SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2023 Standard Performance Evaluation Corporation

Lenovo Global Technology

ThinkSystem SR655 V3
(2.25 GHz, AMD EPYC 9754)

SPECrate®2017_fp_base = 616
SPECrate®2017_fp_energy_base = 1970
SPECrate®2017_fp_peak = 646
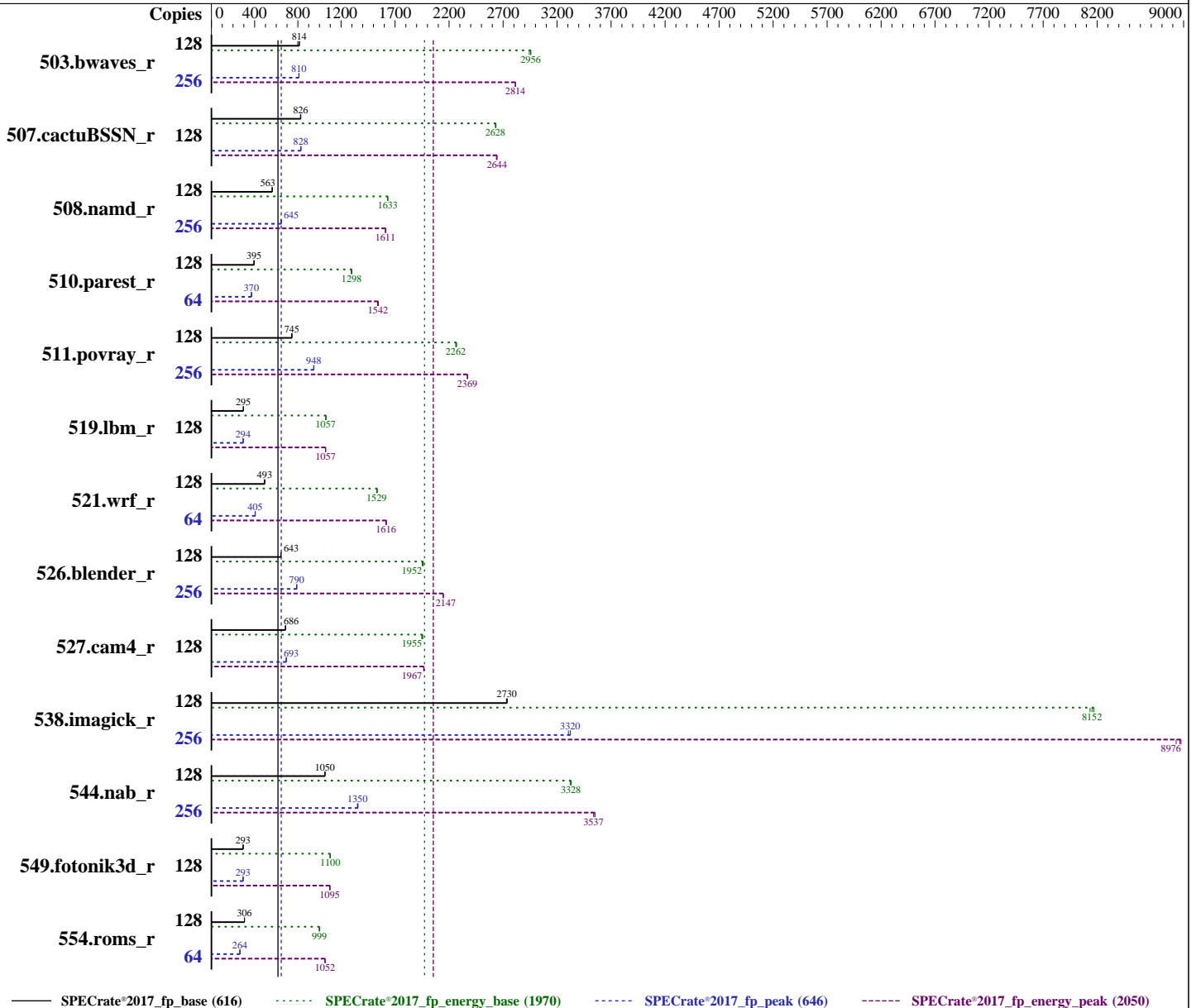SPECrate®2017_fp_energy_peak = 2050

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

Test Date: May-2023
Hardware Availability: Aug-2023
Software Availability: Nov-2022

Copies

Benchmark	Copies	base	energy_base	peak	energy_peak
503.bwaves_r	128	814	2956		
	256	810			2814
507.cactuBSSN_r	128	826	2628	828	2644
508.namd_r	128	563	1633		
	256	645			1611
510.parest_r	128	395	1298		
	64	370			1542
511.povray_r	128	745	2262		
	256	948			2369
519.lbm_r	128	295	1057	294	1057
521.wrf_r	128	493	1529		
	64	405			1616
526.blender_r	128	643	1952		
	256	790			2147
527.cam4_r	128	686	1955	693	1967
538.imagick_r	128	2730	8152		
	256	3320			8976
544.nab_r	128	1050	3328		
	256	1350			3537
549.fotonik3d_r	128	293	1100	293	1095
554.roms_r	128	306	999		
	64	264			1052

—— SPECrate®2017_fp_base (616)   ······ SPECrate®2017_fp_energy_base (1970)   - - - SPECrate®2017_fp_peak (646)   − − − SPECrate®2017_fp_energy_peak (2050)

Hardware

CPU Name: AMD EPYC 9754
 Max MHz: 3100
 Nominal: 2250
Enabled: 128 cores, 1 chip, 2 threads/core
Orderable: 1 chip

(Continued on next page)

Software

OS: SUSE Linux Enterprise Server 15 SP4 (x86_64)
Kernel 5.14.21-150400.22-default
Compiler: C/C++/Fortran: Version 4.0.0 of AOCC
Parallel: No
Firmware: Lenovo BIOS Version KAE111J 2.10 released May-2023

(Continued on next page)

SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2023 Standard Performance Evaluation Corporation

Lenovo Global Technology

ThinkSystem SR655 V3 (2.25 GHz, AMD EPYC 9754)

