Hewlett Packard Enterprise
ProLiant DL385 Gen10 Plus v2
(2.65 GHz, AMD EPYC 7413)

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

CPU Name: AMD EPYC 7413
Max MHz: 3600
Nominal: 2650
Enabled: 48 cores, 2 chips, 2 threads/core
Orderable: 1, 2 chip(s)
Cache L1: 32 KB I + 32 KB D on chip per core
L2: 512 KB I+D on chip per core
L3: 128 MB I+D on chip per chip, 32 MB shared / 6 cores
Other: None
Memory: 2 TB (16 x 128 GB 4Rx4 PC4-3200AA-L)
Storage: 1 x 182 GB SATA SSD, RAID 0
Other: None

Hardware

OS: Ubuntu 20.04.1 LTS (x86_64)
Kernel 5.4.0-42-generic
Compiler: C/C++/Fortran: Version 3.0.0 of AOCC
Parallel: No
Firmware: HPE BIOS Version A42 v2.40 02/15/2021 released Feb-2021
File System: ext4
System State: Run level 5 (multi-user)
Base Pointers: 64-bit
Peak Pointers: 32/64-bit
Other: jemalloc; jemalloc memory allocator library v5.1.0
Power Management: BIOS set to prefer performance at the cost of additional power usage

Software

SPECrate®2017_int_base = 408
SPECrate®2017_int_peak = 421

Test Date: Apr-2021
Hardware Availability: Apr-2021
Software Availability: Mar-2021
results table

<table>
<thead>
<tr>
<th>Benchmark</th>
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<td>557.xz_r</td>
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<td>229</td>
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**SPECrate®2017_int_base = 408**

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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.

### 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>
'echo 8 > /proc/sys/vm/dirty_ratio' run as root to limit dirty cache to 8% of memory.
'echo 1 > /proc/sys/vm/swappiness' run as root to limit swap usage to minimum necessary.
'echo 1 > /proc/sys/vm/zone_reclaim_mode' run as root to free node-local memory and avoid remote memory usage.
'sync; echo 3 > /proc/sys/vm/drop_caches' run as root to reset filesystem caches.
'sysctl -w kernel.randomize_va_space=0' run as root to disable address space layout randomization (ASLR) to reduce run-to-run variability.
'echo always > /sys/kernel/mm/transparent_hugepage/defrag' run as root for peak integer runs and all FP runs to enable Transparent Hugepages (THP).

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

'echo madvise > /sys/kernel/mm/transparent_hugepage/enabled' run as root for base integer runs to enable THP only on request.

The real test date is Apr-2021. The clock was mistakenly set to 2020 before the benchmark was run.

Environment Variables Notes

Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH =
"/home/cpu2017/amd_rate_aocc300_milan_A_lib/64;/home/cpu2017/amd_rate_aocc300_milan_A_lib/32;"
MALLOCP_CONF = "retain:true"

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

General Notes

Binaries were compiled on a system with 2x AMD EPYC 7742 CPU + 512GiB 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 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
Memory PStates set to Disabled
Workload Profile set to Custom
Infinity Fabric Power Management set to Disabled

(Continued on next page)
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(Test Sponsor: HPE)  
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**CPU2017 License:** 3  
**Test Sponsor:** HPE  
**Tested by:** HPE  
**Test Date:** Apr-2021  
**Hardware Availability:** Apr-2021  
**Software Availability:** Mar-2021

**Platform Notes (Continued)**

Infinity Fabric Performance State set to P0  
L2 HW Prefetcher set to Disabled

Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r6538 of 2020-09-24 e8664e66d2d7080afeaa89d4b38e2f1c
running on dl385g10v2 Wed Apr  1 12:29:25 2020

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 7413 24-Core Processor
  2 "physical id"s (chips)
  96 "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
  physical 1: 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:
  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): 96
  On-line CPU(s) list: 0-95
  Thread(s) per core: 2
  Core(s) per socket: 24
  Socket(s): 2
  NUMA node(s): 8
  Vendor ID: AuthenticAMD
  CPU family: 25
  Model: 1
  Model name: AMD EPYC 7413 24-Core Processor
  Stepping: 1
  CPU MHz: 2782.443
  BogoMIPS: 5290.00
  Virtualization: AMD-V
  L1d cache: 1.5 MiB
  L1i cache: 1.5 MiB
  L2 cache: 24 MiB
  L3 cache: 256 MiB
  NUMA node0 CPU(s): 0-5,48-53
  NUMA node1 CPU(s): 6-11,54-59

