## SPEC CPU®2017 Floating Point Speed Result

**ASUSTeK Computer Inc.**  
ASUS RS500A-E10(KRPA-U16) Server System  
2.00 GHz, AMD EPYC 7662

<table>
<thead>
<tr>
<th>SPECspeed®2017_fp_base</th>
<th>137</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECspeed®2017_fp_peak</td>
<td>141</td>
</tr>
</tbody>
</table>

**CPU2017 License:** 9016  
**Test Sponsor:** ASUSTeK Computer Inc.  
**Tested by:** ASUSTeK Computer Inc.

<table>
<thead>
<tr>
<th>Threads</th>
<th>SPECspeed®2017_fp_base</th>
<th>SPECspeed®2017_fp_peak</th>
</tr>
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<tbody>
<tr>
<td>603.bwaves_s 64</td>
<td>216</td>
<td>375</td>
</tr>
<tr>
<td>607.cactuBSSN_s 64</td>
<td>218</td>
<td></td>
</tr>
<tr>
<td>619.lbm_s 128</td>
<td>42.9</td>
<td></td>
</tr>
<tr>
<td>621.wrf_s 64</td>
<td></td>
<td>139</td>
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<tr>
<td>627.cam4_s 64</td>
<td>93.1</td>
<td></td>
</tr>
<tr>
<td>628.pop2_s 64</td>
<td>72.3</td>
<td></td>
</tr>
<tr>
<td>638.imagick_s 64</td>
<td>72.4</td>
<td></td>
</tr>
<tr>
<td>644.nab_s 128</td>
<td>254</td>
<td></td>
</tr>
<tr>
<td>649.fotonik3d_s 64</td>
<td>339</td>
<td></td>
</tr>
<tr>
<td>654.roms_s 64</td>
<td>165</td>
<td></td>
</tr>
</tbody>
</table>

**Software**

**OS:** SUSE Linux Enterprise Server 15 SP1 (x86_64)  
**Kernel:** 4.12.14-195-default  
**Compiler:** C/C++/Fortran: Version 2.0.0 of AOCC  
**Parallel:** Yes  
**Firmware:** Version 0501 released Nov-2019  
**File System:** xfs  
**System State:** Run level 3 (multi-user)  
**Base Pointers:** 64-bit  
**Peak Pointers:** 64-bit  
**Other:** jemalloc: jemalloc memory allocator library v5.1.0  
**Power Management:** BIOS and OS set to prefer performance at the cost of additional power usage.

---

### Hardware

**CPU Name:** AMD EPYC 7662  
**Max MHz:** 3300  
**Nominal:** 2000  
**Enabled:** 64 cores, 1 chip, 2 threads/core  
**Orderable:** 1 chip  
**Cache L1:** 32 KB I + 32 KB D on chip per core  
**L2:** 512 KB I+D on chip per core  
**L3:** 256 MB I+D on chip per chip, 16 MB shared / 4 cores  
**Other:** None  
**Memory:** 512 GB (8 x 64 GB 2Rx4 PC4-3200AA-R)  
**Storage:** 1 x 240 GB SATA SSD  
**Other:** None
## Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
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<tr>
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<td>375</td>
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<tr>
<td>607.cactuBSSN_s</td>
<td>64</td>
<td>77.1</td>
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<td>76.8</td>
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<td>214</td>
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<td>64</td>
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<td>93.1</td>
<td>95.1</td>
<td>93.2</td>
<td>95.3</td>
<td>93.0</td>
<td>64</td>
<td>95.2</td>
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<td>164</td>
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<td>164</td>
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<td>638.imagick_s</td>
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<td>166</td>
<td>94.9</td>
<td>166</td>
<td>95.0</td>
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</tbody>
</table>

## Compiler Notes

The AMD64 AOCC Compiler Suite is available at
http://developer.amd.com/amd-aocc/

## Submit Notes

The config file option 'submit' was used.
'numactl' was used to bind copies to the cores.
See the configuration file for details.

