# SPEC CPU®2017 Floating Point Speed Result

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## Supermicro

Hyper A+ Server AS -2025HS-TNR
(H13DSH , AMD EPYC 9334)

$SPECspeed^{®}2017\_fp\_base = 323$

$SPECspeed^{®}2017\_fp\_peak = 337$

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

**Test Date:** Jan-2024
**Hardware Availability:** Nov-2022
**Software Availability:** Nov-2023

| Benchmark | Threads | Base | Peak |
|---|---|---|---|
| 603.bwaves_s | 64 | 1480 | 1490 |
| 607.cactuBSSN_s | 64 | 486 | |
| 619.lbm_s | 64 | 197 | |
| 621.wrf_s | 64 | 205 | 223 |
| 627.cam4_s | 64 / 128 | 212 | 249 |
| 628.pop2_s | 64 | 71.9 | 73.6 |
| 638.imagick_s | 64 / 128 | 432 | 470 |
| 644.nab_s | 64 | 609 | |
| 649.fotonik3d_s | 64 | 210 | 211 |
| 654.roms_s | 64 / 128 | 497 | 540 |

SPECspeed®2017_fp_base (323)    SPECspeed®2017_fp_peak (337)

## 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 800 GB NVMe SSD
Other: None

## Software

OS: Ubuntu 22.04.3 LTS
 Kernel 5.15.0-91-generic
Compiler: C/C++/Fortran: Version 4.0.0 of AOCC
Parallel: Yes
Firmware: Version 1.6 released Nov-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 prefer performance at the cost of additional power usage.

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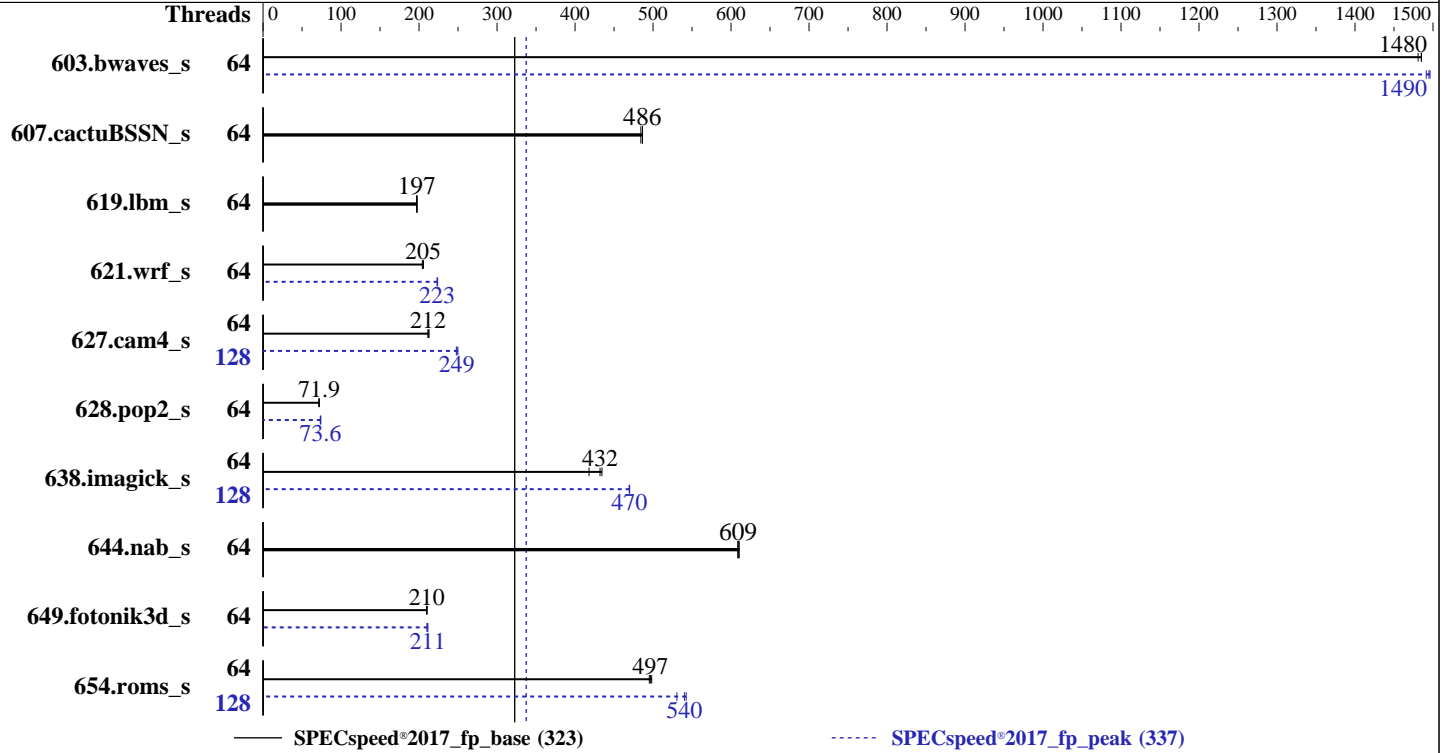SPECspeed®2017_fp_peak = 337

