New H3C Technologies Co., Ltd. H3C UniServer R4900 G5 (Intel Xeon Silver 4316)

<table>
<thead>
<tr>
<th>SPECrate®2017_fp_base = 289</th>
<th>SPECrate®2017_fp_peak = 299</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU2017 License: 9066</td>
<td>Test Date: Dec-2021</td>
</tr>
<tr>
<td>Test Sponsor: New H3C</td>
<td>Hardware Availability: Jun-2021</td>
</tr>
<tr>
<td>Technologies Co., Ltd.</td>
<td>Software Availability: Dec-2020</td>
</tr>
<tr>
<td>Tested by: New H3C Technologies Co., Ltd.</td>
<td></td>
</tr>
</tbody>
</table>

**Hardware**

<table>
<thead>
<tr>
<th>Code</th>
<th>Benchmark</th>
<th>Copies</th>
<th>SPECrate®2017_fp_base (289)</th>
<th>SPECrate®2017_fp_peak (299)</th>
</tr>
</thead>
<tbody>
<tr>
<td>503</td>
<td>bwaves_r</td>
<td>80</td>
<td></td>
<td></td>
</tr>
<tr>
<td>510</td>
<td>parest_r</td>
<td>80</td>
<td>160</td>
<td>194</td>
</tr>
<tr>
<td>511</td>
<td>povray_r</td>
<td>80</td>
<td></td>
<td></td>
</tr>
<tr>
<td>519</td>
<td>lbm_r</td>
<td>80</td>
<td>205</td>
<td></td>
</tr>
<tr>
<td>521</td>
<td>wrf_r</td>
<td>80</td>
<td>266</td>
<td></td>
</tr>
<tr>
<td>526</td>
<td>blender_r</td>
<td>80</td>
<td></td>
<td></td>
</tr>
<tr>
<td>527</td>
<td>cam4_r</td>
<td>80</td>
<td>302</td>
<td></td>
</tr>
<tr>
<td>538</td>
<td>imagick_r</td>
<td>80</td>
<td></td>
<td></td>
</tr>
<tr>
<td>544</td>
<td>nab_r</td>
<td>80</td>
<td></td>
<td>485</td>
</tr>
<tr>
<td>549</td>
<td>fotonik3d_r</td>
<td>80</td>
<td>182</td>
<td></td>
</tr>
<tr>
<td>554</td>
<td>roms_r</td>
<td>80</td>
<td></td>
<td>127</td>
</tr>
</tbody>
</table>

