SPEC CPU®2017 Floating Point Rate Result

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Inspur Electronic Information Industry Co., Ltd. (IEI)

NF5280A7 (AMD EPYC 9334)

$SPECrate®2017\_fp\_base = 832$

$SPECrate®2017\_fp\_peak = 834$

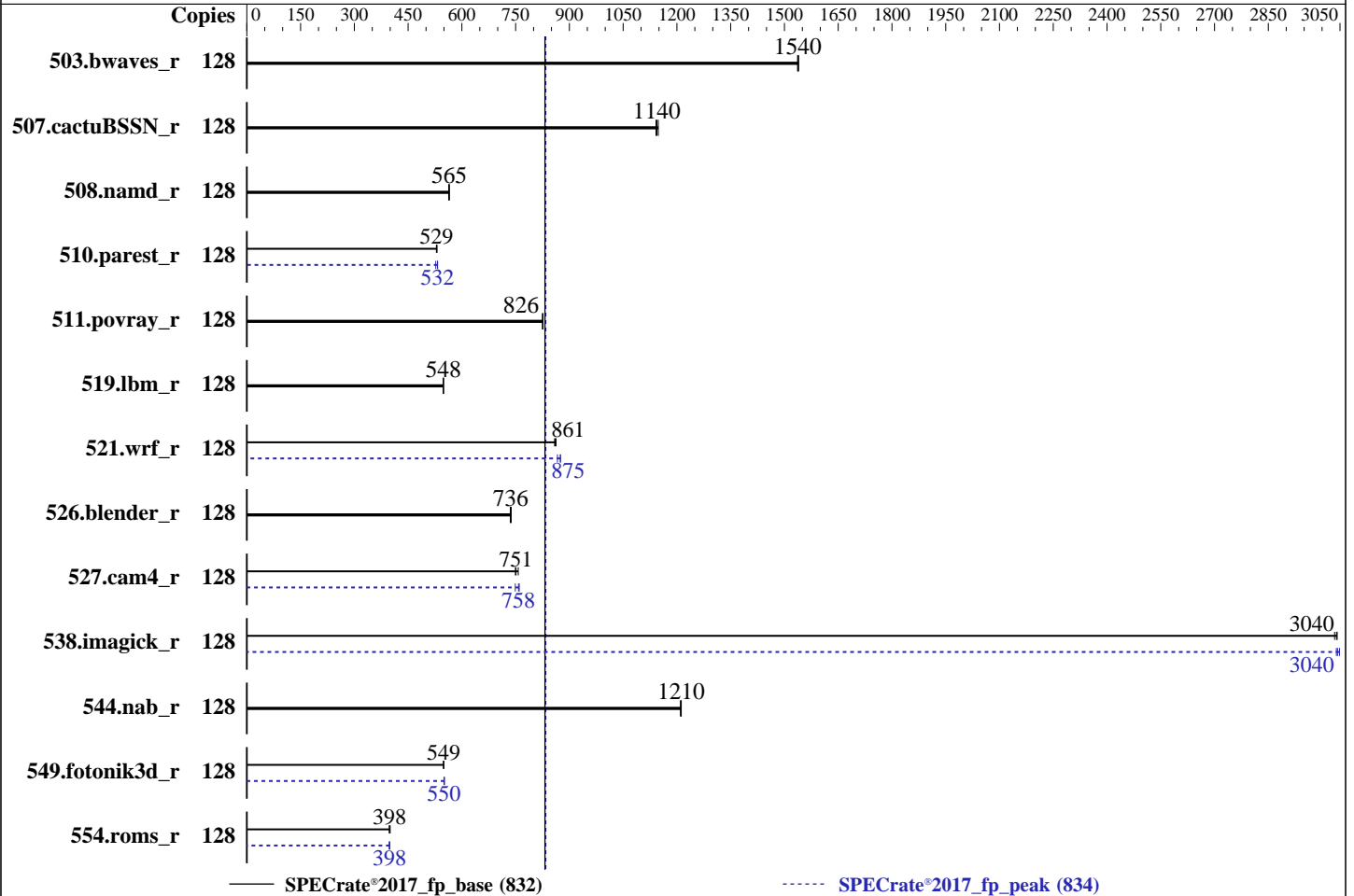**CPU2017 License:** 3358 **Test Date:** Jun-2023
Test Sponsor: Inspur Electronic Information Industry Co., Ltd. (IEI) **Hardware Availability:** Feb-2023
Tested by: Inspur Electronic Information Industry Co., Ltd. (IEI) **Software Availability:** Nov-2022