SPECrate®2017_fp_base =	616
SPECrate®2017_fp_energy_base =	1970
SPECrate®2017_fp_peak =	646
SPECrate®2017_fp_energy_peak =	2050

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

Test Date: May-2023
Hardware Availability: Aug-2023
Software Availability: Nov-2022

Hardware (Continued)

Cache L1: 32 KB I + 32 KB D on chip per core
  L2: 1 MB I+D on chip per core
  L3: 256 MB I+D on chip per chip,
      16 MB shared / 8 cores
  Other: None
Memory: 384 GB (12 x 32 GB 2Rx8 PC5-4800B-R)
Storage: 1 x 480 GB SATA SSD
Other: None

Software (Continued)

File System: xfs
System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: 64-bit
Other: None
Power Management: BIOS and OS set to balance power and performance

Power

Max. Power (W): 472.92
Idle Power (W): 138.42
Min. Temperature (C): 26.50
Elevation (m): 43
Line Standard: 220 V / 50 Hz / 1 phase / 3 wires
Provisioning: Line-powered

Power Settings

Management FW: Version 2.10 of KAX317G
Memory Mode: Normal

Power-Relevant Hardware

Power Supply: 1 x 750 W (non-redundant)
  Details: ThinkSystem 750W Titanium Power Supply 4P57A82019
Backplane: 8 x 2.5-inch HDD back plane
Other Storage: None
Storage Model #s: 4XB7A17107
NICs Installed: 1 x ThinkSystem Ethernet 4-port Adaptor @ 1 Gb
NICs Enabled (FW/OS): 4 / 1
NICs Connected/Speed: 1 @ 1 Gb
Other HW Model #s: 6 x Performance fans

Power Analyzer

Power Analyzer: WIN:9888
Hardware Vendor: YOKOGAWA, Inc.
Model: YokogawaWT310E
Serial Number: C3UG05014E
Input Connection: Default
Metrology Institute: CNAS
Calibration By: GRG METROLOGY & TEST (BEIJING) CO., LTD.
Calibration Label: J202210116758A-0005
Calibration Date: 19-Oct-2022
PTDaemon® Version: 1.10.0 (82175bac; 2022-08-17)
Setup Description: Connected to PSU1
Current Ranges Used: 2.5A
Voltage Range Used: 300V

Temperature Meter

Temperature Meter: WIN:9889
Hardware Vendor: Digi International, Inc.
Model: DigiWATCHPORT_H
Serial Number: W63074363
Input Connection: USB
PTDaemon Version: 1.10.0 (82175bac; 2022-08-17)
Setup Description: 50 mm in front of SUT main intake

Base Results Table

Benchmark	Copies	Seconds	Ratio	Energy (kJ)	Energy Ratio	Average Power	Maximum Power	Seconds	Ratio	Energy (kJ)	Energy Ratio	Average Power	Maximum Power	Seconds	Ratio	Energy (kJ)	Energy Ratio	Average Power	Maximum Power

Table continues on next page. Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

Standard Performance Evaluation Corporation (info@spec.org)
https://www.spec.org/

SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2023 Standard Performance Evaluation Corporation

Lenovo Global Technology

ThinkSystem SR655 V3
(2.25 GHz, AMD EPYC 9754)

SPECrate®2017_fp_base =	616
SPECrate®2017_fp_energy_base =	1970
SPECrate®2017_fp_peak =	646
SPECrate®2017_fp_energy_peak =	2050

CPU2017 License: 9017		**Test Date:**	May-2023
Test Sponsor: Lenovo Global Technology		**Hardware Availability:**	Aug-2023
Tested by: Lenovo Global Technology		**Software Availability:**	Nov-2022

Base Results Table (Continued)

Benchmark	Copies	Seconds	Ratio	Energy (kJ)	Energy Ratio	Average Power	Maximum Power	Seconds	Ratio	Energy (kJ)	Energy Ratio	Average Power	Maximum Power	Seconds	Ratio	Energy (kJ)	Energy Ratio	Average Power	Maximum Power
503.bwaves_r	128	1605	800	475	2940	296	306	1577	814	473	2960	300	311	**1577**	**814**	**473**	**2960**	**300**	**311**
507.cactuBSSN_r	128	197	824	67.7	2630	344	349	196	828	67.6	2630	345	350	**196**	**826**	**67.8**	**2630**	**345**	**350**
508.namd_r	128	**216**	**563**	**81.2**	**1630**	**376**	**391**	216	563	81.2	1630	376	392	216	562	81.2	1630	375	391
510.parest_r	128	847	395	280	1300	331	410	852	393	282	1290	331	415	**847**	**395**	**281**	**1300**	**331**	**400**
511.povray_r	128	403	742	143	2270	355	363	401	746	143	2270	357	365	**401**	**745**	**143**	**2260**	**357**	**365**
519.lbm_r	128	457	295	144	1060	316	319	**457**	**295**	**145**	**1060**	**317**	**322**	455	296	145	1060	318	322
521.wrf_r	128	581	494	204	1540	351	381	584	491	204	1530	350	383	**582**	**493**	**205**	**1530**	**352**	**379**
526.blender_r	128	303	643	108	1960	356	379	303	644	108	1960	355	381	**303**	**643**	**108**	**1950**	**357**	**382**
527.cam4_r	128	327	684	125	1950	383	400	**326**	**686**	**125**	**1960**	**382**	**399**	326	686	125	1960	382	398
538.imagick_r	128	**116**	**2730**	**42.3**	**8150**	**363**	**424**	116	2740	42.2	8170	363	423	117	2730	42.4	8130	364	423
544.nab_r	128	205	1050	70.3	3320	343	368	205	1050	70.1	3330	342	367	**205**	**1050**	**70.2**	**3330**	**342**	**367**
549.fotonik3d_r	128	1700	293	506	1100	297	340	**1701**	**293**	**505**	**1100**	**297**	**330**	1702	293	506	1100	297	322
554.roms_r	128	665	306	225	999	338	351	**665**	**306**	**224**	**999**	**338**	**351**	666	306	224	999	337	351
SPECrate®2017_fp_base =		**616**																	
SPECrate®2017_fp_energy_base =					**1970**														

