## SPEC® CPU2017 Integer Speed Result

**Hewlett Packard Enterprise**  
(Test Sponsor: HPE)  
ProLiant DL360 Gen10  
(2.50 GHz, Intel Xeon Silver 4215)  

<table>
<thead>
<tr>
<th>SPECspeed2017_int_base</th>
<th>8.50</th>
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<tbody>
<tr>
<td>SPECspeed2017_int_peak</td>
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</table>

**CPU2017 License:** 3  
**Test Sponsor:** HPE  
**Tested by:** HPE  
**Test Date:** Apr-2019  
**Hardware Availability:** Apr-2019  
**Software Availability:** Feb-2019

| Threads | 0 | 1.00 | 2.00 | 3.00 | 4.00 | 5.00 | 6.00 | 7.00 | 8.00 | 9.00 | 10.00 | 11.00 | 12.00 | 13.00 | 14.00 | 15.00 | 16.00 | 17.00 | 18.00 |
|---------|---|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 600.perlbench_s | 16 |     |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |     |
| 602.gcc_s | 16 | 8.18 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| 605.mcf_s | 16 |      | 5.36 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| 620.omnetpp_s | 16 |      |      | 11.5 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| 623.xalancbmk_s | 16 |      |      |      | 11.1 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| 625.x264_s | 16 |      |      |      |      | 12.4 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| 631.deepsjeng_s | 16 |      |      |      |      |      | 4.98 |      |      |      |      |      |      |      |      |      |      |      |      |      |
| 641.leela_s | 16 |      |      |      |      |      |      | 4.27 |      |      |      |      |      |      |      |      |      |      |      |      |
| 648.exchange2_s | 16 |      |      |      |      |      |      |      | 12.6 |      |      |      |      |      |      |      |      |      |      |      |
| 657.xz_s | 16 |      |      |      |      |      |      |      |      |      | 17.9 |      |      |      |      |      |      |      |      |      |

---

### Hardware

**CPU Name:** Intel Xeon Silver 4215  
**Max MHz.:** 3500  
**Nominal:** 2500  
**Enabled:** 16 cores, 2 chips  
**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:** 384 GB (24 x 16 GB 2Rx8 PC4-2933V-R, running at 2400)  
**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:** Yes  
**Firmware:** HPE BIOS Version U32 02/02/2019 released Apr-2019  
**File System:** xfs  
**System State:** Run level 3 (multi-user)  
**Base Pointers:** 64-bit  
**Peak Pointers:** Not Applicable  
**Other:** jemalloc memory allocator V5.0.1
Hewlett Packard Enterprise
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(2.50 GHz, Intel Xeon Silver 4215)

SPEC CPU2017 Integer Speed Result
Copyright 2017-2019 Standard Performance Evaluation Corporation

SPECspeed2017_int_base = 8.50
SPECspeed2017_int_peak = Not Run

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
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<th>Seconds</th>
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<tr>
<td>600.perlbench_s</td>
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<td>5.89</td>
<td>298</td>
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<td>623.xalancbmk_s</td>
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<td>11.1</td>
<td>127</td>
<td>11.2</td>
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<td>657.xz_s</td>
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</table>

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

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

General Notes

Environment variables set by runcpu before the start of the run:
KMP_AFFINITY = "granularity=fine,compact"
LD_LIBRARY_PATH = "/home/cpu2017_u2/lib/ia32:/home/cpu2017_u2/lib/intel64"
LD_LIBRARY_PATH = "$LD_LIBRARY_PATH:/home/cpu2017_u2/je5.0.1-32:/home/cpu2017_u2/je5.0.1-64"
OMP_STACKSIZE = "192M"
Binaries compiled on a system with 1x Intel Core i9-7900X CPU + 32GB RAM
memory using Redhat Enterprise Linux 7.5
Yes: 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.
jemalloc, a general purpose malloc implementation
built with the RedHat Enterprise 7.5, and the system compiler gcc 4.8.5
Hewlett Packard Enterprise  
(Test Sponsor: HPE)  
ProLiant DL360 Gen10  
(2.50 GHz, Intel Xeon Silver 4215)

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SPECspeed2017_int_base = 8.50
SPECspeed2017_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

Platform Notes

BIOS Configuration:
Hyper-Threading set to Disabled  
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 Peak Frequency Compute  
Minimum Processor Idle Power Core C-State set to C1E State  
Energy/Performance Bias set to Balanced Power  
Workload Profile set to Custom  
Numa Group Size Optimization set to Flat

