SPEC CPU®2017 Integer Speed Result

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Supermicro

A+ Server 2115GT-HNTF
(H13SST-G , AMD EPYC 9454P)

$SPECspeed^{®}2017\_int\_base = 14.1$

$SPECspeed^{®}2017\_int\_peak = 14.3$

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

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

Threads

Benchmark	Threads	Value
600.perlbench_s	48	8.58
602.gcc_s	48	14.3
605.mcf_s	48 / 1	20.2 / 21.1
620.omnetpp_s	48	10.3
623.xalancbmk_s	48 / 1	19.4 / 21.0
625.x264_s	48	21.8
631.deepsjeng_s	48	7.02
641.leela_s	48	6.00
648.exchange2_s	48	26.7
657.xz_s	48	25.4

SPECspeed®2017_int_base (14.1)   SPECspeed®2017_int_peak (14.3)

Hardware

CPU Name: AMD EPYC 9454P
 Max MHz: 3800
 Nominal: 2750
Enabled: 48 cores, 1 chip
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 / 6 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
Compiler: C/C++/Fortran: Version 4.0.0 of AOCC
Parallel: Yes
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.

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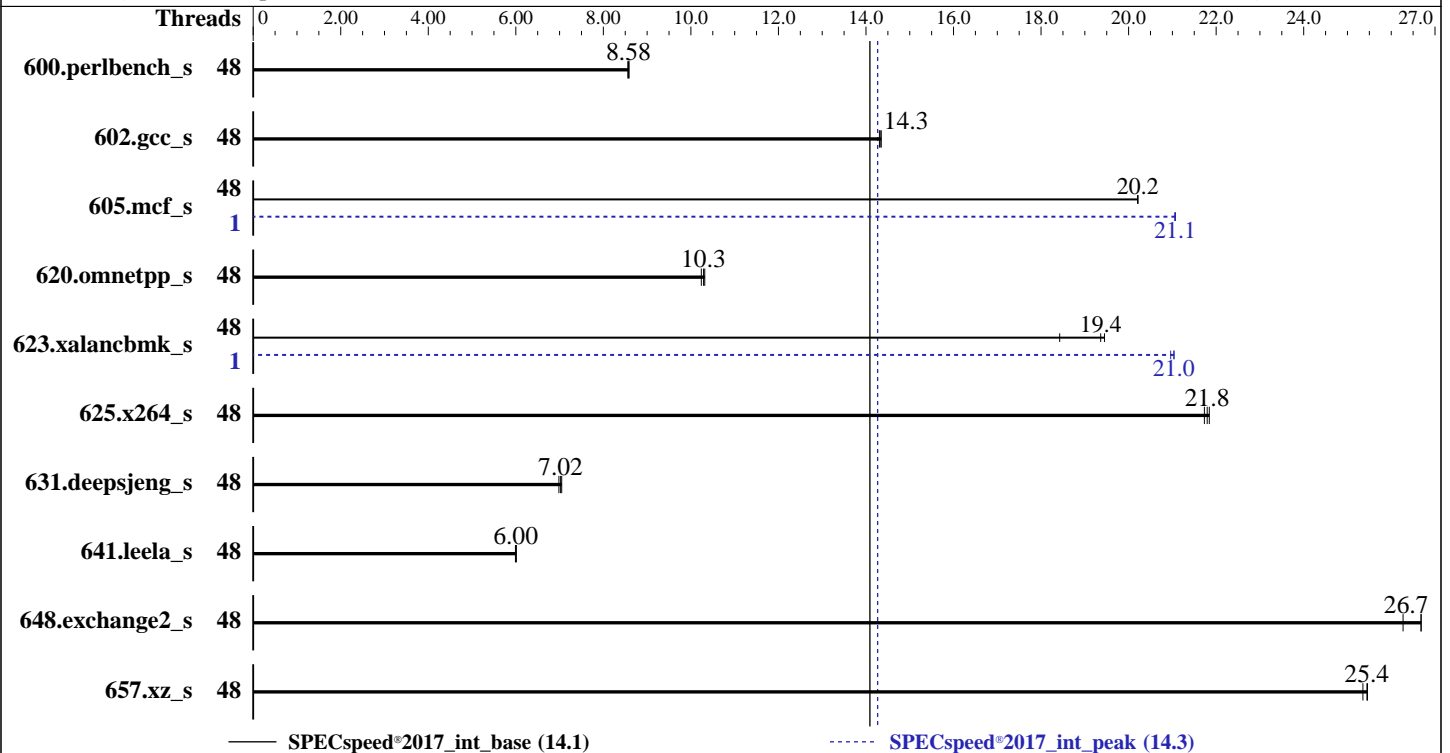SPECspeed®2017_int_peak = 14.3