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

Peak Results Table

Benchmark	Copies	Seconds	Ratio	Energy (kJ)	Energy Ratio	Average Power	Maximum Power	Seconds	Ratio	Energy (kJ)	Energy Ratio	Average Power	Maximum Power	Seconds	Ratio	Energy (kJ)	Energy Ratio	Average Power	Maximum Power
503.bwaves_r	256	3168	810	994	2810	314	319	**3170**	**810**	**994**	**2810**	**314**	**320**	3171	809	994	2810	313	319
507.cactuBSSN_r	128	196	829	67.4	2640	345	349	**196**	**828**	**67.4**	**2640**	**344**	**350**	196	827	67.5	2640	345	350
508.namd_r	256	**377**	**645**	**165**	**1610**	**436**	**455**	376	646	165	1610	437	453	377	645	164	1610	435	451
510.parest_r	64	451	371	118	1550	261	288	452	370	118	1540	262	288	**452**	**370**	**118**	**1540**	**261**	**288**
511.povray_r	256	632	946	274	2370	433	441	630	949	274	2370	435	441	**630**	**948**	**274**	**2370**	**434**	**441**
519.lbm_r	128	**459**	**294**	**145**	**1060**	**316**	**333**	460	293	145	1060	315	321	458	294	145	1060	316	322
521.wrf_r	64	353	406	96.6	1620	274	277	**354**	**405**	**96.9**	**1620**	**274**	**278**	355	404	96.8	1620	273	277
526.blender_r	256	**494**	**790**	**197**	**2150**	**398**	**439**	493	791	197	2150	399	441	495	788	197	2150	398	440
527.cam4_r	128	323	693	124	1970	383	399	**323**	**693**	**124**	**1970**	**384**	**399**	323	693	124	1960	384	401
538.imagick_r	256	**192**	**3320**	**76.8**	**8980**	**401**	**472**	192	3320	76.9	8970	401	471	193	3300	77.2	8930	401	473
544.nab_r	256	319	1350	132	3550	413	440	317	1360	132	3550	414	439	**318**	**1350**	**132**	**3540**	**415**	**441**
549.fotonik3d_r	128	1704	293	507	1100	297	339	1701	293	506	1100	297	330	**1702**	**293**	**507**	**1100**	**298**	**331**
554.roms_r	64	385	264	107	1050	277	281	387	263	107	1050	276	280	**385**	**264**	**107**	**1050**	**277**	**281**
SPECrate®2017_fp_peak =		**646**																	
SPECrate®2017_fp_energy_peak =					**2050**														

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.

SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2023 Standard Performance Evaluation Corporation

Lenovo Global Technology

ThinkSystem SR655 V3
(2.25 GHz, AMD EPYC 9754)

SPECrate®2017_fp_base =   616

SPECrate®2017_fp_energy_base = 1970

SPECrate®2017_fp_peak =   646

SPECrate®2017_fp_energy_peak = 2050

CPU2017 License: 9017

Test Sponsor: Lenovo Global Technology

Tested by: Lenovo Global Technology

Test Date: May-2023

Hardware Availability: Aug-2023

Software Availability: Nov-2022

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.
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/cpu2017-1.1.9-amd-aocc400_znver4_A1/amd_rate_aocc400_znver4_A_lib/lib:/home/cpu2017-1.1.9-amd-a
    occ400_znver4_A1/amd_rate_aocc400_znver4_A_lib/lib32:"
MALLOC_CONF = "retain:true"
```

General Notes

```
Binaries were compiled on a system with 2x AMD EPYC 9174F CPU + 1.5TiB Memory using RHEL 8.6

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.
```

Platform Notes

```
BIOS configuration:
Operating Mode set to Custom Mode
Core Performance Boost set to Disabled
NUMA Nodes per Socket set to NPS4
L2 Stream HW Prefetcher set to Disabled
Global C-state Control set to Disabled

 Sysinfo program /home/cpu2017-1.1.9-amd-aocc400_znver4_A1/bin/sysinfo
 Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
 running on localhost Sat May 20 00:56:03 2023
```

(Continued on next page)

SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2023 Standard Performance Evaluation Corporation

Lenovo Global Technology

ThinkSystem SR655 V3
(2.25 GHz, AMD EPYC 9754)

SPECrate®2017_fp_base = 616

SPECrate®2017_fp_energy_base = 1970

SPECrate®2017_fp_peak = 646

SPECrate®2017_fp_energy_peak = 2050

CPU2017 License: 9017

Test Sponsor: Lenovo Global Technology

Tested by: Lenovo Global Technology

Test Date: May-2023

Hardware Availability: Aug-2023

Software Availability: Nov-2022

Platform Notes (Continued)

```
SUT (System Under Test) info as seen by some common utilities.

------------------------------------------------------------
Table of contents
------------------------------------------------------------
  1. uname -a
  2. w
  3. Username
  4. ulimit -a
  5. sysinfo process ancestry
  6. /proc/cpuinfo
  7. lscpu
  8. numactl --hardware
  9. /proc/meminfo
 10. who -r
 11. Systemd service manager version: systemd 249 (249.11+suse.124.g2bc0b2c447)
 12. Services, from systemctl list-unit-files
 13. Linux kernel boot-time arguments, from /proc/cmdline
 14. cpupower frequency-info
 15. tuned-adm active
 16. sysctl
 17. /sys/kernel/mm/transparent_hugepage
 18. /sys/kernel/mm/transparent_hugepage/khugepaged
 19. OS release
 20. Disk information
 21. /sys/devices/virtual/dmi/id
 22. dmidecode
 23. BIOS
------------------------------------------------------------


------------------------------------------------------------
1. uname -a
  Linux localhost 5.14.21-150400.22-default #1 SMP PREEMPT_DYNAMIC Wed May 11 06:57:18 UTC 2022 (49db222)
  x86_64 x86_64 x86_64 GNU/Linux