(Continued on next page)
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**Platform Notes (Continued)**

NUMA node2 CPU(s): 12-17,60-65
NUMA node3 CPU(s): 18-23,66-71
NUMA node4 CPU(s): 24-29,72-77
NUMA node5 CPU(s): 30-35,78-83
NUMA node6 CPU(s): 36-41,84-89
NUMA node7 CPU(s): 42-47,90-95
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 prct1 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 x2apic movbe popcnt aes xsave avx f16c rdrand lahf_lm cmp_legacy svm extapic cr8_legacy abm sse4a misalignsse 3dnowprefetch osvw iber skinit wdt tce topoext perfctr_core perfctr_nb pbsx perfctr_llc mwmitx 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_at xsaveopt xsavec xgetbv1 xsaves cqm_llc cqm_occup_llc cqm_mbb_total cqm_mbb_local clzero irperf xsaverptr wbdoinvd arat npt lbrv svm_lock nrip_save tsc_scale vmcb_clean flushbyasid decodeassist pausefilter pfthreshold v_vmsave_vmload vgif umip pkp vaes vpclmulqdpk rdpid overflow_recov succor smca

/prorcpuinfo cache data

  cache size : 512 KB

From numactl --hardware WARNING: a numactl 'node' might or might not correspond to a physical chip.

  available: 8 nodes (0-7)
  node 0 cpus: 0 1 2 3 4 5 48 49 50 51 52 53
  node 0 size: 257797 MB
  node 0 free: 257460 MB
  node 1 cpus: 6 7 8 9 10 11 54 55 56 57 58 59
  node 1 size: 258044 MB
  node 1 free: 257786 MB
  node 2 cpus: 12 13 14 15 16 17 60 61 62 63 64 65
  node 2 size: 258044 MB
  node 2 free: 257748 MB
  node 3 cpus: 18 19 20 21 22 23 66 67 68 69 70 71

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Test Date: Apr-2021
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Platform Notes (Continued)

node 3 size: 258032 MB
node 3 free: 257791 MB
node 4 cpus: 24 25 26 27 28 29 72 73 74 75 76 77
node 4 size: 258044 MB
node 4 free: 257840 MB
node 5 cpus: 30 31 32 33 34 35 78 79 80 81 82 83
node 5 size: 258044 MB
node 5 free: 257846 MB
node 6 cpus: 36 37 38 39 40 41 84 85 86 87 88 89
node 6 size: 258044 MB
node 6 free: 257850 MB
node 7 cpus: 42 43 44 45 46 47 90 91 92 93 94 95
node 7 size: 258019 MB
node 7 free: 257734 MB
node distances:
node 0  1  2  3  4  5  6  7
0: 10 12 12 12 32 32 32 32
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

From /proc/meminfo
MemTotal: 2113610392 kB
HugePages_Total: 0
Hugepagesize: 2048 kB
/sbin/tuned-adm active
Current active profile: throughput-performance
/usr/bin/lsb_release -d
Ubuntu 20.04.1 LTS

From /etc/*release* /etc/*version*
debian_version: bullseye/sid
os-release:
NAME="Ubuntu"
VERSION="20.04.1 LTS (Focal Fossa)"
ID=ubuntu
ID_LIKE=debian
PRETTY_NAME="Ubuntu 20.04.1 LTS"
VERSION_ID="20.04"
HOME_URL="https://www.ubuntu.com/
SUPPORT_URL="https://help.ubuntu.com/"

