



# SPEC CPU®2017 Integer Speed Result

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## Lenovo Global Technology ThinkSystem SR665 V3 (3.30 GHz, AMD EPYC 9575F)

SPECspeed®2017\_int\_base = 20.7

SPECspeed®2017\_int\_energy\_base = 87.8

SPECspeed®2017\_int\_peak = 21.0

SPECspeed®2017\_int\_energy\_peak = 89.6

CPU2017 License: 9017

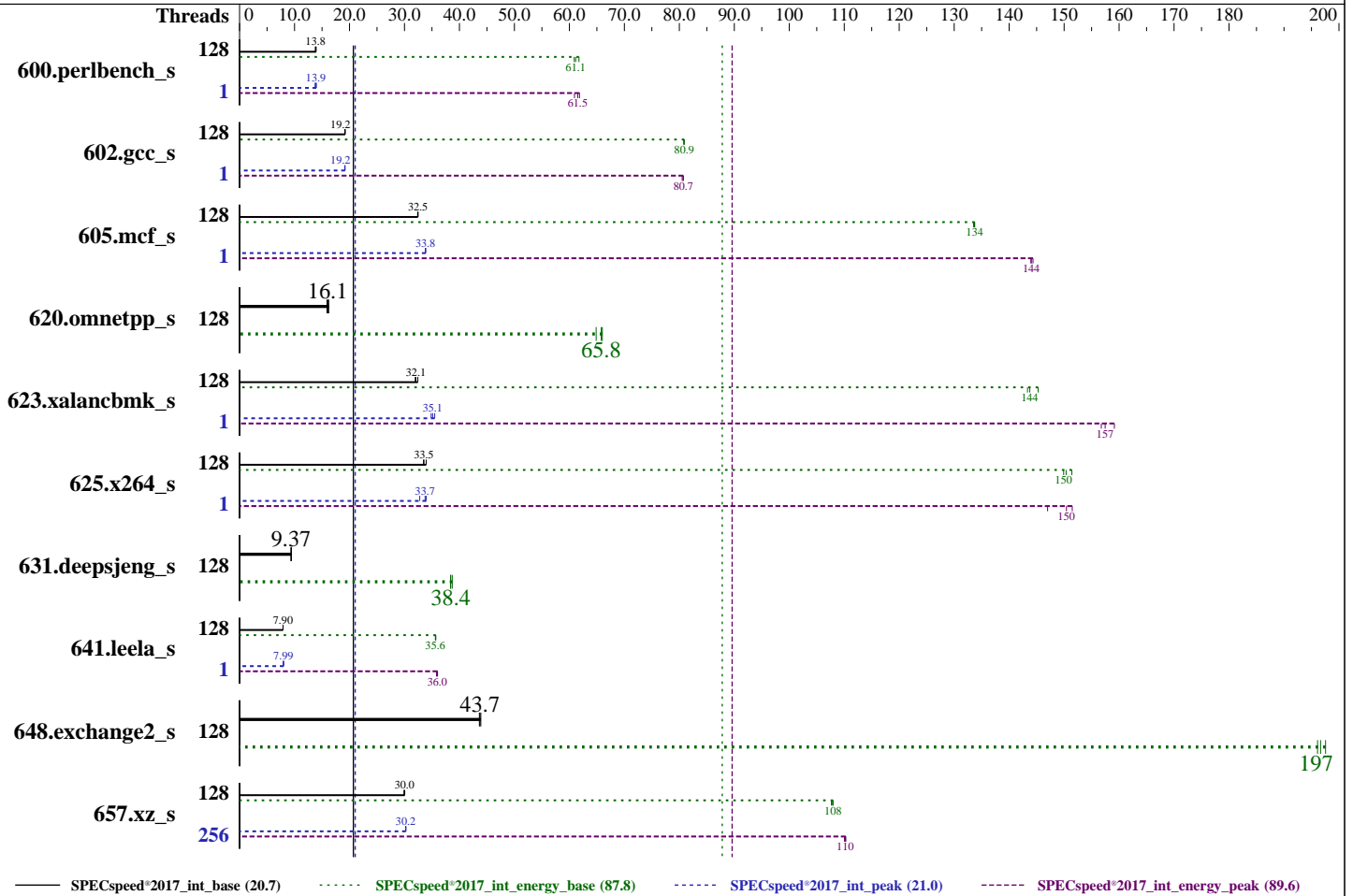
Test Sponsor: Lenovo Global Technology

Tested by: Lenovo Global Technology

Test Date: Sep-2024

Hardware Availability: Nov-2024

Software Availability: Oct-2024



Hardware	Software
CPU Name: AMD EPYC 9575F	OS: SUSE Linux Enterprise Server 15 SP6
Max MHz: 5000	Kernel 6.4.0-150600.21-default
Nominal: 3300	Compiler: C/C++/Fortran: Version 5.0.0 of AOCC
Enabled: 128 cores, 2 chips, 2 threads/core	Parallel: Yes
Orderable: 1,2 chips	Firmware: Lenovo BIOS Version KAE125W 5.10 released Aug-2024
Cache L1: 32 KB I + 48 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, 32 MB shared / 8 cores	Base Pointers: 64-bit
Other: None	Peak Pointers: 64-bit
Memory: 384 GB (24 x 16 GB 1Rx8 PC5-6400B-R, running at 3600)	Other: None
Storage: 1 x 480 GB SATA SSD	Power Management: BIOS and OS set to balance power and performance
Other: CPU Cooling: Air	



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### Power

Max. Power (W): 919.3  
Idle Power (W): 131.39  
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 53.9 of KAX341H  
Memory Mode: Normal

### Power-Relevant Hardware

Power Supply: 2 x 1100 W (redundant)  
Details: ThinkSystem 1100W 230V 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: J202308266858A-0004  
