



SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2021 Standard Performance Evaluation Corporation

Lenovo Global Technology

ThinkSystem SR635
2.00 GHz, AMD EPYC 7713P

SPECrate®2017_fp_base = 298

SPECrate®2017_fp_peak = 317

CPU2017 License: 9017

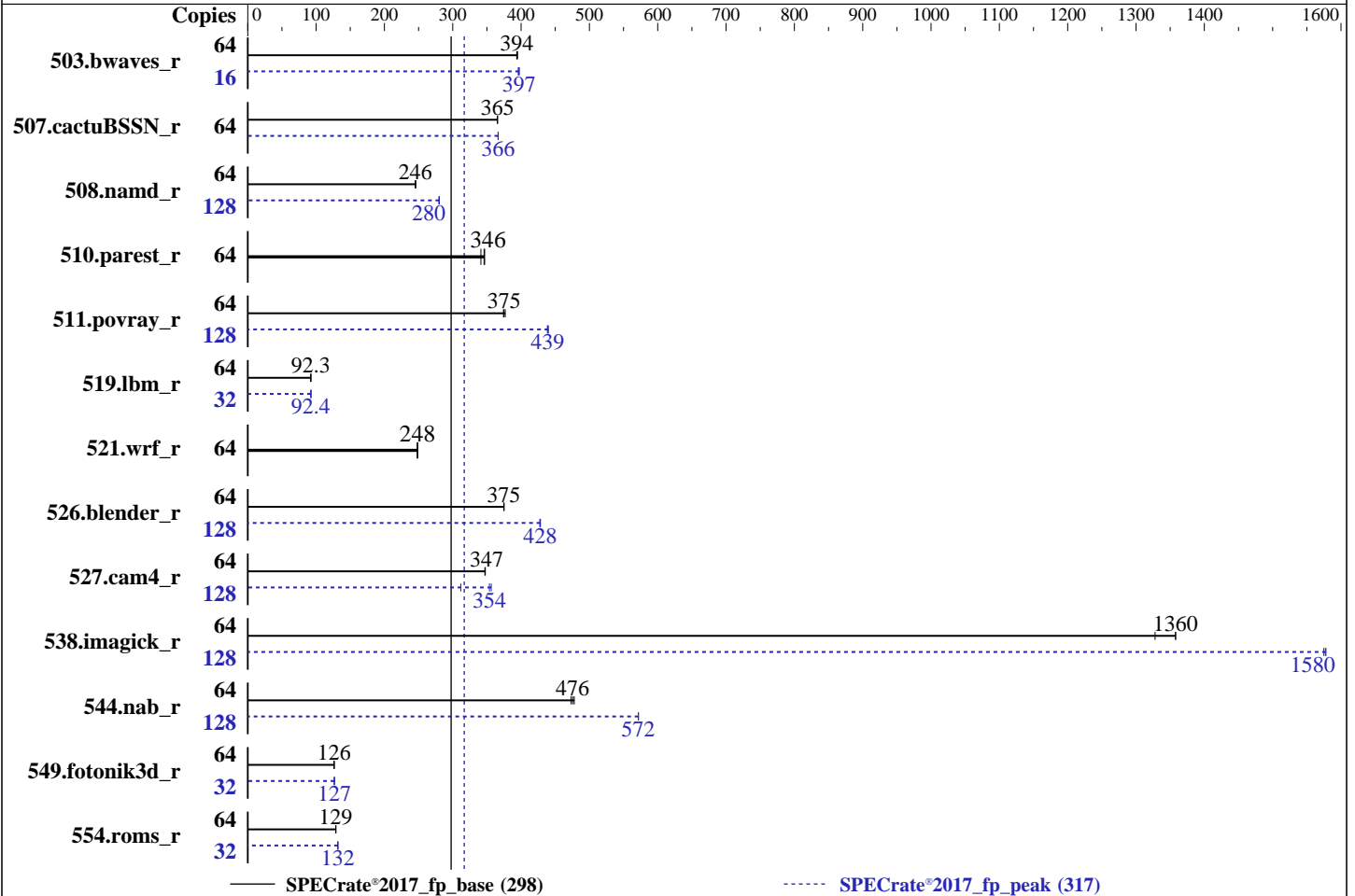
Test Sponsor: Lenovo Global Technology

Tested by: Lenovo Global Technology

Test Date: Aug-2021

Hardware Availability: Jun-2021

Software Availability: Mar-2021



Hardware

CPU Name: AMD EPYC 7713P
 Max MHz: 3675
 Nominal: 2000
 Enabled: 64 cores, 1 chip, 2 threads/core
 Orderable: 1 chip
 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: 256 GB (8 x 32 GB 2Rx4 PC4-3200AA-R)
 Storage: 1 x 960 GB SATA SSD
 Other: None

Software

OS: SUSE Linux Enterprise Server 15 SP2 (x86_64)
 Kernel 5.3.18-22-default
 Compiler: C/C++/Fortran: Version 3.0.0 of AOCC
 Parallel: No
 Firmware: Lenovo BIOS Version CFE125U 6.0 released May-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 and OS set to prefer performance at the cost of additional power usage



SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2021 Standard Performance Evaluation Corporation

Lenovo Global Technology

ThinkSystem SR635
2.00 GHz, AMD EPYC 7713P

SPECrate®2017_fp_base = 298

SPECrate®2017_fp_peak = 317

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

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

