**SPEC® CPU2017 Integer Speed Result**

Hewlett Packard Enterprise

ProLiant DL560 Gen10

(2.70 GHz, Intel Xeon Platinum 8270)

<table>
<thead>
<tr>
<th>Threaded Programs</th>
<th>Base Points</th>
<th>Peak Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>600.perlbench_s</td>
<td>0.00</td>
<td>Not Run</td>
</tr>
<tr>
<td>602.gcc_s</td>
<td>9.71</td>
<td>Not Run</td>
</tr>
<tr>
<td>605.mcf_s</td>
<td>0.00</td>
<td>Not Run</td>
</tr>
<tr>
<td>620.omnetpp_s</td>
<td>9.15</td>
<td>Not Run</td>
</tr>
<tr>
<td>623.xalancbmk_s</td>
<td>0.00</td>
<td>Not Run</td>
</tr>
<tr>
<td>625.x264_s</td>
<td>0.00</td>
<td>Not Run</td>
</tr>
<tr>
<td>631.deepsjeng_s</td>
<td>5.51</td>
<td>Not Run</td>
</tr>
<tr>
<td>641.leela_s</td>
<td>4.86</td>
<td>Not Run</td>
</tr>
<tr>
<td>648.exchange2_s</td>
<td>0.00</td>
<td>Not Run</td>
</tr>
<tr>
<td>657.xz_s</td>
<td>0.00</td>
<td>Not Run</td>
</tr>
</tbody>
</table>

**Hardware**

- **CPU Name:** Intel Xeon Platinum 8270
- **Max MHz.:** 4000
- **Nominal:** 2700
- **Enabled:** 104 cores, 4 chips
- **Orderable:** 1, 2, 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:** 35.75 MB I+D on chip per chip
- **Memory:** 768 GB (24 x 32 GB 2Rx4 PC4-2933Y-R)
- **Storage:** 1 x 400 GB SAS SSD, RAID 0

**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 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
## SPEC CPU2017 Integer Speed Result

**Hewlett Packard Enterprise**

*(Test Sponsor: HPE)*

ProLiant DL560 Gen10  
*(2.70 GHz, Intel Xeon Platinum 8270)*

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

<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>600.perlbench_s</td>
<td>104</td>
<td>256</td>
<td>6.93</td>
<td><strong>254</strong></td>
<td><strong>6.98</strong></td>
<td>253</td>
<td>7.01</td>
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<tr>
<td>602.gcc_s</td>
<td>104</td>
<td>413</td>
<td>9.64</td>
<td>410</td>
<td>9.71</td>
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<td><strong>9.71</strong></td>
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<tr>
<td>605.mcf_s</td>
<td>104</td>
<td><strong>371</strong></td>
<td><strong>12.7</strong></td>
<td>373</td>
<td>12.6</td>
<td>367</td>
<td>12.9</td>
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<td>620.omnetpp_s</td>
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<td>179</td>
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<td><strong>9.15</strong></td>
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<tr>
<td>623.xalancbmk_s</td>
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<td>114</td>
<td>12.4</td>
<td><strong>113</strong></td>
<td><strong>12.5</strong></td>
<td>112</td>
<td>12.6</td>
</tr>
<tr>
<td>625.x264_s</td>
<td>104</td>
<td>121</td>
<td>14.6</td>
<td>120</td>
<td>14.7</td>
<td><strong>120</strong></td>
<td><strong>14.7</strong></td>
</tr>
<tr>
<td>631.deepsjeng_s</td>
<td>104</td>
<td>260</td>
<td>5.50</td>
<td>259</td>
<td>5.52</td>
<td><strong>260</strong></td>
<td><strong>5.51</strong></td>
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<tr>
<td>641.leela_s</td>
<td>104</td>
<td>351</td>
<td>4.86</td>
<td>351</td>
<td>4.86</td>
<td><strong>351</strong></td>
<td><strong>4.86</strong></td>
</tr>
<tr>
<td>648.exchange2_s</td>
<td>104</td>
<td>205</td>
<td>14.3</td>
<td><strong>205</strong></td>
<td><strong>14.3</strong></td>
<td>206</td>
<td>14.3</td>
</tr>
<tr>
<td>657.xz_s</td>
<td>104</td>
<td>247</td>
<td>25.0</td>
<td>248</td>
<td>25.0</td>
<td><strong>247</strong></td>
<td><strong>25.0</strong></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"  
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.  
# SPEC CPU2017 Integer Speed Result

