



# SPEC CPU®2017 Integer Rate Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

## Dell Inc.

SPECrate®2017\_int\_base = 413

PowerEdge R6525 (AMD EPYC 7542, 2.90 GHz)

SPECrate®2017\_int\_peak = 448

CPU2017 License: 55

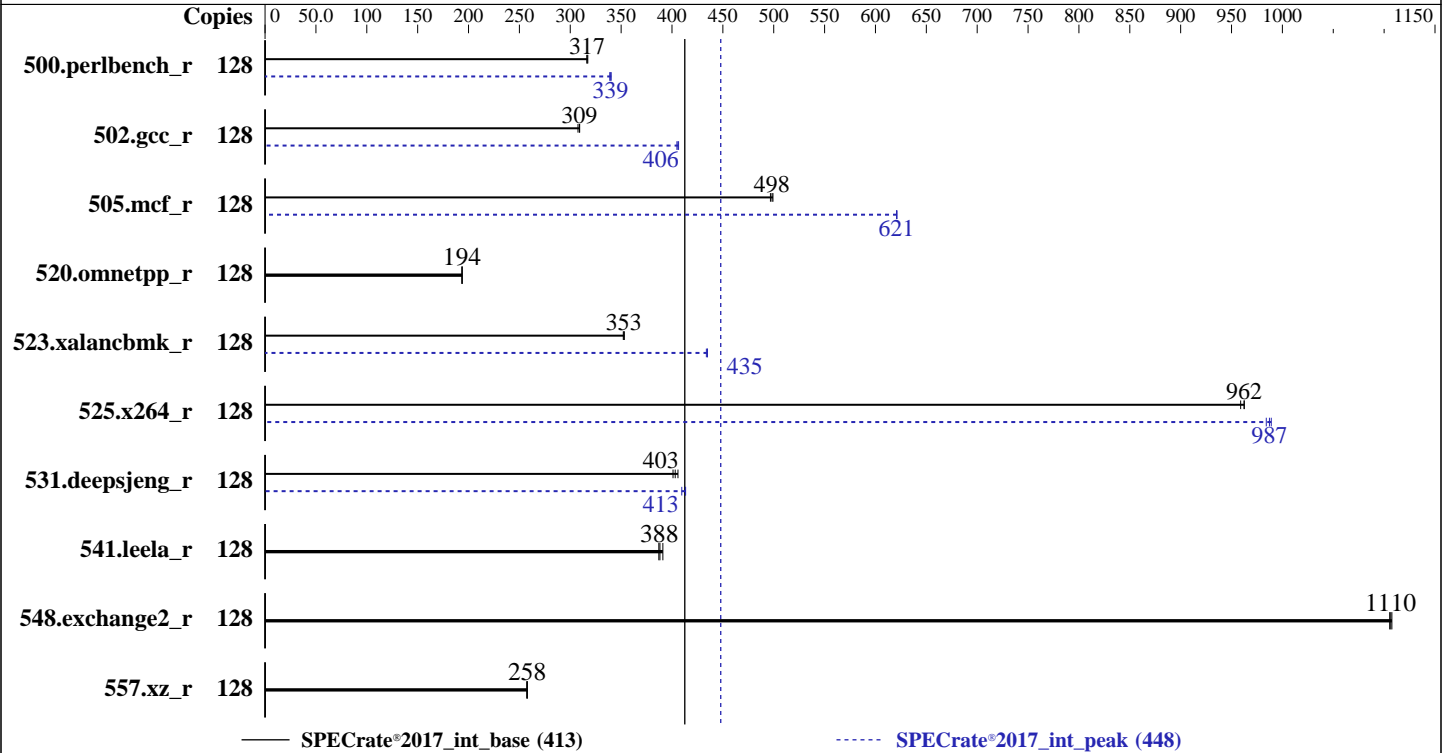
Test Sponsor: Dell Inc.

Tested by: Dell Inc.

Test Date: Sep-2019

Hardware Availability: Oct-2019

Software Availability: Aug-2019



### Hardware

CPU Name: AMD EPYC 7542  
 Max MHz: 3400  
 Nominal: 2900  
 Enabled: 64 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 shared / 4 cores  
 Other: None  
 Memory: 512 GB (16 x 32 GB 2Rx4 PC4-3200AA-R, running at 3200)  
 Storage: 1 x 960 GB 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 0.4.11 released Sep-2019  
 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: --



