New H3C Technologies Co., Ltd. | SPECrate®2017_fp_base = 198
H3C UniServer R4900 G3 (Intel Xeon Gold 6150) | SPECrate®2017_fp_peak = 210

<table>
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<tr>
<th>CPU2017 License:</th>
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<tr>
<td>Test Sponsor:</td>
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<tr>
<td>503.bwaves_r</td>
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<td></td>
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<tr>
<td>507.cactusBSSN_r</td>
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<tr>
<td>508.namd_r</td>
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<tr>
<td>510.parest_r</td>
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<tr>
<td>511.povray_r</td>
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<tr>
<td>519.lbm_r</td>
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<tr>
<td>521.wrf_r</td>
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<tr>
<td>526.blender_r</td>
<td></td>
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</tr>
<tr>
<td>527.cam4_r</td>
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<td></td>
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<tr>
<td>538.imagick_r</td>
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<tr>
<td>544.nab_r</td>
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<tr>
<td>549.fotonik3d_r</td>
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<td></td>
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<tr>
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### Hardware

<table>
<thead>
<tr>
<th>CPU Name:</th>
<th>Intel Xeon Gold 6150</th>
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<tbody>
<tr>
<td>Max MHz:</td>
<td>3700</td>
</tr>
<tr>
<td>Nominal:</td>
<td>2700</td>
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<tr>
<td>Enabled:</td>
<td>36 cores, 2 chips, 2 threads/core</td>
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<tr>
<td>Orderable:</td>
<td>1,2 chips</td>
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<tr>
<td>Cache L1:</td>
<td>32 KB I + 32 KB D on chip per core</td>
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<tr>
<td>L2:</td>
<td>1 MB I+D on chip per core</td>
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<tr>
<td>L3:</td>
<td>24.75 MB I+D on chip per chip</td>
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<tr>
<td>Other:</td>
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<tr>
<td>Memory:</td>
<td>768 GB (24 x 32 GB 2Rx4 PC4-2666V-R)</td>
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<td>Other:</td>
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### Software

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<tr>
<th>OS:</th>
<th>Red Hat Enterprise Linux Server release 7.6 (Maipo)</th>
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<tr>
<td>Compiler:</td>
<td>C/C++: Version 19.0.4.227 of Intel C/C++ Compiler Build 20190416 for Linux; Fortran: Version 19.0.4.227 of Intel Fortran Compiler Build 20190416 for Linux</td>
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<td>File System:</td>
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<tr>
<td>System State:</td>
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<tr>
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<td>Peak Pointers:</td>
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<td>Power Management:</td>
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The table above shows the SPEC CPU 2017 Floating Point Rate Result for the specified programs run on the H3C UniServer R4900 G3 (Intel Xeon Gold 6150) system. The CPU2017 License is 9066, and the test was sponsored and performed by New H3C Technologies Co., Ltd. The test date is Sep-2019, with hardware availability in Jul-2017 and software availability in May-2019. The system specification includes details on CPU, memory, storage, and other hardware configurations. The software details include the OS, compiler versions, firmware, file system, system state, base and peak pointers, and power management settings. The results are compared with SPECrate®2017_fp_base and SPECrate®2017_fp_peak.
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</tbody>
</table>

SPECrate®2017_fp_base = 198
SPECrate®2017_fp_peak = 210

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

### 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/speccpu/lib/intel64"

Binaries compiled on a system with 1x Intel Core i9-799X 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
runcpu command invoked through numactl i.e.:
numactl --interleave=all runcpu <etc>
Yes: The test sponsor attests, as of date of publication, that CVE-2017-5754 (Meltdown) is mitigated in the system as tested and documented.
New H3C Technologies Co., Ltd.
H3C UniServer R4900 G3 (Intel Xeon Gold 6150)