**Software**

| OS: Red Hat Enterprise Linux release 8.2 (Ootpa) 4.18.0-193.el8.x86_64 |
| Compiler: 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 |
| Firmware: Version 5.39 released Nov-2021 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 and OS set to prefer performance at the cost of additional power usage. |
## Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</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>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>503.bwaves_r</td>
<td>80</td>
<td>1329</td>
<td>604</td>
<td>1330</td>
<td>603</td>
<td>1329</td>
<td>604</td>
<td>40</td>
<td>672</td>
<td>597</td>
<td>672</td>
</tr>
<tr>
<td>507.cactuBSSN_r</td>
<td>80</td>
<td>248</td>
<td>408</td>
<td>249</td>
<td>407</td>
<td>246</td>
<td>411</td>
<td>80</td>
<td>248</td>
<td>408</td>
<td>249</td>
</tr>
<tr>
<td>508.namd_r</td>
<td>80</td>
<td>363</td>
<td>209</td>
<td>362</td>
<td>210</td>
<td>363</td>
<td>209</td>
<td>80</td>
<td>363</td>
<td>209</td>
<td>362</td>
</tr>
<tr>
<td>510.parest_r</td>
<td>80</td>
<td>1304</td>
<td>160</td>
<td>1304</td>
<td>160</td>
<td>1297</td>
<td>161</td>
<td>40</td>
<td>540</td>
<td>194</td>
<td>539</td>
</tr>
<tr>
<td>511.povray_r</td>
<td>80</td>
<td>589</td>
<td>317</td>
<td>589</td>
<td>317</td>
<td>590</td>
<td>317</td>
<td>80</td>
<td>515</td>
<td>363</td>
<td>512</td>
</tr>
<tr>
<td>519.lbm_r</td>
<td>80</td>
<td>412</td>
<td>205</td>
<td>412</td>
<td>205</td>
<td>411</td>
<td>205</td>
<td>80</td>
<td>412</td>
<td>205</td>
<td>411</td>
</tr>
<tr>
<td>521.wrf_r</td>
<td>80</td>
<td>675</td>
<td>266</td>
<td>670</td>
<td>267</td>
<td>684</td>
<td>262</td>
<td>80</td>
<td>419</td>
<td>294</td>
<td>419</td>
</tr>
<tr>
<td>526.blender_r</td>
<td>80</td>
<td>464</td>
<td>302</td>
<td>462</td>
<td>303</td>
<td>465</td>
<td>301</td>
<td>80</td>
<td>464</td>
<td>302</td>
<td>462</td>
</tr>
<tr>
<td>527.cam4_r</td>
<td>80</td>
<td>277</td>
<td>485</td>
<td>277</td>
<td>487</td>
<td>279</td>
<td>483</td>
<td>80</td>
<td>272</td>
<td>494</td>
<td>273</td>
</tr>
<tr>
<td>538.imagick_r</td>
<td>80</td>
<td>267</td>
<td>744</td>
<td>274</td>
<td>725</td>
<td>274</td>
<td>727</td>
<td>80</td>
<td>267</td>
<td>744</td>
<td>274</td>
</tr>
<tr>
<td>544.nab_r</td>
<td>80</td>
<td>1709</td>
<td>182</td>
<td>1710</td>
<td>182</td>
<td>1710</td>
<td>182</td>
<td>80</td>
<td>1710</td>
<td>182</td>
<td>1710</td>
</tr>
<tr>
<td>549.fotonik3d_r</td>
<td>80</td>
<td>1035</td>
<td>123</td>
<td>1032</td>
<td>123</td>
<td>1036</td>
<td>123</td>
<td>80</td>
<td>438</td>
<td>145</td>
<td>435</td>
</tr>
</tbody>
</table>

### 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"
- MALLOC_CONF = "retain:true"

### General Notes

Binaries compiled on a system with 1x Intel Core i9-7980XE CPU + 64GB RAM memory using Red Hat Enterprise Linux 8.1

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)

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

H3C UniServer R4900 G5 (Intel Xeon Silver 4316)

General Notes (Continued)

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 (Sub NUMA) to Enabled
Set Power Performance Tuning to BIOS Controls EPB
Set Energy Performance BIAS to Performance
Set XPT Prefetch to Enabled

Sysinfo program /home/speccpu/bin/sysinfo
Rev: r6622 of 2021-04-07 982a61ec0915b55891ef0e16aca6c64d
running on localhost.localdomain Thu Dec 16 17:47:38 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) Silver 4316 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 : 20
  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
  physical 1: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19

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

(Continued on next page)
New H3C Technologies Co., Ltd.
H3C UniServer R4900 G5 (Intel Xeon Silver 4316)

SPECrate®2017_fp_base = 289
SPECrate®2017_fp_peak = 299

<table>
<thead>
<tr>
<th>CPU2017 License: 9066</th>
<th>Test Date: Dec-2021</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Sponsor: New H3C Technologies Co., Ltd.</td>
<td>Hardware Availability: Jun-2021</td>
</tr>
<tr>
<td>Tested by: New H3C Technologies Co., Ltd.</td>
<td>Software Availability: Dec-2020</td>
</tr>
</tbody>
</table>

### Platform Notes (Continued)

```
Thread(s) per core: 2
Core(s) per socket: 20
Socket(s): 2
NUMA node(s): 4
Vendor ID: GenuineIntel
CPU family: 6
Model: 106
Model name: Intel(R) Xeon(R) Silver 4316 CPU @ 2.30GHz
Stepping: 6
CPU MHz: 2800.000
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: 30720K
NUMA node0 CPU(s): 0-9,40-49
NUMA node1 CPU(s): 10-19,50-59
NUMA node2 CPU(s): 20-29,60-69
NUMA node3 CPU(s): 30-39,70-79
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 sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave avx f16c rdrand lahf_lm abm 3dnowprefetch cpuid_fault epb cat_l3 invpcid_single ssbd mba ibrs ibpb stibp ibrs_enum tpr_shadow vmpornorm flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rtm cqm qdxt xsaveopt xsaves cqm_1ic cx0 cqm_occup_1ic cqm_mbb_total cqm_mbb_local wbnoinvd dtme ida arat pln pts hwp hwp_act_window hwp_epp hwp_kkg_req avx512f_vni vmop pku ospke avx512_vbmi2 gfn i vaes vpclmulqdq avx512_vnni avx512_bitalg tme avx512_vpopcntdq ia57 rdpid md_clear pconfug flush_l1d arch_capabilities

/proc/cpuinfo cache data
    cache size: 30720 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 40 41 42 43 44 45 46 47 48 49
node 0 size: 128326 MB
node 0 free: 117292 MB
node 1 cpus: 10 11 12 13 14 15 16 17 18 19 50 51 52 53 54 55 56 57 58 59
```

