### SPEC CPU®2017 Floating Point Speed Result

**Supermicro**  
A+ Server 1123US-TR4  
(H11DSU-iN, AMD EPYC 7352)

| Test Date: | Feb-2020 |
| Test Sponsor: | Supermicro |
| Tested by: | Supermicro |
| CPU2017 License: | 001176 |
| Hardware Availability: | Aug-2019 |
| Software Availability: | Aug-2019 |

#### Hardware

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>SPECspeed®2017_fp_base</th>
<th>SPECspeed®2017_fp_peak</th>
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</thead>
<tbody>
<tr>
<td>603.bwaves_s</td>
<td>48</td>
<td>48</td>
<td>48</td>
</tr>
<tr>
<td>607.cactuBSSN_s</td>
<td>48</td>
<td>48</td>
<td>48</td>
</tr>
<tr>
<td>619.lbm_s</td>
<td>96</td>
<td>96</td>
<td>96</td>
</tr>
<tr>
<td>621.wrf_s</td>
<td>96</td>
<td>96</td>
<td>96</td>
</tr>
<tr>
<td>627.cam4_s</td>
<td>48</td>
<td>48</td>
<td>48</td>
</tr>
<tr>
<td>628.pop2_s</td>
<td>48</td>
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</tr>
<tr>
<td>638.imagick_s</td>
<td>48</td>
<td>48</td>
<td>48</td>
</tr>
<tr>
<td>644.nab_s</td>
<td>96</td>
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<td>96</td>
</tr>
<tr>
<td>649.fotonik3d_s</td>
<td>48</td>
<td>48</td>
<td>48</td>
</tr>
<tr>
<td>654.roms_s</td>
<td>48</td>
<td>48</td>
<td>48</td>
</tr>
</tbody>
</table>

#### Software

**OS:** Ubuntu 19.04  
**Compiler:** C/C++/Fortran: Version 2.0.0 of AOCC  
**Parallel:** Yes  
**Firmware:** Version 2.0b released Nov-2019  
**File System:** ext4  
**System State:** Run level 3 (multi-user)  
**Base Pointers:** 64-bit  
**Peak Pointers:** 64-bit  
**Power Management:** BIOS set to prefer performance at the cost of additional power usage.

### Supermicro

- **CPU Name:** AMD EPYC 7352  
- **Max MHz:** 3200  
- **Nominal:** 2300  
- **Enabled:** 48 cores, 2 chips, 2 threads/core  
- **Orderable:** 1.2 chips  
- **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, 16 MB shared / 3 cores  
- **Other:** None

### Memory

- **Memory:** 256 GB (16 x 16 GB 2Rx8 PC4-3200AA-R)  
- **Other:** None

### Storage

- **Storage:** 1 x 200 GB SATA III SSD  
- **Other:** None
SPEC CPU®2017 Floating Point Speed Result

Supermicro
A+ Server 1123US-TR4
(H11DSU-iN , AMD EPYC 7352)

SPEC®2017_fp_base = 132
SPEC®2017_fp_peak = 138

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
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<tbody>
<tr>
<td>603.bwaves_s</td>
<td>48</td>
<td>113</td>
<td>523</td>
<td>119</td>
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<td>496</td>
<td>48</td>
<td>113</td>
<td>523</td>
<td>119</td>
<td>498</td>
</tr>
<tr>
<td>607.cactuBSSN_s</td>
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<td>76.1</td>
<td>219</td>
<td>77.4</td>
<td>215</td>
<td>77.9</td>
<td>214</td>
<td>48</td>
<td>76.1</td>
<td>219</td>
<td>77.4</td>
<td>215</td>
</tr>
<tr>
<td>619.lbm_s</td>
<td>48</td>
<td>120</td>
<td>43.8</td>
<td>146</td>
<td>36.0</td>
<td>122</td>
<td>42.8</td>
<td>96</td>
<td>98.9</td>
<td>53.0</td>
<td>99.5</td>
<td>52.6</td>
</tr>
<tr>
<td>621.wrf_s</td>
<td>48</td>
<td>123</td>
<td>108</td>
<td>122</td>
<td>108</td>
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<td>627.cam4_s</td>
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<td>85.9</td>
<td>103</td>
<td>85.9</td>
<td>104</td>
<td>85.4</td>
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<td>628.pop2_s</td>
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<td>638.imagick_s</td>
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<td>188</td>
<td>77.6</td>
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<td>77.1</td>
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<td>48</td>
<td>76.8</td>
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<td>77.6</td>
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<tr>
<td>644.nab_s</td>
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<td>96</td>
<td>57.2</td>
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</tr>
<tr>
<td>649.fotonik3d_s</td>
<td>48</td>
<td>109</td>
<td>83.7</td>
<td>109</td>
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<td>110</td>
<td>83.0</td>
<td>48</td>
<td>109</td>
<td>83.7</td>
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<tr>
<td>654.roms_s</td>
<td>48</td>
<td>83.1</td>
<td>190</td>
<td>85.3</td>
<td>185</td>
<td>84.9</td>
<td>185</td>
<td>48</td>
<td>82.9</td>
<td>190</td>
<td>83.1</td>
<td>189</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
'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>

