Supermicro
A+ SuperWorkstation 5014A-TT (M12SWA-TF, AMD Ryzen Threadripper PRO 3945WX)

<table>
<thead>
<tr>
<th>SPECrate®2017_fp_base</th>
<th>SPECrate®2017_fp_peak</th>
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<tbody>
<tr>
<td>113</td>
<td>119</td>
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CPU2017 License: 001176
Test Date: Feb-2021
Hardware Availability: Mar-2021

Test Sponsor: Supermicro
Tested by: Supermicro
Software Availability: Jan-2021

<table>
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<th>Copy Numbers</th>
<th>SPECrate®2017_fp_base</th>
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<td>521.wrf_r</td>
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<td>526.blender_r</td>
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<td>527.cam4_r</td>
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<td>538.imagick_r</td>
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</tr>
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<td>554.roms_r</td>
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Hardware

<table>
<thead>
<tr>
<th>CPU Name: AMD Ryzen Threadripper PRO 3945WX</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max MHz: 4300</td>
</tr>
<tr>
<td>Nominal: 4000</td>
</tr>
<tr>
<td>Enabled: 12 cores, 1 chip, 2 threads/core</td>
</tr>
<tr>
<td>Orderable: 1 chip</td>
</tr>
<tr>
<td>Cache L1: 32 KB I + 32 KB D on chip per core</td>
</tr>
<tr>
<td>L2: 512 KB I+D on chip per core</td>
</tr>
<tr>
<td>L3: 64 MB I+D on chip per core, 16 MB shared / 3 cores</td>
</tr>
<tr>
<td>Other: None</td>
</tr>
<tr>
<td>Memory: 512 GB (8 x 64 GB 2Rx4 PC4-3200AA-R)</td>
</tr>
<tr>
<td>Storage: 1 x 300 GB SATA III, 7200 RPM</td>
</tr>
<tr>
<td>Other: None</td>
</tr>
</tbody>
</table>

Software

<table>
<thead>
<tr>
<th>OS: Ubuntu 20.04.1 LTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compiler: C/C++/Fortran: Version 2.0.0 of AOCC</td>
</tr>
<tr>
<td>Parallel: No</td>
</tr>
<tr>
<td>Firmware: Version 5.17 released Feb-2021</td>
</tr>
<tr>
<td>File System: ext4</td>
</tr>
<tr>
<td>System State: Run level 5 (multi-user without GUI)</td>
</tr>
<tr>
<td>Base Pointers: 64-bit</td>
</tr>
<tr>
<td>Peak Pointers: 64-bit</td>
</tr>
<tr>
<td>Other: jemalloc: jemalloc memory allocator library v5.2.0</td>
</tr>
<tr>
<td>Power Management: BIOS set to prefer performance at the cost of additional power usage.</td>
</tr>
</tbody>
</table>
### Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
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<th>Seconds</th>
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</tbody>
</table>

SPECrater®2017_fp_base = 113
SPECrater®2017_fp_peak = 119

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)
Supermicro
A+ SuperWorkstation 5014A-TT
(M12SWA-TF, AMD Ryzen Threadripper PRO 3945WX)

| SPECrate®2017_fp_base = 113 |
| SPECrate®2017_fp_peak = 119 |

CPU2017 License: 001176
Test Sponsor: Supermicro
Tested by: Supermicro

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;"
MALLOCF_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:
Determinism Control = Manual
Determinism Slider = Power
APBDIS = 1
NUMA Nodes Per Socket = NPS2

Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r6538 of 2020-09-24 e8664e66d2d7080afeaa89d4b38e2f1c
running on m12swa-01 Fri Feb 19 13:52:16 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)
Platform Notes (Continued)

