New H3C Technologies Co., Ltd.  H3C UniServer R6900 G3 (Intel Xeon Gold 6256)  

| SPECspeed®2017_fp_base = 182 | SPECspeed®2017_fp_peak = 182 |

CPU2017 License: 9066  
Test Sponsor: New H3C Technologies Co., Ltd.  
Tested by: New H3C Technologies Co., Ltd.  
Test Date: Sep-2020  
Hardware Availability: Mar-2019  
Software Availability: Apr-2020  

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<th>Threads</th>
<th>SPECspeed®2017_fp_base (182)</th>
<th>SPECspeed®2017_fp_peak (182)</th>
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<tr>
<td>603.bwaves_s 48</td>
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<tr>
<td>607.cactuBSSN_s 48</td>
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<tr>
<td>619.lbm_s 48</td>
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<td>621.wrf_s 48</td>
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<tr>
<td>627.cam4_s 48</td>
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<tr>
<td>628.pop2_s 48</td>
<td>63.9</td>
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<tr>
<td>638.imagick_s 48</td>
<td>140</td>
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<tr>
<td>644.nab_s 48</td>
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<tr>
<td>649.fotonik3d_s 48</td>
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</tr>
<tr>
<td>654.roms_s 48</td>
<td>223</td>
<td>223</td>
</tr>
</tbody>
</table>

### Hardware

- **CPU Name:** Intel Xeon Gold 6256  
- **Max MHz:** 4500  
- **Nominal:** 3600  
- **Enabled:** 48 cores, 4 chips  
- **Orderable:** 1,2,3,4 chips  
- **Cache L1:** 32 KB I + 32 KB D on chip per core  
- **L2:** 1 MB I+D on chip per core  
- **L3:** 33 MB I+D on chip per chip  
- **Other:** None  
- **Memory:** 384 GB (24 x 16 GB 2Rx8 PC4-2933V-R)  
- **Storage:** 1 x 960 GB SATA SSD  
- **Other:** None

### Software

- **OS:** Red Hat Enterprise Linux release 8.2 (Ootpa) 4.18.0-193.el8.x86_64  
- **Compiler:** C/C++: Version 19.1.1.217 of Intel C/C++ Compiler Build 20200306 for Linux; Fortran: Version 19.1.1.217 of Intel Fortran Compiler Build 20200306 for Linux  
- **Parallel:** Yes  
- **Firmware:** Version 2.00.33 released Aug-2019 BIOS  
- **File System:** xfs  
- **System State:** Run level 3 (multi-user)  
- **Base Pointers:** 64-bit  
- **Peak Pointers:** 64-bit  
- **Other:** jemalloc memory allocator V5.0.1  
- **Power Management:** BIOS set to prefer performance at the cost of additional power usage
New H3C Technologies Co., Ltd.  SPECspeed®2017_fp_base = 182
H3C UniServer R6900 G3 (Intel Xeon Gold 6256)  SPECspeed®2017_fp_peak = 182

CPU2017 License: 9066
Test Sponsor: New H3C Technologies Co., Ltd.
Test Date: Sep-2020
Hardware Availability: Mar-2019
Tested by: New H3C Technologies Co., Ltd.
Software Availability: Apr-2020

Results Table

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<th>Benchmark</th>
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<th>Base Seconds</th>
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<td>223</td>
<td>48</td>
<td>70.7</td>
<td>223</td>
<td>73.4</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"

Environment Variables Notes

Environment variables set by runcpu before the start of the run:
KMP_AFFINITY = "granularity=fine,compact"
LD_LIBRARY_PATH = "/home/speccpu/lib/intel64:/home/speccpu/je5.0.1-64"
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
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.
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
jemalloc, a general purpose malloc implementation built with the RedHat Enterprise 7.5, and the system compiler gcc 4.8.5

(Continued on next page)
New H3C Technologies Co., Ltd.  
H3C UniServer R6900 G3 (Intel Xeon Gold 6256)

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

Copyright 2017-2020 Standard Performance Evaluation Corporation

<table>
<thead>
<tr>
<th>SPECspeed®2017_fp_base</th>
<th>182</th>
</tr>
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<tbody>
<tr>
<td>SPECspeed®2017_fp_peak</td>
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</tr>
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CPU2017 License: 9066  
Test Sponsor: New H3C Technologies Co., Ltd.  
Tested by: New H3C Technologies Co., Ltd.

