Epsylon Sp. z o.o. Sp. Komandytowa
eterio 217 RZ1 (AMD Epyc 7272, 2.9 GHz)
AMD EPYC 7272

CPU2017 License: 9081
Test Sponsor: Epsylon Sp. z o.o. Sp. Komandytowa
Tested by: Epsylon Sp. z o.o. Sp. Komandytowa

SPECspeed®2017_fp_base = 92.2
SPECspeed®2017_fp_peak = 94.5

Threads

Hardware

<table>
<thead>
<tr>
<th>Metrics</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU Name:</td>
<td>AMD EPYC 7272</td>
</tr>
<tr>
<td>Max MHz:</td>
<td>3200</td>
</tr>
<tr>
<td>Nominal:</td>
<td>2900</td>
</tr>
<tr>
<td>Enabled:</td>
<td>24 cores, 2 chips, 2 threads/core</td>
</tr>
<tr>
<td>Orderable:</td>
<td>1.2 chips</td>
</tr>
<tr>
<td>Cache L1:</td>
<td>32 KB I + 32 KB D on chip per core</td>
</tr>
<tr>
<td>Cache L2:</td>
<td>512 KB I+D on chip per core</td>
</tr>
<tr>
<td>Cache L3:</td>
<td>64 MB I+D on chip per chip, 16 MB shared / 3 cores</td>
</tr>
<tr>
<td>Other:</td>
<td>None</td>
</tr>
<tr>
<td>Memory:</td>
<td>512 GB (16 x 32 GB 2Rx4 PC4-3200V-L)</td>
</tr>
<tr>
<td>Storage:</td>
<td>1 x 960 GB SSD SATA III</td>
</tr>
<tr>
<td>Other:</td>
<td>None</td>
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</tbody>
</table>

Software

<table>
<thead>
<tr>
<th>Metrics</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>OS:</td>
<td>CentOS Linux 8.2</td>
</tr>
<tr>
<td>kernel version</td>
<td>4.18.0-193.19.1.el8_2.x86_64</td>
</tr>
<tr>
<td>Compiler:</td>
<td>C/C++/Fortran: Version 2.0.0 of AOCC</td>
</tr>
<tr>
<td>Parallel:</td>
<td>Yes</td>
</tr>
<tr>
<td>Firmware:</td>
<td>Version 3003 released Jul-2020</td>
</tr>
<tr>
<td>File System:</td>
<td>xfs</td>
</tr>
<tr>
<td>System State:</td>
<td>Run level 3 (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 and OS set to prefer performance at the cost of additional power usage</td>
</tr>
</tbody>
</table>
**Epsylon Sp. z o.o. Sp. Komandytowa**

**eterio 217 RZ1 (AMD Epyc 7272, 2.9 GHz)**

AMD EPYC 7272

---

**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>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>603.bwaves_s</td>
<td>24</td>
<td>190</td>
<td>311</td>
<td>189</td>
<td>312</td>
<td>190</td>
<td>310</td>
<td>24</td>
<td>190</td>
<td>311</td>
<td>189</td>
</tr>
<tr>
<td>607.cactuBSSN_s</td>
<td>24</td>
<td>111</td>
<td>150</td>
<td>110</td>
<td>152</td>
<td>111</td>
<td>150</td>
<td>24</td>
<td>111</td>
<td>150</td>
<td>110</td>
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<tr>
<td>619.lbm_s</td>
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<td>148</td>
<td>35.5</td>
<td>148</td>
<td>35.4</td>
<td>148</td>
<td>35.3</td>
<td>24</td>
<td>148</td>
<td>35.5</td>
<td>148</td>
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<tr>
<td>621.wrf_s</td>
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<td>99.9</td>
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<td>132</td>
<td>100</td>
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</tr>
<tr>
<td>627.cam4_s</td>
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<td>53.8</td>
<td>165</td>
<td>53.8</td>
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<td>53.6</td>
<td>24</td>
<td>165</td>
<td>53.8</td>
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<tr>
<td>628.pop2_s</td>
<td>24</td>
<td>254</td>
<td>46.7</td>
<td>254</td>
<td>46.7</td>
<td>255</td>
<td>46.6</td>
<td>24</td>
<td>255</td>
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</tr>
<tr>
<td>638.imagick_s</td>
<td>24</td>
<td>136</td>
<td>106</td>
<td>137</td>
<td>105</td>
<td>137</td>
<td>105</td>
<td>24</td>
<td>137</td>
<td>105</td>
<td>137</td>
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<tr>
<td>644.nab_s</td>
<td>24</td>
<td>119</td>
<td>147</td>
<td>119</td>
<td>147</td>
<td>119</td>
<td>147</td>
<td>48</td>
<td>96.4</td>
<td>181</td>
<td>96.0</td>
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<tr>
<td>649.fotonik3d_s</td>
<td>24</td>
<td>141</td>
<td>64.7</td>
<td>141</td>
<td>64.7</td>
<td>141</td>
<td>64.8</td>
<td>24</td>
<td>141</td>
<td>64.7</td>
<td>141</td>
</tr>
<tr>
<td>654.roms_s</td>
<td>24</td>
<td>148</td>
<td>106</td>
<td>149</td>
<td>106</td>
<td>149</td>
<td>105</td>
<td>24</td>
<td>146</td>
<td>108</td>
<td>146</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 -1 2097152' was used to set environment locked pages in memory limit

