## New H3C Technologies Co., Ltd.

### H3C UniServer R4900 G3 (Intel Xeon Silver 4214)

**SPEC CPU®2017 Integer Speed Result**

<table>
<thead>
<tr>
<th>Hardware</th>
<th>Software</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU Name: Intel Xeon Silver 4214</td>
<td>OS: SUSE Linux Enterprise Server 12 SP4</td>
</tr>
<tr>
<td>Max MHz: 3200</td>
<td>Compiler: 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>
</tr>
<tr>
<td>Nominal: 2200</td>
<td>Parallel: Yes</td>
</tr>
<tr>
<td>Enabled: 24 cores, 2 chips</td>
<td>Firmware: Version 2.00.32 released Jul-2019 BIOS</td>
</tr>
<tr>
<td>Orderable: 1.2 chips</td>
<td>File System: ext4</td>
</tr>
<tr>
<td>Cache L1: 32 KB I + 32 KB D on chip per core</td>
<td>System State: Run level 3 (multi-user)</td>
</tr>
<tr>
<td>L2: 1 MB I+D on chip per core</td>
<td>Base Pointers: 64-bit</td>
</tr>
<tr>
<td>L3: 16.5 MB I+D on chip per chip</td>
<td>Peak Pointers: 64-bit</td>
</tr>
<tr>
<td>Other: None</td>
<td>Other: jemalloc memory allocator V5.0.1</td>
</tr>
<tr>
<td>Memory: 192 GB (12 x 16 GB 2Rx8 PC4-2666V-R, running at 2400)</td>
<td>Power Management: --</td>
</tr>
<tr>
<td>Storage: 1 x 480 GB SATA SSD</td>
<td></td>
</tr>
</tbody>
</table>

### CPU2017 License: 9066

**Test Date:** Sep-2019

**Test Sponsor:** New H3C Technologies Co., Ltd.

**Tested by:** New H3C Technologies Co., Ltd.

**Hardware Availability:** Apr-2019

**Software Availability:** May-2019

### SPECspeed®2017_int_base = 8.24

### SPECspeed®2017_int_peak = 8.40

<table>
<thead>
<tr>
<th>Threads</th>
<th>SPECspeed®2017_int_base (8.24)</th>
<th>SPECspeed®2017_int_peak (8.40)</th>
</tr>
</thead>
<tbody>
<tr>
<td>600.perlbench_s  24</td>
<td>5.56</td>
<td>8.40</td>
</tr>
<tr>
<td>602.gcc_s  24</td>
<td>8.22</td>
<td>10.8</td>
</tr>
<tr>
<td>605.mcf_s  24</td>
<td>10.8</td>
<td>10.8</td>
</tr>
<tr>
<td>620.omnetpp_s  24</td>
<td>5.70</td>
<td>10.2</td>
</tr>
<tr>
<td>623.xalancbmk_s  24</td>
<td>5.78</td>
<td>10.2</td>
</tr>
<tr>
<td>625.x264_s  24</td>
<td>11.6</td>
<td>11.6</td>
</tr>
<tr>
<td>631.deepsjeng_s  24</td>
<td>4.57</td>
<td>13.4</td>
</tr>
<tr>
<td>641.leela_s  24</td>
<td>3.86</td>
<td>13.4</td>
</tr>
<tr>
<td>648.exchange2_s  24</td>
<td>5.78</td>
<td>18.4</td>
</tr>
<tr>
<td>657.xz_s  24</td>
<td>18.4</td>
<td>18.6</td>
</tr>
</tbody>
</table>

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New H3C Technologies Co., Ltd.

H3C UniServer R4900 G3 (Intel Xeon Silver 4214)