## Hewlett Packard Enterprise

(Test Sponsor: HPE)

ProLiant DL560 Gen10

(2.70 GHz, Intel Xeon Platinum 8270)

<table>
<thead>
<tr>
<th>SPECspeed2017_int_base</th>
<th>10.3</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECspeed2017_int_peak</td>
<td>Not Run</td>
</tr>
</tbody>
</table>

**CPU2017 License:** 3  
**Test Sponsor:** HPE  
**Tested by:** HPE  
**Test Date:** May-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
- Advanced Memory Protection set to Advanced ECC

**Sysinfo program** /home/cpu2017_u2/bin/sysinfo  
**Rev:** r5974 of 2018-05-19 9bcde8f2999c33d61f64985e45859ea9  
**running on linux-erfc Thu May 23 03:48:03 2019**

**SUT (System Under Test) info as seen by some common utilities.**

- From /proc/cpuinfo
  - model name: Intel(R) Xeon(R) Platinum 8270 CPU @ 2.70GHz
  - 4 "physical id"s (chips)
  - 104 "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: 26
  - siblings: 26
  - physical 0: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 16 17 18 19 20 21 22 24 25 26 27 28 29
  - physical 1: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 16 17 18 19 20 21 22 24 25 26 27 28 29
  - physical 2: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 16 17 18 19 20 21 22 24 25 26 27 28 29
  - physical 3: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 16 17 18 19 20 21 22 24 25 26 27 28 29

- From lscpu:
  - Architecture: x86_64
  - CPU op-mode(s): 32-bit, 64-bit
  - Byte Order: Little Endian
  - CPU(s): 104
  - On-line CPU(s) list: 0-103
  - Thread(s) per core: 1
  - Core(s) per socket: 26
  - Socket(s): 4

(Continued on next page)
Hewlett Packard Enterprise
ProLiant DL560 Gen10
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SPECspeed2017_int_base = 10.3
SPECspeed2017_int_peak = Not Run

Platform Notes (Continued)

NUMA node(s): 4
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Platinum 8270 CPU @ 2.70GHz
Stepping: 6
CPU MHz: 2700.000
BogoMIPS: 5400.00
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 36608K
NUMA node0 CPU(s): 0-25
NUMA node1 CPU(s): 26-51
NUMA node2 CPU(s): 52-77
NUMA node3 CPU(s): 78-103

Flags: fpu vme de pse tsc msr pae mca cmov pat pse36 clflush dts msr pse3s 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 ebda cat_13 cdpl3 invpcid_single intel_pnpin mba tpr_shadow vmmi flexpriority ept vpid fsgsbase tsc_adjust bni hle avx2 smep bmi2 rsm ripcd rtm cmx mpx rdt_a avx512f avx512dq rdseed adx smap clflushopt clwb intel_pt avx512cd avx512bw avx512vl xsaveopt xsave xsaveopt vmm vptp vmptrld xsaveopt xsaveopt xsaveopt vmmirizt ddrrecll mrsqm pdcm dtfms idate intel_pni dca dcap

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

(Continued on next page)
SPEC CPU2017 Integer Speed Result

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| SPECspeed2017_int_base = 10.3 |
| SPECspeed2017_int_peak = Not Run |

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

Platform Notes (Continued)

102 103
node 3 size: 193529 MB
node 3 free: 193345 MB
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: 792246568 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-erfc 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 May 23 03:46

SPEC is set to: /home/cpu2017_u2
Filesystem Type Size Used Avail Use% Mounted on
/dev/sda2 btrfs 371G 115G 256G 31% /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.

(Continued on next page)
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SPEC CPU2017 Integer Speed Result

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Test Sponsor: HPE
Hardware Availability: Apr-2019

CPU2017 License: 3
Software Availability: Feb-2019

Test Date: May-2019

SPECspeed2017_int_base = 10.3
SPECspeed2017_int_peak = Not Run

Platform Notes (Continued)

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)

Compiler Version Notes

==============================================================================
CC  600.perlibench_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)
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.
==============================================================================
FC  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
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<td></td>
</tr>
</tbody>
</table>

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

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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 2019-05-22 18:18:03-0400.