Sysinfo program /home/cpu2017_u2/bin/sysinfo  
Rev: r5974 of 2018-05-19 9bcde8f2999c33d61f64985e45859ea9  
running on linux-nub3 Thu Apr 11 14:59:56 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) Silver 4215 CPU @ 2.50GHz  
  2 "physical id"s (chips)  
  16 "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 : 8  
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): 16  
On–line CPU(s) list: 0–15  
Thread(s) per core: 1  
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 4215 CPU @ 2.50GHz  
Stepping: 6  
CPU MHz: 2500.000

(Continued on next page)
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**Platform Notes (Continued):**

```
BogoMIPS: 5000.00
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 11264K
NUMA node0 CPU(s): 0-7
NUMA node1 CPU(s): 8-15
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 pdselgb rdtscp
       lm constant_tsc art arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc cpuid
       aperfmpref tsc_known_freq 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 cpuid_fault
       epb cat_13 cdp_l3 invpcid_single intel.ppin mba_shadow vmi flexpriority ept
       vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2  ings invpcid rtm cqm mpx rdt_a
       avx512f avx512dq rdseed adx smap clflushopt clwb intel_pt avx512cd avx512bw avx512vl
       xsaveopt xsavec xgetbv1 xsavec cqm_llc cqm_occup_llc cqm_mbm_total cqm_mbm_local
       ibpb ibrs dtlb dtherm ida arat pin 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: 2 nodes (0-1)
  node 0 cpus: 0 1 2 3 4 5 6 7
  node 0 size: 193121 MB
  node 0 free: 192638 MB
  node 1 cpus: 8 9 10 11 12 13 14 15
  node 1 size: 193504 MB
  node 1 free: 193314 MB
  node distances:
    node 0 1
    0: 10 21
    1: 21 10
```

From /proc/meminfo

```
MemTotal: 395905648 KB
HugePages_Total: 0
Hugepagesize: 4096 KB
```

```
From /etc/*release* /etc/*version*
  os-release:
    NAME="SLES"
    VERSION="15"
    VERSION_ID="15"
```

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

Platform Notes (Continued)

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-nub3 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 11 14:57
SPEC is set to: /home/cpu2017_u2
Filesystem      Type  Size  Used Avail Use% Mounted on
/dev/sda1       xfs    373G   95G  279G   26% /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 U32 02/02/2019
Memory:
24x UNKNOWN NOT AVAILABLE 16 GB 2 rank 2933, configured at 2400

(End of data from sysinfo program)

Compiler Version Notes

CC 600.perlbench_s(base) 602.gcc_s(base) 605.mcf_s(base) 625.x264_s(base) 657.xz_s(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 620.omnetpp_s(base) 623.xalancbmk_s(base) 631.deepsjeng_s(base)
### SPEC CPU2017 Integer Speed Result

#### HPE

**Hewlett Packard Enterprise**  
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**SPECspeed2017_int_base** = 8.50  
**SPECspeed2017_int_peak** = Not Run

---

#### Compiler Version Notes (Continued)

```plaintext
641.leela_s(base)
```

Intel(R) C++ Compiler for applications running on Intel(R) 64,  
Version 19.0.2.187 Build 20190117  
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.

```plaintext
648.exchange2_s(base)
```

Intel(R) Fortran 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:**

```plaintext
icc -m64 -std=c11
```

**C++ benchmarks:**

```plaintext
icpc -m64
```

**Fortran benchmarks:**

```plaintext
ifort -m64
```

---

#### Base Portability Flags

```plaintext
600.perlbench_s: -DSPEC_LP64 -DSPEC_LINUX_X64
602.gcc_s: -DSPEC_LP64
605.mcf_s: -DSPEC_LP64
620.omnetpp_s: -DSPEC_LP64
623.xalancbmk_s: -DSPEC_LP64 -DSPEC_LINUX
625.x264_s: -DSPEC_LP64
631.deepsjeng_s: -DSPEC_LP64
641.leela_s: -DSPEC_LP64
648.exchange2_s: -DSPEC_LP64
657.xz_s: -DSPEC_LP64
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CPU2017 License: 3
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Base Optimization Flags

C benchmarks:
-\texttt{-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div}
-\texttt{-qopt-mem-layout-trans=4 -qopenmp -DSPEC\_OPENMP}
-\texttt{-L/home/cpu2017\_u2/je5.0.1-64/ -ljemalloc}

C++ benchmarks:
-\texttt{-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div}
-\texttt{-qopt-mem-layout-trans=4}
-\texttt{-L/usr/local/IntelCompiler19/compilers\_and\_libraries\_2019.1.144/linux/compiler/lib/intel64}
-\texttt{-lqkmalloc}

Fortran benchmarks:
-\texttt{-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-mem-layout-trans=4}
-\texttt{-nostandard-realloc-lhs}

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-revJ.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-revJ.xml
http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.2019-04-03.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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