SPEC CPU®2017 Integer Rate Result

Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL345 Gen11
(2.50 GHz, AMD EPYC 9224)

HPE

SPECrate®2017_int_base = 251
SPECrate®2017_int_peak = 262

CPU2017 License: 3
Test Sponsor: HPE
Tested by: HPE

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

Copies

<table>
<thead>
<tr>
<th>Benchmark</th>
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<tbody>
<tr>
<td>500.perlbench_r</td>
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Hardware

CPU Name: AMD EPYC 9224
Max MHz: 3700
Nominal: 2500
Enabled: 24 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: 64 MB I+D on chip per chip,
16 MB shared / 6 cores
Other: None
Memory: 384 GB (12 x 32 GB 2Rx8 PC5-4800B-R)
Storage: 1 x 1.6 TB NVMe SSD, RAID 0
Other: None

Software

OS: Ubuntu 22.04.1 LTS
Kernel: 5.15.0-53-generic
Compiler: C/C++/Fortran: Version 4.0.0 of AOCC
Parallel: No
Firmware: HPE BIOS Version v1.12 11/24/2022 released
Nov-2022
File System: ext4
System State: Run level 5 (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

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Compiler Notes

The AMD64 AOCC Compiler Suite is available at
http://developer.amd.com/amd-aocc/

Submit Notes

The config file option 'submit' was used.
'numactl' was used to bind copies to the cores.
See the configuration file for details.

Operating System Notes

'ulimit -s unlimited' was used to set environment stack size limit
'ulimit -l 2097152' was used to set environment locked pages in memory limit

runcpu command invoked through numactl i.e.:
numactl --interleave=all runcpu <etc>

To limit dirty cache to 8% of memory, 'sysctl -w vm.dirty_ratio=8' run as root.
To limit swap usage to minimum necessary, 'sysctl -w vm.swappiness=1' run as root.
To free node-local memory and avoid remote memory usage,
'sysctl -w vm.zone_reclaim_mode=1' run as root.
To clear filesystem caches, 'sync; sysctl -w vm.drop_caches=3' run as root.
To disable address space layout randomization (ASLR) to reduce run-to-run variability,
'sysctl -w kernel.randomize_va_space=0' run as root.

(Continued on next page)
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Operating System Notes (Continued)

To enable Transparent Hugepages (THP) 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_aocc400_genoa_B_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
Workload Profile set to General Throughput Compute
Determinism Control set to Manual
Performance Determinism set to Power Deterministic
Last-Level Cache (LLC) as NUMA Node set to Enabled
NUMA memory domains per socket set to Four memory domains per socket
Thermal Configuration set to Maximum Cooling
ACPI CST C2 Latency set to 18 microseconds
Workload Profile set to Custom
Power Regulator set to OS Control Mode

(Continued on next page)
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Platform Notes (Continued)

The system ROM used for this result contains microcode version 0x0A10110e for the
AMD EPYC 9nn4X family of processors. The reference code/AGESA version used in this
ROM is version GenoaPI 1.0.0.1-L6

Sysinfo program /home/CPU2017/bin/sysinfo
Rev: r6622 of 2021-04-07 982a61ec0915b55891ef0e16acaf64d
running on admin1 Mon Jun 27 18:33:04 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 9224 24-Core Processor
 1 "physical id"s (chips)
 48 "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 : 24
siblings : 48
physical 0: cores 0 1 2 3 4 5 8 9 10 11 12 13 16 17 18 19 20 21 24 25 26 27 28 29

From lscpu from util-linux 2.37.2:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Address sizes: 52 bits physical, 57 bits virtual
Byte Order: Little Endian
CPU(s): 48
On-line CPU(s) list: 0-47
Vendor ID: AuthenticAMD
Model name: AMD EPYC 9224 24-Core Processor
CPU family: 25
Model: 17
Thread(s) per core: 2
Core(s) per socket: 24
Socket(s): 1
Stepping: 1
Frequency boost: enabled
CPU max MHz: 3707.0000
CPU min MHz: 400.0000
BogoMIPS: 4992.63
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
  pdelgb rdtscp lm constant_tsc rep_good nopl nonstop_tsc cpuid extd_apicid
  aperfmperf rpl pni pclmulqdq monitor ssse3 fma cx16 pclid 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

