## SPEC CPU®2017 Floating Point Speed Result

**Hewlett Packard Enterprise**

*(Test Sponsor: HPE)*

**ProLiant DL365 Gen10 Plus**

*(2.95 GHz, AMD EPYC 75F3)*

---

**SPECspeed®2017_fp_base** = 221

**SPECspeed®2017_fp_peak** = 230

---

### Hardware

<table>
<thead>
<tr>
<th>Component</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU Name</td>
<td>AMD EPYC 75F3</td>
</tr>
<tr>
<td>Max MHz</td>
<td>4000</td>
</tr>
<tr>
<td>Nominal</td>
<td>2950</td>
</tr>
<tr>
<td>Enabled</td>
<td>64 cores, 2 chips, 2 threads/core</td>
</tr>
<tr>
<td>Orderable</td>
<td>1.2 chip(s)</td>
</tr>
<tr>
<td>Cache L1</td>
<td>32 KB I + 32 KB D on chip per core</td>
</tr>
<tr>
<td>L2</td>
<td>512 KB I+D on chip per core</td>
</tr>
<tr>
<td>L3</td>
<td>256 MB I+D on chip per chip, 32 MB shared / 4 cores</td>
</tr>
<tr>
<td>Other</td>
<td>None</td>
</tr>
<tr>
<td>Memory</td>
<td>2 TB (16 x 128 GB 4Rx4 PC4-3200AA-L)</td>
</tr>
<tr>
<td>Storage</td>
<td>1 x 196 GB SATA SSD, RAID 0</td>
</tr>
<tr>
<td>Other</td>
<td>None</td>
</tr>
</tbody>
</table>

### Software

<table>
<thead>
<tr>
<th>Component</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>OS</td>
<td>Ubuntu 20.04.1 LTS (x86_64)</td>
</tr>
<tr>
<td>Compiler</td>
<td>C/C++/Fortran: Version 3.0.0 of AOCC</td>
</tr>
<tr>
<td>Parallel</td>
<td>Yes</td>
</tr>
<tr>
<td>Firmware</td>
<td>HPE BIOS Version A42 v2.42 04/29/2021 released Apr-2021</td>
</tr>
<tr>
<td>File System</td>
<td>ext4</td>
</tr>
<tr>
<td>System State</td>
<td>Run level 5 (multi-user)</td>
</tr>
<tr>
<td>Base Pointers</td>
<td>64-bit</td>
</tr>
<tr>
<td>Peak Pointers</td>
<td>64-bit</td>
</tr>
<tr>
<td>Other</td>
<td>jemalloc: jemalloc memory allocator library v5.1.0</td>
</tr>
<tr>
<td>Power Management</td>
<td>BIOS set to prefer performance at the cost of additional power usage</td>
</tr>
</tbody>
</table>
Hewlett Packard Enterprise  
(Test Sponsor: HPE)  
ProLiant DL365 Gen10 Plus  
(2.95 GHz, AMD EPYC 75F3)  