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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    | 644        | 316        | 642        | 317         | <b>644</b> | <b>317</b> | 128    | 599        | 340        | <b>600</b> | <b>339</b>  | 601     | 339   |
| 502.gcc_r       | 128    | 586        | 309        | 589        | 308         | <b>587</b> | <b>309</b> | 128    | <b>447</b> | <b>406</b> | 448        | 405         | 446     | 406   |
| 505.mcf_r       | 128    | 414        | 499        | 416        | 497         | <b>415</b> | <b>498</b> | 128    | <b>333</b> | <b>621</b> | 333        | 621         | 333     | 621   |
| 520.omnetpp_r   | 128    | 867        | 194        | <b>867</b> | <b>194</b>  | 867        | 194        | 128    | 867        | 194        | <b>867</b> | <b>194</b>  | 867     | 194   |
| 523.xalancbmk_r | 128    | 383        | 353        | 384        | 352         | <b>383</b> | <b>353</b> | 128    | 311        | 435        | <b>311</b> | <b>435</b>  | 312     | 434   |
| 525.x264_r      | 128    | 233        | 963        | 234        | 959         | <b>233</b> | <b>962</b> | 128    | 228        | 984        | <b>227</b> | <b>987</b>  | 227     | 989   |
| 531.deepsjeng_r | 128    | 361        | 406        | 366        | 401         | <b>364</b> | <b>403</b> | 128    | 358        | 410        | <b>355</b> | <b>413</b>  | 355     | 413   |
| 541.leela_r     | 128    | <b>546</b> | <b>388</b> | 542        | 391         | 548        | 387        | 128    | <b>546</b> | <b>388</b> | 542        | 391         | 548     | 387   |
| 548.exchange2_r | 128    | 303        | 1110       | <b>303</b> | <b>1110</b> | 303        | 1110       | 128    | 303        | 1110       | <b>303</b> | <b>1110</b> | 303     | 1110  |
| 557.xz_r        | 128    | <b>536</b> | <b>258</b> | 536        | 258         | 537        | 257        | 128    | <b>536</b> | <b>258</b> | 536        | 258         | 537     | 257   |

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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)

## General Notes

Environment variables set by runcpu before the start of the run:  
LD\_LIBRARY\_PATH = "/root/cpu2017-1.0.5/amd\_rate\_aocc200\_rome\_B\_lib/64;  
/root/cpu2017-1.0.5/amd\_rate\_aocc200\_rome\_B\_lib/32:"  
MALLOCONF = "retain:true"

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 Domain set to Enabled  
System Profile set to Custom  
CPU Power Management set to Maximum Performance  
Memory Frequency set to Maximum Performance  
Turbo Boost Enabled  
Cstates set to Enabled  
Memory Patrol Scrub Disabled  
Memory Refresh Rate set to 1x  
PCI ASPM L1 Link Power Management Disabled  
Determinism Slider set to Power Determinism  
Efficiency Optimized Mode Disabled  
Sysinfo program /root/cpu2017-1.0.5/bin/sysinfo  
Rev: r5974 of 2018-05-19 9bcde8f2999c33d61f64985e45859ea9  
running on linux-g3ob Tue Sep 10 09:54:09 2019

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>

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## Platform Notes (Continued)

From /proc/cpuinfo

model name : AMD EPYC 7542 32-Core Processor

2 "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 : 32

siblings : 64

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

physical 1: 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

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: 32  
Socket(s): 2  
NUMA node(s): 16  
Vendor ID: AuthenticAMD  
CPU family: 23  
Model: 49  
Model name: AMD EPYC 7542 32-Core Processor  
Stepping: 0  
CPU MHz: 2894.608  
BogoMIPS: 5789.21  
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  
NUMA node9 CPU(s): 36-39,100-103  
NUMA node10 CPU(s): 40-43,104-107

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## Platform Notes (Continued)

```

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 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 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 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: 31676 MB
node 0 free: 31523 MB
node 1 cpus: 4 5 6 7 68 69 70 71
node 1 size: 32254 MB
node 1 free: 32128 MB
node 2 cpus: 8 9 10 11 72 73 74 75
node 2 size: 32254 MB
node 2 free: 32149 MB
node 3 cpus: 12 13 14 15 76 77 78 79
node 3 size: 32254 MB
node 3 free: 32126 MB
node 4 cpus: 16 17 18 19 80 81 82 83
node 4 size: 32254 MB
node 4 free: 32134 MB
node 5 cpus: 20 21 22 23 84 85 86 87
node 5 size: 32254 MB
node 5 free: 32144 MB
node 6 cpus: 24 25 26 27 88 89 90 91
node 6 size: 32254 MB
node 6 free: 32128 MB
node 7 cpus: 28 29 30 31 92 93 94 95
node 7 size: 32240 MB
node 7 free: 32131 MB

```

(Continued on next page)



