



SPEC CPU®2017 Floating Point Speed Result

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Dell Inc.

SPECspeed®2017_fp_base = 155

PowerEdge R7525 (AMD EPYC 7552, 2.20 GHz)

SPECspeed®2017_fp_peak = 157

CPU2017 License: 55

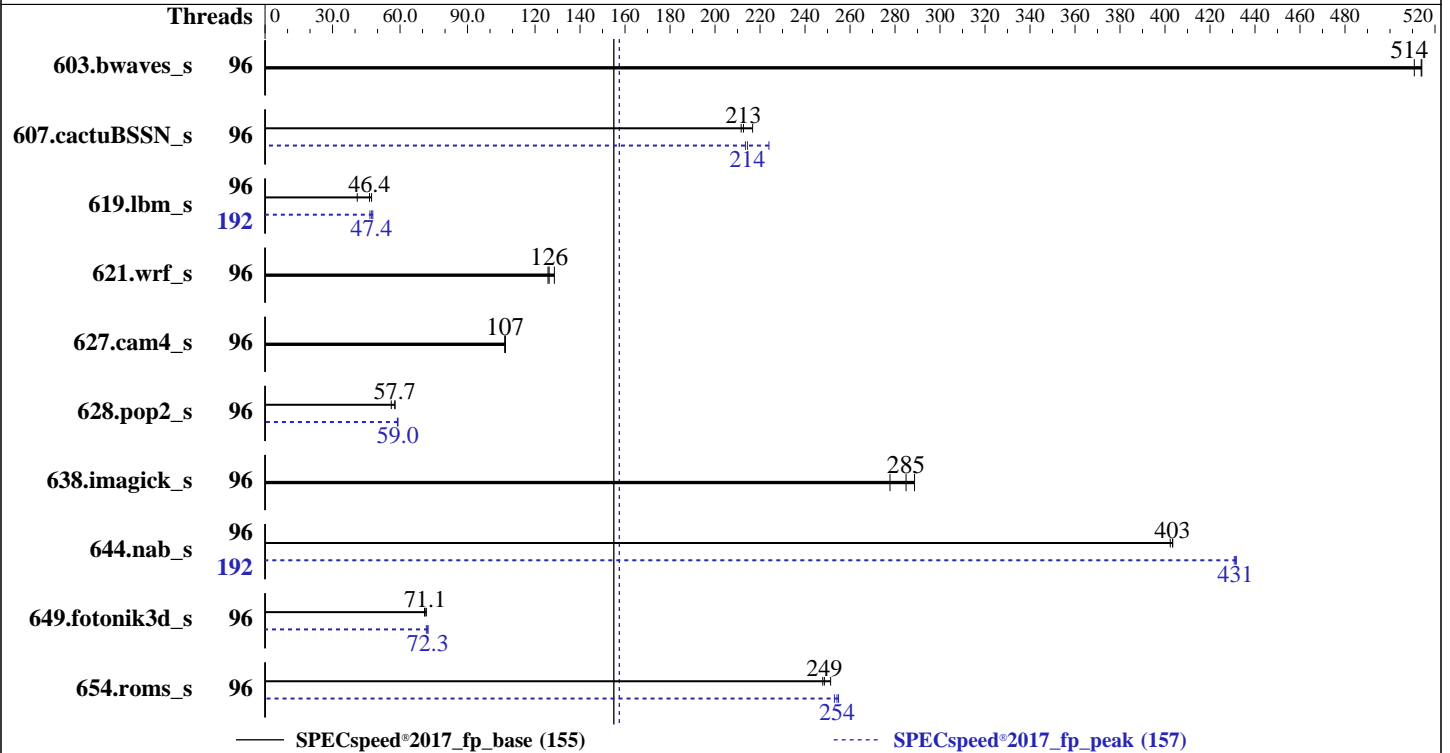
Test Date: Nov-2019

Test Sponsor: Dell Inc.

Hardware Availability: Feb-2020

Tested by: Dell Inc.

Software Availability: Aug-2019



Hardware

CPU Name: AMD EPYC 7552
 Max MHz: 3300
 Nominal: 2200
 Enabled: 96 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: 192 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)
 Storage: 1 x 960 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: Yes
 Firmware: Version 1.2.4 released Nov-2019
 File System: xfs
 System State: Run level 3 (multi-user)
 Base Pointers: 64-bit
 Peak Pointers: 64-bit
 Other: jemalloc: jemalloc memory allocator library v5.1.0
 Power Management: BIOS set to prefer performance at the cost of additional power usage.