Set dirty_ratio=8 to limit dirty cache to 8% of memory
Set swappiness=1 to swap only if necessary
Set zone_reclaim_mode=1 to free local node memory and avoid remote memory
sync then drop_caches=3 to reset caches before invoking runcpu

dirty_ratio, swappiness, zone_reclaim_mode and drop_caches were all set using privileged echo (e.g. echo 1 > /proc/sys/vm/swappiness).

Transparent huge pages set to 'always' for this run (OS default)
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<table>
<thead>
<tr>
<th>SPECspeed®2017_fp_peak</th>
<th>138</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECspeed®2017_fp_base</td>
<td>132</td>
</tr>
</tbody>
</table>

**CPU2017 License:** 001176  
**Test Sponsor:** Supermicro  
**Tested by:** Supermicro  
**Test Date:** Feb-2020  
**Hardware Availability:** Aug-2019  
**Software Availability:** Aug-2019

### Environment Variables Notes

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

```
GOMP_CPU_AFFINITY = "0-95"
LD_LIBRARY_PATH =  
"/home/cpu2017/amd_speed_aocc200_rome_c_lib/64;/home/cpu2017/amd_speed_aocc200_rome_c_lib/32:" 
MALLOC_CONF = "retain:true" 
OMP_DYNAMIC = "false" 
OMP_SCHEDULE = "static" 
OMP_STACKSIZE = "128M" 
OMP_THREAD_LIMIT = "96"
```

**Environment variables set by runcpu during the 619.lbm_s peak run:**

```
GOMP_CPU_AFFINITY = "0 48 1 49 2 50 3 51 4 52 5 53 6 54 7 55 8 56 9 57 10 58  
11 59 12 60 13 61 14 62 15 63 16 64 17 65 18 66 19 67 20 68 21 69 22 70  
23 71 24 72 25 73 26 74 27 75 28 76 29 77 30 78 31 79 32 80 33 81 34 82  
35 83 36 84 37 85 38 86 39 87 40 88 41 89 42 90 43 91 44 92 45 93 46 94  
47 95"
```

**Environment variables set by runcpu during the 621.wrf_s peak run:**

```
GOMP_CPU_AFFINITY = "0 48 1 49 2 50 3 51 4 52 5 53 6 54 7 55 8 56 9 57 10 58  
11 59 12 60 13 61 14 62 15 63 16 64 17 65 18 66 19 67 20 68 21 69 22 70  
23 71 24 72 25 73 26 74 27 75 28 76 29 77 30 78 31 79 32 80 33 81 34 82  
35 83 36 84 37 85 38 86 39 87 40 88 41 89 42 90 43 91 44 92 45 93 46 94  
47 95"
```

**Environment variables set by runcpu during the 644.nab_s peak run:**

```
GOMP_CPU_AFFINITY = "0 48 1 49 2 50 3 51 4 52 5 53 6 54 7 55 8 56 9 57 10 58  
11 59 12 60 13 61 14 62 15 63 16 64 17 65 18 66 19 67 20 68 21 69 22 70  
23 71 24 72 25 73 26 74 27 75 28 76 29 77 30 78 31 79 32 80 33 81 34 82  
35 83 36 84 37 85 38 86 39 87 40 88 41 89 42 90 43 91 44 92 45 93 46 94  
47 95"
```

**Environment variables set by runcpu during the 654.roms_s peak run:**

```
GOMP_CPU_AFFINITY = "0-47"
```

### General Notes

Binaries were compiled on a system with 2x AMD EPYC 7601 CPU + 512GB Memory using Fedora 26

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.

