



SPEC CPU®2017 Floating Point Rate Result

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GIGA-BYTE TECHNOLOGY CO., LTD.

(Test Sponsor: Giga Computing Technology Co., Ltd.)

R183-Z93-LAJ1-000

(2.70 GHz, AMD EPYC 9755)

SPECrate®2017_fp_base = 2320

SPECrate®2017_fp_peak = 2530

CPU2017 License: 9082

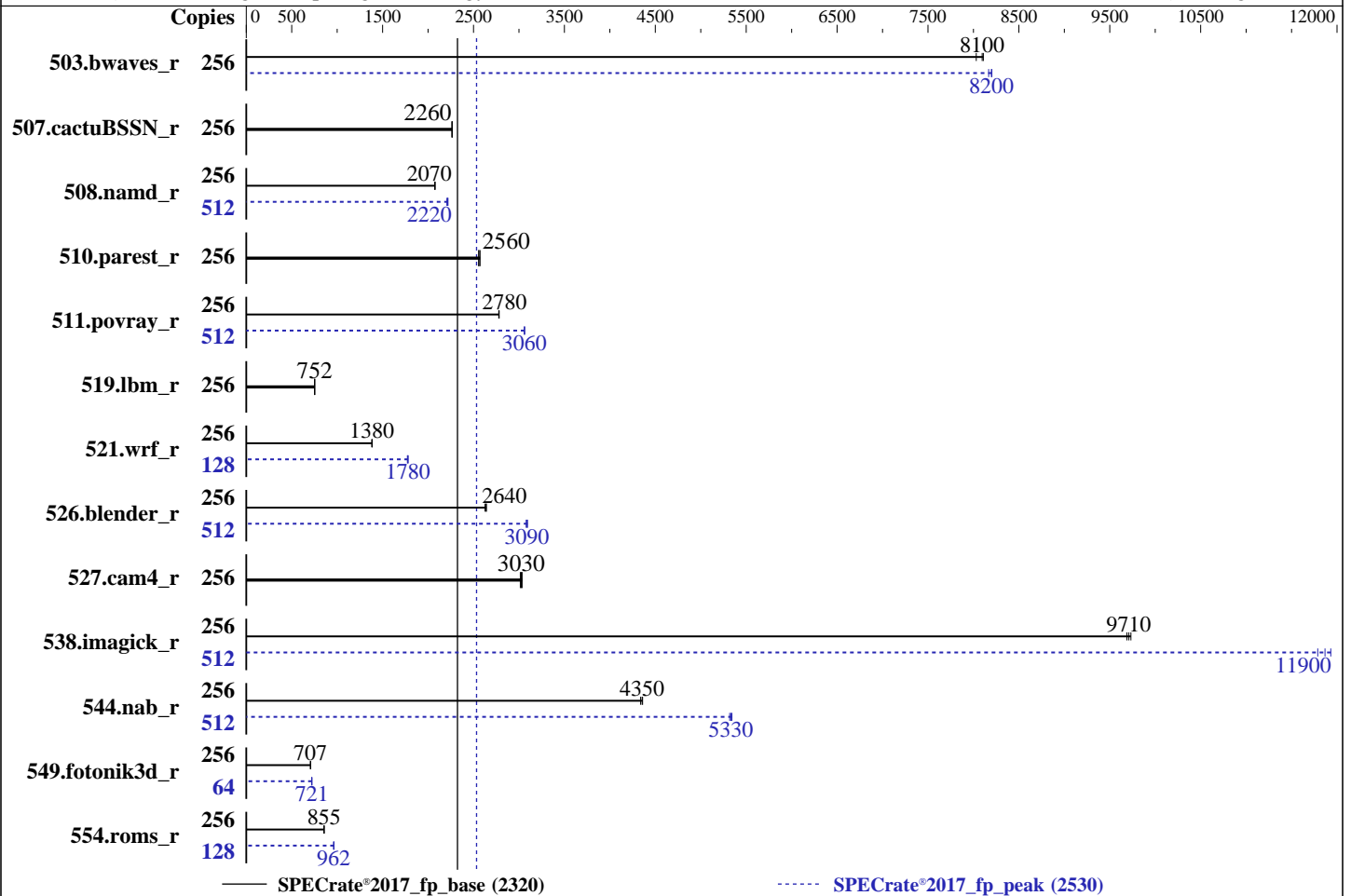
Test Sponsor: Giga Computing Technology Co., Ltd.

Tested by: Giga Computing Technology Co., Ltd.

Test Date: Sep-2024

Hardware Availability: Oct-2024

Software Availability: Aug-2024



Hardware

CPU Name: AMD EPYC 9755
 Max MHz: 4100
 Nominal: 2700
 Enabled: 256 cores, 2 chips, 2 threads/core
 Orderable: 1,2 chips
 Cache L1: 32 KB I + 48 KB D on chip per core
 L2: 1 MB I+D on chip per core
 L3: 512 MB I+D on chip per chip, 32 MB shared / 8 cores
 Other: None
 Memory: 1536 GB (24 x 64 GB 2Rx4 PC5-6400B-R, running at 6000)
 Storage: 1 x 3.84TB SSD
 Other: CPU Cooling: Air

Software

OS: Ubuntu 22.04.03 LTS
 5.15.0-119-generic
 Compiler: C/C++/Fortran: Version 5.0.0 of AOCC
 Parallel: No
 Firmware: Version R02_F19 released Sep-2024
 File System: ext4
 System State: Run level 3 (multi-user)
 Base Pointers: 64-bit
 Peak Pointers: 64-bit
 Other: None
 Power Management: BIOS and OS set to prefer performance at the cost of additional power usage.



