SPEC CPU®2017 Integer Rate Result

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Supermicro

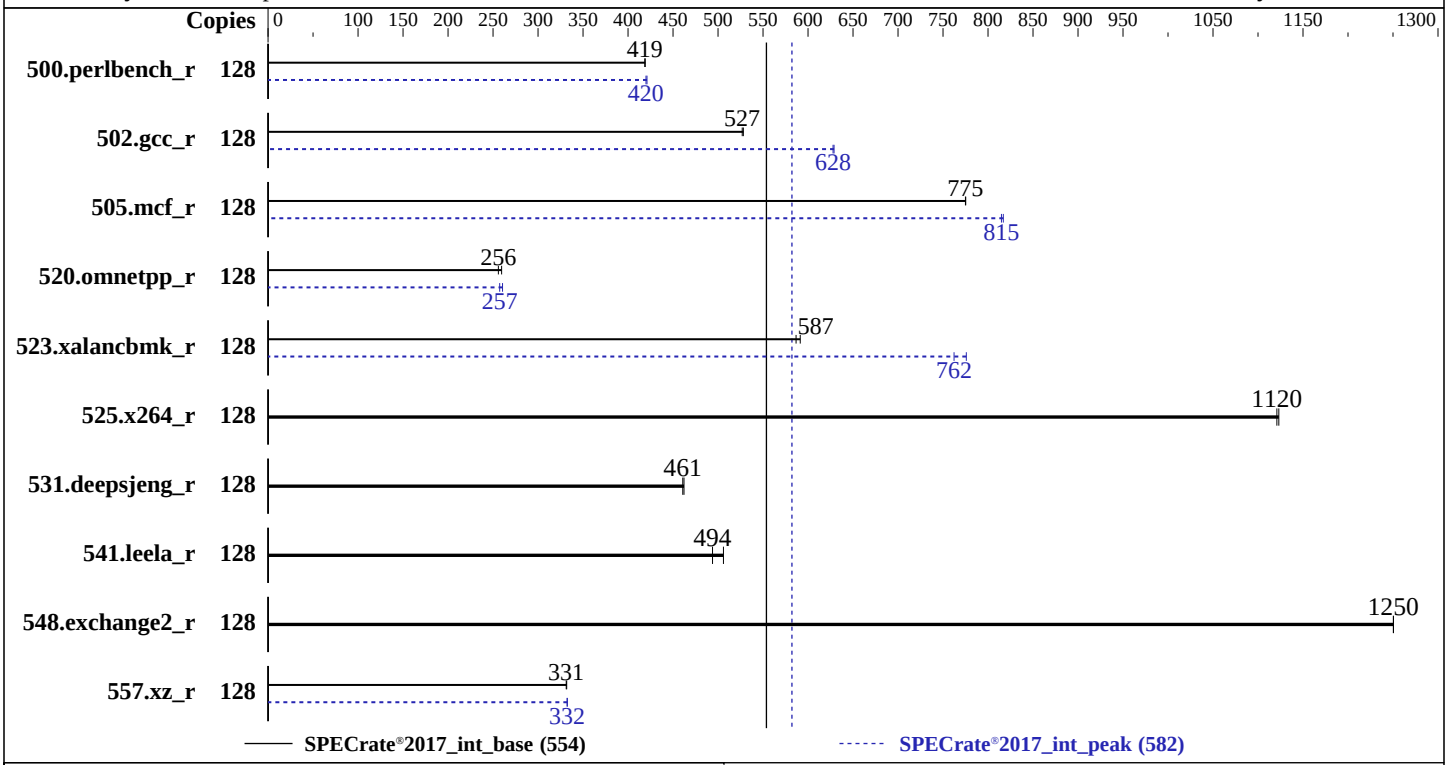
A+ Server 2024US-TRT
(H12DSU-iN , AMD EPYC 7573X)

SPECrate®2017_int_base = 554

SPECrate®2017_int_peak = 582

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

Test Date: Feb-2022
Hardware Availability: Mar-2022
Software Availability: Feb-2022