(Continued on next page)
General Notes (Continued)

jemalloc: configured and built with GCC v9.1.0 in Ubuntu 19.04 with -O3 -znver2 -flto
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 Settings:
Determinism Control = Manual
Determinism Slider = Power
cTDP Control = Manual
cTDP = 180
Package Power Limit Control = Manual
Package Power Limit = 180
APBDIS = 1

Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r6365 of 2019-08-21 295195f888a3d7edble6e46a485a0011
running on h11dsu-02 Sat Feb 22 21:27:39 2020

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 7352 24-Core Processor
  2  "physical id"s (chips)
  96 "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 4 5 6 8 9 10 12 13 14 16 17 18 20 21 22 24 25 26 28 29 30
physical 1: cores 0 1 2 4 5 6 8 9 10 12 13 14 16 17 18 20 21 22 24 25 26 28 29 30

From lscpu:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
Address sizes: 43 bits physical, 48 bits virtual
CPU(s): 96
On-line CPU(s) list: 0-95
Thread(s) per core: 2
Core(s) per socket: 24
Socket(s): 2

(Continued on next page)
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SPECspeed®2017_fp_base = 132
SPECspeed®2017_fp_peak = 138

Platform Notes (Continued)

NUMA node(s): 8
Vendor ID: AuthenticAMD
CPU family: 23
Model: 49
Model name: AMD EPYC 7352 24-Core Processor
Stepping: 0
CPU MHz: 1740.163
CPU max MHz: 2300.0000
CPU min MHz: 1500.0000
BogoMIPS: 4600.15
Virtualization: AMD-V
L1d cache: 32K
L1i cache: 32K
L2 cache: 512K
L3 cache: 16384K
NUMA node0 CPU(s): 0-5, 48-53
NUMA node1 CPU(s): 6-11, 54-59
NUMA node2 CPU(s): 12-17, 60-65
NUMA node3 CPU(s): 18-23, 66-71
NUMA node4 CPU(s): 24-29, 72-77
NUMA node5 CPU(s): 30-35, 78-83
NUMA node6 CPU(s): 36-41, 84-89
NUMA node7 CPU(s): 42-47, 90-95
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 ntopology nonstop_tsc cpuid extd_apicid aperfmperf pni
pclmulqdq monitor ssse3 fma cx16 ssse4_1 ssse4_2 movbe popcnt aes xsave avx f16c
rdseed lahf_lm cmp_legacy svm extapic cmp_legacy abm sse4a misalignsse 3dnowprefetch
osvw ibs skinit wdt tce topoext perfctr_core perfctr_nb bpext perfctr_llc mwaitx cpb
cat_l3 cdp_l3 hw_pstate sme sse4a mca cmov cmov cat_l3 cdp_l3 hw_pstate sme sse4a mca
From numactl --hardware WARNING: a numactl 'node' might or might not correspond to a
physical chip.
available: 8 nodes (0-7)
node 0 cpus: 0 1 2 3 4 5 48 49 50 51 52 53
node 0 size: 32112 MB
node 0 free: 31739 MB
node 1 cpus: 6 7 8 9 10 11 54 55 56 57 58 59
node 1 size: 32428 MB

(Continued on next page)
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Platform Notes (Continued)

node 1 free: 31876 MB
node 2 cpus: 12 13 14 15 16 17 60 61 62 63 64 65
node 2 size: 32248 MB
node 2 free: 31744 MB
node 3 cpus: 18 19 20 21 22 23 66 67 68 69 70 71
node 3 size: 32236 MB
node 3 free: 31932 MB
node 4 cpus: 24 25 26 27 28 29 72 73 74 75 76 77
node 4 size: 32248 MB
node 4 free: 31904 MB
node 5 cpus: 30 31 32 33 34 35 78 79 80 81 82 83
node 5 size: 32225 MB
node 5 free: 31917 MB
node 6 cpus: 36 37 38 39 40 41 84 85 86 87 88 89
node 6 size: 32248 MB
node 6 free: 31909 MB
node 7 cpus: 42 43 44 45 46 47 90 91 92 93 94 95
node 7 size: 32247 MB
node 7 free: 31923 MB
node distances:

From /proc/meminfo
MemTotal: 264005176 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

From /etc/*release* /etc/*version*
debian_version: buster/sid
os-release:
NAME="Ubuntu"
VERSION="19.04 (Disco Dingo)"
ID=ubuntu
ID_LIKE=debian
PRETTY_NAME="Ubuntu 19.04"
VERSION_ID="19.04"
HOME_URL="https://www.ubuntu.com/
SUPPORT_URL="https://help.ubuntu.com/

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Platform Notes (Continued)

uname -a:
   Linux h11dsu-02 5.0.0-25-generic #26-Ubuntu SMP Thu Aug 1 12:04:58 UTC 2019 x86_64
   x86_64 x86_64 GNU/Linux

Kernel self-reported vulnerability status:
CVE-2018-3620 (L1 Terminal Fault): Not affected
Microarchitectural Data Sampling: Not affected
CVE-2017-5754 (Meltdown): Not affected
CVE-2018-3639 (Speculative Store Bypass): Mitigation: Speculative Store Bypass disabled via prctl and seccomp
CVE-2017-5753 (Spectre variant 1): Mitigation: usercopy/swapgs barriers and __user pointer sanitation
CVE-2017-5715 (Spectre variant 2): Mitigation: Full AMD retpoline, IBPB: conditional, IBRS_FW, STIBP: conditional, RSB filling

run-level 3 Feb 21 17:41
SPEC is set to: /home/cpu2017
   Filesystem Type Size Used Avail Use% Mounted on
   /dev/sda2 ext4 183G 20G 154G 12% /

From /sys/devices/virtual/dmi/id
   BIOS: American Megatrends Inc. 2.0b 11/15/2019
   Vendor: Supermicro
   Product: Super Server
   Serial: 0123456789

Additional information from dmidecode 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:
      16x NO DIMM Unknown
      16x SK Hynix HMA82GR7DJR8N-XN 16 kB 2 rank 3200

(End of data from sysinfo program)

Compiler Version Notes

==============================================================================
<table>
<thead>
<tr>
<th>C</th>
<th>619.lbm_s(base, peak) 638.imagick_s(base, peak) 644.nab_s(base, peak)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AOCC.LLVM.2.0.0.B191.2019_07_19 clang version 8.0.0 (CLANG: Jenkins</td>
<td></td>
</tr>
</tbody>
</table>

(Continued on next page)
Compiler Version Notes (Continued)

AOCC_2.0.0-Build#191) (based on LLVM AOCC.LLVM.2.0.0.B191.2019_07_19)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /sppo/dev/compilers/aocc-compiler-2.0.0/bin

==============================================================================
| C++, C, Fortran | 607.cactuBSSN_s(base, peak) |
|----------------|
| AOCC.LLVM.2.0.0.B191.2019_07_19 clang version 8.0.0 (CLANG: Jenkins |
| AOCC_2.0.0-Build#191) (based on LLVM AOCC.LLVM.2.0.0.B191.2019_07_19 |
| Target: x86_64-unknown-linux-gnu |
| Thread model: posix |
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| Target: x86_64-unknown-linux-gnu |
| Thread model: posix |
| InstalledDir: /sppo/dev/compilers/aocc-compiler-2.0.0/bin |

==============================================================================
| Fortran         | 603.bwaves_s(base, peak) 649.fotonik3d_s(base, peak) 654.roms_s(base, peak) |
|----------------|
| AOCC.LLVM.2.0.0.B191.2019_07_19 clang version 8.0.0 (CLANG: Jenkins |
| AOCC_2.0.0-Build#191) (based on LLVM AOCC.LLVM.2.0.0.B191.2019_07_19 |
| Target: x86_64-unknown-linux-gnu |
| Thread model: posix |
| InstalledDir: /sppo/dev/compilers/aocc-compiler-2.0.0/bin |

