SPEC CPU®2017 Floating Point Rate Result

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New H3C Technologies Co., Ltd.

SPECrate®2017_fp_base = 1170

H3C UniServer R4950 G6 (AMD EPYC 9534)
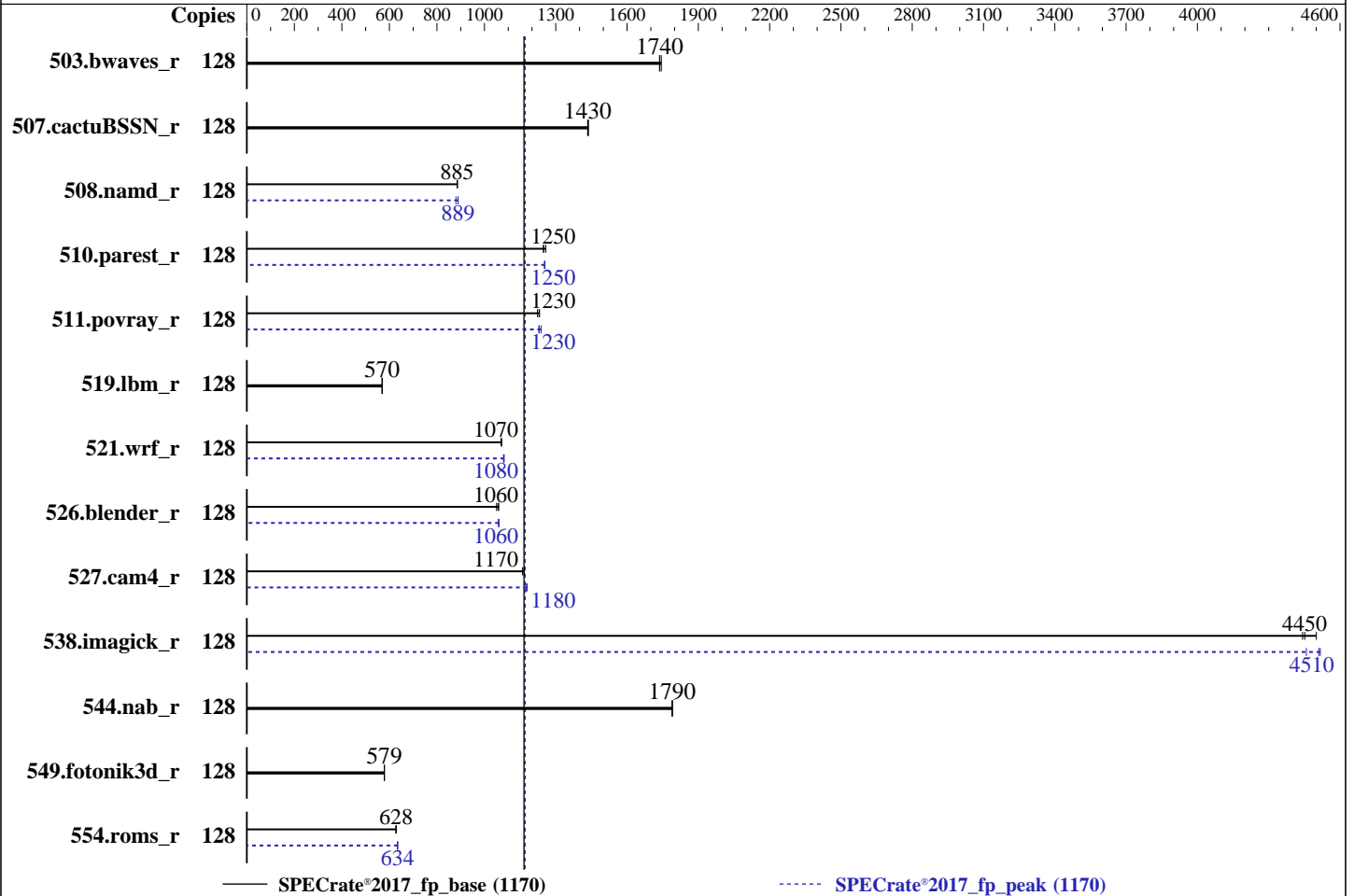
SPECrate®2017_fp_peak = 1170

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

Test Date: Oct-2024
Hardware Availability: Feb-2024
Software Availability: Nov-2023

Benchmark	Copies	Base	Peak
503.bwaves_r	128	1740	
507.cactuBSSN_r	128	1430	
508.namd_r	128	885	889
510.parest_r	128	1250	1250
511.povray_r	128	1230	1230
519.lbm_r	128	570	
521.wrf_r	128	1070	1080
526.blender_r	128	1060	1060
527.cam4_r	128	1170	1180
538.imagick_r	128	4450	4510
544.nab_r	128	1790	
549.fotonik3d_r	128	579	
554.roms_r	128	628	634

———— SPECrate®2017_fp_base (1170)   ┄┄┄┄ SPECrate®2017_fp_peak (1170)

Hardware

CPU Name: AMD EPYC 9534
 Max MHz: 3700
 Nominal: 2450
Enabled: 128 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: 256 MB I+D on chip per chip, 32 MB shared / 8 cores
 Other: None
Memory: 1536 GB (24 x 64 GB 2Rx4 PC5-5600B-R, running at 4800)
Storage: 1 x 256GB NVME
Other: CPU Cooling: Air