CPU2017 License: 001176

Test Sponsor: Supermicro

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Results Table

Benchmark	Base							Peak						
	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
600.perlbench_s	48	**207**	**8.58**	207	8.59	207	8.56	48	**207**	**8.58**	207	8.59	207	8.56
602.gcc_s	48	**278**	**14.3**	278	14.3	278	14.3	48	**278**	**14.3**	278	14.3	278	14.3
605.mcf_s	48	234	20.2	234	20.2	**234**	**20.2**	1	224	21.1	224	21.1	**224**	**21.1**
620.omnetpp_s	48	**159**	**10.3**	159	10.2	158	10.3	48	**159**	**10.3**	159	10.2	158	10.3
623.xalancbmk_s	48	72.9	19.4	76.9	18.4	**73.2**	**19.4**	1	67.6	21.0	67.3	21.0	**67.4**	**21.0**
625.x264_s	48	**80.9**	**21.8**	81.2	21.7	80.8	21.8	48	**80.9**	**21.8**	81.2	21.7	80.8	21.8
631.deepsjeng_s	48	205	6.99	**204**	**7.02**	203	7.05	48	205	6.99	**204**	**7.02**	203	7.05
641.leela_s	48	**284**	**6.00**	284	6.01	285	5.99	48	**284**	**6.00**	284	6.01	285	5.99
648.exchange2_s	48	110	26.7	**110**	**26.7**	112	26.3	48	110	26.7	**110**	**26.7**	112	26.3
657.xz_s	48	244	25.4	**243**	**25.4**	243	25.5	48	244	25.4	**243**	**25.4**	243	25.5
SPECspeed®2017_int_base =		**14.1**												
SPECspeed®2017_int_peak =		**14.3**												

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.
```

(Continued on next page)

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Operating System Notes (Continued)

```
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:
GOMP_CPU_AFFINITY = "0-47"
LD_LIBRARY_PATH = "/home/cpu2017/amd_speed_aocc400_genoa_B_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 = "48"

Environment variables set by runcpu during the 605.mcf_s peak run:
GOMP_CPU_AFFINITY = "15"

Environment variables set by runcpu during the 623.xalancbmk_s peak run:
GOMP_CPU_AFFINITY = "15"
```

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
```

(Continued on next page)

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Platform Notes (Continued)

```
NUMA Nodes Per Socket = NPS4
SMT Control = Disabled
ACPI SRAT L3 cache As NUMA Domain = Enabled

 Sysinfo program /home/cpu2017/bin/sysinfo
 Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
 running on h13sst-9454p Wed Mar  8 11:07:13 2023

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

 ------------------------------------------------------------
 Table of contents
 ------------------------------------------------------------
  1. uname -a
  2. w
  3. Username
  4. ulimit -a
  5. sysinfo process ancestry
  6. /proc/cpuinfo
  7. lscpu
  8. numactl --hardware
  9. /proc/meminfo
 10. who -r
 11. Systemd service manager version: systemd 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-9454p 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
    11:07:13 up 4 min,  2 users,  load average: 0.00, 0.02, 0.00
    USER     TTY      FROM             LOGIN@   IDLE   JCPU   PCPU WHAT
```

(Continued on next page)

