## Lenovo Global Technology

### ThinkSystem SR630

(2.10 GHz, Intel Xeon Silver 4110)

### SPECrate2017_int_base = 73.5

### SPECrate2017_int_peak = 76.6

<table>
<thead>
<tr>
<th>Test Sponsor</th>
<th>Lenovo Global Technology</th>
<th>Hardware Availability: Aug-2017</th>
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<td>Software Availability: Sep-2017</td>
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<td>CPU2017 License</td>
<td>9017</td>
<td>Test Date: Dec-2017</td>
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<tr>
<td>CPU Name</td>
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<tr>
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</tr>
<tr>
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<tr>
<td>L2</td>
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<td>L3</td>
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<tr>
<td>Memory:</td>
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<tr>
<td>Storage:</td>
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<tr>
<td>Other:</td>
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<td>OS:</td>
<td>SUSE Linux Enterprise Server 12 SP2 (x86_64)</td>
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<td>C/C++: Version 18.0.0.128 of Intel C/C++</td>
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<td>Fortran: Version 18.0.0.128 of Intel Fortran</td>
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<td>System State:</td>
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<tr>
<td>Peak Pointers:</td>
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<tr>
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<td>jemalloc: jemalloc memory allocator library V5.0.1</td>
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### Hardware

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<td>54.5</td>
<td>67.7</td>
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<tr>
<td>502.gcc_r</td>
<td>32</td>
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<td>520.omnetpp_r</td>
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<td>523.xalancbmk_r</td>
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<td>525.x264_r</td>
<td>32</td>
<td>92.9</td>
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<tr>
<td>531.deepsjeng_r</td>
<td>32</td>
<td>61.2</td>
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<tr>
<td>541.leela_r</td>
<td>32</td>
<td>57.7</td>
</tr>
<tr>
<td>548.exchange2_r</td>
<td>32</td>
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<tr>
<td>557.xz_r</td>
<td>32</td>
<td>49.6</td>
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**SPEC CPU2017 Integer Rate Result**

**Lenovo Global Technology**

ThinkSystem SR630  
(2.10 GHz, Intel Xeon Silver 4110)

**SPECrate2017_int_base = 73.5**  
**SPECrate2017_int_peak = 76.6**

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<th>Benchmark</th>
<th>Base</th>
<th>Peak</th>
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<tr>
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<td>502.gcc_r</td>
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<td>520.omnetpp_r</td>
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<td>523.xalan_bmk_r</td>
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<tr>
<td>557.xz_r</td>
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**Results Table**

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<tr>
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<td>136</td>
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<td>618</td>
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<tr>
<td>557.xz_r</td>
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<td>637</td>
<td>54.2</td>
<td>638</td>
<td>54.2</td>
<td>637</td>
<td>54.2</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Submit Notes**

The numactl mechanism was used to bind copies to processors. The config file option 'submit' was used to generate numactl commands to bind each copy to a specific processor. For details, please see the config file.

**Operating System Notes**

Stack size set to unlimited using "ulimit -s unlimited"

**General Notes**

Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH = "/home/cpu2017.1.0.2.ic18.0/lib/ia32:/home/cpu2017.1.0.2.ic18.0/lib/intel64"
LD_LIBRARY_PATH = "$LD_LIBRARY_PATH:/home/cpu2017.1.0.2.ic18.0/je5.0.1-32:/home/cpu2017.1.0.2.ic18.0/je5.0.1-64"

Binaries compiled on a system with 1x Intel Core i7-4790 CPU + 32GB RAM
memory using Redhat Enterprise Linux 7.4
Transparent Huge Pages enabled by default
Prior to runcpu invocation
Files system page cache synced and cleared with:
sync; echo 3 > /proc/sys/vm/drop_caches
runcpu command invoked through numactl i.e.:
numactl --interleave=all runcpu <etc>
jemalloc: configured and built at default for
32bit (i686) and 64bit (x86_64) targets;
jemalloc: built with the RedHat Enterprise 7.4,
and the system compiler gcc 4.8.5;
jemalloc: sources available from jemalloc.net or

