SPEC CPU®2017 Integer Rate Result

Supermicro

Mainstream A+ Server AS -1015A-MT
(H13SAE-MF , AMD Ryzen 9 7950X)

$SPECrate^{®}2017\_int\_base = 177$

$SPECrate^{®}2017\_int\_peak = 195$

CPU2017 License: 001176
Test Sponsor: Supermicro
Tested by: Supermicro

Test Date: Jul-2023
Hardware Availability: Jun-2023
Software Availability: Jun-2023

Copies

Benchmark	Copies	base	peak
500.perlbench_r	32	150	
502.gcc_r	32	105	150
505.mcf_r	32	213	213
520.omnetpp_r	32	68.8	69.8
523.xalancbmk_r	32	171	302
525.x264_r	32	524	
531.deepsjeng_r	32	181	
541.leela_r	32	179	179
548.exchange2_r	32	515	516
557.xz_r	32	87.8	87.9

—— SPECrate®2017_int_base (177)   - - - - SPECrate®2017_int_peak (195)

Hardware

CPU Name: AMD Ryzen 9 7950X
 Max MHz: 5700
 Nominal: 4500
Enabled: 16 cores, 1 chip, 2 threads/core
Orderable: 1 chip
Cache L1: 32 KB I + 32 KB D on chip per core
 L2: 1 MB I+D on chip per core
 L3: 64 MB I+D on chip per chip, 32 MB shared / 8 cores
 Other: None
Memory: 64 GB (2 x 32 GB 2Rx4 PC5-5600B-E,
 running at 5200)
Storage: 1 x 480 GB NVMe M.2 SSD
Other: None

Software

OS: Ubuntu 22.04.2 LTS
 Kernel 5.19.0-46-generic
Compiler: C/C++/Fortran: Version 4.0.0 of AOCC
Parallel: No
Firmware: Version 1.0 released May-2023
File System: ext4
System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: 32/64-bit
Other: None
Power Management: Default

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

SPEC CPU®2017 Integer Rate Result
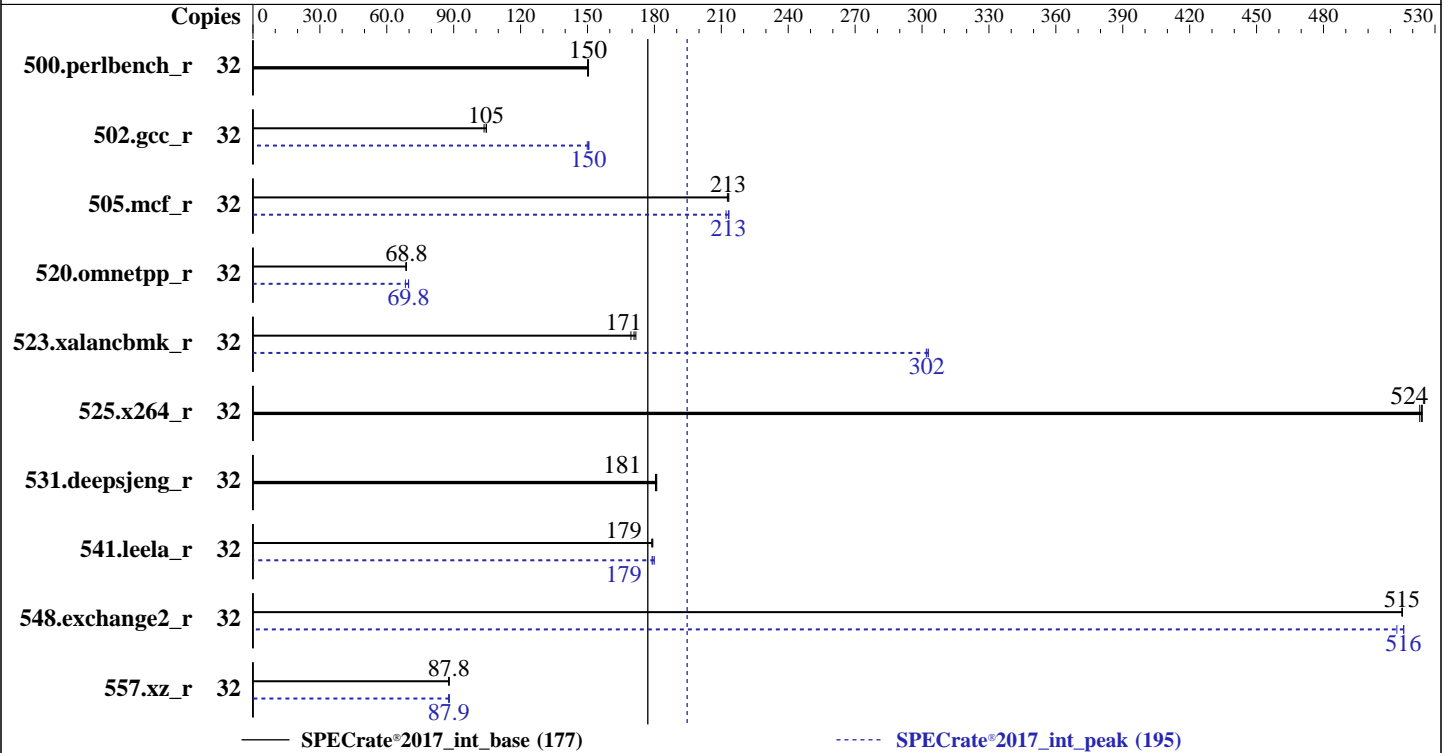Copyright 2017-2023 Standard Performance Evaluation Corporation

