SPEC CPU®2017 Floating Point Speed Result

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Dell Inc.

$SPECspeed^{®}2017\_fp\_base = 129$

PowerEdge R7525 (AMD EPYC 7F52, 3.50 GHz)

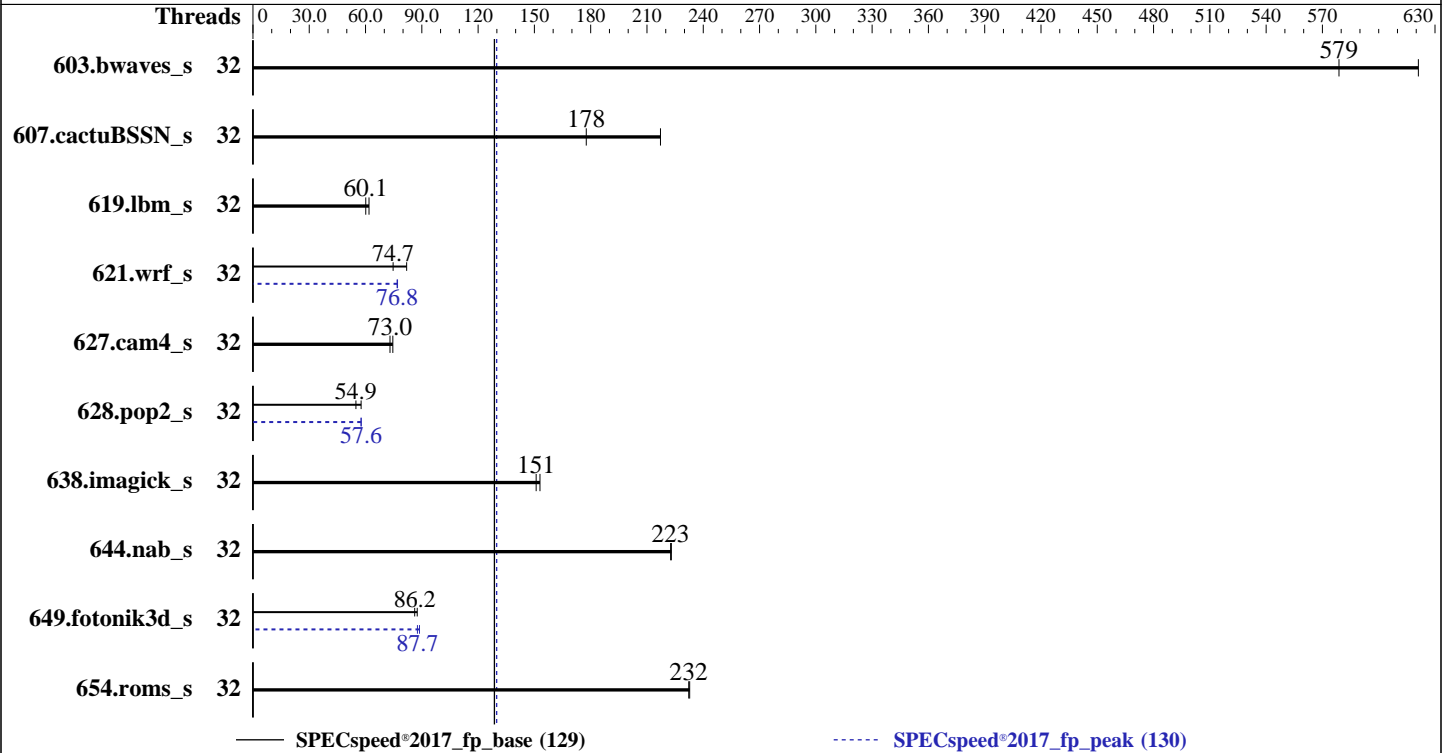$SPECspeed^{®}2017\_fp\_peak = 130$

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

Test Date: Apr-2020
Hardware Availability: Jul-2020
Software Availability: Aug-2019

Threads

Benchmark	Threads	Result
603.bwaves_s	32	579
607.cactuBSSN_s	32	178
619.lbm_s	32	60.1
621.wrf_s	32	74.7 / 76.8
627.cam4_s	32	73.0
628.pop2_s	32	54.9 / 57.6
638.imagick_s	32	151
644.nab_s	32	223
649.fotonik3d_s	32	86.2 / 87.7
654.roms_s	32	232

