## SPEC CPU®2017 Integer Speed Result

**Hewlett Packard Enterprise**  
(Test Sponsor: HPE)  
ProLiant DL580 Gen10  
(3.60 GHz, Intel Xeon Gold 6244)

<table>
<thead>
<tr>
<th>SPECspeed®2017_int_base</th>
<th>Not Run</th>
</tr>
</thead>
</table>

### Hardware

- **CPU Name:** Intel Xeon Gold 6244  
- **Max MHz:** 4400  
- **Nominal:** 3600  
- **Enabled:** 32 cores, 4 chips  
- **Orderable:** 1, 2, 3, 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:** 24.75 MB I+D on chip per chip  
- **Memory:** 768 GB (24 x 32 GB 2Rx4 PC4-2933Y-R)  
- **Storage:** 1 x 600 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 19.0.0.117 of Intel C/C++  
- **Compiler Build:** 20180804 for Linux; Fortran: Version 19.0.0.117 of Intel Fortran  
- **Compiler Build:** 20180804 for Linux  
- **Parallel:** Yes  
- **Firmware:** HPE BIOS Version U34 02/02/2019 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  
- **Power Management:** --

### Performance Results

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>SPECspeed®2017_int_base</th>
</tr>
</thead>
<tbody>
<tr>
<td>600.perlbench_s</td>
<td>32</td>
<td>7.36</td>
</tr>
<tr>
<td>602.gcc_s</td>
<td>32</td>
<td>10.0</td>
</tr>
<tr>
<td>605.mcf_s</td>
<td>32</td>
<td>12.3</td>
</tr>
<tr>
<td>620.omnetpp_s</td>
<td>32</td>
<td>7.16</td>
</tr>
<tr>
<td>623.xalancbmk_s</td>
<td>32</td>
<td>10.8</td>
</tr>
<tr>
<td>625.x264_s</td>
<td>32</td>
<td>14.6</td>
</tr>
<tr>
<td>631.deepsjeng_s</td>
<td>32</td>
<td>6.03</td>
</tr>
<tr>
<td>641.leela_s</td>
<td>32</td>
<td>5.35</td>
</tr>
<tr>
<td>648.exchange2_s</td>
<td>32</td>
<td>16.1</td>
</tr>
<tr>
<td>657.xz_s</td>
<td>32</td>
<td>24.9</td>
</tr>
</tbody>
</table>

**Test Sponsor:** HPE  
**Test Date:** Feb-2019  
**Hardware Availability:** Apr-2019  
**Software Availability:** Nov-2018
SPEC CPU®2017 Integer Speed Result

Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL580 Gen10
(3.60 GHz, Intel Xeon Gold 6244)

SPECspeed®2017_int_base = 10.3
SPECspeed®2017_int_peak = Not Run

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Base</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Base</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Base</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Base</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>600.perlbench_s</td>
<td>32</td>
<td>240</td>
<td>7.39</td>
<td>241</td>
<td>7.36</td>
<td>243</td>
<td>7.30</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>602.gcc_s</td>
<td>32</td>
<td>396</td>
<td>10.0</td>
<td>400</td>
<td>9.96</td>
<td>391</td>
<td>10.2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>605.mcf_s</td>
<td>32</td>
<td>383</td>
<td>12.3</td>
<td>385</td>
<td>12.3</td>
<td>380</td>
<td>12.4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>620.omnetpp_s</td>
<td>32</td>
<td>227</td>
<td>7.19</td>
<td>229</td>
<td>7.13</td>
<td>228</td>
<td>7.16</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>623.xalancbmk_s</td>
<td>32</td>
<td>130</td>
<td>10.9</td>
<td>131</td>
<td>10.8</td>
<td>132</td>
<td>10.7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>625.x264_s</td>
<td>32</td>
<td>121</td>
<td>14.6</td>
<td>121</td>
<td>14.6</td>
<td>121</td>
<td>14.6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>631.deepsjeng_s</td>
<td>32</td>
<td>238</td>
<td>6.03</td>
<td>238</td>
<td>6.03</td>
<td>238</td>
<td>6.03</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>641.leela_s</td>
<td>32</td>
<td>318</td>
<td>5.36</td>
<td>319</td>
<td>5.35</td>
<td>319</td>
<td>5.35</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>648.exchange2_s</td>
<td>32</td>
<td>183</td>
<td>16.1</td>
<td>183</td>
<td>16.1</td>
<td>183</td>
<td>16.1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>657.xz_s</td>
<td>32</td>
<td>249</td>
<td>24.9</td>
<td>249</td>
<td>24.9</td>
<td>249</td>
<td>24.8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

