SPEC CPU®2017 Floating Point Speed Result

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Tyrone Systems
(Test Sponsor: Netweb Pte Ltd)

(Tyrone Camarero SDA200A2N-212)
(3.10 GHz, AMD EPYC 9554)

$SPECspeed^®2017\_fp\_base = 354$

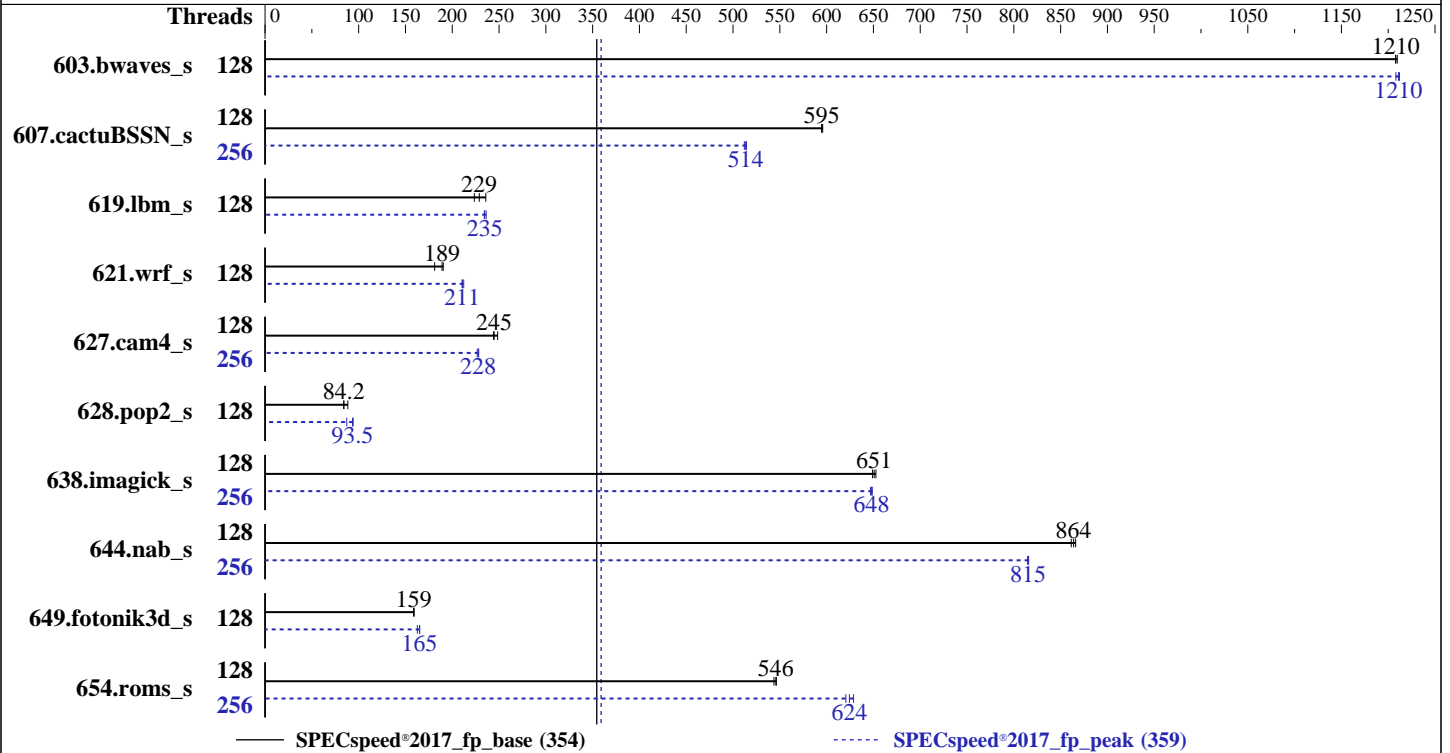$SPECspeed^®2017\_fp\_peak = 359$

CPU2017 License: 6042

Test Sponsor: Netweb Pte Ltd

Tested by: Tyrone Systems

Test Date: Jan-2024

Hardware Availability: Jun-2023

Software Availability: Nov-2023

Benchmark results chart (Threads):