(Continued on next page)
New H3C Technologies Co., Ltd.  
H3C UniServer R4900 G5 (Intel Xeon Silver 4316)

SPECrater2017_fp_base = 289  
SPECrater2017_fp_peak = 299

Platform Notes (Continued)

node 1 size: 129019 MB  
node 1 free: 120573 MB  
node 2 cpus: 20 21 22 23 24 25 26 27 28 29 60 61 62 63 64 65 66 67 68 69  
node 2 size: 129019 MB  
node 2 free: 120034 MB  
node 3 cpus: 30 31 32 33 34 35 36 37 38 39 70 71 72 73 74 75 76 77 78 79  
node 3 size: 129016 MB  
node 3 free: 120645 MB  
node distances:  
node 0 1 2 3  
  0: 10 11 20 20  
  1: 11 10 20 20  
  2: 20 20 10 11  
  3: 20 20 11 10  

From /proc/meminfo  
MemTotal: 527751780 kB  
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  

(Continued on next page)
New H3C Technologies Co., Ltd. | SPEC CPU®2017 Floating Point Rate Result
H3C UniServer R4900 G5 (Intel Xeon Silver 4316)

SPECrate®2017_fp_base = 289
SPECrate®2017_fp_peak = 299

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

Platform Notes (Continued)

CVE-2018-3620 (L1 Terminal Fault): Not affected
Microarchitectural Data Sampling: Not affected
CVE-2017-5754 (Meltdown): Mitigation: Speculative Store
CVE-2018-3639 (Speculative Store Bypass): Bypass disabled via prctl and
CVE-2017-5753 (Spectre variant 1): seccomp
CVE-2017-5715 (Spectre variant 2): Mitigation: usercopy/swapgs
CVE-2020-0543 (Special Register Buffer Data Sampling): barriers and __user pointer
sanitization conditional, RSB filling

run-level 3 Dec 16 10:00
SPEC is set to: /home/speccpu
From /sys/devices/virtual/dmi/id
Vendor: H3C
Product: RS33M2C9S
Product Family: Rack
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 36ASF4G72PZ-3G2E7 32 GB 2 rank 3200, configured at 2666
16x NO DIMM NO DIMM
BIOS:
BIOS Vendor: American Megatrends International, LLC.
BIOS Version: 5.39
BIOS Date: 11/17/2021
BIOS Revision: 5.22

(End of data from sysinfo program)

Compiler Version Notes

==============================================================================
C  | 519.lbm_r(base, peak) 538.imagick_r(base, peak)
544.nab_r(base, peak)

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

H3C UniServer R4900 G5 (Intel Xeon Silver 4316)

SPEC CPU®2017 Floating Point Rate Result

SPECrate®2017_fp_base = 289
SPECrate®2017_fp_peak = 299

CPU2017 License: 9066
Test Sponsor: New H3C Technologies Co., Ltd.
Tested by: New H3C Technologies Co., Ltd.
Test Date: Dec-2021
Hardware Availability: Jun-2021
Software Availability: Dec-2020

Compiler Version Notes (Continued)

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.

------------------------------------------------------------------------------
<table>
<thead>
<tr>
<th>C++</th>
<th>508.namd_r(base, peak) 510.parest_r(base, peak)</th>
</tr>
</thead>
</table>
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          | 511.povray_r(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.

------------------------------------------------------------------------------
| C++, C          | 511.povray_r(base) 526.blender_r(base, 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.
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          | 511.povray_r(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.

