



# SPEC CPU®2017 Floating Point Speed Result

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**Quanta Cloud Technology**

(Test Sponsor: Quanta Computer Inc.)

**QuantaGrid S44NL-1U**

(2.40 GHz,AMD EPYC 9654)

SPECspeed®2017\_fp\_base = 316

SPECspeed®2017\_fp\_peak = Not Run

**CPU2017 License:** 9050

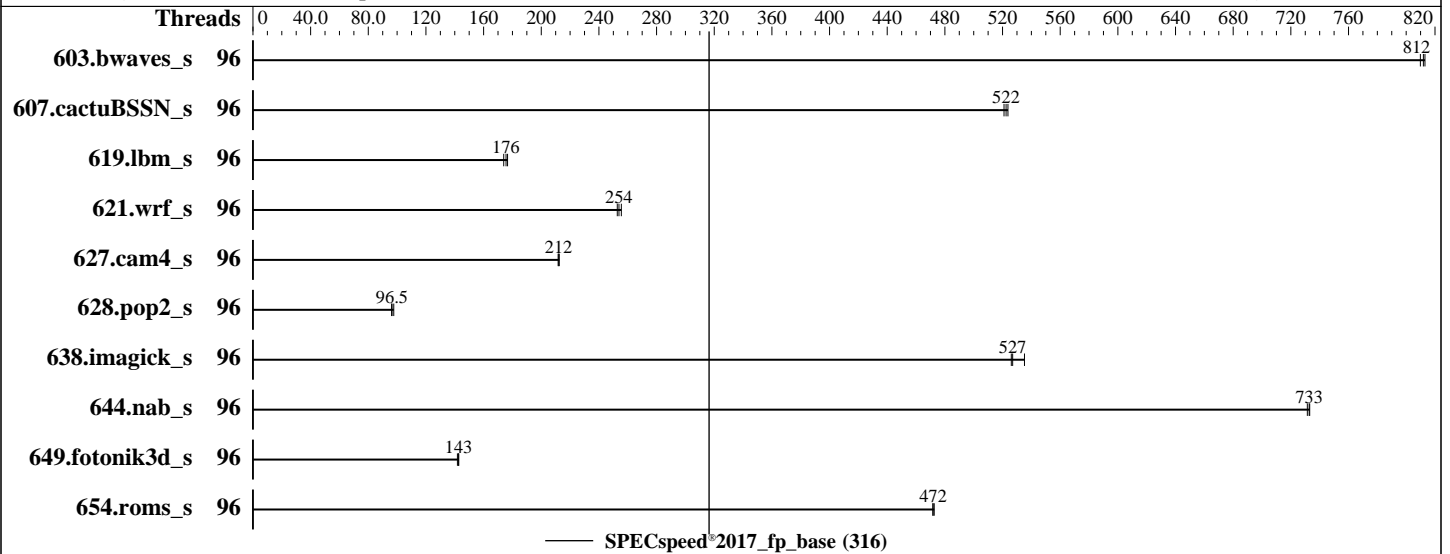
**Test Sponsor:** Quanta Computer Inc.

**Tested by:** Quanta Computer Inc.

**Test Date:** Aug-2023

**Hardware Availability:** Aug-2023

**Software Availability:** Jul-2023



## Hardware

CPU Name: AMD EPYC 9654  
 Max MHz: 3700  
 Nominal: 2400  
 Enabled: 96 cores, 1 chip  
 Orderable: 1 chip  
 Cache L1: 32 KB I + 32 KB D on chip per core  
 L2: 1 MB I+D on chip per core  
 L3: 384 MB I+D on chip per chip,  
 32 MB shared / 8 cores  
 Other: None  
 Memory: 768 GB (12 x 64 GB 2Rx4 PC5-4800B-R)  
 Storage: 1 x 960 GB NVMe SSD  
 Other: None

