New H3C Technologies Co., Ltd. | SPECspeed®2017_fp_base = 179
H3C UniServer R6700 G3 (Intel Xeon Gold 6256) | SPECspeed®2017_fp_peak = 180

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

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

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
# SPEC CPU®2017 Floating Point Speed Result

New H3C Technologies Co., Ltd.  
H3C UniServer R6700 G3 (Intel Xeon Gold 6256)

<table>
<thead>
<tr>
<th>SPECspeed®2017_fp_base</th>
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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-2020  
**Software Availability:** Apr-2020

## Results Table

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<tr>
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<td></td>
<td>69.4</td>
<td>227</td>
<td>68.3</td>
<td>230</td>
</tr>
</tbody>
</table>

## 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. | SPECspeed®2017_fp_peak = 180
---|---
H3C UniServer R6700 G3 (Intel Xeon Gold 6256) | SPECspeed®2017_fp_base = 179

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

General Notes (Continued)


Platform Notes

BIOS Settings:
Set Hyper Threading to Disabled
Set Patrol Scrub to Disabled
Set IMC Interleaving to 2-way Interleave

Sysinfo program /home/speccpu/bin/sysinfo
Rev: r6365 of 2019-08-21 295195f888a3d7ed1e6e46a485a0011
running on localhost.localdomain Tue Sep 15 00:56:08 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

```
motor 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 1 2 5 11 13 16 20 21 25 26 29
physical 1: cores 1 2 4 5 9 10 11 12 16 21 24 29
physical 2: cores 0 10 12 13 16 17 19 21 25 26 27 29
physical 3: cores 0 2 5 8 11 12 13 17 21 25 26 27
```

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: 1403.689
```

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

New H3C Technologies Co., Ltd.
H3C UniServer R6700 G3 (Intel Xeon Gold 6256)

| SPECspeed®2017_fp_base = 179 |
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CPU2017 License: 9066
Test Sponsor: New H3C Technologies Co., Ltd.
Test Date: Sep-2020
Tested by: New H3C Technologies Co., Ltd.
Hardware Availability: Mar-2020
Software Availability: Apr-2020

<table>
<thead>
<tr>
<th>Platform Notes (Continued)</th>
</tr>
</thead>
</table>

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 l 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_pmm ssbd mba ibrs ibpb ibrs Enhanced tpr_shadow vnmi flexpriority
erpt vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rtm
cqm mpx rdt_a avx512f avx512dq rdseed adx smap clflushopt clwb intel_pt avx512cd
         avx512bw avx512vl xsaveopt xsavevc xsavec cqm_llc cqm_occup_llc cqm_mbb_total
cqm_mbb_local dtherm ida arat pni pts hwp hwp_act_window hwp_epp hwp_pkg_req pku
         ospke avx512_vnni md_clear flush_l1d arch_capabilities

/proc/cpuinfo cache data
   cache size: 33792 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
   node 0 size: 95073 MB
   node 0 free: 94668 MB
   node 1 cpus: 12 13 14 15 16 17 18 19 20 21 22 23
   node 1 size: 96765 MB
   node 1 free: 96489 MB
   node 2 cpus: 24 25 26 27 28 29 30 31 32 33 34 35
   node 2 size: 96673 MB
   node 2 free: 95112 MB
   node 3 cpus: 36 37 38 39 40 41 42 43 44 45 46 47
   node 3 size: 96764 MB
   node 3 free: 90744 MB
   node distances:
      node 0 1 2 3
      0: 10 21 21 21
      1: 21 10 21 21

(Continued on next page)
New H3C Technologies Co., Ltd.
H3C UniServer R6700 G3 (Intel Xeon Gold 6256)

SPECspeed®2017_fp_base = 179
SPECspeed®2017_fp_peak = 180

Platform Notes (Continued)

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

From /proc/meminfo
MemTotal:       394523304 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: 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 14 16:24

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)
New H3C Technologies Co., Ltd.
H3C UniServer R6700 G3 (Intel Xeon Gold 6256)

| SPECspeed®2017_fp_base = 179 |
| SPECspeed®2017_fp_peak = 180 |

CPU2017 License: 9066
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: 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>
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<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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<tbody>
<tr>
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New H3C Technologies Co., Ltd.
H3C UniServer R6700 G3 (Intel Xeon Gold 6256)

**Compiler Version Notes (Continued)**

64, Version 19.1.1.217 Build 20200306
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

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
### SPEC CPU®2017 Floating Point Speed Result

New H3C Technologies Co., Ltd.
H3C UniServer R6700 G3 (Intel Xeon Gold 6256)

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<td>Software Availability</td>
<td>Apr-2020</td>
</tr>
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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 6256)

**SPECspeed**®2017 fp_base = 179

**SPECspeed**®2017 fp_peak = 180

---

**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
- -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

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
New H3C Technologies Co., Ltd. | SPECspeed®2017_fp_base = 179
H3C UniServer R6700 G3 (Intel Xeon Gold 6256) | SPECspeed®2017_fp_peak = 180

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<td>Tested by: New H3C Technologies Co., Ltd.</td>
<td>Software Availability: Apr-2020</td>
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You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2017/flags/Intel-ic19.1u1-official-linux64_revA.xml
http://www.spec.org/cpu2017/flags/New_H3C-Platform-Settings-V1.4-CLX-RevB.xml