SPEC CPU®2017 Integer Rate Result

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Kaytus Systems Pte. Ltd.
KR1280E2 (AMD EPYC 9754)

$SPECrate^{®}2017\_int\_base = 1930$

$SPECrate^{®}2017\_int\_peak = 2100$

CPU2017 License: 6865
Test Sponsor: Kaytus Systems Pte. Ltd.
Tested by: Kaytus Systems Pte. Ltd.

Test Date: Mar-2024
Hardware Availability: Feb-2023
Software Availability: Nov-2022

Benchmark	Copies	base	peak
500.perlbench_r	512	1650	
502.gcc_r	512	1170	1620
505.mcf_r	512	2510	
520.omnetpp_r	512	857	
523.xalancbmk_r	512	1580	2730
525.x264_r	512	5470	
531.deepsjeng_r	512	1950	
541.leela_r	512	1870	
548.exchange2_r	512	5320	5320
557.xz_r	512	1010	1010

SPECrate®2017_int_base (1930)   SPECrate®2017_int_peak (2100)

Hardware

CPU Name: AMD EPYC 9754
 Max MHz: 3100
 Nominal: 2250
Enabled: 256 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: 256 MB I+D on chip per chip, 16 MB shared / 8 cores
 Other: None
Memory: 1536 GB (24 x 64 GB 2Rx4 PC5-4800B-R)
Storage: 1 x 1 TB NVME SSD
Other: CPU Cooling: Air

Software

OS: Red Hat Enterprise Linux release 9 (Plow)
 5.14.0-70.22.1.el9_0.x86_64
Compiler: C/C++/Fortran: Version 4.0.0 of AOCC
Parallel: No
Firmware: Version 4.02.28 released Jan-2024
File System: xfs
System State: Run level 3 (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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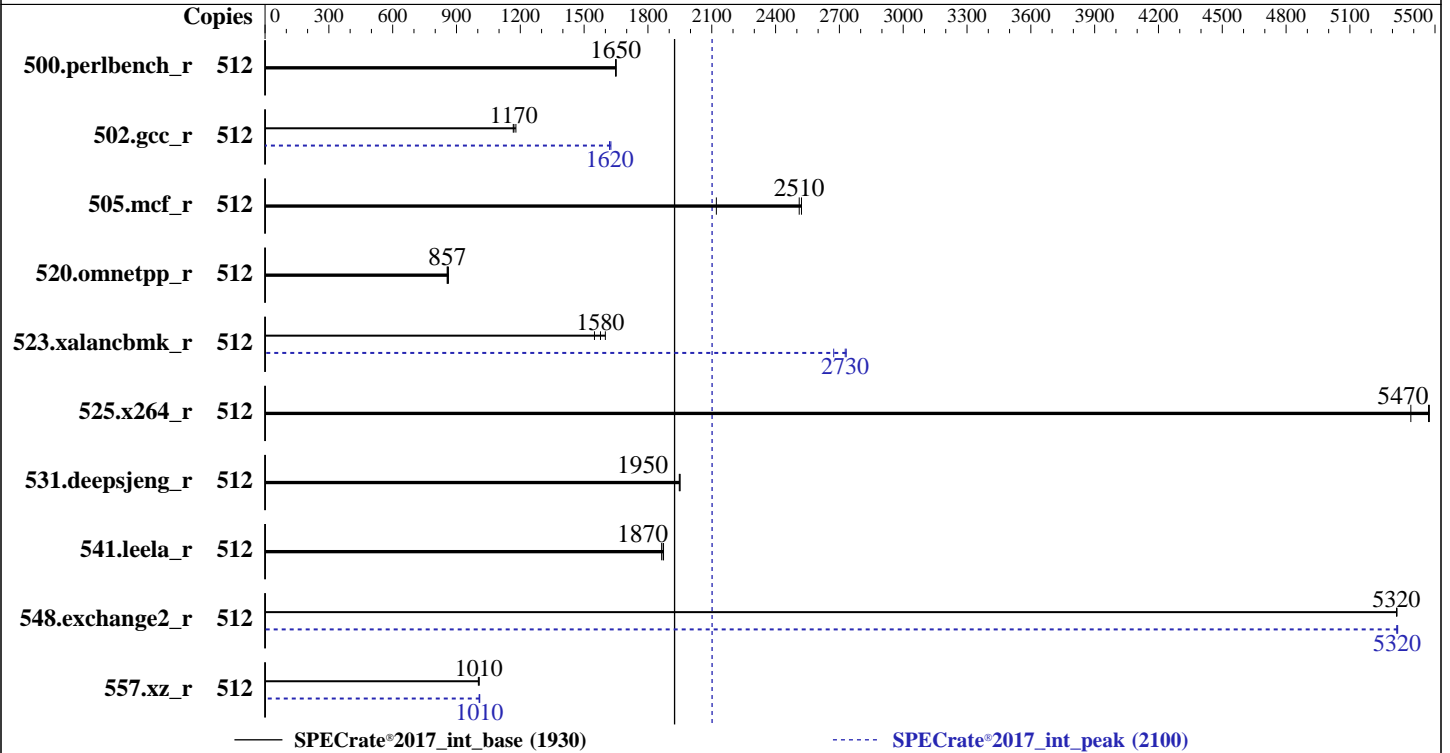
SPECrate®2017_int_peak = 2100

