# SPEC CPU®2017 Floating Point Speed Result

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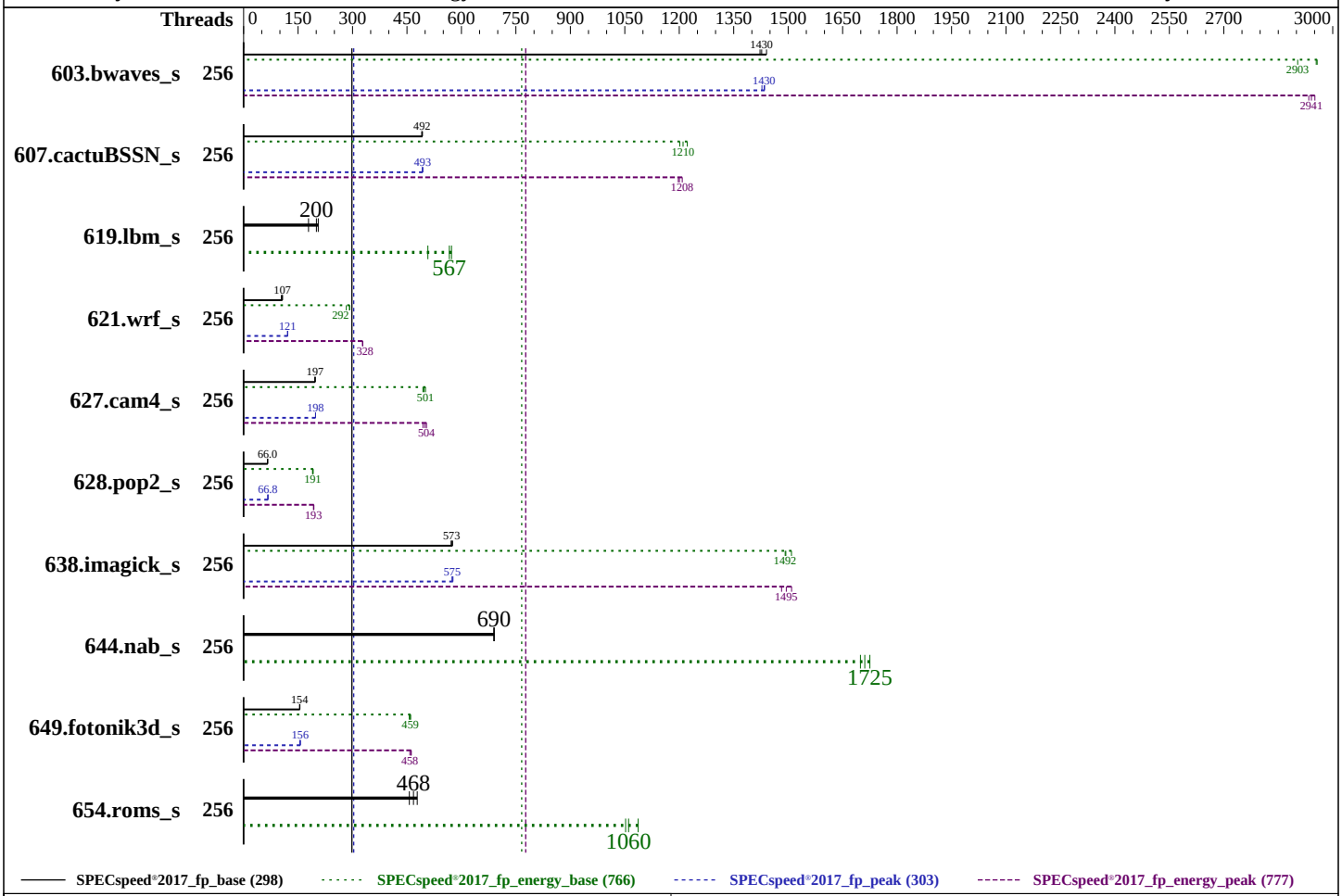
## Lenovo Global Technology

## ThinkSystem SR665 V3 (2.25 GHz, AMD EPYC 9754)

| | |
|---|---|
| SPECspeed®2017_fp_base = | 298 |
| SPECspeed®2017_fp_energy_base = | 766 |
| SPECspeed®2017_fp_peak = | 303 |
| SPECspeed®2017_fp_energy_peak = | 777 |

