



# SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

## Dell Inc.

### SPECrate®2017\_fp\_base = 535

### PowerEdge R7615 (AMD EPYC 9454 48-Core Processor)

### SPECrate®2017\_fp\_peak = 536

CPU2017 License: 6573

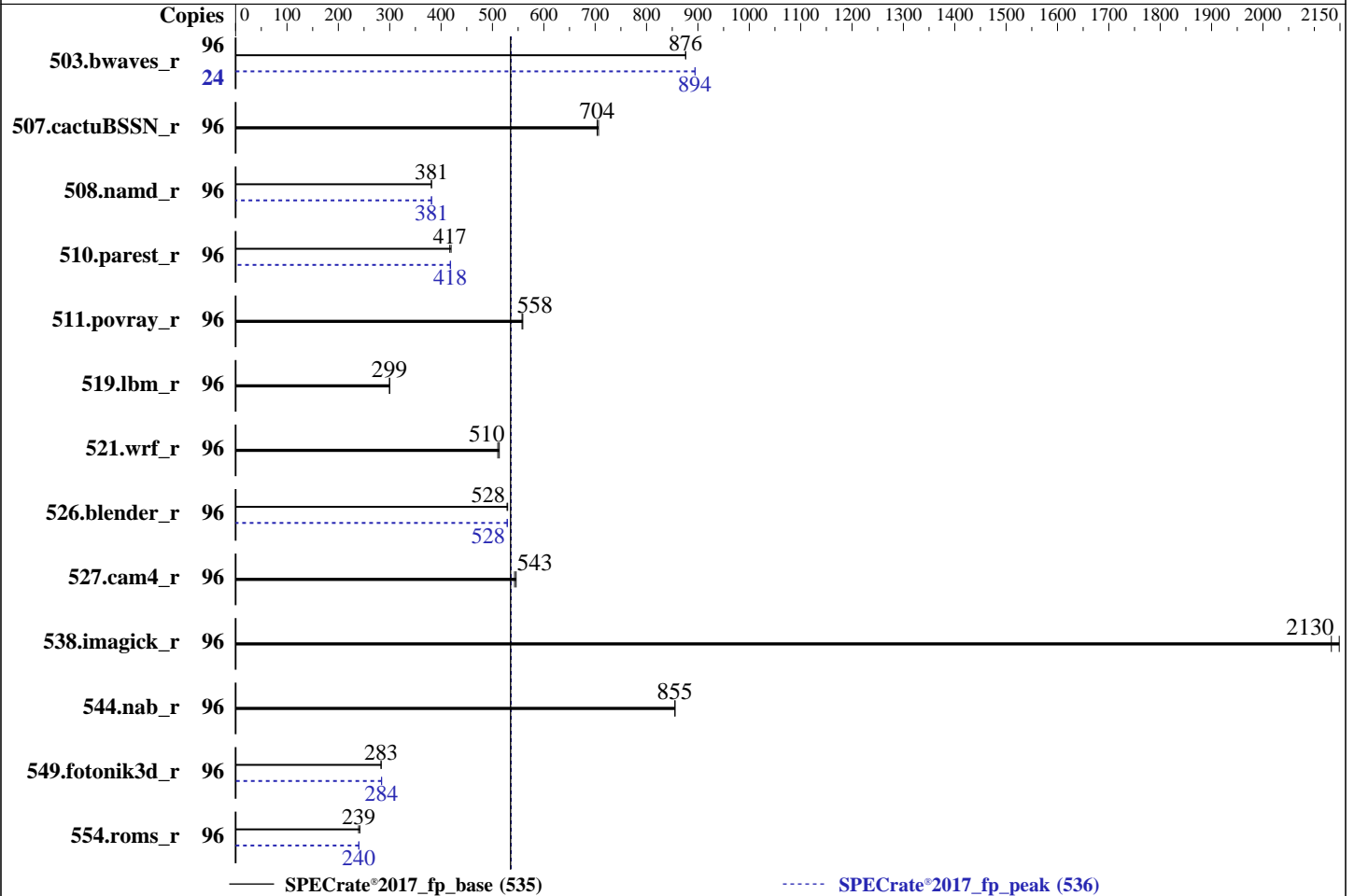
Test Sponsor: Dell Inc.

Tested by: Dell Inc.

Test Date: Oct-2023

Hardware Availability: May-2023

Software Availability: Sep-2023



### Hardware

CPU Name: AMD EPYC 9454  
 Max MHz: 3800  
 Nominal: 2750  
 Enabled: 48 cores, 1 chip, 2 threads/core  
 Orderable: 1 chip  
 Cache L1: 32 KB I + 32 KB D on chip per core  
 L2: 1 MB I+D on chip per core  
 L3: 256 MB I+D on chip per chip, 32 MB shared / 6 cores  
 Other: None  
 Memory: 768 GB (12 x 64 GB 2Rx4 PC5-4800B-R)  
 Storage: 70 GB on tmpfs  
 Other: None

### Software

OS: Ubuntu 22.04.3 LTS  
 5.15.0-84-generic  
 Compiler: C/C++/Fortran: Version 4.0.0 of AOCC  
 Parallel: No  
 Firmware: Version 1.4.6 released Jul-2023  
 File System: tmpfs  
 System State: Run level 5 (graphical multi-user)  
 Base Pointers: 64-bit  
 Peak Pointers: 64-bit  
 Other: None  
 Power Management: BIOS and OS set to prefer performance at the cost of additional power usage.



# SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

## Dell Inc.

SPECrate®2017\_fp\_base = 535

PowerEdge R7615 (AMD EPYC 9454 48-Core Processor)

SPECrate®2017\_fp\_peak = 536

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

Test Date: Oct-2023  
Hardware Availability: May-2023  
Software Availability: Sep-2023

## Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
503.bwaves_r	96	1099	876	<u>1099</u>	<u>876</u>			24	269	894	<u>269</u>	<u>894</u>		
507.cactuBSSN_r	96	172	706	<u>173</u>	<u>704</u>			96	172	706	<u>173</u>	<u>704</u>		
508.namd_r	96	239	381	<u>239</u>	<u>381</u>			96	239	381	<u>239</u>	<u>381</u>		
510.parest_r	96	<u>602</u>	<u>417</u>	599	419			96	<u>601</u>	<u>418</u>	600	419		
511.povray_r	96	401	559	<u>402</u>	<u>558</u>			96	401	559	<u>402</u>	<u>558</u>		
519.lbm_r	96	337	300	<u>338</u>	<u>299</u>			96	337	300	<u>338</u>	<u>299</u>		
521.wrf_r	96	419	513	<u>421</u>	<u>510</u>			96	419	513	<u>421</u>	<u>510</u>		
526.blender_r	96	<u>277</u>	<u>528</u>	276	530			96	<u>277</u>	<u>528</u>	276	529		
527.cam4_r	96	307	546	<u>309</u>	<u>543</u>			96	307	546	<u>309</u>	<u>543</u>		
538.imagick_r	96	<u>112</u>	<u>2130</u>	111	2150			96	<u>112</u>	<u>2130</u>	111	2150		
544.nab_r	96	<u>189</u>	<u>855</u>	189	855			96	<u>189</u>	<u>855</u>	189	855		
549.fotonik3d_r	96	<u>1321</u>	<u>283</u>	1320	283			96	<u>1317</u>	<u>284</u>	1316	284		
554.roms_r	96	<u>637</u>	<u>239</u>	631	242			96	636	240	<u>636</u>	<u>240</u>		

SPECrate®2017\_fp\_base = 535

SPECrate®2017\_fp\_peak = 536

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.  
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,

(Continued on next page)



# SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

Dell Inc.

SPECrate®2017\_fp\_base = 535

PowerEdge R7615 (AMD EPYC 9454 48-Core Processor)

SPECrate®2017\_fp\_peak = 536

CPU2017 License: 6573

Test Sponsor: Dell Inc.

Tested by: Dell Inc.

Test Date: Oct-2023

Hardware Availability: May-2023

Software Availability: Sep-2023

## Operating System Notes (Continued)

'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/cpu2017-1.1.9-aocc400-znver4-Al.1/amd_rate_aocc400_znver4_A_lib/lib:/mnt/ramdisk/cpu2017-1.1.9-aocc400-znver4-Al.1/amd_rate_aocc400_znver4_A_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 70 GB ramdisk created with the cmd: "mount -t tmpfs -o size=70G tmpfs /mnt/ramdisk"

## Platform Notes

BIOS settings:

DRAM Refresh Delay : Performance  
DIMM Self Healing on  
Uncorrectable Memory Error : Disabled

Virtualization Technology : Disabled  
L1 Stride Prefetcher : Disabled  
NUMA Nodes per Socket : 4

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

Sysinfo program /mnt/ramdisk/cpu2017-1.1.9-aocc400-znver4-Al.1/bin/sysinfo  
Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197  
running on amd-spa Wed Oct 11 22:54:16 2023

SUT (System Under Test) info as seen by some common utilities.

-----  
Table of contents  
-----

1. uname -a
2. w

(Continued on next page)



# SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

## Dell Inc.

SPECrate®2017\_fp\_base = 535

PowerEdge R7615 (AMD EPYC 9454 48-Core Processor)

SPECrate®2017\_fp\_peak = 536

**CPU2017 License:** 6573

**Test Sponsor:** Dell Inc.

**Tested by:** Dell Inc.

**Test Date:** Oct-2023

**Hardware Availability:** May-2023

**Software Availability:** Sep-2023

## Platform Notes (Continued)

```

3. Username
4. ulimit -a
5. sysinfo process ancestry
6. /proc/cpuinfo
7. lscpu
8. numactl --hardware
9. /proc/meminfo
10. who -r
11. Systemd service manager version: systemd 249 (249.11-0ubuntu3.10)
12. Services, from systemctl list-unit-files
13. Linux kernel boot-time arguments, from /proc/cmdline
14. cpupower frequency-info
15. tuned-adm active
16. sysctl
17. /sys/kernel/mm/transparent_hugepage
18. /sys/kernel/mm/transparent_hugepage/khugepaged
19. OS release
20. Disk information
21. /sys/devices/virtual/dmi/id
22. dmidecode
23. BIOS

```

```

-----
1. uname -a
Linux amd-spa 5.15.0-84-generic #93-Ubuntu SMP Tue Sep 5 17:16:10 UTC 2023 x86_64 x86_64 x86_64 GNU/Linux

```

```

-----
2. w
 22:54:16 up 3:25, 1 user, load average: 57.31, 86.07, 91.84
USER      TTY      FROM          LOGIN@      IDLE        JCPU   PCPU   WHAT
root      tty1    -             19:33       3:19m      2.23s   0.42s /bin/bash ./amd_rate_aocc400_znver4_A1.sh

```

```

-----
3. Username
From environment variable $USER: root

```

```

-----
4. ulimit -a
time(seconds)          unlimited
file(blocks)           unlimited
data(kbytes)           unlimited
stack(kbytes)          unlimited
coredump(blocks)       0
memory(kbytes)         unlimited
locked memory(kbytes)  2097152
process                 3093842
nofiles                1024
vmemory(kbytes)        unlimited
locks                  unlimited
rtprio                 0

```

```

-----
5. sysinfo process ancestry
/sbin/init
/bin/login -p --
-bash
/bin/bash ./DELL_rate.sh
/bin/bash ./dell-run-main.sh rate
/bin/bash ./dell-run-main.sh rate

```

(Continued on next page)



# SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

Dell Inc.

SPECrate®2017\_fp\_base = 535

PowerEdge R7615 (AMD EPYC 9454 48-Core Processor)

SPECrate®2017\_fp\_peak = 536

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

Test Date: Oct-2023  
Hardware Availability: May-2023  
Software Availability: Sep-2023

## Platform Notes (Continued)

```

/bin/bash ./dell-run-speccpu.sh rate --define DL-BIOSinc=Dell-BIOS_EPYC-4.inc --define DL-BIOS-LogProc=1
--define DL-BIOS-adddcD=1 --define DL-VERS=v4.8 --output_format html,pdf,txt
python3 ./run_amd_rate_aocc400_znver4_A1.py
/bin/bash ./amd_rate_aocc400_znver4_A1.sh
runcpu --config amd_rate_aocc400_znver4_A1.cfg --tune all --reportable --iterations 2 --define DL-BIOS-NPS=4
--define DL-BIOSinc=Dell-BIOS_EPYC-4.inc --define DL-BIOS-LogProc=1 --define DL-BIOS-adddcD=1 --define
DL-VERS=v4.8 --output_format html,pdf,txt fprate
runcpu --configfile amd_rate_aocc400_znver4_A1.cfg --tune all --reportable --iterations 2 --define
DL-BIOS-NPS=4 --define DL-BIOSinc=Dell-BIOS_EPYC-4.inc --define DL-BIOS-LogProc=1 --define
DL-BIOS-adddcD=1 --define DL-VERS=v4.8 --output_format html,pdf,txt --nopower --runmode rate --tune
base:peak --size test:train:refrate fprate --nopreenv --note-preenv --logfile
$SPEC/tmp/CPU2017.002/templogs/preenv.fprate.002.0.log --lognum 002.0 --from_runcpu 2
specperl $SPEC/bin/sysinfo
$SPEC = /mnt/ramdisk/cpu2017-1.1.9-aocc400-znver4-A1.1

```

```

-----
6. /proc/cpuinfo
model name      : AMD EPYC 9454 48-Core Processor
vendor_id      : AuthenticAMD
cpu family     : 25
model         : 17
stepping      : 1
microcode     : 0xa10113e
bugs          : sysret_ss_attrs spectre_v1 spectre_v2 spec_store_bypass
TLB size      : 3584 4K pages
cpu cores     : 48
siblings      : 96
1 physical ids (chips)
96 processors (hardware threads)
physical id 0: core ids 0-5,8-13,16-21,24-29,32-37,40-45,48-53,56-61
physical id 0: apicids 0-11,16-27,32-43,48-59,64-75,80-91,96-107,112-123
Caution: /proc/cpuinfo data regarding chips, cores, and threads is not necessarily reliable, especially for
virtualized systems. Use the above data carefully.

```

```

-----
7. lscpu
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):           96
On-line CPU(s) list: 0-95
Vendor ID:        AuthenticAMD
Model name:       AMD EPYC 9454 48-Core Processor
CPU family:       25
Model:            17
Thread(s) per core: 2
Core(s) per socket: 48
Socket(s):        1
Stepping:         1
Frequency boost:  enabled
CPU max MHz:      3810.7910
CPU min MHz:      1500.0000
BogoMIPS:         5501.17
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 aperfmperf
rapl pni pclmulqdq monitor sse3 fma cx16 pcid sse4_1 sse4_2 x2apic

```

(Continued on next page)



# SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

## Dell Inc.

## SPECrate®2017\_fp\_base = 535

### PowerEdge R7615 (AMD EPYC 9454 48-Core Processor)

## SPECrate®2017\_fp\_peak = 536

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

**Test Date:** Oct-2023  
**Hardware Availability:** May-2023  
**Software Availability:** Sep-2023

### Platform Notes (Continued)

```
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 bpeext 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: 1.5 MiB (48 instances)
L1i cache: 1.5 MiB (48 instances)
L2 cache: 48 MiB (48 instances)
L3 cache: 256 MiB (8 instances)
NUMA node(s): 4
NUMA node0 CPU(s): 0-11,48-59
NUMA node1 CPU(s): 12-23,60-71
NUMA node2 CPU(s): 24-35,72-83
NUMA node3 CPU(s): 36-47,84-95
```

```
Vulnerability Gather data sampling: Not affected
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 always-on, RSB
filling, PBRSE-eIBRS Not affected
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	1.5M	8	Data	1	64	1	64
L1i	32K	1.5M	8	Instruction	1	64	1	64
L2	1M	48M	8	Unified	2	2048	1	64
L3	32M	256M	16	Unified	3	32768	1	64

**8. numactl --hardware**

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

```
available: 4 nodes (0-3)
node 0 cpus: 0-11,48-59
node 0 size: 193075 MB
node 0 free: 188507 MB
node 1 cpus: 12-23,60-71
node 1 size: 193529 MB
node 1 free: 192579 MB
node 2 cpus: 24-35,72-83
node 2 size: 193481 MB
node 2 free: 192559 MB
node 3 cpus: 36-47,84-95
node 3 size: 193487 MB
node 3 free: 192565 MB
```

(Continued on next page)



# SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

Dell Inc.

SPECrate®2017\_fp\_base = 535

PowerEdge R7615 (AMD EPYC 9454 48-Core Processor)

SPECrate®2017\_fp\_peak = 536

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

Test Date: Oct-2023  
Hardware Availability: May-2023  
Software Availability: Sep-2023

## Platform Notes (Continued)

```
node distances:
node    0    1    2    3
0:    10   12   12   12
1:    12   10   12   12
2:    12   12   10   12
3:    12   12   12   10
```

```
-----
9. /proc/meminfo
   MemTotal:      792139560 kB
```

```
-----
10. who -r
    run-level 5 Oct 11 19:28
```

```
-----
11. Systemd service manager version: systemd 249 (249.11-0ubuntu3.10)
    Default Target  Status
    graphical      running
```

```
-----
12. Services, from systemctl list-unit-files
    STATE          UNIT FILES
    enabled        ModemManager apparmor blk-availability console-setup cron dmesg e2scrub_reap finalrd
    getty@ gpu-manager grub-common grub-initrd-fallback irqbalance keyboard-setup lm-sensors
    lvm2-monitor lxd-agent multipathd networkd-dispatcher open-vm-tools pollinate rsyslog
    secureboot-db setvtrgb ssh systemd-networkd systemd-pstore systemd-resolved
    systemd-timesyncd thermald tuned ua-reboot-cmds ubuntu-advantage udisks2 ufw vgauth
    enabled-runtime netplan-ovs-cleanup systemd-fsck-root systemd-remount-fs
    disabled       console-getty debug-shell iscsid nftables open-iscsi rsync serial-getty@
    systemd-boot-check-no-failures systemd-network-generator systemd-sysext
    systemd-time-wait-sync upower
    generated      apport
    indirect        uuid
    masked         cryptdisks cryptdisks-early hwclock lvm2 multipath-tools-boot rc rcS screen-cleanup sudo
    systemd-networkd-wait-online x11-common
```

```
-----
13. Linux kernel boot-time arguments, from /proc/cmdline
    BOOT_IMAGE=/vmlinuz-5.15.0-84-generic
    root=/dev/mapper/ubuntu--vg-ubuntu--lv
    ro
```

```
-----
14. cpupower frequency-info
    analyzing CPU 0:
      current policy: frequency should be within 1.50 GHz and 2.75 GHz.
                       The governor "performance" may decide which speed to use
                       within this range.

    boost state support:
      Supported: yes
      Active: yes
      Boost States: 0
      Total States: 3
      Pstate-P0: 2750MHz
```

```
-----
15. tuned-adm active
    Current active profile: latency-performance
```

(Continued on next page)



# SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

Dell Inc.

SPECrate®2017\_fp\_base = 535

PowerEdge R7615 (AMD EPYC 9454 48-Core Processor)

SPECrate®2017\_fp\_peak = 536

CPU2017 License: 6573

Test Sponsor: Dell Inc.

Tested by: Dell Inc.

Test Date: Oct-2023

Hardware Availability: May-2023

Software Availability: Sep-2023

## Platform Notes (Continued)

```

-----
16. sysctl
kernel.numa_balancing          1
kernel.randomize_va_space     0
vm.compaction_proactiveness    20
vm.dirty_background_bytes      0
vm.dirty_background_ratio      3
vm.dirty_bytes                 0
vm.dirty_expire_centisecs     3000
vm.dirty_ratio                 8
vm.dirty_writeback_centisecs   500
vm.dirtytime_expire_seconds    43200
vm.extfrag_threshold           500
vm.min_unmapped_ratio          1
vm.nr_hugepages                0
vm.nr_hugepages_mempolicy      0
vm.nr_overcommit_hugepages     0
vm.swappiness                  1
vm.watermark_boost_factor      15000
vm.watermark_scale_factor      10
vm.zone_reclaim_mode           1
-----
17. /sys/kernel/mm/transparent_hugepage
defrag          [always] defer defer+madvise madvise never
enabled         [always] madvise never
hpage_pmd_size 2097152
shmem_enabled   always within_size advise [never] deny force
-----
18. /sys/kernel/mm/transparent_hugepage/khugepaged
alloc_sleep_millisecs  60000
defrag                 1
max_ptes_none          511
max_ptes_shared        256
max_ptes_swap          64
pages_to_scan          4096
scan_sleep_millisecs   10000
-----
19. OS release
From /etc/*-release /etc/*-version
os-release Ubuntu 22.04.3 LTS
-----
20. Disk information
SPEC is set to: /mnt/ramdisk/cpu2017-1.1.9-aocc400-znver4-A1.1
Filesystem      Type  Size  Used Avail Use% Mounted on
tmpfs            tmpfs 70G   3.5G  67G   5% /mnt/ramdisk
-----
21. /sys/devices/virtual/dmi/id
Vendor:          Dell Inc.
Product:         PowerEdge R7615
Product Family: PowerEdge
Serial:          RDB5009
-----
22. dmidecode
Additional information from dmidecode 3.3 follows.  WARNING: Use caution when you interpret this section.

```

(Continued on next page)





# SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

Dell Inc.

SPECrate®2017\_fp\_base = 535

PowerEdge R7615 (AMD EPYC 9454 48-Core Processor)

SPECrate®2017\_fp\_peak = 536

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

**Test Date:** Oct-2023  
**Hardware Availability:** May-2023  
**Software Availability:** Sep-2023

## Platform Notes (Continued)

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:

12x 80AD000080AD HMC94MEBRA109N 64 GB 2 rank 4800

### 23. BIOS

(This section combines info from /sys/devices and dmidecode.)

BIOS Vendor: Dell Inc.  
BIOS Version: 1.4.6  
BIOS Date: 07/06/2023  
BIOS Revision: 1.4

## Compiler Version Notes

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

AMD clang version 14.0.6 (CLANG: AOCC\_4.0.0-Build#434 2022\_10\_28) (based on LLVM Mirror.Version.14.0.6)  
Target: x86\_64-unknown-linux-gnu  
Thread model: posix  
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin  
=====

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

AMD clang version 14.0.6 (CLANG: AOCC\_4.0.0-Build#434 2022\_10\_28) (based on LLVM Mirror.Version.14.0.6)  
Target: x86\_64-unknown-linux-gnu  
Thread model: posix  
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin  
=====

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

AMD clang version 14.0.6 (CLANG: AOCC\_4.0.0-Build#434 2022\_10\_28) (based on LLVM Mirror.Version.14.0.6)  
Target: x86\_64-unknown-linux-gnu  
Thread model: posix  
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin  
AMD clang version 14.0.6 (CLANG: AOCC\_4.0.0-Build#434 2022\_10\_28) (based on LLVM Mirror.Version.14.0.6)  
Target: x86\_64-unknown-linux-gnu  
Thread model: posix  
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin  
=====

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

AMD clang version 14.0.6 (CLANG: AOCC\_4.0.0-Build#434 2022\_10\_28) (based on LLVM Mirror.Version.14.0.6)  
Target: x86\_64-unknown-linux-gnu  
Thread model: posix  
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin  
AMD clang version 14.0.6 (CLANG: AOCC\_4.0.0-Build#434 2022\_10\_28) (based on LLVM Mirror.Version.14.0.6)  
Target: x86\_64-unknown-linux-gnu  
Thread model: posix  
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin  
=====

(Continued on next page)



# SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

**Dell Inc.**

**SPECrate®2017\_fp\_base = 535**

PowerEdge R7615 (AMD EPYC 9454 48-Core Processor)

**SPECrate®2017\_fp\_peak = 536**

**CPU2017 License:** 6573

**Test Date:** Oct-2023

**Test Sponsor:** Dell Inc.

**Hardware Availability:** May-2023

**Tested by:** Dell Inc.

**Software Availability:** Sep-2023

## Compiler Version Notes (Continued)

```

AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#434 2022_10_28) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin
-----

```

```

=====
Fortran          | 503.bwaves_r(base, peak) 549.fotonik3d_r(base, peak) 554.roms_r(base, peak)
-----

```

```

AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#434 2022_10_28) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin
-----

```

```

=====
Fortran, C       | 521.wrf_r(base, peak) 527.cam4_r(base, peak)
-----

```

```

AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#434 2022_10_28) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#434 2022_10_28) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/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



# SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

Dell Inc.

SPECrate®2017\_fp\_base = 535

PowerEdge R7615 (AMD EPYC 9454 48-Core Processor)

SPECrate®2017\_fp\_peak = 536

CPU2017 License: 6573

Test Sponsor: Dell Inc.

Tested by: Dell Inc.

Test Date: Oct-2023

Hardware Availability: May-2023

Software Availability: Sep-2023

## 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

```

(Continued on next page)



# SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

**Dell Inc.**

**SPECrate®2017\_fp\_base = 535**

PowerEdge R7615 (AMD EPYC 9454 48-Core Processor)

**SPECrate®2017\_fp\_peak = 536**

**CPU2017 License:** 6573

**Test Sponsor:** Dell Inc.

**Tested by:** Dell Inc.

**Test Date:** Oct-2023

**Hardware Availability:** May-2023

**Software Availability:** Sep-2023

## 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
```

(Continued on next page)



# SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

**Dell Inc.**

SPECrate®2017\_fp\_base = 535

PowerEdge R7615 (AMD EPYC 9454 48-Core Processor)

SPECrate®2017\_fp\_peak = 536

**CPU2017 License:** 6573

**Test Sponsor:** Dell Inc.

**Tested by:** Dell Inc.

**Test Date:** Oct-2023

**Hardware Availability:** May-2023

**Software Availability:** Sep-2023

## 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`

## Peak 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`

## Peak Portability Flags

Same as Base Portability Flags

## Peak Optimization Flags

C benchmarks:

`519.lbm_r: basepeak = yes`

(Continued on next page)



# SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

Dell Inc.

SPECrate®2017\_fp\_base = 535

PowerEdge R7615 (AMD EPYC 9454 48-Core Processor)

SPECrate®2017\_fp\_peak = 536

CPU2017 License: 6573

Test Sponsor: Dell Inc.

Tested by: Dell Inc.

