## Lenovo Global Technology

**ThinkSystem SR665**  
2.45 GHz, AMD EPYC 7763

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

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### SPEC CPU®2017 Floating Point Speed Result

**SPECspeed®2017_fp_base = 252**  
**SPECspeed®2017_fp_peak = 257**

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### Hardware

**CPU Name:** AMD EPYC 7763  
**Max MHz:** 3500  
**Nominal:** 2450  
**Enabled:** 128 cores, 2 chips  
**Orderable:** 1.2 chips  
**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, 32 MB shared / 8 cores  
**Other:** None  
**Memory:** 512 GB (16 x 32 GB 2Rx4 PC4-3200AA-R)  
**Storage:** 1 x 960 GB SATA SSD  
**Other:** None

### Software

**OS:** Red Hat Enterprise Linux release 8.3 (Ootpa)  
**Kernel:** 4.18.0-240.el8.x86_64  
**Compiler:** C/C++/Fortran: Version 3.0.0 of AOCC  
**Parallel:** Yes  
**Firmware:** Lenovo BIOS Version D8E115B 2.00 released Feb-2021  
**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

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### Benchmark Results

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>SPECspeed®2017_fp_peak</th>
<th>SPECspeed®2017_fp_base</th>
</tr>
</thead>
<tbody>
<tr>
<td>603.bwaves_s</td>
<td>128</td>
<td>421</td>
<td>748</td>
</tr>
<tr>
<td>607.cactuBSSN_s</td>
<td>128</td>
<td>128</td>
<td>422</td>
</tr>
<tr>
<td>619.lbm_s</td>
<td>128</td>
<td>180</td>
<td>82.7</td>
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<tr>
<td>621.wrf_s</td>
<td>128</td>
<td>178</td>
<td>82.9</td>
</tr>
<tr>
<td>627.cam4_s</td>
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<td></td>
</tr>
<tr>
<td>628.pop2_s</td>
<td>128</td>
<td></td>
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</tr>
<tr>
<td>638.imagick_s</td>
<td>128</td>
<td>461</td>
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<td>644.nab_s</td>
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</tr>
<tr>
<td>649.fotonik3d_s</td>
<td>128</td>
<td>112</td>
<td></td>
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<tr>
<td>654.roms_s</td>
<td>128</td>
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</tr>
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</table>
Lenovo Global Technology

ThinkSystem SR665
2.45 GHz, AMD EPYC 7763

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Lenovo Global Technology

2.45 GHz, AMD EPYC 7763

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>
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<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
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<td>607.cactuBSSN_s</td>
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<td>619.lbm_s</td>
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<td>378</td>
<td>41.8</td>
<td>377</td>
<td>41.7</td>
<td>378</td>
</tr>
</tbody>
</table>

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>

'echo 8 > /proc/sys/vm/dirty_ratio' run as root to limit dirty cache to 8% of memory.
'echo 1 > /proc/sys/vm/swappiness' run as root to limit swap usage to minimum necessary.
'echo 1 > /proc/sys/vm/zone_reclaim_mode' run as root to free node-local memory and avoid remote memory usage.
'sync; echo 3 > /proc/sys/vm/drop_caches' run as root to reset filesystem caches.
'sysctl -w kernel.randomize_va_space=0' run as root to disable address space layout randomization (ASLR) to reduce run-to-run variability.

(Continued on next page)
Lenovo Global Technology

ThinkSystem SR665
2.45 GHz, AMD EPYC 7763

**Operating System Notes (Continued)**

To enable Transparent Hugepages (THP) for all allocations,
'echo always > /sys/kernel/mm/transparent_hugepage/enabled' and
'echo always > /sys/kernel/mm/transparent_hugepage/defrag' run as root.
To enable THP only on request for peak runs of 628.pop2_s, and 638.imagick_s,
'echo madvise > /sys/kernel/mm/transparent_hugepage/enabled' run as root.
To disable THP for peak runs of 627.cam4_s, 644.nab_s, 649.fotonik3d_s, and 654.roms_s,
'echo never > /sys/kernel/mm/transparent_hugepage/enabled' run as root.

