



# SPEC CPU®2017 Integer Rate Result

Copyright 2017-2020 Standard Performance Evaluation Corporation

## Dell Inc.

SPECrate®2017\_int\_base = 343

PowerEdge R6515 (AMD EPYC 7742, 2.25 GHz)

SPECrate®2017\_int\_peak = 370

CPU2017 License: 55

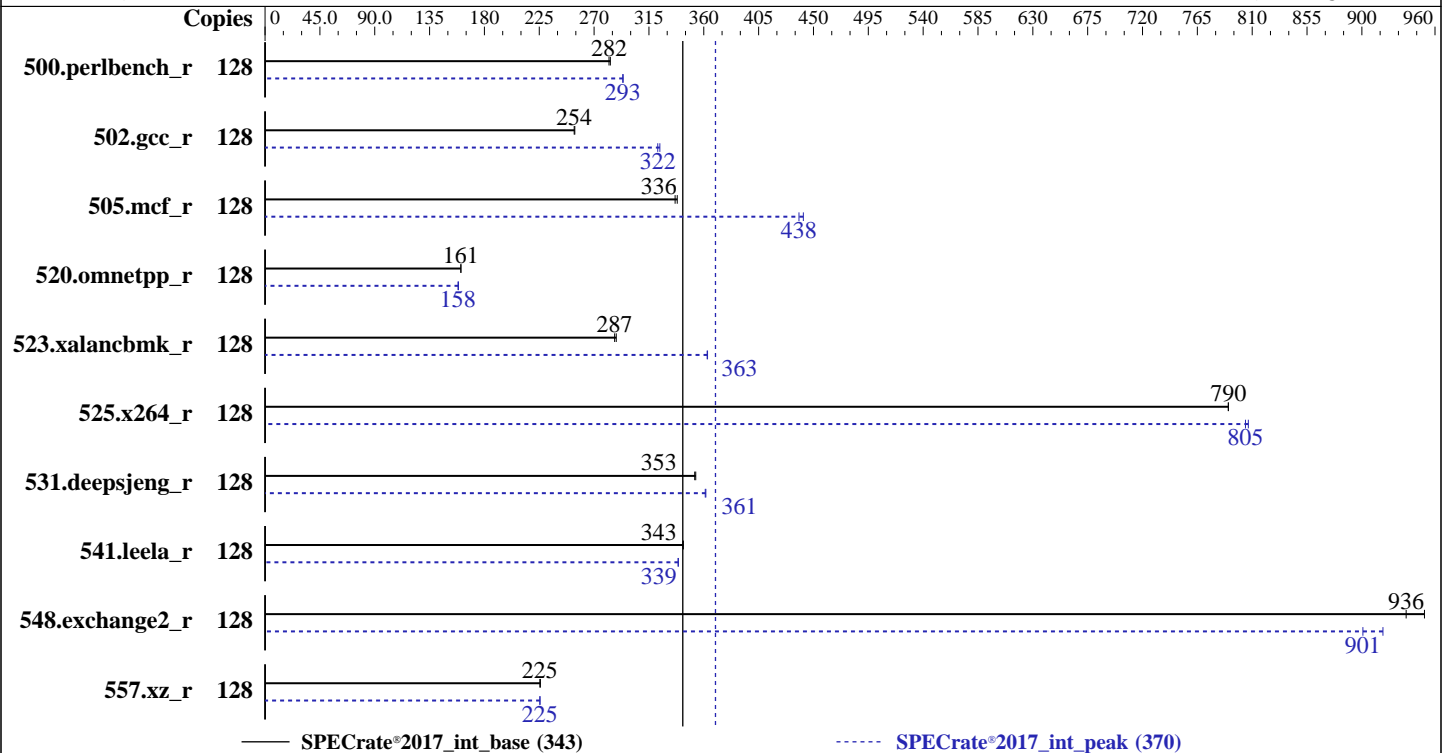
Test Date: May-2020

Test Sponsor: Dell Inc.

Hardware Availability: Oct-2019

Tested by: Dell Inc.

Software Availability: Aug-2019



### Hardware

CPU Name: AMD EPYC 7742  
 Max MHz: 3400  
 Nominal: 2250  
 Enabled: 64 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: 256 MB I+D on chip per chip, 16 MB shared / 4 cores  
 Other: None  
 Memory: 512 GB (8 x 64 GB 4Rx4 PC4-3200V-L)  
 Storage: 1 x 1.6 TB SAS SSD  
 Other: None

### Software

OS: SUSE Linux Enterprise Server 15 SP1  
 kernel 4.12.14-195-default  
 Compiler: C/C++/Fortran: Version 2.0.0 of AOCC  
 Parallel: No  
 Firmware: Version 1.4.8 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 v5.2.0  
 Power Management: BIOS set to prefer performance at the cost of additional power usage.



