# SPEC CPU®2017 Integer Speed Result

## Lenovo Global Technology

ThinkSystem SR850P  
(2.10 GHz, Intel Xeon Gold 6238L)

| SPECspeed®2017_int_base = 10.8 |
| SPECspeed®2017_int_peak = Not Run |

**CPU2017 License:** 9017  
**Test Sponsor:** Lenovo Global Technology  
**Tested by:** Lenovo Global Technology  
**CPU Name:** Intel Xeon Gold 6238L  
**Max MHz:** 3700  
**Nominal:** 2100  
**Enabled:** 88 cores, 4 chips  
**Orderable:** 4 chips  
**Cache L1:** 32 KB I + 32 KB D on chip per core  
**Cache L2:** 1 MB I+D on chip per core  
**Cache L3:** 30.25 MB I+D on chip per chip  
**Other:** None  
**Memory:** 1536 GB (48 x 32 GB 2Rx4 PC4-2933Y-R)  
**Storage:** 1 x 960 GB SATA SSD  
**Other:** None

## Performance Results

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Specspeed®2017_int_base</th>
<th>Specspeed®2017_int_peak</th>
</tr>
</thead>
<tbody>
<tr>
<td>600.perlbench_s</td>
<td>88</td>
<td>6.35</td>
<td>Not Run</td>
</tr>
<tr>
<td>602.gcc_s</td>
<td>88</td>
<td>3.82</td>
<td>Not Run</td>
</tr>
<tr>
<td>605.mcf_s</td>
<td>88</td>
<td>17.6</td>
<td>Not Run</td>
</tr>
<tr>
<td>620.omnetpp_s</td>
<td>88</td>
<td>10.3</td>
<td>Not Run</td>
</tr>
<tr>
<td>623.xalancbmk_s</td>
<td>88</td>
<td>12.9</td>
<td>Not Run</td>
</tr>
<tr>
<td>625.x264_s</td>
<td>88</td>
<td>15.2</td>
<td>Not Run</td>
</tr>
<tr>
<td>631.deepsjeng_s</td>
<td>88</td>
<td>5.50</td>
<td>Not Run</td>
</tr>
<tr>
<td>641.jepsel_s</td>
<td>88</td>
<td>4.54</td>
<td>Not Run</td>
</tr>
<tr>
<td>648.exchange2_s</td>
<td>88</td>
<td>15.7</td>
<td>Not Run</td>
</tr>
<tr>
<td>657.xz_s</td>
<td>88</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Software**

- **OS:** Red Hat Enterprise Linux 8.0 (Ootpa)  
- **Kernel:** 4.18.0-80.el8.x86_64  
- **Compiler:**  
  - C/C++: Version 19.1.1.217 of Intel  
  - Fortran: Version 19.1.1.217 of Intel Fortran  
- **Parallel:** Yes  
- **Firmware:** Lenovo BIOS Version TEE156L 2.61 released May-2020  
- **File System:** xfs  
- **System State:** Run level 3 (multi-user)  
- **Base Pointers:** 64-bit  
- **Peak Pointers:** Not Applicable  
- **Power Management:** BIOS set to prefer performance at the cost of additional power usage
Lenovo Global Technology
ThinkSystem SR850P
(2.10 GHz, Intel Xeon Gold 6238L)

SPEC®2017 Integer Speed Result
Copyright 2017-2020 Standard Performance Evaluation Corporation

Lenovo Global Technology
SPECSpeed®2017_int_base = 10.8
SPECSpeed®2017_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>
<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>88</td>
<td>278</td>
<td>6.39</td>
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<td>602.gcc_s</td>
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<td>9.82</td>
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<td>9.89</td>
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<td></td>
</tr>
<tr>
<td>620.omnetpp_s</td>
<td>88</td>
<td>160</td>
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<td>157</td>
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</tr>
<tr>
<td>623.xalancbmk_s</td>
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<td>110</td>
<td>12.9</td>
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<td>12.9</td>
<td>110</td>
<td>12.9</td>
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<tr>
<td>625.x264_s</td>
<td>88</td>
<td>116</td>
<td>15.2</td>
<td>116</td>
<td>15.2</td>
<td>116</td>
<td>15.3</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>631.deepsjeng_s</td>
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<td>260</td>
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<td>5.50</td>
<td>261</td>
<td>5.49</td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>641.leela_s</td>
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<td>376</td>
<td>4.54</td>
<td>376</td>
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<tr>
<td>648.exchange2_s</td>
<td>88</td>
<td>188</td>
<td>15.7</td>
<td>188</td>
<td>15.7</td>
<td>188</td>
<td>15.6</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>657.xz_s</td>
<td>88</td>
<td>255</td>
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<td>255</td>
<td>24.2</td>
<td>255</td>
<td>24.3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

