SPEC CPU®2017 Floating Point Speed Result

Copyright 2017-2023 Standard Performance Evaluation Corporation

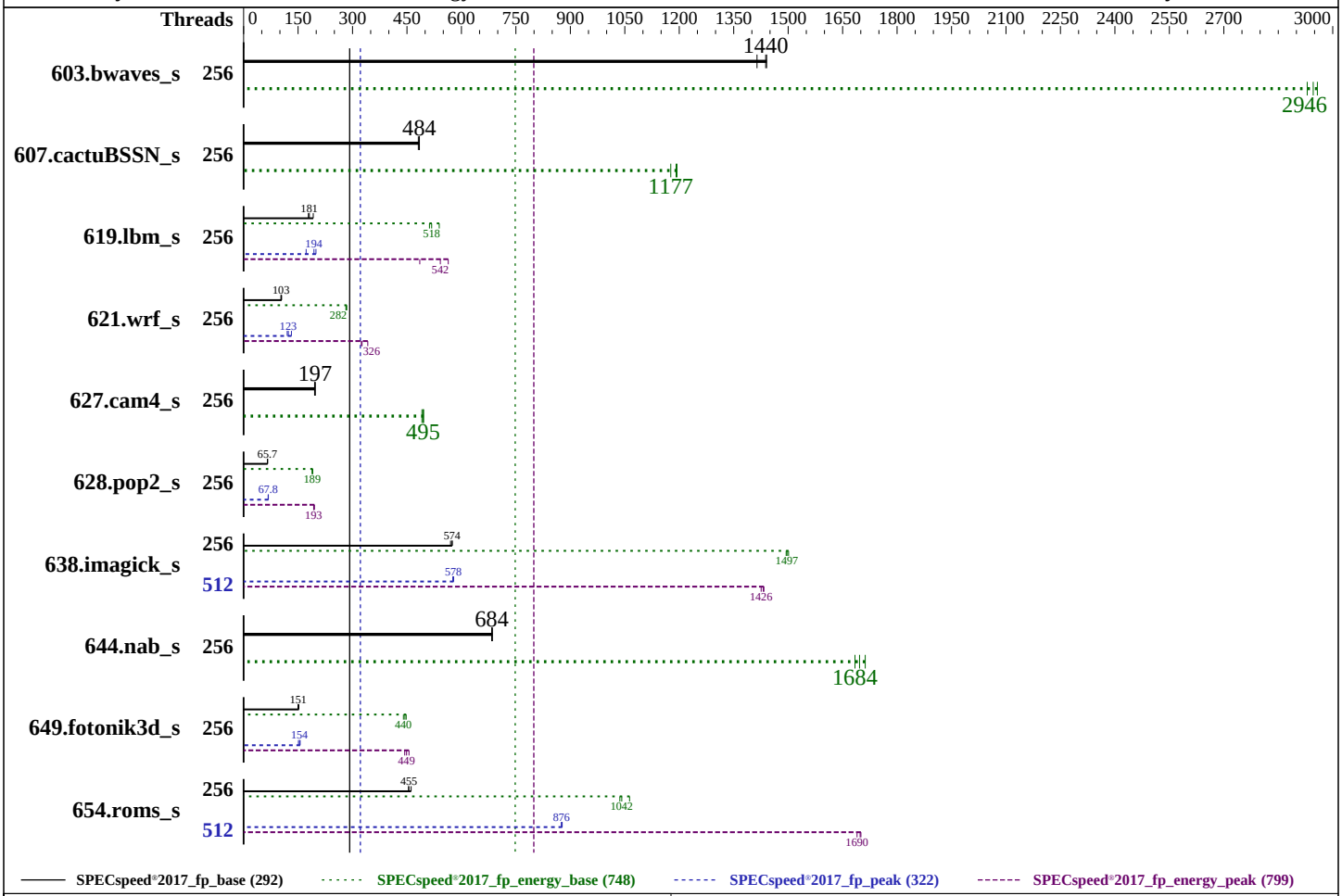
Lenovo Global Technology

ThinkSystem SR665 V3 (2.25 GHz, AMD EPYC 9754)

