



# SPEC CPU®2017 Integer Rate Result

Copyright 2017-2021 Standard Performance Evaluation Corporation

## Fujitsu

(Test Sponsor: Fujitsu)

PRIMERGY RX2450 M1, AMD EPYC 7302,  
3.00 GHz

SPECrate®2017\_int\_base = 244

SPECrate®2017\_int\_peak = Not Run

CPU2017 License: 19

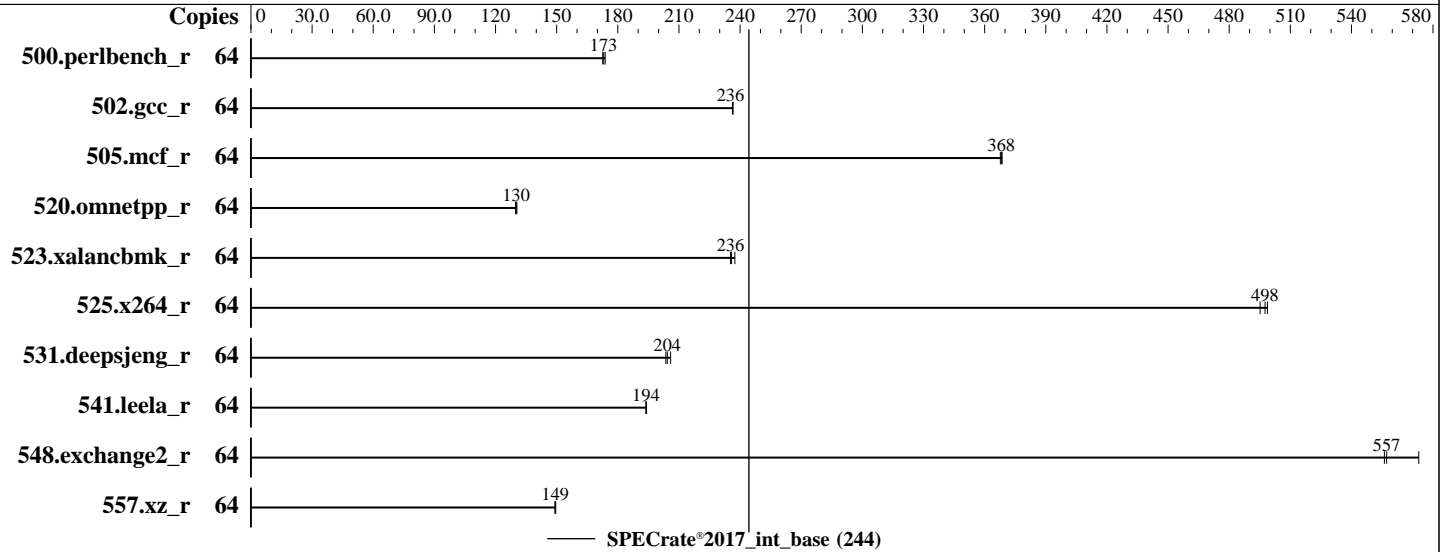
Test Sponsor: Fujitsu

Tested by: Fujitsu

Test Date: Mar-2021

Hardware Availability: Apr-2021

Software Availability: Jul-2020



### Hardware

CPU Name: AMD EPYC 7302  
 Max MHz: 3300  
 Nominal: 3000  
 Enabled: 32 cores, 2 chips, 2 threads/core  
 Orderable: 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 shared / 2 cores  
 Other: None  
 Memory: 2 TB (32 x 64 GB 4Rx4 PC4-3200V-L)  
 Storage: 1 x PCIe SSD, 2TB  
 Other: None

### Software

OS: SUSE Linux Enterprise Server 15 SP2 (x86\_64)  
 kernel version 5.3.18-22-default  
 Compiler: C/C++/Fortran: Version 2.0.0 of AOCC  
 Parallel: No  
 Firmware: Fujitsu BIOS Version 1.2.V1 Released Apr-2021 tested as Dec-2020  
 File System: xfs  
 System State: Run level 3 (multi-user)  
 Base Pointers: 64-bit  
 Peak Pointers: Not Applicable  
 Other: jemalloc: jemalloc memory allocator library v5.2.0  
 Power Management: BIOS set to prefer performance at the cost of additional power usage



# SPEC CPU®2017 Integer Rate Result

Copyright 2017-2021 Standard Performance Evaluation Corporation

**Fujitsu**

(Test Sponsor: Fujitsu)

