SPEC CPU®2017 Integer Rate Result

Copyright 2017-2023 Standard Performance Evaluation Corporation

Dell Inc.

PowerEdge C6615 (AMD EPYC 8534P 64-Core Processor)

$SPECrate^{®}2017\_int\_base = 476$

$SPECrate^{®}2017\_int\_peak = 519$
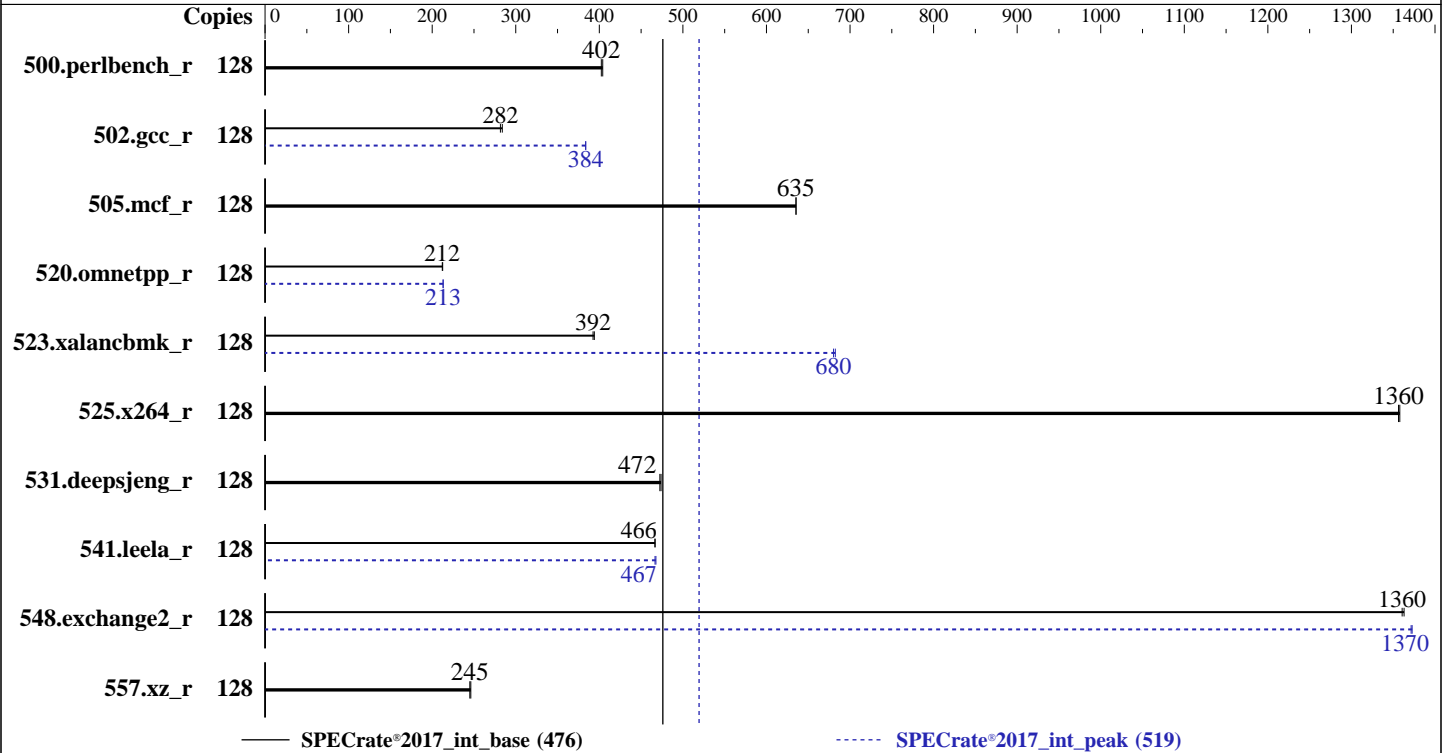
CPU2017 License: 6573

Test Sponsor: Dell Inc.

Tested by: Dell Inc.

