# SPEC CPU®2017 Integer Rate Result

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## IEIT Systems Co., Ltd.

### meta brain NF5280G8 (AMD EPYC 9755)

**SPECrate®2017_int_base = 2790**

**SPECrate®2017_int_peak = 2850**

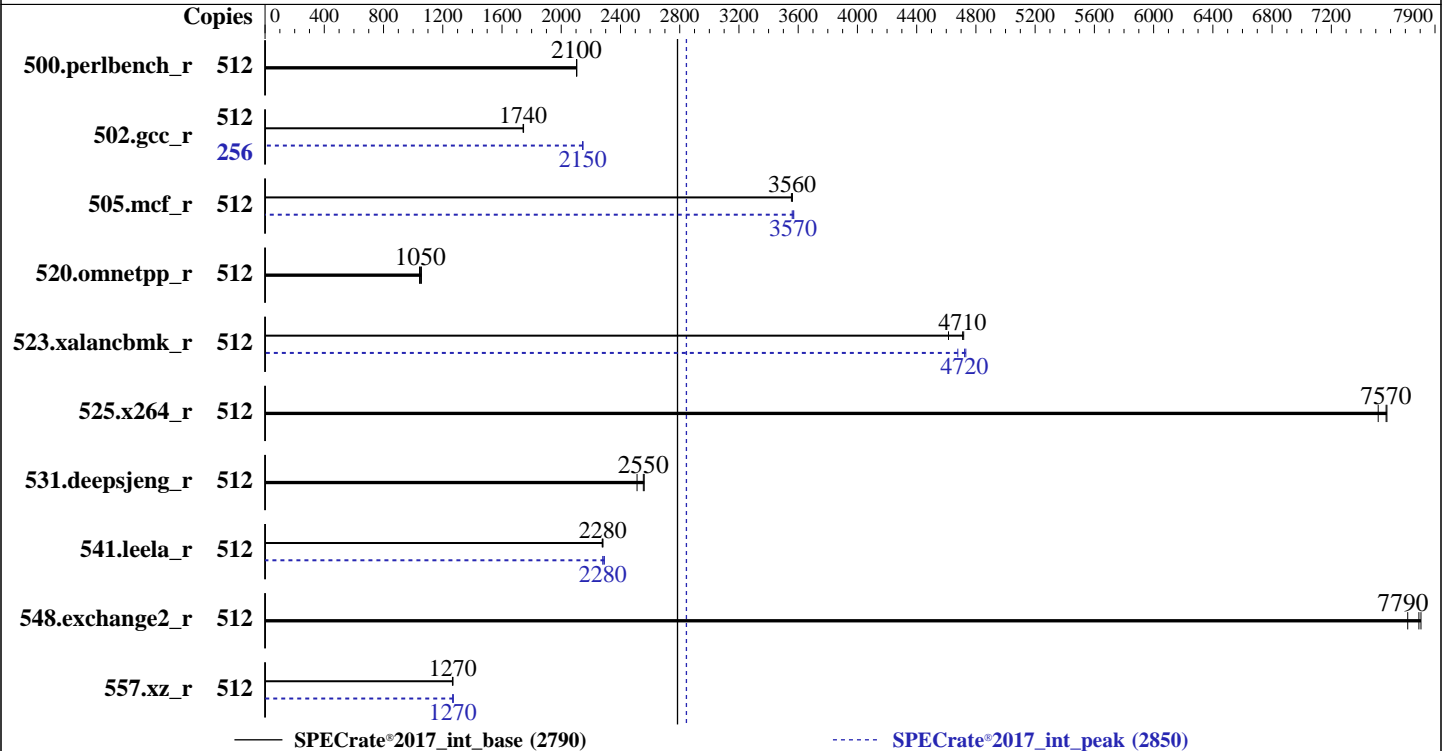| | |
|---|---|
| **CPU2017 License:** 3358 | **Test Date:** Jan-2025 |
| **Test Sponsor:** IEIT Systems Co., Ltd. | **Hardware Availability:** Feb-2025 |
| **Tested by:** IEIT Systems Co., Ltd. | **Software Availability:** Oct-2024 |