Hardware

CPU Name:	AMD EPYC 7573X
Max MHz:	3600
Nominal:	2800
Enabled:	64 cores, 2 chips, 2 threads/core
Orderable:	1,2 chips
Cache L1:	32 KB I + 32 KB D on chip per core
L2:	512 KB I+D on chip per core
L3:	768 MB I+D on chip per chip, 96 MB shared / 4 cores
Other:	None
Memory:	1 TB (16 x 64 GB 2Rx4 PC4-3200AA-R)
Storage:	1 x 200 GB SATA III SSD
Other:	None

Software

OS:	Ubuntu 20.04.3 LTS Kernel 5.4.0-99-generic
Compiler:	C/C++/Fortran: Version 3.2.0 of AOCC
Parallel:	No
Firmware:	Version 2.3a released Jan-2022
File System:	ext4
System State:	Run level 3 (multi-user)
Base Pointers:	64-bit
Peak Pointers:	32/64-bit
Other:	jemalloc: jemalloc memory allocator library v5.1.0
Power Management:	BIOS and OS set to prefer performance at the cost of additional power usage.

Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
500.perlbench_r	128	**487**	**419**	486	419			128	484	421	**485**	**420**		
502.gcc_r	128	343	528	**344**	**527**			128	288	629	**289**	**628**		
505.mcf_r	128	**267**	**775**	267	775			128	**254**	**815**	253	817		
520.omnetpp_r	128	**656**	**256**	647	260			128	**652**	**257**	645	261		
523.xalancbmk_r	128	229	591	**230**	**587**			128	174	776	**177**	**762**		
525.x264_r	128	200	1120	**200**	**1120**			128	200	1120	**200**	**1120**		
531.deepsjeng_r	128	**318**	**461**	317	462			128	**318**	**461**	317	462		
541.leela_r	128	419	506	**429**	**494**			128	419	506	**429**	**494**		
548.exchange2_r	128	**268**	**1250**	268	1250			128	**268**	**1250**	268	1250		
557.xz_r	128	**417**	**331**	417	332			128	**416**	**332**	416	333		

SPECrate®2017_int_base = 554

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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.
```

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Operating System Notes (Continued)

```
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.
```

Environment Variables Notes

```
Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH =
     "/home/cpu2017/amd_rate_aocc320_milanx_A_lib/lib;/home/cpu2017/amd_rate_
     aocc320_milanx_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 7742 CPU + 1TiB Memory using OpenSUSE 15.2

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.

jemalloc: configured and built with GCC v4.8.2 in RHEL 7.4 (No options specified)
jemalloc 5.1.0 is available here:
https://github.com/jemalloc/jemalloc/releases/download/5.1.0/jemalloc-5.1.0.tar.bz2
```

Platform Notes

```
BIOS Settings:
Determinism Control = Manual
Determinism Slider = Power
cTDP Control = Manual
cTDP = 280
Package Power Limit Control = Manual
Package Power Limit = 280
```

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Platform Notes (Continued)

```
APBDIS = 1
NUMA Nodes Per Socket = NPS4

 Sysinfo program /home/cpu2017/bin/sysinfo
 Rev: r6622 of 2021-04-07 982a61ec0915b55891ef0e16acafc64d
 running on h12dsu-7573x Thu Feb 17 07:06:31 2022

 SUT (System Under Test) info as seen by some common utilities.
 For more information on this section, see
    https://www.spec.org/cpu2017/Docs/config.html#sysinfo

 From /proc/cpuinfo
    model name : AMD EPYC 7573X 32-Core Processor
       2  "physical id"s (chips)
       128 "processors"
    cores, siblings (Caution: counting these is hw and system dependent. The following
    excerpts from /proc/cpuinfo might not be reliable.  Use with caution.)
       cpu cores : 32
       siblings  : 64
       physical 0: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
       25 26 27 28 29 30 31
       physical 1: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
       25 26 27 28 29 30 31

