SPEC CPU®2017 Floating Point Speed Result

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Dell Inc.

PowerEdge C6525 (AMD EPYC 7742, 2.25 GHz)

$SPECspeed^{®}2017\_fp\_base = 191$

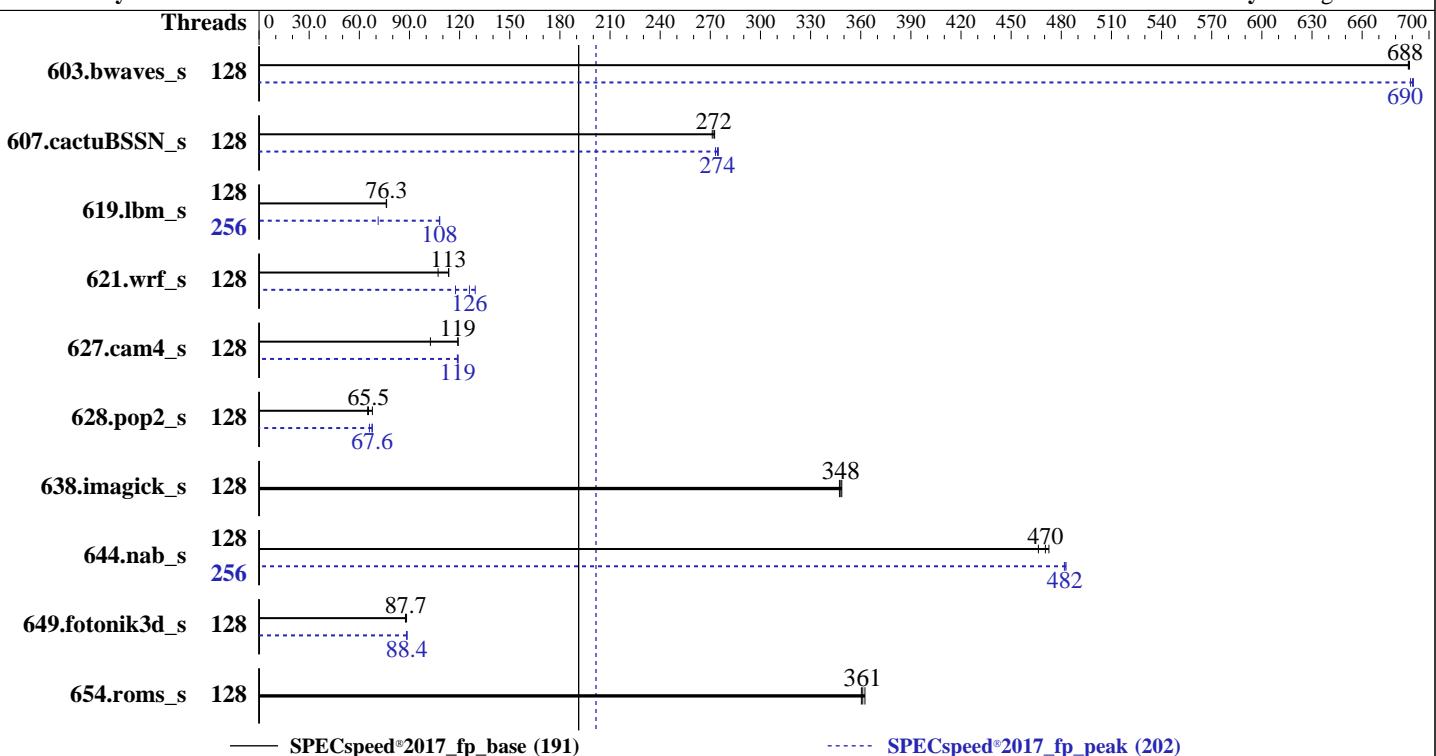$SPECspeed^{®}2017\_fp\_peak = 202$

CPU2017 License: 55

Test Sponsor: Dell Inc.

Tested by: Dell Inc.

Test Date: Nov-2019

Hardware Availability: Feb-2020

Software Availability: Aug-2019

Threads chart:

- **603.bwaves_s** 128: 688; 256(peak): 690
- **607.cactuBSSN_s** 128: 272; peak: 274
- **619.lbm_s** 128: 76.3; 256: 108
- **621.wrf_s** 128: 113; peak: 126
- **627.cam4_s** 128: 119; peak: 119
- **628.pop2_s** 128: 65.5; peak: 67.6
- **638.imagick_s** 128: 348
- **644.nab_s** 128: 470; 256: 482
- **649.fotonik3d_s** 128: 87.7; peak: 88.4
- **654.roms_s** 128: 361

