



# SPEC CPU®2017 Integer Speed Result

Copyright 2017-2020 Standard Performance Evaluation Corporation

## Lenovo Global Technology

ThinkSystem SR645  
3.20 GHz, AMD EPYC 7262

SPECspeed®2017\_int\_base = 8.97

SPECspeed®2017\_int\_peak = 9.20

CPU2017 License: 9017

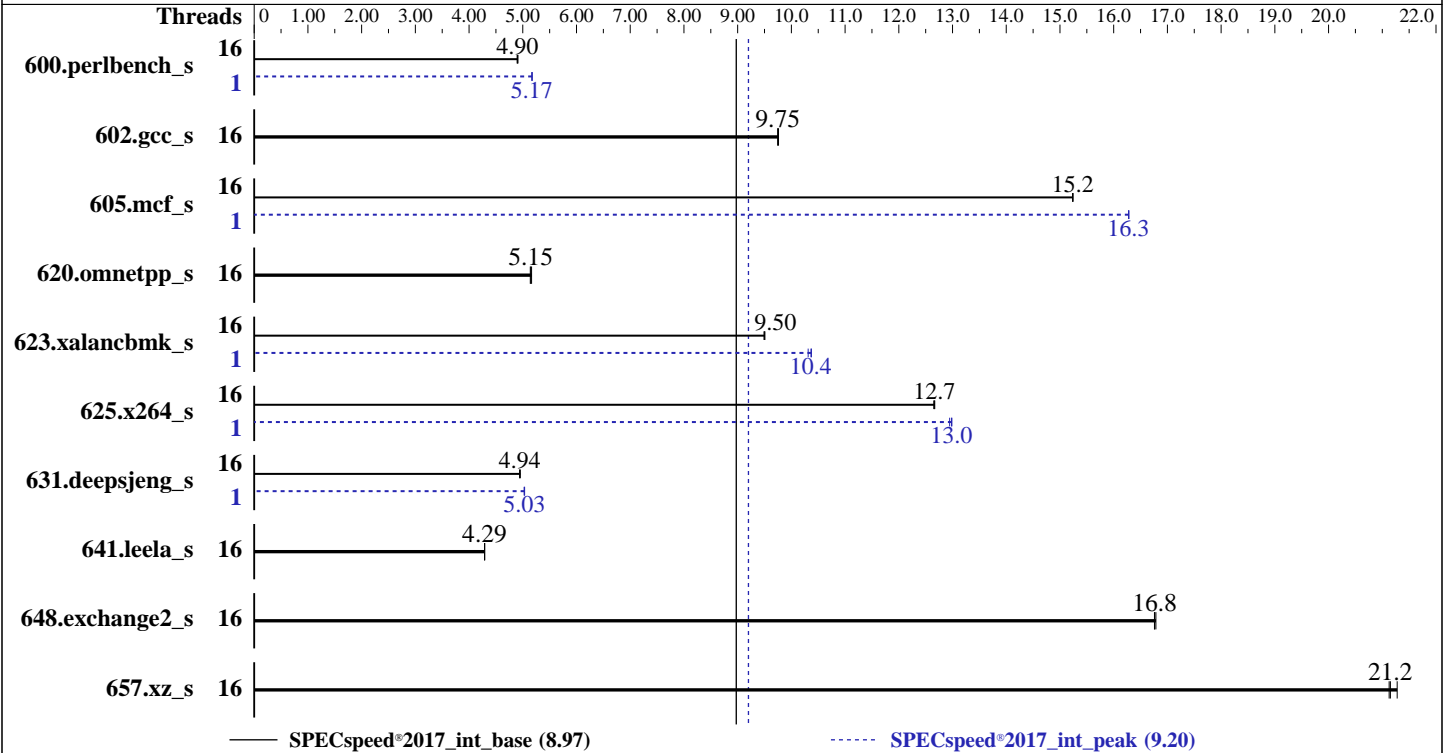
Test Sponsor: Lenovo Global Technology

Tested by: Lenovo Global Technology

Test Date: May-2020

Hardware Availability: Jun-2020

Software Availability: Nov-2019



### Hardware

CPU Name: AMD EPYC 7262  
 Max MHz: 3400  
 Nominal: 3200  
 Enabled: 16 cores, 2 chips, 2 threads/core  
 Orderable: 1,2 chips  
 Cache L1: 32 KB I + 32 KB D on chip per core  
 L2: 512 KB I+D on chip per core  
 L3: 128 MB I+D on chip per chip, 16 MB per core  
 Other: None  
 Memory: 1 TB (32 x 32 GB 2Rx8 PC4-3200AA-R)  
 Storage: 1 x 960 GB SATA SSD  
 Other: None

### Software

OS: Red Hat Enterprise Linux 8.1 (Ootpa)  
 Kernel 4.18.0-147.el8.x86\_64  
 C/C++/Fortran: Version 2.0.0 of AOCC  
 Compiler: Yes  
 Parallel: Yes  
 Firmware: Lenovo BIOS Version D8E105P 1.00 released May-2020  
 File System: xfs  
 System State: Run level 3 (multi-user)  
 Base Pointers: 64-bit  
 Peak Pointers: 32/64-bit  
 Other: jemalloc: jemalloc memory allocator library v5.1.0  
 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