------------------------------------------------------------
2. w
   00:56:03 up 15:37,  1 user,  load average: 0.21, 0.05, 0.34
  USER     TTY      FROM             LOGIN@   IDLE   JCPU   PCPU WHAT
  root     tty1     -                Fri09   16.00s  2.21s  0.13s /bin/bash ./amd_rate_aocc400_znver4_A1.sh


------------------------------------------------------------
3. Username
  From environment variable $USER:  root


------------------------------------------------------------
4. ulimit -a
  core file size          (blocks, -c) unlimited
  data seg size           (kbytes, -d) unlimited
  scheduling priority             (-e) 0
  file size               (blocks, -f) unlimited
  pending signals                 (-i) 1545763
  max locked memory       (kbytes, -l) 2097152
  max memory size         (kbytes, -m) unlimited
  open files                      (-n) 1024
  pipe size            (512 bytes, -p) 8
  POSIX message queues     (bytes, -q) 819200
```

(Continued on next page)

Lenovo Global Technology

ThinkSystem SR655 V3
(2.25 GHz, AMD EPYC 9754)

SPECrate®2017_fp_base = 616

SPECrate®2017_fp_energy_base = 1970

SPECrate®2017_fp_peak = 646

SPECrate®2017_fp_energy_peak = 2050

CPU2017 License: 9017

Test Sponsor: Lenovo Global Technology

Tested by: Lenovo Global Technology

Test Date: May-2023

Hardware Availability: Aug-2023

Software Availability: Nov-2022

Platform Notes (Continued)

```
   real-time priority            (-r) 0
   stack size          (kbytes, -s) unlimited
   cpu time           (seconds, -t) unlimited
   max user processes            (-u) 1545763
   virtual memory      (kbytes, -v) unlimited
   file locks                    (-x) unlimited


   --------------------------------------------------------
5. sysinfo process ancestry
 /usr/lib/systemd/systemd --switched-root --system --deserialize 30
 login -- root
 -bash
 /bin/bash ./run_SR655V3_bergamo.sh
 /bin/bash ./Run026-compliant-amd-ratefp.sh
 python3 ./run_amd_rate_aocc400_znver4_A1.py
 /bin/bash ./amd_rate_aocc400_znver4_A1.sh
 runcpu --power --config amd_rate_aocc400_znver4_A1.cfg --tune all --reportable --iterations 3 fprate
 runcpu --power --configfile amd_rate_aocc400_znver4_A1.cfg --tune all --reportable --iterations 3 --runmode
   rate --tune base:peak --size test:train:refrate fprate --nopreenv --note-preenv --logfile
   $SPEC/tmp/CPU2017.031/templogs/preenv.fprate.031.0.log --lognum 031.0 --from_runcpu 2
 specperl $SPEC/bin/sysinfo
 $SPEC = /home/cpu2017-1.1.9-amd-aocc400_znver4_A1


   --------------------------------------------------------
6. /proc/cpuinfo
     model name        : AMD EPYC 9754 128-Core Processor
     vendor_id         : AuthenticAMD
     cpu family        : 25
     model             : 160
     stepping          : 2
     microcode         : 0xaa00208
     bugs              : sysret_ss_attrs spectre_v1 spectre_v2 spec_store_bypass
     TLB size          : 3584 4K pages
     cpu cores         : 128
     siblings          : 256
     1 physical ids (chips)
     256 processors (hardware threads)
     physical id 0: core ids 0-127
     physical id 0: apicids 0-255
   Caution: /proc/cpuinfo data regarding chips, cores, and threads is not necessarily reliable, especially for
   virtualized systems.  Use the above data carefully.


   --------------------------------------------------------
7. lscpu

 From lscpu from util-linux 2.37.2:
   Architecture:              x86_64
   CPU op-mode(s):            32-bit, 64-bit
   Address sizes:             52 bits physical, 57 bits virtual
   Byte Order:                Little Endian
   CPU(s):                    256
   On-line CPU(s) list:       0-255
   Vendor ID:                 AuthenticAMD
   Model name:                AMD EPYC 9754 128-Core Processor
   CPU family:                25
   Model:                     160
   Thread(s) per core:        2
```

(Continued on next page)

Lenovo Global Technology

ThinkSystem SR655 V3
(2.25 GHz, AMD EPYC 9754)

SPECrate®2017_fp_base = 616

SPECrate®2017_fp_energy_base = 1970

SPECrate®2017_fp_peak = 646

SPECrate®2017_fp_energy_peak = 2050

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

Test Date: May-2023
Hardware Availability: Aug-2023
Software Availability: Nov-2022

Platform Notes (Continued)

```
    Core(s) per socket:          128
    Socket(s):                   1
    Stepping:                    2
    Frequency boost:             disabled
    CPU max MHz:                 3100.3411
    CPU min MHz:                 1500.0000
    BogoMIPS:                    4493.21
    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 rapl
                                 pni pclmulqdq monitor ssse3 fma cx16 pcid sse4_1 sse4_2 x2apic 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 avx512f avx512dq rdseed adx smap
                                 avx512ifma clflushopt clwb avx512cd sha_ni avx512bw avx512vl xsaveopt
                                 xsavec xgetbv1 xsaves cqm_llc cqm_occup_llc cqm_mbm_total cqm_mbm_local
                                 avx512_bf16 clzero irperf xsaveerptr rdpru wbnoinvd amd_ppin arat npt lbrv
                                 svm_lock nrip_save tsc_scale vmcb_clean flushbyasid decodeassists
                                 pausefilter pfthreshold avic v_vmsave_vmload vgif v_spec_ctrl avx512vbmi
                                 umip pku ospke avx512_vbmi2 gfni vaes vpclmulqdq avx512_vnni avx512_bitalg
                                 avx512_vpopcntdq la57 rdpid overflow_recov succor smca fsrm flush_l1d
    Virtualization:              AMD-V
    L1d cache:                   4 MiB (128 instances)
    L1i cache:                   4 MiB (128 instances)
    L2 cache:                    128 MiB (128 instances)
    L3 cache:                    256 MiB (16 instances)
    NUMA node(s):                4
    NUMA node0 CPU(s):           0-31,128-159
    NUMA node1 CPU(s):           32-63,160-191
    NUMA node2 CPU(s):           64-95,192-223
    NUMA node3 CPU(s):           96-127,224-255
    Vulnerability Itlb multihit: Not affected
    Vulnerability L1tf:          Not affected
    Vulnerability Mds:           Not affected
    Vulnerability Meltdown:      Not affected
    Vulnerability Spec store bypass: Mitigation; Speculative Store Bypass disabled via prctl and seccomp
    Vulnerability Spectre v1:    Mitigation; usercopy/swapgs barriers and __user pointer sanitization
    Vulnerability Spectre v2:    Mitigation; Retpolines, IBPB conditional, IBRS_FW, STIBP always-on, RSB
                                 filling
    Vulnerability Srbds:         Not affected
    Vulnerability Tsx async abort: Not affected