runcpu command invoked through numactl i.e.:
numactl --interleave=all runcpu <etc>

Set dirty_ratio=8 to limit dirty cache to 8% of memory
Set swappiness=1 to swap only if necessary
Set zone_reclaim_mode=1 to free local node memory and avoid remote memory
sync then drop_caches=3 to reset caches before invoking runcpu

dirty_ratio, swappiness, zone_reclaim_mode and drop_caches were all set using privileged echo (e.g. echo 1 > /proc/sys/vm/swappiness).

Transparent huge pages set to 'always' for this run (OS default)
SPEC CPU®2017 Floating Point Speed Result
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Epsylon Sp. z o.o. Sp. Komandytowa
AMDR217 RZ1 (AMD Epyc 7272, 2.9 GHz)
AMD EPYC 7272

SPECspeed®2017_fp_base = 92.2
SPECspeed®2017_fp_peak = 94.5

Environment Variables Notes

Environment variables set by runcpu before the start of the run:
GOMP_CPU_AFFINITY = "0-47"
LD_LIBRARY_PATH =
"/home/CPU2017-1.1.0/amd_speed_aocc200_rome_C_lib/64;/home/CPU2017-1.1.0
/amd_speed_aocc200_rome_C_lib/32:"
MALLOC_CONF = "retain:true"
OMP_DYNAMIC = "false"
OMP_SCHEDULE = "static"
OMP_STACKSIZE = "128M"
OMP_THREAD_LIMIT = "48"

Environment variables set by runcpu during the 628.pop2_s peak run:
GOMP_CPU_AFFINITY = "0-23"

Environment variables set by runcpu during the 638.imagick_s peak run:
GOMP_CPU_AFFINITY = "0-23"

Environment variables set by runcpu during the 644.nab_s peak run:
GOMP_CPU_AFFINITY = "0 24 1 25 2 26 3 27 4 28 5 29 6 30 7 31 8 32 9 33 10 34
11 35 12 36 13 37 14 38 15 39 16 40 17 41 18 42 19 43 20 44 21 45 22 46
23 47"

Environment variables set by runcpu during the 649.fotonik3d_s peak run:
GOMP_CPU_AFFINITY = "0-23"

Environment variables set by runcpu during the 654.roms_s peak run:
GOMP_CPU_AFFINITY = "0-23"

General Notes

Binaries were compiled on a system with 2x AMD EPYC 7601 CPU + 512GB Memory using Fedora 26

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 v9.1.0 in Ubuntu 19.04 with -03 -znver2 -flto
jemalloc 5.1.0 is available here:
https://github.com/jemalloc/jemalloc/releases/download/5.1.0/jemalloc-5.1.0.tar.bz2

Test Sponsor: Epsylon Sp. z o.o. Sp. Komandytowa
Hardware Availability: Aug-2019
Tested by: Epsylon Sp. z o.o. Sp. Komandytowa
Software Availability: Sep-2020
Test Date: Oct-2020
**SPEC CPU®2017 Floating Point Speed Result**

