SPEC CPU®2017 Integer Speed Result

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Tyrone Systems
(Test Sponsor: Netweb Pte Ltd)

(Tyrone Camarero SDA200A2N-18)
(3.00 GHz, AMD EPYC 9124)

$SPECspeed^{®}2017\_int\_base = 13.0$

$SPECspeed^{®}2017\_int\_peak = 13.1$

CPU2017 License: 6042	**Test Date:** Jan-2024
Test Sponsor: Netweb Pte Ltd	**Hardware Availability:** Jun-2023
Tested by: Tyrone Systems	**Software Availability:** Nov-2023

Benchmark results (Threads / value):

- **600.perlbench_s**: 32 → 8.16; 1 → 8.17
- **602.gcc_s**: 32 → 13.3; 1 → 13.2
- **605.mcf_s**: 32 → 19.8; 1 → 20.5
- **620.omnetpp_s**: 32 → 6.75; 1 → 6.65
- **623.xalancbmk_s**: 32 → 18.6; 1 → 20.1
- **625.x264_s**: 32 → 20.6; 1 → 20.7
- **631.deepsjeng_s**: 32 → 6.86; 1 → 6.79
- **641.leela_s**: 32 → 5.83; 1 → 5.82
- **648.exchange2_s**: 32 → 25.6; 1 → 25.4
- **657.xz_s**: 32 → 23.8; 64 → 24.6

—— SPECspeed®2017_int_base (13.0)   ------ SPECspeed®2017_int_peak (13.1)

Hardware

CPU Name: AMD EPYC 9124
Max MHz: 3700
Nominal: 3000
Enabled: 32 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: 64 MB I+D on chip per chip, 16 MB shared / 4 cores
Other: None
Memory: 1 TB (16 x 64 GB 2Rx4 PC5-4800B-R)
Storage: 1 x 1 TB NVMe
Other: None

Software

OS: Ubuntu 20.04.4 LTS
 kernel version
 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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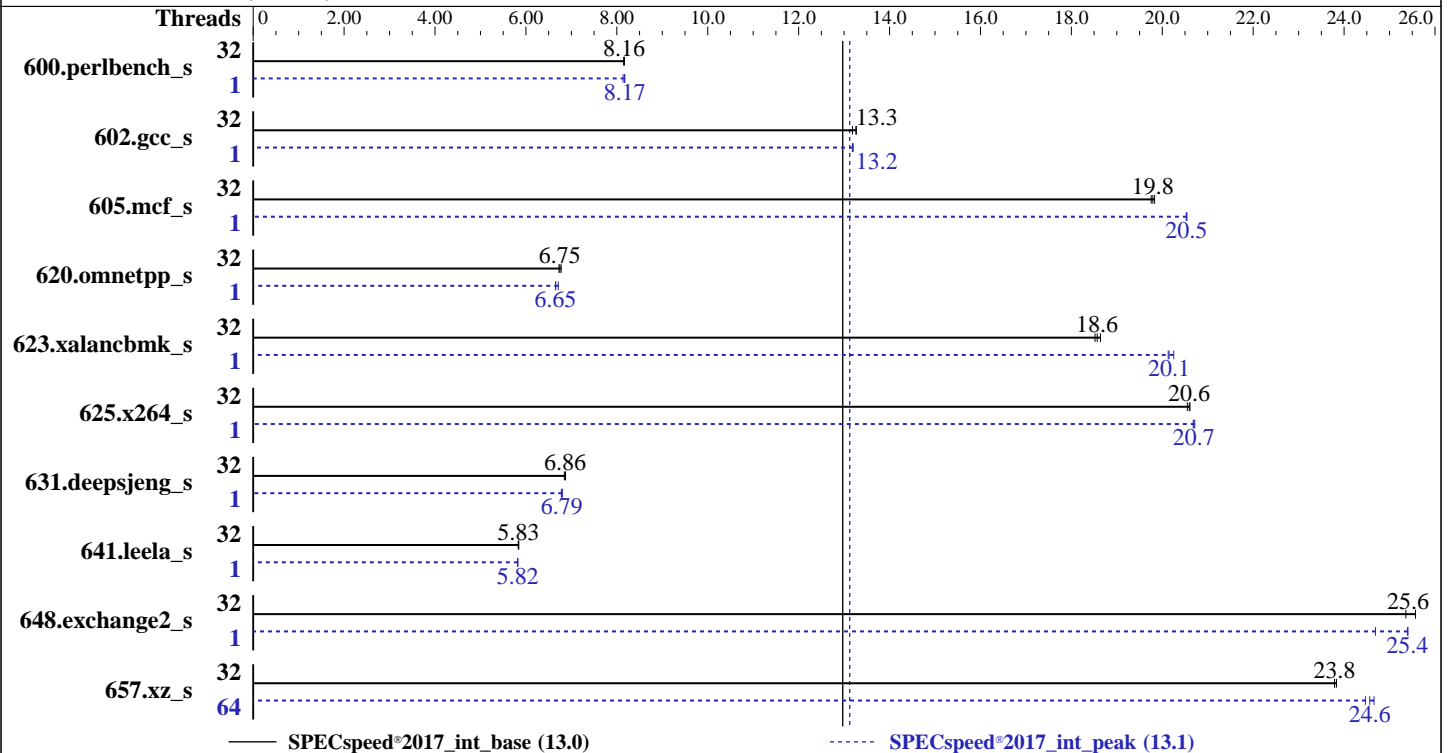SPECspeed®2017_int_base = 13.0