Benchmark	Copies	base	peak
503.bwaves_r	128	1540	
507.cactuBSSN_r	128	1140	
508.namd_r	128	565	
510.parest_r	128	529	532
511.povray_r	128	826	
519.lbm_r	128	548	
521.wrf_r	128	861	875
526.blender_r	128	736	
527.cam4_r	128	751	758
538.imagick_r	128	3040	3040
544.nab_r	128	1210	
549.fotonik3d_r	128	549	550
554.roms_r	128	398	398

SPECrate®2017_fp_base (832)   SPECrate®2017_fp_peak (834)

Hardware

CPU Name: AMD EPYC 9334
 Max MHz: 3900
 Nominal: 2700
Enabled: 64 cores, 2 chips, 2 threads/core
Orderable: 1,2 chips
Cache L1: 32 KB I + 32 KB D on chip per core
 L2: 1 MB I+D on chip per core
 L3: 128 MB I+D on chip per chip, 32 MB shared / 8 cores
 Other: None
Memory: 1536 GB (24 x 64 GB 2Rx4 PC5-4800B-R)
Storage: 1 x 1 TB NVME SSD
Other: None

Software

OS: Red Hat Enterprise Linux release 9 (Plow)
5.14.0-70.13.1.el9_0.x86_64
Compiler: C/C++/Fortran: Version 4.0.0 of AOCC
Parallel: No
Firmware: Version 04.02.14 released Dec-2022
File System: xfs
System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: 64-bit
Other: None
Power Management: BIOS and OS set to prefer performance at the cost of additional power usage.

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

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Results Table

Benchmark	Base						Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
503.bwaves_r	128	834	1540	835	1540	**835**	**1540**	128	834	1540	835	1540	**835**	**1540**
507.cactuBSSN_r	128	141	1150	142	1140	**142**	**1140**	128	141	1150	142	1140	**142**	**1140**
508.namd_r	128	**215**	**565**	215	565	216	563	128	**215**	**565**	215	565	216	563
510.parest_r	128	631	531	633	529	**632**	**529**	128	635	527	**629**	**532**	629	532
511.povray_r	128	362	826	362	825	**362**	**826**	128	362	826	362	825	**362**	**826**
519.lbm_r	128	246	549	**246**	**548**	246	548	128	246	549	**246**	**548**	246	548
521.wrf_r	128	**333**	**861**	334	859	332	863	128	331	867	328	875	**328**	**875**
526.blender_r	128	264	738	**265**	**736**	265	735	128	264	738	**265**	**736**	265	735
527.cam4_r	128	299	749	296	757	**298**	**751**	128	295	760	299	749	**295**	**758**
538.imagick_r	128	105	3040	105	3030	**105**	**3040**	128	104	3050	105	3040	**105**	**3040**
544.nab_r	128	**178**	**1210**	178	1210	178	1210	128	**178**	**1210**	178	1210	178	1210
549.fotonik3d_r	128	**908**	**549**	908	549	909	549	128	**907**	**550**	904	552	907	550
554.roms_r	128	512	397	509	400	**511**	**398**	128	510	399	512	397	**511**	**398**
SPECrate®2017_fp_base =						**832**							
SPECrate®2017_fp_peak =						**834**							

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,
```

(Continued on next page)

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Operating System Notes (Continued)

```
'echo always > /sys/kernel/mm/transparent_hugepage/enabled' and
'echo always > /sys/kernel/mm/transparent_hugepage/defrag' run as root.
```

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"
```

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 = 400
 Package Power Limit = 400

