# SPEC CPU®2017 Floating Point Speed Result

## Supermicro

**A+ Server 1114S-WN10RT**  
(H12SSW-NTR, AMD EPYC 7F72)

### SPECspeed®2017_fp_base = 104
### SPECspeed®2017_fp_peak = 106

**CPU2017 License:** 001176  
**Test Sponsor:** Supermicro  
**Tested by:** Supermicro  
**Test Date:** Jun-2020  
**Hardware Availability:** Jul-2020  
**Software Availability:** Nov-2019

| Threads | 0  | 15.0 | 30.0 | 45.0 | 60.0 | 75.0 | 90.0 | 105 | 120 | 135 | 150 | 165 | 180 | 195 | 210 | 225 | 240 | 255 | 270 | 285 | 300 | 315 | 330 | 345 |
|---------|----|------|------|------|------|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 603.bwaves_s | 24 |     |      |      |      |      |      | 1   | 12  | 10  | 16  | 12  | 16  | 12  | 16  | 12  | 16  | 12  | 16  | 12  | 16  | 12  | 16  | 12  | 16  | 12  | 16  |
| 607.cactuBSSN_s | 24 |     |      |      |      |      |      | 32  | 32  | 32  | 32  | 32  | 32  | 32  | 32  | 32  | 32  | 32  | 32  | 32  | 32  | 32  | 32  | 32  | 32  | 32  | 32  |
| 619.ibm_s | 24 |     |      |      |      |      |      | 32.2 | 32.4 | 32.4 | 32.4 | 32.4 | 32.4 | 32.4 | 32.4 | 32.4 | 32.4 | 32.4 | 32.4 | 32.4 | 32.4 | 32.4 | 32.4 | 32.4 | 32.4 | 32.4 | 32.4 |
| 621.wrf_s | 24 |     |      |      |      |      |      |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 627.cam4_s | 24 |     |      |      |      |      |      |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 628.pop2_s | 24 |     |      |      |      |      |      |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 638.imagick_s | 24 |     |      |      |      |      |      |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 644.nab_s | 24 |     |      |      |      |      |      |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 649.fotonik3d_s | 24 |     |      |      |      |      |      |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 654.roms_s | 24 |     |      |      |      |      |      |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |

**Software**

- **OS:** Ubuntu 19.04  
- **Compiler:** C/C++/Fortran: Version 2.0.0 of AOCC  
- **Parallel:** Yes  
- **Firmware:** Version 1.0 released May-2020  
- **File System:** ext4  
- **System State:** Run level 5 (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
A+ Server 1114S-WN10RT
(H12SSW-NTR, AMD EPYC 7F72)

SPECspeed®2017_fp_base = 104
SPECspeed®2017_fp_peak = 106

Results Table

<table>
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<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Base</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Peak</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
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<tbody>
<tr>
<td>603.bwaves_s</td>
<td>24</td>
<td>175</td>
<td>337</td>
<td>177</td>
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<td>176</td>
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<td>335</td>
<td>24</td>
<td>176</td>
<td>336</td>
<td>176</td>
<td>335</td>
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<tr>
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<td>24</td>
<td>99.4</td>
<td>168</td>
<td>101</td>
<td>164</td>
<td>99.4</td>
<td>168</td>
<td>99.0</td>
<td>168</td>
<td>24</td>
<td>99.3</td>
<td>168</td>
<td>99.3</td>
<td>168</td>
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<tr>
<td>619.lbm_s</td>
<td>24</td>
<td>162</td>
<td>32.2</td>
<td>163</td>
<td>32.2</td>
<td>163</td>
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<td>627.cam4_s</td>
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<tr>
<td>644.nab_s</td>
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<td>172</td>
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<tr>
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<td>63.7</td>
<td>142</td>
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<td>24</td>
<td>131</td>
<td>120</td>
<td>131</td>
<td>120</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)
SPEC CPU®2017 Floating Point Speed Result

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CPU2017 License: 001176
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Tested by: Supermicro

SPECspeed®2017_fp_base = 104
SPECspeed®2017_fp_peak = 106

Test Date: Jun-2020
Hardware Availability: Jul-2020
Software Availability: Nov-2019

Environment Variables Notes

Environment variables set by runcpu before the start of the run:
GOMP_CPU_AFFINITY = "0-47"
LD_LIBRARY_PATH = 
"/root/amd_speed_aocc200_rome_C_lib/64;/root/amd_speed_aocc200_rome_C_lib/32:" MALLOC_CONF = "retain:true" OMP_DYNAMIC = "false" OMP_SCHEDULE = "static" OMP_STACKSIZE = "128M" OMP_THREAD_LIMIT = "48"

Environment variables set by runcpu during the 603.bwaves_s peak run:
GOMP_CPU_AFFINITY = "0-23"

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 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 638.imagick_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 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

(Continued on next page)
General Notes (Continued)

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
APBDIS = 1
NUMA Nodes Per Socket = NPS2

Sysinfo program /root/bin/sysinfo
Rev: r6365 of 2019-08-21 295195f888a3d7ed646e485a0011
running on steven Mon Jun  1 04:48:31 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 7F72 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 4 5 8 9 12 13 16 17 20 21 24 25 28 29 32 33 36 37 40 41 44 45