600.perlbench_s	16	363	4.90	361	4.91	<b><u>362</u></b>	<b><u>4.90</u></b>	1	<b><u>343</u></b>	<b><u>5.17</u></b>	343	5.17	343	5.17
602.gcc_s	16	408	9.76	<b><u>408</u></b>	<b><u>9.75</u></b>	409	9.75	16	408	9.76	<b><u>408</u></b>	<b><u>9.75</u></b>	409	9.75
605.mcf_s	16	310	15.2	310	15.2	<b><u>310</u></b>	<b><u>15.2</u></b>	1	<b><u>290</u></b>	<b><u>16.3</u></b>	290	16.3	290	16.3
620.omnetpp_s	16	316	5.16	<b><u>317</u></b>	<b><u>5.15</u></b>	317	5.14	16	316	5.16	<b><u>317</u></b>	<b><u>5.15</u></b>	317	5.14
623.xalancbmk_s	16	149	9.49	149	9.51	<b><u>149</u></b>	<b><u>9.50</u></b>	1	<b><u>137</u></b>	<b><u>10.4</u></b>	137	10.4	137	10.3
625.x264_s	16	139	12.7	<b><u>139</u></b>	<b><u>12.7</u></b>	139	12.7	1	<b><u>136</u></b>	<b><u>13.0</u></b>	136	13.0	136	12.9
631.deepsjeng_s	16	<b><u>290</u></b>	<b><u>4.94</u></b>	290	4.94	289	4.95	1	<b><u>285</u></b>	<b><u>5.03</u></b>	285	5.03	285	5.03
641.leela_s	16	<b><u>398</u></b>	<b><u>4.29</u></b>	398	4.29	398	4.29	16	<b><u>398</u></b>	<b><u>4.29</u></b>	398	4.29	398	4.29
648.exchange2_s	16	175	16.8	<b><u>175</u></b>	<b><u>16.8</u></b>	175	16.8	16	175	16.8	<b><u>175</u></b>	<b><u>16.8</u></b>	175	16.8
657.xz_s	16	<b><u>292</u></b>	<b><u>21.2</u></b>	293	21.1	291	21.3	16	<b><u>292</u></b>	<b><u>21.2</u></b>	293	21.1	291	21.3

SPECspeed®2017\_int\_base = **8.97**

SPECspeed®2017\_int\_peak = **9.20**

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  
'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>
```

Set dirty\_ratio=8 to limit dirty cache to 8% of memory  
Set swappiness=1 to swap only if necessary  
Set zone\_reclaim\_mode=1 to free local node memory and avoid remote memory  
sync then drop\_caches=3 to reset caches before invoking runcpu

dirty\_ratio, swappiness, zone\_reclaim\_mode and drop\_caches were  
all set using privileged echo (e.g. echo 1 > /proc/sys/vm/swappiness).

Transparent huge pages set to 'always' for this run (OS default)



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## Environment Variables Notes

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

```
GOMP_CPU_AFFINITY = "0-31"
```

```
LD_LIBRARY_PATH =
```

```
"/home/cpu2017-1.1.0-amd-rome-aocc200-cl/amd_speed_aocc200_rome_C_lib/64
```

```
:/home/cpu2017-1.1.0-amd-rome-aocc200-cl/amd_speed_aocc200_rome_C_lib/32
```

```
:"
```

```
MALLOC_CONF = "retain:true"
```

```
OMP_DYNAMIC = "false"
```

```
OMP_SCHEDULE = "static"
```

```
OMP_STACKSIZE = "128M"
```

```
OMP_THREAD_LIMIT = "32"
```

Environment variables set by runcpu during the 600.perlbench\_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"
```

```
OMP_STACKSIZE = "128M"
```

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

```
GOMP_CPU_AFFINITY = "0"
```

Environment variables set by runcpu during the 631.deepsjeng\_s peak run:

```
GOMP_CPU_AFFINITY = "0"
```

## General Notes

Binaries were compiled on a system with 2x AMD EPYC 7601 CPU + 512GB Memory using Fedora 26

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.

Yes: The test sponsor attests, as of date of publication, that CVE-2018-3640 (Spectre variant 3a) is mitigated in the system as tested and documented.

Yes: The test sponsor attests, as of date of publication, that CVE-2018-3639 (Spectre variant 4) is mitigated in the system as tested and documented.

jemalloc: configured and built with GCC v9.1.0 in Ubuntu 19.04 with -O3 -znver2 -flto  
jemalloc 5.1.0 is available here:

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



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### Platform Notes

BIOS settings:

Choose Operating Mode set to Maximum Performance and then set it to Custom Mode  
NUMA nodes per socket set to NPS4

Sysinfo program /home/cpu2017-1.1.0-amd-rome-aocc200-C1/bin/sysinfo  
Rev: r6365 of 2019-08-21 295195f888a3d7edble6e46a485a0011  
running on localhost.localdomain Fri May 29 17:37:48 2020

SUT (System Under Test) info as seen by some common utilities.  
For more information on this section, see  
<https://www.spec.org/cpu2017/Docs/config.html#sysinfo>

From /proc/cpuinfo

```
model name : AMD EPYC 7262 8-Core Processor
 2 "physical id"s (chips)
 32 "processors"
cores, siblings (Caution: counting these is hw and system dependent. The following
excerpts from /proc/cpuinfo might not be reliable. Use with caution.)
cpu cores : 8
siblings : 16
physical 0: cores 0 4 8 12 16 20 24 28
physical 1: cores 0 4 8 12 16 20 24 28
```

From lscpu:

```
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 32
On-line CPU(s) list: 0-31
Thread(s) per core: 2
Core(s) per socket: 8
Socket(s): 2
NUMA node(s): 8
Vendor ID: AuthenticAMD
CPU family: 23
Model: 49
Model name: AMD EPYC 7262 8-Core Processor
Stepping: 0
CPU MHz: 1796.492
CPU max MHz: 3200.0000
CPU min MHz: 1500.0000
BogoMIPS: 6388.33
Virtualization: AMD-V
L1d cache: 32K
L1i cache: 32K
L2 cache: 512K
L3 cache: 16384K
```

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### Platform Notes (Continued)

```

NUMA node0 CPU(s): 0,1,16,17
NUMA node1 CPU(s): 2,3,18,19
NUMA node2 CPU(s): 4,5,20,21
NUMA node3 CPU(s): 6,7,22,23
NUMA node4 CPU(s): 8,9,24,25
NUMA node5 CPU(s): 10,11,26,27
NUMA node6 CPU(s): 12,13,28,29
NUMA node7 CPU(s): 14,15,30,31

```

```

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 xtopology nonstop_tsc cpuid extd_apicid aperfmperf pni
pclmulqdq monitor ssse3 fma cx16 sse4_1 sse4_2 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 hw_pstate sme ssbd mba sev ibrs ibpb stibp vmmcall fsgsbase bml avx2
smep bmi2 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
wbnoinvd arat npt lbrv svm_lock nrip_save tsc_scale vmcb_clean flushbyasid
decodeassists pausefilter pfthreshold avic v_vmsave_vmload vgif umip rdpid
overflow_recov succor smca

```

```

/proc/cpuinfo cache data
cache size : 512 KB

```

From numactl --hardware WARNING: a numactl 'node' might or might not correspond to a physical chip.

```

available: 8 nodes (0-7)
node 0 cpus: 0 1 16 17
node 0 size: 128828 MB
node 0 free: 128699 MB
node 1 cpus: 2 3 18 19
node 1 size: 129021 MB
node 1 free: 128853 MB
node 2 cpus: 4 5 20 21
node 2 size: 129021 MB
node 2 free: 128899 MB
node 3 cpus: 6 7 22 23
node 3 size: 128984 MB
node 3 free: 128843 MB
node 4 cpus: 8 9 24 25
node 4 size: 129021 MB
node 4 free: 128925 MB
node 5 cpus: 10 11 26 27
node 5 size: 129021 MB
node 5 free: 128881 MB
node 6 cpus: 12 13 28 29
node 6 size: 129021 MB

```

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### Platform Notes (Continued)

```

node 6 free: 128944 MB
node 7 cpus: 14 15 30 31
node 7 size: 129021 MB
node 7 free: 128818 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

```

```

From /proc/meminfo
MemTotal:      1056711156 kB
HugePages_Total:      0
Hugepagesize:    2048 kB

```

```

From /etc/*release* /etc/*version*
os-release:
  NAME="Red Hat Enterprise Linux"
  VERSION="8.1 (Ootpa)"
  ID="rhel"
  ID_LIKE="fedora"
  VERSION_ID="8.1"
  PLATFORM_ID="platform:el8"
  PRETTY_NAME="Red Hat Enterprise Linux 8.1 (Ootpa)"
  ANSI_COLOR="0;31"
  redhat-release: Red Hat Enterprise Linux release 8.1 (Ootpa)
  system-release: Red Hat Enterprise Linux release 8.1 (Ootpa)
  system-release-cpe: cpe:/o:redhat:enterprise_linux:8.1:ga

```

```

uname -a:
Linux localhost.localdomain 4.18.0-147.el8.x86_64 #1 SMP Thu Sep 26 15:52:44 UTC 2019
x86_64 x86_64 x86_64 GNU/Linux

```

Kernel self-reported vulnerability status:

```

CVE-2018-3620 (L1 Terminal Fault):      Not affected
Microarchitectural Data Sampling:      Not affected
CVE-2017-5754 (Meltdown):              Not affected
CVE-2018-3639 (Speculative Store Bypass): Mitigation: Speculative Store Bypass disabled
via prctl and seccomp
CVE-2017-5753 (Spectre variant 1):      Mitigation: usercopy/swaps barriers and __user
pointer sanitization

```

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### Platform Notes (Continued)

CVE-2017-5715 (Spectre variant 2): Mitigation: Full AMD retpoline, IBPB: conditional, IBRS\_FW, STIBP: conditional, RSB filling

run-level 3 May 29 17:33

SPEC is set to: /home/cpu2017-1.1.0-amd-rome-aocc200-C1  
Filesystem Type Size Used Avail Use% Mounted on  
/dev/sda2 xfs 838G 33G 806G 4% /home

From /sys/devices/virtual/dmi/id  
BIOS: Lenovo D8E105P-1.00 05/08/2020  
Vendor: Lenovo  
Product: ThinkSystem SR645 MB  
Product Family: ThinkSystem  
Serial: 1234567890

Additional information from dmidecode 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:  
32x Samsung M393A4G43AB3-CWE 32 kB 2 rank 3200

(End of data from sysinfo program)

### 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)  
=====

AOCC.LLVM.2.0.0.B191.2019\_07\_19 clang version 8.0.0 (CLANG: Jenkins AOCC\_2\_0\_0-Build#191) (based on LLVM AOCC.LLVM.2.0.0.B191.2019\_07\_19)  
Target: x86\_64-unknown-linux-gnu  
Thread model: posix  
InstalledDir: /sppo/dev/compilers/aocc-compiler-2.0.0/bin  
=====

=====  
C++ | 623.xalancbmk\_s(peak)  
=====

AOCC.LLVM.2.0.0.B191.2019\_07\_19 clang version 8.0.0 (CLANG: Jenkins AOCC\_2\_0\_0-Build#191) (based on LLVM AOCC.LLVM.2.0.0.B191.2019\_07\_19)  
Target: i386-unknown-linux-gnu  
Thread model: posix

(Continued on next page)



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### Compiler Version Notes (Continued)

InstalledDir: /sppo/dev/compilers/aocc-compiler-2.0.0/bin

=====  
C++ | 620.omnetpp\_s(base, peak) 623.xalancbmk\_s(base)  
| 631.deepsjeng\_s(base, peak) 641.leela\_s(base, peak)  
=====

-----  
AOCC.LLVM.2.0.0.B191.2019\_07\_19 clang version 8.0.0 (CLANG: Jenkins  
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Target: x86\_64-unknown-linux-gnu  
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InstalledDir: /sppo/dev/compilers/aocc-compiler-2.0.0/bin  
-----

=====  
C++ | 623.xalancbmk\_s(peak)  
=====

-----  
AOCC.LLVM.2.0.0.B191.2019\_07\_19 clang version 8.0.0 (CLANG: Jenkins  
AOCC\_2\_0\_0-Build#191) (based on LLVM AOCC.LLVM.2.0.0.B191.2019\_07\_19)  
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Thread model: posix  
InstalledDir: /sppo/dev/compilers/aocc-compiler-2.0.0/bin  
-----

=====  
C++ | 620.omnetpp\_s(base, peak) 623.xalancbmk\_s(base)  
| 631.deepsjeng\_s(base, peak) 641.leela\_s(base, peak)  
=====

-----  
AOCC.LLVM.2.0.0.B191.2019\_07\_19 clang version 8.0.0 (CLANG: Jenkins  
AOCC\_2\_0\_0-Build#191) (based on LLVM AOCC.LLVM.2.0.0.B191.2019\_07\_19)  
Target: x86\_64-unknown-linux-gnu  
Thread model: posix  
InstalledDir: /sppo/dev/compilers/aocc-compiler-2.0.0/bin  
-----

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

-----  
AOCC.LLVM.2.0.0.B191.2019\_07\_19 clang version 8.0.0 (CLANG: Jenkins  
AOCC\_2\_0\_0-Build#191) (based on LLVM AOCC.LLVM.2.0.0.B191.2019\_07\_19)  
Target: x86\_64-unknown-linux-gnu  
Thread model: posix  
InstalledDir: /sppo/dev/compilers/aocc-compiler-2.0.0/bin  
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## 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
641.leela_s: -DSPEC_LP64
648.exchange2_s: -DSPEC_LP64
657.xz_s: -DSPEC_LP64
```

## Base Optimization Flags

C benchmarks:

```
-flto -Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-region-vectorize -Wl,-mllvm -Wl,-vector-library=LIBMVEC
-Wl,-mllvm -Wl,-reduce-array-computations=3 -O3 -ffast-math
-march=znver2 -fstruct-layout=3 -mllvm -unroll-threshold=50
-freemap-arrays -mllvm -function-specialize -mllvm -enable-gvn-hoist
-mllvm -reduce-array-computations=3 -mllvm -global-vectorize-slp
-mllvm -vector-library=LIBMVEC -mllvm -inline-threshold=1000
-flv-function-specialization -z muldefs -DSPEC_OPENMP -fopenmp
-DUSE_OPENMP -fopenmp=libomp -lomp -lpthread -ldl -lmvec -lamdlibm
-ljemalloc -lflang
```

C++ benchmarks:

```
-flto -Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-region-vectorize -Wl,-mllvm -Wl,-vector-library=LIBMVEC
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-suppress-fmas -O3 -ffast-math -march=znver2
-mllvm -loop-unswitch-threshold=200000 -mllvm -vector-library=LIBMVEC
```

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## Base Optimization Flags (Continued)

C++ benchmarks (continued):

```
-mllvm -unroll-threshold=100 -flv-function-specialization
-mllvm -enable-partial-unswitch -z muldefs -DSPEC_OPENMP -fopenmp
-DUSE_OPENMP -fopenmp=libomp -lomp -lpthread -ldl -lmvec -lamdlibm
-ljemalloc -lflang
```

Fortran benchmarks:

```
-flto -Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-region-vectorize -Wl,-mllvm -Wl,-vector-library=LIBMVEC
-Wl,-mllvm -Wl,-reduce-array-computations=3 -ffast-math
-Wl,-mllvm -Wl,-inline-recursion=4 -Wl,-mllvm -Wl,-lsr-in-nested-loop
-Wl,-mllvm -Wl,-enable-iv-split -O3 -march=znver2 -funroll-loops
-Mrecursive -mllvm -vector-library=LIBMVEC -z muldefs
-mllvm -disable-indvar-simplify -mllvm -unroll-aggressive
-mllvm -unroll-threshold=150 -DSPEC_OPENMP -fopenmp -DUSE_OPENMP
-fopenmp=libomp -lomp -lpthread -ldl -lmvec -lamdlibm -ljemalloc
-lflang
```

## Base Other Flags

C benchmarks:

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

C++ benchmarks:

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

Fortran benchmarks:

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

## Peak Compiler Invocation

C benchmarks:

```
clang
```

C++ benchmarks:

```
clang++
```

Fortran benchmarks:

```
flang
```



# SPEC CPU®2017 Integer Speed Result

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## Lenovo Global Technology

ThinkSystem SR645  
3.20 GHz, AMD EPYC 7262

SPECspeed®2017\_int\_base = 8.97

SPECspeed®2017\_int\_peak = 9.20

**CPU2017 License:** 9017

**Test Sponsor:** Lenovo Global Technology

**Tested by:** Lenovo Global Technology

**Test Date:** May-2020

**Hardware Availability:** Jun-2020

**Software Availability:** Nov-2019

## Peak 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 -D_FILE_OFFSET_BITS=64
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

```

## Peak Optimization Flags

C benchmarks:

```

600.perlbench_s: -flto -Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-region-vectorize
-Wl,-mllvm -Wl,-vector-library=LIBMVEC
-Wl,-mllvm -Wl,-reduce-array-computations=3
-fprofile-instr-generate(pass 1)
-fprofile-instr-use(pass 2) -Ofast -march=znver2
-mno-sse4a -fstruct-layout=5
-mllvm -vectorize-memory-aggressively
-mllvm -function-specialize -mllvm -enable-gvn-hoist
-mllvm -unroll-threshold=50 -fremap-arrays
-mllvm -vector-library=LIBMVEC
-mllvm -reduce-array-computations=3
-mllvm -global-vectorize-slp -mllvm -inline-threshold=1000
-flv-function-specialization -DSPEC_OPENMP -fopenmp
-DUSE_OPENMP -lmvec -lamdlibm -fopenmp=libomp -lomp
-lpthread -ldl -ljemalloc -lflang

