



# SPEC CPU®2017 Floating Point Rate Result

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## New H3C Technologies Co., Ltd.

H3C UniServer R3950 G7 (AMD EPYC 9455P)  
AMD EPYC 9455P

SPECrate®2017\_fp\_base = 772

SPECrate®2017\_fp\_peak = 820

CPU2017 License: 9066

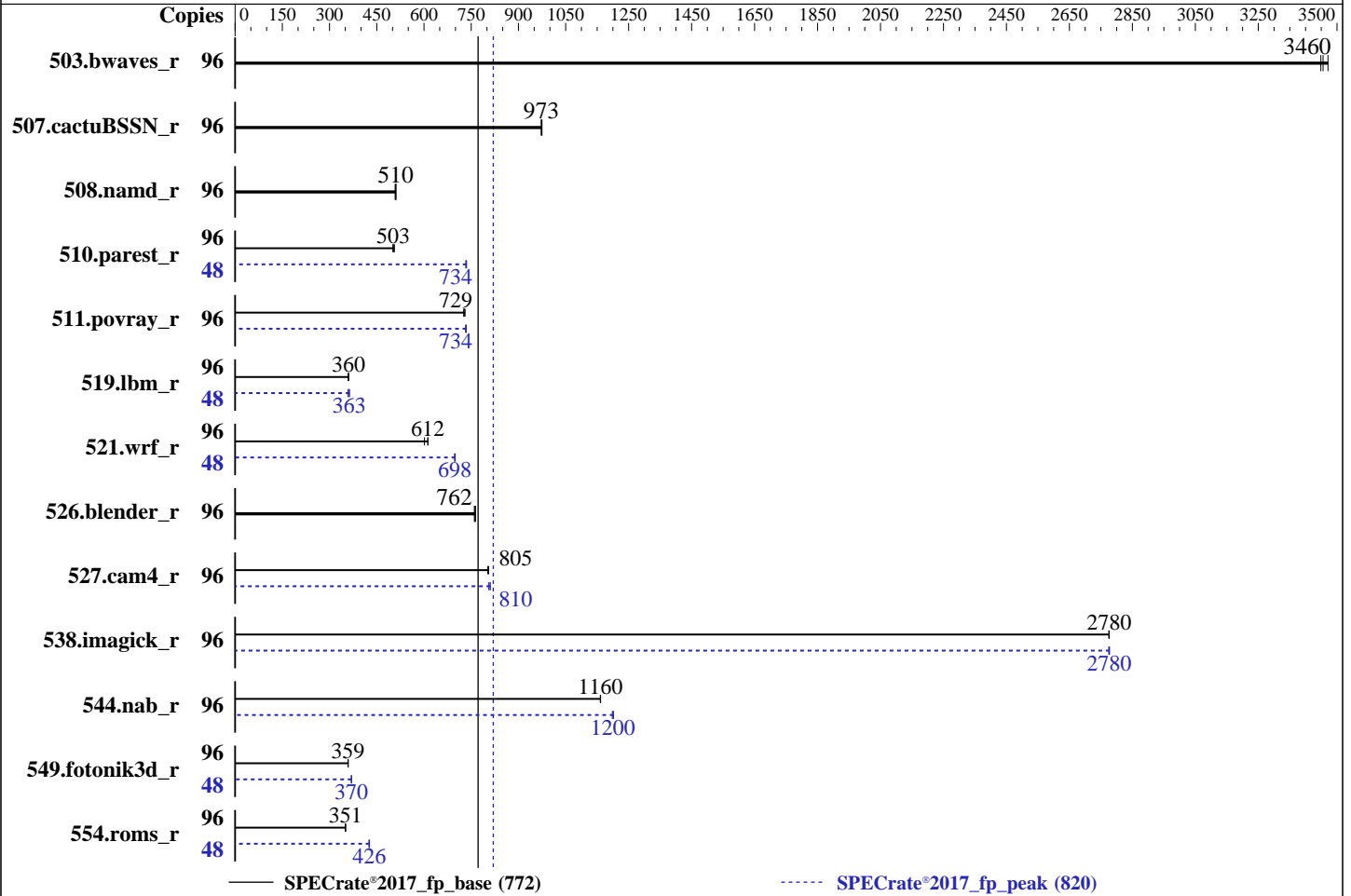
Test Sponsor: New H3C Technologies Co., Ltd.