Results Table

Benchmark	Base						Peak							
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
503.bwaves_r	64	1626	395	<u>1629</u>	<u>394</u>	1630	394	16	<u>404</u>	<u>397</u>	404	397	405	396
507.cactuBSSN_r	64	<u>222</u>	<u>365</u>	222	366	222	365	64	<u>221</u>	<u>366</u>	221	367	221	366
508.namd_r	64	248	245	247	246	<u>248</u>	<u>246</u>	128	435	280	<u>434</u>	<u>280</u>	434	280
510.parest_r	64	483	347	491	341	<u>484</u>	<u>346</u>	64	483	347	491	341	<u>484</u>	<u>346</u>
511.povray_r	64	399	374	397	377	<u>399</u>	<u>375</u>	128	<u>681</u>	<u>439</u>	679	440	682	439
519.lbm_r	64	731	92.2	731	92.3	<u>731</u>	<u>92.3</u>	32	365	92.4	<u>365</u>	<u>92.4</u>	365	92.3
521.wrf_r	64	<u>577</u>	<u>248</u>	577	248	578	248	64	<u>577</u>	<u>248</u>	577	248	578	248
526.blender_r	64	260	375	260	375	<u>260</u>	<u>375</u>	128	456	427	455	428	<u>455</u>	<u>428</u>
527.cam4_r	64	322	348	322	347	<u>322</u>	<u>347</u>	128	<u>633</u>	<u>354</u>	628	356	718	312
538.imagick_r	64	117	1360	<u>117</u>	<u>1360</u>	120	1330	128	202	1580	202	1570	<u>202</u>	<u>1580</u>
544.nab_r	64	228	473	<u>226</u>	<u>476</u>	225	478	128	377	572	<u>377</u>	<u>572</u>	377	572
549.fotonik3d_r	64	1974	126	<u>1974</u>	<u>126</u>	1974	126	32	<u>984</u>	<u>127</u>	984	127	984	127
554.roms_r	64	790	129	<u>789</u>	<u>129</u>	789	129	32	386	132	<u>386</u>	<u>132</u>	385	132

