## SPEC CPU®2017 Floating Point Speed Result

### Supermicro

A+ Server 2124BT-HTR  
(H12DST-B , AMD EPYC 7252)

<table>
<thead>
<tr>
<th>SPECspeed®2017_fp_base = 78.9</th>
<th>SPECspeed®2017_fp_peak = 82.0</th>
</tr>
</thead>
</table>

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

<table>
<thead>
<tr>
<th>Threads</th>
<th>SPECspeed®2017_fp_base (78.9)</th>
<th>SPECspeed®2017_fp_peak (82.0)</th>
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<tr>
<td>603.bwaves_s 16</td>
<td></td>
<td></td>
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<tr>
<td>607.cactuBSSN_s 16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>619.lbm_s 16</td>
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</tr>
<tr>
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<td></td>
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</tr>
<tr>
<td>627.cam4_s 16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>628.pop2_s 16</td>
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<td></td>
</tr>
<tr>
<td>638.imagick_s 16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>644.nab_s 32</td>
<td></td>
<td></td>
</tr>
<tr>
<td>649.fotonik3d_s 16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>654.roms_s 16</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Hardware

- **CPU Name:** AMD EPYC 7252  
- **Max MHz:** 3200  
- **Nominal:** 3100  
- **Enabled:** 16 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:** 64 MB I+D on chip per core, 16 MB shared / 2 cores  
- **Other:** None  
- **Memory:** 512 GB (16 x 32 GB 2Rx4 PC4-3200AA-R)  
- **Storage:** 1 x 200 GB SATA III SSD  
- **Other:** None

### Software

- **OS:** Ubuntu 19.04  
- **Compiler:** C/C++/Fortran: Version 2.0.0 of AOCC  
- **Parallel:** Yes  
- **Firmware:** Version 1.1 released Jan-2020  
- **File System:** ext4  
- **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 set to prefer performance at the cost of additional power usage.
Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Base Seconds</th>
<th>Base Ratio</th>
<th>Peak Seconds</th>
<th>Peak Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>603.bwaves_s</td>
<td>16</td>
<td>203</td>
<td>205</td>
<td>204</td>
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<tr>
<td>607.cactuBSSN_s</td>
<td>16</td>
<td>139</td>
<td>143</td>
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<tr>
<td>619.lbm_s</td>
<td>16</td>
<td>150</td>
<td>35.0</td>
<td>150</td>
<td>35.0</td>
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<tr>
<td>621.wrf_s</td>
<td>16</td>
<td>152</td>
<td>86.8</td>
<td>153</td>
<td>86.7</td>
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<tr>
<td>627.cam4_s</td>
<td>16</td>
<td>209</td>
<td>42.5</td>
<td>209</td>
<td>42.4</td>
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<tr>
<td>628.pop2_s</td>
<td>16</td>
<td>248</td>
<td>47.9</td>
<td>250</td>
<td>47.5</td>
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<tr>
<td>638.imagick_s</td>
<td>16</td>
<td>197</td>
<td>73.3</td>
<td>197</td>
<td>73.3</td>
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<tr>
<td>644.nab_s</td>
<td>16</td>
<td>171</td>
<td>102</td>
<td>171</td>
<td>102</td>
</tr>
<tr>
<td>649.fotonik3d_s</td>
<td>16</td>
<td>162</td>
<td>56.2</td>
<td>163</td>
<td>56.0</td>
</tr>
<tr>
<td>654.roms_s</td>
<td>16</td>
<td>146</td>
<td>108</td>
<td>147</td>
<td>107</td>
</tr>
</tbody>
</table>

SPECspeed®2017_fp_base = 78.9
SPECspeed®2017_fp_peak = 82.0

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)
Supermicro
A+ Server 2124BT-HTR
(H12DST-B, AMD EPYC 7252)

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SPECspeed®2017_fp_peak = 82.0

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

Test Date: Mar-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 = "0-31"
LD_LIBRARY_PATH = 
"/home/cpu2017/amd_speed_aocc200_rome_c_lib/64;/home/cpu2017/amd_speed_a_ 
occ200_rome_c_lib/32:"
MALLOC_CONF = "retain:true"
OMP_DYNAMIC = "false"
OMP_SCHEDULE = "static"
OMP_STACKSIZE = "128M"
OMP_THREAD_LIMIT = "32"

Environment variables set by runcpu during the 603.bwaves_s peak run:
GOMP_CPU_AFFINITY = "0-15"

Environment variables set by runcpu during the 607.cactuBSSN_s peak run:
GOMP_CPU_AFFINITY = "0-15"

