## SPEC® CPU2017 Integer Rate Result

**Hewlett Packard Enterprise**  
(Test Sponsor: HPE)  
ProLiant DL380 Gen10  
(1.80 GHz, Intel Xeon Silver 4108)

<table>
<thead>
<tr>
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</table>

### Hardware

- **CPU Name:** Intel Xeon Silver 4108  
- **Max MHz.:** 3000  
- **Nominal:** 1800  
- **Enabled:** 16 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:** 11 MB I+D on chip per chip  
- **Other:** None  
- **Memory:** 192 GB (24 x 8 GB 2Rx8 PC4-2666V-R, running at 2400)  
- **Storage:** 1 x 960 GB SATA SSD, RAID 0  
- **Other:** None

### Software

- **OS:** SUSE Linux Enterprise Server 12 (x86_64) SP2  
- **Kernel:** 4.4.21-69-default  
- **Compiler:** C/C++: Version 18.0.0.128 of Intel C/C++ Compiler for Linux; Fortran: Version 18.0.0.128 of Intel Fortran Compiler for Linux  
- **Parallel:** No  
- **Firmware:** HPE BIOS Version U30 released Oct-2017 (tested with U30 9/29/2017)  
- **File System:** xfs  
- **System State:** Run level 5 (multi-user, w/GUI)  
- **Base Pointers:** 64-bit  
- **Peak Pointers:** Not Applicable  
- **Other:** jemalloc: jemalloc memory allocator library V5.0.1; configured and built at default for 32bit (i686) and 64bit (x86_64) targets; jemalloc: built with the RedHat Enterprise 7.4, and the system compiler gcc 4.8.5
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SPECrate2017_int_peak = Not Run

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
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<td>756</td>
<td>45.7</td>
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</tbody>
</table>

SPECrate2017_int_base = 65.5
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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"
Prior to runcpu invocation
Filesystem page cache synced and cleared with:
    sync; echo 3> /proc/sys/vm/drop_caches
runspec command invoked through numactl i.e.:
    numactl --interleave=all runspec <etc>
irqbalance disabled with "service irqbalance stop"
tuned profile set with "tuned-adm profile throughput-performance"
VM Dirty ratio was set to 40 using "echo 40 > /proc/sys/vm/dirty_ratio"
Numa balancing was disabled using "echo 0 > /proc/sys/kernel/numa_balancing"

General Notes

Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH = "~/home/spec2017/lib/ia32:/home/spec2017/lib/intel64:/home/spec2017/je5.0.1-32"
LD_LIBRARY_PATH = "$LD_LIBRARY_PATH:/home/spec2017/je5.0.1-64"

Binaries compiled on a system with 1x Intel Core i7-4790 CPU + 32GB RAM memory using Redhat Enterprise Linux 7.4
SPEC CPU2017 Integer Rate Result

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CPU2017 License: 3
Test Sponsor: HPE
Test Date: Oct-2017
Tested by: HPE
Hardware Availability: Oct-2017
Software Availability: Sep-2017

Platform Notes

BIOS Configuration:
Thermal Configuration set to Maximum Cooling
Memory Patrol Scrubbing set to Disabled
LLC Prefetcher set to Enabled
LLC Dead Line Allocation set to Disabled
Workload Profile set to Throughput Frequency Compute
   Minimum Processor Idle Power Core C-State set to C1E State

Sysinfo program /home/spec2017/bin/sysinfo
Rev: r5797 of 2017-06-14 96c45e4568ad54c135fd618bcc091c0f
running on dl380-sys2-sles Thu Oct 26 17:22:56 2017

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) Silver 4108 CPU @ 1.80GHz
   2 "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 : 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

From lscpu:
   Architecture:           x86_64
   CPU op-mode(s):          32-bit, 64-bit
   Byte Order:              Little Endian
   CPU(s):                  32
   On-line CPU(s) list:     0-31
   Thread(s) per core:      2
   Core(s) per socket:      8
   Socket(s):               2
   NUMA node(s):            2
   Vendor ID:               GenuineIntel
   CPU family:              6
   Model:                   85
   Model name:              Intel(R) Xeon(R) Silver 4108 CPU @ 1.80GHz
   Stepping:                4
   CPU MHz:                 1795.782
   BogoMIPS:                3591.56
   Virtualization:          VT-x
   L1d cache:               32K
   L1i cache:               32K