Test Date: Sep-2020  
Hardware Availability: Mar-2019  
Software Availability: Apr-2020

**General Notes (Continued)**


**Platform Notes**

BIOS Settings:
- Set Hyper Threading to Disabled
- Set XPT Prefetch to Auto
- Set Patrol Scrub to Disabled

Sysinfo program /home/speccpu/bin/sysinfo  
Rev: r6365 of 2019-08-21 295195f888a3d7ed16e46a485a0111  
running on localhost.localdomain Thu Sep 10 18:26:15 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 6256 CPU @ 3.60GHz  
- 4 "physical id"s (chips)  
- 48 "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: 12  
- siblings: 12
- physical 0: cores 0 2 5 8 11 12 13 17 21 25 26 27  
- physical 1: cores 0 1 2 5 11 13 16 20 21 25 26 29  
- physical 2: cores 1 2 4 5 9 10 11 12 16 21 24 29  
- physical 3: cores 0 10 12 13 16 17 19 21 25 26 27 29

From lscpu:

- Architecture: x86_64  
- CPU op-mode(s): 32-bit, 64-bit  
- Byte Order: Little Endian  
- CPU(s): 48  
- On-line CPU(s) list: 0-47  
- Thread(s) per core: 1  
- Core(s) per socket: 12  
- Socket(s): 4  
- NUMA node(s): 4  
- Vendor ID: GenuineIntel  
- CPU family: 6  
- Model: 85  
- Model name: Intel(R) Xeon(R) Gold 6256 CPU @ 3.60GHz  
- Stepping: 7  
- CPU MHz: 1200.146

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

H3C UniServer R6900 G3 (Intel Xeon Gold 6256)

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

**CPU2017 License:** 9066  
**Test Sponsor:** New H3C Technologies Co., Ltd.  
**Tested by:** New H3C Technologies Co., Ltd.

**SPECspeed®2017_fp_base = 182**  
**SPECspeed®2017_fp_peak = 182**

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<th>Test Date:</th>
<th>Sep-2020</th>
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<td>Tested by:</td>
<td>New H3C Technologies Co., Ltd.</td>
<td>Software Availability:</td>
<td>Apr-2020</td>
</tr>
</tbody>
</table>

**Platform Notes (Continued)**

CPU max MHz: 4500.0000  
CPU min MHz: 1200.0000  
BogoMIPS: 7200.00  
Virtualization: VT-x  
L1d cache: 32K  
L1i cache: 32K  
L2 cache: 1024K  
L3 cache: 33792K  
NUMA node0 CPU(s): 0-11  
NUMA node1 CPU(s): 12-23  
NUMA node2 CPU(s): 24-35  
NUMA node3 CPU(s): 36-47  
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 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 3dnowprefetch cpuid_fault epb cat_l3 cdp_l3 invpcid_single intel_pmcgov ssbd mba ibrs ibpb ibrs_enable tpr_shadow vnmi flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rtm cqm mxpx rdt_a avx512f avx512dq rdseed adx clflushopt clwb intel_pt avx512cd avx512bw avx512vl xsaveopt xsaves cqm_llc cqm_occplt LLC cqm_mbb_total cqm_mbb_local dtherm ida arat pml pms hwp hwp_act_window hwp_epp hwp_pkg_req pku ospke avx512_vni md_clear flush_lld arch_capabilities

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

From numactl --hardware available: 4 nodes (0-3)

node 0 cpus: 0 1 2 3 4 5 6 7 8 9 10 11
node 0 size: 95071 MB
node 0 free: 87522 MB
node 1 cpus: 12 13 14 15 16 17 18 19 20 21 22 23
node 1 size: 96737 MB
node 1 free: 96241 MB
node 2 cpus: 24 25 26 27 28 29 30 31 32 33 34 35
node 2 size: 96765 MB
node 2 free: 96494 MB
node 3 cpus: 36 37 38 39 40 41 42 43 44 45 46 47
node 3 size: 96764 MB
node 3 free: 96454 MB
node distances:

0: 10 21 21 21
1: 21 10 21 21

(Continued on next page)
New H3C Technologies Co., Ltd.  
H3C UniServer R6900 G3 (Intel Xeon Gold 6256)

CPU2017 License: 9066  
Test Sponsor: New H3C Technologies Co., Ltd.  
Hardware Availability: Mar-2019

Tested by: New H3C Technologies Co., Ltd.  
Software Availability: Apr-2020

Test Date: Sep-2020

SPECspeak®2017_fp_base = 182  
SPECspeak®2017_fp_peak = 182

Platform Notes (Continued)

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

From /proc/meminfo
MemTotal: 394586956 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

