SPEC CPU®2017 Integer Rate Result

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Supermicro

Hyper A+ Server AS -2126HS-TN
(H14DSH , AMD EPYC 9845)

$SPECrate^®2017\_int\_base = 2460$

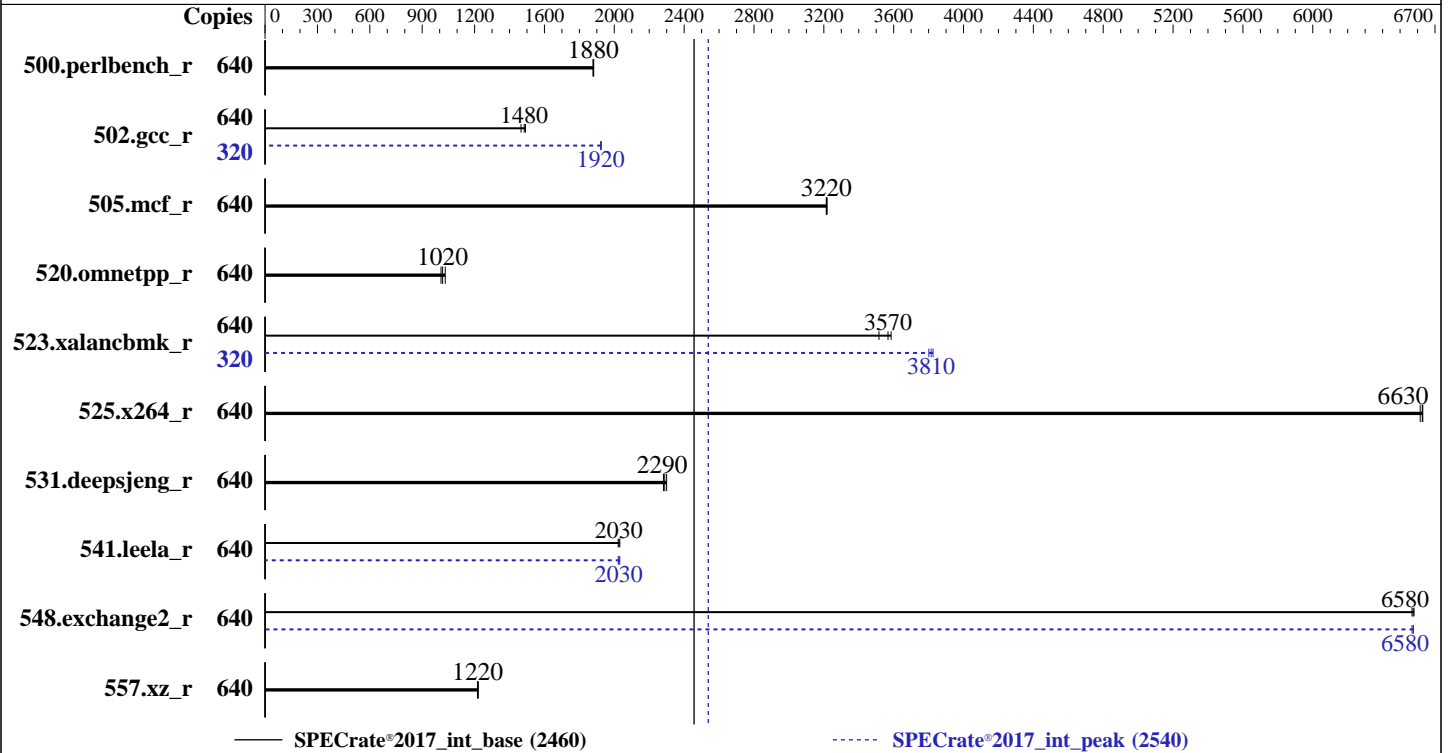$SPECrate^®2017\_int\_peak = 2540$

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

Test Date: Sep-2024
Hardware Availability: Oct-2024
Software Availability: Oct-2024

Benchmark	Copies	Result
500.perlbench_r	640	1880
502.gcc_r	640	1480
502.gcc_r	320	1920
505.mcf_r	640	3220
520.omnetpp_r	640	1020
523.xalancbmk_r	640	3570
523.xalancbmk_r	320	3810
525.x264_r	640	6630
531.deepsjeng_r	640	2290
541.leela_r	640	2030
541.leela_r	640	2030
548.exchange2_r	640	6580
548.exchange2_r	640	6580
557.xz_r	640	1220

