## SPEC CPU®2017 Floating Point Speed Result

### ASUSTeK Computer Inc.
ASUS RS520A-E11(KMPA-U16) Server System  
2.85 GHz, AMD EPYC 7443

**SPECspeed®2017_fp_base = 136**  
**SPECspeed®2017_fp_peak = 141**

<table>
<thead>
<tr>
<th>Threads</th>
<th>SPECspeed®2017_fp_base</th>
<th>SPECspeed®2017_fp_peak</th>
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<tbody>
<tr>
<td>603.bwaves_s</td>
<td>69.8</td>
<td>208</td>
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<tr>
<td>607.cactuBSSN_s</td>
<td>181</td>
<td>217</td>
</tr>
<tr>
<td>619.lbm_s</td>
<td>92.1</td>
<td>90.3</td>
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<tr>
<td>621.wrf_s</td>
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<td>120</td>
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<tr>
<td>627.cam4_s</td>
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<tr>
<td>628.pop2_s</td>
<td>24</td>
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<tr>
<td>638.imagick_s</td>
<td>24</td>
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<tr>
<td>644.nab_s</td>
<td>267</td>
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<tr>
<td>649.fotonik3d_s</td>
<td>120</td>
<td></td>
</tr>
<tr>
<td>654.roms_s</td>
<td>129</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Software</strong></th>
</tr>
</thead>
</table>
| OS: SUSE Linux Enterprise Server 15 SP2 (x86_64)  
Kernel 5.3.18-22-default |
| Compiler: C/C++/Fortran: Version 3.0.0 of AOCC |
| Parallel: Yes |
| Firmware: Version 0401 released Apr-2021 |
| File System: xfs |
| System State: Run level 3 (multi-user) |
| Base Pointers: 64-bit |
| Peak Pointers: 64-bit |
| Other: jemalloc: jemalloc memory allocator library v5.1.0 |
| Power Management: BIOS and OS set to prefer performance at the cost of additional power usage. |

<table>
<thead>
<tr>
<th><strong>Hardware</strong></th>
</tr>
</thead>
</table>
| CPU Name: AMD EPYC 7443  
Max MHz: 4000  
Nominal: 2850 |
| Enabled: 24 cores, 1 chip, 2 threads/core  
Orderable: 1 chip |
| Cache L1: 32 KB I + 32 KB D on chip per core  
L2: 512 KB I+D on chip per core  
L3: 128 MB I+D on chip per chip, 32 MB shared / 6 cores |
| Other: None |
| Memory: 512 GB (8 x 64 GB 4Rx4 PC4-3200AA-L)  
Storage: 1 x 240 GB SATA SSD  
Other: None |
## Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
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<th>Seconds</th>
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<td><strong>181</strong></td>
<td>73.0</td>
<td>181</td>
<td>73.3</td>
<td>180</td>
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<tr>
<td>627.cam4_s</td>
<td>24</td>
<td>96.3</td>
<td>92.0</td>
<td><strong>96.3</strong></td>
<td><strong>92.1</strong></td>
<td>24</td>
<td>96.3</td>
<td>92.0</td>
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<td>90.4</td>
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<tr>
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<td><strong>122</strong></td>
<td><strong>129</strong></td>
<td>122</td>
<td>129</td>
</tr>
</tbody>
</table>

**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>
'echo 8 > /proc/sys/vm/dirty_ratio' run as root to limit dirty cache to 8% of memory.
'echo 1 > /proc/sys/vm/swappiness' run as root to limit swap usage to minimum necessary.
'echo 1 > /proc/sys/vm/zone_reclaim_mode' run as root to free node-local memory and avoid remote memory usage.
'sync; echo 3 > /proc/sys/vm/drop_caches' run as root to reset filesystem caches.
'sysctl -w kernel.randomize_va_space=0' run as root to disable address space layout randomization (ASLR) to reduce run-to-run variability.
To enable Transparent Hugepages (THP) for all allocations,
ASUSTeK Computer Inc.  
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SPECspeed®2017_fp_base = 136  
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Operating System Notes (Continued)

'echo always > /sys/kernel/mm/transparent_hugepage/enabled' and  
'echo always > /sys/kernel/mm/transparent_hugepage/defrag' run as root.  
To enable THP only on request for peak runs of 628.pop2_s, and 638.imagick_s,  
'echo madvise > /sys/kernel/mm/transparent_hugepage/enabled' run as root.  
To disable THP for peak runs of 627.cam4_s, 644.nab_s, 649.fotonik3d_s, and 654.roms_s,  
'echo never > /sys/kernel/mm/transparent_hugepage/enabled' run as root.

