Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL325 Gen10 Plus v2
(2.95 GHz, AMD EPYC 75F3)

SPEC CPU®2017 Integer Rate Result
Copyright 2017-2021 Standard Performance Evaluation Corporation

SPECrater®2017_int_base = 282
SPECrater®2017_int_peak = 292

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

Test Date: Apr-2021
Hardware Availability: Jun-2021
Software Availability: Mar-2021

Copies

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
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<tr>
<td>557.xz_r</td>
<td>64</td>
<td>160</td>
<td>160</td>
</tr>
</tbody>
</table>

Hardware
CPU Name: AMD EPYC 75F3
Max MHz: 4000
Nominal: 2950
Enabled: 32 cores, 1 chip, 2 threads/core
Orderable: 1 chip
Cache L1: 32 KB I + 32 KB D on chip per core
L2: 512 KB I+D on chip per core
L3: 256 MB I+D on chip per chip,
32 MB shared / 4 cores
Other: None
Memory: 1 TB (8 x 128 GB 4Rx4 PC4-3200AA-L)
Storage: 1 x 800 GB SAS SSD, RAID 0
Other: None

Software
OS: Ubuntu 20.04.1 LTS (x86_64)
Kernel 5.4.0-54-generic
Compiler: C/C++/Fortran: Version 3.0.0 of AOCC
Parallel: No
Firmware: HPE BIOS Version A43 v2.42 04/15/2021 released
Apr-2021
File System: ext4
System State: Run level 5 (multi-user, GUI disabled)
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

<table>
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<tr>
<th>Benchmark</th>
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**SPECrate®2017_int_base = 282**

**SPECrate®2017_int_peak = 292**

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

### Compiler Notes


### 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>
'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/enabled' and

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

'echo always > /sys/kernel/mm/transparent_hugepage/defrag' run as root for peak integer runs and all FP runs to enable Transparent Hugepages (THP).
'echo madvise > /sys/kernel/mm/transparent_hugepage/enabled' run as root for base integer runs to enable THP only on request.

Environment Variables Notes

Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH = 
"/cpu2017/amd_rate_aocc300_milan_A_lib/64;/cpu2017/amd_rate_aocc300_milan_A_lib/32:
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 + 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
Memory PStates set to Disabled
Data Fabric C-State Enable set to Force Enabled
Thermal Configuration set to Maximum Cooling
Workload Profile set to Custom
Infinity Fabric Power Management set to Disabled

(Continued on next page)
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Platform Notes (Continued)

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

Sysinfo program /cpu2017/bin/sysinfo
Rev: r6622 of 2021-04-07 982a61ec0915b55891ef0e16aca6c64d
running on dl325gen10plus Fri May 7 14:03:08 2021

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 75F3 32-Core Processor
  1 "physical id"s (chips)
  64 "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

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):                          64
On-line CPU(s) list:             0-63
Thread(s) per core:              2
Core(s) per socket:              32
Socket(s):                       1
NUMA node(s):                    8
Vendor ID:                       AuthenticAMD
CPU family:                      25
Model:                           1
Model name:                      AMD EPYC 75F3 32-Core Processor
Stepping:                        1
CPU MHz:                         1794.943
BogoMIPS:                        5889.02
Virtualization:                  AMD-V
L1d cache:                       1 MiB
L1i cache:                       1 MiB
L2 cache:                        16 MiB
L3 cache:                        256 MiB
NUMA node0 CPU(s):               0-3,32-35
NUMA node1 CPU(s):               4-7,36-39

(Continued on next page)
Platform Notes (Continued)

NUMA node2 CPU(s): 8-11, 40-43
NUMA node3 CPU(s): 12-15, 44-47
NUMA node4 CPU(s): 16-19, 48-51
NUMA node5 CPU(s): 20-23, 52-55
NUMA node6 CPU(s): 24-27, 56-59
NUMA node7 CPU(s): 28-31, 60-63
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 aperfmpref perfctr_core perfctr_nb bext perfctr_l1c mwaitx cpb cat_l3 cdp_l3 invpcid_single hw_pstate sbsb mba ibrs ibpb stibp vmmcall fsqgbase bml1 avx2 smep bml2 invpcid cqcm rdt_a rdseed adx smap clflushopt clwb sha_mask xsaveopt xsavec xgetbv1 xsaves cqcm_l1c cqcm_mmb_total cqcm_mmb_local clzero irperf xsaveerpr wbnoinvd arat npt lbv svm_lock nrip_save tsc_scale vmcb_clean flushbyasid decodeassist pfflush v_msf 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 1M 8 Data 1
L1i 32K 1M 8 Instruction 1
L2 512K 16M 8 Unified 2
L3 32M 256M 16 Unified 3

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 32 33 34 35
node 0 size: 128775 MB
node 0 free: 128561 MB

