Hewlett Packard Enterprise  
(Test Sponsor: HPE)  
ProLiant DL385 Gen10 Plus  
(2.85 GHz, AMD EPYC 7443)

CPU2017 License: 3  
Test Date: May-2021  
Test Sponsor: HPE  
Hardware Availability: Apr-2021

Tested by: HPE  
Software Availability: Mar-2021

Hardware

CPU Name: AMD EPYC 7443  
Max MHz: 4000  
Nominal: 2850  
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

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 A42 v2.42 04/29/2021 released Apr-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

SPEC CPU®2017 Integer Rate Result

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SPECrate®2017_int_base = 422
SPECrate®2017_int_peak = 436

<table>
<thead>
<tr>
<th>Test</th>
<th>Result</th>
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</table>
| perlbench | 500
| gcc | 502
| mcf | 505
| omnetpp | 520
| xalancbmk | 523
| x264 | 525
| deepsjeng | 531
| leela | 541
| exchange2 | 548
| xz | 557

Copies

500.perlbench_r | 96
502.gcc_r | 96
505.mcf_r | 96
520.omnetpp_r | 96
523.xalancbmk_r | 96
525.x264_r | 96
531.deepsjeng_r | 96
541.leela_r | 96
548.exchange2_r | 96
557.xz_r | 96

SPECrate®2017_int_base (422)  
SPECrate®2017_int_peak (436)

0 50 100 150 200 250 300 350 400 450 500 550 600 650 700 750 800 850 900 950 1000 1050

96 291 304 328 399 621 627 201 489 525 881 1010

John Doe  
Test Engineer  
HPE

Page 1  
Standard Performance Evaluation Corporation (info@spec.org)  
https://www.spec.org/
### Results Table

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</table>

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

### Compiler Notes

The AMD64 AOC 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

(Continued on next page)
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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/cpu2017/amd_rate_aocc300_milan_A_lib/64;/home/cpu2017/amd_rate_aoccc300_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 Jun  7 11:52:08 EDT 2021
Submission: cpu2017-20210607-26888.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
Thermal Configuration set to Maximum Cooling

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SPECrup®2017 Integer Rate Result
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Platform Notes (Continued)

Memory PStates set to Disabled
Workload Profile set to Custom
Infinity Fabric Power Management set to Disabled
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 12:26:07 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 7443 24-Core Processor
   "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 7443 24-Core Processor
Stepping: 1
CPU MHz: 1800.284
BogoMIPS: 5689.19
Virtualization: AMD-V
L1d cache: 1.5 MiB
L1i cache: 1.5 MiB
L2 cache: 24 MiB

(Continued on next page)
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ProLiant DL385 Gen10 Plus

Hewlett Packard Enterprise
 Protestant HPE

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Platform Notes (Continued)

L3 cache: 256 MiB
NUMA node0 CPU(s): 0-5,48-53
NUMA node1 CPU(s): 6-11,54-59
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 prctl and seccomp
Vulnerability Spectre v1: Mitigation; usercopy/swapgs barriers and __user pointer sanitization
Vulnerability Spectre v2: Mitigation; Full AMD retpoline, IBPF conditional, IBRS_FW, STIBP always-on, RSB filling
Vulnerability Srbd: 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 rdscrp lm constant_tsc rep_good nopl nonstop_tsc cpuid extd_apicid
        aperfmperf pni pclmulqdq monitor ssse3 fma cx16 pclid sse4_1 sse4_2 movbe popcnt aes
        xsave avx f16c rdrand lahf_lm cmp_legacy svm extapic cr8_legacy abm sse4a
        misalignsse 3nowprefetch osuw 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 vmvcall fsqbase bmi1 avx2 smep bmi2 invpcid cqm rdtd rdseed adx smap
        clflushopt clwb sha ni xsaveopt xsavec xgetbv1 xsave cqm_llc cqm_occupp_llc
        cqm_mbb_total cqm_mbb_local clzero irperf xsaverptr wbnoiwvd arat npt lbv svm_lock
        nrip_save tsc_scale vmcb_clean flushbyaid decodeassists pausefilter pfthreshold
        v_vmsave_vmload vgif umip pk pu ospe vaes vpcmldvq 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 4 5 48 49 50 51 52 53
  node 0 size: 257797 MB
  node 0 free: 257476 MB
  node 1 cpus: 6 7 8 9 10 11 54 55 56 57 58 59
  node 1 size: 258020 MB
  node 1 free: 257713 MB
  node 2 cpus: 12 13 14 15 16 17 60 61 62 63 64 65