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## Results Table

| Benchmark | Base | | | | | | | Peak | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Threads | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Threads | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio |
| 603.bwaves_s | 64 | 39.7 | 1490 | **39.7** | **1480** | 39.8 | 1480 | 64 | 39.6 | 1490 | 39.4 | 1500 | **39.5** | **1490** |
| 607.cactuBSSN_s | 64 | 34.4 | 484 | **34.3** | **486** | 34.3 | 487 | 64 | 34.4 | 484 | **34.3** | **486** | 34.3 | 487 |
| 619.lbm_s | 64 | 26.5 | 198 | 26.6 | 197 | **26.6** | **197** | 64 | 26.5 | 198 | 26.6 | 197 | **26.6** | **197** |
| 621.wrf_s | 64 | 64.8 | 204 | **64.4** | **205** | 64.4 | 205 | 64 | **59.2** | **223** | 59.2 | 223 | 59.1 | 224 |
| 627.cam4_s | 64 | 41.6 | 213 | **41.9** | **212** | 41.9 | 212 | 128 | 35.8 | 248 | **35.7** | **249** | 35.5 | 250 |
| 628.pop2_s | 64 | **165** | **71.9** | 166 | 71.7 | 165 | 72.0 | 64 | 162 | 73.4 | **161** | **73.6** | 160 | 74.1 |
| 638.imagick_s | 64 | **33.4** | **432** | 34.5 | 418 | 33.2 | 435 | 128 | 30.7 | 470 | 30.7 | 470 | **30.7** | **470** |
| 644.nab_s | 64 | 28.7 | 609 | **28.7** | **609** | 28.6 | 611 | 64 | 28.7 | 609 | **28.7** | **609** | 28.6 | 611 |
| 649.fotonik3d_s | 64 | **43.4** | **210** | 43.5 | 210 | 43.3 | 210 | 64 | 43.4 | 210 | 43.2 | 211 | **43.2** | **211** |
| 654.roms_s | 64 | **31.7** | **497** | 31.8 | 495 | 31.6 | 498 | 128 | **29.1** | **540** | 29.7 | 531 | 29.0 | 542 |
| **SPECspeed®2017_fp_base =** | | **323** | | | | | | | | | | | | |
| **SPECspeed®2017_fp_peak =** | | **337** | | | | | | | | | | | | |

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.

OS set to performance mode via cpupower frequency-set -g performance
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.
To always enable THP for peak runs of:
603.bwaves_s, 607.cactuBSSN_s, 619.lbm_s, 627.cam4_s, 628.pop2_s, 638.imagick_s, 644.nab_s, 649.fotonik3d_s:
'echo madvise > /sys/kernel/mm/transparent_hugepage/enabled; echo always > /sys/kernel/mm/transparent_hugepage/defrag'
run as root.

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## Operating System Notes (Continued)

```
To disable THP for peak runs of 621.wrf_s:
'echo never > /sys/kernel/mm/transparent_hugepage/enabled; echo always > /sys/kernel/mm/transparent_hugepage/defrag'
run as root.
To enable THP only on request for peak runs of 654.roms_s:
'echo madvise > /sys/kernel/mm/transparent_hugepage/enabled; echo madvise > /sys/kernel/mm/transparent_hugepage/defrag'
run as root.
```

