**Hewlett Packard Enterprise**  
(Test Sponsor: HPE)  
ProLiant DL345 Gen11  
(3.25 GHz, AMD EPYC 9354P)  

<table>
<thead>
<tr>
<th>SPECrate®2017_fp_peak</th>
<th>SPECrate®2017_fp_base</th>
</tr>
</thead>
<tbody>
<tr>
<td>445</td>
<td>442</td>
</tr>
</tbody>
</table>

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

### Hardware

- **CPU Name:** AMD EPYC 9354P  
  - Max MHz: 3800  
  - Nominal: 3250  
  - Enabled: 32 cores, 1 chip, 2 threads/core  
  - Orderable: 1 chip  
  - Cache L1: 32 KB I + 32 KB D on chip per core  
  - L2: 1 MB I+D on chip per core  
  - L3: 256 MB I+D on chip per chip, 32 MB shared / 4 cores  
  - Other: None  
- **Memory:** 384 GB (12 x 32 GB 2Rx8 PC5-4800B-R)  
- **Storage:** 1 x 1.6 TB NVMe SSD, RAID 0  
- **Other:** None

### Software

- **OS:** Ubuntu 22.04.1 LTS  
  - Kernel 5.15.0-53-generic  
- **Compiler:** C/C++/Fortran: Version 4.0.0 of AOCC  
- **Parallel:** No  
- **Firmware:** HPE BIOS Version v1.12 11/24/2022 released Nov-2022  
- **File System:** ext4  
- **System State:** Run level 5 (multi-user)  
- **Base Pointers:** 64-bit  
- **Peak Pointers:** 64-bit  
- **Other:** None  
- **Power Management:** BIOS and OS set to prefer performance at the cost of additional power usage
SPEC CPU®2017 Floating Point Rate Result
Copyright 2017-2023 Standard Performance Evaluation Corporation

Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL345 Gen11
(3.25 GHz, AMD EPYC 9354P)

SPECrate®2017_fp_base = 442
SPECrate®2017_fp_peak = 445

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Copies</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>503.bwaves_r</td>
<td>64</td>
<td>746</td>
<td>860</td>
<td>748</td>
<td>858</td>
<td>64</td>
<td>746</td>
<td>860</td>
<td>748</td>
<td>858</td>
<td>64</td>
<td>746</td>
</tr>
<tr>
<td>507.cactuBSSN_r</td>
<td>64</td>
<td>143</td>
<td>568</td>
<td>143</td>
<td>568</td>
<td>64</td>
<td>142</td>
<td>572</td>
<td>142</td>
<td>570</td>
<td>142</td>
<td>572</td>
</tr>
<tr>
<td>508.namd_r</td>
<td>64</td>
<td>221</td>
<td>275</td>
<td>221</td>
<td>275</td>
<td>64</td>
<td>221</td>
<td>275</td>
<td>221</td>
<td>275</td>
<td>64</td>
<td>221</td>
</tr>
<tr>
<td>510.parest_r</td>
<td>64</td>
<td>370</td>
<td>452</td>
<td>371</td>
<td>452</td>
<td>64</td>
<td>370</td>
<td>452</td>
<td>371</td>
<td>452</td>
<td>370</td>
<td>453</td>
</tr>
<tr>
<td>511.povray_r</td>
<td>64</td>
<td>377</td>
<td>396</td>
<td>376</td>
<td>397</td>
<td>64</td>
<td>377</td>
<td>396</td>
<td>376</td>
<td>397</td>
<td>377</td>
<td>397</td>
</tr>
<tr>
<td>519.llvm_r</td>
<td>64</td>
<td>239</td>
<td>282</td>
<td>240</td>
<td>281</td>
<td>64</td>
<td>250</td>
<td>282</td>
<td>250</td>
<td>282</td>
<td>240</td>
<td>281</td>
</tr>
<tr>
<td>521.wrf_r</td>
<td>64</td>
<td>309</td>
<td>463</td>
<td>309</td>
<td>465</td>
<td>64</td>
<td>309</td>
<td>485</td>
<td>309</td>
<td>484</td>
<td>296</td>
<td>484</td>
</tr>
<tr>
<td>526.blender_r</td>
<td>64</td>
<td>259</td>
<td>376</td>
<td>258</td>
<td>378</td>
<td>64</td>
<td>259</td>
<td>376</td>
<td>258</td>
<td>378</td>
<td>257</td>
<td>380</td>
</tr>
<tr>
<td>527.cam4-r</td>
<td>64</td>
<td>280</td>
<td>400</td>
<td>282</td>
<td>397</td>
<td>64</td>
<td>280</td>
<td>400</td>
<td>282</td>
<td>397</td>
<td>291</td>
<td>384</td>
</tr>
<tr>
<td>538.imagick_r</td>
<td>64</td>
<td>112</td>
<td>1410</td>
<td>1410</td>
<td>1410</td>
<td>64</td>
<td>112</td>
<td>1410</td>
<td>1410</td>
<td>1410</td>
<td>113</td>
<td>1410</td>
</tr>
<tr>
<td>544.nab_r</td>
<td>64</td>
<td>185</td>
<td>582</td>
<td>185</td>
<td>582</td>
<td>64</td>
<td>184</td>
<td>584</td>
<td>184</td>
<td>587</td>
<td>185</td>
<td>582</td>
</tr>
<tr>
<td>549.fotonik3d_r</td>
<td>64</td>
<td>883</td>
<td>282</td>
<td>884</td>
<td>282</td>
<td>64</td>
<td>883</td>
<td>286</td>
<td>875</td>
<td>285</td>
<td>875</td>
<td>285</td>
</tr>
<tr>
<td>554.roms_r</td>
<td>64</td>
<td>447</td>
<td>228</td>
<td>447</td>
<td>228</td>
<td>64</td>
<td>447</td>
<td>228</td>
<td>444</td>
<td>229</td>
<td>443</td>
<td>229</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>

