



# SPEC CPU®2017 Integer Rate Result

Copyright 2017-2023 Standard Performance Evaluation Corporation

## Lenovo Global Technology ThinkSystem SR655 V3 (2.25 GHz, AMD EPYC 9754)

SPECrate®2017_int_base =	760
SPECrate®2017_int_energy_base =	2210
SPECrate®2017_int_peak =	820
SPECrate®2017_int_energy_peak =	2350

CPU2017 License: 9017

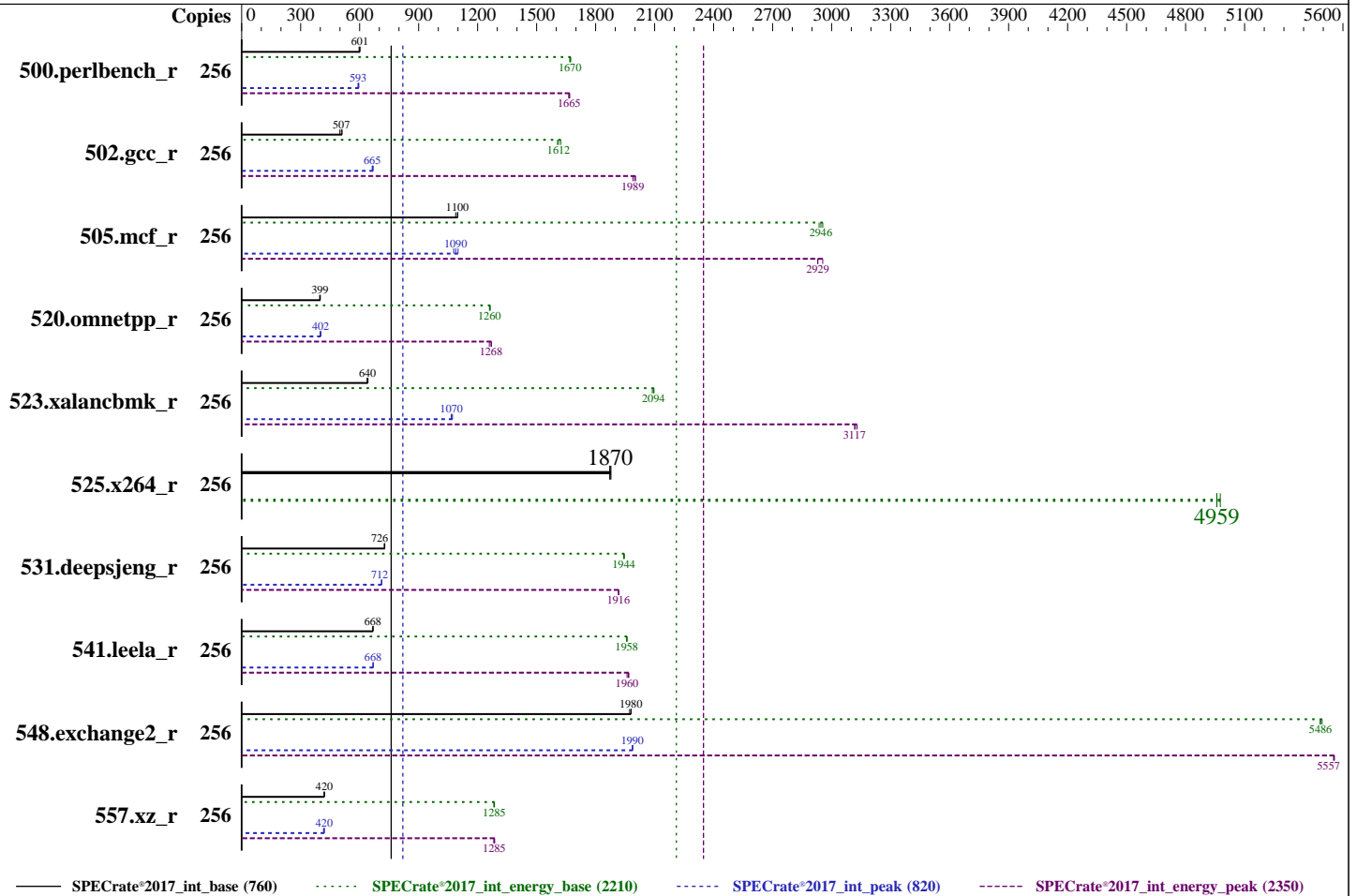
Test Sponsor: Lenovo Global Technology

Tested by: Lenovo Global Technology

Test Date: May-2023

Hardware Availability: Aug-2023

Software Availability: Nov-2022



### Hardware

CPU Name: AMD EPYC 9754  
 Max MHz: 3100  
 Nominal: 2250  
 Enabled: 128 cores, 1 chip, 2 threads/core  
 Orderable: 1 chip  
 Cache L1: 32 KB I + 32 KB D on chip per core  
 L2: 1 MB I+D on chip per core  
 L3: 256 MB I+D on chip per chip,  
 16 MB shared / 8 cores  
 Other: None  
 Memory: 384 GB (12 x 32 GB 2Rx8 PC5-4800B-R)  
 Storage: 1 x 480 GB SATA SSD  
 Other: None

### Software

OS: SUSE Linux Enterprise Server 15 SP4 (x86\_64)  
 Kernel 5.14.21-150400.22-default  
 Compiler: C/C++/Fortran: Version 4.0.0 of AOCC  
 Parallel: No  
 Firmware: Lenovo BIOS Version KAE111J 2.10 released May-2023  
 File System: xfs  
 System State: Run level 3 (multi-user)  
 Base Pointers: 64-bit  
 Peak Pointers: 32/64-bit  
 Other: None  
 Power Management: BIOS and OS set to balance power and performance



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### Power

Max. Power (W): 464.45  
Idle Power (W): 87.48  
Min. Temperature (C): 27.00  
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 750 W (non-redundant)  
Details: ThinkSystem 750W Titanium Power Supply 4P57A82019  
Backplane: 8 x 2.5-inch HDD back plane  
Other Storage: None  
Storage Model #: 4XB7A17107  
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: C3UG05014E  
Input Connection: Default  
Metrology Institute: CNAS  