Software

OS: Red Hat Enterprise Linux release 9.3 (Plow) kernel version 5.14.0-362.8.1.el9_3.x86_64
Compiler: C/C++/Fortran: Version 4.0.0 of AOCC
Parallel: No
Firmware: Version 6.30.28 released Feb-2024
File System: xfs
System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: 64-bit
Other: None
Power Management: BIOS and OS set to prefer performance at the cost of additional power usage

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Results Table

Benchmark	Base						Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
503.bwaves_r	128	736	1740	**739**	**1740**	739	1740	128	736	1740	**739**	**1740**	739	1740
507.cactuBSSN_r	128	113	1440	113	1430	**113**	**1430**	128	113	1440	113	1430	**113**	**1430**
508.namd_r	128	137	887	137	885	**137**	**885**	128	138	880	**137**	**889**	137	889
510.parest_r	128	268	1250	266	1260	**268**	**1250**	128	267	1250	**267**	**1250**	267	1250
511.povray_r	128	244	1220	243	1230	**243**	**1230**	128	243	1230	241	1240	**243**	**1230**
519.lbm_r	128	**237**	**570**	237	570	237	569	128	**237**	**570**	237	570	237	569
521.wrf_r	128	268	1070	267	1070	**268**	**1070**	128	265	1080	265	1080	**265**	**1080**
526.blender_r	128	186	1050	**185**	**1060**	184	1060	128	**184**	**1060**	184	1060	184	1060
527.cam4_r	128	192	1170	**192**	**1170**	193	1160	128	190	1180	191	1170	**190**	**1180**
538.imagick_r	128	71.7	4440	**71.5**	**4450**	70.7	4500	128	70.5	4520	71.4	4460	**70.6**	**4510**
544.nab_r	128	120	1790	120	1790	**120**	**1790**	128	120	1790	120	1790	**120**	**1790**
549.fotonik3d_r	128	861	579	862	578	**862**	**579**	128	861	579	862	578	**862**	**579**
554.roms_r	128	**324**	**628**	324	629	324	628	128	321	633	320	635	**321**	**634**

SPECrate®2017_fp_base =	**1170**	
SPECrate®2017_fp_peak =	**1170**	

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

Compiler Notes

```
The AMD64 AOCC Compiler Suite is available at
http://developer.amd.com/amd-aocc/
```

Submit Notes

```
The config file option 'submit' was used.
'numactl' was used to bind copies to the cores.
See the configuration file for details.
```

Operating System Notes

```
'ulimit -s unlimited' was used to set environment stack size limit
'ulimit -l 2097152' was used to set environment locked pages in memory limit

runcpu command invoked through numactl i.e.:
numactl --interleave=all runcpu <etc>

To limit dirty cache to 8% of memory, 'sysctl -w vm.dirty_ratio=8' run as root.
To limit swap usage to minimum necessary, 'sysctl -w vm.swappiness=1' run as root.
To free node-local memory and avoid remote memory usage,
'sysctl -w vm.zone_reclaim_mode=1' run as root.
To clear filesystem caches, 'sync; sysctl -w vm.drop_caches=3' run as root.
To disable address space layout randomization (ASLR) to reduce run-to-run
variability, 'sysctl -w kernel.randomize_va_space=0' run as root.

To enable Transparent Hugepages (THP) for all allocations,
```

(Continued on next page)

Standard Performance Evaluation Corporation (info@spec.org)   https://www.spec.org/

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Operating System Notes (Continued)

```
'echo always > /sys/kernel/mm/transparent_hugepage/enabled' and
'echo always > /sys/kernel/mm/transparent_hugepage/defrag' run as root.
```

Environment Variables Notes

```
Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH =
     "/home/cpu119/amd_rate_aocc400_znver4_A_lib/lib:/home/cpu119/amd_rate_aocc400_znver4_A_lib/lib32:"
MALLOC_CONF = "retain:true"
```

General Notes

```
Binaries were compiled on a system with 2x AMD EPYC 9174F CPU + 1.5TiB Memory using RHEL 8.6

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.
```

Platform Notes

```
BIOS settings:
cTDP Control: Manual
cTDP: 300
PPT Control: Manual
PPT: 300
Determinism Slider set to Power
NUMA nodes per socket: NPS4
IOMMU: Auto
SVM Mode: Disabled
ACPI SRAT L3 Cache As NUMA Domain: Enabled
SMT Control: Disabled

 Sysinfo program /home/cpu119/bin/sysinfo
 Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
 running on localhost.localdomain Mon Aug 21 20:01:15 2023

 SUT (System Under Test) info as seen by some common utilities.

 ---------------------------------------------------------
 Table of contents
 ---------------------------------------------------------
  1. uname -a
  2. w
  3. Username
  4. ulimit -a
  5. sysinfo process ancestry
  6. /proc/cpuinfo
  7. lscpu
  8. numactl --hardware
  9. /proc/meminfo
```

(Continued on next page)

