



SPEC CPU®2017 Integer Rate Result

Copyright 2017-2020 Standard Performance Evaluation Corporation

Dell Inc.

SPECrate®2017_int_base = 435

PowerEdge C6525 (AMD EPYC 7532, 2.40 GHz)

SPECrate®2017_int_peak = 463

CPU2017 License: 55

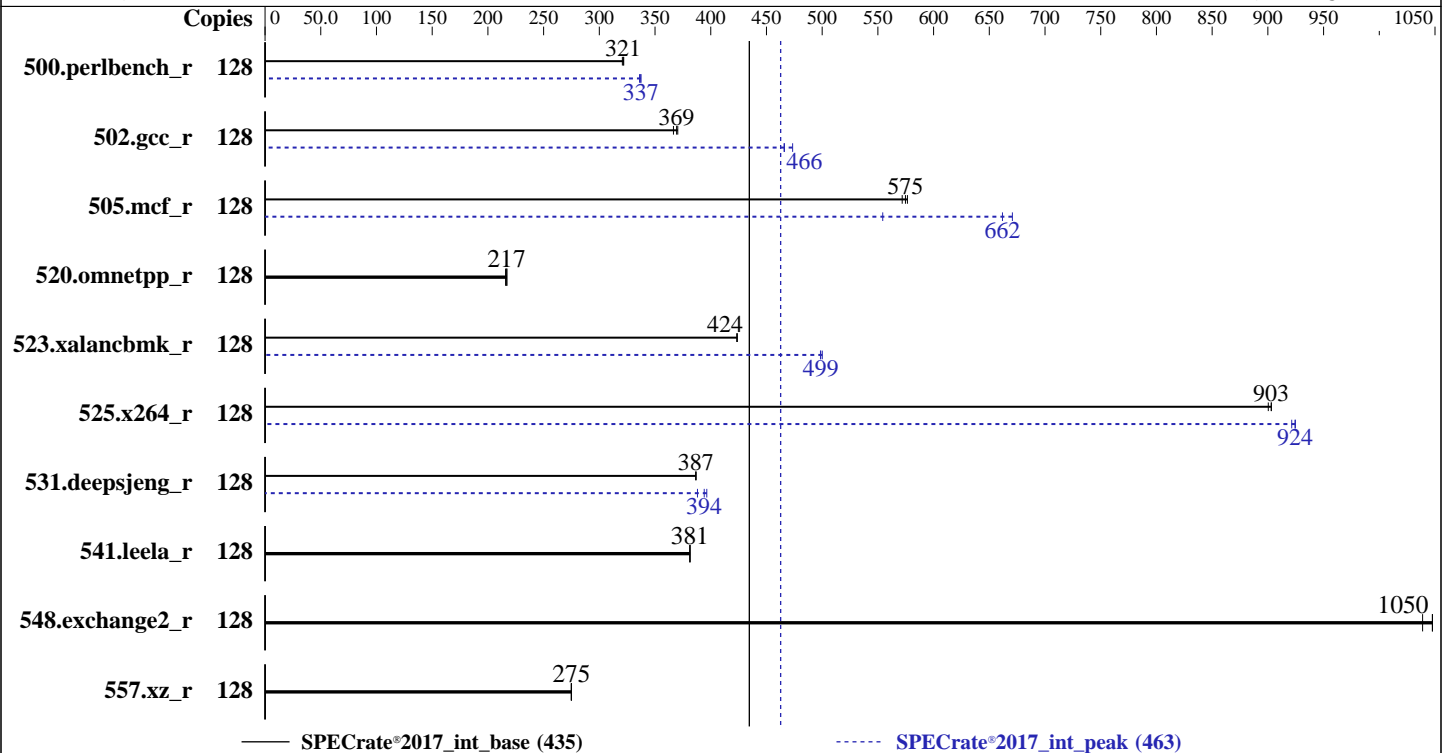
Test Date: Nov-2019

Test Sponsor: Dell Inc.

