FX Fusion
FusionServer 2258 V7
AMD EPYC 9654

CPU2017 License: 6488
Test Sponsor: xFusion
Tested by: xFusion

SPECrate®2017_int_base = 1800
SPECrate®2017_int_peak = Not Run

Test Date: Jan-2024
Hardware Availability: Nov-2023
Software Availability: Dec-2022

Copies

<table>
<thead>
<tr>
<th>Test</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>perlbmch_r</td>
<td>384</td>
</tr>
<tr>
<td>gcc_r</td>
<td>384</td>
</tr>
<tr>
<td>mcf_r</td>
<td>384</td>
</tr>
<tr>
<td>omnetpp_r</td>
<td>384</td>
</tr>
<tr>
<td>xalancbmk_r</td>
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<tr>
<td>x264_r</td>
<td>384</td>
</tr>
<tr>
<td>deepsjeng_r</td>
<td>384</td>
</tr>
<tr>
<td>leela_r</td>
<td>384</td>
</tr>
<tr>
<td>exchange2_r</td>
<td>384</td>
</tr>
<tr>
<td>xz_r</td>
<td>384</td>
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</tbody>
</table>

500.perlbmch_r 384
502.gcc_r 384
505.mcf_r 384
520.omnetpp_r 384
523.xalancbmk_r 384
525.x264_r 384
531.deepsjeng_r 384
541.leela_r 384
548.exchange2_r 384
557.xz_r 384

--- SPECrate®2017_int_base (1800) ---

<table>
<thead>
<tr>
<th>Test</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>perlbmch_r</td>
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<tr>
<td>omnetpp_r</td>
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<tr>
<td>xalancbmk_r</td>
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<tr>
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<tr>
<td>exchange2_r</td>
<td></td>
</tr>
<tr>
<td>xz_r</td>
<td></td>
</tr>
</tbody>
</table>

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: 768 GB (24 x 32 GB 2Rx8 PC5-4800B-R)
Storage: 1 x 960 GB SATA SSD
Other: None

Software

OS: Red Hat Enterprise Linux release 9.0 (Plow)
Compiler: C/C++/Fortran: Version 4.0.0 of AOCC
Parallel: No
Firmware: Version 1.06.29 released Nov-2023
File System: xfs
System State: Run level 5 (multi-user)
Base Pointers: 64-bit
Peak Pointers: Not Applicable
Other: None
Power Management: BIOS and OS set to prefer performance at the cost of additional power usage

Page 1 Standard Performance Evaluation Corporation (info@spec.org) https://www.spec.org/
**Results Table**

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Copies</th>
<th>Seconds</th>
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<th>Seconds</th>
<th>Ratio</th>
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<tr>
<td>531.deepsjeng_r</td>
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<tr>
<td>541.leela_r</td>
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<tr>
<td>548.exchange2_r</td>
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<td>4500</td>
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<td>557.xz_r</td>
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<td>907</td>
<td>910</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

**Compiler Notes**

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

**Submit Notes**

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 madvice > /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.
 SPEC CPU®2017 Integer Rate Result  
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xFusion
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Environment Variables Notes

Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH = 
"/home/cpu2017/amd_rate_aocc400_znver4_A_lib/lib:/home/cpu2017/amd_rate_aocc400_znver4_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:
TDP: 400
Determinism Enable set to Power
PPT: 400
NPS: 4

Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097be9c197
running on localhost.localdomain Fri Jan  5 20:53:20 2024

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

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20. Disk information
21. /sys/devices/virtual/dmi/id
22. dmidecode
23. BIOS

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Platform Notes (Continued)

1. `uname -a`
   Linux localhost.localdomain 5.14.0-70.13.1.el9_0.x86_64 #1 SMP PREEMPT Thu Apr 14 12:42:38 EDT 2022 x86_64 x86_64 GNU/Linux

