# SPEC CPU®2017 Floating Point Speed Result

New H3C Technologies Co., Ltd.  
H3C UniServer R6900 G5 (Intel Xeon Platinum 8380)

<table>
<thead>
<tr>
<th>Threads</th>
<th>SPECspeed®2017_fp_base = 225</th>
<th>SPECspeed®2017_fp_peak = 228</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>30</td>
<td>710</td>
<td>710</td>
</tr>
<tr>
<td>60</td>
<td>30.0</td>
<td>30.0</td>
</tr>
<tr>
<td>90</td>
<td>60.0</td>
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<td>120</td>
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<td>150</td>
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<td>180</td>
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<td>210</td>
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<td>240</td>
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<td>270</td>
<td>240</td>
<td>240</td>
</tr>
<tr>
<td>300</td>
<td>270</td>
<td>270</td>
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<tr>
<td>330</td>
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<td>300</td>
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<tr>
<td>360</td>
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<td>390</td>
<td>360</td>
<td>360</td>
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<tr>
<td>420</td>
<td>390</td>
<td>390</td>
</tr>
<tr>
<td>450</td>
<td>420</td>
<td>420</td>
</tr>
<tr>
<td>480</td>
<td>450</td>
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<tr>
<td>510</td>
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<tr>
<td>540</td>
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<td>630</td>
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<tr>
<td>690</td>
<td>660</td>
<td>660</td>
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<table>
<thead>
<tr>
<th>CPU2017 License:</th>
<th>9066</th>
<th>Test Date:</th>
<th>Oct-2021</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Sponsor:</td>
<td>New H3C Technologies Co., Ltd.</td>
<td>Hardware Availability:</td>
<td>Sep-2020</td>
</tr>
<tr>
<td>Tested by:</td>
<td>New H3C Technologies Co., Ltd.</td>
<td>Software Availability:</td>
<td>Jan-2021</td>
</tr>
</tbody>
</table>

## Hardware

<table>
<thead>
<tr>
<th>Name</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU Name</td>
<td>Intel Xeon Platinum 8380</td>
</tr>
<tr>
<td>Max MHz</td>
<td>3400</td>
</tr>
<tr>
<td>Nominal</td>
<td>2300</td>
</tr>
<tr>
<td>Enabled</td>
<td>80 cores, 2 chips</td>
</tr>
<tr>
<td>Orderable</td>
<td>1.2 chips</td>
</tr>
<tr>
<td>Cache L1</td>
<td>32 KB I + 48 KB D on chip per core</td>
</tr>
<tr>
<td>L2</td>
<td>1.25 MB I+D on chip per core</td>
</tr>
<tr>
<td>L3</td>
<td>60 MB I+D on chip per chip</td>
</tr>
<tr>
<td>Other</td>
<td>None</td>
</tr>
<tr>
<td>Memory</td>
<td>256 GB (16 x 16 GB 2Rx8 PC4-3200V-R)</td>
</tr>
<tr>
<td>Storage</td>
<td>1 x 900GB SATA SSD</td>
</tr>
<tr>
<td>Other</td>
<td>None</td>
</tr>
</tbody>
</table>

## Software

<table>
<thead>
<tr>
<th>Name</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>OS</td>
<td>Red Hat Enterprise Linux release 8.2 (Ootpa)</td>
</tr>
<tr>
<td>Compiler</td>
<td>C/C++: Version 2021.1 of Intel oneAPI DPC++/C++ Compiler Build 20201113 for Linux; Fortran: Version 2021.1 of Intel Fortran Compiler Classic Build 20201112 for Linux; C/C++: Version 2021.1 of Intel C/C++ Compiler Classic Build 20201112 for Linux</td>
</tr>
<tr>
<td>Parallel</td>
<td>Yes</td>
</tr>
<tr>
<td>Firmware</td>
<td>Version 5.34 released Sep-2021 BIOS</td>
</tr>
<tr>
<td>File System</td>
<td>xfs</td>
</tr>
<tr>
<td>System State</td>
<td>Run level 5</td>
</tr>
<tr>
<td>Base Pointers</td>
<td>64-bit</td>
</tr>
<tr>
<td>Peak Pointers</td>
<td>64-bit</td>
</tr>
<tr>
<td>Other</td>
<td>jemalloc memory allocator V5.0.1</td>
</tr>
<tr>
<td>Power Management</td>
<td>BIOS and OS set to prefer performance at the cost of additional power usage.</td>
</tr>
</tbody>
</table>

---
New H3C Technologies Co., Ltd. | SPECspeed®2017_fp_base = 225
H3C UniServer R6900 G5 (Intel Xeon Platinum 8380) | SPECspeed®2017_fp_peak = 228

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Software Availability: Jan-2021

### Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Base</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Base</td>
<td></td>
<td></td>
<td>Peak</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>603.bwaves_s</td>
<td>80</td>
<td>84.5</td>
<td>698</td>
<td>83.7</td>
<td>705</td>
<td>83.7</td>
<td>705</td>
<td>83.7</td>
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<tr>
<td>607.cactuBSSN_s</td>
<td>80</td>
<td>58.2</td>
<td>286</td>
<td>58.3</td>
<td>286</td>
<td>58.1</td>
<td>287</td>
<td>58.2</td>
</tr>
<tr>
<td>619.lbm_s</td>
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<td>39.8</td>
<td>132</td>
<td>37.2</td>
<td>141</td>
<td>37.4</td>
<td>140</td>
<td>37.5</td>
</tr>
<tr>
<td>621.wrf_s</td>
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<td>198</td>
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<td>198</td>
<td>66.5</td>
<td>199</td>
<td>66.5</td>
</tr>
<tr>
<td>627.cam4_s</td>
<td>80</td>
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<td>170</td>
<td>50.8</td>
<td>175</td>
<td>51.5</td>
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<tr>
<td>628.pop2_s</td>
<td>80</td>
<td>123</td>
<td>96.2</td>
<td>127</td>
<td>93.8</td>
<td>128</td>
<td>92.9</td>
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<td>638.imagick_s</td>
<td>80</td>
<td>58.6</td>
<td>246</td>
<td>61.0</td>
<td>236</td>
<td>58.4</td>
<td>247</td>
<td>58.6</td>
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<tr>
<td>644.nab_s</td>
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<td>37.3</td>
<td>469</td>
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<td>649.fotonik3d_s</td>
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<td>114</td>
<td>80.3</td>
<td>114</td>
<td>80.5</td>
<td>113</td>
<td>80.1</td>
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<tr>
<td>654.roms_s</td>
<td>80</td>
<td>55.3</td>
<td>285</td>
<td>55.1</td>
<td>286</td>
<td>57.0</td>
<td>276</td>
<td>55.3</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)
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**New H3C Technologies Co., Ltd.**

H3C UniServer R6900 G5 (Intel Xeon Platinum 8380)

**CPU2017 License:** 9066

**Test Sponsor:** New H3C Technologies Co., Ltd.

**Test Date:** Oct-2021

**Tested by:** New H3C Technologies Co., Ltd.

**Hardware Availability:** Sep-2020

**Software Availability:** Jan-2021

**SPECspeed®2017_fp_base = 225**

**SPECspeed®2017_fp_peak = 228**

### General Notes (Continued)


### Platform Notes

**BIOS Settings:**
- Set Hyper-Threading to Disabled
- Set Power Performance Tuning to BIOS Controls EPB
- Set Energy Performance BIAS to Performance
- Set Patrol Scrub to Disabled

**Sysinfo program** /home/speccpu/bin/sysinfo

Rev: r6622 of 2021-04-07 982a61ec0915b55891ef0e16acafc64d
running on localhost.localdomain Mon Oct 18 11:24:19 2021

**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) Platinum 8380 CPU @ 2.30GHz
 2 "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 : 40
siblings : 40
physical 0: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39
physical 1: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39
```

From lscpu from util-linux 2.32.1:

```
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: 40
Socket(s): 2
NUMA node(s): 2
Vendor ID: GenuineIntel
CPU family: 6
Model: 106
Model name: Intel(R) Xeon(R) Platinum 8380 CPU @ 2.30GHz
Stepping: 6
```

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

- CPU MHz: 3187.500
- CPU max MHz: 3400.0000
- CPU min MHz: 800.0000
- BogoMIPS: 4600.00
- Virtualization: VT-x
- L1d cache: 48K
- L1i cache: 32K
- L2 cache: 1280K
- L3 cache: 61440K
- NUMA node0 CPU(s): 0-39
- NUMA node1 CPU(s): 40-79
- Flags: fpu vme de pse tsc msr pae mce 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 aperfmperf pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16 xtpr pdcm pcid dca dcm mcm nonpERC arch_capabilities

From /proc/cpuinfo cache data

```
cache size : 61440 KB
```

From numactl --hardware

WARNING: a numactl 'node' might or might not correspond to a physical chip.  
available: 2 nodes (0-1)

```
node 0 cpus: 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39
node 0 size: 128322 MB
node 0 free: 126719 MB
node 1 cpus: 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79
node 1 size: 129012 MB
node 1 free: 120555 MB
node distances:
  node 0  1
   0: 10 20
   1: 20 10
```

From /proc/meminfo

