



SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2022 Standard Performance Evaluation Corporation

Lenovo Global Technology

ThinkSystem SR665
2.80 GHz, AMD EPYC 7573X

SPECrate®2017_fp_base = 576

SPECrate®2017_fp_peak = 580

CPU2017 License: 9017

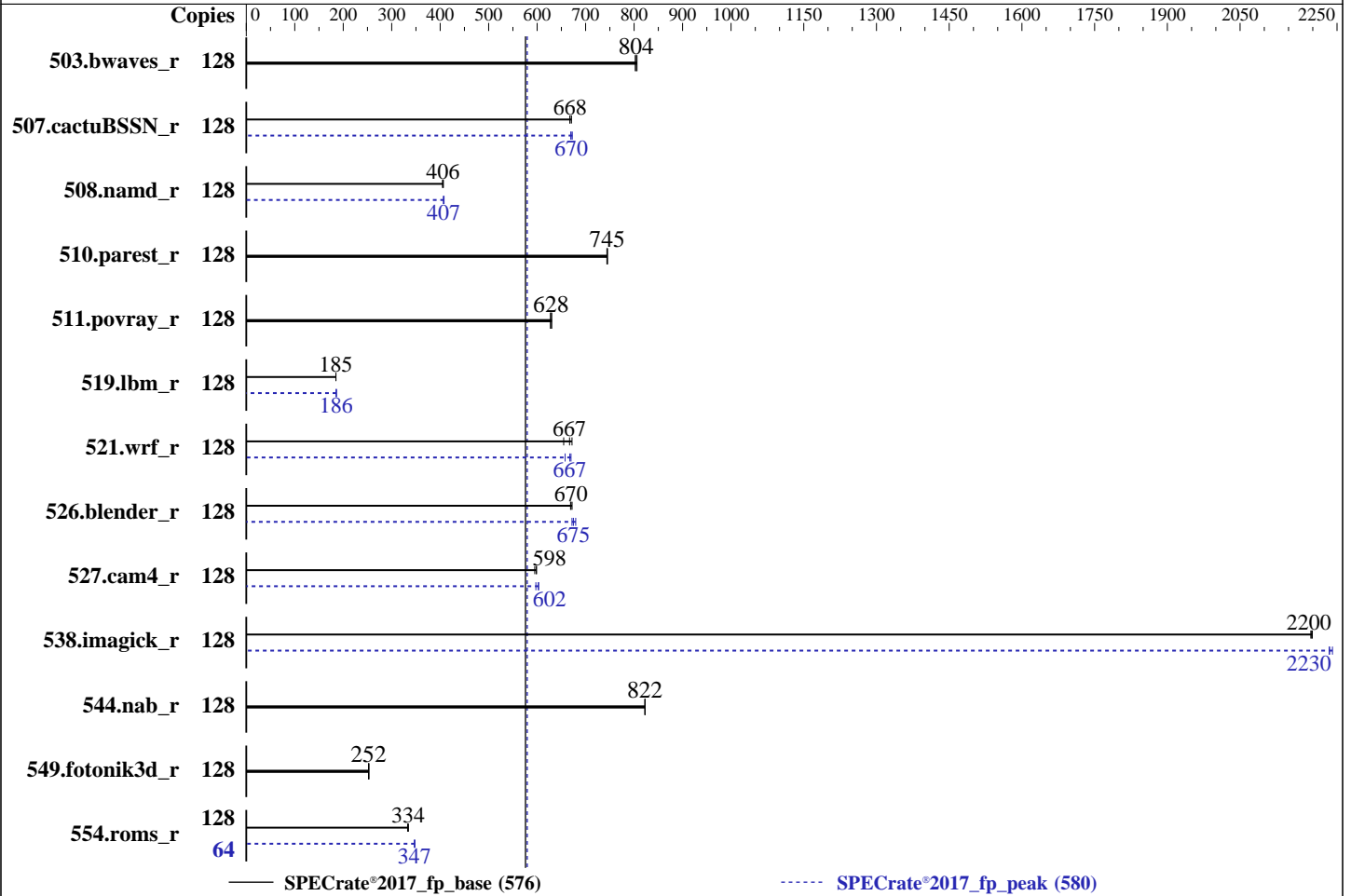
Test Sponsor: Lenovo Global Technology

Tested by: Lenovo Global Technology

Test Date: Aug-2022

Hardware Availability: Aug-2022

Software Availability: Feb-2022



Hardware

CPU Name: AMD EPYC 7573X
 Max MHz: 3600
 Nominal: 2800
 Enabled: 64 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: 768 MB I+D on chip per chip,
 96 MB shared / 4 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 8.5 (Ootpa)
 Kernel 4.18.0-348.el8.x86_64
 Compiler: C/C++/Fortran: Version 3.2.0 of AOCC
 Parallel: No
 Firmware: Lenovo BIOS Version D8E125H 2.41 released Aug-2022
 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 and OS set to prefer performance at the cost of additional power usage



SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2022 Standard Performance Evaluation Corporation

Lenovo Global Technology

ThinkSystem SR665
2.80 GHz, AMD EPYC 7573X

SPECrate®2017_fp_base = 576

SPECrate®2017_fp_peak = 580

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

Test Date: Aug-2022
Hardware Availability: Aug-2022
Software Availability: Feb-2022

Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
503.bwaves_r	128	1593	806	1600	802	<u>1596</u>	<u>804</u>	128	1593	806	1600	802	<u>1596</u>	<u>804</u>
507.cactuBSSN_r	128	243	668	<u>243</u>	<u>668</u>	242	671	128	<u>242</u>	<u>670</u>	242	669	241	673
508.namd_r	128	300	405	<u>300</u>	<u>406</u>	299	407	128	298	408	<u>299</u>	<u>407</u>	299	407
510.parest_r	128	449	745	450	744	<u>450</u>	<u>745</u>	128	449	745	450	744	<u>450</u>	<u>745</u>
511.povray_r	128	474	630	<u>476</u>	<u>628</u>	476	628	128	474	630	<u>476</u>	<u>628</u>	476	628
519.lbm_r	128	730	185	<u>730</u>	<u>185</u>	729	185	128	726	186	<u>727</u>	<u>186</u>	727	186
521.wrf_r	128	<u>430</u>	<u>667</u>	427	672	438	655	128	436	658	428	670	<u>430</u>	<u>667</u>
526.blender_r	128	290	672	<u>291</u>	<u>670</u>	291	669	128	<u>289</u>	<u>675</u>	287	680	290	672
527.cam4_r	128	376	595	<u>374</u>	<u>598</u>	374	599	128	375	597	<u>372</u>	<u>602</u>	371	603
538.imagick_r	128	145	2200	<u>145</u>	<u>2200</u>	145	2200	128	<u>142</u>	<u>2230</u>	142	2230	142	2240
544.nab_r	128	262	822	<u>262</u>	<u>822</u>	262	823	128	262	822	<u>262</u>	<u>822</u>	262	823
549.fotonik3d_r	128	1971	253	<u>1976</u>	<u>252</u>	1978	252	128	1971	253	<u>1976</u>	<u>252</u>	1978	252
554.roms_r	128	611	333	<u>609</u>	<u>334</u>	608	334	64	293	347	292	348	<u>293</u>	<u>347</u>

SPECrate®2017_fp_base = **576**

SPECrate®2017_fp_peak = **580**

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 limit
'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>

To limit dirty cache to 8% of memory, 'sysctl -w vm.dirty_ratio=8' run as root.
To limit swap usage to minimum necessary, 'sysctl -w vm.swappiness=1' run as root.
To free node-local memory and avoid remote memory usage,
'sysctl -w vm.zone_reclaim_mode=1' run as root.

(Continued on next page)



SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2022 Standard Performance Evaluation Corporation

Lenovo Global Technology

ThinkSystem SR665
2.80 GHz, AMD EPYC 7573X

SPECrate®2017_fp_base = 576

SPECrate®2017_fp_peak = 580

CPU2017 License: 9017

Test Sponsor: Lenovo Global Technology

Tested by: Lenovo Global Technology

Test Date: Aug-2022

Hardware Availability: Aug-2022

Software Availability: Feb-2022

Operating System Notes (Continued)

To clear filesystem caches, 'sync; sysctl -w vm.drop_caches=3' run as root.
To disable address space layout randomization (ASLR) to reduce run-to-run variability, 'sysctl -w kernel.randomize_va_space=0' run as root.

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.

Environment Variables Notes

Environment variables set by runcpu before the start of the run:

```
LD_LIBRARY_PATH =  
    "/home/cpu2017-1.1.8-amd-milanx-aocc320-A1/amd_rate_aocc320_milanx_A_lib  
    /lib;/home/cpu2017-1.1.8-amd-milanx-aocc320-A1/amd_rate_aocc320_milanx_A  
    _lib/lib32:"  
MALLOCONF = "retain:true"
```

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>

Platform Notes

BIOS configuration:

Operating Mode set to Maximum Performance and then set it to Custom Mode

NUMA Nodes per Socket set to NPS4

ACPI SRAT L3 Cache as NUMA Domain set to Enable

Memory interleaving set to Disabled

Sysinfo program /home/cpu2017-1.1.8-amd-milanx-aocc320-A1/bin/sysinfo

Rev: r6622 of 2021-04-07 982a61ec0915b55891ef0e16acafc64d

(Continued on next page)



SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2022 Standard Performance Evaluation Corporation

Lenovo Global Technology

ThinkSystem SR665
2.80 GHz, AMD EPYC 7573X

SPECrate®2017_fp_base = 576

SPECrate®2017_fp_peak = 580

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

Test Date: Aug-2022
Hardware Availability: Aug-2022
Software Availability: Feb-2022