**Copies**

- 500.perlbench_r **512** — 2100
- 502.gcc_r **512** — 1740
- 502.gcc_r **256** — 2150
- 505.mcf_r **512** — 3560
- 505.mcf_r — 3570
- 520.omnetpp_r **512** — 1050
- 523.xalancbmk_r **512** — 4710
- 523.xalancbmk_r — 4720
- 525.x264_r **512** — 7570
- 531.deepsjeng_r **512** — 2550
- 541.leela_r **512** — 2280
- 541.leela_r — 2280
- 548.exchange2_r **512** — 7790
- 557.xz_r **512** — 1270
- 557.xz_r — 1270

—— SPECrate®2017_int_base (2790)       ------ SPECrate®2017_int_peak (2850)

## Hardware

CPU Name: AMD EPYC 9755
 Max MHz: 4100
 Nominal: 2700
Enabled: 256 cores, 2 chips, 2 threads/core
Orderable: 1,2 chips
Cache L1: 32 KB I + 48 KB D on chip per core
 L2: 1 MB I+D on chip per core
 L3: 512 MB I+D on chip per chip, 32 MB shared / 8 cores
 Other: None
Memory: 1536 GB (24 x 64 GB 2Rx4 PC5-6400B-R, running at 6000)
Storage: 1 x 960 GB NVME SSD
Other: CPU Cooling: Air

## Software

OS: SUSE Linux Enterprise Server 15 SP6
 6.4.0-150600.21-default
Compiler: C/C++/Fortran: Version 5.0.0 of AOCC
Parallel: No
Firmware: Version 01.07.00 released Nov-2024
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 | **388** | **2100** | 387 | 2110 | 388 | 2100 | 512 | **388** | **2100** | 387 | 2110 | 388 | 2100 |
| 502.gcc_r | 512 | **416** | **1740** | 416 | 1740 | 415 | 1750 | 256 | **169** | **2150** | 169 | 2140 | 169 | 2150 |
| 505.mcf_r | 512 | 233 | 3550 | 232 | 3560 | **232** | **3560** | 512 | 232 | 3560 | **232** | **3570** | 232 | 3570 |
| 520.omnetpp_r | 512 | **640** | **1050** | 636 | 1060 | 644 | 1040 | 512 | **640** | **1050** | 636 | 1060 | 644 | 1040 |
| 523.xalancbmk_r | 512 | 115 | 4720 | **115** | **4710** | 117 | 4610 | 512 | 114 | 4730 | **114** | **4720** | 116 | 4680 |
| 525.x264_r | 512 | 119 | 7520 | **118** | **7570** | 118 | 7580 | 512 | 119 | 7520 | **118** | **7570** | 118 | 7580 |
| 531.deepsjeng_r | 512 | 234 | 2510 | 229 | 2560 | **230** | **2550** | 512 | 234 | 2510 | 229 | 2560 | **230** | **2550** |
| 541.leela_r | 512 | 372 | 2280 | **372** | **2280** | 372 | 2280 | 512 | 372 | 2280 | 370 | 2290 | **372** | **2280** |
| 548.exchange2_r | 512 | 174 | 7720 | 172 | 7810 | **172** | **7790** | 512 | 174 | 7720 | 172 | 7810 | **172** | **7790** |
| 557.xz_r | 512 | 436 | 1270 | **436** | **1270** | 437 | 1270 | 512 | 436 | 1270 | **436** | **1270** | 435 | 1270 |
| **SPECrate®2017_int_base =** | **2790** | | | | | | | | | | | | | |
| **SPECrate®2017_int_peak =** | **2850** | | | | | | | | | | | | | |

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"

Environment variables set by runcpu during the 523.xalancbmk_r peak run:
MALLOC_CONF = "thp:always"
```

## 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 = disable
 DRAM Scrub time = disable
 NUMA nodes per socket = NPS4
 Determinism Slider = Power
 cTDP = 500
 Package Power Limit = 500

 Sysinfo program /home/CPU2017/bin/sysinfo
 Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
 running on localhost Mon Jan 13 22:26:58 2025

 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 254 (254.10+suse.84.ge8d77af424)
 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
```

*(Continued on next page)*

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## Platform Notes (Continued)

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


    -----------------------------------------------------------
 1. uname -a
   Linux localhost 6.4.0-150600.21-default #1 SMP PREEMPT_DYNAMIC Thu May 16 11:09:22 UTC 2024 (36c1e09)
   x86_64 x86_64 x86_64 GNU/Linux


