**SPEC CPU®2017 Integer Rate Result**

**Hewlett Packard Enterprise**  
(Test Sponsor: HPE)  
ProLiant DL345 Gen11  
(2.45 GHz, AMD EPYC 9534)

<table>
<thead>
<tr>
<th>Software</th>
<th>Hardware</th>
</tr>
</thead>
<tbody>
<tr>
<td>OS: Ubuntu 22.04.1 LTS</td>
<td>CPU Name: AMD EPYC 9534</td>
</tr>
<tr>
<td>Compiler: Kernel 5.15.0-53-generic</td>
<td>Max MHz: 3700</td>
</tr>
<tr>
<td>Parallel: No</td>
<td>Nominal: 2450</td>
</tr>
<tr>
<td>Firmware: HPE BIOS Version v1.12 11/24/2022 released</td>
<td>Enabled: 64 cores, 1 chip, 2 threads/core</td>
</tr>
<tr>
<td>File System: ext4</td>
<td>Orderable: 1 chip</td>
</tr>
<tr>
<td>System State: Run level 5 (multi-user)</td>
<td>Cache L1: 32 KB I + 32 KB D on chip per core</td>
</tr>
<tr>
<td>Base Pointers: 64-bit</td>
<td>L2: 1 MB I+D on chip per core</td>
</tr>
<tr>
<td>Peak Pointers: 32/64-bit</td>
<td>L3: 256 MB I+D on chip per chip, 32 MB shared / 8 cores</td>
</tr>
<tr>
<td>Other: None</td>
<td>Other: None</td>
</tr>
<tr>
<td>Power Management: BIOS and OS set to prefer performance at the cost of additional power usage</td>
<td>Memory: 384 GB (12 x 32 GB 2Rx8 PC5-4800B-R)</td>
</tr>
<tr>
<td>Storage: 1 x 1.6 TB NVMe SSD, RAID 0</td>
<td>Other: None</td>
</tr>
</tbody>
</table>

**Test Date:** Dec-2022  
**Hardware Availability:** Dec-2022  
**Software Availability:** Nov-2022

**SPECrate®2017_int_base = 602**  
**SPECrate®2017_int_peak = 638**
## Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
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<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
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<th>Seconds</th>
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<tbody>
<tr>
<td>500.perlbench_r</td>
<td>128</td>
<td>460</td>
<td>443</td>
<td>461</td>
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<td>502.gcc_r</td>
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<td>505.mcf_r</td>
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<td>520.omnetpp_r</td>
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<td>560</td>
<td>300</td>
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<tr>
<td>523.xalancbmk_r</td>
<td>128</td>
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<td>1510</td>
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<td>531.deepsjeng_r</td>
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<tr>
<td>557.xz_r</td>
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<td>439</td>
<td>315</td>
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**SPECrate®2017_int_base = 602**

**SPECrate®2017_int_peak = 638**

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.

'nuactl' 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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CPU2017 License: 3  Test Date:  Dec-2022
Test Sponsor:  HPE  Hardware Availability: Dec-2022
Tested by:  HPE  Software Availability: Nov-2022

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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unning on admin1 Tue Jun 28 00:56:23 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 9534 64-Core Processor
  1 "physical id"s (chips)
  128 "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 : 64
siblings : 128
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 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52
53 54 55 56 57 58 59 60 61 62 63
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):                          128
On-line CPU(s) list:             0-127
Vendor ID:                       AuthenticAMD
Model name:                      AMD EPYC 9534 64-Core Processor
CPU family:                      25
Model:                           17
Thread(s) per core:              2
Core(s) per socket:              64
Socket(s):                       1
Stepping:                        1
Frequency boost:                 enabled
CPU max MHz:                     3719.0000
CPU min MHz:                     400.0000
BogoMIPS:                        4892.54
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
                                pdel1gb rdtscp lm constant_tsc rep_good nopl nonstop_tsc cpuid extd_apicid
                                aperfmperf rapl pni pclmulqdq monitor ssse3 fma cx16 pdcm ssse4_1 sse4_2 x2apic movbe
(Continued on next page)
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Platform Notes (Continued)

