Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL345 Gen10 Plus
(2.80 GHz, AMD EPYC 7543P)

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

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

Software
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 A43 v2.42 04/15/2021 released Apr-2021
File System: ext4
System State: Run level 5 (multi-user)
Base Pointers: 64-bit
Peak Pointers: 32/64-bit
Power Management: BIOS set to prefer performance at the cost of additional power usage

Hardware
CPU Name: AMD EPYC 7543P
Max MHz: 3700
Nominal: 2800
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 480 GB SAS SSD, RAID 0
Other: None

SPECratenet_int_base = 274
SPECratenet_int_peak = 283

500.perlbench_r 64
502.gcc_r 64
505.mcf_r 64
520.omnetpp_r 64
523.xalancbmk_r 64
525.x264_r 64
531.deepsjeng_r 64
541.leela_r 64
548.exchange2_r 64
557.xz_r 64

Hardware

Software
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Results Table

<table>
<thead>
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<th>Benchmark</th>
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<th>Ratio</th>
<th>Seconds</th>
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<td>531.deepsjeng_r</td>
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<td>541.leela_r</td>
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<td>443</td>
</tr>
</tbody>
</table>

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>
'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

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SPEC CPU®2017 Integer Rate Result

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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 = 
   "/home/SPEC_CPU2017/amd_rate_aocc300_milan_A_lib/64;/home/SPEC_CPU2017/a
md_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

Submitted_by: "Bhatnagar, Prateek" <prateek.bhatnagar@hpe.com>
Submitted: Mon May 24 12:30:41 EDT 2021
Submission: cpu2017-20210524-26398.sub

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

(Continued on next page)
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SPEC CPU®2017 Integer Rate Result
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Platform Notes (Continued)

Infinity Fabric Power Management set to Disabled
Infinity Fabric Performance State set to P0
Thermal Configuration set to Maximum Cooling
Workload Profile set to Custom
L2 HW Prefetcher set to Disabled

Sysinfo program /home/SPEC_CPU2017/bin/sysinfo
Rev: r6538 of 2020-09-24 e8664e66d2d7080afeaa89d4b38e2f1c
running on ubuntu Wed Apr 1 10:33:10 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 7543P 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:
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 7543P 32-Core Processor
Stepping: 1
CPU MHz: 3366.622
BogoMIPS: 5589.64
Virtualization: AMD-V
L1d cache: 1 MiB
L1i cache: 1 MiB
L2 cache: 16 MiB

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

Platform Notes (Continued)

L3 cache: 256 MiB
NUMA node0 CPU(s): 0-3, 32-35
NUMA node1 CPU(s): 4-7, 36-39
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 sanitation
Vulnerability Spectre v2: Mitigation; Full AMD retpoline, IBPB conditional, IBRS_FW, STIBP always-on, RSB filling
Vulnerability Srbsds: 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_l1c mwaitx cpb cat_l3 cdpl_l3 invpcid_single hw_pstate ssbd mba ibrs ibpb stibp vmmcall fsqsgbase bml1 avx2 smep bmi2 invpcid cmqm rdtd_a rdseed adx smap clflushopt clwb sha ni xsaveopt xsavec xgetbv1 xsaves cmqm_llc cqm_occup_llc cqm_mbb_total cqm_mbb_local clzero irperf xsaverpr wboinvd arat npt lbiv svm_lock nrp_save tsc_scale vmcb_clean flushbyassist decodeassist pausefilter pffilethreshold v_vmsave_vmload vgif ump pk2 ospe vaes vpclmulqdq rdpid overflow_recov succor smca

/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: 8 nodes (0-7)
node 0 cpus: 0 1 2 3 32 33 34 35
node 0 size: 128775 MB
node 0 free: 128013 MB
node 1 cpus: 4 5 6 7 36 37 38 39
node 1 size: 129020 MB
node 1 free: 128805 MB
node 2 cpus: 8 9 10 11 40 41 42 43

(Continued on next page)
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Hardware Availability: Jun-2021
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Platform Notes (Continued)

node 2 size: 129022 MB
node 2 free: 128849 MB
node 3 cpus: 12 13 14 15 44 45 46 47
node 3 size: 129021 MB
node 3 free: 128823 MB
node 4 cpus: 16 17 18 19 48 49 50 51
node 4 size: 129022 MB
node 4 free: 128856 MB
node 5 cpus: 20 21 22 23 52 53 54 55
node 5 size: 128996 MB
node 5 free: 128818 MB
node 6 cpus: 24 25 26 27 56 57 58 59
node 6 size: 129022 MB
node 6 free: 128843 MB
node 7 cpus: 28 29 30 31 60 61 62 63
node 7 size: 129008 MB
node 7 free: 128834 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 10 11
7: 12 12 12 12 12 12 11 10

From /proc/meminfo
MemTotal: 1056653420 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
  PRETTY_NAME="Ubuntu 20.04.1 LTS"
  VERSION_ID="20.04"
  HOME_URL="https://www.ubuntu.com/
  SUPPORT_URL="https://help.ubuntu.com/"

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Platform Notes (Continued)

uname -a:
   Linux ubuntu 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 sanitization
CVE-2017-5753 (Spectre variant 1): Mitigation: Full AMD retpoline, IBPB: conditional, IBRS_FW, STIBF: always-on, RSB filling
CVE-2017-5715 (Spectre variant 2): Mitigation: Full AMD retpoline, IBPB: conditional, IBRS_FW, STIBF: 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 Apr 1 10:23
SPEC is set to: /home/SPEC_CPU2017

