SPEC CPU®2017 Integer Rate Result

IEIT Systems Co., Ltd.

meta brain i24G8 (AMD EPYC 9755)

$SPECrate^{®}2017\_int\_base = 2550$

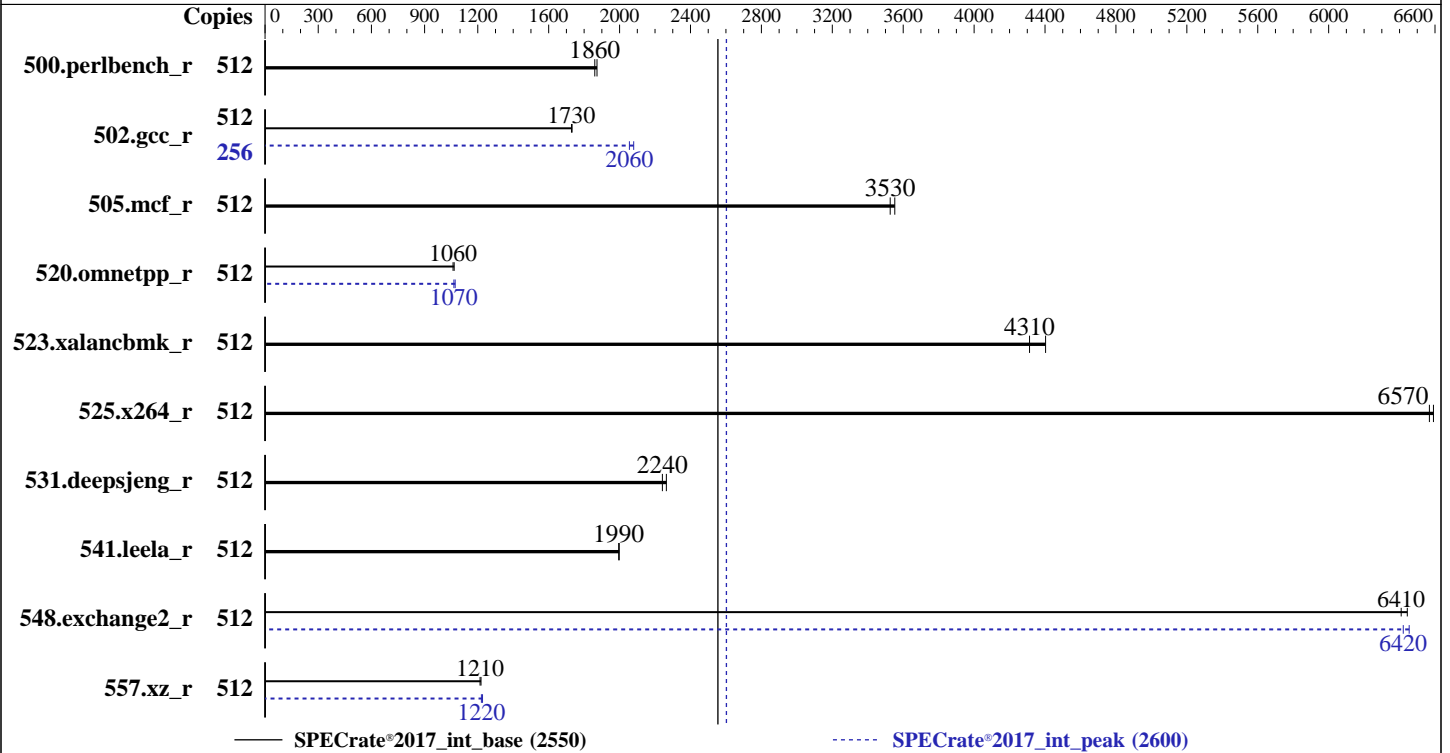$SPECrate^{®}2017\_int\_peak = 2600$

CPU2017 License: 3358
Test Sponsor: IEIT Systems Co., Ltd.
Tested by: IEIT Systems Co., Ltd.

