



SPEC CPU®2017 Floating Point Rate Result

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New H3C Technologies Co., Ltd.

H3C UniServer R4950 G7
AMD EPYC 9754

SPECrate®2017_fp_base = 1610

SPECrate®2017_fp_peak = 1660

CPU2017 License: 9066

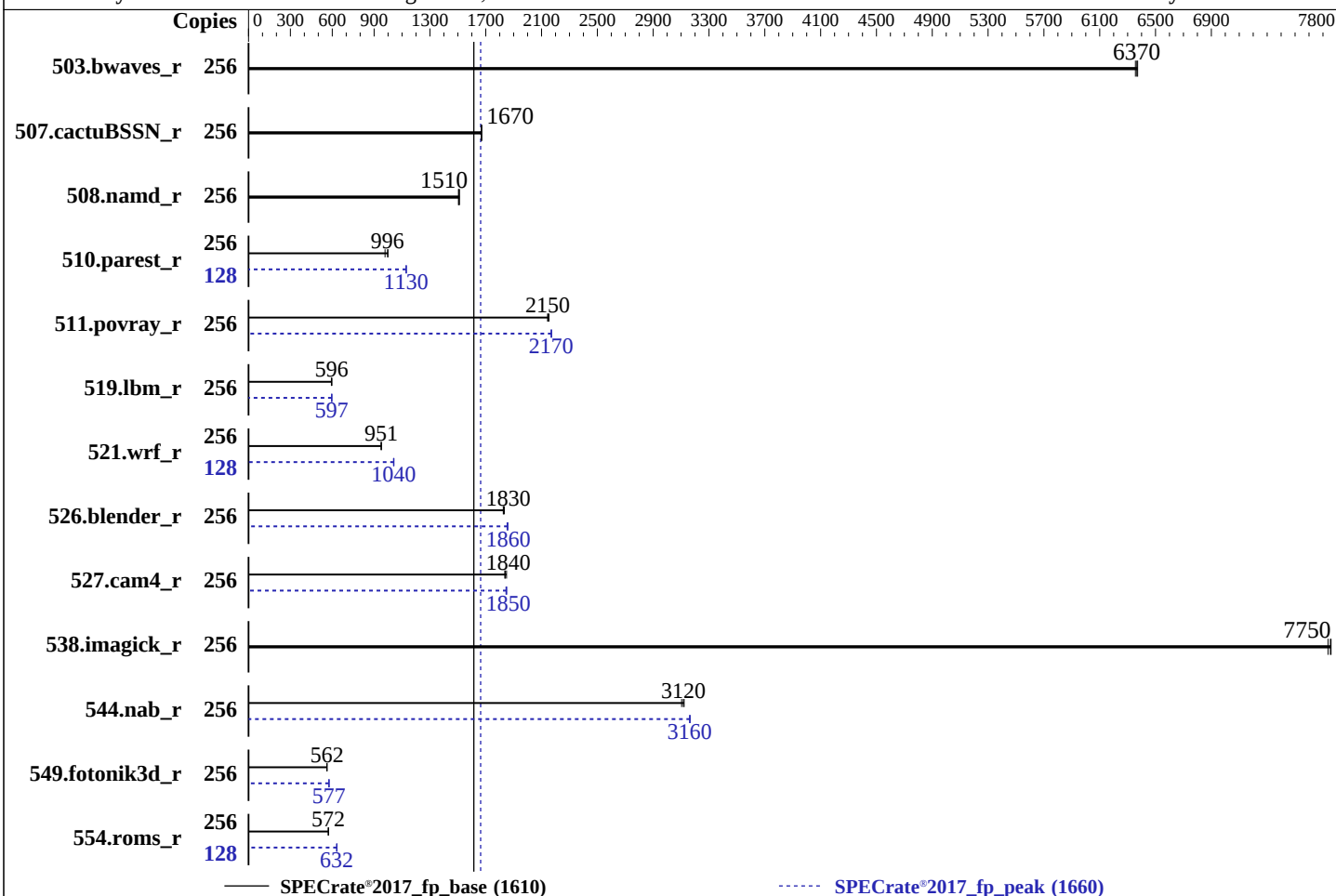
Test Sponsor: New H3C Technologies Co., Ltd.

Tested by: New H3C Technologies Co., Ltd.

