



SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2022 Standard Performance Evaluation Corporation

Dell Inc.

SPECrate®2017_fp_base = 1410

PowerEdge R7625 (AMD EPYC 9654 96-Core Processor)

SPECrate®2017_fp_peak = Not Run

CPU2017 License: 55

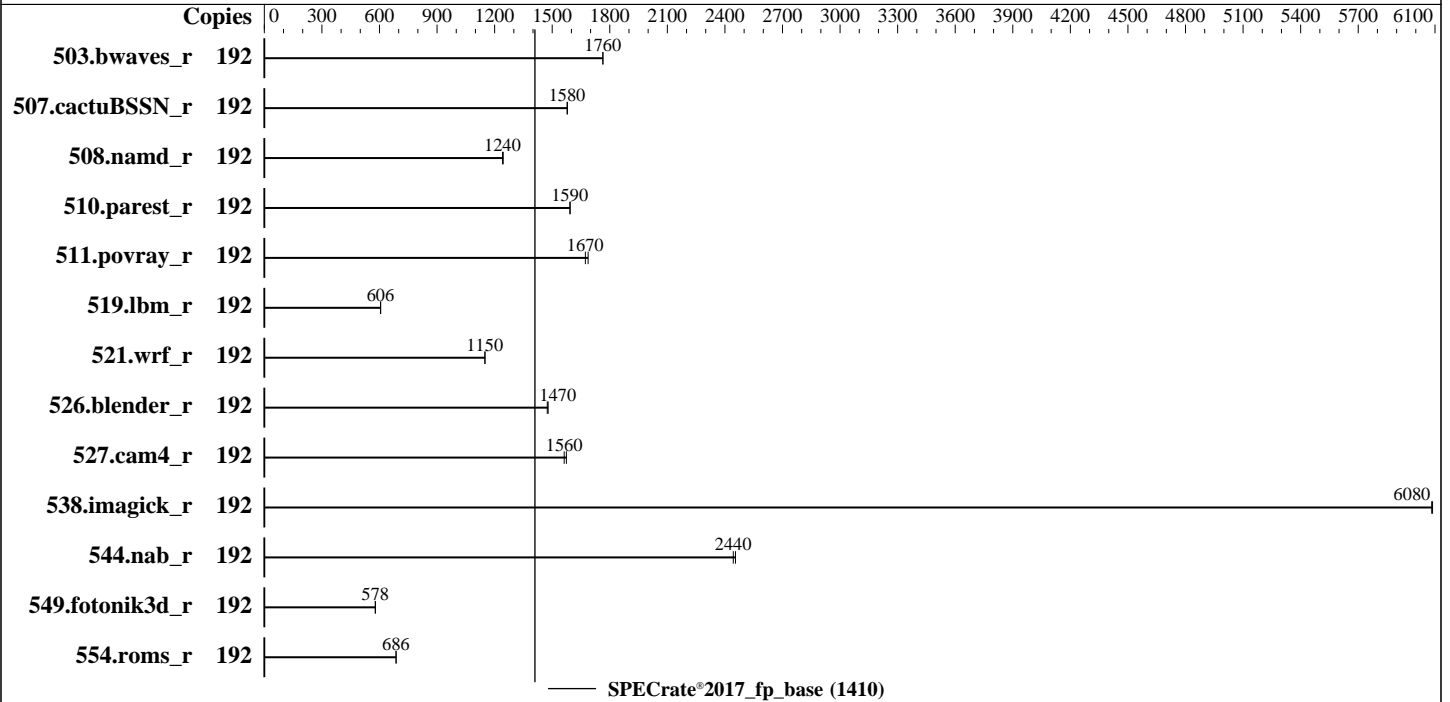
Test Date: Oct-2022

Test Sponsor: Dell Inc.

