### SPEC CPU®2017 Integer Speed Result

**New H3C Technologies Co., Ltd.**

**H3C UniServer R4900 G3 (Intel Xeon Gold 6230R)**

<table>
<thead>
<tr>
<th>SPECspeed®2017_int_base</th>
<th>SPECspeed®2017_int_peak</th>
</tr>
</thead>
<tbody>
<tr>
<td>11.2</td>
<td>11.4</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-2020  
**Software Availability:** Apr-2020

### Hardware

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>600.perlbench_s</td>
<td>6.79</td>
</tr>
<tr>
<td>602.gcc_s</td>
<td>10.2</td>
</tr>
<tr>
<td>605.mcf_s</td>
<td>18.5</td>
</tr>
<tr>
<td>620.omnetpp_s</td>
<td>9.48</td>
</tr>
<tr>
<td>623.xalancbmk_s</td>
<td>13.5</td>
</tr>
<tr>
<td>625.x264_s</td>
<td>16.4</td>
</tr>
<tr>
<td>631.deepsjeng_s</td>
<td>5.90</td>
</tr>
<tr>
<td>641.leela_s</td>
<td>4.90</td>
</tr>
<tr>
<td>648.exchange2_s</td>
<td>16.9</td>
</tr>
<tr>
<td>657.xz_s</td>
<td>23.4</td>
</tr>
</tbody>
</table>

### Software

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>OS</td>
<td>Red Hat Enterprise Linux release 8.2 (Ootpa) 4.18.0-193.el8.x86_64</td>
</tr>
<tr>
<td>Compiler</td>
<td>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</td>
</tr>
<tr>
<td>Parallel</td>
<td>Yes</td>
</tr>
<tr>
<td>Firmware</td>
<td>Version 2.00.33 released Aug-2019 BIOS</td>
</tr>
<tr>
<td>File System</td>
<td>xfs</td>
</tr>
<tr>
<td>System State</td>
<td>Run level 3 (multi-user)</td>
</tr>
<tr>
<td>Base Pointers</td>
<td>64-bit</td>
</tr>
<tr>
<td>Peak Pointers</td>
<td>64-bit</td>
</tr>
<tr>
<td>Other</td>
<td>jemalloc memory allocator V5.0.1</td>
</tr>
<tr>
<td>Power Management</td>
<td>BIOS set to prefer performance at the cost of additional power usage</td>
</tr>
</tbody>
</table>

### Specification

**CPU Name:** Intel Xeon Gold 6230R  
**Max MHz:** 4000  
**Nominal:** 2100  
**Enabled:** 52 cores, 2 chips  
**Orderable:** 1.2 chips  
**Cache L1:** 32 KB I + 32 KB D on chip per core  
**L2:** 1 MB I+D on chip per core  
**L3:** 35.75 MB I+D on chip per chip  
**Memory:** 192 GB (12 x 16 GB 2Rx8 PC4-2933V-R)  
**Storage:** 2 x 600 GB SAS HDD,10k RPM,RAID 1  
**Other:** None
## Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Base Seconds</th>
<th>Ratio</th>
<th>Base Seconds</th>
<th>Ratio</th>
<th>Base Seconds</th>
<th>Ratio</th>
<th>Peak Seconds</th>
<th>Ratio</th>
<th>Peak Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>600.perlbench_s</td>
<td>52</td>
<td>262</td>
<td>6.79</td>
<td>261</td>
<td>6.80</td>
<td>262</td>
<td>6.79</td>
<td>52</td>
<td>227</td>
<td>7.84</td>
<td>7.86</td>
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<tr>
<td>602.gcc_s</td>
<td>52</td>
<td>390</td>
<td>10.2</td>
<td>389</td>
<td>10.2</td>
<td>391</td>
<td>10.2</td>
<td>52</td>
<td>378</td>
<td>10.5</td>
<td>10.6</td>
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<tr>
<td>605.mcf_s</td>
<td>52</td>
<td>258</td>
<td>18.3</td>
<td>256</td>
<td>18.5</td>
<td>255</td>
<td>18.5</td>
<td>52</td>
<td>258</td>
<td>18.3</td>
<td>256</td>
</tr>
<tr>
<td>623.xalanchmk_s</td>
<td>52</td>
<td>105</td>
<td>13.5</td>
<td>105</td>
<td>13.5</td>
<td>105</td>
<td>13.5</td>
<td>52</td>
<td>105</td>
<td>13.5</td>
<td>105</td>
</tr>
<tr>
<td>625.x264_s</td>
<td>52</td>
<td>107</td>
<td>16.4</td>
<td>108</td>
<td>16.4</td>
<td>108</td>
<td>16.4</td>
<td>52</td>
<td>104</td>
<td>17.0</td>
<td>104</td>
</tr>
<tr>
<td>631.deepsjeng_s</td>
<td>52</td>
<td>243</td>
<td>5.90</td>
<td>243</td>
<td>5.90</td>
<td>243</td>
<td>5.90</td>
<td>52</td>
<td>243</td>
<td>5.90</td>
<td>243</td>
</tr>
<tr>
<td>641.leela_s</td>
<td>52</td>
<td>348</td>
<td>4.90</td>
<td>348</td>
<td>4.90</td>
<td>349</td>
<td>4.89</td>
<td>52</td>
<td>348</td>
<td>4.90</td>
<td>349</td>
</tr>
<tr>
<td>648.exchange2_s</td>
<td>52</td>
<td>174</td>
<td>16.9</td>
<td>174</td>
<td>16.9</td>
<td>174</td>
<td>16.9</td>
<td>52</td>
<td>174</td>
<td>16.9</td>
<td>174</td>
</tr>
<tr>
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<td>52</td>
<td>264</td>
<td>23.4</td>
<td>264</td>
<td>23.4</td>
<td>264</td>
<td>23.4</td>
<td>52</td>
<td>264</td>
<td>23.4</td>
<td>264</td>
</tr>
</tbody>
</table>