- **603.bwaves_s** 128: base 1210; peak (128) 1210
- **607.cactuBSSN_s** 128: base 595; 256 peak 514
- **619.lbm_s** 128: base 229; peak 235
- **621.wrf_s** 128: base 189; peak 211
- **627.cam4_s** 128: base 245; 256 peak 228
- **628.pop2_s** 128: base 84.2; peak 93.5
- **638.imagick_s** 128: base 651; 256 peak 648
- **644.nab_s** 128: base 864; 256 peak 815
- **649.fotonik3d_s** 128: base 159; peak 165
- **654.roms_s** 128: base 546; 256 peak 624

SPECspeed®2017_fp_base (354) — SPECspeed®2017_fp_peak (359)

Hardware

CPU Name: AMD EPYC 9554
- Max MHz: 3750
- Nominal: 3100
- Enabled: 256 cores, 2 chips, 2 threads/core
- Orderable: 1,2 chips
- Cache L1: 32 KB I + 32 KB D on chip per core
- L2: 1 MB I+D on chip per core
- L3: 256 MB I+D on chip per chip, 32 MB shared / 8 cores
- Other: None
- Memory: 1 TB (16 x 64 GB 2Rx4 PC5-4800B-R)
- Storage: 1 x 1 TB NVMe
- Other: None

Software

OS: Ubuntu 20.04.4 LTS
kernel version
5.15.0-89-generic
- Compiler: C/C++/Fortran: Version 4.0.0 of AOCC
- Parallel: Yes
- Firmware: Version 1.6 released Nov-2023
- File System: ext4
- System State: Run level 3 (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.

Standard Performance Evaluation Corporation (info@spec.org)

https://www.spec.org/

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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	48.8	1210	48.8	1210	**48.8**	**1210**	128	48.8	1210	**48.7**	**1210**	48.7	1210
607.cactuBSSN_s	128	28.0	596	28.0	595	**28.0**	**595**	256	32.6	512	32.4	514	**32.5**	**514**
619.lbm_s	128	23.4	224	**22.9**	**229**	22.2	236	128	**22.3**	**235**	22.4	234	22.2	236
621.wrf_s	128	**69.9**	**189**	73.0	181	69.5	190	128	**62.8**	**211**	62.3	212	62.8	211
627.cam4_s	128	36.3	244	35.7	249	**36.2**	**245**	256	39.1	227	38.8	228	**38.9**	**228**
628.pop2_s	128	**141**	**84.2**	134	88.4	141	84.1	128	126	94.1	**127**	**93.5**	136	87.3
638.imagick_s	128	22.1	653	**22.2**	**651**	22.2	649	256	22.3	647	**22.3**	**648**	22.2	649
644.nab_s	128	20.2	866	**20.2**	**864**	20.3	861	256	21.4	816	**21.4**	**815**	21.4	815
649.fotonik3d_s	128	57.4	159	57.3	159	**57.3**	**159**	128	**55.2**	**165**	56.0	163	55.2	165
654.roms_s	128	**28.8**	**546**	28.8	546	29.0	544	256	**25.2**	**624**	25.0	629	25.4	621
SPECspeed®2017_fp_base =		**354**												
SPECspeed®2017_fp_peak =		**359**												

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) only on request for base runs,
'echo madvise > /sys/kernel/mm/transparent_hugepage/enabled' run as root.
To enable THP for all allocations for peak runs,
'echo always > /sys/kernel/mm/transparent_hugepage/enabled' and
'echo always > /sys/kernel/mm/transparent_hugepage/defrag' run as root.
```

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Environment Variables Notes