Tested by: New H3C Technologies Co., Ltd.

Test Date: Jan-2025

Hardware Availability: Oct-2024

Software Availability: Oct-2024



### Hardware

CPU Name: AMD EPYC 9455P  
 Max MHz: 4400  
 Nominal: 3150  
 Enabled: 48 cores, 1 chip, 2 threads/core  
 Orderable: 1 chip  
 Cache L1: 32 KB I + 48 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 / 6 cores  
 Other: None  
 Memory: 384 GB (12 x 32 GB 2Rx8 PC5-6400B-R, running at 6000)  
 Storage: 1 x 960GB SSD  
 Other: CPU Cooling: Air

### Software

OS: Ubuntu 24.04.1 LTS  
 kernel version 6.8.0-45-generic  
 Compiler: C/C++/Fortran: Version 5.0.0 of AOCC  
 Parallel: No  
 Firmware: Version 7.30.04 released Dec-2024  
 File System: ext4  
 System State: Run level 5 (multi-user)  
 Base Pointers: 64-bit  
 Peak Pointers: 64-bit  
 Other: None  
 Power Management: BIOS 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	96	<b>279</b>	<b>3460</b>	279	3450	277	3470	96	<b>279</b>	<b>3460</b>	279	3450	277	3470
507.cactuBSSN_r	96	125	973	125	975	<b>125</b>	<b>973</b>	96	125	973	125	975	<b>125</b>	<b>973</b>
508.namd_r	96	179	508	178	511	<b>179</b>	<b>510</b>	96	179	508	178	511	<b>179</b>	<b>510</b>
510.parest_r	96	<b>499</b>	<b>503</b>	496	506	501	501	48	171	733	<b>171</b>	<b>734</b>	171	735
511.povray_r	96	<b>307</b>	<b>729</b>	309	726	307	730	96	305	734	<b>305</b>	<b>734</b>	306	732
519.lbm_r	96	281	360	<b>281</b>	<b>360</b>	281	360	48	<b>140</b>	<b>363</b>	141	358	139	363
521.wrf_r	96	<b>351</b>	<b>612</b>	357	602	351	612	48	<b>154</b>	<b>698</b>	154	699	154	697
526.blender_r	96	191	764	<b>192</b>	<b>762</b>	192	760	96	191	764	<b>192</b>	<b>762</b>	192	760
527.cam4_r	96	208	805	<b>209</b>	<b>805</b>	209	803	96	209	805	207	810	<b>207</b>	<b>810</b>
538.imagick_r	96	86.0	2780	<b>86.0</b>	<b>2780</b>	86.0	2780	96	<b>86.0</b>	<b>2780</b>	86.0	2780	86.0	2780
544.nab_r	96	139	1160	<b>139</b>	<b>1160</b>	139	1160	96	135	1200	<b>135</b>	<b>1200</b>	134	1200
549.fotonik3d_r	96	1041	359	1043	359	<b>1043</b>	<b>359</b>	48	506	370	<b>506</b>	<b>370</b>	506	369
554.roms_r	96	435	351	435	350	<b>435</b>	<b>351</b>	48	<b>179</b>	<b>426</b>	179	425	179	427

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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,

(Continued on next page)



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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/amd/aocc-compiler-5.0.0/lib:/usr/local/amd/aocc-compiler-5.0.0/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:  
SMT Control set to Enabled  
SVM Mode set to Disabled  
Power Profile Selection set to High Performance Mode  
Determinism Slider set to Power  
cTDP set to 300  
PPT set to 300  
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 h3c Wed Jan 8 07:28:06 2025