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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	32	339	150	**339**	**150**	340	150	32	339	150	**339**	**150**	340	150
502.gcc_r	32	433	105	437	104	**433**	**105**	32	302	150	301	151	**301**	**150**
505.mcf_r	32	**243**	**213**	242	213	243	213	32	**243**	**213**	244	212	242	213
520.omnetpp_r	32	610	68.8	**610**	**68.8**	613	68.5	32	601	69.8	614	68.4	**602**	**69.8**
523.xalancbmk_r	32	199	169	**198**	**171**	197	172	32	**112**	**302**	112	302	112	303
525.x264_r	32	107	523	107	524	**107**	**524**	32	107	523	107	524	**107**	**524**
531.deepsjeng_r	32	203	180	203	181	**203**	**181**	32	203	180	203	181	**203**	**181**
541.leela_r	32	296	179	296	179	**296**	**179**	32	**296**	**179**	296	179	294	180
548.exchange2_r	32	163	515	**163**	**515**	163	515	32	163	513	162	516	**163**	**516**
557.xz_r	32	394	87.8	393	88.0	**393**	**87.8**	32	394	87.8	392	88.1	**393**	**87.9**
SPECrate®2017_int_base =			**177**											
SPECrate®2017_int_peak =			**195**											

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/amd_rate_aocc400_genoa_B_lib/lib:/home/cpu2017/amd_rate_aocc400_genoa_B_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

```
The measurements are obtained with default BIOS settings.

 Sysinfo program /home/cpu2017/bin/sysinfo
 Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
 running on super-Super-Server Thu Jul 13 19:20:39 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 (249.11-0ubuntu3.9)
 12. Services, from systemctl list-unit-files
 13. Linux kernel boot-time arguments, from /proc/cmdline
 14. cpupower frequency-info
 15. sysctl
 16. /sys/kernel/mm/transparent_hugepage
 17. /sys/kernel/mm/transparent_hugepage/khugepaged
 18. OS release
 19. Disk information
 20. /sys/devices/virtual/dmi/id
 21. dmidecode
 22. BIOS
 -----------------------------------------------------------
```