Environment variables set by runcpu during the 621.wrf_s peak run:
GOMP_CPU_AFFINITY = "0 16 1 17 2 18 3 19 4 20 5 21 6 22 7 23 8 24 9 25 10 26  
11 27 12 28 13 29 14 30 15 31"

Environment variables set by runcpu during the 638.imagick_s peak run:
GOMP_CPU_AFFINITY = "0-15"

Environment variables set by runcpu during the 644.nab_s peak run:
GOMP_CPU_AFFINITY = "0 16 1 17 2 18 3 19 4 20 5 21 6 22 7 23 8 24 9 25 10 26  
11 27 12 28 13 29 14 30 15 31"

Environment variables set by runcpu during the 654.roms_s peak run:
GOMP_CPU_AFFINITY = "0-15"

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.

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 = 150
- Package Power Limit Control = Manual
- Package Power Limit = 150
- APBDIS = 1

Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r6365 of 2019-08-21 295195f888a3d7edbe6e46a485a0011
running on h12dst-01 Fri Mar  6 13:19:01 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 7252 8-Core Processor
  - 2 "physical id"s (chips)
  - 32 "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 : 8
  - siblings : 16
  - physical 0: cores 0 1 4 5 8 9 12 13
  - physical 1: cores 0 1 4 5 8 9 12 13

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): 32
- On-line CPU(s) list: 0-31
- Thread(s) per core: 2
- Core(s) per socket: 8
- Socket(s): 2
- NUMA node(s): 2
- Vendor ID: AuthenticAMD
- CPU family: 23
- Model: 49
- Model name: AMD EPYC 7252 8-Core Processor
- Stepping: 0
- CPU MHz: 3199.538
- CPU max MHz: 3100.0000
- CPU min MHz: 1500.0000

(Continued on next page)
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SPECspeed®2017_fp_base = 78.9
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Platform Notes (Continued)

BogoMIPS: 6200.32
Virtualization: AMD-V
L1d cache: 32K
L1i cache: 32K
L2 cache: 512K
L3 cache: 16384K
NUMA node0 CPU(s): 0-7,16-23
NUMA node1 CPU(s): 8-15,24-31
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 xtopology nonstop_tsc cpuid extd_apicid aperfmperf pni
pclmulqdq monitor ssse3 fma cx16 sse4_1 sse4_2 movbe popcnt aes 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 hw_pstate sme ssbd mba sev ibrs ibpb stibp vmmcall fsgsbase bmi1 avx2
smep bmi2 cqm rdt_a rdseed adx smap clflushopt clwb sha_ni xsaveopt xsavec xgetbv1
xsaves cqm_llc cqm_occup_llc cqm_mbm_total cqm_mbm_local clzero irperf xsaveerptr
wbnoinvd arat npt lbrv svm_lock nrip_save tsc_scale vmcb_clean flushbyasid
dedecodeassists pausefilter pfthreshold avic v_vmsave_vmload vgfl umip rdpid
overflow_recov succor smca

/proc/cpuinfo cache data
  cache size : 512 KB

From numactl --hardware WARNING: a numactl '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 16 17 18 19 20 21 22 23
    node 0 size: 257911 MB
    node 0 free: 257275 MB
    node 1 cpus: 8 9 10 11 12 13 14 15 24 25 26 27 28 29 30 31
    node 1 size: 258020 MB
    node 1 free: 257584 MB
    node distances:
      node 0 1
      0: 10 32
      1: 32 10

From /proc/meminfo
  MemTotal: 528314268 kB
  HugePages_Total: 0
  Hugepagesize: 2048 kB

/usr/bin/lsb_release -d
  Ubuntu 19.04

From /etc/*release* /etc/*version*
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**Supermicro**

**A+ Server 2124BT-HTR (H12DST-B , AMD EPYC 7252)**

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**Platform Notes (Continued)**

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/"

uname -a:
Linux h12dst-01 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 sanitization
- **CVE-2017-5715 (Spectre variant 2):** Mitigation: Full AMD retpoline, IBPB: conditional, IBRS_FW, STIBP: conditional, RSB filling

run-level 3 Mar 6 07:39

SPEC is set to: /home/cpu2017

<table>
<thead>
<tr>
<th>Filesystem</th>
<th>Type</th>
<th>Size</th>
<th>Used</th>
<th>Avail</th>
<th>Use%</th>
<th>Mounted on</th>
</tr>
</thead>
<tbody>
<tr>
<td>/dev/sda2</td>
<td>ext4</td>
<td>183G</td>
<td>33G</td>
<td>141G</td>
<td>19%</td>
<td>/</td>
</tr>
</tbody>
</table>