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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	512	495	1650	494	1650	**494**	**1650**	512	495	1650	494	1650	**494**	**1650**
502.gcc_r	512	621	1170	615	1180	**620**	**1170**	512	448	1620	446	1630	**447**	**1620**
505.mcf_r	512	390	2120	**329**	**2510**	328	2520	512	390	2120	**329**	**2510**	328	2520
520.omnetpp_r	512	779	862	784	856	**783**	**857**	512	779	862	784	856	**783**	**857**
523.xalancbmk_r	512	338	1600	**343**	**1580**	349	1550	512	202	2670	198	2730	**198**	**2730**
525.x264_r	512	164	5470	**164**	**5470**	166	5390	512	164	5470	**164**	**5470**	166	5390
531.deepsjeng_r	512	301	1950	301	1950	**301**	**1950**	512	301	1950	301	1950	**301**	**1950**
541.leela_r	512	455	1860	**453**	**1870**	453	1870	512	455	1860	**453**	**1870**	453	1870
548.exchange2_r	512	252	5320	**252**	**5320**	252	5320	512	**252**	**5320**	252	5320	252	5320
557.xz_r	512	551	1000	550	1010	**550**	**1010**	512	549	1010	548	1010	**549**	**1010**

SPECrate®2017_int_base =	**1930**
SPECrate®2017_int_peak =	**2100**

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.

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

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Environment Variables Notes

```
Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH =
     "/home/CPU2017/amd_rate_aocc400_genoa_B_lib/lib:/home/CPU2017/amd_rate_aocc400_genoa_B_lib/lib32:"
MALLOC_CONF = "retain:true"

Environment variables set by runcpu during the 523.xalancbmk_r peak run:
MALLOC_CONF = "thp:never"
```

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 configuration:
 SVM Mode set to Disable
 DRAM Scrub time set to Disable
 NUMA nodes per socket set to NPS4
 Determinism Slider set to Power
 cTDP set to 400
 Package Power Limit set to 400

 Sysinfo program /home/CPU2017/bin/sysinfo
 Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
 running on localhost Fri Mar 15 12:04:54 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 250 (250-6.el9_0)
 12. Services, from systemctl list-unit-files
 13. Linux kernel boot-time arguments, from /proc/cmdline
 14. cpupower frequency-info
 15. tuned-adm active
 16. sysctl
 17. /sys/kernel/mm/transparent_hugepage
 18. /sys/kernel/mm/transparent_hugepage/khugepaged
```

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Platform Notes (Continued)

```
 19. OS release
 20. Disk information
 21. /sys/devices/virtual/dmi/id
 22. dmidecode
 23. BIOS
   ----------------------------------------------------------


   ----------------------------------------------------------
 1. uname -a
   Linux localhost 5.14.0-70.22.1.el9_0.x86_64 #1 SMP PREEMPT Tue Aug 2 10:02:12 EDT 2022 x86_64 x86_64 x86_64
   GNU/Linux