popcnt aes xsave avx f16c rdrand lahf_lm cmp_legacy svm extapic cr8 Legacy abm sse4a misalignsse 3dnoprefetch osvw 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 vmccall fsgsbase bmi1 avx2 smep bmi2 erms invpcid cm q rdt_a avx512f
avx512dq rdseed adv smap avx512ifma clflushopt clwb avx512cd sha_ni avx512bw
avx512vl xsaveopt xsave xsaveopt xsaveopt xsaveopt xsaveopt xsaveopt xsaveopt xsaveopt
platform threshold avic v_vmssave_vmload vg1v v_spec_ctrl avx512vbmi umip pku
ospe avx512_vmbi2 gfn vaes vpc1muldq avx512_vnni avx512_bitalg avx512_vpopcntdq
la57 rdpid overflow_recover success smca fsrm flush_l1d
Virtualization: AMD-V
L1d cache: 2 MiB (64 instances)
L1i cache: 2 MiB (64 instances)
L2 cache: 64 MiB (64 instances)
L3 cache: 256 MiB (8 instances)
NUMA node(s): 8
NUMA node0 CPU(s): 0-7, 64-71
NUMA node1 CPU(s): 32-39, 96-103
NUMA node2 CPU(s): 16-23, 80-87
NUMA node3 CPU(s): 48-55, 112-119
NUMA node4 CPU(s): 24-31, 88-95
NUMA node5 CPU(s): 56-63, 120-127
NUMA node6 CPU(s): 8-15, 72-79
NUMA node7 CPU(s): 40-47, 104-111
Vulnerability Itlb Multihit: Not affected
Vulnerability Ltlf: 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 sanitization
Vulnerability Spectre v2: Mitigation; Retpolines, IBFB conditional, IBRS_FW, STIBP always-on, RSB filling, PBRSB-eIBRS Not affected
Vulnerability Srbsds: 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 2M 8 Data 1 64 1 64
L1i 32K 2M 8 Instruction 1 64 1 64
L2 1M 64M 8 Unified 2 2048 1 64
L3 32M 256M 16 Unified 3 32768 1 64

(Continued on next page)
Platform Notes (Continued)

/proc/cpuinfo cache data
  cache size : 1024 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 6 7 64 65 66 67 68 69 70 71
  node 0 size: 48069 MB
  node 0 free: 47425 MB
  node 1 cpus: 32 33 34 35 36 37 38 39 96 97 98 99 100 101 102 103
  node 1 size: 48344 MB
  node 1 free: 47800 MB
  node 2 cpus: 16 17 18 19 20 21 22 23 80 81 82 83 84 85 86 87
  node 2 size: 48380 MB
  node 2 free: 47668 MB
  node 3 cpus: 48 49 50 51 52 53 54 55 112 113 114 115 116 117 118 119
  node 3 size: 48380 MB
  node 3 free: 47745 MB
  node 4 cpus: 24 25 26 27 28 29 30 31 112 113 114 115 116 117 118 119
  node 4 size: 48380 MB
  node 4 free: 47846 MB
  node 5 cpus: 56 57 58 59 60 61 62 63 120 121 122 123 124 125 126 127
  node 5 size: 48380 MB
  node 5 free: 47849 MB
  node 6 cpus: 8 9 10 11 12 13 14 15 72 73 74 75 76 77 78 79
  node 6 size: 48380 MB
  node 6 free: 47850 MB
  node 7 cpus: 40 41 42 43 44 45 46 47 104 105 106 107 108 109 110 111
  node 7 size: 48335 MB
  node 7 free: 47803 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:       395929632 kB
  HugePages_Total:       0
  Hugepagesize:       2048 kB

/sbin/tuned-adm active

(Continued on next page)
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Platform Notes (Continued)

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
   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
reftbleed: 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: Retpolines, IBPB: conditional, IBRS_FW, STIBP: always-on, RSB filling, PBRSB-eIBRS: Not affected
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

(Continued on next page)
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Platform Notes (Continued)

SPEC is set to: /home/cpu2017
Filesytsem          Type  Size  Used  Avail  Use% Mounted on
/dev/mapper/ubuntu--vg-ubuntu--lv  ext4   98G   19G   75G  20% /

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

(End of data from sysinfo program)

Compiler Version Notes

==============================================================================
C       | 502.gcc_r(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: i386-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-4.0-3206-389/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 14.0.6 (CLANG: AOCC_4.0.0-Build#389 2022_10_07) (based on
LLVM Mirror.Version.14.0.6)

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

Target: x86_64-unknown-linux-gnu  
Thread model: posix  
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-4.0-3206-389/bin

---

### C

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

### C++

<table>
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Target: i386-unknown-linux-gnu  
Thread model: posix  
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### C++

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(Continued on next page)
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ProLiant DL345 Gen11
(2.45 GHz, AMD EPYC 9534)

SPECrate®2017_int_base = 602
SPECrate®2017_int_peak = 638

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

Compiler Version Notes (Continued)