2. `w`
   20:53:20 up 8 min,  2 users, load average: 0.32, 0.87, 0.74
   USER     TTY        LOGIN@   IDLE   JCPU   PCPU WHAT
   root     pts/0     20:46   12.00s  1.20s  0.02s -bash
   root     pts/1     20:49    3:51   0.00s  0.00s -bash

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

4. `ulimit -a`
   real-time non-blocking time (microseconds, -R) unlimited
   core file size (blocks, -c) 0
   data seg size (kbytes, -d) unlimited
   scheduling priority (-e) 0
   file size (blocks, -f) unlimited
   pending signals (-i) 6191057
   max locked memory (kbytes, -l) 2097152
   max memory size (kbytes, -m) unlimited
   open files (-n) 1024
   pipe size (512 bytes, -p) 8
   POSIX message queues (bytes, -q) 819200
   real-time priority (-r) 0
   stack size (kbytes, -S) unlimited
   cpu time (seconds, -t) unlimited
   max user processes (-u) 6191057
   virtual memory (kbytes, -v) unlimited
   file locks (-x) unlimited

5. `sysinfo process ancestry`
   /usr/lib/systemd/systemd rhgb --switched-root --system --deserialize 31
   ssd: /usr/sbin/sshd -D [listener] 0 of 10-100 startups
   ssd: root [priv]
   ssd: root@pts/0
   -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 base --iterations 3 intrate
   runcpu --configfile amd_rate_aocc400_znver4_A1.cfg --tune base --iterations 3 --nopower --runmode rate --size test:train:refrate intrate
   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                             |
Platform Notes (Continued)

From lscpu from util-linux 2.37.4:

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): 384
On-line CPU(s) list: 0-383
Vendor ID: AuthenticAMD
Model name: AMD EPYC 9654 96-Core Processor
CPU family: 25
Model: 17
Stepping: 1
Frequency boost: Enabled
CPU max MHz: 3707.8120
BogoMIPS: 4799.82
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 rpl
pi pclmulqdq monitor ssse3 fma cx16 pcid sse4_1 sse4_2 x2apic movbe
popcnt aes xsave avx16c rdrand lahf_lm cmp_legacy svm extapic cr8_legacy
abm ssse3 misalignsse 3dnowprefetch osx救 wdt tce topoext
perfctr_core perfctr_nb perfctr_l1c lwcapx cpb ostat_13 odp_13
invpcid_single hw_pstate ssbd mba ibrs ibttp stibp vmmcall fsgsbase bmi1
avx2 amep bmi2 erms invpcid cmn rdta avx512f avx512dq rdseed adx ssm
avx512ifma clflushopt clwb avx512cd sha_ni avx512bw avx512vl xsaveopt
xsaves xgetbv1 xsaves qcm_l1c qcm_occup_l1c qcm_mbm_total qcm_mbm_local
avx512_bf16 clzero jcrperf xsaveopt rdrpt nblog nvblvd amd_ppin arat npt ibrv
svm_lock nrip_save tsc_scale vmcb_clean flushbyasid decodeassist
pausefilter ptthreshold avic v_mmsave_vmload vgif vspec_ctl avx512vbmi
umip pneumonia avx512_vbmi2 gqf vaes vclmulqdq avx512_vnni avx512_bitalg
avx512_vpopcntdq lal7 rdpid overflow_recov succor smca frm flush_lld
Virtualization: AMD-V
L1d cache: 6 MiB (192 instances)
L1i cache: 6 MiB (192 instances)
L2 cache: 192 MiB (192 instances)
L3 cache: 768 MiB (24 instances)
CPU2017 License: 6488
Test Sponsor: xFusion
Tested by: xFusion

