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

New H3C Technologies Co., Ltd.  
H3C UniServer R6900 G3 (Intel Xeon Gold 6230)

<table>
<thead>
<tr>
<th>threads</th>
<th>SPECspeed®2017_fp_base</th>
<th>SPECspeed®2017_fp_peak</th>
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<tbody>
<tr>
<td>603.bwaves_s 80</td>
<td>205</td>
<td>205</td>
</tr>
<tr>
<td>607.cactuBSSN_s 80</td>
<td>149</td>
<td>149</td>
</tr>
<tr>
<td>619.lbm_s 80</td>
<td>129</td>
<td>129</td>
</tr>
<tr>
<td>621.wrf_s 80</td>
<td>136</td>
<td>132</td>
</tr>
<tr>
<td>627.cam4_s 80</td>
<td>131</td>
<td>131</td>
</tr>
<tr>
<td>628.pop2_s 80</td>
<td>59.2</td>
<td>59.3</td>
</tr>
<tr>
<td>638.imagick_s 80</td>
<td>195</td>
<td>197</td>
</tr>
<tr>
<td>644.nab_s 80</td>
<td>334</td>
<td>335</td>
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<tr>
<td>649.fotonik3d_s 80</td>
<td>116</td>
<td>116</td>
</tr>
<tr>
<td>654.roms_s 80</td>
<td>228</td>
<td>228</td>
</tr>
</tbody>
</table>

### Hardware

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Details</th>
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<tbody>
<tr>
<td>CPU Name</td>
<td>Intel Xeon Gold 6230</td>
</tr>
<tr>
<td>Max MHz</td>
<td>3900</td>
</tr>
<tr>
<td>Nominal</td>
<td>2100</td>
</tr>
<tr>
<td>Enabled</td>
<td>80 cores, 4 chips</td>
</tr>
<tr>
<td>Orderable</td>
<td>1,2,3,4 chips</td>
</tr>
<tr>
<td>Cache L1</td>
<td>32 KB I + 32 KB D on chip per core</td>
</tr>
<tr>
<td>L2</td>
<td>1 MB I+D on chip per core</td>
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<tr>
<td>L3</td>
<td>27.5 MB I+D on chip per chip</td>
</tr>
<tr>
<td>Other:</td>
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<tr>
<td>Memory</td>
<td>384 GB (24 x 16 GB 2Rx8 PC4-2933V-R)</td>
</tr>
<tr>
<td>Storage</td>
<td>1 x 960 GB SATA SSD</td>
</tr>
<tr>
<td>Other:</td>
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### Software

<table>
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<tr>
<td>OS</td>
<td>Red Hat Enterprise Linux Server release 7.6 (Maipo) 3.10.0-957.el7.x86_64</td>
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<td>Compiler:</td>
<td>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>
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<tr>
<td>Parallel:</td>
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<tr>
<td>Firmware:</td>
<td>Version 2.00.33 released Aug-2019 BIOS</td>
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<tr>
<td>File System:</td>
<td>xfs</td>
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<tr>
<td>System State:</td>
<td>Run level 3 (multi-user)</td>
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<tr>
<td>Base Pointers:</td>
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</tr>
<tr>
<td>Peak Pointers:</td>
<td>64-bit</td>
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<td>Other:</td>
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<tr>
<td>Power Management:</td>
<td>BIOS set to prefer performance at the cost of additional power usage</td>
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</table>
## SPEC CPU®2017 Floating Point Speed Result

New H3C Technologies Co., Ltd.

H3C UniServer R6900 G3 (Intel Xeon Gold 6230)

### SPECspeed®2017_fp_base = 184

### SPECspeed®2017_fp_peak = 184

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<th>CPU2017 License:</th>
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<td>Test Sponsor:</td>
<td>New H3C Technologies Co., Ltd.</td>
</tr>
<tr>
<td>Tested by:</td>
<td>New H3C Technologies Co., Ltd.</td>
</tr>
<tr>
<td>Test Date:</td>
<td>Sep-2020</td>
</tr>
<tr>
<td>Hardware Availability:</td>
<td>Mar-2019</td>
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<tr>
<td>Software Availability:</td>
<td>May-2019</td>
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### 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>Seconds</th>
<th>Ratio</th>
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<tbody>
<tr>
<td>603.bwaves_s</td>
<td>80</td>
<td>70.1</td>
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<td>129</td>
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<td>59.3</td>
</tr>
<tr>
<td>638.imagick_s</td>
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<td>195</td>
<td>78.9</td>
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<td>73.2</td>
<td>197</td>
<td>73.3</td>
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<tr>
<td>644.nab_s</td>
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<td>52.3</td>
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<tr>
<td>649.fotonik3d_s</td>
<td>80</td>
<td>79.1</td>
<td>115</td>
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<td>78.2</td>
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<td>654.roms_s</td>
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<td>66.8</td>
<td>236</td>
<td>71.3</td>
<td>221</td>
<td>69.1</td>
<td>228</td>
<td>68.9</td>
<td>228</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"

