## SPEC CPU®2017 Floating Point Rate Result

**Supermicro**

A+ Server 1114S-WN10RT  
(H12SSW-NTR , AMD EPYC 7313P)

| SPECrate®2017_fp_base = 176 |  
| SPECrate®2017_fp_peak = 178 |

### Hardware

| CPU Name: | AMD EPYC 7313P |
| Max MHz: | 3700 |
| Nominal: | 3000 |
| Enabled: | 16 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 / 4 cores |
| Other: | None |
| Memory: | 512 GB (8 x 64 GB 2Rx4 PC4-3200AA-R) |
| Storage: | 1 x 200 GB SATA III SSD |
| Other: | None |

### Software

| OS: | Ubuntu 20.04.3 LTS |
| Compiler: | C/C++/Fortran: Version 3.0.0 of AOCC |
| Parallel: | No |
| Firmware: | Version 2.1 released May-2021 |
| 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. |

---

**Supermicro**  
(H12SSW-NTR, AMD EPYC 7313P)

**A+ Server 1114S-WN10RT**  

**CPU2017 License:** 001176  
**Test Date:** Oct-2021  
**Test Sponsor:** Supermicro  
**Hardware Availability:** Mar-2021  
**Tested by:** Supermicro  
**Software Availability:** Sep-2021  

| SPECrate®2017_fp_base = 176 |  
| SPECrate®2017_fp_peak = 178 |

### Copies

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<thead>
<tr>
<th>SPECrate®2017_fp_base</th>
<th>SPECrate®2017_fp_peak</th>
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<tbody>
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</table>

### Hardware

- **Supermicro**  
  (H12SSW-NTR, AMD EPYC 7313P)

- **A+ Server 1114S-WN10RT**

### SPECrate®2017_fp_base

- **Supermicro**  
  (H12SSW-NTR, AMD EPYC 7313P)

### SPECrate®2017_fp_peak

- **Supermicro**  
  (H12SSW-NTR, AMD EPYC 7313P)
Results Table

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</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

runcpu command invoked through numactl i.e.:
numactl --interleave=all runcpu <etc>

To limit dirty cache to 8% of memory, 'sysctl -w vm.dirty_ratio=8' run as root.
To limit swap usage to minimum necessary, 'sysctl -w vm.swappiness=1' run as root.
To free node-local memory and avoid remote memory usage, 'sysctl -w vm.zone_reclaim_mode=1' run as root.

(Continued on next page)
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### Supermicro

A+ Server 1114S-WN10RT  
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<thead>
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<td>SPECrate®2017_fp_peak</td>
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<table>
<thead>
<tr>
<th>CPU2017 License</th>
<th>001176</th>
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<tbody>
<tr>
<td>Test Sponsor</td>
<td>Supermicro</td>
</tr>
<tr>
<td>Tested by</td>
<td>Supermicro</td>
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<td>Oct-2021</td>
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<tr>
<td>Hardware Availability</td>
<td>Mar-2021</td>
</tr>
<tr>
<td>Software Availability</td>
<td>Sep-2021</td>
</tr>
</tbody>
</table>

### Operating System Notes (Continued)

To clear filesystem caches, 'sync; sysctl -w vm.drop_caches=3' run as root.
To disable address space layout randomization (ASLR) to reduce run-to-run variability, 'sysctl -w kernel.randomize_va_space=0' run as root.

To enable Transparent Hugepages (THP) for all allocations, 'echo always > /sys/kernel/mm/transparent_hugepage/defrag' run as root.

### Environment Variables Notes

Environment variables set by rncpu before the start of the run:

LD_LIBRARY_PATH = 
"/home/cpu2017/amd_rate_aocc300_milan_B_lib/lib;/home/cpu2017/amd_rate_aocc300_milan_B_lib/lib32:" 
MALLOC_CONF = "retain:true"

### 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.

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 Settings:  
Determinism Control = Manual  
Determinism Slider = Power  
cTDP Control = Manual  
cTDP = 180  
Package Power Limit Control = Manual  
Package Power Limit = 180  
APBDIS = 1  
NUMA Nodes Per Socket = NPS4

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

Supermicro
A+ Server 1141S-WN10RT
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CPU2017 License: 001176
Test Sponsor: Supermicro
Tested by: Supermicro

Test Date: Oct-2021
Hardware Availability: Mar-2021
Software Availability: Sep-2021

Platform Notes (Continued)

Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r6622 of 2021-04-07 982a61ec0915b55891ef0e16acaf64d
running on h12ssw-7313p Sat Oct 9 04:26:09 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 7313P 16-Core Processor
  1 "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 : 16
siblings : 32
physical 0: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
```

From lscpu from util-linux 2.34:

```
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): 32
On-line CPU(s) list: 0-31
Thread(s) per core: 2
Core(s) per socket: 16
Socket(s): 1
NUMA node(s): 4
Vendor ID: AuthenticAMD
CPU family: 25
Model: 1
Model name: AMD EPYC 7313P 16-Core Processor
Stepping: 1
Frequency boost: enabled
CPU MHz: 1798.583
CPU max MHz: 3000.0000
CPU min MHz: 1500.0000
BogoMIPS: 5999.99
Virtualization: AMD-V
L1d cache: 512 KiB
L1i cache: 512 KiB
L2 cache: 8 MiB
L3 cache: 128 MiB
NUMA node0 CPU(s): 0-3,16-19
NUMA node1 CPU(s): 4-7,20-23
```

(Continued on next page)
CPU2017 License: 001176
Test Sponsor: Supermicro
Tested by: Supermicro

CPU: Supermicro A+ Server 1114S-WN10RT

H12SSW-NTR, AMD EPYC 7313P

SPECrate®2017_fp_base = 176
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Platform Notes (Continued)

NUMA node2 CPU(s): 8-11, 24-27
NUMA node3 CPU(s): 12-15, 28-31
Vulnerability Itlb multihit: Not affected
Vulnerability L1t: Not affected
Vulnerability Mds: Not affected
Vulnerability Meltdown: Not affected
Vulnerability Spec store bypass: Mitigation; Speculative Store Bypass disabled via prctl and seccomp
Vulnerability Spectre v1: Mitigation; usercopy/swapgs barriers and __user pointer sanitization
Vulnerability Spectre v2: Mitigation; Full AMD retpointe, IBPB conditional, IBRS_FW, STIBP always-on, RSB filling
Vulnerability Srbds: Not affected
Vulnerability Tsx async abort: Not affected

From lscpu --cache:

<table>
<thead>
<tr>
<th>NAME</th>
<th>ONE-SIZE</th>
<th>ALL-SIZE</th>
<th>WAYS</th>
<th>TYPE</th>
<th>LEVEL</th>
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</thead>
<tbody>
<tr>
<td>L1d</td>
<td>32K</td>
<td>512K</td>
<td>8</td>
<td>Data</td>
<td>1</td>
</tr>
<tr>
<td>L1i</td>
<td>32K</td>
<td>512K</td>
<td>8</td>
<td>Instruction</td>
<td>1</td>
</tr>
<tr>
<td>L2</td>
<td>512K</td>
<td>8M</td>
<td>8</td>
<td>Unified</td>
<td>2</td>
</tr>
<tr>
<td>L3</td>
<td>32M</td>
<td>128M</td>
<td>16</td>
<td>Unified</td>
<td>3</td>
</tr>
</tbody>
</table>

From numactl --hardware

WARNING: a numactl 'node' might or might not correspond to a physical chip.
available: 4 nodes (0-3)
node 0 cpus: 0 1 2 3 16 17 18 19
node 0 size: 128897 MB
node 0 free: 127613 MB
node 1 cpus: 4 5 6 7 20 21 22 23
node 1 size: 128897 MB
node 1 free: 128712 MB
node 2 cpus: 8 9 10 11 24 25 26 27
node 2 free: 127613 MB
node 3 cpus: 12 13 14 15 28 29 30 31
node 3 size: 128897 MB
node 3 free: 127613 MB
node 3 memory: 512 KB
node 0 memory: 512 KB
node 1 memory: 512 KB
node 2 memory: 512 KB
node 3 memory: 512 KB

From /proc/cpuinfo cache data

<table>
<thead>
<tr>
<th>NAME</th>
<th>ONE-SIZE</th>
<th>ALL-SIZE</th>
<th>WAYS</th>
<th>TYPE</th>
<th>LEVEL</th>
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<td>32M</td>
<td>128M</td>
<td>16</td>
<td>Unified</td>
<td>3</td>
</tr>
</tbody>
</table>

cape size: 512 KB

(Continued on next page)
Platform Notes (Continued)

node 2 size: 129021 MB  
node 2 free: 125215 MB  
node 3 cpus: 12 13 14 15 28 29 30 31  
node 3 size: 129009 MB  
node 3 free: 122162 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:       528308380 kB  
HugePages_Total:       0  
Hugepagesize:       2048 kB  

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

/usr/bin/lsb_release -d  
Ubuntu 20.04.3 LTS  

From /etc/*release* /etc/*version*  
debian_version: bullseye/sid  
os-release:  
  NAME="Ubuntu"  
  VERSION="20.04.3 LTS (Focal Fossa)"  
  ID=ubuntu  
  ID_LIKE=debian  
  PRETTY_NAME="Ubuntu 20.04.3 LTS"  
  VERSION_ID="20.04"  