Calibration By: GRG METROLOGY & TEST (BEIJING) CO., LTD.  
Calibration Label: J202210116758A-0005  
Calibration Date: 19-Oct-2022  
PTDaemon® Version: 1.10.0 (82175bac; 2022-08-17)  
Setup Description: Connected to PSU1  
Current Ranges Used: 2.5A  
Voltage Range Used: 300V

### Temperature Meter

Temperature Meter: WIN:9889  
Hardware Vendor: Digi International, Inc.  
Model: DigiWATCHPORT\_H  
Serial Number: W63074363  
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	Copies	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
500.perlbench_r	256	683	597	264	1670	387	455	<b>678</b>	<b>601</b>	<b>265</b>	<b>1670</b>	<b>390</b>	<b>459</b>	678	601	265	1670	391	455
502.gcc_r	256	710	511	243	1620	342	418	<b>715</b>	<b>507</b>	<b>244</b>	<b>1610</b>	<b>342</b>	<b>417</b>	726	499	245	1610	338	417
505.mcf_r	256	<b>377</b>	<b>1100</b>	<b>154</b>	<b>2950</b>	<b>408</b>	<b>436</b>	380	1090	154	2940	406	436	376	1100	153	2960	407	435
520.omnetpp_r	256	847	397	289	1260	341	375	<b>842</b>	<b>399</b>	<b>289</b>	<b>1260</b>	<b>343</b>	<b>373</b>	840	400	288	1260	343	375
523.xalancbmk_r	256	421	642	140	2100	332	425	<b>422</b>	<b>640</b>	<b>140</b>	<b>2090</b>	<b>331</b>	<b>413</b>	424	638	140	2090	331	415
525.x264_r	256	239	1880	98.0	4960	411	452	239	1870	97.6	4980	408	452	<b>239</b>	<b>1870</b>	<b>98.0</b>	<b>4960</b>	<b>410</b>	<b>454</b>
531.deepsjeng_r	256	404	726	164	1950	405	417	<b>404</b>	<b>726</b>	<b>164</b>	<b>1940</b>	<b>406</b>	<b>417</b>	403	728	164	1940	407	418
541.leela_r	256	<b>635</b>	<b>668</b>	<b>234</b>	<b>1960</b>	<b>369</b>	<b>408</b>	635	668	234	1960	369	408	635	668	234	1960	369	406
548.exchange2_r	256	339	1980	132	5490	391	399	340	1970	133	5480	390	398	<b>339</b>	<b>1980</b>	<b>133</b>	<b>5490</b>	<b>391</b>	<b>399</b>
557.xz_r	256	<b>658</b>	<b>420</b>	<b>234</b>	<b>1280</b>	<b>356</b>	<b>394</b>	657	421	234	1290	356	394	659	420	234	1280	356	395

