



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

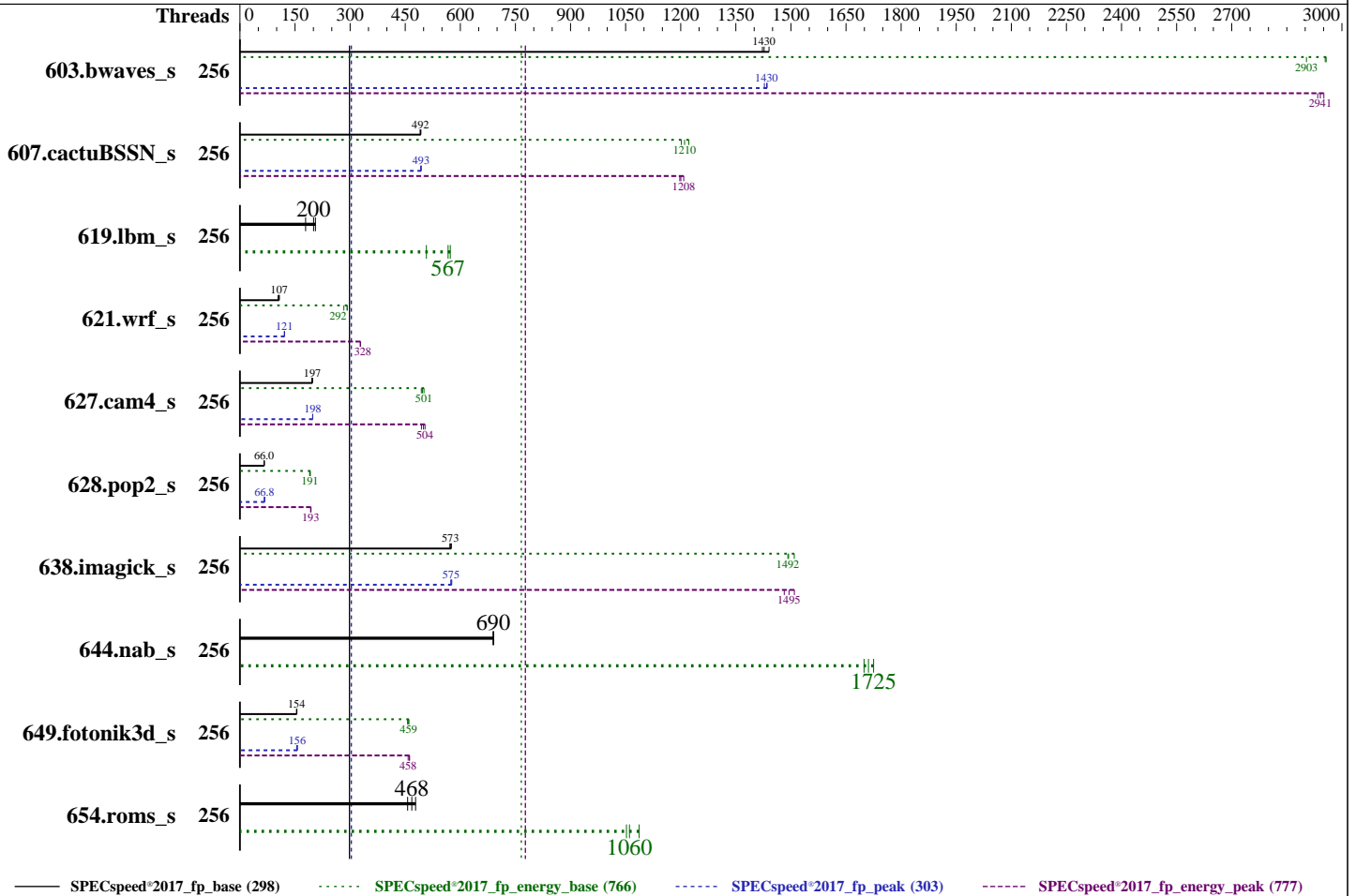
Test Sponsor: Lenovo Global Technology

Tested by: Lenovo Global Technology

Test Date: May-2023

Hardware Availability: Aug-2023

Software Availability: Nov-2022



Hardware	Software
CPU Name: AMD EPYC 9754	OS: SUSE Linux Enterprise Server 15 SP4
Max MHz: 3100	kernel version 5.14.21-150400.22-default
Nominal: 2250	Compiler: C/C++/Fortran: Version 4.0.0 of AOCC
Enabled: 256 cores, 2 chips	Parallel: Yes
Orderable: 1,2 chips	Firmware: Lenovo BIOS Version KAE111J 2.10 released May-2023
Cache L1: 32 KB I + 32 KB D on chip per core	File System: xfs
L2: 1 MB I+D on chip per core	System State: Run level 3 (multi-user)
L3: 256 MB I+D on chip per chip,	Base Pointers: 64-bit
16 MB shared / 8 cores	Peak Pointers: 64-bit
Other: None	Other: None
Memory: 768 GB (24 x 32 GB 2Rx8 PC5-4800B-R)	Power Management: BIOS and OS set to balance power and performance
Storage: 1 x 480 GB SATA SSD	
Other: None	