==============================================================================
| Fortran, C      | 621.wrf_s(base, peak) 627.cam4_s(base, peak) 628.pop2_s(base, peak) |
|----------------|
| AOCC.LLVM.2.0.0.B191.2019_07_19 clang version 8.0.0 (CLANG: Jenkins |
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Target: x86_64-unknown-linux-gnu  
Thread model: posix
InstalledDir: /sppo/dev/compilers/aocc-compiler-2.0.0/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 -Mbyteswapio -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:**
- -flto -Wl,-mlivm -Wl,-function-specialize
- -Wl,-mlivm -Wl,-region-vectorize -Wl,-mlivm -Wl,-vector-library=LIBMVEC
- -Wl,-mlivm -Wl,-reduce-array-computations=3 -O3 -ffast-math
- -march=znver2 -fstruct-layout=3 -mlivm -unroll-threshold=50
- -fremap-arrays -mlivm -function-specialize -mlivm -enable-gvn-hoist

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

**C benchmarks (continued):**

- `-mllvm -reduce-array-computations=3 -mllvm -global-vectorize-slp`
- `-mllvm -vector-library=LIBMVEC -mllvm -inline-threshold=1000`
- `-flv-function-specialization -zmuldefs -DSPEC_OPENMP -fopenmp`
- `-fopenmp=libomp -lomp -lpthread -ldl -lmvec -lamdlibm -ljemalloc -lflang`

**Fortran benchmarks:**

- `-flto -Wl,-mllvm -Wl,-function-specialize`
- `-Wl,-mllvm -Wl,-region-vectorize -Wl,-mllvm -Wl,-vector-library=LIBMVEC`
- `-Wl,-mllvm -Wl,-reduce-array-computations=3 -O3 -march=znver2`
- `-funroll-loops -Mrecursive -mllvm -vector-library=LIBMVEC -z muldefs`
- `-Kieee -fno-finite-math-only -DSPEC_OPENMP -fopenmp -fopenmp=libomp`
- `-lomp -lpthread -ldl -lmvec -lamdlibm -ljemalloc -lflang`

**Benchmarks using both Fortran and C:**

- `-flto -Wl,-mllvm -Wl,-function-specialize`
- `-Wl,-mllvm -Wl,-region-vectorize -Wl,-mllvm -Wl,-vector-library=LIBMVEC`
- `-Wl,-mllvm -Wl,-reduce-array-computations=3 -O3 -ffast-math`
- `-march=znver2 -fstruct-layout=3 -mllvm -unroll-threshold=50`
- `-fremap-arrays -mllvm -function-specialize -mllvm -enable-gvn-hoist`
- `-mllvm -reduce-array-computations=3 -mllvm -global-vectorize-slp`
- `-mllvm -vector-library=LIBMVEC -mllvm -inline-threshold=1000`
- `-flv-function-specialization -funroll-loops -Mrecursive -z muldefs`
- `-Kieee -fno-finite-math-only -DSPEC_OPENMP -fopenmp -fopenmp=libomp`
- `-lomp -lpthread -ldl -lmvec -lamdlibm -ljemalloc -lflang`

**Benchmarks using Fortran, C, and C++:**

- `-std=c++98 -flto -Wl,-mllvm -Wl,-function-specialize`
- `-Wl,-mllvm -Wl,-region-vectorize -Wl,-mllvm -Wl,-vector-library=LIBMVEC`
- `-Wl,-mllvm -Wl,-reduce-array-computations=3`
- `-Wl,-mllvm -Wl,-suppress-fmas -O3 -ffast-math -march=znver2`
- `-fstruct-layout=3 -mllvm -unroll-threshold=50 -fremap-arrays`
- `-mllvm -function-specialize -mllvm -enable-gvn-hoist`
- `-mllvm -reduce-array-computations=3 -mllvm -global-vectorize-slp`
- `-mllvm -vector-library=LIBMVEC -mllvm -inline-threshold=1000`
- `-flv-function-specialization -mllvm -loop-unswitch-threshold=200000`
- `-mllvm -unroll-threshold=100 -mllvm -enable-partial-unswitch`
- `-funroll-loops -Mrecursive -z muldefs -Kieee -fno-finite-math-only -DSPEC_OPENMP -fopenmp -fopenmp=libomp -lomp -lpthread -ldl -lmvec -lamdlibm -ljemalloc -lflang`
Supermicro
A+ Server 1123US-TR4 (H11DSU-iN, AMD EPYC 7352)