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Platform Notes (Continued)

```
  lab       tty1      -                  11:05   2:13   0.43s  0.01s -bash
  lab       pts/0     -                  11:05   8.00s  0.92s  0.40s sudo su -


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


  ------------------------------------------------------------
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                4642780
  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_genoa_B1.py
 /bin/bash ./amd_speed_aocc400_genoa_B1.sh
 runcpu --config amd_speed_aocc400_genoa_B1.cfg --tune all --reportable --iterations 3 intspeed
 runcpu --configfile amd_speed_aocc400_genoa_B1.cfg --tune all --reportable --iterations 3 --nopower
   --runmode speed --tune base:peak --size test:train:refspeed intspeed --nopreenv --note-preenv --logfile
    $SPEC/tmp/CPU2017.001/templogs/preenv.intspeed.001.0.log --lognum 001.0 --from_runcpu 2
 specperl $SPEC/bin/sysinfo
$SPEC = /home/cpu2017


  ------------------------------------------------------------
6. /proc/cpuinfo
    model name     : AMD EPYC 9454P 48-Core Processor
    vendor_id      : AuthenticAMD
    cpu family     : 25
    model          : 17
```

(Continued on next page)

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Platform Notes (Continued)

```
      stepping        : 1
      microcode       : 0xa101111
      bugs            : sysret_ss_attrs spectre_v1 spectre_v2 spec_store_bypass
      TLB size        : 3584 4K pages
      cpu cores       : 48
      siblings        : 48
      1 physical ids (chips)
      48 processors (hardware threads)
      physical id 0: core ids 0-5,16-21,32-37,48-53,64-69,80-85,96-101,112-117
      physical id 0: apicids 0-5,16-21,32-37,48-53,64-69,80-85,96-101,112-117
   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):                    48
   On-line CPU(s) list:       0-47
   Vendor ID:                 AuthenticAMD
   Model name:                AMD EPYC 9454P 48-Core Processor
   CPU family:                25
   Model:                     17
   Thread(s) per core:        1
   Core(s) per socket:        48
   Socket(s):                 1
   Stepping:                  1
   Frequency boost:           enabled
   CPU max MHz:               3812.0000
   CPU min MHz:               400.0000
   BogoMIPS:                  5500.25
   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
```

(Continued on next page)

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Platform Notes (Continued)

```
                            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:                   1.5 MiB (48 instances)
    L1i cache:                   1.5 MiB (48 instances)
    L2 cache:                    48 MiB (48 instances)
    L3 cache:                    256 MiB (8 instances)
    NUMA node(s):                8
    NUMA node0 CPU(s):           0-5
    NUMA node1 CPU(s):           6-11
    NUMA node2 CPU(s):           12-17
    NUMA node3 CPU(s):           18-23
    NUMA node4 CPU(s):           24-29
    NUMA node5 CPU(s):           30-35
    NUMA node6 CPU(s):           36-41
    NUMA node7 CPU(s):           42-47
    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 disabled, 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     1.5M   8 Data            1     64       1               64
      L1i       32K     1.5M   8 Instruction     1     64       1               64
      L2         1M      48M   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: 0-5
    node 0 size: 144880 MB
    node 0 free: 144566 MB
    node 1 cpus: 6-11
    node 1 size: 145144 MB
```

(Continued on next page)

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Platform Notes (Continued)

```
  node 1 free: 144838 MB
  node 2 cpus: 12-17
  node 2 size: 145144 MB
  node 2 free: 144831 MB
  node 3 cpus: 18-23
  node 3 size: 145144 MB
  node 3 free: 144902 MB
  node 4 cpus: 24-29
  node 4 size: 145144 MB
  node 4 free: 144647 MB
  node 5 cpus: 30-35
  node 5 size: 145108 MB
  node 5 free: 144733 MB
  node 6 cpus: 36-41
  node 6 size: 145144 MB
  node 6 free: 144846 MB
  node 7 cpus: 42-47
  node 7 size: 145095 MB
  node 7 free: 144835 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:     1188665368 kB


  ----------------------------------------------------------
  10. who -r
    run-level 3 Mar 8 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
```

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Platform Notes (Continued)

```
   ----------------------------------------------------------------
   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
                         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 3.81 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:  2750MHz


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

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Platform Notes (Continued)

```
     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 22.04.1 LTS


    ----------------------------------------------------------------
20. Disk information
SPEC is set to: /home/cpu2017
    Filesystem      Type  Size  Used Avail Use% Mounted on
    /dev/sda2       ext4  1.8T   64G  1.6T   4% /


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

(Continued on next page)

Supermicro

A+ Server 2115GT-HNTF
(H13SST-G , AMD EPYC 9454P)

