Hewlett Packard Enterprise
ProLiant DL365 Gen10 Plus
(2.80 GHz, AMD EPYC 7543)

SPECspeed®2017_fp_base = 221
SPECspeed®2017_fp_peak = 228

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

Hardware
CPU Name: AMD EPYC 7543
Max MHz: 3700
Nominal: 2800
Enabled: 64 cores, 2 chips
Orderable: 1, 2 chips
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: 2 TB (16 x 128 GB 4Rx4 PC4-3200AA-L)
Storage: 1 x 196 GB SATA SSD, RAID 0
Other: None

Software
OS: Ubuntu 20.04.1 LTS (x86_64)
Kernel 5.4.0-56-generic
Compiler: C/C++/Fortran: Version 3.0.0 of AOCC
Parallel: Yes
Firmware: HPE BIOS Version A42 v2.40 02/23/2021 released Feb-2021
File System: ext4
System State: Run level 5 (multi-user)
Base Pointers: 64-bit
Peak Pointers: 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
## Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
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</thead>
<tbody>
<tr>
<td>603.bwaves_s</td>
<td>64</td>
<td>79.3</td>
<td>744</td>
<td>78.9</td>
<td>748</td>
<td>78.8</td>
<td>748</td>
<td>64</td>
<td>79.3</td>
<td>744</td>
<td>78.9</td>
<td>748</td>
<td>78.8</td>
<td>748</td>
</tr>
<tr>
<td>607.cactuBSSN_s</td>
<td>64</td>
<td>47.4</td>
<td>352</td>
<td>47.7</td>
<td>350</td>
<td>47.4</td>
<td>352</td>
<td>64</td>
<td>47.2</td>
<td>353</td>
<td>47.5</td>
<td>351</td>
<td>47.4</td>
<td>352</td>
</tr>
<tr>
<td>619.lbm_s</td>
<td>64</td>
<td>39.7</td>
<td>132</td>
<td>40.3</td>
<td>130</td>
<td>40.5</td>
<td>129</td>
<td>64</td>
<td>38.7</td>
<td>135</td>
<td>38.8</td>
<td>135</td>
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<td>135</td>
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<tr>
<td>621.wrf_s</td>
<td>64</td>
<td>78.7</td>
<td>168</td>
<td>82.8</td>
<td>160</td>
<td>79.1</td>
<td>167</td>
<td>64</td>
<td>78.7</td>
<td>168</td>
<td>82.8</td>
<td>160</td>
<td>79.1</td>
<td>167</td>
</tr>
<tr>
<td>627.cam4_s</td>
<td>64</td>
<td>54.2</td>
<td>164</td>
<td>53.5</td>
<td>166</td>
<td>53.6</td>
<td>165</td>
<td>64</td>
<td>54.2</td>
<td>164</td>
<td>53.5</td>
<td>166</td>
<td>53.6</td>
<td>165</td>
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<tr>
<td>628.pop2_s</td>
<td>64</td>
<td>175</td>
<td>67.7</td>
<td>173</td>
<td>68.6</td>
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<td>68.2</td>
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<td>173</td>
<td>68.6</td>
<td>174</td>
<td>68.2</td>
</tr>
<tr>
<td>638.imagick_s</td>
<td>64</td>
<td>46.3</td>
<td>312</td>
<td>46.4</td>
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<td>47.0</td>
<td>307</td>
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<td>46.4</td>
<td>311</td>
<td>47.0</td>
<td>307</td>
</tr>
<tr>
<td>644.nab_s</td>
<td>64</td>
<td>39.4</td>
<td>443</td>
<td>39.5</td>
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<td>443</td>
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<td>39.5</td>
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<tr>
<td>649.fotonik3d_s</td>
<td>64</td>
<td>75.2</td>
<td>121</td>
<td>74.7</td>
<td>122</td>
<td>74.8</td>
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<td>64</td>
<td>75.2</td>
<td>121</td>
<td>74.7</td>
<td>122</td>
<td>74.8</td>
<td>122</td>
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<tr>
<td>654.roms_s</td>
<td>64</td>
<td>61.0</td>
<td>258</td>
<td>62.4</td>
<td>252</td>
<td>59.4</td>
<td>265</td>
<td>64</td>
<td>47.5</td>
<td>332</td>
<td>47.6</td>
<td>330</td>
<td>47.6</td>
<td>331</td>
</tr>
</tbody>
</table>

**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
'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.
Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL365 Gen10 Plus
(2.80 GHz, AMD EPYC 7543)

SPEC CPU®2017 Floating Point Speed Result
Copyright 2017-2021 Standard Performance Evaluation Corporation

