



SPEC CPU®2017 Integer Rate Result

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GIGA-BYTE TECHNOLOGY CO., LTD.

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

R283-Z90-AAD1-000

(AMD EPYC 9754, 2.25GHz)

SPECrate®2017_int_base = 1870

SPECrate®2017_int_peak = 2050

CPU2017 License: 9082

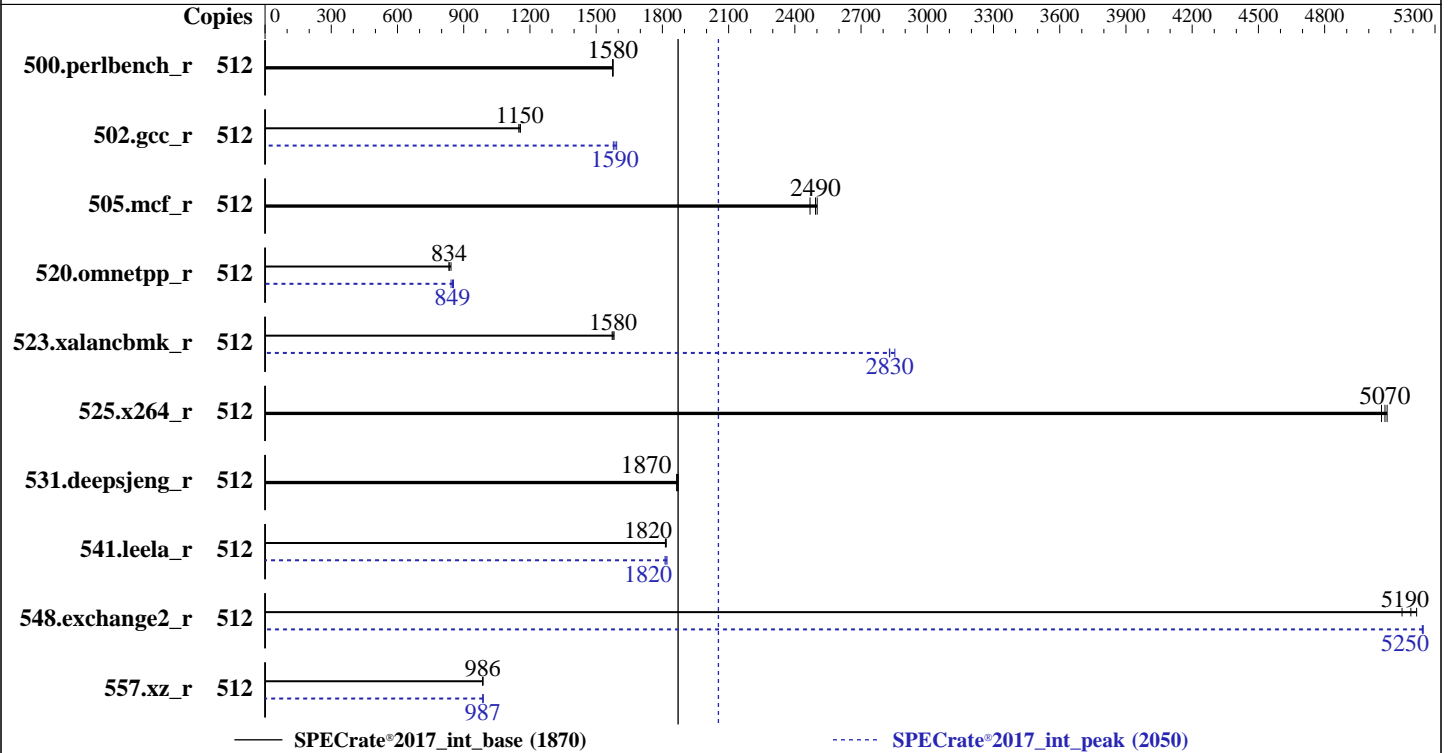
Test Sponsor: Giga Computing Technology Co., Ltd.

Tested by: Giga Computing Technology Co., Ltd.

