SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

Lenovo Global Technology

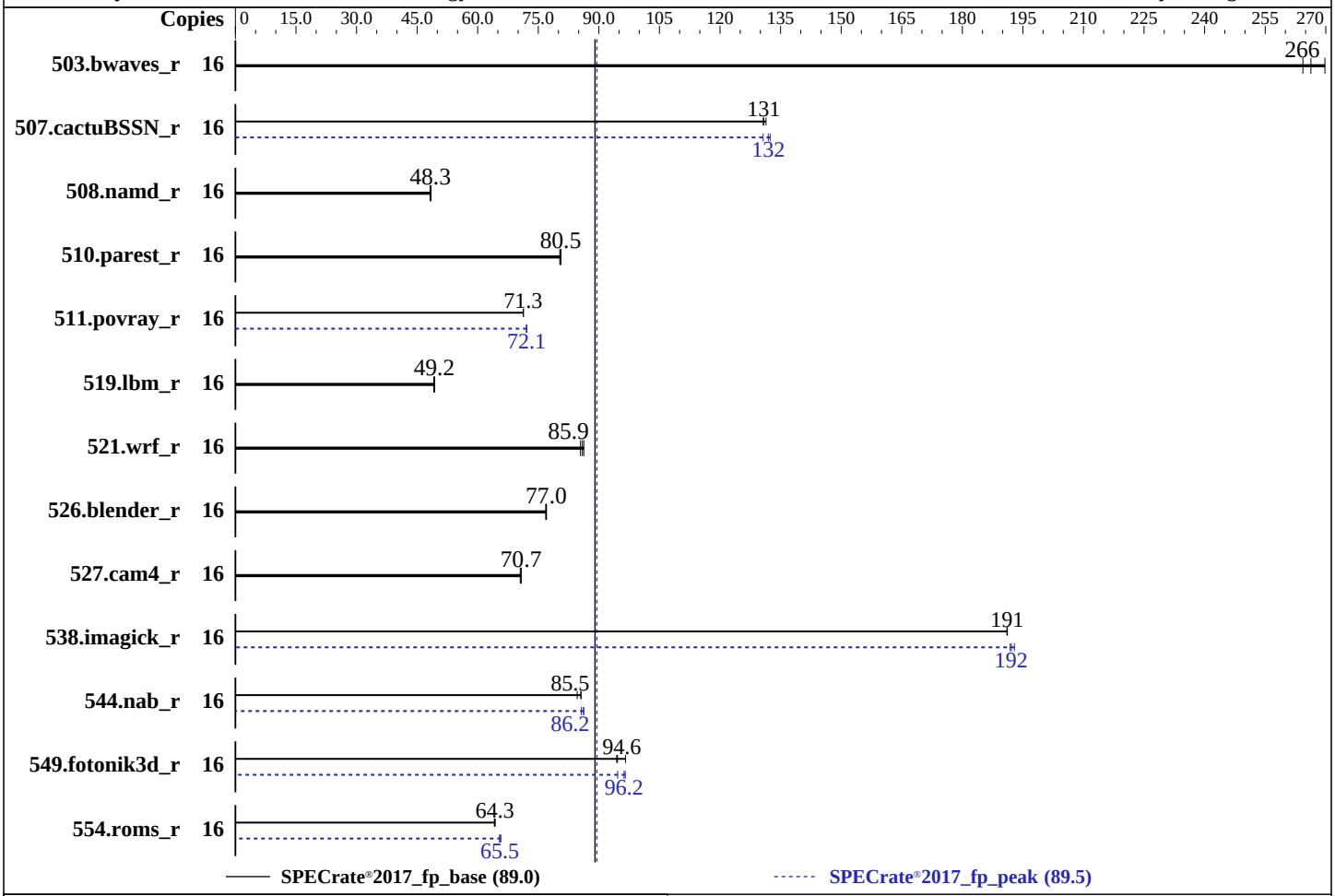
ThinkSystem SR635
3.20 GHz,AMD EPYC 7262

SPECrate®2017_fp_base = 89.0

SPECrate®2017_fp_peak = 89.5

CPU2017 License: 9017
Test Sponsor: Lenovo Global Technology
Tested by: Lenovo Global Technology

Test Date: Sep-2019
Hardware Availability: Aug-2019
Software Availability: Aug-2019