SPECspeed®2017_fp_base (129)   SPECspeed®2017_fp_peak (130)

Hardware

CPU Name: AMD EPYC 7F52
 Max MHz: 3900
 Nominal: 3500
Enabled: 32 cores, 2 chips
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 per core
 Other: None
Memory: 512 GB (16 x 32 GB 2Rx4 PC4-3200AA-R, running at 3200)
Storage: 1 x 960 GB SATA SSD
Other: None

Software

OS: SUSE Linux Enterprise Server 15 SP1 kernel 4.12.14-195-default
Compiler: C/C++/Fortran: Version 2.0.0 of AOCC
Parallel: Yes
Firmware: Version 1.4.6 released Apr-2020
File System: tmpfs
System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: 64-bit
Other: jemalloc: jemalloc memory allocator library v5.1.0
Power Management: BIOS set to prefer performance at the cost of additional power usage.

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Results Table

Benchmark	Base							Peak						
	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
603.bwaves_s	32	95.0	621	**102**	**579**			32	95.0	621	**102**	**579**		
607.cactuBSSN_s	32	76.7	217	**93.8**	**178**			32	76.7	217	**93.8**	**178**		
619.lbm_s	32	84.7	61.9	**87.1**	**60.1**			32	84.7	61.9	**87.1**	**60.1**		
621.wrf_s	32	**177**	**74.7**	161	81.9			32	172	77.1	**172**	**76.8**		
627.cam4_s	32	119	74.6	**121**	**73.0**			32	119	74.6	**121**	**73.0**		
628.pop2_s	32	**216**	**54.9**	206	57.6			32	**206**	**57.6**	206	57.7		
638.imagick_s	32	94.3	153	**95.6**	**151**			32	94.3	153	**95.6**	**151**		
644.nab_s	32	**78.5**	**223**	78.4	223			32	**78.5**	**223**	78.4	223		
649.fotonik3d_s	32	**106**	**86.2**	104	87.6			32	**104**	**87.7**	103	88.7		
654.roms_s	32	67.6	233	**67.8**	**232**			32	67.6	233	**67.8**	**232**		
SPECspeed®2017_fp_base =	**129**													
SPECspeed®2017_fp_peak =	**130**													

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 = "0-31"
LD_LIBRARY_PATH =
      "/mnt/ramdisk/cpu2017-1.1.0/amd_speed_aocc200_rome_C_lib/64;/mnt/ramdisk
      /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 = "32"

Environment variables set by runcpu during the 621.wrf_s peak run:
GOMP_CPU_AFFINITY = "0 16 1 17 2 18 3 19 4 20 5 21 6 22 7 23 8 24 9 25 10 26
      11 27 12 28 13 29 14 30 15 31"

Environment variables set by runcpu during the 628.pop2_s peak run:
GOMP_CPU_AFFINITY = "0-31"

Environment variables set by runcpu during the 649.fotonik3d_s peak run:
GOMP_CPU_AFFINITY = "0-31"
```

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.
Benchmark run from a 225 GB ramdisk created with the cmd; "mount -t tmpfs -o size=225G tmpfs /mnt/ramdisk".
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
```

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Platform Notes (Continued)

```
  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 Auto
  ApbDis set to Disabled
  DLWM set to Unforced
  Logical Processor Disabled


 Sysinfo program /mnt/ramdisk/cpu2017-1.1.0/bin/sysinfo
 Rev: r6365 of 2019-08-21 295195f888a3d7edb1e6e46a485a0011
 running on linux-g3ob Fri Apr 24 14:57:22 2020

 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 7F52 16-Core Processor
       2  "physical id"s (chips)
       32 "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 : 16
       siblings  : 16
       physical 0: cores 0 4 8 12 16 20 24 28 32 36 40 44 48 52 56 60
       physical 1: cores 0 4 8 12 16 20 24 28 32 36 40 44 48 52 56 60

 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):              32
      On-line CPU(s) list: 0-31
      Thread(s) per core:  1
      Core(s) per socket:  16
      Socket(s):           2
      NUMA node(s):        32
      Vendor ID:           AuthenticAMD
      CPU family:          23
      Model:               49
      Model name:          AMD EPYC 7F52 16-Core Processor
      Stepping:            0
```