Hardware Availability: Feb-2020

Tested by: Dell Inc.

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 480 GB SATA 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 1.2.2 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	634	321	633	322	635	321	128	606	336	604	337	604	337
502.gcc_r	128	495	367	491	369	489	370	128	389	466	389	466	383	473
505.mcf_r	128	359	577	362	572	360	575	128	313	662	373	554	308	671
520.omnetpp_r	128	774	217	775	217	778	216	128	774	217	775	217	778	216
523.xalancbmk_r	128	319	424	319	424	319	424	128	270	500	271	499	271	498
525.x264_r	128	248	903	248	903	249	900	128	242	924	243	921	242	925
531.deepsjeng_r	128	379	387	379	387	379	387	128	378	388	372	394	370	396
541.leela_r	128	556	381	556	381	556	381	128	556	381	556	381	556	381
548.exchange2_r	128	320	1050	323	1040	320	1050	128	320	1050	323	1040	320	1050
557.xz_r	128	503	275	503	275	503	275	128	503	275	503	275	503	275

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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 -fltto
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 Fri Dec 13 06:56:34 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: 2395.442
BogoMIPS: 4790.88
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 bpeext
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: 15676 MB
node 0 free: 15599 MB
node 1 cpus: 2 3 66 67
node 1 size: 16127 MB
node 1 free: 16067 MB
node 2 cpus: 4 5 68 69
node 2 size: 16127 MB
node 2 free: 16066 MB
node 3 cpus: 6 7 70 71
node 3 size: 16126 MB
node 3 free: 16039 MB
node 4 cpus: 8 9 72 73
node 4 size: 16127 MB
node 4 free: 16066 MB
node 5 cpus: 10 11 74 75
node 5 size: 16127 MB
node 5 free: 16075 MB
node 6 cpus: 12 13 76 77
node 6 size: 16127 MB
node 6 free: 16073 MB
node 7 cpus: 14 15 78 79
node 7 size: 16126 MB
node 7 free: 16076 MB
node 8 cpus: 16 17 80 81
node 8 size: 16127 MB
node 8 free: 16045 MB
node 9 cpus: 18 19 82 83
node 9 size: 16127 MB
node 9 free: 16073 MB
node 10 cpus: 20 21 84 85
node 10 size: 16127 MB
node 10 free: 16066 MB
node 11 cpus: 22 23 86 87
node 11 size: 16126 MB
node 11 free: 16062 MB
node 12 cpus: 24 25 88 89
node 12 size: 16127 MB
node 12 free: 15792 MB
node 13 cpus: 26 27 90 91
node 13 size: 16127 MB
node 13 free: 16066 MB
node 14 cpus: 28 29 92 93
node 14 size: 16097 MB
node 14 free: 16025 MB
node 15 cpus: 30 31 94 95
node 15 size: 16114 MB

```

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```

node 15 free: 16031 MB
node 16 cpus: 32 33 96 97
node 16 size: 16127 MB
node 16 free: 16081 MB
node 17 cpus: 34 35 98 99
node 17 size: 16127 MB
node 17 free: 16076 MB
node 18 cpus: 36 37 100 101
node 18 size: 16127 MB
node 18 free: 16078 MB
node 19 cpus: 38 39 102 103
node 19 size: 16126 MB
node 19 free: 16078 MB
node 20 cpus: 40 41 104 105
node 20 size: 16127 MB
node 20 free: 16059 MB
node 21 cpus: 42 43 106 107
node 21 size: 16127 MB
node 21 free: 16075 MB
node 22 cpus: 44 45 108 109
node 22 size: 16127 MB
node 22 free: 16069 MB
node 23 cpus: 46 47 110 111
node 23 size: 16126 MB
node 23 free: 16075 MB
node 24 cpus: 48 49 112 113
node 24 size: 16127 MB
node 24 free: 16078 MB
node 25 cpus: 50 51 114 115
node 25 size: 16127 MB
node 25 free: 16081 MB
node 26 cpus: 52 53 116 117
node 26 size: 16127 MB
node 26 free: 16082 MB
node 27 cpus: 54 55 118 119
node 27 size: 16126 MB
node 27 free: 16073 MB
node 28 cpus: 56 57 120 121
node 28 size: 16127 MB
node 28 free: 16084 MB
node 29 cpus: 58 59 122 123
node 29 size: 16127 MB
node 29 free: 16078 MB
node 30 cpus: 60 61 124 125
node 30 size: 16127 MB
node 30 free: 16083 MB
node 31 cpus: 62 63 126 127

