



# SPEC CPU®2017 Floating Point Speed Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

## Dell Inc.

SPECspeed®2017\_fp\_base = 166

PowerEdge C6525 (AMD EPYC 7642, 2.30 GHz)

SPECspeed®2017\_fp\_peak = 170

CPU2017 License: 55

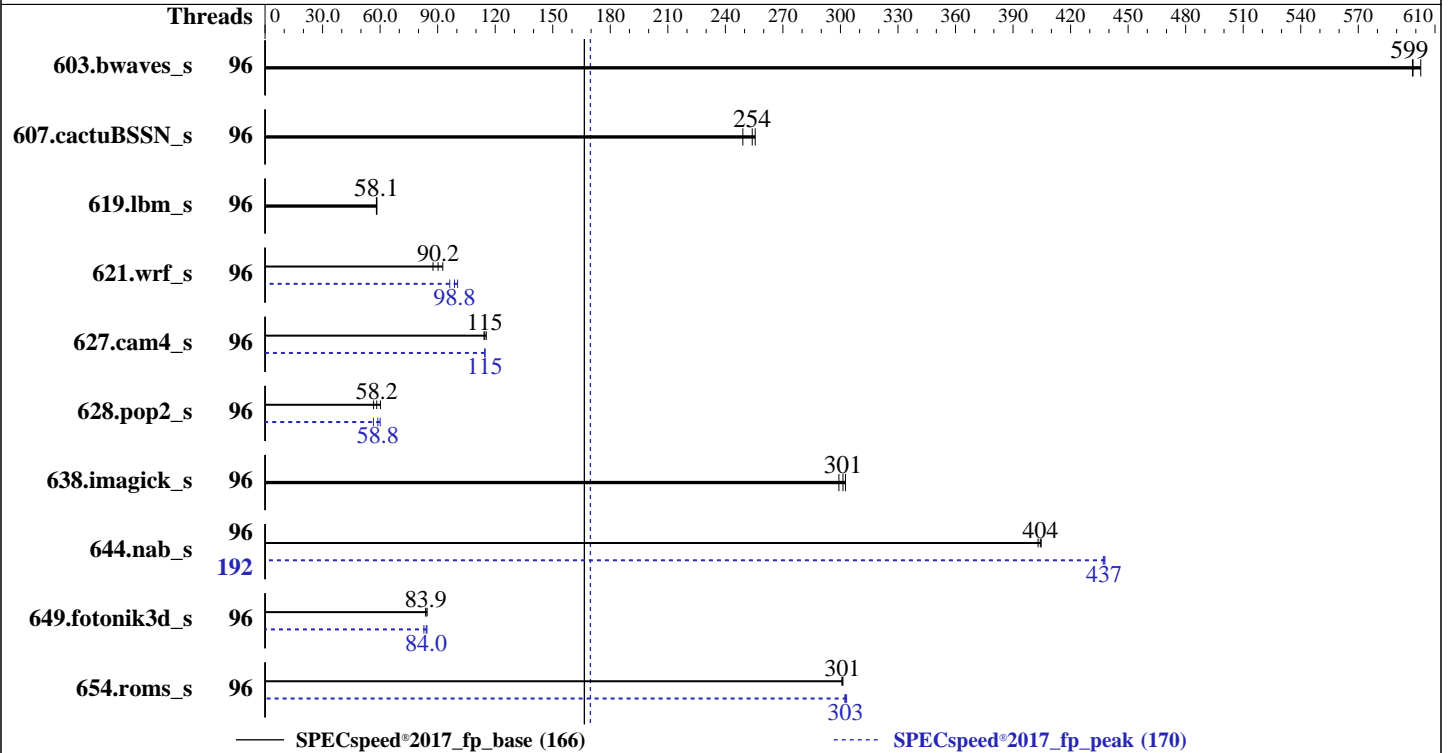
Test Date: Oct-2019

Test Sponsor: Dell Inc.

Hardware Availability: Feb-2020

Tested by: Dell Inc.