<table>
<thead>
<tr>
<th>SPECrate®2017_fp_base = 198</th>
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<tbody>
<tr>
<td>SPECrate®2017_fp_peak = 210</td>
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CPU2017 License: 9066
Test Sponsor: New H3C Technologies Co., Ltd.
Test Date: Sep-2019
Tested by: New H3C Technologies Co., Ltd.
Hardware Availability: Jul-2017
Software Availability: May-2019

General Notes (Continued)

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 Settings:
Set SNC to Enabled
Set IMC Interleaving to 1-way Interleave
Set DCU Streamer Prefetch to Disabled
Set XPT Prefetch to Enabled
Set Autonomous Core C-State to Enabled
Set Package C State to No limit
Set Intel VT for Directed I/O(VT-d) to Disabled
Sysinfo program /home/speccpu/bin/sysinfo
Rev: r5974 of 2018-05-19 9bcde8f2999c33d61f64985e45859ea9
running on localhost.localdomain Tue Sep 10 22:56:24 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 6150 CPU @ 2.70GHz
  2  "physical id"s (chips)
  72 "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 : 18
siblings : 36
physical 0: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
physical 1: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27

From lscpu:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 72
On-line CPU(s) list: 0-71
Thread(s) per core: 2
Core(s) per socket: 18
Socket(s): 2
NUMA node(s): 4
Vendor ID: GenuineIntel
CPU family: 6

(Continued on next page)
New H3C Technologies Co., Ltd.

H3C UniServer R4900 G3 (Intel Xeon Gold 6150)

**SPECrate®2017_fp_base = 198**

**SPECrate®2017_fp_peak = 210**

---

**Platform Notes (Continued)**

- Model: 85
- Model name: Intel(R) Xeon(R) Gold 6150 CPU @ 2.70GHz
- Stepping: 4
- CPU MHz: 1283.422
- CPU max MHz: 3700.0000
- CPU min MHz: 1200.0000
- BogoMIPS: 5400.00
- Virtualization: VT-x
- L1d cache: 32K
- L1i cache: 32K
- L2 cache: 1024K
- L3 cache: 25344K
- NUMA node0 CPU(s): 0-2, 5, 6, 9, 10, 14, 15, 36-38, 41, 42, 45, 46, 50, 51
- NUMA node1 CPU(s): 3, 4, 7, 8, 11-13, 16, 17, 39, 40, 43, 44, 47-49, 52, 53
- NUMA node2 CPU(s): 18-20, 23, 24, 27, 28, 32, 33, 54-56, 59, 60, 63, 64, 68, 69
- NUMA node3 CPU(s): 21, 22, 25, 26, 29-31, 34, 35, 37, 57, 58, 61, 62, 65-67, 70, 71
- Flags: fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov
- cache size: 25344 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 5 6 9 10 14 15 36 37 38 41 42 45 46 50 51
  - node 0 size: 195225 MB
  - node 0 free: 190435 MB
  - node 1 cpus: 3 4 7 8 11 12 13 16 17 39 40 43 44 47 48 49 52 53
  - node 1 size: 196608 MB
  - node 1 free: 191735 MB
  - node 2 cpus: 18 19 20 23 24 27 28 32 33 54 55 56 59 60 63 64 68 69
  - node 2 size: 196608 MB
  - node 2 free: 192152 MB
  - node 3 cpus: 21 22 25 26 29 30 31 34 35 37 58 61 62 65 66 67 70 71
  - node 3 size: 196608 MB
  - node 3 free: 192134 MB

(Continued on next page)
## New H3C Technologies Co., Ltd.
### H3C UniServer R4900 G3 (Intel Xeon Gold 6150)

**SPEC CPU®2017 Floating Point Rate Result**

<table>
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<tr>
<th>CPU2017 License</th>
<th>9066</th>
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<tr>
<td>Test Sponsor</td>
<td>New H3C Technologies Co., Ltd.</td>
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<td>Tested by</td>
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**SPECrate®2017_fp_base = 198**
**SPECrate®2017_fp_peak = 210**