SPECrate®2017_fp_base = **298**

SPECrate®2017_fp_peak = **317**

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>
'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
```

(Continued on next page)



SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2021 Standard Performance Evaluation Corporation

Lenovo Global Technology

ThinkSystem SR635
2.00 GHz, AMD EPYC 7713P

SPECrate®2017_fp_base = 298

SPECrate®2017_fp_peak = 317

CPU2017 License: 9017

Test Sponsor: Lenovo Global Technology

Tested by: Lenovo Global Technology

Test Date: Aug-2021

Hardware Availability: Jun-2021

Software Availability: Mar-2021

Operating System Notes (Continued)

randomization (ASLR) to reduce run-to-run variability.
'echo always > /sys/kernel/mm/transparent_hugepage/enabled' and
'echo always > /sys/kernel/mm/transparent_hugepage/defrag' run as root for peak integer runs and all FP runs to enable Transparent Hugepages (THP).
'echo madvise > /sys/kernel/mm/transparent_hugepage/enabled' run as root for base integer runs to enable THP only on request.

Environment Variables Notes

Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH =
"/home/cpu2017-1.1.8-amd-aocc300-milan-A1/amd_rate_aocc300_milan_A_lib/6
4:/home/cpu2017-1.1.8-amd-aocc300-milan-A1/amd_rate_aocc300_milan_A_lib/
32:"
MALLOCONF = "retain:true"

General Notes

Binaries were compiled on a system with 2x AMD EPYC 7742 CPU + 512GiB 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:

Choose Operating Mode set to Maximum Performance

NUMA nodes per socket set to NPS4

L1 Stream HW Prefetcher set to Disable

L2 Stream HW Prefetcher set to Enable

LLC as NUMA Node set to Enabled

Memory interleaving set to Disabled

Sysinfo program /home/cpu2017-1.1.8-amd-aocc300-milan-A1/bin/sysinfo

Rev: r6622 of 2021-04-07 982a61ec0915b55891ef0e16acafc64d

running on localhost Wed Aug 4 01:29:13 2021

(Continued on next page)



SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2021 Standard Performance Evaluation Corporation

Lenovo Global Technology

ThinkSystem SR635
2.00 GHz, AMD EPYC 7713P

SPECrate®2017_fp_base = 298

SPECrate®2017_fp_peak = 317

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

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

Platform Notes (Continued)

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 7713P 64-Core Processor
 1 "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  : 128
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
```

```
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): 128
On-line CPU(s) list: 0-127
Thread(s) per core: 2
Core(s) per socket: 64
Socket(s): 1
NUMA node(s): 8
Vendor ID: AuthenticAMD
CPU family: 25
Model: 1
Model name: AMD EPYC 7713P 64-Core Processor
Stepping: 1
CPU MHz: 2197.845
CPU max MHz: 2000.0000
CPU min MHz: 1500.0000
BogoMIPS: 3992.89
Virtualization: AMD-V
L1d cache: 32K
L1i cache: 32K
L2 cache: 512K
L3 cache: 32768K
NUMA node0 CPU(s): 0-7,64-71
NUMA node1 CPU(s): 8-15,72-79
NUMA node2 CPU(s): 16-23,80-87
NUMA node3 CPU(s): 24-31,88-95
NUMA node4 CPU(s): 32-39,96-103
```

(Continued on next page)



SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2021 Standard Performance Evaluation Corporation

