Supermicro
A+ Server 1114S-WN10RT (H12SSW-NTR, AMD EPYC 7502)

SPECspeed®2017_fp_base = 107
SPECspeed®2017_fp_peak = 109

603.bwaves_s  607.cactuBSSN_s  619.lbm_s  621.wrf_s  627.cam4_s  628.pop2_s  638.imagick_s  644.nab_s  649.fotonik3d_s  654.roms_s

<table>
<thead>
<tr>
<th>Threads</th>
<th>SPECspeed®2017_fp_base (107)</th>
<th>SPECspeed®2017_fp_peak (109)</th>
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<tbody>
<tr>
<td>32</td>
<td>166</td>
<td>166</td>
</tr>
<tr>
<td>32</td>
<td>28.7</td>
<td>30.4</td>
</tr>
<tr>
<td>32</td>
<td>128</td>
<td>128</td>
</tr>
<tr>
<td>32</td>
<td>73.0</td>
<td>73.0</td>
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<tr>
<td>32</td>
<td>69.1</td>
<td>69.1</td>
</tr>
<tr>
<td>32</td>
<td>139</td>
<td>140</td>
</tr>
<tr>
<td>32</td>
<td>58.7</td>
<td>58.7</td>
</tr>
<tr>
<td>32</td>
<td>121</td>
<td>124</td>
</tr>
</tbody>
</table>

Hardware
CPU Name: AMD EPYC 7502
Max MHz: 3350
Nominal: 2500
Enabled: 32 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, 16 MB shared / 4 cores
Other: None
Memory: 512 GB (8 x 64 GB 4Rx4 PC4-3200V-L)
Storage: 1 x 250 GB SATA III SSD
Other: None

Software
OS: Ubuntu 19.04
kernel 5.0.0-37-generic
Compiler: C/C++/Fortran: Version 2.0.0 of AOCC
Parallel: Yes
Firmware: Version T20200706102212 released Jul-2020
File System: ext4
System State: Run level 5 (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.
Supermicro
A+ Server 1114S-WN10RT
(H12SSW-NTR, AMD EPYC 7502)

SPECspeed®2017_fp_base = 107
SPECspeed®2017_fp_peak = 109

Results Table

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<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
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<th>Seconds</th>
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<tr>
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<td>32</td>
<td>186</td>
<td>317</td>
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<td>99.0</td>
<td>168</td>
<td>101</td>
<td>166</td>
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<tr>
<td>619.lbm_s</td>
<td>32</td>
<td>183</td>
<td>28.7</td>
<td>182</td>
<td>28.7</td>
<td>173</td>
<td>30.3</td>
<td>64</td>
<td>172</td>
<td>30.5</td>
<td>192</td>
<td>27.2</td>
<td>172</td>
<td>30.4</td>
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<td>627.cam4_s</td>
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<td>73.0</td>
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<tr>
<td>628.pop2_s</td>
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<td>69.3</td>
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<td>140</td>
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<td>139</td>
<td>103</td>
<td>141</td>
</tr>
<tr>
<td>644.nab_s</td>
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<td>89.3</td>
<td>196</td>
<td>89.3</td>
<td>196</td>
<td>89.3</td>
<td>196</td>
<td>64</td>
<td>75.3</td>
<td>232</td>
<td>75.4</td>
<td>232</td>
<td>75.3</td>
<td>232</td>
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<td>649.fotonik3d_s</td>
<td>32</td>
<td>155</td>
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<td>654.roms_s</td>
<td>32</td>
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<td>121</td>
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<td>124</td>
<td>127</td>
<td>124</td>
<td>127</td>
<td>124</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)
Supermicro  
A+ Server 1114S-WN10RT  
(H12SSW-NTR, AMD EPYC 7502)  

SPECspeed®2017_fp_base = 107
SPECspeed®2017_fp_peak = 109

Environment Variables Notes

Environment variables set by runcpu before the start of the run:
GOMP_CPU_AFFINITY = "0-63"
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 = "64"

Environment variables set by runcpu during the 607.cactuBSSN_s peak run:
GOMP_CPU_AFFINITY = "0-31"

Environment variables set by runcpu during the 619.lbm_s peak run:
GOMP_CPU_AFFINITY = "0 32 1 33 2 34 3 35 4 36 5 37 6 38 7 39 8 40 9 41 10 42 11 43 12 44 13 45 14 46 15 47 16 48 17 49 18 50 19 51 20 52 21 53 22 54 23 55 24 56 25 57 26 58 27 59 28 60 29 61 30 62 31 63"

Environment variables set by runcpu during the 621.wrf_s peak run:
GOMP_CPU_AFFINITY = "0-31"

Environment variables set by runcpu during the 638.imagick_s peak run:
GOMP_CPU_AFFINITY = "0-31"