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): 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
    CPU family: 23
    Model: 49
    Model name: AMD EPYC 7F72 24-Core Processor
    Stepping: 0

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SPECspeed®2017_fp_base = 104
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Platform Notes (Continued)

CPU MHz: 2981.795
CPU max MHz: 3200.000
CPU min MHz: 2500.0000
BogoMIPS: 6400.00
Virtualization: AMD-V
L1d cache: 32K
L1i cache: 32K
L2 cache: 512K
L3 cache: 16384K
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 sse2 ht syscall nx mmxext fxsr_opt pdpe1gb rdtscp lm
constant_tsc rep_good nopl xtopology nonstop_tsc cpuid ext_apicid aperfmperf pni
pclmulqdq monitor ssse3 fma cx16 sse4_1 sse4_2 movbe popcnt aes xsave avx fl64
cr3guard arch_perfmonitor cpuid rlam ts cs xsave optmiz87 mmxext fimath svm xsave
xsaveopt xsavec xgetbv1 xsaves cqm_llc cqm_occup_llc cqm_mbm_total cqm_mbm_local c1zero irperf xsaveerptr
wbnoinvd arat npt lbrv svm_lock nrip_save tsc_scale vmcb_clean flushbyasid
decodeassists pausefilter pfthreshold avic v_vmsave_vmload vgif 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 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: 257919 MB
    node 0 free: 253721 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: 258055 MB
    node 1 free: 253781 MB
    node distances:
    node 0 1
    0: 10 12
    1: 12 10

From /proc/meminfo

  MemTotal: 528307264 kB
  HugePages_Total: 0
  Hugepagesize: 2048 kB

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

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SPECspeed®2017_fp_peak = 106  
SPECspeed®2017_fp_base = 104

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 steven 5.0.0-37-generic #40-Ubuntu SMP Thu Nov 14 00:14:01 UTC 2019 x86_64
  x86_64 x86_64 GNU/Linux

Kernel self-reported vulnerability status:

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: 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
tsx_async_abort: Not affected

run-level 5 May 27 10:12

SPEC is set to: /root
  Filesystem Type Size Used Avail Use% Mounted on
  /dev/sda2 ext4 220G 17G 192G 8% /

From /sys/devices/virtual/dmi/id
  BIOS: American Megatrends Inc. 1.0 05/27/2020
  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:

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Platform Notes (Continued)

8x NO DIMM Unknown
8x SK Hynix HMAA8GR7AJR4N-XN 64 kB 2 rank 3200

(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) |
| AOCC.LLVM.2.0.0.B191.2019_07_19 clang version 8.0.0 (CLANG: Jenkins |
| 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 |
| 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 |
| 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 |
| 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 |
| 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 |
| 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 |
| 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 |
| 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 |
| 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)

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

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Base Portability Flags (Continued)

649.fotonik3d_s: -DSPEC_LP64
654.roms_s: -DSPEC_LP64

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
-flv-function-specialization -z muldefs -DSPEC_OPENMP -fopenmp
-fopenmp=libomp -lop -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
-lop -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
-lop -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

(Continued on next page)
Supermicro
A+ Server 1114S-WN10RT
(H12SSW-NTR, AMD EPYC 7F72)

SPECspeed®2017_fp_base = 104
SPECspeed®2017_fp_peak = 106

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

Test Date: Jun-2020
Hardware Availability: Jul-2020
Software Availability: Nov-2019

Base Optimization Flags (Continued)

Benchmarks using Fortran, C, and C++ (continued):
-llvm -reduce-array-computations=3 -llvm -global-vectorize-slp
-llvm -vector-library=LIBMVEC -llvm -inline-threshold=1000
-flv-function-specialization -llvm -loop-unswitch-threshold=200000
-llvm -unroll-threshold=100 -llvm -enable-partial-unswitch
-unwrap-loops -Mrecursive -z muldefs -Kieee -fno-finite-math-only
-DSPEC_OPENMP -fopenmp -fopenmp=libomp -lomp -lpthread -ldl -lmvec
-landlibm -ljemalloc -lflang

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
SPEC CPU®2017 Floating Point Speed Result

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Peak Portability Flags
Same as Base Portability Flags

Peak 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 -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`
- `-flv-function-specialization -DSPEC_OPENMP -fopenmp -lmvec -lamdlibm`
- `-fopenmp=libomp -lomp -lpthread -ldl -ljemalloc -lflang`

Fortran benchmarks:

603.bwaves_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 -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 -lflang`

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 -lflang`

Benchmarks using both Fortran and C:

621.wrf_s: basepeak = yes

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

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

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 -Ofast -march=znver2
-mno-ssse4a -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
-flv-function-specialization -mllvm -unroll-threshold=100
-mllvm -enable-partial-unswitch -mllvm -loop-unswitch-threshold=200000
-O3 -funroll-loops -Mrecursive -Kieee -fno-finite-math-only
-DSPEC_OPENMP -fopenmp -fopenmp=libomp -lomp -lpthread -ldl -lmvec
-lamdlibm -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

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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<th>Supermicro A+ Server 1114S-WN10RT (H12SSW-NTR, AMD EPYC 7F72)</th>
<th>SPECspeed®2017_fp_base = 104</th>
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