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Platform Notes (Continued)

```
 10. who -r
 11. Systemd service manager version: systemd 252 (252-18.el9)
 12. Services, from systemctl list-unit-files
 13. Linux kernel boot-time arguments, from /proc/cmdline
 14. cpupower frequency-info
 15. tuned-adm active
 16. sysctl
 17. /sys/kernel/mm/transparent_hugepage
 18. /sys/kernel/mm/transparent_hugepage/khugepaged
 19. OS release
 20. Disk information
 21. /sys/devices/virtual/dmi/id
 22. dmidecode
 23. BIOS
    ------------------------------------------------------------


    ------------------------------------------------------------
 1. uname -a
   Linux localhost.localdomain 5.14.0-362.8.1.el9_3.x86_64 #1 SMP PREEMPT_DYNAMIC Tue Oct 3 11:12:36 EDT 2023
   x86_64 x86_64 x86_64 GNU/Linux


    ------------------------------------------------------------
 2. w
    20:01:15 up 1 min,  1 user,  load average: 3.45, 1.68, 0.63
   USER     TTY          LOGIN@   IDLE   JCPU   PCPU WHAT
   root     tty1         20:00   19.00s  1.26s  0.08s /bin/bash ./amd_rate_aocc400_znver4_A1.sh


    ------------------------------------------------------------
 3. Username
   From environment variable $USER:  root


    ------------------------------------------------------------
 4. ulimit -a
   real-time non-blocking time  (microseconds, -R) unlimited
   core file size              (blocks, -c) 0
   data seg size               (kbytes, -d) unlimited
   scheduling priority                 (-e) 0
   file size                   (blocks, -f) unlimited
   pending signals                     (-i) 6188884
   max locked memory           (kbytes, -l) 2097152
   max memory size             (kbytes, -m) unlimited
   open files                          (-n) 32768
   pipe size                (512 bytes, -p) 8
   POSIX message queues         (bytes, -q) 819200
   real-time priority                  (-r) 0
   stack size                  (kbytes, -s) unlimited
   cpu time                   (seconds, -t) unlimited
   max user processes                  (-u) unlimited
   virtual memory              (kbytes, -v) unlimited
   file locks                          (-x) unlimited


    ------------------------------------------------------------
 5. sysinfo process ancestry
   /usr/lib/systemd/systemd --switched-root --system --deserialize 31
   login -- root
   -bash
   -bash
   python3 ./run_amd_rate_aocc400_znver4_A1.py
   /bin/bash ./amd_rate_aocc400_znver4_A1.sh
   runcpu --config amd_rate_aocc400_znver4_A1.cfg --tune all --reportable --iterations 3 fprate
```

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CPU2017 License: 9066　　　　　　　　　　　　　　　　　**Test Date:** Oct-2024
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Platform Notes (Continued)

```
 runcpu --configfile amd_rate_aocc400_znver4_A1.cfg --tune all --reportable --iterations 3 --nopower
   --runmode rate --tune base:peak --size test:train:refrate fprate --nopreenv --note-preenv --logfile
   $SPEC/tmp/CPU2017.004/templogs/preenv.fprate.004.0.log --lognum 004.0 --from_runcpu 2
 specperl $SPEC/bin/sysinfo
$SPEC = /home/cpu119


  --------------------------------------------------------------
6. /proc/cpuinfo
    model name       : AMD EPYC 9534 64-Core Processor
    vendor_id        : AuthenticAMD
    cpu family       : 25
    model            : 17
    stepping         : 1
    microcode        : 0xa101144
    bugs             : sysret_ss_attrs spectre_v1 spectre_v2 spec_store_bypass
    TLB size         : 3584 4K pages
    cpu cores        : 64
    siblings         : 64
    2 physical ids (chips)
    128 processors (hardware threads)
    physical id 0: core ids 0-7,16-23,32-39,48-55,64-71,80-87,96-103,112-119
    physical id 1: core ids 0-7,16-23,32-39,48-55,64-71,80-87,96-103,112-119
    physical id 0: apicids 0-7,16-23,32-39,48-55,64-71,80-87,96-103,112-119
    physical id 1: apicids 128-135,144-151,160-167,176-183,192-199,208-215,224-231,240-247
  Caution: /proc/cpuinfo data regarding chips, cores, and threads is not necessarily reliable, especially for
  virtualized systems.  Use the above data carefully.


  --------------------------------------------------------------
7. lscpu

From lscpu from util-linux 2.37.4:
  Architecture:             x86_64
  CPU op-mode(s):           32-bit, 64-bit
  Address sizes:            52 bits physical, 57 bits virtual
  Byte Order:               Little Endian
  CPU(s):                   128
  On-line CPU(s) list:      0-127
  Vendor ID:                AuthenticAMD
  BIOS Vendor ID:           Advanced Micro Devices, Inc.
  Model name:               AMD EPYC 9534 64-Core Processor
  BIOS Model name:          AMD EPYC 9534 64-Core Processor
  CPU family:               25
  Model:                    17
  Thread(s) per core:       1
  Core(s) per socket:       64
  Socket(s):                2
  Stepping:                 1
  Frequency boost:          enabled
  CPU max MHz:              3718.0659
  CPU min MHz:              1500.0000
  BogoMIPS:                 4888.48
  Flags:                    fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov pat pse36
                            clflush mmx fxsr sse sse2 ht syscall nx mmxext fxsr_opt pdpe1gb rdtscp
                            lm constant_tsc rep_good amd_lbr_v2 nopl nonstop_tsc cpuid extd_apicid
                            aperfmperf rapl pni pclmulqdq monitor ssse3 fma cx16 pcid sse4_1 sse4_2
                            x2apic movbe popcnt aes xsave avx f16c rdrand lahf_lm cmp_legacy svm
                            extapic cr8_legacy abm sse4a misalignsse 3dnowprefetch osvw ibs skinit
                            wdt tce topoext perfctr_core perfctr_nb bpext perfctr_llc mwaitx cpb
                            cat_l3 cdp_l3 invpcid_single hw_pstate ssbd mba perfmon_v2 ibrs ibpb
                            stibp ibrs_enhanced vmmcall fsgsbase bmi1 avx2 smep bmi2 erms invpcid
```