**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

| | |
|---|---|
| CPU Name: | AMD EPYC 9754 |
| Max MHz: | 3100 |
| Nominal: | 2250 |
| Enabled: | 256 cores, 2 chips |
| Orderable: | 1,2 chips |
| 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: | 768 GB (24 x 32 GB 2Rx8 PC5-4800B-R) |
| Storage: | 1 x 480 GB SATA SSD |
| Other: | None |

## Software

| | |
|---|---|
| OS: | SUSE Linux Enterprise Server 15 SP4 kernel version 5.14.21-150400.22-default |
| Compiler: | C/C++/Fortran: Version 4.0.0 of AOCC |
| Parallel: | Yes |
| Firmware: | Lenovo BIOS Version KAE111J 2.10 released May-2023 |
| 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 |

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### Power

Max. Power (W): 639.4
Idle Power (W): 113.28
Min. Temperature (C): 24.81
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 1100 W (non-redundant)
Details: ThinkSystem 1100W Titanium Power Supply 4P57A72666
Backplane: 8 x 2.5-inch HDD back plane
Other Storage: None
Storage Model #s: 4XB7A82259
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: C3UG05013E
Input Connection: Default
Metrology Institute: CNAS
Calibration By: GRG METROLOGY & TEST (BEIJING) CO., LTD.
Calibration Label: J202210116758A-0007
Calibration Date: 19-Oct-2022
PTDaemon® Version: 1.10.0 (82175bac; 2022-08-17)
Setup Description: Connected to PSU1
Current Ranges Used: 5A
Voltage Range Used: 300V

### Temperature Meter

Temperature Meter: WIN:9889
Hardware Vendor: Digi International, Inc.
Model: DigiWATCHPORT_H
Serial Number: W63390099
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 | Threads | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 603.bwaves_s | 256 | 41.5 | 1420 | 21.8 | 2950 | 525 | 549 | 41.0 | 1440 | 21.8 | 2960 | 531 | 560 | **41.3** | **1430** | **22.2** | **2900** | **536** | **560** |
| 607.cactuBSSN_s | 256 | 34.0 | 491 | 15.2 | 1200 | 447 | 466 | **33.9** | **492** | **15.1** | **1210** | **444** | **468** | 33.8 | 493 | 14.9 | 1220 | 441 | 467 |
| 619.lbm_s | 256 | **26.1** | **200** | **10.5** | **567** | **402** | **438** | 29.3 | 179 | 11.7 | 508 | 400 | 445 | 25.5 | 206 | 10.4 | 573 | 408 | 448 |
| 621.wrf_s | 256 | 127 | 104 | 51.1 | 283 | 401 | 405 | **124** | **107** | **49.5** | **292** | **400** | **405** | 124 | 107 | 49.4 | 292 | 400 | 405 |
| 627.cam4_s | 256 | 44.9 | 197 | 19.4 | 497 | 432 | 462 | **45.0** | **197** | **19.2** | **501** | **428** | **462** | 45.2 | 196 | 19.5 | 494 | 432 | 458 |
| 628.pop2_s | 256 | **180** | **66.0** | **68.5** | **191** | **381** | **386** | 180 | 65.8 | 68.7 | 190 | 381 | 386 | 179 | 66.3 | 68.1 | 192 | 380 | 385 |
| 638.imagick_s | 256 | 25.2 | 572 | 10.4 | 1510 | 413 | 637 | 25.1 | 576 | 10.5 | 1490 | 420 | 639 | **25.2** | **573** | **10.5** | **1490** | **419** | **639** |
| 644.nab_s | 256 | **25.3** | **690** | **11.0** | **1730** | **435** | **503** | 25.3 | 690 | 11.2 | 1700 | 442 | 498 | 25.3 | 690 | 11.1 | 1710 | 439 | 500 |
| 649.fotonik3d_s | 256 | 58.8 | 155 | 22.3 | 460 | 379 | 472 | **59.0** | **154** | **22.3** | **459** | **378** | **471** | 59.1 | 154 | 22.4 | 456 | 380 | 472 |
| 654.roms_s | 256 | 34.5 | 457 | 16.7 | 1050 | 485 | 514 | **33.7** | **468** | **16.6** | **1060** | **493** | **513** | 32.9 | 478 | 16.2 | 1090 | 492 | 514 |

**SPECspeed®2017_fp_base = 298**

**SPECspeed®2017_fp_energy_base = 766**

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

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## ThinkSystem SR665 V3 (2.25 GHz, AMD EPYC 9754)