  HOME_URL="https://www.ubuntu.com/"  
  SUPPORT_URL="https://help.ubuntu.com/"  

uname -a:  
Linux h12ssw-7313p 5.4.0-88-generic #99-Ubuntu SMP Thu Sep 23 17:29:00 UTC 2021 x86_64  
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
Supermicro

A+ Server 1114S-WN10RT
(H12SSW-NTR, AMD EPYC 7313P)

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Copyright 2017-2021 Standard Performance Evaluation Corporation

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Test Date: Oct-2021
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Platform Notes (Continued)

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: 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 Oct 8 11:32

SPEC is set to: /home/cpu2017

From /sys/devices/virtual/dmi/id
Vendor: Supermicro
Product: Super Server
Serial: 0123456789

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 NO DIMM Unknown
8x Samsung M393A8G40AB2-CWE 64 GB 2 rank 3200

BIOS:
BIOS Vendor: American Megatrends Inc.
BIOS Version: 2.1
BIOS Date: 05/07/2021
BIOS Revision: 5.22

(End of data from sysinfo program)

Compiler Version Notes

==============================================================================
C | 519.lbm_r(base, peak) 538.imagick_r(base, peak)
| 544.nab_r(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

(Continued on next page)
Supermicro
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(H12SSW-NTR, AMD EPYC 7313P)

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Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.0.0/bin

C++             | 508.namd_r(base, peak) 510.parest_r(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          | 511.povray_r(base, peak) 526.blender_r(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 | 507.cactuBSSN_r(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

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Compiler Version Notes (Continued)

------------------------------------------------------------------------------
| Fortran | 503.bwaves_r(base, peak) 549.fotonik3d_r(base, peak) |
|         | 554.roms_r(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

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| Fortran, C | 521.wrf_r(base, peak) 527.cam4_r(base, peak) |
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AMD clang version 12.0.0 (CLANG: AOCC_3.0.0-Build#78 2020_12_10) (based on
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Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.0.0/bin
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

C++ benchmarks:
clang++

Fortran benchmarks:
flang

Benchmarks using both Fortran and C:
flang clang

Benchmarks using both C and C++:
clang++ clang

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

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Supermicro
A+ Server 1114S-WNI0RT
(H12SSW-NTR, AMD EPYC 7313P)

SPECrate®2017_fp_base = 176
SPECrate®2017_fp_peak = 178

CPU2017 License: 001176
Test Sponsor: Supermicro
Test Date: Oct-2021
Tested by: Supermicro
Hardware Availability: Mar-2021
Software Availability: Sep-2021

Base Compiler Invocation (Continued)

Benchmarks using Fortran, C, and C++:
clang++ clang flang

Base Portability Flags

503.bwaves_r: -DSPEC_LP64
507.cactuBSSN_r: -DSPEC_LP64
508.namd_r: -DSPEC_LP64
510.parest_r: -DSPEC_LP64
511.povray_r: -DSPEC_LP64
519.lbm_r: -DSPEC_LP64
521.wrf_r: -DSPEC_CASE_FLAG -Mbyteswapio -DSPEC_LP64
526.blender_r: -funsigned-char -D__BOOL_DEFINED -DSPEC_LP64
527.cam4_r: -DSPEC_CASE_FLAG -DSPEC_LP64
538.imagick_r: -DSPEC_LP64
544.nab_r: -DSPEC_LP64
549.fotonik3d_r: -DSPEC_LP64
554.roms_r: -DSPEC_LP64

Base Optimization Flags

C benchmarks:
-m64 -fllto -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 -ffast-math
-march=znver3 -fveclib=AMDLIBM -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-licm-vrp -mllvm -reduce-array-computations=3 -z muldefs
-lamdlibm -ljemalloc -lflang -lflangrti

C++ benchmarks:
-m64 -std=c++98 -mno-adx -mno-sse4a
-Wl,-mllvm -Wl,-x86-use-vzeroupper=false -flto
-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 -ffast-math
-march=znver3 -fveclib=AMDLIBM -mllvm -enable-partial-unswitch
-mllvm -unroll-threshold=100 -finline-aggressive
-flv-function-specialization -mllvm -loop-unswitch-threshold=200000

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SPEC CPU® 2017 Floating Point Rate Result

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Base Optimization Flags (Continued)

C++ benchmarks (continued):
-`-mllvm -reroll-loops -mllvm -aggressive-loop-unswitch`
-`-mllvm -extra-vectorizer-passes -mllvm -reduce-array-computations=3`
-`-mllvm -global-vectorize-slp=true -mllvm -convert-pow-exp-to-int=false`
-`-z muldefs -lamdlibm -ljemalloc -lflang -lflangrti`

Fortran benchmarks:
-`-m64 -Wl,-mllvm -Wl,-enable-X86-prefetching`
-`-Wl,-mllvm -Wl,-enable-licm-vrp -fto -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 -ffast-math`
-`-march=znver3 -fveclib=AMDLIBM -Kieee -Mrecursive`
-`-mllvm -fuse-tile-inner-loop -funroll-loops`
-`-mllvm -extra-vectorizer-passes -mllvm -lsr-in-nested-loop`
-`-mllvm -function-specialize -mllvm -align-all-nofallthru-blocks=6`
-`-Wl,-mllvm -Wl,-reduce-array-computations=3 -O3 -ffast-math`
-`-march=znver3 -fveclib=AMDLIBM -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 -extra-vectorizer-passes -mllvm -lsr-in-nested-loop -z muldefs -lamdlibm -ljemalloc -lflang -lflangrti`

Benchmarks using both Fortran and C:
-`-m64 -Wl,-mllvm -Wl,-enable-X86-prefetching`
-`-Wl,-mllvm -Wl,-enable-licm-vrp -fto -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 -ffast-math`
-`-march=znver3 -fveclib=AMDLIBM -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 -extra-vectorizer-passes -mllvm -lsr-in-nested-loop -z muldefs -lamdlibm -ljemalloc -lflang -lflangrti`

Benchmarks using both C and C++:
-`-m64 -std=c++98 -mno-adx -mno-sse4a`
-`-Wl,-mllvm -Wl,-x86-use-vzeroupper=false -fto`
-`-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 -ffast-math`
-`-march=znver3 -fveclib=AMDLIBM -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 -mllvm -enable-partial-unswitch -mllvm -unroll-threshold=100`

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SPEC CPU®2017 Floating Point Rate Result
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Supermicro
A+ Server 1114S-WN10RT
(H12SSW-NTR, AMD EPYC 7313P)

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Base Optimization Flags (Continued)

Benchmarks using both C and C++ (continued):
- 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
- z muldefs
- lamdlibm
- ljemalloc
- lflang
- lflangrti

Benchmarks using Fortran, C, and C++:
- m64
- std=c++98
- mno-adx
- -m64
- std=c++98
- mno-sse4a
- -Wl,-mllvm -Wl,-x86-use-vzeroupper=false
- -flto
- -Z muldefs
- lamdlibm
- ljemalloc
- lflang
- lflangrti

Base Other Flags

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

C++ benchmarks:
-Wno-unused-command-line-argument

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

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

Benchmarks using both C and C++:
-Wno-unused-command-line-argument

Benchmarks using Fortran, C, and C++:
-Wno-unused-command-line-argument
**SPEC CPU®2017 Floating Point Rate Result**

**Supermicro**
A+ Server 1114S-WN10RT (H12SSW-NTR, AMD EPYC 7313P)

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### Peak Compiler Invocation

**C benchmarks:**
- clang

**C++ benchmarks:**
- clang+

**Fortran benchmarks:**
- flang

**Benchmarks using both Fortran and C:**
- flang clang

**Benchmarks using both C and C++:**
- clang++ clang

**Benchmarks using Fortran, C, and C++:**
- clang++ clang flang

### Peak Portability Flags

Same as Base Portability Flags

### Peak Optimization Flags

**C benchmarks:**

`519.ibm_r`: basepeak = yes