NUMA node(s): 24
NUMA node0 CPU(s): 0-7,192-199
NUMA node1 CPU(s): 8-15,200-207
NUMA node2 CPU(s): 16-23,208-215
NUMA node3 CPU(s): 24-31,216-223
NUMA node4 CPU(s): 32-39,224-231
NUMA node5 CPU(s): 40-47,232-239
NUMA node6 CPU(s): 48-55,240-247
NUMA node7 CPU(s): 56-63,248-255
NUMA node8 CPU(s): 64-71,256-263
NUMA node9 CPU(s): 72-79,264-271
NUMA node10 CPU(s): 80-87,272-279
NUMA node11 CPU(s): 88-95,280-287
NUMA node12 CPU(s): 96-103,288-295
NUMA node13 CPU(s): 104-111,296-303
NUMA node14 CPU(s): 112-119,304-311
NUMA node15 CPU(s): 120-127,312-319
NUMA node16 CPU(s): 128-135,320-327
NUMA node17 CPU(s): 136-143,328-335
NUMA node18 CPU(s): 144-151,336-343
NUMA node19 CPU(s): 152-159,344-351
NUMA node20 CPU(s): 160-167,352-359
NUMA node21 CPU(s): 168-175,360-367
NUMA node22 CPU(s): 176-183,368-375
NUMA node23 CPU(s): 184-191,376-383

Vulnerability Itlb multihit: Not affected
Vulnerability L1f: Not affected
Vulnerability Mds: Not affected
Vulnerability Meltdown: Not affected
Vulnerability Spec store bypass: Mitigation; Speculative Store Bypass disabled via prctl
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
Vulnerability Srbds: Not affected
Vulnerability Tsx async abort: Not affected

From lscpu --cache:

<table>
<thead>
<tr>
<th>NAME ONE-SIZE ALL-SIZE WAYS TYPE</th>
<th>LEVEL</th>
<th>SETS</th>
<th>PHY-LINE</th>
<th>COHERENCY-SIZE</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1d 32K 6M 8 Data</td>
<td>1</td>
<td>64</td>
<td>1</td>
<td>64</td>
</tr>
<tr>
<td>L1i 32K 6M 8 Instruction</td>
<td>1</td>
<td>64</td>
<td>1</td>
<td>64</td>
</tr>
<tr>
<td>L2 1M 192M 8 Unified</td>
<td>2</td>
<td>2048</td>
<td>1</td>
<td>64</td>
</tr>
<tr>
<td>L3 32M 768M 16 Unified</td>
<td>3</td>
<td>32768</td>
<td>1</td>
<td>64</td>
</tr>
</tbody>
</table>

---

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

available: 24 nodes (0-23)
node 0 cpus: 0-7,192-199
node 0 size: 31414 MB
node 0 free: 30520 MB
node 1 cpus: 8-15,200-207
node 1 size: 32252 MB
node 1 free: 31513 MB
node 2 cpus: 16-23,208-215
node 2 size: 32252 MB
node 2 free: 31750 MB
node 3 cpus: 24-31,216-223
node 3 size: 32252 MB
node 3 free: 32022 MB
node 4 cpus: 32-39,224-231

(Continued on next page)
SPEC CPU®2017 Integer Rate Result

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Platform Notes (Continued)

