# Lenovo Global Technology

**ThinkSystem SR655**  
3.20 GHz, AMD EPYC 74F3

## CPU2017 License: 9017

**Test Sponsor:** Lenovo Global Technology  
**Tested by:** Lenovo Global Technology

**Test Date:** Jul-2021  
**Hardware Availability:** Jun-2021  
**Software Availability:** Mar-2021

## Performance Results

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>SPECspeed®2017_fp_base</th>
<th>SPECspeed®2017_fp_peak</th>
</tr>
</thead>
<tbody>
<tr>
<td>603.bwaves_s</td>
<td>24</td>
<td>138</td>
<td>140</td>
</tr>
<tr>
<td>607.cactuBSSN_s</td>
<td>24</td>
<td>138</td>
<td>140</td>
</tr>
<tr>
<td>619.lbm_s</td>
<td>24</td>
<td>140</td>
<td>140</td>
</tr>
<tr>
<td>621.wrf_s</td>
<td>24</td>
<td>138</td>
<td>140</td>
</tr>
<tr>
<td>627.cam4_s</td>
<td>24</td>
<td>138</td>
<td>140</td>
</tr>
<tr>
<td>628.pop2_s</td>
<td>24</td>
<td>138</td>
<td>140</td>
</tr>
<tr>
<td>638.imagick_s</td>
<td>24</td>
<td>138</td>
<td>140</td>
</tr>
<tr>
<td>644.nab_s</td>
<td>24</td>
<td>138</td>
<td>140</td>
</tr>
<tr>
<td>649.fotonik3d_s</td>
<td>24</td>
<td>138</td>
<td>140</td>
</tr>
<tr>
<td>654.roms_s</td>
<td>24</td>
<td>138</td>
<td>140</td>
</tr>
</tbody>
</table>

## Hardware

<table>
<thead>
<tr>
<th>Feature</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU Name</td>
<td>AMD EPYC 74F3</td>
</tr>
<tr>
<td>Max MHz</td>
<td>4000</td>
</tr>
<tr>
<td>Nominal</td>
<td>3200</td>
</tr>
<tr>
<td>Enabled</td>
<td>24 cores, 1 chip</td>
</tr>
<tr>
<td>Orderable</td>
<td>1 chip</td>
</tr>
<tr>
<td>Cache L1</td>
<td>32 KB I + 32 KB D on chip per core</td>
</tr>
<tr>
<td>L2</td>
<td>512 KB I+D on chip per core</td>
</tr>
<tr>
<td>L3</td>
<td>256 MB I+D on chip per chip, 32 MB shared / 3 cores</td>
</tr>
<tr>
<td>Other</td>
<td>None</td>
</tr>
<tr>
<td>Memory</td>
<td>256 GB (8 x 32 GB 2Rx4 PC4-3200AA-R)</td>
</tr>
<tr>
<td>Storage</td>
<td>1 x 960 GB SATA SSD</td>
</tr>
<tr>
<td>Other</td>
<td>None</td>
</tr>
</tbody>
</table>

## Software

<table>
<thead>
<tr>
<th>Feature</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>OS</td>
<td>SUSE Linux Enterprise Server 15 SP2 (x86_64) Kernel 5.3.18-22-default</td>
</tr>
<tr>
<td>Compiler</td>
<td>C/C++/Fortran: Version 3.0.0 of AOCC</td>
</tr>
<tr>
<td>Parallel</td>
<td>Yes</td>
</tr>
<tr>
<td>Firmware</td>
<td>Lenovo BIOS Version CFE125U 6.0 released May-2021</td>
</tr>
<tr>
<td>File System</td>
<td>xfs</td>
</tr>
<tr>
<td>System State</td>
<td>Run level 3 (multi-user)</td>
</tr>
<tr>
<td>Base Pointers</td>
<td>64-bit</td>
</tr>
<tr>
<td>Peak Pointers</td>
<td>64-bit</td>
</tr>
<tr>
<td>Other</td>
<td>jemalloc: jemalloc memory allocator library v5.1.0</td>
</tr>
<tr>
<td>Power Management</td>
<td>BIOS and OS set to prefer performance at the cost of additional power usage</td>
</tr>
</tbody>
</table>
Lenovo Global Technology
ThinkSystem SR655
3.20 GHz, AMD EPYC 74F3