 Sysinfo program /home/CPU2017/bin/sysinfo
 Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
 running on localhost Fri Jun  2 17:06:39 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 250 (250-6.el9_0)
 12. Services, from systemctl list-unit-files
 13. Linux kernel boot-time arguments, from /proc/cmdline
```

(Continued on next page)

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Platform Notes (Continued)

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


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


   ---------------------------------------------------------
   2. w
      17:06:39 up  4:45,  1 user,  load average: 86.59, 117.45, 123.13
      USER     TTY        LOGIN@   IDLE   JCPU   PCPU WHAT
      root     tty1       12:21    4:43m  1.41s  0.28s /bin/bash ./amd_rate_aocc400_genoa_B1.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) 6191158
     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) 6191158
     virtual memory              (kbytes, -v) unlimited
     file locks                      (-x) unlimited

   ---------------------------------------------------------
   5. sysinfo process ancestry
    /usr/lib/systemd/systemd --switched-root --system --deserialize 30
    login -- root
    -bash
    python3 ./run_amd_rate_aocc400_genoa_B1.py
    /bin/bash ./amd_rate_aocc400_genoa_B1.sh
    runcpu --config amd_rate_aocc400_genoa_B1.cfg --tune all --reportable --iterations 3 fprate
    runcpu --configfile amd_rate_aocc400_genoa_B1.cfg --tune all --reportable --iterations 3 --nopower --runmode
      rate --tune base:peak --size test:train:refrate fprate --nopreenv --note-preenv --logfile
      $SPEC/tmp/CPU2017.023/templogs/preenv.fprate.023.0.log --lognum 023.0 --from_runcpu 2
    specperl $SPEC/bin/sysinfo
    $SPEC = /home/CPU2017
```

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Platform Notes (Continued)

```
    ----------------------------------------------------------
 6. /proc/cpuinfo
    model name      : AMD EPYC 9334 32-Core Processor
    vendor_id       : AuthenticAMD
    cpu family      : 25
    model           : 17
    stepping        : 1
    microcode       : 0xa101111
    bugs            : sysret_ss_attrs spectre_v1 spectre_v2 spec_store_bypass
    TLB size        : 3584 4K pages
    cpu cores       : 32
    siblings        : 64
    2 physical ids (chips)
    128 processors (hardware threads)
    physical id 0: core ids 0-31
    physical id 1: core ids 0-31
    physical id 0: apicids 0-63
    physical id 1: apicids 64-127
  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):                 128
   On-line CPU(s) list:    0-127
   Vendor ID:              AuthenticAMD
   BIOS Vendor ID:         Advanced Micro Devices, Inc.
   Model name:             AMD EPYC 9334 32-Core Processor
   BIOS Model name:        AMD EPYC 9334 32-Core Processor
   CPU family:             25
   Model:                  17
   Thread(s) per core:     2
   Core(s) per socket:     32
   Socket(s):              2
   Stepping:               1
   Frequency boost:        enabled
   CPU max MHz:            3910.2529
   CPU min MHz:            1500.0000
   BogoMIPS:               5400.13
   Flags:                  fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov pat pse36
                           clflush mmx fxsr sse sse2 ht syscall nx mmxext fxsr_opt pdpe1gb rdtscp lm
                           constant_tsc rep_good nopl nonstop_tsc cpuid extd_apicid aperfmperf rapl
                           pni pclmulqdq monitor ssse3 fma cx16 pcid sse4_1 sse4_2 x2apic movbe
                           popcnt aes xsave avx f16c rdrand lahf_lm cmp_legacy svm extapic cr8_legacy
                           abm sse4a misalignsse 3dnowprefetch osvw ibs skinit wdt tce topoext
                           perfctr_core perfctr_nb bpext perfctr_llc mwaitx cpb cat_l3 cdp_l3
                           invpcid_single hw_pstate ssbd mba ibrs ibpb stibp vmmcall fsgsbase bmi1
                           avx2 smep bmi2 erms invpcid cqm rdt_a avx512f avx512dq rdseed adx smap
                           avx512ifma clflushopt clwb avx512cd sha_ni avx512bw avx512vl xsaveopt
                           xsavec xgetbv1 xsaves cqm_llc cqm_occup_llc cqm_mbm_total cqm_mbm_local
                           avx512_bf16 clzero irperf xsaveerptr rdpru wbnoinvd amd_ppin arat npt lbrv
                           svm_lock nrip_save tsc_scale vmcb_clean flushbyasid decodeassists
                           pausefilter pfthreshold avic v_vmsave_vmload vgif v_spec_ctrl avx512vbmi
```