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

```
NAME="Red Hat Enterprise Linux"
VERSION="8.2 (Ootpa)"
ID="rhel"
ID_LIKE="fedora"
VERSION_ID="8.2"
PLATFORM_ID="platform:el8"
PRETTY_NAME="Red Hat Enterprise Linux 8.2 (Ootpa)"
ANSI_COLOR="0;31"
redhat-release: Red Hat Enterprise Linux release 8.2 (Ootpa)
system-release: Red Hat Enterprise Linux release 8.2 (Ootpa)
system-release-cpe: cpe:/o:redhat:enterprise_linux:8.2:ga
```

uname -a:
Linux localhost.localdomain 4.18.0-193.el8.x86_64 #1 SMP Fri Mar 27 14:35:58 UTC 2020
x86_64 x86_64 x86_64 GNU/Linux

Kernel self-reported vulnerability status:

```
KVM: Mitigation: Split huge pages
itlb_multihit: Not affected
CVE-2018-3620 (L1 Terminal Fault): Not affected
Microarchitectural Data Sampling: Not affected
CVE-2017-5754 (Meltdown): Not affected
CVE-2018-3639 (Speculative Store Bypass): Mitigation: Speculative Store Bypass disabled via prctl and seccomp
CVE-2017-5753 (Speculative Store Bypass): Mitigation: usercopy/swapgs barriers and __user pointer sanitization
CVE-2017-5715 (Spectre variant 1): Mitigation: Enhanced IBRS, IBPB: conditional, RSB filling
tsx_async_abort: Mitigation: Clear CPU buffers; SMT disabled
```

run-level 3 Sep 10 14:36

SPEC is set to: /home/speccpu

```
Filesystem Type Size Used Avail Use% Mounted on
/dev/mapper/rhel-home xfs 839G 80G 759G 10% /home
```

From /sys/devices/virtual/dmi/id

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

New H3C Technologies Co., Ltd.  
H3C UniServer R6900 G3 (Intel Xeon Gold 6256)

**SPECspeed®2017_fp_base = 182**  
**SPECspeed®2017_fp_peak = 182**

**CPU2017 License:** 9066  
**Test Date:** Sep-2020  
**Test Sponsor:** New H3C Technologies Co., Ltd.  
**Tested by:** New H3C Technologies Co., Ltd.

### Platform Notes (Continued)

- **BIOS:** American Megatrends Inc. 2.00.33 08/22/2019  
- **Vendor:** New H3C Technologies Co., Ltd.  
- **Product:** H3C UniServer R6900 G3  
- **Product Family:** Rack  
- **Serial:** 210235A3T0H204000004

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:**  
- 24x Micron 18ASF2G72PDZ-2G9E1 16 GB 2 rank 2933  
- 24x NO DIMM NO DIMM

(End of data from sysinfo program)

### Compiler Version Notes

---

**C**  
619.lbm_s(base, peak) 638.imagick_s(base, peak)  
644.nab_s(base, peak)

---

Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64,  
Version 19.1.1.217 Build 20200306  
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---

**C++, C, Fortran**  
607.cactuBSSN_s(base, peak)

---

Intel(R) C++ Intel(R) 64 Compiler for applications running on Intel(R) 64,  
Version 19.1.1.217 Build 20200306  
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---

Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64,  
Version 19.1.1.217 Build 20200306  
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---

Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R) 64,  
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---

**Fortran**  
603.bwaves_s(base, peak) 649.fotonik3d_s(base, peak)  
654.roms_s(base, peak)

---

Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R)

(Continued on next page)
New H3C Technologies Co., Ltd. | SPECspeed®2017_fp_base = 182
H3C UniServer R6900 G3 (Intel Xeon Gold 6256) | SPECspeed®2017_fp_peak = 182

CPU2017 License: 9066
Test Sponsor: New H3C Technologies Co., Ltd.
Tested by: New H3C Technologies Co., Ltd.

Compiler Version Notes (Continued)

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------------------------------------------------------------------------------
Fortran, C      | 621.wrf_s(base, peak) 627.cam4_s(base, peak)
                | 628.pop2_s(base, peak)
------------------------------------------------------------------------------

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.
Intel(R) C 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

Fortran benchmarks:
ifort

Benchmarks using both Fortran and C:
ifort icc

Benchmarks using Fortran, C, and C++:
icpc icc ifort

Base Portability Flags

603.bwaves_s: -DSPEC_LP64
607.cactusBSSN_s: -DSPEC_LP64
619.lbm_s: -DSPEC_LP64
621.wrf_s: -DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian
627.cam4_s: -DSPEC_LP64 -DSPEC_CASE_FLAG
628.pop2_s: -DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian
-assume byterecl
638.imagick_s: -DSPEC_LP64
644.nab_s: -DSPEC_LP64
649.fotonik3d_s: -DSPEC_LP64
654.roms_s: -DSPEC_LP64
New H3C Technologies Co., Ltd.