—— **SPECspeed®2017_fp_base (191)**   ------ **SPECspeed®2017_fp_peak (202)**

Hardware

CPU Name: AMD EPYC 7742
 Max MHz: 3400
 Nominal: 2250
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)
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: Yes
Firmware: Version 1.2.2 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 v5.2.0
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	128	85.7	688	**85.8**	**688**	85.8	688	128	85.6	689	85.4	691	**85.5**	**690**
607.cactuBSSN_s	128	61.2	273	**61.3**	**272**	61.5	271	128	60.7	275	61.0	273	**60.8**	**274**
619.lbm_s	128	68.6	76.3	68.8	76.1	**68.7**	**76.3**	256	**48.5**	**108**	73.5	71.3	48.4	108
621.wrf_s	128	123	107	117	114	**117**	**113**	128	113	118	**105**	**126**	102	129
627.cam4_s	128	74.4	119	86.5	103	**74.6**	**119**	128	74.7	119	**74.5**	**119**	74.4	119
628.pop2_s	128	183	65.0	175	67.8	**181**	**65.5**	128	**176**	**67.6**	175	67.7	180	66.0
638.imagick_s	128	**41.4**	**348**	41.4	349	41.5	347	128	**41.4**	**348**	41.4	349	41.5	347
644.nab_s	128	37.0	473	37.5	466	**37.1**	**470**	256	**36.2**	**482**	36.2	483	36.3	482
649.fotonik3d_s	128	104	87.6	**104**	**87.7**	103	88.2	128	103	88.5	103	88.3	**103**	**88.4**
654.roms_s	128	43.4	363	**43.6**	**361**	43.7	360	128	43.4	363	**43.6**	**361**	43.7	360
SPECspeed®2017_fp_base =		**191**												
SPECspeed®2017_fp_peak =								**202**						

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)
```

Standard Performance Evaluation Corporation (info@spec.org)   https://www.spec.org/

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Environment Variables 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/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 = "256"

Environment variables set by runcpu during the 603.bwaves_s peak run:
GOMP_CPU_AFFINITY = "0-127"

Environment variables set by runcpu during the 607.cactuBSSN_s peak run:
GOMP_CPU_AFFINITY = "0-127"

Environment variables set by runcpu during the 619.lbm_s peak run:
GOMP_CPU_AFFINITY = "0 128 1 129 2 130 3 131 4 132 5 133 6 134 7 135 8 136 9
      137 10 138 11 139 12 140 13 141 14 142 15 143 16 144 17 145 18 146 19
      147 20 148 21 149 22 150 23 151 24 152 25 153 26 154 27 155 28 156 29
      157 30 158 31 159 32 160 33 161 34 162 35 163 36 164 37 165 38 166 39
      167 40 168 41 169 42 170 43 171 44 172 45 173 46 174 47 175 48 176 49
      177 50 178 51 179 52 180 53 181 54 182 55 183 56 184 57 185 58 186 59
      187 60 188 61 189 62 190 63 191 64 192 65 193 66 194 67 195 68 196 69
      197 70 198 71 199 72 200 73 201 74 202 75 203 76 204 77 205 78 206 79
      207 80 208 81 209 82 210 83 211 84 212 85 213 86 214 87 215 88 216 89
      217 90 218 91 219 92 220 93 221 94 222 95 223 96 224 97 225 98 226 99
      227 100 228 101 229 102 230 103 231 104 232 105 233 106 234 107 235 108
      236 109 237 110 238 111 239 112 240 113 241 114 242 115 243 116 244 117
      245 118 246 119 247 120 248 121 249 122 250 123 251 124 252 125 253 126
      254 127 255"

Environment variables set by runcpu during the 621.wrf_s peak run:
GOMP_CPU_AFFINITY = "0-127"

Environment variables set by runcpu during the 627.cam4_s peak run:
GOMP_CPU_AFFINITY = "0-127"

Environment variables set by runcpu during the 628.pop2_s peak run:
GOMP_CPU_AFFINITY = "0-127"

Environment variables set by runcpu during the 644.nab_s peak run:
GOMP_CPU_AFFINITY = "0 128 1 129 2 130 3 131 4 132 5 133 6 134 7 135 8 136 9
      137 10 138 11 139 12 140 13 141 14 142 15 143 16 144 17 145 18 146 19
      147 20 148 21 149 22 150 23 151 24 152 25 153 26 154 27 155 28 156 29
      157 30 158 31 159 32 160 33 161 34 162 35 163 36 164 37 165 38 166 39
```