Platform Notes (Continued)

running on localhost.localdomain Fri Aug 19 21:08:45 2022

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 7573X 32-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 : 32
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
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
```

```
From lscpu from util-linux 2.32.1:
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:    2
Core(s) per socket:    32
Socket(s):             2
NUMA node(s):         16
Vendor ID:             AuthenticAMD
BIOS Vendor ID:       Advanced Micro Devices, Inc.
CPU family:            25
Model:                1
Model name:           AMD EPYC 7573X 32-Core Processor
BIOS Model name:      AMD EPYC 7573X 32-Core Processor
Stepping:             2
CPU MHz:              2800.000
CPU max MHz:          3623.0459
CPU min MHz:          1500.0000
BogoMIPS:             5589.38
Virtualization:       AMD-V
L1d cache:            32K
L1i cache:            32K
L2 cache:             512K
L3 cache:             98304K
NUMA node0 CPU(s):    0-3,64-67
NUMA node1 CPU(s):    4-7,68-71
```

(Continued on next page)



SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2022 Standard Performance Evaluation Corporation

Lenovo Global Technology

ThinkSystem SR665
2.80 GHz, AMD EPYC 7573X

SPECrate®2017_fp_base = 576

SPECrate®2017_fp_peak = 580

CPU2017 License: 9017

Test Sponsor: Lenovo Global Technology

Tested by: Lenovo Global Technology

Test Date: Aug-2022

Hardware Availability: Aug-2022

Software Availability: Feb-2022

Platform Notes (Continued)

```

NUMA node2 CPU(s): 8-11,72-75
NUMA node3 CPU(s): 12-15,76-79
NUMA node4 CPU(s): 16-19,80-83
NUMA node5 CPU(s): 20-23,84-87
NUMA node6 CPU(s): 24-27,88-91
NUMA node7 CPU(s): 28-31,92-95
NUMA node8 CPU(s): 32-35,96-99
NUMA node9 CPU(s): 36-39,100-103
NUMA node10 CPU(s): 40-43,104-107
NUMA node11 CPU(s): 44-47,108-111
NUMA node12 CPU(s): 48-51,112-115
NUMA node13 CPU(s): 52-55,116-119
NUMA node14 CPU(s): 56-59,120-123
NUMA node15 CPU(s): 60-63,124-127

```

```

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 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 bpext perfctr_llc mwaitx cpb
cat_l3 cdp_l3 invpcid_single hw_pstate ssbd mba ibrs ibpb stibp vmmcall fsgsbase
bmi1 avx2 smep bmi2 erms invpcid cqm rdt_a rdseed adx smap clflushopt clwb sha_ni
xsaveopt xsavec xgetbv1 xsaves cqm_llc cqm_occup_llc cqm_mbm_total cqm_mbm_local
clzero irperf xsaveerptr wbnoinvd amd_ppin arat npt lbrv svm_lock nrip_save
tsc_scale vmcb_clean flushbyasid decodeassists pausefilter pfthreshold
v_vmsave_vmload vgif v_spec_ctrl umip pku ospke vaes vpclmulqdq rdpid overflow_recov
succor smca fsrm sme sev sev_es

```

```

/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: 16 nodes (0-15)
node 0 cpus: 0 1 2 3 64 65 66 67
node 0 size: 32005 MB
node 0 free: 31890 MB
node 1 cpus: 4 5 6 7 68 69 70 71
node 1 size: 32252 MB
node 1 free: 32155 MB
node 2 cpus: 8 9 10 11 72 73 74 75
node 2 size: 32254 MB
node 2 free: 32086 MB
node 3 cpus: 12 13 14 15 76 77 78 79
node 3 size: 32253 MB
node 3 free: 32115 MB
node 4 cpus: 16 17 18 19 80 81 82 83

```

(Continued on next page)



SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2022 Standard Performance Evaluation Corporation

Lenovo Global Technology

ThinkSystem SR665
2.80 GHz, AMD EPYC 7573X

SPECrate®2017_fp_base = 576

SPECrate®2017_fp_peak = 580

CPU2017 License: 9017

Test Sponsor: Lenovo Global Technology

Tested by: Lenovo Global Technology

Test Date: Aug-2022

Hardware Availability: Aug-2022

Software Availability: Feb-2022

Platform Notes (Continued)

