



# SPEC CPU®2017 Floating Point Speed Result

Copyright 2017-2025 Standard Performance Evaluation Corporation

## Lenovo Global Technology

ThinkSystem SR665 V3  
(3.80 GHz, AMD EPYC 9375F)

SPECspeed®2017\_fp\_base = 471

SPECspeed®2017\_fp\_peak = 485

CPU2017 License: 9017

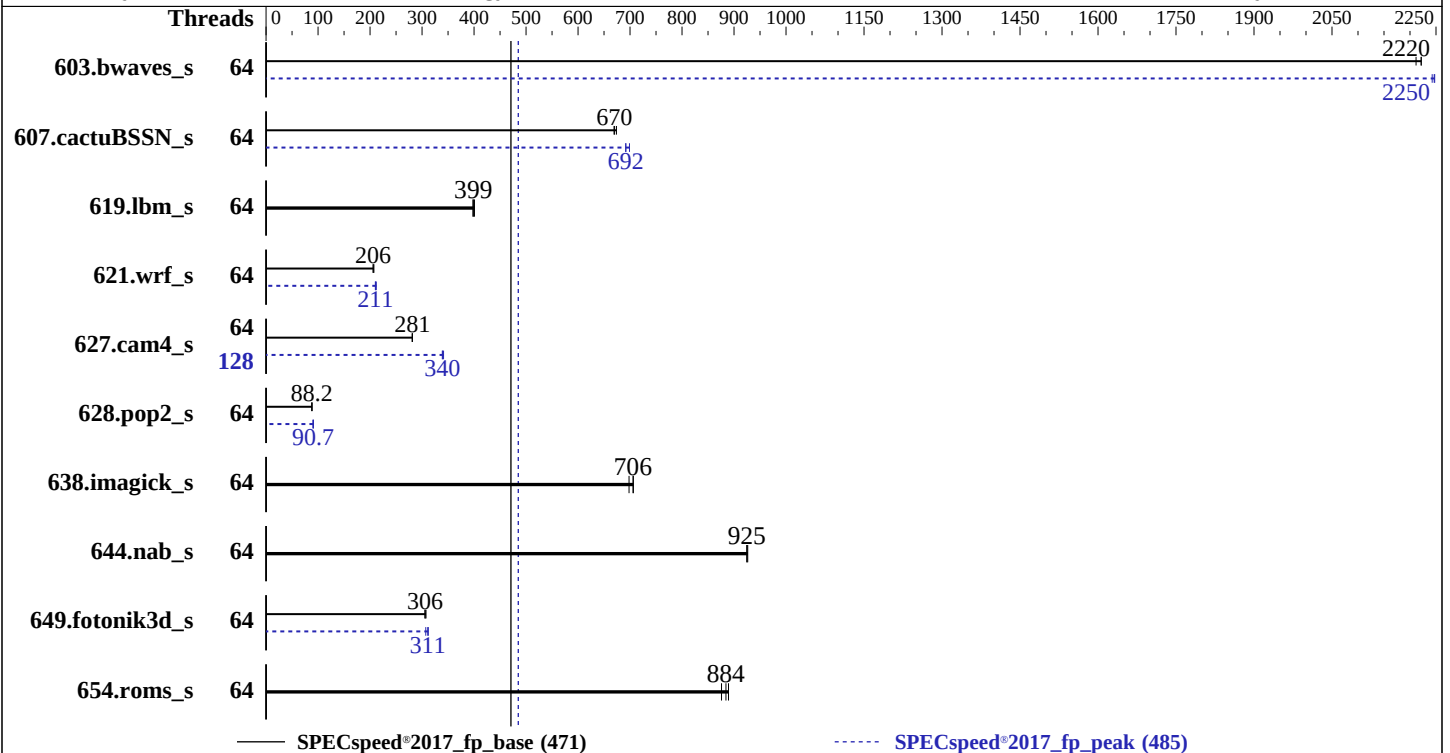
Test Sponsor: Lenovo Global Technology

Tested by: Lenovo Global Technology

Test Date: Mar-2025

Hardware Availability: Feb-2025

Software Availability: Oct-2024



### Hardware

CPU Name: AMD EPYC 9375F  
Max MHz: 4800  
Nominal: 3800  
Enabled: 64 cores, 2 chips, 2 threads/core  
Orderable: 1,2 chips  
Cache L1: 32 KB I + 48 KB D on chip per core  
L2: 1 MB I+D on chip per core  
L3: 256 MB I+D on chip per chip,  
32 MB shared / 4 cores  
Other: None  
Memory: 768 GB (24 x 32 GB 2Rx8 PC5-6400B-R, running at 6000)  
Storage: 1 x 480 GB SATA SSD  
Other: CPU Cooling: DLC