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CPU2017 License: 55   **Test Date:** Apr-2020
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Platform Notes (Continued)

```
CPU MHz:               3493.596
BogoMIPS:              6987.19
Virtualization:        AMD-V
L1d cache:             32K
L1i cache:             32K
L2 cache:              512K
L3 cache:              16384K
NUMA node0 CPU(s):     0
NUMA node1 CPU(s):     1
NUMA node2 CPU(s):     2
NUMA node3 CPU(s):     3
NUMA node4 CPU(s):     4
NUMA node5 CPU(s):     5
NUMA node6 CPU(s):     6
NUMA node7 CPU(s):     7
NUMA node8 CPU(s):     8
NUMA node9 CPU(s):     9
NUMA node10 CPU(s):    10
NUMA node11 CPU(s):    11
NUMA node12 CPU(s):    12
NUMA node13 CPU(s):    13
NUMA node14 CPU(s):    14
NUMA node15 CPU(s):    15
NUMA node16 CPU(s):    16
NUMA node17 CPU(s):    17
NUMA node18 CPU(s):    18
NUMA node19 CPU(s):    19
NUMA node20 CPU(s):    20
NUMA node21 CPU(s):    21
NUMA node22 CPU(s):    22
NUMA node23 CPU(s):    23
NUMA node24 CPU(s):    24
NUMA node25 CPU(s):    25
NUMA node26 CPU(s):    26
NUMA node27 CPU(s):    27
NUMA node28 CPU(s):    28
NUMA node29 CPU(s):    29
NUMA node30 CPU(s):    30
NUMA node31 CPU(s):    31
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
```

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Platform Notes (Continued)

```
    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
   node 0 size: 15547 MB
   node 0 free: 15486 MB
   node 1 cpus: 1
   node 1 size: 16127 MB
   node 1 free: 16103 MB
   node 2 cpus: 2
   node 2 size: 16127 MB
   node 2 free: 16089 MB
   node 3 cpus: 3
   node 3 size: 16126 MB
   node 3 free: 16098 MB
   node 4 cpus: 4
   node 4 size: 16098 MB
   node 4 free: 16057 MB
   node 5 cpus: 5
   node 5 size: 16127 MB
   node 5 free: 16090 MB
   node 6 cpus: 6
   node 6 size: 16127 MB
   node 6 free: 16108 MB
   node 7 cpus: 7
   node 7 size: 16126 MB
   node 7 free: 16090 MB
   node 8 cpus: 8
   node 8 size: 16127 MB
   node 8 free: 16104 MB
   node 9 cpus: 9
   node 9 size: 16127 MB
   node 9 free: 16094 MB
   node 10 cpus: 10
   node 10 size: 16127 MB
   node 10 free: 16103 MB
   node 11 cpus: 11
   node 11 size: 16126 MB
   node 11 free: 16104 MB
```

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Platform Notes (Continued)

```
      node 12 cpus: 12
      node 12 size: 16127 MB
      node 12 free: 16105 MB
      node 13 cpus: 13
      node 13 size: 16127 MB
      node 13 free: 16109 MB
      node 14 cpus: 14
      node 14 size: 16127 MB
      node 14 free: 16108 MB
      node 15 cpus: 15
      node 15 size: 16114 MB
      node 15 free: 16091 MB
      node 16 cpus: 16
      node 16 size: 16127 MB
      node 16 free: 16108 MB
      node 17 cpus: 17
      node 17 size: 16127 MB
      node 17 free: 16108 MB
      node 18 cpus: 18
      node 18 size: 16127 MB
      node 18 free: 16111 MB
      node 19 cpus: 19
      node 19 size: 16126 MB
      node 19 free: 16107 MB
      node 20 cpus: 20
      node 20 size: 16127 MB
      node 20 free: 16081 MB
      node 21 cpus: 21
      node 21 size: 16127 MB
      node 21 free: 16112 MB
      node 22 cpus: 22
      node 22 size: 16127 MB
      node 22 free: 16113 MB
      node 23 cpus: 23
      node 23 size: 16126 MB
      node 23 free: 16110 MB
      node 24 cpus: 24
      node 24 size: 16127 MB
      node 24 free: 14169 MB
      node 25 cpus: 25
      node 25 size: 16127 MB
      node 25 free: 16089 MB
      node 26 cpus: 26
      node 26 size: 16127 MB
      node 26 free: 11637 MB
      node 27 cpus: 27
      node 27 size: 16126 MB
```