Lenovo Global Technology

ThinkSystem SR635
2.00 GHz, AMD EPYC 7713P

SPECrate®2017_fp_base = 298

SPECrate®2017_fp_peak = 317

CPU2017 License: 9017

Test Sponsor: Lenovo Global Technology

Tested by: Lenovo Global Technology

Test Date: Aug-2021

Hardware Availability: Jun-2021

Software Availability: Mar-2021

Platform Notes (Continued)

```

NUMA node5 CPU(s): 40-47,104-111
NUMA node6 CPU(s): 48-55,112-119
NUMA node7 CPU(s): 56-63,120-127
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 arat npt lbrv svm_lock nrip_save tsc_scale
vmcb_clean flushbyasid decodeassists pausefilter pfthreshold v_vmsave_vmload vgif
umip pku ospke 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: 8 nodes (0-7)
node 0 cpus: 0 1 2 3 4 5 6 7 64 65 66 67 68 69 70 71
node 0 size: 32024 MB
node 0 free: 31810 MB
node 1 cpus: 8 9 10 11 12 13 14 15 72 73 74 75 76 77 78 79
node 1 size: 32250 MB
node 1 free: 31923 MB
node 2 cpus: 16 17 18 19 20 21 22 23 80 81 82 83 84 85 86 87
node 2 size: 32252 MB
node 2 free: 32071 MB
node 3 cpus: 24 25 26 27 28 29 30 31 88 89 90 91 92 93 94 95
node 3 size: 32250 MB
node 3 free: 32068 MB
node 4 cpus: 32 33 34 35 36 37 38 39 96 97 98 99 100 101 102 103
node 4 size: 32252 MB
node 4 free: 32068 MB
node 5 cpus: 40 41 42 43 44 45 46 47 104 105 106 107 108 109 110 111
node 5 size: 32250 MB
node 5 free: 32046 MB
node 6 cpus: 48 49 50 51 52 53 54 55 112 113 114 115 116 117 118 119
node 6 size: 32252 MB
node 6 free: 32048 MB
node 7 cpus: 56 57 58 59 60 61 62 63 120 121 122 123 124 125 126 127
node 7 size: 32237 MB
node 7 free: 32007 MB
node distances:

```

(Continued on next page)



SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2021 Standard Performance Evaluation Corporation

Lenovo Global Technology

ThinkSystem SR635
2.00 GHz, AMD EPYC 7713P

SPECrate®2017_fp_base = 298

SPECrate®2017_fp_peak = 317

CPU2017 License: 9017

Test Sponsor: Lenovo Global Technology

Tested by: Lenovo Global Technology

Test Date: Aug-2021

Hardware Availability: Jun-2021

Software Availability: Mar-2021

Platform Notes (Continued)

node	0	1	2	3	4	5	6	7
0:	10	11	12	12	12	12	12	12
1:	11	10	12	12	12	12	12	12
2:	12	12	10	11	12	12	12	12
3:	12	12	11	10	12	12	12	12
4:	12	12	12	12	10	11	12	12
5:	12	12	12	12	11	10	12	12
6:	12	12	12	12	12	12	10	11
7:	12	12	12	12	12	12	11	10

From /proc/meminfo

```
MemTotal:      263955720 kB
HugePages_Total:      0
Hugepagesize:    2048 kB
```

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

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"
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, IBPB: conditional, IBRS_FW, STIBP:
```

(Continued on next page)



SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2021 Standard Performance Evaluation Corporation

Lenovo Global Technology

ThinkSystem SR635
2.00 GHz, AMD EPYC 7713P

SPECrate®2017_fp_base = 298

SPECrate®2017_fp_peak = 317

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

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

Platform Notes (Continued)

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

run-level 3 Aug 4 01:24

SPEC is set to: /home/cpu2017-1.1.8-amd-aocc300-milan-A1
Filesystem Type Size Used Avail Use% Mounted on
/dev/sda3 xfs 892G 66G 826G 8% /

From /sys/devices/virtual/dmi/id
Vendor: Lenovo
Product: ThinkSystem SR635 -[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
BIOS Date: 05/28/2021
BIOS Revision: 6.0

(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 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)



SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2021 Standard Performance Evaluation Corporation

Lenovo Global Technology

ThinkSystem SR635
2.00 GHz, AMD EPYC 7713P

SPECrate®2017_fp_base = 298

SPECrate®2017_fp_peak = 317

CPU2017 License: 9017

Test Sponsor: Lenovo Global Technology

Tested by: Lenovo Global Technology

Test Date: Aug-2021

Hardware Availability: Jun-2021

Software Availability: Mar-2021

Compiler Version Notes (Continued)

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

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

=====
C++, C, Fortran | 507.cactuBSSN_r(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 | 503.bwaves_r(base, peak) 549.fotonik3d_r(base, peak)
| 554.roms_r(base, peak)

(Continued on next page)



SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2021 Standard Performance Evaluation Corporation

Lenovo Global Technology

ThinkSystem SR635
2.00 GHz, AMD EPYC 7713P

SPECrate®2017_fp_base = 298

SPECrate®2017_fp_peak = 317

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

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

Compiler Version Notes (Continued)

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 | 521.wrf_r(base, peak) 527.cam4_r(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

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 2017-2021 Standard Performance Evaluation Corporation

Lenovo Global Technology

SPECrate®2017_fp_base = 298

ThinkSystem SR635
2.00 GHz, AMD EPYC 7713P

SPECrate®2017_fp_peak = 317

CPU2017 License: 9017

Test Sponsor: Lenovo Global Technology

Tested by: Lenovo Global Technology

Test Date: Aug-2021

Hardware Availability: Jun-2021

Software Availability: Mar-2021

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 -O3 -ffast-math
-march=znver3 -fveclib=AMDLIBM -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
-lamdlibm -ljemalloc -lflang -lflangrti