  From lscpu --cache:
      NAME ONE-SIZE ALL-SIZE WAYS TYPE        LEVEL  SETS PHY-LINE COHERENCY-SIZE
      L1d       32K      4M     8 Data            1    64        1             64
      L1i       32K      4M     8 Instruction     1    64        1             64
      L2         1M    128M     8 Unified         2  2048        1             64
      L3        16M    256M    16 Unified         3 16384        1             64

  ----------------------------------------------------------
  8. numactl --hardware
  NOTE: a numactl 'node' might or might not correspond to a physical chip.
    available: 4 nodes (0-3)
    node 0 cpus: 0-31,128-159
    node 0 size: 96488 MB
```

(Continued on next page)

Lenovo Global Technology

ThinkSystem SR655 V3
(2.25 GHz, AMD EPYC 9754)

SPECrate®2017_fp_base = 616

SPECrate®2017_fp_energy_base = 1970

SPECrate®2017_fp_peak = 646

SPECrate®2017_fp_energy_peak = 2050

CPU2017 License: 9017

Test Sponsor: Lenovo Global Technology

Tested by: Lenovo Global Technology

Test Date: May-2023

Hardware Availability: Aug-2023

Software Availability: Nov-2022

Platform Notes (Continued)

```
  node 0 free: 94632 MB
  node 1 cpus: 32-63,160-191
  node 1 size: 96701 MB
  node 1 free: 96251 MB
  node 2 cpus: 64-95,192-223
  node 2 size: 96736 MB
  node 2 free: 96269 MB
  node 3 cpus: 96-127,224-255
  node 3 size: 96538 MB
  node 3 free: 95993 MB
  node distances:
  node   0   1   2   3
    0:  10  12  12  12
    1:  12  10  12  12
    2:  12  12  10  12
    3:  12  12  12  10


  ----------------------------------------------------------
9. /proc/meminfo
   MemTotal:      395739852 kB


  ----------------------------------------------------------
10. who -r
   run-level 3 May 19 09:20


  ----------------------------------------------------------
11. Systemd service manager version: systemd 249 (249.11+suse.124.g2bc0b2c447)
   Default Target  Status
   multi-user      running


  ----------------------------------------------------------
12. Services, from systemctl list-unit-files
   STATE           UNIT FILES
   enabled         YaST2-Firstboot YaST2-Second-Stage apparmor auditd cron getty@ haveged irqbalance iscsi
                   issue-generator kbdsettings klog lvm2-monitor nscd postfix purge-kernels rollback rsyslog
                   smartd sshd wicked wickedd-auto4 wickedd-dhcp4 wickedd-dhcp6 wickedd-nanny
   enabled-runtime systemd-remount-fs
   disabled        autofs autoyast-initscripts blk-availability boot-sysctl ca-certificates chrony-wait
                   chronyd console-getty cups cups-browsed debug-shell ebtables exchange-bmc-os-info
                   firewalld gpm grub2-once haveged-switch-root hwloc-dump-hwdata ipmi ipmievd iscsi-init
                   iscsid iscsiuio issue-add-ssh-keys kexec-load lunmask man-db-create multipathd nfs
                   nfs-blkmap nmb rdisc rpcbind rpmconfigcheck rsyncd serial-getty@ smartd_generate_opts smb
                   snmpd snmptrapd systemd-boot-check-no-failures systemd-network-generator systemd-sysext
                   systemd-time-wait-sync systemd-timesyncd tuned
   generated       ntp_sync
   indirect        wickedd


  ----------------------------------------------------------
13. Linux kernel boot-time arguments, from /proc/cmdline
   BOOT_IMAGE=/boot/vmlinuz-5.14.21-150400.22-default
   root=UUID=4fcd643d-e392-48aa-b6f6-80f024d1c633
   splash=silent
   mitigations=auto
   quiet
   security=apparmor


  ----------------------------------------------------------
```

(Continued on next page)

Lenovo Global Technology

ThinkSystem SR655 V3
(2.25 GHz, AMD EPYC 9754)

SPECrate®2017_fp_base = 616

SPECrate®2017_fp_energy_base = 1970

SPECrate®2017_fp_peak = 646

SPECrate®2017_fp_energy_peak = 2050

CPU2017 License: 9017

Test Sponsor: Lenovo Global Technology

Tested by: Lenovo Global Technology

Test Date: May-2023

Hardware Availability: Aug-2023

Software Availability: Nov-2022

Platform Notes (Continued)

```
  14. cpupower frequency-info
    analyzing CPU 0:
      current policy: frequency should be within 1.50 GHz and 2.25 GHz.
                      The governor "performance" may decide which speed to use
                      within this range.
      boost state support:
        Supported: no
        Active: no


    ----------------------------------------------------------------
  15. tuned-adm active
    It seems that tuned daemon is not running, preset profile is not activated.
    Preset profile: throughput-performance