 From lscpu from util-linux 2.34:
      Architecture:                    x86_64
      CPU op-mode(s):                  32-bit, 64-bit
      Byte Order:                      Little Endian
      Address sizes:                   48 bits physical, 48 bits virtual
      CPU(s):                          128
      On-line CPU(s) list:             0-127
      Thread(s) per core:              2
      Core(s) per socket:              32
      Socket(s):                       2
      NUMA node(s):                    16
      Vendor ID:                       AuthenticAMD
      CPU family:                      25
      Model:                           1
      Model name:                      AMD EPYC 7573X 32-Core Processor
      Stepping:                        2
      Frequency boost:                 enabled
      CPU MHz:                         1900.176
      CPU max MHz:                     2800.0000
      CPU min MHz:                     1500.0000
      BogoMIPS:                        5599.72
      Virtualization:                  AMD-V
      L1d cache:                       2 MiB
```

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Platform Notes (Continued)

```
      L1i cache:                       2 MiB
      L2 cache:                        32 MiB
      L3 cache:                        1.5 GiB
      NUMA node0 CPU(s):               0-3,64-67
      NUMA node1 CPU(s):               4-7,68-71
      NUMA node2 CPU(s):               8-11,72-75
      NUMA node3 CPU(s):               12-15,76-79
      NUMA node4 CPU(s):               16-19,80-83
      NUMA node5 CPU(s):               20-23,84-87
      NUMA node6 CPU(s):               24-27,88-91
      NUMA node7 CPU(s):               28-31,92-95
      NUMA node8 CPU(s):               32-35,96-99
      NUMA node9 CPU(s):               36-39,100-103
      NUMA node10 CPU(s):              40-43,104-107
      NUMA node11 CPU(s):              44-47,108-111
      NUMA node12 CPU(s):              48-51,112-115
      NUMA node13 CPU(s):              52-55,116-119
      NUMA node14 CPU(s):              56-59,120-123
      NUMA node15 CPU(s):              60-63,124-127
      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 and seccomp
      Vulnerability Spectre v1:        Mitigation; usercopy/swapgs barriers and __user
      pointer sanitization
      Vulnerability Spectre v2:        Mitigation; Full AMD retpoline, IBPB conditional,
      IBRS_FW, STIBP always-on, RSB filling
      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 pni pclmulqdq monitor ssse3 fma cx16 pcid sse4_1 sse4_2 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 invpcid cqm rdt_a rdseed adx smap
      clflushopt clwb sha_ni xsaveopt xsavec xgetbv1 xsaves cqm_llc cqm_occup_llc
      cqm_mbm_total cqm_mbm_local clzero irperf xsaveerptr wbnoinvd arat npt lbrv svm_lock
      nrip_save tsc_scale vmcb_clean flushbyasid decodeassists pausefilter pfthreshold
      v_vmsave_vmload vgif umip pku ospke vaes vpclmulqdq rdpid overflow_recov succor smca

  From lscpu --cache:
      NAME ONE-SIZE ALL-SIZE WAYS TYPE        LEVEL
      L1d       32K       2M    8 Data            1
```

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Platform Notes (Continued)

```
      L1i       32K       2M    8 Instruction     1
      L2       512K      32M    8 Unified         2
      L3        96M     1.5G   16 Unified         3