Test Date: Oct-2023

Hardware Availability: May-2023

Software Availability: Sep-2023

## Peak Optimization Flags (Continued)

538.imagick\_r: basepeak = yes

544.nab\_r: basepeak = yes

C++ benchmarks:

```
508.namd_r: -m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-x86-use-vzeroupper=false -Ofast
-march=znver4 -fveclib=AMDLIBM -ffast-math
-inline-aggressive -mllvm -unroll-threshold=100
-mllvm -reduce-array-computations=3 -zopt -lamdlibm
-lamdalloc
```

```
510.parest_r: -m64 -flto -Wl,-mllvm -Wl,-suppress-fmas
-Wl,-mllvm -Wl,-x86-use-vzeroupper=false -Ofast
-march=znver4 -fveclib=AMDLIBM -ffast-math
-inline-aggressive -mllvm -unroll-threshold=100
-mllvm -reduce-array-computations=3 -zopt -lamdlibm
-lamdalloc
```

Fortran benchmarks:

```
503.bwaves_r: -m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-enable-X86-prefetching -Ofast
-march=znver4 -fveclib=AMDLIBM -ffast-math -Mrecursive
-mllvm -reduce-array-computations=3
-fepilog-vectorization-of-inductions -zopt -lamdlibm
-lamdalloc -lflang
```

```
549.fotonik3d_r: -m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-enable-X86-prefetching -Ofast
-march=znver4 -fveclib=AMDLIBM -ffast-math -Kieee
-Mrecursive -mllvm -reduce-array-computations=3
-fepilog-vectorization-of-inductions -fvector-transform
-fscalar-transform -lamdlibm -lamdalloc -lflang
```

554.roms\_r: Same as 503.bwaves\_r

Benchmarks using both Fortran and C:

521.wrf\_r: basepeak = yes

(Continued on next page)



# SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

Dell Inc.

SPECrate®2017\_fp\_base = 535

PowerEdge R7615 (AMD EPYC 9454 48-Core Processor)

SPECrate®2017\_fp\_peak = 536

CPU2017 License: 6573

Test Sponsor: Dell Inc.

Tested by: Dell Inc.

Test Date: Oct-2023

Hardware Availability: May-2023

Software Availability: Sep-2023

## Peak Optimization Flags (Continued)

527.cam4\_r: basepeak = yes

Benchmarks using both C and C++:

511.povray\_r: basepeak = yes

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

Benchmarks using Fortran, C, and C++:

507.cactuBSSN\_r: basepeak = yes

## Peak 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



# SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

Dell Inc.

SPECrate®2017\_fp\_base = 535

PowerEdge R7615 (AMD EPYC 9454 48-Core Processor)

SPECrate®2017\_fp\_peak = 536

**CPU2017 License:** 6573

**Test Date:** Oct-2023

**Test Sponsor:** Dell Inc.

**Hardware Availability:** May-2023

**Tested by:** Dell Inc.

**Software Availability:** Sep-2023

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

[http://www.spec.org/cpu2017/flags/aocc400-flags\\_A1.1.html](http://www.spec.org/cpu2017/flags/aocc400-flags_A1.1.html)

<http://www.spec.org/cpu2017/flags/Dell-Platform-Flags-PowerEdge-AMD-EPYC-v1.1.html>

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

[http://www.spec.org/cpu2017/flags/aocc400-flags\\_A1.1.xml](http://www.spec.org/cpu2017/flags/aocc400-flags_A1.1.xml)

<http://www.spec.org/cpu2017/flags/Dell-Platform-Flags-PowerEdge-AMD-EPYC-v1.1.xml>

SPEC CPU and SPECrate are registered trademarks of the Standard Performance Evaluation Corporation. All other brand and product names appearing in this result are trademarks or registered trademarks of their respective holders.

For questions about this result, please contact the tester. For other inquiries, please contact [info@spec.org](mailto:info@spec.org).

Tested with SPEC CPU®2017 v1.1.9 on 2023-10-11 18:54:16-0400.

Report generated on 2024-01-03 17:38:35 by CPU2017 PDF formatter v6716.

Originally published on 2024-01-02.