------------------------------------------------------------------------------
| C++, C          | 511.povray_r(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.
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.
New H3C Technologies Co., Ltd.  
H3C UniServer R4900 G5 (Intel Xeon Silver 4316)

SPECrate®2017_fp_base = 289  
SPECrate®2017_fp_peak = 299

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

Test Date: Dec-2021  
Hardware Availability: Jun-2021  
Software Availability: Dec-2020

Compiler Version Notes (Continued)

==============================================================================
C++, C          | 511.povray_r(base) 526.blender_r(base, 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.
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 | 507.cactuBSSN_r(base, 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.
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.
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         | 503.bwaves_r(base, peak) 549.fotonik3d_r(base, peak)  
| 554.roms_r(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      | 521.wrf_r(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  
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
==============================================================================
Fortran, C      | 521.wrf_r(base) 527.cam4_r(base, peak)

(Continued on next page)
New H3C Technologies Co., Ltd.  
H3C UniServer R4900 G5 (Intel Xeon Silver 4316)

SPECrerate®2017_fp_peak = 299  
SPECrerate®2017_fp_base = 289

CPU2017 License: 9066  
Test Sponsor: New H3C Technologies Co., Ltd.  
Test Date: Dec-2021  
Hardware Availability: Jun-2021  
Tested by: New H3C Technologies Co., Ltd.  
Software Availability: Dec-2020

Compiler Version Notes (Continued)

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) 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.

Fortran, C  |  521.wrf_r(peak)

Fortran, C  |  521.wrf_r(base)

Base Compiler Invocation

C benchmarks:  
icx

C++ benchmarks:  
icpx

Fortran benchmarks:  
ifort

Benchmarks using both Fortran and C:  
ifort icx

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

New H3C Technologies Co., Ltd.

H3C UniServer R4900 G5 (Intel Xeon Silver 4316)

SPECrater®2017_fp_base = 289
SPECrater®2017_fp_peak = 299

CPU2017 License: 9066
Test Sponsor: New H3C Technologies Co., Ltd.
Tested by: New H3C Technologies Co., Ltd.
Test Date: Dec-2021
Hardware Availability: Jun-2021
Software Availability: Dec-2020

Base Compiler Invocation (Continued)

Benchmarks using both C and C++:
  icpx icx

Benchmarks using Fortran, C, and C++:
  icpx icx 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:
  -w -std=c11 -m64 -Wl,-z,muldefs -xCORE-AVX512 -Ofast -ffast-math
  -flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
  -mbranches-within-32B-boundaries -ljemalloc
  -L/usr/local/jemalloc64-5.0.1/lib

C++ benchmarks:
  -w -m64 -Wl,-z,muldefs -xCORE-AVX512 -Ofast -ffast-math -flto
  -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
  -mbranches-within-32B-boundaries -ljemalloc
  -L/usr/local/jemalloc64-5.0.1/lib

Fortran benchmarks:
  -w -m64 -Wl,-z,muldefs -xCORE-AVX512 -03 -ipo -no-prec-div
  -qopt-prefetch -ffinite-math-only
  -qopt-multiple-gather-scatter-by-shuffles -qopt-mem-layout-trans=4
  -nostandard-realloc-lhs -align array32byte -auto
  -mbranches-within-32B-boundaries -ljemalloc

(Continued on next page)
New H3C Technologies Co., Ltd.
H3C UniServer R4900 G5 (Intel Xeon Silver 4316)

SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2022 Standard Performance Evaluation Corporation

SPECrate®2017_fp_base = 289
SPECrate®2017_fp_peak = 299

CPU2017 License: 9066
Test Sponsor: New H3C Technologies Co., Ltd.
Test Date: Dec-2021
Hardware Availability: Jun-2021
Tested by: New H3C Technologies Co., Ltd.
Software Availability: Dec-2020

Base Optimization Flags (Continued)

Fortran benchmarks (continued):
- L/usr/local/jemalloc64-5.0.1/lib

Benchmarks using both Fortran and C:
- w -m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX512 -Ofast -ffast-math
- flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4 -O3 -ipo
- no-prec-div -qopt-prefetch -ffinite-math-only
- qopt-multiple-gather-scatter-by-shuffles
- mbranches-within-32B-boundaries -nostandard-realloc-lhs
- align array32byte -auto -ljemalloc -L/usr/local/jemalloc64-5.0.1/lib

