# SPEC CPU®2017 Floating Point Speed Result

## Lenovo Global Technology

**Lenovo Global Technology**

**ThinkSystem SR635**

**3.10 GHz, AMD EPYC 7252**

<table>
<thead>
<tr>
<th>CPU2017 License:</th>
<th>9017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Sponsor:</td>
<td>Lenovo Global Technology</td>
</tr>
<tr>
<td>Tested by:</td>
<td>Lenovo Global Technology</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Hardware</th>
<th>Software</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CPU Name:</strong></td>
<td>AMD EPYC 7252</td>
</tr>
<tr>
<td><strong>Max MHz:</strong></td>
<td>3200</td>
</tr>
<tr>
<td><strong>Nominal:</strong></td>
<td>3100</td>
</tr>
<tr>
<td><strong>Enabled:</strong></td>
<td>8 cores, 1 chip</td>
</tr>
<tr>
<td><strong>Orderable:</strong></td>
<td>1 chip</td>
</tr>
<tr>
<td><strong>Cache L1:</strong></td>
<td>32 KB I+ 32 KB D on chip per core</td>
</tr>
<tr>
<td><strong>L2:</strong></td>
<td>512 KB I+D on chip per core</td>
</tr>
<tr>
<td><strong>L3:</strong></td>
<td>64 MB I+D on chip per chip, 16 MB shared / 2 cores</td>
</tr>
<tr>
<td><strong>Other:</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>Memory:</strong></td>
<td>256 GB (8 x 32 GB 2Rx4 PC4-3200AA-R)</td>
</tr>
<tr>
<td><strong>Storage:</strong></td>
<td>1 x 960 GB SATA SSD</td>
</tr>
<tr>
<td><strong>Other:</strong></td>
<td>None</td>
</tr>
</tbody>
</table>

| OS: | SUSE Linux Enterprise Server 12 SP5 (x86_64) |
| **Compiler:** | C/C++/Fortran: Version 2.0.0 of AOCC |
| **Parallel:** | Yes |
| **Firmware:** | Lenovo BIOS Version CFE1070 released Dec-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 |

---

### SPECspeed®2017_fp_base = 43.7

### SPECspeed®2017_fp_peak = 43.9

---

<table>
<thead>
<tr>
<th>Threads</th>
<th>SPECspeed®2017_fp_base (43.7)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>6.8</td>
</tr>
<tr>
<td>10</td>
<td>6.8</td>
</tr>
<tr>
<td>20</td>
<td>6.8</td>
</tr>
<tr>
<td>30</td>
<td>6.8</td>
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<tr>
<td>40</td>
<td>6.8</td>
</tr>
<tr>
<td>50</td>
<td>6.8</td>
</tr>
<tr>
<td>60</td>
<td>6.8</td>
</tr>
<tr>
<td>70</td>
<td>6.8</td>
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<tr>
<td>80</td>
<td>6.8</td>
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<tr>
<td>90</td>
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<td>100</td>
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<tr>
<td>110</td>
<td>6.8</td>
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<td>120</td>
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<tr>
<td>130</td>
<td>6.8</td>
</tr>
<tr>
<td>140</td>
<td>6.8</td>
</tr>
<tr>
<td>150</td>
<td>6.8</td>
</tr>
<tr>
<td>155</td>
<td>6.8</td>
</tr>
</tbody>
</table>

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### SPECspeed®2017_fp_peak (43.9)
**SPEC CPU®2017 Floating Point Speed Result**