SPECspeed®2017_fp_base = 221
SPECspeed®2017_fp_peak = 228

Operating System Notes (Continued)

To enable Transparent Hugepages (THP) for all allocations,
'echo always > /sys/kernel/mm/transparent_hugepage/enabled' and
'echo always > /sys/kernel/mm/transparent_hugepage/defrag' run as root.
To enable THP only on request for peak runs of 628.pop2_s, and 638.imagick_s,
'echo madvise > /sys/kernel/mm/transparent_hugepage/enabled' run as root.
To disable THP for peak runs of 627.cam4_s, 644.nab_s, 649.fotonik3d_s, and 654.roms_s,
'echo never > /sys/kernel/mm/transparent_hugepage/enabled' run as root.

Environment Variables Notes

Environment variables set by runcpu before the start of the run:
GOMP_CPU_AFFINITY = "0-63"
LD_LIBRARY_PATH =
    "/home/cpu2017n/amd_speed_aocc300_milan_B_lib/64;/home/cpu2017n/amd_speed_aocc300_milan_B_lib/32;"
MALLOCONF = "retain:true"
OMP_DYNAMIC = "false"
OMP_SCHEDULE = "static"
OMP_STACKSIZE = "128M"
OMP_THREADLIMIT = "64"

Environment variables set by runcpu during the 607.cactuBSSN_s peak run:
GOMP_CPU_AFFINITY = "0-63"

Environment variables set by runcpu during the 619.lbm_s peak run:
GOMP_CPU_AFFINITY = "0-63"

Environment variables set by runcpu during the 654.roms_s peak run:
GOMP_CPU_AFFINITY = "0-63"

General Notes

Binaries were compiled on a system with 2x AMD EPYC 7742 CPU + 1TiB 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
SPEC CPU®2017 Floating Point Speed Result
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CPU2017 License: 3
Test Sponsor: HPE
Tested by: HPE

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

Platform Notes

BIOS Configuration:
AMD SMT Option set to Disabled
Workload Profile set to General Peak Frequency 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 One memory domain per socket
Thermal Configuration set to Maximum Cooling
Workload Profile set to Custom
Infinity Fabric Power Management set to Disabled
Infinity Fabric Performance State set to P0
Power Regulator set to OS Control Mode

Sysinfo program /home/cpu2017n/bin/sysinfo
Rev: r6538 of 2020-09-24 e8664e66d2d7080afeaa89d4b38e2f1c
running on admin Wed Apr 1 21:22:36 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 7543 32-Core Processor
  2 "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: 32
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
physical 1: 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: 1
Core(s) per socket: 32
Socket(s): 2
NUMA node(s): 16
Vendor ID: AuthenticAMD
CPU family: 25

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

**Hewlett Packard Enterprise**  
**ProLiant DL365 Gen10 Plus**  
**(2.80 GHz, AMD EPYC 7543)**

<table>
<thead>
<tr>
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<td>SPECspeed®2017_fp_peak</td>
<td>228</td>
</tr>
</tbody>
</table>

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

Platform Notes (Continued)

| Model: | 1 |
| Model name: | AMD EPYC 7543 32-Core Processor |
| Stepping: | 1 |
| Frequency boost: | enabled |
| CPU MHz: | 1575.201 |
| CPU max MHz: | 2800.0000 |
| CPU min MHz: | 1500.0000 |
| BogoMIPS: | 5589.57 |
| Virtualization: | AMD-V |
| L1d cache: | 2 MiB |
| L1i cache: | 2 MiB |
| L2 cache: | 32 MiB |
| L3 cache: | 512 MiB |
| NUMA node0 CPU(s): | 0-3 |
| NUMA node1 CPU(s): | 4-7 |
| NUMA node2 CPU(s): | 8-11 |
| NUMA node3 CPU(s): | 12-15 |
| NUMA node4 CPU(s): | 16-19 |
| NUMA node5 CPU(s): | 20-23 |
| NUMA node6 CPU(s): | 24-27 |
| NUMA node7 CPU(s): | 28-31 |
| NUMA node8 CPU(s): | 32-35 |
| NUMA node9 CPU(s): | 36-39 |
| NUMA node10 CPU(s): | 40-43 |
| NUMA node11 CPU(s): | 44-47 |
| NUMA node12 CPU(s): | 48-51 |
| NUMA node13 CPU(s): | 52-55 |
| NUMA node14 CPU(s): | 56-59 |
| NUMA node15 CPU(s): | 60-63 |
| Vulnerability Itlb multihit: | Not affected |
| Vulnerability L1tf: | Not affected |
| Vulnerability Mds: | Not affected |
| Vulnerability Meltdown: | Not affected |
| Vulnerability Spec store bypass: | Mitigation; Speculative Store Bypass disabled via prctl and seccomp |
| Vulnerability Spectre v1: | Mitigation; usercopy/swapgs barriers and __user pointer sanitization |
| Vulnerability Spectre v2: | Mitigation; Full AMD retpoline, IBFB conditional, IBRS_FW, STIBP disabled, 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 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 |

