## SPEC CPU®2017 Floating Point Rate Result

**Altos Computing Inc.**  
**BrainSphere R385 F4 (AMD EPYC 7282)**  

<table>
<thead>
<tr>
<th>SPECrate®2017_fp_base</th>
<th>SPECrate®2017_fp_peak</th>
<th>CPU2017 License</th>
<th>Test Date</th>
<th>Test Sponsor</th>
<th>Tested by</th>
<th>Hardware Availability</th>
<th>Software Availability</th>
</tr>
</thead>
</table>

### Hardware

<table>
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<tr>
<td>503.bwaves_r</td>
<td>64</td>
<td>319</td>
<td>325</td>
</tr>
<tr>
<td>507.cactusBSSN_r</td>
<td>64</td>
<td>169</td>
<td>306</td>
</tr>
<tr>
<td>508.namd_r</td>
<td>64</td>
<td>93.3</td>
<td>249</td>
</tr>
<tr>
<td>510.parest_r</td>
<td>64</td>
<td>252</td>
<td>237</td>
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<tr>
<td>511.povray_r</td>
<td>64</td>
<td>200</td>
<td>208</td>
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<tr>
<td>519.blas_r</td>
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<tr>
<td>521.wrft_r</td>
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<tr>
<td>526.blender_r</td>
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<td>527.cam4_r</td>
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<tr>
<td>538.imagick_r</td>
<td>64</td>
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### Software

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<td>64</td>
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<td>549.fotonik3d_r</td>
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<td>554.roms_r</td>
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</tbody>
</table>

### CPU Name:
AMD EPYC 7282

Max MHz: 3200  
Nominal: 2800  
Enabled: 32 cores, 2 chips, 2 threads/core  
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: 64 MB I+D on chip per chip, 16 MB shared / 4 cores  
Other: None  
Memory: 512 GB (16 x 32 GB 2Rx4 PC4-3200AA-R)  
Storage: 1 x 1.6 TB SATA SSD  
Other: None  

OS: Ubuntu 19.04  
Kernel: 5.0.0-38-generic  
Compiler: C/C++/Fortran: Version 2.0.0 of AOCC  
Parallel: No  
Firmware: Version R27 released Aug-2020  
File System: ext4  
System State: Run level 5 (multi-user)  
Base Pointers: 64-bit  
Peak Pointers: 64-bit  
Other: jemalloc: jemalloc memory allocator library v5.2.0  
Power Management: BIOS set to prefer performance at the cost of additional power usage
Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
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<td>93.0</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>

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

(Continued on next page)
Altos Computing Inc.

BrainSphere R385 F4 (AMD EPYC 7282)

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**Operating System Notes (Continued)**

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)

**Environment Variables Notes**

Environment variables set by runcpu before the start of the run:

```
LD_LIBRARY_PATH = 
    "/home/cpu2017/amd_rate_aocc200_rome_C_lib/64;/home/cpu2017/amd_rate_aocc200_rome_C_lib/32:" 
MALLOC_CONF = "retain:true"
```

**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 -O3 -znver2 -flto
jemalloc 5.2.0 is available here:
https://github.com/jemalloc/jemalloc/releases/download/5.2.0/jemalloc-5.2.0.tar.bz2

**Platform Notes**

BIOS settings:
Power Policy Quick Settings set to Best Performance
NUMA Nodes Per Socket set to NPS4

Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r6365 of 2019-08-21 295195f888a3d7ed1e6e46a485a0011
running on ubuntu Fri Dec 4 16:02:08 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

(Continued on next page)
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Platform Notes (Continued)

model name : AMD EPYC 7282 16-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 : 16
siblings : 32
physical 0: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
physical 1: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

From lscpu:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
Address sizes: 43 bits physical, 48 bits virtual
CPU(s): 64
On-line CPU(s) list: 0-63
Thread(s) per core: 2
Core(s) per socket: 16
Socket(s): 2
NUMA node(s): 2
Vendor ID: AuthenticAMD
CPU family: 23
Model: 49
Model name: AMD EPYC 7282 16-Core Processor
Stepping: 0
CPU MHz: 1338.160
CPU max MHz: 2800.0000
CPU min MHz: 1500.0000
BogoMIPS: 5600.37
Virtualization: AMD-V
L1d cache: 32K
L1i cache: 32K
L2 cache: 512K
L3 cache: 16384K
NUMA node0 CPU(s): 0-15,32-47
NUMA node1 CPU(s): 16-31,48-63
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 xtopology nonstop_tsc cpuid extd_apicid aperfmperf pni
pclmulqdq monitor pdcm cx16 sse4_1 sse4_2 movbe popcnt aes avx f16c
rdrcr lahf_lm cmp_legacy svm extapic cr8_legacy abm sse4a misalignsse 3dnowprefetch
osvw ibs skinit wdt tce topoext perfctr_core perfctr_nb bpext perfctr_llc mwixt cmp
l2p l3p lwp pstate sme ssbd mba sev ibrs ibpb stibp vmmcall fsqgbase bmmi avx2
smep bmi2 cmx rdt_a rdseed adx smap clflushopt clwb sha ni xsaveopt xsaves xgetbv1
xsavees cmx_llc cqm_occup_llc cqm_mbm_total cqm_mbm_local clzero iperf xsaveerptr
wnboinvd arat npt lbrv svm_lock nrip_save tsc_scale vmcb_clean flushbyasid