(Continued on next page)
Platform Notes (Continued)

node 2 size: 258044 MB
node 2 free: 257792 MB
node 3 cpus: 18 19 20 21 22 23 66 67 68 69 70 71
node 3 size: 258032 MB
node 3 free: 257772 MB
node 4 cpus: 24 25 26 27 28 29 72 73 74 75 76 77
node 4 size: 258044 MB
node 4 free: 257805 MB
node 5 cpus: 30 31 32 33 34 35 78 79 80 81 82 83
node 5 size: 258044 MB
node 5 free: 257849 MB
node 6 cpus: 36 37 38 39 40 41 84 85 86 87 88 89
node 6 size: 258044 MB
node 6 free: 257837 MB
node 7 cpus: 42 43 44 45 46 47 90 91 92 93 94 95
node 7 size: 258043 MB
node 7 free: 257808 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  12  12  12  12
5:  32  32  32  32  12  12  12  12
6:  32  32  32  32  12  12  12  12
7:  32  32  32  32  12  12  12  12

From /proc/meminfo
MemTotal:       2113610388 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"

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

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CPU2017 License: 3
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Test Date: May-2021
Hardware Availability: Apr-2021
Software Availability: Mar-2021

Platform Notes (Continued)

VERSION_ID="20.04"
HOME_URL="https://www.ubuntu.com/
SUPPORT_URL="https://help.ubuntu.com/"

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): 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 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   52G  121G  31% /

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 Samsung M386AAG40AM3-CWE 128 GB 4 rank 3200
16x UNKNOWN NOT AVAILABLE

BIOS:

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

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<th>HPE</th>
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(End of data from sysinfo program)

## Compiler Version Notes

```plaintext
### 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
```

```plaintext
### 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
```

```plaintext
### 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
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Compiler Version Notes (Continued)

LLVM Mirror.Version.12.0.0)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /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

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

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**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  
-Wl,-mllvm -Wl,-function-specialize

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

**Hewlett Packard Enterprise**  
(Test Sponsor: HPE)  
ProLiant DL385 Gen10 Plus  
(2.85 GHz, AMD EPYC 7443)

<table>
<thead>
<tr>
<th>SPECrate®2017_int_base = 422</th>
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<tbody>
<tr>
<td>SPECrate®2017_int_peak = 436</td>
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**CPU2017 License:** 3  
**Test Sponsor:** HPE  
**Tested by:** HPE  
**Test Date:** May-2021  
**Hardware Availability:** Apr-2021  
**Software Availability:** Mar-2021

### Base Optimization Flags (Continued)

C benchmarks:
- `-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`
- `-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=cpp98 -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 -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=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

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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,-mlllvm -Wl,-enable-lcm-vrp -flto
  - -Wl,-mlllvm -Wl,-function-specialize
  - -Wl,-mlllvm -Wl,-align-all-nofallthru-blocks=6
  - -Wl,-mlllvm -Wl,-reduce-array-computations=3
  - -fprofile-instr-generate(pass 1)
  - -fprofile-instr-use(pass 2) -Ofast -march=znver3
  - -fveclib=AMDLIBM -fstruct-layout=7
  - -mlllvm -unroll-threshold=50 -fremap-arrays
  - -fly-function-specialization -mlllvm -inline-threshold=1000
  - -mlllvm -enable-gvn-hoist -mlllvm -global-vectorize-slp=false
  - -mlllvm -function-specialize -mlllvm -enable-lcm-vrp
  - -mlllvm -reduce-array-computations=3 -lamdlibm -ljemalloc

- 502.gcc_r: -m32 -Wl,-allow-multiple-definition
  - -Wl,-mlllvm -Wl,-enable-lcm-vrp -flto

(Continued on next page)
Hewlett Packard Enterprise
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HPE
ProLiant DL385 Gen10 Plus
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SPECrates®2017_int_base = 422
SPECrates®2017_int_peak = 436

Peak Optimization Flags (Continued)

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: -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 -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 -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

531.deepsjeng_r: basepeak = yes

(Continued on next page)
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SPECrate®2017_int_base = 422
SPECrate®2017_int_peak = 436

Peak Optimization Flags ( Continued )

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-revQ.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-revQ.xml

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