### Software

OS: SUSE Linux Enterprise Server 15 SP6  
Kernel 6.4.0-150600.21-default  
Compiler: C/C++/Fortran: Version 5.0.0 of AOCC  
Parallel: Yes  
Firmware: Lenovo BIOS Version KAE131I 5.30 released Dec-2024  
File System: btrfs  
System State: Run level 3 (multi-user)  
Base Pointers: 64-bit  
Peak Pointers: 64-bit  
Other: None  
Power Management: BIOS set to prefer performance at the cost of additional power usage



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## Results Table

| Benchmark       | Base    |             |            |             |            |             |             | Peak    |             |             |             |             |             |            |
|-----------------|---------|-------------|------------|-------------|------------|-------------|-------------|---------|-------------|-------------|-------------|-------------|-------------|------------|
|                 | Threads | Seconds     | Ratio      | Seconds     | Ratio      | Seconds     | Ratio       | Threads | Seconds     | Ratio       | Seconds     | Ratio       | Seconds     | Ratio      |
| 603.bwaves_s    | 64      | 26.6        | 2220       | 26.7        | 2210       | <u>26.6</u> | <u>2220</u> | 64      | 26.3        | 2240        | <u>26.3</u> | <u>2250</u> | 26.3        | 2250       |
| 607.cactuBSSN_s | 64      | 24.7        | 674        | 24.9        | 669        | <u>24.9</u> | <u>670</u>  | 64      | 23.9        | 699         | 24.1        | 692         | <u>24.1</u> | <u>692</u> |
| 619.lbm_s       | 64      | 13.2        | 398        | <u>13.1</u> | <u>399</u> | 13.1        | 401         | 64      | 13.2        | 398         | <u>13.1</u> | <u>399</u>  | 13.1        | 401        |
| 621.wrf_s       | 64      | 64.2        | 206        | 63.8        | 207        | <u>64.2</u> | <u>206</u>  | 64      | 62.4        | 212         | <u>62.8</u> | <u>211</u>  | 62.9        | 210        |
| 627.cam4_s      | 64      | 31.5        | 281        | 31.5        | 281        | <u>31.5</u> | <u>281</u>  | 128     | 26.0        | 341         | 26.1        | 339         | <u>26.1</u> | <u>340</u> |
| 628.pop2_s      | 64      | 134         | 88.3       | 135         | 88.1       | <u>135</u>  | <u>88.2</u> | 64      | <u>131</u>  | <u>90.7</u> | 132         | 90.3        | 130         | 91.1       |
| 638.imagick_s   | 64      | <u>20.4</u> | <u>706</u> | 20.4        | 706        | 20.7        | 698         | 64      | <u>20.4</u> | <u>706</u>  | 20.4        | 706         | 20.7        | 698        |
| 644.nab_s       | 64      | 18.9        | 926        | <u>18.9</u> | <u>925</u> | 18.9        | 925         | 64      | 18.9        | 926         | <u>18.9</u> | <u>925</u>  | 18.9        | 925        |
| 649.fotonik3d_s | 64      | <u>29.8</u> | <u>306</u> | 29.6        | 308        | 29.8        | 305         | 64      | 29.7        | 307         | <u>29.3</u> | <u>311</u>  | 29.2        | 312        |
| 654.roms_s      | 64      | 18.0        | 876        | 17.7        | 889        | <u>17.8</u> | <u>884</u>  | 64      | 18.0        | 876         | 17.7        | 889         | <u>17.8</u> | <u>884</u> |

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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.