Calibration Date: 16-Oct-2023  
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: W63181846  
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
600.perlbench_s	128	127	13.9	31.2	61.7	245	252	<b>128</b>	<b>13.8</b>	<b>31.5</b>	<b>61.1</b>	<b>245</b>	<b>252</b>	129	13.8	31.6	60.9	246	277
602.gcc_s	128	208	19.2	53.5	80.9	258	271	<b>208</b>	<b>19.2</b>	<b>53.5</b>	<b>80.9</b>	<b>258</b>	<b>272</b>	207	19.2	53.6	80.8	258	272
605.mcf_s	128	146	32.4	38.6	134	265	270	145	32.5	38.5	134	265	271	<b>145</b>	<b>32.5</b>	<b>38.5</b>	<b>134</b>	<b>265</b>	<b>272</b>
620.omnetpp_s	128	<b>101</b>	<b>16.1</b>	<b>27.0</b>	<b>65.8</b>	<b>266</b>	<b>270</b>	101	16.2	26.9	66.0	267	270	103	15.9	27.4	64.9	267	269
623.xalancbmk_s	128	43.7	32.4	10.6	145	242	251	<b>44.2</b>	<b>32.1</b>	<b>10.7</b>	<b>144</b>	<b>242</b>	<b>250</b>	44.3	32.0	10.7	143	242	249
625.x264_s	128	52.7	33.5	12.8	150	242	267	52.0	33.9	12.7	151	244	268	<b>52.6</b>	<b>33.5</b>	<b>12.8</b>	<b>150</b>	<b>243</b>	<b>267</b>
631.deepsjeng_s	128	152	9.43	40.3	38.7	265	267	<b>153</b>	<b>9.37</b>	<b>40.6</b>	<b>38.4</b>	<b>265</b>	<b>266</b>	153	9.36	40.6	38.4	265	267
641.leela_s	128	<b>216</b>	<b>7.90</b>	<b>51.9</b>	<b>35.6</b>	<b>240</b>	<b>242</b>	216	7.91	51.7	35.7	240	241	216	7.90	51.8	35.6	240	241
648.exchange2_s	128	67.0	43.9	16.2	198	242	245	<b>67.2</b>	<b>43.7</b>	<b>16.3</b>	<b>197</b>	<b>242</b>	<b>264</b>	67.4	43.6	16.3	196	242	245
657.xz_s	128	<b>206</b>	<b>30.0</b>	<b>62.3</b>	<b>108</b>	<b>303</b>	<b>871</b>	207	29.9	62.5	108	302	871	206	30.0	62.4	108	303	869