Test Date: Mar-2025

Hardware Availability: Oct-2024

Software Availability: Oct-2024



Hardware

CPU Name: AMD EPYC 9754
Max MHz: 3100
Nominal: 2250
Enabled: 256 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, 16 MB shared / 8 cores
Other: None
Memory: 1536 GB (24 x 64 GB 2Rx4 PC5-4800B-R)
Storage: 1 x 3.84TB SSD
Other: CPU Cooling: Air

Software

OS: Red Hat Enterprise Linux 9.4 (Plow)
kernel version 5.14.0-427.13.1.el9_4.x86_64
Compiler: C/C++/Fortran: Version 5.0.0 of AOCC
Parallel: No
Firmware: Version 6.30.37P01 released Mar-2025
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	256	403	6370	404	6360	403	6370	256	403	6370	404	6360	403	6370
507.cactuBSSN_r	256	194	1670	194	1670	194	1670	256	194	1670	194	1670	194	1670
508.namd_r	256	162	1510	162	1510	161	1510	256	162	1510	162	1510	161	1510
510.parest_r	256	670	999	684	978	672	996	128	297	1130	296	1130	296	1130
511.povray_r	256	279	2150	278	2150	279	2140	256	276	2170	275	2170	276	2170
519.lbm_r	256	452	597	454	594	453	596	256	453	596	452	597	452	597
521.wrf_r	256	603	951	603	951	602	952	128	276	1040	276	1040	275	1040
526.blender_r	256	213	1830	214	1830	213	1830	256	210	1850	210	1860	210	1860
527.cam4_r	256	243	1840	242	1850	244	1840	256	242	1850	242	1850	243	1840
538.imagick_r	256	82.1	7750	82.1	7760	82.3	7740	256	82.1	7750	82.1	7760	82.3	7740
544.nab_r	256	138	3120	138	3120	139	3100	256	136	3160	136	3160	136	3160
549.fotonik3d_r	256	1775	562	1775	562	1775	562	256	1730	577	1730	577	1731	576
554.roms_r	256	710	573	711	572	711	572	128	322	632	321	633	322	632

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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,

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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/cpu2017/amd_rate_aocc500_znver5_A_lib/lib:/home/cpu2017/amd_rate_aocc500_znver5_A_lib/lib32:/usr/local/mpc-131/lib:/usr/local/gmp-630/lib:/usr/local/mpfr-421/lib:/usr/local/isl-027/lib:/usr/local/gcc-1420/lib64:/usr/local/lib:/usr/lib"  
MALLOCONF = "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:

SMT Control set to Disabled

SVM Mode set to Disabled

Power Profile Selection set to High Performance Mode

Determinism Slider set to Power

cTDP set to 400

PPT set to 400

NUMA nodes per socket set to NPS 4

ACPI SRAT L3 cache as NUMA domain set to Enabled

Sysinfo program /home/cpu2017/bin/sysinfo

Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197

running on localhost.localdomain Fri Mar 21 19:28:50 2025

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

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1. uname -a
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Platform Notes (Continued)

```
11. systemd service manager version: systemd 252 (252-32.el9_4)
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 5.14.0-427.13.1.el9_4.x86_64 #1 SMP PREEMPT_DYNAMIC Wed Apr 10 10:29:16 EDT
2024 x86_64 x86_64 x86_64 GNU/Linux
```

```
2. w
19:28:50 up 2 min, 1 user, load average: 1.49, 1.25, 0.52
USER      TTY      LOGIN@   IDLE   JCPU   PCPU WHAT
root      pts/0    19:28   26.00s  1.55s  0.17s /bin/bash ./amd_rate_aocc500_znver5_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) 6188742
max locked memory            (kbytes, -l) 2097152
max memory size              (kbytes, -m) unlimited
open files                   (-n) 1024
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) 6188742
virtual memory               (kbytes, -v) unlimited
file locks                   (-x) unlimited
```

```
5. sysinfo process ancestry
/usr/lib/systemd/systemd --switched-root --system --deserialize 31
sshd: /usr/sbin/sshd -D [listener] 0 of 10-100 startups
sshd: root [priv]
sshd: root@pts/0
-bash
python3 ./run_amd_rate_aocc500_znver5_A1.py
/bin/bash ./amd_rate_aocc500_znver5_A1.sh
runcpu --config amd_rate_aocc500_znver5_A1.cfg --tune all --reportable --iterations 3 fprate
```

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Platform Notes (Continued)

```
runcpu --configfile amd_rate_aocc500_znver5_A1.cfg --tune all --reportable --iterations 3 --nopower
--runmode rate --tune base:peak --size test:train:refrate fprate --nopreenv --note-preenv --logfile
$SPEC/tmp/CPU2017.006/temlogs/preenv.fprate.006.0.log --lognum 006.0 --from_runcpu 2
specperl $SPEC/bin/sysinfo
$SPEC = /home/cpu2017
```