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## Platform Notes (Continued)

```

node 8 cpus: 32 33 34 35 96 97 98 99
node 8 size: 32224 MB
node 8 free: 32104 MB
node 9 cpus: 36 37 38 39 100 101 102 103
node 9 size: 32254 MB
node 9 free: 32164 MB
node 10 cpus: 40 41 42 43 104 105 106 107
node 10 size: 32254 MB
node 10 free: 32162 MB
node 11 cpus: 44 45 46 47 108 109 110 111
node 11 size: 32254 MB
node 11 free: 32162 MB
node 12 cpus: 48 49 50 51 112 113 114 115
node 12 size: 32254 MB
node 12 free: 32123 MB
node 13 cpus: 52 53 54 55 116 117 118 119
node 13 size: 32254 MB
node 13 free: 32115 MB
node 14 cpus: 56 57 58 59 120 121 122 123
node 14 size: 32254 MB
node 14 free: 32159 MB
node 15 cpus: 60 61 62 63 124 125 126 127
node 15 size: 32250 MB
node 15 free: 32149 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 11 11 11 11 32 32 32 32 32 32 32 32
  1: 11 10 11 11 11 11 11 11 32 32 32 32 32 32 32 32
  2: 11 11 10 11 11 11 11 11 32 32 32 32 32 32 32 32
  3: 11 11 11 10 11 11 11 11 32 32 32 32 32 32 32 32
  4: 11 11 11 11 10 11 11 11 32 32 32 32 32 32 32 32
  5: 11 11 11 11 11 10 11 11 32 32 32 32 32 32 32 32
  6: 11 11 11 11 11 11 10 11 32 32 32 32 32 32 32 32
  7: 11 11 11 11 11 11 11 10 32 32 32 32 32 32 32 32
  8: 32 32 32 32 32 32 32 32 32 10 11 11 11 11 11 11
  9: 32 32 32 32 32 32 32 32 32 11 10 11 11 11 11 11
10: 32 32 32 32 32 32 32 32 32 11 11 10 11 11 11 11
11: 32 32 32 32 32 32 32 32 32 11 11 11 10 11 11 11
12: 32 32 32 32 32 32 32 32 32 11 11 11 11 10 11 11
13: 32 32 32 32 32 32 32 32 32 11 11 11 11 11 10 11
14: 32 32 32 32 32 32 32 32 32 11 11 11 11 11 11 10
15: 32 32 32 32 32 32 32 32 32 11 11 11 11 11 11 10

```

```

From /proc/meminfo
MemTotal: 527815124 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

```

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## Platform Notes (Continued)

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-2017-5754 (Meltdown): Not affected
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 Sep 10 09:51

```
SPEC is set to: /root/cpu2017-1.0.5
Filesystem      Type  Size  Used Avail Use% Mounted on
/dev/sda2       xfs   440G   19G  421G   5% /
```

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.

```
BIOS Dell Inc. 0.4.11 09/05/2019
Memory:
 16x 802C80B3802C 36ASF4G72PZ-3G2E2 32 GB 2 rank 3200
 16x 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
```

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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: 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)  

=====
```

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  
 Thread model: posix  
 InstalledDir: /sppo/dev/compilers/aocc-compiler-2.0.0/bin

```
=====  

C++   | 523.xalancbmk_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)  
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## Compiler Version Notes (Continued)

```
=====
C++      | 520.omnetpp_r(base, peak) 523.xalanbmk_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
  AOCC_2_0_0-Build#191) (based on LLVM AOCC.LLVM.2.0.0.B191.2019_07_19)
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```

```
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C++      | 523.xalanbmk_r(peak)
-----
```

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

```
=====
C++      | 520.omnetpp_r(base, peak) 523.xalanbmk_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
  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  | 548.exchange2_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
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## 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
```

## 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 -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
```

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# SPEC CPU®2017 Integer Rate Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

Dell Inc.

SPECrate®2017\_int\_base = 413

PowerEdge R6525 (AMD EPYC 7542, 2.90 GHz)

SPECrate®2017\_int\_peak = 448

CPU2017 License: 55

Test Sponsor: Dell Inc.

Tested by: Dell Inc.

Test Date: Sep-2019

Hardware Availability: Oct-2019

Software Availability: Aug-2019

## Base Optimization Flags (Continued)

C++ benchmarks (continued):

```
-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
```

## Peak Portability Flags

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



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## 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
```

```
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
```

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## Peak Optimization Flags (Continued)

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

557.xz\_r: basepeak = yes

C++ benchmarks:

520.omnetpp\_r: basepeak = yes

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: -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

541.leela\_r: basepeak = yes

Fortran benchmarks:

548.exchange2\_r: basepeak = yes

## Peak Other Flags

C benchmarks:

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

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## Peak Other Flags (Continued)

C++ benchmarks:

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

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

<http://www.spec.org/cpu2017/flags/aocc200-flags-B1-rate-Dell.html>

<http://www.spec.org/cpu2017/flags/Dell-Platform-Flags-PowerEdge-revE4.2019-10-15.html>

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

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

<http://www.spec.org/cpu2017/flags/Dell-Platform-Flags-PowerEdge-revE4.2019-10-15.xml>

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