(Continued on next page)
Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL365 Gen10 Plus
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Test Sponsor: HPE
Tested by: HPE

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

**Platform Notes (Continued)**

bpext perfctr_llc mwaitx cpb cat_l3 cdp_l3 invpcid_single hw_pstate ssbd mba ibrs ibpb stibp vmmcall fsqgsbase bmi1 avx2 smep bmi2 invpcid cqg rdt_a rdseed adx smap clflushopt clwb sha_ni xsaveopt xsavex xgetbv1 xsavec cqg_llc cqg_occup_llc
cqg_mbm_total cqg_mbm_local clzero irperf xsaverptr wboinvd arat npt lbrv svm_lock
nrip_save tsc_scale vmb_clean flushbyasid decodeassists pfthreshold
v_vmsave_vmload vgic umip pku ospke vaes vpcmldqdq 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: 16 nodes (0-15)
  node 0 cpus: 0 1 2 3
  node 0 size: 128777 MB
  node 0 free: 128656 MB
  node 1 cpus: 4 5 6 7
  node 1 size: 129022 MB
  node 1 free: 128915 MB
  node 2 cpus: 8 9 10 11
  node 2 size: 129022 MB
  node 2 free: 128876 MB
  node 3 cpus: 12 13 14 15
  node 3 size: 129022 MB
  node 3 free: 128876 MB
  node 4 cpus: 16 17 18 19
  node 4 size: 129022 MB
  node 4 free: 128922 MB
  node 5 cpus: 20 21 22 23
  node 5 size: 129022 MB
  node 5 free: 128932 MB
  node 6 cpus: 24 25 26 27
  node 6 size: 129022 MB
  node 6 free: 128893 MB
  node 7 cpus: 28 29 30 31
  node 7 size: 116909 MB
  node 7 free: 116755 MB
  node 8 cpus: 32 33 34 35
  node 8 size: 129022 MB
  node 8 free: 128950 MB
  node 9 cpus: 36 37 38 39
  node 9 size: 129022 MB
  node 9 free: 128931 MB
  node 10 cpus: 40 41 42 43
  node 10 size: 129022 MB
  node 10 free: 128948 MB
  node 11 cpus: 44 45 46 47
```

(Continued on next page)
Hewlett Packard Enterprise
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SPEC CPU®2017 Floating Point Speed Result
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SPECspeed®2017_fp_peak = 228
SPECspeed®2017_fp_base = 221

CPU2017 License: 3
Test Sponsor: HPE
Test Date: Mar-2021
Tested by: HPE
Hardware Availability: Apr-2021
Software Availability: Mar-2021

Platform Notes (Continued)

node 11 size: 129022 MB
node 11 free: 128954 MB
node 12 cpus: 48 49 50 51
node 12 size: 129022 MB
node 12 free: 128950 MB
node 13 cpus: 52 53 54 55
node 13 size: 129022 MB
node 13 free: 128953 MB
node 14 cpus: 56 57 58 59
node 14 size: 129022 MB
node 14 free: 128952 MB
node 15 cpus: 60 61 62 63
node 15 size: 128994 MB
node 15 free: 128919 MB
node distances:

node distances:

node distances:

From /proc/meminfo
MemTotal: 2101226844 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

/sbin/tuned-adm active
Current active profile: balanced

/sys/devices/system/cpu/cpu*/cpufreq/scaling_governor has
performance

/usr/bin/lsb_release -d
Ubuntu 20.04.1 LTS

(Continued on next page)
Platform Notes (Continued)

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/"

uname -a:
  Linux admin 5.4.0-56-generic #62-Ubuntu SMP Mon Nov 23 19:20:19 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/swaps barriers and __user pointer sanitation
CVE-2017-5753 (Spectre variant 1):
  Mitigation: Full AMD retpoline, IBPB: conditional, IBRS_FW, STIBP: disabled, RSB filling
CVE-2017-5715 (Spectre variant 2):
CVE-2020-0543 (Special Register Buffer Data Sampling):
  Not affected
CVE-2019-11135 (TSX Asynchronous Abort):
  Not affected

run-level 5 Apr 1 17:24

SPEC is set to: /home/cpu2017n
 Filesystem            Type  Size  Used Avail Use% Mounted on
/dev/mapper/ubuntu--vg-ubuntu--lv ext4  196G   50G  137G  27% /

From /sys/devices/virtual/dmi/id
Vendor:         HPE
Product:        ProLiant DL365 Gen10 Plus
Product Family: ProLiant
Serial:         CN70430NKR

Additional information from dmidecode follows. WARNING: Use caution when you interpret
Platform Notes (Continued)

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