SPECrate®2017_int_base (2460) SPECrate®2017_int_peak (2540)

Hardware

CPU Name: AMD EPYC 9845
 Max MHz: 3700
 Nominal: 2100
Enabled: 320 cores, 2 chips, 2 threads/core
Orderable: 1,2 chips
Cache L1: 32 KB I + 48 KB D on chip per core
 L2: 1 MB I+D on chip per core
 L3: 320 MB I+D on chip per chip, 32 MB shared / 16 cores
 Other: None
Memory: 1536 GB (24 x 64 GB 2Rx4 PC5-6400B-R, running at 6000)
Storage: 1 x 3.5 TB NVMe SSD
Other: CPU Cooling: Air

Software

OS: Ubuntu 24.04.1 LTS
 Kernel 6.8.0-44-generic
Compiler: C/C++/Fortran: Version 5.0.0 of AOCC
Parallel: No
Firmware: Version 1.1 released Sep-2024
File System: ext4
System State: Run level 5 (multi-user)
Base Pointers: 64-bit
Peak Pointers: 32/64-bit
Other: None
Power Management: BIOS and OS set to prefer performance at the cost of additional power usage.

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Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
500.perlbench_r	640	**542**	**1880**	541	1880	542	1880	640	**542**	**1880**	541	1880	542	1880
502.gcc_r	640	618	1470	**611**	**1480**	608	1490	320	235	1930	**236**	**1920**	236	1920
505.mcf_r	640	321	3220	**322**	**3220**	322	3210	640	321	3220	**322**	**3220**	322	3210
520.omnetpp_r	640	833	1010	**826**	**1020**	814	1030	640	833	1010	**826**	**1020**	814	1030
523.xalancbmk_r	640	192	3520	188	3590	**189**	**3570**	320	88.9	3800	**88.6**	**3810**	88.3	3830
525.x264_r	640	169	6630	169	6620	**169**	**6630**	640	169	6630	169	6620	**169**	**6630**
531.deepsjeng_r	640	319	2300	321	2280	**320**	**2290**	640	319	2300	321	2280	**320**	**2290**
541.leela_r	640	**523**	**2030**	522	2030	524	2020	640	522	2030	**523**	**2030**	524	2020
548.exchange2_r	640	255	6580	**255**	**6580**	255	6570	640	255	6570	255	6580	**255**	**6580**
557.xz_r	640	566	1220	**567**	**1220**	568	1220	640	566	1220	**567**	**1220**	568	1220
SPECrate®2017_int_base =			**2460**											
SPECrate®2017_int_peak =			**2540**											

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

Compiler Notes

The AMD64 AOCC Compiler Suite is available at
http://developer.amd.com/amd-aocc/

Submit Notes

The config file option 'submit' was used.
'numactl' was used to bind copies to the cores.
See the configuration file for details.

Operating System Notes

'ulimit -s unlimited' was used to set environment stack size limit
'ulimit -l 2097152' was used to set environment locked pages in memory limit

runcpu command invoked through numactl i.e.:
numactl --interleave=all runcpu <etc>

To limit dirty cache to 8% of memory, 'sysctl -w vm.dirty_ratio=8' run as root.
To limit swap usage to minimum necessary, 'sysctl -w vm.swappiness=1' run as root.
To free node-local memory and avoid remote memory usage,
'sysctl -w vm.zone_reclaim_mode=1' run as root.
To clear filesystem caches, 'sync; sysctl -w vm.drop_caches=3' run as root.
To disable address space layout randomization (ASLR) to reduce run-to-run
variability, 'sysctl -w kernel.randomize_va_space=0' run as root.

To enable Transparent Hugepages (THP) for all allocations:
'echo always > /sys/kernel/mm/transparent_hugepage/enabled' and
'echo always > /sys/kernel/mm/transparent_hugepage/defrag' run as root.