SPECspeed®2017\_int\_base = **20.7**

SPECspeed®2017\_int\_energy\_base = **87.8**

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



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SPECSpeed®2017\_int\_peak = 21.0  
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Test Date: Sep-2024  
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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
600.perlbench_s	1	<b>128</b>	<b>13.9</b>	<b>31.3</b>	<b>61.5</b>	<b>245</b>	<b>252</b>	127	14.0	31.1	61.8	245	252	129	13.7	31.6	60.9	245	252
602.gcc_s	1	208	19.2	53.6	80.7	258	271	208	19.1	53.8	80.5	258	271	<b>208</b>	<b>19.2</b>	<b>53.6</b>	<b>80.7</b>	<b>258</b>	<b>271</b>
605.mcf_s	1	<b>140</b>	<b>33.8</b>	<b>35.8</b>	<b>144</b>	<b>256</b>	<b>272</b>	139	33.9	35.7	144	256	271	140	33.8	35.8	144	256	272
620.omnetpp_s	128	<b>101</b>	<b>16.1</b>	<b>27.0</b>	<b>65.8</b>	<b>266</b>	<b>270</b>	101	16.2	26.9	66.0	267	270	103	15.9	27.4	64.9	267	269
623.xalancbmk_s	1	39.9	35.5	9.67	159	242	265	40.7	34.8	9.82	157	241	247	<b>40.3</b>	<b>35.1</b>	<b>9.77</b>	<b>157</b>	<b>242</b>	<b>254</b>
625.x264_s	1	52.0	33.9	12.7	151	244	268	<b>52.3</b>	<b>33.7</b>	<b>12.8</b>	<b>150</b>	<b>244</b>	<b>268</b>	53.8	32.8	13.1	147	243	268
631.deepsjeng_s	128	152	9.43	40.3	38.7	265	267	<b>153</b>	<b>9.37</b>	<b>40.6</b>	<b>38.4</b>	<b>265</b>	<b>266</b>	153	9.36	40.6	38.4	265	267
641.leela_s	1	213	8.01	51.3	36.0	241	242	215	7.95	51.6	35.8	240	242	<b>214</b>	<b>7.99</b>	<b>51.4</b>	<b>36.0</b>	<b>240</b>	<b>242</b>
648.exchange2_s	128	67.0	43.9	16.2	198	242	245	<b>67.2</b>	<b>43.7</b>	<b>16.3</b>	<b>197</b>	<b>242</b>	<b>264</b>	67.4	43.6	16.3	196	242	245
657.xz_s	256	<b>204</b>	<b>30.2</b>	<b>61.1</b>	<b>110</b>	<b>299</b>	<b>919</b>	204	30.2	61.0	110	299	896	205	30.2	61.2	110	299	895

SPECSpeed®2017\_int\_peak = 21.0

SPECSpeed®2017\_int\_energy\_peak = 89.6

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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) only on request for base runs,  
'echo madvise > /sys/kernel/mm/transparent\_hugepage/enabled' run as root.  
To enable THP for all allocations for peak runs,  
'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 = "0-255"
LD_LIBRARY_PATH =
"/home/cpu2017-1.1.9-amd-aocc500_znver5_A1/amd_speed_aocc500_znver5_A_lib/lib:/home/cpu2017-1.1.9-amd-
aocc500_znver5_A1/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 = "256"
```

Environment variables set by runcpu during the 600.perlbench\_s peak run:

```
GOMP_CPU_AFFINITY = "0"
```

Environment variables set by runcpu during the 602.gcc\_s peak run:

```
GOMP_CPU_AFFINITY = "0"
```

Environment variables set by runcpu during the 605.mcf\_s peak run:

```
GOMP_CPU_AFFINITY = "0"
```

Environment variables set by runcpu during the 623.xalancbmk\_s peak run:

```
GOMP_CPU_AFFINITY = "0"
```

Environment variables set by runcpu during the 625.x264\_s peak run:

```
GOMP_CPU_AFFINITY = "0"
```

Environment variables set by runcpu during the 641.leela\_s peak run:

```
GOMP_CPU_AFFINITY = "0"
```

Environment variables set by runcpu during the 657.xz\_s peak run:

```
GOMP_CPU_AFFINITY = "0-255"
```

## 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 Custom Mode  
Power Profile Selection set to Balanced Memory Performance Mode  
Memory Speed set to Minimum  
NUMA Nodes per Socket set to NPS4

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

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### Platform Notes (Continued)

Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197  
 running on localhost Sun Sep 22 20:42:29 2024

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 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  
 20:42:29 up 1 min, 1 user, load average: 1.30, 0.81, 0.32  
 USER TTY FROM LOGIN@ IDLE JCPU PCPU WHAT

-----  
 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) 1545527  
 max locked memory (kbytes, -l) 2097152  
 max memory size (kbytes, -m) unlimited  
 open files (-n) 1024  
 pipe size (512 bytes, -p) 8

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### Platform Notes (Continued)