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
10. who -r
11. Systemd service manager version: systemd 255 (255.4-1ubuntu8.4)

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## Platform Notes (Continued)

- 12. Services, from systemctl list-unit-files
- 13. Linux kernel boot-time arguments, from /proc/cmdline
- 14. cpupower frequency-info
- 15. sysctl
- 16. /sys/kernel/mm/transparent\_hugepage
- 17. /sys/kernel/mm/transparent\_hugepage/khugepaged
- 18. OS release
- 19. Disk information
- 20. /sys/devices/virtual/dmi/id
- 21. dmidecode
- 22. BIOS

```
1. uname -a
Linux h3c 6.8.0-45-generic #45-Ubuntu SMP PREEMPT_DYNAMIC Fri Aug 30 12:02:04 UTC 2024 x86_64 x86_64 x86_64
GNU/Linux
```

```
2. w
07:28:06 up 4:06, 2 users, load average: 67.70, 89.05, 92.84
USER      TTY      FROM      LOGIN@   IDLE   JCPU   PCPU WHAT
root          172.17.53.33    03:23   4:06m  0.00s  7.33s sshd: root@pts/0
root          172.17.53.33    03:23   4:06m  0.00s  0.05s sshd: root@notty
```

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

```
4. ulimit -a
time(seconds)      unlimited
file(blocks)       unlimited
data(kbytes)       unlimited
stack(kbytes)      unlimited
coredump(blocks)   0
memory(kbytes)     unlimited
locked memory(kbytes) 2097152
process            1545652
nofiles            1024
vmemory(kbytes)    unlimited
locks              unlimited
rtprio             0
```

```
5. sysinfo process ancestry
/sbin/init
sshd: /usr/sbin/sshd -D [listener] 0 of 10-100 startups
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
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/CPU2017.002/templogs/preenv.fprate.002.0.log --lognum 002.0 --from_runcpu 2
specperl $SPEC/bin/sysinfo
$SPEC = /home/cpu2017
```

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## Platform Notes (Continued)

### 6. /proc/cpuinfo

```

model name      : AMD EPYC 9455P 48-Core Processor
vendor_id      : AuthenticAMD
cpu family     : 26
model          : 2
stepping       : 1
microcode      : 0xb00211a
bugs           : sysret_ss_attrs spectre_v1 spectre_v2 spec_store_bypass
TLB size      : 192 4K pages
cpu cores      : 48
siblings       : 96

```

1 physical ids (chips)

96 processors (hardware threads)

physical id 0: core ids 0-5,8-13,16-21,24-29,32-37,40-45,48-53,56-61

physical id 0: apicids 0-11,16-27,32-43,48-59,64-75,80-91,96-107,112-123

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 2.39.3:

```

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):                96
On-line CPU(s) list:  0-95
Vendor ID:             AuthenticAMD
BIOS Vendor ID:       Advanced Micro Devices, Inc.
Model name:            AMD EPYC 9455P 48-Core Processor
BIOS Model name:      AMD EPYC 9455P 48-Core Processor
BIOS CPU family:      107
CPU family:            26
Model:                 2
Thread(s) per core:   2
Core(s) per socket:   48
Socket(s):             1
Stepping:              1
Frequency boost:      enabled
CPU(s) scaling MHz:   41%
CPU max MHz:          4411.2300
CPU min MHz:          1500.0000
BogoMIPS:              6290.87
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 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 tsc_adjust 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 user_shstk avx_vnni 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

