## SPEC CPU®2017 Floating Point Speed Result

**Supermicro**

A+ Server 1024US-TRT (H12DSU-iN, AMD EPYC 7543)

<table>
<thead>
<tr>
<th>SPECspeed®2017_fp_base</th>
<th>225</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECspeed®2017_fp_peak</td>
<td>231</td>
</tr>
</tbody>
</table>

**CPU2017 License:** 001176

**Test Sponsor:** Supermicro

**Test Date:** Nov-2021

**Hardware Availability:** Mar-2021

**Tested by:** Supermicro

**Software Availability:** May-2021

### Threads

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>64 Threads</th>
</tr>
</thead>
<tbody>
<tr>
<td>603.bwaves_s</td>
<td>64</td>
</tr>
<tr>
<td>607.cactuBSSN_s</td>
<td>64</td>
</tr>
<tr>
<td>619.lbm_s</td>
<td>64</td>
</tr>
<tr>
<td>621.wrf_s</td>
<td>64</td>
</tr>
<tr>
<td>627.cam4_s</td>
<td>64</td>
</tr>
<tr>
<td>628.pop2_s</td>
<td>64</td>
</tr>
<tr>
<td>638.imagick_s</td>
<td>64</td>
</tr>
<tr>
<td>644.nab_s</td>
<td>64</td>
</tr>
<tr>
<td>649.fotonik3d_s</td>
<td>64</td>
</tr>
<tr>
<td>654.roms_s</td>
<td>64</td>
</tr>
</tbody>
</table>

**SPECspeed®2017_fp_peak (231)**

**SPECspeed®2017_fp_base (225)**

### Hardware

**CPU Name:** AMD EPYC 7543

**Max MHz:** 3700

**Nominal:** 2800

**Enabled:** 64 cores, 2 chips

**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:** 256 MB I+D on chip per chip, 32 MB shared / 4 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:** Red Hat Enterprise Linux 8.4

**Kernel:** 4.18.0-305.el8.x86_64

**Compiler:** C/C++/Fortran: Version 3.0.0 of AOCC

**Parallel:** Yes

**Firmware:** Version 2.3 released Oct-2021

**File System:** xfs

**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 and OS set to prefer performance at the cost of additional power usage.
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**SPECspeed®2017_fp_base = 225**

**SPECspeed®2017_fp_peak = 231**

---

### Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
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</thead>
<tbody>
<tr>
<td>603.bwaves_s</td>
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<td>751</td>
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<tr>
<td>607.cactuBSSN_s</td>
<td>64</td>
<td>45.1</td>
<td>369</td>
<td>45.4</td>
<td>367</td>
<td>45.3</td>
<td>368</td>
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<tr>
<td>619.lbm_s</td>
<td>64</td>
<td>41.9</td>
<td>125</td>
<td>44.5</td>
<td>118</td>
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<tr>
<td>621.wrf_s</td>
<td>64</td>
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<td>189</td>
<td>68.4</td>
<td>193</td>
<td>70.1</td>
<td>189</td>
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<tr>
<td>627.cam4_s</td>
<td>64</td>
<td>48.7</td>
<td>182</td>
<td>48.7</td>
<td>182</td>
<td>48.7</td>
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<tr>
<td>628.pop2_s</td>
<td>64</td>
<td>163</td>
<td>72.8</td>
<td>162</td>
<td>73.2</td>
<td>163</td>
<td>72.8</td>
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<tr>
<td>638.imagick_s</td>
<td>64</td>
<td>45.9</td>
<td>314</td>
<td>46.6</td>
<td>309</td>
<td>45.9</td>
<td>314</td>
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<tr>
<td>644.nab_s</td>
<td>64</td>
<td>39.3</td>
<td>444</td>
<td>39.3</td>
<td>445</td>
<td>39.3</td>
<td>444</td>
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<tr>
<td>649.fotonik3d_s</td>
<td>64</td>
<td>78.3</td>
<td>116</td>
<td>75.7</td>
<td>120</td>
<td>78.3</td>
<td>116</td>
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<tr>
<td>654.roms_s</td>
<td>64</td>
<td>60.9</td>
<td>258</td>
<td>61.0</td>
<td>258</td>
<td>47.9</td>
<td>329</td>
</tr>
</tbody>
</table>

