SPEC® CPU2017 Integer Speed Result

Hewlett Packard Enterprise
(Test Sponsor: HPE)
Synergy 660 Gen10
(2.50 GHz, Intel Xeon Gold 5215)

Copyright 2017-2019 Standard Performance Evaluation Corporation

SPECspeed2017_int_base = 8.39
SPECspeed2017_int_peak = Not Run

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

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

Threads

<table>
<thead>
<tr>
<th>Program</th>
<th>Threads</th>
<th>Specspeed2017_int_base (8.39)</th>
</tr>
</thead>
<tbody>
<tr>
<td>600.perlbench_s</td>
<td>40</td>
<td>5.85</td>
</tr>
<tr>
<td>602.gcc_s</td>
<td>40</td>
<td>7.69</td>
</tr>
<tr>
<td>605.mcf_s</td>
<td>40</td>
<td>11.0</td>
</tr>
<tr>
<td>620.omnetpp_s</td>
<td>40</td>
<td>5.62</td>
</tr>
<tr>
<td>623.xalancbmk_s</td>
<td>40</td>
<td>10.8</td>
</tr>
<tr>
<td>625.x264_s</td>
<td>40</td>
<td>11.8</td>
</tr>
<tr>
<td>631.deepsjeng_s</td>
<td>40</td>
<td>4.74</td>
</tr>
<tr>
<td>641.leela_s</td>
<td>40</td>
<td>4.15</td>
</tr>
<tr>
<td>648.exchange2_s</td>
<td>40</td>
<td>12.2</td>
</tr>
<tr>
<td>657.xz_s</td>
<td>40</td>
<td>20.2</td>
</tr>
</tbody>
</table>

Hardware

CPU Name: Intel Xeon Gold 5215
Max MHz.: 3400
Nominal: 2500
Enabled: 40 cores, 4 chips
Orderable: 2, 4 chip(s)
Cache L1: 32 KB I + 32 KB D on chip per core
L2: 1 MB I+D on chip per core
L3: 13.75 MB I+D on chip per chip
Other: None
Memory: 768 GB (24 x 32 GB 2Rx4 PC4-2933Y-R, running at 2666)
Storage: 1 x 480 GB SATA 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 I43 04/18/2019 released Apr-2019
File System: btrfs
System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: Not Applicable
Other: jemalloc memory allocator V5.0.1
SPEC CPU2017 Integer Speed Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

Hewlett Packard Enterprise
(Test Sponsor: HPE)
Synergy 660 Gen10
(2.50 GHz, Intel Xeon Gold 5215)

SPECspeed2017_int_base = 8.39
SPECspeed2017_int_peak = Not Run

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

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

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>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Base</td>
<td></td>
<td></td>
<td>Peak</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>600.perlbench_s</td>
<td>40</td>
<td>302</td>
<td>5.88</td>
<td>304</td>
<td>5.84</td>
<td>303</td>
<td>5.85</td>
</tr>
<tr>
<td>602.gcc_s</td>
<td>40</td>
<td>518</td>
<td>7.68</td>
<td>500</td>
<td>7.96</td>
<td>518</td>
<td>7.69</td>
</tr>
<tr>
<td>605.mcf_s</td>
<td>40</td>
<td>429</td>
<td>11.0</td>
<td>425</td>
<td>11.1</td>
<td>429</td>
<td>11.0</td>
</tr>
<tr>
<td>620.omnetpp_s</td>
<td>40</td>
<td>290</td>
<td>5.62</td>
<td>294</td>
<td>5.55</td>
<td>288</td>
<td>5.67</td>
</tr>
<tr>
<td>623.xalancbmk_s</td>
<td>40</td>
<td>131</td>
<td>10.8</td>
<td>132</td>
<td>10.7</td>
<td>130</td>
<td>10.9</td>
</tr>
<tr>
<td>625.x264_s</td>
<td>40</td>
<td>150</td>
<td>11.8</td>
<td>150</td>
<td>11.8</td>
<td>150</td>
<td>11.8</td>
</tr>
<tr>
<td>631.deepsjeng_s</td>
<td>40</td>
<td>303</td>
<td>4.74</td>
<td>302</td>
<td>4.74</td>
<td>302</td>
<td>4.74</td>
</tr>
<tr>
<td>641.leela_s</td>
<td>40</td>
<td>411</td>
<td>4.15</td>
<td>411</td>
<td>4.15</td>
<td>411</td>
<td>4.15</td>
</tr>
<tr>
<td>648.exchange2_s</td>
<td>40</td>
<td>241</td>
<td>12.2</td>
<td>240</td>
<td>12.2</td>
<td>241</td>
<td>12.2</td>
</tr>
<tr>
<td>657.xz_s</td>
<td>40</td>
<td>305</td>
<td>20.2</td>
<td>305</td>
<td>20.2</td>
<td>312</td>
<td>19.8</td>
</tr>
</tbody>
</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:
/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
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
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