Software Availability: Aug-2019



### Hardware

CPU Name: AMD EPYC 7642  
 Max MHz: 3300  
 Nominal: 2300  
 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: 256 MB I+D on chip per chip, 16 MB shared / 3 cores  
 Other: None  
 Memory: 512 GB (16 x 32 GB 2Rx4 PC4-3200AA-R)  
 Storage: 1 x 480 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: Yes  
 Firmware: Version 1.0.1 released Sep-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 v5.2.0  
 Power Management: BIOS set to prefer performance at the cost of additional power usage.



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## Results Table

Benchmark	Base							Peak						
	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
603.bwaves_s	96	97.9	603	98.6	598	<b>98.6</b>	<b>599</b>	96	97.9	603	98.6	598	<b>98.6</b>	<b>599</b>
607.cactuBSSN_s	96	<b>65.6</b>	<b>254</b>	65.2	256	66.9	249	96	<b>65.6</b>	<b>254</b>	65.2	256	66.9	249
619.lbm_s	96	89.8	58.3	90.2	58.1	<b>90.1</b>	<b>58.1</b>	96	89.8	58.3	90.2	58.1	<b>90.1</b>	<b>58.1</b>
621.wrf_s	96	143	92.7	151	87.6	<b>147</b>	<b>90.2</b>	96	<b>134</b>	<b>98.8</b>	132	100	137	96.3
627.cam4_s	96	<b>77.4</b>	<b>115</b>	77.6	114	76.8	115	96	77.3	115	<b>77.3</b>	<b>115</b>	77.4	114
628.pop2_s	96	210	56.6	197	60.2	<b>204</b>	<b>58.2</b>	96	210	56.5	198	60.0	<b>202</b>	<b>58.8</b>
638.imagick_s	96	<b>47.9</b>	<b>301</b>	48.2	299	47.7	303	96	<b>47.9</b>	<b>301</b>	48.2	299	47.7	303
644.nab_s	96	43.4	403	<b>43.2</b>	<b>404</b>	43.2	405	192	39.9	438	40.0	437	<b>39.9</b>	<b>437</b>
649.fotonik3d_s	96	108	84.5	<b>109</b>	<b>83.9</b>	109	83.7	96	110	82.8	<b>108</b>	<b>84.0</b>	108	84.4
654.roms_s	96	52.4	301	52.3	301	<b>52.3</b>	<b>301</b>	96	52.1	302	<b>52.0</b>	<b>303</b>	51.9	303

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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/cpu2017-1.0.5/cpu2017-1.1.0/amd\_speed\_aocc200\_rome\_C\_lib/64;/root  
/cpu2017-1.0.5/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 621.wrf\_s peak run:

GOMP\_CPU\_AFFINITY = "0-95"

Environment variables set by runcpu during the 627.cam4\_s peak run:

GOMP\_CPU\_AFFINITY = "0-95"

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"

## 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)

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## General Notes (Continued)

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  
Memory Interleaving set to Disabled