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Platform Notes (Continued)

```
--------------------------------------------------------------
1. uname -a
  Linux super-Super-Server 5.19.0-46-generic #47~22.04.1-Ubuntu SMP PREEMPT_DYNAMIC Wed Jun 21 15:35:31 UTC 2
  x86_64 x86_64 x86_64 GNU/Linux


--------------------------------------------------------------
2. w
   19:20:39 up 10:42,  3 users,  load average: 0.16, 0.03, 0.01
  USER     TTY      FROM             LOGIN@   IDLE   JCPU   PCPU WHAT
  super    tty1     -                08:38   34:29   1.98s  0.00s -bash
  super    tty2     -                19:02   18:18   0.03s  0.00s -bash
  super    pts/0    -                18:46    7.00s  0.74s  1.96s sudo su -


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


--------------------------------------------------------------
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               253417
  nofiles               1024
  vmemory(kbytes)       unlimited
  locks                 unlimited
  rtprio                0


--------------------------------------------------------------
5. sysinfo process ancestry
 /sbin/init splash
 /bin/login -p --
 -bash
 sudo su -
 sudo su -
 su -
 -bash
 python3 ./run_amd_rate_aocc400_genoa_B1.py
 /bin/bash ./amd_rate_aocc400_genoa_B1.sh
 runcpu --config amd_rate_aocc400_genoa_B1.cfg --tune all --reportable --iterations 3 intrate
 runcpu --configfile amd_rate_aocc400_genoa_B1.cfg --tune all --reportable --iterations 3 --nopower --runmode
   rate --tune base:peak --size test:train:refrate intrate --nopreenv --note-preenv --logfile
   $SPEC/tmp/CPU2017.001/templogs/preenv.intrate.001.0.log --lognum 001.0 --from_runcpu 2
 specperl $SPEC/bin/sysinfo
 $SPEC = /home/cpu2017


--------------------------------------------------------------
6. /proc/cpuinfo
     model name      : AMD Ryzen 9 7950X 16-Core Processor
     vendor_id       : AuthenticAMD
     cpu family      : 25
     model           : 97
     stepping        : 2
     microcode       : 0xa601203
     bugs            : sysret_ss_attrs spectre_v1 spectre_v2 spec_store_bypass
```

(Continued on next page)

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Platform Notes (Continued)

```
      TLB size        : 3584 4K pages
      cpu cores       : 16
      siblings        : 32
      1 physical ids (chips)
      32 processors (hardware threads)
      physical id 0: core ids 0-15
      physical id 0: apicids 0-31
    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:            48 bits physical, 48 bits virtual
      Byte Order:               Little Endian
      CPU(s):                   32
      On-line CPU(s) list:      0-31
      Vendor ID:                AuthenticAMD
      Model name:               AMD Ryzen 9 7950X 16-Core Processor
      CPU family:               25
      Model:                    97
      Thread(s) per core:       2
      Core(s) per socket:       16
      Socket(s):                1
      Stepping:                 2
      Frequency boost:          enabled
      CPU max MHz:              5879.8818
      CPU min MHz:              3000.0000
      BogoMIPS:                 8982.68
      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 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 hw_pstate ssbd mba
                                perfmon_v2 ibrs ibpb stibp vmmcall fsgsbase bmi1 avx2 smep bmi2 erms
                                invpcid cqm rdt_a avx512f avx512dq rdseed adx smap avx512ifma clflushopt
                                clwb avx512cd sha_ni avx512bw avx512vl xsaveopt xsavec xgetbv1 xsaves
                                cqm_llc cqm_occup_llc cqm_mbm_total cqm_mbm_local avx512_bf16 clzero
                                irperf xsaveerptr rdpru wbnoinvd 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 rdpid overflow_recov succor smca fsrm flush_l1d
      Virtualization:           AMD-V
      L1d cache:                512 KiB (16 instances)
      L1i cache:                512 KiB (16 instances)
      L2 cache:                 16 MiB (16 instances)
      L3 cache:                 64 MiB (2 instances)
      NUMA node(s):             1
      NUMA node0 CPU(s):        0-31
      Vulnerability Itlb multihit:   Not affected
      Vulnerability L1tf:            Not affected
      Vulnerability Mds:             Not affected
      Vulnerability Meltdown:        Not affected
      Vulnerability Mmio stale data: Not affected
```

