



# SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2023 Standard Performance Evaluation Corporation

## Dell Inc.

SPECrate®2017\_fp\_base = 1400

PowerEdge R6625 (AMD EPYC 9654 96-Core Processor)

SPECrate®2017\_fp\_peak = Not Run

CPU2017 License: 6573

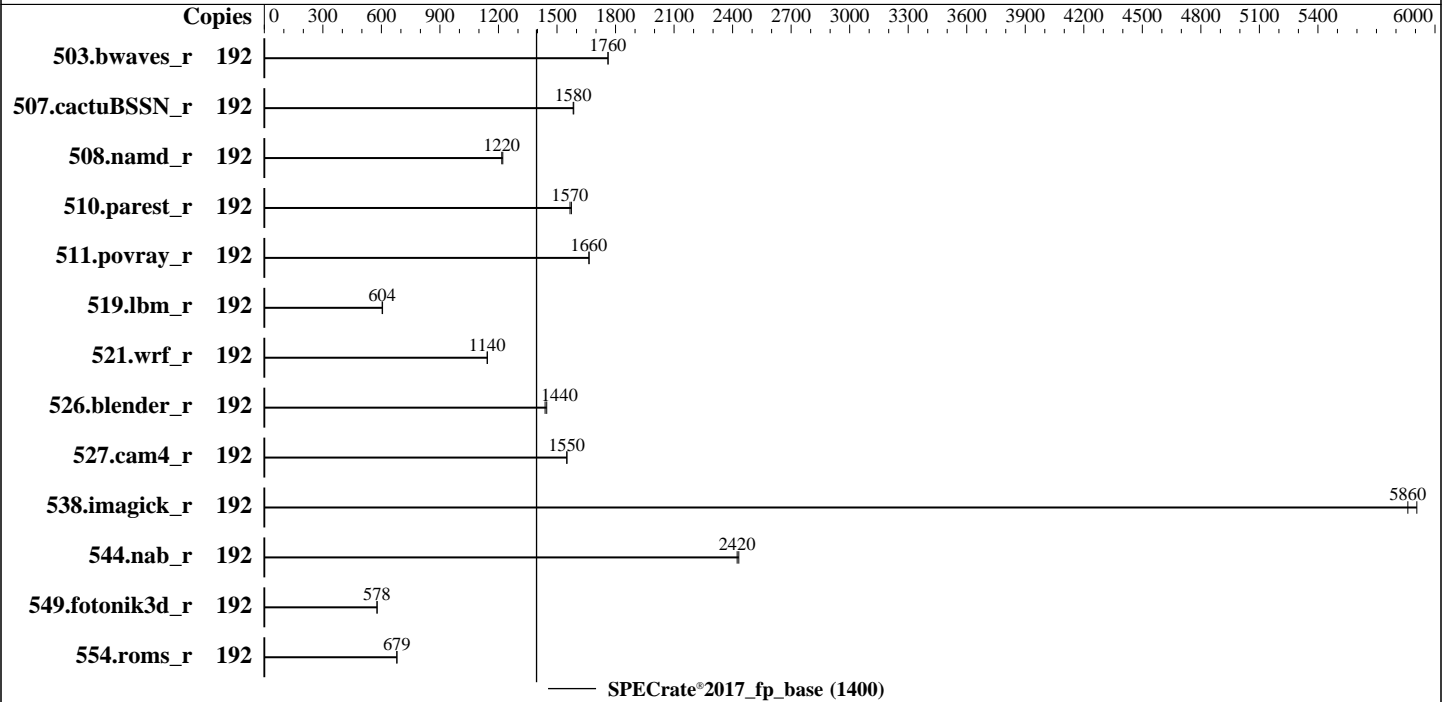
Test Date: Dec-2022

Test Sponsor: Dell Inc.

Hardware Availability: Feb-2023

Tested by: Dell Inc.