Test Date: Jun-2023

Hardware Availability: Jun-2023

Software Availability: Nov-2022



Hardware

CPU Name: AMD EPYC 9754
 Max MHz: 3100
 Nominal: 2250
 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, 16 MB shared / 8 cores
 Other: None
 Memory: 1536 GB (24 x 64 GB 2Rx4 PC5-4800B-R)
 Storage: 1 x 1.92TB PCIE NVME SSD
 Other: None

Software

OS: SUSE Linux Enterprise Server 15 SP4 (x86_64) 5.14.21-150400.22-default
 Compiler: C/C++/Fortran: Version 4.0.0 of AOCC
 Parallel: No
 Firmware: Version F07 released Mar-2023
 File System: xfs
 System State: Run level 3 (multi-user)
 Base Pointers: 64-bit
 Peak Pointers: 32/64-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
500.perlbench_r	512	517	1580	<u>517</u>	<u>1580</u>	518	1570	512	517	1580	<u>517</u>	<u>1580</u>	518	1570
502.gcc_r	512	<u>628</u>	<u>1150</u>	627	1160	631	1150	512	460	1580	<u>457</u>	<u>1590</u>	455	1590
505.mcf_r	512	331	2500	335	2470	<u>332</u>	<u>2490</u>	512	331	2500	335	2470	<u>332</u>	<u>2490</u>
520.omnetpp_r	512	797	842	<u>805</u>	<u>834</u>	806	833	512	<u>791</u>	<u>849</u>	787	854	797	843
523.xalancbmk_r	512	344	1570	<u>343</u>	<u>1580</u>	342	1580	512	<u>191</u>	<u>2830</u>	191	2830	190	2850
525.x264_r	512	<u>177</u>	<u>5070</u>	176	5080	177	5060	512	<u>177</u>	<u>5070</u>	176	5080	177	5060
531.deepsjeng_r	512	<u>314</u>	<u>1870</u>	314	1870	315	1860	512	<u>314</u>	<u>1870</u>	314	1870	315	1860
541.leela_r	512	<u>467</u>	<u>1820</u>	467	1820	467	1810	512	468	1810	<u>467</u>	<u>1820</u>	466	1820
548.exchange2_r	512	260	5150	<u>258</u>	<u>5190</u>	257	5220	512	256	5240	<u>256</u>	<u>5250</u>	256	5250
557.xz_r	512	560	987	<u>561</u>	<u>986</u>	561	986	512	560	987	<u>560</u>	<u>987</u>	560	988

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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:

```
LD_LIBRARY_PATH =
  "/home/cpu2017_znver4_A1/amd_rate_aocc400_znver4_A_lib/lib:/home/cpu2017_znver4_A1/amd_rate_aocc400_zn
  ver4_A_lib/lib32:"
MALLOC_CONF = "retain:true"
```

Environment variables set by runcpu during the 523.xalancbmk_r peak run:

```
MALLOC_CONF = "thp:never"
```

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:

```
SEV Control = Disable
TSME = Disabled
Determinism Control = Manual
Determinism Enable = Power
TDP Control = Manual
TDP = 400
PPT Control = Manual
PPT = 400
```

```
Sysinfo program /home/cpu2017_znver4_A1/bin/sysinfo
Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
running on localhost Thu Jun 1 10:30:56 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 249 (249.11+suse.124.g2bc0b2c447)
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. cpupower frequency-info

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Platform Notes (Continued)

```

16. tuned-adm active
17. sysctl
18. /sys/kernel/mm/transparent_hugepage
19. /sys/kernel/mm/transparent_hugepage/khugepaged
20. OS release
21. Disk information
22. /sys/devices/virtual/dmi/id
23. dmidecode
24. BIOS

```

```

-----
1. uname -a
Linux localhost 5.14.21-150400.22-default #1 SMP PREEMPT_DYNAMIC Wed May 11 06:57:18 UTC 2022 (49db222)
x86_64 x86_64 x86_64 GNU/Linux

```