**Environment Variables Notes**

Environment variables set by runcpu before the start of the run:
GOMP_CPU_AFFINITY = "0-127"
LD_LIBRARY_PATH = 
  "/home/cpu2017-1.1.5-amd-aocc300-milan-A1/amd_speed_aocc300_milan_A_lib/64;
/home/cpu2017-1.1.5-amd-aocc300-milan-A1/amd_speed_aocc300_milan_A_lib/32:" MALLOC_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 = "0-127"

Environment variables set by runcpu during the 607.cactuBSSN_s peak run:
GOMP_CPU_AFFINITY = "0-127"

Environment variables set by runcpu during the 628.pop2_s peak run:
GOMP_CPU_AFFINITY = "0-127"

Environment variables set by runcpu during the 654.roms_s peak run:
GOMP_CPU_AFFINITY = "0-127"

**General Notes**

Binaries were compiled on a system with 2x AMD EPYC 7742 CPU + 1TiB Memory using openSUSE 15.2

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.

(Continued on next page)
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2.45 GHz, AMD EPYC 7763

SPECspeed®2017_fp_base = 252

SPECspeed®2017_fp_peak = 257

CPU2017 License: 9017
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Test Date: Feb-2021
Hardware Availability: Mar-2021
Software Availability: Mar-2021

General Notes (Continued)

ejemalloc: configured and built with GCC v4.8.2 in RHEL 7.4 (No options specified)
ejemalloc 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:
Operating Mode set to Maximum Performance and then set it to Custom Mode
4-Link xGMI Max Speed set to 16Gbps
SOC P-States set to P0
SMT Mode set to Disable
DLWM Support set to Disabled

Sysinfo program /home/cpu2017-1.1.5-amd-aocc300-milan-A1/bin/sysinfo
Rev: r6538 of 2020-09-24 e8664e66d2d7080afeaa89d4b38e2f1c
running on localhost.localdomain Thu Feb 25 02:40:52 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

From /proc/cpuinfo
model name : AMD EPYC 7763 64-Core Processor
2 "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 : 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
physical 1: 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
CPU(s): 128
On-line CPU(s) list: 0-127
Thread(s) per core: 1
Core(s) per socket: 64
Socket(s): 2

(Continued on next page)
Platform Notes (Continued)

NUMA node(s): 2
Vendor ID: AuthenticAMD
CPU family: 25
Model: 1
Model name: AMD EPYC 7763 64-Core Processor
Stepping: 1
CPU MHz: 3231.421
CPU max MHz: 2450.0000
CPU min MHz: 1500.0000
BogoMIPS: 4890.70
Virtualization: AMD-V
L1d cache: 32K
L1i cache: 32K
L2 cache: 512K
L3 cache: 32768K
NUMA node0 CPU(s): 0-63
NUMA node1 CPU(s): 64-127
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 pcid sse4_1 sse4_2 movbe popcnt aes avx f16c rdrand lahf_lm cmp_legacy svm extapic cr8_legacy abm sse4a misalignsse 3dnowprefetch osvw ibr skinit wdt tce topoext perfctr_core perfctr_nb bpext perfctr_llc mwaitx cpb cat_l3 cdp_l3 invpcid_single hw_pstate sme ssbd mba sev ibrs ibpb vmmcall fsgsbase bni avx2 smep bmi2 erms invpcid cqm rdt_a rdseed adx smap clflushopt clwb sha ni xsaveopt xsave xgetbv1 xsaves cqm_llc cqm_occupy_llc cqm_mcm_total cqm_mcm_local clzero irperf xsaveerptr wbnoinvd amd_ppi ar npt lbv svm_lock nrip_save tsc_scale vmcb_clean flushbyasid decodeassists pausefilter pfthreshold v_vmsave_vmload vgif umip pfku ospe vaes vpclmulqdq rdpid overflow_recov succor smca

From numacl --hardware WARNING: a numacl 'node' might or might not correspond to a physical chip.

[Available nodes (0-1)]

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: 257722 MB
node 0 free: 256772 MB
node 1 cpus: 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127
node 1 size: 257945 MB
node 1 free: 257373 MB
node distances:

(Continued on next page)
Lenovo Global Technology
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SPECspeed®2017_fp_base = 252
SPECspeed®2017_fp_peak = 257

Test Date: Feb-2021
Hardware Availability: Mar-2021
Software Availability: Mar-2021

Platform Notes (Continued)

node  0  1
   0: 10  32
   1: 32  10

From /proc/meminfo
MemTotal:       528201524 kB
HugePages_Total:       0
Hugepagesize:       2048 kB