6. /proc/cpuinfo

```
model name      : AMD EPYC 9754 128-Core Processor
vendor_id       : AuthenticAMD
cpu family      : 25
model           : 160
stepping        : 1
microcode       : 0xaa00116
bugs            : sysret_ss_attrs spectre_v1 spectre_v2 spec_store_bypass srs0
TLB size        : 3584 4K pages
cpu cores       : 128
siblings        : 128
2 physical ids (chips)
256 processors (hardware threads)
physical id 0: core ids
0-7,16-23,32-39,48-55,64-71,80-87,96-103,112-119,128-135,144-151,160-167,176-183,192-199,208-215,224-231,
240-247
physical id 1: core ids
0-7,16-23,32-39,48-55,64-71,80-87,96-103,112-119,128-135,144-151,160-167,176-183,192-199,208-215,224-231,
240-247
physical id 0: apicids
0-7,16-23,32-39,48-55,64-71,80-87,96-103,112-119,128-135,144-151,160-167,176-183,192-199,208-215,224-231,
240-247
physical id 1: apicids
256-263,272-279,288-295,304-311,320-327,336-343,352-359,368-375,384-391,400-407,416-423,432-439,448-455,4
64-471,480-487,496-503
```

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):                 256
On-line CPU(s) list:    0-255
Vendor ID:              AuthenticAMD
BIOS Vendor ID:         Advanced Micro Devices, Inc.
Model name:             AMD EPYC 9754 128-Core Processor
BIOS Model name:        AMD EPYC 9754 128-Core Processor
CPU family:             25
Model:                 160
Thread(s) per core:     1
Core(s) per socket:     128
Socket(s):              2
Stepping:               1
Frequency boost:        enabled
CPU(s) scaling MHz:     73%
CPU max MHz:            3100.3411
CPU min MHz:            1500.0000
BogoMIPS:               4489.82
```

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Platform Notes (Continued)

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
aperfmpperf rapl pni pclmulqdq monitor ssse3 fma cx16 pcid sse4_1 sse4_2
x2apic movbe popcnt aes xsave avx f16c rdrand lahf_lm cmp_legacy
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 hw_pstate ssbd mba perfmon_v2 ibrs ibpb stibp
ibrs_enhanced vmmcall fsgsbase bmi1 avx2 smep bmi2 erms invpcid 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 mcb_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 debug_swap

L1d cache: 8 MiB (256 instances)
L1i cache: 8 MiB (256 instances)
L2 cache: 256 MiB (256 instances)
L3 cache: 512 MiB (32 instances)
NUMA node(s): 32
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
NUMA node16 CPU(s): 128-135
NUMA node17 CPU(s): 136-143
NUMA node18 CPU(s): 144-151
NUMA node19 CPU(s): 152-159
NUMA node20 CPU(s): 160-167
NUMA node21 CPU(s): 168-175
NUMA node22 CPU(s): 176-183
NUMA node23 CPU(s): 184-191
NUMA node24 CPU(s): 192-199
NUMA node25 CPU(s): 200-207
NUMA node26 CPU(s): 208-215
NUMA node27 CPU(s): 216-223
NUMA node28 CPU(s): 224-231
NUMA node29 CPU(s): 232-239
NUMA node30 CPU(s): 240-247
NUMA node31 CPU(s): 248-255
Vulnerability Gather data sampling: Not affected
Vulnerability Itlb multihit: Not affected
Vulnerability L1tf: Not affected
Vulnerability Mds: Not affected
Vulnerability Meltdown: Not affected

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Platform Notes (Continued)

Vulnerability Mmio stale data: Not affected
Vulnerability Retbleed: Not affected
Vulnerability Spec rstack overflow: Mitigation; Safe RET
Vulnerability Spec store bypass: Mitigation; Speculative Store Bypass disabled via prctl
Vulnerability Spectre v1: Mitigation; usercopy/swaps barriers and __user pointer sanitization
Vulnerability Spectre v2: Mitigation; Enhanced / Automatic IBRS, IBPB conditional, STIBP disabled, RSB filling, PBRSE-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	8M	8	Data	1	64	1	64
L1i	32K	8M	8	Instruction	1	64	1	64
L2	1M	256M	8	Unified	2	2048	1	64
L3	16M	512M	16	Unified	3	16384	1	64

8. numactl --hardware

NOTE: a numactl 'node' might or might not correspond to a physical chip.

available: 32 nodes (0-31)

node 0 cpus: 0-7

node 0 size: 47502 MB

node 0 free: 47362 MB

node 1 cpus: 8-15

node 1 size: 48381 MB

node 1 free: 48273 MB

node 2 cpus: 16-23

node 2 size: 48381 MB

node 2 free: 48256 MB

node 3 cpus: 24-31

node 3 size: 48381 MB

node 3 free: 48257 MB

node 4 cpus: 32-39

node 4 size: 48381 MB

node 4 free: 48195 MB

node 5 cpus: 40-47

node 5 size: 48381 MB

node 5 free: 48260 MB

node 6 cpus: 48-55

node 6 size: 48381 MB

node 6 free: 48263 MB

node 7 cpus: 56-63

node 7 size: 48381 MB

node 7 free: 48250 MB

node 8 cpus: 64-71

node 8 size: 48381 MB

node 8 free: 48235 MB

node 9 cpus: 72-79

node 9 size: 48381 MB

node 9 free: 48254 MB

node 10 cpus: 80-87

node 10 size: 48381 MB

node 10 free: 48239 MB

node 11 cpus: 88-95

node 11 size: 48381 MB

node 11 free: 47705 MB

node 12 cpus: 96-103

node 12 size: 48381 MB

node 12 free: 48269 MB

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Platform Notes (Continued)