(Continued on next page)

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Platform Notes (Continued)

```
                             cqm rdt_a avx512f avx512dq rdseed adx smap avx512ifma clflushopt clwb
                             avx512cd sha_ni avx512bw avx512vl xsaveopt xsavec xgetbv1 xsaves
                             cqm_llc cqm_occup_llc cqm_mbm_total cqm_mbm_local avx512_bf16 clzero
                             irperf xsaveerptr rdpru wbnoinvd amd_ppin cppc arat npt lbrv svm_lock
                             nrip_save tsc_scale vmcb_clean flushbyasid decodeassists pausefilter
                             pfthreshold avic v_vmsave_vmload vgif x2avic v_spec_ctrl vnmi
                             avx512vbmi umip pku ospke avx512_vbmi2 gfni vaes vpclmulqdq avx512_vnni
                             avx512_bitalg avx512_vpopcntdq la57 rdpid overflow_recov succor smca
                             fsrm flush_l1d
  Virtualization:            AMD-V
  L1d cache:                 4 MiB (128 instances)
  L1i cache:                 4 MiB (128 instances)
  L2 cache:                  128 MiB (128 instances)
  L3 cache:                  512 MiB (16 instances)
  NUMA node(s):              16
  NUMA node0 CPU(s):         0-7
  NUMA node1 CPU(s):         8-15
  NUMA node2 CPU(s):         16-23
  NUMA node3 CPU(s):         24-31
  NUMA node4 CPU(s):         32-39
  NUMA node5 CPU(s):         40-47
  NUMA node6 CPU(s):         48-55
  NUMA node7 CPU(s):         56-63
  NUMA node8 CPU(s):         64-71
  NUMA node9 CPU(s):         72-79
  NUMA node10 CPU(s):        80-87
  NUMA node11 CPU(s):        88-95
  NUMA node12 CPU(s):        96-103
  NUMA node13 CPU(s):        104-111
  NUMA node14 CPU(s):        112-119
  NUMA node15 CPU(s):        120-127
  Vulnerability Gather data sampling: Not affected
  Vulnerability Itlb multihit:       Not affected
  Vulnerability L1tf:                Not affected
  Vulnerability Mds:                 Not affected
  Vulnerability Meltdown:            Not affected
  Vulnerability Mmio stale data:     Not affected
  Vulnerability Retbleed:            Not affected
  Vulnerability Spec store bypass:   Mitigation; Speculative Store Bypass disabled via prctl
  Vulnerability Spectre v1:          Mitigation; usercopy/swapgs barriers and __user pointer sanitization
  Vulnerability Spectre v2:          Mitigation; Enhanced / Automatic IBRS, IBPB conditional, STIBP
                                     disabled, RSB filling, PBRSB-eIBRS Not affected
  Vulnerability Srbds:               Not affected
  Vulnerability Tsx async abort:     Not affected

  From lscpu --cache:
      NAME ONE-SIZE ALL-SIZE WAYS TYPE         LEVEL  SETS PHY-LINE COHERENCY-SIZE
      L1d       32K       4M    8 Data             1    64        1             64
      L1i       32K       4M    8 Instruction      1    64        1             64
      L2         1M     128M    8 Unified          2  2048        1             64
      L3        32M     512M   16 Unified          3 32768        1             64

  -----------------------------------------------------------
  8. numactl --hardware
  NOTE: a numactl 'node' might or might not correspond to a physical chip.
    available: 16 nodes (0-15)
    node 0 cpus: 0-7
    node 0 size: 95878 MB
    node 0 free: 95125 MB
    node 1 cpus: 8-15
```

(Continued on next page)

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Platform Notes (Continued)

```
     node 1 size: 96765 MB
     node 1 free: 96451 MB
     node 2 cpus: 16-23
     node 2 size: 96712 MB
     node 2 free: 96304 MB
     node 3 cpus: 24-31
     node 3 size: 96765 MB
     node 3 free: 96387 MB
     node 4 cpus: 32-39
     node 4 size: 96765 MB
     node 4 free: 95976 MB
     node 5 cpus: 40-47
     node 5 size: 96765 MB
     node 5 free: 96434 MB
     node 6 cpus: 48-55
     node 6 size: 96765 MB
     node 6 free: 96447 MB
     node 7 cpus: 56-63
     node 7 size: 96765 MB
     node 7 free: 96449 MB
     node 8 cpus: 64-71
     node 8 size: 96765 MB
     node 8 free: 96102 MB
     node 9 cpus: 72-79
     node 9 size: 96765 MB
     node 9 free: 96500 MB
     node 10 cpus: 80-87
     node 10 size: 96765 MB
     node 10 free: 96483 MB
     node 11 cpus: 88-95
     node 11 size: 96765 MB
     node 11 free: 96493 MB
     node 12 cpus: 96-103
     node 12 size: 96765 MB
     node 12 free: 96379 MB
     node 13 cpus: 104-111
     node 13 size: 96765 MB
     node 13 free: 96414 MB
     node 14 cpus: 112-119
     node 14 size: 96765 MB
     node 14 free: 96483 MB
     node 15 cpus: 120-127
     node 15 size: 96716 MB
     node 15 free: 96415 MB
     node distances:
     node   0   1   2   3   4   5   6   7   8   9  10  11  12  13  14  15
       0:  10  11  12  12  12  12  12  12  22  22  22  22  22  22  22  22
       1:  11  10  12  12  12  12  12  12  22  22  22  22  22  22  22  22
       2:  12  12  10  11  12  12  12  12  22  22  22  22  22  22  22  22
       3:  12  12  11  10  12  12  12  12  22  22  22  22  22  22  22  22
       4:  12  12  12  12  10  11  12  12  22  22  22  22  22  22  22  22
       5:  12  12  12  12  11  10  12  12  22  22  22  22  22  22  22  22
       6:  12  12  12  12  12  12  10  11  22  22  22  22  22  22  22  22
       7:  12  12  12  12  12  12  11  10  22  22  22  22  22  22  22  22
       8:  22  22  22  22  22  22  22  22  10  11  12  12  12  12  12  12
       9:  22  22  22  22  22  22  22  22  11  10  12  12  12  12  12  12
      10:  22  22  22  22  22  22  22  22  12  12  10  11  12  12  12  12
      11:  22  22  22  22  22  22  22  22  12  12  11  10  12  12  12  12
      12:  22  22  22  22  22  22  22  22  12  12  12  12  10  11  12  12
      13:  22  22  22  22  22  22  22  22  12  12  12  12  11  10  12  12
```