(Continued on next page)

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Platform Notes (Continued)

```
                              umip pku ospke avx512_vbmi2 gfni vaes vpclmulqdq avx512_vnni avx512_bitalg
                              avx512_vpopcntdq la57 rdpid overflow_recov succor smca fsrm flush_l1d
    Virtualization:           AMD-V
    L1d cache:                2 MiB (64 instances)
    L1i cache:                2 MiB (64 instances)
    L2 cache:                 64 MiB (64 instances)
    L3 cache:                 256 MiB (8 instances)
    NUMA node(s):             8
    NUMA node0 CPU(s):        0-7,64-71
    NUMA node1 CPU(s):        8-15,72-79
    NUMA node2 CPU(s):        16-23,80-87
    NUMA node3 CPU(s):        24-31,88-95
    NUMA node4 CPU(s):        32-39,96-103
    NUMA node5 CPU(s):        40-47,104-111
    NUMA node6 CPU(s):        48-55,112-119
    NUMA node7 CPU(s):        56-63,120-127
    Vulnerability Itlb multihit:    Not affected
    Vulnerability L1tf:             Not affected
    Vulnerability Mds:              Not affected
    Vulnerability Meltdown:         Not affected
    Vulnerability Spec store bypass: Mitigation; Speculative Store Bypass disabled via prctl
    Vulnerability Spectre v1:       Mitigation; usercopy/swapgs barriers and __user pointer sanitization
    Vulnerability Spectre v2:       Mitigation; Retpolines, IBPB conditional, IBRS_FW, STIBP always-on, RSB
                                    filling
    Vulnerability Srbds:            Not affected
    Vulnerability Tsx async abort:  Not affected

  From lscpu --cache:
      NAME ONE-SIZE ALL-SIZE WAYS TYPE        LEVEL   SETS PHY-LINE COHERENCY-SIZE
      L1d       32K       2M  8 Data            1     64        1             64
      L1i       32K       2M  8 Instruction     1     64        1             64
      L2         1M      64M  8 Unified         2   2048        1             64
      L3        32M     256M 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: 0-7,64-71
    node 0 size: 193340 MB
    node 0 free: 192297 MB
    node 1 cpus: 8-15,72-79
    node 1 size: 193522 MB
    node 1 free: 192522 MB
    node 2 cpus: 16-23,80-87
    node 2 size: 193522 MB
    node 2 free: 192520 MB
    node 3 cpus: 24-31,88-95
    node 3 size: 193522 MB
    node 3 free: 192486 MB
    node 4 cpus: 32-39,96-103
    node 4 size: 193522 MB
    node 4 free: 192520 MB
    node 5 cpus: 40-47,104-111
    node 5 size: 193522 MB
    node 5 free: 192485 MB
    node 6 cpus: 48-55,112-119
    node 6 size: 193486 MB
    node 6 free: 192472 MB
    node 7 cpus: 56-63,120-127
```

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Platform Notes (Continued)

```
   node 7 size: 193454 MB
   node 7 free: 192435 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:       1585043244 kB


  ---------------------------------------------------------------
  10. who -r
    run-level 3 Jun 2 12:21


  ---------------------------------------------------------------
  11. Systemd service manager version: systemd 250 (250-6.el9_0)
    Default Target  Status
    multi-user      running


  ---------------------------------------------------------------
  12. Services, from systemctl list-unit-files
    STATE            UNIT FILES
    enabled          dbus-broker getty@ lvm2-monitor microcode systemd-network-generator tuned udisks2 upower
    enabled-runtime  systemd-remount-fs
    disabled         NetworkManager NetworkManager-dispatcher NetworkManager-wait-online auditd
                     blk-availability canberra-system-bootup canberra-system-shutdown
                     canberra-system-shutdown-reboot chrony-wait chronyd console-getty cpupower crond
                     debug-shell firewalld hwloc-dump-hwdata irqbalance kdump kvm_stat
                     man-db-restart-cache-update mdmonitor nftables nis-domainname rdisc rhsm rhsm-facts
                     rhsmcertd rpmdb-rebuild rsyslog selinux-autorelabel-mark serial-getty@ sshd sshd-keygen@
                     sssd systemd-boot-check-no-failures systemd-pstore systemd-sysext
    indirect         sssd-autofs sssd-kcm sssd-nss sssd-pac sssd-pam sssd-ssh sssd-sudo

  ---------------------------------------------------------------
  13. Linux kernel boot-time arguments, from /proc/cmdline
    BOOT_IMAGE=(hd0,gpt2)/vmlinuz-5.14.0-70.13.1.el9_0.x86_64
    root=/dev/mapper/rhel-root
    ro
    resume=/dev/mapper/rhel-swap
    rd.lvm.lv=rhel/root
    rd.lvm.lv=rhel/swap


  ---------------------------------------------------------------
  14. cpupower frequency-info
    analyzing CPU 0:
      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
```