    -----------------------------------------------------------
 2. w
    22:26:59 up 2 min,  1 user,  load average: 0.65, 0.28, 0.11
   USER     TTY      FROM            LOGIN@   IDLE   JCPU   PCPU WHAT
   root     tty1     -               22:26   27.00s  1.11s  0.16s /bin/bash ./amd_rate_aocc500_znver5_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) 6187495
   max locked memory       (kbytes, -l) 2097152
   max memory size         (kbytes, -m) unlimited
   open files                      (-n) 65535
   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) 6187495
   virtual memory          (kbytes, -v) unlimited
   file locks                      (-x) unlimited

    -----------------------------------------------------------
 5. sysinfo process ancestry
   /usr/lib/systemd/systemd --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 3 intrate
   runcpu --configfile amd_rate_aocc500_znver5_A1.cfg --tune all --reportable --iterations 3 --nopower
     --runmode rate --tune base:peak --size test:train:refrate intrate --nopreenv --note-preenv --logfile
     $SPEC/tmp/CPU2017.006/templogs/preenv.intrate.006.0.log --lognum 006.0 --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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## Platform Notes (Continued)

```
      model           : 2
      stepping        : 1
      microcode       : 0xb00211a
      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 2.39.3:
      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               Unknown CPU @ 2.7GHz
      BIOS CPU family:      107
      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:             5391.65
      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 user_shstk 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
```

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## Platform Notes (Continued)

```
                                 movdiri movdir64b overflow_recov succor smca fsrm avx512_vp2intersect
                                 flush_l1d debug_swap
  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 Reg file data sampling: Not affected
  Vulnerability Retbleed:        Not affected
  Vulnerability Spec rstack overflow:  Not affected
  Vulnerability Spec store bypass:  Mitigation; Speculative Store Bypass disabled via prctl
  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; BHI Not affected
  Vulnerability Srbds:           Not affected
  Vulnerability Tsx async abort: Not affected

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

  -------------------------------------------------------------
8. numactl --hardware
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: 192913 MB
  node 0 free: 192305 MB
  node 1 cpus: 32-63,288-319
  node 1 size: 193480 MB
  node 1 free: 192975 MB
  node 2 cpus: 64-95,320-351
  node 2 size: 193519 MB
  node 2 free: 192990 MB
  node 3 cpus: 96-127,352-383
  node 3 size: 193519 MB
  node 3 free: 192921 MB
  node 4 cpus: 128-159,384-415
  node 4 size: 193519 MB
  node 4 free: 192950 MB
  node 5 cpus: 160-191,416-447
  node 5 size: 193519 MB
```

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## Platform Notes (Continued)

```
   node 5 free: 193007 MB
   node 6 cpus: 192-223,448-479
   node 6 size: 193519 MB
   node 6 free: 193032 MB
   node 7 cpus: 224-255,480-511
   node 7 size: 192908 MB
   node 7 free: 192356 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:       1584024172 kB


   --------------------------------------------------------------
10. who -r
   run-level 3 Jan 13 22:24


   --------------------------------------------------------------
11. Systemd service manager version: systemd 254 (254.10+suse.84.ge8d77af424)
   Default Target  Status
   multi-user      running


   --------------------------------------------------------------
12. Services, from systemctl list-unit-files
   STATE           UNIT FILES
   enabled         apparmor auditd cron firewalld getty@ irqbalance issue-generator kbdsettings kdump
                   kdump-early kdump-notify nvmefc-boot-connections nvmf-autoconnect postfix purge-kernels
                   rollback sshd systemd-pstore wicked wickedd-auto4 wickedd-dhcp4 wickedd-dhcp6
                   wickedd-nanny
   enabled-runtime systemd-remount-fs
   disabled        boot-sysctl ca-certificates chrony-wait chronyd console-getty debug-shell ebtables
                   exchange-bmc-os-info fsidd grub2-once haveged hwloc-dump-hwdata ipmievd issue-add-ssh-keys
                   kexec-load nfs nfs-blkmap rpcbind rpmconfigcheck serial-getty@
                   systemd-boot-check-no-failures systemd-confext systemd-network-generator systemd-sysext
                   systemd-time-wait-sync systemd-timesyncd tuned
   generated       jexec
   indirect        systemd-userdbd wickedd


   --------------------------------------------------------------
13. Linux kernel boot-time arguments, from /proc/cmdline
   BOOT_IMAGE=/boot/vmlinuz-6.4.0-150600.21-default
   root=UUID=57526b2a-7733-4c34-8e82-bd01bcfc67e9
   splash=silent
   mitigations=auto
   quiet
   security=apparmor
   crashkernel=383M,high
   crashkernel=72M,low


   --------------------------------------------------------------
14. cpupower frequency-info
```