Software Availability: Nov-2022



### Hardware

CPU Name: AMD EPYC 9654  
 Max MHz: 3700  
 Nominal: 2400  
 Enabled: 192 cores, 2 chips  
 Orderable: 1,2 chips  
 Cache L1: 32 KB I + 32 KB D on chip per core  
 L2: 1 MB I+D on chip per core  
 L3: 384 MB I+D on chip per chip, 32 MB shared / 8 cores  
 Other: None  
 Memory: 1536 GB (24 x 64 GB 2Rx4 PC5-4800B-R)  
 Storage: 125 GB on tmpfs  
 Other: None

### Software

OS: Ubuntu 22.04.1 LTS  
 5.15.0-46-generic  
 Compiler: C/C++/Fortran: Version 4.0.0 of AOCC  
 Parallel: No  
 Firmware: Version 1.1.0 released Nov-2022  
 File System: tmpfs  
 System State: Run level 3 (multi-user)  
 Base Pointers: 64-bit  
 Peak Pointers: Not Applicable  
 Other: None  
 Power Management: BIOS and OS set to prefer performance at the cost of additional power usage.



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## Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
503.bwaves_r	192	1093	1760	<b><u>1093</u></b>	<b><u>1760</u></b>									
507.cactuBSSN_r	192	153	1590	<b><u>154</u></b>	<b><u>1580</u></b>									
508.namd_r	192	149	1220	<b><u>150</u></b>	<b><u>1220</u></b>									
510.parest_r	192	<b><u>321</u></b>	<b><u>1570</u></b>	319	1570									
511.povray_r	192	<b><u>269</u></b>	<b><u>1660</u></b>	269	1660									
519.lbm_r	192	<b><u>335</u></b>	<b><u>604</u></b>	334	606									
521.wrf_r	192	376	1140	<b><u>377</u></b>	<b><u>1140</u></b>									
526.blender_r	192	<b><u>203</u></b>	<b><u>1440</u></b>	202	1450									
527.cam4_r	192	<b><u>217</u></b>	<b><u>1550</u></b>	216	1550									
538.imagick_r	192	80.8	5910	<b><u>81.5</u></b>	<b><u>5860</u></b>									
544.nab_r	192	133	2430	<b><u>133</u></b>	<b><u>2420</u></b>									
549.fotonik3d_r	192	<b><u>1295</u></b>	<b><u>578</u></b>	1295	578									
554.roms_r	192	449	679	<b><u>449</u></b>	<b><u>679</u></b>									

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Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

## Compiler Notes

The AMD64 AOCC Compiler Suite is available at  
<http://developer.amd.com/amd-aocc/>

## Submit Notes

The config file option 'submit' was used.  
'numactl' was used to bind copies to the cores.  
See the configuration file for details.

## Operating System Notes

'ulimit -s unlimited' was used to set environment stack size limit  
'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>

To limit dirty cache to 8% of memory, 'sysctl -w vm.dirty\_ratio=8' run as root.  
To limit swap usage to minimum necessary, 'sysctl -w vm.swappiness=1' run as root.  
To free node-local memory and avoid remote memory usage,  
'sysctl -w vm.zone\_reclaim\_mode=1' run as root.

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## Operating System Notes (Continued)

To clear filesystem caches, 'sync; sysctl -w vm.drop\_caches=3' run as root.  
To disable address space layout randomization (ASLR) to reduce run-to-run variability, 'sysctl -w kernel.randomize\_va\_space=0' run as root.

To enable Transparent Hugepages (THP) for all allocations, 'echo always > /sys/kernel/mm/transparent\_hugepage/enabled' and 'echo always > /sys/kernel/mm/transparent\_hugepage/defrag' run as root.

## Environment Variables Notes

Environment variables set by runcpu before the start of the run:  
LD\_LIBRARY\_PATH =  
"/mnt/ramdisk/cpu2017-1.1.8-aocc400-B1b/amd\_rate\_aocc400\_genoa\_B\_lib/lib  
:/mnt/ramdisk/cpu2017-1.1.8-aocc400-B1b/amd\_rate\_aocc400\_genoa\_B\_lib/lib  
32:"  
MALLOC\_CONF = "retain:true"

## General Notes

Binaries were compiled on a system with 2x AMD EPYC 9174F CPU + 1.5TiB Memory using RHEL 8.6  
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 125 GB ramdisk created with the cmd: "mount -t tmpfs -o size=125G tmpfs /mnt/ramdisk"

## Platform Notes

BIOS settings:  
DRAM Refresh Delay : Performance  
DIMM Self Healing on  
Uncorrectable Memory Error : Disabled  
Logical Processor : Disabled  
Virtualization Technology : Disabled  
L1 Stride Prefetcher : Disabled  
NUMA Nodes per Socket : 4  
L3 Cache as NUMA Domain : Enabled

(Continued on next page)



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## Platform Notes (Continued)