## Software

OS: SUSE Linux Enterprise Server 15 SP4  
 Kernel 5.14.21-150400.22-default  
 Compiler: C/C++/Fortran: Version 4.0.0 of AOCC  
 Parallel: Yes  
 Firmware: Version 3A08 released Jul-2023  
 File System: xfs  
 System State: Run level 3 (multi-user)  
 Base Pointers: 64-bit  
 Peak Pointers: Not Applicable  
 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						
	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
603.bwaves_s	96	72.6	813	<b><u>72.7</u></b>	<b><u>812</u></b>	72.8	810							
607.cactuBSSN_s	96	32.0	521	31.8	524	<b><u>31.9</u></b>	<b><u>522</u></b>							
619.lbm_s	96	<b><u>29.8</u></b>	<b><u>176</u></b>	30.1	174	29.7	177							
621.wrf_s	96	52.3	253	51.8	256	<b><u>52.1</u></b>	<b><u>254</u></b>							
627.cam4_s	96	41.9	212	<b><u>41.8</u></b>	<b><u>212</u></b>	41.7	212							
628.pop2_s	96	122	97.7	123	96.2	<b><u>123</u></b>	<b><u>96.5</u></b>							
638.imagick_s	96	27.4	526	<b><u>27.4</u></b>	<b><u>527</u></b>	27.0	535							
644.nab_s	96	<b><u>23.8</u></b>	<b><u>733</u></b>	23.8	733	23.9	731							
649.fotonik3d_s	96	63.9	143	64.3	142	<b><u>63.9</u></b>	<b><u>143</u></b>							
654.roms_s	96	33.4	472	<b><u>33.4</u></b>	<b><u>472</u></b>	33.3	473							

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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,  
'echo always > /sys/kernel/mm/transparent\_hugepage/enabled' and  
'echo always > /sys/kernel/mm/transparent\_hugepage/defrag' run as root.

To always enable THP for peak runs of:

603.bwaves\_s, 607.cactuBSSN\_s, 619.lbm\_s, 627.cam4\_s, 628.pop2\_s, 638.imagick\_s, 644.nab\_s, 649.fotonik3d\_s:  
'echo madvise > /sys/kernel/mm/transparent\_hugepage/enabled; echo always > /sys/kernel/mm/transparent\_hugepage/defrag'

(Continued on next page)



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## Operating System Notes (Continued)

run as root.

To disable THP for peak runs of 621.wrf\_s:

```
'echo never > /sys/kernel/mm/transparent_hugepage/enabled; echo always > /sys/kernel/mm/transparent_hugepage/defrag'
```

run as root.

To enable THP only on request for peak runs of 654.roms\_s:

```
'echo madvise > /sys/kernel/mm/transparent_hugepage/enabled; echo madvise > /sys/kernel/mm/transparent_hugepage/defrag'
```

run as root.

## Environment Variables Notes

Environment variables set by runcpu before the start of the run:

GOMP\_CPU\_AFFINITY = "0-95"

LD\_LIBRARY\_PATH = "/root/cpu2017-Genoa-GCC10/amd\_speed\_aocc400\_znver4\_A\_lib/lib:"

LIBOMP\_NUM\_HIDDEN\_HELPER\_THREADS = "0"

MALLOC\_CONF = "oversize\_threshold:0,retain:true"

OMP\_DYNAMIC = "false"

OMP\_SCHEDULE = "static"

OMP\_STACKSIZE = "128M"

OMP\_THREAD\_LIMIT = "96"

## 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 Configuration

ACPI CST C2 Latency set to 18

SMT set to disable

Determinism Control is Manual

Determinism Slider set to Power

cTDP Control set to Manual

cTDP set to 400

PPT Control set to Manual

PPT set to 400

Sysinfo program /root/cpu2017-Genoa-GCC10/bin/sysinfo

Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197

running on localhost Tue Aug 1 02:16:53 2023

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

-----  
Table of contents  
-----

1. uname -a
2. w

(Continued on next page)



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## Platform Notes (Continued)

- 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 249 (249.11+suse.124.g2bc0b2c447)
- 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 localhost 5.14.21-150400.22-default #1 SMP PREEMPT_DYNAMIC Wed May 11 06:57:18 UTC 2022 (49db222)
x86_64 x86_64 x86_64 GNU/Linux
-----
```

```
-----
2. w
02:16:53 up 2:20, 4 users, load average: 0.09, 0.13, 8.54
USER  TTY      FROM            LOGIN@   IDLE   JCPU   PCPU WHAT
root  tty1    -                23:57   2:15m  7.58s  0.00s xinit /etc/X11/xinit/xinitrc --
/etc/X11/xinit/xserverrc :0 vt1 -keeppty -auth /root/.serverauth.2763 -nolisten tcp
root  tty2    -                23:59   12.00s 1.91s  0.09s /bin/bash ./amd_speed_aocc400_znver4_A1.sh
root  tty3    -                01:17   41:17  0.20s  0.17s -bash
root  pts/1   :0               00:05   2:10m  0.03s  0.03s bash
-----
```

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

```
-----
4. ulimit -a
core file size          (blocks, -c) unlimited
data seg size           (kbytes, -d) unlimited
scheduling priority     (-e) 0
file size               (blocks, -f) unlimited
pending signals         (-i) 1545925
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) 1545925
virtual memory          (kbytes, -v) unlimited
file locks              (-x) unlimited
-----
```

(Continued on next page)



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## Platform Notes (Continued)