```

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### Platform Notes (Continued)

```
avx512vbmi umip pku ospke avx512_vbmi2 gfni vaes vpclmulqdq
avx512_vnni avx512_bitalg avx512_vpopcntdq la57 rdpid bus_lock_detect
movdiri movdir64b overflow_recov succor smca fsrm avx512_vp2intersect
flush_llid debug_swap
```

```
L1d cache: 2.3 MiB (48 instances)
L1i cache: 1.5 MiB (48 instances)
L2 cache: 48 MiB (48 instances)
L3 cache: 256 MiB (8 instances)
NUMA node(s): 8
NUMA node0 CPU(s): 0-5,48-53
NUMA node1 CPU(s): 6-11,54-59
NUMA node2 CPU(s): 12-17,60-65
NUMA node3 CPU(s): 18-23,66-71
NUMA node4 CPU(s): 24-29,72-77
NUMA node5 CPU(s): 30-35,78-83
NUMA node6 CPU(s): 36-41,84-89
NUMA node7 CPU(s): 42-47,90-95
```

```
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 Reg file data sampling: Not affected
Vulnerability Retbleed: Not affected
Vulnerability Spec rstack overflow: Not affected
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
always-on; RSB filling; PBR SB-eIBRS Not affected; BHI 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	48K	2.3M	12	Data	1	64	1	64
L1i	32K	1.5M	8	Instruction	1	64	1	64
L2	1M	48M	16	Unified	2	1024	1	64
L3	32M	256M	16	Unified	3	32768	1	64

8. numactl --hardware

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

```
available: 8 nodes (0-7)
node 0 cpus: 0-5,48-53
node 0 size: 47889 MB
node 0 free: 46991 MB
node 1 cpus: 6-11,54-59
node 1 size: 48379 MB
node 1 free: 47797 MB
node 2 cpus: 12-17,60-65
node 2 size: 48379 MB
node 2 free: 47842 MB
node 3 cpus: 18-23,66-71
node 3 size: 48379 MB
node 3 free: 47839 MB
node 4 cpus: 24-29,72-77
node 4 size: 48379 MB
node 4 free: 47832 MB
node 5 cpus: 30-35,78-83
```

(Continued on next page)



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## Platform Notes (Continued)

```

node 5 size: 48379 MB
node 5 free: 47854 MB
node 6 cpus: 36-41,84-89
node 6 size: 48379 MB
node 6 free: 47830 MB
node 7 cpus: 42-47,90-95
node 7 size: 48322 MB
node 7 free: 47766 MB
node distances:
node  0  1  2  3  4  5  6  7
0:  10  11  12  12  12  12  12  12
1:  11  10  12  12  12  12  12  12
2:  12  12  10  11  12  12  12  12
3:  12  12  11  10  12  12  12  12
4:  12  12  12  12  10  11  12  12
5:  12  12  12  12  11  10  12  12
6:  12  12  12  12  12  12  10  11
7:  12  12  12  12  12  12  11  10

```

```

-----
9. /proc/meminfo
MemTotal:      395765912 kB

```

```

-----
10. who -r
run-level 5 Jan 8 03:22

```

```

-----
11. Systemd service manager version: systemd 255 (255.4-lubuntu8.4)
Default Target  Status
graphical       running

```

```

-----
12. Services, from systemctl list-unit-files
STATE          UNIT FILES
enabled        apparmor appport blk-availability cloud-config cloud-final cloud-init cloud-init-local
               console-setup e2scrub_reap finalrd getty@ gpu-manager grub-common grub-initrd-fallback
               keyboard-setup lm-sensors lvm2-monitor multipathd networkd-dispatcher open-iscsi pollinate
               secureboot-db setvtrgb systemd-networkd systemd-networkd-wait-online systemd-pstore
               systemd-resolved systemd-timesyncd thermald
enabled-runtime netplan-ovs-cleanup systemd-fsck-root systemd-remount-fs
disabled       console-getty debug-shell iscsid serial-getty@ ssh systemd-boot-check-no-failures
               systemd-confext systemd-network-generator systemd-networkd-wait-online@
               systemd-pcrlock-file-system systemd-pcrlock-firmware-code systemd-pcrlock-firmware-config
               systemd-pcrlock-machine-id systemd-pcrlock-make-policy
               systemd-pcrlock-secureboot-authority systemd-pcrlock-secureboot-policy systemd-sysext
               systemd-time-wait-sync upower
indirect       systemd-sysupdate systemd-sysupdate-reboot
masked         cryptdisks cryptdisks-early hwclock multipath-tools-boot sudo x11-common

```