System Profile : Custom  
 Memory Patrol Scrub : Disabled  
 PCI ASPM L1 Link  
 Power Management : Disabled  
 Determinism Slider : Power Determinism

Sysinfo program /mnt/ramdisk/cpu2017-1.1.8-aocc400-Blb/bin/sysinfo  
 Rev: r6622 of 2021-04-07 982a61ec0915b55891ef0e16acafc64d  
 running on genoa-sut Wed Dec 14 15:55:13 2022

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 9654 96-Core Processor  
 2 "physical id"s (chips)  
 192 "processors"  
 cores, siblings (Caution: counting these is hw and system dependent. The following  
 excerpts from /proc/cpuinfo might not be reliable. Use with caution.)  
 cpu cores : 96  
 siblings : 96  
 physical 0: cores 0 1 2 3 4 5 6 7 16 17 18 19 20 21 22 23 32 33 34 35 36 37 38 39  
 48 49 50 51 52 53 54 55 64 65 66 67 68 69 70 71 80 81 82 83 84 85 86 87 96 97 98 99  
 100 101 102 103 112 113 114 115 116 117 118 119 128 129 130 131 132 133 134 135 144  
 145 146 147 148 149 150 151 160 161 162 163 164 165 166 167 176 177 178 179 180 181  
 182 183  
 physical 1: cores 0 1 2 3 4 5 6 7 16 17 18 19 20 21 22 23 32 33 34 35 36 37 38 39  
 48 49 50 51 52 53 54 55 64 65 66 67 68 69 70 71 80 81 82 83 84 85 86 87 96 97 98 99  
 100 101 102 103 112 113 114 115 116 117 118 119 128 129 130 131 132 133 134 135 144  
 145 146 147 148 149 150 151 160 161 162 163 164 165 166 167 176 177 178 179 180 181  
 182 183

From lscpu from util-linux 2.37.2:  
 Architecture: x86\_64  
 CPU op-mode(s): 32-bit, 64-bit  
 Address sizes: 52 bits physical, 57 bits virtual  
 Byte Order: Little Endian  
 CPU(s): 192  
 On-line CPU(s) list: 0-191  
 Vendor ID: AuthenticAMD  
 Model name: AMD EPYC 9654 96-Core Processor  
 CPU family: 25  
 Model: 17  
 Thread(s) per core: 1  
 Core(s) per socket: 96

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## Platform Notes (Continued)

```

Socket(s):                2
Stepping:                 1
Frequency boost:         enabled
CPU max MHz:              3709.0000
CPU min MHz:              400.0000
BogoMIPS:                 4801.63
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
pdpelgb rdtscp lm constant_tsc rep_good nopl nonstop_tsc cpuid extd_apicid
aperfmpperf rapl pni pclmulqdq monitor sse3 fma cx16 pcid 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_llc mwaitx cpb cat_l3 cdp_l3 invpcid_single hw_pstate ssbd mba ibrs
ibpb stibp vmmcall fsgsbase bmi1 avx2 smep bmi2 erms invpcid cqm rdt_a avx512f
avx512dq rdseed adx smap avx512ifma clflushopt clwb avx512cd sha_ni avx512bw
avx512vl xsaveopt xsavec xgetbv1 xsaves cqm_llc cqm_occup_llc cqm_mbm_total
cqm_mbm_local avx512_bf16 clzero irperf xsaveerptr rdpru wbnoinvd amd_ppin cppc arat
npt lbrv svm_lock nrip_save tsc_scale vmcb_clean flushbyasid decodeassists
pausefilter pfthreshold avic v_vmsave_vmload vgif v_spec_ctrl avx512vbmi umip pku
ospke avx512_vbmi2 gfni vaes vpclmulqdq avx512_vnni avx512_bitalg avx512_vpopcntdq
la57 rdpid overflow_recov succor smca fsrm flush_lld
Virtualization:          AMD-V
L1d cache:               6 MiB (192 instances)
L1i cache:               6 MiB (192 instances)
L2 cache:                 192 MiB (192 instances)
L3 cache:                 768 MiB (24 instances)
NUMA node(s):            24
NUMA node0 CPU(s):       0-7
NUMA node1 CPU(s):       32-39
NUMA node2 CPU(s):       64-71
NUMA node3 CPU(s):       16-23
NUMA node4 CPU(s):       48-55
NUMA node5 CPU(s):       80-87
NUMA node6 CPU(s):       24-31
NUMA node7 CPU(s):       56-63
NUMA node8 CPU(s):       88-95
NUMA node9 CPU(s):       8-15
NUMA node10 CPU(s):      40-47
NUMA node11 CPU(s):      72-79
NUMA node12 CPU(s):      96-103
NUMA node13 CPU(s):      128-135
NUMA node14 CPU(s):      160-167
NUMA node15 CPU(s):      112-119
NUMA node16 CPU(s):      144-151
NUMA node17 CPU(s):      176-183
NUMA node18 CPU(s):      120-127
NUMA node19 CPU(s):      152-159