```

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 -O3 -ffast-math
-march=znver3 -fveclib=AMDLIBM -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
-z muldefs -lamdlibm -ljemalloc -lflang -lflangrti

```

Fortran benchmarks:

```

-m64 -Wl,-mllvm -Wl,-enable-X86-prefetching

```

(Continued on next page)



SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2021 Standard Performance Evaluation Corporation

Lenovo Global Technology

ThinkSystem SR635
2.00 GHz, AMD EPYC 7713P

SPECrate®2017_fp_base = 298

SPECrate®2017_fp_peak = 317

CPU2017 License: 9017

Test Sponsor: Lenovo Global Technology

Tested by: Lenovo Global Technology

Test Date: Aug-2021

Hardware Availability: Jun-2021

Software Availability: Mar-2021

Base Optimization Flags (Continued)

Fortran benchmarks (continued):

```
-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 -Hz,1,0x1 -O3 -ffast-math
-march=znver3 -fveclib=AMDLIBM -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 -z muldefs -lamdlibm -ljemalloc
-lflang -lflangrti
```

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 -O3 -ffast-math
-march=znver3 -fveclib=AMDLIBM -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
-Kieee -Mrecursive -mllvm -fuse-tile-inner-loop -funroll-loops
-mllvm -extra-vectorizer-passes -mllvm -lsr-in-nested-loop -z muldefs
-lamdlibm -ljemalloc -lflang -lflangrti
```

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 -O3 -ffast-math
-march=znver3 -fveclib=AMDLIBM -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-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
-z muldefs -lamdlibm -ljemalloc -lflang -lflangrti
```

Benchmarks using Fortran, C, and C++:

```
-m64 -std=c++98 -mno-adx -mno-sse4a
```

(Continued on next page)



SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2021 Standard Performance Evaluation Corporation

Lenovo Global Technology

ThinkSystem SR635
2.00 GHz, AMD EPYC 7713P

SPECrate®2017_fp_base = 298

SPECrate®2017_fp_peak = 317

CPU2017 License: 9017

Test Sponsor: Lenovo Global Technology

Tested by: Lenovo Global Technology

Test Date: Aug-2021

Hardware Availability: Jun-2021

Software Availability: Mar-2021

Base Optimization Flags (Continued)

Benchmarks using Fortran, C, and C++ (continued):

```

-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 -O3 -ffast-math
-march=znver3 -fveclib=AMDLIBM -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-unswitch -mllvm -unroll-threshold=100
-fininline-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 -z muldefs -lamdlibm
-ljemalloc -lflang -lflangrti

```

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

Benchmarks using Fortran, C, and C++:

-Wno-unused-command-line-argument

Peak Compiler Invocation

C benchmarks:

clang

(Continued on next page)



SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2021 Standard Performance Evaluation Corporation

Lenovo Global Technology

ThinkSystem SR635
2.00 GHz, AMD EPYC 7713P

SPECrate®2017_fp_base = 298

SPECrate®2017_fp_peak = 317

CPU2017 License: 9017

Test Sponsor: Lenovo Global Technology

Tested by: Lenovo Global Technology

Test Date: Aug-2021

Hardware Availability: Jun-2021

Software Availability: Mar-2021

Peak Compiler Invocation (Continued)

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 -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 -lamdlibm -ljemalloc
```