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

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>24</td>
<td>156</td>
<td>378</td>
<td>156</td>
<td>378</td>
<td>156</td>
<td>378</td>
<td>24</td>
<td>156</td>
<td>378</td>
<td>156</td>
</tr>
<tr>
<td>607.cactuBSSN_s</td>
<td>24</td>
<td>79.8</td>
<td>209</td>
<td>80.7</td>
<td>206</td>
<td>80.7</td>
<td>207</td>
<td>24</td>
<td>79.8</td>
<td>209</td>
<td>80.7</td>
</tr>
<tr>
<td>619.lbm_s</td>
<td>24</td>
<td>75.6</td>
<td>69.2</td>
<td>75.6</td>
<td>69.2</td>
<td>75.5</td>
<td>69.4</td>
<td>24</td>
<td>74.3</td>
<td>70.5</td>
<td>74.2</td>
</tr>
<tr>
<td>621.wrf_s</td>
<td>24</td>
<td>75.1</td>
<td>176</td>
<td>75.9</td>
<td>174</td>
<td>75.4</td>
<td>176</td>
<td>24</td>
<td>75.1</td>
<td>176</td>
<td>75.9</td>
</tr>
<tr>
<td>627.cam4_s</td>
<td>24</td>
<td>91.8</td>
<td>96.5</td>
<td>91.9</td>
<td>96.5</td>
<td>91.6</td>
<td>96.7</td>
<td>24</td>
<td>91.8</td>
<td>96.5</td>
<td>91.9</td>
</tr>
<tr>
<td>628.pop2_s</td>
<td>24</td>
<td>135</td>
<td>88.0</td>
<td>135</td>
<td>87.6</td>
<td>135</td>
<td>87.8</td>
<td>24</td>
<td>135</td>
<td>88.0</td>
<td>135</td>
</tr>
<tr>
<td>638.imagick_s</td>
<td>24</td>
<td>99.4</td>
<td>145</td>
<td>98.9</td>
<td>146</td>
<td>101</td>
<td>144</td>
<td>24</td>
<td>99.4</td>
<td>145</td>
<td>98.9</td>
</tr>
<tr>
<td>644.nab_s</td>
<td>24</td>
<td>80.5</td>
<td>217</td>
<td>80.4</td>
<td>217</td>
<td>80.4</td>
<td>217</td>
<td>24</td>
<td>80.5</td>
<td>217</td>
<td>80.4</td>
</tr>
<tr>
<td>649.fotonik3d_s</td>
<td>24</td>
<td>125</td>
<td>72.9</td>
<td>125</td>
<td>73.0</td>
<td>125</td>
<td>72.8</td>
<td>24</td>
<td>125</td>
<td>72.9</td>
<td>125</td>
</tr>
<tr>
<td>654.roms_s</td>
<td>24</td>
<td>114</td>
<td>138</td>
<td>114</td>
<td>138</td>
<td>114</td>
<td>138</td>
<td>24</td>
<td>104</td>
<td>152</td>
<td>103</td>
</tr>
</tbody>
</table>

SPECspeed®2017_fp_base = 138
SPECspeed®2017_fp_peak = 140

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.
To enable Transparent Hugepages (THP) for all allocations,
'echo always > /sys/kernel/mm/transparent_hugepage/enabled' and

(Continued on next page)
Lenovo Global Technology

ThinkSystem SR655
3.20 GHz, AMD EPYC 74F3

SPEC CPU®2017 Floating Point Speed Result
Copyright 2017-2021 Standard Performance Evaluation Corporation

Lenovo Global Technology

SPECspeed®2017_fp_base = 138
SPECspeed®2017_fp_peak = 140

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

Operating System Notes (Continued)

'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 = "0-23"
LD_LIBRARY_PATH = 
"/home/cpu2017-1.1.8-amd-aocc300-milan-B1/amd_speed_aocc300_milan_B_lib/
64;/home/cpu2017-1.1.8-amd-aocc300-milan-B1/amd_speed_aocc300_milan_B_lib/
632:");
MALLOC_CONF = "retain:true"
OMP_DYNAMIC = "false"
OMP_SCHEDULE = "static"
OMP_STACKSIZE = "128M"
OMP_THREAD_LIMIT = "24"

Environment variables set by runcpu during the 619.lbm_s peak run:
GOMP_CPU_AFFINITY = "0-23"

Environment variables set by runcpu during the 654.roms_s peak run:
GOMP_CPU_AFFINITY = "0-23"

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.

jemalloc: configured and built with GCC v4.8.2 in RHEL 7.4 (No options specified)
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
ThinkSystem SR655
3.20 GHz, AMD EPYC 74F3