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Platform Notes (Continued)

```
   14:  22  22  22  22  22  22  22  22  12  12  12  12  12  12  10  11
   15:  22  22  22  22  22  22  22  22  12  12  12  12  12  12  11  10


   ------------------------------------------------------------
9. /proc/meminfo
   MemTotal:       1584398088 kB


   ------------------------------------------------------------
10. who -r
   run-level 3 Aug 21 20:00


   ------------------------------------------------------------
11. Systemd service manager version: systemd 252 (252-18.el9)
   Default Target  Status
   multi-user      running


   ------------------------------------------------------------
12. Services, from systemctl list-unit-files
   STATE             UNIT FILES
   enabled           NetworkManager NetworkManager-dispatcher NetworkManager-wait-online auditd chronyd crond
                     dbus-broker getty@ insights-client-boot irqbalance kdump lvm2-monitor mdmonitor microcode
                     nis-domainname nvmefc-boot-connections rhsmcertd rsyslog selinux-autorelabel-mark sshd
                     sssd systemd-boot-update systemd-network-generator tuned udisks2
   enabled-runtime   systemd-remount-fs
   disabled          blk-availability chrony-wait console-getty cpupower debug-shell dnf-system-upgrade
                     firewalld hwloc-dump-hwdata kvm_stat man-db-restart-cache-update nftables nvmf-autoconnect
                     rdisc rhcd rhsm rhsm-facts rpmdb-rebuild selinux-check-proper-disable serial-getty@
                     sshd-keygen@ systemd-boot-check-no-failures systemd-pstore systemd-sysext
   indirect          sssd-autofs sssd-kcm sssd-nss sssd-pac sssd-pam sssd-ssh sssd-sudo systemd-sysupdate
                     systemd-sysupdate-reboot


   ------------------------------------------------------------
13. Linux kernel boot-time arguments, from /proc/cmdline
   BOOT_IMAGE=(hd0,gpt2)/vmlinuz-5.14.0-362.8.1.el9_3.x86_64
   root=/dev/mapper/rhel-root
   ro
   crashkernel=1G-4G:192M,4G-64G:256M,64G-:512M
   resume=/dev/mapper/rhel-swap
   rd.lvm.lv=rhel/root
   rd.lvm.lv=rhel/swap


   ------------------------------------------------------------
14. cpupower frequency-info
   analyzing CPU 0:
     current policy: frequency should be within 1.50 GHz and 2.45 GHz.
                     The governor "performance" may decide which speed to use
                     within this range.
     boost state support:
       Supported: yes
       Active: yes
       Boost States: 0
       Total States: 3
       Pstate-P0:  2450MHz


   ------------------------------------------------------------
15. tuned-adm active
   Current active profile: throughput-performance


   ------------------------------------------------------------
16. sysctl
```

(Continued on next page)

SPEC CPU®2017 Floating Point Rate Result

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SPECrate®2017_fp_base = 1170

H3C UniServer R4950 G6 (AMD EPYC 9534)

SPECrate®2017_fp_peak = 1170

CPU2017 License: 9066   **Test Date:** Oct-2024
Test Sponsor: New H3C Technologies Co., Ltd.   **Hardware Availability:** Feb-2024
Tested by: New H3C Technologies Co., Ltd.   **Software Availability:** Nov-2023

