### Lenovo Global Technology

**ThinkSystem SR665**  
2.75 GHz, AMD EPYC 7453

---

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

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

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#### Software

- **OS:** SUSE Linux Enterprise Server 12 SP5 (x86_64)  
- **Compiler:** C/C++/Fortran: Version 3.0.0 of AOCC  
- **Parallel:** Yes  
- **Firmware:** Lenovo BIOS Version D8E115G 2.02 released Mar-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

---

#### Hardware

- **CPU Name:** AMD EPYC 7453  
- **Max MHz:** 3450  
- **Nominal:** 2750  
- **Enabled:** 56 cores, 2 chips, 2 threads/core  
- **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:** 64 MB I+D on chip per chip,  
  - 16 MB shared / 7 cores  
- **Other:** None  
- **Memory:** 512 GB (16 x 32 GB 2Rx4 PC4-3200AA-R)  
- **Storage:** 1 x 960 GB SATA SSD  
- **Other:** None

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#### Performance Results

- **Specspeed®2017_fp_base = 192**  
- **Specspeed®2017_fp_peak = 197**

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<table>
<thead>
<tr>
<th>Threads</th>
<th>603.bwaves_s</th>
<th>607.cactuBSSN_s</th>
<th>619.lbm_s</th>
<th>621.wrf_s</th>
<th>627.cam4_s</th>
<th>628.pop2_s</th>
<th>638.imagick_s</th>
<th>644.nab_s</th>
<th>649.fotonik3d_s</th>
<th>654.roms_s</th>
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Results Table

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<th>Seconds</th>
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<td>79.7</td>
<td>198</td>
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SPECspeed®2017_fp_base = 192
SPECspeed®2017_fp_peak = 197

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 numacli 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)
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---

**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 = "0-111"  
LD_LIBRARY_PATH = \n  
"/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 = "112"

Environment variables set by runcpu during the 621.wrf_s peak run:  
GOMP_CPU_AFFINITY = "0-55"

Environment variables set by runcpu during the 627.cam4_s peak run:  
GOMP_CPU_AFFINITY = "0 56 1 57 2 58 3 59 4 60 5 61 6 62 7 63 8 64 9 65 10 66  
  11 67 12 68 13 69 14 70 15 71 16 72 17 73 18 74 19 75 20 76 21 77 22 78  
  23 79 24 80 25 81 26 82 27 83 28 84 29 85 30 86 31 87 32 88 33 89 34 90  
  35 91 36 92 37 93 38 94 39 95 40 96 41 97 42 98 43 99 44 100 45 101 46  
  102 47 103 48 104 49 105 50 106 51 107 52 108 53 109 54 110 55 111"

Environment variables set by runcpu during the 644.nab_s peak run:  
GOMP_CPU_AFFINITY = "0 56 1 57 2 58 3 59 4 60 5 61 6 62 7 63 8 64 9 65 10 66  
  11 67 12 68 13 69 14 70 15 71 16 72 17 73 18 74 19 75 20 76 21 77 22 78  
  23 79 24 80 25 81 26 82 27 83 28 84 29 85 30 86 31 87 32 88 33 89 34 90  
  35 91 36 92 37 93 38 94 39 95 40 96 41 97 42 98 43 99 44 100 45 101 46  
  102 47 103 48 104 49 105 50 106 51 107 52 108 53 109 54 110 55 111"

Environment variables set by runcpu during the 654.roms_s peak run:  
GOMP_CPU_AFFINITY = "0-55"

---

**General Notes**

Binaries were compiled on a system with 2x AMD EPYC 7713 CPU + 512GiB Memory using RHEL 8.2

NA: The test sponsor attests, as of date of publication, that CVE-2017-5754 (Meltdown)

(Continued on next page)
General Notes (Continued)

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

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
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 linux-ulti Wed Apr 28 18:37:23 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 7453 28-Core Processor
 2 "physical id"s (chips)
 112 "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 : 28
siblings : 56
physical 0: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24 25 26 27 28 29 30
physical 1: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24 25 26 27 28 29 30

From lscpu:
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): 112
On-line CPU(s) list: 0-111
**Lenovo Global Technology**

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**SPECspeed®2017_fp_base** = 192
**SPECspeed®2017_fp_peak** = 197