Hardware Availability: Nov-2022

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: SUSE Linux Enterprise Server 15 SP4 5.14.21-150400.22-default
 Compiler: C/C++/Fortran: Version 4.0.0 of AOCC
 Parallel: No
 Firmware: Version 1.0.0 released Sep-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	<u>1091</u>	<u>1760</u>	1091	1760									
507.cactuBSSN_r	192	154	1580	<u>154</u>	<u>1580</u>									
508.namd_r	192	<u>147</u>	<u>1240</u>	147	1240									
510.parest_r	192	<u>315</u>	<u>1590</u>	315	1590									
511.povray_r	192	266	1690	<u>268</u>	<u>1670</u>									
519.lbm_r	192	334	606	<u>334</u>	<u>606</u>									
521.wrf_r	192	<u>374</u>	<u>1150</u>	374	1150									
526.blender_r	192	<u>198</u>	<u>1470</u>	198	1480									
527.cam4_r	192	213	1570	<u>215</u>	<u>1560</u>									
538.imagick_r	192	78.4	6090	<u>78.5</u>	<u>6080</u>									
544.nab_r	192	132	2460	<u>132</u>	<u>2440</u>									
549.fotonik3d_r	192	1293	579	<u>1294</u>	<u>578</u>									
554.roms_r	192	444	687	<u>445</u>	<u>686</u>									

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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-B1/amd_rate_aocc400_genoa_B_lib/lib:
/mnt/ramdisk/cpu2017-1.1.8-aocc400-B1/amd_rate_aocc400_genoa_B_lib/lib32
:"
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
```

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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-B1/bin/sysinfo
 Rev: r6622 of 2021-04-07 982a61ec0915b55891ef0e16acafc64d
 running on localhost.localdomain Tue Oct 18 13:07:32 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 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 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80
 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95
 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 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80
 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95

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
 Socket(s): 2
 Stepping: 1

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Platform Notes (Continued)

```

Frequency boost:          enabled
CPU max MHz:             3707.8120
CPU min MHz:             1500.0000
BogoMIPS:                4801.60
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 nonstop_tsc cpuid extd_apicid
aperfmpperf rapl pni pclmulqdq monitor ssse3 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 vmcall 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 arat npt
lbrv svm_lock nrip_save tsc_scale vmcb_clean flushbyasid decodeassists pausefilter
pfthreshold avic v_omsave_omload 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_lli
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):     8-15
NUMA node2 CPU(s):     16-23
NUMA node3 CPU(s):     24-31
NUMA node4 CPU(s):     32-39
NUMA node5 CPU(s):     40-47
NUMA node6 CPU(s):     48-55
NUMA node7 CPU(s):     56-63
NUMA node8 CPU(s):     64-71
NUMA node9 CPU(s):     72-79
NUMA node10 CPU(s):    80-87
NUMA node11 CPU(s):    88-95
NUMA node12 CPU(s):    96-103
NUMA node13 CPU(s):    104-111
NUMA node14 CPU(s):    112-119
NUMA node15 CPU(s):    120-127
NUMA node16 CPU(s):    128-135
NUMA node17 CPU(s):    136-143
NUMA node18 CPU(s):    144-151
NUMA node19 CPU(s):    152-159
NUMA node20 CPU(s):    160-167
NUMA node21 CPU(s):    168-175

```

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Platform Notes (Continued)

```

NUMA node22 CPU(s):          176-183
NUMA node23 CPU(s):          184-191
Vulnerability Itlb multihit: Not affected
Vulnerability L1tf:          Not affected
Vulnerability Mds:           Not affected
Vulnerability Meltdown:      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: 64055 MB
node 0 free: 63184 MB
node 1 cpus: 8 9 10 11 12 13 14 15
node 1 size: 64509 MB
node 1 free: 64081 MB
node 2 cpus: 16 17 18 19 20 21 22 23
node 2 size: 64509 MB
node 2 free: 64065 MB
node 3 cpus: 24 25 26 27 28 29 30 31
node 3 size: 64509 MB
node 3 free: 64081 MB
node 4 cpus: 32 33 34 35 36 37 38 39
node 4 size: 64509 MB
node 4 free: 64049 MB
node 5 cpus: 40 41 42 43 44 45 46 47
node 5 size: 64509 MB
node 5 free: 64080 MB
node 6 cpus: 48 49 50 51 52 53 54 55

```

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Platform Notes (Continued)