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Platform Notes (Continued)

```
     Pstate-P0:   2700MHz


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


    -------------------------------------------------------------
    19. OS release
      From /etc/*-release /etc/*-version
      os-release     Red Hat Enterprise Linux 9.0 (Plow)
      redhat-release Red Hat Enterprise Linux release 9.0 (Plow)
      system-release Red Hat Enterprise Linux release 9.0 (Plow)


    -------------------------------------------------------------
    20. Disk information
    SPEC is set to: /home/CPU2017
      Filesystem            Type  Size  Used Avail Use% Mounted on
      /dev/mapper/rhel-home xfs   819G   22G  797G   3% /home


    -------------------------------------------------------------
    21. /sys/devices/virtual/dmi/id
```

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Platform Notes (Continued)

```
      Vendor:        IEI
      Product:       NF5280A7
      Product Family: Not specified
      Serial:        000000000


    ---------------------------------------------------------------
 22. dmidecode
   Additional information from dmidecode 3.3 follows.  WARNING: Use caution when you interpret this section.
   The 'dmidecode' program reads system data which is "intended to allow hardware to be accurately
   determined", but the intent may not be met, as there are frequent changes to hardware, firmware, and the
   "DMTF SMBIOS" standard.
   Memory:
     1x Samsung M321R8GA0BB0-CQKDS 64 GB 2 rank 4800
     23x Samsung M321R8GA0BB0-CQKMG 64 GB 2 rank 4800



    ---------------------------------------------------------------
 23. BIOS
 (This section combines info from /sys/devices and dmidecode.)
   BIOS Vendor:       American Megatrends International, LLC.
   BIOS Version:      04.02.14
   BIOS Date:         12/29/2022
```

Compiler Version Notes

```
==================================================================================================
C              | 519.lbm_r(base, peak) 538.imagick_r(base, peak) 544.nab_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++            | 508.namd_r(base, peak) 510.parest_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++, C         | 511.povray_r(base, peak) 526.blender_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
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++, C, Fortran | 507.cactuBSSN_r(base, peak)
--------------------------------------------------------------------------------------------------
```

Inspur Electronic Information Industry Co., Ltd. (IEI)

NF5280A7 (AMD EPYC 9334)

SPECrate®2017_fp_base = 832

SPECrate®2017_fp_peak = 834

CPU2017 License: 3358
Test Sponsor: Inspur Electronic Information Industry Co., Ltd. (IEI)
Tested by: Inspur Electronic Information Industry Co., Ltd. (IEI)

Test Date: Jun-2023
Hardware Availability: Feb-2023
Software Availability: Nov-2022

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
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Target: x86_64-unknown-linux-gnu
Thread model: posix
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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     | 503.bwaves_r(base, peak) 549.fotonik3d_r(base, peak) 554.roms_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, C   | 521.wrf_r(base, peak) 527.cam4_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
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`

Benchmarks using both Fortran and C:
`flang clang`

Benchmarks using both C and C++:
`clang++ clang`

(Continued on next page)

Inspur Electronic Information Industry Co., Ltd. (IEI)

NF5280A7 (AMD EPYC 9334)

SPECrate®2017_fp_base = 832

SPECrate®2017_fp_peak = 834

CPU2017 License: 3358
Test Sponsor: Inspur Electronic Information Industry Co., Ltd. (IEI)
Tested by: Inspur Electronic Information Industry Co., Ltd. (IEI)

Test Date: Jun-2023
Hardware Availability: Feb-2023
Software Availability: Nov-2022