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Results Table

Benchmark	Base							Peak						
	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
603.bwaves_s	96	115	511	115	514	<u>115</u>	<u>514</u>	96	115	511	115	514	<u>115</u>	<u>514</u>
607.cactuBSSN_s	96	78.8	212	<u>78.4</u>	<u>213</u>	76.9	217	96	78.1	214	<u>77.7</u>	<u>214</u>	74.4	224
619.lbm_s	96	111	47.3	128	41.0	<u>113</u>	<u>46.4</u>	192	109	47.9	112	46.6	<u>111</u>	<u>47.4</u>
621.wrf_s	96	<u>105</u>	<u>126</u>	103	129	105	126	96	<u>105</u>	<u>126</u>	103	129	105	126
627.cam4_s	96	83.0	107	<u>83.1</u>	<u>107</u>	83.2	107	96	83.0	107	<u>83.1</u>	<u>107</u>	83.2	107
628.pop2_s	96	206	57.8	<u>206</u>	<u>57.7</u>	212	56.1	96	201	59.1	202	58.8	<u>201</u>	<u>59.0</u>
638.imagick_s	96	<u>50.6</u>	<u>285</u>	51.9	278	50.0	289	96	<u>50.6</u>	<u>285</u>	51.9	278	50.0	289
644.nab_s	96	43.4	402	<u>43.3</u>	<u>403</u>	43.3	403	192	40.6	431	<u>40.5</u>	<u>431</u>	40.5	432
649.fotonik3d_s	96	<u>128</u>	<u>71.1</u>	129	70.9	127	71.7	96	<u>126</u>	<u>72.3</u>	127	71.7	126	72.4
654.roms_s	96	63.5	248	<u>63.3</u>	<u>249</u>	62.6	251	96	61.8	255	62.2	253	<u>61.9</u>	<u>254</u>

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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).

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



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Environment Variables Notes

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

GOMP_CPU_AFFINITY = "0-191"

LD_LIBRARY_PATH =

"/root/cpu2017-1.1.0/amd_speed_aocc200_rome_C_lib/64;/root/cpu2017-1.1.0/amd_speed_aocc200_rome_C_lib/32:"

MALLOC_CONF = "retain:true"

OMP_DYNAMIC = "false"

OMP_SCHEDULE = "static"

OMP_STACKSIZE = "128M"

OMP_THREAD_LIMIT = "192"

Environment variables set by runcpu during the 607.cactuBSSN_s peak run:

GOMP_CPU_AFFINITY = "0-95"

Environment variables set by runcpu during the 619.lbm_s peak run:

GOMP_CPU_AFFINITY = "0 96 1 97 2 98 3 99 4 100 5 101 6 102 7 103 8 104 9 105 10 106 11 107 12 108 13 109 14 110 15 111 16 112 17 113 18 114 19 115 20 116 21 117 22 118 23 119 24 120 25 121 26 122 27 123 28 124 29 125 30 126 31 127 32 128 33 129 34 130 35 131 36 132 37 133 38 134 39 135 40 136 41 137 42 138 43 139 44 140 45 141 46 142 47 143 48 144 49 145 50 146 51 147 52 148 53 149 54 150 55 151 56 152 57 153 58 154 59 155 60 156 61 157 62 158 63 159 64 160 65 161 66 162 67 163 68 164 69 165 70 166 71 167 72 168 73 169 74 170 75 171 76 172 77 173 78 174 79 175 80 176 81 177 82 178 83 179 84 180 85 181 86 182 87 183 88 184 89 185 90 186 91 187 92 188 93 189 94 190 95 191"

Environment variables set by runcpu during the 628.pop2_s peak run:

GOMP_CPU_AFFINITY = "0-95"

Environment variables set by runcpu during the 644.nab_s peak run:

GOMP_CPU_AFFINITY = "0 96 1 97 2 98 3 99 4 100 5 101 6 102 7 103 8 104 9 105 10 106 11 107 12 108 13 109 14 110 15 111 16 112 17 113 18 114 19 115 20 116 21 117 22 118 23 119 24 120 25 121 26 122 27 123 28 124 29 125 30 126 31 127 32 128 33 129 34 130 35 131 36 132 37 133 38 134 39 135 40 136 41 137 42 138 43 139 44 140 45 141 46 142 47 143 48 144 49 145 50 146 51 147 52 148 53 149 54 150 55 151 56 152 57 153 58 154 59 155 60 156 61 157 62 158 63 159 64 160 65 161 66 162 67 163 68 164 69 165 70 166 71 167 72 168 73 169 74 170 75 171 76 172 77 173 78 174 79 175 80 176 81 177 82 178 83 179 84 180 85 181 86 182 87 183 88 184 89 185 90 186 91 187 92 188 93 189 94 190 95 191"

Environment variables set by runcpu during the 649.fotonik3d_s peak run:

GOMP_CPU_AFFINITY = "0-95"

Environment variables set by runcpu during the 654.roms_s peak run:

GOMP_CPU_AFFINITY = "0-95"



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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 5.1.0 is available here:

<https://github.com/jemalloc/jemalloc/releases/download/5.1.0/jemalloc-5.1.0.tar.bz2>

Platform Notes

BIOS settings:

- NUMA Nodes Per Socket set to 2
- 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
Rev: r6365 of 2019-08-21 295195f888a3d7edble6e46a485a0011
running on linux-g3ob Wed Nov 20 00:16:34 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 7552 48-Core Processor
 2 "physical id"s (chips)
192 "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 : 48

```

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Platform Notes (Continued)

```

siblings : 96
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
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 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47

```

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):                 192
On-line CPU(s) list:   0-191
Thread(s) per core:     2
Core(s) per socket:    48
Socket(s):              2
NUMA node(s):          24
Vendor ID:              AuthenticAMD
CPU family:             23
Model:                  49
Model name:             AMD EPYC 7552 48-Core Processor
Stepping:               0
CPU MHz:                2195.836
BogoMIPS:               4391.67
Virtualization:        AMD-V
L1d cache:              32K
L1i cache:              32K
L2 cache:               512K
L3 cache:               16384K
NUMA node0 CPU(s):     0-3,96-99
NUMA node1 CPU(s):     4-7,100-103
NUMA node2 CPU(s):     8-11,104-107
NUMA node3 CPU(s):     12-15,108-111
NUMA node4 CPU(s):     16-19,112-115
NUMA node5 CPU(s):     20-23,116-119
NUMA node6 CPU(s):     24-27,120-123
NUMA node7 CPU(s):     28-31,124-127
NUMA node8 CPU(s):     32-35,128-131
NUMA node9 CPU(s):     36-39,132-135
NUMA node10 CPU(s):    40-43,136-139
NUMA node11 CPU(s):    44-47,140-143
NUMA node12 CPU(s):    48-51,144-147
NUMA node13 CPU(s):    52-55,148-151
NUMA node14 CPU(s):    56-59,152-155
NUMA node15 CPU(s):    60-63,156-159
NUMA node16 CPU(s):    64-67,160-163
NUMA node17 CPU(s):    68-71,164-167

```

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Platform Notes (Continued)

```

NUMA node18 CPU(s): 72-75,168-171
NUMA node19 CPU(s): 76-79,172-175
NUMA node20 CPU(s): 80-83,176-179
NUMA node21 CPU(s): 84-87,180-183
NUMA node22 CPU(s): 88-91,184-187
NUMA node23 CPU(s): 92-95,188-191

```

```

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_omsave_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: 24 nodes (0-23)
node 0 cpus: 0 1 2 3 96 97 98 99
node 0 size: 21051 MB
node 0 free: 20832 MB
node 1 cpus: 4 5 6 7 100 101 102 103
node 1 size: 21501 MB
node 1 free: 21416 MB
node 2 cpus: 8 9 10 11 104 105 106 107
node 2 size: 21502 MB
node 2 free: 21370 MB
node 3 cpus: 12 13 14 15 108 109 110 111
node 3 size: 21501 MB
node 3 free: 21432 MB
node 4 cpus: 16 17 18 19 112 113 114 115
node 4 size: 21501 MB
node 4 free: 21452 MB
node 5 cpus: 20 21 22 23 116 117 118 119
node 5 size: 21503 MB
node 5 free: 21467 MB
node 6 cpus: 24 25 26 27 120 121 122 123
node 6 size: 21501 MB
node 6 free: 21477 MB
node 7 cpus: 28 29 30 31 124 125 126 127
node 7 size: 21501 MB