   ----------------------------------------------------------
 2. w
    12:04:54 up 2 min,  1 user,  load average: 0.54, 0.57, 0.25
   USER     TTY        LOGIN@   IDLE   JCPU   PCPU WHAT
   root     tty1       12:04   22.00s  1.56s  0.21s /bin/bash ./amd_rate_aocc400_genoa_B1.sh

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


   ----------------------------------------------------------
 4. ulimit -a
   real-time non-blocking time  (microseconds, -R) unlimited
   core file size              (blocks, -c) 0
   data seg size               (kbytes, -d) unlimited
   scheduling priority               (-e) 0
   file size                   (blocks, -f) unlimited
   pending signals                   (-i) 6190844
   max locked memory           (kbytes, -l) 2097152
   max memory size             (kbytes, -m) unlimited
   open files                        (-n) 1024
   pipe size                (512 bytes, -p) 8
   POSIX message queues         (bytes, -q) 819200
   real-time priority                (-r) 0
   stack size                  (kbytes, -s) unlimited
   cpu time                  (seconds, -t) unlimited
   max user processes                (-u) 6190844
   virtual memory              (kbytes, -v) unlimited
   file locks                        (-x) unlimited

   ----------------------------------------------------------
 5. sysinfo process ancestry
   /usr/lib/systemd/systemd --switched-root --system --deserialize 18
   login -- root
   -bash
   python3 ./run_amd_rate_aocc400_genoa_B1.py
   /bin/bash ./amd_rate_aocc400_genoa_B1.sh
   runcpu --config amd_rate_aocc400_genoa_B1.cfg --tune all --reportable --iterations 3 intrate
   runcpu --configfile amd_rate_aocc400_genoa_B1.cfg --tune all --reportable --iterations 3 --nopower --runmode
     rate --tune base:peak --size test:train:refrate intrate --nopreenv --note-preenv --logfile
     $SPEC/tmp/CPU2017.006/templogs/preenv.intrate.006.0.log --lognum 006.0 --from_runcpu 2
   specperl $SPEC/bin/sysinfo
   $SPEC = /home/CPU2017


   ----------------------------------------------------------
 6. /proc/cpuinfo
     model name      : AMD EPYC 9754 128-Core Processor
     vendor_id       : AuthenticAMD
```

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Platform Notes (Continued)

```
       cpu family      : 25
       model           : 160
       stepping        : 1
       microcode       : 0xaa00116
       bugs            : sysret_ss_attrs spectre_v1 spectre_v2 spec_store_bypass
       TLB size        : 3584 4K pages
       cpu cores       : 128
       siblings        : 256
       2 physical ids (chips)
       512 processors (hardware threads)
       physical id 0: core ids 0-127
       physical id 1: core ids 0-127
       physical id 0: apicids 0-255
       physical id 1: apicids 256-511
    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 2.37.4:
      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):                   512
      On-line CPU(s) list:      0-511
      Vendor ID:                AuthenticAMD
      BIOS Vendor ID:           Advanced Micro Devices, Inc.
      Model name:               AMD EPYC 9754 128-Core Processor
      BIOS Model name:          AMD EPYC 9754 128-Core Processor
      CPU family:               25
      Model:                    160
      Thread(s) per core:       2
      Core(s) per socket:       128
      Socket(s):                2
      Stepping:                 1
      Frequency boost:          enabled
      CPU max MHz:              3100.3411
      CPU min MHz:              1500.0000
      BogoMIPS:                 4493.37
      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 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:                8 MiB (256 instances)
      L1i cache:                8 MiB (256 instances)
```

(Continued on next page)

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Platform Notes (Continued)

