## SPEC CPU®2017 Integer Rate Result

**Hewlett Packard Enterprise**  
(Test Sponsor: HPE)  
ProLiant DL380 Gen10  
(2.90 GHz, Intel Xeon Gold 6208U)  

<table>
<thead>
<tr>
<th>Test Sponsor:</th>
<th>HPE</th>
<th>Hardware Availability:</th>
<th>Feb-2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tested by:</td>
<td>HPE</td>
<td>Software Availability:</td>
<td>Jun-2019</td>
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<table>
<thead>
<tr>
<th>SPECrate®2017_int_base</th>
<th>110</th>
</tr>
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<tbody>
<tr>
<td>SPECrate®2017_int_peak</td>
<td>114</td>
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</table>

| CPU2017 License: | 3 |

**Hardware**  

<table>
<thead>
<tr>
<th>CPU Name:</th>
<th>Intel Xeon Gold 6208U</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max MHz:</td>
<td>3900</td>
</tr>
<tr>
<td>Nominal:</td>
<td>2900</td>
</tr>
<tr>
<td>Enabled:</td>
<td>16 cores, 1 chip, 2 threads/core</td>
</tr>
<tr>
<td>Orderable:</td>
<td>1 chip</td>
</tr>
<tr>
<td>Cache L1:</td>
<td>32 KB I + 32 KB D on chip per core</td>
</tr>
<tr>
<td>L2:</td>
<td>1 MB I+D on chip per core</td>
</tr>
<tr>
<td>L3:</td>
<td>22 MB I+D on chip per core</td>
</tr>
<tr>
<td>Other:</td>
<td>None</td>
</tr>
<tr>
<td>Memory:</td>
<td>192 GB (12 x 16 GB 2Rx8 PC4-2933Y-R)</td>
</tr>
<tr>
<td>Storage:</td>
<td>1 x 400 GB SAS SSD</td>
</tr>
<tr>
<td>Other:</td>
<td>None</td>
</tr>
</tbody>
</table>

**Software**  

<table>
<thead>
<tr>
<th>OS:</th>
<th>SUSE Linux Enterprise Server 15 SP1 (x86_64)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compiler:</td>
<td>C/C++: Version 19.0.4.227 of Intel C/C++ Compiler Build 20190416 for Linux; Fortran: Version 19.0.4.227 of Intel Fortran Compiler Build 20190416 for Linux;</td>
</tr>
<tr>
<td>Parallel:</td>
<td>No</td>
</tr>
<tr>
<td>Firmware:</td>
<td>HPE BIOS Version U30 v2.22 (11/13/2019) released Feb-2020</td>
</tr>
<tr>
<td>File System:</td>
<td>btrfs</td>
</tr>
<tr>
<td>System State:</td>
<td>Run level 3 (multi-user)</td>
</tr>
<tr>
<td>Base Pointers:</td>
<td>64-bit</td>
</tr>
<tr>
<td>Peak Pointers:</td>
<td>32/64-bit</td>
</tr>
<tr>
<td>Other:</td>
<td>jemalloc memory allocator V5.0.1</td>
</tr>
<tr>
<td>Power Management:</td>
<td>BIOS set to prefer performance at the cost of additional power usage</td>
</tr>
</tbody>
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### Benchmark Results

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
<th>SPECrate®2017_int_base</th>
<th>SPECrate®2017_int_peak</th>
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<tbody>
<tr>
<td>500.perlbench_r</td>
<td>32</td>
<td>94.7</td>
<td>114</td>
</tr>
<tr>
<td>502.gcc_r</td>
<td>32</td>
<td>90.8</td>
<td>104</td>
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<td>505.mcf_r</td>
<td>32</td>
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<tr>
<td>520.omnetpp_r</td>
<td>32</td>
<td>147</td>
<td>146</td>
</tr>
<tr>
<td>523.xalancbmk_r</td>
<td>32</td>
<td>122</td>
<td>131</td>
</tr>
<tr>
<td>525.x264_r</td>
<td>32</td>
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</tr>
<tr>
<td>531.deepsjeng_r</td>
<td>32</td>
<td>85.3</td>
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</tr>
<tr>
<td>541.leela_r</td>
<td>32</td>
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<td>220</td>
</tr>
<tr>
<td>548.exchange2_r</td>
<td>32</td>
<td>223</td>
<td>223</td>
</tr>
<tr>
<td>557.xz_r</td>
<td>32</td>
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</tr>
</tbody>
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---