SPECrate®2017\_int\_base = 760

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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	Copies	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
500.perlbench_r	256	688	592	265	1670	385	457	684	596	266	1660	389	456	<b>688</b>	<b>593</b>	<b>266</b>	<b>1670</b>	<b>386</b>	<b>453</b>
502.gcc_r	256	542	669	197	2000	364	418	<b>545</b>	<b>665</b>	<b>198</b>	<b>1990</b>	<b>363</b>	<b>418</b>	546	664	197	2000	360	415
505.mcf_r	256	384	1080	154	2930	403	434	<b>380</b>	<b>1090</b>	<b>154</b>	<b>2930</b>	<b>407</b>	<b>436</b>	376	1100	153	2950	407	434
520.omnetpp_r	256	<b>835</b>	<b>402</b>	<b>287</b>	<b>1270</b>	<b>343</b>	<b>373</b>	841	399	289	1260	343	354	834	403	286	1270	343	373
523.xalancbmk_r	256	252	1070	93.8	3120	372	464	254	1070	93.6	3130	369	457	<b>253</b>	<b>1070</b>	<b>93.9</b>	<b>3120</b>	<b>371</b>	<b>462</b>
525.x264_r	256	239	1880	98.0	4960	411	452	239	1870	97.6	4980	408	452	<b>239</b>	<b>1870</b>	<b>98.0</b>	<b>4960</b>	<b>410</b>	<b>454</b>
531.deepsjeng_r	256	<b>412</b>	<b>712</b>	<b>166</b>	<b>1920</b>	<b>404</b>	<b>415</b>	413	711	166	1920	403	416	412	712	166	1920	404	417
541.leela_r	256	635	668	233	1970	368	403	633	669	233	1970	368	405	<b>634</b>	<b>668</b>	<b>234</b>	<b>1960</b>	<b>369</b>	<b>408</b>
548.exchange2_r	256	<b>337</b>	<b>1990</b>	<b>131</b>	<b>5560</b>	<b>388</b>	<b>394</b>	337	1990	131	5550	388	395	338	1990	131	5550	388	395
557.xz_r	256	664	416	234	1280	353	393	658	420	234	1290	355	396	<b>659</b>	<b>420</b>	<b>234</b>	<b>1290</b>	<b>355</b>	<b>392</b>

SPECrate®2017\_int\_peak = 820

SPECrate®2017\_int\_energy\_peak = 2350

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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:

```
LD_LIBRARY_PATH =  
    "/home/cpu2017-1.1.9-amd-aocc400_znver4_A1/amd_rate_aocc400_znver4_A_lib/lib:/home/cpu2017-1.1.9-amd-a  
    occ400_znver4_A1/amd_rate_aocc400_znver4_A_lib/lib32:"  
MALLOC_CONF = "retain:true"
```

Environment variables set by runcpu during the 523.xalancbmk\_r peak run:

```
MALLOC_CONF = "thp:never"
```

## General Notes

Binaries were compiled on a system with 2x AMD EPYC 9174F CPU + 1.5TiB Memory using RHEL 8.6

NA: The test sponsor attests, as of date of publication, that CVE-2017-5754 (Meltdown) is mitigated in the system as tested and documented.

Yes: The test sponsor attests, as of date of publication, that CVE-2017-5753 (Spectre variant 1) is mitigated in the system as tested and documented.

Yes: The test sponsor attests, as of date of publication, that CVE-2017-5715 (Spectre variant 2) is mitigated in the system as tested and documented.