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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	32	**217**	**8.16**	218	8.15	217	8.16	1	218	8.14	217	8.17	**217**	**8.17**
602.gcc_s	32	**300**	**13.3**	300	13.3	302	13.2	1	302	13.2	302	13.2	**302**	**13.2**
605.mcf_s	32	**239**	**19.8**	239	19.8	238	19.8	1	230	20.5	**230**	**20.5**	230	20.5
620.omnetpp_s	32	**242**	**6.75**	242	6.73	241	6.78	1	245	6.65	243	6.71	**245**	**6.65**
623.xalancbmk_s	32	**76.3**	**18.6**	76.5	18.5	76.0	18.6	1	70.0	20.3	**70.3**	**20.1**	70.4	20.1
625.x264_s	32	85.6	20.6	85.8	20.6	**85.7**	**20.6**	1	**85.2**	**20.7**	85.2	20.7	85.3	20.7
631.deepsjeng_s	32	**209**	**6.86**	209	6.87	209	6.85	1	**211**	**6.79**	211	6.80	211	6.78
641.leela_s	32	293	5.83	**292**	**5.83**	292	5.84	1	293	5.82	293	5.82	**293**	**5.82**
648.exchange2_s	32	115	25.6	116	25.4	**115**	**25.6**	1	116	25.4	**116**	**25.4**	119	24.7
657.xz_s	32	259	23.8	**260**	**23.8**	260	23.8	64	253	24.5	251	24.7	**252**	**24.6**
SPECspeed®2017_int_base =		**13.0**												
SPECspeed®2017_int_peak =		**13.1**												

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) only on request for base runs,
'echo madvise > /sys/kernel/mm/transparent_hugepage/enabled' run as root.
To enable THP for all allocations for peak runs,
'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:
GOMP_CPU_AFFINITY = "0-63"
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 = "64"

Environment variables set by runcpu during the 600.perlbench_s peak run:
GOMP_CPU_AFFINITY = "15"

Environment variables set by runcpu during the 602.gcc_s peak run:
GOMP_CPU_AFFINITY = "15"

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

Environment variables set by runcpu during the 620.omnetpp_s peak run:
GOMP_CPU_AFFINITY = "15"

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

Environment variables set by runcpu during the 625.x264_s peak run:
GOMP_CPU_AFFINITY = "15"