    ----------------------------------------------------------------
  16. sysctl
    kernel.numa_balancing            1
    kernel.randomize_va_space        0
    vm.compaction_proactiveness      20
    vm.dirty_background_bytes        0
    vm.dirty_background_ratio        10
    vm.dirty_bytes                   0
    vm.dirty_expire_centisecs        3000
    vm.dirty_ratio                   8
    vm.dirty_writeback_centisecs     500
    vm.dirtytime_expire_seconds      43200
    vm.extfrag_threshold             500
    vm.min_unmapped_ratio            1
    vm.nr_hugepages                  0
    vm.nr_hugepages_mempolicy        0
    vm.nr_overcommit_hugepages       0
    vm.swappiness                    1
    vm.watermark_boost_factor        15000
    vm.watermark_scale_factor        10
    vm.zone_reclaim_mode             1


    ----------------------------------------------------------------
  17. /sys/kernel/mm/transparent_hugepage
    defrag          [always] defer defer+madvise madvise never
    enabled         [always] madvise never
    hpage_pmd_size  2097152
    shmem_enabled   always within_size advise [never] deny force


    ----------------------------------------------------------------
  18. /sys/kernel/mm/transparent_hugepage/khugepaged
    alloc_sleep_millisecs   60000
    defrag                  1
    max_ptes_none           511
    max_ptes_shared         256
    max_ptes_swap           64
    pages_to_scan           4096
    scan_sleep_millisecs    10000


    ----------------------------------------------------------------
  19. OS release
    From /etc/*-release /etc/*-version
    os-release SUSE Linux Enterprise Server 15 SP4
```

(Continued on next page)

Standard Performance Evaluation Corporation (info@spec.org)   https://www.spec.org/

Lenovo Global Technology

ThinkSystem SR655 V3
(2.25 GHz, AMD EPYC 9754)

SPECrate®2017_fp_base = 616

SPECrate®2017_fp_energy_base = 1970

SPECrate®2017_fp_peak = 646

SPECrate®2017_fp_energy_peak = 2050

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

Test Date: May-2023
Hardware Availability: Aug-2023
Software Availability: Nov-2022

Platform Notes (Continued)

```
    --------------------------------------------------------------
    20. Disk information
    SPEC is set to: /home/cpu2017-1.1.9-amd-aocc400_znver4_A1
      Filesystem      Type  Size  Used Avail Use% Mounted on
      /dev/sda3       xfs   446G   52G  395G  12% /


    --------------------------------------------------------------
    21. /sys/devices/virtual/dmi/id
        Vendor:         Lenovo
        Product:        ThinkSystem SR655V3
        Product Family: ThinkSystem
        Serial:         1234567890


    --------------------------------------------------------------
    22. dmidecode
      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:
        5x SK Hynix HMCG88AEBRA115N 32 GB 2 rank 4800
        7x SK Hynix HMCG88AEBRA168N 32 GB 2 rank 4800



    --------------------------------------------------------------
    23. BIOS
    (This section combines info from /sys/devices and dmidecode.)
      BIOS Vendor:      Lenovo
      BIOS Version:     KAE111J-2.10
      BIOS Date:        05/11/2023
      BIOS Revision:    2.10
      Firmware Revision: 2.10
```

Compiler Version Notes

```
==============================================================================================
C                | 519.lbm_r(base, peak) 538.imagick_r(base, peak) 544.nab_r(base, peak)
----------------------------------------------------------------------------------------------
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#434 2022_10_28) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin
----------------------------------------------------------------------------------------------


==============================================================================================
C++              | 508.namd_r(base, peak) 510.parest_r(base, peak)
----------------------------------------------------------------------------------------------
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#434 2022_10_28) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin
----------------------------------------------------------------------------------------------


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

(Continued on next page)

Lenovo Global Technology

ThinkSystem SR655 V3
(2.25 GHz, AMD EPYC 9754)

SPECrate®2017_fp_base = 616

SPECrate®2017_fp_energy_base = 1970

SPECrate®2017_fp_peak = 646

SPECrate®2017_fp_energy_peak = 2050

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

Test Date: May-2023
Hardware Availability: Aug-2023
Software Availability: Nov-2022

Compiler Version Notes (Continued)

```
----------------------------------------------------------------------------
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#434 2022_10_28) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#434 2022_10_28) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin
----------------------------------------------------------------------------

==============================================================================
C++, C, Fortran | 507.cactuBSSN_r(base, peak)
----------------------------------------------------------------------------
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#434 2022_10_28) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#434 2022_10_28) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#434 2022_10_28) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin
----------------------------------------------------------------------------

==============================================================================
Fortran         | 503.bwaves_r(base, peak) 549.fotonik3d_r(base, peak) 554.roms_r(base, peak)
----------------------------------------------------------------------------
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#434 2022_10_28) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin
----------------------------------------------------------------------------

==============================================================================
Fortran, C      | 521.wrf_r(base, peak) 527.cam4_r(base, peak)
----------------------------------------------------------------------------
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#434 2022_10_28) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#434 2022_10_28) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin
----------------------------------------------------------------------------
```

Base Compiler Invocation

C benchmarks:
```
clang
```

(Continued on next page)

Lenovo Global Technology

ThinkSystem SR655 V3
(2.25 GHz, AMD EPYC 9754)

SPECrate®2017_fp_base =	616
SPECrate®2017_fp_energy_base =	1970
SPECrate®2017_fp_peak =	646
SPECrate®2017_fp_energy_peak =	2050

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

Test Date: May-2023
Hardware Availability: Aug-2023
Software Availability: Nov-2022

Base 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
```

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 -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,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-ldist-scalar-expand -fenable-aggressive-gather -O3
```

(Continued on next page)

Lenovo Global Technology

ThinkSystem SR655 V3
(2.25 GHz, AMD EPYC 9754)

SPECrate®2017_fp_base =	616
SPECrate®2017_fp_energy_base =	1970
SPECrate®2017_fp_peak =	646
SPECrate®2017_fp_energy_peak =	2050

CPU2017 License:	9017		**Test Date:**	May-2023
Test Sponsor:	Lenovo Global Technology		**Hardware Availability:**	Aug-2023
Tested by:	Lenovo Global Technology		**Software Availability:**	Nov-2022

Base Optimization Flags (Continued)