## Environment Variables Notes

```
Environment variables set by runcpu before the start of the run:
GOMP_CPU_AFFINITY = "0-127"
LD_LIBRARY_PATH = "/home/cpu2017/amd_speed_aocc400_znver4_A_lib/lib:"
LIBOMP_NUM_HIDDEN_HELPER_THREADS = "0"
MALLOC_CONF = "oversize_threshold:0,retain:true"
OMP_DYNAMIC = "false"
OMP_SCHEDULE = "static"
OMP_STACKSIZE = "128M"
OMP_THREAD_LIMIT = "128"

Environment variables set by runcpu during the 603.bwaves_s peak run:
GOMP_CPU_AFFINITY = "0-63"

Environment variables set by runcpu during the 621.wrf_s peak run:
GOMP_CPU_AFFINITY = "0-63"

Environment variables set by runcpu during the 627.cam4_s peak run:
GOMP_CPU_AFFINITY = "0-127"

Environment variables set by runcpu during the 628.pop2_s peak run:
GOMP_CPU_AFFINITY = "0-63"

Environment variables set by runcpu during the 638.imagick_s peak run:
GOMP_CPU_AFFINITY = "0-127"

Environment variables set by runcpu during the 649.fotonik3d_s peak run:
GOMP_CPU_AFFINITY = "0-63"
PGHPF_ZMEM = "yes"

Environment variables set by runcpu during the 654.roms_s peak run:
GOMP_CPU_AFFINITY = "0 64 1 65 2 66 3 67 4 68 5 69 6 70 7 71 8 72 9 73 10 74 11 75 12 76 13 77 14 78 15 79
        16 80 17 81 18 82 19 83 20 84 21 85 22 86 23 87 24 88 25 89 26 90 27 91 28 92 29 93 30 94 31 95 32 96
        33 97 34 98 35 99 36 100 37 101 38 102 39 103 40 104 41 105 42 106 43 107 44 108 45 109 46 110 47 111
        48 112 49 113 50 114 51 115 52 116 53 117 54 118 55 119 56 120 57 121 58 122 59 123 60 124 61 125 62
        126 63 127"
```

## 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.
```

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## Platform Notes

```
BIOS Settings:
Determinism Control = Manual
Determinism Enable = Disable Performance Determinism
cTDP Control = Manual
cTDP = 240
Package Power Limit Control = Manual
Package Power Limit = 240

 Sysinfo program /home/cpu2017/bin/sysinfo
 Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
 running on as-2025hs-tnr-9334 Fri Jan 12 05:42:27 2024

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

 ----------------------------------------------------------
 Table of contents
 ----------------------------------------------------------
  1. uname -a
  2. w
  3. Username
  4. ulimit -a
  5. sysinfo process ancestry
  6. /proc/cpuinfo
  7. lscpu
  8. numactl --hardware
  9. /proc/meminfo
 10. who -r
 11. Systemd service manager version: systemd 249 (249.11-0ubuntu3.11)
 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 as-2025hs-tnr-9334 5.15.0-91-generic #101-Ubuntu SMP Tue Nov 14 13:30:08 UTC 2023 x86_64 x86_64
   x86_64 GNU/Linux

 ----------------------------------------------------------
 2. w
    05:42:27 up 4 min,  2 users,  load average: 0.19, 0.24, 0.12
   USER     TTY      FROM             LOGIN@   IDLE   JCPU   PCPU WHAT
   lab      tty1     -                05:41   59.00s  0.24s  0.00s -bash
   lab      pts/0    -                05:41   10.00s  1.02s  0.22s sudo su -

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

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

Standard Performance Evaluation Corporation (info@spec.org)

https://www.spec.org/

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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               6190955
  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_speed_aocc400_znver4_A1.py
 /bin/bash ./amd_speed_aocc400_znver4_A1.sh
 runcpu --config amd_speed_aocc400_znver4_A1.cfg --tune all --reportable --iterations 3 fpspeed
 runcpu --configfile amd_speed_aocc400_znver4_A1.cfg --tune all --reportable --iterations 3 --nopower
   --runmode speed --tune base:peak --size test:train:refspeed fpspeed --nopreenv --note-preenv --logfile
   $SPEC/tmp/CPU2017.001/templogs/preenv.fpspeed.001.0.log --lognum 001.0 --from_runcpu 2
 specperl $SPEC/bin/sysinfo
 $SPEC = /home/cpu2017


  ----------------------------------------------------------
6. /proc/cpuinfo
    model name      : AMD EPYC 9334 32-Core Processor
    vendor_id       : AuthenticAMD
    cpu family      : 25
    model           : 17
    stepping        : 1
    microcode       : 0xa10113e
    bugs            : sysret_ss_attrs spectre_v1 spectre_v2 spec_store_bypass srso
    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 2.37.2:
  Architecture:                 x86_64
  CPU op-mode(s):               32-bit, 64-bit
  Address sizes:                52 bits physical, 57 bits virtual
```

**(Continued on next page)**

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## Platform Notes (Continued)