**SPECspeed®2017_int_base = 11.2**

**SPECspeed®2017_int_peak = 11.4**

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/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)

(Continued on next page)
## SPEC CPU®2017 Integer Speed Result

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

### General Notes (Continued)

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  

### 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 295195f888a3d7edbe6e46a485a0011  
running on localhost.localdomain Fri Sep 11 15:35:59 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 6230R CPU @ 2.10GHz
  2 "physical id"s (chips)
  52 "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
```

From lscpu:

```
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 52
On-line CPU(s) list: 0-51
Thread(s) per core: 1
Core(s) per socket: 26
Socket(s): 2
```

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

H3C UniServer R4900 G3 (Intel Xeon Gold 6230R)

| SPECspeed®2017_int_base = 11.2 | SPECspeed®2017_int_peak = 11.4 |

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

**Platform Notes (Continued)**

- NUMA node(s): 2
- Vendor ID: GenuineIntel
- CPU family: 6
- Model: 85
- Model name: Intel(R) Xeon(R) Gold 6230R CPU @ 2.10GHz
- Stepping: 7
- CPU MHz: 2218.882
- CPU max MHz: 4000.0000
- CPU min MHz: 1000.0000
- BogoMIPS: 4200.00
- 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
- 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 abml rm vbmi rta malleable

```
/platform/cpuinfo/cache/data
```

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

```
<table>
<thead>
<tr>
<th>available</th>
<th>2 nodes (0-1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>node 0 cpus:</td>
<td>0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25</td>
</tr>
<tr>
<td>node 0 size:</td>
<td>95073 MB</td>
</tr>
<tr>
<td>node 0 free:</td>
<td>93213 MB</td>
</tr>
<tr>
<td>node 1 cpus:</td>
<td>26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51</td>
</tr>
<tr>
<td>node 1 size:</td>
<td>96734 MB</td>
</tr>
<tr>
<td>node 1 free:</td>
<td>96344 MB</td>
</tr>
<tr>
<td>node distances:</td>
<td></td>
</tr>
<tr>
<td>node 0 1</td>
<td></td>
</tr>
<tr>
<td>0: 10 21</td>
<td></td>
</tr>
<tr>
<td>1: 21 10</td>
<td></td>
</tr>
</tbody>
</table>

(Continued on next page)
New H3C Technologies Co., Ltd.  
H3C UniServer R4900 G3 (Intel Xeon Gold 6230R)

CPU2017 License: 9066  
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SPECspeed®2017_int_base = 11.2  
SPECspeed®2017_int_peak = 11.4

Platform Notes (Continued)

From /proc/meminfo

MemTotal: 196411664 kB  
HugePages_Total: 0  
Hugepagesize: 2048 kB

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

os-release:
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:

itlb_multihit:  
KVM: Mitigation: Split huge pages
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 (Spectre variant 1): Mitigation: userscopy/swapgs barriers and __user pointer sanitization
CVE-2017-5715 (Spectre variant 2): Mitigation: Enhanced IBRS, IBPB: conditional, RSB filling
tsx_async_abort: Mitigation: Clear CPU buffers; SMT disabled

run-level 3 Sep 11 15:34

SPEC is set to: /home/speccpu

Filesystem Type  Size  Used Avail Use% Mounted on
/dev/mapper/rhel-home xfs 503G 78G 425G 16% /home