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## Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
500.perlbench_r	128	719	283	<b><u>722</u></b>	<b><u>282</u></b>			128	693	294	<b><u>694</u></b>	<b><u>293</u></b>		
502.gcc_r	128	<b><u>715</u></b>	<b><u>254</u></b>	713	254			128	<b><u>562</u></b>	<b><u>322</u></b>	559	324		
505.mcf_r	128	612	338	<b><u>615</u></b>	<b><u>336</u></b>			128	<b><u>472</u></b>	<b><u>438</u></b>	468	442		
520.omnetpp_r	128	<b><u>1046</u></b>	<b><u>161</u></b>	1044	161			128	1058	159	<b><u>1061</u></b>	<b><u>158</u></b>		
523.xalancbmk_r	128	469	288	<b><u>471</u></b>	<b><u>287</u></b>			128	<b><u>373</u></b>	<b><u>363</u></b>	372	363		
525.x264_r	128	<b><u>284</u></b>	<b><u>790</u></b>	284	790			128	<b><u>279</u></b>	<b><u>805</u></b>	278	807		
531.deepsjeng_r	128	<b><u>416</u></b>	<b><u>353</u></b>	415	353			128	<b><u>406</u></b>	<b><u>361</u></b>	406	362		
541.leela_r	128	618	343	<b><u>618</u></b>	<b><u>343</u></b>			128	625	339	<b><u>626</u></b>	<b><u>339</u></b>		
548.exchange2_r	128	353	951	<b><u>358</u></b>	<b><u>936</u></b>			128	<b><u>372</u></b>	<b><u>901</u></b>	366	917		
557.xz_r	128	612	226	<b><u>613</u></b>	<b><u>225</u></b>			128	613	226	<b><u>613</u></b>	<b><u>225</u></b>		

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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  
'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).

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## 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/cpu2017-1.1.0/amd_rate_aocc200_rome_C_lib/64:/home/cpu2017-1.1.0/  
    amd_rate_aocc200_rome_C_lib/32:"  
MALLOCONF = "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 -flto  
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 settings:

```
NUMA Nodes Per Socket set to 4  
CCX as NUMA Enabled  
System Profile set to Custom  
Memory Patrol Scrub Disabled  
Memory Refresh Rate set to 1x  
PCI ASPM L1 Link Power Management Disabled  
Memory Interleaving Disabled  
L1 Stream HW Prefetcher Disabled  
L2 Stream HW Prefetcher Disabled
```

```
Sysinfo program /home/cpu2017-1.1.0/bin/sysinfo  
Rev: r6365 of 2019-08-21 295195f888a3d7edble6e46a485a0011  
running on linux-g3ob Fri May 29 11:10:09 2020
```

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

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## Platform Notes (Continued)

For more information on this section, see <https://www.spec.org/cpu2017/Docs/config.html#sysinfo>

From /proc/cpuinfo

model name : AMD EPYC 7742 64-Core Processor

1 "physical id"s (chips)

128 "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 : 64

siblings : 128

physical 0: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24  
25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52  
53 54 55 56 57 58 59 60 61 62 63

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): 128  
On-line CPU(s) list: 0-127  
Thread(s) per core: 2  
Core(s) per socket: 64  
Socket(s): 1  
NUMA node(s): 16  
Vendor ID: AuthenticAMD  
CPU family: 23  
Model: 49  
Model name: AMD EPYC 7742 64-Core Processor  
Stepping: 0  
CPU MHz: 2245.868  
BogoMIPS: 4491.73  
Virtualization: AMD-V  
L1d cache: 32K  
L1i cache: 32K  
L2 cache: 512K  
L3 cache: 16384K  
NUMA node0 CPU(s): 0-3,64-67  
NUMA node1 CPU(s): 4-7,68-71  
NUMA node2 CPU(s): 8-11,72-75  
NUMA node3 CPU(s): 12-15,76-79  
NUMA node4 CPU(s): 16-19,80-83  
NUMA node5 CPU(s): 20-23,84-87  
NUMA node6 CPU(s): 24-27,88-91  
NUMA node7 CPU(s): 28-31,92-95  
NUMA node8 CPU(s): 32-35,96-99

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## Platform Notes (Continued)

NUMA node9 CPU(s): 36-39,100-103  
 NUMA node10 CPU(s): 40-43,104-107  
 NUMA node11 CPU(s): 44-47,108-111  
 NUMA node12 CPU(s): 48-51,112-115  
 NUMA node13 CPU(s): 52-55,116-119  
 NUMA node14 CPU(s): 56-59,120-123  
 NUMA node15 CPU(s): 60-63,124-127