C benchmarks (continued):
```
-march=znver4 -fveclib=AMDLIBM -ffast-math -fstruct-layout=7
-mllvm -unroll-threshold=50 -mllvm -inline-threshold=1000
-fremap-arrays -fstrip-mining -mllvm -reduce-array-computations=3
-zopt -lamdlibm -lamdalloc -lflang
```

C++ benchmarks:
```
-m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-x86-use-vzeroupper=false -O3 -march=znver4
-fveclib=AMDLIBM -ffast-math -mllvm -unroll-threshold=100
-finline-aggressive -mllvm -loop-unswitch-threshold=200000
-mllvm -reduce-array-computations=3 -zopt -lamdlibm -lamdalloc
-lflang
```

Fortran benchmarks:
```
-m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-enable-X86-prefetching -O3 -march=znver4
-fveclib=AMDLIBM -ffast-math -Kieee -Mrecursive -funroll-loops
-mllvm -lsr-in-nested-loop -mllvm -reduce-array-computations=3
-fepilog-vectorization-of-inductions -zopt -lamdlibm -lamdalloc
-lflang
```

Benchmarks using both Fortran and C:
```
-m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-enable-X86-prefetching -O3 -march=znver4
-fveclib=AMDLIBM -ffast-math -fstruct-layout=7
-mllvm -unroll-threshold=50 -mllvm -inline-threshold=1000
-fremap-arrays -fstrip-mining -mllvm -reduce-array-computations=3
-zopt -Kieee -Mrecursive -funroll-loops -mllvm -lsr-in-nested-loop
-fepilog-vectorization-of-inductions -lamdlibm -lamdalloc -lflang
```

Benchmarks using both C and C++:
```
-m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-x86-use-vzeroupper=false -O3 -march=znver4
-fveclib=AMDLIBM -ffast-math -fstruct-layout=7
-mllvm -unroll-threshold=50 -mllvm -inline-threshold=1000
-fremap-arrays -fstrip-mining -mllvm -reduce-array-computations=3
-zopt -mllvm -unroll-threshold=100 -finline-aggressive
-mllvm -loop-unswitch-threshold=200000 -lamdlibm -lamdalloc -lflang
```

(Continued on next page)

SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2023 Standard Performance Evaluation Corporation

Lenovo Global Technology

ThinkSystem SR655 V3
(2.25 GHz, AMD EPYC 9754)

SPECrate®2017_fp_base = 616
SPECrate®2017_fp_energy_base = 1970
SPECrate®2017_fp_peak = 646
SPECrate®2017_fp_energy_peak = 2050

CPU2017 License: 9017	**Test Date:** May-2023
Test Sponsor: Lenovo Global Technology	**Hardware Availability:** Aug-2023
Tested by: Lenovo Global Technology	**Software Availability:** Nov-2022

Base Optimization Flags (Continued)

Benchmarks using Fortran, C, and C++:

```
-m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-x86-use-vzeroupper=false -O3 -march=znver4
-fveclib=AMDLIBM -ffast-math -fstruct-layout=7
-mllvm -unroll-threshold=50 -mllvm -inline-threshold=1000
-fremap-arrays -fstrip-mining -mllvm -reduce-array-computations=3
-zopt -mllvm -unroll-threshold=100 -finline-aggressive
-mllvm -loop-unswitch-threshold=200000 -Kieee -Mrecursive
-funroll-loops -mllvm -lsr-in-nested-loop
-fepilog-vectorization-of-inductions -lamdlibm -lamdalloc -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
```

Benchmarks using Fortran, C, and C++:
```
-Wno-unused-command-line-argument
```

Peak Compiler Invocation

C benchmarks:
```
clang
```

C++ benchmarks:
```
clang++
```

(Continued on next page)

spec®

Lenovo Global Technology

ThinkSystem SR655 V3
(2.25 GHz, AMD EPYC 9754)

SPECrate®2017_fp_base = 616
SPECrate®2017_fp_energy_base = 1970
SPECrate®2017_fp_peak = 646
SPECrate®2017_fp_energy_peak = 2050

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

Test Date: May-2023
Hardware Availability: Aug-2023
Software Availability: Nov-2022

Peak Compiler Invocation (Continued)

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,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3 -Ofast
-march=znver4 -fveclib=AMDLIBM -ffast-math
-fstruct-layout=7 -mllvm -unroll-threshold=50
-fremap-arrays -fstrip-mining
-mllvm -inline-threshold=1000
-mllvm -reduce-array-computations=3 -zopt -lamdlibm
-lamdalloc
```