From /proc/cpuinfo

model name : AMD Ryzen Threadripper PRO 3945WX 12-Cores
  1 "physical id"s (chips)
  24 "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 : 12
siblings : 24
physical 0: 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
Address sizes:                   43 bits physical, 48 bits virtual
CPU(s):                          24
On-line CPU(s) list:             0-23
Thread(s) per core:              2
Core(s) per socket:              12
Socket(s):                       1
NUMA node(s):                    2
Vendor ID:                       AuthenticAMD
CPU family:                      23
Model:                           49
Model name:                      AMD Ryzen Threadripper PRO 3945WX 12-Cores
Stepping:                        0
Frequency boost:                 enabled
CPU MHz:                         4076.539
CPU max MHz:                     4000.0000
CPU min MHz:                     2200.0000
BogoMIPS:                        7999.97
Virtualization:                  AMD-V
L1d cache:                       384 KiB
L1i cache:                       384 KiB
L2 cache:                        6 MiB
L3 cache:                        64 MiB
NUMA node0 CPU(s):               0-5,12-17
NUMA node1 CPU(s):               6-11,18-23
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

(Continued on next page)
Supermicro
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SPECrate®2017_fp_base = 113
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Test Date: Feb-2021
Tested by: Supermicro
Software Availability: Jan-2021
Hardware Availability: Mar-2021

Platform Notes (Continued)

Vulnerability Spectre v2: Mitigation; Full AMD retropoline, IBPB conditional, STIBP conditional, RSB filling
Vulnerability Srbs: 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
pdpelgb rdtscp lm constant_tsc rep_good nopl nonstop_tsc cpuid extd_apicid
aperfmpref perfstat pmtr monit ssse3 sse4_1 sse4_2 movbe popcnt aes xsave
avx f16c rdrand lahf_lm cmp_legacy svm extapic cr8_legacy abm sse4a misalignsse
3dnowprefetch osuw ibs skinit wdt tce topoext perfctr_core perfctr_nb bpext
perfcntllc mwaitx cmp64 cmp_legacy svm extapic cr8_legacy abm sse4a misalignsse
3dnowprefetch osuw ibs skinit wdt tce topoext perfctr_core perfctr_nb bpext
perfcntllc mwaitx cmp64 cmp_legacy svm extapic cr8_legacy abm sse4a misalignsse
3dnowprefetch osuw ibs skinit wdt tce topoext perfctr_core perfctr_nb bpext

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
pdpelgb rdtscp lm constant_tsc rep_good nopl nonstop_tsc cpuid extd_apicid
aperfmpref perfstat pmtr monit ssse3 sse4_1 sse4_2 movbe popcnt aes xsave
avx f16c rdrand lahf_lm cmp_legacy svm extapic cr8_legacy abm sse4a misalignsse
3dnowprefetch osuw ibs skinit wdt tce topoext perfctr_core perfctr_nb bpext
perfcntllc mwaitx cmp64 cmp_legacy svm extapic cr8_legacy abm sse4a misalignsse
3dnowprefetch osuw ibs skinit wdt tce topoext perfctr_core perfctr_nb bpext

/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 12 13 14 15 16 17
  node 0 size: 257900 MB
  node 0 free: 257314 MB
  node 1 cpus: 6 7 8 9 10 11 18 19 20 21 22 23
  node 1 size: 257996 MB
  node 1 free: 257388 MB
  node distances:
    node 0 1
    0: 10 12
    1: 12 10

From /proc/meminfo
  MemTotal: 528277988 kB
  HugePages_Total: 0
  Hugepagesize: 2048 kB

/sys/devices/system/cpu/cpu*/cpufreq/scaling_governor has performance
/usr/bin/lsb_release -d
  Ubuntu 20.04.1 LTS

From /etc/*release* /etc/*version*
  debian_version: bullseye/sid

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

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SPECrates®2017_fp_base = 113
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CPU2017 License: 001176
Test Sponsor: Supermicro
Tested by: Supermicro

Platform Notes (Continued)

```shell
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 m12swa-01 5.4.0-60-generic #67-Ubuntu SMP Tue Jan 5 18:31:36 UTC 2021 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/swapgs barriers and __user pointer sanitization
- CVE-2017-5753 (Spectre variant 1): Mitigation: Full AMD retpoline, IBPB: conditional, STIBP: conditional, RSB filling
- CVE-2017-5715 (Spectre variant 2): Not affected
- CVE-2020-0543 (Special Register Buffer Data Sampling): Not affected
- CVE-2019-11135 (TSX Asynchronous Abort): Not affected

run-level 5 Feb 19 15:57

SPEC is set to: /home/cpu2017

