SPEC CPU®2017 Floating Point Speed Result

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Quanta Cloud Technology
(Test Sponsor: Quanta Computer Inc.)

QuantaGrid S44NL-1U
(2.25 GHz,AMD EPYC 9754)

$SPECspeed®2017\_fp\_base =$ 307

$SPECspeed®2017\_fp\_peak =$ Not Run

CPU2017 License: 9050

Test Sponsor: Quanta Computer Inc.

Tested by: Quanta Computer Inc.

Test Date: Dec-2023

Hardware Availability: Nov-2023

Software Availability: Nov-2022

Benchmark	Threads	Result
603.bwaves_s	128	910
607.cactuBSSN_s	128	516
619.lbm_s	128	183
621.wrf_s	128	194
627.cam4_s	128	191
628.pop2_s	128	87.7
638.imagick_s	128	590
644.nab_s	128	767
649.fotonik3d_s	128	140
654.roms_s	128	418

SPECspeed®2017_fp_base (307)

Hardware

CPU Name: AMD EPYC 9754
 Max MHz: 3100
 Nominal: 2250
Enabled: 128 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: 256 MB I+D on chip per chip,
 16 MB shared / 8 cores
 Other: None
Memory: 384 GB (12 x 32 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 3A09 released Aug-2023
File System: xfs
System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: Not Applicable
Other: None
Power Management: BIOS and OS set to prefer performance
 at the cost of additional power usage.

Standard Performance Evaluation Corporation (info@spec.org)

https://www.spec.org/

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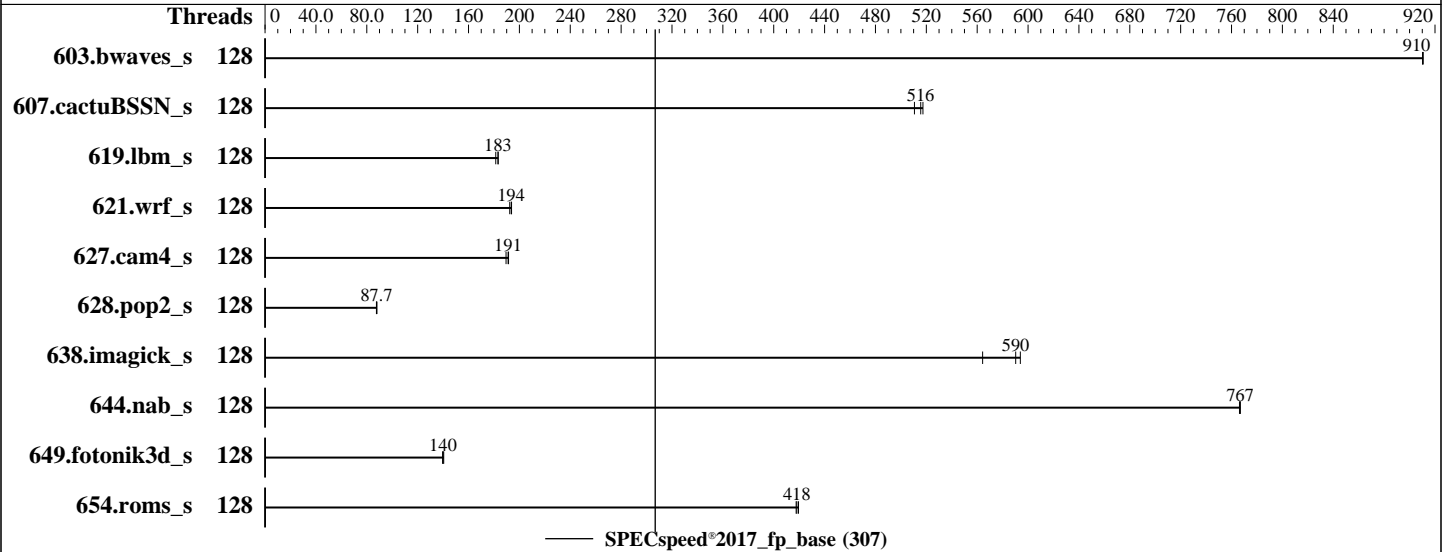
SPECspeed®2017_fp_peak = Not Run

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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	128	64.8	910	64.8	911	**64.8**	**910**							
607.cactuBSSN_s	128	32.6	511	32.2	517	**32.3**	**516**							
619.lbm_s	128	28.6	183	28.9	181	**28.6**	**183**							
621.wrf_s	128	68.7	192	**68.3**	**194**	68.2	194							
627.cam4_s	128	46.8	190	**46.4**	**191**	46.3	191							
628.pop2_s	128	**135**	**87.7**	136	87.6	135	88.0							
638.imagick_s	128	**24.4**	**590**	24.3	594	25.6	564							
644.nab_s	128	22.8	766	**22.8**	**767**	22.8	767							
649.fotonik3d_s	128	65.3	140	**65.1**	**140**	64.9	140							
654.roms_s	128	**37.6**	**418**	37.7	418	37.5	419							

SPECspeed®2017_fp_base =	**307**
SPECspeed®2017_fp_peak =	**Not Run**

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'
```

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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 = "0-127"
LD_LIBRARY_PATH = "/root/speccpu/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 = "128"
```

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/speccpu/bin/sysinfo
 Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
 running on localhost Sun Dec 17 10:40:34 2023