```

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) 1545527
virtual memory             (kbytes, -v) unlimited
file locks                 (-x) unlimited

```

```

-----
5. sysinfo process ancestry
/usr/lib/systemd/systemd --switched-root --system --deserialize=42
sshd: /usr/sbin/sshd -D [listener] 0 of 10-100 startups
sshd: root [priv]
sshd: root@notty
/bin/bash ./02.remote_local_SPECcpu_1.01.sh
/bin/bash ./Run035-compliant-amd-speedint.sh
python3 ./run_amd_speed_aocc500_znver5_A1.py
/bin/bash ./amd_speed_aocc500_znver5_A1.sh
runcpu --power --config amd_speed_aocc500_znver5_A1.cfg --tune all --reportable --iterations 3 intspeak
runcpu --power --configfile amd_speed_aocc500_znver5_A1.cfg --tune all --reportable --iterations 3 --runmode
  speed --tune base:peak --size test:train:refspeak intspeak --nopreenv --note-preenv --logfile
  $SPEC/tmp/CPU2017.002/templogs/preenv.intspeak.002.0.log --lognum 002.0 --from_runcpu 2
specperl $SPEC/bin/sysinfo
$SPEC = /home/cpu2017-1.1.9-amd-aocc500_znver5_A1

```

```

-----
6. /proc/cpuinfo
model name      : AMD EPYC 9575F 64-Core Processor
vendor_id      : AuthenticAMD
cpu family     : 26
model          : 2
stepping       : 1
microcode      : 0xb00210e
bugs           : sysret_ss_attrs spectre_v1 spectre_v2 spec_store_bypass
TLB size      : 192 4K pages
cpu cores     : 64
siblings      : 128
2 physical ids (chips)
256 processors (hardware threads)
physical id 0: core ids 0-63
physical id 1: core ids 0-63
physical id 0: apicids 0-127
physical id 1: apicids 128-255
Caution: /proc/cpuinfo data regarding chips, cores, and threads is not necessarily reliable, especially for
virtualized systems. Use the above data carefully.

```

```

-----
7. lscpu

From lscpu from util-linux 2.39.3:
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):                256
On-line CPU(s) list:   0-255
Vendor ID:             AuthenticAMD

```

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### Platform Notes (Continued)

```

BIOS Vendor ID:          Advanced Micro Devices, Inc.
Model name:              AMD EPYC 9575F 64-Core Processor
BIOS Model name:        AMD EPYC 9575F 64-Core Processor
BIOS CPU family:        107
CPU family:              26
Model:                   2
Thread(s) per core:     2
Core(s) per socket:     64
Socket(s):               2
Stepping:                1
Frequency boost:        enabled
CPU(s) scaling MHz:     30%
CPU max MHz:             5008.0068
CPU min MHz:             1500.0000
BogoMIPS:                6589.72
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 amd_lbr_v2 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 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 cpcp 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 fstrm avx512_vp2intersect
                        flush_lld debug_swap
Virtualization:          AMD-V
L1d cache:               6 MiB (128 instances)
L1i cache:               4 MiB (128 instances)
L2 cache:                128 MiB (128 instances)
L3 cache:                512 MiB (16 instances)
NUMA node(s):            8
NUMA node0 CPU(s):      0-15,128-143
NUMA node1 CPU(s):      16-31,144-159
NUMA node2 CPU(s):      32-47,160-175
NUMA node3 CPU(s):      48-63,176-191
NUMA node4 CPU(s):      64-79,192-207
NUMA node5 CPU(s):      80-95,208-223
NUMA node6 CPU(s):      96-111,224-239
NUMA node7 CPU(s):      112-127,240-255
Vulnerability Gather data sampling: Not affected
Vulnerability Itlb multihit:       Not affected
Vulnerability L1tf:                 Not affected
Vulnerability Mds:                  Not affected
Vulnerability Meltdown:             Not affected
Vulnerability Mmio stale data:      Not affected
Vulnerability Reg file data sampling: Not affected
Vulnerability Retbleed:             Not affected

```

(Continued on next page)



# SPEC CPU®2017 Integer Speed Result

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## Lenovo Global Technology ThinkSystem SR665 V3 (3.30 GHz, AMD EPYC 9575F)

SPECspeed®2017\_int\_base = 20.7  
SPECspeed®2017\_int\_energy\_base = 87.8  
SPECspeed®2017\_int\_peak = 21.0  
SPECspeed®2017\_int\_energy\_peak = 89.6

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

**Test Date:** Sep-2024  
**Hardware Availability:** Nov-2024  
**Software Availability:** Oct-2024

### Platform Notes (Continued)

Vulnerability Spec rstack overflow: Not affected  
Vulnerability Spec store bypass: Mitigation; Speculative Store Bypass disabled via prctl  
Vulnerability Spectre v1: Mitigation; usercopy/swaps barriers and \_\_user pointer sanitization  
Vulnerability Spectre v2: Mitigation; Enhanced / Automatic IBRS; IBPB conditional; STIBP always-on; RSB filling; PBRBS-eIBRS Not affected; BHI Not affected  
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	48K	6M	12	Data	1	64	1	64
L1i	32K	4M	8	Instruction	1	64	1	64
L2	1M	128M	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: 8 nodes (0-7)
node 0 cpus: 0-15,128-143
node 0 size: 47953 MB
node 0 free: 47517 MB
node 1 cpus: 16-31,144-159
node 1 size: 48375 MB
node 1 free: 47969 MB
node 2 cpus: 32-47,160-175
node 2 size: 48337 MB
node 2 free: 47949 MB
node 3 cpus: 48-63,176-191
node 3 size: 48375 MB
node 3 free: 48008 MB
node 4 cpus: 64-79,192-207
node 4 size: 48375 MB
node 4 free: 47957 MB
node 5 cpus: 80-95,208-223
node 5 size: 48375 MB
node 5 free: 48065 MB
node 6 cpus: 96-111,224-239
node 6 size: 48375 MB
node 6 free: 47978 MB
node 7 cpus: 112-127,240-255
node 7 size: 48239 MB
node 7 free: 47873 MB
node distances:
node  0  1  2  3  4  5  6  7
0:  10 12 12 12 32 32 32 32
1:  12 10 12 12 32 32 32 32
2:  12 12 10 12 32 32 32 32
3:  12 12 12 10 32 32 32 32
4:  32 32 32 32 10 12 12 12
5:  32 32 32 32 12 10 12 12
6:  32 32 32 32 12 12 10 12
7:  32 32 32 32 12 12 12 10