/sbin/tuned-adm active
Current active profile: throughput-performance

/sys/devices/system/cpu/cpu*/cpufreq/scaling_governor has performance

From /etc/*release* /etc/*version*
os-release:
   NAME="Red Hat Enterprise Linux"
   VERSION="8.3 (Ootpa)"
   ID="rhel"
   ID_LIKE="fedora"
   VERSION_ID="8.3"
   PLATFORM_ID="platform:el8"
   PRETTY_NAME="Red Hat Enterprise Linux 8.3 (Ootpa)"
   ANSI_COLOR="0;31"
redhat-release: Red Hat Enterprise Linux release 8.3 (Ootpa)
system-release: Red Hat Enterprise Linux release 8.3 (Ootpa)
system-release-cpe: cpe:/o:redhat:enterprise_linux:8.3:ga

uname -a:
Linux localhost.localdomain 4.18.0-240.el8.x86_64 #1 SMP Wed Sep 23 05:13:10 EDT 2020
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): 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/swaps barriers and __user pointer sanitization
CVE-2017-5715 (Spectre variant 2): Mitigation: Full AMD retropoline, IBPB: conditional, IBRS_FW, STIBP:
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Platform Notes (Continued)

disabled, RSB filling
CVE-2020-0543 (Special Register Buffer Data Sampling): Not affected
CVE-2019-11135 (TSX Asynchronous Abort): Not affected

run-level 3 Feb 25 02:39

SPEC is set to: /home/cpu2017-1.1.5-amd-aocc300-milan-A1
Filesyste xfs 819G 86G 734G 11% /home
From /sys/devices/virtual/dmi/id
Vendor: Lenovo
Product: ThinkSystem SR665 MB
Product Family: ThinkSystem
Serial: 1234567890

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:
   16x Samsung M393A4K40DB3-CWE 32 GB 2 rank 3200
   16x Unknown Unknown

BIOS:
   BIOS Vendor: Lenovo
   BIOS Version: D8E115B-2.00
   BIOS Date: 02/02/2021
   BIOS Revision: 2.0
   Firmware Revision: 3.0

(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) |
------------------------------------------------------------------------------------------------- 
AMD clang version 12.0.0 (CLANG: AOCC_3.0.0-Build#78 2020_12_10) (based on LLVM Mirror.Version.12.0.0)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.0.0/bin

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

C++, C, Fortran | 607.cactuBSSN_s(base, peak)

AMD clang version 12.0.0 (CLANG: AOCC_3.0.0-Build#78 2020_12_10) (based on LLVM Mirror.Version.12.0.0)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.0.0/bin
AMD clang version 12.0.0 (CLANG: AOCC_3.0.0-Build#78 2020_12_10) (based on LLVM Mirror.Version.12.0.0)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.0.0/bin
AMD clang version 12.0.0 (CLANG: AOCC_3.0.0-Build#78 2020_12_10) (based on LLVM Mirror.Version.12.0.0)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.0.0/bin

Fortran | 603.bwaves_s(base, peak) 649.fotonik3d_s(base, peak)
| 654.roms_s(base, peak)

AMD clang version 12.0.0 (CLANG: AOCC_3.0.0-Build#78 2020_12_10) (based on LLVM Mirror.Version.12.0.0)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.0.0/bin

Fortran, C | 621.wrf_s(base, peak) 627.cam4_s(base, peak)
| 628.pop2_s(base, peak)

AMD clang version 12.0.0 (CLANG: AOCC_3.0.0-Build#78 2020_12_10) (based on LLVM Mirror.Version.12.0.0)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.0.0/bin
AMD clang version 12.0.0 (CLANG: AOCC_3.0.0-Build#78 2020_12_10) (based on LLVM Mirror.Version.12.0.0)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.0.0/bin
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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:
-m64 -mno-adx -mno-sse4a -Wl,-mllvm -Wl,-region-vectorize
-Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3 -O3 -march=znver3
-fvclibs=AMDLIBM -ffast-math -flto -fstruct-layout=5
-mllvm -unroll-threshold=50 -mllvm -inline-threshold=1000
-freemap-arrays -mllvm -function-specialize -flv-function-specialization
-mllvm -enable-gvn-hoist -mllvm -global-vectorize-slp=true
-mllvm -enable-lcvm-vrp -mllvm -reduce-array-computations=3 -z muldefs
-DSPEC_OMPMP -fopenmp -fopenmp=libomp -lomp -lamdlibm -ljemalloc
-lflang -lflangrti

Fortran benchmarks:
-m64 -mno-adx -mno-sse4a -Wl,-mllvm -Wl,-enable-X86-prefetching

(Continued on next page)
Lenovo Global Technology
ThinkSystem SR665
2.45 GHz, AMD EPYC 7763