Environment variables set by runcpu during the 644.nab_s peak run:
GOMP_CPU_AFFINITY = "0 32 1 33 2 34 3 35 4 36 5 37 6 38 7 39 8 40 9 41 10 42 11 43 12 44 13 45 14 46 15 47 16 48 17 49 18 50 19 51 20 52 21 53 22 54 23 55 24 56 25 57 26 58 27 59 28 60 29 61 30 62 31 63"

Environment variables set by runcpu during the 649.fotonik3d_s peak run:
GOMP_CPU_AFFINITY = "0-31"

Environment variables set by runcpu during the 654.roms_s peak run:
GOMP_CPU_AFFINITY = "0-31"

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)

(Continued on next page)
Supermicro
A+ Server 1114S-WN10RT
(H12SSW-NTR, AMD EPYC 7502)

SPECspeed®2017_fp_base = 107
SPECspeed®2017_fp_peak = 109

General Notes (Continued)

is mitigated in the system as tested and documented.

ejemalloc: configured and built with GCC v9.1.0 in Ubuntu 19.04 with -O3 -znver2 -flto
ejemalloc 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 = 200
Package Power Limit Control = Manual
Package Power Limit = 200
APBDIS = 1
NUMA Nodes Per Socket = NPS4

Sysinfo program /root/bin/sysinfo
Rev: r6365 of 2019-08-21 295195f888a3d7edble6e46a485a0011
running on steven Mon Jul  6 23:55:39 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 7502 32-Core Processor
  1 "physical id"s (chips)
  64 "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 : 32
siblings : 64
physical 0: cores 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

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): 64
On-line CPU(s) list: 0-63
Thread(s) per core: 2

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

Supermicro
A+ Server 1114S-WN10RT
(H12SSW-NTR, AMD EPYC 7502)

SPECspeed®2017_fp_base = 107
SPECspeed®2017_fp_peak = 109

Platform Notes (Continued)

Core(s) per socket: 32
Socket(s): 1
NUMA node(s): 4
Vendor ID: AuthenticAMD
CPU family: 23
Model: 49
Model name: AMD EPYC 7502 32-Core Processor
Stepping: 0
CPU MHz: 1785.363
CPU max MHz: 2500.0000
CPU min MHz: 1500.0000
BogoMIPS: 4999.95
Virtualization: AMD-V
L1d cache: 32K
L1i cache: 32K
L2 cache: 512K
L3 cache: 16384K
NUMA node0 CPU(s): 0-7, 32-39
NUMA node1 CPU(s): 8-15, 40-47
NUMA node2 CPU(s): 16-23, 48-55
NUMA node3 CPU(s): 24-31, 56-63
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 pdel1gb rdtscp lm
constant_tsc rep_good nopl tsc_adjust perfctr_core perfctr_nb bpl perfctr_llc mwaitx cpb

cache size : 512 KB
From numactl --hardware WARNING: a numactl 'node' might or might not correspond to a physical chip.
available: 4 nodes (0-3)
node 0 cpu(s): 0 1 2 3 4 5 6 7 32 33 34 35 36 37 38 39
node 0 size: 128898 MB
node 0 free: 128598 MB
node 1 cpu(s): 8 9 10 11 12 13 14 15 40 41 42 43 44 45 46 47
node 1 size: 129019 MB
node 1 free: 128460 MB
node 2 cpu(s): 16 17 18 19 20 21 22 23 48 49 50 51 52 53 54 55

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

Supermicro
A+ Server 1114S-WN10RT
(H12SSW-NTR, AMD EPYC 7502)

SPECspeed®2017_fp_base = 107
SPECspeed®2017_fp_peak = 109

Platform Notes (Continued)

node 2 size: 128995 MB
node 2 free: 128766 MB
node 3 cpus: 24 25 26 27 28 29 30 31 56 57 58 59 60 61 62 63
node 3 size: 129007 MB
node 3 free: 128791 MB
node distances:
node 0  1  2   3
  0: 10 12 12 12
  1: 12 10 12 12
  2: 12 12 10 12
  3: 12 12 12 10

From /proc/meminfo
MemTotal: 528303752 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/"
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

(Continued on next page)
Platform Notes (Continued)

run-level 5 Jul 6 18:47

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. T20200706102212 07/06/2020
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:
  8x NO DIMM Unknown
  8x SK Hynix HMAA8GR7AJR4N-XN 64 kB 2 rank 3200

(End of data from sysinfo program)

Compiler Version Notes

==============================================================================
<table>
<thead>
<tr>
<th>619.lbm_s(base, peak) 638.imagick_s(base, peak) 644.nab_s(base, peak)</th>
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<tbody>
<tr>
<td>AOCC.LLVM.2.0.0.B191.2019_07_19 clang version 8.0.0 (CLANG: Jenkins</td>
</tr>
<tr>
<td>AOCC_2_0_0-Build#191) (based on LLVM AOCC.LLVM.2.0.0.B191.2019_07_19)</td>
</tr>
<tr>
<td>Target: x86_64-unknown-linux-gnu</td>
</tr>
<tr>
<td>Thread model: posix</td>
</tr>
<tr>
<td>InstalledDir: /sppo/dev/compilers/aocc-compiler-2.0.0/bin</td>
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Supermicro