```
   L2 cache:                    256 MiB (256 instances)
   L3 cache:                    512 MiB (32 instances)
   NUMA node(s):                8
   NUMA node0 CPU(s):           0-31,256-287
   NUMA node1 CPU(s):           32-63,288-319
   NUMA node2 CPU(s):           64-95,320-351
   NUMA node3 CPU(s):           96-127,352-383
   NUMA node4 CPU(s):           128-159,384-415
   NUMA node5 CPU(s):           160-191,416-447
   NUMA node6 CPU(s):           192-223,448-479
   NUMA node7 CPU(s):           224-255,480-511
   Vulnerability Itlb multihit: Not affected
   Vulnerability L1tf:          Not affected
   Vulnerability Mds:           Not affected
   Vulnerability Meltdown:      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; Retpolines, IBPB conditional, IBRS_FW, STIBP always-on, RSB
                                filling
   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       8M    8 Data             1    64        1             64
    L1i       32K       8M    8 Instruction      1    64        1             64
    L2         1M     256M    8 Unified          2  2048        1             64
    L3        16M     512M   16 Unified          3 16384        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: 0-31,256-287
  node 0 size: 193276 MB
  node 0 free: 192291 MB
  node 1 cpus: 32-63,288-319
  node 1 size: 193522 MB
  node 1 free: 192696 MB
  node 2 cpus: 64-95,320-351
  node 2 size: 193522 MB
  node 2 free: 193016 MB
  node 3 cpus: 96-127,352-383
  node 3 size: 193522 MB
  node 3 free: 192892 MB
  node 4 cpus: 128-159,384-415
  node 4 size: 193522 MB
  node 4 free: 192723 MB
  node 5 cpus: 160-191,416-447
  node 5 size: 193522 MB
  node 5 free: 192888 MB
  node 6 cpus: 192-223,448-479
  node 6 size: 193522 MB
  node 6 free: 192137 MB
  node 7 cpus: 224-255,480-511
  node 7 size: 193404 MB
  node 7 free: 192863 MB
  node distances:
  node   0   1   2   3   4   5   6   7
    0:  10  12  12  12  32  32  32  32
```

(Continued on next page)

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Platform Notes (Continued)

```
      1:  12  10  12  12  32  32  32  32
      2:  12  12  10  12  32  32  32  32
      3:  12  12  12  10  32  32  32  32
      4:  32  32  32  32  10  12  12  12
      5:  32  32  32  32  12  10  12  12
      6:  32  32  32  32  12  12  10  12
      7:  32  32  32  32  12  12  12  10


   ----------------------------------------------------------
   9. /proc/meminfo
      MemTotal:       1584963492 kB


   ----------------------------------------------------------
   10. who -r
     run-level 3 Mar 15 12:02


   ----------------------------------------------------------
   11. Systemd service manager version: systemd 250 (250-6.el9_0)
     Default Target  Status
     multi-user      running


   ----------------------------------------------------------
   12. Services, from systemctl list-unit-files
      STATE             UNIT FILES
      enabled           dbus-broker getty@ tuned udisks2 upower
      enabled-runtime   systemd-remount-fs
      disabled          NetworkManager NetworkManager-dispatcher NetworkManager-wait-online auditd
                        blk-availability canberra-system-bootup canberra-system-shutdown
                        canberra-system-shutdown-reboot chrony-wait chronyd console-getty cpupower crond
                        debug-shell firewalld irqbalance kdump kvm_stat lvm2-monitor man-db-restart-cache-update
                        mdmonitor microcode nftables nis-domainname rdisc rhsm rhsm-facts rhsmcertd rpmdb-rebuild
                        rsyslog selinux-autorelabel-mark sep5 serial-getty@ sshd sshd-keygen@ sssd
                        systemd-boot-check-no-failures systemd-network-generator systemd-pstore systemd-sysext
      indirect          sssd-autofs sssd-kcm sssd-nss sssd-pac sssd-pam sssd-ssh sssd-sudo

   ----------------------------------------------------------
   13. Linux kernel boot-time arguments, from /proc/cmdline
      BOOT_IMAGE=(hd0,gpt2)/vmlinuz-5.14.0-70.22.1.el9_0.x86_64
      root=/dev/mapper/rhel-root
      ro
      resume=/dev/mapper/rhel-swap
      rd.lvm.lv=rhel/root
      rd.lvm.lv=rhel/swap


   ----------------------------------------------------------
   14. cpupower frequency-info
     analyzing CPU 0:
       current policy: frequency should be within 1.50 GHz and 2.25 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:  2250MHz


   ----------------------------------------------------------
   15. tuned-adm active
     Current active profile: throughput-performance
```

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Platform Notes (Continued)

```
    ----------------------------------------------------------
    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     Red Hat Enterprise Linux 9.0 (Plow)
      redhat-release Red Hat Enterprise Linux release 9.0 (Plow)
      system-release Red Hat Enterprise Linux release 9.0 (Plow)