Test Date: Mar-2025
Hardware Availability: May-2025
Software Availability: Oct-2024

Benchmark	Copies	base	peak
500.perlbench_r	512	1860	
502.gcc_r	512 / 256	1730	2060
505.mcf_r	512	3530	
520.omnetpp_r	512	1060	1070
523.xalancbmk_r	512	4310	
525.x264_r	512	6570	
531.deepsjeng_r	512	2240	
541.leela_r	512	1990	
548.exchange2_r	512	6410	6420
557.xz_r	512	1210	1220

SPECrate®2017_int_base (2550) ——— SPECrate®2017_int_peak (2600) ------

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)
Storage: 1 x 480 GB SATA SSD
Other: CPU Cooling: CLC

Software

OS: Red Hat Enterprise Linux release 9.4 (Plow)
5.14.0-427.13.1.el9_4.x86_64
Compiler: C/C++/Fortran: Version 5.0.0 of AOCC
Parallel: No
Firmware: Version 04.02.00 released Feb-2025
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	435	1870	**438**	**1860**			512	435	1870	**438**	**1860**		
502.gcc_r	512	419	1730	**419**	**1730**			256	174	2080	**176**	**2060**		
505.mcf_r	512	233	3550	**235**	**3530**			512	233	3550	**235**	**3530**		
520.omnetpp_r	512	**633**	**1060**	630	1070			512	**631**	**1070**	626	1070		
523.xalancbmk_r	512	**125**	**4310**	123	4400			512	**125**	**4310**	123	4400		
525.x264_r	512	136	6590	**136**	**6570**			512	136	6590	**136**	**6570**		
531.deepsjeng_r	512	259	2260	**262**	**2240**			512	259	2260	**262**	**2240**		
541.leela_r	512	**425**	**1990**	424	2000			512	**425**	**1990**	424	2000		
548.exchange2_r	512	208	6440	**209**	**6410**			512	208	6450	**209**	**6420**		
557.xz_r	512	**456**	**1210**	454	1220			512	**453**	**1220**	451	1230		
SPECrate®2017_int_base =	**2550**												
SPECrate®2017_int_peak =	**2600**												

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
'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_aocc500_znver5_A_lib/lib:/home/CPU2017/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 configuration:
 SVM Mode set to disable
 DRAM Scrub time set to disable
 NUMA nodes per socket set to NPS4
 Determinism Slider set to Power
 cTDP set to 500
 Package Power Limit set to 500
 APBDIS set to 1
 Memory Speed set to 6400

 Sysinfo program /home/CPU2017/bin/sysinfo
 Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
 running on localhost.localdomain Mon Mar 18 00:04:03 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 252 (252-32.el9_4)
 12. Services, from systemctl list-unit-files
 13. Linux kernel boot-time arguments, from /proc/cmdline
 14. cpupower frequency-info
 15. tuned-adm active
 16. sysctl
 17. /sys/kernel/mm/transparent_hugepage
 18. /sys/kernel/mm/transparent_hugepage/khugepaged
 19. OS release
```

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IEIT Systems Co., Ltd.

meta brain i24G8 (AMD EPYC 9755)

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CPU2017 License: 3358   **Test Date:** Mar-2025
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Platform Notes (Continued)

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


   --------------------------------------------------------------
   1. uname -a
     Linux localhost.localdomain 5.14.0-427.13.1.el9_4.x86_64 #1 SMP PREEMPT_DYNAMIC Wed Apr 10 10:29:16 EDT
     2024 x86_64 x86_64 x86_64 GNU/Linux


   --------------------------------------------------------------
   2. w
      00:04:03 up 4 min,  1 user,  load average: 0.41, 0.98, 0.53
     USER     TTY         LOGIN@   IDLE   JCPU   PCPU WHAT
     root     tty1        00:00   19.00s  1.08s  0.17s /bin/bash ./amd_rate_aocc500_znver5_A1.sh

   --------------------------------------------------------------
   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) 6187669
     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) 6187669
     virtual memory              (kbytes, -v) unlimited
     file locks                      (-x) unlimited

   --------------------------------------------------------------
   5. sysinfo process ancestry
    /usr/lib/systemd/systemd rhgb --switched-root --system --deserialize 31
    login -- root
    -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 2 intrate
    runcpu --configfile amd_rate_aocc500_znver5_A1.cfg --tune all --reportable --iterations 2 --nopower
      --runmode rate --tune base:peak --size test:train:refrate intrate --nopreenv --note-preenv --logfile
      $SPEC/tmp/CPU2017.004/templogs/preenv.intrate.004.0.log --lognum 004.0 --from_runcpu 2
    specperl $SPEC/bin/sysinfo
    $SPEC = /home/CPU2017


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

(Continued on next page)

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CPU2017 License: 3358		**Test Date:**	Mar-2025
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Platform Notes (Continued)