## Operating System Notes

'ulimit -s unlimited' was used to set environment stack size
'ulimit -l 2097152' was used to set environment locked pages in memory limit

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

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)

(Continued on next page)
ASUSTeK Computer Inc.
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SPECspeed\textsuperscript{\(\text{\textregistered}\)2017\_fp\_base} = 137
SPECspeed\textsuperscript{\(\text{\textregistered}\)2017\_fp\_peak} = 141

Operating System Notes (Continued)

OS set to performance mode via cpupower frequency-set -g performance.

Environment Variables Notes

Environment variables set by runcpu before the start of the run:
GOMP\_CPU\_AFFINITY = "0-127"
LD\_LIBRARY\_PATH = 
"/spec2017c1/amd\_speed\_aocc200\_rome\_C\_lib/64;/spec2017c1/amd\_speed\_aocc2\_00\_rome\_C\_lib/32:"
MALLOCP\_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 = "0-63"

Environment variables set by runcpu during the 607.cactuBSSN\_s peak run:
GOMP\_CPU\_AFFINITY = "0-63"

Environment variables set by runcpu during the 619.lbm\_s peak run:
GOMP\_CPU\_AFFINITY = "0 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 628.pop2\_s peak run:
GOMP\_CPU\_AFFINITY = "0-63"

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 set by runcpu during the 649.fotonik3d\_s peak run:
GOMP\_CPU\_AFFINITY = "0-63"

Environment variables set by runcpu during the 654.roms\_s peak run:
GOMP\_CPU\_AFFINITY = "0-63"
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<td>ASUSTeK Computer Inc.</td>
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<td>Tested by:</td>
<td>ASUSTeK Computer Inc.</td>
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<tr>
<td>Test Date:</td>
<td>Jan-2020</td>
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<tr>
<td>Hardware Availability:</td>
<td>Feb-2020</td>
</tr>
<tr>
<td>Software Availability:</td>
<td>Jun-2019</td>
</tr>
</tbody>
</table>

## 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 5.1.0 is available here:  
https://github.com/jemalloc/jemalloc/releases/download/5.1.0/jemalloc-5.1.0.tar.bz2

## Platform Notes

**BIOS Configuration:**
- 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 /spec2017c1/bin/sysinfo
Rev: r6365 of 2019-08-21 295195f888a3d7ed1b6e46a485a0011  
running on linux-wv9n Mon Jan  6 15:55:41 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 7662 64-Core Processor
  - 1 "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: 64
  - siblings: 128
- 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 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63

From lscpu:
- Architecture: x86_64

(Continued on next page)
Platform Notes (Continued)

- CPU op-mode(s): 32-bit, 64-bit
- Byte Order: Little Endian
- Address sizes: 43 bits physical, 48 bits virtual
- Vendor ID: AuthenticAMD
- CPU family: 23
- Model: 49
- Model name: AMD EPYC 7662 64-Core Processor
- CPU MHz: 2000.000
- CPU max MHz: 2000.0000
- CPU min MHz: 1500.0000
- BogoMIPS: 4039.89
- Virtualization: AMD-V
- Flags: fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov
- /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: 4 nodes (0-3)

(Continued on next page)
SPEC CPU®2017 Floating Point Speed Result
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SPECspeed®2017_fp_base = 137
SPECspeed®2017_fp_peak = 141

Test Date: Jan-2020
Hardware Availability: Feb-2020
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Platform Notes (Continued)

node 0 size: 128825 MB
node 0 free: 128588 MB
node 1 cpus: 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 80 81 82 83 84 85 86 87 88
90 91 92 93 94 95
node 1 size: 128981 MB
node 1 free: 128751 MB
node 2 cpus: 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 96 97 98 99 100 101 102
103 104 105 106 107 108 109 110 111
node 2 size: 129011 MB
node 2 free: 128754 MB
node 3 cpus: 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 112 113 114 115 116 117
118 119 120 121 122 123 124 125 126 127
node 3 size: 128996 MB
node 3 free: 128745 MB
node distances:
node 0 1 2 3
0: 10 12 12 12
1: 12 10 12 12
2: 12 12 10 12
3: 12 12 12 10