Hardware

CPU Name:	AMD EPYC 7262
Max MHz:	3400
Nominal:	3200
Enabled:	8 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:	128 MB I+D on chip per chip, 16 MB per core
Other:	None
Memory:	256 GB (8 x 32 GB 2Rx4 PC4-3200AA-R)
Storage:	1 x 960 GB SATA SSD
Other:	None

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:	No
Firmware:	Lenovo BIOS Version CFE103L released Aug-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 v5.2.0
Power Management:	--

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Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
503.bwaves_r	16	595	270	**602**	**266**	607	264	16	595	270	**602**	**266**	607	264
507.cactuBSSN_r	16	155	131	**155**	**131**	154	131	16	155	131	153	132	**153**	**132**
508.namd_r	16	314	48.5	**315**	**48.3**	315	48.2	16	314	48.5	**315**	**48.3**	315	48.2
510.parest_r	16	521	80.3	519	80.6	**520**	**80.5**	16	521	80.3	519	80.6	**520**	**80.5**
511.povray_r	16	524	71.3	524	71.3	**524**	**71.3**	16	518	72.1	518	72.1	**518**	**72.1**
519.lbm_r	16	342	49.3	**342**	**49.2**	343	49.1	16	342	49.3	**342**	**49.2**	343	49.1
521.wrf_r	16	415	86.3	419	85.5	**417**	**85.9**	16	415	86.3	419	85.5	**417**	**85.9**
526.blender_r	16	317	76.8	316	77.0	**317**	**77.0**	16	317	76.8	316	77.0	**317**	**77.0**
527.cam4_r	16	**396**	**70.7**	397	70.5	395	70.8	16	**396**	**70.7**	397	70.5	395	70.8
538.imagick_r	16	208	191	208	191	**208**	**191**	16	**207**	**192**	207	192	206	193
544.nab_r	16	318	84.6	**315**	**85.5**	315	85.6	16	**312**	**86.2**	314	85.6	312	86.3
549.fotonik3d_r	16	645	96.6	660	94.4	**659**	**94.6**	16	646	96.5	659	94.7	**648**	**96.2**
554.roms_r	16	397	64.1	395	64.3	**396**	**64.3**	16	**388**	**65.5**	387	65.7	389	65.4

SPECrate®2017_fp_base = 89.0

SPECrate®2017_fp_peak = 89.5

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)

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)
```

General Notes

```
Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH = "/home/cpu2017-1.0.5-amd-rome-aocc200/amd_rate_aocc200_rome_A_lib/64"
LD_LIBRARY_PATH = "$LD_LIBRARY_PATH:/home/cpu2017-1.0.5-amd-rome-aocc200/amd_rate_aocc200_rome_A_lib/32"
MALLOC_CONF = "retain:true"
Binaries were compiled on a system with 2p 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.
Yes: The test sponsor attests, as of date of publication, that CVE-2018-3640 (Spectre variant 3a)
is mitigated in the system as tested and documented.
Yes: The test sponsor attests, as of date of publication, that CVE-2018-3639 (Spectre variant 4)
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:
 Operating Mode set to Maximum Performance
 NUMA nodes per socket set to NPS4
 EfficiencyModeEn  set to Auto
 Sysinfo program /home/cpu2017-1.0.5-amd-rome-aocc200/bin/sysinfo
 Rev: r5974 of 2018-05-19 9bcde8f2999c33d61f64985e45859ea9
 running on linux-vapu Tue Sep 24 01:25:44 2019

 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 7262 8-Core Processor
       1  "physical id"s (chips)
       16 "processors"
```

(Continued on next page)

Platform Notes (Continued)

```
    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 : 8
       siblings  : 16
       physical 0: cores 0 4 8 12 16 20 24 28