SPECspeed®2017_fp_base =	292
SPECspeed®2017_fp_energy_base =	748
SPECspeed®2017_fp_peak =	322
SPECspeed®2017_fp_energy_peak =	799

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, 2 threads/core
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): 718.3
Idle Power (W): 118.93
Min. Temperature (C): 25.38
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	41.7	1410	21.8	2960	522	550	41.0	1440	22.0	2930	537	561	**41.0**	**1440**	**21.8**	**2950**	**533**	**560**
607.cactuBSSN_s	256	34.6	481	15.3	1190	442	463	**34.4**	**484**	**15.5**	**1180**	**450**	**467**	34.4	484	15.3	1190	444	465
619.lbm_s	256	29.4	178	11.6	512	396	439	27.3	192	11.0	539	404	444	**28.9**	**181**	**11.5**	**518**	**397**	**441**
621.wrf_s	256	**128**	**103**	**51.1**	**282**	**399**	**404**	126	105	50.8	284	402	406	128	103	51.3	282	400	404
627.cam4_s	256	45.3	195	19.6	491	433	461	45.0	197	19.4	496	432	465	**45.0**	**197**	**19.5**	**495**	**433**	**462**
628.pop2_s	256	181	65.7	69.1	189	382	387	**181**	**65.7**	**68.9**	**189**	**381**	**387**	180	66.1	68.5	191	381	387
638.imagick_s	256	25.1	575	10.5	1490	419	634	25.3	570	10.5	1500	414	633	**25.1**	**574**	**10.5**	**1500**	**418**	**636**
644.nab_s	256	**25.6**	**684**	**11.3**	**1680**	**442**	**499**	25.5	685	11.1	1710	435	502	25.6	684	11.2	1700	438	503
649.fotonik3d_s	256	**60.6**	**151**	**23.3**	**440**	**384**	**470**	60.9	150	23.0	444	378	465	59.9	152	22.9	448	382	471
654.roms_s	256	34.7	454	17.0	1040	490	512	34.1	461	16.6	1060	485	507	**34.6**	**455**	**16.9**	**1040**	**489**	**509**

SPECspeed®2017_fp_base = 292

SPECspeed®2017_fp_energy_base = 748

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

Lenovo Global Technology

ThinkSystem SR665 V3 (2.25 GHz, AMD EPYC 9754)

SPECspeed®2017_fp_base = 292

SPECspeed®2017_fp_energy_base = 748

SPECspeed®2017_fp_peak = 322

SPECspeed®2017_fp_energy_peak = 799

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	41.7	1410	21.8	2960	522	550	41.0	1440	22.0	2930	537	561	**41.0**	**1440**	**21.8**	**2950**	**533**	**560**
607.cactuBSSN_s	256	34.6	481	15.3	1190	442	463	**34.4**	**484**	**15.5**	**1180**	**450**	**467**	34.4	484	15.3	1190	444	465
619.lbm_s	256	26.3	199	10.6	564	402	446	**27.0**	**194**	**11.0**	**542**	**406**	**444**	30.4	172	12.3	485	403	444
621.wrf_s	256	110	120	44.5	324	404	412	**107**	**123**	**44.3**	**326**	**412**	**427**	100	132	42.2	342	421	428
627.cam4_s	256	45.3	195	19.6	491	433	461	45.0	197	19.4	496	432	465	**45.0**	**197**	**19.5**	**495**	**433**	**462**
628.pop2_s	256	174	68.1	66.9	195	384	389	175	67.8	67.5	193	385	390	**175**	**67.8**	**67.6**	**193**	**386**	**392**
638.imagick_s	512	24.9	578	11.0	1430	440	712	25.0	576	11.0	1430	439	718	**25.0**	**578**	**11.0**	**1430**	**442**	**714**
644.nab_s	256	**25.6**	**684**	**11.3**	**1680**	**442**	**499**	25.5	685	11.1	1710	435	502	25.6	684	11.2	1700	438	503
649.fotonik3d_s	256	60.3	151	23.1	444	382	475	58.5	156	22.5	455	384	478	**59.2**	**154**	**22.8**	**449**	**385**	**478**
654.roms_s	512	**18.0**	**876**	**10.4**	**1690**	**579**	**644**	18.0	875	10.4	1700	576	648	17.9	878	10.4	1700	578	646

