SPEC CPU®2017 Floating Point Speed Result

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Dell Inc.

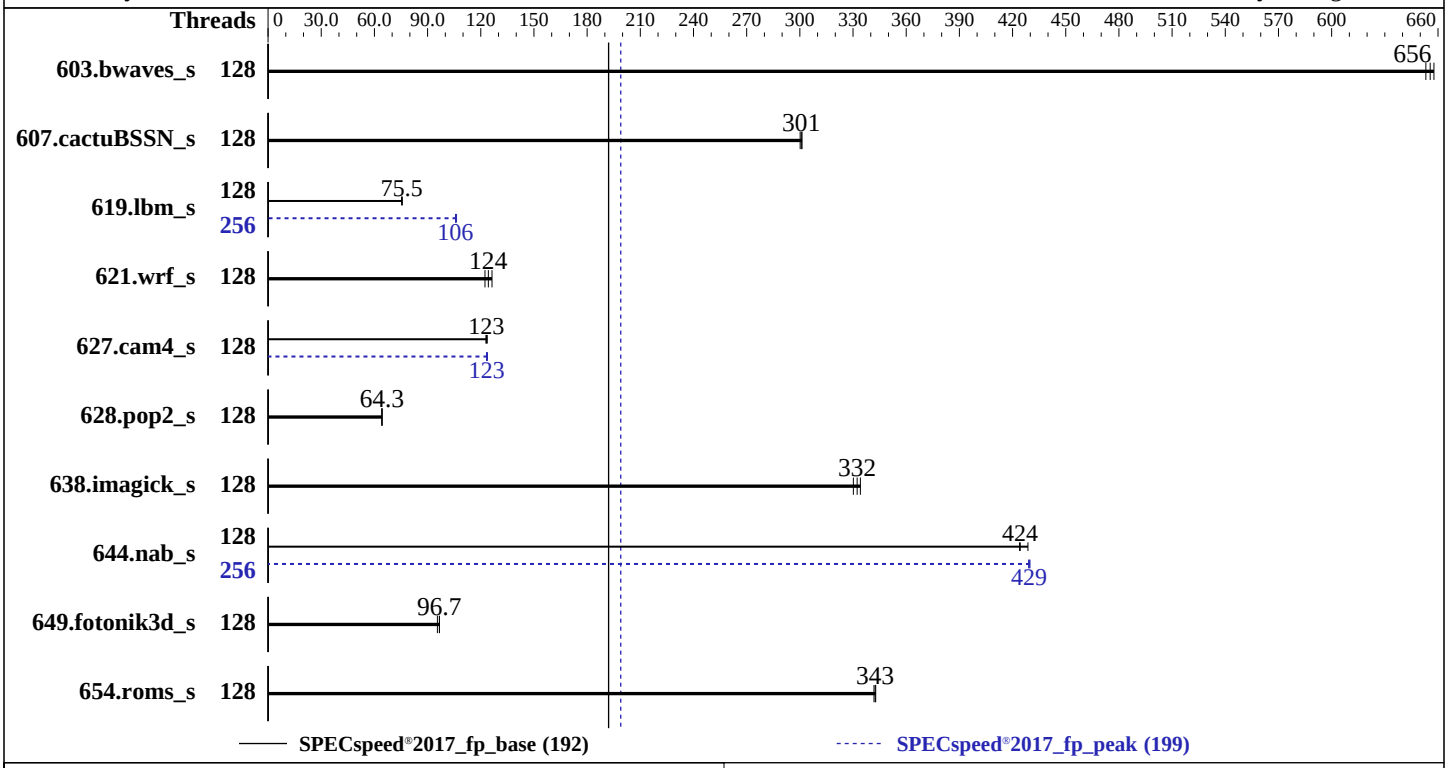
PowerEdge R6525 (AMD EPYC 7702, 2.00 GHz)

SPECspeed®2017_fp_base = 192

SPECspeed®2017_fp_peak = 199

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

Test Date: Sep-2019
Hardware Availability: Oct-2019
Software Availability: Aug-2019



Hardware

CPU Name:	AMD EPYC 7702
Max MHz:	3350
Nominal:	2000
Enabled:	128 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 / 4 cores
Other:	None
Memory:	512 GB (16 x 32 GB 2Rx4 PC4-3200AA-R, running at 3200)
Storage:	1 x 960 GB SAS SSD
Other:	None