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 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\_l2 mwaitx cpb cat\_l3 cdp\_l3 hw\_pstate sme ssbd 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 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: 16 nodes (0-15)
node 0 cpus: 0 1 2 3 64 65 66 67
node 0 size: 31804 MB
node 0 free: 31672 MB
node 1 cpus: 4 5 6 7 68 69 70 71
node 1 size: 32254 MB
node 1 free: 32171 MB
node 2 cpus: 8 9 10 11 72 73 74 75
node 2 size: 32254 MB
node 2 free: 32143 MB
node 3 cpus: 12 13 14 15 76 77 78 79
node 3 size: 32253 MB
node 3 free: 32131 MB
node 4 cpus: 16 17 18 19 80 81 82 83
node 4 size: 32254 MB
node 4 free: 32174 MB
node 5 cpus: 20 21 22 23 84 85 86 87
node 5 size: 32224 MB
node 5 free: 32151 MB
node 6 cpus: 24 25 26 27 88 89 90 91
node 6 size: 32254 MB
node 6 free: 32179 MB
```

(Continued on next page)



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## Platform Notes (Continued)

```

node 7 cpus: 28 29 30 31 92 93 94 95
node 7 size: 32253 MB
node 7 free: 32177 MB
node 8 cpus: 32 33 34 35 96 97 98 99
node 8 size: 32254 MB
node 8 free: 32174 MB
node 9 cpus: 36 37 38 39 100 101 102 103
node 9 size: 32254 MB
node 9 free: 32183 MB
node 10 cpus: 40 41 42 43 104 105 106 107
node 10 size: 32254 MB
node 10 free: 32143 MB
node 11 cpus: 44 45 46 47 108 109 110 111
node 11 size: 32253 MB
node 11 free: 32160 MB
node 12 cpus: 48 49 50 51 112 113 114 115
node 12 size: 32254 MB
node 12 free: 32159 MB
node 13 cpus: 52 53 54 55 116 117 118 119
node 13 size: 32254 MB
node 13 free: 32181 MB
node 14 cpus: 56 57 58 59 120 121 122 123
node 14 size: 32254 MB
node 14 free: 32178 MB
node 15 cpus: 60 61 62 63 124 125 126 127
node 15 size: 32239 MB
node 15 free: 32163 MB
node distances:
node  0  1  2  3  4  5  6  7  8  9 10 11 12 13 14 15
 0: 10 11 11 11 12 12 12 12 12 12 12 12 12 12 12 12
 1: 11 10 11 11 12 12 12 12 12 12 12 12 12 12 12 12
 2: 11 11 10 11 12 12 12 12 12 12 12 12 12 12 12 12
 3: 11 11 11 10 12 12 12 12 12 12 12 12 12 12 12 12
 4: 12 12 12 12 10 11 11 11 12 12 12 12 12 12 12 12
 5: 12 12 12 12 11 10 11 11 12 12 12 12 12 12 12 12
 6: 12 12 12 12 11 11 10 11 12 12 12 12 12 12 12 12
 7: 12 12 12 12 11 11 11 10 12 12 12 12 12 12 12 12
 8: 12 12 12 12 12 12 12 12 10 11 11 11 12 12 12 12
 9: 12 12 12 12 12 12 12 12 11 10 11 11 12 12 12 12
10: 12 12 12 12 12 12 12 12 11 11 10 11 12 12 12 12
11: 12 12 12 12 12 12 12 12 11 11 11 10 12 12 12 12
12: 12 12 12 12 12 12 12 12 12 12 12 12 10 11 11 11
13: 12 12 12 12 12 12 12 12 12 12 12 12 11 10 11 11
14: 12 12 12 12 12 12 12 12 12 12 12 12 11 11 10 11
15: 12 12 12 12 12 12 12 12 12 12 12 12 11 11 11 10

```

From /proc/meminfo

(Continued on next page)



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## Platform Notes (Continued)

MemTotal: 527946224 kB  
HugePages\_Total: 0  
Hugepagesize: 2048 kB

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

```
os-release:
NAME="SLES"
VERSION="15-SP1"
VERSION_ID="15.1"
PRETTY_NAME="SUSE Linux Enterprise Server 15 SP1"
ID="sles"
ID_LIKE="suse"
ANSI_COLOR="0;32"
CPE_NAME="cpe:/o:suse:sles:15:sp1"
```

uname -a:

```
Linux linux-g3ob 4.12.14-195-default #1 SMP Tue May 7 10:55:11 UTC 2019 (8fba516)
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: __user pointer sanitization
CVE-2017-5715 (Spectre variant 2): Mitigation: Full AMD retpoline, IBPB:
conditional, IBRS_FW, STIBP: conditional, RSB
filling
```

run-level 3 May 29 11:00

SPEC is set to: /home/cpu2017-1.1.0