SPECspeed®2017_fp_peak = **322**

SPECspeed®2017_fp_energy_peak = **799**

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 = "0-511"
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 = "512"

Environment variables set by runcpu during the 619.lbm_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 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 = "0-511"

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

Environment variables set by runcpu during the 654.roms_s peak run:
GOMP_CPU_AFFINITY = "0 256 1 257 2 258 3 259 4 260 5 261 6 262 7 263 8 264 9 265 10 266 11 267 12 268 13
     269 14 270 15 271 16 272 17 273 18 274 19 275 20 276 21 277 22 278 23 279 24 280 25 281 26 282 27 283
     28 284 29 285 30 286 31 287 32 288 33 289 34 290 35 291 36 292 37 293 38 294 39 295 40 296 41 297 42
     298 43 299 44 300 45 301 46 302 47 303 48 304 49 305 50 306 51 307 52 308 53 309 54 310 55 311 56 312
     57 313 58 314 59 315 60 316 61 317 62 318 63 319 64 320 65 321 66 322 67 323 68 324 69 325 70 326 71
     327 72 328 73 329 74 330 75 331 76 332 77 333 78 334 79 335 80 336 81 337 82 338 83 339 84 340 85 341
     86 342 87 343 88 344 89 345 90 346 91 347 92 348 93 349 94 350 95 351 96 352 97 353 98 354 99 355 100
     356 101 357 102 358 103 359 104 360 105 361 106 362 107 363 108 364 109 365 110 366 111 367 112 368
     113 369 114 370 115 371 116 372 117 373 118 374 119 375 120 376 121 377 122 378 123 379 124 380 125
     381 126 382 127 383 128 384 129 385 130 386 131 387 132 388 133 389 134 390 135 391 136 392 137 393
     138 394 139 395 140 396 141 397 142 398 143 399 144 400 145 401 146 402 147 403 148 404 149 405 150
     406 151 407 152 408 153 409 154 410 155 411 156 412 157 413 158 414 159 415 160 416 161 417 162 418
     163 419 164 420 165 421 166 422 167 423 168 424 169 425 170 426 171 427 172 428 173 429 174 430 175
     431 176 432 177 433 178 434 179 435 180 436 181 437 182 438 183 439 184 440 185 441 186 442 187 443
     188 444 189 445 190 446 191 447 192 448 193 449 194 450 195 451 196 452 197 453 198 454 199 455 200
     456 201 457 202 458 203 459 204 460 205 461 206 462 207 463 208 464 209 465 210 466 211 467 212 468
     213 469 214 470 215 471 216 472 217 473 218 474 219 475 220 476 221 477 222 478 223 479 224 480 225
     481 226 482 227 483 228 484 229 485 230 486 231 487 232 488 233 489 234 490 235 491 236 492 237 493
     238 494 239 495 240 496 241 497 242 498 243 499 244 500 245 501 246 502 247 503 248 504 249 505 250
     506 251 507 252 508 253 509 254 510 255 511"
```

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

 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 18:24:41 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
```

(Continued on next page)

Platform Notes (Continued)

```
------------------------------------------------------------
2. w
   18:24:41 up 56 min,  1 user,  load average: 0.22, 0.26, 14.46
  USER     TTY      FROM             LOGIN@   IDLE   JCPU   PCPU WHAT
  root     tty1     -                17:29   16.00s  2.38s  0.32s /bin/bash ./amd_speed_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) 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/CPU2017.062/templogs/preenv.fpspeed.062.0.log --lognum 062.0 --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
```