```
Environment variables set by runcpu before the start of the run:
GOMP_CPU_AFFINITY = "0-255"
LD_LIBRARY_PATH = "/home/cpu2017/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 = "256"

Environment variables set by runcpu during the 603.bwaves_s peak run:
GOMP_CPU_AFFINITY = "0-127"

Environment variables set by runcpu during the 607.cactuBSSN_s peak run:
GOMP_CPU_AFFINITY = "0-255"

Environment variables set by runcpu during the 619.lbm_s peak run:
GOMP_CPU_AFFINITY = "0-127"

Environment variables set by runcpu during the 621.wrf_s peak run:
GOMP_CPU_AFFINITY = "0-127"

Environment variables set by runcpu during the 627.cam4_s peak run:
GOMP_CPU_AFFINITY = "0-255"

Environment variables set by runcpu during the 628.pop2_s peak run:
GOMP_CPU_AFFINITY = "0-127"

Environment variables set by runcpu during the 638.imagick_s peak run:
GOMP_CPU_AFFINITY = "0-255"

Environment variables set by runcpu during the 644.nab_s peak run:
GOMP_CPU_AFFINITY = "0-255"

Environment variables set by runcpu during the 649.fotonik3d_s peak run:
GOMP_CPU_AFFINITY = "0-127"
PGHPF_ZMEM = "yes"

Environment variables set by runcpu during the 654.roms_s peak run:
GOMP_CPU_AFFINITY = "0 128 1 129 2 130 3 131 4 132 5 133 6 134 7 135 8 136 9 137 10 138 11 139 12 140 13
      141 14 142 15 143 16 144 17 145 18 146 19 147 20 148 21 149 22 150 23 151 24 152 25 153 26 154 27 155
      28 156 29 157 30 158 31 159 32 160 33 161 34 162 35 163 36 164 37 165 38 166 39 167 40 168 41 169 42
      170 43 171 44 172 45 173 46 174 47 175 48 176 49 177 50 178 51 179 52 180 53 181 54 182 55 183 56 184
      57 185 58 186 59 187 60 188 61 189 62 190 63 191 64 192 65 193 66 194 67 195 68 196 69 197 70 198 71
      199 72 200 73 201 74 202 75 203 76 204 77 205 78 206 79 207 80 208 81 209 82 210 83 211 84 212 85 213
      86 214 87 215 88 216 89 217 90 218 91 219 92 220 93 221 94 222 95 223 96 224 97 225 98 226 99 227 100
      228 101 229 102 230 103 231 104 232 105 233 106 234 107 235 108 236 109 237 110 238 111 239 112 240
      113 241 114 242 115 243 116 244 117 245 118 246 119 247 120 248 121 249 122 250 123 251 124 252 125
      253 126 254 127 255"
```

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.
```

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Software Availability: Nov-2023

General Notes (Continued)

Yes: The test sponsor attests, as of date of publication, that CVE-2017-5715 (Spectre variant 2)
is mitigated in the system as tested and documented.

Platform Notes

```
BIOS Settings:
cTDP: 400
Determinism Slider set to Power
Package Power: 400
EDC: 400
ACPI SRAT L3 Cache as NUMA Domain: enabled
Memory interleaving: Disabled
4-link xGMI max speed: 16Gbps
Fan Speed: Maximum

 Sysinfo program /home/cpu2017/bin/sysinfo
 Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
 running on amd2-Super-Server Sat Jan  6 19:54:08 2024

 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 245 (245.4-4ubuntu3.20)
 12. Failed units, from systemctl list-units --state=failed
 13. Services, from systemctl list-unit-files
 14. Linux kernel boot-time arguments, from /proc/cmdline
 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 amd2-Super-Server 5.15.0-89-generic #99~20.04.1-Ubuntu SMP Thu Nov 2 15:16:47 UTC 2023 x86_64 x86_64
   x86_64 GNU/Linux


 ------------------------------------------------------------
 2. w
    19:54:08 up 1 day,  6:05,  2 users,  load average: 5.90, 6.26, 3.74
    USER     TTY      FROM             LOGIN@   IDLE   JCPU   PCPU WHAT
    root     tty1     -                04Dec23  3:21m  2.05s  0.63s /bin/bash ./amd_speed_aocc400_znver4_A1.sh
```