Sysinfo program /root/cpu2017-1.0.5/cpu2017-1.1.0/bin/sysinfo  
Rev: r6365 of 2019-08-21 295195f888a3d7edble6e46a485a0011  
running on linux-g3ob Sat Oct 26 11:49:19 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 7642 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
siblings  : 96
physical 0: cores 0 1 2 4 5 6 8 9 10 12 13 14 16 17 18 20 21 22 24 25 26 28 29 30
32 33 34 36 37 38 40 41 42 44 45 46 48 49 50 52 53 54 56 57 58 60 61 62
physical 1: cores 0 1 2 4 5 6 8 9 10 12 13 14 16 17 18 20 21 22 24 25 26 28 29 30
32 33 34 36 37 38 40 41 42 44 45 46 48 49 50 52 53 54 56 57 58 60 61 62
```

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## Platform Notes (Continued)

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):          32
Vendor ID:              AuthenticAMD
CPU family:             23
Model:                  49
Model name:             AMD EPYC 7642 48-Core Processor
Stepping:               0
CPU MHz:                2295.709
BogoMIPS:               4591.41
Virtualization:        AMD-V
L1d cache:              32K
L1i cache:              32K
L2 cache:               512K
L3 cache:               16384K
NUMA node0 CPU(s):     0-2,96-98
NUMA node1 CPU(s):     3-5,99-101
NUMA node2 CPU(s):     6-8,102-104
NUMA node3 CPU(s):     9-11,105-107
NUMA node4 CPU(s):     12-14,108-110
NUMA node5 CPU(s):     15-17,111-113
NUMA node6 CPU(s):     18-20,114-116
NUMA node7 CPU(s):     21-23,117-119
NUMA node8 CPU(s):     24-26,120-122
NUMA node9 CPU(s):     27-29,123-125
NUMA node10 CPU(s):    30-32,126-128
NUMA node11 CPU(s):    33-35,129-131
NUMA node12 CPU(s):    36-38,132-134
NUMA node13 CPU(s):    39-41,135-137
NUMA node14 CPU(s):    42-44,138-140
NUMA node15 CPU(s):    45-47,141-143
NUMA node16 CPU(s):    48-50,144-146
NUMA node17 CPU(s):    51-53,147-149
NUMA node18 CPU(s):    54-56,150-152
NUMA node19 CPU(s):    57-59,153-155
NUMA node20 CPU(s):    60-62,156-158
NUMA node21 CPU(s):    63-65,159-161
NUMA node22 CPU(s):    66-68,162-164

```

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## Platform Notes (Continued)

NUMA node23 CPU(s): 69-71,165-167  
 NUMA node24 CPU(s): 72-74,168-170  
 NUMA node25 CPU(s): 75-77,171-173  
 NUMA node26 CPU(s): 78-80,174-176  
 NUMA node27 CPU(s): 81-83,177-179  
 NUMA node28 CPU(s): 84-86,180-182  
 NUMA node29 CPU(s): 87-89,183-185  
 NUMA node30 CPU(s): 90-92,186-188  
 NUMA node31 CPU(s): 93-95,189-191

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 pri  
 pclmulqdq monitor ssse3 fma cx16 sse4\_1 sse4\_2 x2apic movbe popcnt aes xsave avx  
 fl6c 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)
node 0 cpus: 0 1 2 96 97 98
node 0 size: 15676 MB
node 0 free: 15631 MB
node 1 cpus: 3 4 5 99 100 101
node 1 size: 16126 MB
node 1 free: 16100 MB
node 2 cpus: 6 7 8 102 103 104
node 2 size: 16126 MB
node 2 free: 16109 MB
node 3 cpus: 9 10 11 105 106 107
node 3 size: 16125 MB
node 3 free: 16107 MB
node 4 cpus: 12 13 14 108 109 110
node 4 size: 16126 MB
node 4 free: 15976 MB
node 5 cpus: 15 16 17 111 112 113
node 5 size: 16126 MB
node 5 free: 16042 MB
node 6 cpus: 18 19 20 114 115 116
  
```

(Continued on next page)



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## Platform Notes (Continued)