(Continued on next page)
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Platform Notes (Continued)

decodeassists pausefilter pfthreshold avic v_vmsave_vmload vgif umip 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: 2 nodes (0-1)
  node 0 cpus: 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 32 33 34 35 36 37 38 39 40 41 42 43
  44 45 46 47
  node 0 size: 257883 MB
  node 0 free: 257012 MB
  node 1 cpus: 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 48 49 50 51 52 53 54 55 56
  57 58 59 60 61 62 63
  node 1 size: 258040 MB
  node 1 free: 257296 MB
  node distances:
    node 0 1
    0: 10 32
    1: 32 10

From /proc/meminfo
  MemTotal:       528305832 kB
  HugePages_Total:       0
  Hugepagesize:       2048 kB

/usr/bin/lsb_release -d
  Ubuntu 19.04

From /etc/*release* /etc/*version*
  debian_version: buster/sid
  os-release:
    NAME="Ubuntu"
    VERSION="19.04 (Disco Dingo)"
    ID=ubuntu
    ID_LIKE=debian
    PRETTY_NAME="Ubuntu 19.04"
    VERSION_ID="19.04"
    HOME_URL="https://www.ubuntu.com/
    SUPPORT_URL="https://help.ubuntu.com/"

uname -a:
  Linux ubuntu 5.0.0-38-generic #41-Ubuntu SMP Tue Dec 3 00:27:35 UTC 2019 x86_64 x86_64
  x86_64 GNU/Linux

Kernel self-reported vulnerability status:

(Continued on next page)
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Platform Notes (Continued)

- 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 sanitization
- CVE-2017-5715 (Spectre variant 2): Mitigation: Full AMD retpoline, IBPB: conditional, IBRS_FW, STIBP: conditional, RSB filling
- tsx_async_abort: Not affected

run-level 5 Dec 4 07:46

SPEC is set to: /home/cpu2017

Filesystem     Type  Size  Used Avail Use% Mounted on  
/dev/sda2      ext4  1.5T   47G  1.4T   4% /

From /sys/devices/virtual/dmi/id  
BIOS: GIGABYTE R27 08/21/2020  
Vendor: Altos  
Product: BrainSphere R385 F4  
Product Family: Server  
Serial: GJG4P8612A0015

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 M393A4K40DB3-CWE 32 kB 2 rank 3200  
16x Unknown Unknown

(End of data from sysinfo program)

Compiler Version Notes

==============================================================================  
C               | 519.ibm_r(base, peak) 538.imagick_r(base, peak)  
| 544.nab_r(base, peak)  
==============================================================================  
AOCC.LLVM.2.0.0.B191.2019_07_19 clang version 8.0.0 (CLANG: Jenkins  
AOCC_2_0_0-Build191) (based on LLVM AOCC.LLVM.2.0.0.B191.2019_07_19)  
Target: x86_64-unknown-linux-gnu

(Continued on next page)
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BrainSphere R385 F4 (AMD EPYC 7282)

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

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**Compiler Version Notes (Continued)**

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

---

```plaintext
C++ | 508.namd_r(base, peak) 510.parest_r(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

---

```plaintext
C++, C | 511.povray_r(base, peak) 526.blender_r(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