PRIMERGY RX2450 M1, AMD EPYC 7302,  
3.00 GHz

SPECrate®2017\_int\_base = 244

SPECrate®2017\_int\_peak = Not Run

CPU2017 License: 19

Test Sponsor: Fujitsu

Tested by: Fujitsu

Test Date: Mar-2021

Hardware Availability: Apr-2021

Software Availability: Jul-2020

## Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
500.perlbench_r	64	590	173	586	174	<b>589</b>	<b>173</b>							
502.gcc_r	64	384	236	<b>383</b>	<b>236</b>	383	237							
505.mcf_r	64	281	368	<b>281</b>	<b>368</b>	281	369							
520.omnetpp_r	64	647	130	<b>645</b>	<b>130</b>	643	130							
523.xalancbmk_r	64	287	235	285	237	<b>287</b>	<b>236</b>							
525.x264_r	64	226	495	225	499	<b>225</b>	<b>498</b>							
531.deepsjeng_r	64	<b>359</b>	<b>204</b>	356	206	360	204							
541.leela_r	64	547	194	<b>547</b>	<b>194</b>	546	194							
548.exchange2_r	64	293	573	301	556	<b>301</b>	<b>557</b>							
557.xz_r	64	462	150	<b>463</b>	<b>149</b>	463	149							

SPECrate®2017\_int\_base = 244

SPECrate®2017\_int\_peak = Not Run

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).

(Continued on next page)



# SPEC CPU®2017 Integer Rate Result

Copyright 2017-2021 Standard Performance Evaluation Corporation

**Fujitsu**

(Test Sponsor: Fujitsu)

PRIMERGY RX2450 M1, AMD EPYC 7302,  
3.00 GHz

SPECrate®2017\_int\_base = 244

SPECrate®2017\_int\_peak = Not Run

**CPU2017 License:** 19

**Test Sponsor:** Fujitsu

**Tested by:** Fujitsu

**Test Date:** Mar-2021

**Hardware Availability:** Apr-2021

**Software Availability:** Jul-2020

## Operating System Notes (Continued)

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

## Environment Variables Notes

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

LD\_LIBRARY\_PATH =

"/home/Benchmark/speccpu/amd\_rate\_aocc200\_rome\_C\_lib/64:/home/Benchmark/  
speccpu/amd\_rate\_aocc200\_rome\_C\_lib/32:"

MALLOC\_CONF = "retain:true"

## 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.

jemalloc: configured and built with GCC v9.1.0 in Ubuntu 19.04 with -O3 -znver2 -flt0  
jemalloc 5.2.0 is available here:

<https://github.com/jemalloc/jemalloc/releases/download/5.2.0/jemalloc-5.2.0.tar.bz2>

## Platform Notes

BIOS configuration:

cTDP = 180

Determinism Slider = Power

Package Power Limit = 180

SVM Mode = Disabled

NUMA Nodes Per Socket = NPS4

L1 Stream HW Prefetcher = Enabled

L2 Stream HW Prefetcher = Enabled

DRAM Scrub Time = Disabled

Sysinfo program /home/Benchmark/speccpu/bin/sysinfo

Rev: r6538 of 2020-09-24 e8664e66d2d7080afeaa89d4b38e2f1c

running on localhost Wed Dec 23 08:45:18 2020

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

For more information on this section, see

(Continued on next page)



# SPEC CPU®2017 Integer Rate Result

Copyright 2017-2021 Standard Performance Evaluation Corporation

**Fujitsu**

(Test Sponsor: Fujitsu)

PRIMERGY RX2450 M1, AMD EPYC 7302,  
3.00 GHz

SPECrate®2017\_int\_base = 244

SPECrate®2017\_int\_peak = Not Run

**CPU2017 License:** 19

**Test Sponsor:** Fujitsu

**Tested by:** Fujitsu

**Test Date:** Mar-2021

**Hardware Availability:** Apr-2021

**Software Availability:** Jul-2020

## Platform Notes (Continued)

<https://www.spec.org/cpu2017/Docs/config.html#sysinfo>

From /proc/cpuinfo

model name : AMD EPYC 7302 16-Core Processor

2 "physical id"s (chips)

64 "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 : 16

siblings : 32

physical 0: cores 0 1 4 5 8 9 12 13 16 17 20 21 24 25 28 29

physical 1: cores 0 1 4 5 8 9 12 13 16 17 20 21 24 25 28 29

From lscpu:

Architecture: x86\_64

CPU op-mode(s): 32-bit, 64-bit

Byte Order: Little Endian

Address sizes: 43 bits physical, 48 bits virtual

CPU(s): 64

On-line CPU(s) list: 0-63

Thread(s) per core: 2

Core(s) per socket: 16

Socket(s): 2

NUMA node(s): 8

Vendor ID: AuthenticAMD

CPU family: 23

Model: 49

Model name: AMD EPYC 7302 16-Core Processor

Stepping: 0

CPU MHz: 2413.082

CPU max MHz: 3000.0000

CPU min MHz: 1500.0000

BogoMIPS: 6000.09

Virtualization: AMD-V

L1d cache: 32K

L1i cache: 32K

L2 cache: 512K

L3 cache: 16384K

NUMA node0 CPU(s): 0-3,32-35

NUMA node1 CPU(s): 4-7,36-39

NUMA node2 CPU(s): 8-11,40-43

NUMA node3 CPU(s): 12-15,44-47

NUMA node4 CPU(s): 16-19,48-51

NUMA node5 CPU(s): 20-23,52-55

NUMA node6 CPU(s): 24-27,56-59

NUMA node7 CPU(s): 28-31,60-63

Flags: fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov

(Continued on next page)



# SPEC CPU®2017 Integer Rate Result

Copyright 2017-2021 Standard Performance Evaluation Corporation

**Fujitsu**

(Test Sponsor: Fujitsu)

PRIMERGY RX2450 M1, AMD EPYC 7302,  
3.00 GHz

SPECrate®2017\_int\_base = 244

SPECrate®2017\_int\_peak = Not Run

**CPU2017 License:** 19

**Test Sponsor:** Fujitsu

**Tested by:** Fujitsu

**Test Date:** Mar-2021

**Hardware Availability:** Apr-2021

**Software Availability:** Jul-2020

## Platform Notes (Continued)

```

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 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 bpxt perfctr_llc mwaitx cpb cat_l3
cdp_l3 hw_pstate sme ssbd mba sev ibrs ibpb stibp vmmcall fsgsbase bmi1 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 2 3 32 33 34 35
node 0 size: 257776 MB
node 0 free: 257366 MB
node 1 cpus: 4 5 6 7 36 37 38 39
node 1 size: 258010 MB
node 1 free: 257773 MB
node 2 cpus: 8 9 10 11 40 41 42 43
node 2 size: 258044 MB
node 2 free: 257809 MB
node 3 cpus: 12 13 14 15 44 45 46 47
node 3 size: 258032 MB
node 3 free: 257806 MB
node 4 cpus: 16 17 18 19 48 49 50 51
node 4 size: 258044 MB
node 4 free: 257819 MB
node 5 cpus: 20 21 22 23 52 53 54 55
node 5 size: 258044 MB
node 5 free: 257816 MB
node 6 cpus: 24 25 26 27 56 57 58 59
node 6 size: 258044 MB
node 6 free: 257776 MB
node 7 cpus: 28 29 30 31 60 61 62 63
node 7 size: 257804 MB
node 7 free: 257587 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

```

(Continued on next page)



# SPEC CPU®2017 Integer Rate Result

Copyright 2017-2021 Standard Performance Evaluation Corporation

## Fujitsu

(Test Sponsor: Fujitsu)

PRIMERGY RX2450 M1, AMD EPYC 7302,  
3.00 GHz

SPECrate®2017\_int\_base = 244

SPECrate®2017\_int\_peak = Not Run

CPU2017 License: 19

Test Sponsor: Fujitsu

Tested by: Fujitsu

Test Date: Mar-2021

Hardware Availability: Apr-2021

Software Availability: Jul-2020

## Platform Notes (Continued)

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:      2113334328 kB
HugePages_Total:      0
Hugepagesize:    2048 kB
```

/sys/devices/system/cpu/cpu\*/cpufreq/scaling\_governor has performance

From /etc/\*release\* /etc/\*version\*

```
os-release:
NAME="SLES"
VERSION="15-SP2"
VERSION_ID="15.2"
PRETTY_NAME="SUSE Linux Enterprise Server 15 SP2"
ID="sles"
ID_LIKE="suse"
ANSI_COLOR="0;32"
CPE_NAME="cpe:/o:suse:sles:15:sp2"
```

uname -a:

```
Linux localhost 5.3.18-22-default #1 SMP Wed Jun 3 12:16:43 UTC 2020
(720aeba/lp-1a956f1) x86_64 x86_64 x86_64 GNU/Linux
```

Kernel self-reported vulnerability status:

CVE-2018-12207 (iTLB Multihit):	Not affected
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
CVE-2017-5715 (Spectre variant 2):	Mitigation: Full AMD retpoline, IBPB: conditional, IBRS_FW, STIBP: conditional, RSB filling
CVE-2020-0543 (Special Register Buffer Data Sampling):	Not affected
CVE-2019-11135 (TSX Asynchronous Abort):	Not affected

(Continued on next page)



# SPEC CPU®2017 Integer Rate Result

Copyright 2017-2021 Standard Performance Evaluation Corporation

**Fujitsu**

(Test Sponsor: Fujitsu)

PRIMERGY RX2450 M1, AMD EPYC 7302,  
3.00 GHz

SPECrate®2017\_int\_base = 244

SPECrate®2017\_int\_peak = Not Run

**CPU2017 License:** 19

**Test Sponsor:** Fujitsu

**Tested by:** Fujitsu

**Test Date:** Mar-2021

**Hardware Availability:** Apr-2021

**Software Availability:** Jul-2020

## Platform Notes (Continued)

run-level 3 Dec 23 02:52

SPEC is set to: /home/Benchmark/speccpu

Filesystem	Type	Size	Used	Avail	Use%	Mounted on
/dev/nvme1nlp3	xfss	1.3T	16G	1.3T	2%	/home

From /sys/devices/virtual/dmi/id

Vendor:	FUJITSU
Product:	PRIMERGY RX2450 M1
Serial:	MACUxxxxxxx

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 M386A8K40DM2-CWE 64 GB 4 rank 3200

BIOS:

BIOS Vendor:	American Megatrends Inc.
BIOS Version:	1.2.V1
BIOS Date:	12/22/2020
BIOS Revision:	5.14

(End of data from sysinfo program)

## Compiler Version Notes

```

=====
C          | 500.perlbench_r(base) 502.gcc_r(base) 505.mcf_r(base)
          | 525.x264_r(base) 557.xz_r(base)
=====

```

```

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++       | 520.omnetpp_r(base) 523.xalancbmk_r(base) 531.deepsjeng_r(base)
          | 541.leela_r(base)
=====

```

```

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

```

(Continued on next page)



# SPEC CPU®2017 Integer Rate Result

Copyright 2017-2021 Standard Performance Evaluation Corporation

**Fujitsu**

(Test Sponsor: Fujitsu)

PRIMERGY RX2450 M1, AMD EPYC 7302,  
3.00 GHz

SPECrate®2017\_int\_base = 244

SPECrate®2017\_int\_peak = Not Run

**CPU2017 License:** 19

**Test Sponsor:** Fujitsu

**Tested by:** Fujitsu

**Test Date:** Mar-2021

**Hardware Availability:** Apr-2021

**Software Availability:** Jul-2020

## Compiler Version Notes (Continued)

Thread model: posix

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

-----  
Fortran | 548.exchange2\_r(base)

-----  
AOCCLLVM.2.0.0.B191.2019\_07\_19 clang version 8.0.0 (CLANG: Jenkins  
AOCCLLVM.2.0.0.B191.2019\_07\_19) (based on LLVM AOCCLLVM.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

## Base Compiler Invocation

C benchmarks:

clang

C++ benchmarks:

clang++

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





# SPEC CPU®2017 Integer Rate Result

Copyright 2017-2021 Standard Performance Evaluation Corporation

**Fujitsu**

(Test Sponsor: Fujitsu)

PRIMERGY RX2450 M1, AMD EPYC 7302,  
3.00 GHz

SPECrate®2017\_int\_base = 244

SPECrate®2017\_int\_peak = Not Run

**CPU2017 License:** 19

**Test Sponsor:** Fujitsu

**Tested by:** Fujitsu

**Test Date:** Mar-2021

**Hardware Availability:** Apr-2021

**Software Availability:** Jul-2020

## 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  
-fremap-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 -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  
-mllvm -unroll-threshold=100 -flv-function-specialization  
-mllvm -enable-partial-unswitch -z muldefs -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 -lmvec -lamdlibm -ljemalloc -lflang
```

The flags files that were used to format this result can be browsed at

<http://www.spec.org/cpu2017/flags/aocc200-flags-C4.html>

<http://www.spec.org/cpu2017/flags/Fujitsu-Platform-Settings-V1.0-ROME-RevE.html>

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

<http://www.spec.org/cpu2017/flags/aocc200-flags-C4.xml>

<http://www.spec.org/cpu2017/flags/Fujitsu-Platform-Settings-V1.0-ROME-RevE.xml>

SPEC CPU and SPECrate are registered trademarks of the Standard Performance Evaluation Corporation. All other brand and product names appearing in this result are trademarks or registered trademarks of their respective holders.

For questions about this result, please contact the tester. For other inquiries, please contact [info@spec.org](mailto:info@spec.org).

Tested with SPEC CPU®2017 v1.1.5 on 2020-12-22 18:45:17-0500.

Report generated on 2021-04-27 16:20:19 by CPU2017 PDF formatter v6442.

Originally published on 2021-04-27.