Lenovo Global Technology
ThinkSystem SR635
2.25 GHz, AMD EPYC 7742

SPEC®2017_fp_base = 136
SPEC®2017_fp_peak = 136

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

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

Threads

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>SPECspeed®2017_fp_base (136)</th>
<th>SPECspeed®2017_fp_peak (136)</th>
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<tbody>
<tr>
<td>603.bwaves_s</td>
<td>64</td>
<td>342</td>
<td>342</td>
</tr>
<tr>
<td>607.cactuBSSN_s</td>
<td>64</td>
<td>227</td>
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<tr>
<td>619.lbm_s</td>
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<tr>
<td>621.wrf_s</td>
<td>64</td>
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<tr>
<td>627.cam4_s</td>
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<tr>
<td>628.pop2_s</td>
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</tr>
<tr>
<td>638.imagick_s</td>
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</tr>
<tr>
<td>644.nab_s</td>
<td>64</td>
<td>338</td>
<td>338</td>
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<tr>
<td>649.fotonik3d_s</td>
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<tr>
<td>654.roms_s</td>
<td>64</td>
<td>149</td>
<td>149</td>
</tr>
</tbody>
</table>

---

**Hardware**

CPU Name: AMD EPYC 7742
Max MHz: 3400
Nominal: 2250
Enabled: 64 cores, 1 chip
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: 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: Yes
Firmware: Lenovo BIOS Version CFE105D released Sep-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 set to prefer performance at the cost of additional power usage
Lenovo Global Technology
ThinkSystem SR635
2.25 GHz, AMD EPYC 7742

SPECspeed®2017_fp_base = 136
SPECspeed®2017_fp_peak = 136

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
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<td>628.pop2_s</td>
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<td>148</td>
<td>106</td>
<td>149</td>
<td>106</td>
<td>149</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 -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)
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SPECSpeed®2017_fp_base = 136
SPECSpeed®2017_fp_peak = 136

Environment Variables Notes

Environment variables set by runcpu before the start of the run:
GOMP_CPU_AFFINITY = "0-63"
LD_LIBRARY_PATH =
   "/home/cpu2017-1.1.0-amd-rome-aocc200-C1/amd_speed_aocc200_rome_C_lib/64
   ;/home/cpu2017-1.1.0-amd-rome-aocc200-C1/amd_speed_aocc200_rome_C_lib/32
   ;";
MALLOCONF = "retain:true"
OMP_DYNAMIC = "false"
OMP_SCHEDULE = "static"
OMP_STACKSIZE = "128M"
OMP_THREADLIMIT = "64"

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 628.pop2_s peak run:
GOMP_CPU_AFFINITY = "0-63"

Environment variables set by runcpu during the 638.imagick_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"

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.
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 5.1.0 is available here:
https://github.com/jemalloc/jemalloc/releases/download/5.1.0/jemalloc-5.1.0.tar.bz2
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2.25 GHz, AMD EPYC 7742

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

SPECspeed®2017_fp_base = 136
SPECspeed®2017_fp_peak = 136

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

Platform Notes

BIOS settings:
Set Operating Mode set to Maximum Performance
SMT Mode set to Disabled

Sysinfo program /home/cpu2017-1.1.0-amd-rome-aocc200-C1/bin/sysinfo
Rev: r6365 of 2019-08-21 295195f888a3d7ed01e6e646a485a0011
running on linux-vapu Thu Dec 19 20:00:03 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 7742 64-Core Processor
  1 "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 : 64
siblings  : 64
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
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: 1
Core(s) per socket: 64
Socket(s): 1
NUMA node(s): 1
Vendor ID: AuthenticAMD
CPU family: 23
Model: 49
Model name: AMD EPYC 7742 64-Core Processor
Stepping: 0
CPU MHz: 2250.000
CPU max MHz: 2250.0000
CPU min MHz: 1500.0000
BogoMIPS: 4491.86
Virtualization: AMD-V
L1d cache: 32K
L1i cache: 32K

(Continued on next page)
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**CPU2017 License:** 9017
**Test Sponsor:** Lenovo Global Technology
**Tested by:** Lenovo Global Technology

**Specspeed®2017_fp_base = 136**
**Specspeed®2017_fp_peak = 136**

**Test Date:** Dec-2019
**Hardware Availability:** Aug-2019
**Software Availability:** Aug-2019

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**Platform Notes (Continued)**

L2 cache: 512K
L3 cache: 16384K
NUMA node0 CPU(s): 0-63
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
pcimuldq monit 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
osww ibs sinit xdc toppext perfctr_core perfctr_nb bpext perfctr_l2 mwaitx cpb
cat_l3 cpd_l3 hw_pstate sme ssbd sev ibrs ibp stibp vmmcall fsqsbase bni1 av2 smep
bni2 cgm rdt_a rdsed adx smap clflushopt clwb sha_ni xsaveopt xsavexc xgetbv1 xsaves
cqglll cqm_occup_llc cqm_mmb_total cqm_mmb_local clzero irperf xsaveerptr arat npt
lbrv svm_lock nrip_save tsc_scale vmcb_clean flushbyasid decodeassist pausefilter
ptthreshold avic v_vmsave_vmload vgif umip rdpid overflow_recoev succor smca

```
From 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: 1 nodes (0)
   node 0 cpus: 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
   node 0 size: 257757 MB
   node 0 free: 256915 MB
   node distances:
   node 0
   0: 10
```

```
From /proc/meminfo
MemTotal:       263944024 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:
```

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SPECspeed®2017_fp_base = 136
SPECspeed®2017_fp_peak = 136

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Hardware Availability: Aug-2019
Software Availability: Aug-2019

Platform Notes (Continued)

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:

