# SPEC CPU®2017 Integer Speed Result

## Hewlett Packard Enterprise

*(Test Sponsor: HPE)*  
ProLiant DL580 Gen10  
(2.60 GHz, Intel Xeon Gold 6240Y)

**SPECspeed®2017_int_base = 9.77**

**SPECspeed®2017_int_peak = Not Run**

<table>
<thead>
<tr>
<th>CPU2017 License:</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
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<td>HPE</td>
</tr>
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<td>HPE</td>
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</table>

## Hardware

- **CPU Name:** Intel Xeon Gold 6240Y  
- **Max MHz:** 3900  
- **Nominal:** 2600  
- **Enabled:** 72 cores, 4 chips  
- **Orderable:** 1, 2, 3, 4 chip(s)  
- **Cache L1:** 32 KB I + 32 KB D on chip per core  
- **Cache L2:** 1 MB I+D on chip per core  
- **Cache L3:** 24.75 MB I+D on chip per chip  
- **Other:** None  
- **Memory:** 768 GB (24 x 32 GB 2Rx8 PC4-2666V-R)  
- **Storage:** 1 x 960 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 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:** jemalloc memory allocator V5.0.1  
- **Power Management:** --

---

**Thread Performance**

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>SPECspeed®2017_int_base (9.77)</th>
</tr>
</thead>
<tbody>
<tr>
<td>600.perlbench_s</td>
<td>72</td>
<td>6.75</td>
</tr>
<tr>
<td>602.gcc_s</td>
<td>72</td>
<td>8.90</td>
</tr>
<tr>
<td>605.mcf_s</td>
<td>72</td>
<td>12.0</td>
</tr>
<tr>
<td>620.omnetpp_s</td>
<td>72</td>
<td>7.68</td>
</tr>
<tr>
<td>623.xalancbmk_s</td>
<td>72</td>
<td>12.3</td>
</tr>
<tr>
<td>625.x264_s</td>
<td>72</td>
<td>14.1</td>
</tr>
<tr>
<td>631.deepsjeng_s</td>
<td>72</td>
<td>5.37</td>
</tr>
<tr>
<td>641.leela_s</td>
<td>72</td>
<td>4.74</td>
</tr>
<tr>
<td>648.exchange2_s</td>
<td>72</td>
<td>14.0</td>
</tr>
<tr>
<td>657.xz_s</td>
<td>72</td>
<td>23.1</td>
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</table>

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**Test Date:** Jun-2019  
**Hardware Availability:** Apr-2019  
**Software Availability:** Feb-2019
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Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Base Threads</th>
<th>Base Seconds</th>
<th>Base Ratio</th>
<th>Peak Threads</th>
<th>Peak Seconds</th>
<th>Peak Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>600.perlbench_s</td>
<td>72</td>
<td>264</td>
<td>6.72</td>
<td>263</td>
<td>6.75</td>
<td>263</td>
</tr>
<tr>
<td>602.gcc_s</td>
<td>72</td>
<td>444</td>
<td>8.98</td>
<td>447</td>
<td>8.90</td>
<td>460</td>
</tr>
<tr>
<td>605.mcf_s</td>
<td>72</td>
<td>389</td>
<td>12.1</td>
<td>392</td>
<td>12.0</td>
<td>394</td>
</tr>
<tr>
<td>620.omnetpp_s</td>
<td>72</td>
<td>209</td>
<td>7.81</td>
<td>213</td>
<td>7.66</td>
<td>212</td>
</tr>
<tr>
<td>623.xalancbmk_s</td>
<td>72</td>
<td>115</td>
<td>12.3</td>
<td>115</td>
<td>12.3</td>
<td>116</td>
</tr>
<tr>
<td>625.x264_s</td>
<td>72</td>
<td>125</td>
<td>14.1</td>
<td>125</td>
<td>14.1</td>
<td>125</td>
</tr>
<tr>
<td>631.deepsjeng_s</td>
<td>72</td>
<td>267</td>
<td>5.37</td>
<td>267</td>
<td>5.38</td>
<td>267</td>
</tr>
<tr>
<td>641.leela_s</td>
<td>72</td>
<td>359</td>
<td>4.75</td>
<td>360</td>
<td>4.74</td>
<td>360</td>
</tr>
<tr>
<td>648.exchange2_s</td>
<td>72</td>
<td>210</td>
<td>14.0</td>
<td>209</td>
<td>14.0</td>
<td>209</td>
</tr>
<tr>
<td>657.xz_s</td>
<td>72</td>
<td>270</td>
<td>22.9</td>
<td>267</td>
<td>23.2</td>
<td>267</td>
</tr>
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</table>