Environment variables set by runcpu during the 631.deepsjeng_s peak run:
GOMP_CPU_AFFINITY = "15"

Environment variables set by runcpu during the 641.leela_s peak run:
GOMP_CPU_AFFINITY = "15"

Environment variables set by runcpu during the 648.exchange2_s peak run:
GOMP_CPU_AFFINITY = "15"

Environment variables set by runcpu during the 657.xz_s peak run:
GOMP_CPU_AFFINITY = "0-63"
LIBOMP_NUM_HIDDEN_HELPER_THREADS = "8"
```

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

```
 Sysinfo program /home/cpu2017/bin/sysinfo
```

(Continued on next page)

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Tested by: Tyrone Systems   **Software Availability:** Nov-2023

Platform Notes (Continued)

```
Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
running on amd2-Super-Server Wed Jan 24 13:07:59 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 245 (245.4-4ubuntu3.20)
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. sysctl
16. /sys/kernel/mm/transparent_hugepage
17. /sys/kernel/mm/transparent_hugepage/khugepaged
18. OS release
19. Disk information
20. /sys/devices/virtual/dmi/id
21. dmidecode
22. BIOS
------------------------------------------------------------


------------------------------------------------------------
1. uname -a
  Linux amd2-Super-Server 5.15.0-91-generic #101~20.04.1-Ubuntu SMP Thu Nov 16 14:22:28 UTC 2023 x86_64
  x86_64 x86_64 GNU/Linux


------------------------------------------------------------
2. w
   13:07:59 up 20:22,  1 user,  load average: 0.15, 0.03, 0.01
  USER     TTY      FROM             LOGIN@   IDLE   JCPU   PCPU WHAT
  root     tty1     -                Tue16    7.00s  1.73s  0.38s /bin/bash ./amd_speed_aocc400_znver4_A1.sh


------------------------------------------------------------
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              4126174
  nofiles              1024
  vmemory(kbytes)      unlimited
  locks                unlimited
```

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Hardware Availability: Jun-2023
Software Availability: Nov-2023

Platform Notes (Continued)

```
   rtprio              0


  -----------------------------------------------------------
5. sysinfo process ancestry
 /sbin/init splash
 /bin/login -p --
 -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 intspeed
 runcpu --configfile amd_speed_aocc400_znver4_A1.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 9124 16-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       : 16
    siblings        : 32
    2 physical ids (chips)
    64 processors (hardware threads)
    physical id 0: core ids 0-3,8-11,16-19,24-27
    physical id 1: core ids 0-3,8-11,16-19,24-27
    physical id 0: apicids 0-7,16-23,32-39,48-55
    physical id 1: apicids 64-71,80-87,96-103,112-119
  Caution: /proc/cpuinfo data regarding chips, cores, and threads is not necessarily reliable, especially for
  virtualized systems.  Use the above data carefully.


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

From lscpu from util-linux 2.34:
  Architecture:             x86_64
  CPU op-mode(s):           32-bit, 64-bit
  Byte Order:               Little Endian
  Address sizes:            52 bits physical, 57 bits virtual
  CPU(s):                   64
  On-line CPU(s) list:      0-63
  Thread(s) per core:       2
  Core(s) per socket:       16
  Socket(s):                2
  NUMA node(s):             2
  Vendor ID:                AuthenticAMD
  CPU family:               25
  Model:                    17
  Model name:               AMD EPYC 9124 16-Core Processor
  Stepping:                 1
  Frequency boost:          enabled
  CPU MHz:                  1500.000
  CPU max MHz:              3711.9141
  CPU min MHz:              1500.0000
```

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Hardware Availability: Jun-2023

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Platform Notes (Continued)

```
   BogoMIPS:                        6000.18
   Virtualization:                  AMD-V
   L1d cache:                       1 MiB
   L1i cache:                       1 MiB
   L2 cache:                        32 MiB
   L3 cache:                        128 MiB
   NUMA node0 CPU(s):               0-15,32-47
   NUMA node1 CPU(s):               16-31,48-63
   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
   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