  /proc/cpuinfo cache data
     cache size : 512 KB

  From numactl --hardware
  WARNING: a numactl 'node' might or might not correspond to a physical chip.
    available: 16 nodes (0-15)
    node 0 cpus: 0 1 2 3 64 65 66 67
    node 0 size: 64380 MB
    node 0 free: 63807 MB
    node 1 cpus: 4 5 6 7 68 69 70 71
    node 1 size: 64507 MB
    node 1 free: 64323 MB
    node 2 cpus: 8 9 10 11 72 73 74 75
    node 2 size: 64509 MB
    node 2 free: 64346 MB
    node 3 cpus: 12 13 14 15 76 77 78 79
    node 3 size: 64508 MB
    node 3 free: 64371 MB
    node 4 cpus: 16 17 18 19 80 81 82 83
    node 4 size: 64509 MB
    node 4 free: 64331 MB
    node 5 cpus: 20 21 22 23 84 85 86 87
    node 5 size: 64508 MB
    node 5 free: 64337 MB
    node 6 cpus: 24 25 26 27 88 89 90 91
    node 6 size: 64509 MB
    node 6 free: 64368 MB
    node 7 cpus: 28 29 30 31 92 93 94 95
    node 7 size: 64496 MB
    node 7 free: 64349 MB
    node 8 cpus: 32 33 34 35 96 97 98 99
    node 8 size: 64509 MB
    node 8 free: 64337 MB
    node 9 cpus: 36 37 38 39 100 101 102 103
    node 9 size: 64508 MB
    node 9 free: 64291 MB
    node 10 cpus: 40 41 42 43 104 105 106 107
    node 10 size: 64509 MB
    node 10 free: 64305 MB
    node 11 cpus: 44 45 46 47 108 109 110 111
    node 11 size: 64480 MB
    node 11 free: 64317 MB
    node 12 cpus: 48 49 50 51 112 113 114 115
```

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Platform Notes (Continued)

```
   node 12 size: 64509 MB
   node 12 free: 64341 MB
   node 13 cpus: 52 53 54 55 116 117 118 119
   node 13 size: 64508 MB
   node 13 free: 64348 MB
   node 14 cpus: 56 57 58 59 120 121 122 123
   node 14 size: 64509 MB
   node 14 free: 64296 MB
   node 15 cpus: 60 61 62 63 124 125 126 127
   node 15 size: 64507 MB
   node 15 free: 64275 MB
   node distances:
   node   0   1   2   3   4   5   6   7   8   9  10  11  12  13  14  15
     0:  10  11  12  12  12  12  12  12  32  32  32  32  32  32  32  32
     1:  11  10  12  12  12  12  12  12  32  32  32  32  32  32  32  32
     2:  12  12  10  11  12  12  12  12  32  32  32  32  32  32  32  32
     3:  12  12  11  10  12  12  12  12  32  32  32  32  32  32  32  32
     4:  12  12  12  12  10  11  12  12  32  32  32  32  32  32  32  32
     5:  12  12  12  12  11  10  12  12  32  32  32  32  32  32  32  32
     6:  12  12  12  12  12  12  10  11  32  32  32  32  32  32  32  32
     7:  12  12  12  12  12  12  11  10  32  32  32  32  32  32  32  32
     8:  32  32  32  32  32  32  32  32  10  11  12  12  12  12  12  12
     9:  32  32  32  32  32  32  32  32  11  10  12  12  12  12  12  12
    10:  32  32  32  32  32  32  32  32  12  12  10  11  12  12  12  12
    11:  32  32  32  32  32  32  32  32  12  12  11  10  12  12  12  12
    12:  32  32  32  32  32  32  32  32  12  12  12  12  10  11  12  12
    13:  32  32  32  32  32  32  32  32  12  12  12  12  11  10  12  12
    14:  32  32  32  32  32  32  32  32  12  12  12  12  12  12  10  11
    15:  32  32  32  32  32  32  32  32  12  12  12  12  12  12  11  10

  From /proc/meminfo
     MemTotal:       1056746436 kB
     HugePages_Total:       0
     Hugepagesize:       2048 kB

  /sbin/tuned-adm active
      Current active profile: throughput-performance

  /sys/devices/system/cpu/cpu*/cpufreq/scaling_governor has
     performance

  /usr/bin/lsb_release -d
     Ubuntu 20.04.3 LTS

  From /etc/*release* /etc/*version*
     debian_version: bullseye/sid
     os-release:
```

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Platform Notes (Continued)

```
       NAME="Ubuntu"
       VERSION="20.04.3 LTS (Focal Fossa)"
       ID=ubuntu
       ID_LIKE=debian
       PRETTY_NAME="Ubuntu 20.04.3 LTS"
       VERSION_ID="20.04"
       HOME_URL="https://www.ubuntu.com/"
       SUPPORT_URL="https://help.ubuntu.com/"

 uname -a:
    Linux h12dsu-7573x 5.4.0-99-generic #112-Ubuntu SMP Thu Feb 3 13:50:55 UTC 2022 x86_64
    x86_64 x86_64 GNU/Linux