Software

OS:	SUSE Linux Enterprise Server 15 SP1 kernel 4.12.14-195-default
Compiler:	C/C++/Fortran: Version 2.0.0 of AOCC
Parallel:	Yes
Firmware:	Version 0.4.12 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 v5.1.0
Power Management:	--

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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	128	89.7	658	90.3	653	**90.0**	**656**	128	89.7	658	90.3	653	**90.0**	**656**
607.cactuBSSN_s	128	55.3	301	**55.4**	**301**	55.5	300	128	55.3	301	**55.4**	**301**	55.5	300
619.lbm_s	128	69.5	75.4	69.2	75.7	**69.3**	**75.5**	256	49.3	106	49.5	106	**49.5**	**106**
621.wrf_s	128	**106**	**124**	105	126	108	122	128	**106**	**124**	105	126	108	122
627.cam4_s	128	71.7	124	**71.9**	**123**	72.1	123	128	71.9	123	**71.8**	**123**	71.6	124
628.pop2_s	128	**185**	**64.3**	185	64.3	185	64.2	128	**185**	**64.3**	185	64.3	185	64.2
638.imagick_s	128	**43.4**	**332**	43.2	334	43.7	330	128	**43.4**	**332**	43.2	334	43.7	330
644.nab_s	128	40.8	429	41.2	424	**41.2**	**424**	256	**40.7**	**429**	40.7	429	40.6	430
649.fotonik3d_s	128	94.3	96.7	95.4	95.5	**94.3**	**96.7**	128	94.3	96.7	95.4	95.5	**94.3**	**96.7**
654.roms_s	128	46.1	342	**46.0**	**343**	45.9	343	128	46.1	342	**46.0**	**343**	45.9	343

SPECspeed®2017_fp_base = **192**

SPECspeed®2017_fp_peak = **199**

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)
```

General Notes

```
Environment variables set by runcpu before the start of the run:
GOMP_CPU_AFFINITY = "0-255"
LD_LIBRARY_PATH = "/root/cpu2017-1.0.5/amd_speed_aocc200_rome_B_lib/64;
/root/cpu2017-1.0.5/amd_speed_aocc200_rome_B_lib/32:"
MALLOC_CONF = "retain:true"
OMP_DYNAMIC = "false"
OMP_SCHEDULE = "static"
OMP_STACKSIZE = "128M"
OMP_THREAD_LIMIT = "256"

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 4
 CCX as NUMA Domain set to Enabled
 System Profile set to Custom
 CPU Power Management set to Maximum Performance
 Memory Frequency set to Maximum Performance
 Turbo Boost Enabled
 Cstates set to Enabled
 Memory Patrol Scrub Disabled
 Memory Refresh Rate set to 1x
 PCI ASPM L1 Link Power Management Disabled
 Determinism Slider set to Power Determinism
 Efficiency Optimized Mode Disabled
 Sysinfo program /root/cpu2017-1.0.5/bin/sysinfo
 Rev: r5974 of 2018-05-19 9bcde8f2999c33d61f64985e45859ea9
 running on linux-g3ob Thu Sep 19 15:08:24 2019

 SUT (System Under Test) info as seen by some common utilities.
 For more information on this section, see
    https://www.spec.org/cpu2017/Docs/config.html#sysinfo
```

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Platform Notes (Continued)

```
From /proc/cpuinfo
   model name : AMD EPYC 7702 64-Core Processor
      2  "physical id"s (chips)
      256 "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 : 64
      siblings  : 128
      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 48 49 50 51 52
      53 54 55 56 57 58 59 60 61 62 63
      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 48 49 50 51 52
      53 54 55 56 57 58 59 60 61 62 63

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):              256
     On-line CPU(s) list: 0-255
     Thread(s) per core:  2
     Core(s) per socket:  64
     Socket(s):           2
     NUMA node(s):        32
     Vendor ID:           AuthenticAMD
     CPU family:          23
     Model:               49
     Model name:          AMD EPYC 7702 64-Core Processor
     Stepping:            0
     CPU MHz:             1996.439
     BogoMIPS:            3992.87
     Virtualization:      AMD-V
     L1d cache:           32K
     L1i cache:           32K
     L2 cache:            512K
     L3 cache:            16384K
     NUMA node0 CPU(s):   0-3,128-131
     NUMA node1 CPU(s):   4-7,132-135
     NUMA node2 CPU(s):   8-11,136-139
     NUMA node3 CPU(s):   12-15,140-143
     NUMA node4 CPU(s):   16-19,144-147
     NUMA node5 CPU(s):   20-23,148-151
     NUMA node6 CPU(s):   24-27,152-155
     NUMA node7 CPU(s):   28-31,156-159
```

(Continued on next page)

Platform Notes (Continued)

