



# SPEC CPU®2017 Floating Point Speed Result

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## Tyrone Systems

(Test Sponsor: Netweb Pte Ltd)

(Tyrone Camarero SDA200A2N-424)

(2.4 GHz, AMD EPYC 9654)

SPECspeed®2017\_fp\_base = 352

SPECspeed®2017\_fp\_peak = 351

CPU2017 License: 6042

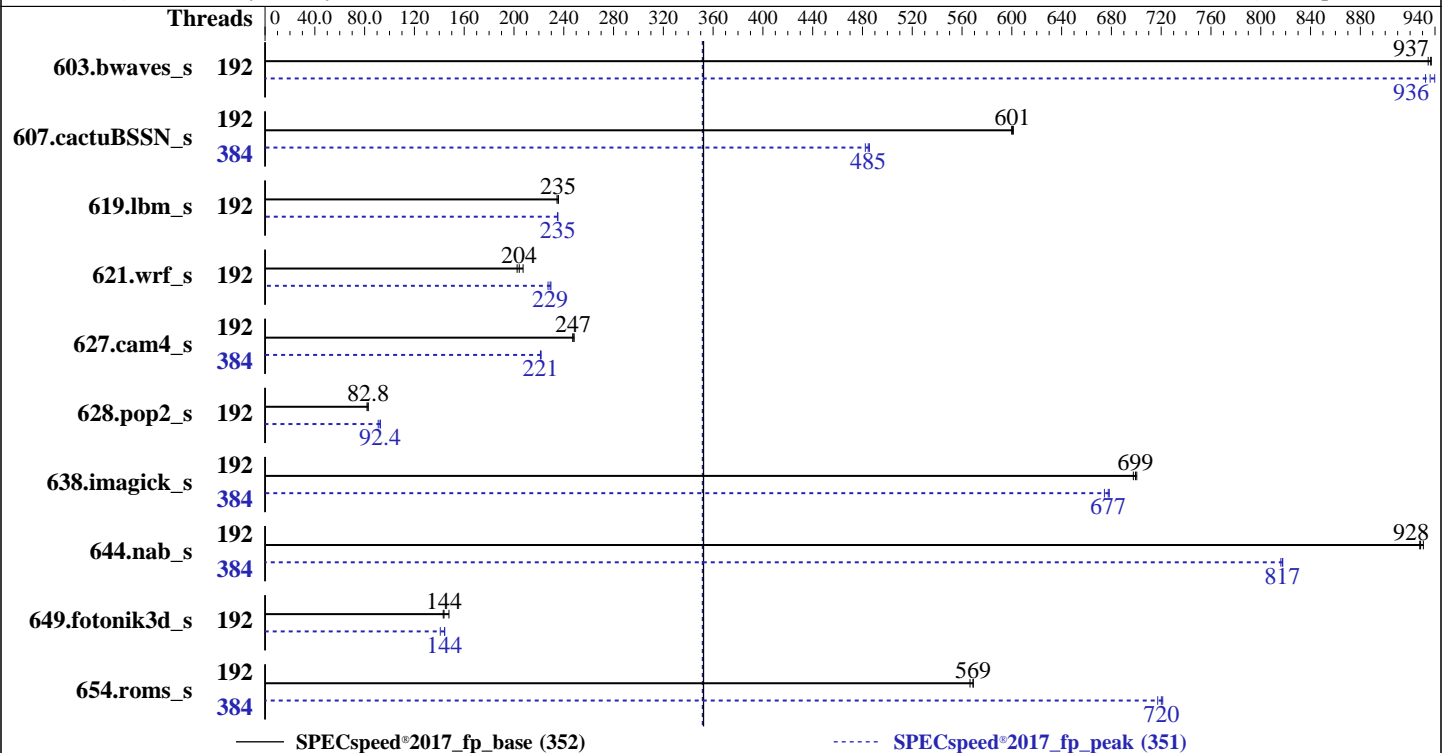
Test Sponsor: Netweb Pte Ltd

Tested by: Tyrone Systems

Test Date: Sep-2023

Hardware Availability: Jun-2023

Software Availability: Sep-2023



### Hardware

CPU Name: AMD EPYC 9654  
 Max MHz: 3700  
 Nominal: 2400  
 Enabled: 192 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: 384 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 960 GB NVMe  
 Other: None