 Kernel self-reported vulnerability status:

 CVE-2018-12207 (iTLB Multihit):                          Not affected
 CVE-2018-3620 (L1 Terminal Fault):                       Not affected
 Microarchitectural Data Sampling:                        Not affected
 CVE-2017-5754 (Meltdown):                                Not affected
 CVE-2018-3639 (Speculative Store Bypass):                Mitigation: Speculative Store
                                                          Bypass disabled via prctl and
                                                          seccomp
 CVE-2017-5753 (Spectre variant 1):                       Mitigation: usercopy/swapgs
                                                          barriers and __user pointer
                                                          sanitization
 CVE-2017-5715 (Spectre variant 2):                       Mitigation: Full AMD retpoline,
                                                        IBPB: conditional, IBRS_FW, STIBP:
                                                          always-on, RSB filling
 CVE-2020-0543 (Special Register Buffer Data Sampling): Not affected
 CVE-2019-11135 (TSX Asynchronous Abort):                 Not affected

 run-level 3 Feb 17 07:05

 SPEC is set to: /home/cpu2017
    Filesystem     Type  Size  Used Avail Use% Mounted on
    /dev/sda3      ext4  178G   22G  148G  13% /

 From /sys/devices/virtual/dmi/id
     Vendor:         Supermicro
     Product:        AS-2024US-TRT
     Serial:         0123456789

 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:
```

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Platform Notes (Continued)

```
     16x NO DIMM Unknown
     16x Samsung M393A8G40AB2-CWE 64 GB 2 rank 3200

 BIOS:
    BIOS Vendor:       American Megatrends Inc.
    BIOS Version:      2.3a
    BIOS Date:         01/25/2022
    BIOS Revision:     5.22

 (End of data from sysinfo program)
```

Compiler Version Notes

```
==============================================================================
C       | 502.gcc_r(peak)
------------------------------------------------------------------------------
AMD clang version 13.0.0 (CLANG: AOCC_3.2.0-Build#128 2021_11_12) (based on
  LLVM Mirror.Version.13.0.0)
Target: i386-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.2.0/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 13.0.0 (CLANG: AOCC_3.2.0-Build#128 2021_11_12) (based on
  LLVM Mirror.Version.13.0.0)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.2.0/bin
------------------------------------------------------------------------------

==============================================================================
C       | 502.gcc_r(peak)
------------------------------------------------------------------------------
AMD clang version 13.0.0 (CLANG: AOCC_3.2.0-Build#128 2021_11_12) (based on
  LLVM Mirror.Version.13.0.0)
Target: i386-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.2.0/bin
------------------------------------------------------------------------------

==============================================================================
C       | 500.perlbench_r(base, peak) 502.gcc_r(base) 505.mcf_r(base, peak)
```


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Compiler Version Notes (Continued)

```
        | 525.x264_r(base, peak) 557.xz_r(base, peak)
------------------------------------------------------------------------------
AMD clang version 13.0.0 (CLANG: AOCC_3.2.0-Build#128 2021_11_12) (based on
  LLVM Mirror.Version.13.0.0)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.2.0/bin
------------------------------------------------------------------------------

==============================================================================
C++     | 523.xalancbmk_r(peak)
------------------------------------------------------------------------------
AMD clang version 13.0.0 (CLANG: AOCC_3.2.0-Build#128 2021_11_12) (based on
  LLVM Mirror.Version.13.0.0)
Target: i386-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.2.0/bin
------------------------------------------------------------------------------

==============================================================================
C++     | 520.omnetpp_r(base, peak) 523.xalancbmk_r(base)
        | 531.deepsjeng_r(base, peak) 541.leela_r(base, peak)
------------------------------------------------------------------------------
AMD clang version 13.0.0 (CLANG: AOCC_3.2.0-Build#128 2021_11_12) (based on
  LLVM Mirror.Version.13.0.0)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.2.0/bin
------------------------------------------------------------------------------