```
      NUMA node8 CPU(s):   32-35,160-163
      NUMA node9 CPU(s):   36-39,164-167
      NUMA node10 CPU(s):  40-43,168-171
      NUMA node11 CPU(s):  44-47,172-175
      NUMA node12 CPU(s):  48-51,176-179
      NUMA node13 CPU(s):  52-55,180-183
      NUMA node14 CPU(s):  56-59,184-187
      NUMA node15 CPU(s):  60-63,188-191
      NUMA node16 CPU(s):  64-67,192-195
      NUMA node17 CPU(s):  68-71,196-199
      NUMA node18 CPU(s):  72-75,200-203
      NUMA node19 CPU(s):  76-79,204-207
      NUMA node20 CPU(s):  80-83,208-211
      NUMA node21 CPU(s):  84-87,212-215
      NUMA node22 CPU(s):  88-91,216-219
      NUMA node23 CPU(s):  92-95,220-223
      NUMA node24 CPU(s):  96-99,224-227
      NUMA node25 CPU(s):  100-103,228-231
      NUMA node26 CPU(s):  104-107,232-235
      NUMA node27 CPU(s):  108-111,236-239
      NUMA node28 CPU(s):  112-115,240-243
      NUMA node29 CPU(s):  116-119,244-247
      NUMA node30 CPU(s):  120-123,248-251
      NUMA node31 CPU(s):  124-127,252-255
      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)
    node 0 cpus: 0 1 2 3 128 129 130 131
    node 0 size: 15548 MB
    node 0 free: 15496 MB
    node 1 cpus: 4 5 6 7 132 133 134 135
```


(Continued on next page)

Platform Notes (Continued)

```
node 1 size: 16126 MB
node 1 free: 16078 MB
node 2 cpus: 8 9 10 11 136 137 138 139
node 2 size: 16126 MB
node 2 free: 16015 MB
node 3 cpus: 12 13 14 15 140 141 142 143
node 3 size: 16126 MB
node 3 free: 15914 MB
node 4 cpus: 16 17 18 19 144 145 146 147
node 4 size: 16126 MB
node 4 free: 16100 MB
node 5 cpus: 20 21 22 23 148 149 150 151
node 5 size: 16126 MB
node 5 free: 16099 MB
node 6 cpus: 24 25 26 27 152 153 154 155
node 6 size: 16126 MB
node 6 free: 16096 MB
node 7 cpus: 28 29 30 31 156 157 158 159
node 7 size: 16126 MB
node 7 free: 16091 MB
node 8 cpus: 32 33 34 35 160 161 162 163
node 8 size: 16096 MB
node 8 free: 16066 MB
node 9 cpus: 36 37 38 39 164 165 166 167
node 9 size: 16126 MB
node 9 free: 16104 MB
node 10 cpus: 40 41 42 43 168 169 170 171
node 10 size: 16126 MB
node 10 free: 16106 MB
node 11 cpus: 44 45 46 47 172 173 174 175
node 11 size: 16126 MB
node 11 free: 16108 MB
node 12 cpus: 48 49 50 51 176 177 178 179
node 12 size: 16126 MB
node 12 free: 16085 MB
node 13 cpus: 52 53 54 55 180 181 182 183
node 13 size: 16126 MB
node 13 free: 16107 MB
node 14 cpus: 56 57 58 59 184 185 186 187
node 14 size: 16126 MB
node 14 free: 16099 MB
node 15 cpus: 60 61 62 63 188 189 190 191
node 15 size: 16110 MB
node 15 free: 16076 MB
node 16 cpus: 64 65 66 67 192 193 194 195
node 16 size: 16126 MB
node 16 free: 16103 MB
```

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Platform Notes (Continued)

