



# SPEC CPU®2017 Integer Speed Result

Copyright 2017-2023 Standard Performance Evaluation Corporation

## Lenovo Global Technology

ThinkSystem SR655  
(2.80 GHz,AMD EPYC 7203P)

SPECspeed®2017\_int\_base = 10.5

SPECspeed®2017\_int\_peak = 10.6

CPU2017 License: 9017

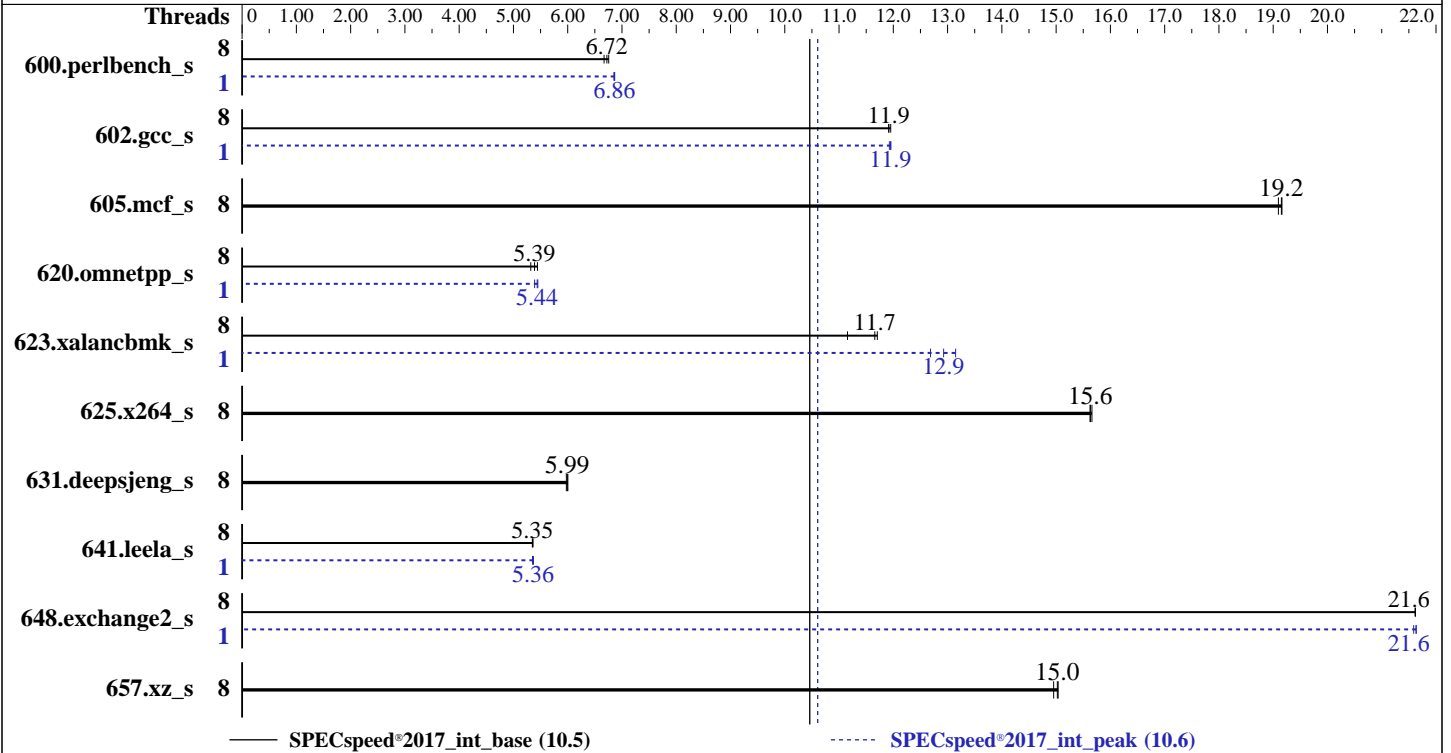
Test Sponsor: Lenovo Global Technology

Tested by: Lenovo Global Technology

Test Date: Aug-2023

Hardware Availability: Oct-2023

Software Availability: Jun-2023



### Hardware

CPU Name: AMD EPYC 7203P  
 Max MHz: 3400  
 Nominal: 2800  
 Enabled: 8 cores, 1 chip, 2 threads/core  
 Orderable: 1 chip  
 Cache L1: 32 KB I + 32 KB D on chip per core  
 L2: 512 KB I+D on chip per core  
 L3: 64 MB I+D on chip per chip,  
 16 MB shared / 2 cores  
 Other: None  
 Memory: 256 GB (8 x 32 GB 2Rx4 PC4-3200AA-R)  
 Storage: 1 x 960 GB SATA SSD  
 Other: None

### Software

OS: SUSE Linux Enterprise Server 15 SP5  
 Kernel 5.14.21-150500.53-default  
 Compiler: C/C++/Fortran: Version 3.2.0 of AOCC  
 Parallel: Yes  
 Firmware: Lenovo BIOS Version CFE137D 7.10 released Jun-2023  
 File System: xfs  
 System State: Run level 3 (multi-user)  
 Base Pointers: 64-bit  
 Peak Pointers: 64-bit  
 Other: jemalloc: jemalloc memory allocator library v5.1.0  
 Power Management: BIOS and OS 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
600.perlbench_s	8	266	6.67	263	6.76	<b>264</b>	<b>6.72</b>	1	259	6.87	259	6.85	<b>259</b>	<b>6.86</b>
602.gcc_s	8	333	12.0	<b>334</b>	<b>11.9</b>	334	11.9	1	333	12.0	<b>333</b>	<b>11.9</b>	334	11.9