From /proc/meminfo
MemTotal: 528194036 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

From /etc/*release* /etc/*version*
os-release:
NAME="SLES"
VERSION="15-SP1"
VERSION_ID="15.1"
PRETTY_NAME="SUSE Linux Enterprise Server 15 SP1"
ID="sles"
ID_LIKE="suse"
ANSL_COLOR="0;32"
CPE_NAME="cpe:/o:suse:sles:15:sp1"

uname -a:
Linux linux-wv9n 4.12.14-195-default #1 SMP Tue May 7 10:55:11 UTC 2019 (8fba516) x86_64 x86_64 x86_64 GNU/Linux

Kernel self-reported vulnerability status:
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

(Continued on next page)
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Platform Notes (Continued)

via prctl and seccomp

CVE-2017-5753 (Spectre variant 1):
Mitigation: __user pointer sanitization
CVE-2017-5715 (Spectre variant 2):
Mitigation: Full AMD retpoline, IBPB:
conditional, IBRS_FW, STIBP: conditional, RSB
filling

run-level 3 Jan 6 10:48

SPEC is set to: /spec2017c1

<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/sdd4</td>
<td>xfs</td>
<td>199G</td>
<td>14G</td>
<td>186G</td>
<td>7%</td>
<td>/</td>
</tr>
</tbody>
</table>

From /sys/devices/virtual/dmi/id
BIOS: American Megatrends Inc. 0501 11/07/2019
Vendor: ASUSTeK COMPUTER INC.
Product: KRPA-U16 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.
Memory:
  8x Samsung M393A8G40AB2-CWE 64 kB 2 rank 3200
  8x Unknown Unknown

(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)
==============================================================================
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, Fortran | 607.cactuBSSN_s(base, peak)
==============================================================================
AOCC.LLVM.2.0.0.B191.2019_07_19 clang version 8.0.0 (CLANG: Jenkins

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

AOCC_2_0_0-Build#191 (based on LLVM AOCC.LLVM.2.0.0.B191.2019_07_19)
Target: x86_64-unknown-linux-gnu
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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
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Fortran         | 603.bwaves_s(base, peak) 649.fotonik3d_s(base, peak)
| 654.roms_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

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
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Compiler Version Notes (Continued)
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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:
-fflto -Wl, -mllvm -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 -DSPEC_OPENMP -fopenmp
-DUSE_OPENMP -fopenmp=libomp -lomp -lpthread -ldl -lmvec -lamdlibm
-ljemalloc -lflang

Fortran benchmarks:
-fflto -Wl, -mllvm -Wl, -function-specialize
-Wl, -mllvm -Wl, -region-vectorize -Wl, -mllvm -Wl, -vector-library=LIBMVEC

(Continued on next page)
ASUSTeK Computer Inc.  
ASUS RS500A-E10(KRPA-U16) Server System  
2.00 GHz, AMD EPYC 7662

SPECspeed®2017_fp_base = 137  
SPECspeed®2017_fp_peak = 141

CPU2017 License: 9016  
Test Date: Jan-2020  
Test Sponsor: ASUSTeK Computer Inc.  
Hardware Availability: Feb-2020  
Tested by: ASUSTeK Computer Inc.  
Software Availability: Jun-2019

Base Optimization Flags (Continued)

Fortran benchmarks (continued):
-Wl,-mllvm -Wl,-reduce-array-computations=3 -O3 -march=znver2  
-funroll-loops -Mrecursive -mllvm -vector-library=LIBMVEC -z muldefs  
-Kieee -fno-finite-math-only -DSPEC_OPENMP -fopenmp -DUSE_OPENMP  
-fopenmp=libomp -lomp -lpthread -ldl -lmvec -lamdlibm -ljemalloc  
-flflag

Benchmarks using both Fortran and C:
-flt -fno -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  
-Kieee -fno-finite-math-only -DSPEC_OPENMP -fopenmp -DUSE_OPENMP  
-fopenmp=libomp -lomp -lpthread -ldl -lmvec -lamdlibm -ljemalloc  
-flflag