```

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## Platform Notes (Continued)

```

NUMA node20 CPU(s):          184-191
NUMA node21 CPU(s):          104-111
NUMA node22 CPU(s):          136-143
NUMA node23 CPU(s):          168-175
Vulnerability Itlb multihit: Not affected
Vulnerability L1tf:          Not affected
Vulnerability Mds:           Not affected
Vulnerability Meltdown:     Not affected
Vulnerability Mmio stale data: Not affected
Vulnerability Retbleed:      Not affected
Vulnerability Spec store bypass: Mitigation; Speculative Store Bypass disabled via prctl and seccomp
Vulnerability Spectre v1:     Mitigation; usercopy/swapgs barriers and __user pointer sanitization
Vulnerability Spectre v2:     Mitigation; Retpolines, IBPB conditional, IBRS_FW, STIBP disabled, RSB filling
Vulnerability Srbds:         Not affected
Vulnerability Tsx async abort: Not affected

```

From lscpu --cache:

NAME	ONE-SIZE	ALL-SIZE	WAYS	TYPE	LEVEL	SETS	PHY-LINE	COHERENCY-SIZE
L1d	32K	6M	8	Data	1	64	1	64
L1i	32K	6M	8	Instruction	1	64	1	64
L2	1M	192M	8	Unified	2	2048	1	64
L3	32M	768M	16	Unified	3	32768	1	64

/proc/cpuinfo cache data  
cache size : 1024 KB

From numactl --hardware

WARNING: a numactl 'node' might or might not correspond to a physical chip.

```

available: 24 nodes (0-23)
node 0 cpus: 0 1 2 3 4 5 6 7
node 0 size: 64056 MB
node 0 free: 63502 MB
node 1 cpus: 32 33 34 35 36 37 38 39
node 1 size: 64509 MB
node 1 free: 64055 MB
node 2 cpus: 64 65 66 67 68 69 70 71
node 2 size: 64508 MB
node 2 free: 64049 MB
node 3 cpus: 16 17 18 19 20 21 22 23
node 3 size: 64509 MB
node 3 free: 64033 MB
node 4 cpus: 48 49 50 51 52 53 54 55
node 4 size: 64509 MB
node 4 free: 64052 MB

```

(Continued on next page)



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## Platform Notes (Continued)

```

node 5 cpus: 80 81 82 83 84 85 86 87
node 5 size: 64508 MB
node 5 free: 64063 MB
node 6 cpus: 24 25 26 27 28 29 30 31
node 6 size: 64509 MB
node 6 free: 64069 MB
node 7 cpus: 56 57 58 59 60 61 62 63
node 7 size: 64509 MB
node 7 free: 64056 MB
node 8 cpus: 88 89 90 91 92 93 94 95
node 8 size: 64508 MB
node 8 free: 64047 MB
node 9 cpus: 8 9 10 11 12 13 14 15
node 9 size: 64509 MB
node 9 free: 64060 MB
node 10 cpus: 40 41 42 43 44 45 46 47
node 10 size: 64509 MB
node 10 free: 64070 MB
node 11 cpus: 72 73 74 75 76 77 78 79
node 11 size: 64492 MB
node 11 free: 64047 MB
node 12 cpus: 96 97 98 99 100 101 102 103
node 12 size: 64474 MB
node 12 free: 64021 MB
node 13 cpus: 128 129 130 131 132 133 134 135
node 13 size: 64509 MB
node 13 free: 64057 MB
node 14 cpus: 160 161 162 163 164 165 166 167
node 14 size: 64508 MB
node 14 free: 64064 MB
node 15 cpus: 112 113 114 115 116 117 118 119
node 15 size: 64509 MB
node 15 free: 64039 MB
node 16 cpus: 144 145 146 147 148 149 150 151
node 16 size: 64509 MB
node 16 free: 63934 MB
node 17 cpus: 176 177 178 179 180 181 182 183
node 17 size: 64508 MB
node 17 free: 64048 MB
node 18 cpus: 120 121 122 123 124 125 126 127
node 18 size: 64509 MB
node 18 free: 64058 MB
node 19 cpus: 152 153 154 155 156 157 158 159
node 19 size: 64509 MB
node 19 free: 60543 MB
node 20 cpus: 184 185 186 187 188 189 190 191
node 20 size: 64508 MB