Platform Notes (Continued)

```
  kernel.numa_balancing                 0
  kernel.randomize_va_space             0
  vm.compaction_proactiveness          20
  vm.dirty_background_bytes             0
  vm.dirty_background_ratio            40
  vm.dirty_bytes                        0
  vm.dirty_expire_centisecs          3000
  vm.dirty_ratio                        8
  vm.dirty_writeback_centisecs        500
  vm.dirtytime_expire_seconds       43200
  vm.extfrag_threshold                500
  vm.min_unmapped_ratio                 1
  vm.nr_hugepages                       0
  vm.nr_hugepages_mempolicy             0
  vm.nr_overcommit_hugepages            0
  vm.swappiness                         1
  vm.watermark_boost_factor         15000
  vm.watermark_scale_factor            10
  vm.zone_reclaim_mode                  1


  ----------------------------------------------------------
17. /sys/kernel/mm/transparent_hugepage
  defrag          [always] defer defer+madvise madvise never
  enabled         [always] madvise never
  hpage_pmd_size  2097152
  shmem_enabled   always within_size advise [never] deny force


  ----------------------------------------------------------
18. /sys/kernel/mm/transparent_hugepage/khugepaged
  alloc_sleep_millisecs   60000
  defrag                      1
  max_ptes_none             511
  max_ptes_shared           256
  max_ptes_swap              64
  pages_to_scan            4096
  scan_sleep_millisecs    50000


  ----------------------------------------------------------
19. OS release
  From /etc/*-release /etc/*-version
  os-release     Red Hat Enterprise Linux 9.3 (Plow)
  redhat-release Red Hat Enterprise Linux release 9.3 (Plow)
  system-release Red Hat Enterprise Linux release 9.3 (Plow)


  ----------------------------------------------------------
20. Disk information
SPEC is set to: /home/cpu119
  Filesystem            Type  Size  Used Avail Use% Mounted on
  /dev/mapper/rhel-home xfs   163G  5.5G  158G   4% /home


  ----------------------------------------------------------
21. /sys/devices/virtual/dmi/id
    Vendor:        H3C
    Product:       RS33M2C9S
    Product Family: Rack
    Serial:        N/A


  ----------------------------------------------------------
22. dmidecode
  Additional information from dmidecode 3.5 follows.  WARNING: Use caution when you interpret this section.
```

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New H3C Technologies Co., Ltd.

H3C UniServer R4950 G6 (AMD EPYC 9534)

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

Test Date: Oct-2024
Hardware Availability: Feb-2024
Software Availability: Nov-2023

Platform Notes (Continued)

```
   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:
     24x Samsung M321R8GA0PB0-CWMJJ 64 GB 2 rank 5600, configured at 4800


   -------------------------------------------------------------
   23. BIOS
   (This section combines info from /sys/devices and dmidecode.)
     BIOS Vendor:        American Megatrends International, LLC.
     BIOS Version:       6.30.28
     BIOS Date:          02/27/2024
     BIOS Revision:      5.27
```

Compiler Version Notes

```
==============================================================================================================
C                  | 519.lbm_r(base, peak) 538.imagick_r(base, peak) 544.nab_r(base, peak)
--------------------------------------------------------------------------------------------------------------
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#434 2022_10_28) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin
--------------------------------------------------------------------------------------------------------------


==============================================================================================================
C++                | 508.namd_r(base, peak) 510.parest_r(base, peak)
--------------------------------------------------------------------------------------------------------------
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#434 2022_10_28) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin
--------------------------------------------------------------------------------------------------------------


==============================================================================================================
C++, C             | 511.povray_r(base, peak) 526.blender_r(base, peak)
--------------------------------------------------------------------------------------------------------------
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#434 2022_10_28) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#434 2022_10_28) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin
--------------------------------------------------------------------------------------------------------------


==============================================================================================================
C++, C, Fortran    | 507.cactuBSSN_r(base, peak)
--------------------------------------------------------------------------------------------------------------
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#434 2022_10_28) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#434 2022_10_28) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin
```

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H3C UniServer R4950 G6 (AMD EPYC 9534)

SPECrate®2017_fp_base = 1170

SPECrate®2017_fp_peak = 1170

CPU2017 License: 9066		**Test Date:**	Oct-2024
Test Sponsor: New H3C Technologies Co., Ltd.		**Hardware Availability:** Feb-2024
Tested by: New H3C Technologies Co., Ltd.		**Software Availability:** Nov-2023

Compiler Version Notes (Continued)

```
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#434 2022_10_28) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin
------------------------------------------------------------------------------------------------------

==============================================================================================
Fortran      | 503.bwaves_r(base, peak) 549.fotonik3d_r(base, peak) 554.roms_r(base, peak)
------------------------------------------------------------------------------------------------------
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#434 2022_10_28) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin
------------------------------------------------------------------------------------------------------

==============================================================================================
Fortran, C   | 521.wrf_r(base, peak) 527.cam4_r(base, peak)
------------------------------------------------------------------------------------------------------
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#434 2022_10_28) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#434 2022_10_28) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin
------------------------------------------------------------------------------------------------------
```

Base Compiler Invocation

C benchmarks:
```
clang
```

C++ benchmarks:
```
clang++
```

Fortran benchmarks:
```
flang
```

Benchmarks using both Fortran and C:
```
flang clang
```

Benchmarks using both C and C++:
```
clang++ clang
```

Benchmarks using Fortran, C, and C++:
```
clang++ clang flang
```

SPEC CPU®2017 Floating Point Rate Result

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New H3C Technologies Co., Ltd.

H3C UniServer R4950 G6 (AMD EPYC 9534)

SPECrate®2017_fp_base = 1170

SPECrate®2017_fp_peak = 1170

CPU2017 License: 9066		**Test Date:**	Oct-2024
Test Sponsor: New H3C Technologies Co., Ltd.		**Hardware Availability:**	Feb-2024
Tested by: New H3C Technologies Co., Ltd.		**Software Availability:**	Nov-2023