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### Compiler Notes


### 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.
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,

(Continued on next page)
Operating System Notes (Continued)

'echo always > /sys/kernel/mm/transparent_hugepage/enabled' and
'echo always > /sys/kernel/mm/transparent_hugepage/defrag' run as root.
To enable THP only on request for peak runs of 628.pop2_s, and 638.imagick_s,
'echo madvise > /sys/kernel/mm/transparent_hugepage/enabled' run as root.
To disable THP for peak runs of 627.cam4_s, 644.nab_s, 649.fotonik3d_s, and 654.roms_s,
'echo never > /sys/kernel/mm/transparent_hugepage/enabled' run as root.

Environment Variables Notes

Environment variables set by runcpu before the start of the run:
GOMP_CPU_AFFINITY = "0-63"
LD_LIBRARY_PATH =
"/home/cpu2017/amd_speed_aocc300_milan_B_lib/lib;/home/cpu2017/amd_speed
_aocc300_milan_B_lib/lib32;"
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 = "0-63"

Environment variables set by runcpu during the 619.lbm_s peak run:
GOMP_CPU_AFFINITY = "0-63"

Environment variables set by runcpu during the 654.roms_s peak run:
GOMP_CPU_AFFINITY = "0-63"

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
SPEC CPU®2017 Floating Point Speed Result

Supermicro
A+ Server 1024US-TRT
(H12DSU-iN, AMD EPYC 7543)

SPECspeed®2017_fp_base = 225
SPECspeed®2017_fp_peak = 231

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

Platform Notes

BIOS Settings:
Determinism Control = Manual
Determinism Slider = Power
cTDP Control = Manual
cTDP = 240
Package Power Limit Control = Manual
Package Power Limit = 240
APBDIS = 1
SMT Control = Disabled

Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r6622 of 2021-04-07 982a61ec0915b55891ef0e16acaf64d
running on H12DSU-7543 Tue Nov 9 18:37:17 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 7543 32-Core Processor
    2 "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 : 32
  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
  physical 1: 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 from util-linux 2.32.1:
  Architecture: x86_64
  CPU op-mode(s): 32-bit, 64-bit
  Byte Order: Little Endian
  CPU(s): 64
  On-line CPU(s) list: 0-63
  Thread(s) per core: 1
  Core(s) per socket: 32
  Socket(s): 2
  NUMA node(s): 2
  Vendor ID: AuthenticAMD
  BIOS Vendor ID: Advanced Micro Devices, Inc.
  CPU family: 25
  Model: 1
  Model name: AMD EPYC 7543 32-Core Processor
  BIOS Model name: AMD EPYC 7543 32-Core Processor

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Stepping: 1
CPU MHz: 2374.528
CPU max MHz: 2800.0000
CPU min MHz: 1500.0000
BogoMIPS: 5600.11
Virtualization: AMD-V
L1d cache: 32K
L1i cache: 32K
L2 cache: 512K
L3 cache: 32768K
NUMA node0 CPU(s): 0-31
NUMA node1 CPU(s): 32-63

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 pdpe1gb rdtscp lm
constant_tsc rep_good nopl nonstop_tsc cpuid extd_apicid aperfmperf pni pclmulqdq
monitor ssse3 fma cx16 pcid sse4_1 sse4_2 movbe popcnt aes xsave avx f16c rdrand
lahf_lm cmp_legacy svm extapic cr8_legacy abm ssse4 misalignsse 3dnowprefetch osvw
ibs skinit wdt tce topoext perfctr_core perfctr_nb bprext perfctr_lsc mwaitx cpb
cat_l3 cdp_l3 invpcid_single hw_pstate sme ssbd mva sev ibrs stibp vmmcall
sev_es fsgsbase bmi1 avx2 smep bmi2 invpcid cqm rdt_a rdseed adx smap clflushopt
clbw sha _ni xsaveopt xsaves xsavec xsaveopt xsaveopt xsaveopt xsaveopt xsaveopt xsaveopt