==============================================================================
C++     | 523.xalancbmk_r(peak)
------------------------------------------------------------------------------
AMD clang version 13.0.0 (CLANG: AOCC_3.2.0-Build#128 2021_11_12) (based on
  LLVM Mirror.Version.13.0.0)
Target: i386-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.2.0/bin
------------------------------------------------------------------------------

==============================================================================
C++     | 520.omnetpp_r(base, peak) 523.xalancbmk_r(base)
        | 531.deepsjeng_r(base, peak) 541.leela_r(base, peak)
------------------------------------------------------------------------------
AMD clang version 13.0.0 (CLANG: AOCC_3.2.0-Build#128 2021_11_12) (based on
  LLVM Mirror.Version.13.0.0)
Target: x86_64-unknown-linux-gnu
```

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Compiler Version Notes (Continued)

```
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.2.0/bin
------------------------------------------------------------------------------

==============================================================================
Fortran | 548.exchange2_r(base, peak)
------------------------------------------------------------------------------
AMD clang version 13.0.0 (CLANG: AOCC_3.2.0-Build#128 2021_11_12) (based on
  LLVM Mirror.Version.13.0.0)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.2.0/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

Base Optimization Flags

C benchmarks:
-m64 -Wl,-allow-multiple-definition -Wl,-mllvm -Wl,-enable-licm-vrp
-flto -Wl,-mllvm -Wl,-region-vectorize
-Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-enable-loop-fusion -O3 -march=znver3 -fveclib=AMDLIBM
-ffast-math -fstruct-layout=5 -mllvm -unroll-threshold=50
-mllvm -inline-threshold=1000 -fremap-arrays
-mllvm -function-specialize -flv-function-specialization
-mllvm -enable-gvn-hoist -mllvm -global-vectorize-slp=true
-mllvm -enable-licm-vrp -mllvm -reduce-array-computations=3
-mllvm -enable-loop-fusion -z muldefs -lamdlibm -ljemalloc -lflang

C++ benchmarks:
-m64 -std=c++98 -flto -Wl,-mllvm -Wl,-region-vectorize
-Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-enable-loop-fusion -O3 -march=znver3 -fveclib=AMDLIBM
-ffast-math -mllvm -enable-partial-unswitch
-mllvm -unroll-threshold=100 -finline-aggressive
-flv-function-specialization -mllvm -loop-unswitch-threshold=200000
-mllvm -reroll-loops -mllvm -aggressive-loop-unswitch
-mllvm -extra-vectorizer-passes -mllvm -reduce-array-computations=3
-mllvm -global-vectorize-slp=true -mllvm -convert-pow-exp-to-int=false
-mllvm -enable-loop-fusion -z muldefs -fvirtual-function-elimination
-fvisibility=hidden -lamdlibm -ljemalloc -lflang

Fortran benchmarks:
-m64 -Wl,-mllvm -Wl,-inline-recursion=4
-Wl,-mllvm -Wl,-lsr-in-nested-loop -Wl,-mllvm -Wl,-enable-iv-split
-flto -Wl,-mllvm -Wl,-region-vectorize
-Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-enable-loop-fusion -O3 -march=znver3 -fveclib=AMDLIBM
-ffast-math -z muldefs -mllvm -unroll-aggressive
-mllvm -unroll-threshold=500 -lamdlibm -ljemalloc -lflang

Base Other Flags

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

(Continued on next page)

Base Other Flags (Continued)

C++ 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
548.exchange2_r: -DSPEC_LP64
557.xz_r: -DSPEC_LP64

Peak Optimization Flags

C benchmarks:

500.perlbench_r: -m64 -Wl,-allow-multiple-definition
-Wl,-mllvm -Wl,-enable-licm-vrp -flto
-Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-fprofile-instr-generate(pass 1)
-fprofile-instr-use(pass 2) -Ofast -march=znver3

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Peak Optimization Flags (Continued)