```

-----
2. w
10:30:56 up 4 min, 1 user, load average: 6.73, 21.23, 11.29
USER      TTY      FROM          LOGIN@      IDLE        JCPU        PCPU        WHAT
root      ttyl    -             10:29      32.00s     1.62s     0.19s /bin/bash ./amd_rate_aocc400_znver4_A1.sh

```

```

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

```

```

-----
4. ulimit -a
core file size          (blocks, -c) unlimited
data seg size           (kbytes, -d) unlimited
scheduling priority     (-e) 0
file size                (blocks, -f) unlimited
pending signals         (-i) 6190496
max locked memory       (kbytes, -l) 2097152
max memory size         (kbytes, -m) unlimited
open files               (-n) 1024000
pipe size                (512 bytes, -p) 8
POSIX message queues    (bytes, -q) 819200
real-time priority      (-r) 0
stack size               (kbytes, -s) unlimited
cpu time                 (seconds, -t) unlimited
max user processes      (-u) 6190496
virtual memory           (kbytes, -v) unlimited
file locks               (-x) unlimited

```

```

-----
5. sysinfo process ancestry
/usr/lib/systemd/systemd --switched-root --system --deserialize 30
login -- root
-bash
python3 ./run_amd_rate_aocc400_znver4_A1.py
/bin/bash ./amd_rate_aocc400_znver4_A1.sh
runcpu --config amd_rate_aocc400_znver4_A1.cfg --tune all --reportable --iterations 3 intrate
runcpu --configfile amd_rate_aocc400_znver4_A1.cfg --tune all --reportable --iterations 3 --nopower
--runmode rate --tune base:peak --size test:train:refrate intrate --nopreenv --note-preenv --logfile
$SPEC/tmp/CPU2017.002/temlogs/preenv.intrate.002.0.log --lognum 002.0 --from_runcpu 2
specperl $SPEC/bin/sysinfo
$SPEC = /home/cpu2017_znver4_A1

```

(Continued on next page)



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Platform Notes (Continued)

```

6. /proc/cpuinfo
model name      : AMD EPYC 9754 128-Core Processor
vendor_id      : AuthenticAMD
cpu family     : 25
model          : 160
stepping       : 1
microcode      : 0xaa00107
bugs           : sysret_ss_attrs spectre_v1 spectre_v2 spec_store_bypass
TLB size      : 3584 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 9754 128-Core Processor
CPU family:            25
Model:                 160
Thread(s) per core:    2
Core(s) per socket:    128
Socket(s):             2
Stepping:              1
Frequency boost:       enabled
CPU max MHz:           3100.3411
CPU min MHz:           1500.0000
BogoMIPS:              4499.87
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
                        xsaves xgetbv1 xsaves cqm_llc cqm_occup_llc cqm_mbm_total cqm_mbm_local
                        avx512_bf16 clzero irperf xsaveerptr rdpru wbnoinvd amd_ppin arat npt lbrv
                        svm_lock 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
Virtualization:        AMD-V
L1d cache:             8 MiB (256 instances)

```

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Platform Notes (Continued)

```

L1i cache:                8 MiB (256 instances)
L2 cache:                 256 MiB (256 instances)
L3 cache:                 512 MiB (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 Itlb multihit: Not affected
Vulnerability L1tf:        Not affected
Vulnerability Mds:         Not affected
Vulnerability Meltdown:   Not affected
Vulnerability Spec store bypass: Mitigation; Speculative Store Bypass disabled via prctl and seccomp
Vulnerability Spectre v1:  Mitigation; usercopy/swaps barriers and __user pointer sanitization
Vulnerability Spectre v2:  Mitigation; Retpolines, IBPB conditional, IBRS_FW, STIBP always-on, RSB
                             filling
Vulnerability Srbds:       Not affected
Vulnerability Tsx async abort: Not affected

```

From lscpu --cache:

NAME	ONE-SIZE	ALL-SIZE	WAYS	TYPE	LEVEL	SETS	PHY-LINE	COHERENCY-SIZE
L1d	32K	8M	8	Data	1	64	1	64
L1i	32K	8M	8	Instruction	1	64	1	64
L2	1M	256M	8	Unified	2	2048	1	64
L3	16M	512M	16	Unified	3	16384	1	64

8. numactl --hardware

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: 48114 MB

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Platform Notes (Continued)