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## Environment Variables Notes

Environment variables set by runcpu before the start of the run:

GOMP\_CPU\_AFFINITY = "0-127"

LD\_LIBRARY\_PATH =

"/home/cpu2017-1.1.9-amd-aocc500\_znver5\_A1.2/amd\_speed\_aocc500\_znver5\_A\_lib/lib:/home/cpu2017-1.1.9-amd-aocc500\_znver5\_A1.2/amd\_speed\_aocc500\_znver5\_A\_lib/lib32:"

LIBOMP\_NUM\_HIDDEN\_HELPER\_THREADS = "0"

MALLOC\_CONF = "retain:true"

OMP\_DYNAMIC = "false"

OMP\_SCHEDULE = "static"

OMP\_STACKSIZE = "128M"

OMP\_THREAD\_LIMIT = "128"

Environment variables set by runcpu during the 603.bwaves\_s peak run:

GOMP\_CPU\_AFFINITY = "0-63"

Environment variables set by runcpu during the 607.cactuBSSN\_s peak run:

GOMP\_CPU\_AFFINITY = "0-63"

Environment variables set by runcpu during the 621.wrf\_s peak run:

GOMP\_CPU\_AFFINITY = "0-63"

Environment variables set by runcpu during the 627.cam4\_s peak run:

GOMP\_CPU\_AFFINITY = "0-127"

Environment variables set by runcpu during the 628.pop2\_s peak run:

GOMP\_CPU\_AFFINITY = "0-63"

Environment variables set by runcpu during the 649.fotonik3d\_s peak run:

GOMP\_CPU\_AFFINITY = "0-63"

## General Notes

Binaries were compiled on a system with 2x AMD EPYC 9D64 CPU + 500GiB Memory using Ubuntu 22.04

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:

Choose Operating Mode set to Maximum Performance and then set it to Custom Mode

GMI Folding set to Disabled

Sysinfo program /home/cpu2017-1.1.9-amd-aocc500\_znver5\_A1.2/bin/sysinfo

Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197

running on localhost Mon Apr 22 20:27:57 2024

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

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### Platform Notes (Continued)

```
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 254 (254.10+suse.84.ge8d77af424)
12. Services, from systemctl list-unit-files
13. Linux kernel boot-time arguments, from /proc/cmdline
14. cpupower frequency-info
15. sysctl
16. /sys/kernel/mm/transparent_hugepage
17. /sys/kernel/mm/transparent_hugepage/khugepaged
18. OS release
19. Disk information
20. /sys/devices/virtual/dmi/id
21. dmidecode
22. BIOS
```

```
-----
1. uname -a
Linux localhost 6.4.0-150600.21-default #1 SMP PREEMPT_DYNAMIC Thu May 16 11:09:22 UTC 2024 (36c1e09)
x86_64 x86_64 x86_64 GNU/Linux
```

```
-----
2. w
20:27:57 up 1 min, 1 user, load average: 0.98, 0.55, 0.21
USER      TTY      FROM            LOGIN@   IDLE   JCPU   PCPU WHAT
root      tty1      -               20:27   21.00s  0.86s  0.11s /bin/bash ./amd_speed_aocc500_znver5_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) 3094118
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) 3094118
virtual memory          (kbytes, -v) unlimited
file locks              (-x) unlimited
```

```
-----
5. sysinfo process ancestry
```

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### Platform Notes (Continued)

```
/usr/lib/systemd/systemd --switched-root --system --deserialize=42
login -- root
-bash
/bin/bash ./Run036-compliant-amd-speedfp.sh
python3 ./run_amd_speed_aocc500_znver5_A1.py
/bin/bash ./amd_speed_aocc500_znver5_A1.sh
runcpu --config amd_speed_aocc500_znver5_A1.cfg --tune all --reportable --iterations 3 fpspeed
runcpu --configfile amd_speed_aocc500_znver5_A1.cfg --tune all --reportable --iterations 3 --nopower
--runmode speed --tune base:peak --size test:train:refspeed fpspeed --nopreenv --note-preenv --logfile
$SPEC/tmp/CPU2017.258/temlogs/preenv.fpspeed.258.0.log --lognum 258.0 --from_runcpu 2
specperl $SPEC/bin/sysinfo
$SPEC = /home/cpu2017-1.1.9-amd-aocc500_znver5_A1.2
```

