SPEC CPU®2017 Floating Point Rate Result

Supermicro

A+ Server 2115GT-HNTF
(H13SST-G , AMD EPYC 9354P)

$SPECrate^{®}2017\_fp\_base = 437$

$SPECrate^{®}2017\_fp\_peak = 440$

CPU2017 License: 001176

Test Sponsor: Supermicro

Tested by: Supermicro

Test Date: Feb-2023

Hardware Availability: Nov-2022

Software Availability: Jan-2023

Copies	
503.bwaves_r	64 — 834
507.cactuBSSN_r	64 — 553
508.namd_r	64 — 275
510.parest_r	64 — 444 / 445
511.povray_r	64 — 406
519.lbm_r	64 — 271
521.wrf_r	64 — 452 / 471
526.blender_r	64 — 379
527.cam4_r	64 — 381 / 387
538.imagick_r	64 — 1500
544.nab_r	64 — 592
549.fotonik3d_r	64 — 271 / 274
554.roms_r	64 — 221 / 222

SPECrate®2017_fp_base (437)

SPECrate®2017_fp_peak (440)

Hardware

CPU Name: AMD EPYC 9354P

 Max MHz: 3800

 Nominal: 3250

Enabled: 32 cores, 1 chip, 2 threads/core

Orderable: 1 chip

Cache L1: 32 KB I + 32 KB D on chip per core

 L2: 1 MB I+D on chip per core

 L3: 256 MB I+D on chip per chip, 32 MB shared / 4 cores

 Other: None

Memory: 1152 GB (12 x 96 GB 2Rx4 PC5-4800B-R)

Storage: 1 x 1.92 TB SATA III SSD

Other: None

Software

OS: Ubuntu 22.04.1 LTS
Kernel 5.15.0-58-generic
5.15.0-58-generic

Compiler: C/C++/Fortran: Version 4.0.0 of AOCC

Parallel: No

Firmware: Version 1.1 released Jan-2023

File System: ext4

System State: Run level 3 (multi-user)

Base Pointers: 64-bit

Peak Pointers: 64-bit

Other: None

Power Management: BIOS and OS set to max performance at the cost of additional power usage.

https://www.spec.org/

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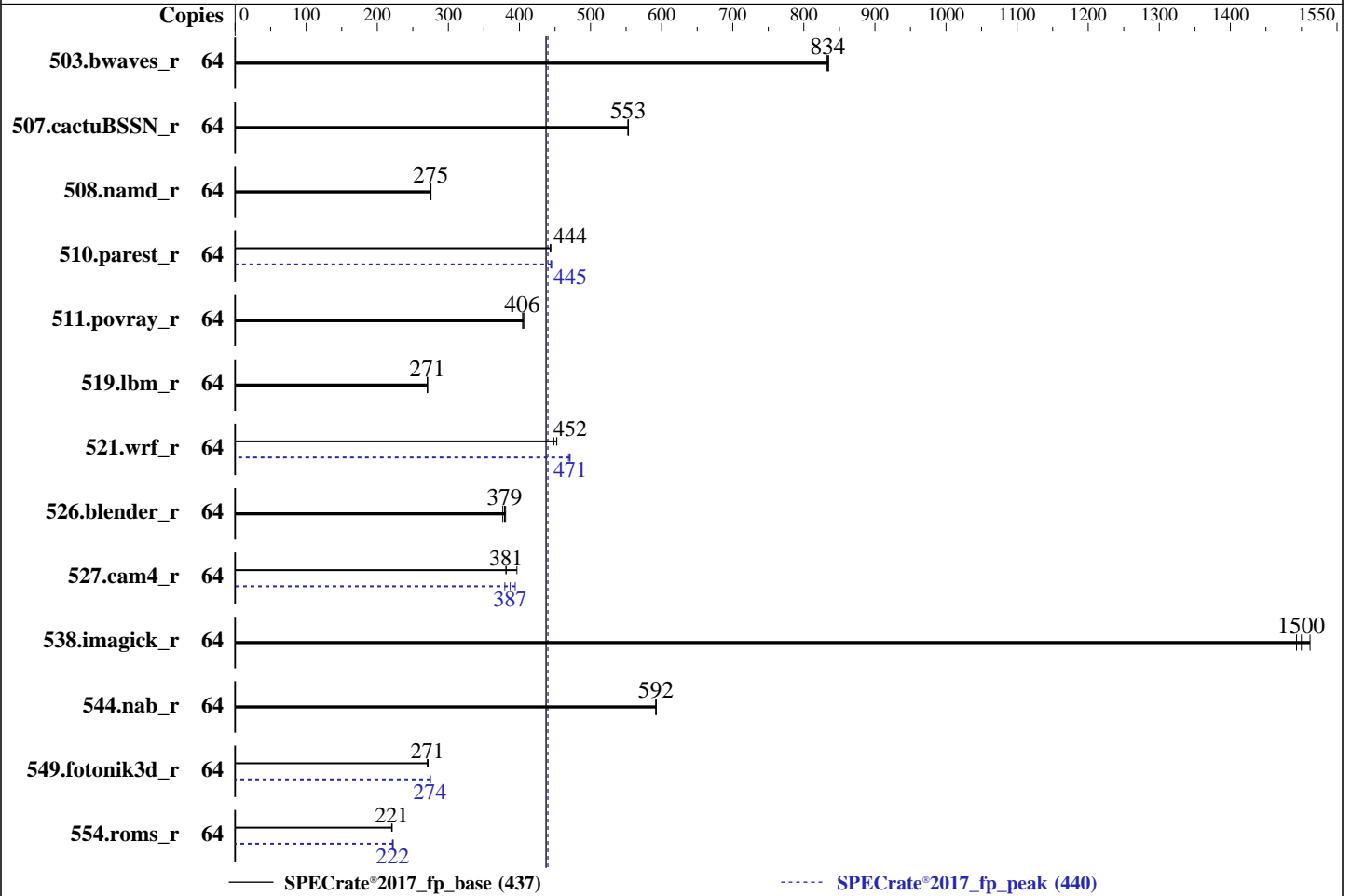Copyright 2017-2023 Standard Performance Evaluation Corporation