## Platform Notes

BIOS configuration:

Operating Mode set to Custom Mode  
Core Performance Boost set to Disabled  
NUMA Nodes per Socket set to NPS4  
Determinism Slider set to Power  
L2 Stream HW Prefetcher 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 Sat May 20 22:57:42 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

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## Platform Notes (Continued)

```
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
22:57:42 up 46 min, 1 user, load average: 0.08, 0.02, 0.00
USER      TTY      FROM          LOGIN@      IDLE        JCPU       PCPU       WHAT
root      tty1    -             22:55      1:15       2.36s     0.20s     /bin/bash ./amd_rate_aocc400_znver4_A1.sh
```

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

```
4. ulimit -a
core file size          (blocks, -c) unlimited
data seg size           (kbytes, -d) unlimited
scheduling priority     (-e) 0
file size                (blocks, -f) unlimited
pending signals         (-i) 1545761
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) 1545761
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 ./run_SR655V3_bergamo.sh
/bin/bash ./Run025-compliant-amd-rateint.sh
python3 ./run_amd_rate_aocc400_znver4_A1.py
/bin/bash ./amd_rate_aocc400_znver4_A1.sh
runcpu --power --config amd_rate_aocc400_znver4_A1.cfg --tune all --reportable --iterations 3 intrate
runcpu --power --configfile amd_rate_aocc400_znver4_A1.cfg --tune all --reportable --iterations 3 --runmode
rate --tune base:peak --size test:train:refrate intrate --nopreenv --note-preenv --logfile
$SPEC/tmp/CPU2017.032/temlogs/preenv.intrate.032.0.log --lognum 032.0 --from_runcpu 2
```

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### Platform Notes (Continued)

```
specperl $SPEC/bin/sysinfo
$SPEC = /home/cpu2017-1.1.9-amd-aocc400_znver4_A1
```

```
-----
6. /proc/cpuinfo
model name      : AMD EPYC 9754 128-Core Processor
vendor_id      : AuthenticAMD
cpu family     : 25
model          : 160
stepping       : 2
microcode      : 0xaa00208
bugs           : sysret_ss_attrs spectre_v1 spectre_v2 spec_store_bypass
TLB size      : 3584 4K pages
cpu cores     : 128
siblings      : 256
1 physical ids (chips)
256 processors (hardware threads)
physical id 0: core ids 0-127
physical id 0: apicids 0-255
```

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 2.37.2:

```
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:   2
Core(s) per socket:   128
Socket(s):             1
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
```

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### Platform Notes (Continued)

pausefilter pfthreshold avic v\_vmsave\_vmload vgif v\_spec\_ctrl avx512vbmi  
umip pku ospke avx512\_vbmi2 gfni vaes vpclmulqdq avx512\_vnni avx512\_bitalg  
avx512\_vpoptndq la57 rdpid overflow\_recov succor smca fsrm flush\_lld

AMD-V

Virtualization: AMD-V  
L1d cache: 4 MiB (128 instances)  
L1i cache: 4 MiB (128 instances)  
L2 cache: 128 MiB (128 instances)  
L3 cache: 256 MiB (16 instances)  
NUMA node(s): 4  
NUMA node0 CPU(s): 0-31,128-159  
NUMA node1 CPU(s): 32-63,160-191  
NUMA node2 CPU(s): 64-95,192-223  
NUMA node3 CPU(s): 96-127,224-255  
Vulnerability Itlb multihit: Not affected  
Vulnerability L1tf: Not affected  
Vulnerability Mds: Not affected  
Vulnerability Meltdown: Not affected  
Vulnerability Spec store bypass: Mitigation; Speculative Store Bypass disabled via prctl and seccomp  
Vulnerability Spectre v1: Mitigation; usercopy/swapgs barriers and \_\_user pointer sanitization  
Vulnerability Spectre v2: Mitigation; Retpolines, IBPB conditional, IBRS\_FW, STIBP always-on, RSB filling  
Vulnerability Srbds: Not affected  
Vulnerability Tsx async abort: Not affected

From lscpu --cache:

NAME	ONE-SIZE	ALL-SIZE	WAYS	TYPE	LEVEL	SETS	PHY-LINE	COHERENCY-SIZE
L1d	32K	4M	8	Data	1	64	1	64
L1i	32K	4M	8	Instruction	1	64	1	64
L2	1M	128M	8	Unified	2	2048	1	64
L3	16M	256M	16	Unified	3	16384	1	64

8. numactl --hardware

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

available: 4 nodes (0-3)  
node 0 cpus: 0-31,128-159  
node 0 size: 96488 MB  
node 0 free: 94735 MB  
node 1 cpus: 32-63,160-191  
node 1 size: 96701 MB  
node 1 free: 96283 MB  
node 2 cpus: 64-95,192-223  
node 2 size: 96736 MB  
node 2 free: 96369 MB  
node 3 cpus: 96-127,224-255  
node 3 size: 96538 MB  
node 3 free: 96019 MB  
node distances:  
node 0 1 2 3  
0: 10 12 12 12  
1: 12 10 12 12  
2: 12 12 10 12  
3: 12 12 12 10