#### 6. /proc/cpuinfo

```
model name      : AMD EPYC 9375F 32-Core Processor
vendor_id       : AuthenticAMD
cpu family      : 26
model           : 2
stepping        : 1
microcode       : 0xb00211a
bugs            : sysret_ss_attrs spectre_v1 spectre_v2 spec_store_bypass
TLB size        : 192 4K pages
cpu cores       : 32
siblings        : 64
2 physical ids (chips)
128 processors (hardware threads)
physical id 0:  core ids 0-3,8-11,16-19,24-27,32-35,40-43,48-51,56-59
physical id 1:  core ids 0-3,8-11,16-19,24-27,32-35,40-43,48-51,56-59
physical id 0:  apicids 0-7,16-23,32-39,48-55,64-71,80-87,96-103,112-119
physical id 1:  apicids 128-135,144-151,160-167,176-183,192-199,208-215,224-231,240-247
```

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 2.39.3:

|                      |                                                                                                                                                                                                                                                                                          |
|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 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):              | 128                                                                                                                                                                                                                                                                                      |
| On-line CPU(s) list: | 0-127                                                                                                                                                                                                                                                                                    |
| Vendor ID:           | AuthenticAMD                                                                                                                                                                                                                                                                             |
| BIOS Vendor ID:      | Advanced Micro Devices, Inc.                                                                                                                                                                                                                                                             |
| Model name:          | AMD EPYC 9375F 32-Core Processor                                                                                                                                                                                                                                                         |
| BIOS Model name:     | AMD EPYC 9375F 32-Core Processor                                                                                                                                                                                                                                                         |
| BIOS CPU family:     | 107                                                                                                                                                                                                                                                                                      |
| CPU family:          | 26                                                                                                                                                                                                                                                                                       |
| Model:               | 2                                                                                                                                                                                                                                                                                        |
| Thread(s) per core:  | 2                                                                                                                                                                                                                                                                                        |
| Core(s) per socket:  | 32                                                                                                                                                                                                                                                                                       |
| Socket(s):           | 2                                                                                                                                                                                                                                                                                        |
| Stepping:            | 1                                                                                                                                                                                                                                                                                        |
| BogoMIPS:            | 7588.01                                                                                                                                                                                                                                                                                  |
| Flags:               | fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov pat<br>pse36 clflush mmx fxsr sse sse2 ht syscall nx mmxext fxsr_opt pdpe1gb<br>rdtscp lm constant_tsc rep_good amd_lbr_v2 nopl nonstop_tsc cpuid<br>extd_apicid aperfmperf rapl pni pclmulqdq monitor ssse3 fma cx16 pcid |

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## Platform Notes (Continued)

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 bpeext  
perfctr\_llc mwaitx cpb cat\_l3 cdp\_l3 hw\_pstate ssbd mba perfmon\_v2  
ibrs ibpb stibp ibrs\_enhanced vmmcall fsgsbase tsc\_adjust 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 user\_shstk avx\_vnni avx512\_bf16 clzero irperf  
xsaveerptr rdpru wbnoinvd amd\_ppin cpc arat npt lbrv svm\_lock  
nrip\_save tsc\_scale vmcb\_clean flushbyasid decodeassists pausefilter  
pfthreshold avic v\_vmsave\_vmload vgif x2avic v\_spec\_ctrl vnmi  
avx512vbmi umip pku ospke avx512\_vbmi2 gfni vaes vpclmulqdq  
avx512\_vnni avx512\_bitalg avx512\_vpopcntdq la57 rdpid bus\_lock\_detect  
movdiri movdir64b overflow\_recov succor smca fsrm avx512\_vp2intersect  
flush\_lld debug\_swap

AMD-V

3 MiB (64 instances)

2 MiB (64 instances)

64 MiB (64 instances)

512 MiB (16 instances)

2

0-31,64-95

32-63,96-127

Not affected

Not affected

Not affected

Not affected

Not affected

Not affected

Not affected

Not affected

Not affected

Mitigation; Speculative Store Bypass disabled via prctl

Mitigation; usercopy/swaps barriers and \_\_user pointer sanitization

Mitigation; Enhanced / Automatic IBRS; IBPB conditional; STIBP

always-on; RSB filling; PBRBS-eIBRS Not affected; BHI Not affected

Not affected

Not affected

Virtualization:

L1d cache:

L1i cache:

L2 cache:

L3 cache:

NUMA node(s):

NUMA node0 CPU(s):

NUMA node1 CPU(s):

Vulnerability Gather data sampling:

Vulnerability Itlb multihit:

Vulnerability L1tf:

Vulnerability Mds:

Vulnerability Meltdown:

Vulnerability Mmio stale data:

Vulnerability Reg file data sampling:

Vulnerability Retbleed:

Vulnerability Spec rstack overflow:

Vulnerability Spec store bypass:

Vulnerability Spectre v1:

Vulnerability Spectre v2:

Vulnerability Srbds:

Vulnerability Tsx async abort:

From lscpu --cache:

| NAME | ONE-SIZE | ALL-SIZE | WAYS | TYPE        | LEVEL | SETS  | PHY-LINE | COHERENCY-SIZE |
|------|----------|----------|------|-------------|-------|-------|----------|----------------|
| L1d  | 48K      | 3M       | 12   | Data        | 1     | 64    | 1        | 64             |
| L1i  | 32K      | 2M       | 8    | Instruction | 1     | 64    | 1        | 64             |
| L2   | 1M       | 64M      | 16   | Unified     | 2     | 1024  | 1        | 64             |
| L3   | 32M      | 512M     | 16   | Unified     | 3     | 32768 | 1        | 64             |

8. numactl --hardware

NOTE: a numactl 'node' might or might not correspond to a physical chip.

available: 2 nodes (0-1)

node 0 cpus: 0-31,64-95

node 0 size: 386599 MB

node 0 free: 385246 MB

node 1 cpus: 32-63,96-127

node 1 size: 386956 MB

node 1 free: 385765 MB

node distances:

node 0 1

0: 10 32

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## Platform Notes (Continued)

1: 32 10

9. /proc/meminfo

MemTotal: 792121044 kB

10. who -r

run-level 3 Apr 22 20:27

11. Systemd service manager version: systemd 254 (254.10+suse.84.ge8d77af424)

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@ irqbalance issue-generator  
kbdsettings klog lvm2-monitor nscd postfix purge-kernels rollback rsyslog smartd sshd  
systemd-pstore 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 ebttables exchange-bmc-os-info  
firewalld fsidd gpm grub2-once haveged hwloc-dump-hwdata ipmi ipmievd issue-add-ssh-keys  
kexec-load lunmask man-db-create multipathd nfs nfs-blkmap rpcbind rpmconfigcheck rsyncd  
serial-getty@ smartd\_generate\_opts snmpd snmptrapd systemd-boot-check-no-failures  
systemd-conftxt systemd-network-generator systemd-sysexit systemd-time-wait-sync  
systemd-timesyncd

generated ntp\_sync

indirect systemd-userdbd wickedd

13. Linux kernel boot-time arguments, from /proc/cmdline

BOOT\_IMAGE=/boot/vmlinuz-6.4.0-150600.21-default  
root=UUID=7b8fe170-8cd6-4f33-a048-ee31798eab65  
splash=silent  
mitigations=auto  
quiet  
security=apparmor

14. cpupower frequency-info

analyzing CPU 74:  
Unable to determine current policy  
boost state support:  
Supported: yes  
Active: yes

15. 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  |

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### Platform Notes (Continued)

```
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
```

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

```
-----
17. /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
-----
```

```
-----
18. OS release
From /etc/*-release /etc/*-version
os-release SUSE Linux Enterprise Server 15 SP6
-----
```

```
-----
19. Disk information
SPEC is set to: /home/cpu2017-1.1.9-amd-aocc500_znver5_A1.2
Filesystem      Type  Size  Used Avail Use% Mounted on
/dev/sda3        btrfs 444G 127G 315G 29% /home
-----
```

```
-----
20. /sys/devices/virtual/dmi/id
Vendor:      Lenovo
Product:     ThinkSystem SR665 V3
Product Family: ThinkSystem
Serial:      1234567890
-----
```

```
-----
21. dmidecode
Additional information from dmidecode 3.4 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:
1x SK Hynix HMC88AHBRA284N 32 GB 2 rank 6400, configured at 6000
4x SK Hynix HMC88AHBRA290N 32 GB 2 rank 6400, configured at 6000
3x SK Hynix HMC88AHBRA292N 32 GB 2 rank 6400, configured at 6000
9x SK Hynix HMC88AHBRA471N 32 GB 2 rank 6400, configured at 6000
2x SK Hynix HMC88AHBRA472N 32 GB 2 rank 6400, configured at 6000
2x SK Hynix HMC88AHBRA477N 32 GB 2 rank 6400, configured at 6000
3x SK Hynix HMC88AHBRA478N 32 GB 2 rank 6400, configured at 6000
```