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Environment Variables Notes

```
Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH =
     "/spec/cpu2017aocc500zen5A1/amd_rate_aocc500_znver5_A_lib/lib:/spec/cpu2017aocc500zen5A1/amd_rate_aocc
     500_znver5_A_lib/lib32:"
MALLOC_CONF = "retain:true"

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

General Notes

```
Binaries were compiled on a system with 2x AMD EPYC 9174F CPU + 1.5TiB Memory using RHEL 8.6

NA: The test sponsor attests, as of date of publication, that CVE-2017-5754 (Meltdown)
is mitigated in the system as tested and documented.
Yes: The test sponsor attests, as of date of publication, that CVE-2017-5753 (Spectre variant 1)
is mitigated in the system as tested and documented.
Yes: The test sponsor attests, as of date of publication, that CVE-2017-5715 (Spectre variant 2)
is mitigated in the system as tested and documented.
```

Platform Notes

```
BIOS Settings:
NUMA Nodes Per Socket = NPS2
Determinism Control = Manual
Determinism Enable = Power
TDP Control = Manual
TDP = 400
Package Power Limit Control = Manual
Package Power Limit = 400

 Sysinfo program /spec/cpu2017aocc500zen5A1/bin/sysinfo
 Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
 running on smc4708turin-u2404os Thu Sep 19 06:46:11 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 255 (255.4-1ubuntu8.4)
 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
```

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Platform Notes (Continued)

```
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 smc4708turin-u2404os 6.8.0-44-generic #44-Ubuntu SMP PREEMPT_DYNAMIC Tue Aug 13 13:35:26 UTC 2024
  x86_64 x86_64 x86_64 GNU/Linux


-------------------------------------------------------------
2. w
  06:46:11 up 8 min,  3 users,  load average: 0.18, 4.82, 5.02
  USER     TTY       FROM            LOGIN@   IDLE   JCPU    PCPU WHAT
  root     tty1      -               06:39    6:18   0.07s   ?    -bash
  root               172.31.22.108   06:40    8:44   0.00s   0.14s sshd: root@pts/0
  root               172.31.22.108   06:40    8:44   0.00s   0.05s sshd: root@notty


-------------------------------------------------------------
3. Username
  From environment variable $USER:  root


-------------------------------------------------------------
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              6188882
  nofiles              1024
  vmemory(kbytes)      unlimited
  locks                unlimited
  rtprio               0


-------------------------------------------------------------
5. sysinfo process ancestry
 /sbin/init
 sshd: /usr/sbin/sshd -D [listener] 0 of 10-100 startups
 sshd: root@pts/0
 -bash
 screen -S cpu
 SCREEN -S cpu
 /bin/bash
 python3 ./run_amd_rate_aocc500_znver5_A1.py
 /bin/bash ./amd_rate_aocc500_znver5_A1.sh
 runcpu --config amd_rate_aocc500_znver5_A1.cfg --tune all --reportable --iterations 3 intrate
 runcpu --configfile amd_rate_aocc500_znver5_A1.cfg --tune all --reportable --iterations 3 --nopower
   --runmode rate --tune base:peak --size test:train:refrate intrate --nopreenv --note-preenv --logfile
   $SPEC/tmp/CPU2017.001/templogs/preenv.intrate.001.0.log --lognum 001.0 --from_runcpu 2
 specperl $SPEC/bin/sysinfo
 $SPEC = /spec/cpu2017aocc500zen5A1