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Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
503.bwaves_r	256	320	8030	317	8110	317	8100	256	313	8200	313	8200	314	8170
507.cactuBSSN_r	256	143	2260	143	2260	143	2270	256	143	2260	143	2260	143	2270
508.namd_r	256	117	2070	117	2080	117	2070	512	219	2220	220	2210	219	2220
510.parest_r	256	262	2560	260	2570	262	2560	256	262	2560	260	2570	262	2560
511.povray_r	256	215	2780	215	2780	215	2780	512	391	3060	391	3060	391	3060
519.lbm_r	256	359	752	358	753	359	752	256	359	752	358	753	359	752
521.wrf_r	256	414	1390	415	1380	415	1380	128	161	1780	161	1780	162	1770
526.blender_r	256	148	2640	148	2630	148	2640	512	252	3090	253	3080	252	3090
527.cam4_r	256	149	3010	148	3030	148	3030	256	149	3010	148	3030	148	3030
538.imagick_r	256	65.4	9730	65.7	9690	65.6	9710	512	108	11800	107	11900	107	11900
544.nab_r	256	98.8	4360	98.9	4350	99.3	4340	512	161	5340	162	5320	162	5330
549.fotonik3d_r	256	1412	706	1411	707	1411	707	64	346	721	346	721	346	720
554.roms_r	256	475	857	476	855	476	855	128	211	962	212	962	211	965

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Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

Compiler Notes

The AMD64 AOCC Compiler Suite is available at <http://developer.amd.com/amd-aocc/>

Submit Notes

The config file option 'submit' was used.
'numactl' was used to bind copies to the cores.
See the configuration file for details.

Operating System Notes

'ulimit -s unlimited' was used to set environment stack size limit
'ulimit -l 2097152' was used to set environment locked pages in memory limit

runcpu command invoked through numactl i.e.:
numactl --interleave=all runcpu <etc>

To limit dirty cache to 8% of memory, 'sysctl -w vm.dirty_ratio=8' run as root.
To limit swap usage to minimum necessary, 'sysctl -w vm.swappiness=1' run as root.
To free node-local memory and avoid remote memory usage,
'sysctl -w vm.zone_reclaim_mode=1' run as root.
To clear filesystem caches, 'sync; sysctl -w vm.drop_caches=3' run as root.
To disable address space layout randomization (ASLR) to reduce run-to-run
variability, 'sysctl -w kernel.randomize_va_space=0' run as root.

To enable Transparent Hugepages (THP) for all allocations,
'echo always > /sys/kernel/mm/transparent_hugepage/enabled' and

(Continued on next page)



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Operating System Notes (Continued)

'echo always > /sys/kernel/mm/transparent_hugepage/defrag' run as root.

Environment Variables Notes

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

LD_LIBRARY_PATH =

"/root/new_RC1298c/amd_rate_aocc500_znver5_A_lib/lib:/root/new_RC1298c/amd_rate_aocc500_znver5_A_lib/lib32:"

MALLOC_CONF = "retain:true"

General Notes

Binaries were compiled on a system with 2x AMD EPYC 9174F CPU + 1.5TiB Memory using RHEL 8.6

NA: The test sponsor attests, as of date of publication, that CVE-2017-5754 (Meltdown) is mitigated in the system as tested and documented.

Yes: The test sponsor attests, as of date of publication, that CVE-2017-5753 (Spectre variant 1) is mitigated in the system as tested and documented.

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

Platform Notes

BIOS Settings:

Power Policy Quick Settings = Best Performance

TDP Control = Manual

TDP = 500

PPT Control = Manual

PPT = 500

SMT Mode = Enabled

Sysinfo program /root/new_RC1298c/bin/sysinfo

Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197

running on mz93-fs1 Tue Jan 2 00:15:57 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 249 (249.11-0ubuntu3.9)
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

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Platform Notes (Continued)

```

15. cpupower frequency-info
16. sysctl
17. /sys/kernel/mm/transparent_hugepage
18. /sys/kernel/mm/transparent_hugepage/khugepaged
19. OS release
20. Disk information
21. /sys/devices/virtual/dmi/id
22. dmidecode
23. BIOS

```

```

-----
1. uname -a
Linux mz93-fs1 5.15.0-119-generic #129-Ubuntu SMP Fri Aug 2 19:25:20 UTC 2024 x86_64 x86_64 x86_64
GNU/Linux

```

```

-----
2. w
00:15:57 up 20:46, 1 user, load average: 209.94, 425.05, 471.77
USER      TTY      FROM          LOGIN@      IDLE        JCPU       PCPU       WHAT
root      ttyl    -             Mon03       5:17m      1.73s     0.69s    /bin/bash ./amd_rate_aocc500_znver5_A1.sh

```

```

-----
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                6189875
nofiles                1024
vmemory(kbytes)        unlimited
locks                  unlimited
rtprio                 0