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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 #: 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 #: 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	<u>41.3</u>	<u>1430</u>	<u>22.2</u>	<u>2900</u>	<u>536</u>	<u>560</u>
607.cactuBSSN_s	256	34.0	491	15.2	1200	447	466	<u>33.9</u>	<u>492</u>	<u>15.1</u>	<u>1210</u>	<u>444</u>	<u>468</u>	33.8	493	14.9	1220	441	467
619.lbm_s	256	<u>26.1</u>	<u>200</u>	<u>10.5</u>	<u>567</u>	<u>402</u>	<u>438</u>	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	<u>124</u>	<u>107</u>	<u>49.5</u>	<u>292</u>	<u>400</u>	<u>405</u>	124	107	49.4	292	400	405
627.cam4_s	256	44.9	197	19.4	497	432	462	<u>45.0</u>	<u>197</u>	<u>19.2</u>	<u>501</u>	<u>428</u>	<u>462</u>	45.2	196	19.5	494	432	458
628.pop2_s	256	<u>180</u>	<u>66.0</u>	<u>68.5</u>	<u>191</u>	<u>381</u>	<u>386</u>	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	<u>25.2</u>	<u>573</u>	<u>10.5</u>	<u>1490</u>	<u>419</u>	<u>639</u>
644.nab_s	256	<u>25.3</u>	<u>690</u>	<u>11.0</u>	<u>1730</u>	<u>435</u>	<u>503</u>	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	<u>59.0</u>	<u>154</u>	<u>22.3</u>	<u>459</u>	<u>378</u>	<u>471</u>	59.1	154	22.4	456	380	472
654.roms_s	256	34.5	457	16.7	1050	485	514	<u>33.7</u>	<u>468</u>	<u>16.6</u>	<u>1060</u>	<u>493</u>	<u>513</u>	32.9	478	16.2	1090	492	514

SPECspeed®2017_fp_base = 298

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



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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	<u>41.1</u>	<u>1430</u>	<u>21.9</u>	<u>2940</u>	<u>532</u>	<u>561</u>
607.cactuBSSN_s	256	<u>33.8</u>	<u>493</u>	<u>15.1</u>	<u>1210</u>	<u>446</u>	<u>468</u>	33.8	493	15.2	1200	451	471	33.9	492	15.2	1200	449	466
619.lbm_s	256	<u>26.1</u>	<u>200</u>	<u>10.5</u>	<u>567</u>	<u>402</u>	<u>438</u>	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	<u>109</u>	<u>121</u>	<u>44.0</u>	<u>328</u>	<u>404</u>	<u>409</u>
627.cam4_s	256	<u>44.7</u>	<u>198</u>	<u>19.1</u>	<u>504</u>	<u>428</u>	<u>460</u>	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	<u>178</u>	<u>66.8</u>	<u>67.7</u>	<u>193</u>	<u>381</u>	<u>386</u>	178	66.8	67.7	193	381	386
638.imagick_s	256	<u>25.1</u>	<u>575</u>	<u>10.5</u>	<u>1490</u>	<u>419</u>	<u>635</u>	25.0	577	10.4	1510	416	639	25.1	575	10.6	1480	423	637
644.nab_s	256	<u>25.3</u>	<u>690</u>	<u>11.0</u>	<u>1730</u>	<u>435</u>	<u>503</u>	25.3	690	11.2	1700	442	498	25.3	690	11.1	1710	439	500
649.fotonik3d_s	256	<u>58.4</u>	<u>156</u>	<u>22.4</u>	<u>458</u>	<u>383</u>	<u>475</u>	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	<u>33.7</u>	<u>468</u>	<u>16.6</u>	<u>1060</u>	<u>493</u>	<u>513</u>	32.9	478	16.2	1090	492	514

SPECSpeed®2017_fp_peak = 303

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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'

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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.



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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

(Continued on next page)



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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,
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Platform Notes (Continued)

physical id 1: apicids

256-263,272-279,288-295,304-311,320-327,336-343,352-359,368-375,384-391,400-407,416-423,432-439,448-455,464-471,480-487,496-503

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_lld

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

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(Continued on next page)



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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

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/swaps 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)



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CPU2017 License: 9017

Test Sponsor: Lenovo Global Technology

Tested by: Lenovo Global Technology

Test Date: May-2023

Hardware Availability: Aug-2023

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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)



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CPU2017 License: 9017
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Test Date: May-2023
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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

```

(Continued on next page)



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CPU2017 License: 9017

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Tested by: Lenovo Global Technology

Test Date: May-2023

Hardware Availability: Aug-2023

Software Availability: Nov-2022

Platform Notes (Continued)

```

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
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
15: 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
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
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
19: 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
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 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 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 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
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 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 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 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 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 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 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)



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CPU2017 License: 9017
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Platform Notes (Continued)

```

enabled-runtime  issue-generator kbdsettings klog lvm2-monitor nscd postfix purge-kernels rollback rsyslog
disabled        smartd sshd wicked wickedd-auto4 wickedd-dhcp4 wickedd-dhcp6 wickedd-nanny
                systemd-remount-fs
                autofsd autofast-initscripts blk-availability boot-sysctl ca-certificates chrony-wait
                chronyd console-getty cups cups-browsed debug-shell ebttables exchange-bmc-os-info
                firewallld 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

```

(Continued on next page)



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CPU2017 License: 9017
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Test Date: May-2023
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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



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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

(Continued on next page)



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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

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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
```




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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

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
-freemap-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
-freemap-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
```

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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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