### SPEC CPU®2017 Floating Point Speed Result

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

H3C UniServer R6700 G3 (Intel Xeon Gold 6230)

<table>
<thead>
<tr>
<th>SPECspeed®2017_fp_base = 181</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECspeed®2017_fp_peak = 181</td>
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</table>

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

#### Threads

<table>
<thead>
<tr>
<th>SPECspeed®2017_fp_base (181)</th>
<th>SPECspeed®2017_fp_peak (181)</th>
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<tbody>
<tr>
<td>603.bwaves_s 80</td>
<td></td>
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<tr>
<td>607.cactuBSSN_s 80</td>
<td></td>
</tr>
<tr>
<td>619.lbm_s 80</td>
<td></td>
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<tr>
<td>621.wrf_s 80</td>
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<tr>
<td>627.cam4_s 80</td>
<td></td>
</tr>
<tr>
<td>628.pop2_s 80</td>
<td></td>
</tr>
<tr>
<td>638.imagick_s 80</td>
<td></td>
</tr>
<tr>
<td>644.nab_s 80</td>
<td></td>
</tr>
<tr>
<td>649.fotonik3d_s 80</td>
<td></td>
</tr>
<tr>
<td>654.roms_s 80</td>
<td></td>
</tr>
</tbody>
</table>

#### Hardware

- **CPU Name:** Intel Xeon Gold 6230  
- **Max MHz:** 3900  
- **Nominal:** 2100  
- **Enabled:** 80 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:** 27.5 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  
  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.

H3C UniServer R6700 G3 (Intel Xeon Gold 6230)

SPECspeed®2017_fp_base = 181
SPECspeed®2017_fp_peak = 181

Results Table

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<td>607.cactuBSSN_s</td>
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<td>65.6</td>
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<td>65.6</td>
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<td>65.6</td>
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<td>198</td>
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<tr>
<td>638.imagick_s</td>
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<tr>
<td>649.fotonik3d_s</td>
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<td>77.7</td>
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<td>654.roms_s</td>
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<td>69.2</td>
<td>227</td>
<td>68.0</td>
<td>232</td>
<td></td>
<td></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 R6700 G3 (Intel Xeon Gold 6230)

SPECspeed®2017_fp_base = 181
SPECspeed®2017_fp_peak = 181

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

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 295195f888a3d7eddb1e6e46a485a0011
running on localhost.localdomain Tue Sep 8 14:58:58 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 6230 CPU @ 2.10GHz
    4 "physical id"s (chips)
    80 "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 : 20
    siblings : 20
    physical 0: cores 0 1 2 3 4 8 9 10 11 12 16 17 18 19 20 24 25 26 27 28
    physical 1: cores 0 1 2 3 4 8 9 10 11 12 16 17 18 19 20 24 25 26 27 28
    physical 2: cores 0 1 2 3 4 8 9 10 11 12 16 17 18 19 20 24 25 26 27 28
    physical 3: cores 0 1 2 3 4 8 9 10 11 12 16 17 18 19 20 24 25 26 27 28

From lscpu:
    Architecture: x86_64
    CPU op-mode(s): 32-bit, 64-bit
    Byte Order: Little Endian
    CPU(s): 80
    On-line CPU(s) list: 0-79
    Thread(s) per core: 1
    Core(s) per socket: 20
    Socket(s): 4
    NUMA node(s): 4
    Vendor ID: GenuineIntel
    CPU family: 6
    Model: 85
    Model name: Intel(R) Xeon(R) Gold 6230 CPU @ 2.10GHz
    Stepping: 7
    CPU MHz: 800.445

(Continued on next page)
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**SPECspeed®2017_fp_base = 181**

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**Software Availability:** Apr-2020

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**Platform Notes (Continued)**

- **CPU max MHz:** 3900.0000
- **CPU min MHz:** 800.0000
- **BogoMIPS:** 4200.00
- **Virtualization:** VT-x
- **L1d cache:** 32K
- **L1i cache:** 32K
- **L2 cache:** 1024K
- **L3 cache:** 28160K
- **NUMA node0 CPU(s):** 0-19
- **NUMA node1 CPU(s):** 20-39
- **NUMA node2 CPU(s):** 40-59
- **NUMA node3 CPU(s):** 60-79
- **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 xtrunc 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_pinn ssbd mba ibrs ibpb stibp ibrs_enhanced tpr_shadow vnmi flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rtm cqm mxp rdt_a avx512f avx512dq rdseed adx smap clflushopt clwb intel_pt avx512cd avx512bw avx512vl xsaveopt xsavec xsavec xsvavc cqm_llc cqm_occ unp_llc cqm_mbb_total cqm_mbb_local dtherm ida arat pts hwp hwp_act_window hwp_epp hwp_pkg_req pku ospke avx512_vnni md_clear flush_lld arch_capabilities

/proc/cpuinfo cache data
  - **cache size:** 28160 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 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19
- **node 0 size:** 95071 MB
- **node 0 free:** 94421 MB
- **node 1 cpus:** 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39
- **node 1 size:** 96735 MB
- **node 1 free:** 96142 MB
- **node 2 cpus:** 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59
- **node 2 size:** 96699 MB
- **node 2 free:** 89532 MB
- **node 3 cpus:** 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79
- **node 3 size:** 96762 MB
- **node 3 free:** 96563 MB
- **node distances:**
  - **node 0:** 10 21 21 21
  - **node 1:** 21 10 21 21

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

```markdown
2:  21  21  10  21  
3:  21  21  21  10  
```

From `/proc/meminfo`

- MemTotal: 394516384 kB
- HugePages_Total: 0
- Hugepagesize: 2048 kB

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

```markdown
**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
```

```markdown
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:

```markdown
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: usercopy/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 8 10:43

```markdown
SPEC is set to: /home/speccpu
Filesystem Type  Size  Used Avail Use% Mounted on
/dev/mapper/rhel-home xfs  839G  19G  820G  3% /home
```

From `/sys/devices/virtual/dmi/id`

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

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Platform Notes (Continued)

BIOS: American Megatrends Inc. 2.00.33 08/22/2019
Vendor: New H3C Technologies Co., Ltd.
Product: UniServer R6700 G3
Product Family: Rack
Serial: 210200A01SH18B000020

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 Hynix HMA82GR7CJR8N-WM 16 GB 2 rank 2933
24x NO DIMM NO DIMM

(End of data from sysinfo program)

Compiler Version Notes

==============================================================================
<table>
<thead>
<tr>
<th>C</th>
<th>619.lbm_s(base, peak) 638.imagick_s(base, peak) 644.nab_s(base, peak)</th>
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<td></td>
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<tr>
<td>Version 19.1.1.217 Build 20200306</td>
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<tr>
<td>Copyright (C) 1985-2020 Intel Corporation. All rights reserved.</td>
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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.

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. | SPECspeed®2017_fp_base = 181
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**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:
icc

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 R6700 G3 (Intel Xeon Gold 6230)  

**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 -O3 -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
## SPEC CPU®2017 Floating Point Speed Result

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

**H3C UniServer R6700 G3 (Intel Xeon Gold 6230)**

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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](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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