```

-----
13. Linux kernel boot-time arguments, from /proc/cmdline
BOOT_IMAGE=/vmlinuz-6.8.0-45-generic
root=/dev/mapper/ubuntu--vg-ubuntu--lv
ro
iommu=pt

```

```

-----
14. cpupower frequency-info
analyzing CPU 3:

```

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## Platform Notes (Continued)

current policy: frequency should be within 1.50 GHz and 3.15 GHz.  
The governor "schedutil" may decide which speed to use within this range.

boost state support:

Supported: yes  
Active: yes  
Boost States: 0  
Total States: 3  
Pstate-P0: 11800MHz

```

-----
15. 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
-----

```

```

-----
16. /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
-----

```

```

-----
17. /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
-----

```

```

-----
18. OS release
From /etc/*-release /etc/*-version
os-release Ubuntu 24.04.1 LTS
-----

```

```

-----
19. Disk information
SPEC is set to: /home/cpu2017
Filesystem                Type      Size  Used Avail Use% Mounted on
/dev/mapper/ubuntu--vg-ubuntu--lv ext4      98G   21G   73G  22% /
-----

```

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## Platform Notes (Continued)

20. /sys/devices/virtual/dmi/id

Vendor: H3C  
Product: R3950 G6  
Product Family: Rack  
Serial: 202311A3SFH20C000109

21. 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:

5x Samsung M321R4GA3EB2-CCPEC 32 GB 2 rank 6400, configured at 6000  
2x Samsung M321R4GA3EB2-CCPKC 32 GB 2 rank 6400, configured at 6000  
3x Samsung M321R4GA3EB2-CCPPC 32 GB 2 rank 6400, configured at 6000  
2x Samsung M321R4GA3EB2-CCPWC 32 GB 2 rank 6400, configured at 6000

22. BIOS

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

BIOS Vendor: American Megatrends International, LLC.  
BIOS Version: 7.30.04  
BIOS Date: 12/10/2024  
BIOS Revision: 5.35  
Firmware Revision: 1.12

## 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

(Continued on next page)



# SPEC CPU®2017 Floating Point Rate Result

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New H3C Technologies Co., Ltd.  
H3C UniServer R3950 G7 (AMD EPYC 9455P)  
AMD EPYC 9455P

SPECrate®2017\_fp\_base = 772  
SPECrate®2017\_fp\_peak = 820

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

**Test Date:** Jan-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

=====  
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  
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

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# SPEC CPU®2017 Floating Point Rate Result

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New H3C Technologies Co., Ltd.

H3C UniServer R3950 G7 (AMD EPYC 9455P)  
AMD EPYC 9455P

SPECrate®2017\_fp\_base = 772

SPECrate®2017\_fp\_peak = 820

CPU2017 License: 9066

Test Sponsor: New H3C Technologies Co., Ltd.

Tested by: New H3C Technologies Co., Ltd.

Test Date: Jan-2025

Hardware Availability: Oct-2024

Software Availability: Oct-2024

## Base Compiler Invocation (Continued)

Benchmarks using both C and C++:

clang++ clang

Benchmarks using Fortran, C, and C++:

clang++ clang flang

## 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

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New H3C Technologies Co., Ltd.

SPECrate®2017\_fp\_base = 772

H3C UniServer R3950 G7 (AMD EPYC 9455P)  
AMD EPYC 9455P

SPECrate®2017\_fp\_peak = 820

CPU2017 License: 9066

Test Date: Jan-2025

Test Sponsor: New H3C Technologies Co., Ltd.

Hardware Availability: Oct-2024

Tested by: New H3C Technologies Co., Ltd.

Software Availability: Oct-2024

## Base Optimization Flags (Continued)

C++ benchmarks (continued):