From /sys/devices/virtual/dmi/id
Vendor: HPE
Product: ProLiant DL345 Gen10 Plus
Product Family: ProLiant
Serial: J20APP0014

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

BIOS:
   BIOS Vendor: HPE
   BIOS Version: A43
   BIOS Date: 04/15/2021

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SPECrater®2017_int_base = 274
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Platform Notes (Continued)

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) |
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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) |
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| C       | 500.perlbench_r(base, peak) 502.gcc_r(base) 505.mcf_r(base, peak) |
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### Compiler Version Notes (Continued)

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)
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)
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  
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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)
(Continued on next page)
```
SPEC CPU®2017 Integer Rate Result
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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,-mllvm -Wl,-enable-lcvm-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 -O3 -ffast-math
-march=znver3 -fveclib=AMDLIBM -fstruct-layout=5

(Continued on next page)
Hewlett Packard Enterprise
ProLiant DL345 Gen10 Plus
(2.80 GHz, AMD EPYC 7543P)

 SPEC CPU®2017 Integer Rate Result

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SPECrate®2017_int_base = 274
SPECrate®2017_int_peak = 283

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

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

Base Optimization Flags (Continued)

C benchmarks (continued):
-mllvm -unroll-threshold=50 -mllvm -inline-threshold=1000
-ffreemap-arrays -mllvm -function-specialize -flv-function-specialization
-mllvm -enable-gvn-hoist -mllvm -global-vectorize-slp=true
-mllvm -enable-lcm-vrp -mllvm -reduce-array-computations=3 -z muldefs
-lamdlibm -ljemalloc -lflang -lfangrti

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 -fvecclib=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 -lfangrti

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 -fvecclib=AMDLIBM -z muldefs -mllvm -unroll-aggressive
-mllvm -unroll-threshold=500 -lamdlibm -ljemalloc -lflang -lfangrti

Base Other Flags

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

C++ benchmarks:
-Wno-unused-command-line-argument
Hewlett Packard Enterprise  
-ProLiant DL345 Gen10 Plus  
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**SPEC CPU®2017 Integer Rate Result**  
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**SPECrater®2017_int_base = 274**  
**SPECrater®2017_int_peak = 283**

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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.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  
-fvcclib=AMDLIBM -fsstruct-layout=7  
-mllvm -unroll-threshold=50 -fremap-arrays  
-ffunc-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

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

502.gcc_r (continued):
- Wl,-mlirm -Wl,-function-specialize -Ofast -march=znver3
- fvecclib=AMDLIBM -fstruct-layout=7
- mlirm -unroll-threshold=50 -fremap-arrays
- flv-function-specialization -mlirm -inline-threshold=1000
- mlirm -enable-gvn-hoist -mlirm -global-vectorize-slp=true
- mlirm -function-specialize -mlirm -enable-lpmc-vrp
- mlirm -reduce-array-computations=3 -fgnu89-inline
- ljemalloc

505.mcf_r: -m64 -Wl,-allow-multiple-definition
- Wl,-mlirm -Wl,-enable-lpmc-vrp -flto
- Wl,-mlirm -Wl,-function-specialize
- Wl,-mlirm -Wl,-align-all-nofallthru-blocks=6
- Wl,-mlirm -Wl,-reduce-array-computations=3 -Ofast
- march=znver3 -fvecclib=AMDLIBM -fstruct-layout=7
- mlirm -unroll-threshold=50 -fremap-arrays
- flv-function-specialization -mlirm -inline-threshold=1000
- mlirm -enable-gvn-hoist -mlirm -global-vectorize-slp=true
- mlirm -function-specialize -mlirm -enable-lpmc-vrp
- mlirm -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
- Wl,-mlirm -Wl,-do-block-reorder-aggressive -flto
- Wl,-mlirm -Wl,-function-specialize
- Wl,-mlirm -Wl,-align-all-nofallthru-blocks=6
- Wl,-mlirm -Wl,-reduce-array-computations=3 -Ofast
- march=znver3 -fvecclib=AMDLIBM -finline-aggressive
- mlirm -unroll-threshold=100 -flv-function-specialization
- mlirm -enable-lpmc-vrp -mlirm -reroll-loops
- mlirm -aggressive-loop-unswitch
- mlirm -reduce-array-computations=3
- mlirm -global-vectorize-slp=true
- mlirm -do-block-reorder-aggressive
- fvrlirtual-function-elimination -fvisibility=hidden
- lamdlibm -ljemalloc

523.xalancbk_r: -m32 -Wl,-mlirm -Wl,-do-block-reorder-aggressive -flto
- Wl,-mlirm -Wl,-function-specialize
- Wl,-mlirm -Wl,-align-all-nofallthru-blocks=6

(Continued on next page)
Hewlett Packard Enterprise
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Peak Optimization Flags (Continued)

523.xalancbmk_r (continued):
- W1,-mlllvm -W1,-reduce-array-computations=3 -Ofast
- march=znver3 -fveclib=AMDLIBM -finline-aggressive
- -mlllvm -unroll-threshold=100 -flv-function-specialization
- -mlllvm -enable-lcm-vr -mlllvm -reroll-loops
- -mlllvm -aggressive-loop-unswitch
- -mlllvm -reduce-array-computations=3
- -mlllvm -global-vectorize-slp=true
- -mlllvm -do-block-reorder=aggressive
- -fvirtual-function-elimination -fvisibility=hidden
- -ljemalloc

531.deepsjeng_r: basepeak = yes

541.leela_r: Same as 520.omnetpp_r

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

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