



# SPEC CPU®2017 Floating Point Speed Result

Copyright 2017-2023 Standard Performance Evaluation Corporation

## ASUSTeK Computer Inc.

ASUS RS520A-E12-RS12U  
(3.85 GHz, AMD EPYC 9374F)

SPECspeed®2017\_fp\_base = 256

SPECspeed®2017\_fp\_peak = 272

CPU2017 License: 9016

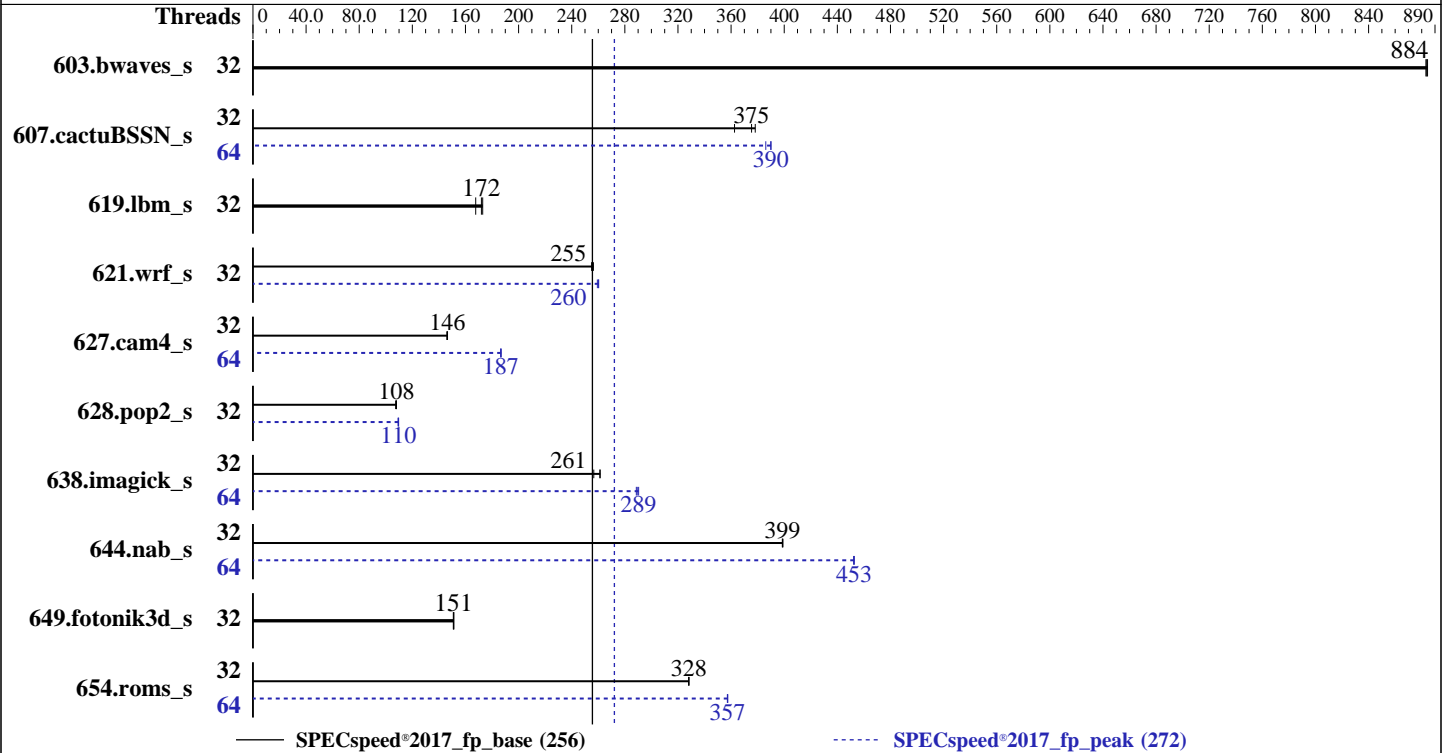
Test Sponsor: ASUSTeK Computer Inc.

Tested by: ASUSTeK Computer Inc.