Environment Variables Notes

Environment variables set by runcpu before the start of the run:
  GOMP_CPU_AFFINITY = "0-47"
  LD_LIBRARY_PATH =  
  
  
  MALLOC_CONF = "retain:true"
  OMP_DYNAMIC = "false"
  OMP_SCHEDULE = "static"
  OMP_STACKSIZE = "128M"
  OMP_THREAD_LIMIT = "48"

Environment variables set by runcpu during the 607.cactuBSSN_s peak run:
  GOMP_CPU_AFFINITY = "0-23"

Environment variables set by runcpu during the 619.lbm_s peak run:
  GOMP_CPU_AFFINITY = "0-23"

Environment variables set by runcpu during the 644.nab_s peak run:
  GOMP_CPU_AFFINITY = "0 24 1 25 2 26 3 27 4 28 5 29 6 30 7 31 8 32 9 33 10 34  
  11 35 12 36 13 37 14 38 15 39 16 40 17 41 18 42 19 43 20 44 21 45 22 46  
  23 47"

Environment variables set by runcpu during the 654.roms_s peak run:
  GOMP_CPU_AFFINITY = "0-23"

General Notes

Binaries were compiled on a system with 2x AMD EPYC 7742 CPU + 1TiB Memory using OpenSUSE 15.2

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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SPECspeed®2017_fp_base = 136
SPECspeed®2017_fp_peak = 141

CPU2017 License: 9016
Test Sponsor: ASUSTeK Computer Inc.
Test Date: Aug-2021
Tested by: ASUSTeK Computer Inc.
Hardware Availability: May-2021
Software Availability: Mar-2021

General Notes (Continued)
jemalloc: configured and built with GCC v4.8.2 in RHEL 7.4 (No options specified)
jemalloc 5.1.0 is available here:
https://github.com/jemalloc/jemalloc/releases/download/5.1.0/jemalloc-5.1.0.tar.bz2

Platform Notes

BIOS Configuration:
DLWM Support = Disabled
SVM Mode = Disabled
NUMA nodes per socket = NPS2
APBDIS = 1
Fix SOC P-state = P0
Engine Boost = Enabled
IOMMU = Disabled

Sysinfo program /cpu18/bin/sysinfo
Rev: r6622 of 2021-04-07 982a61ec0915b55891ef0e16aca64d
running on localhost Mon Aug 30 15:01:06 2021

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 7443 24-Core Processor
  1 "physical id"s (chips)
  48 "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 : 24
siblings : 48
physical 0: cores 0 1 2 3 4 5 8 9 10 11 12 13 16 17 18 19 20 21 24 25 26 27 28 29

From lscpu from util-linux 2.33.1:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
Address sizes: 48 bits physical, 48 bits virtual
CPU(s): 48
On-line CPU(s) list: 0-47
Thread(s) per core: 2
Core(s) per socket: 24
Socket(s): 1
NUMA node(s): 2
Vendor ID: AuthenticAMD

(Continued on next page)
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Platform Notes (Continued)