```
Filesystem Type Size Used Avail Use% Mounted on
/dev/sda2 xfs 440G 72G 369G 17% /
```

From /sys/devices/virtual/dmi/id

```
BIOS: Dell Inc. 1.4.8 05/06/2020
Vendor: Dell Inc.
Product: PowerEdge R6515
Product Family: PowerEdge
Serial: HTDRG13
```

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

(Continued on next page)



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## Platform Notes (Continued)

frequent changes to hardware, firmware, and the "DMTF SMBIOS" standard.

Memory:

2x 802C80B3802C 36ASF8G72PZ-3G2B2 64 GB 2 rank 3200

6x 802C8632802C 36ASF8G72PZ-3G2B2 64 GB 2 rank 3200

8x Not Specified Not Specified

(End of data from sysinfo program)

## Compiler Version Notes

=====  
C | 502.gcc\_r(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  
InstalledDir: /sppo/dev/compilers/aocc-compiler-2.0.0/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)

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 | 502.gcc\_r(peak)  
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AOCC.LLVM.2.0.0.B191.2019\_07\_19 clang version 8.0.0 (CLANG: Jenkins

(Continued on next page)





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## Compiler Version Notes (Continued)

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++ | 523.xalancbmk\_r(peak)

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 Target: i386-unknown-linux-gnu  
 Thread model: posix  
 InstalledDir: /sppo/dev/compilers/aocc-compiler-2.0.0/bin

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

AOCC.LLVM.2.0.0.B191.2019\_07\_19 clang version 8.0.0 (CLANG: Jenkins  
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=====  
 C++ | 523.xalancbmk\_r(peak)

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

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## Compiler Version Notes (Continued)

=====  
Fortran | 548.exchange2\_r(base, peak)  
=====

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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  
=====

## Base Compiler Invocation

C benchmarks:

clang

C++ benchmarks:

clang++

Fortran benchmarks:

flang

## Base Portability Flags

500.perlbenc\_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:

-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

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Test Sponsor: Dell Inc.

Hardware Availability: Oct-2019

Tested by: Dell Inc.

Software Availability: Aug-2019

## Base Optimization Flags (Continued)

C benchmarks (continued):

```
-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 -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
```

## Peak Compiler Invocation

C benchmarks:

clang

C++ benchmarks:

clang++

Fortran benchmarks:

flang



# SPEC CPU®2017 Integer Rate Result

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SPECrate®2017\_int\_base = 343

PowerEdge R6515 (AMD EPYC 7742, 2.25 GHz)

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## Peak Portability Flags

```
500.perlbench_r: -DSPEC_LINUX_X64 -DSPEC_LP64
502.gcc_r: -D_FILE_OFFSET_BITS=64
505.mcf_r: -DSPEC_LP64
520.omnetpp_r: -DSPEC_LP64
523.xalancbmk_r: -DSPEC_LINUX -D_FILE_OFFSET_BITS=64
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: -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 -lmvec -lamdlibm -ljemalloc
-lflang

502.gcc_r: -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 -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 -fgnu89-inline -ljemalloc
```

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## Peak Optimization Flags (Continued)

```
505.mcf_r: -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
-mllvm -global-vectorize-slp -mllvm -inline-threshold=1000
-flv-function-specialization -lmvec -lamdlibm -ljemalloc
-lflang
```

525.x264\_r: Same as 500.perlbench\_r

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

C++ benchmarks:

```
520.omnetpp_r: -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 -lmvec -lamdlibm -ljemalloc
-lflang
```

```
523.xalancbmk_r: -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 -ljemalloc
```

531.deepsjeng\_r: Same as 520.omnetpp\_r

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## Peak Optimization Flags (Continued)

541.leela\_r: Same as 520.omnetpp\_r

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
-mllvm -disable-indvar-simplify -mllvm -unroll-aggressive
-mllvm -unroll-threshold=150 -lmvec -lamdlibm -ljemalloc -lflang

```

## Peak Other Flags

C benchmarks:

502.gcc\_r: -L/sppo/dev/cpu2017/v110/amd\_rate\_aocc200\_rome\_C\_lib/32

C++ benchmarks:

523.xalancbmk\_r: -L/sppo/dev/cpu2017/v110/amd\_rate\_aocc200\_rome\_C\_lib/32

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

<http://www.spec.org/cpu2017/flags/aocc200-flags-C3.html>

<http://www.spec.org/cpu2017/flags/Dell-Platform-Flags-PowerEdge-revE11.html>

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

<http://www.spec.org/cpu2017/flags/aocc200-flags-C3.xml>

<http://www.spec.org/cpu2017/flags/Dell-Platform-Flags-PowerEdge-revE11.xml>

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