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

run-level 3 Dec 19 19:58

SPEC is set to: /home/cpu2017-1.1.0-amd-rome-aocc200-C1

Filesystem Type Size Used Avail Use% Mounted on
/dev/sdb2 xfs 893G 56G 837G 7% /

From /sys/devices/virtual/dmi/id
BIOS: Lenovo CFE105D 09/17/2019
Vendor: Lenovo
Product: ThinkSystem SR635 -[7Y00000000]-
Product Family: ThinkSystem
Serial: 0123456789

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 M393A4K40DB2-CWE 32 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)
==============================================================================
AOCCLLVM.2.0.0.B191.2019_07_19 clang version 8.0.0 (CLANG: Jenkins
AOCCL_2_0_0-Build#191) (based on LLVM AOCCLLVM.2.0.0.B191.2019_07_19)

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SPECspeed®2017_fp_base = 136
SPECspeed®2017_fp_peak = 136

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

Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /sppo/dev/compilers/aocc-compiler-2.0.0/bin

Compiler Version Notes (Continued)

C++, C, Fortran | 607.cactuBSSN_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

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         | 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
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
SPECSpec CPU®2017 Floating Point Speed Result
Copyright 2017-2020 Standard Performance Evaluation Corporation

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Compiler Version Notes (Continued)
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 -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:
-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

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Lenovo Global Technology
ThinkSystem SR635
2.25 GHz, AMD EPYC 7742

CPU2017 License: 9017
Test Sponsor: Lenovo Global Technology
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SPEC CPU®2017 Floating Point Speed Result
Copyright 2017-2020 Standard Performance Evaluation Corporation

Lenovo Global Technology
ThinkSystem SR635
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SPECspeed®2017_fp_base = 136
SPECspeed®2017_fp_peak = 136

C benchmarks (continued):
-mlvm -vector-library=LIBMVEC -mlvm -inline-threshold=1000
-flv-function-specialization -z muldefs -DSPEC_OPENMP -fopenmp
-DUSE_OPENMP -fopenmp=libomp -lomp -lpthread -ldl -lmvec -lamdlibm
-1jemalloc -lflang

Fortran benchmarks:
-float -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 -DSPEC_OPENMP -fopenmp -DUSE_OPENMP
-fopenmp=libomp -lomp -lpthread -ldl -lmvec -lamdlibm -ljemalloc
-1flang

Benchmarks using both Fortran and C:
-float -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-hoist
-mlvm -reduce-array-computations=3 -mlvm -global-vectorize-slp
-mlvm -vector-library=LIBMVEC -mlvm -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
-1flang

Benchmarks using Fortran, C, and C++:
-std=c++98 -float -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-hoist
-mlvm -reduce-array-computations=3 -mlvm -global-vectorize-slp
-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
-DSPEC_OPENMP -fopenmp -DUSE_OPENMP -fopenmp=libomp -lomp -lpthread
-ldl -lmvec -lamdlibm -ljemalloc -1flang
Lenovo Global Technology

ThinkSystem SR635
2.25 GHz, AMD EPYC 7742

SPECspeed®2017_fp_base = 136
SPECspeed®2017_fp_peak = 136

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

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

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

Peak Portability Flags

Same as Base Portability Flags

Peak Optimization Flags

C benchmarks:

619.lbm_s: basepeak = yes


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

638.imagick_s (continued):
- -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
- -fly-function-specialization -DSPEC_OPENMP -fopenmp
- -DUSE_OPENMP -lmvec -lamdlibm -fopenmp=libomp -lomp
- -lpthread -ldl -ljemalloc -lflang

644.nab_s: basepeak = yes

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
- -mllvm -vector-library=LIBMVEC -Kieee
- -fno-finite-math-only -DSPEC_OPENMP -fopenmp -DUSE_OPENMP
- -fopenmp=libomp -lomp -lpthread -ldl -lmvec -lamdlibm
- -ljemalloc -lflang

649.fotonik3d_s: basepeak = yes

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 -mllvm -vector-library=LIBMVEC
- -Kieee -fno-finite-math-only -DSPEC_OPENMP -fopenmp
- -DUSE_OPENMP -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,-mllvm -Wl,-function-specialize
- -Wl,-mllvm -Wl,-region-vectorize

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#### Peak Optimization Flags (Continued)

628.pop2_s (continued):
- `-Wl,-mllvm -Wl,-vector-library=LIBMVEC`
- `-Wl,-mllvm -Wl,-reduce-array-computations=3 -Ofast`
- `-march=znver2 -mno-sse4a -fstruct-layout=5`
- `-mllvm -vectorize-memory-agnostically`
- `-mllvm -function-specialize -mllvm -enable-gvn-hoist`
- `-mllvm -unroll-frequency=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`
- `-Mrecursive -Kieee -fno-finite-math-only -DSPEC_OPENMP`
- `-fopenmp -DUSE_OPENMP -fopenmp=libomp -lomp -lpthread`
- `-ldl -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 -Ofast -march=znver2`
- `-mno-sse4a -fstruct-layout=5 -mllvm -vectorize-memory-agnostically`
- `-mllvm -function-specialize -mllvm -enable-gvn-hoist`
- `-mllvm -unroll-frequency=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-unschedule -mllvm -loop-unschedule-threshold=200000`
- `-O3 -funroll-loops -Mrecursive -Kieee -fno-finite-math-only`
- `-DSPEC_OPENMP -fopenmp -DUSE_OPENMP -fopenmp=libomp -lomp -lpthread`
- `-ldl -lmvec -lamdlibm -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`
**Lenovo Global Technology**

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

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/Lenovo-Platform-SPECcpu2017-Flags-V1.2-Rome-C.xml

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