    ----------------------------------------------------------
    20. Disk information
    SPEC is set to: /home/CPU2017
      Filesystem          Type  Size  Used Avail Use% Mounted on
      /dev/mapper/rhel-home xfs   819G   29G  790G   4% /home


    ----------------------------------------------------------
    21. /sys/devices/virtual/dmi/id
       Vendor:         KAYTUS
       Product:        KR1280-E2-A0-R0-00
       Product Family: Not specified
       Serial:         000000000
```

(Continued on next page)

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Platform Notes (Continued)

```
----------------------------------------------------------------
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:
     3x Hynix HMCG94MEBRA109N 64 GB 2 rank 4800
     6x Samsung M329R8GA0BB0-CQKDG 64 GB 2 rank 4800
     10x Samsung M329R8GA0BB0-CQKEG 64 GB 2 rank 4800
     5x Samsung M329R8GA0BB0-CQKVG 64 GB 2 rank 4800


----------------------------------------------------------------
23. BIOS
(This section combines info from /sys/devices and dmidecode.)
   BIOS Vendor:       American Megatrends International, LLC.
   BIOS Version:      04.02.28
   BIOS Date:         01/04/2024
```

Compiler Version Notes

```
==============================================================================
C       | 502.gcc_r(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: i386-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-4.0-3206-389/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 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       | 502.gcc_r(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: i386-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-4.0-3206-389/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 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
------------------------------------------------------------------------------
```

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SPEC CPU®2017 Integer Rate Result

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Kaytus Systems Pte. Ltd.
KR1280E2 (AMD EPYC 9754)

SPECrate®2017_int_base = 1930

SPECrate®2017_int_peak = 2100

CPU2017 License: 6865
Test Sponsor: Kaytus Systems Pte. Ltd.
Tested by: Kaytus Systems Pte. Ltd.

Test Date: Mar-2024
Hardware Availability: Feb-2023
Software Availability: Nov-2022

Compiler Version Notes (Continued)

```
==================================================================================================
C++      | 523.xalancbmk_r(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: i386-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-4.0-3206-389/bin
--------------------------------------------------------------------------------------------------


==================================================================================================
C++      | 520.omnetpp_r(base, peak) 523.xalancbmk_r(base) 531.deepsjeng_r(base, peak) 541.leela_r(base,
         | peak)
--------------------------------------------------------------------------------------------------
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#389 2022_10_07) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-4.0-3206-389/bin
--------------------------------------------------------------------------------------------------


==================================================================================================
C++      | 523.xalancbmk_r(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: i386-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-4.0-3206-389/bin
--------------------------------------------------------------------------------------------------


==================================================================================================
C++      | 520.omnetpp_r(base, peak) 523.xalancbmk_r(base) 531.deepsjeng_r(base, peak) 541.leela_r(base,
         | peak)
--------------------------------------------------------------------------------------------------
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#389 2022_10_07) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-4.0-3206-389/bin
--------------------------------------------------------------------------------------------------


==================================================================================================
Fortran  | 548.exchange2_r(base, peak)
--------------------------------------------------------------------------------------------------
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#389 2022_10_07) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-4.0-3206-389/bin
--------------------------------------------------------------------------------------------------
```

Base Compiler Invocation

C benchmarks:
clang

C++ benchmarks:
clang++

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Kaytus Systems Pte. Ltd.
KR1280E2 (AMD EPYC 9754)

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Test Date: Mar-2024
Hardware Availability: Feb-2023
Software Availability: Nov-2022

Base Compiler Invocation (Continued)

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`

Base Optimization Flags

C benchmarks:
```
-m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-ldist-scalar-expand -fenable-aggressive-gather
-z muldefs -O3 -march=znver4 -fveclib=AMDLIBM -ffast-math
-fstruct-layout=7 -mllvm -unroll-threshold=50
-mllvm -inline-threshold=1000 -fremap-arrays -fstrip-mining
-mllvm -reduce-array-computations=3 -zopt -lamdlibm -lflang
-lamdalloc
```

C++ benchmarks:
```
-m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3 -z muldefs -O3
-march=znver4 -fveclib=AMDLIBM -ffast-math
-mllvm -unroll-threshold=100 -finline-aggressive
-mllvm -loop-unswitch-threshold=200000
-mllvm -reduce-array-computations=3 -zopt
-fvirtual-function-elimination -fvisibility=hidden -lamdlibm -lflang
-lamdalloc-ext
```

Fortran benchmarks:
```
-m64 -flto -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
```

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Kaytus Systems Pte. Ltd.
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SPECrate®2017_int_peak = 2100

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Test Date: Mar-2024
Hardware Availability: Feb-2023
Software Availability: Nov-2022

Base Optimization Flags (Continued)

Fortran benchmarks (continued):
```
-Wl,-mllvm -Wl,-enable-iv-split -z muldefs -O3 -march=znver4
-fveclib=AMDLIBM -ffast-math -fepilog-vectorization-of-inductions
-mllvm -optimize-strided-mem-cost -floop-transform
-mllvm -unroll-aggressive -mllvm -unroll-threshold=500 -lamdlibm
-lflang -lamdalloc
```

Base Other Flags

C benchmarks:
```
-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