Epsylon Sp. z o.o. Sp. Komandytowa
eterio 217 RZ1 (AMD Epyc 7272, 2.9 GHz)
AMD EPYC 7272

<table>
<thead>
<tr>
<th>SPECspeed®2017_fp_base</th>
<th>92.2</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECspeed®2017_fp_peak</td>
<td>94.5</td>
</tr>
</tbody>
</table>

**CPU2017 License:** 9081
**Test Date:** Oct-2020

**Test Sponsor:** Epsylon Sp. z o.o. Sp. Komandytowa
**Hardware Availability:** Aug-2019

**Tested by:** Epsylon Sp. z o.o. Sp. Komandytowa
**Software Availability:** Sep-2020

### Platform Notes

**BIOS settings:**
- Power phase shedding = Disabled
- SVM Mode = Disabled
- SR-IOV support = Disabled
- DRAM Scrub time = Disabled
- NUMA nodes per socket = NPS4
- Determinism Slider = Power

**Sysinfo program** /home/CPU2017-1.1.0/bin/sysinfo
**Rev:** r6365 of 2019-08-21 295195f888a3d7ed1e6e46a485a0011
**running on Zyxel Sat Oct 24 16:54:56 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 7272 12-Core Processor
- `physical id`'s (chips): 2
- `processors`: 48
- `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`: 12
  - `siblings`: 24
  - `physical 0: cores 0 1 2 4 5 6 8 9 10 12 13 14`
  - `physical 1: cores 0 1 2 4 5 6 8 9 10 12 13 14`

From `lscpu`:
- `Architecture`: x86_64
- `CPU op-mode(s)`: 32-bit, 64-bit
- `Byte Order`: Little Endian
- `CPU(s)`: 48
- `On-line CPU(s) list`: 0-47
- `Thread(s) per core`: 2
- `Core(s) per socket`: 12
- `Socket(s)`: 2
- `NUMA node(s)`: 2
- `Vendor ID`: AuthenticAMD
- `CPU family`: 23
- `Model`: 49
- `Model name`: AMD EPYC 7272 12-Core Processor
- `Stepping`: 0
- `CPU MHz`: 2149.128
- `CPU max MHz`: 2900.0000
- `CPU min MHz`: 1500.0000
- `BogoMIPS`: 5799.98
- `Virtualization`: AMD-V

(Continued on next page)
Epsylon Sp. z o.o. Sp. Komandytowa
eterio 217 RZ1 (AMD Epyc 7272, 2.9 GHz)
AMD EPYC 7272

SPEC CPU®2017 Floating Point Speed Result

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SPECspeed®2017_fp_base = 92.2
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Test Sponsor: Epsylon Sp. z o.o. Sp. Komandytowa
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Hardware Availability: Aug-2019
Software Availability: Sep-2020

Platform Notes (Continued)

L1d cache: 32K
L1i cache: 32K
L2 cache: 512K
L3 cache: 16384K
NUMA node0 CPU(s): 0-11,24-35
NUMA node1 CPU(s): 12-23,36-47
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 nop1 nonstop_tsc cpuid extd_apicid aperfmperf pni pclmulqdq
monitor ssse3 fma cx16 sse4_1 sse4_2 movbe popcnt aes avx f16c rdrand lahf_lm
cmp_legacy svm extapic cr8_legacy abm sse4a misa lnsse3 dnowprefetch osvw ibs
skinit wdt tce topoext perfctr_core perfctr_nb bext perfctr_llc mwaitx cpb cat_l3
cdp_l3 hw_pstate sme ssbd mba sev ibrs ibpb stibp vmmcall fsgsbase bmi1 avx2 smep
bmi2 cqm rdt_a rdseed adx smap clflushopt clwb sha ni xsaveopt xsavec xgetbv1 xsave

/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: 2 nodes (0-1)
  node 0 cpus: 0 1 2 3 4 5 6 7 8 9 10 11 24 25 26 27 28 29 30 31 32 33 34 35
  node 0 size: 257553 MB
  node 0 free: 257117 MB
  node 1 cpus: 12 13 14 15 16 17 18 19 20 21 22 23 36 37 38 39 40 41 42 43 44 45 46 47
  node 1 size: 258041 MB
  node 1 free: 257322 MB
  node distances:
    node 0 1
    0: 10 32
    1: 32 10

