



# SPEC CPU®2017 Integer Rate Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

## Dell Inc.

PowerEdge R6525 (AMD EPYC 7532, 2.40 GHz)

SPECrate®2017\_int\_base = 437

SPECrate®2017\_int\_peak = 465

CPU2017 License: 55

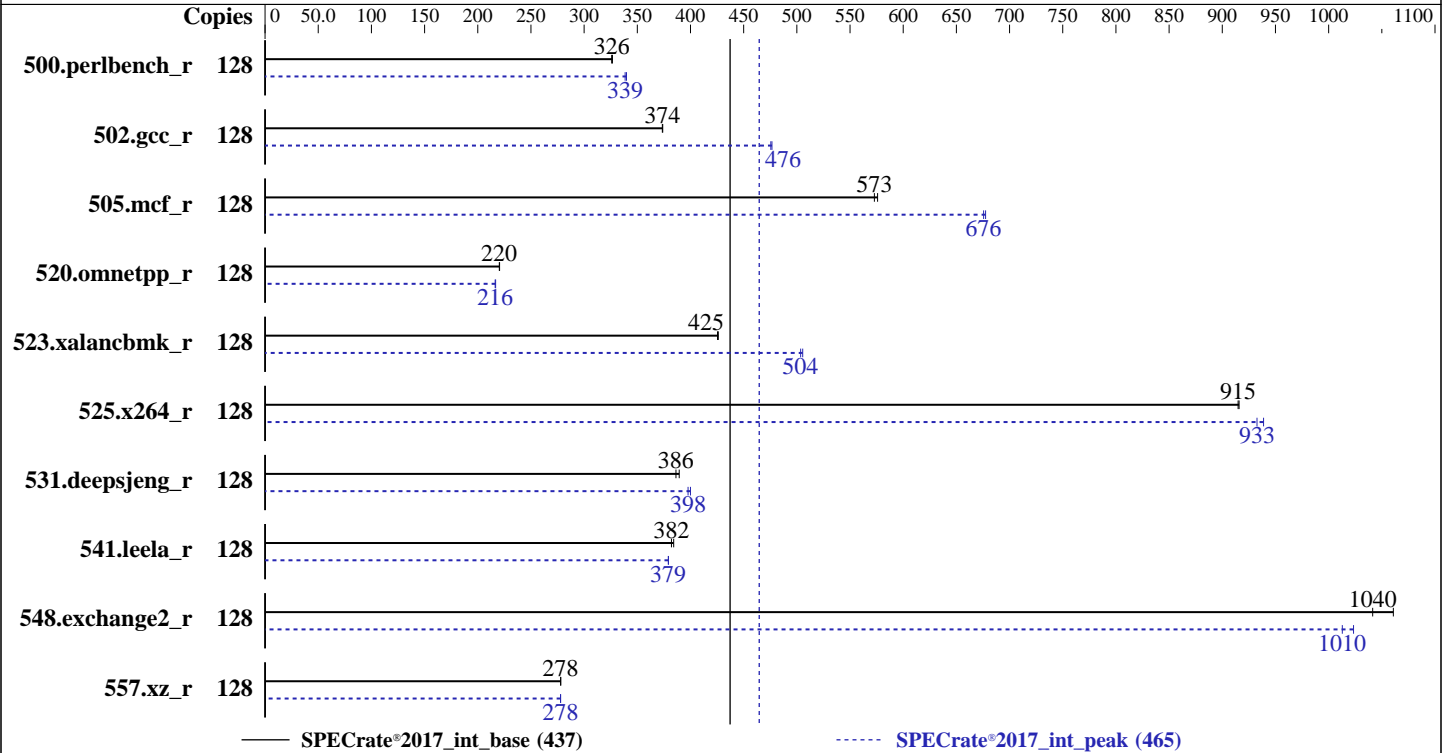
Test Sponsor: Dell Inc.

Tested by: Dell Inc.