Benchmarks using both C and C++:
- w -m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX512 -Ofast -ffast-math
- flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
- mbranches-within-32B-boundaries -ljemalloc
- L/usr/local/jemalloc64-5.0.1/lib

Benchmarks using Fortran, C, and C++:
- w -m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX512 -Ofast -ffast-math
- flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
- no-prec-div -qopt-prefetch -ffinite-math-only
- qopt-multiple-gather-scatter-by-shuffles
- mbranches-within-32B-boundaries -nostandard-realloc-lhs
- align array32byte -auto -ljemalloc -L/usr/local/jemalloc64-5.0.1/lib

Peak Compiler Invocation

C benchmarks:
icx

C++ benchmarks:
icpx

Fortran benchmarks:
ifort

Benchmarks using both Fortran and C:
521.wrf_r: ifort icc
527.cam4_r: ifort icx

Benchmarks using both C and C++:

(Continued on next page)
Peak Compiler Invocation (Continued)

511.povray_r: icpc icc

526.blender_r: icpx icx

Benchmarks using Fortran, C, and C++:

icpx icx ifort

Peak Portability Flags

Same as Base Portability Flags

Peak Optimization Flags

C benchmarks:

519.lbm_r: basepeak = yes

538.imagick_r: basepeak = yes

544.nab_r: -w -std=c11 -m64 -Wl,-z,muldefs -xCORE-AVX512 -flto
-Ofast -gopt-mem-layout-trans=4
-flto -fimf-accuracy-chips=14:sqrt
-mbranches-within-32B-boundaries -ljemalloc
-L/usr/local/jemalloc64-5.0.1/lib

C++ benchmarks:

508.namd_r: basepeak = yes

510.parest_r: -w -m64 -Wl,-z,muldefs -xCORE-AVX512 -Ofast -ffast-math
-flto -mfpmath=sse -funroll-loops
-gopt-mem-layout-trans=4 -mbranches-within-32B-boundaries
-ljemalloc -L/usr/local/jemalloc64-5.0.1/lib

Fortran benchmarks:

503.bwaves_r: -w -m64 -Wl,-z,muldefs -xCORE-AVX512 -O3 -ipo
-no-prec-div -gopt-prefetch -ffinite-math-only
-gopt-multiple-gather-scatter-by-shuffles
-gopt-mem-layout-trans=4 -nostandard-realloc-lhs
-align array32byte -auto -mbranches-within-32B-boundaries
-ljemalloc -L/usr/local/jemalloc64-5.0.1/lib
New H3C Technologies Co., Ltd.
H3C UniServer R4900 G5 (Intel Xeon Silver 4316)

SPECrate®2017_fp_base = 289
SPECrate®2017_fp_peak = 299

CPU2017 License: 9066
Test Sponsor: New H3C Technologies Co., Ltd.
Tested by: New H3C Technologies Co., Ltd.
Test Date: Dec-2021
Hardware Availability: Jun-2021
Software Availability: Dec-2020

Peak Optimization Flags (Continued)

549.fotonik3d_r: basepeak = yes
554.roms_r: Same as 503.bwaves_r

Benchmarks using both Fortran and C:

521.wrf_r: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX512 -O3
-ipo -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-multiple-gather-scatter-by-shuffles
-qopt-mem-layout-trans=4 -mbranches-within-32B-boundaries
-nostandard-realloc-lhs -align array32byte -auto
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

527.cam4_r: basepeak = yes

Benchmarks using both C and C++:

511.povray_r: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX512 -O3
-ipo -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-multiple-gather-scatter-by-shuffles
-qopt-mem-layout-trans=4 -mbranches-within-32B-boundaries
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

526.blender_r: basepeak = yes

Benchmarks using Fortran, C, and C++:

507.cactuBSSN_r: basepeak = yes

The flags files that were used to format this result can be browsed at

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-RevD.xml

SPEC CPU and SPECrate are registered trademarks of the Standard Performance Evaluation Corporation. All other brand and product names appearing in this result are trademarks or registered trademarks of their respective holders.

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 2021-12-16 04:47:37-0500.
Report generated on 2022-01-10 11:03:45 by CPU2017 PDF formatter v6442.
Originally published on 2022-01-07.