From /proc/meminfo
  MemTotal: 527968712 kB
  HugePages_Total: 0
  Hugepagesize: 2048 kB

From /etc/*release* /etc/*version*
  centos-release: CentOS Linux release 8.2.2004 (Core)
  centos-release-upstream: Derived from Red Hat Enterprise Linux 8.2 (Source)
  os-release:
    NAME="CentOS Linux"
    VERSION="8 (Core)"

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

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**Epsylon Sp. z o.o. Sp. Komandytowa**

**Cpu2017 License:** 9081  
**Test Sponsor:** Epsylon Sp. z o.o. Sp. Komandytowa  
**Tested by:** Epsylon Sp. z o.o. Sp. Komandytowa

---

**Platform Notes (Continued)**

```plaintext
ID="centos"  
ID_LIKE="rhel fedora"  
VERSION_ID="8"  
PLATFORM_ID="platform:el8"  
PRETTY_NAME="CentOS Linux 8 (Core)"  
ANSI_COLOR="0;31"  
redhat-release: CentOS Linux release 8.2.2004 (Core)  
system-release: CentOS Linux release 8.2.2004 (Core)  
system-release-cpe: cpe:/o:centos:centos:8
```

```plaintext
uname -a:  
Linux Zyxel 4.18.0-193.193.1.el8_2.x86_64 #1 SMP Mon Sep 14 14:37:00 UTC 2020 x86_64  
x86_64 x86_64 GNU/Linux
```

**Kernel self-reported vulnerability status:**

```plaintext
itlb_multihit: Not affected  
CVE-2018-3620 (L1 Terminal Fault): Not affected  
Microarchitectural Data Sampling: Not affected  
CVE-2017-5754 (Meltdown): Not affected  
CVE-2018-3639 (Speculative Store Bypass): Mitigation: Speculative Store Bypass disabled via prctl and seccomp  
CVE-2017-5753 (Spectre variant 1): Mitigation: usercopy/swapgs barriers and __user pointer sanitation  
CVE-2017-5715 (Spectre variant 2): Mitigation: Full AMD retpoline, IBPB: conditional, IBRS_FW, STIBP: conditional, RSB filling  
srbds: Not affected  
tsx_async_abort: Not affected
```

**run-level 3 Jun 22 11:12**

**SPEC is set to:** /home/CPU2017-1.1.0  
**Filesystem** | **Type** | **Size** | **Used** | **Avail** | **Use%** | **Mounted on**
--- | --- | --- | --- | --- | --- | ---
/dev/mapper/cl_zyxel-home xfs | 839G | 9.8G | 829G | 2% | /home

**From /sys/devices/virtual/dmi/id**

**BIOS:** American Megatrends Inc. 3003 07/10/2020  
**Vendor:** ASUSTeK COMPUTER INC.  
**Product:** KNPP-D32-R Series  
**Product Family:** Server  
**Serial:** System Serial Number

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.

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

Epsylon Sp. z o.o. Sp. Komandytowa

**eterio 217 RZ1 (AMD Epyc 7272, 2.9 GHz)**

AMD EPYC 7272

<table>
<thead>
<tr>
<th>SPECspeed®2017_fp_base</th>
<th>92.2</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECspeed®2017_fp_peak</td>
<td>94.5</td>
</tr>
</tbody>
</table>

**CPU2017 License:** 9081

**Test Sponsor:** Epsylon Sp. z o.o. Sp. Komandytowa

**Tested by:** Epsylon Sp. z o.o. Sp. Komandytowa

**Test Date:** Oct-2020

**Hardware Availability:** Aug-2019

**Software Availability:** Sep-2020

### Platform Notes (Continued)

**Memory:**
- 16x Micron Technology 36ASF4G72PZ-3G2E2 32 kB 2 rank 3200
- 16x Unknown Unknown

(End of data from sysinfo program)

### Compiler Version Notes

<table>
<thead>
<tr>
<th>C</th>
<th>619.lbm_s(base, peak) 638.imagick_s(base, peak) 644.nab_s(base, peak)</th>
</tr>
</thead>
</table>
| AOCC.LLVM.2.0.0.B191.2019_07_19 clang version 8.0.0 (CLANG: Jenkins Target: x86_64-unknown-linux-gnu
| Thread model: posix InstalledDir: /sppo/dev/compilers/aocc-compiler-2.0.0/bin |