```
538.imagick_r: Same as 519.lbm_r
```

```
544.nab_r: -m64 -flto -Wl,-mllvm -Wl,-ldist-scalar-expand
-fenable-aggressive-gather -Ofast -march=znver4
-fveclib=AMDLIBM -ffast-math -fstruct-layout=7
-mllvm -unroll-threshold=50 -fremap-arrays -fstrip-mining
-mllvm -inline-threshold=1000
-mllvm -reduce-array-computations=3 -zopt -lamdlibm
```

(Continued on next page)

Lenovo Global Technology

ThinkSystem SR655 V3
(2.25 GHz, AMD EPYC 9754)

SPECrate®2017_fp_base =	616
SPECrate®2017_fp_energy_base =	1970
SPECrate®2017_fp_peak =	646
SPECrate®2017_fp_energy_peak =	2050

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

Test Date: May-2023
Hardware Availability: Aug-2023
Software Availability: Nov-2022

Peak Optimization Flags (Continued)

544.nab_r (continued):
```
-lamdalloc
```

C++ benchmarks:

508.namd_r: `-m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6`
`-Wl,-mllvm -Wl,-reduce-array-computations=3`
`-Wl,-mllvm -Wl,-x86-use-vzeroupper=false -Ofast`
`-march=znver4 -fveclib=AMDLIBM -ffast-math`
`-finline-aggressive -mllvm -unroll-threshold=100`
`-mllvm -reduce-array-computations=3 -zopt -lamdlibm`
`-lamdalloc`

510.parest_r: `-m64 -flto -Wl,-mllvm -Wl,-suppress-fmas`
`-Wl,-mllvm -Wl,-x86-use-vzeroupper=false -Ofast`
`-march=znver4 -fveclib=AMDLIBM -ffast-math`
`-finline-aggressive -mllvm -unroll-threshold=100`
`-mllvm -reduce-array-computations=3 -zopt -lamdlibm`
`-lamdalloc`

Fortran benchmarks:

503.bwaves_r: `-m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6`
`-Wl,-mllvm -Wl,-reduce-array-computations=3`
`-Wl,-mllvm -Wl,-enable-X86-prefetching -Ofast`
`-march=znver4 -fveclib=AMDLIBM -ffast-math -Mrecursive`
`-mllvm -reduce-array-computations=3`
`-fepilog-vectorization-of-inductions -zopt -lamdlibm`
`-lamdalloc -lflang`

549.fotonik3d_r: `-m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6`
`-Wl,-mllvm -Wl,-reduce-array-computations=3`
`-Wl,-mllvm -Wl,-enable-X86-prefetching -Ofast`
`-march=znver4 -fveclib=AMDLIBM -ffast-math -Kieee`
`-Mrecursive -mllvm -reduce-array-computations=3`
`-fepilog-vectorization-of-inductions -fvector-transform`
`-fscalar-transform -lamdlibm -lamdalloc -lflang`

554.roms_r: `Same as 503.bwaves_r`

Benchmarks using both Fortran and C:

521.wrf_r: `-m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6`
`-Wl,-mllvm -Wl,-reduce-array-computations=3`

(Continued on next page)

Lenovo Global Technology

ThinkSystem SR655 V3
(2.25 GHz, AMD EPYC 9754)

SPECrate®2017_fp_base = 616
SPECrate®2017_fp_energy_base = 1970
SPECrate®2017_fp_peak = 646
SPECrate®2017_fp_energy_peak = 2050

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

Test Date: May-2023
Hardware Availability: Aug-2023
Software Availability: Nov-2022

Peak Optimization Flags (Continued)

521.wrf_r (continued):
```
-Wl,-mllvm -Wl,-enable-X86-prefetching -Ofast
-march=znver4 -fveclib=AMDLIBM -ffast-math
-fstruct-layout=7 -mllvm -unroll-threshold=50
-fremap-arrays -fstrip-mining
-mllvm -inline-threshold=1000
-mllvm -reduce-array-computations=3 -zopt -Mrecursive
-fepilog-vectorization-of-inductions -lamdlibm -lamdalloc
-lflang
```

527.cam4_r: `-m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6`
```
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-enable-X86-prefetching -O3 -march=znver4
-fveclib=AMDLIBM -ffast-math -fstruct-layout=7
-mllvm -unroll-threshold=50 -mllvm -inline-threshold=1000
-fremap-arrays -mllvm -reduce-array-computations=3 -zopt
-Kieee -Mrecursive -funroll-loops
-mllvm -lsr-in-nested-loop
-fepilog-vectorization-of-inductions -lamdlibm -lamdalloc
-lflang
```

Benchmarks using both C and C++:

511.povray_r: `-m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6`
```
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-x86-use-vzeroupper=false -O3 -march=znver4
-fveclib=AMDLIBM -ffast-math -fstruct-layout=7
-mllvm -unroll-threshold=50 -mllvm -inline-threshold=1000
-fremap-arrays -mllvm -reduce-array-computations=3 -zopt
-mllvm -unroll-threshold=100 -finline-aggressive
-mllvm -loop-unswitch-threshold=200000 -lamdlibm
-lamdalloc
```

526.blender_r: `-m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6`
```
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-x86-use-vzeroupper=false -Ofast
-march=znver4 -fveclib=AMDLIBM -ffast-math
-fstruct-layout=7 -mllvm -unroll-threshold=50
-fremap-arrays -fstrip-mining
-mllvm -inline-threshold=1000
-mllvm -reduce-array-computations=3 -zopt
-finline-aggressive -mllvm -unroll-threshold=100 -lamdlibm
-lamdalloc
```

(Continued on next page)

Lenovo Global Technology

ThinkSystem SR655 V3
(2.25 GHz, AMD EPYC 9754)

SPECrate®2017_fp_base = 616
SPECrate®2017_fp_energy_base = 1970
SPECrate®2017_fp_peak = 646
SPECrate®2017_fp_energy_peak = 2050

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

Test Date: May-2023
Hardware Availability: Aug-2023
Software Availability: Nov-2022

Peak Optimization Flags (Continued)

Benchmarks using Fortran, C, and C++:
```
-m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-x86-use-vzeroupper=false -Ofast -march=znver4
-fveclib=AMDLIBM -ffast-math -fstruct-layout=7
-mllvm -unroll-threshold=50 -fremap-arrays -fstrip-mining
-mllvm -inline-threshold=1000 -mllvm -reduce-array-computations=3 -zopt
-mllvm -unroll-threshold=100 -mllvm -loop-unswitch-threshold=200000
-finline-aggressive -faggressive-loop-transform -fvector-transform
-fscalar-transform -Mrecursive -fepilog-vectorization-of-inductions
-lamdlibm -lamdalloc -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
```

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2017/flags/aocc400-flags.html
http://www.spec.org/cpu2017/flags/Lenovo-Platform-SPECcpu2017-Flags-V1.2-Bergamo-S.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2017/flags/aocc400-flags.xml
http://www.spec.org/cpu2017/flags/Lenovo-Platform-SPECcpu2017-Flags-V1.2-Bergamo-S.xml

SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2023 Standard Performance Evaluation Corporation

Lenovo Global Technology

ThinkSystem SR655 V3
(2.25 GHz, AMD EPYC 9754)

SPECrate®2017_fp_base =	616
SPECrate®2017_fp_energy_base =	1970
SPECrate®2017_fp_peak =	646
SPECrate®2017_fp_energy_peak =	2050

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

Test Date: May-2023
Hardware Availability: Aug-2023
Software Availability: Nov-2022

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

Tested with SPEC CPU®2017 v1.1.9 on 2023-05-19 12:56:02-0400.
Report generated on 2023-06-29 19:02:28 by CPU2017 PDF formatter v6716.
Originally published on 2023-06-29.