(Continued on next page)
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Platform Notes (Continued)

bpext perfctr_llc mwaitx cpb cat_l3 cdp_l3 invpcid_single hw_pstate ssbd mba ibrs
ibpb stibp vmmcall fsqsbased bni2 avx2 smep bmi2 erms invpcid cqm rdt_a avx512f
avx512dq rdseed adx smap avx512fma clflushopt clwb avx512cd sha ni avx512bw
avx512vl xsaveopt xsavec xgetbv1 xsaves cqm_llc cqm_occup_level cqm_mbm_total
bm ai clzero iperf xsaves xprpc rdpru wbnoinvd amd_pipin cpc arat
npt lbrv svm_lock nrip_save tsc_scale vmcb_clean flushbyasid decodeassist
pausefilter pfthreshold avic v_vmsave_vmload vgif v_spec_ctrl avx512vbmi ump pku
ospe avx512_vbmi2 gfn vaes vpclmuldq avx512_vnni avx512_bitalg avx512_vpopcntdq
la57 rdpid overflow_reco ssmca farm flush_l1d

Virtualization: AMD-V
L1d cache: 768 KiB (24 instances)
L1i cache: 768 KiB (24 instances)
L2 cache: 24 MiB (24 instances)
L3 cache: 64 MiB (4 instances)
NUMA node(s): 4
NUMA node0 CPU(s): 0-5, 24-29
NUMA node1 CPU(s): 12-17, 36-41
NUMA node2 CPU(s): 18-23, 42-47
NUMA node3 CPU(s): 6-11, 30-35

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 sanitation
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 768K 8 Data 1 64 1 64
L1i 32K 768K 8 Instruction 1 64 1 64
L2 1M 24M 8 Unified 2 2048 1 64
L3 16M 64M 16 Unified 3 16384 1 64

From numactl --hardware
WARNING: a numactl 'node' might or might not correspond to a physical chip.
available: 4 nodes (0-3)
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<td>node 0 cpus: 0 1 2 3 4 5 24 25 26 27 28 29</td>
</tr>
<tr>
<td>node 0 size: 96454 MB</td>
</tr>
<tr>
<td>node 0 free: 96041 MB</td>
</tr>
<tr>
<td>node 1 cpus: 12 13 14 15 16 17 36 37 38 39 40 41</td>
</tr>
<tr>
<td>node 1 size: 96764 MB</td>
</tr>
<tr>
<td>node 1 free: 96399 MB</td>
</tr>
<tr>
<td>node 2 cpus: 18 19 20 21 22 23 42 43 44 45 46 47</td>
</tr>
<tr>
<td>node 2 size: 96729 MB</td>
</tr>
<tr>
<td>node 2 free: 96357 MB</td>
</tr>
<tr>
<td>node 3 cpus: 6 7 8 9 10 11 30 31 32 33 34 35</td>
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<tr>
<td>node 3 size: 96724 MB</td>
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<td>node 3 free: 96399 MB</td>
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<td>node distances:</td>
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<tr>
<td>node 0: 10 12 12 12</td>
</tr>
<tr>
<td>node 1: 12 10 12 12</td>
</tr>
<tr>
<td>node 2: 12 12 10 12</td>
</tr>
<tr>
<td>node 3: 12 12 12 10</td>
</tr>
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</table>

From `/proc/meminfo`
- MemTotal: 395953896 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 22.04.1 LTS