### Software

OS: Ubuntu 20.04.4 LTS  
 kernel version 5.15.0-84-generic  
 Compiler: C/C++/Fortran: Version 4.0.0 of AOCC  
 Parallel: Yes  
 Firmware: Version 1.4 released Apr-2023  
 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						
	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
603.bwaves_s	192	63.1	935	<b>63.0</b>	<b>937</b>	63.0	937	192	63.3	932	62.8	940	<b>63.0</b>	<b>936</b>
607.cactuBSSN_s	192	27.8	600	<b>27.8</b>	<b>601</b>	27.7	601	384	34.3	486	<b>34.4</b>	<b>485</b>	34.6	482
619.lbm_s	192	22.2	236	<b>22.2</b>	<b>235</b>	22.3	235	192	<b>22.3</b>	<b>235</b>	22.3	235	22.3	235
621.wrf_s	192	<b>64.8</b>	<b>204</b>	65.3	203	63.8	207	192	<b>57.8</b>	<b>229</b>	58.2	227	57.6	230
627.cam4_s	192	35.8	247	35.7	248	<b>35.8</b>	<b>247</b>	384	40.0	222	<b>40.0</b>	<b>221</b>	40.1	221
628.pop2_s	192	143	82.8	145	81.9	<b>143</b>	<b>82.8</b>	192	131	90.9	128	92.7	<b>129</b>	<b>92.4</b>
638.imagick_s	192	20.6	700	<b>20.6</b>	<b>699</b>	20.7	698	384	21.3	678	<b>21.3</b>	<b>677</b>	21.4	674
644.nab_s	192	18.8	928	<b>18.8</b>	<b>928</b>	18.8	931	384	<b>21.4</b>	<b>817</b>	21.4	816	21.4	818
649.fotonik3d_s	192	63.7	143	61.7	148	<b>63.4</b>	<b>144</b>	192	64.7	141	63.1	144	<b>63.2</b>	<b>144</b>
654.roms_s	192	27.7	569	<b>27.7</b>	<b>569</b>	27.8	566	384	22.0	717	<b>21.9</b>	<b>720</b>	21.8	721

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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) 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 = "0-383"
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 = "384"
```

Environment variables set by runcpu during the 603.bwaves\_s peak run:

```
GOMP_CPU_AFFINITY = "0-191"
```

Environment variables set by runcpu during the 607.cactuBSSN\_s peak run:

```
GOMP_CPU_AFFINITY = "0-383"
```

Environment variables set by runcpu during the 619.lbm\_s peak run:

```
GOMP_CPU_AFFINITY = "0-191"
```

Environment variables set by runcpu during the 621.wrf\_s peak run:

```
GOMP_CPU_AFFINITY = "0-191"
```

Environment variables set by runcpu during the 627.cam4\_s peak run:

```
GOMP_CPU_AFFINITY = "0-383"
```

Environment variables set by runcpu during the 628.pop2\_s peak run:

```
GOMP_CPU_AFFINITY = "0-191"
```

Environment variables set by runcpu during the 638.imagick\_s peak run:

```
GOMP_CPU_AFFINITY = "0-383"
```

Environment variables set by runcpu during the 644.nab\_s peak run:

```
GOMP_CPU_AFFINITY = "0-383"
```

Environment variables set by runcpu during the 649.fotonik3d\_s peak run:

```
GOMP_CPU_AFFINITY = "0-191"
```

```
PGHPF_ZMEM = "yes"
```

Environment variables set by runcpu during the 654.roms\_s peak run:

```
GOMP_CPU_AFFINITY = "0 192 1 193 2 194 3 195 4 196 5 197 6 198 7 199 8 200 9 201 10 202 11 203 12 204 13
205 14 206 15 207 16 208 17 209 18 210 19 211 20 212 21 213 22 214 23 215 24 216 25 217 26 218 27 219
28 220 29 221 30 222 31 223 32 224 33 225 34 226 35 227 36 228 37 229 38 230 39 231 40 232 41 233 42
234 43 235 44 236 45 237 46 238 47 239 48 240 49 241 50 242 51 243 52 244 53 245 54 246 55 247 56 248
57 249 58 250 59 251 60 252 61 253 62 254 63 255 64 256 65 257 66 258 67 259 68 260 69 261 70 262 71
263 72 264 73 265 74 266 75 267 76 268 77 269 78 270 79 271 80 272 81 273 82 274 83 275 84 276 85 277
86 278 87 279 88 280 89 281 90 282 91 283 92 284 93 285 94 286 95 287 96 288 97 289 98 290 99 291 100
292 101 293 102 294 103 295 104 296 105 297 106 298 107 299 108 300 109 301 110 302 111 303 112 304
113 305 114 306 115 307 116 308 117 309 118 310 119 311 120 312 121 313 122 314 123 315 124 316 125
317 126 318 127 319 128 320 129 321 130 322 131 323 132 324 133 325 134 326 135 327 136 328 137 329
138 330 139 331 140 332 141 333 142 334 143 335 144 336 145 337 146 338 147 339 148 340 149 341 150
342 151 343 152 344 153 345 154 346 155 347 156 348 157 349 158 350 159 351 160 352 161 353 162 354
163 355 164 356 165 357 166 358 167 359 168 360 169 361 170 362 171 363 172 364 173 365 174 366 175
367 176 368 177 369 178 370 179 371 180 372 181 373 182 374 183 375 184 376 185 377 186 378 187 379
188 380 189 381 190 382 191 383"
```



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## 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:  
cTDP: 360  
Determinism Slider set to Power  
Package Power: 360  
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 Sep 30 14:11:29 2023

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 5.15.0-84-generic #93~20.04.1-Ubuntu SMP Wed Sep 6 16:15:40 UTC 2023 x86\_64 x86\_64 x86\_64 GNU/Linux

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## Platform Notes (Continued)

```
-----
2. w
  14:11:29 up 3 days, 1:31, 1 user, load average: 6.10, 7.20, 4.23
USER      TTY      FROM          LOGIN@      IDLE        JCPU       PCPU       WHAT
amd2      tty2     -             Wed12       3:24m      2.19s     0.04s     -bash
```

```
-----
3. Username
From environment variable $USER:  root
From the command 'logname':      amd2
```

```
-----
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            4126356
nofiles            1024
vmemory(kbytes)    unlimited
locks              unlimited
rtprio             0
```

```
-----
5. sysinfo process ancestry
/sbin/init splash
/bin/login -p --
-bash
sudo su
su
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 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       : 192
2 physical ids (chips)
384 processors (hardware threads)
physical id 0: core ids 0-95
physical id 1: core ids 0-95
```

(Continued on next page)



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## Platform Notes (Continued)

physical id 0: apicids 0-191  
physical id 1: apicids 256-447

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:

```

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):                       384
On-line CPU(s) list:         0-383
Thread(s) per core:          2
Core(s) per socket:          96
Socket(s):                    2
NUMA node(s):                 2
Vendor ID:                    AuthenticAMD
CPU family:                   25
Model:                        17
Model name:                   AMD EPYC 9654 96-Core Processor
Stepping:                     1
Frequency boost:              enabled
CPU MHz:                      3634.736
CPU max MHz:                  3707.8120
CPU min MHz:                  1500.0000
BogoMIPS:                     4800.33
Virtualization:               AMD-V
L1d cache:                    6 MiB
L1i cache:                    6 MiB
L2 cache:                     192 MiB
L3 cache:                     768 MiB
NUMA node0 CPU(s):           0-95,192-287
NUMA node1 CPU(s):           96-191,288-383
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 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, PBRSE-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

```

(Continued on next page)



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## Platform Notes (Continued)

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 pftreshold 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:

NAME	ONE-SIZE	ALL-SIZE	WAYS	TYPE	LEVEL
L1d	32K	6M	8	Data	1
L1i	32K	6M	8	Instruction	1
L2	1M	192M	8	Unified	2
L3	32M	768M	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: 0-95,192-287
node 0 size: 515700 MB
node 0 free: 512002 MB
node 1 cpus: 96-191,288-383
node 1 size: 515964 MB
node 1 free: 512250 MB
node distances:
node  0  1
  0:  10  32
  1:  32  10
```