### Platform Notes (Continued)

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<tr>
<td>3</td>
<td>21</td>
<td>21</td>
<td>11</td>
<td>10</td>
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</tbody>
</table>

From /proc/meminfo

- MemTotal: 790963356 kB
- HugePages_Total: 0
- Hugepagesize: 2048 kB

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

- os-release:
  - NAME="Red Hat Enterprise Linux Server"
  - VERSION="7.6 (Maipo)"
  - ID="rhel"
  - ID_LIKE="fedora"
  - VARIANT="Server"
  - VARIANT_ID="server"
  - VERSION_ID="7.6"
  - PRETTY_NAME="Red Hat Enterprise Linux Server 7.6 (Maipo)"

- system-release: Red Hat Enterprise Linux Server release 7.6 (Maipo)

- uname -a:
  Linux localhost.localdomain 3.10.0-957.el7.x86_64 #1 SMP Thu Oct 4 20:48:51 UTC 2018
  x86_64 x86_64 x86_64 GNU/Linux

Kernel self-reported vulnerability status:

- CVE-2017-5754 (Meltdown): Mitigation: PTI
- CVE-2017-5753 (Spectre variant 1): Mitigation: Load fences, __user pointer sanitization
- CVE-2017-5715 (Spectre variant 2): Mitigation: IBRS (kernel)

run-level 3 Sep 10 22:51

**SPEC is set to: /home/spec/cpu**

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<tr>
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<th>Type</th>
<th>Size</th>
<th>Used</th>
<th>Avail</th>
<th>Use%</th>
<th>Mounted on</th>
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<tbody>
<tr>
<td>/dev/mapper/rhel-home</td>
<td>xfs</td>
<td>169G</td>
<td>77G</td>
<td>92G</td>
<td>46%</td>
<td>/home</td>
</tr>
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</table>

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 American Megatrends Inc. 2.00.30 06/20/2019
- Memory:
**Platform Notes (Continued)**

24x Micron 36ASF4G72PZ-2G6D1 32 GB 2 rank 2666

(End of data from sysinfo program)

**Compiler Version Notes**

<table>
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<tr>
<th>C</th>
<th>519.lbm_r(base, peak) 538.imagick_r(base, peak) 544.nab_r(base, peak)</th>
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<tbody>
<tr>
<td>Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64, Version 19.0.4.227 Build 20190416</td>
<td></td>
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<tr>
<td>Copyright (C) 1985-2019 Intel Corporation. All rights reserved.</td>
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(Continued on next page)
New H3C Technologies Co., Ltd.
H3C UniServer R4900 G3 (Intel Xeon Gold 6150)

CPU2017 License: 9066
Test Sponsor: New H3C Technologies Co., Ltd.
Test Date: Sep-2019
Tested by: New H3C Technologies Co., Ltd.
Hardware Availability: Jul-2017
Software Availability: May-2019

Compiler Version Notes (Continued)

------------------------------------------------------------------------------
Fortran         | 503.bwaves_r(base, peak) 549.fotonik3d_r(base, peak)
                | 554.roms_r(base, peak)
------------------------------------------------------------------------------
Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R)
64, Version 19.0.4.227 Build 20190416
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------------------------------------------------------------------------------
Fortran, C      | 521.wrf_r(base, peak) 527.cam4_r(base, peak)
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Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R)
64, Version 19.0.4.227 Build 20190416
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

Benchmarks using both Fortran and C:
ifort -m64 icc -m64 -std=c11

Benchmarks using both C and C++:
icpc -m64 icc -m64 -std=c11

Benchmarks using Fortran, C, and C++:
icpc -m64 icc -m64 -std=c11 ifort -m64
Base Portability Flags