Test Date: Dec-2019

Hardware Availability: Oct-2019

Software Availability: Aug-2019



### Hardware

CPU Name: AMD EPYC 7532  
 Max MHz: 3300  
 Nominal: 2400  
 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: 256 MB I+D on chip per chip, 16 MB shared / 2 cores  
 Other: None  
 Memory: 512 GB (16 x 32 GB 2Rx4 PC4-3200AA-R)  
 Storage: 1 x 1.6TB 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 1.2.4 released Nov-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: 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	624	327	<b><u>625</u></b>	<b><u>326</u></b>			128	600	340	<b><u>602</u></b>	<b><u>339</u></b>		
502.gcc_r	128	<b><u>485</u></b>	<b><u>374</u></b>	485	374			128	380	477	<b><u>381</u></b>	<b><u>476</u></b>		
505.mcf_r	128	<b><u>361</u></b>	<b><u>573</u></b>	359	576			128	<b><u>306</u></b>	<b><u>676</u></b>	305	677		
520.omnetpp_r	128	762	221	<b><u>762</u></b>	<b><u>220</u></b>			128	775	217	<b><u>776</u></b>	<b><u>216</u></b>		
523.xalancbmk_r	128	<b><u>318</u></b>	<b><u>425</u></b>	317	426			128	267	506	<b><u>268</u></b>	<b><u>504</u></b>		
525.x264_r	128	<b><u>245</u></b>	<b><u>915</u></b>	245	916			128	239	939	<b><u>240</u></b>	<b><u>933</u></b>		
531.deepsjeng_r	128	<b><u>380</u></b>	<b><u>386</u></b>	377	389			128	367	400	<b><u>369</u></b>	<b><u>398</u></b>		
541.leela_r	128	<b><u>555</u></b>	<b><u>382</u></b>	552	384			128	559	379	<b><u>559</u></b>	<b><u>379</u></b>		
548.exchange2_r	128	<b><u>322</u></b>	<b><u>1040</u></b>	316	1060			128	<b><u>331</u></b>	<b><u>1010</u></b>	328	1020		
557.xz_r	128	497	278	<b><u>497</u></b>	<b><u>278</u></b>			128	<b><u>498</u></b>	<b><u>278</u></b>	497	278		

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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 =  
    "/root/cpu2017-1.1.0/amd_rate_aocc200_rome_C_lib/64:/root/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 -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 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  
Memory Interleaving set to Disabled
```

Sysinfo program /root/cpu2017-1.1.0/bin/sysinfo

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## Platform Notes (Continued)

Rev: r6365 of 2019-08-21 295195f888a3d7edble6e46a485a0011  
running on linux-g3ob Wed Dec 4 10:17:35 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>

From /proc/cpuinfo

```
model name : AMD EPYC 7532 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 4 5 8 9 12 13 16 17 20 21 24 25 28 29 32 33 36 37 40 41 44 45
48 49 52 53 56 57 60 61
physical 1: cores 0 1 4 5 8 9 12 13 16 17 20 21 24 25 28 29 32 33 36 37 40 41 44 45
48 49 52 53 56 57 60 61
```

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): 32
Vendor ID: AuthenticAMD
CPU family: 23
Model: 49
Model name: AMD EPYC 7532 32-Core Processor
Stepping: 0
CPU MHz: 2395.513
BogoMIPS: 4791.02
Virtualization: AMD-V
L1d cache: 32K
L1i cache: 32K
L2 cache: 512K
L3 cache: 16384K
NUMA node0 CPU(s): 0,1,64,65
NUMA node1 CPU(s): 2,3,66,67
NUMA node2 CPU(s): 4,5,68,69
NUMA node3 CPU(s): 6,7,70,71
```