SPECspeed®2017_fp_base = 298

SPECspeed®2017_fp_energy_base = 766

SPECspeed®2017_fp_peak = 303

SPECspeed®2017_fp_energy_peak = 777

**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 Results Table

| Benchmark | Threads | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 603.bwaves_s | 256 | 41.3 | 1430 | 21.8 | 2950 | 528 | 559 | 41.1 | 1440 | 21.9 | 2930 | 534 | 558 | **41.1** | **1430** | **21.9** | **2940** | **532** | **561** |
| 607.cactuBSSN_s | 256 | **33.8** | **493** | **15.1** | **1210** | **446** | **468** | 33.8 | 493 | 15.2 | 1200 | 451 | 471 | 33.9 | 492 | 15.2 | 1200 | 449 | 466 |
| 619.lbm_s | 256 | **26.1** | **200** | **10.5** | **567** | **402** | **438** | 29.3 | 179 | 11.7 | 508 | 400 | 445 | 25.5 | 206 | 10.4 | 573 | 408 | 448 |
| 621.wrf_s | 256 | 109 | 121 | 44.1 | 328 | 403 | 411 | 109 | 122 | 44.0 | 328 | 405 | 410 | **109** | **121** | **44.0** | **328** | **404** | **409** |
| 627.cam4_s | 256 | **44.7** | **198** | **19.1** | **504** | **428** | **460** | 44.7 | 198 | 19.5 | 494 | 436 | 496 | 44.8 | 198 | 19.3 | 500 | 431 | 462 |
| 628.pop2_s | 256 | 177 | 67.2 | 67.4 | 194 | 381 | 387 | **178** | **66.8** | **67.7** | **193** | **381** | **386** | 178 | 66.8 | 67.7 | 193 | 381 | 386 |
| 638.imagick_s | 256 | **25.1** | **575** | **10.5** | **1490** | **419** | **635** | 25.0 | 577 | 10.4 | 1510 | 416 | 639 | 25.1 | 575 | 10.6 | 1480 | 423 | 637 |
| 644.nab_s | 256 | **25.3** | **690** | **11.0** | **1730** | **435** | **503** | 25.3 | 690 | 11.2 | 1700 | 442 | 498 | 25.3 | 690 | 11.1 | 1710 | 439 | 500 |
| 649.fotonik3d_s | 256 | **58.4** | **156** | **22.4** | **458** | **383** | **475** | 58.3 | 156 | 22.2 | 461 | 381 | 475 | 59.0 | 155 | 22.2 | 462 | 376 | 476 |
| 654.roms_s | 256 | 34.5 | 457 | 16.7 | 1050 | 485 | 514 | **33.7** | **468** | **16.6** | **1060** | **493** | **513** | 32.9 | 478 | 16.2 | 1090 | 492 | 514 |

**SPECspeed®2017_fp_peak = 303**

**SPECspeed®2017_fp_energy_peak = 777**

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.
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.
To always enable THP for peak runs of:
603.bwaves_s, 607.cactuBSSN_s, 619.lbm_s, 627.cam4_s, 628.pop2_s, 638.imagick_s, 644.nab_s, 649.fotonik3d_s:
'echo madvise > /sys/kernel/mm/transparent_hugepage/enabled; echo always > /sys/kernel/mm/transparent_hugepage/defrag'
run as root.
To disable THP for peak runs of 621.wrf_s:
'echo never > /sys/kernel/mm/transparent_hugepage/enabled; echo always > /sys/kernel/mm/transparent_hugepage/defrag'
```

**(Continued on next page)**

## Operating System Notes (Continued)

```
run as root.
To enable THP only on request for peak runs of 654.roms_s:
'echo madvise > /sys/kernel/mm/transparent_hugepage/enabled; echo madvise > /sys/kernel/mm/transparent_hugepage/defrag'
run as root.
```

## Environment Variables Notes

```
Environment variables set by runcpu before the start of the run:
GOMP_CPU_AFFINITY = "0-255"
LD_LIBRARY_PATH = "/home/cpu2017-1.1.9-amd-aocc400_znver4_A1/amd_speed_aocc400_znver4_A_lib/lib:"
LIBOMP_NUM_HIDDEN_HELPER_THREADS = "0"
MALLOC_CONF = "oversize_threshold:0,retain:true"
OMP_DYNAMIC = "false"
OMP_SCHEDULE = "static"
OMP_STACKSIZE = "128M"
OMP_THREAD_LIMIT = "256"

Environment variables set by runcpu during the 603.bwaves_s peak run:
GOMP_CPU_AFFINITY = "0-255"