From /sys/devices/virtual/dmi/id

BIOS: American Megatrends Inc. 2.00.33 08/22/2019
Vendor: H3C

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

Product: RS33M2C9S  
Product Family: Rack

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:**
- 12x NO DIMM NO DIMM
- 12x Samsung M393A2K43CB2-CVF 16 GB 2 rank 2933

(End of data from sysinfo program)

### Compiler Version Notes

<table>
<thead>
<tr>
<th></th>
<th>600.perlbench_s(base) 602.gcc_s(base, peak) 605.mcf_s(base, peak)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>625.x264_s(base, peak) 657.xz_s(base, peak)</td>
</tr>
</tbody>
</table>

Intel(R) C Compiler for applications running on Intel(R) 64, Version 2021.1
NextGen Build 20200304
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<table>
<thead>
<tr>
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<th>600.perlbench_s(peak)</th>
</tr>
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<tbody>
<tr>
<td></td>
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<table>
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(Continued on next page)
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## Compiler Version Notes (Continued)

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---

**C++**

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Flags</th>
</tr>
</thead>
<tbody>
<tr>
<td>620.omnetpp_s(base, peak)</td>
<td>-DSPEC_LP64 -DSPEC_LINUX_X64</td>
</tr>
<tr>
<td>623.xalancbmk_s(base, peak)</td>
<td></td>
</tr>
<tr>
<td>631.deepsjeng_s(base, peak)</td>
<td>-DSPEC_LP64</td>
</tr>
<tr>
<td>641.leela_s(base, peak)</td>
<td>-DSPEC_LP64 -DSPEC_LINUX</td>
</tr>
</tbody>
</table>

Intel(R) C++ Compiler for applications running on Intel(R) 64, Version 2021.1

NextGen Build 20200304

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**Fortran**

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Flags</th>
</tr>
</thead>
<tbody>
<tr>
<td>648.exchange2_s(base, peak)</td>
<td>-DSPEC_LP64</td>
</tr>
</tbody>
</table>

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

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---

## 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
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Test Sponsor: New H3C Technologies Co., Ltd.
Tested by: New H3C Technologies Co., Ltd.

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

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

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
- -Wl,-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
- -lqkmailbox

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

Peak Compiler Invocation

C benchmarks:
icc

C++ benchmarks:
icpc

Fortran benchmarks:
ifort

Peak Portability Flags

600.perlbench_s: -DSPEC_LP64 -DSPEC_LINUX_X64
602.gcc_s: -DSPEC_LP64(*) -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

(Continued on next page)
New H3C Technologies Co., Ltd.  
H3C UniServer R4900 G3 (Intel Xeon Gold 6230R)

| SPECspeed®2017_int_base = 11.2 |
| SPECspeed®2017_int_peak = 11.4 |

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

Test Date: Sep-2020

Peak Portability Flags (Continued)

648.exchange2_s: -DSPEC_LP64
657.xz_s: -DSPEC_LP64

(*) Indicates a portability flag that was found in a non-portability variable.

Peak Optimization Flags

C benchmarks:

600.perlbench_s: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2)  
-xCORE-AVX512 -ipo -O3 -no-prec-div  
-qopt-mem-layout-trans=4 -fno-strict-overflow  
-mbranches-within-32B-boundaries  
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

602.gcc_s: -m64 -qnextgen -std=c11 -fuse-ld= gold  
-Wl,-plugin-opt=-x86-branches-within-32B-boundaries  
-Wl,-z,muldefs -fprofile-generate(pass 1)  
-fprofile-use=default.profdata(pass 2) -xCORE-AVX512 -flto  
-Ofast(pass 1) -O3 -ffast-math -qopt-mem-layout-trans=4  
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

605.mcf_s: basepeak = yes

620.omnetpp_s: basepeak = yes

623.xalancbmk_s: basepeak = yes

631.deepsjeng_s: basepeak = yes

641.leela_s: basepeak = yes

C++ benchmarks:

620.omnetpp_s: basepeak = yes

623.xalancbmk_s: basepeak = yes

631.deepsjeng_s: basepeak = yes

641.leela_s: basepeak = yes

Fortran benchmarks:

(Continued on next page)
New H3C Technologies Co., Ltd.
H3C UniServer R4900 G3 (Intel Xeon Gold 6230R)

| SPECspeed®2017_int_base = 11.2 |
| SPECspeed®2017_int_peak = 11.4 |

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

Peak Optimization Flags (Continued)

648.exchange2_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

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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