(Continued on next page)
## Platform Notes (Continued)

- **L2 cache:** 1024K
- **L3 cache:** 11264K
- **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 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
  - aperfmperf eagerfpu 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 ida arat epb pln pts dtherm intel_pt
  - tpr_shadow vnni fplibxsaveopt scsied64 tm2 ssse3 sse now哈哈

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: 96276 MB
node 0 free: 94515 MB
node 1 cpus: 8 9 10 11 12 13 14 15 24 25 26 27 28 29 30 31
node 1 size: 96649 MB
node 1 free: 95671 MB
node distances:
node 0 1
  0: 10 21
  1: 21 10
```

From `/proc/meminfo`

```
MemTotal: 197556252 kB
HugePages_Total: 0
Hugepagesize: 2048 kB
```

From `/usr/bin/lsb_release -d`

```
SUSE Linux Enterprise Server 12 SP2
```

From `/etc/*release*` /`/etc/*version*`

```
SuSE-release:
  SUSE Linux Enterprise Server 12 (x86_64)
  VERSION = 12
  PATCHLEVEL = 2
  # This file is deprecated and will be removed in a future service pack or release.
  # Please check `/etc/os-release` for details about this release.

os-release:
```

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

Platform Notes (Continued)

NAME="SLES"
VERSION="12-SP2"
VERSION_ID="12.2"
PRETTY_NAME="SUSE Linux Enterprise Server 12 SP2"
ID="sles"
ANSI_COLOR="0;32"
CPE_NAME="cpe:/o:suse:sles:12:sp2"

uname -a:
Linux dl380-sys2-sles 4.4.21-69-default #1 SMP Tue Oct 25 10:58:20 UTC 2016 (9464f67)
x86_64 x86_64 x86_64 GNU/Linux

run-level 5 Oct 26 07:34
SPEC is set to: /home/spec2017

Filesystem     Type  Size  Used Avail Use% Mounted on
/dev/sdb4      xfs   400G   13G  387G   4% /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 U30 09/29/2017
Memory:
24x UNKNOWN NOT AVAILABLE 8 GB 2 rank 2666, configured at 2400

(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)
---------------------------------------------------------------
iccc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
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 CXXC 520.omnetpp_r(base) 523.xalancbmk_r(base) 531.deepsjeng_r(base)
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- **Software Availability:** Sep-2017

### Compiler Version Notes (Continued)

```
FC 548.exchange2_r(base)
```

ifort (IFORT) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.

### Base Compiler Invocation

- **C benchmarks:**
  - icc

- **C++ benchmarks:**
  - icpc

- **Fortran benchmarks:**
  - ifort

### 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=3 -L/usr/local/je5.0.1-64/lib -ljemalloc

- **C++ benchmarks:**
  - -W1, -z, muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div
  - -qopt-mem-layout-trans=3 -L/usr/local/je5.0.1-64/lib -ljemalloc

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**Hardware Availability:** Oct-2017  
**Tested by:** HPE  
**Software Availability:** Sep-2017

**Base Optimization Flags (Continued)**

Fortran benchmarks:
- `-Wl,-z,muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div`
- `-qopt-mem-layout-trans=3 -nostandard-realloc-lhs -align array32byte`
- `-L/usr/local/je5.0.1-64/lib -ljemalloc`

**Base Other Flags**

C benchmarks:
- `-m64 -std=c11`

C++ benchmarks:
- `-m64`

Fortran benchmarks:
- `-m64`

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-SKX-revD.html](http://www.spec.org/cpu2017/flags/HPE-Platform-Flags-Intel-V1.2-SKX-revD.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-SKX-revD.xml](http://www.spec.org/cpu2017/flags/HPE-Platform-Flags-Intel-V1.2-SKX-revD.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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