node 4 size: 32252 MB
node 4 free: 32004 MB
node 5 cpus: 40-47,232-239
node 5 size: 32252 MB
node 5 free: 31955 MB
node 6 cpus: 48-55,240-247
node 6 size: 32252 MB
node 6 free: 32020 MB
node 7 cpus: 56-63,248-255
node 7 size: 32252 MB
node 7 free: 32004 MB
node 8 cpus: 64-71,256-263
node 8 size: 32252 MB
node 8 free: 31967 MB
node 9 cpus: 72-79,264-271
node 9 size: 32252 MB
node 9 free: 32030 MB
node 10 cpus: 80-87,272-279
node 10 size: 32216 MB
node 10 free: 31995 MB
node 11 cpus: 88-95,280-287
node 11 size: 32252 MB
node 11 free: 31964 MB
node 12 cpus: 96-103,288-295
node 12 size: 32252 MB
node 12 free: 32033 MB
node 13 cpus: 104-111,296-303
node 13 size: 32252 MB
node 13 free: 31992 MB
node 14 cpus: 112-119,304-311
node 14 size: 32252 MB
node 14 free: 31984 MB
node 15 cpus: 120-127,312-319
node 15 size: 32252 MB
node 15 free: 31996 MB
node 16 cpus: 128-135,320-327
node 16 size: 32252 MB
node 16 free: 32025 MB
node 17 cpus: 136-143,328-335
node 17 size: 32252 MB
node 17 free: 31964 MB
node 18 cpus: 144-151,336-343
node 18 size: 32252 MB
node 18 free: 32026 MB
node 19 cpus: 152-159,344-351
node 19 size: 32252 MB
node 19 free: 31982 MB
node 20 cpus: 160-167,352-359
node 20 size: 32252 MB
node 20 free: 32004 MB
node 21 cpus: 168-175,360-367
node 21 size: 32252 MB
node 21 free: 31966 MB
node 22 cpus: 176-183,368-375
node 22 size: 32252 MB
node 22 free: 31871 MB
node 23 cpus: 184-191,376-383
node 23 size: 32177 MB
node 23 free: 31840 MB
node distances: (Continued on next page)
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Platform Notes (Continued)

9. /proc/meminfo
   MemTotal: 791664556 kB

10. who -r
    run-level 5 Jan 5 20:45

11. Systemd service manager version: systemd 250 (250-6.e19_0)
    Default Target Status
    graphical running

12. Services, from systemctl list-unit-files

   STATE          UNIT FILES
   enabled        ModemManager NetworkManager dispatcher NetworkManager-wait-online
debounced       accounts-daemon atd auditd avahi-daemon bluetooth chronyd crond cups dbus-broker firewalld
gdm getty@ insights-client-boot irqbalance iscsi iscsilooboot kdump libstoragemgmt
    low-memory-monitor lvm2-monitor mcelog mdmonitor micropathd nis-dommainname
    nvmeof-boot-connections ostree-remount power-profiles-daemon gemu-guest-agent rhmcertd
    rsyslog rtkit-daemon selinux-autorelabel-mark systemd sshd switcheroo-control
    systemd-network-generator tuned udisks2 upower vauthd wtoolsd
    systemctl-restart-fs

   disabled       arp-ethers blk-availability brltty canberra-system-bootup canberra-system-shutdown
canberra-system-shutdown-reboot chrony-wait cni-dhcp console-getty cpupower cups-browsed
dbus-daemon debug-shell dnsmasq hwloc-dump-hwdata iprdump iprinit iprupdate iscsid
    iscsiutil kpartx kvm_stat ledmon man-db-restart-cache-update nftables nvmf-autoconnect
    podman podman-auto-update podman-restart psacct ras-mc-cti rasdaemon rdisc rhcd rhsm
    rshm-facts rpmdb-rebuild serial-getty@ speech-dispatcherd sshd-keygen
    systemd-boot-check-no-failures systemd-pstore systemd-secrets psm thumbprint wpa_supplicant
    spice-vdagentd sshd-async sshd kcm sssd-ns sssd-pam sssd-sshd sssd-sudo

   indirect       systemd-restart-fs

(Continued on next page)
13. Linux kernel boot-time arguments, from /proc/cmdline
   BOOT_IMAGE=(hd0,gpt2)/vmlinuz-5.14.0-70.13.1.el9_0.x86_64
   root=/dev/mapper/rhel_huawei-root
   ro
   crashkernel=1G-4G:192M,4G-64G:256M,64G-:512M
   resume=/dev/mapper/rhel_huawei-swap
   rd.lvm.lv=rhel_huawei/root
   rd.lvm.lv=rhel_huawei/swap
   rhgb
   quiet
   nohup_full=1-383