(Continued on next page)

Platform Notes (Continued)

```
     2 physical ids (chips)
     512 processors (hardware threads)
     physical id 0: core ids 0-127
     physical id 1: core ids 0-127
     physical id 0: apicids 0-255
     physical id 1: apicids 256-511
   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):                          512
   On-line CPU(s) list:             0-511
   Vendor ID:                       AuthenticAMD
   Model name:                      AMD EPYC 9754 128-Core Processor
   CPU family:                      25
   Model:                           160
   Thread(s) per core:              2
   Core(s) per socket:              128
   Socket(s):                       2
   Stepping:                        2
   Frequency boost:                 disabled
   CPU max MHz:                     3100.3411
   CPU min MHz:                     1500.0000
   BogoMIPS:                        4493.42
   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):               0-7,256-263
   NUMA node1 CPU(s):               8-15,264-271
   NUMA node2 CPU(s):               16-23,272-279
   NUMA node3 CPU(s):               24-31,280-287
```

(Continued on next page)

Platform Notes (Continued)

```
  NUMA node4 CPU(s):                32-39,288-295
  NUMA node5 CPU(s):                40-47,296-303
  NUMA node6 CPU(s):                48-55,304-311
  NUMA node7 CPU(s):                56-63,312-319
  NUMA node8 CPU(s):                64-71,320-327
  NUMA node9 CPU(s):                72-79,328-335
  NUMA node10 CPU(s):               80-87,336-343
  NUMA node11 CPU(s):               88-95,344-351
  NUMA node12 CPU(s):               96-103,352-359
  NUMA node13 CPU(s):               104-111,360-367
  NUMA node14 CPU(s):               112-119,368-375
  NUMA node15 CPU(s):               120-127,376-383
  NUMA node16 CPU(s):               128-135,384-391
  NUMA node17 CPU(s):               136-143,392-399
  NUMA node18 CPU(s):               144-151,400-407
  NUMA node19 CPU(s):               152-159,408-415
  NUMA node20 CPU(s):               160-167,416-423
  NUMA node21 CPU(s):               168-175,424-431
  NUMA node22 CPU(s):               176-183,432-439
  NUMA node23 CPU(s):               184-191,440-447
  NUMA node24 CPU(s):               192-199,448-455
  NUMA node25 CPU(s):               200-207,456-463
  NUMA node26 CPU(s):               208-215,464-471
  NUMA node27 CPU(s):               216-223,472-479
  NUMA node28 CPU(s):               224-231,480-487
  NUMA node29 CPU(s):               232-239,488-495
  NUMA node30 CPU(s):               240-247,496-503
  NUMA node31 CPU(s):               248-255,504-511
  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       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: 0-7,256-263
  node 0 size: 23936 MB
  node 0 free: 23127 MB
  node 1 cpus: 8-15,264-271
  node 1 size: 24187 MB
  node 1 free: 24002 MB
  node 2 cpus: 16-23,272-279
```

(Continued on next page)