605.mcf_s	8	<b>247</b>	<b>19.2</b>	246	19.2	247	19.1	8	<b>247</b>	<b>19.2</b>	246	19.2	247	19.1
620.omnetpp_s	8	307	5.32	<b>303</b>	<b>5.39</b>	300	5.44	1	299	5.45	<b>300</b>	<b>5.44</b>	303	5.39
623.xalancbmk_s	8	<b>122</b>	<b>11.7</b>	121	11.7	127	11.2	1	<b>110</b>	<b>12.9</b>	108	13.1	112	12.7
625.x264_s	8	<b>113</b>	<b>15.6</b>	113	15.6	113	15.7	8	<b>113</b>	<b>15.6</b>	113	15.6	113	15.7
631.deepsjeng_s	8	239	6.00	240	5.97	<b>239</b>	<b>5.99</b>	8	239	6.00	240	5.97	<b>239</b>	<b>5.99</b>
641.leela_s	8	319	5.35	<b>319</b>	<b>5.35</b>	318	5.36	1	319	5.35	<b>318</b>	<b>5.36</b>	318	5.37
648.exchange2_s	8	<b>136</b>	<b>21.6</b>	136	21.6	136	21.6	1	<b>136</b>	<b>21.6</b>	136	21.6	136	21.6
657.xz_s	8	<b>412</b>	<b>15.0</b>	413	15.0	411	15.0	8	<b>412</b>	<b>15.0</b>	413	15.0	411	15.0

SPECspeed®2017\_int\_base = **10.5**

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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 = "0-15"

LD\_LIBRARY\_PATH =

"/home/cpu2017-1.1.9-amd-milanx-aocc320-A1/amd\_speed\_aocc320\_milanx\_A\_lib/lib:/home/cpu2017-1.1.9-amd-milanx-aocc320-A1/amd\_speed\_aocc320\_milanx\_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 = "16"

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 620.omnetpp\_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 641.leela\_s peak run:

GOMP\_CPU\_AFFINITY = "0"

Environment variables set by runcpu during the 648.exchange2\_s peak run:

GOMP\_CPU\_AFFINITY = "0"