```

node 0 free: 47404 MB
node 1 cpus: 8-15,264-271
node 1 size: 48379 MB
node 1 free: 48092 MB
node 2 cpus: 16-23,272-279
node 2 size: 48379 MB
node 2 free: 48107 MB
node 3 cpus: 24-31,280-287
node 3 size: 48379 MB
node 3 free: 48116 MB
node 4 cpus: 32-39,288-295
node 4 size: 48379 MB
node 4 free: 48179 MB
node 5 cpus: 40-47,296-303
node 5 size: 48379 MB
node 5 free: 48251 MB
node 6 cpus: 48-55,304-311
node 6 size: 48379 MB
node 6 free: 48256 MB
node 7 cpus: 56-63,312-319
node 7 size: 48379 MB
node 7 free: 48245 MB
node 8 cpus: 64-71,320-327
node 8 size: 48379 MB
node 8 free: 48229 MB
node 9 cpus: 72-79,328-335
node 9 size: 48379 MB
node 9 free: 48224 MB
node 10 cpus: 80-87,336-343
node 10 size: 48379 MB
node 10 free: 48250 MB
node 11 cpus: 88-95,344-351
node 11 size: 48379 MB
node 11 free: 48242 MB
node 12 cpus: 96-103,352-359
node 12 size: 48379 MB
node 12 free: 47666 MB
node 13 cpus: 104-111,360-367
node 13 size: 48379 MB
node 13 free: 46305 MB
node 14 cpus: 112-119,368-375
node 14 size: 48379 MB
node 14 free: 47922 MB
node 15 cpus: 120-127,376-383
node 15 size: 48379 MB
node 15 free: 47679 MB
node 16 cpus: 128-135,384-391
node 16 size: 48379 MB
node 16 free: 48298 MB
node 17 cpus: 136-143,392-399
node 17 size: 48379 MB
node 17 free: 48268 MB
node 18 cpus: 144-151,400-407
node 18 size: 48379 MB
node 18 free: 48300 MB
node 19 cpus: 152-159,408-415
node 19 size: 48379 MB
node 19 free: 48229 MB
node 20 cpus: 160-167,416-423
node 20 size: 48377 MB

```

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Platform Notes (Continued)

```

node 20 free: 48251 MB
node 21 cpus: 168-175,424-431
node 21 size: 48381 MB
node 21 free: 48237 MB
node 22 cpus: 176-183,432-439
node 22 size: 48377 MB
node 22 free: 48242 MB
node 23 cpus: 184-191,440-447
node 23 size: 48347 MB
node 23 free: 48209 MB
node 24 cpus: 192-199,448-455
node 24 size: 48379 MB
node 24 free: 48248 MB
node 25 cpus: 200-207,456-463
node 25 size: 48379 MB
node 25 free: 48217 MB
node 26 cpus: 208-215,464-471
node 26 size: 48379 MB
node 26 free: 48255 MB
node 27 cpus: 216-223,472-479
node 27 size: 48379 MB
node 27 free: 48249 MB
node 28 cpus: 224-231,480-487
node 28 size: 48379 MB
node 28 free: 48244 MB
node 29 cpus: 232-239,488-495
node 29 size: 48379 MB
node 29 free: 48308 MB
node 30 cpus: 240-247,496-503
node 30 size: 48379 MB
node 30 free: 48310 MB
node 31 cpus: 248-255,504-511
node 31 size: 48171 MB
node 31 free: 48037 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
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
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
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
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
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
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
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
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
9:	12	12	12	12	12	12	12	12	11	10	11	11	12	12	12	12	32	32	32	32	32	32	32	32	32
10:	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
11:	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

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SPEC CPU®2017 Integer Rate Result

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R283-Z90-AAD1-000

(AMD EPYC 9754, 2.25GHz)

SPECrate®2017_int_base = 1870

SPECrate®2017_int_peak = 2050

CPU2017 License: 9082

Test Sponsor: Giga Computing Technology Co., Ltd.

