New H3C Technologies Co., Ltd.

H3C UniServer R4900 G3 (Intel Xeon Gold 6128)

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

<table>
<thead>
<tr>
<th>Threads</th>
<th>SPECspeed®2017_fp_base = 75.5</th>
<th>SPECspeed®2017_fp_peak = 76.2</th>
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<tbody>
<tr>
<td>603.bwaves_s 12</td>
<td>72.3</td>
<td>72.3</td>
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<tr>
<td>607.cactuBSSN_s 12</td>
<td>60.4</td>
<td>60.4</td>
</tr>
<tr>
<td>619.lbm_s 12</td>
<td>85.4</td>
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</tr>
<tr>
<td>621.wrf_s 12</td>
<td>39.5</td>
<td>39.8</td>
</tr>
<tr>
<td>627.cam4_s 12</td>
<td>55.7</td>
<td>57.6</td>
</tr>
<tr>
<td>628.pop2_s 12</td>
<td>49.9</td>
<td>50.0</td>
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<td>638.imagick_s 12</td>
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<td>644.nab_s 12</td>
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<td>649.fotonik3d_s 12</td>
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**CPU2017 License:** 9066
**Test Date:** Jul-2020

**Test Sponsor:** New H3C Technologies Co., Ltd.
**Hardware Availability:** Mar-2019

**Tested by:** New H3C Technologies Co., Ltd.
**Software Availability:** May-2019

**CPU Name:** Intel Xeon Gold 6128
**Max MHz:** 3700
**Nominal:** 3400
**Enabled:** 12 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:** 19.25 MB I+D on chip per chip
**Other:** None

**Memory:** 384 GB (12 x 32 GB 2Rx8 PC4-2666V-R, running at 2666)

**Storage:** 1 x 960 GB SATA SSD
**Other:** None

**OS:** Red Hat Enterprise Linux Server release 7.6 (Maipo) 3.10.0-957.el7.x86_64
**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

**Parallel:** Yes
**Firmware:** Version 2.00.42 released Jun-2020 BIOS
**File System:** xfs
**System State:** Run level 3 (multi-user)
**Base Pointers:** 64-bit
**Peak Pointers:** 64-bit
**Other:** None

**Power Management:** BIOS set to prefer performance at the cost of additional power usage
New H3C Technologies Co., Ltd. | SPECspeed®2017_fp_base = 75.5
H3C UniServer R4900 G3 (Intel Xeon Gold 6128) | SPECspeed®2017_fp_peak = 76.2

CPU2017 License: 9066
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Test Date: Jul-2020
Hardware Availability: Mar-2019
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Results Table

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<th>Ratio</th>
<th>Seconds</th>
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<td>75.7</td>
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</table>

SPECspeed®2017_fp_base = 75.5
SPECspeed®2017_fp_peak = 76.2

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"
OMP_STACKSIZE = "192M"

General Notes
Binaries compiled on a system with 1x Intel Core i9-7900X CPU + 32GB RAM memory using Redhat Enterprise Linux 7.5
Yes: 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
Platform Notes

BIOS settings:
Set Hyper-Threading to Disabled
Set IMC Interleaving to 2-way Interleave
Set Patrol Scrub to Disabled
Set LLC dead line alloc to Disabled
Set VT-d to Disabled

Sysinfo program /home/speccpu/bin/sysinfo
Rev: r6365 of 2019-08-21 295195f888a3d7edb1e6e46a485a0011
running on localhost.localdomain Sat Jul 4 16:17:58 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 6128 CPU @ 3.40GHz
   2 "physical id"s (chips)
   12 "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 : 6
   siblings : 6
   physical 0: cores 0 6 9 10 11 13
   physical 1: cores 0 2 3 4 6 13