A+ Server 1114S-WN10RT (H12SSW-NTR, AMD EPYC 7502)

SPEC CPU®2017 Floating Point Speed Result

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Supermicro

A+ Server 1114S-WN10RT (H12SSW-NTR, AMD EPYC 7502)

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

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

SPECspeed®2017_fp_base = 107
SPECspeed®2017_fp_peak = 109

Compiler Version Notes (Continued)

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, C

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

Base Compiler Invocation

C benchmarks:
clang

Fortran benchmarks:
flang

(Continued on next page)
Supermicro
A+ Server 1114S-WN10RT
(H12SSW-NTR, AMD EPYC 7502)

SPECspeed®2017_fp_base = 107
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CPU2017 License: 001176
Test Sponsor: Supermicro
Tested by: Supermicro

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

Base Compiler Invocation (Continued)

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

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 -mlib -unroll-threshold=50
-fremp-array -mllvm -function-specialize -mllvm -enable-gvn-hoist
-mllvm -reduce-array-computations=3 -mllvm -global-vectorize-slp
-mllvm -vector-library=LIBMVEC -mllvm -inline-threshold=1000
-fly-function-specialization -z muldefs -DSPEC_OPENMP -fopenmp
-fopenmp=libomp -lomp -lpthread -ldl -lmvec -lamdlibm -ljemalloc
-lflang

Fortran benchmarks:
-fflto -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 -mrecursion -mllvm -vector-library=LIBMVEC -z muldefs
-fKee -fno-finite-math-only -DSPEC_OPENMP -fopenmp -fopenmp=libomp
-lomp -lpthread -ldl -lmvec -lamdlibm -ljemalloc -lflang

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

**Supermicro**
A+ Server 1114S-WN10RT  
(H12SSW-NTR, AMD EPYC 7502)

<table>
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<tr>
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<tr>
<td>SPECspeed®2017_fp_peak</td>
<td>109</td>
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</table>

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

<table>
<thead>
<tr>
<th>Test Date:</th>
<th>Jul-2020</th>
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<tbody>
<tr>
<td>Hardware Availability:</td>
<td>Jul-2020</td>
</tr>
<tr>
<td>Software Availability:</td>
<td>Nov-2019</td>
</tr>
</tbody>
</table>

---

**Base Optimization Flags (Continued)**

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`

---

**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`
**SPEC CPU®2017 Floating Point Speed Result**

**Supermicro**

A+ Server 1114S-WN10RT  
(H12SSW-NTR, AMD EPYC 7502)

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

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**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:

- `-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 `mlvm -enable-gvn-hoist`
- `-mllvm -unroll-threshold=50 -fremap-arrays`
- `-mlvm -vector-library=LIBMVEC -mlvm -reduce-array-computations=3`
- `-mlvm -global-vectorize-slp -mlvm -inline-threshold=1000`
- `-flv-function-specialization -DSPEC_OPENMP -fopenmp -lmvec -lamdlibm`
- `-fopenmp=libomp -lomp -lpthread -ldl -ljemalloc -lflang`

Fortran benchmarks:

603.bwaves_s: `basepeak = yes`

649.fotonik3d_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`

- `-mlvm -vector-library=LIBMVEC -Kieee`

- `-fno-finite-math-only -DSPEC_OPENMP -fopenmp`

- `-fopenmp=libomp -lomp -lpthread -ldl -lmvec -lamdlibm`

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

649.fotonik3d_s (continued):
-ljemalloc -lflang

654.roms_s: -fopenmp -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 -Wl,-function-specialize
-Kieee -fno-finite-math-only -DSPEC_OPENMP -fopenmp
-fopenmp=libomp -lomp -lpthread -ldl -lmvec -lamlbim
-1jemalloc -lflang

Benchmarks using both Fortran and C:

621.wrf_s: -fopenmp -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 -O3 -funroll-loops
-Mrecursive -Kieee -fno-finite-math-only -DSPEC_OPENMP
-fopenmp=libomp -lomp -lpthread -ldl -lmvec
-1jemalloc -lflang

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

Benchmarks using Fortran, C, and C++:

-std=c++98 -fopenmp -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 -mllvm -global-vectorize-slp -mllvm -reduce-array-computations=3
-mllvm -enable-partial-unswitch -mllvm -loop-unswitch-threshold=200000
### Supermicro

**A+ Server 1114S-WN10RT**  
(H12SSW-NTR, AMD EPYC 7502)

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### Peak Optimization Flags (Continued)

Benchmarks using Fortran, C, and C++ (continued):

- `-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:


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