```
   Byte Order:                      Little Endian
   CPU(s):                          128
   On-line CPU(s) list:             0-127
   Vendor ID:                       AuthenticAMD
   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:                        5400.37
   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:                       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):                    2
   NUMA node0 CPU(s):               0-31,64-95
   NUMA node1 CPU(s):               32-63,96-127
   Vulnerability Gather data sampling: Not affected
   Vulnerability Itlb multihit:     Not affected
   Vulnerability L1tf:              Not affected
   Vulnerability Mds:               Not affected
   Vulnerability Meltdown:          Not affected
   Vulnerability Mmio stale data:   Not affected
   Vulnerability Retbleed:          Not affected
   Vulnerability Spec rstack overflow: Mitigation; safe RET
   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       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
```

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## Platform Notes (Continued)

```
      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: 2 nodes (0-1)
  node 0 cpus: 0-31,64-95
  node 0 size: 773770 MB
  node 0 free: 772235 MB
  node 1 cpus: 32-63,96-127
  node 1 size: 774081 MB
  node 1 free: 772245 MB
  node distances:
  node   0   1
    0:  10  32
    1:  32  10


    ----------------------------------------------------------
9. /proc/meminfo
   MemTotal:       1585000484 kB


    ----------------------------------------------------------
10. who -r
   run-level 3 Jan 12 05:40


    ----------------------------------------------------------
11. Systemd service manager version: systemd 249 (249.11-0ubuntu3.11)
   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 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 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         apparmor 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
   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-5.15.0-91-generic
   root=UUID=63a5bd49-1a2b-4fc5-945b-bc07b22b6218
   ro


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

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## Platform Notes (Continued)

```
   15. 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
         Pstate-P0:  2700MHz


   ----------------------------------------------------------------
   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 Ubuntu 22.04.3 LTS

   ----------------------------------------------------------------
   20. Disk information
   SPEC is set to: /home/cpu2017
     Filesystem      Type  Size  Used Avail Use% Mounted on
```

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## Platform Notes (Continued)

```
  /dev/nvme0n1p2 ext4  732G  52G  644G  8% /


   ----------------------------------------------------------
  21. /sys/devices/virtual/dmi/id
      Vendor:        Supermicro
      Product:       Super Server
      Product Family: SMC H13
      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
    "DMTF SMBIOS" standard.
    Memory:
      24x Micron Technology MTC40F2046S1RC48BA1 64 GB 2 rank 4800



   ----------------------------------------------------------
  23. BIOS
  (This section combines info from /sys/devices and dmidecode.)
    BIOS Vendor:       American Megatrends International, LLC.
    BIOS Version:      1.6
    BIOS Date:         11/16/2023
    BIOS Revision:     5.27
```

## Compiler Version Notes

```
==================================================================================================
C             | 619.lbm_s(base, peak) 638.imagick_s(base, peak) 644.nab_s(base, peak)
--------------------------------------------------------------------------------------------------
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#434 2022_10_28) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin
--------------------------------------------------------------------------------------------------


==================================================================================================
C++, C, Fortran | 607.cactuBSSN_s(base, peak)
--------------------------------------------------------------------------------------------------
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#434 2022_10_28) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#434 2022_10_28) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#434 2022_10_28) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin
--------------------------------------------------------------------------------------------------


==================================================================================================
Fortran       | 603.bwaves_s(base, peak) 649.fotonik3d_s(base, peak) 654.roms_s(base, peak)
--------------------------------------------------------------------------------------------------
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#434 2022_10_28) (based on LLVM Mirror.Version.14.0.6)
```

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## Supermicro

Hyper A+ Server AS -2025HS-TNR
(H13DSH , AMD EPYC 9334)

SPECspeed®2017_fp_base = 323

SPECspeed®2017_fp_peak = 337

**CPU2017 License:** 001176

**Test Sponsor:** Supermicro

**Tested by:** Supermicro

**Test Date:** Jan-2024

**Hardware Availability:** Nov-2022

**Software Availability:** Nov-2023

## Compiler Version Notes (Continued)

```
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin
-------------------------------------------------------------------------------

================================================================================
Fortran, C    | 621.wrf_s(base, peak) 627.cam4_s(base, peak) 628.pop2_s(base, peak)
-------------------------------------------------------------------------------
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#434 2022_10_28) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#434 2022_10_28) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin
-------------------------------------------------------------------------------
```