Environment variables set by runcpu during the 607.cactuBSSN_s peak run:
GOMP_CPU_AFFINITY = "0-255"

Environment variables set by runcpu during the 621.wrf_s peak run:
GOMP_CPU_AFFINITY = "0-255"

Environment variables set by runcpu during the 627.cam4_s peak run:
GOMP_CPU_AFFINITY = "0-255"

Environment variables set by runcpu during the 628.pop2_s peak run:
GOMP_CPU_AFFINITY = "0-255"

Environment variables set by runcpu during the 638.imagick_s peak run:
GOMP_CPU_AFFINITY = "0-255"

Environment variables set by runcpu during the 649.fotonik3d_s peak run:
GOMP_CPU_AFFINITY = "0-255"
PGHPF_ZMEM = "yes"
```

## 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
ACPI SRAT L3 Cache as NUMA Domain set to Enabled
Core Performance Boost set to Disabled
DF P-states set to P1
SMT Mode 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 Thu May 18 19:48:21 2023

 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
    19:48:21 up 4 min,  1 user,  load average: 0.33, 0.32, 0.17
   USER     TTY      FROM             LOGIN@   IDLE   JCPU   PCPU WHAT
   root     tty1     -                19:46   22.00s  2.37s  0.29s /bin/bash ./amd_speed_aocc400_znver4_A1.sh

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

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

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## Platform Notes (Continued)

```
 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) 3093976
   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
   real-time priority              (-r) 0
   stack size              (kbytes, -s) unlimited
   cpu time               (seconds, -t) unlimited
   max user processes              (-u) 3093976
   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 ./speedfp.sh
  /bin/bash ./Run036-compliant-amd-speedfp.sh
  python3 ./run_amd_speed_aocc400_znver4_A1.py
  /bin/bash ./amd_speed_aocc400_znver4_A1.sh
  runcpu --power --config amd_speed_aocc400_znver4_A1.cfg --tune all --reportable --iterations 3 fpspeed
  runcpu --power --configfile amd_speed_aocc400_znver4_A1.cfg --tune all --reportable --iterations 3 --runmode
    speed --tune base:peak --size test:train:refspeed fpspeed --nopreenv --note-preenv --logfile
    $SPEC/tmp/CPU2017.063/templogs/preenv.fpspeed.063.0.log --lognum 063.0 --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        : 128
     2 physical ids (chips)
     256 processors (hardware threads)
     physical id 0: core ids
     0-7,16-23,32-39,48-55,64-71,80-87,96-103,112-119,128-135,144-151,160-167,176-183,192-199,208-215,224-231,
     240-247
     physical id 1: core ids
     0-7,16-23,32-39,48-55,64-71,80-87,96-103,112-119,128-135,144-151,160-167,176-183,192-199,208-215,224-231,
     240-247
     physical id 0: apicids
     0-7,16-23,32-39,48-55,64-71,80-87,96-103,112-119,128-135,144-151,160-167,176-183,192-199,208-215,224-231,
     240-247
```

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## Platform Notes (Continued)

```
    physical id 1: apicids
    256-263,272-279,288-295,304-311,320-327,336-343,352-359,368-375,384-391,400-407,416-423,432-439,448-455,4
    64-471,480-487,496-503
  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:              1
  Core(s) per socket:              128
  Socket(s):                       2
  Stepping:                        2
  Frequency boost:                 disabled
  CPU max MHz:                     3100.3411
  CPU min MHz:                     1500.0000
  BogoMIPS:                        4493.50
  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:                       8 MiB (256 instances)
  L1i cache:                       8 MiB (256 instances)
  L2 cache:                        256 MiB (256 instances)
  L3 cache:                        512 MiB (32 instances)
  NUMA node(s):                    32
  NUMA node0 CPU(s):               0-7
  NUMA node1 CPU(s):               8-15
  NUMA node2 CPU(s):               16-23
  NUMA node3 CPU(s):               24-31
  NUMA node4 CPU(s):               32-39
  NUMA node5 CPU(s):               40-47
  NUMA node6 CPU(s):               48-55
```

**(Continued on next page)**

## Platform Notes (Continued)