CPU family: 25
Model: 1
Model name: AMD EPYC 7443 24-Core Processor
Stepping: 1
CPU MHz: 2206.156
CPU max MHz: 2850.0000
CPU min MHz: 1500.0000
BogoMIPS: 5689.19
Virtualization: AMD-V
L1d cache: 32K
L1i cache: 32K
L2 cache: 512K
L3 cache: 32768K
NUMA node0 CPU(s): 0-11,24-35
NUMA node1 CPU(s): 12-23,36-47
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 pni pclmulqdq monitor ssse3 fma cx16 pcid sse4_1 sse4_2 movbe popcnt aes avx f16c rdrand
lahf_lm cmp_legacy svm extapic cr8_legacy abm sse4a misalignsse 3nowprefetch osvw ibs skinit cmp_legacy svm extapic cr8_legacy abm sse4a misalignsse 3nowprefetch osvw ibs skinit cmp_legacy svm extapic cr8_legacy abm sse4a misalignsse 3nowprefetch osvw ibs skinit cmp_legacy svm extapic cr8_legacy abm sse4a misalignsse 3nowprefetch osvw ibs skinit cmp_legacy svm extapic cr8_legacy abm sse4a misalignsse 3nowprefetch osvw ibs skinit cmp_legacy svm extapic cr8_legacy abm sse4a misalignsse 3nowprefetch osvw ibs skinit cmp_legacy svm extapic cr8_legacy abm sse4a misalignsse 3nowprefetch osvw ibs skinit cmp_legacy svm extapic cr8_legacy abm sse4a misalignsse 3nowprefetch osvw ibs skinit cmp_legacy svm extapic cr8_legacy abm sse4a misalignsse 3nowprefetch osvw ibs skinit cmp_legacy svm extapic cr8_legacy abm sse4a misalignsse 3nowprefetch osvw ibs skinit cmp_legacy svm extapic cr8_legacy abm sse4a misalignsse 3nowprefetch osvw ibs skinit cmp_legacy svm extapic cr8_legacy abm sse4a misalignsse 3nowprefetch osvw ibs skinit

From /proc/cpuinfo cache data

From numacl --hardware
WARNING: a numacl 'node' might or might not correspond to a physical chip.
available: 2 nodes (0-1)
node 0 cpus: 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
node 0 size: 257854 MB
node 0 free: 257333 MB
node 1 cpus: 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35
node 1 size: 257994 MB
node 1 free: 257549 MB
node distances:
node 0 1
  0: 10 12
  1: 12 10

From /proc/meminfo
MemTotal: 528229668 kB

(Continued on next page)
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SPEC(speed)\textsuperscript{2017\_fp\_base} = 136
SPEC(speed)\textsuperscript{2017\_fp\_peak} = 141

Platform Notes (Continued)

HugePages_Total: 0
Hugepagesize: 2048 kB

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

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

NAME="SLES"
VERSION="15-SP2"
VERSION_ID="15.2"
PRETTY_NAME="SUSE Linux Enterprise Server 15 SP2"
ID="sles"
ID\_LIKE="suse"
ANSI\_COLOR="0;32"
CPE\_NAME="cpe:/o:suse:sles:15:sp2"

uname -a:
Linux localhost 5.3.18-22-default #1 SMP Wed Jun 3 12:16:43 UTC 2020 (720aeba) 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: uservcopy/swaps barriers and __user pointer sanitation

CVE-2017-5715 (Spectre variant 2):
Mitigation: Full AMD retpoline, IBPB: conditional, IBRS\_FW, STIBP: always-on, RSB filling

CVE-2020-0543 (Special Register Buffer Data Sampling):
Not affected

CVE-2019-11135 (TSX Asynchronous Abort):
Not affected

run-level 3 Aug 30 09:17

SPEC is set to: /cpu118

Filesystem Type Size Used Avail Use% Mounted on
/dev/sda4 xfs 199G 27G 173G 14% /

From /sys/devices/virtual/dmi/id
Vendor: ASUSTeK COMPUTER INC.

(Continued on next page)
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<td>141</td>
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</table>

**CPU2017 License:** 9016

**Test Sponsor:** ASUSTeK Computer Inc.

**Test Date:** Aug-2021

**Tested by:** ASUSTeK Computer Inc.

**Hardware Availability:** May-2021

**Software Availability:** Mar-2021

## Platform Notes (Continued)

<table>
<thead>
<tr>
<th>Product:</th>
<th>RS520A-E11-RS24U</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product Family:</td>
<td>Server</td>
</tr>
<tr>
<td>Serial:</td>
<td>333366669999</td>
</tr>
</tbody>
</table>

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:**
- 8x Samsung M386A8K40DM2-CWE 64 GB 4 rank 3200
- 8x Unknown Unknown

**BIOS:**
- **BIOS Vendor:** American Megatrends Inc.
- **BIOS Version:** 0401
- **BIOS Date:** 04/14/2021
- **BIOS Revision:** 4.1

(End of data from sysinfo program)