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`

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Kaytus Systems Pte. Ltd.
KR1280E2 (AMD EPYC 9754)

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SPECrate®2017_int_peak = 2100

CPU2017 License: 6865
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Tested by: Kaytus Systems Pte. Ltd.

Test Date: Mar-2024
Hardware Availability: Feb-2023
Software Availability: Nov-2022

Peak Portability Flags (Continued)

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 -z muldefs -Ofast -march=znver4`
`-fveclib=AMDLIBM -ffast-math -fstruct-layout=7`
`-mllvm -unroll-threshold=50 -fremap-arrays -fstrip-mining`
`-mllvm -inline-threshold=1000`
`-mllvm -reduce-array-computations=3 -zopt -fgnu89-inline`
`-lamdalloc`

505.mcf_r: `basepeak = yes`

525.x264_r: `basepeak = yes`

557.xz_r: `-m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6`
`-Wl,-mllvm -Wl,-reduce-array-computations=3 -Ofast`
`-march=znver4 -fveclib=AMDLIBM -ffast-math`
`-fstruct-layout=7 -mllvm -unroll-threshold=50`
`-fremap-arrays -fstrip-mining`
`-mllvm -inline-threshold=1000`
`-mllvm -reduce-array-computations=3 -zopt -lamdlibm`
`-lflang -lamdalloc`

C++ benchmarks:

520.omnetpp_r: `basepeak = yes`

523.xalancbmk_r: `-m32 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6`
`-Wl,-mllvm -Wl,-reduce-array-computations=3`
`-Wl,-mllvm -Wl,-do-block-reorder=aggressive`
`-fno-loop-reroll -Ofast -march=znver4 -fveclib=AMDLIBM`
`-ffast-math -finline-aggressive`
`-mllvm -unroll-threshold=100`
`-mllvm -reduce-array-computations=3 -zopt`
`-mllvm -do-block-reorder=aggressive`
`-fvirtual-function-elimination -fvisibility=hidden`
`-lamdalloc-ext`

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SPEC CPU®2017 Integer Rate Result

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Test Date: Mar-2024
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Software Availability: Nov-2022

Peak Optimization Flags (Continued)

531.deepsjeng_r: `basepeak = yes`

541.leela_r: `basepeak = yes`

Fortran benchmarks:
```
-m64 -flto -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 -fepilog-vectorization-of-inductions
-mllvm -optimize-strided-mem-cost -floop-transform
-mllvm -unroll-aggressive -mllvm -unroll-threshold=500 -lamdlibm
-lflang -lamdalloc
```

Peak Other Flags

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

502.gcc_r: `-L/usr/lib32 -Wno-unused-command-line-argument`
`-L/home/work/cpu2017/v118/aocc4/b1/rate/amd_rate_aocc400_genoa_B_lib/lib32`

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

523.xalancbmk_r: `-L/usr/lib32 -Wno-unused-command-line-argument`
`-L/home/work/cpu2017/v118/aocc4/b1/rate/amd_rate_aocc400_genoa_B_lib/lib32`

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/Kaytus-Platform-Settings-amd-V1.0.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/Kaytus-Platform-Settings-amd-V1.0.xml

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

SPEC CPU®2017 Integer Rate Result

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

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