```

5. sysinfo process ancestry
/usr/lib/systemd/systemd --switched-root --system --deserialize 30
login -- root
-bash
python3 ./run_amd_speed_aocc400_znver4_A1.py
/bin/bash ./amd_speed_aocc400_znver4_A1.sh
runcpu --config amd_speed_aocc400_znver4_A1.cfg --tune base --reportable --iterations 3 fpspeed
runcpu --configfile amd_speed_aocc400_znver4_A1.cfg --tune base --reportable --iterations 3 --nopower
--runmode speed --tune base --size test:train:refspeed fpspeed --nopreenv --note-preenv --logfile
$SPEC/tmp/CPU2017.001/templogs/preenv.fpspeed.001.0.log --lognum 001.0 --from_runcpu 2
specperl $SPEC/bin/sysinfo
$SPEC = /root/cpu2017-Genoa-GCC10

```

```

6. /proc/cpuinfo
model name      : AMD EPYC 9654 96-Core Processor
vendor_id      : AuthenticAMD
cpu family     : 25
model          : 17
stepping       : 1
microcode      : 0xa10113e
bugs           : sysret_ss_attrs spectre_v1 spectre_v2 spec_store_bypass
TLB size      : 3584 4K pages
cpu cores     : 96
siblings       : 96
1 physical ids (chips)
96 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
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
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 2.37.2:

```

Architecture:          x86_64
CPU op-mode(s):        32-bit, 64-bit
Address sizes:         46 bits physical, 57 bits virtual
Byte Order:            Little Endian
CPU(s):                96
On-line CPU(s) list:  0-95
Vendor ID:             AuthenticAMD
Model name:            AMD EPYC 9654 96-Core Processor
CPU family:            25
Model:                 17
Thread(s) per core:   1
Core(s) per socket:   96
Socket(s):             1
Stepping:              1
Frequency boost:      enabled
CPU max MHz:           3707.8120
CPU min MHz:           1500.0000
BogoMIPS:              4792.44
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 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

```

(Continued on next page)



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## Platform Notes (Continued)

```

abm sse4a misalignsse 3dnowprefetch osvw ibs skinit wdt tce topoext
perfctr_core perfctr_nb bpeext perfctr_llc mwaitx cpb cat_l3 cdp_l3
invpcid_single hw_pstate ssbd mba ibrs ibpb stibp 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
xsaves xgetbv1 xsaves cqm_llc cqm_occup_llc cqm_mbm_total cqm_mbm_local
avx512_bf16 clzero irperf xsaveerptr rdpru wbnoinvd amd_ppin arat npt lbrv
svm_lock nrp_save tsc_scale vmcb_clean flushbyasid decodeassists
pausefilter pfthreshold avic v_vmsave_vmload vgif v_spec_ctrl avx512vbmi
umip pku ospke avx512_vbmi2 gfni vaes vpclmulqdq avx512_vnni avx512_bitalg
avx512_vpopcntdq la57 rdpid overflow_recov succor smca fsrm flush_l1d sme
sev sev_es

```

Virtualization:

```

AMD-V
L1d cache: 3 MiB (96 instances)
L1i cache: 3 MiB (96 instances)
L2 cache: 96 MiB (96 instances)
L3 cache: 384 MiB (12 instances)

```

```

NUMA node(s): 1
NUMA node0 CPU(s): 0-95
Vulnerability Itlb multihit: Not affected
Vulnerability L1tf: Not affected
Vulnerability Mds: Not affected
Vulnerability Meltdown: Not affected

```

```

Vulnerability Spec store bypass: Mitigation; Speculative Store Bypass disabled via prctl and seccomp
Vulnerability Spectre v1: Mitigation; usercopy/swapgs barriers and __user pointer sanitization
Vulnerability Spectre v2: Mitigation; Retpolines, IBPB conditional, IBRS_FW, STIBP disabled, RSB
filling

```

```

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	3M	8	Data	1	64	1	64
L1i	32K	3M	8	Instruction	1	64	1	64
L2	1M	96M	8	Unified	2	2048	1	64
L3	32M	384M	16	Unified	3	32768	1	64

8. numactl --hardware

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

```

available: 1 nodes (0)
node 0 cpus: 0-95
node 0 size: 773198 MB
node 0 free: 770940 MB
node distances:
node 0
0: 10

```

9. /proc/meminfo

MemTotal: 791755276 kB

10. who -r

run-level 3 Jul 31 23:57

11. Systemd service manager version: systemd 249 (249.11+suse.124.g2bc0b2c447)