BIOS:
  BIOS Vendor: HPE
  BIOS Version: A42
  BIOS Date: 02/23/2021
  BIOS Revision: 2.40
  Firmware Revision: 2.40

(End of data from sysinfo program)

Compiler Version Notes

C
   619.lbm_s(base, peak) 638.imagick_s(base, peak)
   644.nab_s(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++, C, Fortran
   607.cactuBSSN_s(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
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
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
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

(Continued on next page)
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CPU2017 License: 3
Test Sponsor: HPE
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Compiler Version Notes (Continued)

InstalledDir: /opt/AMD/aocc-compiler-3.0.0/bin

Fortran         | 603.bwaves_s(base, peak) 649.fotonik3d_s(base, peak)
                | 654.roms_s(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, C      | 621.wrf_s(base, peak) 627.cam4_s(base, peak)
                | 628.pop2_s(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

Fortran benchmarks:
flang

Benchmarks using both Fortran and C:
flang clang

Benchmarks using Fortran, C, and C++:
clang++ clang flang
Hewlett Packard Enterprise

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SPECspeed®2017_fp_base = 221
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Base Portability Flags

603.bwaves_s: -DSPEC_LP64
607.cactuBSSN_s: -DSPEC_LP64
619.lbm_s: -DSPEC_LP64
621.wrf_s: -DSPEC_CASE_FLAG -Mbyteswapio -DSPEC_LP64
627.cam4_s: -DSPEC_CASE_FLAG -DSPEC_LP64
628.pop2_s: -DSPEC_CASE_FLAG -Mbyteswapio -DSPEC_LP64
638.imagick_s: -DSPEC_LP64
644.nab_s: -DSPEC_LP64
649.fotonik3d_s: -DSPEC_LP64
654.roms_s: -DSPEC_LP64

Base Optimization Flags

C benchmarks:
-m64 -mno-adx -mno-sse4a -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 -march=znver3
-fveclib=AMDLIBM -ffast-math -flto -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-vm -mllvm -reduce-array-computations=3 -z muldefs
-DSPEC_OPENMP -fopenmp -fopenmp=libomp -lomp -ldl -lm -ljemalloc
-llflang -lflang

Fortran benchmarks:
-m64 -mno-adx -mno-sse4a -Wl,-mllvm -Wl,-enable-X86-prefetching
-Wl,-mllvm -Wl,-enable-licm-vmr -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 -Hz,1,0x1 -O3
-march=znver3 -fveclib=AMDLIBM -ffast-math -Mrecursive
-mllvm -fuse-tile-inner-loop -funroll-loops
-mllvm -extra-vectorizer-passes -mllvm -lsr-in-nested-loop
-mllvm -enable-licm-vm -mllvm -reduce-array-computations=3
-mllvm -global-vectorize-slp=true -z muldefs -DSPEC_OPENMP -fopenmp
-fopenmp -lomp -ldl -lm -ljemalloc -llflang -llflangrti

Benchmarks using both Fortran and C:
-m64 -mno-adx -mno-sse4a -Wl,-mllvm -Wl,-enable-X86-prefetching
-Wl,-mllvm -Wl,-enable-licm-vm -Wl,-mllvm -Wl,-region-vectorize
-Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6

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SPEC CPU®2017 Floating Point Speed Result

Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL365 Gen10 Plus
(2.80 GHz, AMD EPYC 7543)

SPECSPEED®2017_fp_base = 221
SPECSPEED®2017_fp_peak = 228

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

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

Base Optimization Flags (Continued)

Benchmarks using both Fortran and C (continued):
- -Wl,-mllvm -Wl,-reduce-array-computations=3 -O3 -march=znver3
- -fveclib=AMDLIBM -ffast-math -flto -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 -Hz,1,0x1
- -Mrecursive -mllvm -fuse-tile-inner-loop -funroll-loops
- -mllvm -extra-vectorizer-passes -mllvm -lsr-in-nested-loop -z muldefs
- -DSPEC_OPENMP -fopenmp -fopenmp=libomp -lomp -lamdlibm -ljemalloc
- -lflang -lflangrti

Benchmarks using Fortran, C, and C++:
- -m64 -mno-adx -mno-sse4a -std=c++98
- -Wl,-mllvm -Wl,-x86-use-vzeroupper=false