```
  NUMA node7 CPU(s):               56-63
  NUMA node8 CPU(s):               64-71
  NUMA node9 CPU(s):               72-79
  NUMA node10 CPU(s):              80-87
  NUMA node11 CPU(s):              88-95
  NUMA node12 CPU(s):              96-103
  NUMA node13 CPU(s):              104-111
  NUMA node14 CPU(s):              112-119
  NUMA node15 CPU(s):              120-127
  NUMA node16 CPU(s):              128-135
  NUMA node17 CPU(s):              136-143
  NUMA node18 CPU(s):              144-151
  NUMA node19 CPU(s):              152-159
  NUMA node20 CPU(s):              160-167
  NUMA node21 CPU(s):              168-175
  NUMA node22 CPU(s):              176-183
  NUMA node23 CPU(s):              184-191
  NUMA node24 CPU(s):              192-199
  NUMA node25 CPU(s):              200-207
  NUMA node26 CPU(s):              208-215
  NUMA node27 CPU(s):              216-223
  NUMA node28 CPU(s):              224-231
  NUMA node29 CPU(s):              232-239
  NUMA node30 CPU(s):              240-247
  NUMA node31 CPU(s):              248-255
  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 disabled, 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       8M    8 Data            1    64        1             64
     L1i       32K       8M    8 Instruction     1    64        1             64
     L2         1M     256M    8 Unified         2  2048        1             64
     L3        16M     512M   16 Unified         3 16384        1             64

------------------------------------------------------------
8. numactl --hardware
NOTE: a numactl 'node' might or might not correspond to a physical chip.
  available: 32 nodes (0-31)
  node 0 cpus: 0-7
  node 0 size: 23936 MB
  node 0 free: 22349 MB
  node 1 cpus: 8-15
  node 1 size: 24187 MB
  node 1 free: 24094 MB
  node 2 cpus: 16-23
  node 2 size: 24187 MB
  node 2 free: 24109 MB
  node 3 cpus: 24-31
```

**(Continued on next page)**

## Platform Notes (Continued)

```
  node 3 size: 24187 MB
  node 3 free: 24111 MB
  node 4 cpus: 32-39
  node 4 size: 24187 MB
  node 4 free: 23992 MB
  node 5 cpus: 40-47
  node 5 size: 24187 MB
  node 5 free: 24078 MB
  node 6 cpus: 48-55
  node 6 size: 24187 MB
  node 6 free: 24115 MB
  node 7 cpus: 56-63
  node 7 size: 24187 MB
  node 7 free: 24092 MB
  node 8 cpus: 64-71
  node 8 size: 24187 MB
  node 8 free: 24092 MB
  node 9 cpus: 72-79
  node 9 size: 24187 MB
  node 9 free: 24112 MB
  node 10 cpus: 80-87
  node 10 size: 24187 MB
  node 10 free: 24060 MB
  node 11 cpus: 88-95
  node 11 size: 24187 MB
  node 11 free: 24083 MB
  node 12 cpus: 96-103
  node 12 size: 24187 MB
  node 12 free: 24104 MB
  node 13 cpus: 104-111
  node 13 size: 24187 MB
  node 13 free: 24117 MB
  node 14 cpus: 112-119
  node 14 size: 24187 MB
  node 14 free: 24079 MB
  node 15 cpus: 120-127
  node 15 size: 24187 MB
  node 15 free: 24104 MB
  node 16 cpus: 128-135
  node 16 size: 24187 MB
  node 16 free: 24078 MB
  node 17 cpus: 136-143
  node 17 size: 24187 MB
  node 17 free: 24079 MB
  node 18 cpus: 144-151
  node 18 size: 24187 MB
  node 18 free: 24123 MB
  node 19 cpus: 152-159
  node 19 size: 24187 MB
  node 19 free: 24112 MB
  node 20 cpus: 160-167
  node 20 size: 24187 MB
  node 20 free: 24109 MB
  node 21 cpus: 168-175
  node 21 size: 24187 MB
  node 21 free: 24118 MB
  node 22 cpus: 176-183
```

**(Continued on next page)**

## Platform Notes (Continued)