SPECspeed®2017_fp_base = 132
SPECspeed®2017_fp_peak = 138

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

Test Date: Feb-2020
Hardware Availability: Aug-2019
Software Availability: Aug-2019

Base Other Flags

C benchmarks:
- -Wno-return-type -DUSE_OPENMP

Fortran benchmarks:
- -DUSE_OPENMP -Wno-return-type

Benchmarks using both Fortran and C:
- -DUSE_OPENMP -Wno-return-type

Benchmarks using Fortran, C, and C++:
- -Wno-return-type -DUSE_OPENMP

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: -flto -Wl,-mllvm -Wl,-function-specialize
- Wl,-mllvm -Wl,-region-vectorize
- Wl,-mllvm -Wl,-vector-library=LIBMVEC
- Wl,-mllvm -Wl,-reduce-array-computations=3 -Ofast
- march=znver2 -mno-sse4a -fstruct-layout=5
- mllvm -vectorize-memory-aggressively

(Continued on next page)
619.lbm_s (continued):
-mllvm -function-specialize -mllvm -enable-gvn-hoist
-mllvm -unroll-threshold=50 -fremap-arrays
-mllvm -vector-library=LIBMVEC
-mllvm -reduce-array-computations=3
-mllvm -global-vectorize-slp -mllvm -inline-threshold=1000
-fly-function-specialization -DSPEC_OPENMP -fopenmp
-lmvec -lamdlibm -fopenmp=libomp -lomp -lpthread -ldl
-ljemalloc -liflang

638.imagick_s: basepeak = yes

644.nab_s: Same as 619.lbm_s

Fortran benchmarks:

603.bwaves_s: basepeak = yes

649.fotonik3d_s: basepeak = yes

654.roms_s: -flto -Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-region-vectorize
-Wl,-mllvm -Wl,-vector-library=LIBMVEC
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-enable-X86-prefetching -O3 -march=znver2
-funroll-loops -Mrecursive -mllvm -vector-library=LIBMVEC
-Kieee -fno-finite-math-only -DSPEC_OPENMP -fopenmp
-fopenmp=libomp -lomp -lpthread -ldl -lmvec -lamdlibm
-ljemalloc -liflang

Benchmarks using both Fortran and C:

621.wrf_s: -flto -Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-region-vectorize
-Wl,-mllvm -Wl,-vector-library=LIBMVEC
-Wl,-mllvm -Wl,-reduce-array-computations=3 -Ofast
-march=znver2 -mno-sse4a -fstruct-layout=5
-mllvm -vectorize-memory-aggressively
-mllvm -function-specialize -mllvm -enable-gvn-hoist
-mllvm -unroll-threshold=50 -fremap-arrays
-mllvm -vector-library=LIBMVEC
-mllvm -reduce-array-computations=3
-mllvm -global-vectorize-slp -mllvm -inline-threshold=1000
-fly-function-specialization -O3 -funroll-loops
-Mrecursive -Kieee -fno-finite-math-only -DSPEC_OPENMP
-fopenmp -fopenmp=libomp -lomp -lpthread -ldl -lmvec

(Continued on next page)
**Supermicro**

A+ Server 1123US-TR4
(H11DSU-iN, AMD EPYC 7352)

**SPECspeed®2017_fp_base = 132**

**SPECspeed®2017_fp_peak = 138**

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**Peak Optimization Flags (Continued)**

621.wrf_s (continued):
- lamdlibm
- ljemalloc
- lflang

627.cam4_s: basepeak = yes

628.pop2_s: basepeak = yes

Benchmarks using Fortran, C, and C++:

607.cactuBSSN_s: basepeak = yes

---

**Peak Other Flags**

C benchmarks:
- Wno-return-type
- DUSE_OPENMP

Fortran benchmarks:
- DUSE_OPENMP
- Wno-return-type

Benchmarks using both Fortran and C:
- DUSE_OPENMP
- Wno-return-type

Benchmarks using Fortran, C, and C++:
- Wno-return-type
- DUSE_OPENMP

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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/Supermicro-Platform-Settings-V1.2-Rome-revB.xml

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