From /sys/devices/virtual/dmi/id

- BIOS: American Megatrends Inc. 1.1 01/10/2020
- 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 SK Hynix HMA84GR7CJR4N-XN 32 kB 2 rank 3200
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**Platform Notes (Continued)**

(End of data from sysinfo program)

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### Compiler Version Notes

C

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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

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
InstalledDir: /sppo/dev/compilers/aocc-compiler-2.0.0/bin

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

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

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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

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### Compiler Version Notes (Continued)

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<tr>
<th>Fortran, C</th>
<th>621.wrf_s(base, peak) 627.cam4_s(base, peak) 628.pop2_s(base, peak)</th>
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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

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

### 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 |
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SPECspeed®2017_fp_base = 78.9
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Base Optimization Flags

C 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 -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
- -fllvm-function-specialization -z muldefs -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
- -fllvm-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
- -fllvm-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
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(H12DST-B , AMD EPYC 7252)

SPECspeed®2017_fp_base = 78.9
SPECspeed®2017_fp_peak = 82.0

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

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

Base Other Flags

C benchmarks:
-Wno-return-type

Fortran benchmarks:
-Wno-return-type

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

Benchmarks using Fortran, C, and C++:
-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: basepeak = yes


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

638.imagick_s (continued):
- 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
- fvl-function-specialization -DSPEC_OPENMP -fopenmp
- lmvec -lamdlibm -fopenmp=libomp -lomp -lpthread -ldl
- ljemalloc -lflag

644.nab_s: Same as 638.imagick_s

Fortran benchmarks:

603.bwaves_s: -flto -W1,-mllvm -W1,-function-specialize
- W1,-mllvm -W1,-region-vectorize
- W1,-mllvm -W1,-vector-library=LIBMVEC
- W1,-mllvm -W1,-reduce-array-computations=3 -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 -lflag

649.fotonik3d_s: basepeak = yes

654.roms_s: -flto -W1,-mllvm -W1,-function-specialize
- W1,-mllvm -W1,-region-vectorize
- W1,-mllvm -W1,-vector-library=LIBMVEC
- W1,-mllvm -W1,-reduce-array-computations=3
- W1,-mllvm -W1,-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 -lflag

Benchmarks using both Fortran and C:

621.wrf_s: -flto -W1,-mllvm -W1,-function-specialize
- W1,-mllvm -W1,-region-vectorize
- W1,-mllvm -W1,-vector-library=LIBMVEC
- W1,-mllvm -W1,-reduce-array-computations=3 -Ofast
- march=znver2 -mno-sse4a -fstruct-layout=5
- mllvm -vectorize-memory-aggressively

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

621.wrf_s (continued):
-mlir -function-specialize -mlir -enable-gvn-hoist
-mlir -unroll-threshold=50 -fremap-arrays
-mlir -vector-library=LIBMVEC
-mlir -reduce-array-computations=3
-mlir -global-vectorize-slp -mlir -inline-threshold=1000
-llvm -function-specialization -O3 -funroll-loops
-Mrecursive -Klee -fno-finite-math-only -DSPEC_OPENMP
-fopenmp -fopenmp=libomp -lomp -lpthread -ldl -lmvec
-llang -ljemalloc -lflang

627.cam4_s: basepeak = yes
628.pop2_s: basepeak = yes

Benchmarks using Fortran, C, and C++:
-std=c++98 -fno -Wl,-Wl,-function-specialize
-mlir -fno -Wl,-Wl,-region-vectorize -Wl,-mlir -Wl,-vector-library=LIBMVEC
-Wl,-mlir -Wl,-reduce-array-computations=3 -O3 -march=znver2
-mlir -fno -Wl,-Wl,-fstruct-layout=5 -mlir -vectorize-memory-aggressively
-llang -fno -Wl,-Wl,-function-specialization -mlir -enable-gvn-hoist
-mlir -mlir -unroll-threshold=50 -fremap-arrays
-mlir -vector-library=LIBMVEC -mlir -reduce-array-computations=3
-mlir -global-vectorize-slp -mlir -inline-threshold=1000
-llvm -function-specialization -mlir -unroll-threshold=100
-mlir -enable-partial-unswitch -mlir -loop-unswitch-threshold=200000
-mlir -funroll-loops -Mrecursive -Klee -fno-finite-math-only
-DSPEC_OPENMP -fopenmp -fopenmp=libomp -lomp -lpthread -ldl -lmvec
-llang -ljemalloc -lflang

Peak Other Flags

C benchmarks:
-Wno-return-type

Fortran benchmarks:
-Wno-return-type

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

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