SPECspeed®2017_fp_base = 138
SPECspeed®2017_fp_peak = 140

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

Test Date: Jul-2021
Hardware Availability: Jun-2021
Software Availability: Mar-2021

Platform Notes

BIOS configuration:
Choose Operating Mode set to Maximum Performance
SMT Mode set to Disable

Sysinfo program /home/cpu2017-1.1.8-amd-aocc300-milan-B1/bin/sysinfo
Rev: r6622 of 2021-04-07 982a61ec0915b55891ef0e16a6ac64d
running on localhost Fri Apr 17 21:15:20 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 74F3 24-Core Processor
 1 "physical id"s (chips)
 24 "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 : 24
siblings : 24
physical 0: cores 0 1 2 4 5 6 8 9 10 12 13 14 16 17 18 20 21 22 24 25 26 28 29 30

From lscpu from util-linux 2.33.1:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
Address sizes: 48 bits physical, 48 bits virtual
CPU(s): 24
On-line CPU(s) list: 0-23
Thread(s) per core: 1
Core(s) per socket: 24
Socket(s): 1
NUMA node(s): 1
Vendor ID: AuthenticAMD
CPU family: 25
Model: 1
Model name: AMD EPYC 74F3 24-Core Processor
Stepping: 1
CPU MHz: 2542.456
CPU max MHz: 3200.0000
CPU min MHz: 1500.0000
BogoMIPS: 6387.85
Virtualization: AMD-V
L1d cache: 32K
L1i cache: 32K
L2 cache: 512K
L3 cache: 32768K

(Continued on next page)
Platform Notes (Continued)

NUMA node0 CPU(s):   0-23
Flags:               fpu vme de pse tsc msr pae 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 xsave avx f16c rdrand
       lahf_lm cmp_legacy svm extapic cr8_legacy abm sse4a mce mmxplus 3dnowprefetch osvw
       ibs skinit wdt tce topoext perfctr_core perfctr_nb bperf perfctr_l1c mwaitx cpb
cpu_13 cdp_13 invpcid_single hw_pstate ssbd mba ibrs ibpb stibp vmcall fsgsbase
   bm1 avx2 smep bmi2 erva invpcid cqm rdt_a rdseed adx smap clflushopt clwb sha_ni
   xsaveopt xsaves xgetbv1 xsaves cqm_llc cqm_occu1_l1c cqm_mbmm_total cqm_mbmm_local
clzero irepfr xsaveerptr wbnoinvd arat npt lrbr svm_lock nrp_save tsc_scale
   vmcb_clean flushbyasid decodeassists pausefilter pfthreshold v_vmsave_vmload vgif
   umip pkup ospe vaes vpclmulqdq rdpid overflow_recov 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 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
 node 0 size: 257615 MB
 node 0 free: 257081 MB
 node distances:
   node 0
     0: 10

From /proc/meminfo
MemTotal:       263798392 kB
HugePages_Total:       0
Hugepagesize:       2048 kB
/sys/devices/system/cpu/cpu*/cpufreq/scaling_governor has
performance
/usr/bin/lsb_release -d
SUSE Linux Enterprise Server 15 SP2

From /etc/*release*/etc/*version*
os-release:
  NAME="SLES"
  VERSION="15-SP2"
  VERSION_ID="15.2"
  PRETTY_NAME="SUSE Linux Enterprise Server 15 SP2"
  ID="sles"
  ID_LIKE="suse"
  ANSI_COLOR="0;32"
SPEC CPU®2017 Floating Point Speed Result

Copyright 2017-2021 Standard Performance Evaluation Corporation

Lenovo Global Technology
ThinkSystem SR655
3.20 GHz, AMD EPYC 74F3

SPECspeed®2017_fp_base = 138
SPECspeed®2017_fp_peak = 140

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

Test Date: Jul-2021
Hardware Availability: Jun-2021
Software Availability: Mar-2021

Platform Notes (Continued)

CPE_NAME="cpe:o:suse:sles:15:sp2"

uname -a:
   Linux localhost 5.3.18-22-default #1 SMP Wed Jun 3 12:16:43 UTC 2020 (720aeba) 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/swapgs barriers and __user pointer sanitization
CVE-2017-5715 (Spectre variant 2): Mitigation: Full AMD retpoline, IBFB: conditional, IBRS_FW, STIBP: disabled, RSB filling
CVE-2020-0543 (Special Register Buffer Data Sampling): Not affected
CVE-2019-11135 (TSX Asynchronous Abort): Not affected

run-level 3 Apr 17 21:13

SPEC is set to: /home/cpu2017-1.1.8-amd-aocc300-milan-B1
Filesystem Type Size Used Avail Use% Mounted on
/dev/md126p3 xfs 892G 85G 808G 10% /