```

(Continued on next page)



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## Platform Notes (Continued)

```

node 20 free: 64075 MB
node 21 cpus: 104 105 106 107 108 109 110 111
node 21 size: 64509 MB
node 21 free: 64063 MB
node 22 cpus: 136 137 138 139 140 141 142 143
node 22 size: 64509 MB
node 22 free: 64055 MB
node 23 cpus: 168 169 170 171 172 173 174 175
node 23 size: 64482 MB
node 23 free: 64035 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
 0: 10 11 11 12 12 12 12 12 12 12 12 12 32 32 32 32 32 32 32 32
 32 32 32 32
 1: 11 10 11 12 12 12 12 12 12 12 12 12 32 32 32 32 32 32 32 32
 32 32 32 32
 2: 11 11 10 12 12 12 12 12 12 12 12 12 32 32 32 32 32 32 32 32
 32 32 32 32
 3: 12 12 12 12 10 11 11 12 12 12 12 12 32 32 32 32 32 32 32 32
 32 32 32 32
 4: 12 12 12 11 10 11 12 12 12 12 12 12 32 32 32 32 32 32 32 32
 32 32 32 32
 5: 12 12 12 11 11 10 12 12 12 12 12 12 32 32 32 32 32 32 32 32
 32 32 32 32
 6: 12 12 12 12 12 12 12 10 11 11 12 12 12 32 32 32 32 32 32 32
 32 32 32 32
 7: 12 12 12 12 12 12 12 11 10 11 12 12 12 32 32 32 32 32 32 32
 32 32 32 32
 8: 12 12 12 12 12 12 12 11 11 10 12 12 12 32 32 32 32 32 32 32
 32 32 32 32
 9: 12 12 12 12 12 12 12 12 12 12 10 11 11 32 32 32 32 32 32 32
 32 32 32 32
10: 12 12 12 12 12 12 12 12 12 12 11 10 11 32 32 32 32 32 32 32
 32 32 32 32
11: 12 12 12 12 12 12 12 12 12 12 11 11 10 32 32 32 32 32 32 32
 32 32 32 32
12: 32 32 32 32 32 32 32 32 32 32 32 32 32 10 11 11 12 12 12 12
 12 12 12 12
13: 32 32 32 32 32 32 32 32 32 32 32 32 32 11 10 11 12 12 12 12
 12 12 12 12
14: 32 32 32 32 32 32 32 32 32 32 32 32 32 11 11 10 12 12 12 12
 12 12 12 12
15: 32 32 32 32 32 32 32 32 32 32 32 32 32 12 12 12 10 11 11 12
 12 12 12 12
16: 32 32 32 32 32 32 32 32 32 32 32 32 32 12 12 12 11 10 11 12
 12 12 12 12

```

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## Platform Notes (Continued)

```

17:  32  32  32  32  32  32  32  32  32  32  32  32  32  12  12  12  11  11  10  12  12
12  12  12  12
18:  32  32  32  32  32  32  32  32  32  32  32  32  32  12  12  12  12  12  12  10  11
11  12  12  12
19:  32  32  32  32  32  32  32  32  32  32  32  32  32  12  12  12  12  12  12  11  10
11  12  12  12
20:  32  32  32  32  32  32  32  32  32  32  32  32  32  12  12  12  12  12  12  11  11
10  12  12  12
21:  32  32  32  32  32  32  32  32  32  32  32  32  32  12  12  12  12  12  12  12  12
12  10  11  11
22:  32  32  32  32  32  32  32  32  32  32  32  32  32  12  12  12  12  12  12  12  12
12  11  10  11
23:  32  32  32  32  32  32  32  32  32  32  32  32  32  12  12  12  12  12  12  12  12
12  11  11  10

```

```

From /proc/meminfo
MemTotal:      1584840004 kB
HugePages_Total:      0
Hugepagesize:    2048 kB