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

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Platform Notes (Continued)

```
6. /proc/cpuinfo
     model name        : AMD EPYC 9845 160-Core Processor
     vendor_id         : AuthenticAMD
     cpu family        : 26
     model             : 17
     stepping          : 0
     microcode         : 0xb101021
     bugs              : sysret_ss_attrs spectre_v1 spectre_v2 spec_store_bypass
     TLB size          : 192 4K pages
     cpu cores         : 160
     siblings          : 320
     2 physical ids (chips)
     640 processors (hardware threads)
     physical id 0: core ids 0-159
     physical id 1: core ids 0-159
     physical id 0: apicids 0-319
     physical id 1: apicids 512-831
   Caution: /proc/cpuinfo data regarding chips, cores, and threads is not necessarily reliable, especially for
   virtualized systems.  Use the above data carefully.


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

From lscpu from util-linux 2.39.3:
  Architecture:             x86_64
  CPU op-mode(s):           32-bit, 64-bit
  Address sizes:            52 bits physical, 57 bits virtual
  Byte Order:               Little Endian
  CPU(s):                   640
  On-line CPU(s) list:      0-639
  Vendor ID:                AuthenticAMD
  BIOS Vendor ID:           Advanced Micro Devices, Inc.
  Model name:               AMD EPYC 9845 160-Core Processor
  BIOS Model name:          AMD EPYC 9845 160-Core Processor              Unknown CPU @ 2.1GHz
  BIOS CPU family:          107
  CPU family:               26
  Model:                    17
  Thread(s) per core:       2
  Core(s) per socket:       160
  Socket(s):                2
  Stepping:                 0
  Frequency boost:          enabled
  CPU(s) scaling MHz:       57%
  CPU max MHz:              3718.0659
  CPU min MHz:              1500.0000
  BogoMIPS:                 4193.61
  Flags:                    fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov pat
                            pse36 clflush mmx fxsr sse sse2 ht syscall nx mmxext fxsr_opt pdpe1gb
                            rdtscp lm constant_tsc rep_good amd_lbr_v2 nopl nonstop_tsc cpuid
                            extd_apicid aperfmperf rapl pni pclmulqdq monitor ssse3 fma cx16 pcid
                            sse4_1 sse4_2 x2apic movbe popcnt aes xsave avx f16c rdrand lahf_lm
                            cmp_legacy svm extapic cr8_legacy abm sse4a misalignsse 3dnowprefetch
                            osvw ibs skinit wdt tce topoext perfctr_core perfctr_nb bpext
                            perfctr_llc mwaitx cpb cat_l3 cdp_l3 hw_pstate ssbd mba perfmon_v2
                            ibrs ibpb stibp ibrs_enhanced vmmcall fsgsbase tsc_adjust bmi1 avx2
                            smep bmi2 erms invpcid cqm rdt_a avx512f avx512dq rdseed adx smap
                            avx512ifma clflushopt clwb avx512cd sha_ni avx512bw avx512vl xsaveopt
                            xsavec xgetbv1 xsaves cqm_llc cqm_occup_llc cqm_mbm_total
                            cqm_mbm_local user_shstk avx_vnni avx512_bf16 clzero irperf
                            xsaveerptr rdpru wbnoinvd amd_ppin cppc arat npt lbrv svm_lock
```

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Platform Notes (Continued)

```
                            nrip_save tsc_scale vmcb_clean flushbyasid decodeassists pausefilter
                            pfthreshold avic v_vmsave_vmload vgif x2avic v_spec_ctrl vnmi
                            avx512vbmi umip pku ospke avx512_vbmi2 gfni vaes vpclmulqdq
                            avx512_vnni avx512_bitalg avx512_vpopcntdq la57 rdpid bus_lock_detect
                            movdiri movdir64b overflow_recov succor smca fsrm avx512_vp2intersect
                            flush_l1d debug_swap
  Virtualization:           AMD-V
  L1d cache:                15 MiB (320 instances)
  L1i cache:                10 MiB (320 instances)
  L2 cache:                 320 MiB (320 instances)
  L3 cache:                 640 MiB (20 instances)
  NUMA node(s):             4
  NUMA node0 CPU(s):        0-79,320-399
  NUMA node1 CPU(s):        80-159,400-479
  NUMA node2 CPU(s):        160-239,480-559
  NUMA node3 CPU(s):        240-319,560-639
  Vulnerability Gather data sampling:  Not affected
  Vulnerability Itlb multihit:         Not affected
  Vulnerability L1tf:                  Not affected
  Vulnerability Mds:                   Not affected
  Vulnerability Meltdown:              Not affected
  Vulnerability Mmio stale data:       Not affected
  Vulnerability Reg file data sampling: Not affected
  Vulnerability Retbleed:              Not affected
  Vulnerability Spec rstack overflow:  Not affected
  Vulnerability Spec store bypass:     Mitigation; Speculative Store Bypass disabled via prctl
  Vulnerability Spectre v1:            Mitigation; usercopy/swapgs barriers and __user pointer sanitization
  Vulnerability Spectre v2:            Mitigation; Enhanced / Automatic IBRS; IBPB conditional; STIBP
                                       always-on; RSB filling; PBRSB-eIBRS Not affected; BHI Not affected
  Vulnerability Srbds:                 Not affected
  Vulnerability Tsx async abort:       Not affected

  From lscpu --cache:
    NAME ONE-SIZE ALL-SIZE WAYS TYPE        LEVEL  SETS PHY-LINE COHERENCY-SIZE
    L1d       48K      15M   12 Data            1    64        1             64
    L1i       32K      10M    8 Instruction     1    64        1             64
    L2         1M     320M   16 Unified         2  1024        1             64
    L3        32M     640M   16 Unified         3 32768        1             64

  ------------------------------------------------------------
8. numactl --hardware
NOTE: a numactl 'node' might or might not correspond to a physical chip.
  available: 4 nodes (0-3)
  node 0 cpus: 0-79,320-399
  node 0 size: 386392 MB
  node 0 free: 384020 MB
  node 1 cpus: 80-159,400-479
  node 1 size: 387017 MB
  node 1 free: 385849 MB
  node 2 cpus: 160-239,480-559
  node 2 size: 386974 MB
  node 2 free: 385782 MB
  node 3 cpus: 240-319,560-639
  node 3 size: 386906 MB
  node 3 free: 384889 MB
  node distances:
  node   0   1   2   3
    0:  10  12  32  32
    1:  12  10  32  32
    2:  32  32  10  12
```