SPECspeed®2017_int_base = 9.77
SPECspeed®2017_int_peak = Not Run

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:
/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
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.
jemalloc, a general purpose malloc implementation built with the RedHat Enterprise 7.5, and the system compiler gcc 4.8.5
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**CPU2017 License:** 3  
**Test Date:** Jun-2019  
**Test Sponsor:** HPE  
**Tested by:** HPE  
**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
- Advanced Memory Protection set to Advanced ECC

**Sysinfo program** /home/cpu2017_u2/bin/sysinfo  
Rev: r5974 of 2018-05-19 9bcede8f2999c33d61f64985e45859ea9  
running on linux-sypg Wed Sep 5 16:18:00 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 6240C CPU @ 2.60GHz
- 4 "physical id"s (chips)
- 72 "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: 18
  - siblings: 18
  - physical 0: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
  - physical 1: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
  - physical 2: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
  - physical 3: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27

**From lscpu:**
- Architecture: x86_64
- CPU op-mode(s): 32-bit, 64-bit
- Byte Order: Little Endian
- CPU(s): 72
- On-line CPU(s) list: 0-71
- Thread(s) per core: 1
- Core(s) per socket: 18
- Socket(s): 4
- NUMA node(s): 4
- Vendor ID: GenuineIntel
- CPU family: 6
- Model: 85

(Continued on next page)
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CPU2017 License: 3
Test Sponsor: HPE
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Platform Notes (Continued)

Model name: Intel(R) Xeon(R) Gold 6240C CPU @ 2.60GHz
Stepping: 6
CPU MHz: 2600.000
BogoMIPS: 5200.00
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 25344K
NUMA node0 CPU(s): 0-17
NUMA node1 CPU(s): 18-35
NUMA node2 CPU(s): 36-53
NUMA node3 CPU(s): 54-71
Flags: fpu vme de pse tsc msr pae 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 pti msr 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 lm abm 3nowprefetch cpuid_fault epb cat_l3 cdp_l3 invpcid_single intel_pmm mba trp_shadow vnmi flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 bgcolor rdtscp aarch64 mpx rdset_a avx512f vfpv10 model_l1d xsaveopt xsavec xsaveopt xsavec xgetbv1 xsave vperm286 vpermciasm cmov Reflect

From numactl --hardware WARNING: a numactl 'node' might or might not correspond to a physical chip.

/home: 4 nodes (0-3)
node 0 cpus: 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17
node 0 size: 193117 MB
node 0 free: 192773 MB
node 1 cpus: 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35
node 1 size: 193503 MB
node 1 free: 193149 MB
node 2 cpus: 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53
node 2 size: 193532 MB
node 2 free: 193146 MB
node 3 cpus: 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71
node 3 size: 193530 MB
node 3 free: 193375 MB
node distances:
node 0 1 2 3
0: 10 21 21 21
1: 21 10 21 21

(Continued on next page)
Platform Notes (Continued)

From /proc/meminfo
MemTotal:       792253000 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 Sep 5 16:16

SPEC is set to: /home/cpu2017_u2
  Filesystem Type Size Used Avail Use% Mounted on
  /dev/sda1 xfs  894G  83G  812G 10% /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)
The marketing name for the processor in this result, which appears in the CPU name and hardware (Continued on next page)
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Platform Notes (Continued)

model areas, is different from sysinfo because a pre-production processor was used. The pre-production processor differs from the production processor in name only.

Compiler Version Notes

==============================================================================
C       | 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.
------------------------------------------------------------------------------
==============================================================================
C++     | 620.omnetpp_s(base) 623.xalancbmk_s(base) 631.deepsjeng_s(base)
       | 641.leela_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.
------------------------------------------------------------------------------
==============================================================================
Fortran | 648.exchange2_s(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

Test Date:       Jun-2019
Hardware Availability: Apr-2019
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Base Portability Flags

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

Base Optimization Flags

C benchmarks:
-W1, -z, muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP
-L/home/cpu2017_u2/je5.0.1-64/ -ljemalloc

C++ benchmarks:
-W1, -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:
-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-mem-layout-trans=4
-nostandard-realloc-lhs

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2017/flags/HPE-ic19.0u1-flags-linux64.2019-12-10.html
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-ic19.0u1-flags-linux64.2019-12-10.xml
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 CPU®2017 v1.0.5 on 2018-09-05 16:18:00-0400.
Originally published on 2019-12-10.