Test Date: Jul-2023

Hardware Availability: Nov-2022

Software Availability: Nov-2022



### Hardware

CPU Name: AMD EPYC 9374F  
 Max MHz: 4300  
 Nominal: 3850  
 Enabled: 32 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 / 4 cores  
 Other: None  
 Memory: 768 GB (12 x 64 GB 2Rx4 PC5-4800B-R)  
 Storage: 1 x 1.6 TB PCIe NVMe SSD  
 Other: None

### Software

OS: SUSE Linux Enterprise Server 15 SP4 (x86\_64)  
 Kernel 5.14.21-150400.22-default  
 Compiler: C/C++/Fortran: Version 4.0.0 of AOCC  
 Parallel: Yes  
 Firmware: Version 0901 released May-2023  
 File System: xfs  
 System State: Run level 3 (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.



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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	66.8	883	66.7	884	<b>66.8</b>	<b>884</b>	32	66.8	883	66.7	884	<b>66.8</b>	<b>884</b>
607.cactuBSSN_s	32	46.0	363	<b>44.4</b>	<b>375</b>	44.1	378	64	<b>42.8</b>	<b>390</b>	42.7	390	43.2	386
619.lbm_s	32	30.3	173	<b>30.5</b>	<b>172</b>	31.2	168	32	30.3	173	<b>30.5</b>	<b>172</b>	31.2	168
621.wrf_s	32	51.9	255	51.6	256	<b>51.8</b>	<b>255</b>	32	51.0	259	<b>50.9</b>	<b>260</b>	50.8	260
627.cam4_s	32	60.7	146	60.5	146	<b>60.6</b>	<b>146</b>	64	47.4	187	47.5	187	<b>47.5</b>	<b>187</b>
628.pop2_s	32	110	108	<b>110</b>	<b>108</b>	111	107	32	109	109	<b>108</b>	<b>110</b>	108	110
638.imagick_s	32	<b>55.2</b>	<b>261</b>	56.2	257	55.2	261	64	49.7	290	50.0	289	<b>49.9</b>	<b>289</b>
644.nab_s	32	43.8	399	<b>43.8</b>	<b>399</b>	43.8	399	64	<b>38.6</b>	<b>453</b>	38.6	453	38.6	452
649.fotonik3d_s	32	<b>60.3</b>	<b>151</b>	60.4	151	60.3	151	32	<b>60.3</b>	<b>151</b>	60.4	151	60.3	151
654.roms_s	32	<b>48.0</b>	<b>328</b>	48.0	328	48.0	328	64	<b>44.1</b>	<b>357</b>	44.1	357	44.0	357

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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
OS set to performance mode via cpupower frequency-set -g performance
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,
'echo always > /sys/kernel/mm/transparent_hugepage/enabled' and
'echo always > /sys/kernel/mm/transparent_hugepage/defrag' run as root.
To always enable THP for peak runs of:
603.bwaves_s, 607.cactuBSSN_s, 619.lbm_s, 627.cam4_s, 628.pop2_s, 638.imagick_s, 644.nab_s, 649.fotonik3d_s:
'echo madvise > /sys/kernel/mm/transparent_hugepage/enabled; echo always > /sys/kernel/mm/transparent_hugepage/defrag'
run as root.
```

(Continued on next page)



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### Operating System Notes (Continued)

To disable THP for peak runs of 621.wrf\_s:  
 'echo never > /sys/kernel/mm/transparent\_hugepage/enabled; echo always > /sys/kernel/mm/transparent\_hugepage/defrag'  
 run as root.

To enable THP only on request for peak runs of 654.roms\_s:  
 'echo madvise > /sys/kernel/mm/transparent\_hugepage/enabled; echo madvise > /sys/kernel/mm/transparent\_hugepage/defrag'  
 run as root.

### Environment Variables Notes

Environment variables set by runcpu before the start of the run:

```
GOMP_CPU_AFFINITY = "0-63"
LD_LIBRARY_PATH = "/cpull9/amd_speed_aocc400_genoa_B_lib/lib:"
LIBOMP_NUM_HIDDEN_HELPER_THREADS = "0"
MALLOC_CONF = "oversize_threshold:0,retain:true"
OMP_DYNAMIC = "false"
OMP_SCHEDULE = "static"
OMP_STACKSIZE = "128M"
OMP_THREAD_LIMIT = "64"
```

Environment variables set by runcpu during the 607.cactuBSSN\_s peak run:

GOMP\_CPU\_AFFINITY = "0-63"

Environment variables set by runcpu during the 621.wrf\_s peak run:

GOMP\_CPU\_AFFINITY = "0-31"

Environment variables set by runcpu during the 627.cam4\_s peak run:

GOMP\_CPU\_AFFINITY = "0-63"

Environment variables set by runcpu during the 628.pop2\_s peak run:

GOMP\_CPU\_AFFINITY = "0-31"

Environment variables set by runcpu during the 638.imagick\_s peak run:

GOMP\_CPU\_AFFINITY = "0-63"

Environment variables set by runcpu during the 644.nab\_s peak run:

GOMP\_CPU\_AFFINITY = "0-63"

Environment variables set by runcpu during the 654.roms\_s peak run:

```
GOMP_CPU_AFFINITY = "0 32 1 33 2 34 3 35 4 36 5 37 6 38 7 39 8 40 9 41 10 42 11 43 12 44 13 45 14 46 15 47
16 48 17 49 18 50 19 51 20 52 21 53 22 54 23 55 24 56 25 57 26 58 27 59 28 60 29 61 30 62 31 63"
```

### 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.



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## Platform Notes

### BIOS Configuration:

SR-IOV Support = Disabled  
 SVM Mode = Disabled  
 NUMA nodes per socket = NPS1  
 Determinism Control = Manual  
 Determinism Enable = Power  
 Engine Boost = Aggressive  
 TDP Control = Manual  
 TDP = 400  
 PPT Control = Manual  
 PPT = 400  
 IOMMU = Disabled  
 BMC Configuration:  
 Fan mode = Full speed mode

Sysinfo program /cpu119/bin/sysinfo  
 Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197  
 running on localhost Mon Jul 10 13:16:19 2023

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

### Table of contents

1. uname -a
2. w
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+suse.124.g2bc0b2c447)
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 localhost 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

2. w  
 13:16:19 up 4:02, 2 users, load average: 21.27, 37.69, 39.48

USER	TTY	FROM	LOGIN@	IDLE	JCPU	PCPU	WHAT
root	tty1	-	09:14	4:00m	1.06s	0.08s	/bin/bash ./amd_speed_aocc400_genoa_B1.sh
root	tty2	-	10:01	20:26	0.02s	0.02s	-bash

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### Platform Notes (Continued)

-----  
3. Username

From environment variable \$USER: root

-----  
4. ulimit -a

```
core file size          (blocks, -c) unlimited
data seg size           (kbytes, -d) unlimited
scheduling priority     (-e) 0
file size               (blocks, -f) unlimited
pending signals         (-i) 3093078
max locked memory       (kbytes, -l) 2097152
max memory size         (kbytes, -m) unlimited
open files              (-n) 1024
pipe size               (512 bytes, -p) 8
POSIX message queues    (bytes, -q) 819200
real-time priority      (-r) 0
stack size              (kbytes, -s) unlimited
cpu time                (seconds, -t) unlimited
max user processes      (-u) 3093078
virtual memory          (kbytes, -v) unlimited
file locks              (-x) unlimited
```

-----  
5. sysinfo process ancestry

```
/usr/lib/systemd/systemd --switched-root --system --deserialize 30
login -- root
-bash
/bin/bash ./speed.sh
python3 ./run_amd_speed_aocc400_genoa_B1.py
/bin/bash ./amd_speed_aocc400_genoa_B1.sh
runcpu --config amd_speed_aocc400_genoa_B1.cfg --tune all --reportable --iterations 3 fpspeed
runcpu --configfile amd_speed_aocc400_genoa_B1.cfg --tune all --reportable --iterations 3 --nopower
--runmode speed --tune base:peak --size test:train:refspeed fpspeed --nopreenv --note-preenv --logfile
$SPEC/tmp/CPU2017.401/templogs/preenv.fpspeed.401.0.log --lognum 401.0 --from_runcpu 2
specperl $SPEC/bin/sysinfo
$SPEC = /cpull9
```

-----  
6. /proc/cpuinfo

```
model name      : AMD EPYC 9374F 32-Core Processor
vendor_id      : AuthenticAMD
cpu family      : 25
model          : 17
stepping       : 1
microcode      : 0xa101116
bugs           : sysret_ss_attrs spectre_v1 spectre_v2 spec_store_bypass
TLB size       : 3584 4K pages
cpu cores      : 32
siblings       : 64
1 physical ids (chips)
64 processors (hardware threads)
physical id 0: core ids 0-3,8-11,16-19,24-27,32-35,40-43,48-51,56-59
physical id 0: apicids 0-7,16-23,32-39,48-55,64-71,80-87,96-103,112-119
Caution: /proc/cpuinfo data regarding chips, cores, and threads is not necessarily reliable, especially for
virtualized systems. Use the above data carefully.
```

-----  
7. lscpu

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### Platform Notes (Continued)

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):               64
On-line CPU(s) list:  0-63
Vendor ID:            AuthenticAMD
Model name:           AMD EPYC 9374F 32-Core Processor
CPU family:           25
Model:                17
Thread(s) per core:  2
Core(s) per socket:  32
Socket(s):            1
Stepping:             1
Frequency boost:      enabled
CPU max MHz:          4304.9312
CPU min MHz:          1500.0000
BogoMIPS:             7688.51
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 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 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 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 MiB (32 instances)
L1i cache:            1 MiB (32 instances)
L2 cache:             32 MiB (32 instances)
L3 cache:             256 MiB (8 instances)
NUMA node(s):        1
NUMA node0 CPU(s):   0-63
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 always-on, 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	1M	8	Data	1	64	1	64
L1i	32K	1M	8	Instruction	1	64	1	64
L2	1M	32M	8	Unified	2	2048	1	64
L3	32M	256M	16	Unified	3	32768	1	64

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### Platform Notes (Continued)

```

-----
8. numactl --hardware
NOTE: a numactl 'node' might or might not correspond to a physical chip.
available: 1 nodes (0)
node 0 cpus: 0-63
node 0 size: 773294 MB
node 0 free: 771904 MB
node distances:
node   0
0:   10

```

```

-----
9. /proc/meminfo
MemTotal:      791853244 kB

```

```

-----
10. who -r
run-level 3 Jul 10 09:14

```

```

-----
11. Systemd service manager version: systemd 249 (249.11+suse.124.g2bc0b2c447)
Default Target   Status
multi-user       running

```

```

-----
12. Services, from systemctl list-unit-files
STATE      UNIT FILES
enabled    YaST2-Firstboot YaST2-Second-Stage apparmor auditd cron display-manager getty@ haveged
            irqbalance issue-generator kbdsettings klog lvm2-monitor nscd nvme-fc-boot-connections
            postfix purge-kernels rollback rsyslog smartd sshd wicked wickedd-auto4 wickedd-dhcp4
            wickedd-dhcp6 wickedd-nanny
enabled-runtime systemd-remount-fs
disabled   autofs autoyast-initscripts blk-availability boot-sysctl ca-certificates chrony-wait
            chronyd console-getty cups cups-browsed debug-shell ebttables exchange-bmc-os-info
            firewalld gpm grub2-once haveged-switch-root ipmi ipmievdev issue-add-ssh-keys kexec-load
            lunmask man-db-create multipathd nfs nfs-blkmap nvme-autoconnect rdisc rpcbind
            rpmconfigcheck rsyncd serial-getty@ smartd_generate_opts snmpd snmptrapd svnservice
            systemd-boot-check-no-failures systemd-network-generator systemd-sysext
            systemd-time-wait-sync systemd-timesyncd tuned udisks2
indirect   wickedd

```

```

-----
13. Linux kernel boot-time arguments, from /proc/cmdline
BOOT_IMAGE=/boot/vmlinuz-5.14.21-150400.22-default
root=UUID=9bcf0374-b29f-4a4c-932e-9c0e90fb0803
splash=silent
mitigations=auto
quiet

```