(Continued on next page)

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Platform Notes (Continued)

```
      3:  32  32  12  10

     -----------------------------------------------------------
   9. /proc/meminfo
      MemTotal:       1584426372 kB


     -----------------------------------------------------------
   10. who -r
     run-level 5 Sep 19 06:39


     -----------------------------------------------------------
   11. Systemd service manager version: systemd 255 (255.4-1ubuntu8.4)
     Default Target  Status
     graphical       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
     Legend: LOAD   -> Reflects whether the unit definition was properly loaded.
             ACTIVE -> The high-level unit activation state, i.e. generalization of SUB.
             SUB    -> The low-level unit activation state, values depend on unit type.
     1 loaded units listed.


     -----------------------------------------------------------
   13. Services, from systemctl list-unit-files
     STATE           UNIT FILES
     enabled         ModemManager apparmor apport 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 keyboard-setup lvm2-monitor multipathd
                     networkd-dispatcher nvmefc-boot-connections nvmf-autoconnect open-iscsi open-vm-tools
                     pollinate rsyslog secureboot-db setvtrgb snapd sysstat systemd-networkd
                     systemd-networkd-wait-online systemd-pstore systemd-resolved systemd-timesyncd thermald
                     ua-reboot-cmds ubuntu-advantage udisks2 ufw unattended-upgrades vgauth
     enabled-runtime netplan-ovs-cleanup systemd-fsck-root systemd-remount-fs
     disabled        console-getty debug-shell ipmievd iscsid nftables rsync serial-getty@ ssh
                     systemd-boot-check-no-failures systemd-confext systemd-network-generator
                     systemd-networkd-wait-online@ systemd-pcrlock-file-system systemd-pcrlock-firmware-code
                     systemd-pcrlock-firmware-config systemd-pcrlock-machine-id systemd-pcrlock-make-policy
                     systemd-pcrlock-secureboot-authority systemd-pcrlock-secureboot-policy systemd-sysext
                     systemd-time-wait-sync upower
     generated       openipmi
     indirect        systemd-sysupdate systemd-sysupdate-reboot uuidd
     masked          cryptdisks cryptdisks-early hwclock multipath-tools-boot screen-cleanup sudo x11-common

     -----------------------------------------------------------
   14. Linux kernel boot-time arguments, from /proc/cmdline
      BOOT_IMAGE=/boot/vmlinuz-6.8.0-44-generic
      root=UUID=7434a739-6d8b-459f-b16c-dd9667f397b8
      ro


     -----------------------------------------------------------
   15. cpupower frequency-info
      analyzing CPU 260:
        current policy: frequency should be within 1.50 GHz and 2.10 GHz.
                        The governor "performance" may decide which speed to use
                        within this range.
        boost state support:
          Supported: yes
          Active: yes
```

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Platform Notes (Continued)

```
        Boost States: 0
        Total States: 3
        Pstate-P0:  32800MHz


    ----------------------------------------------------------
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 24.04.1 LTS


    ----------------------------------------------------------
20. Disk information
SPEC is set to: /spec/cpu2017aocc500zen5A1
  Filesystem     Type  Size  Used Avail Use% Mounted on
  /dev/nvme2n1p2 ext4  3.5T   89G  3.2T   3% /


    ----------------------------------------------------------
21. /sys/devices/virtual/dmi/id
    Vendor:         Supermicro
    Product:        AS -2126HS-TN
    Product Family: SMC H14
    Serial:         S920464X4524708
```