```

```

/sbin/tuned-adm active
Current active profile: latency-performance

```

```

/sys/devices/system/cpu/cpu*/cpufreq/scaling_governor has
performance

```

```

/usr/bin/lsb_release -d
Ubuntu 22.04.1 LTS

```

```

From /etc/*release* /etc/*version*
debian_version: bookworm/sid
os-release:
PRETTY_NAME="Ubuntu 22.04.1 LTS"
NAME="Ubuntu"
VERSION_ID="22.04"
VERSION="22.04.1 LTS (Jammy Jellyfish)"
VERSION_CODENAME=jammy
ID=ubuntu
ID_LIKE=debian
HOME_URL="https://www.ubuntu.com/"

```

```

uname -a:
Linux genoa-sut 5.15.0-46-generic #49-Ubuntu SMP Thu Aug 4 18:03:25 UTC 2022 x86_64
x86_64 x86_64 GNU/Linux

```

Kernel self-reported vulnerability status:

(Continued on next page)



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## Platform Notes (Continued)

CVE-2018-12207 (iTLB Multihit):	Not affected
CVE-2018-3620 (L1 Terminal Fault):	Not affected
Microarchitectural Data Sampling:	Not affected
CVE-2017-5754 (Meltdown):	Not affected
mmio_stale_data:	Not affected
retbleed:	Not affected
CVE-2018-3639 (Speculative Store Bypass):	Mitigation: Speculative Store Bypass disabled via prctl and seccomp
CVE-2017-5753 (Spectre variant 1):	Mitigation: usercopy/swaps barriers and __user pointer sanitization
CVE-2017-5715 (Spectre variant 2):	Mitigation: Retpolines, IBPB: conditional, IBRS_FW, STIBP: disabled, RSB filling
CVE-2020-0543 (Special Register Buffer Data Sampling):	Not affected
CVE-2019-11135 (TSX Asynchronous Abort):	Not affected

run-level 3 Dec 14 14:31

SPEC is set to: /mnt/ramdisk/cpu2017-1.1.8-aocc400-B1b

Filesystem	Type	Size	Used	Avail	Use%	Mounted on
tmpfs	tmpfs	125G	3.4G	122G	3%	/mnt/ramdisk

```

From /sys/devices/virtual/dmi/id
Vendor:          Dell Inc.
Product:         PowerEdge R6625
Product Family: PowerEdge
Serial:          BGP4016

```

Additional information from dmidecode 3.3 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:
 24x 802C0000802C MTC40F2046S1RC48BA1 64 GB 2 rank 4800

```

```

BIOS:
 BIOS Vendor:      Dell Inc.
 BIOS Version:     1.1.0
 BIOS Date:        11/25/2022
 BIOS Revision:    1.1

```

(End of data from sysinfo program)



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**Test Date:** Dec-2022  
**Hardware Availability:** Feb-2023  
**Software Availability:** Nov-2022

## Compiler Version Notes

=====  
C | 519.lbm\_r(base) 538.imagick\_r(base) 544.nab\_r(base)  
-----

AMD clang version 14.0.6 (CLANG: AOCC\_4.0.0-Build#389 2022\_10\_07) (based on LLVM Mirror.Version.14.0.6)  
Target: x86\_64-unknown-linux-gnu  
Thread model: posix  
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-4.0-3206-389/bin  
-----

=====  
C++ | 508.namd\_r(base) 510.parest\_r(base)  
-----

AMD clang version 14.0.6 (CLANG: AOCC\_4.0.0-Build#389 2022\_10\_07) (based on LLVM Mirror.Version.14.0.6)  
Target: x86\_64-unknown-linux-gnu  
Thread model: posix  
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-4.0-3206-389/bin  
-----

=====  
C++, C | 511.povray\_r(base) 526.blender\_r(base)  
-----

AMD clang version 14.0.6 (CLANG: AOCC\_4.0.0-Build#389 2022\_10\_07) (based on LLVM Mirror.Version.14.0.6)  
Target: x86\_64-unknown-linux-gnu  
Thread model: posix  
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-4.0-3206-389/bin  
AMD clang version 14.0.6 (CLANG: AOCC\_4.0.0-Build#389 2022\_10\_07) (based on LLVM Mirror.Version.14.0.6)  
Target: x86\_64-unknown-linux-gnu  
Thread model: posix  
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-4.0-3206-389/bin  
-----

=====  
C++, C, Fortran | 507.cactuBSSN\_r(base)  
-----

AMD clang version 14.0.6 (CLANG: AOCC\_4.0.0-Build#389 2022\_10\_07) (based on LLVM Mirror.Version.14.0.6)  
Target: x86\_64-unknown-linux-gnu  
Thread model: posix  
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-4.0-3206-389/bin  
AMD clang version 14.0.6 (CLANG: AOCC\_4.0.0-Build#389 2022\_10\_07) (based on LLVM Mirror.Version.14.0.6)  
Target: x86\_64-unknown-linux-gnu  
Thread model: posix  
-----

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# SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2023 Standard Performance Evaluation Corporation

Dell Inc.

SPECrate®2017\_fp\_base = 1400

PowerEdge R6625 (AMD EPYC 9654 96-Core Processor)

SPECrate®2017\_fp\_peak = Not Run

CPU2017 License: 6573  
Test Sponsor: Dell Inc.  
Tested by: Dell Inc.

Test Date: Dec-2022  
Hardware Availability: Feb-2023  
Software Availability: Nov-2022

## Compiler Version Notes (Continued)

InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-4.0-3206-389/bin  
AMD clang version 14.0.6 (CLANG: AOCC\_4.0.0-Build#389 2022\_10\_07) (based on LLVM Mirror.Version.14.0.6)  
Target: x86\_64-unknown-linux-gnu  
Thread model: posix  
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-4.0-3206-389/bin

=====  
Fortran | 503.bwaves\_r(base) 549.fotonik3d\_r(base) 554.roms\_r(base)  
=====

AMD clang version 14.0.6 (CLANG: AOCC\_4.0.0-Build#389 2022\_10\_07) (based on LLVM Mirror.Version.14.0.6)  
Target: x86\_64-unknown-linux-gnu  
Thread model: posix  
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-4.0-3206-389/bin

=====  
Fortran, C | 521.wrf\_r(base) 527.cam4\_r(base)  
=====

AMD clang version 14.0.6 (CLANG: AOCC\_4.0.0-Build#389 2022\_10\_07) (based on LLVM Mirror.Version.14.0.6)  
Target: x86\_64-unknown-linux-gnu  
Thread model: posix  
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-4.0-3206-389/bin  
AMD clang version 14.0.6 (CLANG: AOCC\_4.0.0-Build#389 2022\_10\_07) (based on LLVM Mirror.Version.14.0.6)  
Target: x86\_64-unknown-linux-gnu  
Thread model: posix  
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-4.0-3206-389/bin

## Base Compiler Invocation

C benchmarks:  
clang

C++ benchmarks:  
clang++

Fortran benchmarks:  
flang

Benchmarks using both Fortran and C:  
flang clang

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# SPEC CPU®2017 Floating Point Rate Result

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CPU2017 License: 6573

Test Date: Dec-2022

Test Sponsor: Dell Inc.

Hardware Availability: Feb-2023

Tested by: Dell Inc.

Software Availability: Nov-2022

## Base Compiler Invocation (Continued)

Benchmarks using both C and C++:

clang++ clang

Benchmarks using Fortran, C, and C++:

clang++ clang flang

## Base Portability Flags

503.bwaves\_r: -DSPEC\_LP64  
507.cactuBSSN\_r: -DSPEC\_LP64  
508.namd\_r: -DSPEC\_LP64  
510.parest\_r: -DSPEC\_LP64  
511.povray\_r: -DSPEC\_LP64  