```
      model           : 2
      stepping        : 1
      microcode       : 0xb00211e
      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 2.37.4:
  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):                512
  On-line CPU(s) list:   0-511
  Vendor ID:             AuthenticAMD
  BIOS Vendor ID:        Advanced Micro Devices, Inc.
  Model name:            AMD EPYC 9755 128-Core Processor
  BIOS 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(s) scaling MHz:    66%
  CPU max MHz:           4121.1909
  CPU min MHz:           1500.0000
  BogoMIPS:              5391.78
  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 amd_lbr_v2 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 hw_pstate ssbd mba perfmon_v2 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 x2avic
                         v_spec_ctrl vnmi 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_l1d debug_swap
```

(Continued on next page)

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Platform Notes (Continued)

```
  Virtualization:                  AMD-V
  L1d cache:                       12 MiB (256 instances)
  L1i cache:                       8 MiB (256 instances)
  L2 cache:                        256 MiB (256 instances)
  L3 cache:                        1 GiB (32 instances)
  NUMA node(s):                    8
  NUMA node0 CPU(s):               0-31,256-287
  NUMA node1 CPU(s):               32-63,288-319
  NUMA node2 CPU(s):               64-95,320-351
  NUMA node3 CPU(s):               96-127,352-383
  NUMA node4 CPU(s):               128-159,384-415
  NUMA node5 CPU(s):               160-191,416-447
  NUMA node6 CPU(s):               192-223,448-479
  NUMA node7 CPU(s):               224-255,480-511
  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 Retbleed:          Not affected
  Vulnerability Spec rstack overflow: 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; Enhanced / Automatic IBRS, IBPB conditional, 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      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
  NOTE: a numactl 'node' might or might not correspond to a physical chip.
    available: 8 nodes (0-7)
    node 0 cpus: 0-31,256-287
    node 0 size: 192486 MB
    node 0 free: 191457 MB
    node 1 cpus: 32-63,288-319
    node 1 size: 193519 MB
    node 1 free: 192566 MB
    node 2 cpus: 64-95,320-351
    node 2 size: 193519 MB
    node 2 free: 192406 MB
    node 3 cpus: 96-127,352-383
    node 3 size: 193519 MB
    node 3 free: 191951 MB
    node 4 cpus: 128-159,384-415
    node 4 size: 193519 MB
    node 4 free: 192875 MB
    node 5 cpus: 160-191,416-447
    node 5 size: 193478 MB
    node 5 free: 192868 MB
    node 6 cpus: 192-223,448-479
    node 6 size: 193519 MB
```

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Platform Notes (Continued)

```
   node 6 free: 192799 MB
   node 7 cpus: 224-255,480-511
   node 7 size: 193417 MB
   node 7 free: 192751 MB
   node distances:
   node   0   1   2   3   4   5   6   7
     0:  10  12  12  12  32  32  32  32
     1:  12  10  12  12  32  32  32  32
     2:  12  12  10  12  32  32  32  32
     3:  12  12  12  10  32  32  32  32
     4:  32  32  32  32  10  12  12  12
     5:  32  32  32  32  12  10  12  12
     6:  32  32  32  32  12  12  10  12
     7:  32  32  32  32  12  12  12  10


  -------------------------------------------------------------
9. /proc/meminfo
   MemTotal:       1584109572 kB


  -------------------------------------------------------------
10. who -r
   run-level 3 Mar 18 00:00