```
node 22 size: 24187 MB
node 22 free: 24111 MB
node 23 cpus: 184-191
node 23 size: 24187 MB
node 23 free: 24105 MB
node 24 cpus: 192-199
node 24 size: 24187 MB
node 24 free: 24084 MB
node 25 cpus: 200-207
node 25 size: 24187 MB
node 25 free: 24084 MB
node 26 cpus: 208-215
node 26 size: 24187 MB
node 26 free: 24024 MB
node 27 cpus: 216-223
node 27 size: 23979 MB
node 27 free: 23874 MB
node 28 cpus: 224-231
node 28 size: 24153 MB
node 28 free: 23790 MB
node 29 cpus: 232-239
node 29 size: 24187 MB
node 29 free: 23963 MB
node 30 cpus: 240-247
node 30 size: 24187 MB
node 30 free: 24061 MB
node 31 cpus: 248-255
node 31 size: 24187 MB
node 31 free: 24062 MB
node distances:
node   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
  0:  10  11  11  11  11  11  11  11  11  11  11  11  11  11  11  11  32  32  32  32  32  32  32  32  32
  32  32  32  32  32  32  32
  1:  11  10  11  11  11  11  11  11  11  11  11  11  11  11  11  11  32  32  32  32  32  32  32  32  32
  32  32  32  32  32  32  32
  2:  11  11  10  11  11  11  11  11  11  11  11  11  11  11  11  11  32  32  32  32  32  32  32  32  32
  32  32  32  32  32  32  32
  3:  11  11  11  10  11  11  11  11  11  11  11  11  11  11  11  11  32  32  32  32  32  32  32  32  32
  32  32  32  32  32  32  32
  4:  11  11  11  11  10  11  11  11  11  11  11  11  11  11  11  11  32  32  32  32  32  32  32  32  32
  32  32  32  32  32  32  32
  5:  11  11  11  11  11  10  11  11  11  11  11  11  11  11  11  11  32  32  32  32  32  32  32  32  32
  32  32  32  32  32  32  32
  6:  11  11  11  11  11  11  10  11  11  11  11  11  11  11  11  11  32  32  32  32  32  32  32  32  32
  32  32  32  32  32  32  32
  7:  11  11  11  11  11  11  11  10  11  11  11  11  11  11  11  11  32  32  32  32  32  32  32  32  32
  32  32  32  32  32  32  32
  8:  11  11  11  11  11  11  11  11  10  11  11  11  11  11  11  11  32  32  32  32  32  32  32  32  32
  32  32  32  32  32  32  32
  9:  11  11  11  11  11  11  11  11  11  10  11  11  11  11  11  11  32  32  32  32  32  32  32  32  32
  32  32  32  32  32  32  32
 10:  11  11  11  11  11  11  11  11  11  11  10  11  11  11  11  11  32  32  32  32  32  32  32  32  32
 32  32  32  32  32  32  32
 11:  11  11  11  11  11  11  11  11  11  11  11  10  11  11  11  11  32  32  32  32  32  32  32  32  32
 32  32  32  32  32  32  32
 12:  11  11  11  11  11  11  11  11  11  11  11  11  10  11  11  11  32  32  32  32  32  32  32  32  32
```

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## Platform Notes (Continued)

```
    32  32  32  32  32  32  32
   13:  11  11  11  11  11  11  11  11  11  11  11  11  11  11  10  11  11  32  32  32  32  32  32  32  32
   32  32  32  32  32  32  32
   14:  11  11  11  11  11  11  11  11  11  11  11  11  11  11  11  10  11  32  32  32  32  32  32  32  32
   32  32  32  32  32  32  32
   15:  11  11  11  11  11  11  11  11  11  11  11  11  11  11  11  11  10  32  32  32  32  32  32  32  32
   32  32  32  32  32  32  32
   16:  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  10  11  11  11  11  11  11  11
   11  11  11  11  11  11  11
   17:  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  11  10  11  11  11  11  11  11
   11  11  11  11  11  11  11
   18:  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  11  11  10  11  11  11  11  11
   11  11  11  11  11  11  11
   19:  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  11  11  11  10  11  11  11  11
   11  11  11  11  11  11  11
   20:  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  11  11  11  11  10  11  11  11
   11  11  11  11  11  11  11
   21:  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  11  11  11  11  11  10  11  11
   11  11  11  11  11  11  11
   22:  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  11  11  11  11  11  11  10  11
   11  11  11  11  11  11  11
   23:  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  11  11  11  11  11  11  11  10
   11  11  11  11  11  11  11
   24:  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  11  11  11  11  11  11  11  11
   10  11  11  11  11  11  11
   25:  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  11  11  11  11  11  11  11  11
   10  11  11  11  11  11  11
   26:  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  11  11  11  11  11  11  11  11
   11  10  11  11  11  11  11
   27:  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  11  11  11  11  11  11  11  11
   11  11  10  11  11  11  11
   28:  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  11  11  11  11  11  11  11  11
   11  11  11  10  11  11  11
   29:  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  11  11  11  11  11  11  11  11
   11  11  11  11  10  11  11
   30:  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  11  11  11  11  11  11  11  11
   11  11  11  11  11  10  11
   31:  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  11  11  11  11  11  11  11  11
   11  11  11  11  11  11  10