```
-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  
-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=200000 -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
```

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New H3C Technologies Co., Ltd.  
H3C UniServer R3950 G7 (AMD EPYC 9455P)  
AMD EPYC 9455P

SPECrate®2017\_fp\_base = 772  
SPECrate®2017\_fp\_peak = 820

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

**Test Date:** Jan-2025  
**Hardware Availability:** Oct-2024  
**Software Availability:** Oct-2024

## Base Optimization Flags (Continued)

Benchmarks using Fortran, C, and C++ (continued):

-mllvm -reduce-array-computations=3 -zopt -mllvm -unroll-threshold=100  
-mllvm -loop-unswitch-threshold=200000 -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

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

(Continued on next page)



# SPEC CPU®2017 Floating Point Rate Result

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New H3C Technologies Co., Ltd.

H3C UniServer R3950 G7 (AMD EPYC 9455P)  
AMD EPYC 9455P

SPECrate®2017\_fp\_base = 772

SPECrate®2017\_fp\_peak = 820

CPU2017 License: 9066

Test Sponsor: New H3C Technologies Co., Ltd.

Tested by: New H3C Technologies Co., Ltd.

Test Date: Jan-2025

Hardware Availability: Oct-2024

Software Availability: Oct-2024

## Peak Compiler Invocation (Continued)

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: -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
-freemap-arrays -fstrip-mining
-mllvm -inline-threshold=1000
-mllvm -reduce-array-computations=3 -zopt -lamdlibm
-lamdalloc -ldl
```

538.imagick\_r: Same as 519.lbm\_r

```
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 -freemap-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
```

(Continued on next page)



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New H3C Technologies Co., Ltd.

SPECrate®2017\_fp\_base = 772

H3C UniServer R3950 G7 (AMD EPYC 9455P)  
AMD EPYC 9455P

SPECrate®2017\_fp\_peak = 820

CPU2017 License: 9066

Test Date: Jan-2025

Test Sponsor: New H3C Technologies Co., Ltd.

Hardware Availability: Oct-2024

Tested by: New H3C Technologies Co., Ltd.

Software Availability: Oct-2024

## Peak Optimization Flags (Continued)

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
-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
-freemap-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 -freemap-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++:

(Continued on next page)





# SPEC CPU®2017 Floating Point Rate Result

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H3C UniServer R3950 G7 (AMD EPYC 9455P)  
AMD EPYC 9455P

SPECrate®2017\_fp\_base = 772

SPECrate®2017\_fp\_peak = 820

CPU2017 License: 9066

Test Sponsor: New H3C Technologies Co., Ltd.

Tested by: New H3C Technologies Co., Ltd.

Test Date: Jan-2025

Hardware Availability: Oct-2024

Software Availability: Oct-2024

## Peak Optimization Flags (Continued)

```

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
-freemap-arrays -mllvm -reduce-array-computations=3 -zopt
-mllvm -unroll-threshold=100
-mllvm -loop-unswitch-threshold=200000 -lamdlibm
-lamdalloc -ldl

```

526.blender\_r: basepeak = yes

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-V1.5-Turin.html](http://www.spec.org/cpu2017/flags/New_H3C-Platform-AMD-Settings-V1.5-Turin.html)



# SPEC CPU®2017 Floating Point Rate Result

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SPECrate®2017\_fp\_base = 772  
SPECrate®2017\_fp\_peak = 820

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

**Test Date:** Jan-2025  
**Hardware Availability:** Oct-2024  
**Software Availability:** Oct-2024

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-V1.5-Turin.xml](http://www.spec.org/cpu2017/flags/New_H3C-Platform-AMD-Settings-V1.5-Turin.xml)

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For questions about this result, please contact the tester. For other inquiries, please contact [info@spec.org](mailto:info@spec.org).

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