/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
node 0 size: 257832 MB
node 0 free: 257129 MB
node 1 cpus: 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56
57 58 59 60 61 62 63
node 1 size: 257999 MB
node 1 free: 257573 MB
node distances:
node 0 1
0: 10 32
1: 32 10

From /proc/meminfo
MemTotal: 528211848 kB
HugePages_Total: 0
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Test Sponsor: Supermicro
Tested by: Supermicro

SPECspeed®2017_fp_base = 225
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Test Date: Nov-2021
Hardware Availability: Mar-2021
Software Availability: May-2021

Platform Notes (Continued)

Hugepagesize: 2048 kB
/sbin/tuned-adm active
Current active profile: throughput-performance
/sys/devices/system/cpu/cpu*/cpufreq/scaling_governor has performance
From /etc/*release* /etc/*version*

os-release:
NAME="Red Hat Enterprise Linux"
VERSION="8.4 (Ootpa)"
ID="rhel"
ID_LIKE="fedora"
VERSION_ID="8.4"
PLATFORM_ID="platform:el8"
PRETTY_NAME="Red Hat Enterprise Linux 8.4 (Ootpa)"
ANSI_COLOR="0;31"
redhat-release: Red Hat Enterprise Linux release 8.4 (Ootpa)
system-release: Red Hat Enterprise Linux release 8.4 (Ootpa)
system-release-cpe: cpe:/o:redhat:enterprise_linux:8.4:ga

uname -a:
Linux H12DSU-7543 4.18.0-305.el8.x86_64 #1 SMP Thu Apr 29 08:54:30 EDT 2021 x86_64
x86_64 x86_64 GNU/Linux

Kernel self-reported vulnerability status:

CVE-2018-12207 (iTLB Multihit):
CVE-2018-3620 (L1 Terminal Fault):
Microarchitectural Data Sampling:
CVE-2017-5754 (Meltdown):
CVE-2018-3639 (Speculative Store Bypass):

CVE-2017-5753 (Spectre variant 1):
CVE-2017-5715 (Spectre variant 2):
CVE-2020-0543 (Special Register Buffer Data Sampling):
CVE-2019-11135 (TSX Asynchronous Abort):

run-level 3 Nov 9 18:36

SPEC is set to: /home/cpu2017

(Continued on next page)
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Tested by: Supermicro

Test Date: Nov-2021
Hardware Availability: Mar-2021
Software Availability: May-2021

Platform Notes (Continued)

<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/sda4</td>
<td>xfs</td>
<td>184G</td>
<td>19G</td>
<td>166G</td>
<td>10%</td>
<td>/</td>
</tr>
</tbody>
</table>

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:
16x SK Hynix HMAA4GR7AJR8N-XN 32 GB 2 rank 3200

BIOS:
- BIOS Vendor: American Megatrends Inc.
- BIOS Version: 2.3
- BIOS Date: 10/12/2021
- BIOS Revision: 5.22

(End of data from sysinfo program)

Compiler Version Notes

==============================================================================
<table>
<thead>
<tr>
<th>C</th>
<th>619.lbm_s(base, peak) 638.imagick_s(base, peak) 644.nab_s(base, peak)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AMD clang version 12.0.0 (CLANG: AOCC_3.0.0-Build#78 2020_12_10)</td>
<td>(based on LLVM Mirror.Version.12.0.0)</td>
</tr>
<tr>
<td>Target: x86_64-unknown-linux-gnu</td>
<td></td>
</tr>
<tr>
<td>Thread model: posix</td>
<td></td>
</tr>
<tr>
<td>InstalledDir: /opt/AMD/aocc-compiler-3.0.0/bin</td>
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</tr>
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</table>