From `/etc/*release* /etc/*version*`
- debian_version: bookworm/sid
- os-release:
  - PRETTY_NAME="Ubuntu 22.04.1 LTS"
  - NAME="Ubuntu"
  - VERSION_ID="22.04"
  - VERSION="22.04.1 LTS (Jammy Jellyfish)"
  - VERSION_CODENAME=jammy
  - ID=ubuntu
  - ID_LIKE=debian
  - HOME_URL="https://www.ubuntu.com/"

`uname -a`:
- Linux admin1 5.15.0-53-generic #59-Ubuntu SMP Mon Oct 17 18:53:30 UTC 2022 x86_64

(Continued on next page)
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Platform Notes (Continued)

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
mmio_stale_data: Not affected
retnleed: 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 sanitation
CVE-2017-5715 (Spectre variant 2): Mitigation: Retpolines, IBPB: conditional, IBRS_FW, STIBP: always-on, RSB filling, PBRSB-eIBRS: Not affected
CVE-2020-0543 (Special Register Buffer Data Sampling): Not affected
CVE-2019-11135 (TSX Asynchronous Abort): Not affected

run-level 5 Jun 27 18:30

SPEC is set to: /home/CPU2017
From /sys/devices/virtual/dmi/id

Vendor: HPE
Product: ProLiant DL345 Gen11
Product Family: ProLiant
Serial: DL345G11-002

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:
4x Hynix HMCG88AEBRA168N 32 GB 2 rank 4800
4x Hynix HMCG88MEBRA113N 32 GB 2 rank 4800
4x Hynix HMCG88MEBRA115N 32 GB 2 rank 4800

BIOS:
BIOS Vendor: HPE
BIOS Version: 1.12

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**Platform Notes (Continued)**

- BIOS Date: 11/24/2022
- BIOS Revision: 1.12
- Firmware Revision: 1.10

(End of data from sysinfo program)

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- **Compiler 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

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- **Target**: x86_64-unknown-linux-gnu

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SPECraten®2017콧 peak = 262

SPECraten®2017怆 base = 251

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Compiler Version Notes (Continued)

Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-4.0-3206-389/bin

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

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

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

(Continued on next page)
Compiler Version Notes (Continued)

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++

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 -f1ito -W1,-mllvm -W1,-align-all-nofallthru-blocks=6
-W1,-mllvm -W1,-reduce-array-computations=3
-W1,-mllvm -W1,-ldist-scalar-expand -fenable-aggressive-gather
-z muldefs -O3 -march=znver4 -fveclib=AMDLIBM -ffast-math
-fstruct-layout=7 -mllvm -unroll-threshold=50

(Continued on next page)
Base Optimization Flags (Continued)

C benchmarks (continued):
-mlir -inline-threshold=1000 -fremap-arrays -fstrip-mining
-mlir -reduce-array-computations=3 -zopt -lamdlibm -lflang
-lamdalloc

C++ benchmarks:
-m64 -flto -W1,-mlir -W1,-align-all-nofallthru-blocks=6
-W1,-mlir -W1,-reduce-array-computations=3 -z muldefs -O3
-march=znver4 -fvectlib=AMDLIBM -ffast-math
-mlir -unroll-threshold=100 -finline-aggressive
-mlir -loop-unswitch-threshold=200000
-mlir -reduce-array-computations=3 -zopt
-fvirtual-function-elimination -fvisibility=hidden -lamdlibm -lflang
-lamdalloc-ext

Fortran benchmarks:
-m64 -flto -W1,-mlir -W1,-align-all-nofallthru-blocks=6
-W1,-mlir -W1,-reduce-array-computations=3
-W1,-mlir -W1,-inline-recursion=4 -W1,-mlir -W1,-lsr-in-nested-loop
-W1,-mlir -W1,-enable-iv-split -z muldefs -O3 -march=znver4
-fveclib=AMDLIBM -ffast-math -fepilog-vectorization-of-inductions
-mlir -optimize-strided-mem-cost -floop-transform
-mlir -unroll-aggressive -mlir -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

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SPEC CPU®2017 Integer Rate Result
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Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL345 Gen11
(2.50 GHz, AMD EPYC 9224)

| SPECrate®2017_int_base = 251 |
| SPECrate®2017_int_peak = 262 |

CPU2017 License: 3
Test Sponsor: HPE
Tested by: HPE

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

Peak Compiler Invocation (Continued)

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
-mlvm -unroll-threshold=50 -fremap-arrays -fstrip-mining
-mlvm -inline-threshold=1000
-mlvm -reduce-array-computations=3 -zopt -fgnu89-inline
-lamdalloc

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

(Continued on next page)
Peak Optimization Flags (Continued)

525.x264_r: basepeak = yes

557.xz_r: basepeak = yes

C++ benchmarks:

520.omnetpp_r: -m64 -flto -Wl,-mlvmd -Wl,-align-all-nofallthru-blocks=6
-Wl,-mlvmd -Wl,-reduce-array-computations=3 -Ofast
-march=znver4 -fveclib=AMDLIBM -ffast-math
-finline-aggressive -mlvmd -unroll-threshold=100
-mlvmd -reduce-array-computations=3 -zopt
-fvirtual-function-elimination -fvirtual-function-elimination -fvirtual-function-elimination
-mlvmd -lamdalloc-ext

523.xalancbmk_r: -m32 -flto -Wl,-mlvmd -Wl,-align-all-nofallthru-blocks=6
-Wl,-mlvmd -Wl,-reduce-array-computations=3
-Wl,-mlvmd -Wl,-do-block-reorder=aggressive
-fno-loop-reoff -O3 -march=znver4 -fveclib=AMDLIBM
-ffast-math -finline-aggressive
-mlvmd -unroll-threshold=100
-mlvmd -reduce-array-computations=3 -zopt
-mlvmd -do-block-reorder=aggressive
-fvirtual-function-elimination -fvirtual-function-elimination -fvirtual-function-elimination
-mlvmd -lamdalloc-ext

531.deepsjeng_r: -m64 -flto -Wl,-mlvmd -Wl,-align-all-nofallthru-blocks=6
-Wl,-mlvmd -Wl,-reduce-array-computations=3 -O3
-march=znver4 -fveclib=AMDLIBM -ffast-math
-mlvmd -unroll-threshold=100 -finline-aggressive
-mlvmd -loop-unswitch-threshold=200000
-mlvmd -reduce-array-computations=3 -zopt
-fvirtual-function-elimination -fvirtual-function-elimination -fvirtual-function-elimination
-mlvmd -lamdalloc-ext

541.leela_r: basepeak = yes

Fortran benchmarks:

-m64 -flto -Wl,-mlvmd -Wl,-align-all-nofallthru-blocks=6
-Wl,-mlvmd -Wl,-reduce-array-computations=3
-Wl,-mlvmd -Wl,-inline-recursion=4 -Wl,-mlvmd -Wl,-lsl-in-nested-loop
-Wl,-mlvmd -Wl,-enable-iv-split -O3 -march=znver4 -fveclib=AMDLIBM
-ffast-math -fepilog-vectorization-of-inductions
-mlvmd -optimize-strided-mem-cost -floop-transform
-mlvmd -rearrange-argument-order -mlvmd -unroll-threshold=500 -lamdlib
-llflang -lamdalloc
Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL345 Gen11
(2.50 GHz, AMD EPYC 9224)

SPECrate®2017_int_base = 251
SPECrate®2017_int_peak = 262

CPU2017 License: 3
Test Sponsor: HPE
Tested by: HPE

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

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/HPE-Platform-Flags-AMD-Genoa-rev2.1.html
http://www.spec.org/cpu2017/flags/aocc400-flags.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2017/flags/HPE-Platform-Flags-AMD-Genoa-rev2.1.xml
http://www.spec.org/cpu2017/flags/aocc400-flags.xml

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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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