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.

(Continued on next page)
Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL345 Gen11
(3.25 GHz, AMD EPYC 9354P)

<table>
<thead>
<tr>
<th>CPU2017 License: 3</th>
<th>Test Date: Dec-2022</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Sponsor: HPE</td>
<td>Hardware Availability: Dec-2022</td>
</tr>
<tr>
<td>Tested by: HPE</td>
<td>Software Availability: Nov-2022</td>
</tr>
</tbody>
</table>

**SPEC CPU®2017 Floating Point Rate Result**

**SPECrate®2017_fp_base = 442**

**SPECrate®2017_fp_peak = 445**

---

Operating System Notes (Continued)

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.

To enable Transparent Hugepages (THP) for all allocations, '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/lib:/home/cpu2017/amd_rate_aocc400_genoa_B_lib/lib32:"

MALLOC_CONF = "retain:true"

---

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
Determism 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
ACPI CST C2 Latency set to 18 microseconds
Thermal Configuration set to Maximum Cooling
Workload Profile set to Custom
Power Regulator set to OS Control Mode

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

(Continued on next page)
Platform Notes (Continued)

ROM is version GenoaPI 1.0.0.1-L6

Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r6622 of 2021-04-07 982a61ec0915b55891ef0e16acafc64d
running on admin1 Mon Jun 27 18:34:38 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 9354P 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 2.37.2:

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): 64
On-line CPU(s) list: 0-63
Vendor ID: AuthenticAMD
Model name: AMD EPYC 9354P 32-Core Processor
CPU family: 25
Model: 17
Thread(s) per core: 2
Core(s) per socket: 32
Socket(s): 1
Stepping: 1
Frequency boost: enabled
CPU max MHz: 3800.0000
CPU min MHz: 400.0000
BogoMIPS: 6490.22
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 perf hammer 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 ibr skinit wdt tce topoext perfctr_core perfctr_nb
bpext perfctr_llc mwaidx cpb cat_13 cdp_13 invpcid_single hw_pstate ssbd mba ibrs
**SPEC CPU®2017 Floating Point Rate Result**