Lenovo Global Technology
ThinkSystem SR635 3.10 GHz, AMD EPYC 7252

**SPECspeed®2017_fp_base = 43.7**
**SPECspeed®2017_fp_peak = 43.9**

**Results Table**

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>603.bwaves_s</td>
<td>8</td>
<td>390</td>
<td>151</td>
<td>388</td>
<td>152</td>
<td>387</td>
<td>153</td>
<td>8</td>
<td>390</td>
<td>151</td>
<td>388</td>
</tr>
<tr>
<td>607.cactuBSSN_s</td>
<td>8</td>
<td>242</td>
<td>68.9</td>
<td>242</td>
<td>68.8</td>
<td>242</td>
<td>69.0</td>
<td>8</td>
<td>240</td>
<td>69.6</td>
<td>241</td>
</tr>
<tr>
<td>619.ibm_s</td>
<td>8</td>
<td>288</td>
<td>18.2</td>
<td>289</td>
<td>18.1</td>
<td>289</td>
<td>18.1</td>
<td>8</td>
<td>288</td>
<td>18.2</td>
<td>289</td>
</tr>
<tr>
<td>621.wrf_s</td>
<td>8</td>
<td>275</td>
<td>48.2</td>
<td>275</td>
<td>48.1</td>
<td>275</td>
<td>48.1</td>
<td>8</td>
<td>275</td>
<td>48.2</td>
<td>275</td>
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<tr>
<td>627.cam4_s</td>
<td>8</td>
<td>375</td>
<td>23.7</td>
<td>372</td>
<td>23.8</td>
<td>373</td>
<td>23.8</td>
<td>8</td>
<td>373</td>
<td>23.7</td>
<td>372</td>
</tr>
<tr>
<td>628.pop2_s</td>
<td>8</td>
<td>316</td>
<td>37.6</td>
<td>318</td>
<td>37.4</td>
<td>317</td>
<td>37.4</td>
<td>8</td>
<td>317</td>
<td>37.5</td>
<td>314</td>
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<tr>
<td>638.imagick_s</td>
<td>8</td>
<td>366</td>
<td>39.4</td>
<td>366</td>
<td>39.4</td>
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<td>644.nab_s</td>
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<td>324</td>
<td>53.8</td>
<td>8</td>
<td>324</td>
<td>53.9</td>
<td>324</td>
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<tr>
<td>649.fotonik3d_s</td>
<td>8</td>
<td>297</td>
<td>30.7</td>
<td>298</td>
<td>30.6</td>
<td>298</td>
<td>30.6</td>
<td>8</td>
<td>297</td>
<td>30.7</td>
<td>298</td>
</tr>
<tr>
<td>654.roms_s</td>
<td>8</td>
<td>324</td>
<td>48.6</td>
<td>324</td>
<td>48.6</td>
<td>324</td>
<td>48.5</td>
<td>8</td>
<td>317</td>
<td>49.7</td>
<td>316</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)
Lenovo Global Technology
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3.10 GHz, AMD EPYC 7252

SPECspeed®2017_fp_base = 43.7
SPECspeed®2017_fp_peak = 43.9

Environment Variables Notes

Environment variables set by runcpu before the start of the run:
GOMP_CPU_AFFINITY = "0-7"
LD_LIBRARY_PATH =
  "/home/cpu2017-1.1.0-amd-rome-aocc200-C3/amd_speed_aocc200_rome_C_lib/64
   ;/home/cpu2017-1.1.0-amd-rome-aocc200-C3/amd_speed_aocc200_rome_C_lib/32
   ;"
MALLOC_CONF = "retain:true"
OMP_DYNAMIC = "false"
OMP_SCHEDULE = "static"
OMP_STACKSIZE = "128M"
OMP_THREAD_LIMIT = "8"

Environment variables set by runcpu during the 607.cactuBSSN_s peak run:
GOMP_CPU_AFFINITY = "0-7"

Environment variables set by runcpu during the 627.cam4_s peak run:
GOMP_CPU_AFFINITY = "0-7"

Environment variables set by runcpu during the 628.pop2_s peak run:
GOMP_CPU_AFFINITY = "0-7"

Environment variables set by runcpu during the 654.roms_s peak run:
GOMP_CPU_AFFINITY = "0-7"

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
## Lenovo Global Technology

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<table>
<thead>
<tr>
<th>CPU2017 License:</th>
<th>9017</th>
<th>Test Date:</th>
<th>Mar-2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Sponsor:</td>
<td>Lenovo Global Technology</td>
<td>Hardware Availability:</td>
<td>Jan-2020</td>
</tr>
<tr>
<td>Tested by:</td>
<td>Lenovo Global Technology</td>
<td>Software Availability:</td>
<td>Dec-2019</td>
</tr>
</tbody>
</table>

### SPECspeed®2017_fp_base = 43.7

### SPECspeed®2017_fp_peak = 43.9

---

### 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-C3/bin/sysinfo`

- Rev: r6365 of 2019-08-21 295195f888a3d7ed9b6e46a485a0011
- running on linux-4au0 Tue Mar 17 19:58:10 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](https://www.spec.org/cpu2017/Docs/config.html#sysinfo)

From `/proc/cpuinfo`

```
model name : AMD EPYC 7252 8-Core Processor
  1 "physical id"s (chips)
  8 "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 : 8
  siblings : 8
  physical 0: cores 0 1 4 5 8 9 12 13
```