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**Hardware Availability:** Feb-2020  
**Software Availability:** Jun-2019
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ProLiant DL380 Gen10
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SPECrate®2017_int_base = 110
SPECrate®2017_int_peak = 114

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
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<th>Seconds</th>
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<td>69.5</td>
<td>497</td>
<td>69.6</td>
<td>499</td>
<td>69.3</td>
</tr>
</tbody>
</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>

Environment Variables Notes

Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH = 
"/home/cpu2017/lib/intel64:/home/cpu2017/lib/ia32:/home/cpu2017/je5.0.1-32"

General Notes

Binaries compiled on a system with 1x Intel Core i9-7900X CPU + 32GB RAM

(Continued on next page)
# SPEC CPU®2017 Integer Rate Result

**General Notes (Continued)**

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:
- 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 Power

Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r6365 of 2019-08-21 295195f888a3d7ed81e6e46a485a0011 running on linux-r6ge Sat Feb 29 14:22:11 2020

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 6208U CPU @ 2.90GHz
1 "physical id"'s (chips)
32 "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 : 16
siblings : 32
physical 0: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

From lscpu:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit

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<td>Software Availability:</td>
<td>Jun-2019</td>
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CPU2017 License: 3
Test Sponsor: HPE
Tested by: HPE

Test Date: Feb-2020
Hardware Availability: Feb-2020
Software Availability: Jun-2019

Platform Notes (Continued)

Byte Order: Little Endian
Address sizes: 46 bits physical, 48 bits virtual
CPU(s): 32
On-line CPU(s) list: 0-31
Thread(s) per core: 2
Core(s) per socket: 16
Socket(s): 1
NUMA node(s): 2
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Gold 6208U CPU @ 2.90GHz
Stepping: 7
CPU MHz: 2900.000
BogoMIPS: 5800.00
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 22528K
NUMA node0 CPU(s): 0-7,16-23
NUMA node1 CPU(s): 8-15,24-31
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 aperfmperf 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 abalrelaxed cpb bts xnoemcmpt xsaveopt x Merit cpuid_fault
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 22528K
NUMA node0 CPU(s): 0-7,16-23
NUMA node1 CPU(s): 8-15,24-31
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 aperfmperf 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 abalrelaxed cpb bts xnoemcmpt xsaveopt x Merit cpuid_fault

/platform/hostname/proc/cpuinfo cache data
cache size : 22528 KB

From numactl --hardware WARNING: a numactl 'node' might or might not correspond to a physical chip.
available: 2 nodes (0-1)
node 0 cpus: 0 1 2 3 4 5 6 7 16 17 18 19 20 21 22 23
node 0 size: 96359 MB
node 0 free: 95948 MB
node 1 cpus: 8 9 10 11 12 13 14 15 24 25 26 27 28 29 30 31
node 1 size: 96735 MB
node 1 free: 94478 MB

(Continued on next page)
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</table>

Platform Notes (Continued)

```
node distances:
node  0  1
 0:  10  21
 1:  21  10
```

From /proc/meminfo
```
MemTotal:       197728996 kB
HugePages_Total:       0
Hugepagesize:       2048 kB
```

From /etc/*release* /etc/*version*
```
os-release:
  NAME="SLES"
  VERSION="15-SP1"
  VERSION_ID="15.1"
  PRETTY_NAME="SUSE Linux Enterprise Server 15 SP1"
  ID="sles"
  ID_LIKE="suse"
  ANSI_COLOR="0;32"
  CPE_NAME="cpe:/o:suse:sles:15:sp1"
```

uname -a:
```
Linux linux-r6ge 4.12.14-195-default #1 SMP Tue May 7 10:55:11 UTC 2019 (8fba516)
x86_64 x86_64 x86_64 GNU/Linux
```

Kernel self-reported vulnerability status:

- CVE-2018-3620 (L1 Terminal Fault): Not affected
- Microarchitectural Data Sampling: Not affected
- CVE-2017-5754 (Meltdown): Not affected
- CVE-2018-3639 (Speculative Store Bypass): Mitigation: Speculative Store Bypass disabled via prctl and seccomp
- CVE-2017-5753 (Spectre variant 1): Mitigation: __user pointer sanitization
- CVE-2017-5715 (Spectre variant 2): Mitigation: Enhanced IBRS, IBPB: conditional, RSB filling

run-level 3 Feb 29 14:19

SPEC is set to: /home/cpu2017
```
Filesystem     Type   Size  Used Avail Use% Mounted on
/dev/sda2      btrfs  371G  140G  231G  38% /home
```

From /sys/devices/virtual/dmi/id
```
BIOS:      HPE U30 11/13/2019
Vendor:    HPE
Product:   ProLiant DL380 Gen10
Product Family: ProLiant
```

(Continued on next page)
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</tr>
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</table>

**Platform Notes (Continued)**

Serial: 2M294204YX

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.