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

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
```
New H3C Technologies Co., Ltd.

H3C UniServer R6900 G3 (Intel Xeon Gold 6230)

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

Test Date: Sep-2020
Hardware Availability: Mar-2019
Software Availability: May-2019

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

**SPECspeed®2017_fp_base = 184**

**SPECspeed®2017_fp_peak = 184**

---

**Platform Notes**

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

Sysinfo program /home/speccpu/bin/sysinfo
Rev: r6365 of 2019-08-21 295195f888a3d7edbble6e46a485a0011
running on localhost.localdomain Fri Sep 4 14:23:47 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:               2101.000
  CPU max MHz:           2101.0000
  CPU min MHz:           800.0000
  BogoMIPS:              4200.00
  Virtualization:        VT-x

(Continued on next page)
New H3C Technologies Co., Ltd.  
H3C UniServer R6900 G3 (Intel Xeon Gold 6230)

SPECspeak®2017 fp_base = 184  
SPECspeak®2017 fp_peak = 184

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

Platform Notes (Continued)

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 art arch_perfmon pebs bts rep_good nop1 xtopology nonstop_tsc
aperfmonperf eagerfpu pni 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 3dnowprefetch cpb cat_l3 cdp_l3 intel_pinn
intel_pt ssbd mba ibrs ibpb stibp ibrs_enhanced tpr_shadow vnummi flexpriority ept
vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rtm cmqm mpx rdtd_a
avx512f avx512dq rdseed adx smap clflushopt clwb avx512cd avx512bw avx512v1 xsaveopt
xsavec xgetbv1 cmqm_llc cmqm_occp_llc cmqm_mbt_total cmqm_mbt_local dtherm ida arat pln
pts kpu ospke avx512_vnni spec_ctrl intel_stibp flush_l1d arch_capabilities

/proc/cpuinfo cache data

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: 96919 MB

node 0 free: 90919 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: 98304 MB

node 1 free: 95156 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: 98304 MB

node 2 free: 94812 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: 98304 MB

node 3 free: 93426 MB

node distances:

node 0 1 2 3

0: 10 21 21 21

1: 21 10 21 21

2: 21 21 10 21

3: 21 21 21 10

From /proc/meminfo

MemTotal: 394622720 KB

(Continued on next page)
Platform Notes (Continued)

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"
   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):        Not affected
Microarchitectural Data Sampling:         No status reported
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: Load fences, __user pointer
   sanitation
CVE-2017-5715 (Spectre variant 2):        Mitigation: Enhanced IBRS

run-level 3 Sep 4 09:50

SPEC is set to: /home/speccpu
   Filesystem            Type  Size  Used Avail Use% Mounted on
   /dev/mapper/rhel-home xfs   839G  104G  735G  13% /home

From /sys/devices/virtual/dmi/id
   BIOS:    American Megatrends Inc. 2.00.33 08/22/2019
   Vendor:  New H3C Technologies Co., Ltd.
   Product: H3C UniServer R6900 G3
   Serial:  210235A3T0H204000004

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
New H3C Technologies Co., Ltd.  | SPECspeed®2017_fp_base = 184
H3C UniServer R6900 G3 (Intel Xeon Gold 6230)  | SPECspeed®2017_fp_peak = 184

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

Platform Notes (Continued)

frequent changes to hardware, firmware, and the "DMTF SMBIOS" standard.
Memory:
24x Micron 18ASF2G72PDZ-2G9E1 16 GB 2 rank 2933
24x NO DIMM NO DIMM

(End of data from sysinfo program)

Compiler Version Notes

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<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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<tbody>
<tr>
<td>Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64,</td>
<td></td>
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<tr>
<td>Version 19.0.4.227 Build 20190416</td>
<td></td>
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<tr>
<td>Copyright (C) 1985-2019 Intel Corporation. All rights reserved.</td>
<td></td>
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</tbody>
</table>
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==============================================================================
<table>
<thead>
<tr>
<th>C++, C, Fortran</th>
<th>607.cactuBSSN_s(base, peak)</th>
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<tr>
<td>Intel(R) C++ Intel(R) 64 Compiler for applications running on Intel(R) 64,</td>
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<td>Version 19.0.4.227 Build 20190416</td>
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</table>
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Version 19.0.4.227 Build 20190416                                      
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.         
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.         

==============================================================================
<table>
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<tr>
<th>Fortran</th>
<th>603.bwaves_s(base, peak) 649.fotonik3d_s(base, peak) 654.roms_s(base, peak)</th>
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<table>
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<tr>
<th>Fortran, C</th>
<th>621.wrf_s(base, peak) 627.cam4_s(base, peak) 628.pop2_s(base, peak)</th>
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<tr>
<td>Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R)</td>
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New H3C Technologies Co., Ltd.
H3C UniServer R6900 G3 (Intel Xeon Gold 6230)

**SPECspeed®2017_fp_base = 184**

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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  
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**Software Availability:** May-2019

---

### Compiler Version Notes (Continued)

64, Version 19.0.4.227 Build 20190416
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.
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.

---

### Base 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
```

---

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

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

H3C UniServer R6900 G3 (Intel Xeon Gold 6230)

SPECspeed®2017_fp_base = 184
SPECspeed®2017_fp_peak = 184

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

Base Optimization Flags (Continued)

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

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

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 -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP
New H3C Technologies Co., Ltd.  
H3C UniServer R6900 G3 (Intel Xeon Gold 6230)

**SPECspeed®2017_fp_base = 184**

**SPECspeed®2017_fp_peak = 184**

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

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### Peak Optimization Flags (Continued)

**Fortran benchmarks:**

- 603.bwaves_s: -prof-gen(pass 1) -prof-use(pass 2) -DSPEC_SUPPRESS_OPENMP -DSPEC_OPENMP -o2 -xCORE-AVX512 -qopt-prefetch -ipo -O3 -ffinite-math-only -no-prec-div -qopt-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 -qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=4 -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_SUPPRESS_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

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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)

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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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