---

```plaintext
C++, C, Fortran | 507.cactuBSSN_r(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)  
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Compiler Version Notes (Continued)

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| Fortran         | 503.bwaves_r(base, peak) 549.fotonik3d_r(base, peak) 554.roms_r(base, peak) |
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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

------------------------------------------------------------------------------
| Fortran, C      | 521.wrf_r(base, peak) 527.cam4_r(base, peak) |
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AOCC.LLVM.2.0.0.B191.2019_07_19 clang version 8.0.0 (CLANG: Jenkins
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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

C++ benchmarks:
clang++

Fortran benchmarks:
flang

Benchmarks using both Fortran and C:
flang clang

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

(Continued on next page)
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Base Compiler Invocation (Continued)

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
519.libm_r: -DSPEC_LP64
521.wrf_r: -DSPEC_CASE_FLAG -Mbyteswapio -DSPEC_LP64
526.blender_r: -funsigned-char -D__BOOL_DEFINED -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:
-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
-flvl-function-specialization -z muldefs -lmvec -ljemalloc -lflang

C++ benchmarks:
-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
-mlllvm -loop-unswitch-threshold=200000 -mlllvm -vector-library=LIBMVEC
-mlllvm -unroll-threshold=100 -flvl-function-specialization
-mlllvm -enable-partial-unswitch -z muldefs -lmvec -ljemalloc -lflang

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

Altos Computing Inc.

BrainSphere R385 F4 (AMD EPYC 7282)

SAME PERFORMANCE EVALUATION CORPORATION
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SPECrate®2017_fp_base = 194

SPECrate®2017_fp_peak = 208

CPU2017 License: 97
Test Sponsor: Altos Computing Inc.
Test Date: Dec-2020
Tested by: Altos Computing Inc.
Hardware Availability: Dec-2019
Software Availability: Dec-2019

Base Optimization Flags (Continued)

Fortran benchmarks:
-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 -z muldefs
-Kieee -fno-finite-math-only -lmvec -lamdlibm -ljemalloc -lflang

Benchmarks using both Fortran and C:
-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 -ffast-math
-march=znver2 -fstruct-layout=3 -mlvm -unroll-threshold=50
-fremap-arrays -mlvm -function-specialize -mlvm -enable-gvn-quiet
-mlvm -reduce-array-computations=3 -mlvm -disable-gvn-quiet
-mlvm -vector-library=LIBMVEC -mlvm -inline-threshold=1000
-flv-function-specialization -funroll-loops -Mrecursive -z muldefs
-Kieee -fno-finite-math-only -lmvec -lamdlibm -ljemalloc -lflang

Benchmarks using both C and C++:
-std=c++98 -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,-suppress-fmas -O3 -ffast-math -march=znver2
-fstruct-layout=3 -mlvm -unroll-threshold=50 -fremap-arrays
-mlvm -function-specialize -mlvm -enable-gvn-quiet
-mlvm -reduce-array-computations=3 -mlvm -disable-gvn-quiet
-mlvm -vector-library=LIBMVEC -mlvm -inline-threshold=1000
-flv-function-specialization -mlvm -loop-unswitch-threshold=200000
-mlvm -unroll-threshold=100 -mlvm -enable-partial-unswitch -z muldefs
-lmvec -lamdlibm -ljemalloc -lflang

Benchmarks using Fortran, C, and C++:
-std=c++98 -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,-suppress-fmas -O3 -ffast-math -march=znver2
-fstruct-layout=3 -mlvm -unroll-threshold=50 -fremap-arrays
-mlvm -function-specialize -mlvm -enable-gvn-quiet
-mlvm -reduce-array-computations=3 -mlvm -disable-gvn-quiet
-mlvm -vector-library=LIBMVEC -mlvm -inline-threshold=1000
-flv-function-specialization -mlvm -loop-unswitch-threshold=200000
-mlvm -unroll-threshold=100 -mlvm -enable-partial-unswitch
-funroll-loops -Mrecursive -z muldefs -Kieee -fno-finite-math-only
-lmvec -lamdlibm -ljemalloc -lflang
**SPEC CPU®2017 Floating Point Rate Result**

Altos Computing Inc.  
BrainSphere R385 F4 (AMD EPYC 7282)  

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**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:
- -flto -Wl,-mllvm -Wl,-function-specialize
- -Wl,-mllvm -Wl,-region-vectorize -Wl,-mllvm -Wl,-vector-library=LIBMVEC
- -Wl,-mllvm -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 -lmvec -lamlb -ljemalloc -lflang

C++ benchmarks:
- 508.namd_r:basepeak = yes

- 510.parest_r: -std=c++98 -flto -Wl,-mllvm -Wl,-function-specialize
- -Wl,-mllvm -Wl,-region-vectorize
- -Wl,-mllvm -Wl,-vector-library=LIBMVEC

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

510.parest_r (continued):
-Wl,-mlllvm -Wl,-reduce-array-computations=3
-Wl,-mlllvm -Wl,-suppress-fmas -Ofast -march=znver2
-flv-function-specialization -mlllvm -unroll-threshold=100
-mlllvm -enable-partial-unswitch
-mlllvm -loop-unswitch-threshold=200000
-mlllvm -vector-library=LIBMVEC
-mlllvm -inline-threshold=1000 -lmvec -lamlibm -ljemalloc
-lflang

Fortran benchmarks:

503.bwaves_r: -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 -Kieee
-fno-finite-math-only -lmvec -lamlibm -ljemalloc
-lflang

549.fotonik3d_r: Same as 503.bwaves_r

554.roms_r: -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,-enable-X86-prefetching -O3 -march=znver2
-funroll-loops -Mrecursive -mlllvm -vector-library=LIBMVEC
-Kieee -fno-finite-math-only -lmvec -lamlibm -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 -march=znver2
-mno-sse4a -fstruct-layout=5 -mlllvm -vectorize-memory-aggressively
-mlllvm -function-specialize -mlllvm -enable-gvn-hoist
-mlllvm -unroll-threshold=50 -fremap-arrays
-mlllvm -vector-library=LIBMVEC -mlllvm -reduce-array-computations=3
-mlllvm -global-vectorize-slp -mlllvm -inline-threshold=1000
-flv-function-specialization -O3 -funroll-loops -Mrecursive -Kieee
-fno-finite-math-only -lmvec -lamlibm -ljemalloc -lflang

Benchmarks using both C and C++:

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### Altos Computing Inc.  
**BrainSphere R385 F4 (AMD EPYC 7282)**

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</tbody>
</table>

**SPECrate®2017_fp_base = 194**  
**SPECrate®2017_fp_peak = 208**

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**Peak Optimization Flags (Continued)**


- `526.blender_r`: basepeak = yes

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

- `507.cactuBSSN_r`: basepeak = yes

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

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