Test Date: Aug-2023

Hardware Availability: Sep-2023

Software Availability: Jul-2023

Benchmark	Copies	base	peak
500.perlbench_r	128	402	
502.gcc_r	128	282	384
505.mcf_r	128	635	
520.omnetpp_r	128	212	213
523.xalancbmk_r	128	392	680
525.x264_r	128	1360	
531.deepsjeng_r	128	472	
541.leela_r	128	466	467
548.exchange2_r	128	1360	1370
557.xz_r	128	245	

SPECrate®2017_int_base (476) SPECrate®2017_int_peak (519)

Hardware

CPU Name: AMD EPYC 8534P

 Max MHz: 3100

 Nominal: 2300

Enabled: 64 cores, 1 chip, 2 threads/core

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: 128 MB I+D on chip per chip, 16 MB shared / 8 cores

 Other: None

Memory: 192 GB (6 x 32 GB 2Rx8 PC5-4800B-R)

Storage: 80 GB on tmpfs

Other: None

Software

OS: Ubuntu 22.04.2 LTS
 5.15.0-78-generic

Compiler: C/C++/Fortran: Version 4.0.0 of AOCC

Parallel: No

Firmware: Version 1.0.2 released Jul-2023

File System: tmpfs

System State: Run level 5 (graphical multi-user)

Base Pointers: 64-bit

Peak Pointers: 32/64-bit

Other: None

Power Management: BIOS and OS set to prefer performance at the cost of additional power usage.

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Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
500.perlbench_r	128	504	404	**506**	**402**			128	504	404	**506**	**402**		
502.gcc_r	128	638	284	**644**	**282**			128	**472**	**384**	472	384		
505.mcf_r	128	**326**	**635**	326	635			128	**326**	**635**	326	635		
520.omnetpp_r	128	**792**	**212**	790	213			128	**788**	**213**	788	213		
523.xalancbmk_r	128	343	394	**344**	**392**			128	**199**	**680**	198	682		
525.x264_r	128	165	1360	**165**	**1360**			128	165	1360	**165**	**1360**		
531.deepsjeng_r	128	310	474	**310**	**472**			128	310	474	**310**	**472**		
541.leela_r	128	**454**	**466**	454	467			128	**454**	**467**	453	468		
548.exchange2_r	128	246	1360	**246**	**1360**			128	**245**	**1370**	244	1370		
557.xz_r	128	561	246	**564**	**245**			128	561	246	**564**	**245**		

SPECrate®2017_int_base =	**476**
SPECrate®2017_int_peak =	**519**

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:
LD_LIBRARY_PATH =
     "/mnt/ramdisk/cpu2017-1.1.9-aocc400-znver4-A1/amd_rate_aocc400_znver4_A_lib/lib:/mnt/ramdisk/cpu2017-1
     .1.9-aocc400-znver4-A1/amd_rate_aocc400_znver4_A_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.


 Benchmark run from a 80 GB ramdisk created with the cmd: "mount -t tmpfs -o size=80G tmpfs /mnt/ramdisk"
```

Platform Notes

```
 BIOS settings:
            DRAM Refresh Delay : Performance
         DIMM Self Healing on
    Uncorrectable Memory Error : Disabled
     Virtualization Technology : Disabled
          NUMA Nodes per Socket : 4
      L3 Cache as NUMA Domain : Enabled

                System Profile : Custom
           Memory Patrol Scrub : Disabled
          PCI ASPM L1 Link
               Power Management : Disabled
            Determinism Slider : Power Determinism

 Sysinfo program /mnt/ramdisk/cpu2017-1.1.9-aocc400-znver4-A1/bin/sysinfo
 Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
 running on nt2 Mon Aug 14 21:50:30 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
```

(Continued on next page)

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Platform Notes (Continued)

```
 9. /proc/meminfo
10. who -r
11. Systemd service manager version: systemd 249 (249.11-0ubuntu3.7)
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
19. OS release
20. Disk information
21. /sys/devices/virtual/dmi/id
22. dmidecode
23. BIOS
    ----------------------------------------------------------


    ----------------------------------------------------------
1. uname -a
   Linux nt2 5.15.0-78-generic #85-Ubuntu SMP Fri Jul 7 15:25:09 UTC 2023 x86_64 x86_64 x86_64 GNU/Linux


    ----------------------------------------------------------
2. w
    21:50:30 up 4 min,  2 users,  load average: 0.30, 0.12, 0.04
   USER     TTY      FROM             LOGIN@   IDLE   JCPU   PCPU WHAT
   dell     tty1     -                21:47    2:52   0.21s  0.00s -bash
   dell     pts/0    -                21:47    38.00s 1.45s  0.18s sudo su


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


    ----------------------------------------------------------
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              770612
   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
   /bin/bash ./DELL_rate.sh
   /bin/bash ./dell-run-main.sh rate
   /bin/bash ./dell-run-main.sh rate
```

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Platform Notes (Continued)

```
 /bin/bash ./dell-run-speccpu.sh rate --define DL-BIOSinc=Dell-BIOS_EPYC-4.inc --define DL-BIOS-VirtD=1
   --define DL-VERS=v4.6 --output_format html,pdf,txt
 python3 ./run_amd_rate_aocc400_znver4_A1.py
 /bin/bash ./amd_rate_aocc400_znver4_A1.sh
 runcpu --config amd_rate_aocc400_znver4_A1.cfg --tune all --reportable --iterations 2 --define
   DL-BIOSinc=Dell-BIOS_EPYC-4.inc --define DL-BIOS-VirtD=1 --define DL-VERS=v4.6 --output_format
   html,pdf,txt intrate
 runcpu --configfile amd_rate_aocc400_znver4_A1.cfg --tune all --reportable --iterations 2 --define
   DL-BIOSinc=Dell-BIOS_EPYC-4.inc --define DL-BIOS-VirtD=1 --define DL-VERS=v4.6 --output_format
   html,pdf,txt --nopower --runmode rate --tune base:peak --size test:train:refrate intrate --nopreenv
   --note-preenv --logfile $SPEC/tmp/CPU2017.001/templogs/preenv.intrate.001.0.log --lognum 001.0
   --from_runcpu 2
 specperl $SPEC/bin/sysinfo
$SPEC = /mnt/ramdisk/cpu2017-1.1.9-aocc400-znver4-A1


  ---------------------------------------------------------------
6. /proc/cpuinfo
    model name       : AMD EPYC 8534P 64-Core Processor
    vendor_id        : AuthenticAMD
    cpu family       : 25
    model            : 160
    stepping         : 2
    microcode        : 0xaa00212
    bugs             : sysret_ss_attrs spectre_v1 spectre_v2 spec_store_bypass
    TLB size         : 3584 4K pages
    cpu cores        : 64
    siblings         : 128
    1 physical ids (chips)
    128 processors (hardware threads)
    physical id 0: core ids 0-63
    physical id 0: apicids 0-127
  Caution: /proc/cpuinfo data regarding chips, cores, and threads is not necessarily reliable, especially for
  virtualized systems.  Use the above data carefully.


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

From lscpu from util-linux 2.37.2:
  Architecture:           x86_64
  CPU op-mode(s):         32-bit, 64-bit
  Address sizes:          52 bits physical, 57 bits virtual
  Byte Order:             Little Endian
  CPU(s):                 128
  On-line CPU(s) list:    0-127
  Vendor ID:              AuthenticAMD
  Model name:             AMD EPYC 8534P 64-Core Processor
  CPU family:             25
  Model:                  160
  Thread(s) per core:     2
  Core(s) per socket:     64
  Socket(s):              1
  Stepping:               2
  Frequency boost:        enabled
  CPU max MHz:            3101.8550
  CPU min MHz:            1500.0000
  BogoMIPS:               4593.22
  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
```

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Platform Notes (Continued)

```
               popcnt aes xsave avx f16c rdrand lahf_lm cmp_legacy svm extapic cr8_legacy
               abm sse4a misalignsse 3dnowprefetch osvw ibs skinit wdt tce topoext
               perfctr_core perfctr_nb bpext perfctr_llc mwaitx cpb cat_l3 cdp_l3
               invpcid_single hw_pstate ssbd mba ibrs ibpb stibp vmmcall fsgsbase bmi1
               avx2 smep bmi2 erms invpcid cqm rdt_a avx512f avx512dq rdseed adx smap
               avx512ifma clflushopt clwb avx512cd sha_ni avx512bw avx512vl xsaveopt
               xsavec xgetbv1 xsaves cqm_llc cqm_occup_llc cqm_mbm_total cqm_mbm_local
               avx512_bf16 clzero irperf xsaveerptr rdpru wbnoinvd amd_ppin cppc arat npt
               lbrv svm_lock nrip_save tsc_scale vmcb_clean flushbyasid decodeassists
               pausefilter pfthreshold avic v_vmsave_vmload vgif v_spec_ctrl avx512vbmi
               umip pku ospke avx512_vbmi2 gfni vaes vpclmulqdq avx512_vnni avx512_bitalg
               avx512_vpopcntdq la57 rdpid overflow_recov succor smca fsrm flush_l1d
   Virtualization:         AMD-V
   L1d cache:              2 MiB (64 instances)
   L1i cache:              2 MiB (64 instances)
   L2 cache:               64 MiB (64 instances)
   L3 cache:               128 MiB (8 instances)
   NUMA node(s):           1
   NUMA node0 CPU(s):      0-127
   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 always-on, RSB
                                  filling, PBRSB-eIBRS Not affected
   Vulnerability Srbds:           Not affected
   Vulnerability Tsx async abort: Not affected

 From lscpu --cache:
     NAME ONE-SIZE ALL-SIZE WAYS TYPE        LEVEL  SETS PHY-LINE COHERENCY-SIZE
     L1d      32K       2M   8 Data          1     64      1             64
     L1i      32K       2M   8 Instruction   1     64      1             64
     L2        1M      64M   8 Unified       2   2048      1             64
     L3       16M     128M  16 Unified       3  16384      1             64

 --------------------------------------------------------------
 8. numactl --hardware
 NOTE: a numactl 'node' might or might not correspond to a physical chip.
   available: 1 nodes (0)
   node 0 cpus: 0-127
   node 0 size: 192767 MB
   node 0 free: 188153 MB
   node distances:
   node   0
     0:  10


 --------------------------------------------------------------
 9. /proc/meminfo
   MemTotal:      197393572 kB


 --------------------------------------------------------------
 10. who -r
   run-level 5 Aug 14 21:46

 --------------------------------------------------------------
 11. Systemd service manager version: systemd 249 (249.11-0ubuntu3.7)
```

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Platform Notes (Continued)

```
  Default Target  Status
  graphical       running


  -------------------------------------------------------------
12. Services, from systemctl list-unit-files
  STATE             UNIT FILES
  enabled           apparmor blk-availability cloud-config cloud-final cloud-init cloud-init-local
                    console-setup e2scrub_reap finalrd getty@ gpu-manager grub-common grub-initrd-fallback
                    keyboard-setup lm-sensors lvm2-monitor multipathd networkd-dispatcher open-iscsi pollinate
                    secureboot-db setvtrgb ssh systemd-networkd systemd-networkd-wait-online systemd-pstore
                    systemd-resolved systemd-timesyncd thermald tuned
  enabled-runtime   netplan-ovs-cleanup systemd-fsck-root systemd-remount-fs
  disabled          console-getty debug-shell iscsid rsync serial-getty@ systemd-boot-check-no-failures
                    systemd-network-generator systemd-sysext systemd-time-wait-sync upower
  generated         apport
  masked            cryptdisks cryptdisks-early hwclock lvm2 multipath-tools-boot rc rcS sudo x11-common

  -------------------------------------------------------------
13. Linux kernel boot-time arguments, from /proc/cmdline
  BOOT_IMAGE=/vmlinuz-5.15.0-78-generic
  root=/dev/mapper/ubuntu--vg-ubuntu--lv
  ro

  -------------------------------------------------------------
14. cpupower frequency-info
  analyzing CPU 0:
    current policy: frequency should be within 1.50 GHz and 2.30 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:  2300MHz

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

  -------------------------------------------------------------
16. sysctl
  kernel.numa_balancing             0
  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
```

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Platform Notes (Continued)

```
   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 22.04.2 LTS


  ----------------------------------------------------------------
  20. Disk information
  SPEC is set to: /mnt/ramdisk/cpu2017-1.1.9-aocc400-znver4-A1
    Filesystem      Type   Size  Used Avail Use% Mounted on
    tmpfs           tmpfs   80G  3.5G   77G   5% /mnt/ramdisk