From /sys/devices/virtual/dmi/id
Vendor: Lenovo
Product: ThinkSystem SR655 -[7Y00000000]-
Product Family: ThinkSystem
Serial: 0123456789

Additional information from dmidecode 3.2 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 M393A4K40DB3-CWE 32 GB 2 rank 3200
   8x Unknown Unknown

BIOS:
   BIOS Vendor: Lenovo
   BIOS Version: CFE125U

(Continued on next page)
Lenovo Global Technology
ThinkSystem SR655
3.20 GHz, AMD EPYC 74F3

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

BIOS Date: 05/28/2021
BIOS Revision: 6.0

(End of data from sysinfo program)

Platform Notes (Continued)

(Continued on next page)
Lenovo Global Technology
ThinkSystem SR655
3.20 GHz, AMD EPYC 74F3

Copyright 2017-2021 Standard Performance Evaluation Corporation

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

Test Date: Jul-2021
Hardware Availability: Jun-2021
Software Availability: Mar-2021

Compiler Version Notes (Continued)

Installs: /opt/AMD/aocc-compiler-3.0.0/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.ibm_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

(Continued on next page)
Lenovo Global Technology

ThinkSystem SR655
3.20 GHz, AMD EPYC 74F3

SPECspeed®2017_fp_base = 138
SPECspeed®2017_fp_peak = 140

Base Portability Flags (Continued)

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
- fveclib=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-licm-vrp -mllvm -reduce-array-computations=3 -z muldefs
- DSPEC_OPENMP -fopenmp -fopenmp=libomp -lomp -lamdlibm -ljemalloc
- lflang -lflangrti

Fortran benchmarks:
- m64 -mno-adx -mno-sse4a -Wl,-mllvm -Wl,-enable-X86-prefetching
- Wl,-mllvm -Wl,-enable-licm-vrp -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 -Hz,1,0x1 -O3
- march=znver3 -fveclib=AMDLIBM -ffast-math -Mrecursive
- mllvm -fuse-tile-inner-loop -funroll-loops
- mllvm -extra-vectorizer-passes -mllvm -lsr-in-nested-loop
- mllvm -enable-licm-vrp -mllvm -reduce-array-computations=3
- mllvm -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,-mllvm -Wl,-enable-X86-prefetching
- Wl,-mllvm -Wl,-enable-licm-vrp -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
- fveclib=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
- Mrecursive -mllvm -fuse-tile-inner-loop -funroll-loops
- mllvm -extra-vectorizer-passes -mllvm -lsr-in-nested-loop -z muldefs

(Continued on next page)
Lenovo Global Technology

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

---

**Base Optimization Flags (Continued)**

Benchmarks using both Fortran and C (continued):
-DSPEC_OPENMP -fopenmp -fopenmp=libomp -lomp -lamdlibm -ljemalloc  
-llang -llflagrti

Benchmarks using Fortran, C, and C++:
-m64 -mno-adx -mno-sse4a -std=c++98  
-Wl,-mlllvm -Wl,-x86-use-vzeroupper=false  
-Wl,-mlllvm -Wl,-region-vectorize -Wl,-mlllvm -Wl,-function-specialize  
-Wl,-mlllvm -Wl,-align-all-nofallthru-blocks=6  
-Wl,-mlllvm -Wl,-reduce-array-computations=3 -O3 -march=znver3  
-fveclib=AMDLIBM -ffast-math -flto -fstruct-layout=5  
-mlllvm -unroll-threshold=50 -mlllvm -inline-threshold=1000  
-fremap-arrays -mlllvm -function-specialize -flv-function-specialization  
-mlllvm -enable-gvn-hoist -mlllvm -global-vectorize-slp=true  
-mlllvm -enable-partial-unswitch -mlllvm -unroll-threshold=100  
-finline-aggressive -mlllvm -loop-unswitch-threshold=200000  
-mlllvm -reroll-loops -mlllvm -aggressive-loop-unswitch  
-mlllvm -extra-vectorizer-passes -mlllvm -convert-pow-exp-to-int=false  
-Hz,1,0x1 -Mrecursive -mlllvm -fuse-tile-inner-loop -funroll-loops  
-mlllvm -lsr-in-nested-loop -z muldefs -DSPEC_OPENMP -fopenmp  
-fopenmp=libomp -lomp -lamdlibm -ljemalloc -llang -llflagrti