------------------------------------------------------------
9. /proc/meminfo
   MemTotal:       792082580 kB

------------------------------------------------------------
10. who -r
  run-level 3 May 18 19:45

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

(Continued on next page)

## Platform Notes (Continued)

```
                  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
                  issue-add-ssh-keys kexec-load lunmask man-db-create multipathd nfs nfs-blkmap rdisc
                  rpcbind rpmconfigcheck rsyncd serial-getty@ smartd_generate_opts snmpd snmptrapd
                  systemd-boot-check-no-failures systemd-network-generator systemd-sysext
                  systemd-time-wait-sync systemd-timesyncd tuned udisks2
  indirect        wickedd

------------------------------------------------------------
13. Linux kernel boot-time arguments, from /proc/cmdline
  BOOT_IMAGE=/boot/vmlinuz-5.14.21-150400.22-default
  root=UUID=a318787d-19c7-4838-85d1-48f29c075c16
  splash=silent
  mitigations=auto
  quiet
  security=apparmor

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

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## Platform Notes (Continued)

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

------------------------------------------------------------
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   59G  387G  14% /

------------------------------------------------------------
21. /sys/devices/virtual/dmi/id
    Vendor:         Lenovo
    Product:        ThinkSystem SR665 V3 MB,Genoa,Kauai,DDR5,Kauai,2U
    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:
    8x SK Hynix HMCG88AEBRA115N 32 GB 2 rank 4800
    16x 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               | 619.lbm_s(base, peak) 638.imagick_s(base, peak) 644.nab_s(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, Fortran | 607.cactuBSSN_s(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         | 603.bwaves_s(base, peak) 649.fotonik3d_s(base, peak) 654.roms_s(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      | 621.wrf_s(base, peak) 627.cam4_s(base, peak) 628.pop2_s(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

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## Base Compiler Invocation (Continued)

Fortran benchmarks:
flang

Benchmarks using both Fortran and C:
flang clang

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

## Base Portability Flags

603.bwaves_s: -DSPEC_LP64
607.cactuBSSN_s: -DSPEC_LP64
619.lbm_s: -DSPEC_LP64
621.wrf_s: -DSPEC_CASE_FLAG -Mbyteswapio -DSPEC_LP64
627.cam4_s: -DSPEC_CASE_FLAG -DSPEC_LP64
628.pop2_s: -DSPEC_CASE_FLAG -Mbyteswapio -DSPEC_LP64
638.imagick_s: -DSPEC_LP64
644.nab_s: -DSPEC_LP64
649.fotonik3d_s: -DSPEC_LP64
654.roms_s: -DSPEC_LP64

## Base Optimization Flags

C benchmarks:
-m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3 -O3 -march=znver4
-fveclib=AMDLIBM -ffast-math -fopenmp -flto -fstruct-layout=7
-mllvm -unroll-threshold=50 -mllvm -inline-threshold=1000
-fremap-arrays -fstrip-mining -mllvm -reduce-array-computations=3
-DSPEC_OPENMP -zopt -fopenmp=libomp -lomp -lamdlibm -lamdalloc
-lflang

Fortran benchmarks:
-m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-enable-X86-prefetching -DSPEC_OPENMP -O3 -march=znver4
-fveclib=AMDLIBM -ffast-math -fopenmp -flto -Mrecursive
-funroll-loops -mllvm -lsr-in-nested-loop

**(Continued on next page)**

## Base Optimization Flags (Continued)

Fortran benchmarks (continued):
-mllvm -reduce-array-computations=3 -zopt -fopenmp=libomp -lomp
-lamdlibm -lamdalloc -lflang

Benchmarks using both Fortran and C:
-m64 -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 -fopenmp -flto -fstruct-layout=7
-mllvm -unroll-threshold=50 -mllvm -inline-threshold=1000
-fremap-arrays -fstrip-mining -mllvm -reduce-array-computations=3
-DSPEC_OPENMP -zopt -Mrecursive -funroll-loops
-mllvm -lsr-in-nested-loop -fopenmp=libomp -lomp -lamdlibm -lamdalloc
-lflang

Benchmarks using Fortran, C, and C++:
-m64 -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 -fopenmp -flto -fstruct-layout=7