  From lscpu --cache:
      NAME ONE-SIZE ALL-SIZE WAYS TYPE         LEVEL
      L1d       32K       1M   8 Data            1
      L1i       32K       1M   8 Instruction     1
      L2         1M      32M   8 Unified         2
      L3        16M     128M  16 Unified         3

  ------------------------------------------------------------
  8. numactl --hardware
  NOTE: a numactl 'node' might or might not correspond to a physical chip.
    available: 2 nodes (0-1)
    node 0 cpus: 0-15,32-47
    node 0 size: 515621 MB
    node 0 free: 513951 MB
    node 1 cpus: 16-31,48-63
    node 1 size: 515996 MB
    node 1 free: 514696 MB
    node distances:
    node   0   1
      0:  10  32
```

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Platform Notes (Continued)

```
     1:  32  10


    -----------------------------------------------------------
    9. /proc/meminfo
       MemTotal:       1056377592 kB


    -----------------------------------------------------------
    10. who -r
      run-level 3 Jan 23 16:45


    -----------------------------------------------------------
    11. Systemd service manager version: systemd 245 (245.4-4ubuntu3.20)
      Default Target  Status
      multi-user      degraded


    -----------------------------------------------------------
    12. Failed units, from systemctl list-units --state=failed
        UNIT                  LOAD   ACTIVE SUB    DESCRIPTION
      * fwupd-refresh.service loaded failed failed Refresh fwupd metadata and update motd


    -----------------------------------------------------------
    13. Services, from systemctl list-unit-files
      STATE            UNIT FILES
      enabled          ModemManager NetworkManager NetworkManager-dispatcher NetworkManager-wait-online
                       accounts-daemon anacron apparmor autovt@ avahi-daemon bluetooth console-setup cron cups
                       cups-browsed dmesg e2scrub_reap getty@ gpu-manager grub-common grub-initrd-fallback
                       irqbalance kerneloops keyboard-setup network-manager networkd-dispatcher ondemand openvpn
                       pppd-dns rsync rsyslog secureboot-db setvtrgb snapd ssh sshd switcheroo-control syslog
                       systemd-pstore systemd-resolved systemd-timesyncd thermald ua-reboot-cmds udisks2 ufw
                       unattended-upgrades whoopsie wpa_supplicant
      enabled-runtime  netplan-ovs-cleanup systemd-fsck-root systemd-remount-fs
      disabled         acpid brltty console-getty debug-shell ipmievd openvpn-client@ openvpn-server@ openvpn@
                       rtkit-daemon serial-getty@ speech-dispatcher speech-dispatcherd
                       systemd-boot-check-no-failures systemd-network-generator systemd-networkd
                       systemd-networkd-wait-online systemd-time-wait-sync upower wpa_supplicant-nl80211@
                       wpa_supplicant-wired@ wpa_supplicant@
      generated        apport ipmidrv openipmi
      indirect         display-manager lightdm saned@ spice-vdagent spice-vdagentd uuidd
      masked           alsa-utils cryptdisks cryptdisks-early hwclock pulseaudio-enable-autospawn rc rcS saned
                       sudo x11-common


    -----------------------------------------------------------
    14. Linux kernel boot-time arguments, from /proc/cmdline
      BOOT_IMAGE=/boot/vmlinuz-5.15.0-91-generic
      root=UUID=1ae71a13-cac0-48f6-b6e6-e15e5e687f57
      ro
      quiet
      splash
      vt.handoff=7


    -----------------------------------------------------------
    15. 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
```

(Continued on next page)

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Platform Notes (Continued)

```
   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


   ----------------------------------------------------------------
16. /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


   ----------------------------------------------------------------
17. /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


   ----------------------------------------------------------------
18. OS release
   From /etc/*-release /etc/*-version
   os-release Ubuntu 20.04.4 LTS