From lscpu:
   Architecture: x86_64
   CPU op-mode(s): 32-bit, 64-bit
   Byte Order: Little Endian
   CPU(s): 12
   On-line CPU(s) list: 0-11
   Thread(s) per core: 1
   Core(s) per socket: 6
   Socket(s): 2
   NUMA node(s): 2
   Vendor ID: GenuineIntel
   CPU family: 6
   Model: 85
   Model name: Intel(R) Xeon(R) Gold 6128 CPU @ 3.40GHz
   Stepping: 4
   CPU MHz: 1612.841
   CPU max MHz: 3700.0000
   CPU min MHz: 1200.0000
   BogoMIPS: 6800.00
   Virtualization: VT-x
   L1d cache: 32K

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

New H3C Technologies Co., Ltd.
H3C UniServer R4900 G3 (Intel Xeon Gold 6128)

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SPECspeed®2017_fp_peak = 76.2

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

Platform Notes (Continued)

L1i cache: 32K
L2 cache: 1024K
L3 cache: 19712K
NUMA node0 CPU(s): 0-5
NUMA node1 CPU(s): 6-11
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 rdtsscp
lm constant_tsc arch_perfmon pebs bts rep_good ncpu kamo cmov
pat pse36 clflush dts acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx pdpe1gb rdtsscp
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pat pse36 clflush dts acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx pdpe1gb rdtsscp
lm constant_tsc arch_perfmon pebs bts rep_good ncpu kamo cmov
pat pse36 clflush dts acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx pdpe1� for a physical chip.
available: 2 nodes (0-1)
node 0 cpus: 0 1 2 3 4 5
node 0 size: 195223 MB
node 0 free: 186569 MB
node 1 cpus: 6 7 8 9 10 11
node 1 size: 196608 MB
node 1 free: 188369 MB
node distances:
node 0 1
0: 10 21
1: 21 10

From /proc/meminfo
MemTotal: 394622032 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

From /etc/*release* /etc/*version*
os-release:
NAME="Red Hat Enterprise Linux Server"
VERSION="7.6 (Maipo)"
ID="rhel"
ID_LIKE="fedora"
VARIANT="Server"
VARIANT_ID="server"

(Continued on next page)
New H3C Technologies Co., Ltd.  
H3C UniServer R4900 G3 (Intel Xeon Gold 6128)

SPECspeed®2017_fp_peak = 76.2
SPECspeed®2017_fp_base = 75.5

CPU2017 License: 9066  
Test Sponsor: New H3C Technologies Co., Ltd.  
Test Date: Jul-2020

Tested by: New H3C Technologies Co., Ltd.  
Hardware Availability: Mar-2019

Software Availability: May-2019

Platform Notes (Continued)

VERSION_ID="7.6"
PRETTY_NAME="Red Hat Enterprise Linux Server 7.6 (Maipo)"
redhat-release: Red Hat Enterprise Linux Server release 7.6 (Maipo)
system-release: Red Hat Enterprise Linux Server release 7.6 (Maipo)

uname -a:
   Linux localhost.localdomain 3.10.0-957.el7.x86_64 #1 SMP Thu Oct 4 20:48:51 UTC 2018
   x86_64 x86_64 x86_64 GNU/Linux

Kernel self-reported vulnerability status:

CVE-2018-3620 (L1 Terminal Fault): Mitigation: PTE Inversion; VMX: SMT disabled, L1D conditional cache flushes
Microarchitectural Data Sampling: No status reported
CVE-2017-5754 (Meltdown): Mitigation: PTI
CVE-2018-3639 (Speculative Store Bypass): Mitigation: Speculative Store Bypass disabled via prctl and seccomp
CVE-2017-5753 (Spectre variant 1): Mitigation: Load fences, __user pointer sanitation
CVE-2017-5715 (Spectre variant 2): Mitigation: IBRS (kernel)

run-level 3 Jul 4 11:00

SPEC is set to: /home/spec
Filesystem        Type  Size  Used Avail Use% Mounted on
/dev/mapper/rhel-home xfs   839G   20G  820G   3% /home

From /sys/devices/virtual/dmi/id
BIOS: American Megatrends Inc. 2.00.42 06/22/2020
Vendor: New H3C Technologies Co., Ltd.
Product: UniServer R4900 G3
Serial: 210235A3QUH188000033