(Continued on next page)

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Platform Notes (Continued)

```
   node 27 free: 16027 MB
   node 28 cpus: 28
   node 28 size: 16127 MB
   node 28 free: 16110 MB
   node 29 cpus: 29
   node 29 size: 16127 MB
   node 29 free: 16111 MB
   node 30 cpus: 30
   node 30 size: 16127 MB
   node 30 free: 16113 MB
   node 31 cpus: 31
   node 31 size: 16126 MB
   node 31 free: 16106 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
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Platform Notes (Continued)

```
     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
     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:       527825808 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"
```

(Continued on next page)

Dell Inc.

PowerEdge R7525 (AMD EPYC 7F52, 3.50 GHz)

SPECspeed®2017_fp_base = 129

SPECspeed®2017_fp_peak = 130

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

Test Date: Apr-2020
Hardware Availability: Jul-2020
Software Availability: Aug-2019

Platform Notes (Continued)

```
        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: disabled, RSB
                                          filling


run-level 3 Apr 24 11:51 last=5


SPEC is set to: /mnt/ramdisk/cpu2017-1.1.0
    Filesystem      Type   Size  Used Avail Use% Mounted on
    tmpfs           tmpfs  225G  4.3G  221G   2% /mnt/ramdisk

From /sys/devices/virtual/dmi/id
    BIOS:    Dell Inc. 1.4.6 04/10/2020
    Vendor:  Dell Inc.
    Product: PowerEdge R7525
    Product Family: PowerEdge
    Serial:  48LN333


Additional information from dmidecode follows.  WARNING: Use caution when you interpret
this section. The 'dmidecode' program reads system data which is "intended to allow
hardware to be accurately determined", but the intent may not be met, as there are
frequent changes to hardware, firmware, and the "DMTF SMBIOS" standard.
  Memory:
    16x 802C80B3802C 36ASF4G72PZ-3G2E7 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)
```

(Continued on next page)

Dell Inc.

PowerEdge R7525 (AMD EPYC 7F52, 3.50 GHz)

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Compiler Version Notes (Continued)

```
                          | 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
--------------------------------------------------------------------------------


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

(Continued on next page)

Dell Inc.

PowerEdge R7525 (AMD EPYC 7F52, 3.50 GHz)

$SPECspeed®2017\_fp\_base = 129$

$SPECspeed®2017\_fp\_peak = 130$

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

Test Date: Apr-2020
Hardware Availability: Jul-2020
Software Availability: Aug-2019

Compiler Version Notes (Continued)

```
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
```

(Continued on next page)

Dell Inc.

PowerEdge R7525 (AMD EPYC 7F52, 3.50 GHz)

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Base Optimization Flags (Continued)

C benchmarks (continued):
```
-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
-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 -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 -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 -fopenmp=libomp -lomp -lpthread -ldl -lmvec
-lamdlibm -ljemalloc -lflang
```

SPEC CPU®2017 Floating Point Speed Result

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Dell Inc.

PowerEdge R7525 (AMD EPYC 7F52, 3.50 GHz)

SPECspeed®2017_fp_base = 129

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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: `basepeak = yes`

638.imagick_s: `basepeak = yes`

644.nab_s: `basepeak = yes`

(Continued on next page)

Standard Performance Evaluation Corporation (info@spec.org)

https://www.spec.org/

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Software Availability: Aug-2019

Peak Optimization Flags (Continued)

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`
`-fno-finite-math-only -DSPEC_OPENMP -fopenmp`
`-fopenmp=libomp -lomp -lpthread -ldl -lmvec -lamdlibm`
`-ljemalloc -lflang`

654.roms_s: basepeak = yes

Benchmarks using both Fortran and C:

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

627.cam4_s: basepeak = yes

628.pop2_s: `Same as 621.wrf_s`

Benchmarks using Fortran, C, and C++:

607.cactuBSSN_s: basepeak = yes

SPEC CPU®2017 Floating Point Speed Result

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Software Availability: Aug-2019

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-C4.html`
`http://www.spec.org/cpu2017/flags/Dell-Platform-Flags-PowerEdge-revE9.html`

You can also download the XML flags sources by saving the following links:
`http://www.spec.org/cpu2017/flags/aocc200-flags-C4.xml`
`http://www.spec.org/cpu2017/flags/Dell-Platform-Flags-PowerEdge-revE9.xml`

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

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