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Platform Notes (Continued)

```
   -----------------------------------------------------------
   22. dmidecode
     Additional information from dmidecode 3.5 follows.  WARNING: Use caution when you interpret this section.
     The 'dmidecode' program reads system data which is "intended to allow hardware to be accurately
     determined", but the intent may not be met, as there are frequent changes to hardware, firmware, and the
     "DMTF SMBIOS" standard.
     Memory:
       24x Samsung M321R8GA0PB1-CCPWC 64 GB 2 rank 6400, configured at 6000


   -----------------------------------------------------------
   23. BIOS
   (This section combines info from /sys/devices and dmidecode.)
     BIOS Vendor:        American Megatrends International, LLC.
     BIOS Version:       1.1
     BIOS Date:          09/09/2024
     BIOS Revision:      5.35
```

Compiler Version Notes

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


==============================================================================
C       | 500.perlbench_r(base, peak) 502.gcc_r(base) 505.mcf_r(base, peak) 525.x264_r(base, peak)
        | 557.xz_r(base, peak)
------------------------------------------------------------------------------
AMD clang version 17.0.6 (CLANG: AOCC_5.0.0-Build#1316 2024_09_09)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-5.0.0-4925-1316/bin
------------------------------------------------------------------------------


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


==============================================================================
C       | 500.perlbench_r(base, peak) 502.gcc_r(base) 505.mcf_r(base, peak) 525.x264_r(base, peak)
        | 557.xz_r(base, peak)
------------------------------------------------------------------------------
AMD clang version 17.0.6 (CLANG: AOCC_5.0.0-Build#1316 2024_09_09)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-5.0.0-4925-1316/bin
------------------------------------------------------------------------------
```

SPEC CPU®2017 Integer Rate Result

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Supermicro

Hyper A+ Server AS -2126HS-TN
(H14DSH , AMD EPYC 9845)

SPECrate®2017_int_base = 2460

SPECrate®2017_int_peak = 2540

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

Test Date: Sep-2024
Hardware Availability: Oct-2024
Software Availability: Oct-2024

Compiler Version Notes (Continued)

```
==============================================================================
C++      | 520.omnetpp_r(base, peak) 523.xalancbmk_r(base, peak) 531.deepsjeng_r(base, peak)
         | 541.leela_r(base, peak)
------------------------------------------------------------------------------
AMD clang version 17.0.6 (CLANG: AOCC_5.0.0-Build#1316 2024_09_09)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-5.0.0-4925-1316/bin
------------------------------------------------------------------------------