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

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Base</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Peak</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>603.bwaves_s</td>
<td>64</td>
<td>79.5</td>
<td>742</td>
<td></td>
<td>79.2</td>
<td>745</td>
<td>79.5</td>
<td>742</td>
<td>128</td>
<td>78.2</td>
<td>754</td>
<td>78.4</td>
<td>753</td>
</tr>
<tr>
<td>607.cactuBSSN_s</td>
<td>64</td>
<td>47.3</td>
<td>352</td>
<td></td>
<td>47.3</td>
<td>353</td>
<td>47.4</td>
<td>352</td>
<td>64</td>
<td>47.3</td>
<td>352</td>
<td>47.3</td>
<td>353</td>
</tr>
<tr>
<td>619.lbm_s</td>
<td>64</td>
<td>39.6</td>
<td>132</td>
<td></td>
<td>39.6</td>
<td>132</td>
<td>46.1</td>
<td>114</td>
<td>128</td>
<td>41.1</td>
<td>127</td>
<td>39.2</td>
<td>134</td>
</tr>
<tr>
<td>621.wrf_s</td>
<td>64</td>
<td>77.0</td>
<td>172</td>
<td></td>
<td>81.2</td>
<td>163</td>
<td>83.4</td>
<td>159</td>
<td>64</td>
<td>77.0</td>
<td>172</td>
<td>81.2</td>
<td>163</td>
</tr>
<tr>
<td>627.cam4_s</td>
<td>64</td>
<td>52.5</td>
<td>169</td>
<td></td>
<td>53.8</td>
<td>165</td>
<td>52.7</td>
<td>168</td>
<td>64</td>
<td>52.5</td>
<td>169</td>
<td>53.8</td>
<td>165</td>
</tr>
<tr>
<td>628.pop2_s</td>
<td>64</td>
<td>177</td>
<td>66.9</td>
<td>177</td>
<td>67.2</td>
<td>176</td>
<td>67.6</td>
<td>176</td>
<td>64</td>
<td>177</td>
<td>66.9</td>
<td>177</td>
<td>67.2</td>
</tr>
<tr>
<td>638.imagick_s</td>
<td>64</td>
<td>44.7</td>
<td>323</td>
<td></td>
<td>44.6</td>
<td>323</td>
<td>44.5</td>
<td>324</td>
<td>64</td>
<td>44.7</td>
<td>323</td>
<td>44.6</td>
<td>323</td>
</tr>
<tr>
<td>644.nab_s</td>
<td>64</td>
<td>38.6</td>
<td>453</td>
<td></td>
<td>38.5</td>
<td>453</td>
<td>38.6</td>
<td>453</td>
<td>128</td>
<td>35.3</td>
<td>495</td>
<td>35.4</td>
<td>494</td>
</tr>
<tr>
<td>649.fotonik3d_s</td>
<td>64</td>
<td>76.0</td>
<td>120</td>
<td></td>
<td>75.3</td>
<td>121</td>
<td>75.8</td>
<td>120</td>
<td>64</td>
<td>76.0</td>
<td>120</td>
<td>75.3</td>
<td>121</td>
</tr>
<tr>
<td>654.roms_s</td>
<td>64</td>
<td>63.3</td>
<td>249</td>
<td></td>
<td>63.4</td>
<td>249</td>
<td>63.6</td>
<td>247</td>
<td>64</td>
<td>47.7</td>
<td>330</td>
<td>47.6</td>
<td>330</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
'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.
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 = "0-127"
LD_LIBRARY_PATH =
"/home/SPEC_CPU2017/amd_speed_aocc300_milan_B_lib/64;/home/SPEC_CPU2017/
amd_speed_aocc300_milan_B_lib/32:"
MALLOC_CONF = "retain:true"
OMP_DYNAMIC = "false"
OMP_SCHEDULE = "static"
OMP_STACKSIZE = "128M"
OMP_THREAD_LIMIT = "128"

Environment variables set by runcpu during the 603.bwaves_s peak run:
GOMP_CPU_AFFINITY = "0 64 1 65 2 66 3 67 4 68 5 69 6 70 7 71 8 72 9 73 10 74
11 75 12 76 13 77 14 78 15 79 16 80 17 81 18 82 19 83 20 84 21 85 22 86
23 87 24 88 25 89 26 90 27 91 28 92 29 93 30 94 31 95 32 96 33 97 34 98
35 99 36 100 37 101 38 102 39 103 40 104 41 105 42 106 43 107 44 108 45
109 46 110 47 111 48 112 49 113 50 114 51 115 52 116 53 117 54 118 55
119 56 120 57 121 58 122 59 123 60 124 61 125 62 126 63 127"