SPECspeed®2017_fp_base = 252
SPECspeed®2017_fp_peak = 257

CPU2017 License: 9017
Test Date: Feb-2021
Test Sponsor: Lenovo Global Technology
Tested by: Lenovo Global Technology
Hardware Availability: Mar-2021
Software Availability: Mar-2021

Base Optimization Flags (Continued)

Fortran benchmarks (continued):
-Wl,-mlivm -Wl,-enable-licm-vrp -Wl,-mlivm -Wl,-region-vectorize
-Wl,-mlivm -Wl,-function-specialize
-Wl,-mlivm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mlivm -Wl,-reduce-array-computations=3 -Hz,1,0x1 -O3
-march=znver3 -fveclib=AMDLIBM -ffast-math -Mrecursive
-mlivm -fuse-tile-inner-loop -funroll-loops
-mlivm -extra-vectorizer-passes -mlivm -lsr-in-nested-loop
-mlivm -enable-licm-vrp -mlivm -reduce-array-computations=3
-mlivm -global-vectorize-slp=true -z muldefs -DSPEC_OPENMP -fopenmp
-fopenmp=libomp -lomp -lamdlibm -ljemalloc -lflang -lflangrti

Benchmarks using both Fortran and C:
-m64 -mno-adx -mno-sse4a -Wl,-mlivm -Wl,-enable-X86-prefetching
-Wl,-mlivm -Wl,-enable-licm-vrp -Wl,-mlivm -Wl,-region-vectorize
-Wl,-mlivm -Wl,-function-specialize
-Wl,-mlivm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mlivm -Wl,-reduce-array-computations=3 -O3 -march=znver3
-fveclib=AMDLIBM -ffast-math -fmsc -fstruct-layout=5
-mlivm -unroll-threshold=1000 -mlivm -inline-threshold=1000
-fremap-arrays -mlivm -function-specialize -flv-function-specialization
-mlivm -enable-gvn-hoist -mlivm -global-vectorize-slp=true
-mlivm -enable-licm-vrp -mlivm -reduce-array-computations=3 -Hz,1,0x1
-Mrecursive -mlivm -fuse-tile-inner-loop -funroll-loops
-mlivm -extra-vectorizer-passes -mlivm -lsr-in-nested-loop -z muldefs
-DSPEC_OPENMP -fopenmp -fopenmp=libomp -lomp -lamdlibm -ljemalloc
-lflang -lflangrti

Benchmarks using Fortran, C, and C++:
-m64 -mno-adx -mno-sse4a -std=c++98
-Wl,-mlivm -Wl,-x86-use-vzeroupper=false
-Wl,-mlivm -Wl,-region-vectorize -Wl,-mlivm -Wl,-function-specialize
-Wl,-mlivm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mlivm -Wl,-reduce-array-computations=3 -O3 -march=znver3
-fveclib=AMDLIBM -ffast-math -fmsc -fstruct-layout=5
-mlivm -unroll-threshold=1000 -mlivm -inline-threshold=1000
-fremap-arrays -mlivm -function-specialize -flv-function-specialization
-mlivm -enable-gvn-hoist -mlivm -global-vectorize-slp=true
-mlivm -enable-licm-vrp -mlivm -reduce-array-computations=3
-mlivm -enable-partial-unswitch -mlivm -unroll-threshold=100
-finline-aggressive -mlivm -loop-unswitch=threshold=200000
-mlivm -reroll-loops -mlivm -aggressive-loop-unswitch
-mlivm -extra-vectorizer-passes -mlivm -convert-pow-exp-to-int=false
-Hz,1,0x1 -Mrecursive -mlivm -fuse-tile-inner-loop -funroll-loops
-mlivm -lsr-in-nested-loop -z muldefs -DSPEC_OPENMP -fopenmp
-fopenmp=libomp -lomp -lamdlibm -ljemalloc -lflang -lflangrti
Lenovo Global Technology
ThinkSystem SR665
2.45 GHz, AMD EPYC 7763

SPECspeed®2017_fp_base = 252
SPECspeed®2017_fp_peak = 257

CPU2017 License: 9017
Test Sponsor: Lenovo Global Technology
Test Date: Feb-2021
Tested by: Lenovo Global Technology
Hardware Availability: Mar-2021
Software Availability: Mar-2021

Base Other Flags

C benchmarks:
-Wno-unused-command-line-argument -Wno-return-type

Fortran benchmarks:
-Wno-unused-command-line-argument -Wno-return-type

Benchmarks using both Fortran and C:
-Wno-unused-command-line-argument -Wno-return-type