**(Continued on next page)**

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## Platform Notes (Continued)

```
   analyzing CPU 447:
     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


  -------------------------------------------------------------
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                   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
  max_ptes_swap             64
  pages_to_scan           4096
  scan_sleep_millisecs   10000


  -------------------------------------------------------------
19. OS release
  From /etc/*-release /etc/*-version
  os-release SUSE Linux Enterprise Server 15 SP6


  -------------------------------------------------------------
20. Disk information
SPEC is set to: /home/CPU2017
```

**(Continued on next page)**

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## Platform Notes (Continued)

```
  Filesystem      Type  Size  Used Avail Use% Mounted on
  /dev/nvme0n1p3 xfs   854G   36G  818G   5% /home


  -------------------------------------------------------------
  21. /sys/devices/virtual/dmi/id
     Vendor:          IEIT SYSTEMS
     Product:         NF5280-A8-A0-R0-00
     Product Family: Not specified
     Serial:          000000000


  -------------------------------------------------------------
  22. dmidecode
    Additional information from dmidecode 3.4 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, configured at 6000



  -------------------------------------------------------------
  23. BIOS
  (This section combines info from /sys/devices and dmidecode.)
    BIOS Vendor:       American Megatrends International, LLC.
    BIOS Version:      01.07.00
    BIOS Date:         11/15/2024
```

## 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
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)
```

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## IEIT Systems Co., Ltd.

meta brain NF5280G8 (AMD EPYC 9755)

SPECrate®2017_int_base = 2790

SPECrate®2017_int_peak = 2850

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

**Test Date:** Jan-2025
**Hardware Availability:** Feb-2025
**Software Availability:** Oct-2024

## Compiler Version Notes (Continued)

```
         | 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
```

## 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`

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## IEIT Systems Co., Ltd.

### meta brain NF5280G8 (AMD EPYC 9755)

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SPECrate®2017_int_peak = 2850

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# Base Portability Flags (Continued)

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
```

# Base Other Flags

C benchmarks:
```
-Wno-unused-command-line-argument
```

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## IEIT Systems Co., Ltd.

### meta brain NF5280G8 (AMD EPYC 9755)

SPECrate®2017_int_base = 2790

SPECrate®2017_int_peak = 2850

**CPU2017 License:** 3358
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**Test Date:** Jan-2025
**Hardware Availability:** Feb-2025
**Software Availability:** Oct-2024

## Base Other Flags (Continued)

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`

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`

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## IEIT Systems Co., Ltd.

SPECrate®2017_int_base = 2790

### meta brain NF5280G8 (AMD EPYC 9755)

SPECrate®2017_int_peak = 2850

**CPU2017 License:** 3358
**Test Sponsor:** IEIT Systems Co., Ltd.
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**Test Date:** Jan-2025
**Hardware Availability:** Feb-2025
**Software Availability:** Oct-2024

# Peak Optimization Flags (Continued)

502.gcc_r (continued):
```
-fremap-arrays -fstrip-mining
-mllvm -inline-threshold=1000
-mllvm -reduce-array-computations=3 -zopt -fgnu89-inline
-lamdalloc
```

505.mcf_r: `-m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6`
```
-Wl,-mllvm -Wl,-reduce-array-computations=3
-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
```

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: `basepeak = yes`

523.xalancbmk_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
-fvirtual-function-elimination -fvisibility=hidden
-mllvm -do-block-reorder=advanced -lamdlibm -lflang
-lamdalloc-ext -ldl
```

531.deepsjeng_r: `basepeak = yes`

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## IEIT Systems Co., Ltd.

### meta brain NF5280G8 (AMD EPYC 9755)

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SPECrate®2017_int_peak = 2850

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# Peak Optimization Flags (Continued)

```
541.leela_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 -lflang
-lamdalloc-ext -ldl
```

Fortran benchmarks:

```
548.exchange2_r: basepeak = yes
```

# 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-V1.0.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-V1.0.xml
```

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 2025-01-13 22:26:58-0500.
Report generated on 2025-03-12 10:24:58 by CPU2017 PDF formatter v6716.
Originally published on 2025-03-11.