==============================================================================
<table>
<thead>
<tr>
<th>C++, C, Fortran</th>
<th>607.cactuBSSN_s(base, peak)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AMD clang version 12.0.0 (CLANG: AOCC_3.0.0-Build#78 2020_12_10)</td>
<td>(based on LLVM Mirror.Version.12.0.0)</td>
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<tr>
<td>Target: x86_64-unknown-linux-gnu</td>
<td></td>
</tr>
<tr>
<td>Thread model: posix</td>
<td></td>
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CPU2017 License: 001176
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SPECspeed®2017_fp_base = 225
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Compiler Version Notes (Continued)

Target: x86_64-unknown-linux-gnu
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

==============================================================================
Fortran         | 603.bwaves_s(base, peak) 649.fotonik3d_s(base, peak)
| 654.roms_s(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
==============================================================================
Fortran, C      | 621.wrf_s(base, peak) 627.cam4_s(base, peak)
| 628.pop2_s(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
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

Fortran benchmarks:
flang

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SPECspeed®2017_fp_base = 225
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SPECspeed®2017_fp_peak = 231

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:
-m64 -mno-adx -mno-sse4a -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 -march=znver3
-fvcclib=AMDLIBM -ffast-math -flto -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
-DSPEC_OPENMP -fopenmp -fopenmp=libomp -lomp -lamdlibm -ljemalloc
-lflang -lflangrti

Fortran benchmarks:
-m64 -mno-adx -mno-sse4a -Wl,-mllvm -Wl,-enable-X86-prefetching
-Wl,-mllvm -Wl,-enable-licm-vrp -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
-march=znver3 -fvcclib=AMDLIBM -ffast-math -Mrecursive
-mllvm -fuse-tile-inner-loop -funroll-loops

(Continued on next page)
Supermicro

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A+ Server 1024US-TRT
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SPECspeed®2017_fp_base = 225
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Fortran benchmarks (continued):
-mlvm -extra-vectorizer-passes -mlvm -lsr-in-nested-loop
-mlvm -enable-licm-vrp -mlvm -reduce-array-computations=3
-mlvm -global-vectorize-slp=true -z muldefs -DSPEC_OPENMP -fopenmp
-fopenmp=libomp -lomp -lamlibm -ljemalloc -lflang -lflangrti

Benchmarks using both Fortran and C:
-m64 -mno-adx -mno-sse4a -Wl,-mlvm -Wl,-enable-X86-prefetching
-Wl,-mlvm -Wl,-enable-licm-vrp -Wl,-mlvm -Wl,-region-vectorize
-Wl,-mlvm -Wl,-function-specialize
-Wl,-mlvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mlvm -Wl,-reduce-array-computations=3 -O3 -march=zrver3
-fveclib=AMDLIBM -ffast-math -flto -fstruct-layout=5
-mlvm -unroll-threshold=50 -mlvm -inline-threshold=1000
-fremap-arrays -mlvm -function-specialize -flv-function-specialization
-mlvm -enable-gvn-hoist -mlvm -global-vectorize-slp=true
-Mrecursive -mlvm -fuse-tile-inner-loop -funroll-loops
-mlvm -extra-vectorizer-passes -mlvm -lsr-in-nested-loop -z muldefs
-DSPEC_OPENMP -fopenmp -fopenmp=libomp -lomp -lamlibm -ljemalloc
-lflang -lflangrti