```
node 13 cpus: 104-111
node 13 size: 48381 MB
node 13 free: 48266 MB
node 14 cpus: 112-119
node 14 size: 48381 MB
node 14 free: 48270 MB
node 15 cpus: 120-127
node 15 size: 48381 MB
node 15 free: 48268 MB
node 16 cpus: 128-135
node 16 size: 48381 MB
node 16 free: 48262 MB
node 17 cpus: 136-143
node 17 size: 48381 MB
node 17 free: 48238 MB
node 18 cpus: 144-151
node 18 size: 48381 MB
node 18 free: 48212 MB
node 19 cpus: 152-159
node 19 size: 48381 MB
node 19 free: 48260 MB
node 20 cpus: 160-167
node 20 size: 48379 MB
node 20 free: 48207 MB
node 21 cpus: 168-175
node 21 size: 48383 MB
node 21 free: 48218 MB
node 22 cpus: 176-183
node 22 size: 48379 MB
node 22 free: 48234 MB
node 23 cpus: 184-191
node 23 size: 48383 MB
node 23 free: 48228 MB
node 24 cpus: 192-199
node 24 size: 48381 MB
node 24 free: 48257 MB
node 25 cpus: 200-207
node 25 size: 48381 MB
node 25 free: 48268 MB
node 26 cpus: 208-215
node 26 size: 48381 MB
node 26 free: 48258 MB
node 27 cpus: 216-223
node 27 size: 48381 MB
node 27 free: 48243 MB
node 28 cpus: 224-231
node 28 size: 48381 MB
node 28 free: 48253 MB
node 29 cpus: 232-239
node 29 size: 48381 MB
node 29 free: 48262 MB
node 30 cpus: 240-247
node 30 size: 48381 MB
node 30 free: 48252 MB
node 31 cpus: 248-255
node 31 size: 48271 MB
node 31 free: 48137 MB
node distances:
node 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
```

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Platform Notes (Continued)

0:	10	11	11	11	12	12	12	12	12	12	12	12	12	12	12	22	22	22	22	22	22	22	22	22
22	22	22	22	22	22	22	22																	
1:	11	10	11	11	12	12	12	12	12	12	12	12	12	12	12	22	22	22	22	22	22	22	22	22
22	22	22	22	22	22	22	22																	
2:	11	11	10	11	12	12	12	12	12	12	12	12	12	12	12	22	22	22	22	22	22	22	22	22
22	22	22	22	22	22	22	22																	
3:	11	11	11	10	12	12	12	12	12	12	12	12	12	12	12	22	22	22	22	22	22	22	22	22
22	22	22	22	22	22	22	22																	
4:	12	12	12	12	10	11	11	11	12	12	12	12	12	12	12	22	22	22	22	22	22	22	22	22
22	22	22	22	22	22	22	22																	
5:	12	12	12	12	12	11	10	11	11	12	12	12	12	12	12	22	22	22	22	22	22	22	22	22
22	22	22	22	22	22	22	22																	
6:	12	12	12	12	11	11	10	11	12	12	12	12	12	12	12	22	22	22	22	22	22	22	22	22
22	22	22	22	22	22	22	22																	
7:	12	12	12	12	11	11	11	10	12	12	12	12	12	12	12	22	22	22	22	22	22	22	22	22
22	22	22	22	22	22	22	22																	
8:	12	12	12	12	12	12	12	12	12	10	11	11	11	12	12	22	22	22	22	22	22	22	22	22
22	22	22	22	22	22	22	22																	
9:	12	12	12	12	12	12	12	12	12	11	10	11	11	12	12	22	22	22	22	22	22	22	22	22
22	22	22	22	22	22	22	22																	
10:	12	12	12	12	12	12	12	12	12	11	11	10	11	12	12	22	22	22	22	22	22	22	22	22
22	22	22	22	22	22	22	22																	