```

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Platform Notes (Continued)

```

node 7 free: 21479 MB
node 8 cpus: 32 33 34 35 128 129 130 131
node 8 size: 21503 MB
node 8 free: 21481 MB
node 9 cpus: 36 37 38 39 132 133 134 135
node 9 size: 21501 MB
node 9 free: 21418 MB
node 10 cpus: 40 41 42 43 136 137 138 139
node 10 size: 21501 MB
node 10 free: 21474 MB
node 11 cpus: 44 45 46 47 140 141 142 143
node 11 size: 21490 MB
node 11 free: 21467 MB
node 12 cpus: 48 49 50 51 144 145 146 147
node 12 size: 21501 MB
node 12 free: 21470 MB
node 13 cpus: 52 53 54 55 148 149 150 151
node 13 size: 21501 MB
node 13 free: 21481 MB
node 14 cpus: 56 57 58 59 152 153 154 155
node 14 size: 21502 MB
node 14 free: 21480 MB
node 15 cpus: 60 61 62 63 156 157 158 159
node 15 size: 21501 MB
node 15 free: 21479 MB
node 16 cpus: 64 65 66 67 160 161 162 163
node 16 size: 21501 MB
node 16 free: 21481 MB
node 17 cpus: 68 69 70 71 164 165 166 167
node 17 size: 21503 MB
node 17 free: 21482 MB
node 18 cpus: 72 73 74 75 168 169 170 171
node 18 size: 21501 MB
node 18 free: 21479 MB
node 19 cpus: 76 77 78 79 172 173 174 175
node 19 size: 21501 MB
node 19 free: 21480 MB
node 20 cpus: 80 81 82 83 176 177 178 179
node 20 size: 21503 MB
node 20 free: 21482 MB
node 21 cpus: 84 85 86 87 180 181 182 183
node 21 size: 21472 MB
node 21 free: 21450 MB
node 22 cpus: 88 89 90 91 184 185 186 187
node 22 size: 21501 MB
node 22 free: 21481 MB
node 23 cpus: 92 93 94 95 188 189 190 191

```

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Platform Notes (Continued)

node 23 size: 21501 MB

node 23 free: 21480 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	10	11	11	11	11	11	12	12	12	12	12	12	32	32	32	32	32	32	32	32
21	11	10	11	11	11	11	12	12	12	12	12	12	32	32	32	32	32	32	32	32
22	11	11	10	11	11	11	12	12	12	12	12	12	32	32	32	32	32	32	32	32
23	11	11	11	10	11	11	12	12	12	12	12	12	32	32	32	32	32	32	32	32
0:	10	11	11	11	11	11	12	12	12	12	12	12	32	32	32	32	32	32	32	32
32	32	32	32																	
1:	11	10	11	11	11	11	12	12	12	12	12	12	32	32	32	32	32	32	32	32
32	32	32	32																	
2:	11	11	10	11	11	11	12	12	12	12	12	12	32	32	32	32	32	32	32	32
32	32	32	32																	
3:	11	11	11	10	11	11	12	12	12	12	12	12	32	32	32	32	32	32	32	32
32	32	32	32																	
4:	11	11	11	11	10	11	12	12	12	12	12	12	32	32	32	32	32	32	32	32
32	32	32	32																	
5:	11	11	11	11	11	10	12	12	12	12	12	12	32	32	32	32	32	32	32	32
32	32	32	32																	
6:	12	12	12	12	12	12	10	11	11	11	11	11	32	32	32	32	32	32	32	32
32	32	32	32																	
7:	12	12	12	12	12	12	11	10	11	11	11	11	32	32	32	32	32	32	32	32
32	32	32	32																	
8:	12	12	12	12	12	12	11	11	10	11	11	11	32	32	32	32	32	32	32	32
32	32	32	32																	
9:	12	12	12	12	12	12	11	11	11	10	11	11	32	32	32	32	32	32	32	32
32	32	32	32																	
10:	12	12	12	12	12	12	11	11	11	11	10	11	32	32	32	32	32	32	32	32
32	32	32	32																	
11:	12	12	12	12	12	12	11	11	11	11	11	10	32	32	32	32	32	32	32	32
32	32	32	32																	
12:	32	32	32	32	32	32	32	32	32	32	32	32	32	10	11	11	11	11	11	12
12	12	12	12																	
13:	32	32	32	32	32	32	32	32	32	32	32	32	32	11	10	11	11	11	11	12
12	12	12	12																	
14:	32	32	32	32	32	32	32	32	32	32	32	32	32	11	11	10	11	11	11	12
12	12	12	12																	
15:	32	32	32	32	32	32	32	32	32	32	32	32	32	11	11	11	10	11	11	12
12	12	12	12																	
16:	32	32	32	32	32	32	32	32	32	32	32	32	32	11	11	11	11	10	11	12
12	12	12	12																	
17:	32	32	32	32	32	32	32	32	32	32	32	32	32	11	11	11	11	11	10	12
12	12	12	12																	
18:	32	32	32	32	32	32	32	32	32	32	32	32	32	12	12	12	12	12	12	10
11	11	11	11																	
19:	32	32	32	32	32	32	32	32	32	32	32	32	32	12	12	12	12	12	12	11
11	11	11	11																	
20:	32	32	32	32	32	32	32	32	32	32	32	32	32	12	12	12	12	12	12	11
10	11	11	11																	