```

node 4 size: 32254 MB
node 4 free: 32113 MB
node 5 cpus: 20 21 22 23 84 85 86 87
node 5 size: 32253 MB
node 5 free: 32123 MB
node 6 cpus: 24 25 26 27 88 89 90 91
node 6 size: 32216 MB
node 6 free: 32125 MB
node 7 cpus: 28 29 30 31 92 93 94 95
node 7 size: 32241 MB
node 7 free: 32141 MB
node 8 cpus: 32 33 34 35 96 97 98 99
node 8 size: 32254 MB
node 8 free: 32150 MB
node 9 cpus: 36 37 38 39 100 101 102 103
node 9 size: 32253 MB
node 9 free: 32150 MB
node 10 cpus: 40 41 42 43 104 105 106 107
node 10 size: 32254 MB
node 10 free: 32159 MB
node 11 cpus: 44 45 46 47 108 109 110 111
node 11 size: 32253 MB
node 11 free: 32163 MB
node 12 cpus: 48 49 50 51 112 113 114 115
node 12 size: 32254 MB
node 12 free: 32164 MB
node 13 cpus: 52 53 54 55 116 117 118 119
node 13 size: 32253 MB
node 13 free: 32156 MB
node 14 cpus: 56 57 58 59 120 121 122 123
node 14 size: 32254 MB
node 14 free: 32147 MB
node 15 cpus: 60 61 62 63 124 125 126 127
node 15 size: 32252 MB
node 15 free: 32049 MB
node distances:
node  0  1  2  3  4  5  6  7  8  9 10 11 12 13 14 15
 0:  10 11 12 12 12 12 12 12 32 32 32 32 32 32 32 32
 1:  11 10 12 12 12 12 12 12 32 32 32 32 32 32 32 32
 2:  12 12 10 11 12 12 12 12 32 32 32 32 32 32 32 32
 3:  12 12 11 10 12 12 12 12 32 32 32 32 32 32 32 32
 4:  12 12 12 12 10 11 12 12 32 32 32 32 32 32 32 32
 5:  12 12 12 12 11 10 12 12 32 32 32 32 32 32 32 32
 6:  12 12 12 12 12 12 10 11 32 32 32 32 32 32 32 32
 7:  12 12 12 12 12 12 11 10 32 32 32 32 32 32 32 32
 8:  32 32 32 32 32 32 32 32 10 11 12 12 12 12 12 12
 9:  32 32 32 32 32 32 32 32 11 10 12 12 12 12 12 12

```

(Continued on next page)



SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2022 Standard Performance Evaluation Corporation

Lenovo Global Technology

ThinkSystem SR665
2.80 GHz, AMD EPYC 7573X

SPECrate®2017_fp_base = 576

SPECrate®2017_fp_peak = 580

CPU2017 License: 9017

Test Sponsor: Lenovo Global Technology

Tested by: Lenovo Global Technology

Test Date: Aug-2022

Hardware Availability: Aug-2022

Software Availability: Feb-2022

Platform Notes (Continued)

10:	32	32	32	32	32	32	32	32	12	12	10	11	12	12	12
11:	32	32	32	32	32	32	32	32	12	12	11	10	12	12	12
12:	32	32	32	32	32	32	32	32	12	12	12	12	10	11	12
13:	32	32	32	32	32	32	32	32	12	12	12	12	11	10	12
14:	32	32	32	32	32	32	32	32	12	12	12	12	12	12	10
15:	32	32	32	32	32	32	32	32	12	12	12	12	12	12	11

From /proc/meminfo

```
MemTotal:      528137060 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="8.5 (Ootpa)"
ID="rhel"
ID_LIKE="fedora"
VERSION_ID="8.5"
PLATFORM_ID="platform:el8"
PRETTY_NAME="Red Hat Enterprise Linux 8.5 (Ootpa)"
ANSI_COLOR="0;31"
redhat-release: Red Hat Enterprise Linux release 8.5 (Ootpa)
system-release: Red Hat Enterprise Linux release 8.5 (Ootpa)
system-release-cpe: cpe:/o:redhat:enterprise_linux:8::baseos
```

uname -a:

```
Linux localhost.localdomain 4.18.0-348.el8.x86_64 #1 SMP Mon Oct 4 12:17:22 EDT 2021
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

(Continued on next page)



SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2022 Standard Performance Evaluation Corporation

Lenovo Global Technology

ThinkSystem SR665
2.80 GHz, AMD EPYC 7573X

SPECrate®2017_fp_base = 576

SPECrate®2017_fp_peak = 580

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

Test Date: Aug-2022
Hardware Availability: Aug-2022
Software Availability: Feb-2022

Platform Notes (Continued)

```

CVE-2017-5715 (Spectre variant 2): sanitization
Mitigation: Full AMD retpoline,
IBPB: conditional, IBRS_FW, STIBP:
always-on, RSB filling
CVE-2020-0543 (Special Register Buffer Data Sampling): Not affected
CVE-2019-11135 (TSX Asynchronous Abort): Not affected

```

run-level 3 Aug 19 21:02

```

SPEC is set to: /home/cpu2017-1.1.8-amd-milanx-aocc320-A1
Filesystem      Type  Size  Used Avail Use% Mounted on
/dev/sda4       xfs   819G  351G  468G  43% /home

```

```

From /sys/devices/virtual/dmi/id
Vendor:          Lenovo
Product:         ThinkSystem SR665-2S
Product Family: ThinkSystem
Serial:          1234567890