## Compiler Version Notes

---

C

| 619.lbm_s(base, peak) 638.imagick_s(base, peak) 644.nab_s(base, peak) |
---

AMD clang version 12.0.0 (CLANG: AOCC_3.0.0-Build#78 2020_12_10) (based on LLVM Mirror.Version.12.0.0)

Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.0.0/bin

---

C++, C, Fortran | 607.cactuBSSN_s(base, peak)
---

AMD clang version 12.0.0 (CLANG: AOCC_3.0.0-Build#78 2020_12_10) (based on LLVM Mirror.Version.12.0.0)

Target: x86_64-unknown-linux-gnu
Thread model: posix
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Compiler Version Notes (Continued)

AMD clang version 12.0.0 (CLANG: AOCC_3.0.0-Build#78 2020_12_10) (based on  
LLVM Mirror.Version.12.0.0)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.0.0/bin

Fortran         | 603.bwaves_s(base, peak) 649.fotonik3d_s(base, peak) 654.roms_s(base, peak)
---------------|-----------------------------------------------------------------------------

AMD clang version 12.0.0 (CLANG: AOCC_3.0.0-Build#78 2020_12_10) (based on  
LLVM Mirror.Version.12.0.0)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.0.0/bin

Fortran, C      | 621.wrf_s(base, peak) 627.cam4_s(base, peak) 628.pop2_s(base, peak)
---------------|-----------------------------------------------------------------------------

AMD clang version 12.0.0 (CLANG: AOCC_3.0.0-Build#78 2020_12_10) (based on  
LLVM Mirror.Version.12.0.0)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.0.0/bin

Base Compiler Invocation

C benchmarks:
clang

Fortran benchmarks:
flang

Benchmarks using both Fortran and C:
flang clang

(Continued on next page)
**Base Compiler Invocation (Continued)**

Benchmarks using Fortran, C, and C++:

```
clang++ clang flang
```

---

**Base Portability Flags**

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Flags</th>
</tr>
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<tbody>
<tr>
<td>603.bwaves_s</td>
<td>-DSPEC_LP64</td>
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<tr>
<td>607.cactuBSSN_s</td>
<td>-DSPEC_LP64</td>
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<tr>
<td>619.ibm_s</td>
<td>-DSPEC_LP64</td>
</tr>
<tr>
<td>621.wrf_s</td>
<td>-DSPEC_CASE_FLAG -Mbyteswapio -DSPEC_LP64</td>
</tr>
<tr>
<td>627.cam4_s</td>
<td>-DSPEC_CASE_FLAG -DSPEC_LP64</td>
</tr>
<tr>
<td>628.pop2_s</td>
<td>-DSPEC_CASE_FLAG -Mbyteswapio -DSPEC_LP64</td>
</tr>
<tr>
<td>638.imagick_s</td>
<td>-DSPEC_LP64</td>
</tr>
<tr>
<td>644.nab_s</td>
<td>-DSPEC_LP64</td>
</tr>
<tr>
<td>649.fotonik3d_s</td>
<td>-DSPEC_LP64</td>
</tr>
<tr>
<td>654.roms_s</td>
<td>-DSPEC_LP64</td>
</tr>
</tbody>
</table>

---

**Base Optimization Flags**

**C benchmarks:**

```
-m64 -mno-adx -mno-sse4a -Wl,-mllvm -Wl,-region-vectorize
-Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3 -O3 -march=znver3
-fveclib=AMDLIBM -ffast-math -flto -fstruct-layout=5
-mllvm -unroll-threshold=50 -mllvm -inline-threshold=1000
-fremap-arrays -mllvm -function-specialize -flv-function-specialization
-mllvm -enable-gvn-hoist -mllvm -global-vectorize-slp=true
-mllvm -enable-licm-vrp -mllvm -reduce-array-computations=3 -z muldefs
-DSPEC_OPENMP -fopenmp -fopenmp=libomp -lomp -lamdlibm -ljemalloc
-lflang -lflangrti
```