11:	12	12	12	12	12	12	12	12	12	11	11	11	10	12	12	22	22	22	22	22	22	22	22	22
22	22	22	22	22	22	22	22																	
12:	12	12	12	12	12	12	12	12	12	12	12	12	10	11	11	22	22	22	22	22	22	22	22	22
22	22	22	22	22	22	22	22																	
13:	12	12	12	12	12	12	12	12	12	12	12	11	10	11	11	22	22	22	22	22	22	22	22	22
22	22	22	22	22	22	22	22																	
14:	12	12	12	12	12	12	12	12	12	12	12	11	11	10	11	22	22	22	22	22	22	22	22	22
22	22	22	22	22	22	22	22																	
15:	12	12	12	12	12	12	12	12	12	12	12	11	11	11	10	22	22	22	22	22	22	22	22	22
22	22	22	22	22	22	22	22																	
16:	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	10	11	11	11	12	12	12	12
12	12	12	12	12	12	12	12																	
17:	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	11	10	11	11	12	12	12	12
12	12	12	12	12	12	12	12																	
18:	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	11	11	10	11	12	12	12	12
12	12	12	12	12	12	12	12																	
19:	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	11	11	11	10	12	12	12	12
12	12	12	12	12	12	12	12																	
20:	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	12	12	12	12	10	11	11	11
12	12	12	12	12	12	12	12																	
21:	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	12	12	12	12	11	10	11	11
12	12	12	12	12	12	12	12																	
22:	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	12	12	12	12	11	11	10	11
12	12	12	12	12	12	12	12																	
23:	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	12	12	12	12	11	11	11	10
12	12	12	12	12	12	12	12																	
24:	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	12	12	12	12	12	12	12	10
11	11	11	12	12	12	12	12																	
25:	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	12	12	12	12	12	12	12	11
10	11	11	12	12	12	12	12																	
26:	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	12	12	12	12	12	12	12	11
11	10	11	12	12	12	12	12																	
27:	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	12	12	12	12	12	12	12	11
11	11	10	12	12	12	12	12																	
28:	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	12	12	12	12	12	12	12	12
12	12	12	10	11	11	11	11																	
29:	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	12	12	12	12	12	12	12	12
12	12	12	11	10	11	11	11																	

(Continued on next page)



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H3C UniServer R4950 G7
AMD EPYC 9754

SPECrate®2017_fp_base = 1610

SPECrate®2017_fp_peak = 1660

CPU2017 License: 9066

Test Sponsor: New H3C Technologies Co., Ltd.

Tested by: New H3C Technologies Co., Ltd.

Test Date: Mar-2025

Hardware Availability: Oct-2024

Software Availability: Oct-2024

Platform Notes (Continued)