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Results Table

Benchmark	Base						Peak					
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
503.bwaves_r	64	**770**	**834**	769	835	771	832	64	**770**	**834**	769	835	771	832
507.cactuBSSN_r	64	147	552	146	553	**146**	**553**	64	147	552	146	553	**146**	**553**
508.namd_r	64	**221**	**275**	221	276	221	275	64	**221**	**275**	221	276	221	275
510.parest_r	64	377	444	**377**	**444**	378	443	64	**376**	**445**	377	444	376	445
511.povray_r	64	370	404	368	406	**368**	**406**	64	370	404	368	406	**368**	**406**
519.lbm_r	64	249	271	**249**	**271**	250	270	64	249	271	**249**	**271**	250	270
521.wrf_r	64	**317**	**452**	317	453	320	448	64	306	469	304	471	**304**	**471**
526.blender_r	64	259	377	**257**	**379**	256	381	64	259	377	**257**	**379**	256	381
527.cam4_r	64	282	396	**294**	**381**	294	381	64	295	379	284	394	**289**	**387**
538.imagick_r	64	105	1510	107	1490	**106**	**1500**	64	105	1510	107	1490	**106**	**1500**
544.nab_r	64	182	592	**182**	**592**	182	592	64	182	592	**182**	**592**	182	592
549.fotonik3d_r	64	922	270	919	272	**921**	**271**	64	908	275	**909**	**274**	910	274
554.roms_r	64	460	221	462	220	**461**	**221**	64	**458**	**222**	460	221	457	222

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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.

(Continued on next page)

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Operating System Notes (Continued)

```
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.
```

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_a
     occ400_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 Settings:
Determinism Control = Manual
Determinism Enable = Disable Performance Determinism
cTDP Control = Manual
cTDP = 300
Package Power Limit Control = Manual
Package Power Limit = 300
NUMA Nodes Per Socket = NPS4
ACPI SRAT L3 cache As NUMA Domain = Enabled