- -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 -march=znver3
- -fveclib=AMDLIBM -ffast-math -flto -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
- -mllvm -enable-partial-unswitch -mllvm -unroll-threshold=100
- -finline-aggressive -mllvm -loop-unswitch-threshold=200000
- -mllvm -reroll-loops -mllvm -aggressive-loop-unswitch
- -mllvm -extra-vectorizer-passes -mllvm -convert-pow-exp-to-int=false
- -Hz,1,0x1 -Mrecursive -mllvm -fuse-tile-inner-loop -funroll-loops
- -mllvm -lsr-in-nested-loop -z muldefs -DSPEC_OPENMP -fopenmp
- -fopenmp=libomp -lomp -lamdlibm -ljemalloc -lflang -lflangrti

Base Other Flags

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

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

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

Benchmarks using Fortran, C, and C++:
- -Wno-unused-command-line-argument -Wno-return-type
Hewlett Packard Enterprise

ProLiant DL365 Gen10 Plus
(2.80 GHz, AMD EPYC 7543)

SPECspeed®2017_fp_base = 221
SPECspeed®2017_fp_peak = 228

CPU2017 License: 3
Test Sponsor: HPE
Test Date: Mar-2021
Tested by: HPE
Hardware Availability: Apr-2021
Software Availability: Mar-2021

Peak CompilerInvocation

C benchmarks:
clang

Fortran benchmarks:
flang

Benchmarks using both Fortran and C:
flang clang

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

Peak Portability Flags

Same as Base Portability Flags

Peak Optimization Flags

C benchmarks:

619.lbm_s: -m64 -mno-adx -mno-sse4a
-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 -ffast-math -fido
-fstruct-layout=5 -mllvm -unroll-threshold=50
-freemap-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 -DSPEC_OPENMP -fopenmp
-fopenmp=libomp -lomp -ljemalloc -lflang

638.imagick_s: basepeak = yes

644.nab_s: basepeak = yes

Fortran benchmarks:

603.bwaves_s: basepeak = yes

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

649.fotonik3d_s: basepeak = yes

654.roms_s: -m64 -mno-adx -mno-sse4a
- Wl,-mlllvm -Wl,-enable-X86-prefetching
- Wl,-mlllvm -Wl,-enable-licm-vrp
- Wl,-mlllvm -Wl,-function-specialize
- Wl,-mlllvm -Wl,-align-all-nofallthru-blocks=6
- Wl,-mlllvm -Wl,-reduce-array-computations=3 -Ofast
- march=znver3 -fveclib=AMDLIBM -ffast-math -Mrecursive
- mlllvm -reduce-array-computations=3
- mlllvm -global-vectorize-slp=true -mlllvm -enable-licm-vrp
- DSPEC_OPENMP -fopenmp -fopenmp=libomp -lomp -lamdlibm
- ljemalloc -lflang

 Benchmarks using both Fortran and C:

621.wrf_s: basepeak = yes
627.cam4_s: basepeak = yes
628.pop2_s: basepeak = yes

 Benchmarks using Fortran, C, and C++:

- m64 -mno-adx -mno-sse4a -std=c++98
- Wl,-mlllvm -Wl,-x86-use-vzeroupper=false -Wl,-mlllvm -Wl,-enable-licm-vrp
- Wl,-mlllvm -Wl,-function-specialize
- Wl,-mlllvm -Wl,-align-all-nofallthru-blocks=6
- Wl,-mlllvm -Wl,-reduce-array-computations=3 -Ofast -march=znver3
- fveclib=AMDLIBM -ffast-math -flt os -fstruct-layout=5
- mlllvm -unroll-threshold=50 -fremap-arrays -flv-function-specialization
- mlllvm -inline-threshold=1000 -mlllvm -enable-gvn-hoist
- mlllvm -global-vectorize-slp=true -mlllvm -function-specialize
- mlllvm -enable-licm-vrp -mlllvm -reduce-array-computations=3
- finline-aggressive -mlllvm -unroll-threshold=100 -mlllvm -reroll-loops
- mlllvm -aggressive-loop-unswitch -Mrecursive -DSPEC_OPENMP -fopenmp
- fopenmp=libomp -lomp -lamdlibm -ljemalloc -lflang

Peak Other Flags

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

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

(Continued on next page)
Hewlett Packard Enterprise  
ProLiant DL365 Gen10 Plus  
(2.80 GHz, AMD EPYC 7543)

SPECspeed®2017_fp_base = 221  
SPECspeed®2017_fp_peak = 228

Peak Other Flags (Continued)

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

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

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