```

-----
14. cpupower frequency-info
analyzing CPU 0:
current policy: frequency should be within 1.50 GHz and 3.85 GHz.
                  The governor "performance" may decide which speed to use
                  within this range.

boost state support:
Supported: yes
Active: yes

```

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### Platform Notes (Continued)

-----  
15. tuned-adm active

It seems that tuned daemon is not running, preset profile is not activated.  
Preset profile: throughput-performance

-----  
16. sysctl

kernel.numa_balancing	0
kernel.randomize_va_space	0
vm.compaction_proactiveness	20
vm.dirty_background_bytes	0
vm.dirty_background_ratio	10
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 SUSE Linux Enterprise Server 15 SP4

-----  
20. Disk information

SPEC is set to: /cpu119  
Filesystem Type Size Used Avail Use% Mounted on  
/dev/nvme0n1p8 xfs 500G 229G 272G 46% /

-----  
21. /sys/devices/virtual/dmi/id

Vendor: ASUSTeK COMPUTER INC.  
Product: RS520A-E12-RS12U  
Product Family: Server

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### Platform Notes (Continued)

Serial: 123456789012

#### 22. dmidecode

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:

12x Samsung M321R8GA0BB0-CQKVG 64 GB 2 rank 4800

#### 23. BIOS

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

BIOS Vendor: American Megatrends Inc.  
BIOS Version: 0901  
BIOS Date: 05/04/2023  
BIOS Revision: 9.1

### Compiler Version Notes

C | 619.lbm\_s(base, peak) 638.imagick\_s(base, peak) 644.nab\_s(base, peak)

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 | 607.cactuBSSN\_s(base, peak)

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 | 603.bwaves\_s(base, peak) 649.fotonik3d\_s(base, peak) 654.roms\_s(base, peak)

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 | 621.wrf\_s(base, peak) 627.cam4\_s(base, peak) 628.pop2\_s(base, peak)

(Continued on next page)



# SPEC CPU®2017 Floating Point Speed Result

Copyright 2017-2023 Standard Performance Evaluation Corporation

**ASUSTeK Computer Inc.**

SPECspeed®2017\_fp\_base = 256

ASUS RS520A-E12-RS12U  
(3.85 GHz, AMD EPYC 9374F)

SPECspeed®2017\_fp\_peak = 272

CPU2017 License: 9016

Test Date: Jul-2023

Test Sponsor: ASUSTeK Computer Inc.

Hardware Availability: Nov-2022

Tested by: ASUSTeK Computer Inc.

Software Availability: Nov-2022

## 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
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

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:

```

-m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3 -O3 -march=znver4
-fveclib=AMDLIBM -ffast-math -fopenmp -flto -fstruct-layout=7

```

(Continued on next page)



# SPEC CPU®2017 Floating Point Speed Result

Copyright 2017-2023 Standard Performance Evaluation Corporation

**ASUSTeK Computer Inc.**

ASUS RS520A-E12-RS12U  
(3.85 GHz, AMD EPYC 9374F)

SPECspeed®2017\_fp\_base = 256

SPECspeed®2017\_fp\_peak = 272

**CPU2017 License:** 9016

**Test Sponsor:** ASUSTeK Computer Inc.

**Tested by:** ASUSTeK Computer Inc.

**Test Date:** Jul-2023

**Hardware Availability:** Nov-2022

**Software Availability:** Nov-2022

## Base Optimization Flags (Continued)

C benchmarks (continued):

```
-mllvm -unroll-threshold=50 -mllvm -inline-threshold=1000
-freemap-arrays -fstrip-mining -mllvm -reduce-array-computations=3
-DSPEC_OPENMP -zopt -fopenmp=libomp -lomp -lamdlibm -lamdalloc
-lflang
```

Fortran benchmarks:

```
-m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-enable-X86-prefetching -DSPEC_OPENMP -O3 -march=znver4
-fveclib=AMDLIBM -ffast-math -fopenmp -flto -Mrecursive
-funroll-loops -mllvm -lsr-in-nested-loop
-mllvm -reduce-array-computations=3 -zopt -fopenmp=libomp -lomp
-lamdlibm -lamdalloc -lflang
```

Benchmarks using both Fortran and C:

```
-m64 -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 -fopenmp -flto -fstruct-layout=7
-mllvm -unroll-threshold=50 -mllvm -inline-threshold=1000
-freemap-arrays -fstrip-mining -mllvm -reduce-array-computations=3
-DSPEC_OPENMP -zopt -Mrecursive -funroll-loops
-mllvm -lsr-in-nested-loop -fopenmp=libomp -lomp -lamdlibm -lamdalloc
-lflang
```

Benchmarks using Fortran, C, and C++:

```
-m64 -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 -fopenmp -flto -fstruct-layout=7
-mllvm -unroll-threshold=50 -mllvm -inline-threshold=1000
-freemap-arrays -fstrip-mining -mllvm -reduce-array-computations=3
-DSPEC_OPENMP -zopt -mllvm -unroll-threshold=100 -finline-aggressive
-mllvm -loop-unswitch-threshold=200000 -Mrecursive -funroll-loops
-mllvm -lsr-in-nested-loop -fopenmp=libomp -lomp -lamdlibm -lamdalloc
-lflang
```

## Base Other Flags

C benchmarks:

```
-Wno-return-type -Wno-unused-command-line-argument
```

(Continued on next page)



# SPEC CPU®2017 Floating Point Speed Result

Copyright 2017-2023 Standard Performance Evaluation Corporation

**ASUSTeK Computer Inc.**

ASUS RS520A-E12-RS12U  
(3.85 GHz, AMD EPYC 9374F)

SPECspeed®2017\_fp\_base = 256

SPECspeed®2017\_fp\_peak = 272

**CPU2017 License:** 9016

**Test Sponsor:** ASUSTeK Computer Inc.

**Tested by:** ASUSTeK Computer Inc.

**Test Date:** Jul-2023

**Hardware Availability:** Nov-2022

**Software Availability:** Nov-2022

## Base Other Flags (Continued)

Fortran benchmarks:

-Wno-unused-command-line-argument

Benchmarks using both Fortran and C:

-Wno-return-type -Wno-unused-command-line-argument

Benchmarks using Fortran, C, and C++:

-Wno-return-type -Wno-unused-command-line-argument

## 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: -m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6

-Wl,-mllvm -Wl,-reduce-array-computations=3 -Ofast

-march=znver4 -fveclib=AMDLIBM -ffast-math -fopenmp

-flto -fstruct-layout=9 -mllvm -unroll-threshold=50

-fremap-arrays -fstrip-mining

-mllvm -inline-threshold=1000

-mllvm -reduce-array-computations=3 -DSPEC\_OPENMP -zopt

(Continued on next page)



# SPEC CPU®2017 Floating Point Speed Result

Copyright 2017-2023 Standard Performance Evaluation Corporation

## ASUSTeK Computer Inc.

ASUS RS520A-E12-RS12U  
(3.85 GHz, AMD EPYC 9374F)

SPECspeed®2017\_fp\_base = 256

SPECspeed®2017\_fp\_peak = 272

CPU2017 License: 9016

Test Sponsor: ASUSTeK Computer Inc.

Tested by: ASUSTeK Computer Inc.

Test Date: Jul-2023

Hardware Availability: Nov-2022

Software Availability: Nov-2022

## Peak Optimization Flags (Continued)

638.imagick\_s (continued):

```
-fopenmp=libomp -lomp -lamdlibm -lamdalloc -lflang
```

644.nab\_s: -m64 -Wl,-mllvm -Wl,-region-vectorize -Ofast

```
-march=znver4 -fveclib=AMDLIBM -ffast-math -fopenmp
```

```
-flto -fstruct-layout=9 -mllvm -unroll-threshold=50
```

```
-fremap-arrays -fstrip-mining
```

```
-mllvm -inline-threshold=1000
```

```
-mllvm -reduce-array-computations=3 -DSPEC_OPENMP -zopt
```

```
-fopenmp=libomp -lomp -lamdlibm -lamdalloc -lflang
```

Fortran benchmarks:

603.bwaves\_s: basepeak = yes

649.fotonik3d\_s: basepeak = yes

654.roms\_s: -m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6