 Sysinfo program /home/cpu2017/bin/sysinfo
 Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
 running on h13sst-9554 Tue Feb 21 15:50:04 2023
```

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Platform Notes (Continued)

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

  ------------------------------------------------------------
  Table of contents
  ------------------------------------------------------------
   1. uname -a
   2. w
   3. Username
   4. ulimit -a
   5. sysinfo process ancestry
   6. /proc/cpuinfo
   7. lscpu
   8. numactl --hardware
   9. /proc/meminfo
  10. who -r
  11. Systemd service manager version: systemd 249 (249.11-0ubuntu3.6)
  12. Failed units, from systemctl list-units --state=failed
  13. Services, from systemctl list-unit-files
  14. Linux kernel boot-time arguments, from /proc/cmdline
  15. cpupower frequency-info
  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 h13sst-9554 5.15.0-58-generic #64-Ubuntu SMP Thu Jan 5 11:43:13 UTC 2023 x86_64 x86_64 x86_64
    GNU/Linux


  ------------------------------------------------------------
  2. w
     15:50:04 up  4:47,  2 users,  load average: 47.79, 60.13, 62.29
    USER     TTY      FROM             LOGIN@   IDLE   JCPU   PCPU WHAT
    lab      tty1     -                11:04    4:45m  1.28s  0.01s -bash
    lab      pts/0    -                11:04    4:44m  1.06s  1.26s sudo su -


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

(Continued on next page)

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Platform Notes (Continued)

```
    ----------------------------------------------------------------
 4. ulimit -a
   time(seconds)          unlimited
   file(blocks)           unlimited
   data(kbytes)           unlimited
   stack(kbytes)          unlimited
   coredump(blocks)       0
   memory(kbytes)         unlimited
   locked memory(kbytes)  2097152
   process                4642712
   nofiles                1024
   vmemory(kbytes)        unlimited
   locks                  unlimited
   rtprio                 0


    ----------------------------------------------------------------
 5. sysinfo process ancestry
  /sbin/init
  /bin/login -p --
  -bash
  sudo su -
  sudo su -
  su -
  -bash
  python3 ./run_amd_rate_aocc400_genoa_B1.py
  /bin/bash ./amd_rate_aocc400_genoa_B1.sh
  runcpu --config amd_rate_aocc400_genoa_B1.cfg --tune all --reportable --iterations 3 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/CPU2017.002/templogs/preenv.fprate.002.0.log --lognum 002.0 --from_runcpu 2
  specperl $SPEC/bin/sysinfo
 $SPEC = /home/cpu2017


    ----------------------------------------------------------------
 6. /proc/cpuinfo
    model name     : AMD EPYC 9354P 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
    1 physical ids (chips)
```

(Continued on next page)

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Platform Notes (Continued)

```
     64 processors (hardware threads)
     physical id 0: core ids 0-3,8-11,16-19,24-27,32-35,40-43,48-51,56-59
     physical id 0: apicids 0-7,16-23,32-39,48-55,64-71,80-87,96-103,112-119
  Caution: /proc/cpuinfo data regarding chips, cores, and threads is not necessarily reliable, especially for
  virtualized systems.  Use the above data carefully.


  -------------------------------------------------------------
7. lscpu

From lscpu from util-linux 2.37.2:
  Architecture:               x86_64
  CPU op-mode(s):             32-bit, 64-bit
  Address sizes:              52 bits physical, 57 bits virtual
  Byte Order:                 Little Endian
  CPU(s):                     64
  On-line CPU(s) list:        0-63
  Vendor ID:                  AuthenticAMD
  Model name:                 AMD EPYC 9354P 32-Core Processor
  CPU family:                 25
  Model:                      17
  Thread(s) per core:         2
  Core(s) per socket:         32
  Socket(s):                  1
  Stepping:                   1
  Frequency boost:            enabled
  CPU max MHz:                3800.0000
  CPU min MHz:                400.0000
  BogoMIPS:                   6500.08
  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 cppc arat npt
                                lbrv svm_lock nrip_save tsc_scale vmcb_clean flushbyasid decodeassists
                                pausefilter pfthreshold avic v_vmsave_vmload vgif v_spec_ctrl avx512vbmi
                               umip pku ospke avx512_vbmi2 gfni vaes vpclmulqdq avx512_vnni avx512_bitalg
                                avx512_vpopcntdq la57 rdpid overflow_recov succor smca fsrm flush_l1d
  Virtualization:             AMD-V
  L1d cache:                  1 MiB (32 instances)
  L1i cache:                  1 MiB (32 instances)
```

(Continued on next page)

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Platform Notes (Continued)