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): 8
On-line CPU(s) list: 0-7
Thread(s) per core: 1
Core(s) per socket: 8
Socket(s): 1
NUMA node(s): 1
Vendor ID: AuthenticAMD
CPU family: 23
Model: 49
Model name: AMD EPYC 7252 8-Core Processor
Stepping: 0
CPU MHz: 3100.000
CPU max MHz: 3100.0000
CPU min MHz: 1500.0000
BogoMIPS: 6188.20
Virtualization: AMD-V
L1d cache: 32K
L1i cache: 32K
L2 cache: 512K
L3 cache: 16384K
```

(Continued on next page)
Platform Notes (Continued)

NUMA node0 CPU(s):   0-7
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 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 bptext 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 xsaves
cqm_llc cqm_occup_llc cqm_mbm_total cqm_mbm_local clzero irperf xsaverptr wbnoinvd
arat npt lbv svm_lock nrip_save tsc_scale vmbc_clean flushbyasid decodeassists
pausefilter pfthreshold avic v_vmsave_vmload vgif umip rdpid overflow_recover 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: 1 nodes (0)
  node 0 cpus: 0 1 2 3 4 5 6 7
  node 0 size: 257760 MB
  node 0 free: 257055 MB
  node distances:
     node 0
        0:  10

From /proc/meminfo
  MemTotal:       263946832 kB
  HugePages_Total:       0
  Hugepagesize:       2048 kB

From /etc/*release* /etc/*version*
  SuSE-release:
    SUSE Linux Enterprise Server 12 (x86_64)
    VERSION = 12
    PATCHLEVEL = 5
    # This file is deprecated and will be removed in a future service pack or release.
    # Please check /etc/os-release for details about this release.
  os-release:
    NAME="SLES"
    VERSION="12-SP5"
    VERSION_ID="12.5"
    PRETTY_NAME="SUSE Linux Enterprise Server 12 SP5"
    ID="sles"
    ANSI_COLOR="0;32"
    CPE_NAME="cpe:/o:suse:sles:12:sp5"

(Continued on next page)
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SPECspeed®2017_fp_base = 43.7
SPECspeed®2017_fp_peak = 43.9

Platform Notes (Continued)

uname -a:
   Linux linux-4au0 4.12.14-120-default #1 SMP Thu Nov 7 16:39:09 UTC 2019 (fd9dc36)
   x86_64 x86_64 x86_64 GNU/Linux

Kernel self-reported vulnerability status:

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

run-level 3 Mar 17 19:54

SPEC is set to: /home/cpu2017-1.1.0-amd-rome-aocc200-C3
   /dev/sda2 xfs 893G 30G 863G  4% /

From /sys/devices/virtual/dmi/id
   BIOS: Lenovo CFE107O 12/28/2019
   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)
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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
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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

(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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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

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
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Base Optimization Flags

C benchmarks:
- -flto -Wl,-mlllvm -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 -DSPEC_OPENMP -fopenmp
- -fopenmp=libomp -lomp -lpthread -ldl -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 -DSPEC_OPENMP -fopenmp -fopenmp=libomp
- -lomp -lpthread -ldl -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
- -flv-function-specialization -funroll-loops -Mrecursive -z muldefs
- -Kieee -fno-finite-math-only -DSPEC_OPENMP -fopenmp -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
- -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 -fopenmp=libomp -lomp -lpthread -ldl -lmvec
- -lamdlibm -ljemalloc -lflang
Lenovo Global Technology
ThinkSystem SR635
3.10 GHz, AMD EPYC 7252

SPECspeed®2017_fp_base = 43.7
SPECspeed®2017_fp_peak = 43.9

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

Test Date: Mar-2020
Hardware Availability: Jan-2020
Software Availability: Dec-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
638.imagick_s: basepeak = yes
644.nab_s: basepeak = yes

(Continued on next page)
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<table>
<thead>
<tr>
<th>SPECspeed®2017_fp_base</th>
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</tbody>
</table>

**CPU2017 License:** 9017  
**Test Date:** Mar-2020  
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**Hardware Availability:** Jan-2020  
**Tested by:** Lenovo Global Technology  
**Software Availability:** Dec-2019

**Peak Optimization Flags (Continued)**

Fortran benchmarks:

- 603.bwaves_s: `basepeak = yes`
- 649.fotonik3d_s: `basepeak = yes`

Benchmarks using both Fortran and C:

- 621.wrf_s: `basepeak = yes`

Benchmarks using Fortran, C, and C++:


(Continued on next page)
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Hardware Availability: Jan-2020
Software Availability: Dec-2019

Peak Optimization Flags (Continued)

Benchmarks using Fortran, C, and C++ (continued):
-mlvm -global-vectorize-slp -mlvm -inline-threshold=1000
-llvm-function-specialization -mlvm -unroll-threshold=100
-mlvm -enable-partial-unswitch -mlvm -loop-unswitch-threshold=200000
-O3 -funroll-loops -Mrecursive -Kieee -fno-finite-math-only
-DSPEC_OPENMP -fopenmp -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

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-E.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-E.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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