(Continued on next page)
Platform Notes (Continued)

node 1 cpus: 4 5 6 7 36 37 38 39
node 1 size: 128995 MB
node 1 free: 128820 MB
node 2 cpus: 8 9 10 11 40 41 42 43
node 2 size: 129022 MB
node 2 free: 128828 MB
node 3 cpus: 12 13 14 15 44 45 46 47
node 3 size: 129021 MB
node 3 free: 128521 MB
node 4 cpus: 16 17 18 19 48 49 50 51
node 4 size: 129022 MB
node 4 free: 128863 MB
node 5 cpus: 20 21 22 23 52 53 54 55
node 5 size: 129021 MB
node 5 free: 128879 MB
node 6 cpus: 24 25 26 27 56 57 58 59
node 6 size: 129022 MB
node 6 free: 128854 MB
node 7 cpus: 28 29 30 31 60 61 62 63
node 7 size: 129008 MB
node 7 free: 128861 MB

node distances:
node 0 1 2 3 4 5 6 7
0: 10 11 12 12 12 12 12 12
1: 11 10 12 12 12 12 12 12
2: 12 12 10 11 12 12 12 12
3: 12 12 11 10 12 12 12 12
4: 12 12 12 12 10 11 12 12
5: 12 12 12 12 11 10 12 12
6: 12 12 12 12 12 12 12 11
7: 12 12 12 12 12 12 11 10

From /proc/meminfo
MemTotal: 1056653572 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

/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
Hewlett Packard Enterprise
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Platform Notes (Continued)

PRETTY_NAME="Ubuntu 20.04.1 LTS"
VERSION_ID="20.04"
HOME_URL=\"https://www.ubuntu.com/\"
SUPPORT_URL=\"https://help.ubuntu.com/\"

uname -a:
Linux dl325gen10plus 5.4.0-54-generic #60-Ubuntu SMP Fri Nov 6 10:37:59 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):
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: Full AMD retpoline, IBFB: 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 5 May 7 14:00
SPEC is set to: /cpu2017

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:
8x Samsung M386AAG40AM3-CWE 128 GB 4 rank 3200
8x UNKNOWN NOT AVAILABLE

(Continued on next page)
Platform Notes (Continued)

BIOS:
- BIOS Vendor: HPE
- BIOS Version: A43
- BIOS Date: 04/15/2021
- BIOS Revision: 2.42
- 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

==============================================================================
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)
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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)
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(Continued on next page)
spec

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Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.0.0/bin

C++ | 523.xalancbmk_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++ | 520.omnetpp_r(base, peak) 523.xalancbmk_r(base) 531.deepsjeng_r(base, peak) 541.leela_r(base, peak)
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C++ | 523.xalancbmk_r(peak)
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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

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

---

**Fortran** | 548.exchange2_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

---

## 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

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Base Optimization Flags (Continued)

C benchmarks (continued):
- Wl, -mllvm -Wl, -function-specialize
- Wl, -mllvm -Wl, -align-all-nofallthru-blocks=6
- Wl, -mllvm -Wl, -reduce-array-computations=3 -O3 -ffast-math
- march=znode3 -fveclib=AMDLIBM -fstruct-layout=5
- mllvm -unroll-threshold=50 -mllvm -inline-threshold=1000
- freemap-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=znode3 -fveclib=AMDLIBM -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
- 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=znode3 -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 DL325 Gen10 Plus v2  
(2.95 GHz, AMD EPYC 75F3)  

<table>
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<tr>
<th>SPECrate®2017_int_base</th>
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<tr>
<td>SPECrate®2017_int_peak</td>
<td>292</td>
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</table>

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

**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:

- `-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`
- `-fveclib=AMDLIBM` `-fstruct-layout=7`
- `-mllvm -unroll-threshold=50` `-fremap-arrays`
- `-fllvm-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`

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### SPEC CPU®2017 Integer Rate Result

**Hewlett Packard Enterprise**  
(Test Sponsor: HPE)  
ProLiant DL325 Gen10 Plus v2  
(2.95 GHz, AMD EPYC 75F3)  

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<td>Tested by: HPE</td>
<td>Software Availability: Mar-2021</td>
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</table>

**Peak Optimization Flags (Continued)**

502.gcc_r (continued):
- `-Wl,-mllvm -Wl,-function-specialize -Ofast -march=znver3`
- `-fvecclib=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: `-m64 -Wl,-allow-multiple-definition`
- `-Wl,-mllvm -Wl,-function-specialize -flto`
- `-Wl,-mllvm -Wl,-function-specialize -flto`
- `-Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6`
- `-Wl,-mllvm -Wl,-reduce-array-computations=3 -Ofast`
- `-march=znver3 -fvecclib=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 -lamdlibm -ljemalloc`

525.x264_r: basepeak = yes

557.xz_r: Same as 505.mcf_r

**C++ benchmarks:**

520.omnetpp_r: basepeak = yes

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 -fvecclib=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`

531.deepsjeng_r: basepeak = yes

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

541.leela_r: basepeak = yes

Fortran benchmarks:
-m64 -Wl,-mllv -Wl,-inline-recursion=4
-flto -Wl,-mllv -Wl,-function-specialize
-Wl,-mllv -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllv -Wl,-reduce-array-computations=3 -O3 -ffast-math
-march=znver3 -fveclib=AMDLIBM -mllv -unroll-aggressive
-mllv -unroll-threshold=500 -lamdlibm -ljemalloc -lflang -lflangrti

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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Tested with SPEC CPU®2017 v1.1.8 on 2021-05-07 15:03:08-0400.
Originally published on 2021-05-25.