Environment variables set by runcpu during the 619.lbm_s peak run:
GOMP_CPU_AFFINITY = "0 64 1 65 2 66 3 67 4 68 5 69 6 70 7 71 8 72 9 73 10 74
11 75 12 76 13 77 14 78 15 79 16 80 17 81 18 82 19 83 20 84 21 85 22 86
23 87 24 88 25 89 26 90 27 91 28 92 29 93 30 94 31 95 32 96 33 97 34 98
35 99 36 100 37 101 38 102 39 103 40 104 41 105 42 106 43 107 44 108 45
109 46 110 47 111 48 112 49 113 50 114 51 115 52 116 53 117 54 118 55
119 56 120 57 121 58 122 59 123 60 124 61 125 62 126 63 127"

Environment variables set by runcpu during the 644.nab_s peak run:
GOMP_CPU_AFFINITY = "0 64 1 65 2 66 3 67 4 68 5 69 6 70 7 71 8 72 9 73 10 74
11 75 12 76 13 77 14 78 15 79 16 80 17 81 18 82 19 83 20 84 21 85 22 86
23 87 24 88 25 89 26 90 27 91 28 92 29 93 30 94 31 95 32 96 33 97 34 98
35 99 36 100 37 101 38 102 39 103 40 104 41 105 42 106 43 107 44 108 45
109 46 110 47 111 48 112 49 113 50 114 51 115 52 116 53 117 54 118 55
119 56 120 57 121 58 122 59 123 60 124 61 125 62 126 63 127"
Environment Variables Notes (Continued)

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

Submitted_by: "Bhatnagar, Prateek" <prateek.bhatnagar@hpe.com>
Submitted: Mon Jun  7 11:53:57 EDT 2021
Submission: cpu2017-20210607-26889.sub

Platform Notes

BIOS Configuration
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
Infinity Fabric Power Management set to Disabled
Infinity Fabric Performance State set to P0
Workload Profile set to Custom
Power Regulator set to OS Control Mode

Sysinfo program /home/SPEC_CPU2017/bin/sysinfo
Rev: r6538 of 2020-09-24 e8664e6664b2d7080a9eaa89d4b38e2f1c
running on admin Sun Jun  6 15:49:13 2021

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

(Continued on next page)
Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL365 Gen10 Plus
(2.95 GHz, AMD EPYC 75F3)

SPECspeed®2017_fp_base = 221
SPECspeed®2017_fp_peak = 230

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

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

Platform Notes (Continued)

From /proc/cpuinfo
model name : AMD EPYC 75F3 32-Core Processor
 2 "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 : 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
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): 128
On-line CPU(s) list: 0-127
Thread(s) per core: 2
Core(s) per socket: 32
Socket(s): 2
NUMA node(s): 16
Vendor ID: AuthenticAMD
CPU family: 25
Model: 1
Model name: AMD EPYC 75F3 32-Core Processor
Stepping: 1
CPU MHz: 2799.036
BogoMIPS: 5889.03
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, 64-67
NUMA node1 CPU(s): 4-7, 68-71
NUMA node2 CPU(s): 8-11, 72-75
NUMA node3 CPU(s): 12-15, 76-79
NUMA node4 CPU(s): 16-19, 80-83
NUMA node5 CPU(s): 20-23, 84-87
NUMA node6 CPU(s): 24-27, 88-91
NUMA node7 CPU(s): 28-31, 92-95
NUMA node8 CPU(s): 32-35, 96-99
NUMA node9 CPU(s): 36-39, 100-103
NUMA node10 CPU(s): 40-43, 104-107

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

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Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL365 Gen10 Plus
(2.95 GHz, AMD EPYC 75F3)

| SPECspeed®2017_fp_base = 221 |
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CPU2017 License: 3
Test Sponsor: HPE
Tested by: HPE

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

Platform Notes (Continued)