```
Filesystem Type Size Used Avail Use% Mounted on
/dev/sda4 ext4 272G 24G 234G 10% /
```

From /sys/devices/virtual/dmi/id
Vendor: Supermicro
Product: M12SWA-TF
Product Family: SMC M12
Serial: 123456789

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

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

frequent changes to hardware, firmware, and the "DMTF SMBIOS" standard.

Memory:
8x SK Hynix HMAA8GR7AJR4N-XN 64 GB 2 rank 3200

BIOS:
- BIOS Vendor: American Megatrends International, LLC.
- BIOS Version: 5.17
- BIOS Date: 02/01/2021
- BIOS Revision: 5.17

(End of data from sysinfo program)

### Compiler Version Notes

---

<table>
<thead>
<tr>
<th>C</th>
<th>519.lbm_r(base, peak) 538.imagick_r(base, peak)</th>
<th>544.nab_r(base, peak)</th>
</tr>
</thead>
</table>

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

---

| 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

---

| 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
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(Continued on next page)
Supermicro
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SPEC CPU®2017 Floating Point Rate Result
Copyright 2017-2021 Standard Performance Evaluation Corporation

Spec CPU

SPECrate®2017_fp_base = 113
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CPU2017 License: 001176
Test Sponsor: Supermicro
Test Date: Feb-2021
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Compiler Version Notes (Continued)
Thread model: posix
InstalledDir: /sppo/dev/compilers/aocc-compiler-2.0.0/bin

==============================================================================
C++, Fortran, 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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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

==============================================================================
Fortran, C, Fortran | 503.bwaves_r(base, peak) 549.fotonik3d_r(base, peak) 554.roms_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

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

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SPECrate®2017_fp_base = 113
SPECrate®2017_fp_peak = 119

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</tr>
<tr>
<td>Tested by: Supermicro</td>
<td>Software Availability:</td>
<td>Jan-2021</td>
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</tbody>
</table>

Compiler Version Notes (Continued)

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

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.lbm_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
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SPEC CPU®2017 Floating Point Rate Result

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Base Optimization Flags

C benchmarks:
-flt0 -Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-region-vectorize -Wl,-mllvm -Wl,-vector-library=LIBMVEC
-Wl,-mllvm -Wl,-reduce-array-computations=3 -O3 -ffast-math
-march=znver2 -fstruct-layout=3 -mllvm -unroll-threshold=50
-fremap-arrays -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 -z muldefs -lmvec -lamdlibm -ljemalloc
-lflang

C++ benchmarks:
-std=c++98 -flt0 -Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-region-vectorize -Wl,-mllvm -Wl,-vector-library=LIBMVEC
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-suppress-fmas -O3 -ffast-math -march=znver2
-mllvm -loop-unswitch-threshold=200000 -mllvm -vector-library=LIBMVEC
-mllvm -unroll-threshold=100 -flv-function-specialization
-mllvm -enable-partial-unswitch -z muldefs -lmvec -lamdlibm
-ljemalloc -lflang

Fortran benchmarks:
-flt0 -Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-region-vectorize -Wl,-mllvm -Wl,-vector-library=LIBMVEC
-Wl,-mllvm -Wl,-reduce-array-computations=3 -O3 -march=znver2
-funroll-loops -Mrecursive -mllvm -vector-library=LIBMVEC -z muldefs
-Kiee -fno-finite-math-only -lmvec -lamdlibm -ljemalloc -lflang

Benchmarks using both Fortran and C:
-flt0 -Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-region-vectorize -Wl,-mllvm -Wl,-vector-library=LIBMVEC
-Wl,-mllvm -Wl,-reduce-array-computations=3 -O3 -ffast-math