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_CASE_FLAG -Mbyteswapio -DSPEC_LP64`
526.blender_r: `-funsigned-char -DSPEC_LP64`
527.cam4_r: `-DSPEC_CASE_FLAG -DSPEC_LP64`
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 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-ldist-scalar-expand -fenable-aggressive-gather -O3
-march=znver4 -fveclib=AMDLIBM -ffast-math -fstruct-layout=7
-mllvm -unroll-threshold=50 -mllvm -inline-threshold=1000
-fremap-arrays -fstrip-mining -mllvm -reduce-array-computations=3
-zopt -lamdlibm -lamdalloc -lflang
```

C++ benchmarks:
```
-m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-x86-use-vzeroupper=false -O3 -march=znver4
-fveclib=AMDLIBM -ffast-math -mllvm -unroll-threshold=100
-finline-aggressive -mllvm -loop-unswitch-threshold=200000
-mllvm -reduce-array-computations=3 -zopt -lamdlibm -lamdalloc
-lflang
```

Fortran benchmarks:
```
-m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-enable-X86-prefetching -O3 -march=znver4
-fveclib=AMDLIBM -ffast-math -Kieee -Mrecursive -funroll-loops
-mllvm -lsr-in-nested-loop -mllvm -reduce-array-computations=3
-fepilog-vectorization-of-inductions -zopt -lamdlibm -lamdalloc
-lflang
```

Standard Performance Evaluation Corporation (info@spec.org) https://www.spec.org/

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SPECrate®2017_fp_base = 1170

H3C UniServer R4950 G6 (AMD EPYC 9534)

SPECrate®2017_fp_peak = 1170

CPU2017 License: 9066		**Test Date:**	Oct-2024
Test Sponsor:	New H3C Technologies Co., Ltd.	**Hardware Availability:**	Feb-2024
Tested by:	New H3C Technologies Co., Ltd.	**Software Availability:**	Nov-2023

Base Optimization Flags (Continued)

Benchmarks using both Fortran and C:
```
-m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-enable-X86-prefetching -O3 -march=znver4
-fveclib=AMDLIBM -ffast-math -fstruct-layout=7
-mllvm -unroll-threshold=50 -mllvm -inline-threshold=1000
-fremap-arrays -fstrip-mining -mllvm -reduce-array-computations=3
-zopt -Kieee -Mrecursive -funroll-loops -mllvm -lsr-in-nested-loop
-fepilog-vectorization-of-inductions -lamdlibm -lamdalloc -lflang
```

Benchmarks using both C and C++:
```
-m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-x86-use-vzeroupper=false -O3 -march=znver4
-fveclib=AMDLIBM -ffast-math -fstruct-layout=7
-mllvm -unroll-threshold=50 -mllvm -inline-threshold=1000
-fremap-arrays -fstrip-mining -mllvm -reduce-array-computations=3
-zopt -mllvm -unroll-threshold=100 -finline-aggressive
-mllvm -loop-unswitch-threshold=200000 -lamdlibm -lamdalloc -lflang
```

Benchmarks using Fortran, C, and C++:
```
-m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-x86-use-vzeroupper=false -O3 -march=znver4
-fveclib=AMDLIBM -ffast-math -fstruct-layout=7
-mllvm -unroll-threshold=50 -mllvm -inline-threshold=1000
-fremap-arrays -fstrip-mining -mllvm -reduce-array-computations=3
-zopt -mllvm -unroll-threshold=100 -finline-aggressive
-mllvm -loop-unswitch-threshold=200000 -Kieee -Mrecursive
-funroll-loops -mllvm -lsr-in-nested-loop
-fepilog-vectorization-of-inductions -lamdlibm -lamdalloc -lflang
```

Base Other Flags

C benchmarks:
```
-Wno-unused-command-line-argument
```

C++ benchmarks:
```
-Wno-unused-command-line-argument
```

Fortran benchmarks:
```
-Wno-unused-command-line-argument
```

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H3C UniServer R4950 G6 (AMD EPYC 9534)

SPECrate®2017_fp_base = 1170

SPECrate®2017_fp_peak = 1170

CPU2017 License: 9066   **Test Date:** Oct-2024
Test Sponsor: New H3C Technologies Co., Ltd.   **Hardware Availability:** Feb-2024
Tested by: New H3C Technologies Co., Ltd.   **Software Availability:** Nov-2023

Base Other Flags (Continued)

Benchmarks using both Fortran and C:
```
-Wno-unused-command-line-argument
```

Benchmarks using both C and C++:
```
-Wno-unused-command-line-argument
```

Benchmarks using Fortran, C, and C++:
```
-Wno-unused-command-line-argument
```

Peak Compiler Invocation

C benchmarks:
```
clang
```

C++ benchmarks:
```
clang++
```

Fortran benchmarks:
```
flang
```

Benchmarks using both Fortran and C:
```
flang clang
```

Benchmarks using both C and C++:
```
clang++ clang
```

Benchmarks using Fortran, C, and C++:
```
clang++ clang flang
```

Peak Portability Flags