**Hewlett Packard Enterprise**
(Test Sponsor: HPE)
ProLiant DL345 Gen11
(3.25 GHz, AMD EPYC 9354P)

<table>
<thead>
<tr>
<th>CPU2017 License:</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Sponsor:</td>
<td>HPE</td>
</tr>
<tr>
<td>Tested by:</td>
<td>HPE</td>
</tr>
</tbody>
</table>

**SPECrate®2017_fp_base = 442**

**SPECrate®2017_fp_peak = 445**

**Platform Notes (Continued)**

ibpb stibp vmmcall fsqsbased bni1 avx2 smep bmi2 erms invpcid cqm rdt_a avx512f
avx512dq rdseed adx smap avx512ifma clflushopt clwb avx512cd sha ni avx512bw
avx512vl xsaveopt xsavec xgetbv1 xsaves cqm_llc cqm_occup_llc cqm_mbb_total
cqm_mbb_local avx512_bf16 clzero irperf xsaveerptr rdpru wbnoinvd amd_prpin cppc arat
npt lbrv svm_lock nrip_save tsc_scale vmcb_clean flushbyasid decodeassists
pausefilter pfthreshold avic v_vmsave_vmload vgif v_spec_ctrl avx512vbmi umip pku
ospke avx512_vmbi gfn vaes vpcm昔1dq avx512_vnni avx512_bitalg avx512_vpopcntdq
la57 rdpid overflow_recover succor smca farm flush l1d

Virtualization:          AMD-V
L1d cache:               1 MiB (32 instances)
L1i cache:               1 MiB (32 instances)
L2 cache:                32 MiB (32 instances)
L3 cache:                256 MiB (8 instances)
NUMA node(s):            8
NUMA node0 CPU(s):       0-3,32-35
NUMA node1 CPU(s):       16-19,48-51
NUMA node2 CPU(s):       8-11,40-43
NUMA node3 CPU(s):       24-27,56-59
NUMA node4 CPU(s):       12-15,44-47
NUMA node5 CPU(s):       28-31,60-63
NUMA node6 CPU(s):       4-7,36-39
NUMA node7 CPU(s):       20-23,52-55

Vulnerability Itlb multihit: Not affected
Vulnerability L1tf:      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
ptrt1 and seccomp
Vulnerability Spectre v1: Mitigation; usercopy/swapgs barriers and __user
pointer sanitization
Vulnerability Spectre v2: Mitigation; Retpolines, IBPB 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:

<table>
<thead>
<tr>
<th>NAME</th>
<th>ONE-SIZE</th>
<th>ALL-SIZE</th>
<th>WAYS</th>
<th>TYPE</th>
<th>LEVEL</th>
<th>SETS</th>
<th>PHY-LINE</th>
<th>COHERENCY-SIZE</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1d</td>
<td>32K</td>
<td>1M</td>
<td>8</td>
<td>Data</td>
<td>1</td>
<td>64</td>
<td>1</td>
<td>64</td>
</tr>
<tr>
<td>L1i</td>
<td>32K</td>
<td>1M</td>
<td>8</td>
<td>Instruction</td>
<td>1</td>
<td>64</td>
<td>1</td>
<td>64</td>
</tr>
<tr>
<td>L2</td>
<td>1M</td>
<td>32M</td>
<td>8</td>
<td>Unified</td>
<td>2</td>
<td>2048</td>
<td>1</td>
<td>64</td>
</tr>
<tr>
<td>L3</td>
<td>32M</td>
<td>256M</td>
<td>16</td>
<td>Unified</td>
<td>3</td>
<td>32768</td>
<td>1</td>
<td>64</td>
</tr>
</tbody>
</table>

/proc/cpuinfo cache data
  cache size : 1024 KB

(Continued on next page)
Platform Notes (Continued)