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# SPEC CPU®2017 Floating Point Speed Result

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Lenovo Global Technology

ThinkSystem SR665 V3  
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SPECspeed®2017\_fp\_base = 471

SPECspeed®2017\_fp\_peak = 485

CPU2017 License: 9017

Test Sponsor: Lenovo Global Technology

Tested by: Lenovo Global Technology

Test Date: Mar-2025

Hardware Availability: Feb-2025

Software Availability: Oct-2024

## Platform Notes (Continued)

### 22. BIOS

(This section combines info from /sys/devices and dmidecode.)

BIOS Vendor: Lenovo  
BIOS Version: KAE131I-5.30  
BIOS Date: 12/17/2024  
BIOS Revision: 5.30  
Firmware Revision: 54.6

## Compiler Version Notes

C | 619.lbm\_s(base, peak) 638.imagick\_s(base, peak) 644.nab\_s(base, peak)

AMD clang version 17.0.6 (CLANG: AOCC\_5.0.0-Build#1316 2024\_09\_09)  
Target: x86\_64-unknown-linux-gnu  
Thread model: posix  
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-5.0.0-4925-1316/bin

C++, C, Fortran | 607.cactuBSSN\_s(base, peak)

AMD clang version 17.0.6 (CLANG: AOCC\_5.0.0-Build#1316 2024\_09\_09)  
Target: x86\_64-unknown-linux-gnu  
Thread model: posix  
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-5.0.0-4925-1316/bin  
AMD clang version 17.0.6 (CLANG: AOCC\_5.0.0-Build#1316 2024\_09\_09)  
Target: x86\_64-unknown-linux-gnu  
Thread model: posix  
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-5.0.0-4925-1316/bin  
AMD clang version 17.0.6 (CLANG: AOCC\_5.0.0-Build#1316 2024\_09\_09)  
Target: x86\_64-unknown-linux-gnu  
Thread model: posix  
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-5.0.0-4925-1316/bin

Fortran | 603.bwaves\_s(base, peak) 649.fotonik3d\_s(base, peak) 654.roms\_s(base, peak)

AMD clang version 17.0.6 (CLANG: AOCC\_5.0.0-Build#1316 2024\_09\_09)  
Target: x86\_64-unknown-linux-gnu  
Thread model: posix  
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-5.0.0-4925-1316/bin

Fortran, C | 621.wrf\_s(base, peak) 627.cam4\_s(base, peak) 628.pop2\_s(base, peak)

AMD clang version 17.0.6 (CLANG: AOCC\_5.0.0-Build#1316 2024\_09\_09)  
Target: x86\_64-unknown-linux-gnu  
Thread model: posix  
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-5.0.0-4925-1316/bin  
AMD clang version 17.0.6 (CLANG: AOCC\_5.0.0-Build#1316 2024\_09\_09)  
Target: x86\_64-unknown-linux-gnu  
Thread model: posix  
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-5.0.0-4925-1316/bin

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Hardware Availability: Feb-2025

Software Availability: Oct-2024

## Compiler Version Notes (Continued)

### 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=znver5  
-fveclib=AMDLIBM -ffast-math -fopenmp -DSPEC\_OPENMP -flto  
-fremap-arrays -fstrip-mining -fstruct-layout=7  
-mllvm -inline-threshold=1000 -mllvm -reduce-array-computations=3  
-mllvm -unroll-threshold=50 -zopt -mrecip=none -fopenmp=libomp -lomp  
-lamdlibm -lamdalloc -lflang

Fortran benchmarks:

-m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6

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## Base Optimization Flags (Continued)

Fortran benchmarks (continued):