SPECspeed®2017_int_base = 10.3
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/lib/ia32:/home/cpu2017/lib/intel64"
LD_LIBRARY_PATH = "$LD_LIBRARY_PATH:/home/cpu2017/je5.0.1-32:/home/cpu2017/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
## 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 AdvancedECC
- Sysinfo program: `/home/cpu2017/bin/sysinfo`
- Rev: `r5974` of `2018-05-19 9bcde8f2999c33d61f64985e45859ea9`
- Running on `linux-lj2l Fri Feb 22 13:58:26 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](https://www.spec.org/cpu2017/Docs/config.html#sysinfo)

From `/proc/cpuinfo`

```plaintext`
model name : Intel(R) Xeon(R) Gold 6244 CPU @ 3.60GHz
  4 "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 : 8
  physical 0: cores 1 2 3 4 8 9 18 27
  physical 1: cores 2 8 9 18 19 20 25 26
  physical 2: cores 4 8 17 18 19 24 25 27
  physical 3: cores 2 3 4 11 16 24 25 26
```

From `lscpu`:

```plaintext`
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: 1
Core(s) per socket: 8
Socket(s): 4
NUMA node(s): 4
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
```

(Continued on next page)
**SPEC CPU®2017 Integer Speed Result**

**Hewlett Packard Enterprise**  
(Test Sponsor: HPE)  
ProLiant DL580 Gen10  
(3.60 GHz, Intel Xeon Gold 6244)

<table>
<thead>
<tr>
<th>SPECspeed®2017_int_base</th>
<th>10.3</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECspeed®2017_int_peak</td>
<td>Not Run</td>
</tr>
</tbody>
</table>

**CPU2017 License:** 3  
**Test Sponsor:** HPE  
**Tested by:** HPE  
**Test Date:** Feb-2019  
**Hardware Availability:** Apr-2019  
**Software Availability:** Nov-2018

**Platform Notes (Continued)**

- **Model name:** Intel(R) Xeon(R) Gold 6244 CPU @ 3.60GHz  
- **Stepping:** 6  
- **CPU MHz:** 3600.000  
- **BogoMIPS:** 7200.00  
- **Virtualization:** VT-x  
- **L1d cache:** 32K  
- **L1i cache:** 32K  
- **L2 cache:** 1024K  
- **L3 cache:** 25344K  
- **NUMA node0 CPU(s):** 0-7  
- **NUMA node1 CPU(s):** 8-15  
- **NUMA node2 CPU(s):** 16-23  
- **NUMA node3 CPU(s):** 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 cpuid aperfmperf tsc_known_freq pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16 xtpr pdcm pclid dca sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave avx f16c rdrand lahf_lm abm 3dnowprefetch cpuid_fault ebpx cat_13 cpd_13 invpcid_single intel_ppip mba tpr_shadow vmmi flexpriority ept vpid fsbgbase tsc_adjust bmi1 hle avx2 smep bmi2 erts invpcid rtm cqm mpx rdt_a avx512f avx512dq rdseed adx smap clflushopt clwb intel_pt avx512cd avx512bw avx512vl xsaveopt xsavec xgetbv1 xsave vmmi llc_qc_occup llc_qc_mbb_total llc_mbb_local ibpb ibrs stibp dtherm ida arat pln pts pkp ospke avx512_vnni arch_capabilities ssbd

```
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
    node 0 size: 193119 MB
    node 0 free: 192760 MB
    node 1 cpus: 8 9 10 11 12 13 14 15
    node 1 size: 193534 MB
    node 1 free: 193359 MB
    node 2 cpus: 16 17 18 19 20 21 22 23
    node 2 size: 193505 MB
    node 2 free: 193357 MB
    node 3 cpus: 24 25 26 27 28 29 30 31
    node 3 size: 193533 MB
    node 3 free: 193184 MB
    node distances:
      node 0 1 2 3
        0: 10 21 21 21
        1: 21 10 21 21
```