Platform Notes (Continued)

```
node 2 size: 24153 MB
node 2 free: 23961 MB
node 3 cpus: 24-31,280-287
node 3 size: 24187 MB
node 3 free: 24008 MB
node 4 cpus: 32-39,288-295
node 4 size: 24187 MB
node 4 free: 23989 MB
node 5 cpus: 40-47,296-303
node 5 size: 24187 MB
node 5 free: 24009 MB
node 6 cpus: 48-55,304-311
node 6 size: 24187 MB
node 6 free: 23965 MB
node 7 cpus: 56-63,312-319
node 7 size: 24187 MB
node 7 free: 23970 MB
node 8 cpus: 64-71,320-327
node 8 size: 24187 MB
node 8 free: 23975 MB
node 9 cpus: 72-79,328-335
node 9 size: 24187 MB
node 9 free: 23555 MB
node 10 cpus: 80-87,336-343
node 10 size: 24187 MB
node 10 free: 23955 MB
node 11 cpus: 88-95,344-351
node 11 size: 24187 MB
node 11 free: 23968 MB
node 12 cpus: 96-103,352-359
node 12 size: 24187 MB
node 12 free: 23972 MB
node 13 cpus: 104-111,360-367
node 13 size: 24187 MB
node 13 free: 23993 MB
node 14 cpus: 112-119,368-375
node 14 size: 24187 MB
node 14 free: 24003 MB
node 15 cpus: 120-127,376-383
node 15 size: 24187 MB
node 15 free: 24005 MB
node 16 cpus: 128-135,384-391
node 16 size: 24187 MB
node 16 free: 24019 MB
node 17 cpus: 136-143,392-399
node 17 size: 24187 MB
node 17 free: 23973 MB
node 18 cpus: 144-151,400-407
node 18 size: 24187 MB
node 18 free: 24031 MB
node 19 cpus: 152-159,408-415
node 19 size: 24187 MB
node 19 free: 24028 MB
node 20 cpus: 160-167,416-423
node 20 size: 24187 MB
node 20 free: 24037 MB
node 21 cpus: 168-175,424-431
```

(Continued on next page)

Platform Notes (Continued)

```
node 21 size: 24187 MB
node 21 free: 24030 MB
node 22 cpus: 176-183,432-439
node 22 size: 24187 MB
node 22 free: 24038 MB
node 23 cpus: 184-191,440-447
node 23 size: 24187 MB
node 23 free: 24020 MB
node 24 cpus: 192-199,448-455
node 24 size: 24187 MB
node 24 free: 24042 MB
node 25 cpus: 200-207,456-463
node 25 size: 24187 MB
node 25 free: 23958 MB
node 26 cpus: 208-215,464-471
node 26 size: 24187 MB
node 26 free: 24087 MB
node 27 cpus: 216-223,472-479
node 27 size: 23979 MB
node 27 free: 23753 MB
node 28 cpus: 224-231,480-487
node 28 size: 24187 MB
node 28 free: 23917 MB
node 29 cpus: 232-239,488-495
node 29 size: 24187 MB
node 29 free: 24045 MB
node 30 cpus: 240-247,496-503
node 30 size: 24187 MB
node 30 free: 24008 MB
node 31 cpus: 248-255,504-511
node 31 size: 24187 MB
node 31 free: 23989 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
```

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Platform Notes (Continued)

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

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

------------------------------------------------------------
10. who -r
  run-level 3 May 18 17:29

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

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

(Continued on next page)

Platform Notes (Continued)

```
12. Services, from systemctl list-unit-files
  STATE            UNIT FILES
  enabled          YaST2-Firstboot YaST2-Second-Stage apparmor auditd cron getty@ haveged irqbalance
                   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
```

(Continued on next page)

Platform Notes (Continued)

```
  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

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

(Continued on next page)

Platform Notes (Continued)

```
    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

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

(Continued on next page)

Base Optimization Flags (Continued)

Fortran benchmarks (continued):
-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
-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

(Continued on next page)

Base Other Flags (Continued)

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: `-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`

638.imagick_s: `Same as 619.lbm_s`

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Peak Optimization Flags (Continued)

644.nab_s: basepeak = yes

Fortran benchmarks:

603.bwaves_s: basepeak = yes

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: -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 -Mrecursive -mllvm -reduce-array-computations=3
-fvector-transform -fscalar-transform -fopenmp=libomp
-lomp -lamdlibm -lamdalloc -lflang

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: basepeak = yes

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
-fremap-arrays -fstrip-mining
-mllvm -inline-threshold=1000

(Continued on next page)

Peak Optimization Flags (Continued)

628.pop2_s (continued):
-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++:

607.cactuBSSN_s: basepeak = yes

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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