## General Notes

Binaries were compiled on a system with 2x AMD EPYC 7742 CPU + 1TiB Memory using openSUSE 15.2

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.

jemalloc: configured and built with GCC v4.8.2 in RHEL 7.4 (No options specified)

jemalloc 5.1.0 is available here:

<https://github.com/jemalloc/jemalloc/releases/download/5.1.0/jemalloc-5.1.0.tar.bz2>

## Platform Notes

BIOS configuration:

Choose Operating Mode set to Maximum Performance

NUMA Nodes per Socket set to NPS2

Sysinfo program /home/cpu2017-1.1.9-amd-milanx-aocc320-A1/bin/sysinfo

Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197

running on localhost Wed Aug 23 08:41:29 2023

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

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## Platform Notes (Continued)

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```
1. uname -a
Linux localhost 5.14.21-150500.53-default #1 SMP PREEMPT_DYNAMIC Wed May 10 07:56:26 UTC 2023 (b630043)
x86_64 x86_64 x86_64 GNU/Linux
```

```
2. w
08:41:29 up 0 min, 1 user, load average: 0.00, 0.00, 0.00
USER      TTY      FROM          LOGIN@   IDLE   JCPU   PCPU WHAT
root      tty1     -             08:40   17.00s 1.23s  0.03s /bin/bash ./amd_speed_aocc320_milanx_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) 1026786
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) 1026786
virtual memory          (kbytes, -v) unlimited
```

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### Platform Notes (Continued)

file locks (-x) unlimited

#### 5. sysinfo process ancestry

```

/usr/lib/systemd/systemd --switched-root --system --deserialize 30
login -- root
-bash
-bash
/bin/bash ./Run035-compliant-amd-speedint.sh
python3 ./run_amd_speed_aocc320_milanx_A1.py
/bin/bash ./amd_speed_aocc320_milanx_A1.sh
runcpu --config amd_speed_aocc320_milanx_A1.cfg --tune all --reportable --iterations 3 intspeak
runcpu --configfile amd_speed_aocc320_milanx_A1.cfg --tune all --reportable --iterations 3 --nopower
--runmode speed --tune base:peak --size test:train:refspeak intspeak --nopreenv --note-preenv --logfile
$SPEC/tmp/CPU2017.173/templogs/preenv.intspeak.173.0.log --lognum 173.0 --from_runcpu 2
specperl $SPEC/bin/sysinfo
$SPEC = /home/cpu2017-1.1.9-amd-milanx-aocc320-A1

```

#### 6. /proc/cpuinfo

```

model name      : AMD EPYC 7203P 8-Core Processor
vendor_id      : AuthenticAMD
cpu family     : 25
model          : 1
stepping       : 1
microcode      : 0xa0011ce
bugs           : sysret_ss_attrs spectre_v1 spectre_v2 spec_store_bypass
TLB size      : 2560 4K pages
cpu cores     : 8
siblings      : 16
1 physical ids (chips)
16 processors (hardware threads)
physical id 0: core ids 0-7
physical id 0: apicids 0-15

```

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 2.37.4:

```

Architecture:      x86_64
CPU op-mode(s):    32-bit, 64-bit
Address sizes:     48 bits physical, 48 bits virtual
Byte Order:        Little Endian
CPU(s):            16
On-line CPU(s) list: 0-15
Vendor ID:         AuthenticAMD
Model name:        AMD EPYC 7203P 8-Core Processor
CPU family:        25
Model:             1
Thread(s) per core: 2
Core(s) per socket: 8
Socket(s):         1
Stepping:          1
Frequency boost:   enabled
CPU max MHz:       3431.6399
CPU min MHz:       1500.0000
BogoMIPS:          5589.79
Flags:              fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov pat pse36

```

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### Platform Notes (Continued)

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 movbe popcnt aes xsave avx fl6c 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 invpcid cqm rdt\_a rdseed adx smap clflushopt clwb sha\_ni xsaveopt xsavec xgetbv1 xsaves cqm\_llc cqm\_occup\_llc cqm\_mbm\_total cqm\_mbm\_local clzero irperf xsaveerptr rdpru wbnoinvd amd\_ppin brs arat npt lbrv svm\_lock nrip\_save tsc\_scale vmcb\_clean flushbyasid decodeassists pausefilter pfthreshold v\_vmsave\_vmload vgif v\_spec\_ctrl umip pku ospke vaes vpclmulqdq rdpid overflow\_recov succor smca

Virtualization:

AMD-V  
L1d cache: 256 KiB (8 instances)  
L1i cache: 256 KiB (8 instances)  
L2 cache: 4 MiB (8 instances)  
L3 cache: 64 MiB (4 instances)

NUMA node(s): 2  
NUMA node0 CPU(s): 0-3,8-11  
NUMA node1 CPU(s): 4-7,12-15  
Vulnerability Itlb multihit: Not affected  
Vulnerability L1tf: Not affected  
Vulnerability Mds: Not affected  
Vulnerability Meltdown: Not affected  
Vulnerability Mmio stale data: Not affected  
Vulnerability Retbleed: 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, PBRSE-eIBRS 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	32K	256K	8	Data	1	64	1	64
L1i	32K	256K	8	Instruction	1	64	1	64
L2	512K	4M	8	Unified	2	1024	1	64
L3	16M	64M	16	Unified	3	16384	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: 0-3,8-11  
node 0 size: 127723 MB  
node 0 free: 127142 MB  
node 1 cpus: 4-7,12-15  
node 1 size: 129003 MB  
node 1 free: 128609 MB  
node distances:  
node 0 1  
0: 10 12  
1: 12 10

9. /proc/meminfo

MemTotal: 262888016 kB

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### Platform Notes (Continued)

10. who -r  
run-level 3 Aug 23 08:40

11. Systemd service manager version: systemd 249 (249.16+suse.171.gdad0071f15)  
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 gpm grub2-once haveged haveged-switch-root 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-network-generator systemd-sysexit systemd-time-wait-sync systemd-timesyncd
indirect	wickedd

13. Linux kernel boot-time arguments, from /proc/cmdline  
BOOT\_IMAGE=/boot/vmlinuz-5.14.21-150500.53-default  
root=UUID=24d1e11b-665b-4592-9918-8c0c6c3eb850  
splash=silent  
quiet  
security=apparmor  
mitigations=auto

14. cpupower frequency-info  
analyzing CPU 0:  
current policy: frequency should be within 1.50 GHz and 2.80 GHz.  
The governor "performance" 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
vm.extfrag_threshold	500
vm.min_unmapped_ratio	1
vm.nr_hugepages	0
vm.nr_hugepages_mempolicy	0
vm.nr_overcommit_hugepages	0

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### Platform Notes (Continued)

```
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 SP5
```

```
-----
19. Disk information
SPEC is set to: /home/cpu2017-1.1.9-amd-milanx-aocc320-A1
Filesystem      Type  Size  Used Avail Use% Mounted on
/dev/sda3        xfs   893G  26G  868G   3% /
```

```
-----
20. /sys/devices/virtual/dmi/id
Vendor:         Lenovo
Product:        ThinkSystem SR655 -[7Y00000000]-
Product Family: ThinkSystem
Serial:         0123456789
```

```
-----
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:
  8x Samsung M393A4K40DB3-CWE 32 GB 2 rank 3200
```