  ----------------------------------------------------------------
  21. /sys/devices/virtual/dmi/id
     Vendor:         Dell Inc.
     Product:        PowerEdge C6615
     Product Family: PowerEdge
     Serial:         SC665C2


  ----------------------------------------------------------------
  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:
      6x 80CE000080CE M321R4GA3BB6-CQKVG 32 GB 2 rank 4800



  ----------------------------------------------------------------
  23. BIOS
  (This section combines info from /sys/devices and dmidecode.)
    BIOS Vendor:      Dell Inc.
    BIOS Version:     1.0.2
    BIOS Date:        07/26/2023
    BIOS Revision:    1.0
```

Compiler Version Notes

```
==========================================================================================
C        | 502.gcc_r(peak)
```

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Compiler Version Notes (Continued)

```
--------------------------------------------------------------------------------
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: i386-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/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#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        | 502.gcc_r(peak)
--------------------------------------------------------------------------------
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#434 2022_10_28) (based on LLVM Mirror.Version.14.0.6)
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--------------------------------------------------------------------------------


================================================================================
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#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++      | 523.xalancbmk_r(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: i386-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/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#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++      | 523.xalancbmk_r(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: i386-unknown-linux-gnu
```

(Continued on next page)

Dell Inc.

SPECrate®2017_int_base = 476

SPECrate®2017_int_peak = 519

PowerEdge C6615 (AMD EPYC 8534P 64-Core Processor)

CPU2017 License: 6573
Test Sponsor: Dell Inc.
Tested by: Dell Inc.

Test Date: Aug-2023
Hardware Availability: Sep-2023
Software Availability: Jul-2023

Compiler Version Notes (Continued)

```
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/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#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 | 548.exchange2_r(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`

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`

SPEC CPU®2017 Integer Rate Result

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Dell Inc.

PowerEdge C6615 (AMD EPYC 8534P 64-Core Processor)

$SPECrate^®2017\_int\_base = 476$

$SPECrate^®2017\_int\_peak = 519$

CPU2017 License: 6573		**Test Date:**	Aug-2023
Test Sponsor: Dell Inc.		**Hardware Availability:**	Sep-2023
Tested by: Dell Inc.		**Software Availability:**	Jul-2023

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
-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
```

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CPU2017 License: 6573		**Test Date:**	Aug-2023
Test Sponsor:	Dell Inc.	**Hardware Availability:**	Sep-2023
Tested by:	Dell Inc.	**Software Availability:**	Jul-2023

Peak Compiler Invocation

C benchmarks:
`clang`

C++ benchmarks:
`clang++`

Fortran benchmarks:
`flang`

Peak Portability Flags

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

Peak Optimization Flags

C benchmarks:

500.perlbench_r: `basepeak = yes`

502.gcc_r: `-m32 -flto -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: `basepeak = yes`

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PowerEdge C6615 (AMD EPYC 8534P 64-Core Processor)

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CPU2017 License: 6573	**Test Date:** Aug-2023
Test Sponsor: Dell Inc.	**Hardware Availability:** Sep-2023
Tested by: Dell Inc.	**Software Availability:** Jul-2023

Peak Optimization Flags (Continued)

C++ benchmarks:

520.omnetpp_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`
`-finline-aggressive -mllvm -unroll-threshold=100`
`-mllvm -reduce-array-computations=3 -zopt`
`-fvirtual-function-elimination -fvisibility=hidden`
`-lamdlibm -lamdalloc-ext`

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`

531.deepsjeng_r: `basepeak = yes`

541.leela_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`
`-finline-aggressive -mllvm -unroll-threshold=100`
`-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`
`-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`

SPEC CPU®2017 Integer Rate Result

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Test Date: Aug-2023
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Software Availability: Jul-2023

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/v119/aocc4/znver4/rate/amd_rate_aocc400_znver4_A_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/v119/aocc4/znver4/rate/amd_rate_aocc400_znver4_A_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/Dell-Platform-Flags-PowerEdge-AMD-EPYC-v1.1.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/Dell-Platform-Flags-PowerEdge-AMD-EPYC-v1.1.xml`

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

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