---

**Platform Notes (Continued)**

Thread(s) per core: 2
Core(s) per socket: 28
Socket(s): 2
NUMA node(s): 2
Vendor ID: AuthenticAMD
CPU family: 25
Model: 1
Model name: AMD EPYC 7453 28-Core Processor
Stepping: 1
CPU MHz: 2750.000
CPU max MHz: 2750.0000
CPU min MHz: 1500.0000
BogoMIPS: 5489.63
Virtualization: AMD-V
L1d cache: 32K
L1i cache: 32K
L2 cache: 512K
L3 cache: 16384K
NUMA node0 CPU(s): 0-27,56-83
NUMA node1 CPU(s): 28-55,84-111
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 rdrand
lahf_lm cmp_legacy svm extapic cr8_legacy abm sse4a misalignsse 3dnowprefetch osvw
ibs skinit wdt tce topoext perfctr_core perfctr_nb bprext perfctr_l2 mwaitx cmp
cat_13 cdp_13 invpcid_single hw_pstate sme sshd sev ibrs ibpb stibp vmcall fsgsbase
bmi1 avx2 smep bmi2 erms invpcid cmq rdt_a rdsed adx smap clflushopt clwb sha_ni
xsaves opt xsaveopt xsave xsaveopt xsavec xsaves cmq_llc cmq_occum llc cmq_mbm_total
clqwe irperf xsaveerptr wboinvid arat npt lbrv svm_lock nrip_save tsc_scale
vmcb_clean flushbyasid decodeassists pausefilter pfthreshold v_vmsave_vmlast vgif
umip pk uospke vaes vpclmulqdq rdpid overflow_recov succor smca

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

available: 2 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
56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83
node 0 size: 257837 MB
node 0 free: 257432 MB
node 1 cpus: 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 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
node 1 size: 258004 MB

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(Continued on next page)
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Software Availability: Mar-2021

Platform Notes (Continued)

node 1 free: 257520 MB
node distances:
node  0  1
  0: 10 32
  1: 32 10

From /proc/meminfo
MemTotal: 528221960 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

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

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"

uname -a:
Linux linux-ult 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:

CVE-2018-12207 (iTLB Multihit):
Not affected

CVE-2018-3620 (L1 Terminal Fault):
Not affected

Microarchitectural Data Sampling:
Not affected

CVE-2017-5754 (Meltdown):
Mitigation: Speculative Store Bypass disabled via prctl and seccomp

CVE-2018-3639 (Speculative Store Bypass):
Mitigation: usercopy/swapsgs barriers and __user pointer sanitation

CVE-2017-5753 (Spectre variant 1):
Mitigation: Full AMD retpoline,
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**SPECspeed®2017_fp_base = 192**

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---

**Platform Notes (Continued)**

IBPB: conditional, IBRS_FW, STIBP: conditional, RSB filling

CVE-2020-0543 (Special Register Buffer Data Sampling): No status reported
CVE-2019-11135 (TSX Asynchronous Abort): Not affected

---

run-level 3 Apr 28 18:30

SPEC is set to: /home/cpu2017-1.1.5-amd-aocc300-milan-A1

---

Filesystem Type Size Used Avail Use% Mounted on
/dev/sdb2 xfs 893G 57G 837G 7% /

---

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: D8E115G-2.02
BIOS Date: 03/25/2021
BIOS Revision: 2.2
Firmware Revision: 3.1

---

(End of data from sysinfo program)

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**Compiler Version Notes**

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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

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Target: x86_64-unknown-linux-gnu  
Thread model: posix  
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<td>SPECspeed®2017_fp_peak</td>
<td>197</td>
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**CPU2017 License:** 9017  
**Test Sponsor:** Lenovo Global Technology  
**Tested by:** Lenovo Global Technology  
**Test Date:** Apr-2021  
**Hardware Availability:** Apr-2021  
**Software Availability:** Mar-2021

### 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,-mllv -Wl,-region-vectorize`
  - `-Wl,-mllv -Wl,-function-specialize`
  - `-Wl,-mllv -Wl,-align-all-nofallthru-blocks=6`
  - `-Wl,-mllv -Wl,-reduce-array-computations=3 -03 -march=znver3`
  - `-fveclib=AMDLIBM -ffast-math -flto -fstruct-layout=5`
  - `-mllv -unroll-threshold=50 -mllv -inline-threshold=1000`
  - `-fremap-arrays -mllv -function-specialize -flv-function-specialization`
  - `-mllv -enable-gvn-hoist -mllv -global-vectorize-slp=true`
  - `-mllv -enable-licm-vrp -mllv -reduce-array-computations=3 -z muldefs`
  - `-DSPEC_OPENMP -fopenmp -fopenmp=libomp -lomp -lamdlibm -ljemalloc`
  - `-lflang -lflangrti`