  -------------------------------------------------------------
11. Systemd service manager version: systemd 252 (252-32.el9_4)
   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 atd auditd avahi-daemon bluetooth chronyd crond cups dbus-broker firewalld
                   gdm getty@ insights-client-boot irqbalance iscsi-onboot iscsi-starter kdump libstoragemgmt
                   low-memory-monitor lvm2-monitor mcelog mdmonitor microcode multipathd nis-domainname
                   nvmefc-boot-connections openibd ostree-remount power-profiles-daemon qemu-guest-agent
                   rhsmcertd rpcbind rsyslog rtkit-daemon selinux-autorelabel-mark smartd sshd sssd
                   switcheroo-control sysstat systemd-boot-update systemd-network-generator tuned udisks2
                   upower vgauthd vmtoolsd
   enabled-runtime rc-local systemd-remount-fs
   disabled        arp-ethers blk-availability bmc-watchdog brltty canberra-system-bootup
                   canberra-system-shutdown canberra-system-shutdown-reboot chrony-wait chronyd-restricted
                   cni-dhcp console-getty cpupower cups-browsed dbus-daemon debug-shell dnf-system-upgrade
                   dnsmasq gssproxy hwloc-dump-hwdata ibacm ipmi ipmidetectd iprdump iprinit iprupdate
                   iscsi-init iscsid iscsiuio kpatch kvm_stat ledmon man-db-restart-cache-update
                   netavark-dhcp-proxy netavark-firewalld-reload nfs-blkmap nfs-server nftables
                   nvmf-autoconnect opensmd opensmd@ ostree-readonly-sysroot-migration ostree-state-overlay@
                   podman podman-auto-update podman-clean-transient podman-kube@ podman-restart psacct
                   ras-mc-ctl rasdaemon rdisc reboot rhcd rhsm rhsm-facts rpmdb-rebuild rshim
                   selinux-check-proper-disable serial-getty@ speech-dispatcherd srp_daemon srp_daemon_port@
                   sshd-keygen@ systemd-boot-check-no-failures systemd-pstore systemd-sysext vsftpd
                   wpa_supplicant
   generated       mst
   indirect        iscsi spice-vdagentd sssd-autofs sssd-kcm sssd-nss sssd-pac sssd-pam sssd-ssh sssd-sudo
                   systemd-sysupdate systemd-sysupdate-reboot tftp vsftpd@


  -------------------------------------------------------------
13. Linux kernel boot-time arguments, from /proc/cmdline
   BOOT_IMAGE=(hd0,gpt2)/vmlinuz-5.14.0-427.13.1.el9_4.x86_64
   root=/dev/mapper/rhel-root
```

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Platform Notes (Continued)

```
    ro
    crashkernel=1G-4G:192M,4G-64G:256M,64G-:512M
    resume=/dev/mapper/rhel-swap
    rd.lvm.lv=rhel/root
    rd.lvm.lv=rhel/swap
    rhgb
    quiet


  ----------------------------------------------------------
  14. cpupower frequency-info
    analyzing CPU 64:
      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


  ----------------------------------------------------------
  15. tuned-adm active
    Current active 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                   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


  ----------------------------------------------------------
  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
```

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Platform Notes (Continued)

```
    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 9.4 (Plow)
   redhat-release Red Hat Enterprise Linux release 9.4 (Plow)
   system-release Red Hat Enterprise Linux release 9.4 (Plow)

   ----------------------------------------------------------
20. Disk information
SPEC is set to: /home/CPU2017
   Filesystem            Type  Size  Used Avail Use% Mounted on
   /dev/mapper/rhel-home xfs   372G   12G  360G   4% /home

   ----------------------------------------------------------
21. /sys/devices/virtual/dmi/id
    Vendor:         IEIT SYSTEMS
    Product:        i24-A8-C0-R0-00
    Product Family: Not specified
    Serial:         000000000

   ----------------------------------------------------------
22. dmidecode
   Additional information from dmidecode 3.5 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 M321R8GA0PB2-CCPEC 64 GB 2 rank 6400



   ----------------------------------------------------------
23. BIOS
(This section combines info from /sys/devices and dmidecode.)
    BIOS Vendor:      American Megatrends International, LLC.
    BIOS Version:     04.02.00
    BIOS Date:        02/26/2025
```

Compiler Version Notes

```
==================================================================================================
C        | 502.gcc_r(peak)
--------------------------------------------------------------------------------------------------
AMD clang version 17.0.6 (CLANG: AOCC_5.0.0-Build#1316 2024_09_09)
Target: i386-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-5.0.0-4925-1316/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 17.0.6 (CLANG: AOCC_5.0.0-Build#1316 2024_09_09)
Target: x86_64-unknown-linux-gnu
Thread model: posix
```

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IEIT Systems Co., Ltd.

SPECrate®2017_int_base = 2550

meta brain i24G8 (AMD EPYC 9755)

SPECrate®2017_int_peak = 2600

CPU2017 License: 3358
Test Sponsor: IEIT Systems Co., Ltd.
Tested by: IEIT Systems Co., Ltd.

Test Date: Mar-2025
Hardware Availability: May-2025
Software Availability: Oct-2024

Compiler Version Notes (Continued)

```
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-5.0.0-4925-1316/bin
--------------------------------------------------------------------------------