(Continued on next page)
SPEC CPU2017 Integer Rate Result

Lenovo Global Technology
ThinkSystem SR630
(2.10 GHz, Intel Xeon Silver 4110)

SPECrate2017_int_base = 73.5
SPECrate2017_int_peak = 76.6

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

Test Date: Dec-2017
Hardware Availability: Aug-2017
Software Availability: Sep-2017

General Notes (Continued)

No: The test sponsor attests, as of date of publication, that CVE-2017-5754 (Meltdown) is mitigated in the system as tested and documented.
No: 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.
No: 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.
This benchmark result is intended to provide perspective on past performance using the historical hardware and/or software described on this result page.
The system as described on this result page was formerly generally available. At the time of this publication, it may not be shipping, and/or may not be supported, and/or may fail to meet other tests of General Availability described in the SPEC OSG Policy document, http://www.spec.org/osg/policy.html
This measured result may not be representative of the result that would be measured were this benchmark run with hardware and software available as of the publication date.

Platform Notes

BIOS configuration:
Choose Operating Mode set to Maximum Performance
SNC set to Enable
Hardware Prefetcher set to Disable
MONITORM/WAIT set to Enable
Execute Disable Bit set to Disable
Trusted Execution Technology set to Enable
Stale AtoS set to Enable
LLC Deadline Alloc set to Disable
Sysinfo program /home/cpu2017.1.0.2.ic18.0/bin/sysinfo
Rev: r5797 of 2017-06-14 96c45e4568ad54c135fd618bcc091c0f
running on Cable-SPECcpu2017-SUSE12SP2 Wed Dec 13 19:39:28 2017

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) Silver 4110 CPU @ 2.10GHz
  2 "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 : 16
physical 0: cores 0 1 2 3 4 5 6 7

(Continued on next page)
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Platform Notes (Continued)

 physical 1: cores 0 1 2 3 4 5 6 7

From lscpu:
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: 2
Core(s) per socket: 8
Socket(s): 2
NUMA node(s): 2
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Silver 4110 CPU @ 2.10GHz
Stepping: 4
CPU MHz: 2095.085
BogoMIPS: 4190.17
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 11264K
NUMA node0 CPU(s): 0-7,16-23
NUMA node1 CPU(s): 8-15,24-31
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
aperfmpref eagerfpu pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg
fma cx16 xptr pdcm pcid dca sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes
xsave avx f16c rdrand lahf_lm abm 3dnowprefetch ida arat epb pnpa pts dtherm intel_pt
tpr_shadow vnmi flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2
emms invpcid rtm cqm mpx avx512f avx512dq rdseed adx smap clflushopt clwb avx512cd
avx512bw avx512v1 xsavesopt xsaveopt xsave xgetbv1 cqm_llc cqm_occup_llc

/proc/cpuinfo cache data
cache size : 11264 KB

From numactl --hardware WARNING: a numactl 'node' might or might not correspond to a
physical chip.
available: 2 nodes (0-1)
node 0 cpus: 0 1 2 3 4 5 6 7 16 17 18 19 20 21 22 23
node 0 size: 193110 MB
node 0 free: 191710 MB
node 1 cpus: 8 9 10 11 12 13 14 15 24 25 26 27 28 29 30 31
node 1 size: 193504 MB

(Continued on next page)
## Platform Notes (Continued)

node 1 free: 192114 MB
node distances:
node    0    1
  0:  10   21
  1:  21   10

From /proc/meminfo
MemTotal: 395893920 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

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

SuSE-release:
  SUSE Linux Enterprise Server 12 (x86_64)
  VERSION = 12
  PATCHLEVEL = 2
  # This file is deprecated and will be removed in a future service pack or release.
  # Please check /etc/os-release for details about this release.