```

node 6 size: 16126 MB
node 6 free: 15755 MB
node 7 cpus: 21 22 23 117 118 119
node 7 size: 16125 MB
node 7 free: 16038 MB
node 8 cpus: 24 25 26 120 121 122
node 8 size: 16126 MB
node 8 free: 16070 MB
node 9 cpus: 27 28 29 123 124 125
node 9 size: 16126 MB
node 9 free: 16107 MB
node 10 cpus: 30 31 32 126 127 128
node 10 size: 16126 MB
node 10 free: 16107 MB
node 11 cpus: 33 34 35 129 130 131
node 11 size: 16125 MB
node 11 free: 16096 MB
node 12 cpus: 36 37 38 132 133 134
node 12 size: 16126 MB
node 12 free: 16108 MB
node 13 cpus: 39 40 41 135 136 137
node 13 size: 16126 MB
node 13 free: 16109 MB
node 14 cpus: 42 43 44 138 139 140
node 14 size: 16126 MB
node 14 free: 16109 MB
node 15 cpus: 45 46 47 141 142 143
node 15 size: 16113 MB
node 15 free: 16096 MB
node 16 cpus: 48 49 50 144 145 146
node 16 size: 16126 MB
node 16 free: 16110 MB
node 17 cpus: 51 52 53 147 148 149
node 17 size: 16126 MB
node 17 free: 16110 MB
node 18 cpus: 54 55 56 150 151 152
node 18 size: 16126 MB
node 18 free: 16110 MB
node 19 cpus: 57 58 59 153 154 155
node 19 size: 16096 MB
node 19 free: 16080 MB
node 20 cpus: 60 61 62 156 157 158
node 20 size: 16126 MB
node 20 free: 16110 MB
node 21 cpus: 63 64 65 159 160 161
node 21 size: 16126 MB
node 21 free: 16110 MB

```

(Continued on next page)



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## Platform Notes (Continued)

```

node 22 cpus: 66 67 68 162 163 164
node 22 size: 16126 MB
node 22 free: 16110 MB
node 23 cpus: 69 70 71 165 166 167
node 23 size: 16125 MB
node 23 free: 16110 MB
node 24 cpus: 72 73 74 168 169 170
node 24 size: 16126 MB
node 24 free: 16106 MB
node 25 cpus: 75 76 77 171 172 173
node 25 size: 16126 MB
node 25 free: 16110 MB
node 26 cpus: 78 79 80 174 175 176
node 26 size: 16126 MB
node 26 free: 16110 MB
node 27 cpus: 81 82 83 177 178 179
node 27 size: 16125 MB
node 27 free: 16109 MB
node 28 cpus: 84 85 86 180 181 182
node 28 size: 16126 MB
node 28 free: 16110 MB
node 29 cpus: 87 88 89 183 184 185
node 29 size: 16126 MB
node 29 free: 16107 MB
node 30 cpus: 90 91 92 186 187 188
node 30 size: 16126 MB
node 30 free: 16110 MB
node 31 cpus: 93 94 95 189 190 191
node 31 size: 16124 MB
node 31 free: 16108 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 21 22 23 24 25 26 27 28 29 30 31
0: 10 11 11 11 12 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
1: 11 10 11 11 12 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
2: 11 11 10 11 12 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
3: 11 11 11 10 12 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
4: 12 12 12 12 10 11 11 11 12 12 12 12 12 12 12 12 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 12 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 12 32 32 32 32
32 32 32 32 32 32 32 32 32 32 32

```

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7:	12	12	12	12	11	11	11	10	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	32
8:	12	12	12	12	12	12	12	12	10	11	11	11	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	32
9:	12	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	32
10:	12	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	32
11:	12	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	32
12:	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	32
13:	12	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	32
14:	12	12	12	12	12	12	12	12	12	12	12	12	12	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	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	32	32
16:	32	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	12
17:	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	11	10	11
12	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	10
12	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	11
12	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	12
10	11	11	11	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
21:	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	12	12	12
11	10	11	11	12	12	12	12	12	12	12	12	12	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	32	12	12	12
11	11	10	11	12	12	12	12	12	12	12	12	12	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	32	12	12	12
11	11	11	10	12	12	12	12	12	12	12	12	12	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	32	12	12	12
12	12	12	12	10	11	11	11	12	12	12	12	12	12	12	12	12	12	12	12	12
25:	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	12	12	12
12	12	12	12	11	10	11	11	12	12	12	12	12	12	12	12	12	12	12	12	12
26:	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	12	12	12
12	12	12	12	11	11	10	11	12	12	12	12	12	12	12	12	12	12	12	12	12
27:	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	12	12	12
12	12	12	12	11	11	11	10	12	12	12	12	12	12	12	12	12	12	12	12	12
28:	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	10	11	11	11	11	11	11	11	11	11	12	12	12
29:	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	11	10	11	11	11	11	11	11	11	12	12	12
30:	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	12	12	12

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# SPEC CPU®2017 Floating Point Speed Result

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Dell Inc.

SPECspeed®2017\_fp\_base = 166

PowerEdge C6525 (AMD EPYC 7642, 2.30 GHz)

SPECspeed®2017\_fp\_peak = 170

CPU2017 License: 55  
Test Sponsor: Dell Inc.  
Tested by: Dell Inc.

Test Date: Oct-2019  
Hardware Availability: Feb-2020  
Software Availability: Aug-2019

## Platform Notes (Continued)