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

Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL580 Gen10
(3.60 GHz, Intel Xeon Gold 6244)

SPECspeed®2017_int_base = 10.3
SPECspeed®2017_int_peak = Not Run

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

Platform Notes (Continued)

2: 21 21 10 21
3: 21 21 21 10

From /proc/meminfo
MemTotal: 792261576 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-lj2l 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 Feb 22 13:55

SPEC is set to: /home/cpu2017
Filesystem Type Size Used Avail Use% Mounted on
/dev/sdb3 xfs 141G 29G 112G 21% /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 02/02/2019
Memory:
24x UNKNOWN NOT AVAILABLE
24x UNKNOWN NOT AVAILABLE 32 GB 2 rank 2933

(End of data from sysinfo program)
Hewlett Packard Enterprise  
(Test Sponsor: HPE)  
ProLiant DL580 Gen10  
(3.60 GHz, Intel Xeon Gold 6244)  

SPECspeed®2017_int_base = 10.3  
SPECspeed®2017_int_peak = Not Run

CPU2017 License: 3  
Test Date: Feb-2019  
Test Sponsor: HPE  
Hardware Availability: Apr-2019  
Tested by: HPE  
Software Availability: Nov-2018

---

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>
</table>

Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64,  
Version 19.0.0.117 Build 20180804  
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.  
---

<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>
</table>

Intel(R) C++ Intel(R) 64 Compiler for applications running on Intel(R) 64,  
Version 19.0.0.117 Build 20180804  
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.  
---

<table>
<thead>
<tr>
<th>Fortran</th>
<th>648.exchange2_s(base)</th>
</tr>
</thead>
</table>

Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R) 64,  
Version 19.0.0.117 Build 20180804  
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

---

Base Compiler Invocation

C benchmarks:  
icc -m64 -std=gnu11

C++ benchmarks:  
icpc -m64

Fortran benchmarks:  
ifort -m64

---

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

(Continued on next page)
**SPEC CPU®2017 Integer Speed Result**

Hewlett Packard Enterprise  
(Test Sponsor: HPE)  
ProLiant DL580 Gen10  
(3.60 GHz, Intel Xeon Gold 6244)  

**SPECspeed®2017_int_base = 10.3**  
**SPECspeed®2017_int_peak = Not Run**

**CPU2017 License:** 3  
**Test Date:** Feb-2019  
**Test Sponsor:** HPE  
**Hardware Availability:** Apr-2019  
**Tested by:** HPE  
**Software Availability:** Nov-2018

---

**Base Portability Flags (Continued)**

- 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=3 -qopenmp -DSPEC_OPENMP`
- `-L/usr/local/je5.0.1-64/lib -ljemalloc`

**C++ benchmarks:**
- `-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div`
- `-qopt-mem-layout-trans=3 -L/usr/local/je5.0.1-64/lib -ljemalloc`

**Fortran benchmarks:**
- `-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div`
- `-qopt-mem-layout-trans=3 -nostandard-realloc-lhs -align array32byte`
- `-L/usr/local/je5.0.1-64/lib -ljemalloc`

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

---

SPEC CPU and SPECspeed are registered trademarks 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 CPU®2017 v1.0.5 on 2019-02-22 03:28:26-0500.  
Report generated on 2021-01-05 17:04:09 by CPU2017 PDF formatter v6255.  
Originally published on 2019-04-03.