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 Micron 36ASF4G72PZ-2G6D1 32 GB 2 rank 2666
   12x NO DIMM NO DIMM

(End of data from sysinfo program)
New H3C Technologies Co., Ltd.
H3C UniServer R4900 G3 (Intel Xeon Gold 6128)

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### Compiler Version Notes

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<th>607.cactuBSSN_s(base, peak)</th>
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---|---
H3C UniServer R4900 G3 (Intel Xeon Gold 6128) | SPECspeed®2017_fp_peak = 76.2

**Base Compiler Invocation**

C benchmarks:
```bash
icc -m64 -std=c11
```

Fortran benchmarks:
```bash
ifort -m64
```

Benchmarks using both Fortran and C:
```bash
ifort -m64 icc -m64 -std=c11
```

Benchmarks using Fortran, C, and C++:
```bash
icpc -m64 icc -m64 -std=c11 ifort -m64
```

**Base Portability Flags**

603.bwaves_s: -DSPEC_LP64
607.cactuBSSN_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

**Base Optimization Flags**

C benchmarks:
```bash
-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP
```

Fortran benchmarks:
```bash
-DSPEC_OPENMP -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp
-nostandard-realloc-lhs
```

Benchmarks using both Fortran and C:
```bash
-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP
-nostandard-realloc-lhs
```
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Base Optimization Flags (Continued)

Benchmarks using Fortran, C, and C++:
-xCORE-AVX512 -ipo -O3 -no-prec-div -gopt-prefetch
-ffinite-math-only -gopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP
-nostandard-realloc-lhs

Peak Compiler Invocation

C benchmarks:
icc -m64 -std=c11

Fortran benchmarks:
ifort -m64

Benchmarks using both Fortran and C:
ifort -m64 icc -m64 -std=c11

Benchmarks using Fortran, C, and C++:
icpc -m64 icc -m64 -std=c11 ifort -m64

Peak Portability Flags

Same as Base Portability Flags

Peak Optimization Flags

C benchmarks:
-xCORE-AVX512 -ipo -O3 -no-prec-div -gopt-prefetch
-ffinite-math-only -gopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP

Fortran benchmarks:
603.bwaves_s: -prof-gen(pass 1) -prof-use(pass 2) -DSPEC.Suppress_OPENMP
-DSPEC_OPENMP -O2 -xCORE-AVX512 -gopt-prefetch -ipo -O3
-ffinite-math-only -no-prec-div -gopt-mem-layout-trans=4
-qopenmp -nostandard-realloc-lhs
649.fotonik3d_s: Same as 603.bwaves_s
654.roms_s: -DSPEC_OPENMP -xCORE-AVX512 -ipo -O3 -no-prec-div
-gopt-prefetch -ffinite-math-only -gopt-mem-layout-trans=4

(Continued on next page)
New H3C Technologies Co., Ltd.
H3C UniServer R4900 G3 (Intel Xeon Gold 6128)

<table>
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<tr>
<th>SPECspeed®2017_fp_base = 75.5</th>
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<td>SPECspeed®2017_fp_peak = 76.2</td>
</tr>
</tbody>
</table>

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Tested by: New H3C Technologies Co., Ltd.

Peak Optimization Flags (Continued)

654.roms_s (continued):
-qopenmp -nostandard-realloc-lhs

Benchmarks using both Fortran and C:

621.wrf_s: -prof-gen(pass 1) -prof-use(pass 2) -O2 -xCORE-AVX512
-qopt-prefetch -ipo -O3 -ffinite-math-only -no-prec-div
-qopt-mem-layout-trans=4 -DSPEC_SUPPRESS_OPENMP -qopenmp
-DSPEC_OPENMP -nostandard-realloc-lhs

627.cam4_s: -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp
-DSPEC_OPENMP -nostandard-realloc-lhs

628.pop2_s: Same as 621.wrf_s

Benchmarks using Fortran, C, and C++:

-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP
-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-RevE.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2017/flags/New_H3C-Platform-Settings-V1.3-SKL-RevE.xml

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