```

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

```

```

BIOS:
  BIOS Vendor:      Lenovo
  BIOS Version:     D8E125H-2.41
  BIOS Date:        07/08/2022
  BIOS Revision:    2.41
  Firmware Revision: 4.12

```

(End of data from sysinfo program)

Compiler Version Notes

```

=====
C          | 519.lbm_r(base, peak) 538.imagick_r(base, peak)
          | 544.nab_r(base, peak)
=====

```

```

AMD clang version 13.0.0 (CLANG: AOCC_3.2.0-Build#128 2021_11_12) (based on
LLVM Mirror.Version.13.0.0)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.2.0/bin

```

(Continued on next page)



SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2022 Standard Performance Evaluation Corporation

Lenovo Global Technology

ThinkSystem SR665
2.80 GHz, AMD EPYC 7573X

SPECrate®2017_fp_base = 576

SPECrate®2017_fp_peak = 580

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

Test Date: Aug-2022
Hardware Availability: Aug-2022
Software Availability: Feb-2022

Compiler Version Notes (Continued)

=====
C++ | 508.namd_r(base, peak) 510.parest_r(base, peak)
=====

AMD clang version 13.0.0 (CLANG: AOCC_3.2.0-Build#128 2021_11_12) (based on LLVM Mirror.Version.13.0.0)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.2.0/bin
=====

=====
C++, C | 511.povray_r(base, peak) 526.blender_r(base, peak)
=====

AMD clang version 13.0.0 (CLANG: AOCC_3.2.0-Build#128 2021_11_12) (based on LLVM Mirror.Version.13.0.0)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.2.0/bin
AMD clang version 13.0.0 (CLANG: AOCC_3.2.0-Build#128 2021_11_12) (based on LLVM Mirror.Version.13.0.0)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.2.0/bin
=====

=====
C++, C, Fortran | 507.cactuBSSN_r(base, peak)
=====

AMD clang version 13.0.0 (CLANG: AOCC_3.2.0-Build#128 2021_11_12) (based on LLVM Mirror.Version.13.0.0)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.2.0/bin
AMD clang version 13.0.0 (CLANG: AOCC_3.2.0-Build#128 2021_11_12) (based on LLVM Mirror.Version.13.0.0)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.2.0/bin
AMD clang version 13.0.0 (CLANG: AOCC_3.2.0-Build#128 2021_11_12) (based on LLVM Mirror.Version.13.0.0)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.2.0/bin
=====

(Continued on next page)



SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2022 Standard Performance Evaluation Corporation

Lenovo Global Technology

ThinkSystem SR665
2.80 GHz, AMD EPYC 7573X

SPECrate®2017_fp_base = 576

SPECrate®2017_fp_peak = 580

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

Test Date: Aug-2022
Hardware Availability: Aug-2022
Software Availability: Feb-2022

Compiler Version Notes (Continued)

=====
Fortran | 503.bwaves_r(base, peak) 549.fotonik3d_r(base, peak)
| 554.roms_r(base, peak)
=====

AMD clang version 13.0.0 (CLANG: AOCC_3.2.0-Build#128 2021_11_12) (based on LLVM Mirror.Version.13.0.0)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.2.0/bin
=====

=====
Fortran, C | 521.wrf_r(base, peak) 527.cam4_r(base, peak)
=====

AMD clang version 13.0.0 (CLANG: AOCC_3.2.0-Build#128 2021_11_12) (based on LLVM Mirror.Version.13.0.0)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.2.0/bin
AMD clang version 13.0.0 (CLANG: AOCC_3.2.0-Build#128 2021_11_12) (based on LLVM Mirror.Version.13.0.0)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.2.0/bin
=====

Base Compiler Invocation

C benchmarks:
clang

C++ benchmarks:
clang++

Fortran benchmarks:
flang

Benchmarks using both Fortran and C:
flang clang

Benchmarks using both C and C++:
clang++ clang

Benchmarks using Fortran, C, and C++:
clang++ clang flang



SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2022 Standard Performance Evaluation Corporation

Lenovo Global Technology

ThinkSystem SR665
2.80 GHz, AMD EPYC 7573X

SPECrate®2017_fp_base = 576

SPECrate®2017_fp_peak = 580

CPU2017 License: 9017

Test Sponsor: Lenovo Global Technology

Tested by: Lenovo Global Technology

Test Date: Aug-2022

Hardware Availability: Aug-2022

Software Availability: Feb-2022

Base Portability Flags

```

503.bwaves_r: -DSPEC_LP64
507.cactuBSSN_r: -DSPEC_LP64
508.namd_r: -DSPEC_LP64
510.parest_r: -DSPEC_LP64
511.povray_r: -DSPEC_LP64
519.lbm_r: -DSPEC_LP64
521.wrf_r: -DSPEC_CASE_FLAG -Mbyteswapio -DSPEC_LP64
526.blender_r: -funsigned-char -D__BOOL_DEFINED -DSPEC_LP64
527.cam4_r: -DSPEC_CASE_FLAG -DSPEC_LP64
538.imagick_r: -DSPEC_LP64
544.nab_r: -DSPEC_LP64
549.fotonik3d_r: -DSPEC_LP64
554.roms_r: -DSPEC_LP64

```

Base Optimization Flags

C benchmarks:

```

-m64 -flto -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
-Wl,-mllvm -Wl,-enable-loop-fusion -O3 -march=znver3 -fveclib=AMDLIBM
-ffast-math -fstruct-layout=5 -mllvm -unroll-threshold=50
-mllvm -inline-threshold=1000 -fremap-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-loop-fusion -z muldefs -lamdlibm -ljemalloc -lflang

```

C++ benchmarks:

```

-m64 -std=c++98 -mno-adx -mno-sse4a
-Wl,-mllvm -Wl,-x86-use-vzeroupper=false -flto
-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
-Wl,-mllvm -Wl,-enable-loop-fusion -O3 -march=znver3 -fveclib=AMDLIBM
-ffast-math -mllvm -enable-partial-unswitch
-mllvm -unroll-threshold=100 -finline-aggressive
-flv-function-specialization -mllvm -loop-unswitch-threshold=200000
-mllvm -reroll-loops -mllvm -aggressive-loop-unswitch
-mllvm -extra-vectorizer-passes -mllvm -reduce-array-computations=3
-mllvm -global-vectorize-slp=true -mllvm -convert-pow-exp-to-int=false
-mllvm -enable-loop-fusion -z muldefs -lamdlibm -ljemalloc -lflang

```

(Continued on next page)



SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2022 Standard Performance Evaluation Corporation

Lenovo Global Technology

ThinkSystem SR665
2.80 GHz, AMD EPYC 7573X

SPECrate®2017_fp_base = 576

SPECrate®2017_fp_peak = 580

CPU2017 License: 9017

Test Sponsor: Lenovo Global Technology

Tested by: Lenovo Global Technology

Test Date: Aug-2022

Hardware Availability: Aug-2022

Software Availability: Feb-2022

Base Optimization Flags (Continued)

Fortran benchmarks:

```

-m64 -Wl,-mllvm -Wl,-enable-X86-prefetching
-Wl,-mllvm -Wl,-enable-licm-vrp -flto -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
-Wl,-mllvm -Wl,-enable-loop-fusion -Hz,1,0x1 -O3 -march=znver3
-fveclib=AMDLIBM -ffast-math -Kieee -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 -mllvm -enable-loop-fusion
-mllvm -enable-loopinterchange -mllvm -compute-interchange-order
-z muldefs -lamdlibm -ljemalloc -lflang

```

Benchmarks using both Fortran and C:

```

-m64 -Wl,-mllvm -Wl,-enable-X86-prefetching
-Wl,-mllvm -Wl,-enable-licm-vrp -flto -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
-Wl,-mllvm -Wl,-enable-loop-fusion -O3 -march=znver3 -fveclib=AMDLIBM
-ffast-math -fstruct-layout=5 -mllvm -unroll-threshold=50
-mllvm -inline-threshold=1000 -fremap-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-loop-fusion -Hz,1,0x1 -Kieee -Mrecursive
-mllvm -fuse-tile-inner-loop -funroll-loops
-mllvm -extra-vectorizer-passes -mllvm -lsr-in-nested-loop
-mllvm -enable-loopinterchange -mllvm -compute-interchange-order
-z muldefs -lamdlibm -ljemalloc -lflang

```

Benchmarks using both C and C++:

```

-m64 -std=c++98 -mno-adx -mno-sse4a
-Wl,-mllvm -Wl,-x86-use-vzeroupper=false -flto
-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
-Wl,-mllvm -Wl,-enable-loop-fusion -O3 -march=znver3 -fveclib=AMDLIBM
-ffast-math -fstruct-layout=5 -mllvm -unroll-threshold=50
-mllvm -inline-threshold=1000 -fremap-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-loop-fusion -mllvm -enable-partial-unswitch

```

(Continued on next page)



SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2022 Standard Performance Evaluation Corporation

Lenovo Global Technology

ThinkSystem SR665
2.80 GHz, AMD EPYC 7573X

SPECrate®2017_fp_base = 576

SPECrate®2017_fp_peak = 580

CPU2017 License: 9017

Test Sponsor: Lenovo Global Technology

Tested by: Lenovo Global Technology

Test Date: Aug-2022

Hardware Availability: Aug-2022

Software Availability: Feb-2022

Base Optimization Flags (Continued)

Benchmarks using both C and C++ (continued):

```
-mllvm -unroll-threshold=100 -finline-aggressive
-mllvm -loop-unswitch-threshold=200000 -mllvm -reroll-loops
-mllvm -aggressive-loop-unswitch -mllvm -extra-vectorizer-passes
-mllvm -convert-pow-exp-to-int=false -z muldefs -lamdlibm -ljemalloc
-lflang
```

Benchmarks using Fortran, C, and C++:

```
-m64 -std=c++98 -mno-adx -mno-sse4a
-Wl,-mllvm -Wl,-x86-use-vzeroupper=false -flto
-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
-Wl,-mllvm -Wl,-enable-loop-fusion -O3 -march=znver3 -fveclib=AMDLIBM
-ffast-math -fstruct-layout=5 -mllvm -unroll-threshold=50
-mllvm -inline-threshold=1000 -fremap-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-loop-fusion -mllvm -enable-partial-unswitch
-mllvm -unroll-threshold=100 -finline-aggressive
-mllvm -loop-unswitch-threshold=200000 -mllvm -reroll-loops
-mllvm -aggressive-loop-unswitch -mllvm -extra-vectorizer-passes
-mllvm -convert-pow-exp-to-int=false -Hz,1,0x1 -Kieee -Mrecursive
-mllvm -fuse-tile-inner-loop -funroll-loops -mllvm -lsr-in-nested-loop
-mllvm -enable-loopinterchange -mllvm -compute-interchange-order
-z muldefs -lamdlibm -ljemalloc -lflang
```

Base Other Flags

C benchmarks:

```
-Wno-unused-command-line-argument
```

C++ benchmarks:

```
-Wno-unused-command-line-argument
```

Fortran benchmarks:

```
-Wno-unused-command-line-argument
```

Benchmarks using both Fortran and C:

```
-Wno-unused-command-line-argument
```

Benchmarks using both C and C++:

```
-Wno-unused-command-line-argument
```

(Continued on next page)



SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2022 Standard Performance Evaluation Corporation

Lenovo Global Technology

ThinkSystem SR665
2.80 GHz, AMD EPYC 7573X

SPECrate®2017_fp_base = 576

SPECrate®2017_fp_peak = 580

CPU2017 License: 9017

Test Sponsor: Lenovo Global Technology

Tested by: Lenovo Global Technology

Test Date: Aug-2022

Hardware Availability: Aug-2022

Software Availability: Feb-2022

Base Other Flags (Continued)

Benchmarks using Fortran, C, and C++:

-Wno-unused-command-line-argument

Peak Compiler Invocation

C benchmarks:

clang

C++ benchmarks:

clang++

Fortran benchmarks:

flang

Benchmarks using both Fortran and C:

flang clang

Benchmarks using both C and C++:

clang++ clang

Benchmarks using Fortran, C, and C++:

clang++ clang flang

Peak Portability Flags

Same as Base Portability Flags

Peak Optimization Flags

C benchmarks:

```
519.lbm_r: -m64 -flto -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
-fstruct-layout=7 -mllvm -unroll-threshold=50
-fremap-arrays -flv-function-specialization
-mllvm -inline-threshold=1000 -mllvm -enable-gvn-hoist
```

(Continued on next page)



SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2022 Standard Performance Evaluation Corporation

Lenovo Global Technology

SPECrate®2017_fp_base = 576

ThinkSystem SR665
2.80 GHz, AMD EPYC 7573X

SPECrate®2017_fp_peak = 580

CPU2017 License: 9017

Test Sponsor: Lenovo Global Technology

Tested by: Lenovo Global Technology

Test Date: Aug-2022

Hardware Availability: Aug-2022

Software Availability: Feb-2022

Peak Optimization Flags (Continued)

519.lbm_r (continued):

```
-mllvm -global-vectorize-slp=true  
-mllvm -function-specialize -mllvm -enable-licm-vrp  
-mllvm -reduce-array-computations=3 -lamdlibm -ljemalloc
```

538.imagick_r: Same as 519.lbm_r

544.nab_r: basepeak = yes

C++ benchmarks:

```
508.namd_r: -m64 -std=c++98 -mno-adx -mno-sse4a  
-Wl,-mllvm -Wl,-x86-use-vzeroupper=false  
-Wl,-mllvm -Wl,-enable-licm-vrp -flto  
-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  
-finline-aggressive -mllvm -unroll-threshold=100  
-flv-function-specialization -mllvm -enable-licm-vrp  
-mllvm -reroll-loops -mllvm -aggressive-loop-unswitch  
-mllvm -reduce-array-computations=3  
-mllvm -global-vectorize-slp=true -lamdlibm -ljemalloc
```

510.parest_r: basepeak = yes

Fortran benchmarks:

503.bwaves_r: basepeak = yes

549.fotonik3d_r: basepeak = yes

```
554.roms_r: -m64 -Wl,-mllvm -Wl,-enable-X86-prefetching  
-Wl,-mllvm -Wl,-enable-licm-vrp -flto  
-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  
-Hz,1,0x1 -mllvm -fuse-tile-inner-loop -lamdlibm  
-ljemalloc -lflang
```

Benchmarks using both Fortran and C:

(Continued on next page)



SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2022 Standard Performance Evaluation Corporation

Lenovo Global Technology

ThinkSystem SR665
2.80 GHz, AMD EPYC 7573X

SPECrate®2017_fp_base = 576

SPECrate®2017_fp_peak = 580

CPU2017 License: 9017

Test Sponsor: Lenovo Global Technology

Tested by: Lenovo Global Technology

Test Date: Aug-2022

Hardware Availability: Aug-2022

Software Availability: Feb-2022

Peak Optimization Flags (Continued)