Benchmarks using Fortran, C, and C++:
-m64 -mno-adx -mno-sse4a -std=c++98
-Wl,-mlvm -Wl,-x86-use-vzeroupper=false
-Wl,-mlvm -Wl,-region-vectorize -Wl,-mlvm -Wl,-function-specialize
-Wl,-mlvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mlvm -Wl,-reduce-array-computations=3 -O3 -march=zrver3
-fveclib=AMDLIBM -ffast-math -flto -fstruct-layout=5
-mlvm -unroll-threshold=50 -mlvm -inline-threshold=1000
-fremap-arrays -mlvm -function-specialize -flv-function-specialization
-mlvm -enable-gvn-hoist -mlvm -global-vectorize-slp=true
-mlvm -enable-licm-vrp -mlvm -reduce-array-computations=3
-mlvm -enable-partial-unswitch -mlvm -unroll-threshold=100
-finline-aggressive -mlvm -loop-unswitch-threshold=200000
-mlvm -reroll-loops -mlvm -aggressive-loop-unswitch
-mlvm -extra-vectorizer-passes -mlvm -convert-pow-exp-to-int=false
-Hz,1,0x1 -Mrecursive -mlvm -fuse-tile-inner-loop -funroll-loops
-mlvm -lsr-in-nested-loop -z muldefs -DSPEC_OPENMP -fopenmp
-fopenmp=libomp -lomp -lamlibm -ljemalloc -lflang -lflangrti
Supermicro
A+ Server 1024US-TRT
(H12DSU-iN, AMD EPYC 7543)

SPECspeed®2017_fp_base = 225
SPECspeed®2017_fp_peak = 231

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

Base Other Flags

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

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

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

Benchmarks using Fortran, C, and C++:
-Wno-unused-command-line-argument -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: -m64 -mno-adx -mno-sse4a
-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 -ffast-math -flto
-fstruct-layout=5 -mllvm -unroll-threshold=50

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

619.lbm_s (continued):
-fremap-arrays -flv-function-specialization
-mlir -inline-threshold=1000 -mlir -enable-gvn-hoist
-mlir -global-vectorize-slp=true
-mlir -function-specialize -mlir -enable-licm-vrp
-mlir -reduce-array-computations=3 -DSPEC.OPENMP -fopenmp
-fopenmp=libomp -lomp -landlibm -ljemalloc -lflang

644.nab_s: basepeak = yes

Forran benchmarks:

603.bwaves_s: basepeak = yes

649.fotonik3d_s: basepeak = yes

654.roms_s: -m64 -mno-adx -mno-sse4a
-W1,-mlir -W1,-enable-X86-prefetching
-W1,-mlir -W1,-enable-licm-vrp
-W1,-mlir -W1,-function-specialize
-W1,-mlir -W1,-align-all-nofallthru-blocks=6
-W1,-mlir -W1,-reduce-array-computations=3 -Ofast
-march=znver3 -fveclib=AMDLIBM -ffast-math -Mrecursive
-mlir -reduce-array-computations=3
-mlir -global-vectorize-slp=true -mlir -enable-licm-vrp
-DSPEC.OPENMP -fopenmp -fopenmp=libomp -lomp -landlibm
-ljemalloc -lflang

Benchmarks using both Fortran and C:

621.wrf_s: basepeak = yes

627.cam4_s: basepeak = yes

628.pop2_s: basepeak = yes

Benchmarks using Fortran, C, and C++:

-m64 -mno-adx -mno-sse4a -std=c++98
-W1,-mlir -W1,-x86-use-vzeroupper=false -W1,-mlir -W1,-enable-licm-vrp
-W1,-mlir -W1,-function-specialize
-W1,-mlir -W1,-align-all-nofallthru-blocks=6
-W1,-mlir -W1,-reduce-array-computations=3 -Ofast -march=znver3
-fveclib=AMDLIBM -ffast-math -flto -fstruct-layout=5
-mlir -unroll-threshold=50 -fremap-arrays -flv-function-specialization
Supermicro
A+ Server 1024US-TRT
(H12DSU-iN, AMD EPYC 7543)

SPECspeed®2017_fp_base = 225
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Test Date: Nov-2021
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Peak Optimization Flags (Continued)

Benchmarks using Fortran, C, and C++ (continued):
-`-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`
-`-finline-aggressive -mllvm -unroll-threshold=100 -mllvm -reroll-loops`
-`-mllvm -aggressive-loop-unswitch -Mrecursive -DSPEC_OPENMP -fopenmp`
-`-fopenmp=libomp -lomp -lamdlibm -ljemalloc -lflang`

Peak Other Flags

C benchmarks:
-`-Wno-unused-command-line-argument -Wno-return-type`

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

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

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