## Base Compiler Invocation

C benchmarks:
`clang`

Fortran benchmarks:
`flang`

Benchmarks using both Fortran and C:
`flang clang`

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

## Base Portability Flags

603.bwaves_s: `-DSPEC_LP64`
607.cactuBSSN_s: `-DSPEC_LP64`
619.lbm_s: `-DSPEC_LP64`
621.wrf_s: `-DSPEC_CASE_FLAG -Mbyteswapio -DSPEC_LP64`
627.cam4_s: `-DSPEC_CASE_FLAG -DSPEC_LP64`
628.pop2_s: `-DSPEC_CASE_FLAG -Mbyteswapio -DSPEC_LP64`
638.imagick_s: `-DSPEC_LP64`
644.nab_s: `-DSPEC_LP64`
649.fotonik3d_s: `-DSPEC_LP64`
654.roms_s: `-DSPEC_LP64`

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

# SPEC CPU®2017 Floating Point Speed Result

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## Supermicro

Hyper A+ Server AS -2025HS-TNR
(H13DSH , AMD EPYC 9334)

$SPECspeed®2017\_fp\_base = 323$

$SPECspeed®2017\_fp\_peak = 337$

**CPU2017 License:** 001176　　　　　　　　　　　　　　　　**Test Date:** Jan-2024
**Test Sponsor:** Supermicro　　　　　　　　　　　　　　　**Hardware Availability:** Nov-2022
**Tested by:** Supermicro　　　　　　　　　　　　　　　　**Software Availability:** Nov-2023

## Base Optimization Flags

C benchmarks:
```
-m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3 -O3 -march=znver4
-fveclib=AMDLIBM -ffast-math -fopenmp -flto -fstruct-layout=7
-mllvm -unroll-threshold=50 -mllvm -inline-threshold=1000
-fremap-arrays -fstrip-mining -mllvm -reduce-array-computations=3
-DSPEC_OPENMP -zopt -fopenmp=libomp -lomp -lamdlibm -lamdalloc
-lflang
```

Fortran benchmarks:
```
-m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-enable-X86-prefetching -DSPEC_OPENMP -O3 -march=znver4
-fveclib=AMDLIBM -ffast-math -fopenmp -flto -Mrecursive
-funroll-loops -mllvm -lsr-in-nested-loop
-mllvm -reduce-array-computations=3 -zopt -fopenmp=libomp -lomp
-lamdlibm -lamdalloc -lflang
```

Benchmarks using both Fortran and C:
```
-m64 -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 -fopenmp -flto -fstruct-layout=7
-mllvm -unroll-threshold=50 -mllvm -inline-threshold=1000
-fremap-arrays -fstrip-mining -mllvm -reduce-array-computations=3
-DSPEC_OPENMP -zopt -Mrecursive -funroll-loops
-mllvm -lsr-in-nested-loop -fopenmp=libomp -lomp -lamdlibm -lamdalloc
-lflang
```

Benchmarks using Fortran, C, and C++:
```
-m64 -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 -fopenmp -flto -fstruct-layout=7
-mllvm -unroll-threshold=50 -mllvm -inline-threshold=1000
-fremap-arrays -fstrip-mining -mllvm -reduce-array-computations=3
-DSPEC_OPENMP -zopt -mllvm -unroll-threshold=100 -finline-aggressive
-mllvm -loop-unswitch-threshold=200000 -Mrecursive -funroll-loops
-mllvm -lsr-in-nested-loop -fopenmp=libomp -lomp -lamdlibm -lamdalloc
-lflang
```

# SPEC CPU®2017 Floating Point Speed Result

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## Supermicro

Hyper A+ Server AS -2025HS-TNR
(H13DSH , AMD EPYC 9334)

SPECspeed®2017_fp_base = 323

SPECspeed®2017_fp_peak = 337

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

**Test Date:** Jan-2024
**Hardware Availability:** Nov-2022
**Software Availability:** Nov-2023

# Base Other Flags

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

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

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

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

# Peak Compiler Invocation

C benchmarks:
```
clang
```

Fortran benchmarks:
```
flang
```

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

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

# Peak Portability Flags

```
Same as Base Portability Flags
```

# Peak Optimization Flags

C benchmarks:

619.lbm_s: `basepeak = yes`

638.imagick_s: `-m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6`
`-Wl,-mllvm -Wl,-reduce-array-computations=3 -Ofast`
`-march=znver4 -fveclib=AMDLIBM -ffast-math -fopenmp`
`-flto -fstruct-layout=9 -mllvm -unroll-threshold=50`