- **Fortran benchmarks:**
  - `-m64 -mno-adx -mno-sse4a -Wl,-mllv -Wl,-enable-X86-prefetching

(Continued on next page)
BASE OPTIMIZATION FLAGS (CONTINUED)

**Fortran benchmarks (continued):**
- `-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`
- `-mllvm -enable-licm-VRP -mllvm -reduce-array-computations=3 -Hz,1,0x1`
- `-Mrecursive -mllvm -fuse-tile-inner-loop -funroll-loops`
- `-mllvm -extra-vectorizer-passes -mllvm -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,-mllvm -Wl,-x86-use-vzeroupper=false`
- `-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`
- `-mllvm -enable-partial-unschedule -mllvm -unroll-threshold=100`
- `-finline-aggressive -mllvm -loop-unschedule-threshold=200000`
- `-mllvm -reroll-loops -mllvm -aggressive-loop-unschedule`
- `-mllvm -extra-vectorizer-passes -mllvm -convert-pow-exp-to-int=false`
- `-Hz,1,0x1 -Mrecursive -mllvm -fuse-tile-inner-loop -funroll-loops`
- `-mllvm -lsr-in-nested-loop -z muldefs -DSPEC_OPENMP -fopenmp`
- `-fopenmp=libomp -lomp -lamdlibm -ljemalloc -lflang -lflangrti`
Lenovo Global Technology
ThinkSystem SR665
2.75 GHz, AMD EPYC 7453

SPECspeed®2017_fp_base = 192
SPECspeed®2017_fp_peak = 197

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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: -m64 -mno-adx -mno-sse4a -Wl,-mllvm -Wl,-region-vectorize -Wl,-mllvm -Wl,-function-specialize -Ofast -march=znver3

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

644.nab_s (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 -DSPEC_OPENMP -fopenmp
- fopenmp=libomp -lomp -lamdlibm -ljemalloc -lflang

Fortran benchmarks:

603.bwaves_s: basepeak = yes
649.fotonik3d_s: basepeak = yes
654.roms_s: -m64 -mno-adx -mno-sse4a
- W1,-mlvm -W1,-enable-X86-prefetching
- W1,-mlvm -W1,-enable-licm-vrp
- W1,-mlvm -W1,-function-specialize
- W1,-mlvm -W1,-align-all-nofallthru-blocks=6
- W1,-mlvm -W1,-reduce-array-computations=3 -Ofast
- march=znver3 -fveclib=AMDLIBM -ffast-math -Mrecursive
- mlvm -reduce-array-computations=3
- mlvm -global-vectorize-slp=true -mlvm -enable-licm-vrp
- DSPEC_OPENMP -fopenmp -fopenmp=libomp -lomp -lamdlibm
- ljemalloc -lflang

Benchmarks using both Fortran and C:

621.wrf_s: -m64 -mno-adx -mno-sse4a
- W1,-mlvm -W1,-enable-X86-prefetching
- W1,-mlvm -W1,-enable-licm-vrp
- W1,-mlvm -W1,-function-specialize
- W1,-mlvm -W1,-align-all-nofallthru-blocks=6
- W1,-mlvm -W1,-reduce-array-computations=3 -Ofast
- march=znver3 -fveclib=AMDLIBM -ffast-math -fcto
- 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 -Hz,1,0x1 -O3
- Mrecursive -mlvm -fuse-tile-inner-loop -funroll-loops
- mlvm -extra-vectorizer-passes -mlvm -lsr-in-nested-loop
- DSPEC_OPENMP -fopenmp -fopenmp=libomp -lomp -lamdlibm
- ljemalloc -lflang

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ThinkSystem SR665
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SPECspeed®2017_fp_base = 192
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Peak Optimization Flags (Continued)

627.cam4_s: -m64 -mno-adx -mno-sse4a
-Wl,-mllvm -Wl,-enable-X86-prefetching
-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=xnver3 -fveclib=AMDLIBM -ffast-math -ftlo
-fstruct-layout=5 -mllvm -unroll-threshold=50
-fremap-arrays -fly-function-specialization
-mllvm -inline-threshold=1000 -mllvm -enable-gvn-hoist
-mllvm -global-vectorize-slp=true
-mllvm -function-specialize -mllvm -enable-licm-vrp
-mllvm -reduce-array-computations=3 -Mrecursive
-DSPEC_OPENMP -fopenmp -fopenmp=libomp -lomp -lamdlibm
-ljemalloc -lflang

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 SR665**  
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You can also download the XML flags sources by saving the following links:


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