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

 ------------------------------------------------------------
 Table of contents
 ------------------------------------------------------------
  1. uname -a
  2. w
  3. Username
```

(Continued on next page)

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Test Date: Dec-2023

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Platform Notes (Continued)

```
  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
     10:40:34 up 59 min,  1 user,  load average: 72.47, 105.81, 110.35
    USER      TTY      FROM             LOGIN@   IDLE   JCPU   PCPU WHAT
    root      tty1     -                09:41   59:33   1.38s  0.04s /bin/bash ./amd_speed_aocc400_znver4_A1.sh

    ------------------------------------------------------------
  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) 1545166
    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) 1545166
    virtual memory          (kbytes, -v) unlimited
    file locks                      (-x) unlimited


    ------------------------------------------------------------
  5. sysinfo process ancestry
   /usr/lib/systemd/systemd --switched-root --system --deserialize 30
   login -- root
   -bash
```

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Platform Notes (Continued)

```
 /bin/bash ./test.sh
 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/speccpu


 ------------------------------------------------------------
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
    TLB size         : 3584 4K pages
    cpu cores        : 128
    siblings         : 128
    1 physical ids (chips)
    128 processors (hardware threads)
    physical id 0: core ids
    0-7,16-23,32-39,48-55,64-71,80-87,96-103,112-119,128-135,144-151,160-167,176-183,192-199,208-215,224-231,
    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
  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):                    128
   On-line CPU(s) list:       0-127
   Vendor ID:                 AuthenticAMD
   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):                 1
   Stepping:                  1
   Frequency boost:           enabled
   CPU max MHz:               3100.3411
   CPU min MHz:               1500.0000
   BogoMIPS:                  4492.85
   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
```

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Platform Notes (Continued)

```
                 abm sse4a misalignsse 3dnowprefetch osvw ibs skinit wdt tce topoext
                 perfctr_core perfctr_nb bpext perfctr_llc mwaitx cpb cat_l3 cdp_l3
                 invpcid_single hw_pstate ssbd mba 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
                 xsavec 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 nrip_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:                  4 MiB (128 instances)
  L1i cache:                  4 MiB (128 instances)
  L2 cache:                   128 MiB (128 instances)
  L3 cache:                   256 MiB (16 instances)
  NUMA node(s):               1
  NUMA node0 CPU(s):          0-127
  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      4M   8 Data            1    64      1            64
    L1i      32K      4M   8 Instruction     1    64      1            64
    L2        1M    128M   8 Unified         2  2048      1            64
    L3       16M    256M  16 Unified         3 16384      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: 0-127
  node 0 size: 386315 MB
  node 0 free: 385137 MB
  node distances:
  node   0
    0:  10

-----------------------------------------------------------
9. /proc/meminfo
   MemTotal:       395587272 kB

-----------------------------------------------------------
10. who -r
   run-level 3 Dec 17 09:41

-----------------------------------------------------------
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
                        nvmefc-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 autoyast-initscripts blk-availability boot-sysctl ca-certificates chrony-wait
                        chronyd console-getty cups cups-browsed debug-shell ebtables 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 nvmf-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 2.25 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/speccpu
  Filesystem      Type  Size  Used Avail Use% Mounted on
  /dev/nvme0n1p2 xfs   717G   68G  649G  10% /


    ----------------------------------------------------------
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 HMCG88MEBRA113N 32 GB 2 rank 4800



    ----------------------------------------------------------
22. BIOS
(This section combines info from /sys/devices and dmidecode.)
    BIOS Vendor:       American Megatrends International, LLC.
    BIOS Version:      3A09
    BIOS Date:         08/08/2023
    BIOS Revision:     5.27
    Firmware Revision: 3.17
```

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
```

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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

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Quanta Cloud Technology
(Test Sponsor: Quanta Computer Inc.)

QuantaGrid S44NL-1U
(2.25 GHz,AMD EPYC 9754)

SPECspeed®2017_fp_base =   307

SPECspeed®2017_fp_peak = Not Run

CPU2017 License: 9050		**Test Date:**	Dec-2023
Test Sponsor:	Quanta Computer Inc.	**Hardware Availability:**	Nov-2023
Tested by:	Quanta Computer Inc.	**Software Availability:**	Nov-2022

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
-fremap-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
-fremap-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)

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

SPEC CPU®2017 Floating Point Speed Result

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Quanta Cloud Technology
(Test Sponsor: Quanta Computer Inc.)

QuantaGrid S44NL-1U
(2.25 GHz,AMD EPYC 9754)

SPECspeed®2017_fp_base =   307

SPECspeed®2017_fp_peak = Not Run

CPU2017 License: 9050		**Test Date:**	Dec-2023
Test Sponsor: Quanta Computer Inc.		**Hardware Availability:**	Nov-2023
Tested by: Quanta Computer Inc.		**Software Availability:**	Nov-2022

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-A1.2.html
http://www.spec.org/cpu2017/flags/Quanta-Computer-Inc-amd-speccpu-setting-v1_AMD_Bergamo.html

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

http://www.spec.org/cpu2017/flags/aocc400-flags-A1.2.xml
http://www.spec.org/cpu2017/flags/Quanta-Computer-Inc-amd-speccpu-setting-v1_AMD_Bergamo.xml

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

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