500.perlbench_r (continued):
-fveclib=AMDLIBM -ffast-math -fstruct-layout=7
-mllvm -unroll-threshold=50 -fremap-arrays
-flv-function-specialization -mllvm -inline-threshold=1000
-mllvm -enable-gvn-hoist -mllvm -global-vectorize-slp=false
-mllvm -function-specialize -mllvm -enable-licm-vrp
-mllvm -reduce-array-computations=3 -lamdlibm -ljemalloc

502.gcc_r: -m32 -Wl,-allow-multiple-definition
-Wl,-mllvm -Wl,-enable-licm-vrp -flto
-Wl,-mllvm -Wl,-function-specialize -Ofast -march=znver3
-fveclib=AMDLIBM -ffast-math -fstruct-layout=7
-mllvm -unroll-threshold=50 -fremap-arrays
-flv-function-specialization -mllvm -inline-threshold=1000
-mllvm -enable-gvn-hoist -mllvm -global-vectorize-slp=true
-mllvm -function-specialize -mllvm -enable-licm-vrp
-mllvm -reduce-array-computations=3 -fgnu89-inline
-ljemalloc

505.mcf_r: -m64 -Wl,-allow-multiple-definition
-Wl,-mllvm -Wl,-enable-licm-vrp -flto
-Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3 -Ofast
-march=znver3 -fveclib=AMDLIBM -ffast-math
-fstruct-layout=7 -mllvm -unroll-threshold=50
-fremap-arrays -flv-function-specialization
-mllvm -inline-threshold=1000 -mllvm -enable-gvn-hoist
-mllvm -global-vectorize-slp=true
-mllvm -function-specialize -mllvm -enable-licm-vrp
-mllvm -reduce-array-computations=3 -lamdlibm -ljemalloc

525.x264_r: basepeak = yes

557.xz_r: Same as 505.mcf_r

C++ benchmarks:

520.omnetpp_r: -m64 -std=c++98 -flto -Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3 -Ofast
-march=znver3 -fveclib=AMDLIBM -ffast-math
-finline-aggressive -mllvm -unroll-threshold=100
-flv-function-specialization -mllvm -enable-licm-vrp
-mllvm -reroll-loops -mllvm -aggressive-loop-unswitch
-mllvm -reduce-array-computations=3

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Peak Optimization Flags (Continued)

520.omnetpp_r (continued):
-mllvm -global-vectorize-slp=true
-fvirtual-function-elimination -fvisibility=hidden
-lamdlibm -ljemalloc

523.xalancbmk_r: -m32 -Wl,-mllvm -Wl,-do-block-reorder=aggressive -flto
-Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3 -Ofast
-march=znver3 -fveclib=AMDLIBM -ffast-math
-finline-aggressive -mllvm -unroll-threshold=100
-flv-function-specialization -mllvm -enable-licm-vrp
-mllvm -reroll-loops -mllvm -aggressive-loop-unswitch
-mllvm -reduce-array-computations=3
-mllvm -global-vectorize-slp=true
-mllvm -do-block-reorder=aggressive
-fvirtual-function-elimination -fvisibility=hidden
-ljemalloc

531.deepsjeng_r: basepeak = yes

541.leela_r: basepeak = yes

Fortran benchmarks:

548.exchange2_r: basepeak = yes

Peak Other Flags

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

502.gcc_r: -L/usr/lib -Wno-unused-command-line-argument
-L/sppo/bin/cpu2017v118-aocc3-milanX/amd_rate_aocc320_milanx_A_lib/lib32

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

523.xalancbmk_r: -L/usr/lib -Wno-unused-command-line-argument
-L/sppo/bin/cpu2017v118-aocc3-milanX/amd_rate_aocc320_milanx_A_lib/lib32

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2017/flags/aocc320-flags-A1.html
http://www.spec.org/cpu2017/flags/Supermicro-Platform-Settings-V1.2-Milan-revD.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2017/flags/aocc320-flags-A1.xml
http://www.spec.org/cpu2017/flags/Supermicro-Platform-Settings-V1.2-Milan-revD.xml

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