```

```

-----
5. sysinfo process ancestry
/sbin/init
/bin/login -f
-bash
python3 ./run_amd_rate_aocc500_znver5_A1.py
/bin/bash ./amd_rate_aocc500_znver5_A1.sh
runcpu --config amd_rate_aocc500_znver5_A1.cfg --tune all --reportable --iterations 3 fprate
runcpu --configfile amd_rate_aocc500_znver5_A1.cfg --tune all --reportable --iterations 3 --nopower
--runmode rate --tune base:peak --size test:train:refrate fprate --nopreenv --note-preenv --logfile
$SPEC/tmp/CPU2017.005/templogs/preenv.fprate.005.0.log --lognum 005.0 --from_runcpu 2
specperl $SPEC/bin/sysinfo
$SPEC = /root/new_RC1298c

```

```

-----
6. /proc/cpuinfo
model name      : AMD EPYC 9755 128-Core Processor
vendor_id      : AuthenticAMD
cpu family     : 26

```

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Platform Notes (Continued)

```

model          : 2
stepping       : 1
microcode      : 0xb002116
bugs           : sysret_ss_attrs spectre_v1 spectre_v2 spec_store_bypass
TLB size      : 192 4K pages
cpu cores     : 128
siblings       : 256
2 physical ids (chips)
512 processors (hardware threads)
physical id 0: core ids 0-127
physical id 1: core ids 0-127
physical id 0: apicids 0-255
physical id 1: apicids 256-511

```

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:         52 bits physical, 57 bits virtual
Byte Order:            Little Endian
CPU(s):                512
On-line CPU(s) list:  0-511
Vendor ID:             AuthenticAMD
Model name:            AMD EPYC 9755 128-Core Processor
CPU family:            26
Model:                 2
Thread(s) per core:   2
Core(s) per socket:   128
Socket(s):             2
Stepping:              1
Frequency boost:      enabled
CPU max MHz:           4121.1909
CPU min MHz:           1500.0000
BogoMIPS:              5399.77
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
aperfmpperf rapl pni pclmulqdq monitor sse3 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 ibrs_enhanced vmmcall fsgsbase tsc_adjust bmi1
avx2 smep bmi2 erms invpcid cqm rdt_a avx512f avx512dq rdseed adx
smap avx512ifma clflushopt clwb avx512cd sha_ni avx512bw avx512vl
xsaveopt xsavec xgetbv1 xsaves cqm_llc cqm_occup_llc cqm_mbm_total
cqm_mbm_local avx_vnni avx512_bf16 clzero irperf xsaveerptr rdpru
wbnoinvd amd_ppin cppc arat npt lbrv svm_lock nrip_save tsc_scale
vmcb_clean flushbyasid decodeassists pausefilter pfthreshold avic
v_vmsave_vmload vgif v_spec_ctrl avx512vbmi umip pku ospke
avx512_vbmi2 gfni vaes vpclmulqdq avx512_vnni avx512_bitalg
avx512_vpopcntdq la57 rdpid bus_lock_detect movdiri movdir64b
overflow_recov succor smca fsrm avx512_vp2intersect flush_lld
AMD-V
Virtualization:       AMD-V
L1d cache:            12 MiB (256 instances)
L1i cache:            8 MiB (256 instances)

```

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Platform Notes (Continued)

```

L2 cache:                256 MiB (256 instances)
L3 cache:                1 GiB (32 instances)
NUMA node(s):           32
NUMA node0 CPU(s):      0-7,256-263
NUMA node1 CPU(s):      8-15,264-271
NUMA node2 CPU(s):      16-23,272-279
NUMA node3 CPU(s):      24-31,280-287
NUMA node4 CPU(s):      32-39,288-295
NUMA node5 CPU(s):      40-47,296-303
NUMA node6 CPU(s):      48-55,304-311
NUMA node7 CPU(s):      56-63,312-319
NUMA node8 CPU(s):      64-71,320-327
NUMA node9 CPU(s):      72-79,328-335
NUMA node10 CPU(s):     80-87,336-343
NUMA node11 CPU(s):     88-95,344-351
NUMA node12 CPU(s):     96-103,352-359
NUMA node13 CPU(s):    104-111,360-367
NUMA node14 CPU(s):    112-119,368-375
NUMA node15 CPU(s):    120-127,376-383
NUMA node16 CPU(s):    128-135,384-391
NUMA node17 CPU(s):    136-143,392-399
NUMA node18 CPU(s):    144-151,400-407
NUMA node19 CPU(s):    152-159,408-415
NUMA node20 CPU(s):    160-167,416-423
NUMA node21 CPU(s):    168-175,424-431
NUMA node22 CPU(s):    176-183,432-439
NUMA node23 CPU(s):    184-191,440-447
NUMA node24 CPU(s):    192-199,448-455
NUMA node25 CPU(s):    200-207,456-463
NUMA node26 CPU(s):    208-215,464-471
NUMA node27 CPU(s):    216-223,472-479
NUMA node28 CPU(s):    224-231,480-487
NUMA node29 CPU(s):    232-239,488-495
NUMA node30 CPU(s):    240-247,496-503
NUMA node31 CPU(s):    248-255,504-511
Vulnerability Gather data sampling: Not affected
Vulnerability Itlb multihit:      Not affected
Vulnerability L1tf:               Not affected
Vulnerability Mds:                Not affected
Vulnerability Meltdown:           Not affected
Vulnerability Mmio stale data:    Not affected
Vulnerability Reg file data sampling: Not affected
Vulnerability Retbleed:           Not affected
Vulnerability Spec rstack overflow: Not affected
Vulnerability Spec store bypass:  Mitigation; Speculative Store Bypass disabled via prctl and seccomp
Vulnerability Spectre v1:         Mitigation; usercopy/swaps barriers and __user pointer sanitization
Vulnerability Spectre v2:         Mitigation; Enhanced / Automatic IBRS; IBPB conditional; STIBP
always-on; RSB filling; PBRBS-eIBRS Not affected; BHI Not affected
Vulnerability Srbds:              Not affected
Vulnerability Tsx async abort:    Not affected

```

From lscpu --cache:

NAME	ONE-SIZE	ALL-SIZE	WAYS	TYPE	LEVEL	SETS	PHY-LINE	COHERENCY-SIZE
L1d	48K	12M	12	Data	1	64	1	64
L1i	32K	8M	8	Instruction	1	64	1	64
L2	1M	256M	16	Unified	2	1024	1	64
L3	32M	1G	16	Unified	3	32768	1	64

8. numactl --hardware

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Platform Notes (Continued)

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

```

available: 32 nodes (0-31)
node 0 cpus: 0-7,256-263
node 0 size: 47951 MB
node 0 free: 46937 MB
node 1 cpus: 8-15,264-271
node 1 size: 48379 MB
node 1 free: 47545 MB
node 2 cpus: 16-23,272-279
node 2 size: 48379 MB
node 2 free: 47586 MB
node 3 cpus: 24-31,280-287
node 3 size: 48379 MB
node 3 free: 47591 MB
node 4 cpus: 32-39,288-295
node 4 size: 48379 MB
node 4 free: 47607 MB
node 5 cpus: 40-47,296-303
node 5 size: 48379 MB
node 5 free: 47639 MB
node 6 cpus: 48-55,304-311
node 6 size: 48379 MB
node 6 free: 47625 MB
node 7 cpus: 56-63,312-319
node 7 size: 48379 MB
node 7 free: 47629 MB
node 8 cpus: 64-71,320-327
node 8 size: 48379 MB
node 8 free: 47616 MB
node 9 cpus: 72-79,328-335
node 9 size: 48379 MB
node 9 free: 47634 MB
node 10 cpus: 80-87,336-343
node 10 size: 48379 MB
node 10 free: 47619 MB
node 11 cpus: 88-95,344-351
node 11 size: 48379 MB
node 11 free: 47626 MB
node 12 cpus: 96-103,352-359
node 12 size: 48379 MB
node 12 free: 47600 MB
node 13 cpus: 104-111,360-367
node 13 size: 48379 MB
node 13 free: 47619 MB
node 14 cpus: 112-119,368-375
node 14 size: 48379 MB
node 14 free: 47628 MB
node 15 cpus: 120-127,376-383
node 15 size: 48379 MB
node 15 free: 47631 MB
node 16 cpus: 128-135,384-391
node 16 size: 48379 MB
node 16 free: 47606 MB
node 17 cpus: 136-143,392-399
node 17 size: 48379 MB
node 17 free: 47639 MB
node 18 cpus: 144-151,400-407
node 18 size: 48379 MB
node 18 free: 47609 MB
node 19 cpus: 152-159,408-415

```

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Platform Notes (Continued)

```

node 19 size: 48379 MB
node 19 free: 47632 MB
node 20 cpus: 160-167,416-423
node 20 size: 48377 MB
node 20 free: 47634 MB
node 21 cpus: 168-175,424-431
node 21 size: 48381 MB
node 21 free: 47612 MB
node 22 cpus: 176-183,432-439
node 22 size: 48377 MB
node 22 free: 47609 MB
node 23 cpus: 184-191,440-447
node 23 size: 48381 MB
node 23 free: 47603 MB
node 24 cpus: 192-199,448-455
node 24 size: 48379 MB
node 24 free: 47587 MB
node 25 cpus: 200-207,456-463
node 25 size: 48379 MB
node 25 free: 47604 MB
node 26 cpus: 208-215,464-471
node 26 size: 48332 MB
node 26 free: 47557 MB
node 27 cpus: 216-223,472-479
node 27 size: 48379 MB
node 27 free: 47636 MB
node 28 cpus: 224-231,480-487
node 28 size: 48379 MB
node 28 free: 47604 MB
node 29 cpus: 232-239,488-495
node 29 size: 48379 MB
node 29 free: 47610 MB
node 30 cpus: 240-247,496-503
node 30 size: 48379 MB
node 30 free: 47610 MB
node 31 cpus: 248-255,504-511
node 31 size: 48281 MB
node 31 free: 47517 MB
node distances:
node  0  1  2  3  4  5  6  7  8  9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
25 26 27 28 29 30 31
0: 10 11 11 11 12 12 12 12 12 12 12 12 12 12 12 12 32 32 32 32 32 32 32 32
32 32 32 32 32 32 32
1: 11 10 11 11 12 12 12 12 12 12 12 12 12 12 12 12 32 32 32 32 32 32 32 32
32 32 32 32 32 32 32
2: 11 11 10 11 12 12 12 12 12 12 12 12 12 12 12 12 32 32 32 32 32 32 32 32
32 32 32 32 32 32 32
3: 11 11 11 10 12 12 12 12 12 12 12 12 12 12 12 12 32 32 32 32 32 32 32 32
32 32 32 32 32 32 32
4: 12 12 12 12 10 11 11 11 12 12 12 12 12 12 12 12 32 32 32 32 32 32 32 32
32 32 32 32 32 32 32
5: 12 12 12 12 11 10 11 11 12 12 12 12 12 12 12 12 32 32 32 32 32 32 32 32
32 32 32 32 32 32 32
6: 12 12 12 12 11 11 10 11 12 12 12 12 12 12 12 12 32 32 32 32 32 32 32 32
32 32 32 32 32 32 32
7: 12 12 12 12 11 11 11 10 12 12 12 12 12 12 12 12 32 32 32 32 32 32 32 32
32 32 32 32 32 32 32
8: 12 12 12 12 12 12 12 12 10 11 11 11 12 12 12 12 32 32 32 32 32 32 32 32
32 32 32 32 32 32 32
9: 12 12 12 12 12 12 12 12 12 11 10 11 11 12 12 12 12 32 32 32 32 32 32 32 32

```

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Platform Notes (Continued)

```

32 32 32 32 32 32 32
10: 12 12 12 12 12 12 12 12 12 12 11 11 10 11 12 12 12 12 32 32 32 32 32 32 32 32
32 32 32 32 32 32 32
11: 12 12 12 12 12 12 12 12 12 12 11 11 11 10 12 12 12 12 32 32 32 32 32 32 32 32
32 32 32 32 32 32 32
12: 12 12 12 12 12 12 12 12 12 12 12 12 12 10 11 11 11 32 32 32 32 32 32 32 32 32
32 32 32 32 32 32 32
13: 12 12 12 12 12 12 12 12 12 12 12 12 11 10 11 11 32 32 32 32 32 32 32 32 32 32
32 32 32 32 32 32 32
14: 12 12 12 12 12 12 12 12 12 12 12 12 11 11 10 11 32 32 32 32 32 32 32 32 32 32
32 32 32 32 32 32 32
15: 12 12 12 12 12 12 12 12 12 12 12 12 11 11 11 10 32 32 32 32 32 32 32 32 32 32
32 32 32 32 32 32 32
16: 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 10 11 11 11 12 12 12 12 12
12 12 12 12 12 12 12
17: 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 11 10 11 11 12 12 12 12 12
12 12 12 12 12 12 12
18: 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 11 11 10 11 12 12 12 12 12
12 12 12 12 12 12 12
19: 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 11 11 11 10 12 12 12 12 12
12 12 12 12 12 12 12
20: 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 12 12 12 12 10 11 11 11 12
12 12 12 12 12 12 12
21: 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 12 12 12 12 11 10 11 11 12
12 12 12 12 12 12 12
22: 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 12 12 12 12 11 11 10 11 12
12 12 12 12 12 12 12
23: 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 12 12 12 12 11 11 11 10 12
12 12 12 12 12 12 12
24: 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 12 12 12 12 12 12 12 12 10
11 11 11 12 12 12 12
25: 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 12 12 12 12 12 12 12 12 11
10 11 11 12 12 12 12
26: 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 12 12 12 12 12 12 12 12 11
11 10 11 12 12 12 12
27: 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 12 12 12 12 12 12 12 12 11
11 11 10 12 12 12 12
28: 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 12 12 12 12 12 12 12 12 12
12 12 12 10 11 11 11
29: 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 12 12 12 12 12 12 12 12 12
12 12 12 11 10 11 11
30: 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 12 12 12 12 12 12 12 12 12
12 12 12 11 11 10 11
31: 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 32 12 12 12 12 12 12 12 12 12
12 12 12 11 11 11 10

```

```

-----
9. /proc/meminfo
MemTotal: 1584725108 kB

```

```

-----
10. who -r
run-level 3 Jan 1 03:31

```

```

-----
11. Systemd service manager version: systemd 249 (249.11-0ubuntu3.9)
Default Target Status
multi-user degraded
-----

```

(Continued on next page)



SPEC CPU®2017 Floating Point Rate Result

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R183-Z93-LAJ1-000

(2.70 GHz, AMD EPYC 9755)

SPECrate®2017_fp_base = 2320

SPECrate®2017_fp_peak = 2530

CPU2017 License: 9082

Test Sponsor: Giga Computing Technology Co., Ltd.

Tested by: Giga Computing Technology Co., Ltd.

Test Date: Sep-2024

Hardware Availability: Oct-2024

Software Availability: Aug-2024

Platform Notes (Continued)

12. Failed units, from `systemctl list-units --state=failed`

UNIT	LOAD	ACTIVE	SUB	DESCRIPTION
* <code>fwupd-refresh.service</code>	loaded	failed	failed	Refresh fwupd metadata and update motd
* <code>systemd-networkd-wait-online.service</code>	loaded	failed	failed	Wait for Network to be Configured

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

STATE	UNIT FILES
enabled	ModemManager apparmor blk-availability cloud-config cloud-final cloud-init cloud-init-local console-setup cron dmesg e2scrub_reap finalrd getty@ gpu-manager grub-common grub-initrd-fallback irqbalance keyboard-setup lvm2-monitor lxd-agent multipathd networkd-dispatcher open-iscsi open-vm-tools pollinate rsyslog secureboot-db setvtrgb snapd ssh systemd-networkd systemd-networkd-wait-online systemd-pstore systemd-resolved systemd-timesyncd thermald ua-reboot-cmds ubuntu-advantage udisks2 ufw unattended-upgrades vgauth
enabled-runtime	netplan-ovs-cleanup systemd-fsck-root systemd-remount-fs
disabled	console-getty debug-shell ipmievd iscsid nftables rsync serial-getty@ systemd-boot-check-no-failures systemd-network-generator systemd-sysext systemd-time-wait-sync upower
generated	apport openipmi
indirect	uuid
masked	cryptdisks cryptdisks-early hwclock lvm2 multipath-tools-boot rc rcS screen-cleanup sudo x11-common

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

```
BOOT_IMAGE=/boot/vmlinuz-5.15.0-119-generic
root=UUID=1380e2bd-2201-4a69-ae3-09a8eb63e291
ro
```

15. `cpupower frequency-info`

```
analyzing CPU 0:
  current policy: frequency should be within 1.50 GHz and 2.70 GHz.
                  The governor "performance" may decide which speed to use
                  within this range.

  boost state support:
    Supported: yes
    Active: yes
    Boost States: 0
    Total States: 3
    Pstate-P0: 2800MHz
```

16. `sysctl`

<code>kernel.numa_balancing</code>	1
<code>kernel.randomize_va_space</code>	0
<code>vm.compaction_proactiveness</code>	20
<code>vm.dirty_background_bytes</code>	0
<code>vm.dirty_background_ratio</code>	10
<code>vm.dirty_bytes</code>	0
<code>vm.dirty_expire_centisecs</code>	3000
<code>vm.dirty_ratio</code>	8
<code>vm.dirty_writeback_centisecs</code>	500
<code>vm.dirtytime_expire_seconds</code>	43200
<code>vm.extfrag_threshold</code>	500
<code>vm.min_unmapped_ratio</code>	1
<code>vm.nr_hugepages</code>	0
<code>vm.nr_hugepages_mempolicy</code>	0
<code>vm.nr_overcommit_hugepages</code>	0

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Platform Notes (Continued)

```

vm.swappiness                1
vm.watermark_boost_factor   15000
vm.watermark_scale_factor   10
vm.zone_reclaim_mode        1

```

```

-----
17. /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

```

```

-----
18. /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

```

```

-----
19. OS release
From /etc/*-release /etc/*-version
os-release Ubuntu 22.04.3 LTS

```

```

-----
20. Disk information
SPEC is set to: /root/new_RC1298c
Filesystem Type Size Used Avail Use% Mounted on
/dev/nvme0n1p2 ext4 3.5T 396G 2.9T 12% /

```

```

-----
21. /sys/devices/virtual/dmi/id
Vendor:      Giga Computing
Product:     R183-Z93-LAJ1-000
Product Family: Server
Serial:      01234567890123456789AB

```

```

-----
22. dmidecode
Additional information from dmidecode 3.3 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:
  24x Samsung M321R8GA0EB2-CCPWC 64 GB 2 rank 6400, configured at 6000

```

```

-----
23. BIOS
(This section combines info from /sys/devices and dmidecode.)
BIOS Vendor:      GIGABYTE
BIOS Version:     R02_F19
BIOS Date:        09/18/2024
BIOS Revision:    5.35

```



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Compiler Version Notes

C | 519.lbm_r(base, peak) 538.imagick_r(base, peak) 544.nab_r(base, peak)

AMD clang version 17.0.6 (CLANG: AOCC_5.0.0-Build#1316 2024_09_09)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-5.0.0-4925-1316/bin

C++ | 508.namd_r(base, peak) 510.parest_r(base, peak)

AMD clang version 17.0.6 (CLANG: AOCC_5.0.0-Build#1316 2024_09_09)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-5.0.0-4925-1316/bin

C++, C | 511.povray_r(base, peak) 526.blender_r(base, peak)

AMD clang version 17.0.6 (CLANG: AOCC_5.0.0-Build#1316 2024_09_09)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-5.0.0-4925-1316/bin
AMD clang version 17.0.6 (CLANG: AOCC_5.0.0-Build#1316 2024_09_09)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-5.0.0-4925-1316/bin

C++, C, Fortran | 507.cactuBSSN_r(base, peak)

AMD clang version 17.0.6 (CLANG: AOCC_5.0.0-Build#1316 2024_09_09)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-5.0.0-4925-1316/bin
AMD clang version 17.0.6 (CLANG: AOCC_5.0.0-Build#1316 2024_09_09)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-5.0.0-4925-1316/bin
AMD clang version 17.0.6 (CLANG: AOCC_5.0.0-Build#1316 2024_09_09)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-5.0.0-4925-1316/bin

Fortran | 503.bwaves_r(base, peak) 549.fotonik3d_r(base, peak) 554.roms_r(base, peak)

AMD clang version 17.0.6 (CLANG: AOCC_5.0.0-Build#1316 2024_09_09)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-5.0.0-4925-1316/bin

Fortran, C | 521.wrf_r(base, peak) 527.cam4_r(base, peak)

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Compiler Version Notes (Continued)

```

AMD clang version 17.0.6 (CLANG: AOCC_5.0.0-Build#1316 2024_09_09)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-5.0.0-4925-1316/bin
AMD clang version 17.0.6 (CLANG: AOCC_5.0.0-Build#1316 2024_09_09)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-5.0.0-4925-1316/bin
-----

```

Base Compiler Invocation

C benchmarks:

clang

C++ benchmarks:

clang++

Fortran benchmarks:

flang

Benchmarks using both Fortran and C:

flang clang

Benchmarks using both C and C++:

clang++ clang

Benchmarks using Fortran, C, and C++:

clang++ clang flang

Base Portability Flags

```

503.bwaves_r: -DSPEC_LP64
507.cactuBSSN_r: -DSPEC_LP64
508.namd_r: -DSPEC_LP64
510.parest_r: -DSPEC_LP64
511.povray_r: -DSPEC_LP64
519.lbm_r: -DSPEC_LP64
521.wrf_r: -DSPEC_CASE_FLAG -Mbyteswapio -DSPEC_LP64
526.blender_r: -funsigned-char -DSPEC_LP64
527.cam4_r: -DSPEC_CASE_FLAG -DSPEC_LP64
538.imagick_r: -DSPEC_LP64
544.nab_r: -DSPEC_LP64
549.fotonik3d_r: -DSPEC_LP64
554.roms_r: -DSPEC_LP64

```



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Base Optimization Flags

C benchmarks:

```
-m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-ldist-scalar-expand -fenable-aggressive-gather -O3
-march=znver5 -fveclib=AMDLIBM -ffast-math -fno-PIE -no-pie -flto
-fstruct-layout=7 -mllvm -unroll-threshold=50
-mllvm -inline-threshold=1000 -fremap-arrays -fstrip-mining
-mllvm -reduce-array-computations=3 -zopt -lamdlibm -lamdalloc
-lflang -ldl
```

C++ benchmarks:

```
-m64 -std=c++14 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-x86-use-vzeroupper=false -Wl,-mllvm -Wl,-extra-inliner
-O3 -march=znver5 -fveclib=AMDLIBM -ffast-math -flto
-mllvm -unroll-threshold=100 -mllvm -loop-unswitch-threshold=200000
-mllvm -reduce-array-computations=3 -zopt -lamdlibm -lamdalloc
-lflang -ldl
```

Fortran benchmarks:

```
-m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-enable-X86-prefetching
-Wl,-mllvm -Wl,-enable-aggressive-gather=true
-Wl,-mllvm -Wl,-enable-masked-gather-sequence=false -O3 -march=znver5
-fveclib=AMDLIBM -ffast-math -flto -Mrecursive -funroll-loops
-mllvm -lsr-in-nested-loop -mllvm -reduce-array-computations=3
-fepilog-vectorization-of-inductions -zopt -lamdlibm -lamdalloc
-lflang -ldl
```

Benchmarks using both Fortran and C:

```
-m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-enable-X86-prefetching
-Wl,-mllvm -Wl,-enable-aggressive-gather=true
-Wl,-mllvm -Wl,-enable-masked-gather-sequence=false -O3 -march=znver5
-fveclib=AMDLIBM -ffast-math -fno-PIE -no-pie -flto
-fstruct-layout=7 -mllvm -unroll-threshold=50
-mllvm -inline-threshold=1000 -fremap-arrays -fstrip-mining
-mllvm -reduce-array-computations=3 -zopt -Mrecursive -funroll-loops
-mllvm -lsr-in-nested-loop -fepilog-vectorization-of-inductions
-lamdlibm -lamdalloc -lflang -ldl
```

Benchmarks using both C and C++:

```
-m64 -std=c++14 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
```

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Base Optimization Flags (Continued)

Benchmarks using both C and C++ (continued):

```
-Wl,-mllvm -Wl,-x86-use-vzeroupper=false -Wl,-mllvm -Wl,-extra-inliner
-O3 -march=znver5 -fveclib=AMDLIBM -ffast-math -fno-PIE -no-pie
-flto -fstruct-layout=7 -mllvm -unroll-threshold=50
-mllvm -inline-threshold=1000 -fremap-arrays -fstrip-mining
-mllvm -reduce-array-computations=3 -zopt -mllvm -unroll-threshold=100
-mllvm -loop-unswitch-threshold=200000 -lamdlibm -lamdalloc -lflang
-ldl
```

Benchmarks using Fortran, C, and C++:

```
-m64 -std=c++14 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-x86-use-vzeroupper=false -Wl,-mllvm -Wl,-extra-inliner
-O3 -march=znver5 -fveclib=AMDLIBM -ffast-math -fno-PIE -no-pie
-flto -fstruct-layout=7 -mllvm -unroll-threshold=50
-mllvm -inline-threshold=1000 -fremap-arrays -fstrip-mining
-mllvm -reduce-array-computations=3 -zopt -mllvm -unroll-threshold=100
-mllvm -loop-unswitch-threshold=200000 -Mrecursive -funroll-loops
-mllvm -lsr-in-nested-loop -fepilog-vectorization-of-inductions
-lamdlibm -lamdalloc -lflang -ldl
```

Base Other Flags

C benchmarks:

-Wno-unused-command-line-argument

C++ benchmarks:

-Wno-unused-command-line-argument

Fortran benchmarks:

-Wno-unused-command-line-argument

Benchmarks using both Fortran and C:

-Wno-unused-command-line-argument

Benchmarks using both C and C++:

-Wno-unused-command-line-argument

Benchmarks using Fortran, C, and C++:

-Wno-unused-command-line-argument



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Peak Compiler Invocation

C benchmarks:

clang

C++ benchmarks:

clang++

Fortran benchmarks:

flang

Benchmarks using both Fortran and C:

flang clang

Benchmarks using both C and C++:

clang++ clang

Benchmarks using Fortran, C, and C++:

clang++ clang flang

Peak Portability Flags

Same as Base Portability Flags

Peak Optimization Flags

C benchmarks:

519.lbm_r: basepeak = yes

538.imagick_r: -m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3 -Ofast
-march=znver5 -fveclib=AMDLIBM -ffast-math -flto
-fstruct-layout=7 -mllvm -unroll-threshold=50
-fremap-arrays -fstrip-mining
-mllvm -inline-threshold=1000
-mllvm -reduce-array-computations=3 -zopt -lamdlibm
-lamdalloc -ldl

544.nab_r: -m64 -flto -Wl,-mllvm -Wl,-ldist-scalar-expand
-fenable-aggressive-gather -Ofast -march=znver5
-fveclib=AMDLIBM -ffast-math -fstruct-layout=7
-mllvm -unroll-threshold=50 -fremap-arrays -fstrip-mining
-mllvm -inline-threshold=1000

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Peak Optimization Flags (Continued)

544.nab_r (continued):