519.lbm\_r: -DSPEC\_LP64  
521.wrf\_r: -DSPEC\_CASE\_FLAG -Mbyteswapio -DSPEC\_LP64  
526.blender\_r: -funsigned-char -DSPEC\_LP64  
527.cam4\_r: -DSPEC\_CASE\_FLAG -DSPEC\_LP64  
538.imagick\_r: -DSPEC\_LP64  
544.nab\_r: -DSPEC\_LP64  
549.fotonik3d\_r: -DSPEC\_LP64  
554.roms\_r: -DSPEC\_LP64

## Base Optimization Flags

C benchmarks:

-m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6  
-Wl,-mllvm -Wl,-reduce-array-computations=3  
-Wl,-mllvm -Wl,-ldist-scalar-expand -fenable-aggressive-gather -O3  
-march=znver4 -fveclib=AMDLIBM -ffast-math -fstruct-layout=7  
-mllvm -unroll-threshold=50 -mllvm -inline-threshold=1000  
-fremap-arrays -fstrip-mining -mllvm -reduce-array-computations=3  
-zopt -lamdlibm -lamdalloc -lflang

C++ benchmarks:

-m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6  
-Wl,-mllvm -Wl,-reduce-array-computations=3  
-Wl,-mllvm -Wl,-x86-use-vzeroupper=false -O3 -march=znver4  
-fveclib=AMDLIBM -ffast-math -mllvm -unroll-threshold=100  
-finline-aggressive -mllvm -loop-unswitch-threshold=200000  
-mllvm -reduce-array-computations=3 -zopt -lamdlibm -lamdalloc

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# SPEC CPU®2017 Floating Point Rate Result

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Software Availability: Nov-2022

## Base Optimization Flags (Continued)

C++ benchmarks (continued):

-lflang

Fortran benchmarks:

-m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6  
-Wl,-mllvm -Wl,-reduce-array-computations=3  
-Wl,-mllvm -Wl,-enable-X86-prefetching -O3 -march=znver4  
-fveclib=AMDLIBM -ffast-math -Kieee -Mrecursive -funroll-loops  
-mllvm -lsr-in-nested-loop -mllvm -reduce-array-computations=3  
-fepilog-vectorization-of-inductions -zopt -lamdlibm -lamdalloc  
-lflang

Benchmarks using both Fortran and C:

-m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6  
-Wl,-mllvm -Wl,-reduce-array-computations=3  
-Wl,-mllvm -Wl,-enable-X86-prefetching -O3 -march=znver4  
-fveclib=AMDLIBM -ffast-math -fstruct-layout=7  
-mllvm -unroll-threshold=50 -mllvm -inline-threshold=1000  
-fremap-arrays -fstrip-mining -mllvm -reduce-array-computations=3  
-zopt -Kieee -Mrecursive -funroll-loops -mllvm -lsr-in-nested-loop  
-fepilog-vectorization-of-inductions -lamdlibm -lamdalloc -lflang

Benchmarks using both C and C++:

-m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6  
-Wl,-mllvm -Wl,-reduce-array-computations=3  
-Wl,-mllvm -Wl,-x86-use-vzeroupper=false -O3 -march=znver4  
-fveclib=AMDLIBM -ffast-math -fstruct-layout=7  
-mllvm -unroll-threshold=50 -mllvm -inline-threshold=1000  
-fremap-arrays -fstrip-mining -mllvm -reduce-array-computations=3  
-zopt -mllvm -unroll-threshold=100 -finline-aggressive  
-mllvm -loop-unswitch-threshold=200000 -lamdlibm -lamdalloc -lflang

Benchmarks using Fortran, C, and C++:

-m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6  
-Wl,-mllvm -Wl,-reduce-array-computations=3  
-Wl,-mllvm -Wl,-x86-use-vzeroupper=false -O3 -march=znver4  
-fveclib=AMDLIBM -ffast-math -fstruct-layout=7  
-mllvm -unroll-threshold=50 -mllvm -inline-threshold=1000  
-fremap-arrays -fstrip-mining -mllvm -reduce-array-computations=3  
-zopt -mllvm -unroll-threshold=100 -finline-aggressive  
-mllvm -loop-unswitch-threshold=200000 -Kieee -Mrecursive  
-funroll-loops -mllvm -lsr-in-nested-loop  
-fepilog-vectorization-of-inductions -lamdlibm -lamdalloc -lflang



# SPEC CPU®2017 Floating Point Rate Result

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SPECrate®2017\_fp\_base = 1400

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## Base Other Flags

C benchmarks:

-Wno-unused-command-line-argument

C++ benchmarks:

-Wno-unused-command-line-argument

Fortran benchmarks:

-Wno-unused-command-line-argument

Benchmarks using both Fortran and C:

-Wno-unused-command-line-argument

Benchmarks using both C and C++:

-Wno-unused-command-line-argument

Benchmarks using Fortran, C, and C++:

-Wno-unused-command-line-argument

The flags files that were used to format this result can be browsed at

<http://www.spec.org/cpu2017/flags/aocc400-flags.html>

<http://www.spec.org/cpu2017/flags/Dell-Platform-Flags-PowerEdge-AMD-EPYC-v1.0.html>

You can also download the XML flags sources by saving the following links:

<http://www.spec.org/cpu2017/flags/aocc400-flags.xml>

<http://www.spec.org/cpu2017/flags/Dell-Platform-Flags-PowerEdge-AMD-EPYC-v1.0.xml>

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