SPECspeed®2017_int_base = 8.24
SPECspeed®2017_int_peak = 8.40

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>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>600.perlbench_s</td>
<td>24</td>
<td>320</td>
<td>5.55</td>
<td>317</td>
<td>5.60</td>
<td>319</td>
<td>5.56</td>
<td>24</td>
<td>275</td>
<td>6.44</td>
<td>276</td>
<td>6.44</td>
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<tr>
<td>602.gcc_s</td>
<td>24</td>
<td>486</td>
<td>8.19</td>
<td>484</td>
<td>8.23</td>
<td>485</td>
<td>8.22</td>
<td>24</td>
<td>472</td>
<td>8.43</td>
<td>479</td>
<td>8.31</td>
</tr>
<tr>
<td>605.mcf_s</td>
<td>24</td>
<td>437</td>
<td>10.8</td>
<td>440</td>
<td>10.7</td>
<td>438</td>
<td>10.8</td>
<td>24</td>
<td>436</td>
<td>10.8</td>
<td>443</td>
<td>10.7</td>
</tr>
<tr>
<td>620.omnetpp_s</td>
<td>24</td>
<td>285</td>
<td>5.73</td>
<td>286</td>
<td>5.70</td>
<td>287</td>
<td>5.69</td>
<td>24</td>
<td>282</td>
<td>5.78</td>
<td>284</td>
<td>5.74</td>
</tr>
<tr>
<td>623.xalanchmk_s</td>
<td>24</td>
<td>139</td>
<td>10.2</td>
<td>139</td>
<td>10.2</td>
<td>139</td>
<td>10.2</td>
<td>24</td>
<td>140</td>
<td>10.1</td>
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<td>10.2</td>
</tr>
<tr>
<td>625.x264_s</td>
<td>24</td>
<td>153</td>
<td>11.6</td>
<td>152</td>
<td>11.6</td>
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<td>313</td>
<td>4.57</td>
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<td>4.57</td>
<td>314</td>
<td>4.56</td>
<td>24</td>
<td>315</td>
<td>4.56</td>
<td>312</td>
<td>4.59</td>
</tr>
<tr>
<td>641.leela_s</td>
<td>24</td>
<td>442</td>
<td>3.86</td>
<td>442</td>
<td>3.86</td>
<td>443</td>
<td>3.85</td>
<td>24</td>
<td>441</td>
<td>3.87</td>
<td>436</td>
<td>3.91</td>
</tr>
<tr>
<td>648.exchange2_s</td>
<td>24</td>
<td>219</td>
<td>13.5</td>
<td>219</td>
<td>13.4</td>
<td>220</td>
<td>13.4</td>
<td>24</td>
<td>219</td>
<td>13.4</td>
<td>216</td>
<td>13.6</td>
</tr>
<tr>
<td>657.xz_s</td>
<td>24</td>
<td>335</td>
<td>18.5</td>
<td>336</td>
<td>18.4</td>
<td>335</td>
<td>18.4</td>
<td>24</td>
<td>332</td>
<td>18.6</td>
<td>332</td>
<td>18.6</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"

General 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"

OMP_STACKSIZE = "192M"

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

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.

jemalloc, a general purpose malloc implementation

built with the RedHat Enterprise 7.5, and the system compiler gcc 4.8.5

New H3C Technologies Co., Ltd.
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SPECspeed®2017_int_base = 8.24
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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: Apr-2019
Software Availability: May-2019

Platform Notes

BIOS Settings:
Hyper-Threading set to Disabled
Adjacent Cache Prefetch set to Disabled
Sysinfo program /home/speccpu/bin/sysinfo
Rev: r5974 of 2018-05-19 9bcde8f2999c33d61f64985e45859ea9
running on linux-4kgd Thu Sep 5 00:15:40 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) Silver 4214 CPU @ 2.20GHz
  2 "physical id"s (chips)
  24 "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 1 2 3 4 5 8 9 10 11 12 13
  physical 1: cores 0 1 2 3 4 5 8 9 10 11 12 13

From lscpu:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 24
On-line CPU(s) list: 0-23
Thread(s) per core: 1
Core(s) per socket: 12
Socket(s): 2
NUMA node(s): 2
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Silver 4214 CPU @ 2.20GHz
Stepping: 7
CPU MHz: 2200.000
CPU max MHz: 3200.0000
CPU min MHz: 1000.0000
BogoMIPS: 4400.00
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 16896K
NUMA node0 CPU(s): 0-11

(Continued on next page)
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Platform Notes (Continued)

NUMA node1 CPU(s):  12-23
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 cpuid
aperfmperf pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16
xtrm 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_pppin ssbd mba ibrs ibpb stibp tpr_shadow vmi flexpriority ept
vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rtm cqm mpx rt_a
avx512f avx512dq rdseed adx smap clflushopt clwb intel_pt avx512cd avx512bw avx512vl
xsavesopt xsaveopt xsavec xgetbv1 xsavecap cgmx llc cgmx_occup_llc cgmx_mbb_total cgmx_mbb_local
dtherm ida arat pln pts hwp hwp_act_window hwp_epp hwp_pkg_req pku ospke avx512_vnni
flush_l1d arch_capabilities

/cache cache data
cache size: 16896 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 8 9 10 11
node 0 size: 95239 MB
node 0 free: 76073 MB
node 1 cpus: 12 13 14 15 16 17 18 19 20 21 22 23
node 1 size: 96527 MB
node 1 free: 95749 MB
node distances:
nodel 0 1
0: 10 21
1: 21 10

From /proc/meminfo
MemTotal: 196369560 kB
HugePages_Total: 0
Hugepagesize: 2048 kB
/usr/bin/lsb_release -d
SUSE Linux Enterprise Server 12 SP4

From /etc/*release* /etc/*version*
SuSE-release:
SUSE Linux Enterprise Server 12 (x86_64)
VERSION = 12
PATCHLEVEL = 4
# 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:

(Continued on next page)
New H3C Technologies Co., Ltd.  
H3C UniServer R4900 G3 (Intel Xeon Silver 4214)

| SPECspeed®2017_int_base = 8.24 |
| SPECspeed®2017_int_peak = 8.40 |

**Platform Notes (Continued)**

```plaintext
NAME="SLES"  
VERSION="12-SP4"  
VERSION_ID="12.4"  
PRETTY_NAME="SUSE Linux Enterprise Server 12 SP4"  
ID="sles"  
ANSI_COLOR="0;32"  
CPE_NAME="cpe:/o:suse:sles:12:sp4"
```

```plaintext
uname -a:
x86_64 x86_64 x86_64 GNU/Linux
```