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Platform Notes (Continued)

```
  root     tty3      -                 Fri13  29:54m  0.04s  0.02s -bash


   --------------------------------------------------------
   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               4126565
    nofiles               1024
    vmemory(kbytes)       unlimited
    locks                 unlimited
    rtprio                0


   --------------------------------------------------------
   5. sysinfo process ancestry
    /sbin/init splash
    /bin/login -p --
    -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 all --reportable --iterations 3 fpspeed
    runcpu --configfile amd_speed_aocc400_znver4_A1.cfg --tune all --reportable --iterations 3 --nopower
      --runmode speed --tune base:peak --size test:train:refspeed fpspeed --nopreenv --note-preenv --logfile
      $SPEC/tmp/CPU2017.002/templogs/preenv.fpspeed.002.0.log --lognum 002.0 --from_runcpu 2
    specperl $SPEC/bin/sysinfo
   $SPEC = /home/cpu2017


   --------------------------------------------------------
   6. /proc/cpuinfo
      model name       : AMD EPYC 9554 64-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 srso
      TLB size         : 3584 4K pages
      cpu cores        : 64
      siblings         : 128
      2 physical ids (chips)
      256 processors (hardware threads)
      physical id 0: core ids 0-63
      physical id 1: core ids 0-63
      physical id 0: apicids 0-127
      physical id 1: apicids 128-255
     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 2.34:
```

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Platform Notes (Continued)

```
Architecture:                        x86_64
CPU op-mode(s):                      32-bit, 64-bit
Byte Order:                          Little Endian
Address sizes:                       52 bits physical, 57 bits virtual
CPU(s):                              256
On-line CPU(s) list:                 0-255
Thread(s) per core:                  2
Core(s) per socket:                  64
Socket(s):                           2
NUMA node(s):                        2
Vendor ID:                           AuthenticAMD
CPU family:                          25
Model:                               17
Model name:                          AMD EPYC 9554 64-Core Processor
Stepping:                            1
Frequency boost:                     enabled
CPU MHz:                             1500.000
CPU max MHz:                         3762.9880
CPU min MHz:                         1500.0000
BogoMIPS:                            6199.82
Virtualization:                      AMD-V
L1d cache:                           4 MiB
L1i cache:                           4 MiB
L2 cache:                            128 MiB
L3 cache:                            512 MiB
NUMA node0 CPU(s):                   0-63,128-191
NUMA node1 CPU(s):                   64-127,192-255
Vulnerability Gather data sampling:  Not affected
Vulnerability Itlb multihit:         Not affected
Vulnerability L1tf:                  Not affected
Vulnerability Mds:                   Not affected
Vulnerability Meltdown:              Not affected
Vulnerability Mmio stale data:       Not affected
Vulnerability Retbleed:              Not affected
Vulnerability Spec rstack overflow:  Mitigation; safe RET
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 always-on, RSB
                                     filling, PBRSB-eIBRS Not affected
Vulnerability Srbds:                 Not affected
Vulnerability Tsx async abort:       Not affected
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 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 cppc 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

   From lscpu --cache:
```