```
MemTotal:   263511856 kB
```

(Continued on next page)
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Platform Notes (Continued)

HugePages_Total:       0
Hugepagesize:        2048 kB
/sbin/tuned-adm active
  Current active profile: throughput-performance
/sys/devices/system/cpu/cpu*/cpufreq/scaling_governor has performance

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:

CVE-2018-12207 (iTLB Multihit): Not affected
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/swaps barriers and __user pointer sanitization
CVE-2017-5715 (Spectre variant 2): Mitigation: Enhanced IBRS, IBPB: conditional, RSB filling
CVE-2020-0543 (Special Register Buffer Data Sampling): No status reported
CVE-2019-11135 (TSX Asynchronous Abort): Not affected

SPEC is set to: /home/speccpu
Filesystem   Type Size Used Avail Use% Mounted on

(Continued on next page)
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Platform Notes (Continued)
/dev/mapper/rhel-home xfs  839G  161G  679G  20% /home

From /sys/devices/virtual/dmi/id
Vendor:         New H3C Technologies Co., Ltd.
Product:        H3C UniServer R4900 G5
Product Family: Rack
Serial:         210235A2RH212000005

Additional information from dmidecode 3.2 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:
16x Micron 18ASF2G72PDZ-3G2E1 16 GB 2 rank 3200
16x NO DIMM NO DIMM

BIOS:
BIOS Vendor: American Megatrends International, LLC.
BIOS Version: 5.34
BIOS Date: 09/11/2021
BIOS Revision: 5.22

(End of data from sysinfo program)

Compiler Version Notes
==============================================================================
C            | 619.lbm_s(base, peak) 638.imagick_s(base, peak)  
            | 644.nab_s(base)
==============================================================================
Intel(R) C Intel(R) 64 Compiler Classic for applications running on Intel(R)  
64, Version 2021.1 Build 20201112_000000  
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
==============================================================================
C            | 644.nab_s(peak)
==============================================================================
Intel(R) oneAPI DPC+/C++ Compiler for applications running on Intel(R) 64,  
Version 2021.1 Build 20201113  
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
==============================================================================
C            | 619.lbm_s(base, peak) 638.imagick_s(base, peak)  
            | 644.nab_s(base)
(Continued on next page)
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Compiler Version Notes (Continued)

Intel(R) C Intel(R) 64 Compiler Classic for applications running on Intel(R) 64, Version 2021.1 Build 20201112_000000  
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

C | 644.nab_s(peak)

Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2021.1 Build 20201113  
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

C++, C, Fortran | 607.cactuBSSN_s(base, peak)

Intel(R) C++ Intel(R) 64 Compiler Classic for applications running on Intel(R) 64, Version 2021.1 Build 20201112_000000  
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.  
Intel(R) C Intel(R) 64 Compiler Classic for applications running on Intel(R) 64, Version 2021.1 Build 20201112_000000  
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.  
Intel(R) Fortran Intel(R) 64 Compiler Classic for applications running on Intel(R) 64, Version 2021.1 Build 20201112_000000  
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

Fortran | 603.bwaves_s(base, peak) 649.fotonik3d_s(base, peak) 654.roms_s(base, peak)

Intel(R) Fortran Intel(R) 64 Compiler Classic for applications running on Intel(R) 64, Version 2021.1 Build 20201112_000000  
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 Classic for applications running on Intel(R) 64, Version 2021.1 Build 20201112_000000  
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.  
Intel(R) C Intel(R) 64 Compiler Classic for applications running on Intel(R) 64, Version 2021.1 Build 20201112_000000  
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Compiler Version Notes (Continued)

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.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:
-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 -f95, -z, mudefs -DSPEC_OPENMP -xCORE-AVX512 -ipo -O3
-no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=4 -qopenmp -nostandard-realloc-lhs

(Continued on next page)
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Software Availability: Jan-2021

Base Optimization Flags (Continued)

Fortran benchmarks (continued):
-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 (except as noted below):
icc

644.nab_s: icx

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

Peak Optimization Flags

C benchmarks:

(Continued on next page)
New H3C Technologies Co., Ltd.  SPECspeed®2017_fp_base = 225
H3C UniServer R6900 G5 (Intel Xeon Platinum 8380)  SPECspeed®2017_fp_peak = 228

Peak Optimization Flags (Continued)

619.lbm_s: basepeak = yes

638.imagick_s: basepeak = yes

644.nab_s: -m64 -Wl,-z,muldefs -xCORE-AVX512 -Ofast -ffast-math
-flt -mfpmath=sse -funroll-loops -fopenmp
-DSPEC_OPENMP -qopt-mem-layout-trans=4
-finet-accuracy-bits=14:sqrt
-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=gnu11 -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
<table>
<thead>
<tr>
<th>SPEC CPU®2017 Floating Point Speed Result</th>
</tr>
</thead>
<tbody>
<tr>
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</table>

You can also download the XML flags sources by saving the following links:

http://www.spec.org/cpu2017/flags/Intel-ic2021-official-linux64_revA.xml
http://www.spec.org/cpu2017/flags/New_H3C-Platform-Settings-V1.0-CPX-Rev0.xml

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<th>Test Sponsor: New H3C Technologies Co., Ltd.</th>
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</table>

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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 v1.1.8 on 2021-10-18 11:24:18-0400.
Originally published on 2021-11-23.