NUMA node11 CPU(s): 44-47,108-111
NUMA node12 CPU(s): 48-51,112-115
NUMA node13 CPU(s): 52-55,116-119
NUMA node14 CPU(s): 56-59,120-123
NUMA node15 CPU(s): 60-63,124-127
Vulnerability Itlb multihit: Not affected
Vulnerability L1tfl: 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, IBP conditional, IBRS_FW, STIBP always-on, RSB filling
Vulnerability Srbds: 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 aperf perfprof pni pclmulqdq monitor ssse3 fma cx16 pclmiov msi cmov pmovnb pimaxmb pmovis pmovmskb setmmx mfldstore mfxss mfxprec mmxext fxsr_opt pdpe1gb rdtscp lm constant_tsc rep_good nopl nonstop_tsc cpuid extd_apicid aperf perfprof pni pclmulqdq monitor ssse3 fma cx16 pclmiov msi cmov pmovnb pimaxmb pmovis pmovmskb setmmx mfldstore mfxss mfxprec mmxext fxsr_opt

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 64 65 66 67
node 0 size: 128775 MB
node 0 free: 128583 MB
node 1 cpus: 4 5 6 7 68 69 70 71
node 1 size: 129022 MB
node 1 free: 128675 MB
node 2 cpus: 8 9 10 11 72 73 74 75
node 2 size: 129022 MB
node 2 free: 128829 MB
node 3 cpus: 12 13 14 15 76 77 78 79
node 3 size: 129022 MB

/proc/cpuinfo cache data
cache size : 512 KB
SPEC CPU®2017 Floating Point Speed Result

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ProLiant DL365 Gen10 Plus
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SPECspeed®2017_fp_base = 221
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CPU2017 License: 3
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Tested by: HPE
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Software Availability: Mar-2021

Platform Notes (Continued)

node 3 free: 128810 MB
node 4 cpus: 16 17 18 19 80 81 82 83
node 4 size: 129022 MB
node 4 free: 128904 MB
node 5 cpus: 20 21 22 23 84 85 86 87
node 5 size: 129022 MB
node 5 free: 128865 MB
node 6 cpus: 24 25 26 27 88 89 90 91
node 6 size: 129022 MB
node 6 free: 128841 MB
node 7 cpus: 28 29 30 31 92 93 94 95
node 7 size: 116909 MB
node 7 free: 116807 MB
node 8 cpus: 32 33 34 35 96 97 98 99
node 8 size: 129022 MB
node 8 free: 128870 MB
node 9 cpus: 36 37 38 39 100 101 102 103
node 9 size: 129022 MB
node 9 free: 128919 MB
node 10 cpus: 40 41 42 43 104 105 106 107
node 10 size: 129022 MB
node 10 free: 128913 MB
node 11 cpus: 44 45 46 47 108 109 110 111
node 11 size: 128997 MB
node 11 free: 128896 MB
node 12 cpus: 48 49 50 51 112 113 114 115
node 12 size: 129022 MB
node 12 free: 128911 MB
node 13 cpus: 52 53 54 55 116 117 118 119
node 13 size: 129022 MB
node 13 free: 128915 MB
node 14 cpus: 56 57 58 59 120 121 122 123
node 14 size: 129022 MB
node 14 free: 128906 MB
node 15 cpus: 60 61 62 63 124 125 126 127
node 15 size: 129016 MB
node 15 free: 128903 MB
node distances:
node 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
0: 10 11 11 11 11 11 11 11 32 32 32 32 32 32 32 32

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

**Hewlett Packard Enterprise**  
(Test Sponsor: HPE)  
ProLiant DL365 Gen10 Plus  
(2.95 GHz, AMD EPYC 75F3)  

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<td>SPECspeed®2017_fp_peak</td>
<td>230</td>
</tr>
</tbody>
</table>

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

Platform Notes (Continued)


From /proc/meminfo
MemTotal:       2101211156 kB
HugePages_Total:       0
Hugepagesize:       2048 kB

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

/usr/bin/lsb_release -d
Ubuntu 20.04.1 LTS

From /etc/*release* /etc/*version*
debian_version: bullseye/sid
os-release:
  NAME="Ubuntu"
  VERSION="20.04.1 LTS (Focal Fossa)"
  ID=ubuntu
  ID_LIKE=debian
  PRETTY_NAME="Ubuntu 20.04.1 LTS"
  VERSION_ID="20.04"
  HOME_URL="https://www.ubuntu.com/"
  SUPPORT_URL="https://help.ubuntu.com/"