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Platform Notes (Continued)

```
        NAME ONE-SIZE ALL-SIZE WAYS TYPE         LEVEL
        L1d      32K      4M   8 Data            1
        L1i      32K      4M   8 Instruction     1
        L2        1M    128M   8 Unified         2
        L3       32M    512M  16 Unified         3


    ------------------------------------------------------------
    8. numactl --hardware
    NOTE: a numactl 'node' might or might not correspond to a physical chip.
      available: 2 nodes (0-1)
      node 0 cpus: 0-63,128-191
      node 0 size: 515707 MB
      node 0 free: 513416 MB
      node 1 cpus: 64-127,192-255
      node 1 size: 516009 MB
      node 1 free: 513140 MB
      node distances:
      node   0   1
        0:  10  32
        1:  32  10


    ------------------------------------------------------------
    9. /proc/meminfo
      MemTotal:       1056477736 kB


    ------------------------------------------------------------
    10. who -r
      run-level 3 Dec 4 14:24


    ------------------------------------------------------------
    11. Systemd service manager version: systemd 245 (245.4-4ubuntu3.20)
      Default Target  Status
      multi-user      degraded


    ------------------------------------------------------------
    12. Failed units, from systemctl list-units --state=failed
        UNIT                 LOAD    ACTIVE SUB    DESCRIPTION
      * fwupd-refresh.service loaded failed failed Refresh fwupd metadata and update motd


    ------------------------------------------------------------
    13. Services, from systemctl list-unit-files
      STATE            UNIT FILES
      enabled          ModemManager NetworkManager NetworkManager-dispatcher NetworkManager-wait-online
                       accounts-daemon anacron apparmor autovt@ avahi-daemon bluetooth console-setup cron cups
                       cups-browsed dmesg e2scrub_reap getty@ gpu-manager grub-common grub-initrd-fallback
                       irqbalance kerneloops keyboard-setup network-manager networkd-dispatcher ondemand openvpn
                       pppd-dns rsync rsyslog secureboot-db setvtrgb snapd ssh sshd switcheroo-control syslog
                       systemd-pstore systemd-resolved systemd-timesyncd thermald ua-reboot-cmds udisks2 ufw
                       unattended-upgrades whoopsie wpa_supplicant
      enabled-runtime  netplan-ovs-cleanup systemd-fsck-root systemd-remount-fs
      disabled         acpid brltty console-getty debug-shell ipmievd openvpn-client@ openvpn-server@ openvpn@
                       rtkit-daemon serial-getty@ speech-dispatcher speech-dispatcherd
                       systemd-boot-check-no-failures systemd-network-generator systemd-networkd
                       systemd-networkd-wait-online systemd-time-wait-sync upower wpa_supplicant-nl80211@
                       wpa_supplicant-wired@ wpa_supplicant@
      generated        apport ipmidrv openipmi
      indirect         display-manager lightdm saned@ spice-vdagent spice-vdagentd uuidd
      masked           alsa-utils cryptdisks cryptdisks-early hwclock pulseaudio-enable-autospawn rc rcS saned
                       sudo x11-common
```

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Platform Notes (Continued)

```
-----------------------------------------------------------
14. Linux kernel boot-time arguments, from /proc/cmdline
   BOOT_IMAGE=/boot/vmlinuz-5.15.0-89-generic
   root=UUID=1ae71a13-cac0-48f6-b6e6-e15e5e687f57
   ro
   quiet
   splash
   vt.handoff=7


-----------------------------------------------------------
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 20.04.4 LTS


-----------------------------------------------------------
19. Disk information
SPEC is set to: /home/cpu2017
   Filesystem     Type  Size  Used Avail Use% Mounted on
   /dev/nvme0n1p2 ext4  938G   20G  871G   3% /


-----------------------------------------------------------
```

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(Tyrone Camarero SDA200A2N-212)
(3.10 GHz, AMD EPYC 9554)