```
30:  22  22  22  22  22  22  22  22  22  22  22  22  22  22  22  22  22  12  12  12  12  12  12  12  12
12:  12  12  12  11  11  10  11
31:  22  22  22  22  22  22  22  22  22  22  22  22  22  22  22  22  22  12  12  12  12  12  12  12  12
12:  12  12  12  11  11  11  10
```

9. /proc/meminfo
MemTotal: 1584362024 kB

10. who -r
run-level 3 Mar 21 19:27

11. Systemd service manager version: systemd 252 (252-32.el9_4)
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 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 chronyd-restricted console-getty cpupower debug-shell dnf-system-upgrade firewalld hwloc-dump-hwdata kvm_stat man-db-restart-cache-update nftables rdisc rhcd rhsm rhsm-facts rpmbd-rebuild selinux-check-proper-disable serial-getty@ sshd-keygen@ systemd-boot-check-no-failures systemd-pstore systemd-sysex 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-5.14.0-427.13.1.el9_4.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 186:
current policy: frequency should be within 1.50 GHz and 2.25 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: 2250MHz

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

(Continued on next page)



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Hardware Availability: Oct-2024

Software Availability: Oct-2024

Platform Notes (Continued)

16. sysctl

kernel.numa_balancing	1
kernel.randomize_va_space	0
vm.compaction_proactiveness	20
vm.dirty_background_bytes	0
vm.dirty_background_ratio	10
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	10000

19. OS release

From /etc/*-release /etc/*-version	
os-release	Red Hat Enterprise Linux 9.4 (Plow)
redhat-release	Red Hat Enterprise Linux release 9.4 (Plow)
system-release	Red Hat Enterprise Linux release 9.4 (Plow)

20. Disk information

SPEC is set to: /home/cpu2017

Filesystem	Type	Size	Used	Avail	Use%	Mounted on
/dev/mapper/rhel-home	xfs	3.5T	44G	3.4T	2%	/home

21. /sys/devices/virtual/dmi/id

Vendor:	N/A
Product:	N/A
Product Family:	Rack
Serial:	N/A

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Software Availability: Oct-2024

Platform Notes (Continued)

22. dmidecode

Additional information from dmidecode 3.5 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:

1x SK Hynix HMC94AEBRA102N 64 GB 2 rank 4800
17x SK Hynix HMC94AEBRA109N 64 GB 2 rank 4800
4x SK Hynix HMC94AEBRA123N 64 GB 2 rank 4800
2x SK Hynix HMC94MEBRA109N 64 GB 2 rank 4800

23. BIOS

(This section combines info from /sys/devices and dmidecode.)

BIOS Vendor: American Megatrends International, LLC.
BIOS Version: 6.30.37P01
BIOS Date: 03/20/2025
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 17.0.6 (CLANG: AOCC_5.0.0-Build#1316 2024_09_09)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-5.0.0-4925-1316/bin
=====

=====
C++ | 508.namd_r(base, peak) 510.parest_r(base, peak)
=====

AMD clang version 17.0.6 (CLANG: AOCC_5.0.0-Build#1316 2024_09_09)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-5.0.0-4925-1316/bin
=====

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

AMD clang version 17.0.6 (CLANG: AOCC_5.0.0-Build#1316 2024_09_09)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-5.0.0-4925-1316/bin
AMD clang version 17.0.6 (CLANG: AOCC_5.0.0-Build#1316 2024_09_09)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-5.0.0-4925-1316/bin
=====

=====
C++, C, Fortran | 507.cactuBSSN_r(base, peak)
=====

AMD clang version 17.0.6 (CLANG: AOCC_5.0.0-Build#1316 2024_09_09)
Target: x86_64-unknown-linux-gnu
Thread model: posix

(Continued on next page)



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SPECrate®2017_fp_peak = 1660

CPU2017 License: 9066

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Tested by: New H3C Technologies Co., Ltd.

Test Date: Mar-2025

Hardware Availability: Oct-2024

Software Availability: Oct-2024

Compiler Version Notes (Continued)

InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-5.0.0-4925-1316/bin
AMD clang version 17.0.6 (CLANG: AOCC_5.0.0-Build#1316 2024_09_09)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-5.0.0-4925-1316/bin
AMD clang version 17.0.6 (CLANG: AOCC_5.0.0-Build#1316 2024_09_09)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-5.0.0-4925-1316/bin