```
-Wl,-mllvm -Wl,-reduce-array-computations=3
```

```
-Wl,-mllvm -Wl,-enable-X86-prefetching -DSPEC_OPENMP
```

```
-Ofast -march=znver4 -fveclib=AMDLIBM -ffast-math
```

```
-fopenmp -Mrecursive -mllvm -reduce-array-computations=3
```

```
-fvector-transform -fscalar-transform -fopenmp=libomp
```

```
-lomp -lamdlibm -lamdalloc -lflang
```

Benchmarks using both Fortran and C:

621.wrf\_s: -m64 -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 -fopenmp
```

```
-flto -fstruct-layout=9 -mllvm -unroll-threshold=50
```

```
-fremap-arrays -fstrip-mining
```

```
-mllvm -inline-threshold=1000
```

```
-mllvm -reduce-array-computations=3 -DSPEC_OPENMP -zopt
```

```
-O3 -Mrecursive -funroll-loops -mllvm -lsr-in-nested-loop
```

```
-fopenmp=libomp -lomp -lamdlibm -lamdalloc -lflang
```

627.cam4\_s: -m64 -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 -fopenmp
```

```
-flto -fstruct-layout=9 -mllvm -unroll-threshold=50
```

```
-fremap-arrays -fstrip-mining
```

```
-mllvm -inline-threshold=1000
```

```
-mllvm -reduce-array-computations=3 -DSPEC_OPENMP -zopt
```

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# SPEC CPU®2017 Floating Point Speed Result

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## Peak Optimization Flags (Continued)

627.cam4\_s (continued):

```
-Mrecursive -fopenmp=libomp -lomp -lamdlibm -lamdalloc  
-lflang
```

```
628.pop2_s: -m64 -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 -fopenmp  
-flto -fstruct-layout=9 -mllvm -unroll-threshold=50  
-fremap-arrays -fstrip-mining  
-mllvm -inline-threshold=1000  
-mllvm -reduce-array-computations=3 -DSPEC_OPENMP -zopt  
-Mrecursive -fvector-transform -fscalar-transform  
-fopenmp=libomp -lomp -lamdlibm -lamdalloc -lflang
```

Benchmarks using Fortran, C, and C++:

```
-m64 -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 -fopenmp -flto -fstruct-layout=9  
-mllvm -unroll-threshold=50 -fremap-arrays -fstrip-mining  
-mllvm -inline-threshold=1000 -mllvm -reduce-array-computations=3  
-DSPEC_OPENMP -zopt -finline-aggressive -mllvm -unroll-threshold=100  
-Mrecursive -fopenmp=libomp -lomp -lamdlibm -lamdalloc -lflang
```

## Peak Other Flags

C benchmarks:

```
-Wno-return-type -Wno-unused-command-line-argument
```

Fortran benchmarks:

```
-Wno-unused-command-line-argument
```

Benchmarks using both Fortran and C:

```
-Wno-return-type -Wno-unused-command-line-argument
```

Benchmarks using Fortran, C, and C++:

```
-Wno-return-type -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/ASUSTekPlatform-Settings-AMD-K14-V1.4.html>

<http://www.spec.org/cpu2017/flags/aocc400-flags-asusv01.html>



# SPEC CPU®2017 Floating Point Speed Result

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SPECspeed®2017\_fp\_base = 256

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**CPU2017 License:** 9016

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**Test Date:** Jul-2023

**Hardware Availability:** Nov-2022

**Software Availability:** Nov-2022

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

<http://www.spec.org/cpu2017/flags/ASUSTekPlatform-Settings-AMD-K14-V1.4.xml>

<http://www.spec.org/cpu2017/flags/aocc400-flags-asusv01.xml>

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Tested with SPEC CPU®2017 v1.1.9 on 2023-07-10 01:16:19-0400.

Report generated on 2023-08-02 16:29:55 by CPU2017 PDF formatter v6716.

Originally published on 2023-08-01.