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### Platform Notes (Continued)

```

NUMA node4 CPU(s): 8,9,72,73
NUMA node5 CPU(s): 10,11,74,75
NUMA node6 CPU(s): 12,13,76,77
NUMA node7 CPU(s): 14,15,78,79
NUMA node8 CPU(s): 16,17,80,81
NUMA node9 CPU(s): 18,19,82,83
NUMA node10 CPU(s): 20,21,84,85
NUMA node11 CPU(s): 22,23,86,87
NUMA node12 CPU(s): 24,25,88,89
NUMA node13 CPU(s): 26,27,90,91
NUMA node14 CPU(s): 28,29,92,93
NUMA node15 CPU(s): 30,31,94,95
NUMA node16 CPU(s): 32,33,96,97
NUMA node17 CPU(s): 34,35,98,99
NUMA node18 CPU(s): 36,37,100,101
NUMA node19 CPU(s): 38,39,102,103
NUMA node20 CPU(s): 40,41,104,105
NUMA node21 CPU(s): 42,43,106,107
NUMA node22 CPU(s): 44,45,108,109
NUMA node23 CPU(s): 46,47,110,111
NUMA node24 CPU(s): 48,49,112,113
NUMA node25 CPU(s): 50,51,114,115
NUMA node26 CPU(s): 52,53,116,117
NUMA node27 CPU(s): 54,55,118,119
NUMA node28 CPU(s): 56,57,120,121
NUMA node29 CPU(s): 58,59,122,123
NUMA node30 CPU(s): 60,61,124,125
NUMA node31 CPU(s): 62,63,126,127

```

```

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 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: 32 nodes (0-31)

```

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## Platform Notes (Continued)

```

node 0 cpus: 0 1 64 65
node 0 size: 15548 MB
node 0 free: 15421 MB
node 1 cpus: 2 3 66 67
node 1 size: 16127 MB
node 1 free: 16049 MB
node 2 cpus: 4 5 68 69
node 2 size: 16127 MB
node 2 free: 16019 MB
node 3 cpus: 6 7 70 71
node 3 size: 16126 MB
node 3 free: 16049 MB
node 4 cpus: 8 9 72 73
node 4 size: 16127 MB
node 4 free: 16061 MB
node 5 cpus: 10 11 74 75
node 5 size: 16127 MB
node 5 free: 16060 MB
node 6 cpus: 12 13 76 77
node 6 size: 16127 MB
node 6 free: 16058 MB
node 7 cpus: 14 15 78 79
node 7 size: 16126 MB
node 7 free: 16053 MB
node 8 cpus: 16 17 80 81
node 8 size: 16127 MB
node 8 free: 16042 MB
node 9 cpus: 18 19 82 83
node 9 size: 16127 MB
node 9 free: 16049 MB
node 10 cpus: 20 21 84 85
node 10 size: 16127 MB
node 10 free: 15956 MB
node 11 cpus: 22 23 86 87
node 11 size: 16126 MB
node 11 free: 16047 MB
node 12 cpus: 24 25 88 89
node 12 size: 16127 MB
node 12 free: 16041 MB
node 13 cpus: 26 27 90 91
node 13 size: 16127 MB
node 13 free: 16051 MB
node 14 cpus: 28 29 92 93
node 14 size: 16127 MB
node 14 free: 16059 MB
node 15 cpus: 30 31 94 95
node 15 size: 16084 MB

```

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## Platform Notes (Continued)

```

node 15 free: 16018 MB
node 16 cpus: 32 33 96 97
node 16 size: 16127 MB
node 16 free: 16061 MB
node 17 cpus: 34 35 98 99
node 17 size: 16127 MB
node 17 free: 16075 MB
node 18 cpus: 36 37 100 101
node 18 size: 16127 MB
node 18 free: 16079 MB
node 19 cpus: 38 39 102 103
node 19 size: 16126 MB
node 19 free: 16076 MB
node 20 cpus: 40 41 104 105
node 20 size: 16127 MB
node 20 free: 16080 MB
node 21 cpus: 42 43 106 107
node 21 size: 16127 MB
node 21 free: 16081 MB
node 22 cpus: 44 45 108 109
node 22 size: 16127 MB
node 22 free: 16082 MB
node 23 cpus: 46 47 110 111
node 23 size: 16126 MB
node 23 free: 16081 MB
node 24 cpus: 48 49 112 113
node 24 size: 16127 MB
node 24 free: 15966 MB
node 25 cpus: 50 51 114 115
node 25 size: 16127 MB
node 25 free: 16076 MB
node 26 cpus: 52 53 116 117
node 26 size: 16127 MB
node 26 free: 16025 MB
node 27 cpus: 54 55 118 119
node 27 size: 16126 MB
node 27 free: 16064 MB
node 28 cpus: 56 57 120 121
node 28 size: 16127 MB
node 28 free: 16071 MB
node 29 cpus: 58 59 122 123
node 29 size: 16127 MB
node 29 free: 16075 MB
node 30 cpus: 60 61 124 125
node 30 size: 16127 MB
node 30 free: 16082 MB
node 31 cpus: 62 63 126 127