```
521.wrf_r: -m64 -Wl,-mllvm -Wl,-enable-X86-prefetching
-Wl,-mllvm -Wl,-enable-licm-vrp -flto
-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
-fstruct-layout=7 -mllvm -unroll-threshold=50
-freemap-arrays -flv-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 -lamdlibm
-ljemalloc -lflang
```

```
527.cam4_r: -m64 -Wl,-mllvm -Wl,-enable-X86-prefetching
-Wl,-mllvm -Wl,-enable-licm-vrp -flto
-Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-force-vector-interleave=1 -Ofast
-march=znver3 -fveclib=AMDLIBM -ffast-math
-fstruct-layout=7 -mllvm -unroll-threshold=50
-freemap-arrays -flv-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 -O3 -funroll-loops
-mllvm -extra-vectorizer-passes -mllvm -lsr-in-nested-loop
-Mrecursive -Hz,1,0x1 -mllvm -enable-loopinterchange
-mllvm -compute-interchange-order -lamdlibm -ljemalloc
-lflang
```

Benchmarks using both C and C++:

511.povray_r: basepeak = yes

```
526.blender_r: -m64 -std=c++98 -mno-adx -mno-sse4a
-Wl,-mllvm -Wl,-x86-use-vzeroupper=false
-Wl,-mllvm -Wl,-enable-licm-vrp -flto
-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
-fstruct-layout=7 -mllvm -unroll-threshold=50
-freemap-arrays -flv-function-specialization
-mllvm -inline-threshold=1000 -mllvm -enable-gvn-hoist
-mllvm -global-vectorize-slp=true
-mllvm -function-specialize -mllvm -enable-licm-vrp
```

(Continued on next page)



SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2022 Standard Performance Evaluation Corporation

Lenovo Global Technology

ThinkSystem SR665
2.80 GHz, AMD EPYC 7573X

SPECrate®2017_fp_base = 576

SPECrate®2017_fp_peak = 580

CPU2017 License: 9017

Test Sponsor: Lenovo Global Technology

Tested by: Lenovo Global Technology

Test Date: Aug-2022

Hardware Availability: Aug-2022

Software Availability: Feb-2022

Peak Optimization Flags (Continued)

526.blender_r (continued):

```
-mllvm -reduce-array-computations=3 -finline-aggressive
-mllvm -unroll-threshold=100 -mllvm -reroll-loops
-mllvm -aggressive-loop-unswitch -lamdlibm -ljemalloc
```

Benchmarks using Fortran, C, and C++:

```
-m64 -std=c++98 -mno-adx -mno-sse4a
-Wl,-mllvm -Wl,-x86-use-vzeroupper=false -Wl,-mllvm -Wl,-enable-licm-vrp
-flto -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 -fstruct-layout=7
-mllvm -unroll-threshold=50 -fremap-arrays -flv-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
-mllvm -unroll-threshold=100 -mllvm -loop-unswitch-threshold=200000
-finline-aggressive -mllvm -reroll-loops
-mllvm -aggressive-loop-unswitch -mllvm -extra-vectorizer-passes
-mllvm -convert-pow-exp-to-int=false -Mrecursive -lamdlibm -ljemalloc
-lflang
```

Peak Other Flags

C benchmarks:

```
-Wno-unused-command-line-argument
```

C++ benchmarks:

```
-Wno-unused-command-line-argument
```

Fortran benchmarks:

```
-Wno-unused-command-line-argument
```

Benchmarks using both Fortran and C:

```
-Wno-unused-command-line-argument
```

Benchmarks using both C and C++:

```
-Wno-unused-command-line-argument
```

Benchmarks using Fortran, C, and C++:

```
-Wno-unused-command-line-argument
```



SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2022 Standard Performance Evaluation Corporation

Lenovo Global Technology

ThinkSystem SR665
2.80 GHz, AMD EPYC 7573X

SPECrate®2017_fp_base = 576

SPECrate®2017_fp_peak = 580

CPU2017 License: 9017

Test Sponsor: Lenovo Global Technology

Tested by: Lenovo Global Technology

Test Date: Aug-2022

Hardware Availability: Aug-2022

Software Availability: Feb-2022

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-MilanX-L.html>

<http://www.spec.org/cpu2017/flags/aocc320-flags-A1.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-MilanX-L.xml>

<http://www.spec.org/cpu2017/flags/aocc320-flags-A1.xml>

SPEC CPU and SPECrate 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 2022-08-19 09:08:45-0400.

Report generated on 2022-09-27 17:14:15 by CPU2017 PDF formatter v6442.

Originally published on 2022-09-27.