Benchmarks using Fortran, C, and C++:
-std=c++98 -flt -fno -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 -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 -DUSE_OPENMP -fopenmp=libomp -lomp -lpthread  
-ldl -lmvec -lamdlibm -ljemalloc -flflag

Base Other Flags

C benchmarks:
-Wno-return-type

Fortran benchmarks:
-Wno-return-type

(Continued on next page)
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Base Other Flags (Continued)

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

Benchmarks using Fortran, C, and C++:
-Wno-return-type

Peek 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.ibm_s: -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 -DSPEC_OPENMP -fopenmp

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

619.lbm_s (continued):
-DUSE_OPENMP -lmvec -lamdlibm -fopenmp=libomp -lomp
-lpthread -ldl -ljemalloc -lflang

638.imagick_s: basepeak = yes

644.nab_s: Same as 619.lbm_s

Fortran benchmarks:

603.bwaves_s: -flto -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
-mlllvm -vector-library=LIBMVEC -Kieee
-fno-finite-math-only -DSPEC_OPENMP -fopenmp -DUSE_OPENMP
-fopenmp=libomp -lomp -lpthread -ldl -lmvec -lamdlibm
-lljemalloc -lflang

649.fotonik3d_s: Same as 603.bwaves_s

654.roms_s: -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,-enable-X86-prefetching -O3 -march=znver2
-funroll-loops -Mrecursive -mlllvm -vector-library=LIBMVEC
-Kieee -fno-finite-math-only -DSPEC_OPENMP -fopenmp
-DSPEC_OPENMP -fopenmp=libomp -lomp -lpthread -ldl
-mlvec -lamdlibm -ljemalloc -lflang

Benchmarks using both Fortran and C:

621.wrf_s: basepeak = yes

627.cam4_s: basepeak = yes

628.pop2_s: -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
-mlllvm -vectorize-memory-aggressively
-mlllvm -function-specialize -mlllvm -enable-gvn-hoist
-mlllvm -unroll-threshold=50 -fremap-arrays

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SPEC CPU®2017 Floating Point Speed Result
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Peak Optimization Flags (Continued)

628.pop2_s (continued):
-mlirvm -vector-library=LIBMVEC
-mlirvm -reduce-array-computations=3
-mlirvm -global-vectorize-slp -mlirvm -inline-threshold=1000
-flv-function-specialization -O3 -funroll-loops
-Mrecursive -Kieee -fno-finite-math-only -DSPEC_OPENMP
-fopenmp -DUSE_OPENMP -fopenmp=libomp -lomp -lpthread
-ldl -lmvec -lamlidlibm -ljemalloc -lflang

Benchmarks using Fortran, C, and C++:
-std=c++98 -flto -Wl,-mlirvm -Wl,-function-specialize
-Wl,-mlirvm -Wl,-region-vectorize -Wl,-mlirvm -Wl,-vector-library=LIBMVEC
-Wl,-mlirvm -Wl,-reduce-array-computations=3 -Ofast -march=znver2
-mno-sse4a -fstruct-layout=5 -mlirvm -vectorize-memory-aggressively
-mlirvm -function-specialize -mlirvm -enable-gvn-hoist
-mlirvm -unroll-threshold=50 -fremap-arrays
-mlirvm -vector-library=LIBMVEC -mlirvm -reduce-array-computations=3
-mlirvm -global-vectorize-slp -mlirvm -inline-threshold=1000
-flv-function-specialization -mlirvm -unroll-threshold=100
-mlirvm -enable-partial-unswitch -mlirvm -loop-unswitch-threshold=200000
-O3 -funroll-loops -Mrecursive -Kieee -fno-finite-math-only
-DSPEC_OPENMP -fopenmp -DUSE_OPENMP -fopenmp=libomp -lomp -lpthread
-ldl -lmvec -lamlidlibm -ljemalloc -lflang

Peak 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

The flags files that were used to format this result can be browsed at
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You can also download the XML flags sources by saving the following links: