## SPEC CPU®2017 Floating Point Rate Result

**Supermicro**

WIO A+ Server AS-1115SV-WTNRT (H13SVW-NT, AMD EPYC 8024PN)

<table>
<thead>
<tr>
<th>SPECrate®2017_fp_base</th>
<th>SPECrate®2017_fp_peak</th>
</tr>
</thead>
<tbody>
<tr>
<td>= 99.5</td>
<td>= 100</td>
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</table>

**CPU2017 License:** 001176  
**Test Sponsor:** Supermicro  
**Tested by:** Supermicro  
**Test Date:** Sep-2023  
**Hardware Availability:** Sep-2023  
**Software Availability:** Sep-2023

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
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<tbody>
<tr>
<td>503.bwaves_r</td>
<td>16</td>
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<tr>
<td>507.cactuBSSN_r</td>
<td>16</td>
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<tr>
<td>508.namd_r</td>
<td>16</td>
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<tr>
<td>510.parest_r</td>
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<tr>
<td>511.povray_r</td>
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<td>527.cam4_r</td>
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<td>538.imagick_r</td>
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<td>544.nab_r</td>
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<td>549.fotonik3d_r</td>
<td>16</td>
</tr>
<tr>
<td>554.roms_r</td>
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</tr>
</tbody>
</table>

**Hardware**

- **CPU Name:** AMD EPYC 8024PN  
- **Max MHz:** 3000  
- **Nominal:** 2050  
- **Enabled:** 8 cores, 1 chip, 2 threads/core  
- **Orderable:** 1 chip  
- **Cache L1:** 32 KB I + 32 KB D on chip per core  
- **Cache L2:** 1 MB I+D on chip per core  
- **Cache L3:** 32 MB I+D on chip per core, 16 MB shared / 4 cores  
- **Other:** None  
- **Memory:** 384 GB (6 x 64 GB 2Rx4 PC5-4800B-R)  
- **Storage:** 1 x 3.84 TB NVMe SSD  
- **Power Management:** BIOS and OS set to prefer performance at the cost of additional power usage.

**Software**

- **OS:** Ubuntu 22.04.3 LTS  
- **Kernel:** 5.15.0-84-generic  
- **Compiler:** C/C++/Fortran: Version 4.0.0 of AOCC  
- **Parallel:** No  
- **Firmware:** Version 1.0 released Aug-2023  
- **File System:** ext4  
- **System State:** Run level 5 (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.
## Results Table

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</table>

SPECrate®2017_fp_base = **99.5**  
SPECrate®2017_fp_peak = **100**

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.:  
umactl --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

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Test Sponsor: Supermicro
Tested by: Supermicro

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SPECrate®2017_fp_peak = 100

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

Operating System Notes (Continued)

'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 =
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.

Platform Notes

BIOS Settings:
Determinism Control = Manual
Determinism Enable = Disable Performance Determinism
TSME = Disabled
SEV Control = Disabled

Sysinfo program /root/cpu2017znver4A1.1/bin/sysinfo
Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
running on smcsienacpu2017 Fri Sep 22 10:13:13 2023

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

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7. lscpu
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10. who --r
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13. Services, from systemctl list-unit-files
14. Linux kernel boot-time arguments, from /proc/cmdline
15. cpupower frequency-info

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17. `/sys/kernel/mm/transparent_hugepage`
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19. `OS release`
20. `Disk information`
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22. `dmidecode`
23. `BIOS`

1. `uname -a`
   Linux smcsienacpu2017 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`
   10:13:13 up  5:53,  1 user,  load average: 12.02, 15.05, 15.64
   USER     TTY      FROM             LOGIN@   IDLE   JCPU   PCPU WHAT
   root     tty1     -                04:22    5:49m  0.05s  0.00s -bash

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
   processes 1545902
   nofiles 1024
   vmemory(kbytes) unlimited
   locks unlimited
   rtprio 0

5. `sysinfo process ancestry`
   /lib/systemd/systemd --switched-root --system --deserialize 30
   SCREEN -S cpu
   /bin/bash
   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 3 fprate
   runcpu --configfile amd_rate_aocc400_znver4_A1.cfg --tune all --reportable --iterations 3 --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 = /root/cpu2017znver4A1.1

6. `/proc/cpuinfo`
   model name : AMD EPYC 8024PN 8-Core Processor
   vendor_id : AuthenticAMD
   cpu family : 25
   model : 160

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SPECrates®2017_fp_base = 99.5
SPECrates®2017_fp_peak = 100

Platform Notes (Continued)

stepping : 2
microcode : 0xa0020f
bugs : sysret_ss_attn specr_v1 specr_v2 spec_store_bypass
TLB size : 3584 4K pages
cpu cores : 8
siblings : 16
1 physical ids (chips)
16 processors (hardware threads)
physical id 0: core ids 0-3, 8-11
physical id 0: apicids 0-7,16-23
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): 16
On-line CPU(s) list: 0-15
Vendor ID: AuthenticAMD
Model name: AMD EPYC 8024PN 8-Core Processor
CPU family: 25
Model: 160
Thread(s) per core: 2
Core(s) per socket: 8
Socket(s): 1
Stepping: 2
Frequency boost: enabled
CPU max MHz: 3002.9290
CPU min MHz: 1500.0000
BogoMIPS: 4093.96
Flags: fpu vme de pse tsc msr pae mca cmov pat pse36
clflush mmx fxsr sse sse2 ht syscall xt8gsopt ftxsor opt pdpe1gb rdtsscp
lm constant_tsc rep_good nopt nonstop_tsc cpuid extd_apicid aperfmpref
rapl pnr pmlmulqg monitor ssse3 fma cx16 pclid ssse4_1 ssse4_2 x2apic
movbe popcnt aes xsave avx f16c rzrand lahff_lm cmp_legacy svm extatic
cr8_legacy abm ssse4 misalignsse 3dnowprefetch osxw iobs skinlt wdt tce
topoext perfctr_core perfctr_nb bpext perfctr_l1c mwaitx cpb cat_l3
cdp_l3 invpcid_single hw pstate ssbd mba ibrs ibpb stibp vmmcall
fsgsbase bml1 avx2 smep bmi2 erms invpcid cmq rdt_a avx512f avx512d
rsdseed adx rnsm avx512lifma clflushopt clwb avx512dcd sha_ni avx512bw
avx512vl xsaveopt xgetbv1 xsaves cmq_llc cmq_occup_llc
cmg_mwb_mtotal cmg_mwb_local avx512_bf16 clzero ierperf xsaveerpr rdrpr
wboinvmd amd mpn cppc arat npt lbr vsvm_lock nrip_save tsc_scale
vmcb_clean flushbyasid decodeassist pausefilter pfsocket abv v_vmsave_vmioclav if v_spec_ctrl 4 avx512vbmi umip pu op Avx512vbmi2
gfni vms avpcm ulqmg advif v_spec_ctrl 4 avx512vbmi umip pu op Avx512vbmi2
rdpid overflow recov succor smca fasm flush_l1d
Virtualization: AMD-V
L1d cache: 256 KIB (8 instances)
L1i cache: 256 KIB (8 instances)
L2 cache: 8 MIB (8 instances)
L3 cache: 32 MIB (2 instances)
NUMA node(s): 1
NUMA node0 CPU(s): 0-15
Vulnerability Gather data sampling: Not affected

(Continued on next page)
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SPECrate®2017_fp_base = 99.5
SPECrate®2017_fp_peak = 100

Platform Notes (Continued)

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/swaps barriers and _user pointer sanitization
Vulnerability Spectre v2: Mitigation; Retpolines, IBPB conditional, IBRS_FW, STIBP always-on, RSB filling, FPRSB-eIBRS Not affected
Vulnerability Srbd: Not affected
Vulnerability Tax async abort: Not affected

From lscpu --cache:

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<td></td>
<td>3 16384</td>
<td></td>
<td>1</td>
<td>64</td>
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</tbody>
</table>

8. numactl --hardware
NOTE: a numactl 'node' might or might not correspond to a physical chip.
available: 1 nodes (0)
node 0 cpus: 0-15
node 0 size: 386497 MB
node 0 free: 385151 MB
node distances:
node   0
0:  10

9. /proc/meminfo
MemTotal: 395773688 kB

10. who -r
run-level 5 Sep 22 04:22

11. Systemd service manager version: systemd 249 (249.11-0ubuntu3.9)
Default Target Status
graphical degraded

12. Failed units, from systemctl list-units --state=failed
UNIT LOAD ACTIVE SUB DESCRIPTION
* systemd-networkd-wait-online.service loaded failed failed failed Wait for Network to be Configured

13. Services, from systemctl list-unit-files
STATE UNIT FILES
disable ModemManager apparmor blk-availability cloud-config cloud-final cloud-init
ccloud-init-local console-setup cron dmesg e2fsck_reap finalrd getty@ gpu-manager
grub-common grub-initrd-fallback irqbalance keyboard-setup lxd-agent
multipathd networkd-dispatcher nvme-cc-boot-connections nvme-autoconnect open-iscsi
open-vm-tools pollinate rsyslog secureboot-dk setvtrgb snapd ssh systemd-networkd
systemd-networkd-wait-online systemd-pstore systemd-resolved systemd-timesyncd thermald
ua-reboot-cmds ubuntu-advantage udisks2 ufw unattended-upgrades vgauth
enable-runtime netplan-ovs-cleanup systemd-fsck-root systemd-remount-fs

(Continued on next page)
Platform Notes (Continued)

14. Linux kernel boot-time arguments, from /proc/cmdline
   BOOT_IMAGE=/boot/vmlinuz-5.15.0-84-generic
   root=UUID=b1f703cd-b1aa-4ada-a083-50dc8f47c86c
   ro

15. cpupower frequency-info
   analyzing CPU 0:
   current policy: frequency should be within 1.50 GHz and 2.05 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:  2050MHz

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+madvice madvice never
   enabled [always] madvice 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

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### Platform Notes (Continued)

- `max_pites=None` 511
- `max_pites_shared` 256
- `max_pites_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: `/root/cpu2017znver4A1.1`  
Filesystem Type Size Used Avail Use% Mounted on  
/dev/nvme0n1p2 ext4 3.5T 18G 3.3T 1% /

21. `/sys/devices/virtual/dmi/id`  
Vendor: Supermicro  
Product: Super Server  
Product Family: SMC H13  
Serial:  123456789

22. dmidecode  
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 SM BIOS" standard.  
Memory:  
6x Micron Technology MTC40F2046S1RC48BA1 64 GB 2 rank 4800

23. BIOS  
(This section combines info from `/sys/devices` and `dmidecode`.)  
BIOS Vendor: American Megatrends International, LLC.  
BIOS Version: 1.0  
BIOS Date: 08/11/2023  
BIOS Revision: 5.30

### Compiler Version Notes

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**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

(Continued on next page)
Supermicro
WIO A+ Server AS-1115SV-WTNRT
(H13SVW-NT, AMD EPYC 8024PN)

SPEC CPU®2017 Floating Point Rate Result

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SPECrate®2017_fp_base = 99.5
SPECrate®2017_fp_peak = 100

CPU2017 License: 001176
Test Sponsor: Supermicro
Tested by: Supermicro

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

Compiler Version Notes (Continued)

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

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

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.TBM_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,-mlivm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mlivm -Wl,-reduce-array-computations=3
-Wl,-mlivm -Wl,-ldist-scalar-expand -fenable-aggressive-gather -O3
-march=xnver4 -fveclib=AMDLIBM -ffast-math -fstruct-layout=7
-mlivm -unroll-threshold=50 -mlivm -inline-threshold=1000

(Continued on next page)
Base Optimization Flags (Continued)