```

9. /proc/meminfo

MemTotal: 395681868 kB

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### Platform Notes (Continued)

-----  
 10. who -r  
 run-level 3 Sep 22 20:41  
 -----

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  
 firewallld 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-confext systemd-network-generator systemd-sysextd systemd-time-wait-sync  
 systemd-timesyncd  
 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=97229c89-a686-427c-85c3-9eef128c0ead  
 splash=silent  
 mitigations=auto  
 quiet  
 security=apparmor  
 -----

14. cpupower frequency-info  
 analyzing CPU 143:  
 current policy: frequency should be within 1.50 GHz and 3.30 GHz.  
 The governor "ondemand" may decide which speed to use  
 within this range.  
 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  
 vm.dirtytime\_expire\_seconds 43200  
 -----

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### Platform Notes (Continued)

```
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 defer+madvise madvise never
enabled     [always] madvise 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
Filesystem  Type  Size  Used Avail Use% Mounted on
/dev/sda3   xfs   446G  46G  400G  11% /
```

```
-----
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:
13x Micron Technology MTC10F1084S1RC64BD2 QSFF 16 GB 1 rank 6400, configured at 3600
11x Micron Technology MTC10F1084S1RC64BD2 UXCC 16 GB 1 rank 6400, configured at 3600
```

(Continued on next page)



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## Platform Notes (Continued)

22. BIOS  
(This section combines info from /sys/devices and dmidecode.)  
BIOS Vendor: Lenovo  
BIOS Version: KAE125W-5.10  
BIOS Date: 08/02/2024  
BIOS Revision: 5.10  
Firmware Revision: 53.9

## Compiler Version Notes

=====  
C | 600.perlbench\_s(base, peak) 602.gcc\_s(base, peak) 605.mcf\_s(base, peak) 625.x264\_s(base, peak)  
| 657.xz\_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++ | 620.omnetpp\_s(base, peak) 623.xalancbmk\_s(base, peak) 631.deepsjeng\_s(base, peak)  
| 641.leela\_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 | 648.exchange2\_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  
=====

## Base Compiler Invocation

C benchmarks:  
clang

C++ benchmarks:  
clang++

Fortran benchmarks:  
flang



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## Base Portability Flags

```
600.perlbench_s: -DSPEC_LINUX_X64 -DSPEC_LP64
602.gcc_s: -DSPEC_LP64
605.mcf_s: -DSPEC_LP64
620.omnetpp_s: -DSPEC_LP64
623.xalancbmk_s: -DSPEC_LINUX -DSPEC_LP64
625.x264_s: -DSPEC_LP64
631.deepsjeng_s: -DSPEC_LP64
641.leela_s: -DSPEC_LP64
648.exchange2_s: -DSPEC_LP64
657.xz_s: -DSPEC_LP64
```