SPECspeed®2017_fp_base = 354

SPECspeed®2017_fp_peak = 359

CPU2017 License: 6042

Test Sponsor: Netweb Pte Ltd

Tested by: Tyrone Systems

Test Date: Jan-2024

Hardware Availability: Jun-2023

Software Availability: Nov-2023

Platform Notes (Continued)

```
  20. /sys/devices/virtual/dmi/id
      Vendor:         Tyrone Systems
      Product:        Tyrone Camarero SDA200A2N-212
      Product Family: SMC H13
      Serial:         A509935X3C07492


      -------------------------------------------------------------
  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:
        8x NO DIMM NO DIMM
        16x Samsung M321R8GA0BB0-CQKZJ 64 GB 2 rank 4800



      -------------------------------------------------------------
  22. BIOS
  (This section combines info from /sys/devices and dmidecode.)
      BIOS Vendor:        American Megatrends International, LLC.
      BIOS Version:       1.6
      BIOS Date:          11/16/2023
      BIOS Revision:      5.27
```

Compiler Version Notes

```
==============================================================================
C               | 619.lbm_s(base, peak) 638.imagick_s(base, peak) 644.nab_s(base, peak)
------------------------------------------------------------------------------
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#434 2022_10_28) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin
------------------------------------------------------------------------------


==============================================================================
C++, C, Fortran | 607.cactuBSSN_s(base, peak)
------------------------------------------------------------------------------
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#434 2022_10_28) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#434 2022_10_28) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin
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, peak) 649.fotonik3d_s(base, peak) 654.roms_s(base, peak)
------------------------------------------------------------------------------
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#434 2022_10_28) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
```

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Tyrone Systems
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(3.10 GHz, AMD EPYC 9554)

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CPU2017 License: 6042
Test Sponsor: Netweb Pte Ltd
Tested by: Tyrone Systems

Test Date: Jan-2024
Hardware Availability: Jun-2023
Software Availability: Nov-2023

Compiler Version Notes (Continued)

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


================================================================================
Fortran, C     | 621.wrf_s(base, peak) 627.cam4_s(base, peak) 628.pop2_s(base, peak)
--------------------------------------------------------------------------------
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#434 2022_10_28) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#434 2022_10_28) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin
--------------------------------------------------------------------------------
```

Base Compiler Invocation

C benchmarks:
`clang`

Fortran benchmarks:
`flang`

Benchmarks using both Fortran and C:
`flang clang`

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

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`

SPEC CPU®2017 Floating Point Speed Result

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Tyrone Systems
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(Tyrone Camarero SDA200A2N-212)
(3.10 GHz, AMD EPYC 9554)

$SPECspeed®2017\_fp\_base = 354$

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CPU2017 License: 6042		**Test Date:**	Jan-2024
Test Sponsor:	Netweb Pte Ltd	**Hardware Availability:**	Jun-2023
Tested by:	Tyrone Systems	**Software Availability:**	Nov-2023

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
-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
```

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SPECspeed®2017_fp_base = 354

SPECspeed®2017_fp_peak = 359

CPU2017 License: 6042
Test Sponsor: Netweb Pte Ltd
Tested by: Tyrone Systems

Test Date: Jan-2024
Hardware Availability: Jun-2023
Software Availability: Nov-2023

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
```

Peak 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
```

Peak Portability Flags

```
Same as Base Portability Flags
```

Peak Optimization Flags

C benchmarks:

```
619.lbm_s: -m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3 -Ofast
-march=znver4 -fveclib=AMDLIBM -ffast-math -fopenmp
-flto -fstruct-layout=9 -mllvm -unroll-threshold=50
-fremap-arrays -fstrip-mining
-mllvm -inline-threshold=1000
```

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Tyrone Systems
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Peak Optimization Flags (Continued)

619.lbm_s (continued):
```
-mllvm -reduce-array-computations=3 -DSPEC_OPENMP -zopt
-fopenmp=libomp -lomp -lamdlibm -lamdalloc -lflang
```

638.imagick_s: `Same as 619.lbm_s`

644.nab_s: `-m64 -Wl,-mllvm -Wl,-region-vectorize -Ofast`
```
-march=znver4 -fveclib=AMDLIBM -ffast-math -fopenmp
-flto -fstruct-layout=9 -mllvm -unroll-threshold=50
-fremap-arrays -fstrip-mining
-mllvm -inline-threshold=1000
-mllvm -reduce-array-computations=3 -DSPEC_OPENMP -zopt
-fopenmp=libomp -lomp -lamdlibm -lamdalloc -lflang
```