```

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### Platform Notes (Continued)

node 31 size: 16124 MB

node 31 free: 16075 MB

node distances:

node	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
20	0:	10	11	11	11	12	12	12	12	12	12	12	12	12	12	12	32	32	32	32
	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
	1:	11	10	11	11	12	12	12	12	12	12	12	12	12	12	12	32	32	32	32
	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
	2:	11	11	10	11	12	12	12	12	12	12	12	12	12	12	12	32	32	32	32
	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
	3:	11	11	11	10	12	12	12	12	12	12	12	12	12	12	12	32	32	32	32
	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
	4:	12	12	12	12	10	11	11	11	12	12	12	12	12	12	12	32	32	32	32
	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
	5:	12	12	12	12	11	10	11	11	12	12	12	12	12	12	12	32	32	32	32
	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
	6:	12	12	12	12	11	11	10	11	12	12	12	12	12	12	12	32	32	32	32
	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
	7:	12	12	12	12	11	11	11	10	12	12	12	12	12	12	12	32	32	32	32
	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
	8:	12	12	12	12	12	12	12	12	10	11	11	11	12	12	12	32	32	32	32
	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
	9:	12	12	12	12	12	12	12	12	11	10	11	11	12	12	12	32	32	32	32
	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
	10:	12	12	12	12	12	12	12	12	11	11	10	11	12	12	12	32	32	32	32
	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
	11:	12	12	12	12	12	12	12	12	11	11	11	10	12	12	12	32	32	32	32
	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
	12:	12	12	12	12	12	12	12	12	12	12	12	12	10	11	11	32	32	32	32
	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
	13:	12	12	12	12	12	12	12	12	12	12	12	12	11	10	11	32	32	32	32
	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
	14:	12	12	12	12	12	12	12	12	12	12	12	12	12	11	11	10	11	32	32
	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
	15:	12	12	12	12	12	12	12	12	12	12	12	12	12	11	11	11	10	32	32
	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
	16:	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	10	11	11
	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
	17:	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	11	10
	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
	18:	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	11	11
	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
	19:	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	11	11
	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
	20:	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	12	12
	10	11	11	11	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12

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## Platform Notes (Continued)

```

21:  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  12  12  12  12
11  10  11  11  12  12  12  12  12  12  12  12
22:  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  12  12  12  12
11  11  10  11  12  12  12  12  12  12  12  12
23:  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  12  12  12  12
11  11  11  10  12  12  12  12  12  12  12  12
24:  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  12  12  12  12
12  12  12  12  10  11  11  11  12  12  12  12
25:  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  12  12  12  12
12  12  12  12  11  10  11  11  12  12  12  12
26:  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  12  12  12  12
12  12  12  12  11  11  10  11  12  12  12  12
27:  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  12  12  12  12
12  12  12  12  11  11  11  10  12  12  12  12
28:  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  12  12  12  12
12  12  12  12  12  12  12  12  10  11  11  11
29:  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  12  12  12  12
12  12  12  12  12  12  12  12  11  10  11  11
30:  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  12  12  12  12
12  12  12  12  12  12  12  12  11  11  10  11
31:  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  12  12  12  12
12  12  12  12  12  12  12  12  11  11  11  10

```

```

From /proc/meminfo
MemTotal:      527808280 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

```

(Continued on next page)



# SPEC CPU®2017 Integer Rate Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

**Dell Inc.**

PowerEdge R6525 (AMD EPYC 7532, 2.40 GHz)

SPECrate®2017\_int\_base = 437

SPECrate®2017\_int\_peak = 465

CPU2017 License: 55

Test Sponsor: Dell Inc.