```

node 6 size: 64509 MB
node 6 free: 64083 MB
node 7 cpus: 56 57 58 59 60 61 62 63
node 7 size: 64509 MB
node 7 free: 62309 MB
node 8 cpus: 64 65 66 67 68 69 70 71
node 8 size: 64508 MB
node 8 free: 64032 MB
node 9 cpus: 72 73 74 75 76 77 78 79
node 9 size: 64492 MB
node 9 free: 64066 MB
node 10 cpus: 80 81 82 83 84 85 86 87
node 10 size: 64473 MB
node 10 free: 64055 MB
node 11 cpus: 88 89 90 91 92 93 94 95
node 11 size: 64508 MB
node 11 free: 62365 MB
node 12 cpus: 96 97 98 99 100 101 102 103
node 12 size: 64509 MB
node 12 free: 64073 MB
node 13 cpus: 104 105 106 107 108 109 110 111
node 13 size: 64509 MB
node 13 free: 64086 MB
node 14 cpus: 112 113 114 115 116 117 118 119
node 14 size: 64509 MB
node 14 free: 64088 MB
node 15 cpus: 120 121 122 123 124 125 126 127
node 15 size: 64509 MB
node 15 free: 64061 MB
node 16 cpus: 128 129 130 131 132 133 134 135
node 16 size: 64509 MB
node 16 free: 64080 MB
node 17 cpus: 136 137 138 139 140 141 142 143
node 17 size: 64509 MB
node 17 free: 64100 MB
node 18 cpus: 144 145 146 147 148 149 150 151
node 18 size: 64509 MB
node 18 free: 64087 MB
node 19 cpus: 152 153 154 155 156 157 158 159
node 19 size: 64509 MB
node 19 free: 64068 MB
node 20 cpus: 160 161 162 163 164 165 166 167
node 20 size: 64508 MB
node 20 free: 64085 MB
node 21 cpus: 168 169 170 171 172 173 174 175
node 21 size: 64442 MB
node 21 free: 64015 MB

```

(Continued on next page)



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Platform Notes (Continued)

```

node 22 cpus: 176 177 178 179 180 181 182 183
node 22 size: 64508 MB
node 22 free: 64089 MB
node 23 cpus: 184 185 186 187 188 189 190 191
node 23 size: 64508 MB
node 23 free: 64044 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 12 12 12 11 12 12 12 11 12 12 12 32 32 32 32 32 32 32 32
32 32 32 32
1: 12 10 12 12 12 11 12 12 12 11 12 12 32 32 32 32 32 32 32 32
32 32 32 32
2: 12 12 10 12 12 12 11 12 12 12 11 12 32 32 32 32 32 32 32 32
32 32 32 32
3: 12 12 12 10 12 12 12 11 12 12 12 11 32 32 32 32 32 32 32 32
32 32 32 32
4: 11 12 12 12 12 10 12 12 12 11 12 12 32 32 32 32 32 32 32 32
32 32 32 32
5: 12 11 12 12 12 12 10 12 12 12 11 12 32 32 32 32 32 32 32 32
32 32 32 32
6: 12 12 11 12 12 12 10 12 12 12 11 12 32 32 32 32 32 32 32 32
32 32 32 32
7: 12 12 12 11 12 12 12 10 12 12 12 11 32 32 32 32 32 32 32 32
32 32 32 32
8: 11 12 12 12 11 12 12 12 10 12 12 12 32 32 32 32 32 32 32 32
32 32 32 32
9: 12 11 12 12 12 11 12 12 12 10 12 12 32 32 32 32 32 32 32 32
32 32 32 32
10: 12 12 11 12 12 12 11 12 12 12 10 12 32 32 32 32 32 32 32 32
32 32 32 32
11: 12 12 12 11 12 12 12 11 12 12 12 10 32 32 32 32 32 32 32 32
32 32 32 32
12: 32 32 32 32 32 32 32 32 32 32 32 32 10 12 12 12 11 12 12 12
11 12 12 12
13: 32 32 32 32 32 32 32 32 32 32 32 32 12 10 12 12 12 11 12 12
12 11 12 12
14: 32 32 32 32 32 32 32 32 32 32 32 32 12 12 10 12 12 12 11 12
12 12 11 12
15: 32 32 32 32 32 32 32 32 32 32 32 32 12 12 12 10 12 12 12 11
12 12 12 11
16: 32 32 32 32 32 32 32 32 32 32 32 32 11 12 12 12 10 12 12 12
11 12 12 12
17: 32 32 32 32 32 32 32 32 32 32 32 32 12 11 12 12 12 10 12 12
12 11 12 12
18: 32 32 32 32 32 32 32 32 32 32 32 32 12 12 11 12 12 12 10 12
12 12 11 12