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

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

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 Jun 6 15:47

SPEC is set to: /home/SPEC_CPU2017

<table>
<thead>
<tr>
<th>Filesystem</th>
<th>Type</th>
<th>Size</th>
<th>Used</th>
<th>Avail</th>
<th>Use%</th>
<th>Mounted on</th>
</tr>
</thead>
<tbody>
<tr>
<td>/dev/mapper/ubuntu--vg-ubuntu--lv</td>
<td>ext4</td>
<td>196G</td>
<td>42G</td>
<td>145G</td>
<td>23%</td>
<td>/</td>
</tr>
</tbody>
</table>

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 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:**
  - **Vendor:** HPE
  - **Version:** A42
  - **Date:** 04/29/2021
  - **Revision:** 2.42
  - **Firmware:** 2.42

(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 LLVMMirror.Version.12.0.0)

- Target: x86_64-unknown-linux-gnu
- Thread model: posix

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

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

==============================================================================
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
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

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Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL365 Gen10 Plus
(2.95 GHz, AMD EPYC 75F3)

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Hewlett Packard Enterprise
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ProLiant DL365 Gen10 Plus
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SPECspeed®2017_fp_base = 221
SPECspeed®2017_fp_peak = 230

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

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

Compiler Version Notes (Continued)

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

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 -W1, -ml1vm -W1, -region-vectorize
-W1, -ml1vm -W1, -function-specialize
-W1, -ml1vm -W1, -align-all-nofallthru-blocks=6
-W1, -ml1vm -W1, -reduce-array-computations=3 -O3 -march=znver3
-fveclib=AMDLIBM -ffast-math -flto -fstruct-layout=5
-ml1vm -unroll-threshold=50 -ml1vm -inline-threshold=1000
-fremap-arrays -ml1vm -function-specialize -flv-function-specialization
-ml1vm -enable-gvn-hoist -ml1vm -global-vectorize-slp=true

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SPEC CPU®2017 Floating Point Speed Result

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SPECspeed®2017_fp_base = 221
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Base Optimization Flags (Continued)

C benchmarks (continued):
-mlvm -enable-licm-vrp -mlvm -reduce-array-computations=3 -z muldefs
-DSPEC_OPENMP -fopenmp -fopenmp=libomp -lomp -lamdlibm -ljemalloc
-lflang -lflangrti

Fortran benchmarks:
-m64 -mno-adx -mno-sse4a -W1,-mlvm -W1,-enable-X86-prefetching
-W1,-mlvm -W1,-enable-licm-vrp -W1,-mlvm -W1,-region-vectorize
-W1,-mlvm -W1,-function-specialize
-W1,-mlvm -W1,-align-all-nofallthru-blocks=6
-W1,-mlvm -W1,-reduce-array-computations=3 -Hz,1,0x1 -O3
-march=znver3 -fveclib=AMDLIBM -ffast-math -Mrecursive
-mlvm -fuse-tile-inner-loop -funroll-loops
-mlvm -extra-vectorizer-passes -mlvm -lsr-in-nested-loop
-mlvm -enable-licm-vrp -mlvm -reduce-array-computations=3
-mlvm -global-vectorize-slp=true -z muldefs -DSPEC_OPENMP -fopenmp
-fopenmp=libomp -lomp -lamdlibm -ljemalloc -lflang -lflangrti