 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):              16
      On-line CPU(s) list: 0-15
      Thread(s) per core:  2
      Core(s) per socket:  8
      Socket(s):           1
      NUMA node(s):        4
      Vendor ID:           AuthenticAMD
      CPU family:          23
      Model:               49
      Model name:          AMD EPYC 7262 8-Core Processor
      Stepping:            0
      CPU MHz:             3200.000
      CPU max MHz:         3200.0000
      CPU min MHz:         1500.0000
      BogoMIPS:            6387.93
      Virtualization:      AMD-V
      L1d cache:           32K
      L1i cache:           32K
      L2 cache:            512K
      L3 cache:            16384K
      NUMA node0 CPU(s):   0,1,8,9
      NUMA node1 CPU(s):   2,3,10,11
      NUMA node2 CPU(s):   4,5,12,13
      NUMA node3 CPU(s):   6,7,14,15
      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 ssse3 fma cx16 sse4_1 sse4_2 movbe popcnt aes xsave avx f16c
     rdrand lahf_lm cmp_legacy svm extapic cr8_legacy abm sse4a misalignsse 3dnowprefetch
     osvw ibs skinit wdt tce topoext perfctr_core perfctr_nb bpext perfctr_l2 mwaitx cpb
     cat_l3 cdp_l3 hw_pstate sme ssbd sev ibrs ibpb stibp vmmcall fsgsbase bmi1 avx2 smep
     bmi2 cqm rdt_a rdseed adx smap clflushopt clwb sha_ni xsaveopt xsavec xgetbv1 xsaves
     cqm_llc cqm_occup_llc cqm_mbm_total cqm_mbm_local clzero irperf xsaveerptr arat npt
     lbrv svm_lock nrip_save tsc_scale vmcb_clean flushbyasid decodeassists pausefilter
     pfthreshold avic v_vmsave_vmload vgif umip rdpid overflow_recov succor smca
```

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Platform Notes (Continued)

```
/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)
  node 0 cpus: 0 1 8 9
  node 0 size: 64304 MB
  node 0 free: 64102 MB
  node 1 cpus: 2 3 10 11
  node 1 size: 64499 MB
  node 1 free: 64270 MB
  node 2 cpus: 4 5 12 13
  node 2 size: 64470 MB
  node 2 free: 64282 MB
  node 3 cpus: 6 7 14 15
  node 3 size: 64485 MB
  node 3 free: 64307 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:       263945540 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"
      ANSI_COLOR="0;32"
      CPE_NAME="cpe:/o:suse:sles:15:sp1"

uname -a:
   Linux linux-vapu 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:
```


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Platform Notes (Continued)

```
 CVE-2017-5754 (Meltdown):          Not affected
 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 Sep 24 01:14

 SPEC is set to: /home/cpu2017-1.0.5-amd-rome-aocc200
    Filesystem     Type  Size  Used Avail Use% Mounted on
    /dev/sdb2      xfs   893G   91G  802G  11% /

 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.
   BIOS Lenovo             CFE103L 08/19/2019
   Memory:
    8x Samsung M393A4K40DB2-CWE 32 kB 2 rank 3200
    8x Unknown Unknown

 (End of data from sysinfo program)
```

Compiler Version Notes

```
==============================================================================
C               | 519.lbm_r(base, peak) 538.imagick_r(base, peak)
                | 544.nab_r(base, peak)
------------------------------------------------------------------------------
AOCC.LLVM.2.0.0.B179.2019_06_12 clang version 8.0.0 (CLANG: Jenkins
  AOCC_2_0_0-Build#179) (based on LLVM AOCC.LLVM.2.0.0.B179.2019_06_12)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-2.0.0/bin
------------------------------------------------------------------------------

==============================================================================
C++             | 508.namd_r(base, peak) 510.parest_r(base, peak)
------------------------------------------------------------------------------
AOCC.LLVM.2.0.0.B179.2019_06_12 clang version 8.0.0 (CLANG: Jenkins
  AOCC_2_0_0-Build#179) (based on LLVM AOCC.LLVM.2.0.0.B179.2019_06_12)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-2.0.0/bin
------------------------------------------------------------------------------

==============================================================================
```


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Compiler Version Notes (Continued)

```
C++, C          | 511.povray_r(base, peak) 526.blender_r(base, peak)
------------------------------------------------------------------------------
AOCC.LLVM.2.0.0.B179.2019_06_12 clang version 8.0.0 (CLANG: Jenkins
  AOCC_2_0_0-Build#179) (based on LLVM AOCC.LLVM.2.0.0.B179.2019_06_12)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-2.0.0/bin
AOCC.LLVM.2.0.0.B179.2019_06_12 clang version 8.0.0 (CLANG: Jenkins
  AOCC_2_0_0-Build#179) (based on LLVM AOCC.LLVM.2.0.0.B179.2019_06_12)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-2.0.0/bin
------------------------------------------------------------------------------