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: 48071 MB
  node 0 free: 47826 MB
  node 1 cpus: 16 17 18 19 48 49 50 51
  node 1 size: 48381 MB
  node 1 free: 48138 MB
  node 2 cpus: 8 9 10 11 40 41 42 43
  node 2 size: 48381 MB
  node 2 free: 48117 MB
  node 3 cpus: 24 25 26 27 56 57 58 59
  node 3 size: 48381 MB
  node 3 free: 48220 MB
  node 4 cpus: 12 13 14 15 44 45 46 47
  node 4 size: 48381 MB
  node 4 free: 48194 MB
  node 5 cpus: 28 29 30 31 60 61 62 63
  node 5 size: 48381 MB
  node 5 free: 48192 MB
  node 6 cpus: 4 5 6 7 36 37 38 39
  node 6 size: 48381 MB
  node 6 free: 48214 MB
  node 7 cpus: 20 21 22 23 52 53 54 55
  node 7 size: 48304 MB
  node 7 free: 48123 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:       395947320 kB
  HugePages_Total:       0
  Hugepagesize:       2048 kB

/sbin/tuned-adm active
  Current active profile: throughput-performance

/sys/devices/system/cpu/cpu*/cpufreq/scaling_governor has
Platform Notes (Continued)

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
retbleed: 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/swaps barriers and __user pointer sanitization
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

SPEC is set to: /home/cpu2017
   Filesystem Type Size Used Avail Use% Mounted on
   /dev/mapper/ubuntu--vg-ubuntu--lv ext4 98G 18G 76G 20% /
Platform Notes (Continued)

From /sys/devices/virtual/dmi/id
Vendor:         HPE
Product:        ProLiant DL345 Gen11
Product Family: ProLiant
Serial:         DL3x5GEN11

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               | 519.lbm_r(base, peak) 538.imagick_r(base, peak)
                | 544.nab_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
==============================================================================

C++             | 508.namd_r(base, peak) 510.parest_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
(Continued on next page)
Compiler Version Notes (Continued)

C++, C | 511.povray_r(base, peak) 526.blender_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

C++, C, Fortran | 507.cactuBSSN_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 | 503.bwaves_r(base, peak) 549.fotonik3d_r(base, peak) 554.roms_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
(Continued on next page)
Spec CPU®2017 Floating Point Rate Result

Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL345 Gen11
(3.25 GHz, AMD EPYC 9354P)

SPECrater®2017_fp_base = 442
SPECrater®2017_fp_peak = 445

<table>
<thead>
<tr>
<th>CPU2017 License: 3</th>
<th>Test Date: Dec-2022</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Sponsor: HPE</td>
<td>Hardware Availability: Dec-2022</td>
</tr>
<tr>
<td>Tested by: HPE</td>
<td>Software Availability: Nov-2022</td>
</tr>
</tbody>
</table>

Compiler Version Notes (Continued)

Fortran, C  | 521.wrf_r(base, peak) 527.cam4_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
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

Benchmarks using both Fortran and C:
flang clang

Benchmarks using both C and C++:
clang++ clang

Benchmarks using Fortran, C, and C++:
clang++ clang flang

Base Portability Flags

503.bwaves_r: -DSPEC_LP64
507.cactuBSSN_r: -DSPEC_LP64
508.namd_r: -DSPEC_LP64
510.parest_r: -DSPEC_LP64
511.povray_r: -DSPEC_LP64

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

Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL345 Gen11
(3.25 GHz, AMD EPYC 9354P)

SPECrate®2017_fp_base = 442
SPECrate®2017_fp_peak = 445

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

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

Base Portability Flags (Continued)

519.lbm_r: -DSPEC_LP64
521.wrf_r: -DSPEC_CASE_FLAG -Mbyteswapio -DSPEC_LP64
526.blender_r: -funsigned-char -DSPEC_LP64
527.cam4_r: -DSPEC_CASE_FLAG -DSPEC_LP64
538.imagick_r: -DSPEC_LP64
544.nab_r: -DSPEC_LP64
549.fotonik3d_r: -DSPEC_LP64
554.roms_r: -DSPEC_LP64

Base Optimization Flags

C benchmarks:
-m64 -flto -Wl,-mlllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mlllvm -Wl,-reduce-array-computations=3
-Wl,-mlllvm -Wl,-ldist-scalar-expand -fenable-aggressive-gather -O3
-march=znver4 -fveclib=AMDLIBM -ffast-math -fstruct-layout=7
-mlllvm -unroll-threshold=50 -mlllvm -inline-threshold=1000
-fremap-arrays -fstrip-mining -mlllvm -reduce-array-computations=3
-zopt -lamdllibm -lamdalloc -lflang