```
Same as Base Portability Flags
```

Peak Optimization Flags

C benchmarks:

519.lbm_r: basepeak = yes

(Continued on next page)

New H3C Technologies Co., Ltd.

H3C UniServer R4950 G6 (AMD EPYC 9534)

CPU2017 License: 9066		**Test Date:**	Oct-2024
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Tested by:	New H3C Technologies Co., Ltd.	**Software Availability:**	Nov-2023

Peak Optimization Flags (Continued)

538.imagick_r: `-m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6 -Wl,-mllvm -Wl,-reduce-array-computations=3 -Ofast -march=znver4 -fveclib=AMDLIBM -ffast-math -fstruct-layout=7 -mllvm -unroll-threshold=50 -fremap-arrays -fstrip-mining -mllvm -inline-threshold=1000 -mllvm -reduce-array-computations=3 -zopt -lamdlibm -lamdalloc`

544.nab_r: `basepeak = yes`

C++ benchmarks:

508.namd_r: `-m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6 -Wl,-mllvm -Wl,-reduce-array-computations=3 -Wl,-mllvm -Wl,-x86-use-vzeroupper=false -Ofast -march=znver4 -fveclib=AMDLIBM -ffast-math -finline-aggressive -mllvm -unroll-threshold=100 -mllvm -reduce-array-computations=3 -zopt -lamdlibm -lamdalloc`

510.parest_r: `-m64 -flto -Wl,-mllvm -Wl,-suppress-fmas -Wl,-mllvm -Wl,-x86-use-vzeroupper=false -Ofast -march=znver4 -fveclib=AMDLIBM -ffast-math -finline-aggressive -mllvm -unroll-threshold=100 -mllvm -reduce-array-computations=3 -zopt -lamdlibm -lamdalloc`

Fortran benchmarks:

503.bwaves_r: `basepeak = yes`

549.fotonik3d_r: `basepeak = yes`

554.roms_r: `-m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6 -Wl,-mllvm -Wl,-reduce-array-computations=3 -Wl,-mllvm -Wl,-enable-X86-prefetching -Ofast -march=znver4 -fveclib=AMDLIBM -ffast-math -Mrecursive -mllvm -reduce-array-computations=3 -fepilog-vectorization-of-inductions -zopt -lamdlibm -lamdalloc -lflang`

Benchmarks using both Fortran and C:

521.wrf_r: `-m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6 -Wl,-mllvm -Wl,-reduce-array-computations=3`

(Continued on next page)

New H3C Technologies Co., Ltd.

H3C UniServer R4950 G6 (AMD EPYC 9534)

SPECrate®2017_fp_base = 1170

SPECrate®2017_fp_peak = 1170

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

Test Date: Oct-2024
Hardware Availability: Feb-2024
Software Availability: Nov-2023

Peak Optimization Flags (Continued)

521.wrf_r (continued):
```
-Wl,-mllvm -Wl,-enable-X86-prefetching -Ofast
-march=znver4 -fveclib=AMDLIBM -ffast-math
-fstruct-layout=7 -mllvm -unroll-threshold=50
-fremap-arrays -fstrip-mining
-mllvm -inline-threshold=1000
-mllvm -reduce-array-computations=3 -zopt -Mrecursive
-fepilog-vectorization-of-inductions -lamdlibm -lamdalloc
-lflang
```

527.cam4_r: `-m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6`
```
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-enable-X86-prefetching -O3 -march=znver4
-fveclib=AMDLIBM -ffast-math -fstruct-layout=7
-mllvm -unroll-threshold=50 -mllvm -inline-threshold=1000
-fremap-arrays -mllvm -reduce-array-computations=3 -zopt
-Kieee -Mrecursive -funroll-loops
-mllvm -lsr-in-nested-loop
-fepilog-vectorization-of-inductions -lamdlibm -lamdalloc
-lflang
```

Benchmarks using both C and C++:

511.povray_r: `-m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6`
```
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-x86-use-vzeroupper=false -O3 -march=znver4
-fveclib=AMDLIBM -ffast-math -fstruct-layout=7
-mllvm -unroll-threshold=50 -mllvm -inline-threshold=1000
-fremap-arrays -mllvm -reduce-array-computations=3 -zopt
-mllvm -unroll-threshold=100 -finline-aggressive
-mllvm -loop-unswitch-threshold=200000 -lamdlibm
-lamdalloc
```

526.blender_r: `-m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6`
```
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-x86-use-vzeroupper=false -Ofast
-march=znver4 -fveclib=AMDLIBM -ffast-math
-fstruct-layout=7 -mllvm -unroll-threshold=50
-fremap-arrays -fstrip-mining
-mllvm -inline-threshold=1000
-mllvm -reduce-array-computations=3 -zopt
-finline-aggressive -mllvm -unroll-threshold=100 -lamdlibm
-lamdalloc
```

Benchmarks using Fortran, C, and C++:

(Continued on next page)

New H3C Technologies Co., Ltd.

SPECrate®2017_fp_base = 1170

H3C UniServer R4950 G6 (AMD EPYC 9534)

SPECrate®2017_fp_peak = 1170

CPU2017 License: 9066		**Test Date:**	Oct-2024
Test Sponsor: New H3C Technologies Co., Ltd.		**Hardware Availability:**	Feb-2024
Tested by: New H3C Technologies Co., Ltd.		**Software Availability:**	Nov-2023

Peak Optimization Flags (Continued)

507.cactuBSSN_r: `basepeak = yes`

Peak Other Flags

C benchmarks:
`-Wno-unused-command-line-argument`

C++ benchmarks:
`-Wno-unused-command-line-argument`

Fortran benchmarks:
`-Wno-unused-command-line-argument`

Benchmarks using both Fortran and C:
`-Wno-unused-command-line-argument`

Benchmarks using both C and C++:
`-Wno-unused-command-line-argument`

Benchmarks using Fortran, C, and C++:
`-Wno-unused-command-line-argument`

The flags files that were used to format this result can be browsed at
`http://www.spec.org/cpu2017/flags/New_H3C-Platform-AMD-Settings-V1.4-Genoa.html`
`http://www.spec.org/cpu2017/flags/aocc400-flags.html`

You can also download the XML flags sources by saving the following links:
`http://www.spec.org/cpu2017/flags/New_H3C-Platform-AMD-Settings-V1.4-Genoa.xml`
`http://www.spec.org/cpu2017/flags/aocc400-flags.xml`

For questions about this result, please contact the tester. For other inquiries, please contact info@spec.org.

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