Fortran | 503.bwaves_r(base, peak) 549.fotonik3d_r(base, peak) 554.roms_r(base, peak)

AMD clang version 17.0.6 (CLANG: AOCC_5.0.0-Build#1316 2024_09_09)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-5.0.0-4925-1316/bin

Fortran, C | 521.wrf_r(base, peak) 527.cam4_r(base, peak)

AMD clang version 17.0.6 (CLANG: AOCC_5.0.0-Build#1316 2024_09_09)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-5.0.0-4925-1316/bin
AMD clang version 17.0.6 (CLANG: AOCC_5.0.0-Build#1316 2024_09_09)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-5.0.0-4925-1316/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



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Tested by: New H3C Technologies Co., Ltd.

Test Date: Mar-2025

Hardware Availability: Oct-2024

Software Availability: Oct-2024

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 -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=znver5 -fveclib=AMDLIBM -ffast-math -fno-PIE -no-pie -flto
-fstruct-layout=7 -mllvm -unroll-threshold=50
-mllvm -inline-threshold=1000 -fremap-arrays -fstrip-mining
-mllvm -reduce-array-computations=3 -zopt -lamdlibm -lamdalloc
-lflang -ldl

C++ benchmarks:

-m64 -std=c++14 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-x86-use-vzeroupper=false -Wl,-mllvm -Wl,-extra-inliner
-O3 -march=znver5 -fveclib=AMDLIBM -ffast-math -flto
-mllvm -unroll-threshold=100 -mllvm -loop-unswitch-threshold=200000
-mllvm -reduce-array-computations=3 -zopt -lamdlibm -lamdalloc
-lflang -ldl

Fortran benchmarks:

-m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-enable-X86-prefetching
-Wl,-mllvm -Wl,-enable-aggressive-gather=true
-Wl,-mllvm -Wl,-enable-masked-gather-sequence=false -O3 -march=znver5
-fveclib=AMDLIBM -ffast-math -flto -Mrecursive -funroll-loops
-mllvm -lsr-in-nested-loop -mllvm -reduce-array-computations=3
-fepilog-vectorization-of-inductions -zopt -lamdlibm -lamdalloc

(Continued on next page)



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CPU2017 License: 9066

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Tested by: New H3C Technologies Co., Ltd.

Test Date: Mar-2025

Hardware Availability: Oct-2024

Software Availability: Oct-2024

Base Optimization Flags (Continued)

Fortran benchmarks (continued):

-lflang -ldl

Benchmarks using both Fortran and C:

-m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-enable-X86-prefetching
-Wl,-mllvm -Wl,-enable-aggressive-gather=true
-Wl,-mllvm -Wl,-enable-masked-gather-sequence=false -O3 -march=znver5
-fveclib=AMDLIBM -ffast-math -fno-PIE -no-pie -flto
-fstruct-layout=7 -mllvm -unroll-threshold=50
-mllvm -inline-threshold=1000 -fremap-arrays -fstrip-mining
-mllvm -reduce-array-computations=3 -zopt -Mrecursive -funroll-loops
-mllvm -lsr-in-nested-loop -fepilog-vectorization-of-inductions
-lamdlibm -lamdalloc -lflang -ldl

Benchmarks using both C and C++:

-m64 -std=c++14 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-x86-use-vzeroupper=false -Wl,-mllvm -Wl,-extra-inliner
-O3 -march=znver5 -fveclib=AMDLIBM -ffast-math -fno-PIE -no-pie
-flto -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
-mllvm -loop-unswitch-threshold=2000000 -lamdlibm -lamdalloc -lflang
-ldl

Benchmarks using Fortran, C, and C++:

-m64 -std=c++14 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-x86-use-vzeroupper=false -Wl,-mllvm -Wl,-extra-inliner
-O3 -march=znver5 -fveclib=AMDLIBM -ffast-math -fno-PIE -no-pie
-flto -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
-mllvm -loop-unswitch-threshold=2000000 -Mrecursive -funroll-loops
-mllvm -lsr-in-nested-loop -fepilog-vectorization-of-inductions
-lamdlibm -lamdalloc -lflang -ldl

Base Other Flags

C benchmarks:

-Wno-unused-command-line-argument

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Hardware Availability: Oct-2024

Software Availability: Oct-2024

Base Other Flags (Continued)

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

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



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Hardware Availability: Oct-2024

Software Availability: Oct-2024

Peak Optimization Flags

C benchmarks:

```
519.lbm_r: -m64 -Wl, -mllvm -Wl, -align-all-nofallthru-blocks=6  
-Wl, -mllvm -Wl, -reduce-array-computations=3 -Ofast  
-march=znver5 -fveclib=AMDLIBM -ffast-math -flto  
-fstruct-layout=7 -mllvm -unroll-threshold=50  
-fremap-arrays -fstrip-mining  
-mllvm -inline-threshold=1000  
-mllvm -reduce-array-computations=3 -zopt -lamdlibm  
-lamdalloc -ldl
```

538.imagick_r: basepeak = yes

```
544.nab_r: -m64 -flto -Wl, -mllvm -Wl, -ldist-scalar-expand  
-fenable-aggressive-gather -Ofast -march=znver5  
-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 -ldl
```

C++ benchmarks:

508.namd_r: basepeak = yes

```
510.parest_r: -m64 -std=c++14 -flto -Wl, -mllvm -Wl, -suppress-fmas  
-Wl, -mllvm -Wl, -x86-use-vzeroupper=false -Ofast  
-march=znver5 -fveclib=AMDLIBM -ffast-math  
-mllvm -unroll-threshold=100  
-mllvm -reduce-array-computations=3 -zopt -lamdlibm  
-lamdalloc -ldl
```

Fortran benchmarks:

503.bwaves_r: basepeak = yes

```
549.fotonik3d_r: -m64 -Wl, -mllvm -Wl, -align-all-nofallthru-blocks=6  
-Wl, -mllvm -Wl, -reduce-array-computations=3 -Ofast  
-march=znver5 -fveclib=AMDLIBM -ffast-math -flto  
-Mrecursive -mllvm -reduce-array-computations=3  
-fepilog-vectorization-of-inductions -fvector-transform  
-fscalar-transform -lamdlibm -lamdalloc -ldl -lflang
```

```
554.roms_r: -m64 -Wl, -mllvm -Wl, -align-all-nofallthru-blocks=6  
-Wl, -mllvm -Wl, -reduce-array-computations=3 -Ofast  
-march=znver5 -fveclib=AMDLIBM -ffast-math -flto
```

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SPEC CPU®2017 Floating Point Rate Result

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H3C UniServer R4950 G7
AMD EPYC 9754

SPECrate®2017_fp_base = 1610

SPECrate®2017_fp_peak = 1660

CPU2017 License: 9066

Test Sponsor: New H3C Technologies Co., Ltd.

Tested by: New H3C Technologies Co., Ltd.

Test Date: Mar-2025

Hardware Availability: Oct-2024

Software Availability: Oct-2024

Peak Optimization Flags (Continued)

554.roms_r (continued):

-Mrecursive -mllvm -reduce-array-computations=3
-fepilog-vectorization-of-inductions -zopt -lamdlibm
-lamdalloc -ldl -lflang

Benchmarks using both Fortran and C:

521.wrf_r: -m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3 -Ofast
-march=znver5 -fveclib=AMDLIBM -ffast-math -flto
-fstruct-layout=7 -mllvm -unroll-threshold=50
-fremap-arrays -fstrip-mining
-mllvm -inline-threshold=1000
-mllvm -reduce-array-computations=3 -zopt -Mrecursive
-funroll-loops -mllvm -lsr-in-nested-loop
-fepilog-vectorization-of-inductions -lamdlibm -lamdalloc
-ldl -lflang

527.cam4_r: -m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-enable-X86-prefetching -Ofast
-march=znver5 -fveclib=AMDLIBM -ffast-math -flto
-fstruct-layout=7 -mllvm -unroll-threshold=50
-mllvm -inline-threshold=1000 -fremap-arrays
-mllvm -reduce-array-computations=3 -zopt -Mrecursive
-funroll-loops -mllvm -lsr-in-nested-loop
-fepilog-vectorization-of-inductions -lamdlibm -lamdalloc
-ldl -lflang

Benchmarks using both C and C++:

511.povray_r: -m64 -std=c++14
-Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-x86-use-vzeroupper=false
-Wl,-mllvm -Wl,-extra-inliner -Ofast -march=znver5
-fveclib=AMDLIBM -ffast-math -flto -fstruct-layout=7
-mllvm -unroll-threshold=50 -mllvm -inline-threshold=1000
-fremap-arrays -mllvm -reduce-array-computations=3 -zopt
-mllvm -unroll-threshold=100
-mllvm -loop-unswitch-threshold=2000000 -lamdlibm
-lamdalloc -ldl

526.blender_r: -m64 -std=c++14
-Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3

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Peak Optimization Flags (Continued)

526.blender_r (continued):

```
-Wl, -mllvm -Wl, -x86-use-vzeroupper=false -Ofast  
-march=znver5 -fveclib=AMDLIBM -ffast-math -flt0  
-fstruct-layout=7 -mllvm -unroll-threshold=50  
-fremap-arrays -fstrip-mining  
-mllvm -inline-threshold=1000  
-mllvm -reduce-array-computations=3 -zopt  
-mllvm -unroll-threshold=100 -lamdlibm -lamdalloc -ldl
```

Benchmarks using Fortran, C, and C++:

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/aocc500-flags.2024-10-10.html>

http://www.spec.org/cpu2017/flags/New_H3C-Platform-AMD-Settings-V1.7-Turin.html

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

<http://www.spec.org/cpu2017/flags/aocc500-flags.2024-10-10.xml>

http://www.spec.org/cpu2017/flags/New_H3C-Platform-AMD-Settings-V1.7-Turin.xml



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