C benchmarks (continued):
-ffast-math
-fstruct-layout=7
-mllvm -reduced-array-computations=3
-zopt -lamdlibm -lamdalloc -lflang

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

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

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

Benchmarks using both C and C++:
-m64 -flto -Wl,-mlibm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mlibm -Wl,-reduce-array-computations=3
-Wl,-mlibm -Wl,-x86-use-vzeroupper=false -O3 -march=znver4
-fveclib=AMDLIBM -ffast-math -fstruct-layout=7
-mlibm -unroll-threshold=50 -mlibm -inline-threshold=1000
-fremap-arrays -fstruct-mining -mlibm -reduce-array-computations=3
-zopt -mlibm -unroll-threshold=100 -finline-aggressive
-mlibm -loop-unsswitch-threshold=200000 -lamdlibm -lamdalloc -lflang

Benchmarks using Fortran, C, and C++:
-m64 -flto -Wl,-mlibm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mlibm -Wl,-reduce-array-computations=3
-Wl,-mlibm -Wl,-x86-use-vzeroupper=false -O3 -march=znver4

(Continued on next page)
Base Optimization Flags (Continued)

Benchmarks using Fortran, C, and C++ (continued):
- 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 -1flang

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

Peak Compiler Invocation

C benchmarks:
clang

C++ benchmarks:
clang++

Fortran benchmarks:
flang

Benchmarks using both Fortran and C:
flang clang

(Continued on next page)
Supermicro
WIO A+ Server AS-1115SV-WTNRT
(H13SVW-NT, AMD EPYC 8024PN)

SPECrate®2017_fp_base = 99.5
SPECrate®2017_fp_peak = 100

CPU2017 License: 001176
Test Sponsor: Supermicro
Tested by: Supermicro

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

Peak Compiler Invocation (Continued)

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: -m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3 -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 --lmdlibm
--lmdalloc
538.imagick_r: basepeak = yes
544.nab_r: basepeak = yes

C++ benchmarks:
508.namd_r: basepeak = yes
510.parest_r: basepeak = yes

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

(Continued on next page)
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SPEC CPU®2017 Floating Point Rate Result
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Hardware Availability: Sep-2023
Software Availability: Sep-2023

Peak Optimization Flags (Continued)

503.bwaves_r (continued):
- felon- vectorization-of-inductions -zopt - lamdlibm
  - lamdalloc -lflang

549.fotonik3d_r: -m64 -flto -W1, -mllvm -W1, -align-all-nofallthru-blocks=6
  - W1, -mllvm -W1, -reduce-array-computations=3
  - W1, -mllvm -W1, -enable-X86-prefetching -Ofast
  - march=znver4 -fveclib=AMDLiBM -ffast-math -Kieee
  - Mrecursive -mllvm -Wl,-reduce-array-computations=3
  - felon- vectorization-of-inductions - fvector-transform
  - fsccal- transform -lamdlibm - lamdalloc -lflang

554.roms_r: Same as 503.bwaves_r

Benchmarks using both Fortran and C:

521.wrf_r: -m64 -flto -W1, -mllvm -W1, -align-all-nofallthru-blocks=6
  - W1, -mllvm -W1, -reduce-array-computations=3
  - W1, -mllvm -W1, -enable-X86-prefetching -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 -Mrecursive
  - felon- vectorization-of-inductions - lamdlibm - lamdalloc
  - lflang

527.cam4_r: basepeak = yes

Benchmarks using both C and C++:

511.povray_r: basepeak = yes

526.blender_r: basepeak = yes

Benchmarks using Fortran, C, and C++:

507.cactuBSSN_r: basepeak = yes

Peak Other Flags

C benchmarks:
-Wno-unused-command-line-argument

(Continued on next page)
Supermicro
WIO A+ Server AS-1115SV-WTNRT
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Peak Other Flags (Continued)

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/Supermicro-Platform-Settings-V1.2-Siena-revA.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2017/flags/Supermicro-Platform-Settings-V1.2-Siena-revA.xml

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

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