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Environment Variables Notes (Continued)

```
    167 40 168 41 169 42 170 43 171 44 172 45 173 46 174 47 175 48 176 49
    177 50 178 51 179 52 180 53 181 54 182 55 183 56 184 57 185 58 186 59
    187 60 188 61 189 62 190 63 191 64 192 65 193 66 194 67 195 68 196 69
    197 70 198 71 199 72 200 73 201 74 202 75 203 76 204 77 205 78 206 79
    207 80 208 81 209 82 210 83 211 84 212 85 213 86 214 87 215 88 216 89
    217 90 218 91 219 92 220 93 221 94 222 95 223 96 224 97 225 98 226 99
    227 100 228 101 229 102 230 103 231 104 232 105 233 106 234 107 235 108
    236 109 237 110 238 111 239 112 240 113 241 114 242 115 243 116 244 117
    245 118 246 119 247 120 248 121 249 122 250 123 251 124 252 125 253 126
    254 127 255"

Environment variables set by runcpu during the 649.fotonik3d_s peak run:
GOMP_CPU_AFFINITY = "0-127"
```

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 5.2.0 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
```

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Platform Notes (Continued)

```
 Memory Interleaving set to Disabled

 Sysinfo program /root/cpu2017-1.0.5/cpu2017-1.1.0/bin/sysinfo
 Rev: r6365 of 2019-08-21 295195f888a3d7edb1e6e46a485a0011
 running on linux-g3ob Fri Nov 22 15:42:03 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 7742 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 7742 64-Core Processor
      Stepping:            0
      CPU MHz:             2245.845
      BogoMIPS:            4491.69
      Virtualization:      AMD-V
      L1d cache:           32K
      L1i cache:           32K
      L2 cache:            512K
```

(Continued on next page)

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Platform Notes (Continued)

```
    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
    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
```

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Platform Notes (Continued)

```
      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: 15675 MB
   node 0 free: 15618 MB
   node 1 cpus: 4 5 6 7 132 133 134 135
   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: 16014 MB
   node 3 cpus: 12 13 14 15 140 141 142 143
   node 3 size: 16125 MB
   node 3 free: 16096 MB
   node 4 cpus: 16 17 18 19 144 145 146 147
   node 4 size: 16126 MB
   node 4 free: 16098 MB
   node 5 cpus: 20 21 22 23 148 149 150 151
   node 5 size: 16126 MB
   node 5 free: 16105 MB
   node 6 cpus: 24 25 26 27 152 153 154 155
   node 6 size: 16126 MB
   node 6 free: 16097 MB
   node 7 cpus: 28 29 30 31 156 157 158 159
   node 7 size: 16125 MB
   node 7 free: 16065 MB
   node 8 cpus: 32 33 34 35 160 161 162 163
   node 8 size: 16126 MB
   node 8 free: 15961 MB
   node 9 cpus: 36 37 38 39 164 165 166 167
   node 9 size: 16126 MB
   node 9 free: 16105 MB
   node 10 cpus: 40 41 42 43 168 169 170 171
   node 10 size: 16126 MB
   node 10 free: 16107 MB
   node 11 cpus: 44 45 46 47 172 173 174 175
   node 11 size: 16125 MB
   node 11 free: 16106 MB
   node 12 cpus: 48 49 50 51 176 177 178 179
   node 12 size: 16126 MB
   node 12 free: 16088 MB
   node 13 cpus: 52 53 54 55 180 181 182 183
   node 13 size: 16126 MB
   node 13 free: 16096 MB
```

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Platform Notes (Continued)

```
    node 14 cpus: 56 57 58 59 184 185 186 187
    node 14 size: 16126 MB
    node 14 free: 16106 MB
    node 15 cpus: 60 61 62 63 188 189 190 191
    node 15 size: 16113 MB
    node 15 free: 15759 MB
    node 16 cpus: 64 65 66 67 192 193 194 195
    node 16 size: 16126 MB
    node 16 free: 16107 MB
    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: 16096 MB
    node 18 free: 16077 MB
    node 19 cpus: 76 77 78 79 204 205 206 207
    node 19 size: 16125 MB
    node 19 free: 16105 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: 16108 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: 16125 MB
    node 23 free: 16105 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: 16104 MB
    node 27 cpus: 108 109 110 111 236 237 238 239
    node 27 size: 16125 MB
    node 27 free: 16107 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
```

(Continued on next page)

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Platform Notes (Continued)