Fortran benchmarks:

603.bwaves_s: `-m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6`
```
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-enable-X86-prefetching -DSPEC_OPENMP
-Ofast -march=znver4 -fveclib=AMDLIBM -ffast-math
-fopenmp -Mrecursive -mllvm -reduce-array-computations=3
-fvector-transform -fscalar-transform -fopenmp=libomp
-lomp -lamdlibm -lamdalloc -lflang
```

649.fotonik3d_s: `-m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6`
```
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-enable-X86-prefetching -DSPEC_OPENMP
-Ofast -march=znver4 -fveclib=AMDLIBM -ffast-math
-fopenmp -flto -Mrecursive
-mllvm -reduce-array-computations=3 -zopt -fopenmp=libomp
-lomp -lamdlibm -lamdalloc -lflang
```

654.roms_s: `Same as 603.bwaves_s`

Benchmarks using both Fortran and C:

621.wrf_s: `-m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6`
```
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-enable-X86-prefetching -Ofast
-march=znver4 -fveclib=AMDLIBM -ffast-math -fopenmp
-flto -fstruct-layout=9 -mllvm -unroll-threshold=50
-fremap-arrays -fstrip-mining
-mllvm -inline-threshold=1000
-mllvm -reduce-array-computations=3 -DSPEC_OPENMP -zopt
-O3 -Mrecursive -funroll-loops -mllvm -lsr-in-nested-loop
-fopenmp=libomp -lomp -lamdlibm -lamdalloc -lflang
```

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SPEC CPU®2017 Floating Point Speed Result

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Tyrone Systems
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Peak Optimization Flags (Continued)

```
627.cam4_s: -m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-enable-X86-prefetching -Ofast
-march=znver4 -fveclib=AMDLIBM -ffast-math -fopenmp
-flto -fstruct-layout=9 -mllvm -unroll-threshold=50
-fremap-arrays -fstrip-mining
-mllvm -inline-threshold=1000
-mllvm -reduce-array-computations=3 -DSPEC_OPENMP -zopt
-Mrecursive -fopenmp=libomp -lomp -lamdlibm -lamdalloc
-lflang
```

```
628.pop2_s: -m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-enable-X86-prefetching -Ofast
-march=znver4 -fveclib=AMDLIBM -ffast-math -fopenmp
-flto -fstruct-layout=9 -mllvm -unroll-threshold=50
-fremap-arrays -fstrip-mining
-mllvm -inline-threshold=1000
-mllvm -reduce-array-computations=3 -DSPEC_OPENMP -zopt
-Mrecursive -fvector-transform -fscalar-transform
-fopenmp=libomp -lomp -lamdlibm -lamdalloc -lflang
```

Benchmarks using Fortran, C, and C++:
```
-m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-x86-use-vzeroupper=false -Ofast -march=znver4
-fveclib=AMDLIBM -ffast-math -fopenmp -flto -fstruct-layout=9
-mllvm -unroll-threshold=50 -fremap-arrays -fstrip-mining
-mllvm -inline-threshold=1000 -mllvm -reduce-array-computations=3
-DSPEC_OPENMP -zopt -finline-aggressive -mllvm -unroll-threshold=100
-Mrecursive -fopenmp=libomp -lomp -lamdlibm -lamdalloc -lflang
```

Peak 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
```

(Continued on next page)

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

Tyrone Systems
(Test Sponsor: Netweb Pte Ltd)

(Tyrone Camarero SDA200A2N-212)
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CPU2017 License: 6042

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Peak Other Flags (Continued)

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/Tyrone-Platform-Settings-V1.2-Genoa-revC.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/Tyrone-Platform-Settings-V1.2-Genoa-revC.xml
```

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

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