```

Default Target Status
multi-user running

```

(Continued on next page)



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## Platform Notes (Continued)

-----  
12. Services, from `systemctl list-unit-files`

STATE	UNIT FILES
enabled	YaST2-Firstboot YaST2-Second-Stage apparmor auditd cron display-manager firewalld getty@ haveged irqbalance issue-generator kbdsettings klog lvm2-monitor nscd nvme-fc-boot-connections postfix purge-kernels rollback rsyslog smartd sshd wicked wickedd-auto4 wickedd-dhcp4 wickedd-dhcp6 wickedd-nanny
enabled-runtime	systemd-remount-fs
disabled	autofs autyast-initscripts blk-availability boot-sysctl ca-certificates chrony-wait chronyd console-getty cups cups-browsed debug-shell ebttables exchange-bmc-os-info gpm grub2-once haveged-switch-root hwloc-dump-hwdata ipmi ipmievd issue-add-ssh-keys kexec-load lunmask man-db-create multipathd nfs nfs-blkmap nvme-autoconnect rdisc rpcbind rpmconfigcheck rsyncd serial-getty@ smartd-generate_opts snmpd snmptrapd systemd-boot-check-no-failures systemd-network-generator systemd-sysext systemd-time-wait-sync systemd-timesyncd
indirect	wickedd

-----  
13. Linux kernel boot-time arguments, from `/proc/cmdline`

```

BOOT_IMAGE=/boot/vmlinuz-5.14.21-150400.22-default
root=UUID=0cc41f89-8ac0-4222-a067-6a610cf6a136
mitigations=auto
quiet
security=apparmor

```

-----  
14. `cpupower frequency-info`

```

analyzing CPU 0:
  current policy: frequency should be within 1.50 GHz and 2.40 GHz.
                  The governor "performance" may decide which speed to use
                  within this range.

boost state support:
  Supported: yes
  Active: yes

```

-----  
15. `sysctl`

```

kernel.numa_balancing          0
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`

(Continued on next page)



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## Platform Notes (Continued)

```

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 SUSE Linux Enterprise High Performance Computing 15 SP4

```

```

-----
19. Disk information
SPEC is set to: /root/cpu2017-Genoa-GCC10
Filesystem      Type  Size  Used Avail Use% Mounted on
/dev/nvme0n1p2 xfs   717G  16G  702G   3% /

```

```

-----
20. /sys/devices/virtual/dmi/id
Vendor:          Quanta Cloud Technology Inc.
Product:         QuantaGrid S44NL-1U
Product Family: S6NL

```

```

-----
21. dmidecode
Additional information from dmidecode 3.2 follows.  WARNING: Use caution when you interpret this section.
The 'dmidecode' program reads system data which is "intended to allow hardware to be accurately
determined", but the intent may not be met, as there are frequent changes to hardware, firmware, and the
"DMTF SMBIOS" standard.
Memory:
12x SK Hynix HMC94MEBRA123N 64 GB 2 rank 4800

```

```

-----
22. BIOS
(This section combines info from /sys/devices and dmidecode.)
BIOS Vendor:     American Megatrends International, LLC.
BIOS Version:    3A08
BIOS Date:       07/14/2023
BIOS Revision:   5.27
Firmware Revision: 3.12

```

## Compiler Version Notes

```

=====
C | 619.lbm_s(base) 638.imagick_s(base) 644.nab_s(base)
=====

```

```

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

```

(Continued on next page)





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## Compiler Version Notes (Continued)

InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin

=====  
C++, C, Fortran | 607.cactuBSSN\_s(base)

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

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 | 603.bwaves\_s(base) 649.fotonik3d\_s(base) 654.roms\_s(base)

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 | 621.wrf\_s(base) 627.cam4\_s(base) 628.pop2\_s(base)

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

Fortran benchmarks:

flang

Benchmarks using both Fortran and C:

flang clang

Benchmarks using Fortran, C, and C++:

clang++ clang flang



# SPEC CPU®2017 Floating Point Speed Result

Copyright 2017-2023 Standard Performance Evaluation Corporation

**Quanta Cloud Technology**

(Test Sponsor: Quanta Computer Inc.)