(Continued on next page)
SPEC CPU2017 Integer Speed Result
Copyright 2017-2019 Standard Performance Evaluation Corporation

Hewlett Packard Enterprise
(Test Sponsor: HPE)
Synergy 660 Gen10
(2.50 GHz, Intel Xeon Gold 5215)

| SPECspeed2017_int_base = 8.39 |
| SPECspeed2017_int_peak = Not Run |

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

General Notes (Continued)

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 sy660-gen10 Sat Jun 8 01:36:26 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) Gold 5215 CPU @ 2.50GHz
  4 "physical id"s (chips)
  40 "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 : 10
siblings : 10
  physical 0: cores 0 1 2 3 4 8 9 10 11 12
  physical 1: cores 0 1 2 3 4 8 9 10 11 12
  physical 2: cores 0 1 2 3 4 8 9 10 11 12
  physical 3: cores 0 1 2 3 4 8 9 10 11 12

From lscpu:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 40
On-line CPU(s) list: 0-39
Thread(s) per core: 1
Core(s) per socket: 10
Socket(s): 4

(Continued on next page)
## SPEC CPU2017 Integer Speed Result

**Test Sponsor:** HPE  
**Hardware Availability:** Apr-2019  
**Software Availability:** Feb-2019  

### CPU2017 License:
- 3

### Test Date:
- Jun-2019

### Hardware Availability:
- Apr-2019

### Software Availability:
- Feb-2019

### Platform Notes (Continued)

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>NUMA node(s):</td>
<td>4</td>
</tr>
<tr>
<td>Vendor ID:</td>
<td>GenuineIntel</td>
</tr>
<tr>
<td>CPU family:</td>
<td>6</td>
</tr>
<tr>
<td>Model:</td>
<td>85</td>
</tr>
<tr>
<td>Model name:</td>
<td>Intel(R) Xeon(R) Gold 5215 CPU @ 2.50GHz</td>
</tr>
<tr>
<td>Stepping:</td>
<td>6</td>
</tr>
<tr>
<td>CPU MHz:</td>
<td>2500.000</td>
</tr>
<tr>
<td>BogoMIPS:</td>
<td>5000.00</td>
</tr>
<tr>
<td>Virtualization:</td>
<td>VT-x</td>
</tr>
<tr>
<td>L1d cache:</td>
<td>32K</td>
</tr>
<tr>
<td>L1i cache:</td>
<td>32K</td>
</tr>
<tr>
<td>L2 cache:</td>
<td>1024K</td>
</tr>
<tr>
<td>L3 cache:</td>
<td>14080K</td>
</tr>
<tr>
<td>NUMA node0 CPU(s):</td>
<td>0-9</td>
</tr>
<tr>
<td>NUMA node1 CPU(s):</td>
<td>10-19</td>
</tr>
<tr>
<td>NUMA node2 CPU(s):</td>
<td>20-29</td>
</tr>
<tr>
<td>NUMA node3 CPU(s):</td>
<td>30-39</td>
</tr>
<tr>
<td>Flags:</td>
<td>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 arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc cpuid aperfmperf 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_l3 cdp_l3 invpcid_single intel_pmm tpr_shadow vmx flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rtm cqm mpx rdt_a avx512f avx512dq rdseed adx smap clflushopt clwb intel_pt avx512cd avx512bw avx512vl xsaveopt xsaves xsavec xgetbv1 xsavec qm_llc qm_occp_llc qm_mbm_total qm_mbm_local ibpb ibrs stibp dtherm ida arat pln pts pku ospke avx512_vnni arch_capabilities ssbd</td>
</tr>
</tbody>
</table>