```

602.gcc\_s: basepeak = yes

```

605.mcf_s: -flto -Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-region-vectorize
-Wl,-mllvm -Wl,-vector-library=LIBMVEC
-Wl,-mllvm -Wl,-reduce-array-computations=3 -Ofast
-march=znver2 -mno-sse4a -fstruct-layout=5
-mllvm -vectorize-memory-aggressively
-mllvm -function-specialize -mllvm -enable-gvn-hoist
-mllvm -unroll-threshold=50 -fremap-arrays
-mllvm -vector-library=LIBMVEC
-mllvm -reduce-array-computations=3

```

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## Peak Optimization Flags (Continued)

605.mcf\_s (continued):

```
-mllvm -global-vectorize-slp -mllvm -inline-threshold=1000  
-flv-function-specialization -DSPEC_OPENMP -fopenmp  
-DUSE_OPENMP -lmvec -lamdlibm -fopenmp=libomp -lomp  
-lpthread -ldl -ljemalloc -lflang
```

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

657.xz\_s: basepeak = yes

C++ benchmarks:

620.omnetpp\_s: basepeak = yes

```
623.xalancbmk_s: -m32 -flto -Wl,-mllvm -Wl,-function-specialize  
-Wl,-mllvm -Wl,-region-vectorize  
-Wl,-mllvm -Wl,-vector-library=LIBMVEC  
-Wl,-mllvm -Wl,-reduce-array-computations=3 -Ofast  
-march=znver2 -flv-function-specialization  
-mllvm -unroll-threshold=100  
-mllvm -enable-partial-unswitch  
-mllvm -loop-unswitch-threshold=200000  
-mllvm -vector-library=LIBMVEC  
-mllvm -inline-threshold=1000 -DSPEC_OPENMP -fopenmp  
-DUSE_OPENMP -fopenmp=libomp -lomp -lpthread -ldl  
-ljemalloc
```

```
631.deepsjeng_s: -flto -Wl,-mllvm -Wl,-function-specialize  
-Wl,-mllvm -Wl,-region-vectorize  
-Wl,-mllvm -Wl,-vector-library=LIBMVEC  
-Wl,-mllvm -Wl,-reduce-array-computations=3 -Ofast  
-march=znver2 -flv-function-specialization  
-mllvm -unroll-threshold=100  
-mllvm -enable-partial-unswitch  
-mllvm -loop-unswitch-threshold=200000  
-mllvm -vector-library=LIBMVEC  
-mllvm -inline-threshold=1000 -DSPEC_OPENMP -fopenmp  
-DUSE_OPENMP -fopenmp=libomp -lomp -lpthread -ldl  
-lmvec -lamdlibm -ljemalloc -lflang
```

641.leela\_s: basepeak = yes

Fortran benchmarks:

648.exchange2\_s: basepeak = yes



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**Hardware Availability:** Jun-2020

**Software Availability:** Nov-2019

## Peak Other Flags

C benchmarks:

-Wno-return-type

C++ benchmarks (except as noted below):

-Wno-return-type

623.xalancbmk\_s: -Wno-return-type

-L/sppo/dev/cpu2017/v110/amd\_speed\_aocc200\_rome\_C\_lib/32

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/aocc200-flags-B1-1.html>

<http://www.spec.org/cpu2017/flags/Lenovo-Platform-SPECcpu2017-Flags-V1.2-Rome2P-K.html>

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

<http://www.spec.org/cpu2017/flags/aocc200-flags-B1-1.xml>

<http://www.spec.org/cpu2017/flags/Lenovo-Platform-SPECcpu2017-Flags-V1.2-Rome2P-K.xml>

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