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```

21:  32  32  32  32  32  32  32  32  32  32  32  32  32  12  12  12  12  12  12  11  11
11  10  11  11
22:  32  32  32  32  32  32  32  32  32  32  32  32  32  12  12  12  12  12  12  11  11
11  11  10  11
23:  32  32  32  32  32  32  32  32  32  32  32  32  32  12  12  12  12  12  12  11  11
11  11  11  10

```

From /proc/meminfo

```

MemTotal:      527930668 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 Nov 19 03:57 last=5

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

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PowerEdge R7525 (AMD EPYC 7552, 2.20 GHz)

SPECspeed®2017_fp_peak = 157

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)

Vendor: Dell Inc.
Product: PowerEdge R7525
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:

3x 802C80B3802C 36ASF4G72PZ-3G2E2 32 GB 2 rank 3200
1x 802C80B3802C 36ASF4G72PZ-3G2E7 32 GB 2 rank 3200
2x 802C8632802C 36ASF4G72PZ-3G2E2 32 GB 2 rank 3200
1x 802C869D802C 36ASF4G72PZ-3G2E2 32 GB 2 rank 3200
9x 80AD863280AD HMA84GR7CJR4N-XN 32 GB 2 rank 3200
16x Not Specified Not Specified

(End of data from sysinfo program)

Compiler Version Notes

=====
C | 619.lbm_s(base, peak) 638.imagick_s(base, peak)
| 644.nab_s(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++, C, Fortran | 607.cactuBSSN_s(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
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
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
```

```
=====  
Fortran          | 603.bwaves_s(base, peak) 649.fotonik3d_s(base, peak)  
                  | 654.roms_s(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, C      | 621.wrf_s(base, peak) 627.cam4_s(base, peak)  
                  | 628.pop2_s(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  
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

Fortran benchmarks:
flang

Benchmarks using both Fortran and C:
flang clang

Benchmarks using Fortran, C, and C++:
clang++ clang flang



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Base Portability Flags

```
603.bwaves_s: -DSPEC_LP64
607.cactuBSSN_s: -DSPEC_LP64
619.lbm_s: -DSPEC_LP64
621.wrf_s: -DSPEC_CASE_FLAG -Mbyteswapio -DSPEC_LP64
627.cam4_s: -DSPEC_CASE_FLAG -DSPEC_LP64
628.pop2_s: -DSPEC_CASE_FLAG -Mbyteswapio -DSPEC_LP64
638.imagick_s: -DSPEC_LP64
644.nab_s: -DSPEC_LP64
649.fotonik3d_s: -DSPEC_LP64
654.roms_s: -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 -DSPEC_OPENMP -fopenmp
-DUSE_OPENMP -fopenmp=libomp -lomp -lpthread -ldl -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 -O3 -march=znver2
-funroll-loops -Mrecursive -mllvm -vector-library=LIBMVEC -z muldefs
-Kieee -fno-finite-math-only -DSPEC_OPENMP -fopenmp -DUSE_OPENMP
-fopenmp=libomp -lomp -lpthread -ldl -lmvec -lamdlibm -ljemalloc
-lflang
```