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Platform Notes (Continued)

```

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

```

From /proc/meminfo

```

MemTotal:      1584796700 kB
HugePages_Total:      0
Hugepagesize:    2048 kB

```

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

From /etc/*release* /etc/*version*

```

os-release:
NAME="SLES"
VERSION="15-SP4"
VERSION_ID="15.4"
PRETTY_NAME="SUSE Linux Enterprise Server 15 SP4"
ID="sles"
ID_LIKE="suse"
ANSI_COLOR="0;32"
CPE_NAME="/o:suse:sles:15:sp4"

```

uname -a:

```

Linux localhost.localdomain 5.14.21-150400.22-default #1 SMP PREEMPT_DYNAMIC Wed May 11 06:57:18 UTC 2022 (49db222) x86_64 x86_64 x86_64 GNU/Linux

```

Kernel self-reported vulnerability status:

```

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
CVE-2018-3639 (Speculative Store Bypass): Mitigation: Speculative Store Bypass disabled via prctl and seccomp
CVE-2017-5753 (Spectre variant 1):      Mitigation: usercopy/swapgs barriers and __user pointer sanitization
CVE-2017-5715 (Spectre variant 2):      Mitigation: Retpolines, IBPB:

```

(Continued on next page)



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Platform Notes (Continued)

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 Oct 18 11:41

SPEC is set to: /mnt/ramdisk/cpu2017-1.1.8-aocc400-B1

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 R7625
 Product Family: PowerEdge
 Serial: 1234567

Additional information from dmidecode 3.2 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 80AD000080AD HMC94MEBRA109N 64 GB 2 rank 4800

BIOS:

BIOS Vendor: Dell Inc.
 BIOS Version: 1.0.0
 BIOS Date: 09/28/2022
 BIOS Revision: 1.0

(End of data from sysinfo program)

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)
-----
```

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Compiler Version Notes (Continued)

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
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

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Dell Inc.

SPECrate®2017_fp_base = 1410

PowerEdge R7625 (AMD EPYC 9654 96-Core Processor)

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CPU2017 License: 55

Test Sponsor: Dell Inc.

Tested by: Dell Inc.

Test Date: Oct-2022

Hardware Availability: Nov-2022

Software Availability: Nov-2022

Compiler Version Notes (Continued)

```

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

Benchmarks using both C and C++:

clang++ clang

Benchmarks using Fortran, C, and C++:

clang++ clang flang



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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
-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

```

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Software Availability: Nov-2022

Base Optimization Flags (Continued)

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
-freemap-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
-freemap-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
-freemap-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
```

Base Other Flags

C benchmarks:

-Wno-unused-command-line-argument

C++ benchmarks:

-Wno-unused-command-line-argument

Fortran benchmarks:

-Wno-unused-command-line-argument

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Base Other Flags (Continued)

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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