**Kernel self-reported vulnerability status:**

- **CVE-2017-5754 (Meltdown):** Not affected
- **CVE-2017-5753 (Spectre variant 1):** Mitigation: __user pointer sanitization
- **CVE-2017-5715 (Spectre variant 2):** Mitigation: Indirect Branch Restricted Speculation, IBPB, IBRS_FW

```plaintext
run-level 3 Sep 4 23:29 last=5
```

**SPEC is set to:** /home/speccpu

```plaintext
Filesystem     Type  Size  Used Avail Use% Mounted on  
/dev/sde       ext4  440G  7.1G  410G   2% /home
```

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.

```plaintext
BIOS American Megatrends Inc. 2.00.32 07/19/2019  
Memory:  
12x Hynix HMA82GR7AFR8N-VK 16 GB 2 rank 2666, configured at 2400  
12x NO DIMM NO DIMM
```

(End of data from sysinfo program)

**Compiler Version Notes**

```plaintext
==================================================================================================
| C         | 600.perlbench_s(base, peak) 602.gcc_s(base, peak) 605.mcf_s(base, peak) 625.x264_s(base, peak) |
|           | 625.x264_s(base, peak) 657.xz_s(base, peak) |
==================================================================================================
```

Intel(R) C 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.

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

New H3C Technologies Co., Ltd.
H3C UniServer R4900 G3 (Intel Xeon Silver 4214)

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Software Availability: May-2019

Compiler Version Notes (Continued)

==============================================================================
C++     | 620.omnetpp_s(base, peak) 623.xalancbmk_s(base, peak)
        | 631.deepsjeng_s(base, peak) 641.leela_s(base, peak)
------------------------------------------------------------------------------
Intel(R) C++ 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.
------------------------------------------------------------------------------
==============================================================================
Fortran | 648.exchange2_s(base, peak)
------------------------------------------------------------------------------
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

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
SPEC CPU®2017 Integer Speed Result

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Base Optimization Flags

C benchmarks:
-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP
-L/usr/local/je5.0.1-64/lib -ljemalloc

C++ benchmarks:
-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4
-L/usr/local/intel/compiler/compilers_and_libraries_2019.4.227/linux/compiler/lib/intel64
-lqkmalloc

Fortran benchmarks:
-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-mem-layout-trans=4
-nostandard-realloc-lhs

Peak Compiler Invocation

C benchmarks:
icc -m64 -std=c11

C++ benchmarks:
icpc -m64

Fortran benchmarks:
ifort -m64

Peak Portability Flags

Same as Base Portability Flags

Peak Optimization Flags

C benchmarks:
600.perlbench_s: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -O2
-xCORE-AVX512 -qopt-mem-layout-trans=4 -ipo -O3
-no-prec-div -DSPEC_SUPPRESS_OPENMP -gopenmp
-DSPEC_OPENMP -fno-strict-overflow
-L/usr/local/je5.0.1-64/lib -ljemalloc

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

602.gcc_s: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -O2
-xCORE-AVX512 -qopt-mem-layout-trans=4 -ipo -O3
-no-prec-div -DSPEC_SUPPRESS_OPENMP
-L/usr/local/je5.0.1-64/lib -ljemalloc

605.mcf_s: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo
-xCORE-AVX512 -O3 -no-prec-div -qopt-mem-layout-trans=4
-DSPEC_SUPPRESS_OPENMP -qopenmp -DSPEC_OPENMP
-L/usr/local/je5.0.1-64/lib -ljemalloc

625.x264_s: -Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP
-L/usr/local/je5.0.1-64/lib -ljemalloc

657.xz_s: -Wl,-z,muldefs -xCORE-AVX512 -ipo -O3
-xCORE-AVX512 -qopt-mem-layout-trans=4 -ipo -O3
-no-prec-div -DSPEC_SUPPRESS_OPENMP -qopenmp
-DSPEC_OPENMP -L/usr/local/je5.0.1-64/lib -ljemalloc

C++ benchmarks:

620.omnetpp_s: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo
-xCORE-AVX512 -O3 -no-prec-div -qopt-mem-layout-trans=4
-DSPEC_SUPPRESS_OPENMP
-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.4.227/linux/compiler/lib/intel64
-lqkmalloc

623.xalancbmk_s: -Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4
-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.4.227/linux/compiler/lib/intel64
-lqkmalloc

631.deepsjeng_s: Same as 623.xalancbmk_s

641.leela_s: Same as 623.xalancbmk_s

Fortran benchmarks:

-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-mem-layout-trans=4
-nostandard-realloc-lhs

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
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H3C UniServer R4900 G3 (Intel Xeon Silver 4214)

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<td>8.24</td>
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9066

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

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### Test Date:
Sep-2019

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Apr-2019

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May-2019

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

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