Benchmarks using both Fortran and C:
-m64 -mno-adx -mno-sse4a -W1,-mlvm -W1,-enable-X86-prefetching
-W1,-mlvm -W1,-enable-licm-vrp -W1,-mlvm -W1,-region-vectorize
-W1,-mlvm -W1,-function-specialize
-W1,-mlvm -W1,-align-all-nofallthru-blocks=6
-W1,-mlvm -W1,-reduce-array-computations=3 -O3 -march=znver3
-fveclib=AMDLIBM -ffast-math -flto -fstruct-layout=5
-mlvm -unroll-threshold=50 -mlvm -inline-threshold=1000
-fremap-arrays -mlvm -function-specialize -flv-function-specialization
-mlvm -enable-gvn-hoist -mlvm -global-vectorize-slp=true
-mlvm -enable-licm-vrp -mlvm -reduce-array-computations=3 -Hz,1,0x1
-Mrecursive -mlvm -fuse-tile-inner-loop -funroll-loops
-mlvm -extra-vectorizer-passes -mlvm -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
-W1,-mlvm -W1,-x86-use-vzeroupper=false
-W1,-mlvm -W1,-region-vectorize -W1,-mlvm -W1,-function-specialize
-W1,-mlvm -W1,-align-all-nofallthru-blocks=6
-W1,-mlvm -W1,-reduce-array-computations=3 -O3 -march=znver3
-fveclib=AMDLIBM -ffast-math -flto -fstruct-layout=5
-mlvm -unroll-threshold=50 -mlvm -inline-threshold=1000
-fremap-arrays -mlvm -function-specialize -flv-function-specialization
-mlvm -enable-gvn-hoist -mlvm -global-vectorize-slp=true
-mlvm -enable-licm-vrp -mlvm -reduce-array-computations=3
-mlvm -enable-partial-unswitch -mlvm -unroll-threshold=100

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## Base Optimization Flags (Continued)

Benchmarks using Fortran, C, and C++ (continued):
- `-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 -lslr-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`

## Peak 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`

## Peak Portability Flags

Same as Base Portability Flags
Peak Optimization Flags

C benchmarks:

619.lbm_s: -m64 -mno-adx -mno-sse4a
-WL,-mlirvm -WL,-function-specialize
-WL,-mlirvm -WL,-align-all-nofallthru-blocks=6
-WL,-mlirvm -WL,-reduce-array-computations=3 -Ofast
-march=znver3 -fveclib=AMDLIBM -ffast-math -flto
-fstruct-layout=5 -mlirvm -unroll-threshold=50
-fremp-arrays -flv-function-specialization
-mlirvm -inline-threshold=1000 -mlirvm -enable-gvn-hoist
-mlirvm -global-vectorize-slp=true
-mlirvm -function-specialize -mlirvm -enable-licm-vrp
-mlirvm -reduce-array-computations=3 -DSPEC_OPENMP -fopenmp
-fopenmp=libomp -lomp -lamdlibm -ljemalloc -lflang

638.imagick_s: basepeak = yes

644.nab_s: -m64 -mno-adx -mno-sse4a -Wl,-mlirvm -Wl,-region-vectorize
-Wl,-mllvm -Wl,-function-specialize -Ofast -march=znver3
-fveclib=AMDLIBM -ffast-math -flto -fstruct-layout=5
-mlirvm -unroll-threshold=50 -fremp-arrays
-flv-function-specialization -mlirvm -inline-threshold=1000
-mlirvm -enable-gvn-hoist -mlirvm -global-vectorize-slp=true
-mlirvm -function-specialize -mlirvm -enable-licm-vrp
-mlirvm -reduce-array-computations=3 -DSPEC_OPENMP -fopenmp
-fopenmp=libomp -lomp -lamdlibm -ljemalloc -lflang

Fortran benchmarks:

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

649.fotonik3d_s: basepeak = yes

654.roms_s: Same as 603.bwaves_s

(Continued on next page)
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CPU2017 License: 3
Test Sponsor: HPE
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Test Date: Jun-2021
Hardware Availability: Jun-2021
Software Availability: Mar-2021

Peak Optimization Flags (Continued)

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++:
607.cactuBSSN_s: basepeak = yes

Peak 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

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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Specified with SPEC CPU®2017 v1.1.5 on 2021-06-06 11:49:12-0400.
Report generated on 2021-06-22 17:03:06 by CPU2017 PDF formatter v6442.
Originally published on 2021-06-22.