<table>
<thead>
<tr>
<th>C++, C, Fortran</th>
<th>607.cactuBSSN_s(base, peak)</th>
</tr>
</thead>
</table>
| AOCC.LLVM.2.0.0.B191.2019_07_19 clang version 8.0.0 (CLANG: Jenkins Target: x86_64-unknown-linux-gnu
| Thread model: posix InstalledDir: /sppo/dev/compilers/aocc-compiler-2.0.0/bin |

<table>
<thead>
<tr>
<th>Fortran</th>
<th>603.bwaves_s(base, peak) 649.fotonik3d_s(base, peak) 654.roms_s(base, peak)</th>
</tr>
</thead>
</table>
| AOCC.LLVM.2.0.0.B191.2019_07_19 clang version 8.0.0 (CLANG: Jenkins Target: x86_64-unknown-linux-gnu
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(Continued on next page)
Epsylon Sp. z o.o. Sp. Komandytowa

Eterno 217 RZ1 (AMD Epyc 7272, 2.9 GHz)
AMD EPYC 7272

SPECspec®2017_fp_base = 92.2
SPECspec®2017_fp_peak = 94.5

**Compiler Version Notes (Continued)**

Thread model: posix
InstalledDir: /sppo/dev/compilers/aocc-compiler-2.0.0/bin

```
Fortran, C
621.wrf_s(base, peak) 627.cam4_s(base, peak)
628.pop2_s(base, peak)
```

AOCC.LLVM.2.0.0.B191.2019_07_19 clang version 8.0.0 (CLANG: Jenkins
AOCC_2_0_0-Build#191) (based on LLVM AOCC.LLVM.2.0.0.B191.2019_07_19)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /sppo/dev/compilers/aocc-compiler-2.0.0/bin
AOCC.LLVM.2.0.0.B191.2019_07_19 clang version 8.0.0 (CLANG: Jenkins
AOCC_2_0_0-Build#191) (based on LLVM AOCC.LLVM.2.0.0.B191.2019_07_19)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /sppo/dev/compilers/aocc-compiler-2.0.0/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

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

**Epsylon Sp. z o.o. Sp. Komandytowa**

**Eterio 217 RZ1 (AMD Epyc 7272, 2.9 GHz)**

**AMD EPYC 7272**

**SPECspeed®2017_fp_base = 92.2**

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**CPU2017 License:** 9081  
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**Hardware Availability:** Aug-2019  
**Tested by:** Epsylon Sp. z o.o. Sp. Komandytowa  
**Software Availability:** Sep-2020

### Base Portability Flags (Continued)

- 644.nab_s: -DSPEC_LP64  
- 649.fotonik3d_s: -DSPEC_LP64  
- 654.roms_s: -DSPEC_LP64

### Base Optimization Flags

**C benchmarks:**

- -flto -Wl,-mlllvm -Wl,-function-specialize  
- -Wl,-mlllvm -Wl,-region-vectorize -Wl,-mlllvm -Wl,-vector-library=LIBMVEC  
- -Wl,-mlllvm -Wl,-reduce-array-computations=3 -O3 -ffast-math  
- -march=znver2 -fstruct-layout=3 -mlllvm -unroll-threshold=50  
- -fremap-arrays -mlllvm -function-specialize -mlllvm -enable-gvn-hoist  
- -mlllvm -reduce-array-computations=3 -mlllvm -global-vectorize-slp  
- -mlllvm -vector-library=LIBMVEC -mlllvm -inline-threshold=1000  
- -fllvm-function-specialization -z muldefs -DSPEC_OPENMP -fopenmp  
- -fopenmp=libomp -lomp -lpthread -ldl -lmvec -lamdlibm -ljemalloc  
- lflang

**Fortran benchmarks:**

- -flto -Wl,-mlllvm -Wl,-function-specialize  
- -Wl,-mlllvm -Wl,-region-vectorize -Wl,-mlllvm -Wl,-vector-library=LIBMVEC  
- -Wl,-mlllvm -Wl,-reduce-array-computations=3 -O3 -march=znver2  
- -funroll-loops -Mrecursive -mlllvm -vector-library=LIBMVEC -z muldefs  
- -Kieee -fno-finite-math-only -DSPEC_OPENMP -fopenmp -fopenmp=libomp  
- -lomp -lpthread -ldl -lmvec -lamdlibm -ljemalloc -lflang