---

**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

(Continued on next page)
Lenovo Global Technology
ThinkSystem SR655
3.20 GHz, AMD EPYC 74F3

Peak Compiler Invocation (Continued)

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: -m64 -mno-adx -mno-sse4a
-W1,-ml1vm -W1,-function-specialize
-W1,-ml1vm -W1,-align-all-nofallthru-blocks=6
-W1,-ml1vm -W1,-reduce-array-computations=3 -Ofast
-march=znuver3 -fvecclib=AMDLIBM -ffast-math -flto
-fstruct-layout=5 -ml1vm -unroll-threshold=50
-fremap-arrays -flv-function-specialization
-ml1vm -inline-threshold=1000 -ml1vm -enable-gvn-hoist
-ml1vm -global-vectorize-slp=true
-ml1vm -function-specialize -ml1vm -enable-licm-vrp
-ml1vm -reduce-array-computations=3 -DSPEC_OPENMP -fopenmp
-fopenmp=libomp -lomp -llamdlibm -ljemalloc -lflang

638.imagick_s: basepeak = yes
644.nab_s: basepeak = yes

Fortran benchmarks:
603.bwaves_s: basepeak = yes
649.fotonik3d_s: basepeak = yes
654.roms_s: -m64 -mno-adx -mno-sse4a
-W1,-ml1vm -W1,-enable-X86-prefetching

(Continued on next page)
Lenovo Global Technology
ThinkSystem SR655
3.20 GHz, AMD EPYC 74F3

<table>
<thead>
<tr>
<th>CPU2017 License: 9017</th>
<th>Test Date: Jul-2021</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Sponsor: Lenovo Global Technology</td>
<td>Hardware Availability: Jun-2021</td>
</tr>
<tr>
<td>Tested by: Lenovo Global Technology</td>
<td>Software Availability: Mar-2021</td>
</tr>
</tbody>
</table>

**SPEC CPU®2017 Floating Point Speed Result**

| SPECspeed®2017_fp_base = 138 | SPECspeed®2017_fp_peak = 140 |

**Peak Optimization Flags (Continued)**

654.roms_s (continued):
- `-Wl,-mllvm -Wl,-enable-licm-vrp`
- `-Wl,-mllvm -Wl,-function-specialize`
- `-Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6`
- `-Wl,-mllvm -Wl,-reduce-array-computations=3 -Ofast`
- `-march=znver3 -fveclib=AMDLIBM -ffast-math -Mrecursive`
- `-mllvm -reduce-array-computations=3`
- `-mllvm -global-vectorize-slp=true -mllvm -enable-licm-vrp`
- `-DSPEC_OPENMP -fopenmp -fopenmp=libomp -lomp -lamdlibm`
- `-ljemalloc -lflang`

Benchmarks using both Fortran and C:
- `621.wrf_s: basepeak = yes`
- `627.cam4_s: basepeak = yes`
- `628.pop2_s: basepeak = yes`

Benchmarks using Fortran, C, and C++:
- `607.cactuBSSN_s: basepeak = yes`

**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
**Lenovo Global Technology**

**ThinkSystem SR655**

3.20 GHz, AMD EPYC 74F3

<table>
<thead>
<tr>
<th>SPECspeed®2017_fp_peak</th>
<th>140</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECspeed®2017_fp_base</td>
<td>138</td>
</tr>
</tbody>
</table>

**CPU2017 License:** 9017

**Test Sponsor:** Lenovo Global Technology

**Tested by:** Lenovo Global Technology

**Test Date:** Jul-2021

**Hardware Availability:** Jun-2021

**Software Availability:** Mar-2021

You can also download the XML flags sources by saving the following links:


SPEC CPU and SPECspeed are registered trademarks of the Standard Performance Evaluation Corporation. All other brand and product names appearing in this result are trademarks or registered trademarks of their respective holders.

For questions about this result, please contact the tester. For other inquiries, please contact info@spec.org.

Tested with SPEC CPU®2017 v1.1.8 on 2020-04-17 09:15:19-0400.

Report generated on 2021-08-19 10:52:59 by CPU2017 PDF formatter v6442.

Originally published on 2021-08-17.