==============================================================================
C++, C, Fortran | 507.cactuBSSN_r(base, peak)
------------------------------------------------------------------------------
AOCC.LLVM.2.0.0.B179.2019_06_12 clang version 8.0.0 (CLANG: Jenkins
  AOCC_2_0_0-Build#179) (based on LLVM AOCC.LLVM.2.0.0.B179.2019_06_12)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-2.0.0/bin
AOCC.LLVM.2.0.0.B179.2019_06_12 clang version 8.0.0 (CLANG: Jenkins
  AOCC_2_0_0-Build#179) (based on LLVM AOCC.LLVM.2.0.0.B179.2019_06_12)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-2.0.0/bin
AOCC.LLVM.2.0.0.B179.2019_06_12 clang version 8.0.0 (CLANG: Jenkins
  AOCC_2_0_0-Build#179) (based on LLVM AOCC.LLVM.2.0.0.B179.2019_06_12)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-2.0.0/bin
------------------------------------------------------------------------------

==============================================================================
Fortran         | 503.bwaves_r(base, peak) 549.fotonik3d_r(base, peak)
                | 554.roms_r(base, peak)
------------------------------------------------------------------------------
AOCC.LLVM.2.0.0.B179.2019_06_12 clang version 8.0.0 (CLANG: Jenkins
  AOCC_2_0_0-Build#179) (based on LLVM AOCC.LLVM.2.0.0.B179.2019_06_12)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-2.0.0/bin
------------------------------------------------------------------------------

==============================================================================
Fortran, C      | 521.wrf_r(base, peak) 527.cam4_r(base, peak)
```

(Continued on next page)

Compiler Version Notes (Continued)

```
------------------------------------------------------------------------------
AOCC.LLVM.2.0.0.B179.2019_06_12 clang version 8.0.0 (CLANG: Jenkins
  AOCC_2_0_0-Build#179) (based on LLVM AOCC.LLVM.2.0.0.B179.2019_06_12)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-2.0.0/bin
AOCC.LLVM.2.0.0.B179.2019_06_12 clang version 8.0.0 (CLANG: Jenkins
  AOCC_2_0_0-Build#179) (based on LLVM AOCC.LLVM.2.0.0.B179.2019_06_12)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/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

(Continued on next page)

Base Portability Flags (Continued)

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,-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 -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
-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:
-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 -mllvm -vector-library=LIBMVEC -z muldefs
-Kieee -fno-finite-math-only -lmvec -lamdlibm -ljemalloc -lflang

Benchmarks using both Fortran and C:
-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 -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

(Continued on next page)

Base Optimization Flags (Continued)

Benchmarks using both Fortran and C (continued):
-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,-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 -z muldefs
-lmvec -lamdlibm -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 -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
-lmvec -lamdlibm -ljemalloc -lflang

Peak Compiler Invocation

C benchmarks:
clang

C++ benchmarks:
clang++

Fortran benchmarks:
flang

Benchmarks using both Fortran and C:
flang clang

(Continued on next page)

Peak Compiler Invocation (Continued)

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:

519.lbm_r: basepeak = yes

538.imagick_r: -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 -lamdlibm -ljemalloc
-lflang

544.nab_r: Same as 538.imagick_r

C++ benchmarks:

508.namd_r: basepeak = yes

510.parest_r: basepeak = yes

Fortran benchmarks:

(Continued on next page)

Peak Optimization Flags (Continued)

503.bwaves_r: basepeak = yes

549.fotonik3d_r: -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
-mllvm -vector-library=LIBMVEC -Kieee
-fno-finite-math-only -lmvec -lamdlibm -ljemalloc
-lflang

554.roms_r: -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 -mllvm -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_r: -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,-x86-use-vzeroupper=false -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 -mllvm -unroll-threshold=100
-mllvm -enable-partial-unswitch
-mllvm -loop-unswitch-threshold=200000 -lmvec -lamdlibm
-ljemalloc -lflang

(Continued on next page)

Peak Optimization Flags (Continued)

526.blender_r: basepeak = yes

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 -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 -mllvm -unroll-threshold=100
-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
http://www.spec.org/cpu2017/flags/aocc200-flags-A1-1.html
http://www.spec.org/cpu2017/flags/Lenovo-Platform-SPECcpu2017-Flags-V1.2-Rome-C.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2017/flags/aocc200-flags-A1-1.xml
http://www.spec.org/cpu2017/flags/Lenovo-Platform-SPECcpu2017-Flags-V1.2-Rome-C.xml

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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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