Tested by: Giga Computing Technology Co., Ltd.

Test Date: Jun-2023

Hardware Availability: Jun-2023

Software Availability: Nov-2022

Platform Notes (Continued)

```

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
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
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
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:      1584791428 kB

```

```

-----
10. who -r
    run-level 3 Jun 1 10:28

```

```

-----
11. Systemd service manager version: systemd 249 (249.11+suse.124.g2bc0b2c447)
    Default Target    Status
    multi-user        degraded

```

```

-----
12. Failed units, from systemctl list-units --state=failed
    UNIT                                LOAD    ACTIVE SUB    DESCRIPTION
* systemd-udev-settle.service loaded failed failed Wait for udev To Complete Device Initialization

```

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Platform Notes (Continued)

13. Services, from systemctl list-unit-files

STATE	UNIT FILES
enabled	YaST2-Firstboot YaST2-Second-Stage apparmor auditd cron display-manager getty@ haveged irqbalance issue-generator kbdsettings klog lvm2-monitor nscd nvme-fc-boot-connections postfix purge-kernels rollback rsyslog smartd sshd wicked wickedd-auto4 wickedd-dhcp4 wickedd-dhcp6 wickedd-nanny
enabled-runtime	systemd-remount-fs
disabled	accounts-daemon autofs autoyast-initscripts blk-availability boot-sysctl ca-certificates chrony-wait chronyd console-getty cups cups-browsed debug-shell ebttables exchange-bmc-os-info fancontrol firewalld gpm grub2-once haveged-switch-root ipmi ipmievie issue-add-ssh-keys kdump kdump-early kexec-load lm_sensors lunmask man-db-create multipathd nfs nfs-blkmap nvme-fc-autoconnect rdisc rpcbind rpmconfigcheck rsyncd runssj serial-getty@ smartd_generate_opts snmpd snmptrapd systemd-boot-check-no-failures systemd-network-generator systemd-sysext systemd-time-wait-sync systemd-timesyncd tuned udisks2
indirect	wickedd

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

```

BOOT_IMAGE=/boot/vmlinuz-5.14.21-150400.22-default
root=UUID=d7640ab6-1cf7-45d7-8b8e-5805bbb10001
splash=silent
resume=/dev/disk/by-uuid/5c9fc2ce-054f-420c-8d23-68348791fb2a
mitigations=auto
quiet
security=apparmor

```

15. cpupower frequency-info

```

analyzing CPU 0:
  current policy: frequency should be within 1.50 GHz and 2.25 GHz.
                  The governor "performance" may decide which speed to use
                  within this range.

  boost state support:
    Supported: yes
    Active: yes

```

16. tuned-adm active

```

It seems that tuned daemon is not running, preset profile is not activated.
Preset profile: throughput-performance

```

17. 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

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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

```

```

-----
18. /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

```

```

-----
19. /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

```

```

-----
20. OS release
From /etc/*-release /etc/*-version
os-release SUSE Linux Enterprise Server 15 SP4

```

```

-----
21. Disk information
SPEC is set to: /home/cpu2017_znver4_A1
Filesystem Type Size Used Avail Use% Mounted on
/dev/nvme0n1p3 xfs 237G 6.7G 230G 3% /home

```

```

-----
22. /sys/devices/virtual/dmi/id
Vendor:      GIGABYTE
Product:     R283-Z90-AAD1-000
Product Family: Server
Serial:      GMG6D1212A0002

```

```

-----
23. 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:
  24x Micron Technology MTC40F2046S1RC48BA1 64 GB 2 rank 4800

```