(Continued on next page)

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Platform Notes (Continued)

```
  Vulnerability Retbleed:          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, PBRSB-eIBRS 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     32K     512K    8 Data           1   64       1            64
      L1i     32K     512K    8 Instruction    1   64       1            64
      L2       1M      16M    8 Unified        2  2048      1            64
      L3      32M      64M   16 Unified        3 32768      1            64


  -------------------------------------------------------------
  8. numactl --hardware
  NOTE: a numactl 'node' might or might not correspond to a physical chip.
    available: 1 nodes (0)
    node 0 cpus: 0-31
    node 0 size: 63432 MB
    node 0 free: 62634 MB
    node distances:
    node   0
      0:  10


  -------------------------------------------------------------
  9. /proc/meminfo
    MemTotal:       64954664 kB


  -------------------------------------------------------------
  10. who -r
    run-level 3 Jul 13 08:37


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


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

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Platform Notes (Continued)

```
          ----------------------------------------------------------
13. Linux kernel boot-time arguments, from /proc/cmdline
    BOOT_IMAGE=/boot/vmlinuz-5.19.0-46-generic
    root=UUID=cd23bff8-09e7-4cd0-ab5f-4e9677be9fcc
    ro
    quiet
    splash
    vt.handoff=7


          ----------------------------------------------------------
14. cpupower frequency-info
    analyzing CPU 0:
       current policy: frequency should be within 3.00 GHz and 4.50 GHz.
                       The governor "schedutil" may decide which speed to use
                       within this range.
       boost state support:
         Supported: yes
         Active: yes
         Boost States: 0
         Total States: 2
         Pstate-P0:  4500MHz


          ----------------------------------------------------------
15. sysctl
    kernel.numa_balancing               0
    kernel.randomize_va_space           0
    vm.compaction_proactiveness        20
    vm.dirty_background_bytes           0
    vm.dirty_background_ratio          10
    vm.dirty_bytes                      0
    vm.dirty_expire_centisecs        3000
    vm.dirty_ratio                      8
    vm.dirty_writeback_centisecs      500
    vm.dirtytime_expire_seconds     43200
    vm.extfrag_threshold              500
    vm.min_unmapped_ratio               1
    vm.nr_hugepages                     0
    vm.nr_hugepages_mempolicy           0
    vm.nr_overcommit_hugepages          0
    vm.swappiness                       1
    vm.watermark_boost_factor       15000
    vm.watermark_scale_factor          10
    vm.zone_reclaim_mode                1


          ----------------------------------------------------------
16. /sys/kernel/mm/transparent_hugepage
    defrag          [always] defer defer+madvise madvise never
    enabled         [always] madvise never
    hpage_pmd_size  2097152
    shmem_enabled   always within_size advise [never] deny force


          ----------------------------------------------------------
17. /sys/kernel/mm/transparent_hugepage/khugepaged
    alloc_sleep_millisecs   60000
    defrag                      1
    max_ptes_none             511
    max_ptes_shared           256
    max_ptes_swap              64
    pages_to_scan            4096
    scan_sleep_millisecs    10000
```

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Platform Notes (Continued)

```
  ----------------------------------------------------------
  18. OS release
    From /etc/*-release /etc/*-version
    os-release Ubuntu 22.04.2 LTS

  ----------------------------------------------------------
  19. Disk information
  SPEC is set to: /home/cpu2017
    Filesystem     Type  Size  Used Avail Use% Mounted on
    /dev/nvme0n1p2 ext4  439G   15G  402G   4% /