**QuantaGrid S44NL-1U**

(2.40 GHz,AMD EPYC 9654)

SPECspeed®2017\_fp\_base = 316

SPECspeed®2017\_fp\_peak = Not Run

**CPU2017 License:** 9050

**Test Sponsor:** Quanta Computer Inc.

**Tested by:** Quanta Computer Inc.

**Test Date:** Aug-2023

**Hardware Availability:** Aug-2023

**Software Availability:** Jul-2023

## Base Portability Flags

```
603.bwaves_s: -DSPEC_LP64
607.cactuBSSN_s: -DSPEC_LP64
619.lbm_s: -DSPEC_LP64
621.wrf_s: -DSPEC_CASE_FLAG -Mbyteswapio -DSPEC_LP64
627.cam4_s: -DSPEC_CASE_FLAG -DSPEC_LP64
628.pop2_s: -DSPEC_CASE_FLAG -Mbyteswapio -DSPEC_LP64
638.imagick_s: -DSPEC_LP64
644.nab_s: -DSPEC_LP64
649.fotonik3d_s: -DSPEC_LP64
654.roms_s: -DSPEC_LP64
```

## Base Optimization Flags

### C benchmarks:

```
-m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3 -O3 -march=znver4
-fveclib=AMDLIBM -ffast-math -fopenmp -flto -fstruct-layout=7
-mllvm -unroll-threshold=50 -mllvm -inline-threshold=1000
-freemap-arrays -fstrip-mining -mllvm -reduce-array-computations=3
-DSPEC_OPENMP -zopt -fopenmp=libomp -lomp -lamdlibm -lamdalloc
-lflang
```

### Fortran benchmarks:

```
-m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-enable-X86-prefetching -DSPEC_OPENMP -O3 -march=znver4
-fveclib=AMDLIBM -ffast-math -fopenmp -flto -Mrecursive
-funroll-loops -mllvm -lsr-in-nested-loop
-mllvm -reduce-array-computations=3 -zopt -fopenmp=libomp -lomp
-lamdlibm -lamdalloc -lflang
```

### 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 -O3 -march=znver4
-fveclib=AMDLIBM -ffast-math -fopenmp -flto -fstruct-layout=7
-mllvm -unroll-threshold=50 -mllvm -inline-threshold=1000
-freemap-arrays -fstrip-mining -mllvm -reduce-array-computations=3
-DSPEC_OPENMP -zopt -Mrecursive -funroll-loops
-mllvm -lsr-in-nested-loop -fopenmp=libomp -lomp -lamdlibm -lamdalloc
-lflang
```

### Benchmarks using Fortran, C, and C++:

```
-m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
```

(Continued on next page)



# SPEC CPU®2017 Floating Point Speed Result

Copyright 2017-2023 Standard Performance Evaluation Corporation

**Quanta Cloud Technology**

(Test Sponsor: Quanta Computer Inc.)

**QuantaGrid S44NL-1U**

(2.40 GHz,AMD EPYC 9654)

SPECspeed®2017\_fp\_base = 316

SPECspeed®2017\_fp\_peak = Not Run

**CPU2017 License:** 9050

**Test Sponsor:** Quanta Computer Inc.

**Tested by:** Quanta Computer Inc.

**Test Date:** Aug-2023

**Hardware Availability:** Aug-2023

**Software Availability:** Jul-2023

## Base Optimization Flags (Continued)

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

```
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-x86-use-vzeroupper=false -O3 -march=znver4
-fveclib=AMDLIBM -ffast-math -fopenmp -flto -fstruct-layout=7
-mllvm -unroll-threshold=50 -mllvm -inline-threshold=1000
-fremap-arrays -fstrip-mining -mllvm -reduce-array-computations=3
-DSPEC_OPENMP -zopt -mllvm -unroll-threshold=100 -finline-aggressive
-mllvm -loop-unswitch-threshold=200000 -Mrecursive -funroll-loops
-mllvm -lsr-in-nested-loop -fopenmp=libomp -lomp -lamdlibm -lamdalloc
-lflang
```

## Base Other Flags

C benchmarks:

```
-Wno-return-type -Wno-unused-command-line-argument
```

Fortran benchmarks:

```
-Wno-unused-command-line-argument
```

Benchmarks using both Fortran and C:

```
-Wno-return-type -Wno-unused-command-line-argument
```

Benchmarks using Fortran, C, and C++:

```
-Wno-return-type -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/aocc400-flags.html>

[http://www.spec.org/cpu2017/flags/Quanta-Computer-Inc-amd-speccpu-setting-v1\\_AMD\\_Genoa.html](http://www.spec.org/cpu2017/flags/Quanta-Computer-Inc-amd-speccpu-setting-v1_AMD_Genoa.html)

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

<http://www.spec.org/cpu2017/flags/aocc400-flags.xml>

[http://www.spec.org/cpu2017/flags/Quanta-Computer-Inc-amd-speccpu-setting-v1\\_AMD\\_Genoa.xml](http://www.spec.org/cpu2017/flags/Quanta-Computer-Inc-amd-speccpu-setting-v1_AMD_Genoa.xml)

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