td>
</tr>
</tbody>
</table>

**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) (Continued on next page)
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 linux-sypg Tue Aug 7 16:20:29 2018

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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ProLiant DL580 Gen10  
(3.00 GHz, Intel Xeon Gold 5217)

---

**SPECrate®2017_int_base** = 212

**SPECrate®2017_int_peak** = Not Run

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**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 cmov pat pse36 clflush dts acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx pdpe1gb rdtscp lm constant_tsc arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc cpuid aperfperf tsc_known_freq pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16 xtr Wich pdc P migrating movbe popcnt tsc_deadline_timer aes xsave avx f16c rdrand lahf_lm abm 3nowprefetch cpuid_fault epb cat_l3 cdp_l3 invpcid_single intel_ppip mba tpr_shadow vnmi flexpriority ept vpid fsgsbase tsc_adjust bni hle avx2 smep bmi2 ems invpcid rtm cqm mpx rdt_a avx512f avx512dq rdseed adx smap clflushopt clwb intel_pt avx512cd avx512bw avx512vl xsaveopt xsaves xsavec xgetbv1 xsave csq ltc qm_occu p llc qm_mmb_total qm_mmb_local ibpb ibrs stibp dtherm ida arat pln pts pku ospke avx512_vnni arch_capabilities ssbd

/proc/cpuinfo cache data  
```text
  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: 193119 MB  
node 0 free: 192552 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: 193292 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: 193327 MB  
node 3 cpus: 24 25 26 27 28 29 30 31 56 57 58 59 60 61 62 63  
node 3 size: 193531 MB  
node 3 free: 193332 MB  
node distances:

node 0:
  0: 10 21 21 21

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

SPECrated®2017_int_base = 212
SPECrated®2017_int_peak = Not Run

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

Platform Notes (Continued)

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

From /proc/meminfo
MemTotal:       792256556 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 Aug 7 16:18
SPEC is set to: /home/cpu2017_u2
  Filesystem Type  Size Used Avail Use% Mounted on
  /dev/sda1 xfs  894G  71G  824G  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 05/21/2019
  Memory:
    24x UNKNOWN NOT AVAILABLE
    24x UNKNOWN NOT AVAILABLE 32 GB 2 rank 2666

(End of data from sysinfo program)
Hewlett Packard Enterprise
(Test Sponsor: HPE)
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Compiler Version Notes

==============================================================================
C     | 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.
------------------------------------------------------------------------------

C++   | 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.
------------------------------------------------------------------------------

Fortran | 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
- /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
- /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
- /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.

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