C++ benchmarks:
-m64 -flto -Wl,-mlllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mlllvm -Wl,-reduce-array-computations=3
-Wl,-mlllvm -Wl,-x86-use-vzeroupper=false -O3 -march=znver4
-fveclib=AMDLIBM -ffast-math -mlllvm -unroll-threshold=100
-finline-aggressive -mlllvm -loop-unswitch-threshold=200000
-mlllvm -reduce-array-computations=3 -zopt -lamdllibm -lamdalloc

Fortran benchmarks:
-m64 -flto -Wl,-mlllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mlllvm -Wl,-reduce-array-computations=3
-Wl,-mlllvm -Wl,-enable-X86-prefetching -O3 -march=znver4
-fveclib=AMDLIBM -ffast-math -Kieee -Mrecursive -funroll-loops
-mlllvm -lsr-in-nested-loop -mlllvm -reduce-array-computations=3
-fepilog-vectorization-of-inductions -zopt -lamdllibm -lamdalloc

Benchmarks using both Fortran and C:
-m64 -flto -Wl,-mlllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mlllvm -Wl,-reduce-array-computations=3
-Wl,-mlllvm -Wl,-enable-X86-prefetching -O3 -march=znver4
-fveclib=AMDLIBM -ffast-math -fstruct-layout=7
-mlllvm -unroll-threshold=50 -mlllvm -inline-threshold=1000

(Continued on next page)
Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL345 Gen11
(3.25 GHz, AMD EPYC 9354P)

SPECrate®2017_fp_base = 442
SPECrate®2017_fp_peak = 445

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

Base Optimization Flags (Continued)

- fremap-arrays -fstrip-mining -mllvm -reduce-array-computations=3
- zopt -Kieee -Mrecursive -funroll-loops -mllvm -lsr-in-nested-loop
- fepilog-vectorization-of-inductions -lamdlibm -lamdalloc -lflang

Benchmarks using both C and C++:
- m64 -f1to -W1,-mllvm -W1,-align-all-nofallthru-blocks=6
- W1,-mllvm -W1,-reduce-array-computations=3
- W1,-mllvm -W1,-x86-use-vzeroupper=false -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 -mllvm -unroll-threshold=100 -finline-aggressive
- mllvm -loop-unswitch-threshold=200000 -lamdlibm -lamdalloc -lflang

Benchmarks using Fortran, C, and C++:
- m64 -f1to -W1,-mllvm -W1,-align-all-nofallthru-blocks=6
- W1,-mllvm -W1,-reduce-array-computations=3
- W1,-mllvm -W1,-x86-use-vzeroupper=false -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 -mllvm -unroll-threshold=100 -finline-aggressive
- mllvm -loop-unswitch-threshold=200000 -Kieee -Mrecursive
- funroll-loops -mllvm -lsr-in-nested-loop
- fepilog-vectorization-of-inductions -lamdlibm -lamdalloc -lflang

Base Other Flags

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

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

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

Benchmarks using both Fortran and C:
- Wno-unused-command-line-argument

Benchmarks using both C and C++:
- Wno-unused-command-line-argument

(Continued on next page)
Base Other Flags (Continued)

Benchmarks using Fortran, C, and C++:
- -Wno-unused-command-line-argument

Peak Compiler Invocation

C benchmarks:
clang

C++ benchmarks:
clang++

Fortran benchmarks:
flang

Benchmarks using both Fortran and C:
flang clang

Benchmarks using both C and C++:
clang++ clang

Benchmarks using Fortran, C, and C++:
clang++ clang flang

Peak Portability Flags

Same as Base Portability Flags

Peak Optimization Flags

C benchmarks:

519.lbm_r: basepeak = yes

538.imagick_r: basepeak = yes

544.nab_r: -m64 -flto -Wl,-mllvm -Wl,-ldist-scalar-expand
-fenable-aggressive-gather -Ofast -march=znver4
-fveclib=AMDLIBM -ffast-math -fstruct-layout=7
-mllvm -unroll-threshold=50 -fremap-arrays -fstrip-mining
-mllvm -inline-threshold=1000

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

544.nab_r (continued):
-mlir -reduce-array-computations=3 -zopt -lamdlibm
-lamdalloc

C++ benchmarks:

508.namd_r: basepeak = yes
510.parest_r: basepeak = yes

Fortran benchmarks:

503.bwaves_r: basepeak = yes

549.fotonik3d_r: -m64 -flto -Wl,-mlir -Wl,-align-all-nofallthru-blocks=6
-Wl,-mlir -Wl,-reduce-array-computations=3
-Wl,-mlir -Wl,-enable-X86-prefetching -Ofast
-march=znver4 -fveclib=AMDLIBM -ffast-math -Kieee
-Mrecursive -mlir -reduce-array-computations=3
-fepilog-vectorization-of-inductions -fvector-transform
-fscalar-transform -lamdlibm -lmdalloc -lflang

554.roms_r: -m64 -flto -Wl,-mlir -Wl,-align-all-nofallthru-blocks=6
-Wl,-mlir -Wl,-reduce-array-computations=3
-Wl,-mlir -Wl,-enable-X86-prefetching -Ofast
-march=znver4 -fveclib=AMDLIBM -ffast-math -Mrecursive
-mlir -reduce-array-computations=3
-fepilog-vectorization-of-inductions -zopt -lamdlibm
-lmdalloc -lflang

Benchmarks using both Fortran and C:

521.wrf_r: -m64 -flto -Wl,-mlir -Wl,-align-all-nofallthru-blocks=6
-Wl,-mlir -Wl,-reduce-array-computations=3
-Wl,-mlir -Wl,-enable-X86-prefetching -Ofast
-march=znver4 -fveclib=AMDLIBM -ffast-math
-fstruct-layout=7 -mlir -unroll-threshold=50
-fremap-arrays -fstrip-mining
-mlir -inline-threshold=1000
-mlir -reduce-array-computations=3 -zopt -Mrecursive
-fepilog-vectorization-of-inductions -lmdlibm -lmdalloc
-llflang

527.cam4_r: basepeak = yes

(Continued on next page)
Hewlett Packard Enterprise
ProLiant DL345 Gen11
(3.25 GHz, AMD EPYC 9354P)

SPECrate®2017_fp_base = 442
SPECrate®2017_fp_peak = 445

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

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

Peak Optimization Flags (Continued)

Benchmarks using both C and C++:

511.povray_r.basepeak = yes
526.blender_r.basepeak = yes

Benchmarks using Fortran, C, and C++:

- m64 -flto -Wl,-mllvm -Wl,-reduce-array-computations=6
- Wl,-mllvm -Wl,-reduce-array-computations=3
- Wl,-mllvm -Wl,-x86-use-vzeroupper=false -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
- mllvm -unroll-threshold=100 -mllvm -loop-unswitch-threshold=200000
- finline-aggressive -faggressive-loop-transform -fvector-transform
- fscalar-transform -Mrecursive -fepilog-vectorization-of-inductions
- lamdlibm -lamlalloc -lflang

Peak Other Flags

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

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

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

Benchmarks using both Fortran and C:
- Wno-unused-command-line-argument

Benchmarks using both C and C++:
- Wno-unused-command-line-argument

Benchmarks using Fortran, C, and C++:
- 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
Hewlett Packard Enterprise  
(Test Sponsor: HPE)  
ProLiant DL345 Gen11  
(3.25 GHz, AMD EPYC 9354P)  

SPECrater®2017_fp_base = 442  
SPECrater®2017_fp_peak = 445

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

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

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

SPEC CPU and SPECrater are registered trademarks of the Standard Performance Evaluation Corporation. All other brand and product names appearing in this result are trademarks or registered trademarks of their respective holders.

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

Tested with SPEC CPU®2017 v1.1.8 on 2022-06-27 14:34:37-0400.  
Report generated on 2023-02-01 18:24:59 by CPU2017 PDF formatter v6442.  
Originally published on 2023-02-01.