Benchmarks using Fortran, C, and C++:
-Wno-unused-command-line-argument -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)
Peak Optimization Flags (Continued)

Fortran benchmarks:

603.bwaves_s: -m64 -mno-adx -mno-sse4a
-Wl,-mlllvm -Wl,--enable-X86-prefetching
-Wl,-mlllvm -Wl,--enable-licm-vrp
-Wl,-mlllvm -Wl,--function-specialize
-Wl,-mlllvm -Wl,--align-all-nofallthru-blocks=6
-Wl,-mlllvm -Wl,--reduce-array-computations=3 -Ofast
-march=znver3 -fveclib=AMDLIBM -ffast-math -Mrecursive
-mlllvm -reduce-array-computations=3
-mlllvm -global-vectorize-slp=true -mlllvm -enable-licm-vrp
-DSPEC_OPENMP -fopenmp -fopenmp=libomp -lomp -lamdlibm
-ljemalloc -lflang

649.fotonik3d_s: basepeak = yes

654.roms_s: Same as 603.bwaves_s

Benchmarks using both Fortran and C:

621.wrf_s: basepeak = yes

627.cam4_s: basepeak = yes

628.pop2_s: -m64 -mno-adx -mno-sse4a
-Wl,-mlllvm -Wl,--enable-X86-prefetching
-Wl,-mlllvm -Wl,--enable-licm-vrp
-Wl,-mlllvm -Wl,--function-specialize
-Wl,-mlllvm -Wl,--align-all-nofallthru-blocks=6
-Wl,-mlllvm -Wl,--reduce-array-computations=3 -Ofast
-march=znver3 -fveclib=AMDLIBM -ffast-math -flto
-fstruct-layout=5 -mlllvm -unroll-threshold=50
-freemap-arrays -flv-function-specialization
-mlllvm -inline-threshold=1000 -mlllvm -enable-gvn-hoist
-mlllvm -global-vectorize-slp=true
-mlllvm -function-specialize -mlllvm -enable-licm-vrp
-mlllvm -reduce-array-computations=3 -Mrecursive
-DSPEC_OPENMP -fopenmp -fopenmp=libomp -lomp -lamdlibm
-ljemalloc -lflang

Benchmarks using Fortran, C, and C++:

-m64 -mno-adx -mno-sse4a -std=c++98
-Wl,-mlllvm -Wl,-x86-use-vzeroupper=false -Wl,-mlllvm -Wl,--enable-licm-vrp
-Wl,-mlllvm -Wl,--function-specialize
-Wl,-mlllvm -Wl,--align-all-nofallthru-blocks=6
-Wl,-mlllvm -Wl,--reduce-array-computations=3 -Ofast -march=znver3

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Lenovo Global Technology
ThinkSystem SR665
2.45 GHz, AMD EPYC 7763

SPEC CPU®2017 Floating Point Speed Result

Lenovo Global Technology

SPECspeed®2017_fp_base = 252
SPECspeed®2017_fp_peak = 257

CPU2017 License: 9017
Test Sponsor: Lenovo Global Technology
Test Date: Feb-2021
Tested by: Lenovo Global Technology
Hardware Availability: Mar-2021
Software Availability: Mar-2021

Peak Optimization Flags (Continued)
Benchmarks using Fortran, C, and C++ (continued):
-fveclib=AMDLIBM -ffast-math -flto -fstruct-layout=5
-mlvm -unroll-threshold=50 -fremap-arrays -flv-function-specialization
-mlvm -inline-threshold=1000 -mlvm -enable-gvn-hoist
-mlvm -global-vectorize-slp=true -mlvm -function-specialize
-mlvm -enable-licm-vrp -mlvm -reduce-array-computations=3
-finline-aggressive -mlvm -unroll-threshold=100 -mlvm -reroll-loops
-mlvm -aggressive-loop-unswitch -Mrecursive -DSPEC_OPENMP -fopenmp
-fopenmp=libomp -lomp -lamdlibm -ljemalloc -lflang

Peak Other Flags
C benchmarks:
-Wno-unused-command-line-argument -Wno-return-type
Fortran benchmarks:
-Wno-unused-command-line-argument -Wno-return-type
Benchmarks using both Fortran and C:
-Wno-unused-command-line-argument -Wno-return-type
Benchmarks using Fortran, C, and C++:
-Wno-unused-command-line-argument -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-Milan-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-Milan-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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