```

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Platform Notes (Continued)

node 31 size: 16124 MB

node 31 free: 16076 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
21	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
22	1:	11	10	11	11	12	12	12	12	12	12	12	12	12	12	12	32	32	32	32
23	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
24	2:	11	11	10	11	12	12	12	12	12	12	12	12	12	12	12	32	32	32	32
25	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
26	3:	11	11	11	10	12	12	12	12	12	12	12	12	12	12	12	32	32	32	32
27	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
28	4:	12	12	12	12	10	11	11	11	12	12	12	12	12	12	12	32	32	32	32
29	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
30	5:	12	12	12	12	11	10	11	11	12	12	12	12	12	12	12	32	32	32	32
31	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
0	6:	12	12	12	12	11	11	10	11	12	12	12	12	12	12	12	32	32	32	32
1	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
2	7:	12	12	12	12	11	11	11	10	12	12	12	12	12	12	12	32	32	32	32
3	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
4	8:	12	12	12	12	12	12	12	12	10	11	11	11	12	12	12	32	32	32	32
5	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
6	9:	12	12	12	12	12	12	12	12	11	10	11	11	12	12	12	32	32	32	32
7	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
8	10:	12	12	12	12	12	12	12	12	11	11	10	11	11	12	12	32	32	32	32
9	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
10	11:	12	12	12	12	12	12	12	12	11	11	11	10	12	12	12	32	32	32	32
11	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	12	12	12	12	32	32	32	32
13	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
14	13:	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	32	32	32	32
15	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
16	14:	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	32	32	32	32
17	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
18	15:	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	32	32	32	32
19	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
20	16:	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
21	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
22	17:	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
23	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
24	18:	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
25	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
26	19:	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
27	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
28	20:	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	32	32	32	32
29	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
30	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:      527939172 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

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Dell Inc.

SPECrate®2017_int_base = 435

PowerEdge C6525 (AMD EPYC 7532, 2.40 GHz)

SPECrate®2017_int_peak = 463

CPU2017 License: 55

Test Sponsor: Dell Inc.

Tested by: Dell Inc.

Test Date: Nov-2019

Hardware Availability: Feb-2020

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 13 06:28

SPEC is set to: /root/cpu2017-1.1.0

Filesystem	Type	Size	Used	Avail	Use%	Mounted on
/dev/sdb2	xfs	440G	40G	401G	10%	/

From /sys/devices/virtual/dmi/id
 BIOS: Dell Inc. 1.2.2 11/13/2019
 Vendor: Dell Inc.
 Product: PowerEdge C6525
 Product Family: PowerEdge

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:
 16x 80AD863280AD HMA84GR7CJR4N-XN 32 GB 2 rank 3200

(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
```

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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 | 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
 AOCC_2_0_0-Build#191) (based on LLVM AOCC.LLVM.2.0.0.B191.2019_07_19)
 Target: x86_64-unknown-linux-gnu
 Thread model: posix
 InstalledDir: /sppo/dev/compilers/aocc-compiler-2.0.0/bin

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Compiler Version Notes (Continued)

=====
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
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
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



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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
-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
```



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Tested by: Dell Inc.

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Software Availability: Aug-2019

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
-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
```

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Peak Optimization Flags (Continued)

```
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: 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
```

(Continued on next page)



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Software Availability: Aug-2019

Peak Optimization Flags (Continued)

```
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/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-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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For questions about this result, please contact the tester. For other inquiries, please contact info@spec.org.

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