os-release:
  NAME="SLES"
  VERSION="12-SP2"
  VERSION_ID="12.2"
  PRETTY_NAME="SUSE Linux Enterprise Server 12 SP2"
  ID="sles"
  ANSI_COLOR="0;32"
  CPE_NAME="cpe:/o:suse:sles:12:sp2"

uname -a:
  Linux Cable-SPECcpu2017-SUSE12SP2 4.4.21-69-default #1 SMP Tue Oct 25 10:58:20 UTC 2016 (9464f67) x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Dec 13 02:21

SPEC is set to: /home/cpu2017.1.0.2.ic18.0

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 Lenovo -[IVE109Q-1.00]- 06/28/2017
  Memory:
    24x Samsung M393A2K43BB1-CTD 16 GB 2 rank 2666, configured at 2400

(End of data from sysinfo program)
**SPEC CPU2017 Integer Rate Result**

**Lenovo Global Technology**  
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(2.10 GHz, Intel Xeon Silver 4110)  

<table>
<thead>
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<tr>
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</table>

**Compiler Version Notes**

```
==-----------------------------------------------------------------==
|                      CC  500.perlbench_r(base) 502.gcc_r(base) 505.mcf_r(base, peak) |
|                      525.x264_r(base, peak) 557.xz_r(base, peak)                |
|-----------------------------------------------------------------==
| icc (ICC) 18.0.0 20170811                                      |
| Copyright (C) 1985-2017 Intel Corporation. All rights reserved. |

==-----------------------------------------------------------------==
|                      CC  500.perlbench_r(peak) 502.gcc_r(peak)          |
|-----------------------------------------------------------------==
| icc (ICC) 18.0.0 20170811                                      |
| Copyright (C) 1985-2017 Intel Corporation. All rights reserved. |

==-----------------------------------------------------------------==
|                      CXXC 520.omnetpp_r(base) 523.xalancbmk_r(base) 531.deepsjeng_r(base) |
|                      541.leela_r(base)                                    |
|-----------------------------------------------------------------==
| icpc (ICC) 18.0.0 20170811                                      |
| Copyright (C) 1985-2017 Intel Corporation. All rights reserved. |

==-----------------------------------------------------------------==
|                      CXXC 520.omnetpp_r(peak) 523.xalancbmk_r(peak) 531.deepsjeng_r(peak) |
|                      541.leela_r(peak)                                    |
|-----------------------------------------------------------------==
| icpc (ICC) 18.0.0 20170811                                      |
| Copyright (C) 1985-2017 Intel Corporation. All rights reserved. |

==-----------------------------------------------------------------==
|                      FC  548.exchange2_r(base, peak)                  |
|-----------------------------------------------------------------==
| ifort (IFORT) 18.0.0 20170811                                   |
| Copyright (C) 1985-2017 Intel Corporation. All rights reserved. |
```

**Base Compiler Invocation**

C benchmarks:
icc

C++ benchmarks:
icpc

(Continued on next page)
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**Base Compiler Invocation (Continued)**

Fortran benchmarks:
ifort

### Base Portability Flags

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Flags</th>
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<tbody>
<tr>
<td>500.perlbench_r</td>
<td>-DSPEC_LP64 -DSPEC_LINUX_X64</td>
</tr>
<tr>
<td>502.gcc_r</td>
<td>-DSPEC_LP64</td>
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<td>548.exchange2_r</td>
<td>-DSPEC_LP64</td>
</tr>
<tr>
<td>557.xz_r</td>
<td>-DSPEC_LP64</td>
</tr>
</tbody>
</table>

### Base Optimization Flags

**C benchmarks**:
- W1, -z, muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
- qopt-mem-layout-trans=3 -L/usr/local/je5.0.1-64/lib -ljemalloc

**C++ benchmarks**:
- W1, -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**:
- W1, -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

### Base Other Flags

**C benchmarks**:
- m64 -std=c11

**C++ benchmarks**:
- m64
### SPEC CPU2017 Integer Rate Result

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ThinkSystem SR630  
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</table>