```
-----
22. BIOS
(This section combines info from /sys/devices and dmidecode.)
BIOS Vendor:    Lenovo
BIOS Version:   CFE137D
BIOS Date:      06/28/2023
BIOS Revision:  7.10
```





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-----  
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 13.0.0 (CLANG: AOCC\_3.2.0-Build#128 2021\_11\_12) (based on LLVM Mirror.Version.13.0.0)  
Target: x86\_64-unknown-linux-gnu  
Thread model: posix  
InstalledDir: /opt/AMD/aocc-compiler-3.2.0/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 13.0.0 (CLANG: AOCC\_3.2.0-Build#128 2021\_11\_12) (based on LLVM Mirror.Version.13.0.0)  
Target: x86\_64-unknown-linux-gnu  
Thread model: posix  
InstalledDir: /opt/AMD/aocc-compiler-3.2.0/bin  
-----

-----  
Fortran | 648.exchange2\_s(base, peak)  
-----

AMD clang version 13.0.0 (CLANG: AOCC\_3.2.0-Build#128 2021\_11\_12) (based on LLVM Mirror.Version.13.0.0)  
Target: x86\_64-unknown-linux-gnu  
Thread model: posix  
InstalledDir: /opt/AMD/aocc-compiler-3.2.0/bin  
-----

### Base Compiler Invocation

C benchmarks:  
clang

C++ benchmarks:  
clang++

Fortran benchmarks:  
flang

### 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

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# SPEC CPU®2017 Integer Speed Result

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## Lenovo Global Technology

ThinkSystem SR655  
(2.80 GHz,AMD EPYC 7203P)

SPECspeed®2017\_int\_base = 10.5

SPECspeed®2017\_int\_peak = 10.6

**CPU2017 License:** 9017

**Test Sponsor:** Lenovo Global Technology

**Tested by:** Lenovo Global Technology

**Test Date:** Aug-2023

**Hardware Availability:** Oct-2023

**Software Availability:** Jun-2023

## Base Portability Flags (Continued)

641.leela\_s: -DSPEC\_LP64  
648.exchange2\_s: -DSPEC\_LP64  
657.xz\_s: -DSPEC\_LP64

## Base Optimization Flags

C benchmarks:

```
-m64 -Wl,-allow-multiple-definition -Wl,-mllvm -Wl,-enable-licm-vrp
-Wl,-mllvm -Wl,-region-vectorize -Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3 -O3 -march=znver3
-fveclib=AMDLIBM -ffast-math -fopenmp -flto -fstruct-layout=5
-mllvm -unroll-threshold=50 -mllvm -inline-threshold=1000
-freemap-arrays -mllvm -function-specialize -flv-function-specialization
-mllvm -enable-gvn-hoist -mllvm -global-vectorize-slp=true
-mllvm -enable-licm-vrp -mllvm -reduce-array-computations=3 -z muldefs
-DSPEC_OPENMP -fopenmp=libomp -lomp -lamdlibm -ljemalloc -lflang
```

C++ benchmarks:

```
-m64 -Wl,-mllvm -Wl,-region-vectorize
-Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3 -O3 -march=znver3
-fveclib=AMDLIBM -ffast-math -fopenmp -flto
-mllvm -enable-partial-unswitch -mllvm -unroll-threshold=100
-finline-aggressive -flv-function-specialization
-mllvm -loop-unswitch-threshold=200000 -mllvm -reroll-loops
-mllvm -aggressive-loop-unswitch -mllvm -extra-vectorizer-passes
-mllvm -reduce-array-computations=3 -mllvm -global-vectorize-slp=true
-mllvm -convert-pow-exp-to-int=false -z muldefs
-fvirtual-function-elimination -fvisibility=hidden -DSPEC_OPENMP
-fopenmp=libomp -lomp -lamdlibm -ljemalloc -lflang
```

Fortran benchmarks:

```
-m64 -Wl,-mllvm -Wl,-inline-recursion=4
-Wl,-mllvm -Wl,-lsr-in-nested-loop -Wl,-mllvm -Wl,-enable-iv-split
-Wl,-mllvm -Wl,-region-vectorize -Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3 -O3 -march=znver3
-fveclib=AMDLIBM -ffast-math -fopenmp -flto -z muldefs
-mllvm -unroll-aggressive -mllvm -unroll-threshold=150 -DSPEC_OPENMP
-fopenmp=libomp -lomp -lamdlibm -ljemalloc -lflang
```



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## Base Other Flags

C benchmarks:

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

C++ benchmarks:

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

Fortran benchmarks:

-Wno-return-type

## 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,-allow-multiple-definition
-Wl,-mllvm -Wl,-enable-licm-vrp
-Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3 -Ofast
-march=znver3 -fveclib=AMDLIBM -ffast-math -fopenmp
-flto -fstruct-layout=5 -mllvm -unroll-threshold=50
-fremap-arrays -flv-function-specialization
-mllvm -inline-threshold=1000 -mllvm -enable-gvn-hoist
-mllvm -global-vectorize-slp=true
-mllvm -function-specialize -mllvm -enable-licm-vrp
-mllvm -reduce-array-computations=3 -DSPEC_OPENMP
```

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## Peak Optimization Flags (Continued)

600.perlbench\_s (continued):

-fopenmp=libomp -lomp -lamdlibm -ljemalloc -lflang

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

605.mcf\_s: basepeak = yes

625.x264\_s: basepeak = yes

657.xz\_s: basepeak = yes

C++ benchmarks:

620.omnetpp\_s: -m64 -Wl,-mllvm -Wl,-function-specialize

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

-Wl,-mllvm -Wl,-reduce-array-computations=3 -Ofast

-march=znver3 -fveclib=AMDLIBM -ffast-math -fopenmp

-flto -finline-aggressive -mllvm -unroll-threshold=100

-flv-function-specialization -mllvm -enable-licm-vrp

-mllvm -reroll-loops -mllvm -aggressive-loop-unswitch

-mllvm -reduce-array-computations=3

-mllvm -global-vectorize-slp=true

-fvirtual-function-elimination -fvisibility=hidden

-DSPEC\_OPENMP -fopenmp=libomp -lomp -lamdlibm -ljemalloc

-lflang

623.xalancbmk\_s: -m64 -Wl,-mllvm -Wl,-function-specialize

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

-Wl,-mllvm -Wl,-reduce-array-computations=3

-Wl,-mllvm -Wl,-do-block-reorder=aggressive -Ofast

-march=znver3 -fveclib=AMDLIBM -ffast-math -fopenmp

-flto -finline-aggressive -mllvm -unroll-threshold=100

-flv-function-specialization -mllvm -enable-licm-vrp

-mllvm -reroll-loops -mllvm -aggressive-loop-unswitch

-mllvm -reduce-array-computations=3

-mllvm -global-vectorize-slp=true

-mllvm -do-block-reorder=aggressive

-fvirtual-function-elimination -fvisibility=hidden

-DSPEC\_OPENMP -fopenmp=libomp -lomp -lamdlibm -ljemalloc

-lflang

631.deepsjeng\_s: basepeak = yes

641.leela\_s: Same as 620.omnetpp\_s

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## Peak Optimization Flags (Continued)

Fortran benchmarks:

```
-m64 -Wl,-mllvm -Wl,-inline-recursion=4
-Wl,-mllvm -Wl,-lsr-in-nested-loop -Wl,-mllvm -Wl,-enable-iv-split
-Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3 -O3 -march=znver3
-fveclib=AMDLIBM -ffast-math -fopenmp -flto -mllvm -unroll-aggressive
-mllvm -unroll-threshold=150 -DSPEC_OPENMP -fopenmp=libomp -lomp
-lamdlIBM -ljemalloc -lflang
```

## Peak Other Flags

C benchmarks:

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

C++ benchmarks:

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

Fortran benchmarks:

```
-Wno-return-type
```

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-Genoa-T.html>

<http://www.spec.org/cpu2017/flags/aocc320-flags-A1.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-Genoa-T.xml>

<http://www.spec.org/cpu2017/flags/aocc320-flags-A1.xml>

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