-march=znver2 -fstruct-layout=3 -mllvm -unroll-threshold=50
-fremap-arrays -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 -funroll-loops -Mrecursive -z muldefs
-Kiee -fno-finite-math-only -lmvec -lamdlibm -ljemalloc -lflang

Benchmarks using both C and C++:
-std=c++98 -flt0 -Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-region-vectorize -Wl,-mllvm -Wl,-vector-library=LIBMVEC
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-suppress-fmas -O3 -ffast-math -march=znver2
-fstruct-layout=3 -mllvm -unroll-threshold=50 -fremap-arrays
-mllvm -function-specialize -mllvm -enable-gvn-hoist

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### Base Optimization Flags (Continued)

Benchmarks using both C and C++ (continued):
- mllvm -reduce-array-computations=3 -mllvm -global-vectorize-slp
- mllvm -vector-library=LIBMVEC -mllvm -inline-threshold=1000
- fllv-function-specialization -mllvm -loop-unswitch-threshold=200000
- mllvm -unroll-threshold=100 -mllvm -enable-partial-unswitch -z muldefs
- lmvec -lamlbim -ljemalloc -lflang

Benchmarks using Fortran, C, and C++:
- std=c++98 -flto -Wl,-mllvm -Wl,-function-specialize
- Wl,-mllvm -Wl,-region-vectorize -Wl,-mllvm -Wl,-vector-library=LIBMVEC
- Wl,-mllvm -Wl,-reduce-array-computations=3
- Wl,-mllvm -Wl,-suppress-fmas -O3 -ffast-math -march=znver2
- fstruct-layout=3 -mllvm -unroll-threshold=50 -fremap-arrays
- mllvm -function-specialize -mllvm -enable-gvn-hoist
- mllvm -reduce-array-computations=3 -mllvm -global-vectorize-slp
- mllvm -function-specialize -mllvm -linear-threshold=1000
- fllv-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
- lmvec -lamlbim -ljemalloc -lflang

### 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
SPEC CPU®2017 Floating Point Rate Result

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Peak Portability Flags
Same as Base Portability Flags

Peak 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 -Ofast -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 -lmvec -lamdlibm -ljemalloc -lflang

C++ benchmarks:
508.namd_r: basepeak = yes
510.parest_r: 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,-supress-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 -lamdlibm -ljemalloc
- lflang

Fortran benchmarks:
503.bwaves_r: basepeak = yes
549.fotonik3d_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 -lamdlibm -ljemalloc
- lflang

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Peak Optimization Flags (Continued)

554.roms_r: -flto -Wl,-mllvm -Wl,-function-specialize
-1Wl,-mllvm -Wl,-region-vectorize
-1Wl,-mllvm -Wl,-vector-library=LIBMVEC
-1Wl,-mllvm -Wl,-reduce-array-computations=3
-1Wl,-mllvm -Wl,-enable-X86-prefetching -O3 -march=znver2
-nfunroll-loops -Mrecursive -mllvm -Wl,-vector-library=LIBMVEC
-Kieee -fno-finite-math-only -lmvec -lamdlibm -ljemalloc
-lflang

Benchmarks using both Fortran and C:

521.wrf_r: basepeak = yes
527.cam4_r: basepeak = yes

Benchmarks using both C and C++:

511.povray -std=c++98 -flto -Wl,-mllvm -Wl,-function-specialize
-1Wl,-mllvm -Wl,-region-vectorize
-1Wl,-mllvm -Wl,-vector-library=LIBMVEC
-1Wl,-mllvm -Wl,-reduce-array-computations=3
-1Wl,-mllvm -Wl,-x86-use-vzeroupper=false -Ofast
-march=znver2 -nmno-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 -mllvm -unroll-threshold=100
-mllvm -enable-partial-unswitch
-mllvm -loop-unswitch-threshold=200000 -lmvec -lamdlibm
-ljemalloc -lflang

526.blender_r: basepeak = yes

Benchmarks using Fortran, C, and C++:

-std=c++98 -flto -Wl,-mllvm -Wl,-function-specialize
-1Wl,-mllvm -Wl,-region-vectorize -Wl,-mllvm -Wl,-vector-library=LIBMVEC
-1Wl,-mllvm -Wl,-reduce-array-computations=3 -Ofast -march=znver2
-nmno-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 -mllvm -unroll-threshold=100

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**Peak Optimization Flags (Continued)**

Benchmarks using Fortran, C, and C++ (continued):
- `-mllvm -enable-partial-unswitch -mllvm -loop-unswitch-threshold=200000`
- `-O3 -funroll-loops -Mrecursive -Kieee -fno-finite-math-only -lmvec`
- `-lamdlibm -ljemalloc -lflang`

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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