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## Supermicro

Hyper A+ Server AS -2025HS-TNR
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**Test Date:** Jan-2024
**Hardware Availability:** Nov-2022
**Software Availability:** Nov-2023

# Peak Optimization Flags (Continued)

638.imagick_s (continued):
```
-fremap-arrays -fstrip-mining
-mllvm -inline-threshold=1000
-mllvm -reduce-array-computations=3 -DSPEC_OPENMP -zopt
-fopenmp=libomp -lomp -lamdlibm -lamdalloc -lflang
```

644.nab_s: basepeak = yes

Fortran benchmarks:

603.bwaves_s: `-m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6`
```
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-enable-X86-prefetching -DSPEC_OPENMP
-Ofast -march=znver4 -fveclib=AMDLIBM -ffast-math
-fopenmp -Mrecursive -mllvm -reduce-array-computations=3
-fvector-transform -fscalar-transform -fopenmp=libomp
-lomp -lamdlibm -lamdalloc -lflang
```

649.fotonik3d_s: `-m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6`
```
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-enable-X86-prefetching -DSPEC_OPENMP
-Ofast -march=znver4 -fveclib=AMDLIBM -ffast-math
-fopenmp -flto -Mrecursive
-mllvm -reduce-array-computations=3 -zopt -fopenmp=libomp
-lomp -lamdlibm -lamdalloc -lflang
```

654.roms_s: Same as 603.bwaves_s

Benchmarks using both Fortran and C:

621.wrf_s: `-m64 -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 -fopenmp
-flto -fstruct-layout=9 -mllvm -unroll-threshold=50
-fremap-arrays -fstrip-mining
-mllvm -inline-threshold=1000
-mllvm -reduce-array-computations=3 -DSPEC_OPENMP -zopt
-O3 -Mrecursive -funroll-loops -mllvm -lsr-in-nested-loop
-fopenmp=libomp -lomp -lamdlibm -lamdalloc -lflang
```

627.cam4_s: `-m64 -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 -fopenmp
-flto -fstruct-layout=9 -mllvm -unroll-threshold=50
```

**(Continued on next page)**

## Supermicro

Hyper A+ Server AS -2025HS-TNR
(H13DSH , AMD EPYC 9334)

SPECspeed®2017_fp_base = 323

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**CPU2017 License:** 001176
**Test Sponsor:** Supermicro
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**Test Date:** Jan-2024
**Hardware Availability:** Nov-2022
**Software Availability:** Nov-2023

# Peak Optimization Flags (Continued)

627.cam4_s (continued):
```
-fremap-arrays -fstrip-mining
-mllvm -inline-threshold=1000
-mllvm -reduce-array-computations=3 -DSPEC_OPENMP -zopt
-Mrecursive -fopenmp=libomp -lomp -lamdlibm -lamdalloc
-lflang
```

628.pop2_s: `-m64 -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 -fopenmp
-flto -fstruct-layout=9 -mllvm -unroll-threshold=50
-fremap-arrays -fstrip-mining
-mllvm -inline-threshold=1000
-mllvm -reduce-array-computations=3 -DSPEC_OPENMP -zopt
-Mrecursive -fvector-transform -fscalar-transform
-fopenmp=libomp -lomp -lamdlibm -lamdalloc -lflang
```

Benchmarks using Fortran, C, and C++:

607.cactuBSSN_s: `basepeak = yes`

# Peak Other Flags

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

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

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

Benchmarks using Fortran, C, and C++:
`-Wno-return-type -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-A1.2.html
http://www.spec.org/cpu2017/flags/Supermicro-Platform-Settings-V1.2-Genoa-revC.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2017/flags/aocc400-flags-A1.2.xml
http://www.spec.org/cpu2017/flags/Supermicro-Platform-Settings-V1.2-Genoa-revC.xml

# SPEC CPU®2017 Floating Point Speed Result

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## Supermicro

Hyper A+ Server AS -2025HS-TNR
(H13DSH , AMD EPYC 9334)

$SPECspeed®2017\_fp\_base = 323$

$SPECspeed®2017\_fp\_peak = 337$

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

**Test Date:** Jan-2024
**Hardware Availability:** Nov-2022
**Software Availability:** Nov-2023

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 2024-01-12 00:42:26-0500.
Report generated on 2024-01-30 23:28:50 by CPU2017 PDF formatter v6716.
Originally published on 2024-01-30.