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

**H3C UniServer R4900 G3 (Intel Xeon Gold 6226)**

**SPECrate®2017_fp_base = 176**

**SPECrate®2017_fp_peak = Not Run**

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

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</tr>
<tr>
<td>554.roms_r</td>
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<td>85.7</td>
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</table>

### Hardware

- **CPU Name:** Intel Xeon Gold 6226  
- **Max MHz:** 3700  
- **Nominal:** 2700  
- **Enabled:** 24 cores, 2 chips, 2 threads/core  
- **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  
- **Memory:** 192 GB (12 x 16 GB 2Rx8 PC4-2933V-R)  
- **Storage:** 2 x 600 GB SAS HDD,10000RPM,RAID 1  
- **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:** No  
- **Firmware:** Version 2.00.33 released Aug-2019 BIOS  
  xfs  
- **System State:** Run level 3 (multi-user)  
- **Base Pointers:** 64-bit  
- **Peak Pointers:** Not Applicable  
- **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 R4900 G3 (Intel Xeon Gold 6226)

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

Results Table

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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.

Submit Notes

The numactl mechanism was used to bind copies to processors. The config file option 'submit' was used to generate numactl commands to bind each copy to a specific processor. For details, please see the config file.

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:
LD_LIBRARY_PATH = "/home/speccpu/lib/intel64:/home/speccpu/je5.0.1-64"
MALLOCONF = "retain:true"
SPEC CPU®2017 Floating Point Rate Result
Copyright 2017-2020 Standard Performance Evaluation Corporation

New H3C Technologies Co., Ltd. SPEC®2017_fp_base = 176
H3C UniServer R4900 G3 (Intel Xeon Gold 6226) SPEC®2017_fp_peak = Not Run

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

Test Date: Oct-2020
Hardware Availability: Jun-2019
Software Availability: Apr-2020

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
runcpu command invoked through numactl i.e.:
numactl --interleave=all runcpu <etc>
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 SNC to Enabled
Set IMC Interleaving to 1-way Interleave
Set Patrol Scrub to Disabled

Sysinfo program /home/speccpu/bin/sysinfo
Rev: r6365 of 2019-08-21 295195f888a3d7ed16e646a485a0011
running on localhost.localdomain Tue Oct 27 00:21:06 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 6226 CPU @ 2.70GHz
 2 "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 : 24
 physical 0: cores 1 2 3 4 5 8 9 10 11 12 13 14
 physical 1: cores 0 2 3 4 5 6 8 9 10 11 13 14

From lscpu:
 Architecture: x86_64

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

H3C UniServer R4900 G3 (Intel Xeon Gold 6226)

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

SPECrate®2017_fp_base = 176
SPECrate®2017_fp_peak = Not Run

Platform Notes (Continued)

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: 2
Core(s) per socket: 12
Socket(s): 2
NUMA node(s): 4
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Gold 6226 CPU @ 2.70GHz
Stepping: 7
CPU MHz: 3515.012
CPU max MHz: 3700.0000
CPU min MHz: 1200.0000
BogoMIPS: 5400.00
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 19712K
NUMA node0 CPU(s): 0-2,5-7,24-26,29-31
NUMA node1 CPU(s): 3,4,8-11,27,28,32-35
NUMA node2 CPU(s): 12-14,18-20,36-38,42-44
NUMA node3 CPU(s): 15-17,21-23,39-41,45-47
Flags: fpu vme de pse tsc msr pae 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 aperfmpref pln 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 abm 3nowprefetch cpuid_fault epb cat_l3 cdp_l3 invpcid_single intel_ppn ssbd mba ibrs ibpb stibp ibrs_enhanced tpr_shadow vnni fgoalortif vptid fsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invvpid rtm cmqc mpbx rdt_a avx512f avx512dq rdseed adx smap clflushopt clwb intel_pt avx512cd avx512bw avx512vl xsaveopt xsaves xsavec xgetbv1 xsaves cqm_llc cqm_occu_llc cqm_mbm_total cqm_mbm_local dtherm ida arat pln pts pkup ospke avx512_vnni md_clear flush_l1d arch_capabilities

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 5 6 7 24 25 26 29 30 31
node 0 size: 46693 MB

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

H3C UniServer R4900 G3 (Intel Xeon Gold 6226)

SPECrade®2017_fp_base = 176
SPECrade®2017_fp_peak = Not Run

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

Platform Notes (Continued)

node 0 free: 40731 MB
node 1 cpus: 3 4 8 9 10 11 27 28 32 33 34 35
node 1 size: 48353 MB
node 1 free: 45127 MB
node 2 cpus: 12 13 14 18 19 20 36 37 38 42 43 44
node 2 size: 48381 MB
node 2 free: 45755 MB
node 3 cpus: 15 16 17 21 22 23 39 40 41 45 46 47
node 3 size: 48380 MB
node 3 free: 45703 MB
node distances:

node 0 1 2 3
0:  10  11  21  21
1:  11  10  21  21
2:  21  21  11  11
3:  21  21  11  10

From /proc/meminfo
MemTotal:       196412252 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