9. /proc/meminfo

MemTotal: 395739420 kB

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## Platform Notes (Continued)

-----  
10. who -r  
run-level 3 May 20 22:12  
-----

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 iscsi  
chronyd console-getty cups cups-browsed debug-shell ebttables exchange-bmc-os-info  
smartd sshd wicked wickedd-auto4 wickedd-dhcp4 wickedd-dhcp6 wickedd-nanny  
enabled-runtime systemd-remount-fs  
disabled autofs autoyast-initscripts blk-availability boot-sysctl ca-certificates chrony-wait  
console-getty cups cups-browsed debug-shell ebttables exchange-bmc-os-info  
firewalld gpm grub2-once haveged-switch-root hwloc-dump-hwdata ipmi ipmievd iscsi-init  
iscsid iscsiui issue-add-ssh-keys kexec-load lunmask man-db-create multipathd nfs  
nfs-blkmap nmb rdisc rpcbind rpmconfigcheck rsyncd serial-getty@ smartd\_generate\_opts smb  
snmpd snmptrapd systemd-boot-check-no-failures systemd-network-generator systemd-sysext  
systemd-time-wait-sync systemd-timesyncd tuned  
generated ntp\_sync  
indirect wickedd  
-----

13. Linux kernel boot-time arguments, from /proc/cmdline  
BOOT\_IMAGE=/boot/vmlinuz-5.14.21-150400.22-default  
root=UUID=4fcd643d-e392-48aa-b6f6-80f024d1c633  
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  
-----

(Continued on next page)





# SPEC CPU®2017 Integer Rate Result

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## Lenovo Global Technology ThinkSystem SR655 V3 (2.25 GHz, AMD EPYC 9754)

SPECrate®2017_int_base =	760
SPECrate®2017_int_energy_base =	2210
SPECrate®2017_int_peak =	820
SPECrate®2017_int_energy_peak =	2350

**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)

```

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

```

```

-----
17. /sys/kernel/mm/transparent_hugepage
defrag      [always] 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  52G  395G  12% /

```

```

-----
21. /sys/devices/virtual/dmi/id
Vendor:         Lenovo
Product:        ThinkSystem SR655V3
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.

```

(Continued on next page)



# SPEC CPU®2017 Integer Rate Result

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**Lenovo Global Technology**  
**ThinkSystem SR655 V3**  
**(2.25 GHz, AMD EPYC 9754)**

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## Platform Notes (Continued)

### Memory:

5x SK Hynix HMC88AEBRA115N 32 GB 2 rank 4800  
7x SK Hynix HMC88AEBRA168N 32 GB 2 rank 4800

### 23. BIOS

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

BIOS Vendor: Lenovo  
BIOS Version: KAE111J-2.10  
BIOS Date: 05/11/2023  
BIOS Revision: 2.10  
Firmware Revision: 2.10

## Compiler Version Notes

C | 502.gcc\_r(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: i386-unknown-linux-gnu  
Thread model: posix  
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin

C | 500.perlbench\_r(base, peak) 502.gcc\_r(base) 505.mcf\_r(base, peak) 525.x264\_r(base, peak)  
| 557.xz\_r(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 | 502.gcc\_r(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: i386-unknown-linux-gnu  
Thread model: posix  
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin

C | 500.perlbench\_r(base, peak) 502.gcc\_r(base) 505.mcf\_r(base, peak) 525.x264\_r(base, peak)  
| 557.xz\_r(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++ | 523.xalancbmk\_r(peak)

(Continued on next page)



# SPEC CPU®2017 Integer Rate Result

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SPECrate®2017\_int\_base = 760  
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## Compiler Version Notes (Continued)

-----  
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: i386-unknown-linux-gnu  
Thread model: posix  
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin  
-----

=====  
C++ | 520.omnetpp\_r(base, peak) 523.xalancbmk\_r(base) 531.deepsjeng\_r(base, peak) 541.leela\_r(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++ | 523.xalancbmk\_r(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: i386-unknown-linux-gnu  
Thread model: posix  
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin  
-----