```
     node 29 free: 16108 MB
     node 30 cpus: 120 121 122 123 248 249 250 251
     node 30 size: 16126 MB
     node 30 free: 16108 MB
     node 31 cpus: 124 125 126 127 252 253 254 255
     node 31 size: 16122 MB
     node 31 free: 16104 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  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  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  32
       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
       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
       9:  12  12  12  12  12  12  12  12  11  10  11  11  12  12  12  12  32  32  32  32
      32  32  32  32  32  32  32  32  32  32  32  32
      10:  12  12  12  12  12  12  12  12  11  11  10  11  12  12  12  12  32  32  32  32
      32  32  32  32  32  32  32  32  32  32  32  32
      11:  12  12  12  12  12  12  12  12  11  11  11  10  12  12  12  12  32  32  32  32
      32  32  32  32  32  32  32  32  32  32  32  32
      12:  12  12  12  12  12  12  12  12  12  12  12  12  10  11  11  11  32  32  32  32
      32  32  32  32  32  32  32  32  32  32  32  32
      13:  12  12  12  12  12  12  12  12  12  12  12  12  11  10  11  11  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  11  11  10  11  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  11  11  11  10  32  32  32  32
      32  32  32  32  32  32  32  32  32  32  32  32
      16:  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  10  11  11  11
      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  11  10  11  11
      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  11  11  10  11
```

(Continued on next page)

Dell Inc.

PowerEdge C6525 (AMD EPYC 7742, 2.25 GHz)

SPECspeed®2017_fp_base = 191

SPECspeed®2017_fp_peak = 202

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)

```
     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  11  11  11  10
     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  12  12  12  12
     10  11  11  11  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  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:       527913928 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
```

(Continued on next page)

Dell Inc.

PowerEdge C6525 (AMD EPYC 7742, 2.25 GHz)

$\text{SPECspeed}^{®}\text{2017\_fp\_base} = 191$

$\text{SPECspeed}^{®}\text{2017\_fp\_peak} = 202$

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)

```
  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 21 09:58

  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   23G  418G   6% /

  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:
      5x 802C80B3802C 36ASF4G72PZ-3G2E2 32 GB 2 rank 3200
      1x 802C8632802C 36ASF4G72PZ-3G2E2 32 GB 2 rank 3200
      5x 802C869D802C 36ASF4G72PZ-3G2E2 32 GB 2 rank 3200
      5x 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
```

(Continued on next page)

Dell Inc.

PowerEdge C6525 (AMD EPYC 7742, 2.25 GHz)

SPECspeed®2017_fp_base = 191

SPECspeed®2017_fp_peak = 202

Compiler Version Notes (Continued)

```
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
-------------------------------------------------------------------------


==========================================================================
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
```

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SPEC CPU®2017 Floating Point Speed Result

Copyright 2017-2020 Standard Performance Evaluation Corporation

Dell Inc.

PowerEdge C6525 (AMD EPYC 7742, 2.25 GHz)

SPECspeed®2017_fp_base = 191

SPECspeed®2017_fp_peak = 202

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

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

Compiler Version Notes (Continued)

```
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
```

(Continued on next page)

Standard Performance Evaluation Corporation (info@spec.org)   https://www.spec.org/

Dell Inc.

PowerEdge C6525 (AMD EPYC 7742, 2.25 GHz)

SPECspeed®2017_fp_base = 191

SPECspeed®2017_fp_peak = 202

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

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

Base Optimization Flags (Continued)

C benchmarks (continued):
```
-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
-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
```

SPEC CPU®2017 Floating Point Speed Result

Copyright 2017-2020 Standard Performance Evaluation Corporation

Dell Inc.

PowerEdge C6525 (AMD EPYC 7742, 2.25 GHz)

SPECspeed®2017_fp_base = 191

SPECspeed®2017_fp_peak = 202

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

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

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
```

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
```

(Continued on next page)

Standard Performance Evaluation Corporation (info@spec.org)

https://www.spec.org/

Dell Inc.

PowerEdge C6525 (AMD EPYC 7742, 2.25 GHz)

SPECspeed®2017_fp_base = 191

SPECspeed®2017_fp_peak = 202

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

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

Peak Optimization Flags (Continued)

619.lbm_s (continued):
```
-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: `-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
-fno-finite-math-only -DSPEC_OPENMP -fopenmp -DUSE_OPENMP
-fopenmp=libomp -lomp -lpthread -ldl -lmvec -lamdlibm
-ljemalloc -lflang
```

649.fotonik3d_s: Same as 603.bwaves_s

654.roms_s: basepeak = yes

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++:
```
-std=c++98 -flto -Wl,-mllvm -Wl,-function-specialize
```

(Continued on next page)

Dell Inc.

PowerEdge C6525 (AMD EPYC 7742, 2.25 GHz)

$SPECspeed®2017\_fp\_base = 191$

$SPECspeed®2017\_fp\_peak = 202$

CPU2017 License: 55		**Test Date:**	Nov-2019
Test Sponsor:	Dell Inc.	**Hardware Availability:**	Feb-2020
Tested by:	Dell Inc.	**Software Availability:**	Aug-2019

Peak Optimization Flags (Continued)

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