Base Compiler Invocation (Continued)

Benchmarks using Fortran, C, and C++:
```
clang++ clang flang
```

Base Portability Flags

503.bwaves_r: `-DSPEC_LP64`
507.cactuBSSN_r: `-DSPEC_LP64`
508.namd_r: `-DSPEC_LP64`
510.parest_r: `-DSPEC_LP64`
511.povray_r: `-DSPEC_LP64`
519.lbm_r: `-DSPEC_LP64`
521.wrf_r: `-DSPEC_CASE_FLAG -Mbyteswapio -DSPEC_LP64`
526.blender_r: `-funsigned-char -DSPEC_LP64`
527.cam4_r: `-DSPEC_CASE_FLAG -DSPEC_LP64`
538.imagick_r: `-DSPEC_LP64`
544.nab_r: `-DSPEC_LP64`
549.fotonik3d_r: `-DSPEC_LP64`
554.roms_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 -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 -lamdalloc -lflang
```

C++ benchmarks:
```
-m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-x86-use-vzeroupper=false -O3 -march=znver4
-fveclib=AMDLIBM -ffast-math -mllvm -unroll-threshold=100
-finline-aggressive -mllvm -loop-unswitch-threshold=200000
-mllvm -reduce-array-computations=3 -zopt -lamdlibm -lamdalloc
-lflang
```

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

Inspur Electronic Information Industry Co., Ltd. (IEI)

NF5280A7 (AMD EPYC 9334)

SPECrate®2017_fp_base = 832

SPECrate®2017_fp_peak = 834

CPU2017 License: 3358		**Test Date:**	Jun-2023
Test Sponsor:	Inspur Electronic Information Industry Co., Ltd. (IEI)	**Hardware Availability:**	Feb-2023
Tested by:	Inspur Electronic Information Industry Co., Ltd. (IEI)	**Software Availability:**	Nov-2022

Base Optimization Flags (Continued)

Fortran benchmarks (continued):
```
-Wl,-mllvm -Wl,-enable-X86-prefetching -O3 -march=znver4
-fveclib=AMDLIBM -ffast-math -Kieee -Mrecursive -funroll-loops
-mllvm -lsr-in-nested-loop -mllvm -reduce-array-computations=3
-fepilog-vectorization-of-inductions -zopt -lamdlibm -lamdalloc
-lflang
```

Benchmarks using both Fortran and C:
```
-m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-enable-X86-prefetching -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 -Kieee -Mrecursive -funroll-loops -mllvm -lsr-in-nested-loop
-fepilog-vectorization-of-inductions -lamdlibm -lamdalloc -lflang
```

Benchmarks using both C and C++:
```
-m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-x86-use-vzeroupper=false -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 -mllvm -unroll-threshold=100 -finline-aggressive
-mllvm -loop-unswitch-threshold=200000 -lamdlibm -lamdalloc -lflang
```

Benchmarks using Fortran, C, and C++:
```
-m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-x86-use-vzeroupper=false -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 -mllvm -unroll-threshold=100 -finline-aggressive
-mllvm -loop-unswitch-threshold=200000 -Kieee -Mrecursive
-funroll-loops -mllvm -lsr-in-nested-loop
-fepilog-vectorization-of-inductions -lamdlibm -lamdalloc -lflang
```

Base Other Flags

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

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Inspur Electronic Information Industry Co., Ltd. (IEI)

NF5280A7 (AMD EPYC 9334)

SPECrate®2017_fp_base = 832

SPECrate®2017_fp_peak = 834

CPU2017 License: 3358
Test Sponsor: Inspur Electronic Information Industry Co., Ltd. (IEI)
Tested by: Inspur Electronic Information Industry Co., Ltd. (IEI)

Test Date: Jun-2023
Hardware Availability: Feb-2023
Software Availability: Nov-2022

Base Other Flags (Continued)

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

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

Benchmarks using both Fortran and C:
```
-Wno-unused-command-line-argument
```

Benchmarks using both C and C++:
```
-Wno-unused-command-line-argument
```

Benchmarks using Fortran, C, and C++:
```
-Wno-unused-command-line-argument
```

Peak Compiler Invocation

C benchmarks:
```
clang
```

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

Fortran benchmarks:
```
flang
```

Benchmarks using both Fortran and C:
```
flang clang
```

Benchmarks using both C and C++:
```
clang++ clang
```

Benchmarks using Fortran, C, and C++:
```
clang++ clang flang
```

Peak Portability Flags