==============================================================================
C++ | 523.xalancbmk_r(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: i386-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-4.0-3206-389/bin
==============================================================================

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

==============================================================================
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
Hewlett Packard Enterprise  
(Test Sponsor: HPE)  
ProLiant DL345 Gen11  
(2.45 GHz, AMD EPYC 9534)  

<table>
<thead>
<tr>
<th>SPECrate®2017_int_base</th>
<th>SPECrate®2017_int_peak</th>
</tr>
</thead>
<tbody>
<tr>
<td>602</td>
<td>638</td>
</tr>
</tbody>
</table>

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

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 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6  
- Wl,-mllvm -Wl,-reduce-array-computations=3  
- Wl,-mllvm -Wl,-ldist-scalar-expand -fenable-aggressive-gather  
- z muldefs -O3 -march=znver4 -fveclib=AMDLIBM -ffast-math  
- fstruct-layout=7 -mllvm -unroll-threshold=50  
- mllvm -inline-threshold=1000 -fremap-arrays -fstrip-mining  
- mllvm -reduce-array-computations=3 -zopt -lamdlibm -flang  
- lamdalloc

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

Fortran benchmarks:
- m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6  
- Wl,-mllvm -Wl,-reduce-array-computations=3  
- Wl,-mllvm -Wl,-inline-recursion=4 -Wl,-mllvm -Wl,-lsr-in-nested-loop  
- Wl,-mllvm -Wl,-enable-lv-split -z muldefs -O3 -march=znver4  
- fveclib=AMDLIBM -ffast-math -fepilog-vectorization-of-inductions  
- mllvm -optimize-strided-mem-cost -floop-transform  
- mllvm -unroll-aggressive -mllvm -unroll-threshold=500 -lamdlibm  
- flang -lamdalloc
SPEC CPU®2017 Integer Rate Result
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Hewlett Packard Enterprise
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ProLiant DL345 Gen11
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SPECrate®2017_int_base = 602
SPECrate®2017_int_peak = 638

| CPU2017 License: 3 | Test Date: Dec-2022 |
| Test Sponsor: HPE | Hardware Availability: Dec-2022 |
| Tested by: HPE | Software Availability: Nov-2022 |

**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`

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`

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

502.gcc_r: -m32 -flto -z muldefs -Ofast -march=znver4
   -fveclib=AMDLIBM -ffast-math -fstruct-layout=7
   -mllvm -unroll-threshold=50 -fremap-arrays -fstrip-mining
   -mllvm -inline-threshold=1000
   -mllvm -reduce-array-computations=3 -zopt -fgnu89-inline
   -lamdalloc

505.mcf_r: basepeak = yes
525.x264_r: basepeak = yes
557.xz_r: basepeak = yes

C++ benchmarks:

520.omnetpp_r: basepeak = yes
523.xalancbmk_r: -m32 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
   -Wl,-mllvm -Wl,-reduce-array-computations=3
   -Wl,-mllvm -Wl,-do-block-reorder=aggressive
   -fno-loop-reroll -Ofast -march=znver4 -fveclib=AMDLIBM
   -ffast-math -finline-aggressive
   -mllvm -unroll-threshold=100
   -mllvm -reduce-array-computations=3 -zopt
   -mllvm -do-block-reorder=aggressive
   -fvirtual-function-elimination -fvisibility=hidden
   -lamdalloc-ext

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

541.leela_r: -m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
   -Wl,-mllvm -Wl,-reduce-array-computations=3 -Ofast
   -march=znver4 -fveclib=AMDLIBM -ffast-math
   -ffast-math -finline-aggressive -mllvm -unroll-threshold=100
   -mllvm -reduce-array-computations=3 -zopt
   -fvirtual-function-elimination -fvisibility=hidden
   -lamdlibm -lflang -lamdalloc-ext

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Peak Optimization Flags (Continued)

Fortran benchmarks:
-m64 -flto -Wl,-mlvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mlllvm -Wl,-reduce-array-computations=3
-Wl,-mlllvm -Wl,-inline-recursion=4 -Wl,-mlllvm -Wl,-lsr-in-nested-loop
-Wl,-mlllvm -Wl,-enable-iv-split -O3 -march=znver4 -fveclib=AMDLIBM
-ffast-math -fepilog-vectorization-of-inductions
-mlllvm -optimize-strided-mem-cost -floop-transform
-mlllvm -unroll-aggressive -mlllvm -unroll-threshold=500 -lamlibm
-lflang -lamdalloc

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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