```
-mllvm -reduce-array-computations=3 -zopt -lamdlibm
-lamdalloc -ldl
```

C++ benchmarks:

508.namd_r: -m64 -std=c++14

```
-Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-x86-use-vzeroupper=false -Ofast
-march=znver5 -fveclib=AMDLIBM -ffast-math -flto
-mllvm -unroll-threshold=100
-mllvm -reduce-array-computations=3 -zopt -lamdlibm
-lamdalloc -ldl
```

510.parest_r: basepeak = yes

Fortran benchmarks:

503.bwaves_r: -m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6

```
-Wl,-mllvm -Wl,-reduce-array-computations=3 -Ofast
-march=znver5 -fveclib=AMDLIBM -ffast-math -flto
-Mrecursive -mllvm -reduce-array-computations=3
-fepilog-vectorization-of-inductions -zopt -lamdlibm
-lamdalloc -ldl -lflang
```

549.fotonik3d_r: -m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6

```
-Wl,-mllvm -Wl,-reduce-array-computations=3 -Ofast
-march=znver5 -fveclib=AMDLIBM -ffast-math -flto
-Mrecursive -mllvm -reduce-array-computations=3
-fepilog-vectorization-of-inductions -fvector-transform
-fscalar-transform -lamdlibm -lamdalloc -ldl -lflang
```

554.roms_r: Same as 503.bwaves_r

Benchmarks using both Fortran and C:

521.wrf_r: -m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6

```
-Wl,-mllvm -Wl,-reduce-array-computations=3 -Ofast
-march=znver5 -fveclib=AMDLIBM -ffast-math -flto
-fstruct-layout=7 -mllvm -unroll-threshold=50
-fremap-arrays -fstrip-mining
-mllvm -inline-threshold=1000
-mllvm -reduce-array-computations=3 -zopt -Mrecursive
-funroll-loops -mllvm -lsr-in-nested-loop
-fepilog-vectorization-of-inductions -lamdlibm -lamdalloc
```

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Test Date: Sep-2024

Hardware Availability: Oct-2024

Software Availability: Aug-2024

Peak Optimization Flags (Continued)

521.wrf_r (continued):

-ldl -lflang

527.cam4_r: basepeak = yes

Benchmarks using both C and C++:

511.povray_r: -m64 -std=c++14

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

-Wl,-mllvm -Wl,-reduce-array-computations=3

-Wl,-mllvm -Wl,-x86-use-vzeroupper=false

-Wl,-mllvm -Wl,-extra-inliner -Ofast -march=znver5

-fveclib=AMDLIBM -ffast-math -flto -fstruct-layout=7

-mllvm -unroll-threshold=50 -mllvm -inline-threshold=1000

-fremap-arrays -mllvm -reduce-array-computations=3 -zopt

-mllvm -unroll-threshold=100

-mllvm -loop-unswitch-threshold=200000 -lamdlibm

-lamdalloc -ldl

526.blender_r: -m64 -std=c++14

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

-Wl,-mllvm -Wl,-reduce-array-computations=3

-Wl,-mllvm -Wl,-x86-use-vzeroupper=false -Ofast

-march=znver5 -fveclib=AMDLIBM -ffast-math -flto

-fstruct-layout=7 -mllvm -unroll-threshold=50

-fremap-arrays -fstrip-mining

-mllvm -inline-threshold=1000

-mllvm -reduce-array-computations=3 -zopt

-mllvm -unroll-threshold=100 -lamdlibm -lamdalloc -ldl

Benchmarks using Fortran, C, and C++:

507.cactuBSSN_r: basepeak = yes

Peak Other Flags

C benchmarks:

-Wno-unused-command-line-argument

C++ benchmarks:

-Wno-unused-command-line-argument

Fortran benchmarks:

-Wno-unused-command-line-argument

(Continued on next page)



SPEC CPU®2017 Floating Point Rate Result

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R183-Z93-LAJ1-000

(2.70 GHz, AMD EPYC 9755)

SPECrate®2017_fp_base = 2320

SPECrate®2017_fp_peak = 2530

CPU2017 License: 9082

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Peak Other Flags (Continued)

Benchmarks using both Fortran and C:

-Wno-unused-command-line-argument

Benchmarks using both C and C++:

-Wno-unused-command-line-argument

Benchmarks using Fortran, C, and C++:

-Wno-unused-command-line-argument

The flags files that were used to format this result can be browsed at

<http://www.spec.org/cpu2017/flags/aocc500-flags.2024-10-10.00.html>

<http://www.spec.org/cpu2017/flags/GIGA-BYTE-Platform-SPECcpu2017-Flags-V1.0-Turin.html>

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

<http://www.spec.org/cpu2017/flags/aocc500-flags.2024-10-10.00.xml>

<http://www.spec.org/cpu2017/flags/GIGA-BYTE-Platform-SPECcpu2017-Flags-V1.0-Turin.xml>

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