   ----------------------------------------------------------------
19. Disk information
SPEC is set to: /home/cpu2017
   Filesystem      Type  Size  Used Avail Use% Mounted on
   /dev/nvme0n1p2 ext4  938G   20G  871G   3% /


   ----------------------------------------------------------------
20. /sys/devices/virtual/dmi/id
      Vendor:        Tyrone Systems
      Product:       Tyrone Camarero SDA200A2N-18
      Product Family: SMC H13
      Serial:        A509935X3C01325


   ----------------------------------------------------------------
21. dmidecode
   Additional information from dmidecode 3.2 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:
     8x NO DIMM NO DIMM
     16x Samsung M321R8GA0BB0-CQKZJ 64 GB 2 rank 4800



   ----------------------------------------------------------------
22. BIOS
```

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CPU2017 License: 6042		**Test Date:** Jan-2024
Test Sponsor: Netweb Pte Ltd		**Hardware Availability:** Jun-2023
Tested by: Tyrone Systems		**Software Availability:** Nov-2023

Platform Notes (Continued)

```
   (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         | 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#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++       | 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#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 | 648.exchange2_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
------------------------------------------------------------------------------
```

Base Compiler Invocation

C benchmarks:
```
clang
```

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

Fortran benchmarks:
```
flang
```

SPEC CPU®2017 Integer Speed Result

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Tyrone Systems
(Test Sponsor: Netweb Pte Ltd)

(Tyrone Camarero SDA200A2N-18)
(3.00 GHz, AMD EPYC 9124)

SPECspeed®2017_int_base = 13.0

SPECspeed®2017_int_peak = 13.1

CPU2017 License: 6042
Test Sponsor: Netweb Pte Ltd
Tested by: Tyrone Systems

Test Date: Jan-2024
Hardware Availability: Jun-2023
Software Availability: Nov-2023

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
-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

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SPEC CPU®2017 Integer Speed Result

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(Tyrone Camarero SDA200A2N-18)
(3.00 GHz, AMD EPYC 9124)

SPECspeed®2017_int_base = 13.0

SPECspeed®2017_int_peak = 13.1

CPU2017 License: 6042
Test Sponsor: Netweb Pte Ltd
Tested by: Tyrone Systems

Test Date: Jan-2024
Hardware Availability: Jun-2023
Software Availability: Nov-2023

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++
```

Fortran benchmarks:
```
flang
```

Peak Portability Flags

```
Same as Base Portability Flags
```

Peak Optimization Flags

C benchmarks:

```
 600.perlbench_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
```

```
 602.gcc_s: -m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
```

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CPU2017 License: 6042
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Tested by: Tyrone Systems

Test Date: Jan-2024
Hardware Availability: Jun-2023
Software Availability: Nov-2023

Peak Optimization Flags (Continued)

602.gcc_s (continued):
```
-Wl,-allow-multiple-definition -z muldefs -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
```

605.mcf_s: Same as 600.perlbench_s

625.x264_s: Same as 600.perlbench_s

657.xz_s: Same as 600.perlbench_s

C++ benchmarks:

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

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
```

631.deepsjeng_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 -finline-aggressive -mllvm -unroll-threshold=100
-mllvm -reduce-array-computations=3 -DSPEC_OPENMP -zopt
-fvirtual-function-elimination -fvisibility=hidden
-fopenmp=libomp -lomp -lamdlibm -lamdalloc -lflang
```

641.leela_s: Same as 631.deepsjeng_s

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CPU2017 License: 6042	**Test Date:** Jan-2024
Test Sponsor: Netweb Pte Ltd	**Hardware Availability:** Jun-2023
Tested by: Tyrone Systems	**Software Availability:** Nov-2023

Peak Optimization Flags (Continued)

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 -lamdalloc -lflang
```

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/Tyrone-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.xml
http://www.spec.org/cpu2017/flags/Tyrone-Platform-Settings-V1.2-Genoa-revC.xml

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

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