-----------------------------------------------------------------------------------------------
14. cpupower frequency-info
   analyzing CPU 0:
   current policy: frequency should be within 1.50 GHz and 2.40 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: 2400MHz

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

-----------------------------------------------------------------------------------------------
16. 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 20
   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

-----------------------------------------------------------------------------------------------
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

(Continued on next page)
xFusion
FusionServer 2258 V7
AMD EPYC 9654

CPU2017 License: 6488
Test Sponsor: xFusion
Tested by: xFusion

SPECrate®2017_int_base = 1800
SPECrate®2017_int_peak = Not Run

Test Date: Jan-2024
Hardware Availability: Nov-2023
Software Availability: Dec-2022

Platform Notes (Continued)

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     Red Hat Enterprise Linux 9.0 (Plow)
   redhat-release Red Hat Enterprise Linux release 9.0 (Plow)
   system-release Red Hat Enterprise Linux release 9.0 (Plow)

   ------------------------------------------------------------------------

20. Disk information
   SPEC is set to: /home/cpu2017
   Filesystem                   Type  Size  Used  Avail  Use% Mounted on
   /dev/mapper/rhel_huawei-home  xfs   819G   11G  809G   2%  /home

   ------------------------------------------------------------------------

21. /sys/devices/virtual/dmi/id
   Product:        2258 V7
   Product Family: Genoa

   ------------------------------------------------------------------------

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 Micron Technology MTC20F2085S1RC48BA1 32 GB 2 rank 4800

   ------------------------------------------------------------------------

23. BIOS
   (This section combines info from /sys/devices and dmidecode.)
   BIOS Vendor:       INSYDE Corp.
   BIOS Version:      1.06.29
   BIOS Date:         11/23/2023
   BIOS Revision:     1.6

   ------------------------------------------------------------------------

Compiler Version Notes

<table>
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<tr>
<th>C</th>
<th>500.perlbench_r(base) 502.qcc_r(base) 505.mcf_r(base) 525.x264_r(base) 557.xz_r(base)</th>
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<tbody>
<tr>
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<td>AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#434 2022_10_28) (based on LLVM Mirror.Version.14.0.6)</td>
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<tr>
<td></td>
<td>Thread model: posix</td>
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<tr>
<td></td>
<td>InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin</td>
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<table>
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<tr>
<th>C++</th>
<th>520.omnetpp_r(base) 523.xalancbmk_r(base) 531.deepsjeng_r(base) 541.leela_r(base)</th>
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(Continued on next page)
# SPEC CPU®2017 Integer Rate Result

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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: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin

---

**Fortran** | 548.exchange2_r(base)
---

AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#434 2022_10_28) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin

### Base Compiler Invocation

- **C benchmarks:**
  - clang
- **C++ benchmarks:**
  - clang++
- **Fortran benchmarks:**
  - flang

### Base Portability Flags

- **C benchmarks:**
  - `-m64`  `-flto`  `-Wl,-mllvm,-align-all-nofallthru-blocks=6`
  - `-Wl,-mllvm,-reduce-array-computations=3`

### Base Optimization Flags

(Continued on next page)
**SPEC CPU®2017 Integer Rate Result**

**xFusion**

FusionServer 2258 V7
AMD EPYC 9654

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**Base Optimization Flags (Continued)**

- `-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 -lamlibm -lflang`
- `-lamlalloc`

**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 -lamlibm -lflang`
- `-lamlalloc-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 -lamlibm`
- `-lflang -lamlalloc`

**Base Other Flags**

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

**C++ benchmarks:**

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

**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/xFusion-Platform-Settings-AMD-V1.0.html](http://www.spec.org/cpu2017/flags/xFusion-Platform-Settings-AMD-V1.0.html)
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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/xFusion-Platform-Settings-AMD-V1.0.xml

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

Tested with SPEC CPU®2017 v1.1.9 on 2024-01-05 07:53:20-0500.
Originally published on 2024-01-30.