==============================================================================
Fortran | 548.exchange2_r(base, peak)
------------------------------------------------------------------------------
AMD clang version 17.0.6 (CLANG: AOCC_5.0.0-Build#1316 2024_09_09)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-5.0.0-4925-1316/bin
------------------------------------------------------------------------------
```

Base Compiler Invocation

C benchmarks:
`clang`

C++ benchmarks:
`clang++`

Fortran benchmarks:
`flang`

Base Portability Flags

500.perlbench_r: `-DSPEC_LINUX_X64 -DSPEC_LP64`
502.gcc_r: `-DSPEC_LP64`
505.mcf_r: `-DSPEC_LP64`
520.omnetpp_r: `-DSPEC_LP64`
523.xalancbmk_r: `-DSPEC_LINUX -DSPEC_LP64`
525.x264_r: `-DSPEC_LP64`
531.deepsjeng_r: `-DSPEC_LP64`
541.leela_r: `-DSPEC_LP64`
548.exchange2_r: `-DSPEC_LP64`
557.xz_r: `-DSPEC_LP64`

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Base Optimization Flags

C benchmarks:
```
-m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-ldist-scalar-expand -fenable-aggressive-gather
-Wl,-mllvm -Wl,-extra-inliner -z muldefs -O3 -march=znver5
-fveclib=AMDLIBM -ffast-math -fno-PIE -no-pie -flto
-fstruct-layout=7 -mllvm -unroll-threshold=50
-mllvm -inline-threshold=1000 -fremap-arrays -fstrip-mining
-mllvm -reduce-array-computations=3 -zopt -lamdlibm -lflang
-lamdalloc-ext -ldl
```

C++ benchmarks:
```
-m64 -std=c++14 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-do-block-reorder=advanced -z muldefs -O3 -march=znver5
-fveclib=AMDLIBM -ffast-math -flto -mllvm -unroll-threshold=100
-mllvm -loop-unswitch-threshold=200000
-mllvm -reduce-array-computations=3 -zopt -fno-PIE -no-pie
-fvirtual-function-elimination -fvisibility=hidden
-mllvm -do-block-reorder=advanced -lamdlibm -lflang -lamdalloc-ext
-ldl
```

Fortran benchmarks:
```
-m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-inline-recursion=4 -Wl,-mllvm -Wl,-lsr-in-nested-loop
-Wl,-mllvm -Wl,-enable-iv-split -z muldefs -O3 -march=znver5
-fveclib=AMDLIBM -ffast-math -flto
-fepilog-vectorization-of-inductions -mllvm -optimize-strided-mem-cost
-floop-transform -mllvm -unroll-aggressive -mllvm -unroll-threshold=500
-lamdlibm -lflang -lamdalloc -ldl
```

Base Other Flags

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

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

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

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CPU2017 License: 001176

Test Sponsor: Supermicro

Tested by: Supermicro

Test Date: Sep-2024

Hardware Availability: Oct-2024

Software Availability: Oct-2024

Peak Compiler Invocation

C benchmarks:
```
clang
```

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

Fortran benchmarks:
```
flang
```

Peak Portability Flags

500.perlbench_r: `-DSPEC_LINUX_X64 -DSPEC_LP64`
502.gcc_r: `-D_FILE_OFFSET_BITS=64`
505.mcf_r: `-DSPEC_LP64`
520.omnetpp_r: `-DSPEC_LP64`
523.xalancbmk_r: `-DSPEC_LINUX -DSPEC_LP64`
525.x264_r: `-DSPEC_LP64`
531.deepsjeng_r: `-DSPEC_LP64`
541.leela_r: `-DSPEC_LP64`
548.exchange2_r: `-DSPEC_LP64`
557.xz_r: `-DSPEC_LP64`

Peak Optimization Flags

C benchmarks:

500.perlbench_r: `basepeak = yes`

502.gcc_r: `-m32 -flto -Wl,-mllvm -Wl,-ldist-scalar-expand`
`-fenable-aggressive-gather -Wl,-mllvm -Wl,-extra-inliner`
`-z muldefs -Ofast -march=znver5 -fveclib=AMDLIBM`
`-ffast-math -fstruct-layout=7 -mllvm -unroll-threshold=50`
`-fremap-arrays -fstrip-mining`
`-mllvm -inline-threshold=1000`
`-mllvm -reduce-array-computations=3 -zopt -fgnu89-inline`
`-lamdalloc`

505.mcf_r: `basepeak = yes`

525.x264_r: `basepeak = yes`

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Peak Optimization Flags (Continued)

557.xz_r: basepeak = yes

C++ benchmarks:

520.omnetpp_r: basepeak = yes

523.xalancbmk_r: -m64 -std=c++14
-Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-do-block-reorder=advanced -Ofast
-march=znver5 -fveclib=AMDLIBM -ffast-math -flto
-mllvm -unroll-threshold=100
-mllvm -reduce-array-computations=3 -zopt
-fvirtual-function-elimination -fvisibility=hidden
-mllvm -do-block-reorder=advanced -lamdlibm -lflang
-lamdalloc-ext -ldl

531.deepsjeng_r: basepeak = yes

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

Fortran benchmarks:
-m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-inline-recursion=4 -Wl,-mllvm -Wl,-lsr-in-nested-loop
-Wl,-mllvm -Wl,-enable-iv-split -O3 -march=znver5 -fveclib=AMDLIBM
-ffast-math -flto -fepilog-vectorization-of-inductions
-mllvm -optimize-strided-mem-cost -floop-transform
-mllvm -unroll-aggressive -mllvm -unroll-threshold=500 -lamdlibm
-lflang -lamdalloc -ldl

Peak Other Flags

C benchmarks (except as noted below):
-Wno-unused-command-line-argument

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Peak Other Flags (Continued)

502.gcc_r: `-L/usr/lib32 -Wno-unused-command-line-argument`
`-L/home/work/cpu2017/v119/aocc5/1316/amd_rate_aocc500_znver5_A_lib/lib32`

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

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

The flags files that were used to format this result can be browsed at
`http://www.spec.org/cpu2017/flags/aocc500-flags.html`
`http://www.spec.org/cpu2017/flags/Supermicro-Platform-Settings-V1.2-Turin-revB.html`

You can also download the XML flags sources by saving the following links:
`http://www.spec.org/cpu2017/flags/aocc500-flags.xml`
`http://www.spec.org/cpu2017/flags/Supermicro-Platform-Settings-V1.2-Turin-revB.xml`

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

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