```
Same as Base Portability Flags
```

Inspur Electronic Information Industry Co., Ltd. (IEI)

NF5280A7 (AMD EPYC 9334)

SPECrate®2017_fp_base = 832

SPECrate®2017_fp_peak = 834

CPU2017 License: 3358
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Tested by: Inspur Electronic Information Industry Co., Ltd. (IEI)

Test Date: Jun-2023
Hardware Availability: Feb-2023
Software Availability: Nov-2022

Peak Optimization Flags

C benchmarks:

519.lbm_r: basepeak = yes

538.imagick_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
-lamdalloc

544.nab_r: basepeak = yes

C++ benchmarks:

508.namd_r: basepeak = yes

510.parest_r: -m64 -flto -Wl,-mllvm -Wl,-suppress-fmas
-Wl,-mllvm -Wl,-x86-use-vzeroupper=false -Ofast
-march=znver4 -fveclib=AMDLIBM -ffast-math
-finline-aggressive -mllvm -unroll-threshold=100
-mllvm -reduce-array-computations=3 -zopt -lamdlibm
-lamdalloc

Fortran benchmarks:

503.bwaves_r: basepeak = yes

549.fotonik3d_r: -m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-enable-X86-prefetching -Ofast
-march=znver4 -fveclib=AMDLIBM -ffast-math -Kieee
-Mrecursive -mllvm -reduce-array-computations=3
-fepilog-vectorization-of-inductions -fvector-transform
-fscalar-transform -lamdlibm -lamdalloc -lflang

554.roms_r: -m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-enable-X86-prefetching -Ofast
-march=znver4 -fveclib=AMDLIBM -ffast-math -Mrecursive
-mllvm -reduce-array-computations=3
-fepilog-vectorization-of-inductions -zopt -lamdlibm
-lamdalloc -lflang

SPEC CPU®2017 Floating Point Rate Result
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Inspur Electronic Information Industry Co., Ltd. (IEI)

NF5280A7 (AMD EPYC 9334)

SPECrate®2017_fp_base = 832

SPECrate®2017_fp_peak = 834

CPU2017 License: 3358   **Test Date:** Jun-2023
Test Sponsor: Inspur Electronic Information Industry Co., Ltd. (IEI)   **Hardware Availability:** Feb-2023
Tested by: Inspur Electronic Information Industry Co., Ltd. (IEI)   **Software Availability:** Nov-2022

Peak Optimization Flags (Continued)

Benchmarks using both Fortran and C:

```
521.wrf_r: -m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-enable-X86-prefetching -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 -Mrecursive
-fepilog-vectorization-of-inductions -lamdlibm -lamdalloc
-lflang
```

```
527.cam4_r: -m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-enable-X86-prefetching -O3 -march=znver4
-fveclib=AMDLIBM -ffast-math -fstruct-layout=7
-mllvm -unroll-threshold=50 -mllvm -inline-threshold=1000
-fremap-arrays -mllvm -reduce-array-computations=3 -zopt
-Kieee -Mrecursive -funroll-loops
-mllvm -lsr-in-nested-loop
-fepilog-vectorization-of-inductions -lamdlibm -lamdalloc
-lflang
```

Benchmarks using both C and C++:

```
511.povray_r: basepeak = yes
```

```
526.blender_r: basepeak = yes
```

Benchmarks using Fortran, C, and C++:

```
507.cactuBSSN_r: basepeak = yes
```

Peak Other Flags

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

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

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

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SPEC CPU®2017 Floating Point Rate Result

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Inspur Electronic Information Industry Co., Ltd. (IEI)

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Peak Other Flags (Continued)

Benchmarks using both Fortran and C:
```
-Wno-unused-command-line-argument
```

Benchmarks using both C and C++:
```
-Wno-unused-command-line-argument
```

Benchmarks using Fortran, C, and C++:
```
-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/Inspur-Platform-Settings-amd-V3.0.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/Inspur-Platform-Settings-amd-V3.0.xml
```

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

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