### proc/cpuinfo cache data
- cache size : 14080 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 8 9
- node 0 size: 193048 MB
- node 0 free: 192699 MB
- node 1 cpus: 10 11 12 13 14 15 16 17 18 19
- node 1 size: 193533 MB
- node 1 free: 193263 MB
- node 2 cpus: 20 21 22 23 24 25 26 27 28 29
- node 2 size: 193533 MB
- node 2 free: 193308 MB
- node 3 cpus: 30 31 32 33 34 35 36 37 38 39
- node 3 size: 193295 MB
- node 3 free: 193147 MB

(Continued on next page)
Platform Notes (Continued)

node distances:
node 0 1 2 3
0: 10 21 21 21
1: 21 10 21 21
2: 21 21 10 21
3: 21 21 21 10

From /proc/meminfo
MemTotal: 791973864 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 sy660-gen10 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 Jun 8 01:35
SPEC is set to: /home/cpu2017_u2
  Filesystem Type Size Used Avail Use% Mounted on
  /dev/sdb2 btrfs 445G 124G 321G 28% /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 SMI BIOS" standard.
  BIOS HPE I43 04/18/2019
  Memory:
  24x UNKNOWN NOT AVAILABLE

(Continued on next page)
### SPEC CPU2017 Integer Speed Result

**Hewlett Packard Enterprise**  
(Test Sponsor: HPE)

### Platform Notes (Continued)

24x UNKNOWN NOT AVAILABLE 32 GB 2 rank 2933, configured at 2666

(End of data from sysinfo program)

### Compiler Version Notes

<table>
<thead>
<tr>
<th>C</th>
<th>600.perlbench_s(base) 602.gcc_s(base) 605.mcf_s(base) 625.x264_s(base) 657.xz_s(base)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64, Version 19.0.2.187 Build 20190117</td>
</tr>
<tr>
<td></td>
<td>Copyright (C) 1985-2019 Intel Corporation. All rights reserved.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>C++</th>
<th>620.omnetpp_s(base) 623.xalancbmk_s(base) 631.deepsjeng_s(base) 641.leela_s(base)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Intel(R) C++ Intel(R) 64 Compiler for applications running on Intel(R) 64, Version 19.0.2.187 Build 20190117</td>
</tr>
<tr>
<td></td>
<td>Copyright (C) 1985-2019 Intel Corporation. All rights reserved.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Fortran</th>
<th>648.exchange2_s(base)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R) 64, Version 19.0.2.187 Build 20190117</td>
</tr>
<tr>
<td></td>
<td>Copyright (C) 1985-2019 Intel Corporation. All rights reserved.</td>
</tr>
</tbody>
</table>

### Base Compiler Invocation

**C benchmarks:**

```shell
icc -m64 -std=c11
```

**C++ benchmarks:**

```shell
icpc -m64
```

**Fortran benchmarks:**

```shell
ifort -m64
```
# SPEC CPU2017 Integer Speed Result

**Hewlett Packard Enterprise**  
(Test Sponsor: HPE)  
Synergy 660 Gen10  
(2.50 GHz, Intel Xeon Gold 5215)

<table>
<thead>
<tr>
<th>SPECspeed2017_int_base</th>
<th>SPECspeed2017_int_peak</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.39</td>
<td>Not Run</td>
</tr>
</tbody>
</table>

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

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

## 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:**  
-Wl,-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:**  
-Wl,-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.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.xml  
http://www.spec.org/cpu2017/flags/HPE-Platform-Flags-Intel-V1.2-CLX-revB.xml

SPEC is a registered trademark of the Standard Performance Evaluation Corporation. All other brand and product names appearing in this result are trademarks or registered trademarks of their respective holders.

For questions about this result, please contact the tester. For other inquiries, please contact info@spec.org.

Tested with SPEC CPU2017 v1.0.5 on 2019-06-08 02:36:25-0400.  
Report generated on 2019-07-22 11:44:00 by CPU2017 PDF formatter v6067.  