SPECSpeed®2017_int_base = 10.8
SPECSpeed®2017_int_peak = Not Run

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

Compiler Notes
The inconsistent Compiler version information under Compiler Version section is due to a discrepancy in Intel Compiler. The correct version of C/C++ compiler is: Version 19.1.1.217 Build 20200306 Compiler for Linux
The correct version of Fortran compiler is: Version 19.1.1.217 Build 20200306 Compiler for Linux

Operating System Notes
Stack size set to unlimited using "ulimit -s unlimited"

Environment Variables Notes
Environment variables set by runcpu before the start of the run:
KMP_AFFINITY = "granularity=fine,scatter"
LD_LIBRARY_PATH = ""/home/cpu2017-1.1.0-ic19.1.1/lib/intel64:/home/cpu2017-1.1.0-ic19.1.1/j
e5.0.1-64"
MALLOC_CONF = "retain:true"
OMP_STACKSIZE = "192M"

General Notes
Binaries compiled on a system with 1x Intel Core i9-7980XE CPU + 64GB RAM memory using Redhat Enterprise Linux 8.0
Transparent Huge Pages enabled by default
Prior to runcpu invocation
Filesystem page cache synced and cleared with:

(Continued on next page)
Lenovo Global Technology
ThinkSystem SR850P
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**SPECspeed®2017_int_base = 10.8**

**SPECspeed®2017_int_peak = Not Run**

<table>
<thead>
<tr>
<th>CPU2017 License:</th>
<th>Lenovo Global Technology</th>
<th>Test Date:</th>
<th>Nov-2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Sponsor:</td>
<td>Lenovo Global Technology</td>
<td>Hardware Availability:</td>
<td>Jun-2020</td>
</tr>
<tr>
<td>Tested by:</td>
<td>Lenovo Global Technology</td>
<td>Software Availability:</td>
<td>Apr-2020</td>
</tr>
</tbody>
</table>

**General Notes (Continued)**

```bash
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.


**Platform Notes**

BIOS configuration:
Choose Operating Mode set to Maximum Performance and then set it to Custom Mode
MONITOR/MWAIT set to Enable
Hyper-Threading set to Disable
DCU Streamer Prefetcher set to Disable
Patrol Scrub set to Disable
LLC dead line alloc set to Disable

Sysinfo program /home/cpu2017-1.1.0-ic19.1.1/bin/sysinfo
Rev: r6365 of 2019-08-21 295195f888a3d7edbble6e46a485a0011
running on localhost.localdomain Tue Nov 10 21:21:37 2020

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 6238L CPU @ 2.10GHz
4 "physical id"s (chips)
88 "processors"
core, siblings (Caution: counting these is hw and system dependent. The following excerpts from /proc/cpuinfo might not be reliable. Use with caution.)
cpu cores : 22
siblings : 22
physical 0: cores 0 1 2 3 4 5 8 9 10 11 12 16 17 18 19 20 21 24 25 26 27 28
physical 1: cores 0 1 2 3 4 5 8 9 10 11 12 16 17 18 19 20 21 24 25 26 27 28
physical 2: cores 0 1 2 3 4 5 8 9 10 11 12 16 17 18 19 20 21 24 25 26 27 28
physical 3: cores 0 1 2 3 4 5 8 9 10 11 12 16 17 18 19 20 21 24 25 26 27 28
```