`544.nab_r`: `-m64 -flto -Wl,-mllvm -Wl,-region-vectorize -Wl,-mllvm -Wl,-function-specialize -Ofast -march=znver3 -fveclib=AMDLIBM -fstruct-layout=7 -mllvm -unroll-threshold=50 -fremap-arrays`

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

544.nab_r (continued):
  -flv-function-specialization -mllvm -inline-threshold=1000
  -mllvm -enable-gvn-hoist -mllvm -global-vectorize-slp=true
  -mllvm -function-specialize -mllvm -enable-licm-vrp
  -mllvm -reduce-array-computations=3 -lamdlibm -ljemalloc

C++ benchmarks:

508.namd_r: basepeak = yes

510.parest_r: -m64 -std=c++98 -mno-adx -mno-sse4a
  -Wl,-mllvm -Wl,-x86-use-vzeroupper=false
  -Wl,-mllvm -Wl,-enable-licm-vrp -flto
  -Wl,-mllvm -Wl,-suppress-fmas
  -Wl,-mllvm -Wl,-function-specialize -Ofast -march=znver3
  -fveclib=AMDLIBM -finline-aggressive
  -mllvm -unroll-threshold=100 -flv-function-specialization
  -mllvm -enable-licm-vrp -mllvm -reroll-loops
  -mllvm -aggressive-loop-unswitch
  -mllvm -reduce-array-computations=3
  -mllvm -global-vectorize-slp=true -lamdlibm -ljemalloc

Fortran benchmarks:

503.bwaves_r: basepeak = yes

549.fotonik3d_r: basepeak = yes

554.roms_r: -m64 -Wl,-mllvm -Wl,-enable-X86-prefetching
  -Wl,-mllvm -Wl,-enable-licm-vrp -flto
  -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 -Kieee -Mrecursive
  -mllvm -reduce-array-computations=3
  -mllvm -global-vectorize-slp=true -mllvm -enable-licm-vrp
  -Hz,1,0x1 -mllvm -fuse-tile-inner-loop -lamdlibm
  -ljemalloc -flang -flangrti

Benchmarks using both Fortran and C:

521.wrf_r: basepeak = yes

527.cam4_r: -m64 -Wl,-mllvm -Wl,-enable-X86-prefetching
  -Wl,-mllvm -Wl,-enable-licm-vrp -flto
  -Wl,-mllvm -Wl,-function-specialize

(Continued on next page)
Supermicro
A+ Server 1114S-WN10RT
(H12SSW-NTR, AMD EPYC 7313P)

SPECrates®

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Tested by: Supermicro

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Peak Optimization Flags (Continued)

527.cam4_r (continued):
- W1, -mllvm -W1, -force-vector-interleave=1 -Ofast
- march=znver3 -fveclib=AMDLIBM -fstruct-layout=7
- mlvm -unroll-threshold=50 -fremap-arrays
- flv-function-specialization -mlvm -inline-threshold=1000
- mlvm -enable-gvn-hoist -mlvm -global-vectorize-slp=true
- mlvm -function-specialize -mlvm -enable-lcm-vrp
- mlvm -reduce-array-computations=3 -O3 -ffast-math
- funroll-loops -mlvm -extra-vectorizer-passes
- mlvm -lsr-in-nested-loop -Mrecursive -lamdlibm
- ljemalloc -lflang -lflangrti

Benchmarks using both C and C++:

511.povray_r -m64 -std=c++98 -mno-adx -mno-sse4a
- W1, -mllvm -W1, -x86-use-vzeroupper=false
- W1, -mllvm -W1, -enable-lcm-vrp -flto
- W1, -mllvm -W1, -function-specialize
- W1, -mllvm -W1, -align-all-nofallthru-blocks=6
- W1, -mllvm -W1, -reduce-array-computations=3 -Ofast
- march=znver3 -fveclib=AMDLIBM -fstruct-layout=7
- mlvm -unroll-threshold=50 -fremap-arrays
- flv-function-specialization -mlvm -inline-threshold=1000
- mlvm -enable-gvn-hoist -mlvm -global-vectorize-slp=true
- mlvm -function-specialize -mlvm -enable-lcm-vrp
- mlvm -reduce-array-computations=3 -finline-aggressive
- mlvm -unroll-threshold=100 -mlvm -rerto-loops
- mlvm -aggressive-loop-unswitch -lamdlibm -ljemalloc

526.blender_r: basepeak = yes

Benchmarks using Fortran, C, and C++:

507.cactuBSSN_r: basepeak = yes

Peak Other Flags

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

C++ benchmarks:
- Wno-unused-command-line-argument

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### SPEC CPU®2017 Floating Point Rate Result

**Supermicro**

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#### Peak Other Flags (Continued)

- Fortran benchmarks:
  - `-Wno-unused-command-line-argument`

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

- Benchmarks using both C and C++:
  - `-Wno-unused-command-line-argument`

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

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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