## Base Optimization Flags

C benchmarks:

```
-m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-allow-multiple-definition -Wl,-mllvm -Wl,-extra-inliner -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 -fopenmp=libomp -lomp -lamdlibm
-lflang -lamdalloc
```

C++ benchmarks:

```
-m64 -std=c++14 -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
-mllvm -loop-unswitch-threshold=200000
-mllvm -reduce-array-computations=3 -mllvm -unroll-threshold=100 -zopt
-fvirtual-function-elimination -fvisibility=hidden -fopenmp=libomp
-lomp -lamdlibm -lflang -lamdalloc-ext
```

Fortran benchmarks:

```
-m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-enable-iv-split -Wl,-mllvm -Wl,-inline-recursion=4
-Wl,-mllvm -Wl,-lsr-in-nested-loop -O3 -march=znver5 -fveclib=AMDLIBM
-ffast-math -fopenmp -flto -mllvm -optimize-strided-mem-cost
-mllvm -unroll-aggressive -mllvm -unroll-threshold=150 -fopenmp=libomp
-lomp -lamdlibm -lflang -lamdalloc
```



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**Software Availability:** Oct-2024

## Base Other Flags

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

## Peak Compiler Invocation

C benchmarks:  
clang  
C++ benchmarks:  
clang++  
Fortran benchmarks:  
flang

## Peak Portability Flags

Same as Base Portability Flags

## Peak Optimization Flags

C benchmarks:  
600.perlbench\_s: -m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6  
-Wl,-mllvm -Wl,-reduce-array-computations=3  
-Wl,-allow-multiple-definition  
-Wl,-mllvm -Wl,-extra-inliner -Ofast -march=znver5  
-fveclib=AMDLIBM -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 -fopenmp=libomp -lomp

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## Peak Optimization Flags (Continued)

600.perlbench\_s (continued):

-lamdlibm -lamdalloc -lflang

602.gcc\_s: Same as 600.perlbench\_s

605.mcf\_s: -m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6

-Wl,-mllvm -Wl,-reduce-array-computations=3  
-Wl,-mllvm -Wl,-extra-inliner -Ofast -march=znver5  
-fveclib=AMDLIBM -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 -fopenmp=libomp -lomp  
-lamdlibm -lamdalloc -lflang

625.x264\_s: Same as 600.perlbench\_s

657.xz\_s: Same as 600.perlbench\_s

C++ benchmarks:

620.omnetpp\_s: basepeak = yes

623.xalancbmk\_s: -m64 -std=c++14

-Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6  
-Wl,-mllvm -Wl,-reduce-array-computations=3  
-Wl,-mllvm -Wl,-do-block-reorder=advanced -Ofast  
-march=znver5 -fveclib=AMDLIBM -ffast-math -fopenmp  
-flto -DSPEC\_OPENMP -mllvm -reduce-array-computations=3  
-mllvm -unroll-threshold=100 -zopt  
-fvirtual-function-elimination -fvisibility=hidden  
-mllvm -do-block-reorder=advanced -fopenmp=libomp -lomp  
-lamdlibm -lamdalloc-ext -lflang

631.deepsjeng\_s: basepeak = yes

641.leela\_s: -m64 -std=c++14

-Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6  
-Wl,-mllvm -Wl,-reduce-array-computations=3 -Ofast  
-march=znver5 -fveclib=AMDLIBM -ffast-math -fopenmp  
-flto -DSPEC\_OPENMP -mllvm -reduce-array-computations=3  
-mllvm -unroll-threshold=100 -zopt  
-fvirtual-function-elimination -fvisibility=hidden  
-fopenmp=libomp -lomp -lamdlibm -lamdalloc -lflang

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## Peak Optimization Flags (Continued)

Fortran benchmarks:

648.exchange2\_s: basepeak = yes

## Peak Other Flags

C benchmarks:

-Wno-return-type -Wno-unused-command-line-argument

C++ benchmarks:

-Wno-unused-command-line-argument

Fortran benchmarks:

-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-A.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-A.xml>  
<http://www.spec.org/cpu2017/flags/aocc500-flags.2024-10-10.xml>

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