```
  L2 cache:                          32 MiB (32 instances)
  L3 cache:                          256 MiB (8 instances)
  NUMA node(s):                      8
  NUMA node0 CPU(s):                 0-3,32-35
  NUMA node1 CPU(s):                 4-7,36-39
  NUMA node2 CPU(s):                 8-11,40-43
  NUMA node3 CPU(s):                 12-15,44-47
  NUMA node4 CPU(s):                 16-19,48-51
  NUMA node5 CPU(s):                 20-23,52-55
  NUMA node6 CPU(s):                 24-27,56-59
  NUMA node7 CPU(s):                 28-31,60-63
  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 store bypass: Mitigation; Speculative Store Bypass disabled via prctl and seccomp
  Vulnerability Spectre v1:          Mitigation; usercopy/swapgs barriers and __user pointer sanitization
  Vulnerability Spectre v2:          Mitigation; Retpolines, IBPB conditional, IBRS_FW, STIBP always-on, RSB
                                     filling, PBRSB-eIBRS Not affected
  Vulnerability Srbds:               Not affected
  Vulnerability Tsx async abort:     Not affected


 From lscpu --cache:
     NAME ONE-SIZE ALL-SIZE WAYS TYPE          LEVEL   SETS PHY-LINE COHERENCY-SIZE
     L1d       32K       1M    8 Data             1     64        1             64
     L1i       32K       1M    8 Instruction      1     64        1             64
     L2         1M      32M    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: 0-3,32-35
   node 0 size: 144863 MB
   node 0 free: 144206 MB
   node 1 cpus: 4-7,36-39
   node 1 size: 145144 MB
   node 1 free: 144557 MB
   node 2 cpus: 8-11,40-43
   node 2 size: 145144 MB
   node 2 free: 144360 MB
   node 3 cpus: 12-15,44-47
   node 3 size: 145144 MB
   node 3 free: 144556 MB
```

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Platform Notes (Continued)

```
   node 4 cpus: 16-19,48-51
   node 4 size: 145108 MB
   node 4 free: 144539 MB
   node 5 cpus: 20-23,52-55
   node 5 size: 145144 MB
   node 5 free: 144590 MB
   node 6 cpus: 24-27,56-59
   node 6 size: 145144 MB
   node 6 free: 144589 MB
   node 7 cpus: 28-31,60-63
   node 7 size: 145095 MB
   node 7 free: 144476 MB
   node distances:
   node   0   1   2   3   4   5   6   7
     0:  10  11  12  12  12  12  12  12
     1:  11  10  12  12  12  12  12  12
     2:  12  12  10  11  12  12  12  12
     3:  12  12  11  10  12  12  12  12
     4:  12  12  12  12  10  11  12  12
     5:  12  12  12  12  11  10  12  12
     6:  12  12  12  12  12  12  10  11
     7:  12  12  12  12  12  12  11  10


  ------------------------------------------------------------
 9. /proc/meminfo
   MemTotal:       1188648084 kB


  ------------------------------------------------------------
 10. who -r
   run-level 3 Feb 21 11:04


  ------------------------------------------------------------
 11. Systemd service manager version: systemd 249 (249.11-0ubuntu3.6)
   Default Target  Status
   multi-user      degraded


  ------------------------------------------------------------
 12. Failed units, from systemctl list-units --state=failed
     UNIT                              LOAD   ACTIVE SUB    DESCRIPTION
   * systemd-networkd-wait-online.service loaded failed failed Wait for Network to be Configured


  ------------------------------------------------------------
 13. Services, from systemctl list-unit-files
   STATE            UNIT FILES
   enabled          ModemManager apparmor blk-availability cloud-config cloud-final cloud-init
                    cloud-init-local console-setup cron dmesg e2scrub_reap finalrd getty@ gpu-manager
                    grub-common grub-initrd-fallback irqbalance keyboard-setup lm-sensors lvm2-monitor
```

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Platform Notes (Continued)