==============================================================================
C       | 502.gcc_r(peak)
--------------------------------------------------------------------------------
AMD clang version 17.0.6 (CLANG: AOCC_5.0.0-Build#1316 2024_09_09)
Target: i386-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-5.0.0-4925-1316/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 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++     | 520.omnetpp_r(base, peak) 523.xalancbmk_r(base, peak) 531.deepsjeng_r(base, peak)
        | 541.leela_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 | 548.exchange2_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
--------------------------------------------------------------------------------
```

Base Compiler Invocation

C benchmarks:
```
clang
```

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

Fortran benchmarks:
```
flang
```

SPEC CPU®2017 Integer Rate Result

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IEIT Systems Co., Ltd.

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Test Date: Mar-2025
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Software Availability: Oct-2024

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 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-ldist-scalar-expand -fenable-aggressive-gather
-Wl,-mllvm -Wl,-extra-inliner -z muldefs -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 -lflang
-lamdalloc-ext -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,-do-block-reorder=advanced -z muldefs -O3 -march=znver5
-fveclib=AMDLIBM -ffast-math -flto -mllvm -unroll-threshold=100
-mllvm -loop-unswitch-threshold=200000
-mllvm -reduce-array-computations=3 -zopt -fno-PIE -no-pie
-fvirtual-function-elimination -fvisibility=hidden
-mllvm -do-block-reorder=advanced -lamdlibm -lflang -lamdalloc-ext
-ldl
```

Fortran benchmarks:
```
-m64 -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=znver5
-fveclib=AMDLIBM -ffast-math -flto
-fepilog-vectorization-of-inductions -mllvm -optimize-strided-mem-cost
-floop-transform -mllvm -unroll-aggressive -mllvm -unroll-threshold=500
-lamdlibm -lflang -lamdalloc -ldl
```

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SPEC CPU®2017 Integer Rate Result

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IEIT Systems Co., Ltd.

meta brain i24G8 (AMD EPYC 9755)

SPECrate®2017_int_base = 2550

SPECrate®2017_int_peak = 2600

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Test Sponsor: IEIT Systems Co., Ltd.
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Test Date: Mar-2025
Hardware Availability: May-2025
Software Availability: Oct-2024

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`

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`

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IEIT Systems Co., Ltd.

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Software Availability: Oct-2024

Peak Optimization Flags (Continued)

```
502.gcc_r: -m32 -flto -Wl,-mllvm -Wl,-ldist-scalar-expand
-fenable-aggressive-gather -Wl,-mllvm -Wl,-extra-inliner
-z muldefs -Ofast -march=znver5 -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: basepeak = yes
```

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

```
557.xz_r: -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 -Wl,-mllvm -Wl,-extra-inliner
-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
-lflang -lamdalloc-ext -ldl
```

C++ benchmarks:

```
520.omnetpp_r: -m64 -std=c++14
-Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-do-block-reorder=advanced -Ofast
-march=znver5 -fveclib=AMDLIBM -ffast-math -flto
-mllvm -unroll-threshold=100
-mllvm -reduce-array-computations=3 -zopt -fno-PIE
-no-pie -fvirtual-function-elimination -fvisibility=hidden
-mllvm -do-block-reorder=advanced -lamdlibm -lamdalloc-ext
-ldl
```

```
523.xalancbmk_r: basepeak = yes
```

```
531.deepsjeng_r: basepeak = yes
```

```
541.leela_r: basepeak = yes
```

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

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Peak Optimization Flags (Continued)

Fortran benchmarks (continued):
```
-Wl,-mllvm -Wl,-inline-recursion=4 -Wl,-mllvm -Wl,-lsr-in-nested-loop
-Wl,-mllvm -Wl,-enable-iv-split -O3 -march=znver5 -fveclib=AMDLIBM
-ffast-math -flto -fepilog-vectorization-of-inductions
-mllvm -optimize-strided-mem-cost -floop-transform
-mllvm -unroll-aggressive -mllvm -unroll-threshold=500 -lamdlibm
-lflang -lamdalloc -ldl
```

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/aocc5/1316/amd_rate_aocc500_znver5_A_lib/lib32
```

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/aocc500-flags.2024-10-10.00.html
http://www.spec.org/cpu2017/flags/IEIT-Platform-Settings-amd-V1.1.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/IEIT-Platform-Settings-amd-V1.1.xml
```

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

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