H3C UniServer R6900 G3 (Intel Xeon Gold 6256)

SPECspeed®2017_fp_base = 182
SPECspeed®2017_fp_peak = 182

CPU2017 License: 9066
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Test Date: Sep-2020
Hardware Availability: Mar-2019
Software Availability: Apr-2020

Base Optimization Flags

C benchmarks:
- m64 -std=c11 -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
- ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP
- mbranches-within-32B-boundaries

Fortran benchmarks:
- m64 -Wl,-z,muldefs -DSPEC_OPENMP -xCORE-AVX512 -ipo -O3
- no-prec-div -qopt-prefetch -ffinite-math-only
- qopt-mem-layout-trans=4 -qopenmp -nostandard-realloc-lhs
- mbranches-within-32B-boundaries -L/usr/local/jemalloc64-5.0.1/lib
  -ljemalloc

Benchmarks using both Fortran and C:
- m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
- qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp
- DSPEC_OPENMP -mbranches-within-32B-boundaries -nostandard-realloc-lhs
  -L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

Benchmarks using Fortran, C, and C++:
- m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
- qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp
- DSPEC_OPENMP -mbranches-within-32B-boundaries -nostandard-realloc-lhs
  -L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

Peak Compiler Invocation

C benchmarks:
iccc

Fortran benchmarks:
ifort

Benchmarks using both Fortran and C:
ifort icc

Benchmarks using Fortran, C, and C++:
icpc icc ifort

Peak Portability Flags

Same as Base Portability Flags
New H3C Technologies Co., Ltd.
H3C UniServer R6900 G3 (Intel Xeon Gold 6256)

SPECspeed®2017_fp_base = 182
SPECspeed®2017_fp_peak = 182

CPU2017 License: 9066
Test Sponsor: New H3C Technologies Co., Ltd.
Tested by: New H3C Technologies Co., Ltd.
Test Date: Sep-2020
Hardware Availability: Mar-2019
Software Availability: Apr-2020

Peak Optimization Flags

C benchmarks:
619.lbm_s: basepeak = yes
638.imagick_s: basepeak = yes
644.nab_s: -m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX512 -ipo -O3
-no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP
-mbranches-within-32B-boundaries
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

Fortran benchmarks:
603.bwaves_s: -m64 -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2)
-DSPEC_SUPPRESS_OPENMP -DSPEC_OPENMP -ipo -xCORE-AVX512
-03 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=4 -qopenmp -nostandard-realloc-lhs
-mbranches-within-32B-boundaries
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc
649.fotonik3d_s: Same as 603.bwaves_s
654.roms_s: basepeak = yes

Benchmarks using both Fortran and C:
621.wrf_s: -m64 -std=c11 -Wl,-z,muldefs -prof-gen(pass 1)
-prof-use(pass 2) -ipo -xCORE-AVX512 -03 -no-prec-div
-qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=4
-DSPEC_SUPPRESS_OPENMP -qopenmp -DSPEC_OPENMP
-mbranches-within-32B-boundaries -nostandard-realloc-lhs
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc
627.cam4_s: basepeak = yes
628.pop2_s: basepeak = yes

Benchmarks using Fortran, C, and C++:
607.cactuBSSN_s: basepeak = yes

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2017/flags/New_H3C-Platform-Settings-V1.4-CLX-RevB.html
<table>
<thead>
<tr>
<th>SPEC CPU®2017 Floating Point Speed Result</th>
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</thead>
<tbody>
<tr>
<td>New H3C Technologies Co., Ltd.</td>
</tr>
<tr>
<td>H3C UniServer R6900 G3 (Intel Xeon Gold 6256)</td>
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<tr>
<td>SPECspeed®2017_fp_base = 182</td>
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<tr>
<td>SPECspeed®2017_fp_peak = 182</td>
</tr>
</tbody>
</table>

| CPU2017 License: | 9066 |
| Test Sponsor:    | New H3C Technologies Co., Ltd. |
| Tested by:       | New H3C Technologies Co., Ltd. |
| Test Date:       | Sep-2020 |
| Hardware Availability: | Mar-2019 |
| Software Availability: | Apr-2020 |

You can also download the XML flags sources by saving the following links:

http://www.spec.org/cpu2017/flags/New_H3C-Platform-Settings-V1.4-CLX-RevB.xml

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For questions about this result, please contact the tester. For other inquiries, please contact info@spec.org.

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