```
node 17 cpus: 68 69 70 71 196 197 198 199
node 17 size: 16126 MB
node 17 free: 16108 MB
node 18 cpus: 72 73 74 75 200 201 202 203
node 18 size: 16126 MB
node 18 free: 16108 MB
node 19 cpus: 76 77 78 79 204 205 206 207
node 19 size: 16126 MB
node 19 free: 16109 MB
node 20 cpus: 80 81 82 83 208 209 210 211
node 20 size: 16126 MB
node 20 free: 16107 MB
node 21 cpus: 84 85 86 87 212 213 214 215
node 21 size: 16126 MB
node 21 free: 16107 MB
node 22 cpus: 88 89 90 91 216 217 218 219
node 22 size: 16126 MB
node 22 free: 16108 MB
node 23 cpus: 92 93 94 95 220 221 222 223
node 23 size: 16126 MB
node 23 free: 16109 MB
node 24 cpus: 96 97 98 99 224 225 226 227
node 24 size: 16126 MB
node 24 free: 16108 MB
node 25 cpus: 100 101 102 103 228 229 230 231
node 25 size: 16126 MB
node 25 free: 16108 MB
node 26 cpus: 104 105 106 107 232 233 234 235
node 26 size: 16126 MB
node 26 free: 16109 MB
node 27 cpus: 108 109 110 111 236 237 238 239
node 27 size: 16126 MB
node 27 free: 16108 MB
node 28 cpus: 112 113 114 115 240 241 242 243
node 28 size: 16126 MB
node 28 free: 16108 MB
node 29 cpus: 116 117 118 119 244 245 246 247
node 29 size: 16126 MB
node 29 free: 16108 MB
node 30 cpus: 120 121 122 123 248 249 250 251
node 30 size: 16126 MB
node 30 free: 16109 MB
node 31 cpus: 124 125 126 127 252 253 254 255
node 31 size: 16119 MB
node 31 free: 16101 MB
node distances:
node   0   1   2   3   4   5   6   7   8   9  10  11  12  13  14  15  16  17  18  19
```

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Platform Notes (Continued)

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

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Platform Notes (Continued)

```
    23:  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  11  11  11  11
    11  11  11  10  11  11  11  11  11  11  11  11
    24:  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  11  11  11  11
    11  11  11  11  10  11  11  11  11  11  11  11
    25:  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  11  11  11  11
    11  11  11  11  11  10  11  11  11  11  11  11
    26:  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  11  11  11  11
    11  11  11  11  11  11  10  11  11  11  11  11
    27:  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  11  11  11  11
    11  11  11  11  11  11  11  10  11  11  11  11
    28:  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  11  11  11  11
    11  11  11  11  11  11  11  11  10  11  11  11
    29:  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  11  11  11  11
    11  11  11  11  11  11  11  11  11  10  11  11
    30:  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  11  11  11  11
    11  11  11  11  11  11  11  11  11  11  10  11
    31:  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  11  11  11  11
    11  11  11  11  11  11  11  11  11  11  11  10

  From /proc/meminfo
     MemTotal:       527783204 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-2017-5754 (Meltdown):          Not affected
  CVE-2017-5753 (Spectre variant 1): Mitigation: __user pointer sanitization
  CVE-2017-5715 (Spectre variant 2): Mitigation: Full AMD retpoline, IBPB: conditional,
  IBRS_FW, STIBP: conditional, RSB filling

  run-level 3 Sep 19 09:49
```

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Platform Notes (Continued)

```
 SPEC is set to: /root/cpu2017-1.0.5
    Filesystem     Type  Size  Used Avail Use% Mounted on
    /dev/sda2      xfs   440G   20G  421G   5% /

 Additional information from dmidecode follows.  WARNING: Use caution when you interpret
 this section. The 'dmidecode' program reads system data which is "intended to allow
 hardware to be accurately determined", but the intent may not be met, as there are
 frequent changes to hardware, firmware, and the "DMTF SMBIOS" standard.
   BIOS Dell Inc. 0.4.12 09/11/2019
   Memory:
    16x 802C80B3802C 36ASF4G72PZ-3G2E2 32 GB 2 rank 3200
    16x Not Specified Not Specified

 (End of data from sysinfo program)
```

Compiler Version Notes

```
==============================================================================
C               | 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
```


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Compiler Version Notes (Continued)

```
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`

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
-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 -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
-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 -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`

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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: basepeak = yes

654.roms_s: basepeak = yes

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Peak Optimization Flags (Continued)

Benchmarks using both Fortran and C:

621.wrf_s: `basepeak = yes`

627.cam4_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`

628.pop2_s: `basepeak = yes`

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`

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-revE4.2019-10-15.html`

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2017/flags/aocc200-flags-B1-speed-Dell.xml
http://www.spec.org/cpu2017/flags/Dell-Platform-Flags-PowerEdge-revE4.2019-10-15.xml

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