(Continued on next page)
**Platform Notes (Continued)**

uname -a:
```
Linux dl385g10v2 5.4.0-42-generic #46-Ubuntu SMP Fri Jul 10 00:24:02 UTC 2020 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):** Mitigation: Speculative Store Bypass disabled via prctl and seccomp
- **CVE-2018-3639 (Speculative Store Bypass):** Mitigation: usercopy/swapgs barriers and __user pointer sanitation
- **CVE-2017-5753 (Spectre variant 1):** Mitigation: Full AMD retpoline, IBPB: conditional, IBRS_FW, STIBP: always-on, RSB filling
- **CVE-2017-5715 (Spectre variant 2):** Not affected
- **CVE-2020-0543 (Special Register Buffer Data Sampling):** Not affected
- **CVE-2019-11135 (TSX Asynchronous Abort):** Not affected

run-level 5 Apr 1 12:23

SPEC is set to: /home/cpu2017

```
Filesystem                        Type  Size  Used Avail Use% Mounted on
/dev/mapper/ubuntu--vg-ubuntu--lv ext4 182G  40G  134G  23% /
```

From /sys/devices/virtual/dmi/id

- **Vendor:** HPE
- **Product:** ProLiant DL385 Gen10 Plus
- **Product Family:** ProLiant
- **Serial:** CN79340HC3

Additional information from dmidecode 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:**
  - 16x UNKNOWN M386AAG40AM3-CWE 128 GB 4 rank 3200
  - 16x UNKNOWN NOT AVAILABLE

- **BIOS:**
  - **BIOS Vendor:** HPE
  - **BIOS Version:** A42
  - **BIOS Date:** 02/15/2021
Hewlett Packard Enterprise
(Test Sponsor: HPE)
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SPEC CPU®2017 Integer Rate Result
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Platform Notes (Continued)

BIOS Revision: 2.40
Firmware Revision: 2.40

(End of data from sysinfo program)

Compiler Version Notes

==============================================================================
C     | 502.gcc_r(peak)
AMD clang version 12.0.0 (CLANG: AOCC_3.0.0-Build#78 2020_12_10) (based on LLVM Mirror.Version.12.0.0)
Target: i386-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.0.0/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 12.0.0 (CLANG: AOCC_3.0.0-Build#78 2020_12_10) (based on LLVM Mirror.Version.12.0.0)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.0.0/bin

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Target: x86_64-unknown-linux-gnu
Thread model: posix

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

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<td>C++</td>
<td>523.xalancbmk_r(peak)</td>
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| C++      | 520.omnetpp_r(base, peak) 523.xalancbmk_r(base) | 531.deepsjeng_r(base, peak) 541.leela_r(base, peak) |
|          | AMD clang version 12.0.0 (CLANG: AOCC_3.0.0-Build#78 2020_12_10) (based on LLVM Mirror.Version.12.0.0) |                                       |
|          | Target: x86_64-unknown-linux-gnu   |                                     |
|          | Thread model: posix                |                                     |
|          | InstalledDir: /opt/AMD/aocc-compiler-3.0.0/bin |                                     |

| C++      | 523.xalancbmk_r(peak)              | /opt/AMD/aocc-compiler-3.0.0/bin    |
|          | AMD clang version 12.0.0 (CLANG: AOCC_3.0.0-Build#78 2020_12_10) (based on LLVM Mirror.Version.12.0.0) |                                       |
|          | Target: i386-unknown-linux-gnu     |                                     |
|          | Thread model: posix                |                                     |
|          | InstalledDir: /opt/AMD/aocc-compiler-3.0.0/bin |                                     |

| C++      | 520.omnetpp_r(base, peak) 523.xalancbmk_r(base) | 531.deepsjeng_r(base, peak) 541.leela_r(base, peak) |
|          | AMD clang version 12.0.0 (CLANG: AOCC_3.0.0-Build#78 2020_12_10) (based on LLVM Mirror.Version.12.0.0) |                                       |
|          | Target: x86_64-unknown-linux-gnu   |                                     |
|          | Thread model: posix                |                                     |
|          | InstalledDir: /opt/AMD/aocc-compiler-3.0.0/bin |                                     |

| Fortran  | 548.exchange2_r(base, peak)        | /opt/AMD/aocc-compiler-3.0.0/bin    |