538.imagick_r: Same as 519.lbm_r

```
544.nab_r: -m64 -flto -Wl,-mllvm -Wl,-region-vectorize
-Wl,-mllvm -Wl,-function-specialize -Ofast -march=znver3
-fveclib=AMDLIBM -fstruct-layout=7
-mllvm -unroll-threshold=50 -fremap-arrays
-flv-function-specialization -mllvm -inline-threshold=1000
```

(Continued on next page)



SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2021 Standard Performance Evaluation Corporation

Lenovo Global Technology

ThinkSystem SR635
2.00 GHz, AMD EPYC 7713P

SPECrate®2017_fp_base = 298

SPECrate®2017_fp_peak = 317

CPU2017 License: 9017

Test Sponsor: Lenovo Global Technology

Tested by: Lenovo Global Technology

Test Date: Aug-2021

Hardware Availability: Jun-2021

Software Availability: Mar-2021

Peak Optimization Flags (Continued)

544.nab_r (continued):

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

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 -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: -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 -Kieee -Mrecursive  
-mllvm -reduce-array-computations=3  
-mllvm -global-vectorize-slp=true -mllvm -enable-licm-vrp  
-lamdlibm -ljemalloc -lflang -lflangrti
```

549.fotonik3d_r: Same as 503.bwaves_r

```
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 -Kieee -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 -lflangrti
```

(Continued on next page)



SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2021 Standard Performance Evaluation Corporation

Lenovo Global Technology

ThinkSystem SR635
2.00 GHz, AMD EPYC 7713P

SPECrate®2017_fp_base = 298

SPECrate®2017_fp_peak = 317

CPU2017 License: 9017

Test Sponsor: Lenovo Global Technology

Tested by: Lenovo Global Technology

Test Date: Aug-2021

Hardware Availability: Jun-2021

Software Availability: Mar-2021

Peak Optimization Flags (Continued)

Benchmarks using both Fortran and C:

521.wrf_r: basepeak = yes

```
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 -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 -O3 -ffast-math
-funroll-loops -mllvm -extra-vectorizer-passes
-mllvm -lsr-in-nested-loop -Mrecursive -lamdlibm
-ljemalloc -lflang -lflangrti
```

Benchmarks using both 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 -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
-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 -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
```

(Continued on next page)



SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2021 Standard Performance Evaluation Corporation

Lenovo Global Technology

ThinkSystem SR635
2.00 GHz, AMD EPYC 7713P

SPECrate®2017_fp_base = 298

SPECrate®2017_fp_peak = 317

CPU2017 License: 9017

Test Sponsor: Lenovo Global Technology

Tested by: Lenovo Global Technology

Test Date: Aug-2021

Hardware Availability: Jun-2021

Software Availability: Mar-2021

Peak Optimization Flags (Continued)

Benchmarks using Fortran, C, and C++ (continued):

```
-finline-aggressive -mllvm -reroll-loops
-mllvm -aggressive-loop-unswitch -mllvm -extra-vectorizer-passes
-mllvm -convert-pow-exp-to-int=false -Kieee -Mrecursive -lamdlibm
-ljemalloc -lflang -lflangrti
```

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
```

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-Milan1P-G.html>

<http://www.spec.org/cpu2017/flags/aocc300-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-Milan1P-G.xml>

<http://www.spec.org/cpu2017/flags/aocc300-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 2021-08-03 13:29:13-0400.

Report generated on 2021-09-01 14:25:24 by CPU2017 PDF formatter v6442.

Originally published on 2021-08-31.