**Fortran benchmarks:**

```
-m64 -mno-adx -mno-sse4a -Wl,-mllvm -Wl,-enable-X86-prefetching
-Wl,-mllvm -Wl,-enable-licm-vrp -Wl,-mllvm -Wl,-region-vectorize
-Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3 -Hz,1,0x1 -O3
-march=znver3 -fveclib=AMDLIBM -ffast-math -Mrecursive
-mllvm -fuse-tile-inner-loop -funroll-loops
-mllvm -extra-vectorizer-passes -mllvm -lsr-in-nested-loop
-mllvm -enable-licm-vrp -mllvm -reduce-array-computations=3
-mllvm -global-vectorize-slp=true -z muldefs -DSPEC_OPENMP -fopenmp
```

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

Fortran benchmarks (continued):
```
fopenmp=libomp -lomp -lamdlibm -ljemalloc -lflang -lflangrti
```

Benchmarks using both Fortran and C:
```
-m64 -mno-adx -mno-sse4a -W1,-mllvm -W1,-enable-X86-prefetching
-W1,-mllvm -W1,-enable-lcms-vrp -W1,-mllvm -W1,-region-vectorize
-W1,-mllvm -W1,-function-specialize
-W1,-mllvm -W1,-align-all-nofallthru-blocks=6
-W1,-mllvm -W1,-reduce-array-computations=3 -O3 -march=znver3
-fveclib=AMDLIBM -ffast-math -flto -fstruct-layout=5
-mllvm -unroll-threshold=50 -mllvm -inline-threshold=1000
-freemap-arrays -mllvm -function-specialize -flv-function-specialization
-mllvm -enable-gvn-hoist -mllvm -global-vectorize-slp=true
-mllvm -enable-lcms-vrp -mllvm -reduce-array-computations=3 -Hz,1,0x1
-Mrecursive -mllvm -fuse-tile-inner-loop -funroll-loops
-mllvm -extra-vectorizer-passes -mllvm -lsr-in-nested-loop -z muldefs
-DSPEC_OPENMP -fopenmp -fopenmp=libomp -lomp -lamdlibm -ljemalloc
-lflang -lflangrti
```

Benchmarks using Fortran, C, and C++:
```
-m64 -mno-adx -mno-sse4a -std=c++98
-W1,-mllvm -W1,-x86-use-vzeroupper=false
-W1,-mllvm -W1,-region-vectorize -W1,-mllvm -W1,-function-specialize
-W1,-mllvm -W1,-align-all-nofallthru-blocks=6
-W1,-mllvm -W1,-reduce-array-computations=3 -O3 -march=znver3
-fveclib=AMDLIBM -ffast-math -flto -fstruct-layout=5
-mllvm -unroll-threshold=50 -mllvm -inline-threshold=1000
-freemap-arrays -mllvm -function-specialize -flv-function-specialization
-mllvm -enable-gvn-hoist -mllvm -global-vectorize-slp=true
-mllvm -enable-lcms-vrp -mllvm -reduce-array-computations=3
-mllvm -enable-partial-unswitch -mllvm -unroll-threshold=100
-finline-aggressive -mllvm -loop-unswitch-threshold=200000
-mllvm -reroll-loops -mllvm -aggressive-loop-unswitch
-mllvm -extra-vectorizer-passes -mllvm -convert-pow-exp-to-int=false
-Hz,1,0x1 -Mrecursive -mllvm -fuse-tile-inner-loop -funroll-loops
-mllvm -lsr-in-nested-loop -z muldefs -DSPEC_OPENMP -fopenmp
-fopenmp=libomp -lomp -lamdlibm -ljemalloc -lflang -lflangrti
```

## Base Other Flags

C benchmarks:
```
-Wno-unused-command-line-argument -Wno-return-type
```

(Continued on next page)
ASUSTeK Computer Inc.
ASUS RS520A-E11(KMPA-U16) Server System
2.85 GHz, AMD EPYC 7443

SPECspeed®2017_fp_base = 136
SPECspeed®2017_fp_peak = 141

CPU2017 License: 9016
Test Sponsor: ASUSTeK Computer Inc.
Tested by: ASUSTeK Computer Inc.

Test Date: Aug-2021
Hardware Availability: May-2021
Software Availability: Mar-2021

Base Other Flags (Continued)

Fortran benchmarks:
-Wno-unused-command-line-argument -Wno-return-type

Benchmarks using both Fortran and C:
-Wno-unused-command-line-argument -Wno-return-type

Benchmarks using Fortran, C, and C++:
-Wno-unused-command-line-argument -Wno-return-type

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: -m64 -mno-adx -mno-sse4a
-Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3 -Ofast
-march=znver3 -fveclib=AMDLIBM -ffast-math -flto
-fstruct-layout=5 -mllvm -unroll-threshold=50
-fremap-arrays -flv-function-specialization
-mllvm -inline-threshold=1000 -mllvm -enable-gvn-hoist
-mllvm -global-vectorize-slp=true

(Continued on next page)
SPEC CPU®2017 Floating Point Speed Result

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Software Availability: Mar-2021

Peak Optimization Flags (Continued)

619.lbm_s (continued):
-mlvm -function-specialize -mlvm -enable-licm-vrp
-mlvm -reduce-array-computations=3 -DSPEC_OPENMP -fopenmp
-fopenmp=libomp -lomp -lamdlibm -ljemalloc -lflang

638.imagick_s: basepeak = yes

644.nab_s: -m64 -mno-adx -mno-sse4a -Wl,-mlvm -Wl,-region-vectorize
-Wl,-mlvm -Wl,-function-specialize -Ofast -march=znver3
-fveclib=AMDLIBM -ffast-math -flto -fstruct-layout=5
-mlvm -unroll-threshold=50 -fremap-arrays
-fly-function-specialization -mlvm -inline-threshold=1000
-mlvm -enable-gvn-hoist -mlvm -global-vectorize-slp=true
-mlvm -function-specialize -mlvm -enable-licm-vrp
-mlvm -reduce-array-computations=3 -DSPEC_OPENMP -fopenmp
-fopenmp=libomp -lomp -lamdlibm -ljemalloc -lflang

Fortran benchmarks:

603.bwaves_s: basepeak = yes

649.fotonik3d_s: basepeak = yes

654.roms_s: -m64 -mno-adx -mno-sse4a
-Wl,-mlvm -Wl,-enable-X86-prefetching
-Wl,-mlvm -Wl,-enable-licm-vrp
-Wl,-mlvm -Wl,-function-specialize
-Wl,-mlvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mlvm -Wl,-reduce-array-computations=3 -Ofast
-march=znver3 -fveclib=AMDLIBM -ffast-math -Mrecursive
-mlvm -reduce-array-computations=3
-mlvm -global-vectorize-slp=true -mlvm -enable-licm-vrp
-DSPEC_OPENMP -fopenmp -fopenmp=libomp -lomp -lamdlibm
-ljemalloc -lflang

Benchmarks using both Fortran and C:

621.wrf_s: basepeak = yes

627.cam4_s: basepeak = yes

628.pop2_s: basepeak = yes

Benchmarks using Fortran, C, and C++:
-m64 -mno-adx -mno-sse4a -std=c++98
-Wl,-mlvm -Wl,-x86-use-vzeroupper=false -Wl,-mlvm -Wl,-enable-licm-vrp

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

Benchmarks using Fortran, C, and C++ (continued):
—W1, -mlirn -W1, -function-specialize
—W1, -mlirn -W1, -align-all-nofallthru-blocks=6
—W1, -mlirn -W1, -reduce-array-computations=3 -Ofast -march=znver3
-fveclib=AMDLIBM -ffast-math -flto -fstruct-layout=5
-mlirn -unroll-threshold=50 -fremap-arrays -flv-function-specialization
-mlirn -inline-threshold=1000 -mlirn -enable-gvn-hoist
-mlirn -global-vectorize-isl=true -mlirn -function-specialize
-mlirn -enable-licm-vrp -mlirn -reduce-array-computations=3
-finline-aggressive -mlirn -unroll-threshold=100 -mlirn -reroll-loops
-mlirn -aggressive-loop-unswitch -Mrecursive -DSPEC_OPENMP -fopenmp
-fopenmp=libomp -lomp -lamdlibm -ljemalloc -lflang

Peak Other Flags

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

Fortran benchmarks:
-Wno-unused-command-line-argument -Wno-return-type

Benchmarks using both Fortran and C:
-Wno-unused-command-line-argument -Wno-return-type

Benchmarks using Fortran, C, and C++:
-Wno-unused-command-line-argument -Wno-return-type

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

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2017/flags/ASUSTekPlatform-Settings-AMD-Milan-V1.3.2021-07-06.xml

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Originaly published on 2021-09-29.