```

-----
24. BIOS
(This section combines info from /sys/devices and dmidecode.)
BIOS Vendor:      GIGABYTE
BIOS Version:     F07
BIOS Date:        03/17/2023
BIOS Revision:    5.27

```



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Compiler Version Notes

=====
C | 502.gcc_r(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: i386-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin
=====

=====
C | 500.perlbench_r(base, peak) 502.gcc_r(base) 505.mcf_r(base, peak) 525.x264_r(base, peak)
| 557.xz_r(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 | 502.gcc_r(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: i386-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin
=====

=====
C | 500.perlbench_r(base, peak) 502.gcc_r(base) 505.mcf_r(base, peak) 525.x264_r(base, peak)
| 557.xz_r(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++ | 523.xalancbmk_r(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: i386-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin
=====

=====
C++ | 520.omnetpp_r(base, peak) 523.xalancbmk_r(base) 531.deepsjeng_r(base, peak) 541.leela_r(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++ | 523.xalancbmk_r(peak)
=====

(Continued on next page)



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CPU2017 License: 9082

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Test Date: Jun-2023

Hardware Availability: Jun-2023

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Compiler Version Notes (Continued)

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: i386-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin

=====
C++ | 520.omnetpp_r(base, peak) 523.xalancbmk_r(base) 531.deepsjeng_r(base, peak) 541.leela_r(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 | 548.exchange2_r(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

Base Compiler Invocation

C benchmarks:

clang

C++ benchmarks:

clang++

Fortran benchmarks:

flang

Base Portability Flags

500.perlbench_r: -DSPEC_LINUX_X64 -DSPEC_LP64
502.gcc_r: -DSPEC_LP64
505.mcf_r: -DSPEC_LP64
520.omnetpp_r: -DSPEC_LP64
523.xalancbmk_r: -DSPEC_LINUX -DSPEC_LP64
525.x264_r: -DSPEC_LP64
531.deepsjeng_r: -DSPEC_LP64
541.leela_r: -DSPEC_LP64
548.exchange2_r: -DSPEC_LP64
557.xz_r: -DSPEC_LP64



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CPU2017 License: 9082

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Test Date: Jun-2023

Hardware Availability: Jun-2023

Software Availability: Nov-2022

Base Optimization Flags

C benchmarks:

```
-m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-ldist-scalar-expand -fenable-aggressive-gather
-z muldefs -O3 -march=znver4 -fveclib=AMDLIBM -ffast-math
-fstruct-layout=7 -mllvm -unroll-threshold=50
-mllvm -inline-threshold=1000 -fremap-arrays -fstrip-mining
-mllvm -reduce-array-computations=3 -zopt -lamdlibm -lflang
-lamdalloc
```

C++ benchmarks:

```
-m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3 -z muldefs -O3
-march=znver4 -fveclib=AMDLIBM -ffast-math
-mllvm -unroll-threshold=100 -finline-aggressive
-mllvm -loop-unswitch-threshold=200000
-mllvm -reduce-array-computations=3 -zopt
-fvirtual-function-elimination -fvisibility=hidden -lamdlibm -lflang
-lamdalloc-ext
```

Fortran benchmarks:

```
-m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-inline-recursion=4 -Wl,-mllvm -Wl,-lsr-in-nested-loop
-Wl,-mllvm -Wl,-enable-iv-split -z muldefs -O3 -march=znver4
-fveclib=AMDLIBM -ffast-math -fepilog-vectorization-of-inductions
-mllvm -optimize-strided-mem-cost -floop-transform
-mllvm -unroll-aggressive -mllvm -unroll-threshold=500 -lamdlibm
-lflang -lamdalloc
```

Base Other Flags

C benchmarks:

-Wno-unused-command-line-argument

C++ benchmarks:

-Wno-unused-command-line-argument

Fortran benchmarks:

-Wno-unused-command-line-argument



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Software Availability: Nov-2022

Peak Compiler Invocation

C benchmarks:

clang

C++ benchmarks:

clang++

Fortran benchmarks:

flang

Peak Portability Flags