  ----------------------------------------------------------
  20. /sys/devices/virtual/dmi/id
      Vendor:        Supermicro
      Product:       Super Server
      Product Family: Family
      Serial:        0123456789

  ----------------------------------------------------------
  21. 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:
      2x Micron Technology MTC20C2085S1EC56BGZ 32 GB 2 rank 5600, configured at 5200
      2x NO DIMM NO DIMM


  ----------------------------------------------------------
  22. BIOS
  (This section combines info from /sys/devices and dmidecode.)
    BIOS Vendor:      American Megatrends International, LLC.
    BIOS Version:     1.0
    BIOS Date:        05/25/2023
    BIOS Revision:    5.26
```

Compiler Version Notes

```
==========================================================================================================
C        | 502.gcc_r(peak)
----------------------------------------------------------------------------------------------------------
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#389 2022_10_07) (based on LLVM Mirror.Version.14.0.6)
Target: i386-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-4.0-3206-389/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#389 2022_10_07) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-4.0-3206-389/bin
----------------------------------------------------------------------------------------------------------
```

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Target: x86_64-unknown-linux-gnu
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----------------------------------------------------------------------------------------------


==============================================================================================
C++      | 523.xalancbmk_r(peak)
----------------------------------------------------------------------------------------------
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#389 2022_10_07) (based on LLVM Mirror.Version.14.0.6)
Target: i386-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-4.0-3206-389/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#389 2022_10_07) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-4.0-3206-389/bin
----------------------------------------------------------------------------------------------


==============================================================================================
C++      | 523.xalancbmk_r(peak)
----------------------------------------------------------------------------------------------
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#389 2022_10_07) (based on LLVM Mirror.Version.14.0.6)
Target: i386-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-4.0-3206-389/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#389 2022_10_07) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-4.0-3206-389/bin
----------------------------------------------------------------------------------------------


==============================================================================================
Fortran | 548.exchange2_r(base, peak)
----------------------------------------------------------------------------------------------
```

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SPEC CPU®2017 Integer Rate Result

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Supermicro

Mainstream A+ Server AS -1015A-MT
(H13SAE-MF , AMD Ryzen 9 7950X)

SPECrate®2017_int_base = 177

SPECrate®2017_int_peak = 195

CPU2017 License: 001176
Test Sponsor: Supermicro
Tested by: Supermicro

Test Date: Jul-2023
Hardware Availability: Jun-2023
Software Availability: Jun-2023

Compiler Version Notes (Continued)

```
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#389 2022_10_07) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-4.0-3206-389/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

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

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Base Optimization Flags (Continued)

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
```

Peak Compiler Invocation

C benchmarks:
```
clang
```

C++ benchmarks:
```
clang++
```

Fortran benchmarks:
```
flang
```

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(H13SAE-MF , AMD Ryzen 9 7950X)

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Test Date: Jul-2023
Hardware Availability: Jun-2023
Software Availability: Jun-2023

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
-lamdalloc

 505.mcf_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
-fstruct-layout=7 -mllvm -unroll-threshold=50
-fremap-arrays -fstrip-mining
-mllvm -inline-threshold=1000
-mllvm -reduce-array-computations=3 -zopt -lamdlibm
-lflang -lamdalloc

 525.x264_r: basepeak = yes

 557.xz_r: Same as 505.mcf_r

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

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Peak Optimization Flags (Continued)

520.omnetpp_r (continued):
```
-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
-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/v118/aocc4/b1/rate/amd_rate_aocc400_genoa_B_lib/lib32
```

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Peak Other Flags (Continued)

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/v118/aocc4/b1/rate/amd_rate_aocc400_genoa_B_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/Supermicro-Platform-Settings-V1.2-AM5-revA.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/Supermicro-Platform-Settings-V1.2-AM5-revA.xml

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

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