SPECspeed®2017_int_base = 14.1

SPECspeed®2017_int_peak = 14.3

Platform Notes (Continued)

```
     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:
     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        | 600.perlbench_s(base, peak) 602.gcc_s(base, peak) 605.mcf_s(base,
         | peak) 625.x264_s(base, peak) 657.xz_s(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++      | 620.omnetpp_s(base, peak) 623.xalancbmk_s(base, peak)
         | 631.deepsjeng_s(base, peak) 641.leela_s(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  | 648.exchange2_s(base, peak)
```

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SPEC CPU®2017 Integer Speed Result

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SPECspeed®2017_int_peak = 14.3

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

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

Compiler Version Notes (Continued)

```
--------------------------------------------------------------------
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#389 2022_10_07) (based on
  LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-4.0-3206-389/bin
--------------------------------------------------------------------
```

Base Compiler Invocation

C benchmarks:
```
clang
```

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

Fortran benchmarks:
```
flang
```

Base Portability Flags

600.perlbench_s: `-DSPEC_LINUX_X64 -DSPEC_LP64`
602.gcc_s: `-DSPEC_LP64`
605.mcf_s: `-DSPEC_LP64`
620.omnetpp_s: `-DSPEC_LP64`
623.xalancbmk_s: `-DSPEC_LINUX -DSPEC_LP64`
625.x264_s: `-DSPEC_LP64`
631.deepsjeng_s: `-DSPEC_LP64`
641.leela_s: `-DSPEC_LP64`
648.exchange2_s: `-DSPEC_LP64`
657.xz_s: `-DSPEC_LP64`

Base Optimization Flags

C benchmarks:
```
-m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-allow-multiple-definition -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
```

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

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Base Optimization Flags (Continued)

C benchmarks (continued):
```
-DSPEC_OPENMP -zopt -fopenmp=libomp -lomp -lamdlibm -lflang
-lamdalloc
```

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
-mllvm -unroll-threshold=100 -finline-aggressive
-mllvm -loop-unswitch-threshold=200000
-mllvm -reduce-array-computations=3 -DSPEC_OPENMP -zopt
-fvirtual-function-elimination -fvisibility=hidden -fopenmp=libomp
-lomp -lamdlibm -lflang -lamdalloc-ext
```

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=znver4 -fveclib=AMDLIBM
-ffast-math -fopenmp -flto -mllvm -optimize-strided-mem-cost
-mllvm -unroll-aggressive -mllvm -unroll-threshold=150 -fopenmp=libomp
-lomp -lamdlibm -lflang -lamdalloc
```

Base Other Flags

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

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

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

Peak Compiler Invocation

C benchmarks:
```
clang
```

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

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

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

Peak Compiler Invocation (Continued)

Fortran benchmarks:
```
flang
```

Peak Portability Flags

```
Same as Base Portability Flags
```

Peak Optimization Flags

C benchmarks:

600.perlbench_s: basepeak = yes

602.gcc_s: basepeak = yes

605.mcf_s: `-m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6`
`-Wl,-mllvm -Wl,-reduce-array-computations=3`
`-Wl,-allow-multiple-definition -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`
`-fopenmp=libomp -lomp -lamdlibm -lamdalloc -lflang`

625.x264_s: basepeak = yes

657.xz_s: basepeak = yes

C++ benchmarks:

620.omnetpp_s: basepeak = yes

623.xalancbmk_s: `-m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6`
`-Wl,-mllvm -Wl,-reduce-array-computations=3`
`-Wl,-mllvm -Wl,-do-block-reorder=aggressive -Ofast`
`-march=znver4 -fveclib=AMDLIBM -ffast-math -fopenmp`
`-flto -finline-aggressive -mllvm -unroll-threshold=100`
`-mllvm -reduce-array-computations=3 -DSPEC_OPENMP -zopt`
`-mllvm -do-block-reorder=aggressive`
`-fvirtual-function-elimination -fvisibility=hidden`
`-fopenmp=libomp -lomp -lamdlibm -lamdalloc-ext -lflang`

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Peak Optimization Flags (Continued)

631.deepsjeng_s: `basepeak = yes`

641.leela_s: `basepeak = yes`

Fortran benchmarks:

648.exchange2_s: `basepeak = yes`

Peak Other Flags

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

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/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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