```
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: 527927004 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 Oct 24 12:29
```

```
SPEC is set to: /root/cpu2017-1.0.5/cpu2017-1.1.0
Filesystem Type Size Used Avail Use% Mounted on
/dev/sda2 xfs 440G 32G 409G 8% /
```

```
From /sys/devices/virtual/dmi/id
BIOS: Dell Inc. 1.0.1 09/21/2019
Vendor: Dell Inc.
Product: PowerEdge C6525
Product Family: PowerEdge
```

(Continued on next page)



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## Platform Notes (Continued)

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:

4x 802C80B3802C 36ASF4G72PZ-3G2E2 32 GB 2 rank 3200  
4x 802C869D802C 36ASF4G72PZ-3G2E2 32 GB 2 rank 3200  
8x 80AD863280AD HMA84GR7CJR4N-XN 32 GB 2 rank 3200

(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  
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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CPU2017 License: 55

Test Sponsor: Dell Inc.

Tested by: Dell Inc.

Test Date: Oct-2019

Hardware Availability: Feb-2020

Software Availability: Aug-2019

## Compiler Version Notes (Continued)

```
Fortran          | 603.bwaves_s(base, peak) 649.fotonik3d_s(base, peak)
                  | 654.roms_s(base, peak)
```

```
-----
AOCCLLVM.2.0.0.B191.2019_07_19 clang version 8.0.0 (CLANG: Jenkins
  AOCCLLVM.2.0.0.B191.2019_07_19) (based on LLVM AOCCLLVM.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)
```

```
-----
AOCCLLVM.2.0.0.B191.2019_07_19 clang version 8.0.0 (CLANG: Jenkins
  AOCCLLVM.2.0.0.B191.2019_07_19) (based on LLVM AOCCLLVM.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
AOCCLLVM.2.0.0.B191.2019_07_19 clang version 8.0.0 (CLANG: Jenkins
  AOCCLLVM.2.0.0.B191.2019_07_19) (based on LLVM AOCCLLVM.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

## Base Portability Flags

603.bwaves\_s: -DSPEC\_LP64

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Tested by: Dell Inc.

Software Availability: Aug-2019

## Base Portability Flags (Continued)

```

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

```

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CPU2017 License: 55

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Tested by: Dell Inc.

Test Date: Oct-2019

Hardware Availability: Feb-2020

Software Availability: Aug-2019

## Base Optimization Flags (Continued)

Benchmarks using both Fortran and C (continued):

-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

Benchmarks using both Fortran and C:

flang clang

(Continued on next page)



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SPECspeed®2017\_fp\_peak = 170

CPU2017 License: 55

Test Date: Oct-2019

Test Sponsor: Dell Inc.

Hardware Availability: Feb-2020

Tested by: Dell Inc.

Software Availability: Aug-2019

## Peak Compiler Invocation (Continued)

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: basepeak = yes

638.imagick\_s: basepeak = yes

```

644.nab_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

```

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
-mllvm -vector-library=LIBMVEC -Kieee

```

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## Peak Optimization Flags (Continued)

649.fotonik3d\_s (continued):

```
-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:

```
-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++:

607.cactuBSSN\_s: basepeak = yes

## Peak Other Flags

C benchmarks:

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

Fortran benchmarks:

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

Benchmarks using both Fortran and C:

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

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## Peak Other Flags (Continued)

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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