```
500.perlbench_r: -DSPEC_LINUX_X64 -DSPEC_LP64
502.gcc_r: -D_FILE_OFFSET_BITS=64
505.mcf_r: -DSPEC_LP64
520.omnetpp_r: -DSPEC_LP64
523.xalancbmk_r: -DSPEC_LINUX -DSPEC_LP64
525.x264_r: -DSPEC_LP64
531.deepsjeng_r: -DSPEC_LP64
541.leela_r: -DSPEC_LP64
548.exchange2_r: -DSPEC_LP64
557.xz_r: -DSPEC_LP64
```

Peak Optimization Flags

C benchmarks:

```
500.perlbench_r: basepeak = yes
```

```
502.gcc_r: -m32 -flto -z muldefs -Ofast -march=znver4
-fveclib=AMDLIBM -ffast-math -fstruct-layout=7
-mllvm -unroll-threshold=50 -fremap-arrays -fstrip-mining
-mllvm -inline-threshold=1000
-mllvm -reduce-array-computations=3 -zopt -fgnu89-inline
-lamdaloc
```

```
505.mcf_r: basepeak = yes
```

```
525.x264_r: basepeak = yes
```

```
557.xz_r: -m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3 -Ofast
-march=znver4 -fveclib=AMDLIBM -ffast-math
```

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Peak Optimization Flags (Continued)

557.xz_r (continued):

```
-fstruct-layout=7 -mllvm -unroll-threshold=50
-freemap-arrays -fstrip-mining
-mllvm -inline-threshold=1000
-mllvm -reduce-array-computations=3 -zopt -lamdlibm
-lflang -lamdalloc
```

C++ benchmarks:

```
520.omnetpp_r: -m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3 -Ofast
-march=znver4 -fveclib=AMDLIBM -ffast-math
-finline-aggressive -mllvm -unroll-threshold=100
-mllvm -reduce-array-computations=3 -zopt
-fvirtual-function-elimination -fvisibility=hidden
-lamdlibm -lamdalloc-ext
```

```
523.xalancbmk_r: -m32 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-do-block-reorder=aggressive
-fno-loop-reroll -Ofast -march=znver4 -fveclib=AMDLIBM
-ffast-math -finline-aggressive
-mllvm -unroll-threshold=100
-mllvm -reduce-array-computations=3 -zopt
-mllvm -do-block-reorder=aggressive
-fvirtual-function-elimination -fvisibility=hidden
-lamdalloc-ext
```

531.deepsjeng_r: basepeak = yes

```
541.leela_r: -m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3 -Ofast
-march=znver4 -fveclib=AMDLIBM -ffast-math
-finline-aggressive -mllvm -unroll-threshold=100
-mllvm -reduce-array-computations=3 -zopt
-fvirtual-function-elimination -fvisibility=hidden
-lamdlibm -lflang -lamdalloc-ext
```

Fortran benchmarks:

```
-m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-inline-recursion=4 -Wl,-mllvm -Wl,-lsr-in-nested-loop
-Wl,-mllvm -Wl,-enable-iv-split -O3 -march=znver4 -fveclib=AMDLIBM
-ffast-math -fepilog-vectorization-of-inductions
-mllvm -optimize-strided-mem-cost -floop-transform
-mllvm -unroll-aggressive -mllvm -unroll-threshold=500 -lamdlibm
```

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Peak Optimization Flags (Continued)

Fortran benchmarks (continued):

`-lflang -lamdalloc`

Peak Other Flags

C benchmarks (except as noted below):

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

`502 gcc_r: -L/usr/lib32 -Wno-unused-command-line-argument`

`-L/home/work/cpu2017/v119/aocc4/znver4/rate/amd_rate_aocc400_znver4_A_lib/lib32`

C++ benchmarks (except as noted below):

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

`523.xalancbmk_r: -L/usr/lib32 -Wno-unused-command-line-argument`

`-L/home/work/cpu2017/v119/aocc4/znver4/rate/amd_rate_aocc400_znver4_A_lib/lib32`

Fortran benchmarks:

`-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/GIGA-BYTE-Platform-SPECcpu2017-Flags-V1.1-Bergamo.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/GIGA-BYTE-Platform-SPECcpu2017-Flags-V1.1-Bergamo.xml>

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

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