-mllvm -unroll-threshold=50 -mllvm -inline-threshold=1000
-fremap-arrays -fstrip-mining -mllvm -reduce-array-computations=3
-DSPEC_OPENMP -zopt -mllvm -unroll-threshold=100 -finline-aggressive
-mllvm -loop-unswitch-threshold=200000 -Mrecursive -funroll-loops
-mllvm -lsr-in-nested-loop -fopenmp=libomp -lomp -lamdlibm -lamdalloc
-lflang

## Base Other Flags

C benchmarks:
-Wno-return-type -Wno-unused-command-line-argument

Fortran benchmarks:
-Wno-unused-command-line-argument

Benchmarks using both Fortran and C:
-Wno-return-type -Wno-unused-command-line-argument

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

## Peak Compiler Invocation

C benchmarks:
clang

Fortran benchmarks:
flang

Benchmarks using both Fortran and C:
flang clang

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

## Peak Portability Flags

Same as Base Portability Flags

## Peak Optimization Flags

C benchmarks:

619.lbm_s: basepeak = yes

638.imagick_s: -m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3 -Ofast
-march=znver4 -fveclib=AMDLIBM -ffast-math -fopenmp
-flto -fstruct-layout=9 -mllvm -unroll-threshold=50
-fremap-arrays -fstrip-mining
-mllvm -inline-threshold=1000
-mllvm -reduce-array-computations=3 -DSPEC_OPENMP -zopt
-fopenmp=libomp -lomp -lamdlibm -lamdalloc -lflang

644.nab_s: basepeak = yes

Fortran benchmarks:

603.bwaves_s: -m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-enable-X86-prefetching -DSPEC_OPENMP
-Ofast -march=znver4 -fveclib=AMDLIBM -ffast-math

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## Peak Optimization Flags (Continued)

603.bwaves_s (continued):
-fopenmp -Mrecursive -mllvm -reduce-array-computations=3
-fvector-transform -fscalar-transform -fopenmp=libomp
-lomp -lamdlibm -lamdalloc -lflang

649.fotonik3d_s: -m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-enable-X86-prefetching -DSPEC_OPENMP
-Ofast -march=znver4 -fveclib=AMDLIBM -ffast-math
-fopenmp -flto -Mrecursive
-mllvm -reduce-array-computations=3 -zopt -fopenmp=libomp
-lomp -lamdlibm -lamdalloc -lflang

654.roms_s: basepeak = yes

Benchmarks using both Fortran and C:

621.wrf_s: -m64 -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 -fopenmp
-flto -fstruct-layout=9 -mllvm -unroll-threshold=50
-fremap-arrays -fstrip-mining
-mllvm -inline-threshold=1000
-mllvm -reduce-array-computations=3 -DSPEC_OPENMP -zopt
-O3 -Mrecursive -funroll-loops -mllvm -lsr-in-nested-loop
-fopenmp=libomp -lomp -lamdlibm -lamdalloc -lflang

627.cam4_s: -m64 -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 -fopenmp
-flto -fstruct-layout=9 -mllvm -unroll-threshold=50
-fremap-arrays -fstrip-mining
-mllvm -inline-threshold=1000
-mllvm -reduce-array-computations=3 -DSPEC_OPENMP -zopt
-Mrecursive -fopenmp=libomp -lomp -lamdlibm -lamdalloc
-lflang

628.pop2_s: -m64 -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 -fopenmp
-flto -fstruct-layout=9 -mllvm -unroll-threshold=50

**(Continued on next page)**

## Peak Optimization Flags (Continued)

628.pop2_s (continued):
-fremap-arrays -fstrip-mining
-mllvm -inline-threshold=1000
-mllvm -reduce-array-computations=3 -DSPEC_OPENMP -zopt
-Mrecursive -fvector-transform -fscalar-transform
-fopenmp=libomp -lomp -lamdlibm -lamdalloc -lflang

Benchmarks using Fortran, C, and C++:
-m64 -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 -fopenmp -flto -fstruct-layout=9
-mllvm -unroll-threshold=50 -fremap-arrays -fstrip-mining
-mllvm -inline-threshold=1000 -mllvm -reduce-array-computations=3
-DSPEC_OPENMP -zopt -finline-aggressive -mllvm -unroll-threshold=100
-Mrecursive -fopenmp=libomp -lomp -lamdlibm -lamdalloc -lflang

## Peak Other Flags

C benchmarks:
-Wno-return-type -Wno-unused-command-line-argument

Fortran benchmarks:
-Wno-unused-command-line-argument

Benchmarks using both Fortran and C:
-Wno-return-type -Wno-unused-command-line-argument

Benchmarks using Fortran, C, and C++:
-Wno-return-type -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

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


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