503.bwaves_r: -DSPEC_LP64
507.cactuBSSN_r: -DSPEC_LP64
508.namd_r: -DSPEC_LP64
510.parest_r: -DSPEC_LP64
511.povray_r: -DSPEC_LP64
519.lbm_r: -DSPEC_LP64
521.wrf_r: -DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian
526.blender_r: -DSPEC_LP64 -DSPEC_LINUX -funsigned-char
527.cam4_r: -DSPEC_LP64 -DSPEC_CASE_FLAG
538.imagick_r: -DSPEC_LP64
544.nab_r: -DSPEC_LP64
549.fotonik3d_r: -DSPEC_LP64
554.roms_r: -DSPEC_LP64

Base Optimization Flags

C benchmarks:
-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=4

C++ benchmarks:
-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=4

Fortran benchmarks:
-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=4 -auto
-nostandard-realloc-lhs -align array32byte

Benchmarks using both Fortran and C:
-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=4 -auto
-nostandard-realloc-lhs -align array32byte

Benchmarks using both C and C++:
-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=4

Benchmarks using Fortran, C, and C++:
-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=4 -auto
-nostandard-realloc-lhs -align array32byte
## New H3C Technologies Co., Ltd.

**H3C UniServer R4900 G3 (Intel Xeon Gold 6150)**

**SPECrate®2017_fp_base = 198**

**SPECrate®2017_fp_peak = 210**

**CPU2017 License:** 9066  
**Test Sponsor:** New H3C Technologies Co., Ltd.  
**Tested by:** New H3C Technologies Co., Ltd.  
**Test Date:** Sep-2019  
**Hardware Availability:** Jul-2017  
**Software Availability:** May-2019

### Peak Compiler Invocation

C benchmarks:
```bash
icc -m64 -std=c11
```

C++ benchmarks:
```bash
icpc -m64
```

Fortran benchmarks:
```bash
ifort -m64
```

Benchmarks using both Fortran and C:
```bash
ifort -m64 icc -m64 -std=c11
```

Benchmarks using both C and C++:
```bash
icpc -m64 icc -m64 -std=c11
```

Benchmarks using Fortran, C, and C++:
```bash
icpc -m64 icc -m64 -std=c11 ifort -m64
```

### Peak Portability Flags

Same as Base Portability Flags

### Peak Optimization Flags

C benchmarks:
```bash
519.lbm_r: -prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX512 -O3 -no-prec-div -qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=4
```

```bash
538.imagick_r: -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=4
```

```bash
544.nab_r: Same as 538.imagick_r
```

C++ benchmarks:
```bash
508.namd_r: -prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX512 -O3 -no-prec-div -qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=4
```
## Peak Optimization Flags (Continued)

- **510.parest_r**: `-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=4`

Fortran benchmarks:

- **503.bwaves_r**: `-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=4 -auto
-nostandard-realloc-lhs -align array32byte`

- **549.fotonik3d_r**: Same as 503.bwaves_r

- **554.roms_r**: `-prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX512
-O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=4 -auto -nostandard-realloc-lhs
-align array32byte`

Benchmarks using both Fortran and C:

- **511.povray_r**: `-prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX512
-O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=4 -auto -nostandard-realloc-lhs
-align array32byte`

Benchmarks using both C and C++:

- **526.blender_r**: `-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=4`

Benchmarks using Fortran, C, and C++:

- `-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=4 -auto
-nostandard-realloc-lhs -align array32byte`

The flags files that were used to format this result can be browsed at:
- [http://www.spec.org/cpu2017/flags/New_H3C-Platform-Settings-V1.3-SKL-RevD.2019-09-03.00.html](http://www.spec.org/cpu2017/flags/New_H3C-Platform-Settings-V1.3-SKL-RevD.2019-09-03.00.html)

You can also download the XML flags sources by saving the following links:
- [http://www.spec.org/cpu2017/flags/New_H3C-Platform-Settings-V1.3-SKL-RevD.2019-09-03.00.xml](http://www.spec.org/cpu2017/flags/New_H3C-Platform-Settings-V1.3-SKL-RevD.2019-09-03.00.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 v1.0.5 on 2019-09-10 22:56:23-0400.
Originally published on 2019-10-01.