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

**H3C UniServer R4900 G3 (Intel Xeon Gold 6226)**

<table>
<thead>
<tr>
<th><strong>SPECrate®2017_fp_base</strong></th>
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<tr>
<td><strong>SPECrate®2017_fp_peak</strong></td>
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**CPU2017 License:** 9066  
**Test Date:** Oct-2020  
**Test Sponsor:** New H3C Technologies Co., Ltd.  
**Hardware Availability:** Jun-2019  
**Tested by:** New H3C Technologies Co., Ltd.  
**Software Availability:** Apr-2020

### Platform Notes (Continued)

- **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 vulnerable

**run-level 3 Oct 26 20:28**

**SPEC is set to:** /home/speccpu  
**Filesystem** | **Type** | **Size** | **Used** | **Avail** | **Use%** | **Mounted on**
<table>
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<td>xfs</td>
<td>503G</td>
<td>54G</td>
<td>449G</td>
<td>11%</td>
<td>/home</td>
</tr>
</tbody>
</table>

**From /sys/devices/virtual/dmi/id**

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

```bash
<table>
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<th>519.lbm_r(base) 538.imagick_r(base) 544.nab_r(base)</th>
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```

**Intel(R) C Compiler for applications running on Intel(R) 64, Version 2021.1**  
**NextGen Build 20200304**  
**Copyright (C) 1985-2020 Intel Corporation. All rights reserved.**

```bash
<table>
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<th>508.namd_r(base) 510.parest_r(base)</th>
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</thead>
</table>
```

**Intel(R) C++ Compiler for applications running on Intel(R) 64, Version 2021.1**  
**NextGen Build 20200304**  
**Copyright (C) 1985-2020 Intel Corporation. All rights reserved.**

(Continued on next page)
New H3C Technologies Co., Ltd. | SPECraté®2017_fp_base = 176
H3C UniServer R4900 G3 (Intel Xeon Gold 6226) | SPECraté®2017_fp_peak = Not Run

CPU2017 License: 9066 | Test Date: Oct-2020
Test Sponsor: New H3C Technologies Co., Ltd. | Hardware Availability: Jun-2019
Tested by: New H3C Technologies Co., Ltd. | Software Availability: Apr-2020

Compiler Version Notes (Continued)

==============================================================================
C++, C | 511.povray_r(base) 526.blender_r(base)
==============================================================================
Intel(R) C++ Compiler for applications running on Intel(R) 64, Version 2021.1
NextGen Build 20200304
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
Intel(R) C Compiler for applications running on Intel(R) 64, Version 2021.1
NextGen Build 20200304
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------

==============================================================================
C++, C, Fortran | 507.cactuBSSN_r(base)
------------------------------------------------------------------------------
Intel(R) C++ Compiler for applications running on Intel(R) 64, Version 2021.1
NextGen Build 20200304
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
Intel(R) C Compiler for applications running on Intel(R) 64, Version 2021.1
NextGen Build 20200304
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
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.
------------------------------------------------------------------------------

==============================================================================
Fortran | 503.bwaves_r(base) 549.fotonik3d_r(base) 554.roms_r(base)
==============================================================================
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.
------------------------------------------------------------------------------

==============================================================================
Fortran, C | 521.wrf_r(base) 527.cam4_r(base)
==============================================================================
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.
Intel(R) C Compiler for applications running on Intel(R) 64, Version 2021.1
NextGen Build 20200304
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
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H3C UniServer R4900 G3 (Intel Xeon Gold 6226)

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Hardware Availability: Jun-2019
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Base Compiler Invocation

C benchmarks:
icc

C++ benchmarks:
icpc

Fortran benchmarks:
ifort

Benchmarks using both Fortran and C:
ifort icc

Benchmarks using both C and C++:
icpc icc

Benchmarks using Fortran, C, and C++:
icpc icc ifort

Base Portability Flags

503.bwaves_r: -DSPEC_LP64
507.cactuBSSN_r: -DSPEC_LP64
508.namd_r: -DSPEC_LP64
510.parest_r: -DSPEC_LP64
511.povray_r: -DSPEC_LP64
519.lbm_r: -DSPEC_LP64
521.wrf_r: -DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian
526.blender_r: -DSPEC_LP64 -DSPEC_LINUX -funsigned-char
527.cam4_r: -DSPEC_LP64 -DSPEC_CASE_FLAG
538.imagick_r: -DSPEC_LP64
544.nab_r: -DSPEC_LP64
549.fotonik3d_r: -DSPEC_LP64
554.roms_r: -DSPEC_LP64

Base Optimization Flags

C benchmarks:
-m64 -mnextgen -std=c11
-Wl,-plugin-opt=-x86-branches-within-32B-boundaries -Wl,-z,muldefs
-fuse-ld=gold -xCORE-AVX512 -Ofast -ffast-math -flto -mfpmath=sse
-funroll-loops -gopt-mem-layout-trans=4
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

(Continued on next page)
**Base Optimization Flags (Continued)**

C++ benchmarks:

Fortran benchmarks:

Benchmarks using both Fortran and C:

Benchmarks using both C and C++:

Benchmarks using Fortran, C, and C++:
## SPEC CPU®2017 Floating Point Rate Result

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

### H3C UniServer R4900 G3 (Intel Xeon Gold 6226)

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</tr>
</tbody>
</table>

**SPECrate®2017_fp_base = 176**

**SPECrate®2017_fp_peak = Not Run**

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](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](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.

Tested with SPEC CPU®2017 v1.1.0 on 2020-10-26 12:21:06-0400.