9. /proc/meminfo

MemTotal: 1056424352 kB

10. who -r

run-level 5 Sep 27 12:40

11. Systemd service manager version: systemd 245 (245.4-4ubuntu3.20)

Default Target	Status
graphical	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 openvpn-client@ openvpn-server@ openvpn@ rtkit-daemon serial-getty@ speech-dispatcher speech-dispatcherd

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## Platform Notes (Continued)

```

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
indirect
masked
apport
display-manager lightdm saned@ spice-vdagent spice-vdagentd uidd
alsa-utils cryptdisks cryptdisks-early hwclock pulseaudio-enable-autospawn rc rcS saned
sudo x11-common

```

### 14. Linux kernel boot-time arguments, from /proc/cmdline

```

BOOT_IMAGE=/boot/vmlinuz-5.15.0-84-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

```

(Continued on next page)





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**Hardware Availability:** Jun-2023  
**Software Availability:** Sep-2023

## Platform Notes (Continued)

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

20. /sys/devices/virtual/dmi/id  
Vendor: Tyrone Systems  
Product: Tyrone Camarero SDA200A2R-424  
Product Family: SMC H13  
Serial: A509935X3311011  
-----

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.  
-----

22. BIOS  
(This section combines info from /sys/devices and dmidecode.)  
BIOS Vendor: American Megatrends International, LLC.  
BIOS Version: 1.4  
BIOS Date: 04/19/2023  
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  
-----  
=====

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# SPEC CPU®2017 Floating Point Speed Result

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## Tyrone Systems

(Test Sponsor: Netweb Pte Ltd)

(Tyrone Camarero SDA200A2N-424)

(2.4 GHz, AMD EPYC 9654)

SPECspeed®2017\_fp\_base = 352

SPECspeed®2017\_fp\_peak = 351

CPU2017 License: 6042

Test Sponsor: Netweb Pte Ltd

Tested by: Tyrone Systems

Test Date: Sep-2023

Hardware Availability: Jun-2023

Software Availability: Sep-2023

## Compiler Version Notes (Continued)

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

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



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(2.4 GHz, AMD EPYC 9654)

SPECspeed®2017\_fp\_base = 352

SPECspeed®2017\_fp\_peak = 351

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

**Test Date:** Sep-2023  
**Hardware Availability:** Jun-2023  
**Software Availability:** Sep-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
```



# SPEC CPU®2017 Floating Point Speed Result

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**Tyrone Systems**  
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(Tyrone Camarero SDA200A2N-424)  
(2.4 GHz, AMD EPYC 9654)

SPECspeed®2017\_fp\_base = 352

SPECspeed®2017\_fp\_peak = 351

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

**Test Date:** Sep-2023  
**Hardware Availability:** Jun-2023  
**Software Availability:** Sep-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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**CPU2017 License:** 6042  
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**Test Date:** Sep-2023  
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**Software Availability:** Sep-2023

## 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
-freemap-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
-freemap-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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(2.4 GHz, AMD EPYC 9654)

SPECspeed®2017\_fp\_base = 352

SPECspeed®2017\_fp\_peak = 351

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

**Test Date:** Sep-2023  
**Hardware Availability:** Jun-2023  
**Software Availability:** Sep-2023

## 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
-freemap-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
-freemap-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 -freemap-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
```

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# SPEC CPU®2017 Floating Point Speed Result

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**Tyrone Systems**

(Test Sponsor: Netweb Pte Ltd)

(Tyrone Camarero SDA200A2N-424)

(2.4 GHz, AMD EPYC 9654)

SPECspeed®2017\_fp\_base = 352

SPECspeed®2017\_fp\_peak = 351

**CPU2017 License:** 6042

**Test Sponsor:** Netweb Pte Ltd

**Tested by:** Tyrone Systems

**Test Date:** Sep-2023

**Hardware Availability:** Jun-2023

**Software Availability:** Sep-2023

## 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>

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