Tested by: Dell Inc.

Test Date: Dec-2019

Hardware Availability: Oct-2019

Software Availability: Aug-2019

## Platform Notes (Continued)

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 Dec 4 10:08

SPEC is set to: /root/cpu2017-1.1.0

Filesystem	Type	Size	Used	Avail	Use%	Mounted on
/dev/sda2	xfs	440G	41G	400G	10%	/

From /sys/devices/virtual/dmi/id

BIOS: Dell Inc. 1.2.4 11/05/2019  
 Vendor: Dell Inc.  
 Product: PowerEdge R6525  
 Product Family: PowerEdge  
 Serial: 1234567

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:

5x 802C80B3802C 36ASF4G72PZ-3G2E2 32 GB 2 rank 3200  
 2x 802C8632802C 36ASF4G72PZ-3G2E2 32 GB 2 rank 3200  
 1x 802C869D802C 36ASF4G72PZ-3G2E2 32 GB 2 rank 3200  
 8x 80AD863280AD HMA84GR7CJR4N-XN 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  
 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

(Continued on next page)



# SPEC CPU®2017 Integer Rate Result

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## Compiler Version Notes (Continued)

```
=====
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
  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++       | 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)
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
```

(Continued on next page)



# SPEC CPU®2017 Integer Rate Result

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**CPU2017 License:** 55

**Test Sponsor:** Dell Inc.

**Tested by:** Dell Inc.

**Test Date:** Dec-2019

**Hardware Availability:** Oct-2019

**Software Availability:** Aug-2019

## Compiler Version Notes (Continued)

```

AOC2_2_0_0-Build#191) (based on LLVM AOC2.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)
-----

```

```

AOC2.LLVM.2.0.0.B191.2019_07_19 clang version 8.0.0 (CLANG: Jenkins
AOC2_2_0_0-Build#191) (based on LLVM AOC2.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++      | 520.omnetpp_r(base, peak) 523.xalancbmk_r(base)
          | 531.deepsjeng_r(base, peak) 541.leela_r(base, peak)
-----

```

```

AOC2.LLVM.2.0.0.B191.2019_07_19 clang version 8.0.0 (CLANG: Jenkins
AOC2_2_0_0-Build#191) (based on LLVM AOC2.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)
-----

```

```

AOC2.LLVM.2.0.0.B191.2019_07_19 clang version 8.0.0 (CLANG: Jenkins
AOC2_2_0_0-Build#191) (based on LLVM AOC2.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++

(Continued on next page)



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**Software Availability:** Aug-2019

## Base Compiler Invocation (Continued)

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
-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
```

(Continued on next page)



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**Tested by:** Dell Inc.

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**Hardware Availability:** Oct-2019

**Software Availability:** Aug-2019

## Base Optimization Flags (Continued)

Fortran benchmarks (continued):

```
-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.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
```

(Continued on next page)



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## Peak Optimization Flags (Continued)

500.perlbench\_r (continued):

```
-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
```

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

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

C++ benchmarks:

(Continued on next page)



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## Peak Optimization Flags (Continued)

```
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

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

(Continued on next page)





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**Software Availability:** Aug-2019

## Peak Other Flags (Continued)

C++ benchmarks:

523.xalancbmk\_r: -L/sppo/dev/cpu2017/v1110/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-B1-speed-Dell.html>

<http://www.spec.org/cpu2017/flags/Dell-Platform-Flags-PowerEdge-revE7.html>

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

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

<http://www.spec.org/cpu2017/flags/Dell-Platform-Flags-PowerEdge-revE7.xml>

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