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

### Base Other Flags (Continued)

Fortran benchmarks:
- `-m64`

### Peak Compiler Invocation

C benchmarks:
- `icc`

C++ benchmarks:
- `icpc`

Fortran benchmarks:
- `ifort`

### Peak Portability Flags

500 perlbench_r: `-DSPEC_LP64 -DSPEC_LINUX_X64`
502 gcc_r: `-D_FILE_OFFSET_BITS=64`
505 mcf_r: `-DSPEC_LP64`
520 omnetpp_r: `-DSPEC_LP64`
523 xalancbmk_r: `-D_FILE_OFFSET_BITS=64 -DSPEC_LINUX`
525 x264_r: `-DSPEC_LP64`
531 deepsjeng_r: `-DSPEC_LP64`
541 leela_r: `-DSPEC_LP64`
548 exchange2_r: `-DSPEC_LP64`
557 xz_r: `-DSPEC_LP64`

### Peak Optimization Flags

C benchmarks:
500 perlbench_r: `-Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo`  
`-xCORE-AVX512 -O3 -no-prec-div -qopt-mem-layout-trans=3`  
`-fno-strict-overflow -L/usr/local/je5.0.1-64/lib`  
`-ljemalloc`

502 gcc_r: `-L/opt/intel/compilers_and_libraries_2018/linux/lib/ia32`  
`-Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo`  
`-xCORE-AVX512 -O3 -no-prec-div -qopt-mem-layout-trans=3`  
`-L/usr/local/je5.0.1-32/lib -ljemalloc`

*Continued on next page*
## Peak Optimization Flags (Continued)

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Flags</th>
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<tbody>
<tr>
<td>505.mcf_r</td>
<td><code>-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-mem-layout-trans=3 -L/usr/local/je5.0.1-64/lib -ljemalloc</code></td>
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<tr>
<td>525.x264_r</td>
<td><code>-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-mem-layout-trans=3 -fno-alias -L/usr/local/je5.0.1-64/lib -ljemalloc</code></td>
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<td>557.xz_r</td>
<td>Same as 505.mcf_r</td>
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### C++ benchmarks:

<table>
<thead>
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<th>Benchmark</th>
<th>Flags</th>
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<tr>
<td>520.omnetpp_r</td>
<td><code>-Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX512 -O3 -no-prec-div -qopt-mem-layout-trans=3 -L/usr/local/je5.0.1-64/lib -ljemalloc</code></td>
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<tr>
<td>523.xalancbmk_r</td>
<td><code>-L/opt/intel/compilers_and_libraries_2018/linux/lib/ia32 -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX512 -O3 -no-prec-div -qopt-mem-layout-trans=3 -L/usr/local/je5.0.1-32/lib -ljemalloc</code></td>
</tr>
<tr>
<td>531.deepsjeng_r</td>
<td>Same as 520.omnetpp_r</td>
</tr>
<tr>
<td>541.leela_r</td>
<td>Same as 520.omnetpp_r</td>
</tr>
</tbody>
</table>

### Fortran benchmarks:


## Peak Other Flags

### C benchmarks (except as noted below):

- `-m64 -std=c11`

- `502.gcc_r: -m32 -std=c11`

### C++ benchmarks (except as noted below):

- `-m64`

- `523.xalancbmk_r: -m32`

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

## Lenovo Global Technology

**ThinkSystem SR630**  
(2.10 GHz, Intel Xeon Silver 4110)

<table>
<thead>
<tr>
<th>SPECrate2017_int_base</th>
<th>SPECrate2017_int_peak</th>
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<tbody>
<tr>
<td>73.5</td>
<td>76.6</td>
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### CPU2017 License
9017

### Test Sponsor
Lenovo Global Technology

### Tested by
Lenovo Global Technology

### Test Date
Dec-2017

### Hardware Availability
Aug-2017

### Software Availability
Sep-2017

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**Peak Other Flags (Continued)**

Fortran benchmarks:
- `-m64`

The flags files that were used to format this result can be browsed at:
- [http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.html](http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.html)

You can also download the XML flags sources by saving the following links:
- [http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.xml](http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.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 v1.0.2 on 2017-12-13 06:39:27-0500.  
Report generated on 2018-10-31 16:44:08 by CPU2017 PDF formatter v6067.  
Originally published on 2018-03-06.