Memory:
12x UNKNOWN NOT AVAILABLE
12x UNKNOWN NOT AVAILABLE 16 GB 2 rank 2933

(End of data from sysinfo program)

**Compiler Version Notes**

```
C       | 502.gcc_r(peak)
-----------------------------------------------
Intel(R) C Intel(R) 64 Compiler for applications running on IA-32, Version 19.0.4.227 Build 20190416
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.
-----------------------------------------------

C       | 500.perlbench_r(base, peak) 502.gcc_r(base) 505.mcf_r(base, peak)
| 525.x264_r(base, peak) 557.xz_r(base, peak)
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Compiler Version Notes (Continued)

==============================================================================
C++ | 523.xalancbmk_r(peak)

Intel(R) C++ Intel(R) 64 Compiler for applications running on IA-32, Version 19.0.4.227 Build 20190416
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.

==============================================================================
C++ | 520.omnetpp_r(base, peak) 523.xalancbmk_r(base)
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C++ | 523.xalancbmk_r(peak)

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Fortran | 548.exchange2_r(base, peak)

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Base Compiler Invocation

C benchmarks:
imc -m64 -std=c11

C++ benchmarks:
imc -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
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:
-W1,-z,muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4
-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.4.227/linux/compiler/lib/intel64
-lqkmalloc

C++ benchmarks:
-W1,-z,muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4
-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.4.227/linux/compiler/lib/intel64
-lqkmalloc

Fortran benchmarks:
-W1,-z,muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4 -nostandard-realloc-lhs -align array32byte
-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.4.227/linux/compiler/lib/intel64
-lqkmalloc
## Peak Compiler Invocation

C benchmarks (except as noted below):
```bash
icc -m64 -std=c11
```


C++ benchmarks (except as noted below):
```bash
icpc -m64
```

523.xalancbmk_r: `icpc -m32 -L/usr/local/IntelCompiler19/compilers_and_libraries_2019.4.227/linux/compiler/lib/ia32_lin`

Fortran benchmarks:
```bash
ifort -m64
```

## Peak Portability Flags

500.perlbench_r: -DSPEC_LP64 -DSPEC_LINUX_X64
502.gcc_r: -D_FILE_OFFSET_BITS=64
505.mcf_r: -DSPEC_LP64
520.omnetpp_r: -DSPEC_LP64
523.xalancbmk_r: -D_FILE_OFFSET_BITS=64 -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

## Peak Optimization Flags

C benchmarks:
```bash
500.perlbench_r: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo
-xCORE-AVX2 -O3 -no-prec-div -qopt-mem-layout-trans=4
-fno-strict-overflow
-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.4.227/linux/compiler/lib/intel64
-lqkmalloc
```

502.gcc_r: `Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo
-xCORE-AVX2 -O3 -no-prec-div -qopt-mem-layout-trans=4
-L/usr/local/je5.0.1-32/lib -ljemalloc`

505.mcf_r: `-Wl,-z,muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4`

(Continued on next page)
Peak Optimization Flags (Continued)

505.mcf_r (continued):
-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.4.227/linux/compiler/lib/intel64
-lqkmalloc

525.x264_r: -Wl,-z,muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4 -fno-alias
-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.4.227/linux/compiler/lib/intel64
-lqkmalloc

557.xz_r: Same as 505.mcf_r

C++ benchmarks:

520.omnetpp_r: -Wl,-z,muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4
-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.4.227/linux/compiler/lib/intel64
-lqkmalloc

523.xalancbmk_r: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo
-xCORE-AVX2 -O3 -no-prec-div -qopt-mem-layout-trans=4
-L/usr/local/je5.0.1-32/lib -ljemalloc

531.deepsjeng_r: Same as 520.omnetpp_r

541.leela_r: Same as 520.omnetpp_r

Fortran benchmarks:

-Wl,-z,muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4 -nostandard-realloc-lhs -align array32byte
-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.4.227/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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