=====  
C++ | 520.omnetpp\_r(base, peak) 523.xalancbmk\_r(base) 531.deepsjeng\_r(base, peak) 541.leela\_r(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 | 548.exchange2\_r(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  
-----

## Base Compiler Invocation

C benchmarks:  
clang

C++ benchmarks:  
clang++

(Continued on next page)



# SPEC CPU®2017 Integer Rate Result

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**Lenovo Global Technology**  
**ThinkSystem SR655 V3**  
**(2.25 GHz, AMD EPYC 9754)**

SPECrate®2017\_int\_base = 760  
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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  
**Software Availability:** Nov-2022

## Base Compiler Invocation (Continued)

Fortran benchmarks:  
flang

## Base Portability Flags

```
500.perlbench_r: -DSPEC_LINUX_X64 -DSPEC_LP64
502.gcc_r: -DSPEC_LP64
505.mcf_r: -DSPEC_LP64
520.omnetpp_r: -DSPEC_LP64
523.xalancbmk_r: -DSPEC_LINUX -DSPEC_LP64
525.x264_r: -DSPEC_LP64
531.deepsjeng_r: -DSPEC_LP64
541.leela_r: -DSPEC_LP64
548.exchange2_r: -DSPEC_LP64
557.xz_r: -DSPEC_LP64
```

## Base Optimization Flags

C benchmarks:

```
-m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-ldist-scalar-expand -fenable-aggressive-gather
-z muldefs -O3 -march=znver4 -fveclib=AMDLIBM -ffast-math
-fstruct-layout=7 -mllvm -unroll-threshold=50
-mllvm -inline-threshold=1000 -fremap-arrays -fstrip-mining
-mllvm -reduce-array-computations=3 -zopt -lamdlibm -lflang
-lamdalloc
```

C++ benchmarks:

```
-m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3 -z muldefs -O3
-march=znver4 -fveclib=AMDLIBM -ffast-math
-mllvm -unroll-threshold=100 -finline-aggressive
-mllvm -loop-unswitch-threshold=200000
-mllvm -reduce-array-computations=3 -zopt
-fvirtual-function-elimination -fvisibility=hidden -lamdlibm -lflang
-lamdalloc-ext
```

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# SPEC CPU®2017 Integer Rate Result

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SPECrate®2017\_int\_base = 760  
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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

**Software Availability:** Nov-2022

## Base Optimization Flags (Continued)

Fortran benchmarks:

```
-m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-inline-recursion=4 -Wl,-mllvm -Wl,-lsr-in-nested-loop
-Wl,-mllvm -Wl,-enable-iv-split -z muldefs -O3 -march=znver4
-fveclib=AMDLIBM -ffast-math -fepilog-vectorization-of-inductions
-mllvm -optimize-strided-mem-cost -floop-transform
-mllvm -unroll-aggressive -mllvm -unroll-threshold=500 -lamdlibm
-lflang -lamdalloc
```

## Base Other Flags

C benchmarks:

```
-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

```
500.perlbench_r: -DSPEC_LINUX_X64 -DSPEC_LP64
```

```
502.gcc_r: -D_FILE_OFFSET_BITS=64
```

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# SPEC CPU®2017 Integer Rate Result

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SPECrate®2017\_int\_base = 760  
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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

Software Availability: Nov-2022

## Peak Portability Flags (Continued)

505.mcf\_r: -DSPEC\_LP64  
520.omnetpp\_r: -DSPEC\_LP64  
523.xalancbmk\_r: -DSPEC\_LINUX -DSPEC\_LP64  
525.x264\_r: -DSPEC\_LP64  
531.deepsjeng\_r: -DSPEC\_LP64  
541.leela\_r: -DSPEC\_LP64  
548.exchange2\_r: -DSPEC\_LP64  
557.xz\_r: -DSPEC\_LP64

## Peak Optimization Flags

C benchmarks:

500.perlbench\_r: -m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6  
-Wl,-mllvm -Wl,-reduce-array-computations=3  
-fprofile-instr-generate(pass 1)  
-fprofile-instr-use(pass 2) -Ofast -march=znver4  
-fveclib=AMDLIBM -ffast-math -fstruct-layout=7  
-mllvm -unroll-threshold=50 -fremap-arrays  
-mllvm -inline-threshold=1000  
-mllvm -reduce-array-computations=3  
-faggressive-loop-transform -fvector-transform  
-fscalar-transform -lamdlibm -lflang -lamdalloc

502.gcc\_r: -m32 -flto -z muldefs -Ofast -march=znver4  
-fveclib=AMDLIBM -ffast-math -fstruct-layout=7  
-mllvm -unroll-threshold=50 -fremap-arrays -fstrip-mining  
-mllvm -inline-threshold=1000  
-mllvm -reduce-array-computations=3 -zopt -fgnu89-inline  
-lamdalloc

505.mcf\_r: -m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6  
-Wl,-mllvm -Wl,-reduce-array-computations=3 -Ofast  
-march=znver4 -fveclib=AMDLIBM -ffast-math  
-fstruct-layout=7 -mllvm -unroll-threshold=50  
-fremap-arrays -fstrip-mining  
-mllvm -inline-threshold=1000  
-mllvm -reduce-array-computations=3 -zopt -lamdlibm  
-lflang -lamdalloc

525.x264\_r: basepeak = yes

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SPECrate®2017\_int\_energy\_peak = 2350

**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 Optimization Flags (Continued)

557.xz\_r: Same as 505.mcf\_r

C++ benchmarks:

```
520.omnetpp_r: -m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3 -Ofast
-march=znver4 -fveclib=AMDLIBM -ffast-math
-inline-aggressive -mllvm -unroll-threshold=100
-mllvm -reduce-array-computations=3 -zopt
-fvirtual-function-elimination -fvisibility=hidden
-lamdlibm -lamdalloc-ext
```

```
523.xalancbmk_r: -m32 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-do-block-reorder=aggressive
-fno-loop-reroll -Ofast -march=znver4 -fveclib=AMDLIBM
-ffast-math -inline-aggressive
-mllvm -unroll-threshold=100
-mllvm -reduce-array-computations=3 -zopt
-mllvm -do-block-reorder=aggressive
-fvirtual-function-elimination -fvisibility=hidden
-lamdalloc-ext
```

```
531.deepsjeng_r: -m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3 -O3
-march=znver4 -fveclib=AMDLIBM -ffast-math
-mllvm -unroll-threshold=100 -inline-aggressive
-mllvm -loop-unswitch-threshold=200000
-mllvm -reduce-array-computations=3 -zopt
-fvirtual-function-elimination -fvisibility=hidden
-lamdlibm -lamdalloc-ext
```

```
541.leela_r: -m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3 -Ofast
-march=znver4 -fveclib=AMDLIBM -ffast-math
-inline-aggressive -mllvm -unroll-threshold=100
-mllvm -reduce-array-computations=3 -zopt
-fvirtual-function-elimination -fvisibility=hidden
-lamdlibm -lflang -lamdalloc-ext
```

Fortran benchmarks:

```
-m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-inline-recursion=4 -Wl,-mllvm -Wl,-lsr-in-nested-loop
```

(Continued on next page)



# SPEC CPU®2017 Integer Rate Result

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**Lenovo Global Technology**  
**ThinkSystem SR655 V3**  
**(2.25 GHz, AMD EPYC 9754)**

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**Tested by:** Lenovo Global Technology

**Test Date:** May-2023  
**Hardware Availability:** Aug-2023  
**Software Availability:** Nov-2022

## Peak Optimization Flags (Continued)

Fortran benchmarks (continued):

```
-Wl,-mllvm -Wl,-enable-iv-split -O3 -march=znver4 -fveclib=AMDLIBM  
-ffast-math -fepilog-vectorization-of-inductions  
-mllvm -optimize-strided-mem-cost -floop-transform  
-mllvm -unroll-aggressive -mllvm -unroll-threshold=500 -lamdlibm  
-lflang -lamdalloc
```

## Peak Other Flags

C benchmarks (except as noted below):

```
-Wno-unused-command-line-argument
```

```
502.gcc_r: -L/usr/lib32 -Wno-unused-command-line-argument  
-L/home/work/cpu2017/v119/aocc4/znver4/rate/amd_rate_aocc400_znver4_A_lib/lib32
```

C++ benchmarks (except as noted below):

```
-Wno-unused-command-line-argument
```

```
523.xalancbmk_r: -L/usr/lib32 -Wno-unused-command-line-argument  
-L/home/work/cpu2017/v119/aocc4/znver4/rate/amd_rate_aocc400_znver4_A_lib/lib32
```

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/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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