From lscpu:
```
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
```

(Continued on next page)
## Lenovo Global Technology

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</table>

### CPU2017 License: 9017  
Test Sponsor: Lenovo Global Technology  
Tested by: Lenovo Global Technology

### Platform Notes (Continued)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU(s):</td>
<td>88</td>
</tr>
<tr>
<td>On-line CPU(s) list:</td>
<td>0-87</td>
</tr>
<tr>
<td>Thread(s) per core:</td>
<td>1</td>
</tr>
<tr>
<td>Core(s) per socket:</td>
<td>22</td>
</tr>
<tr>
<td>Socket(s):</td>
<td>4</td>
</tr>
<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 6238L CPU @ 2.10GHz</td>
</tr>
<tr>
<td>Stepping:</td>
<td>7</td>
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<tr>
<td>CPU MHz:</td>
<td>1917.965</td>
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<tr>
<td>CPU max MHz:</td>
<td>3700.0000</td>
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<tr>
<td>CPU min MHz:</td>
<td>1000.0000</td>
</tr>
<tr>
<td>BogoMIPS:</td>
<td>4200.00</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>30976K</td>
</tr>
<tr>
<td>NUMA node0 CPU(s):</td>
<td>0-21</td>
</tr>
<tr>
<td>NUMA node1 CPU(s):</td>
<td>22-43</td>
</tr>
<tr>
<td>NUMA node2 CPU(s):</td>
<td>44-65</td>
</tr>
<tr>
<td>NUMA node3 CPU(s):</td>
<td>66-87</td>
</tr>
<tr>
<td>Flags:</td>
<td>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 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 3nowprefetch cpuid_fault epb cat_l3 cdp_l3 invpcid_single intel_puin ssbd mba ibrs ibpb stibp ibrs enhanced tpr_shadow vnmi flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 ermv invpcid rtm cmx mpx rdt_a avx512f avx512dq rdseed adx smap clflushopt clwb intel_pt avx512cd avx512bw avx512vl xsaveopt xsaveopt xsavec xgetbv1 xsavec xsavelegacy 128bitcap intel_pimpc_meren clear讓他 flush_l1d arch_capabilities</td>
</tr>
</tbody>
</table>

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

### numactl --hardware output

<table>
<thead>
<tr>
<th>Node</th>
<th>CPUs</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>386683 MB</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>386282 MB</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43</td>
<td></td>
</tr>
</tbody>
</table>
## Lenovo Global Technology

**ThinkSystem SR850P**  
(2.10 GHz, Intel Xeon Gold 6238L)

<table>
<thead>
<tr>
<th>CPU2017 License:</th>
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<tbody>
<tr>
<td>Test Sponsor:</td>
<td>Lenovo Global Technology</td>
</tr>
<tr>
<td>Tested by:</td>
<td>Lenovo Global Technology</td>
</tr>
</tbody>
</table>

### SPECspeed®2017 Int Base

**SPECspeed®2017_int_base = 10.8**

**SPECspeed®2017_int_peak = Not Run**

### Platform Notes (Continued)

```
node 1 size: 387042 MB  
node 1 free: 386767 MB  
node 2 cpus: 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65
node 2 size: 387067 MB  
node 2 free: 385800 MB  
node 3 cpus: 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87
node 3 size: 387066 MB  
node 3 free: 386708 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: 1585009148 kB
- HugePages_Total: 0
- Hugepagesize: 2048 kB

From `/etc/*release* /etc/*version*`

- os-release:
  - NAME="Red Hat Enterprise Linux"
  - VERSION="8.0 (Ootpa)"
  - ID="rhel"
  - ID_LIKE="fedora"
  - VERSION_ID="8.0"
  - PLATFORM_ID="platform:el8"
  - PRETTY_NAME="Red Hat Enterprise Linux 8.0 (Ootpa)"
  - ANSI_COLOR="0;31"

- redhat-release: Red Hat Enterprise Linux release 8.0 (Ootpa)
- system-release: Red Hat Enterprise Linux release 8.0 (Ootpa)
- system-release-cpe: cpe:/o:redhat:enterprise_linux:8.0:ga

uname -a:

```
Linux localhost.localdomain 4.18.0-80.el8.x86_64 #1 SMP Wed Mar 13 12:02:46 UTC 2019  
x86_64 x86_64 x86_64 GNU/Linux
```

Kernel self-reported vulnerability status:

- CVE-2018-3620 (L1 Terminal Fault): Not affected
- Microarchitectural Data Sampling: No status reported
- CVE-2017-5754 (Meltdown): Not affected
- CVE-2018-3639 (Speculative Store Bypass): Mitigation: Speculative Store Bypass disabled via prctl and seccomp
- CVE-2017-5753 (Spectre variant 1): Mitigation: __user pointer sanitization
- CVE-2017-5715 (Spectre variant 2): Mitigation: Enhanced IBRS, IBPB: conditional,
Lenovo Global Technology
ThinkSystem SR850P
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SPECSpeed®2017_int_base = 10.8
SPECSpeed®2017_int_peak = Not Run

Platform Notes (Continued)

RSB filling

run-level 3 Nov 10 21:19

SPEC is set to: /home/cpu2017-1.1.0-ic19.1.1

Filesystem Type Size Used Avail Use% Mounted on
/dev/sda4 xfs 839G 22G 817G 3% /home

From /sys/devices/virtual/dmi/id
BIOS: Lenovo -[TEE156L-2.61]- 05/20/2020
Vendor: Lenovo
Product: ThinkSystem SR850P -[7D2HCTO1WW]-
Product Family: ThinkSystem
Serial: 1234567890

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.

Memory:
48x Samsung M393A4K40CB2-CVF 32 GB 2 rank 2933

(End of data from sysinfo program)

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 Compiler for applications running on Intel(R) 64, Version 2021.1
NextGen Build 20200304
Copyright (C) 1985-2020 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++ Compiler for applications running on Intel(R) 64, Version 2021.1
NextGen Build 20200304
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------------------------------------------

------------------------------------------------------------------------------------------------------------------
Fortran | 648.exchange2_s(base)
(Continued on next page)
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Test Date: Nov-2020
Hardware Availability: Jun-2020
Software Availability: Apr-2020

Compiler Version Notes (Continued)

Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R) 64, Version 19.1.1.217 Build 20200306
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

Base Compiler Invocation

C benchmarks:
icc

C++ benchmarks:
icpc

Fortran benchmarks:
ifort

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:
-m64 -qnextgen -std=c11
-Wl,-plugin-opt=-x86-branches-within-32B-boundaries -Wl,-z,muldefs
-xCORE-AVX512 -O3 -ffast-math -flto -mfpmath=sse -funroll-loops
-fuse-ld=gold -qopt-mem-layout-trans=4 -fopenmp -DSPEC_OPENMP
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

C++ benchmarks:
-m64 -qnextgen -Wl,-plugin-opt=-x86-branches-within-32B-boundaries

(Continued on next page)
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Test Sponsor: Lenovo Global Technology
Tested by: Lenovo Global Technology

Test Date: Nov-2020
Hardware Availability: Jun-2020
Software Availability: Apr-2020

Base Optimization Flags (Continued)

C++ benchmarks (continued):
- W1, -z, muldefs -xCORE-AVX512 -O3 -ffast-math -flto -mfpmath=sse
- funroll-loops -fuse-ld=gold -qopt-mem-layout-trans=4
- L/usr/local/IntelCompiler19/compilers_and_libraries_2020.1.217/linux/compiler/lib/intel64_lin
  -1qkmalloc

Fortran benchmarks:
- m64 -Wl,-plugin-opt=-x86-branches-within-32B-boundaries -xCORE-AVX512
- O3 -ipo -no-prec-div -qopt-mem-layout-trans=4
- nostandard-realloc-lhs -align array32byte
- mbranches-within-32B-boundaries

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2017/flags/Lenovo-Platform-SPECcpu2017-Flags-V1.2-CLX-I.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2017/flags/Intel-ic19.1u1-official-linux64_revA.xml
http://www.spec.org/cpu2017/flags/Lenovo-Platform-SPECcpu2017-Flags-V1.2-CLX-I.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 v1.1.0 on 2020-11-10 08:21:37-0500.
Report generated on 2020-12-08 15:18:29 by CPU2017 PDF formatter v6255.
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