Benchmarks using both Fortran and C:

```
-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 -funroll-loops -Mrecursive -z muldefs
-Kieee -fno-finite-math-only -DSPEC_OPENMP -fopenmp -DUSE_OPENMP
```

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Base Optimization Flags (Continued)

Benchmarks using both Fortran and C (continued):

```
-fopenmp=libomp -lomp -lpthread -ldl -lmvec -lamdlibm -ljemalloc
-lflang
```

Benchmarks using Fortran, C, and C++:

```
-std=c++98 -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
-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 -mllvm -loop-unswitch-threshold=200000
-mllvm -unroll-threshold=100 -mllvm -enable-partial-unswitch
-funroll-loops -mrecursive -z muldefs -Kieee -fno-finite-math-only
-DSPEC_OPENMP -fopenmp -DUSE_OPENMP -fopenmp=libomp -lomp -lpthread
-ldl -lmvec -lamdlibm -ljemalloc -lflang
```

Base Other Flags

C benchmarks:

```
-Wno-return-type
```

Fortran benchmarks:

```
-Wno-return-type
```

Benchmarks using both Fortran and C:

```
-Wno-return-type
```

Benchmarks using Fortran, C, and C++:

```
-Wno-return-type
```

Peak Compiler Invocation

C benchmarks:

```
clang
```

Fortran benchmarks:

```
flang
```

(Continued on next page)



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Peak Compiler Invocation (Continued)

Benchmarks using both Fortran and C:

flang clang

Benchmarks using Fortran, C, and C++:

clang++ clang flang

Peak Portability Flags

Same as Base Portability Flags

Peak Optimization Flags

C benchmarks:

```
619.lbm_s: -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 -DSPEC_OPENMP -fopenmp
-DUSE_OPENMP -lmvec -lamdlibm -fopenmp=libomp -lomp
-lpthread -ldl -ljemalloc -lflang
```

638.imagick_s: basepeak = yes

644.nab_s: Same as 619.lbm_s

Fortran benchmarks:

603.bwaves_s: basepeak = yes

```
649.fotonik3d_s: -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
-march=znver2 -funroll-loops -Mrecursive
```

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Peak Optimization Flags (Continued)

649.fotonik3d_s (continued):

```
-mllvm -vector-library=LIBMVEC -Kieee
-fno-finite-math-only -DSPEC_OPENMP -fopenmp -DUSE_OPENMP
-fopenmp=libomp -lomp -lpthread -ldl -lmvec -lamdlibm
-ljemalloc -lflang
```

```
654.roms_s: -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,-enable-X86-prefetching -O3 -march=znver2
-funroll-loops -Mrecursive -mllvm -vector-library=LIBMVEC
-Kieee -fno-finite-math-only -DSPEC_OPENMP -fopenmp
-DUSE_OPENMP -fopenmp=libomp -lomp -lpthread -ldl
-lmvec -lamdlibm -ljemalloc -lflang
```

Benchmarks using both Fortran and C:

621.wrf_s: basepeak = yes

627.cam4_s: basepeak = yes

```
628.pop2_s: -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 -O3 -funroll-loops
-Mrecursive -Kieee -fno-finite-math-only -DSPEC_OPENMP
-fopenmp -DUSE_OPENMP -fopenmp=libomp -lomp -lpthread
-ldl -lmvec -lamdlibm -ljemalloc -lflang
```

Benchmarks using Fortran, C, and C++:

```
-std=c++98 -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
```

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Peak Optimization Flags (Continued)

Benchmarks using Fortran, C, and C++ (continued):

```
-mllvm -global-vectorize-slp -mllvm -inline-threshold=1000
-flv-function-specialization -mllvm -unroll-threshold=100
-mllvm -enable-partial-unswitch -mllvm -loop-unswitch-threshold=200000
-O3 -funroll-loops -Mrecursive -Kieee -fno-finite-math-only
-DSPEC_OPENMP -fopenmp -DUSE_OPENMP -fopenmp=libomp -lomp -lpthread
-ldl -lmvec -lamdlibm -ljemalloc -lflang
```

Peak Other Flags

C benchmarks:

```
-Wno-return-type
```

Fortran benchmarks:

```
-Wno-return-type
```

Benchmarks using both Fortran and C:

```
-Wno-return-type
```

Benchmarks using Fortran, C, and C++:

```
-Wno-return-type
```

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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