-Wl,-mllvm -Wl,-reduce-array-computations=3  
-Wl,-mllvm -Wl,-enable-X86-prefetching -DSPEC\_OPENMP -O3 -march=znver5  
-fvecLib=AMDLIBM -ffast-math -fopenmp -fltO -funroll-loops  
-mllvm -lsr-in-nested-loop -mllvm -reduce-array-computations=3  
-Mrecursive -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=znver5  
-fvecLib=AMDLIBM -ffast-math -fopenmp -DSPEC\_OPENMP -fltO  
-fremap-arrays -fstrip-mining -fstruct-layout=7  
-mllvm -inline-threshold=1000 -mllvm -reduce-array-computations=3  
-mllvm -unroll-threshold=50 -zopt -funroll-loops  
-mllvm -lsr-in-nested-loop -Mrecursive -mrecip=none -fopenmp=libomp  
-lomp -lamdlibm -lamdalloc -lflang

Benchmarks using Fortran, C, and C++:

-m64 -std=c++14 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6  
-Wl,-mllvm -Wl,-reduce-array-computations=3  
-Wl,-mllvm -Wl,-x86-use-vzeroupper=false -O3 -march=znver5  
-fvecLib=AMDLIBM -ffast-math -fopenmp -DSPEC\_OPENMP -fltO  
-fremap-arrays -fstrip-mining -fstruct-layout=7  
-mllvm -inline-threshold=1000 -mllvm -reduce-array-computations=3  
-mllvm -unroll-threshold=50 -zopt  
-mllvm -loop-unswitch-threshold=200000 -mllvm -unroll-threshold=100  
-funroll-loops -mllvm -lsr-in-nested-loop -Mrecursive -mrecip=none  
-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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Software Availability: Oct-2024

## 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: basepeak = yes

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=znver5 -fveclib=AMDLIBM -ffast-math

-fopenmp -fscalar-transform -fvector-transform

-mllvm -reduce-array-computations=3 -Mrecursive

-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=znver5 -fveclib=AMDLIBM -ffast-math

-fopenmp -flto -mllvm -reduce-array-computations=3

-Mrecursive -zopt -fopenmp=libomp -lomp -lamdlibm

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## Peak Optimization Flags (Continued)

649.fotonik3d\_s (continued):

-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=znver5 -fveclib=AMDLIB -ffast-math -fopenmp  
-flto -DSPEC\_OPENMP -fremap-arrays -fstrip-mining  
-fstruct-layout=9 -mllvm -inline-threshold=1000  
-mllvm -reduce-array-computations=3  
-mllvm -unroll-threshold=50 -zopt -funroll-loops  
-mllvm -lsr-in-nested-loop -Mrecursive -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=znver5 -fveclib=AMDLIB -ffast-math -fopenmp  
-flto -DSPEC\_OPENMP -fremap-arrays -fstrip-mining  
-fstruct-layout=9 -mllvm -inline-threshold=1000  
-mllvm -reduce-array-computations=3  
-mllvm -unroll-threshold=50 -zopt -Mrecursive  
-mrecip=none -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=znver5 -fveclib=AMDLIB -ffast-math -fopenmp  
-flto -DSPEC\_OPENMP -fremap-arrays -fstrip-mining  
-fstruct-layout=9 -mllvm -inline-threshold=1000  
-mllvm -reduce-array-computations=3  
-mllvm -unroll-threshold=50 -zopt -fscalar-transform  
-fvector-transform -Mrecursive -fopenmp=libomp -lomp  
-lamdlibm -lamdalloc -lflang

Benchmarks using Fortran, C, and C++:

-m64 -std=c++14 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6  
-Wl,-mllvm -Wl,-reduce-array-computations=3  
-Wl,-mllvm -Wl,-x86-use-vzeroupper=false -Ofast -march=znver5  
-fveclib=AMDLIB -ffast-math -fopenmp -flto -DSPEC\_OPENMP  
-fremap-arrays -fstrip-mining -fstruct-layout=9

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## Peak Optimization Flags (Continued)

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

-mllvm -inline-threshold=1000 -mllvm -reduce-array-computations=3  
-mllvm -unroll-threshold=50 -zopt -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/Lenovo-Platform-SPECcpu2017-Flags-V1.2-Turin-E.html>  
<http://www.spec.org/cpu2017/flags/aocc500-flags.2024-10-10.html>

You can also download the XML flags sources by saving the following links:

<http://www.spec.org/cpu2017/flags/Lenovo-Platform-SPECcpu2017-Flags-V1.2-Turin-E.xml>  
<http://www.spec.org/cpu2017/flags/aocc500-flags.2024-10-10.xml>

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