```
                    lxd-agent multipathd networkd-dispatcher open-iscsi open-vm-tools pollinate rsyslog
                    secureboot-db setvtrgb ssh systemd-networkd systemd-networkd-wait-online systemd-pstore
                    systemd-resolved systemd-timesyncd thermald ua-reboot-cmds ubuntu-advantage udisks2 ufw
                        vgauth
    enabled-runtime  netplan-ovs-cleanup systemd-fsck-root systemd-remount-fs
    disabled         console-getty debug-shell iscsid nftables rsync serial-getty@
                     systemd-boot-check-no-failures systemd-network-generator systemd-sysext
                     systemd-time-wait-sync upower
    generated        apport trousers
    indirect         uuidd
   masked            cryptdisks cryptdisks-early hwclock lvm2 multipath-tools-boot rc rcS screen-cleanup sudo
                        x11-common


    ----------------------------------------------------------
 14. Linux kernel boot-time arguments, from /proc/cmdline
    BOOT_IMAGE=/boot/vmlinuz-5.15.0-58-generic
    root=UUID=d0cc852e-9857-40c1-b230-5999cbe027bc
    ro


    ----------------------------------------------------------
 15. cpupower frequency-info
    analyzing CPU 0:
      current policy: frequency should be within 400 MHz and 3.80 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:  3250MHz


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

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Platform Notes (Continued)

```
    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 Ubuntu 22.04.1 LTS


  ----------------------------------------------------------------
20. Disk information
SPEC is set to: /home/cpu2017
    Filesystem      Type  Size  Used Avail Use% Mounted on
    /dev/sda2       ext4  1.8T   59G  1.6T   4% /


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


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

(Continued on next page)

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A+ Server 2115GT-HNTF
(H13SST-G , AMD EPYC 9354P)

SPECrate®2017_fp_base = 437

SPECrate®2017_fp_peak = 440

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

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

Platform Notes (Continued)

```
      "DMTF SMBIOS" standard.
   Memory:
      12x Micron Technology MTC40F204WS1RC48BBZ 96 GB 2 rank 4800



  ------------------------------------------------------------
 23. BIOS
 (This section combines info from /sys/devices and dmidecode.)
   BIOS Vendor:        American Megatrends International, LLC.
   BIOS Version:       1.1
   BIOS Date:          01/17/2023
   BIOS Revision:      5.27
```

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)
```

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A+ Server 2115GT-HNTF
(H13SST-G , AMD EPYC 9354P)

SPECrate®2017_fp_base = 437

SPECrate®2017_fp_peak = 440

Compiler Version Notes (Continued)

```
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)
------------------------------------------------------------------------------
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
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
```

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Supermicro

A+ Server 2115GT-HNTF
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Test Date: Feb-2023
Hardware Availability: Nov-2022
Software Availability: Jan-2023

Compiler Version Notes (Continued)

```
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`

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`

SPEC CPU®2017 Floating Point Rate Result
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A+ Server 2115GT-HNTF
(H13SST-G , AMD EPYC 9354P)

SPECrate®2017_fp_base = 437

SPECrate®2017_fp_peak = 440

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
-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
```

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Supermicro

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(H13SST-G , AMD EPYC 9354P)

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Test Date: Feb-2023
Hardware Availability: Nov-2022
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Base Optimization Flags (Continued)

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
```

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++
```

(Continued on next page)

Supermicro

A+ Server 2115GT-HNTF
(H13SST-G , AMD EPYC 9354P)

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

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

Peak Compiler Invocation (Continued)

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
```

Peak Optimization Flags

C benchmarks:

519.lbm_r: `basepeak = yes`

538.imagick_r: `basepeak = yes`

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`

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Supermicro

A+ Server 2115GT-HNTF
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Test Date: Feb-2023
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Peak Optimization Flags (Continued)

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`

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`

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A+ Server 2115GT-HNTF
(H13SST-G , AMD EPYC 9354P)

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Software Availability: Jan-2023

Peak Optimization Flags (Continued)

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`

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/Supermicro-Platform-Settings-V1.2-Genoa-revB.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2017/flags/aocc400-flags.xml
http://www.spec.org/cpu2017/flags/Supermicro-Platform-Settings-V1.2-Genoa-revB.xml

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

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