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

AMD clang version 12.0.0 (CLANG: AOCC_3.0.0-Build#78 2020_12_10) (based on LLVM Mirror.Version.12.0.0)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.0.0/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

Base Optimization Flags

C benchmarks:
-m64 -Wl,-allow-multiple-definition -Wl,-mlllvm -Wl,-enable-licm-vrp
-flto -Wl,-mlllvm -Wl,-region-vectorize
-Wl,-mlllvm -Wl,-function-specialize
-Wl,-mlllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mlllvm -Wl,-reduce-array-computations=3 -O3 -ffast-math
-march=znver3 -fveclib=AMDLIBM -fstruct-layout=5

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Base Optimization Flags (Continued)

C benchmarks (continued):
-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 -z muldefs
-lamdlibm -ljemalloc -lflang -lflangrti

C++ benchmarks:
-m64 -std=c++98 -Wl,-mllvm -Wl,-do-block-reorder=aggressive -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 -O3 -ffast-math
-march=znver3 -fveclib=AMDLIBM -mllvm -enable-partial-unswitch
-mllvm -unroll-threshold=100 -finline-aggressive
-flv-function-specialization -mllvm -loop-unswitch-threshold=200000
-mllvm -reroot-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
-z muldefs -mllvm -do-block-reorder=aggressive
-fvirtual-function-elimination -fvisibility=hidden -lamdlibm
-ljemalloc -lflang -lflangrti

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 -O3 -ffast-math
-march=znver3 -fveclib=AMDLIBM -z muldefs -mllvm -unroll-aggressive
-mllvm -unroll-threshold=500 -lamdlibm -ljemalloc -lflang -lflangrti

Base Other Flags

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

C++ benchmarks:
-Wno-unused-command-line-argument
**SPEC CPU®2017 Integer Rate Result**

**Hewlett Packard Enterprise**  
(Test Sponsor: HPE)

ProLiant DL385 Gen10 Plus v2  
(2.65 GHz, AMD EPYC 7413)

<table>
<thead>
<tr>
<th>SPECrate®2017_int_base = 408</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECrate®2017_int_peak = 421</td>
</tr>
</tbody>
</table>

**CPU2017 License:** 3  
**Test Date:** Apr-2021

**Test Sponsor:** HPE  
**Hardware Availability:** Apr-2021

**Tested by:** HPE  
**Software Availability:** Mar-2021

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### 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.valachrmk_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`
- `-W1,-mlvm -Wl,-enable-licm-vrp -flto`
- `-W1,-mlvm -Wl,-function-specialize`
- `-W1,-mlvm -Wl,-align-all-nofallthru-blocks=6`
- `-W1,-mlvm -Wl,-reduce-array-computations=3`
- `-fprofile-instr-generate(pass 1)`
- `-fprofile-instr-use(pass 2) -Ofast -march=znver3`
- `-fveclib=AMDLIBM -fstruct-layout=7`
- `-mlvm -unroll-threshold=50 -fremap-arrays`
- `-fllvm-function-specialization -mlvm -inline-threshold=1000`
- `-mlvm -enable-gvn-hoist -mlvm -global-vectorize-slp=false`
- `-mlvm -function-specialize -mlvm -enable-licm-vrp`
- `-mlvm -reduce-array-computations=3 -łamdlibm -ljemalloc`

- `502.gcc_r`: `-m32 -Wl,-allow-multiple-definition`
- `-W1,-mlvm -Wl,-enable-licm-vrp -flto`

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502.gcc_r (continued):
-Wl,-mllvm -Wl,-function-specialize -Ofast -march=znver3
-fveclib=AMDLIBM -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: basepeak = yes
525.x264_r: basepeak = yes
557.xz_r: basepeak = yes

C++ benchmarks:
520.omnetpp_r: -m64 -std=c++98
-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 -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
-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 -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

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Peak Optimization Flags (Continued)

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/cpu2017v115aocc3/amd_rate_aocc300_milan_A_lib/32

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/cpu2017v115aocc3/amd_rate_aocc300_milan_A_lib/32

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2017/flags/HPE-Platform-Flags-AMD-V1.2-EPYC-revP.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2017/flags/HPE-Platform-Flags-AMD-V1.2-EPYC-revP.xml

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