**Benchmarks using both Fortran and C:**

- -flto -Wl,-mlllvm -Wl,-function-specialize  
- -Wl,-mlllvm -Wl,-region-vectorize -Wl,-mlllvm -Wl,-vector-library=LIBMVEC  
- -Wl,-mlllvm -Wl,-reduce-array-computations=3 -O3 -ffast-math  
- -march=znver2 -fstruct-layout=3 -mlllvm -unroll-threshold=50  
- -fremap-arrays -mlllvm -function-specialize -mlllvm -enable-gvn-hoist  
- -mlllvm -reduce-array-computations=3 -mlllvm -global-vectorize-slp  
- -mlllvm -vector-library=LIBMVEC -mlllvm -inline-threshold=1000  
- -fllvm-function-specialization -funroll-loops -Mrecursive -z muldefs  
- -Kieee -fno-finite-math-only -DSPEC_OPENMP -fopenmp -fopenmp=libomp  
- -lomp -lpthread -ldl -lmvec -lamdlibm -ljemalloc -lflang

**Benchmarks using Fortran, C, and C++:**

- -std=c++98 -flto -Wl,-mlllvm -Wl,-function-specialize  
- -Wl,-mlllvm -Wl,-region-vectorize -Wl,-mlllvm -Wl,-vector-library=LIBMVEC  
- -Wl,-mlllvm -Wl,-reduce-array-computations=3  
- -Wl,-mlllvm -Wl,-suppress-fmas -O3 -ffast-math -march=znver2  
- -fstruct-layout=3 -mlllvm -unroll-threshold=50 -fremap-arrays

(Continued on next page)
### Base Optimization Flags (Continued)

Benchmarks using Fortran, C, and C++ (continued):
- `-mllvm -function-specialize`  
- `-mllvm -enable-gvn-hoist`  
- `-mllvm -reduce-array-computations=3`  
- `-mllvm -global-vectorize-slp`  
- `-mllvm -vector-library=LIBMVEC`  
- `-mllvm -inline-threshold=1000`  
- `-flv-function-specialization`  
- `-mllvm -loop-unswitch-threshold=200000`  
- `-mllvm -unroll-threshold=100`  
- `-mllvm -enable-partial-unswitch`  
- `-funroll-loops`  
- `-Mrecursive`  
- `-z muldefs`  
- `-Kieee`  
- `-fno-finite-math-only`  
- `-DSPEC_OPENMP`  
- `-fopenmp`  
- `-fopenmp=libomp`  
- `-lomp`  
- `-lpthread`  
- `-ldl`  
- `-lmvec`  
- `-lamdlibm`  
- `-ljemalloc`  
- `-lflang`  

### Base Other Flags

C benchmarks:
- `-Wno-return-type`

Fortran benchmarks:
- `-Wno-return-type`

Benchmarks using both Fortran and C:
- `-Wno-return-type`

Benchmarks using Fortran, C, and C++:
- `-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`
Epsylon Sp. z o.o. Sp. Komandytowa

Eterio 217 RZ1 (AMD Epyc 7272, 2.9 GHz)
AMD EPYC 7272

SPEC CPU®2017 Floating Point Speed Result

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AMD EPYC 7272
TEST DATE: Oct-2020

SPECspeed®2017_fp_base = 92.2

SPECspeed®2017_fp_peak = 94.5

CPU2017 License: 9081
Test Sponsor: Epsylon Sp. z o.o. Sp. Komandytowa
Tested by: Epsylon Sp. z o.o. Sp. Komandytowa

Hardware Availability: Aug-2019
Software Availability: Sep-2020

Peak Portability Flags

Same as Base Portability Flags

Peak Optimization Flags

C benchmarks:

619.lbm_s: basepeak = yes

638.imagick_s: -flto -Wl,-mlvm -Wl,-function-specialize
-Wl,-mlvm -Wl,-region-vectorize
-Wl,-mlvm -Wl,-vector-library=LIBMVEC
-Wl,-mlvm -Wl,-reduce-array-computations=3 -Ofast
-march=znver2 -mno-sse4a -fstruct-layout=5
-mlvm -vectorize-memory-aggressively
-mlvm -function-specialize -mllvm -enable-gvn-hoist
-mlvm -unroll-threshold=50 -fremap-arrays
-mlvm -vector-library=LIBMVEC
-mlvm -reduce-array-computations=3
-mlvm -global-vectorize-slp -mllvm -inline-threshold=1000
-flv-function-specialization -DSPEC_OPENMP -fopenmp
-LMVEC -lamdlibm -fopenmp=libomp -lomp -lpthread -ldl
-ljemalloc -lflang

644.nab_s: Same as 638.imagick_s

Fortran benchmarks:

603.bwaves_s: basepeak = yes

649.fotonik3d_s: -flto -Wl,-mlvm -Wl,-function-specialize
-Wl,-mlvm -Wl,-region-vectorize
-Wl,-mlvm -Wl,-vector-library=LIBMVEC
-Wl,-mlvm -Wl,-reduce-array-computations=3 -O3
-march=znver2 -funroll-loops -Mrecursive
-mlvm -vector-library=LIBMVEC -Kieee
-fno-finite-math-only -DSPEC_OPENMP -fopenmp
-fopenmp=libomp -lomp -lpthread -ldl -lmvec -lamdlibm
-ljemalloc -lflang

654.roms_s: -flto -Wl,-mlvm -Wl,-function-specialize
-Wl,-mlvm -Wl,-region-vectorize
-Wl,-mlvm -Wl,-vector-library=LIBMVEC
-Wl,-mlvm -Wl,-reduce-array-computations=3
-Wl,-mlvm -Wl,-enable-X86-prefetching -O3 -march=znver2

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AMD EPYC 7272

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SPECspeed®2017_fp_base = 92.2
SPECspeed®2017_fp_peak = 94.5

Peak Optimization Flags (Continued)

654.roms_s (continued):
- funroll-loops -Mrecursive -mllvm -vector-library=LIBMVEC
- Klee -fno-finite-math-only -DSPEC_OPENMP -fopenmp
- fopenmp=libomp -lomp -lpthread -ldl -lmvec -lamdlibm
- ljemalloc -lflang

Benchmarks using both Fortran and C:

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

628.pop2_s: -flto -Wl,-mlvml -Wl,-function-specialize
- Wl,-mlvml -Wl,-region-vectorize
- Wl,-mlvml -Wl,-vector-library=LIBMVEC
- Wl,-mlvml -Wl,-reduce-array-computations=3 -Ofast
- march=znver2 -mno-sse4a -fstruct-layout=5
- mllvm -vectorize-memory-aggressively
- mllvm -function-specialize -mllvm -enable-gvn-hoist
- mllvm -unroll-threshold=50 -fremap-arrays
- mllvm -vector-library=LIBMVEC
- mllvm -reduce-array-computations=3
- mllvm -global-vectorize-slp -mllvm -inline-threshold=1000
- flv-function-specialization -O3 -funroll-loops
- Klee -fno-finite-math-only -DSPEC_OPENMP
- fopenmp -fopenmp=libomp -lomp -lpthread -ldl -lmvec
- lamdlibm -ljemalloc -lflang

Benchmarks using Fortran, C, and C++:

607.cactuBSSN_s: basepeak = yes

Peak Other Flags

C benchmarks:
- Wno-return-type

Fortran benchmarks:
- Wno-return-type

Benchmarks using both Fortran and C:
- Wno-return-type

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

**Epsylon Sp. z o.o. Sp. Komandytowa**

**eterio 217 RZ1 (AMD Epyc 7272, 2.9 GHz)**

**AMD EPYC 7272**

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**CPU2017 License:** 9081  
**Test Sponsor:** Epsylon Sp. z o.o. Sp. Komandytowa  
**Tested by:** Epsylon Sp. z o.o. Sp. Komandytowa

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#### Peak Other Flags (Continued)

Benchmarks using Fortran, C, and C++:

- `-Wno-return-type`

The flags files that were used to format this result can be browsed at:


You can also download the XML flags sources by saving the following links:


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